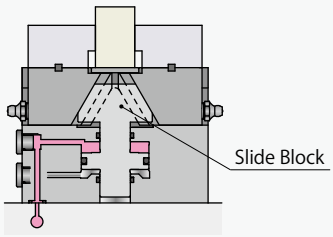
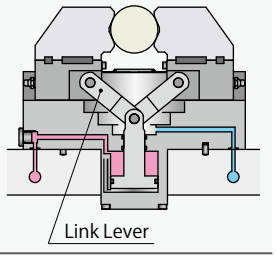
Centering Vise

Model FVA
Model FVD
Model FVC



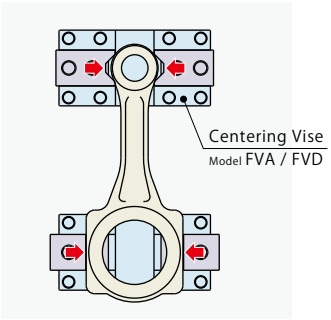
High Accuracy, High Power, Long Stroke

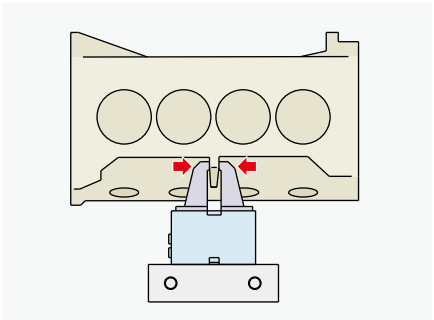
For Gripping Cylindrical Workpiece, and Workpiece Transfer Hand

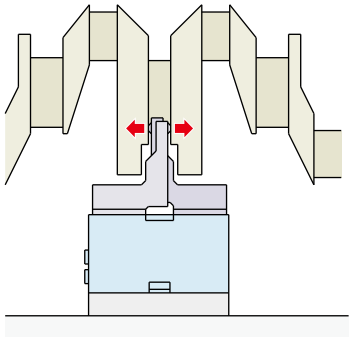
Double Action MAX. 7 MPa	 Model FVA → P.929	 Model FVD → P.933	Model FVD-L → P.933	 Model FVC → P.941
Classification	Slide Block Model			Link Motion Model
	Compact	High Power	Long Stroke	Long Stroke
Cross Section				
Features	High Accuracy	High Accuracy and High Power	High Accuracy and Long Stroke	Long Stroke of Link Motion Model
Locating Repeatability (X-axis Direction)	±0.01 mm			±0.03 mm
Slider Stroke (One Side)	FVA0401 : 5 mm FVA0631 : 5 mm FVA1001 : 5 mm	FVD1600 : 6 mm FVD2500 : 8 mm FVD4000 : 8 mm	FVD1600-L : 12 mm FVD2500-L : 16 mm FVD4000-L : 16 mm	FVC0630 : 10 mm FVC1000 : 15 mm FVC1600 : 20 mm
Accessories	• Speed Control Valve : Model BZL • Air Bleed Valve : Model BZX • G Thread Plug (With Air Breeding Function) : Model JZG • Direct-Mount Sequence Valve : Model BZS → P.947			

Application Examples

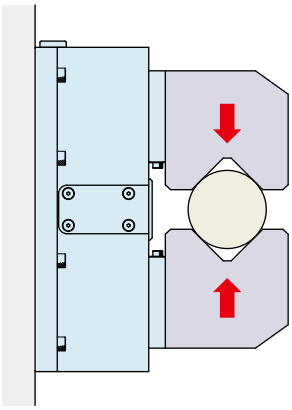
● High Accuracy Model for Locating Workpiece



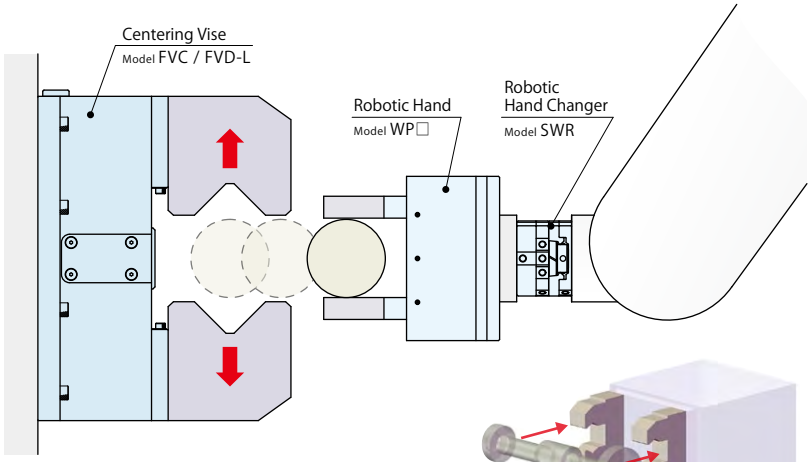




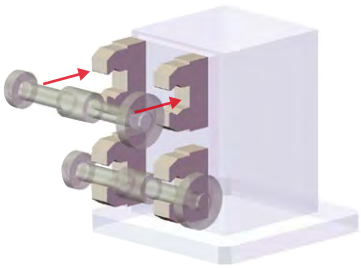
● Long Stroke Model for Automatic Transfer with Robot



Locked State



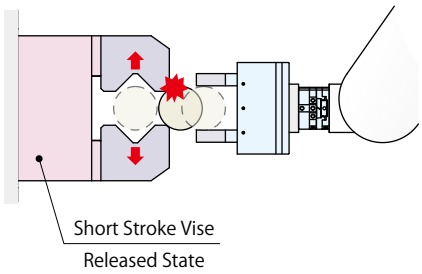
Released State



Solvable Problems

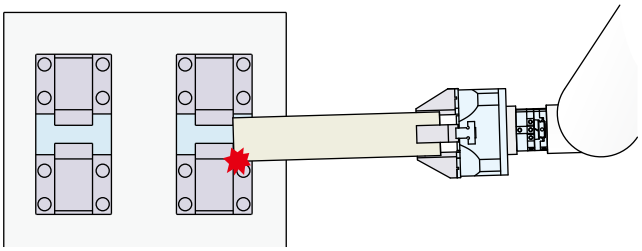
When Loading from the Front

Short stroke vise is unable to secure the clearance for loading the workpiece.

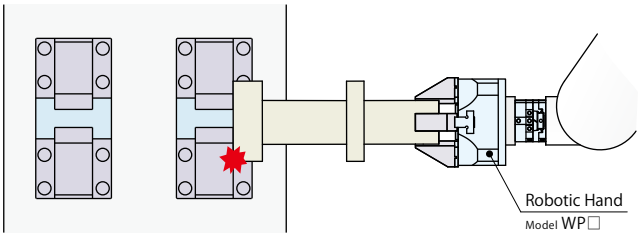


When Loading from the Side

For the long workpiece, the robot cannot keep it horizontal.

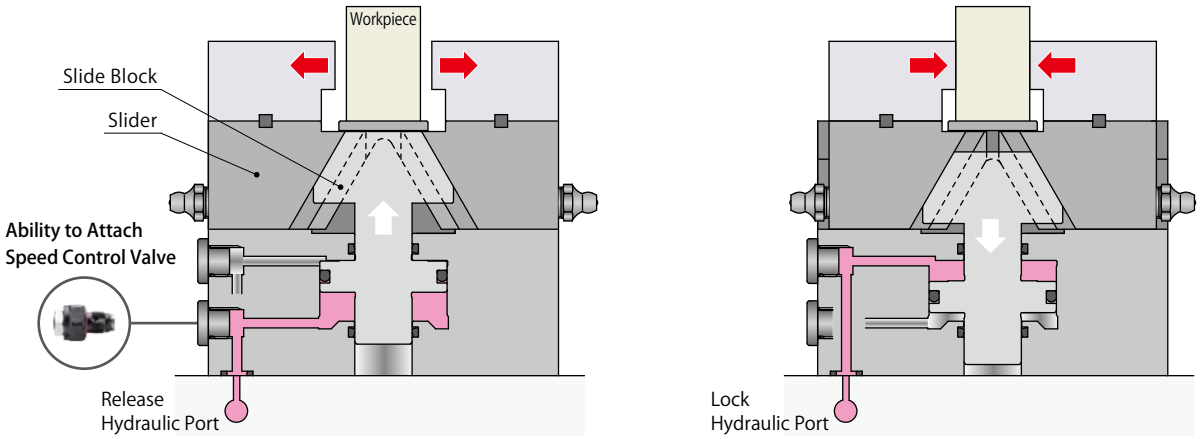


It is unable to secure the clearance for loading the irregular-shape workpiece.



Action Description : Slide Block Model

Model FVA/FVD



Release Action

The slide block is ascended to open the slider by supplying hydraulic pressure to the release port.

Lock Action

The slide block is descended to close the slider by supplying hydraulic pressure to the lock port.

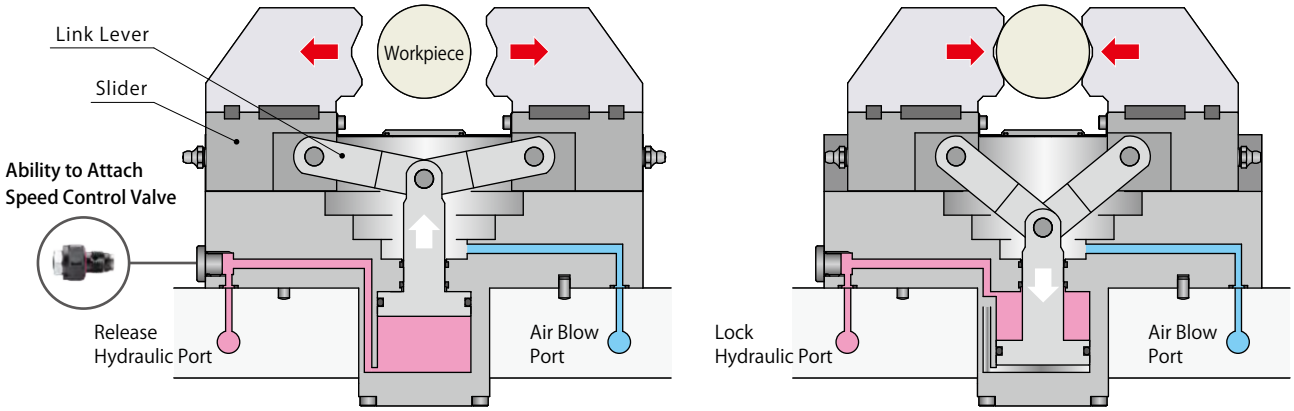
High Accuracy

The slide block design enables high repeatability and is suitable for high accuracy application.

Locating Repeatability (X-axis Direction) : ±0.01 mm

Action Description : Link Motion Model

Model FVC



Release Action

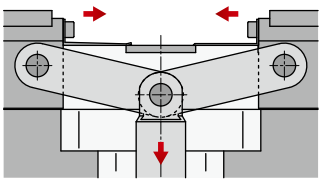
The slider is opened with the movement of the link lever by supplying hydraulic pressure to the release port.

Lock Action

The slider is closed with the movement of the link lever by supplying hydraulic pressure to the lock port.

Long Stroke

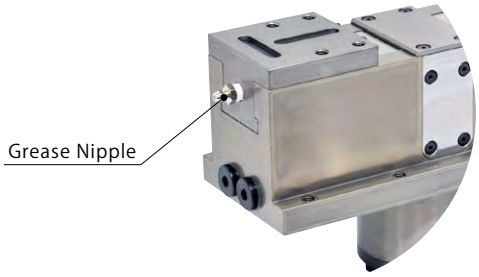
Link motion mechanism allows for wider stroke of the slider and easy loading/unloading of workpieces. Suitable for automatic transfer.



Link Motion Mechanism

● Excellent Maintainability!

The grease nipple is equipped for lubricating internal parts.



● Easy to Machine the Mounting Surface of the Clamp Lever!

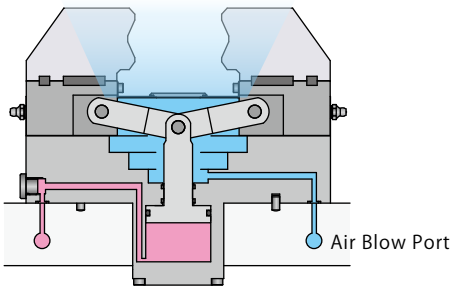
Only key slot and bolt hole need to be machined for mounting the clamp lever.
No need of complicated serration machining.

● Secure Locking of Workpiece with Powerful Gripping Force!

● Equipped with Dust Cover!

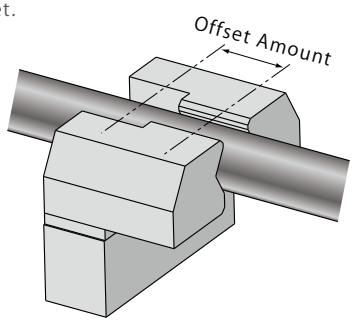
● Air Blow Function! FVA/FVC Only

The dust cover and air blow prevent contaminants and enable a longer operational life span.



● Offset Available! FVC Only

Offset of the workpiece is available.
Drill tools are accessible avoiding interference with loaders etc.
※ Please contact us when using it with offset.



Model No. Indication

FVA 063 1

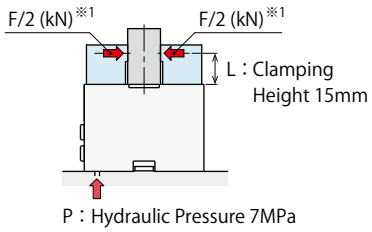
1 2

1 Clamping Force※1

040：Clamping Force 5.2 kN (At Hydraulic Pressure 7 MPa, Clamping Height 15mm)

063：Clamping Force 8.6 kN (At Hydraulic Pressure 7 MPa, Clamping Height 15mm)

100：Clamping Force 14.0 kN (At Hydraulic Pressure 7 MPa, Clamping Height 15mm)



Note：

※1. F indicates the total value of clamping force (kN) on both sides.

2 Design No.

1 ：Revision Number

Specifications

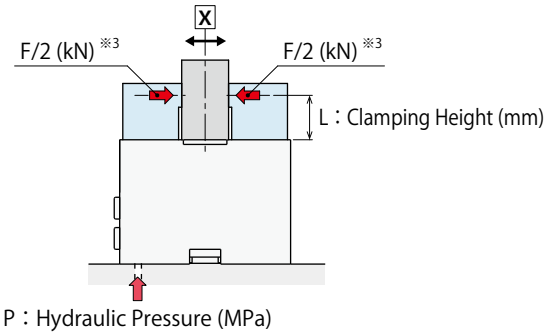
Model No.			FVA0401	FVA0631	FVA1001
Slider Stroke (One Side)		mm	5		
Max. Clamping Height (At 7MPa)		mm	50	65	75
Cylinder Area	Lock	cm2	6.0	10.0	15.8
	Release	cm2	6.0	10.0	15.8
Cylinder Capacity	Lock	cm3	5.5	9.1	14.4
	Release	cm3	5.5	9.1	14.4
Max. Operating Pressure		MPa	7.0		
Min. Operating Pressure		MPa	1.5		
Withstanding Pressure		MPa	10.5		
Locating Repeatability (X-axis Direction)※2		mm	±0.01		
Operating Temperature		℃	0 ~ 70		
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG32		
Weight		kg	2.5	3.4	4.3

Notes：

1. Adjust the operating speed so that the slider fully strokes within 1 ~ 2 seconds.
2. Secure the extra stroke of 1mm or more.

※2. Locating repeatability under the same condition.

Clamping Force Curve



Notes:

1. This table and graph show the relationship among F:Clamping Force (kN), P:Supply Hydraulic Pressure (MPa), and L:Clamping Height (mm).
2. Using in the non-usable range may damage the product and lead to fluid leakage.
3. When load is applied from the same direction the slider (X-axis direction), please consider it referring to F/2:clamping force on one side.

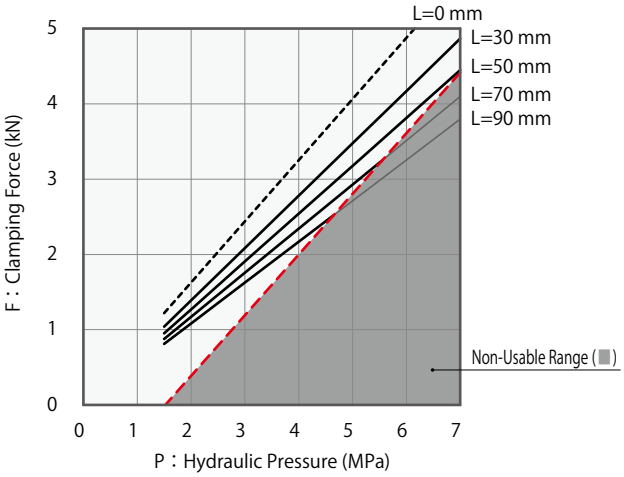
※3. F indicates the total value of clamping force (kN) on both sides.
※4. F:Clamping Force (kN), P:Supply Hydraulic Pressure (MPa), L:Clamping Height (mm).

FVA0401

Calculation Formula ※4 (kN) F=(148×P) / (183+L)

Clamping Force (kN) Non-Usable Range (■)

Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	30	50	70	90
7	4.86	4.45		
6	4.17	3.81		
5	3.47	3.18	2.92	
4	2.78	2.54	2.34	2.17
3	2.08	1.91	1.75	1.63
2	1.39	1.27	1.17	1.08
1.5	1.04	0.95	0.88	0.81

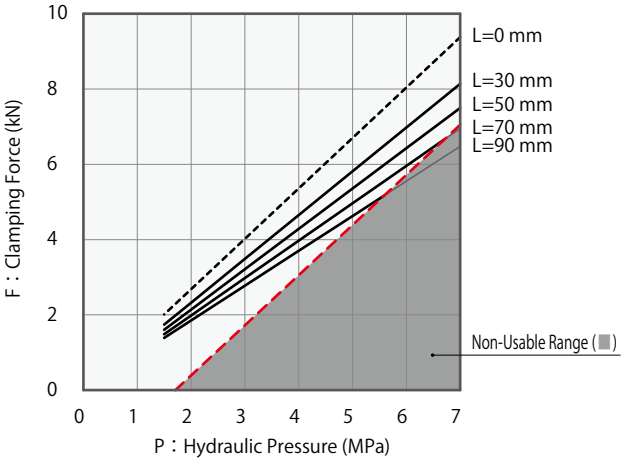


FVA0631

Calculation Formula ※4 (kN) F=(272×P) / (204+L)

Clamping Force (kN) Non-Usable Range (■)

Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	30	50	70	90
7	8.14	7.50		
6	6.97	6.43	5.96	
5	5.81	5.35	4.96	4.63
4	4.65	4.28	3.97	3.70
3	3.49	3.21	2.98	2.78
2	2.32	2.14	1.99	1.85
1.5	1.74	1.61	1.49	1.39

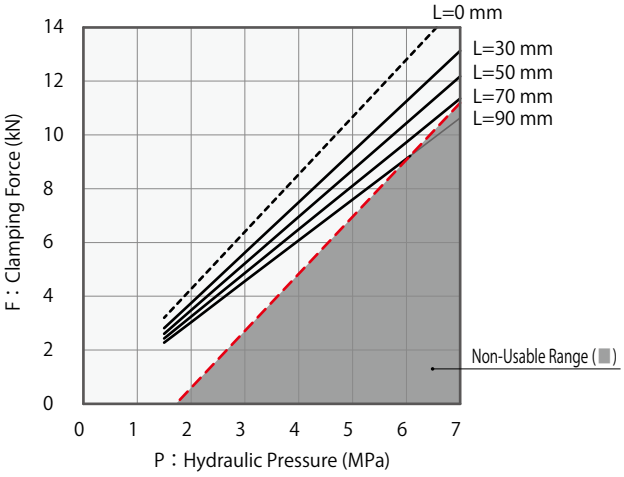


FVA1001

Calculation Formula ※4 (kN) F=(480×P) / (226+L)

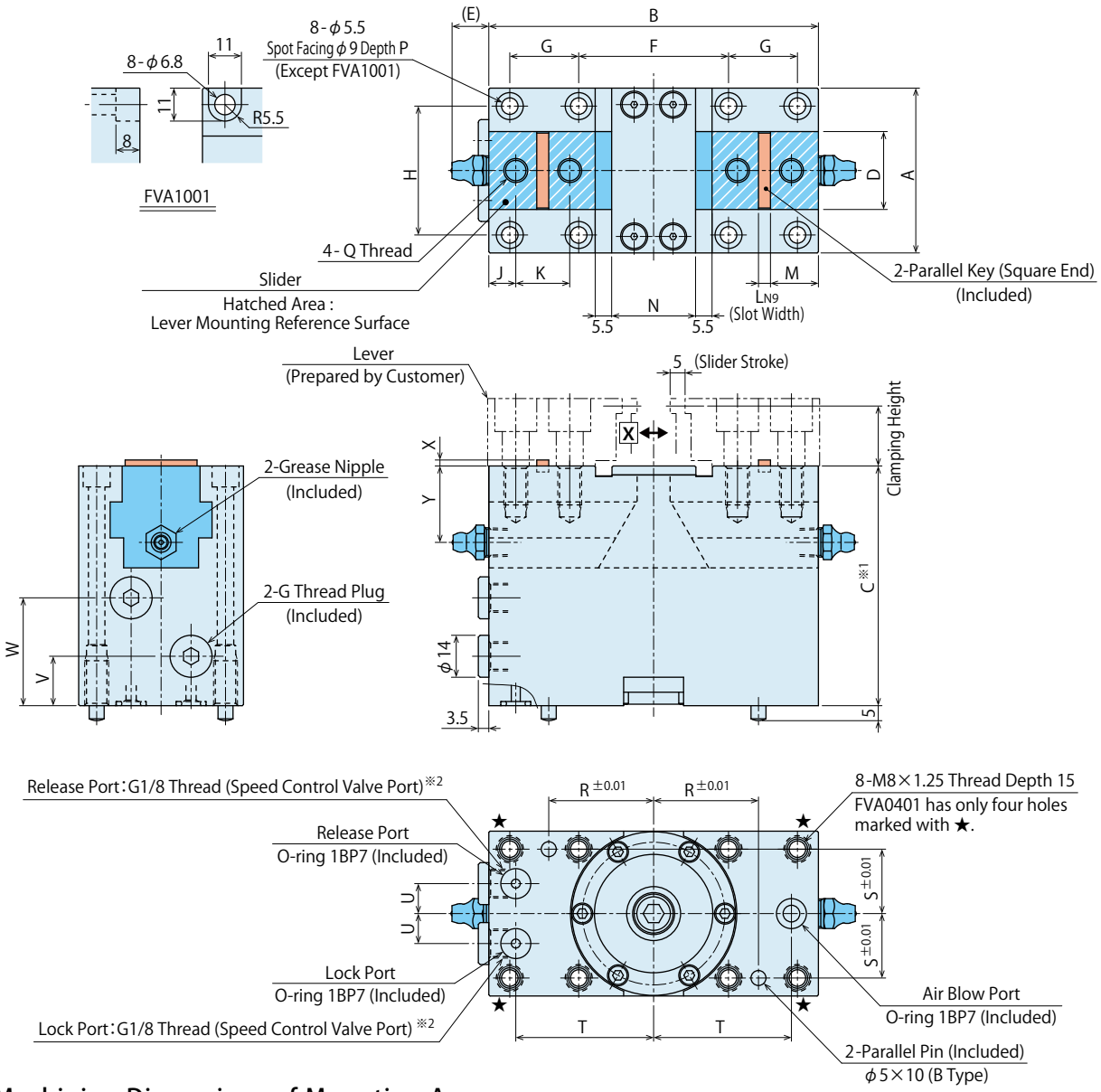
Clamping Force (kN) Non-Usable Range (■)

Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	30	50	70	90
7	13.13	12.17	11.35	
6	11.25	10.43	9.73	9.11
5	9.38	8.70	8.11	7.59
4	7.50	6.96	6.49	6.08
3	5.63	5.22	4.86	4.56
2	3.75	3.48	3.24	3.04
1.5	2.81	2.61	2.43	2.28

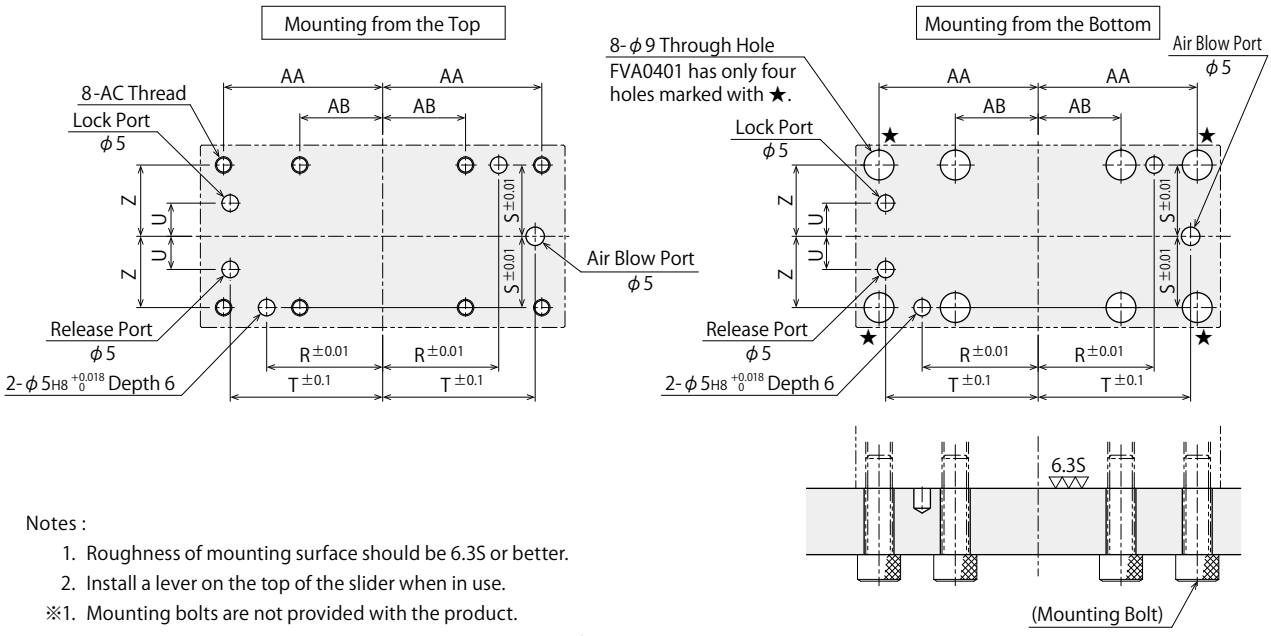


External Dimensions

※ The drawing shows the released state of FVA.



Machining Dimensions of Mounting Area



Notes :

1. Roughness of mounting surface should be 6.3S or better.
2. Install a lever on the top of the slider when in use.

※1. Mounting bolts are not provided with the product.
Please prepare them according to the mounting height referring to dimension 'C'.

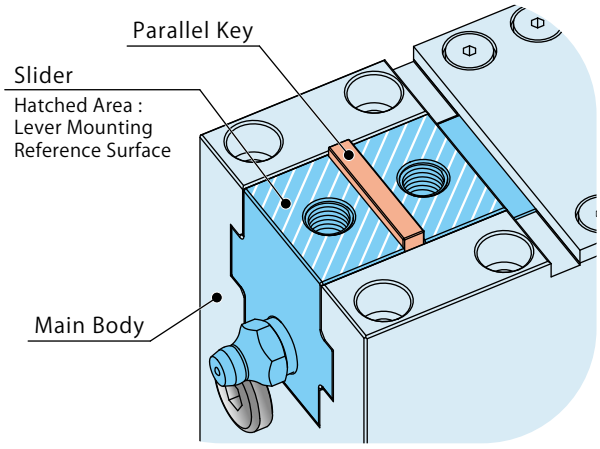
※2. Speed control valve is sold separately. Please refer to P.947 for further information.

External Dimensions and Machining Dimensions for Mounting

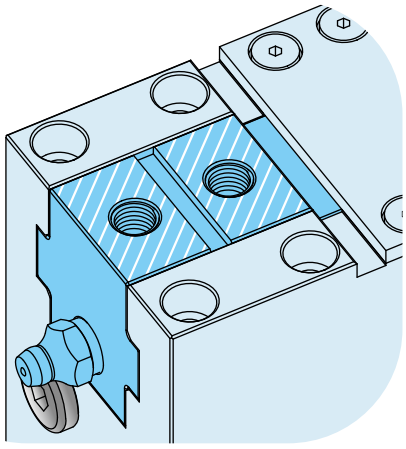
(mm)

Model No.	FVA0401	FVA0631	FVA1001
A	50	55	60
B	100	110	120
C	72	80	85
D	23	26	28
E	9	15	15
F	45	50	65
G	20	23	20
H	39	43	49
J	7	9	9
K	18	18	22
L	$4^{\ 0}_{-0.030}$	$4^{\ 0}_{-0.030}$	$5^{\ 0}_{-0.030}$
M	14	16	17.5
N	24	28	28
P	6	7	-
Q (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×13	M10×1.5×15
R	32	35	42.5
S	19.5	21.5	24.5
T	41	46	51
U	9	10	10
V	15	16.5	17
W	31	36	36.5
X	2	2	2.5
Y	23.5	25.5	29.5
Z	19.5	21.5	24.5
AA	42.5	48	52.5
AB	22.5	25	32.5
AC (Nominal×Pitch×Depth)	M5×0.8×10	M5×0.8×10	M6×1×12
Parallel Key (Width×Height×Length)	$4^{\ 0}_{-0.030}$ ×4×20	$4^{\ 0}_{-0.030}$ ×4×25	$5^{\ 0}_{-0.030}$ ×5×25

Lever Mounting Part



When the parallel key is installed.



When the parallel key is removed.

Model No. Indication

FVD 160 0 - □

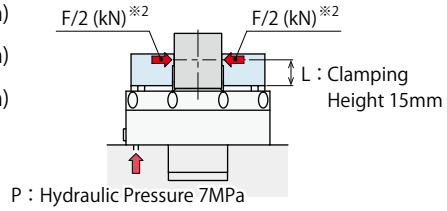
1 2 3

1 Clamping Force ※1 ※2

160：Clamping Force 32 kN (At Hydraulic Pressure 7 MPa, Clamping Height 15mm)

250：Clamping Force 50 kN (At Hydraulic Pressure 7 MPa, Clamping Height 15mm)

400：Clamping Force 80 kN (At Hydraulic Pressure 7 MPa, Clamping Height 15mm)



Notes：

※1. Clamping Force of 3 **Blank**：Standard Stroke
Refer to the clamping force curve for clamping force of 3 **L**：Long Stroke.

※2. F indicates the total value of clamping force (kN) on both sides.

2 Design No.

0 ：Revision Number

3 Stroke Code

Blank：Standard Stroke

L ：Long Stroke

Specifications

Model No.			FVD1600-□	FVD2500-□	FVD4000-□
Slider Stroke (One Side)	mm	3 **Blank** selected	6	8	8
		3 **L** selected	12	16	16
Max. Clamping Height (At 7MPa)	mm	3 **Blank** selected	60	65	70
		3 **L** selected	100	100	100
Cylinder Area	cm^2	Lock	19.5	30.6	48.7
		Release	21.2	33.2	56.7
Cylinder Capacity	cm^3	Lock	46.1	93.4	151.5
		Release	50.3	103.2	176.5
Max. Operating Pressure	MPa		7.0		
Min. Operating Pressure	MPa		1.5		
Withstanding Pressure	MPa		10.5		
Locating Repeatability (X-axis Direction) ※3	mm		±0.01		
Operating Temperature	℃		0 ~ 70		
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG32		
Weight	kg		7.6	13	20

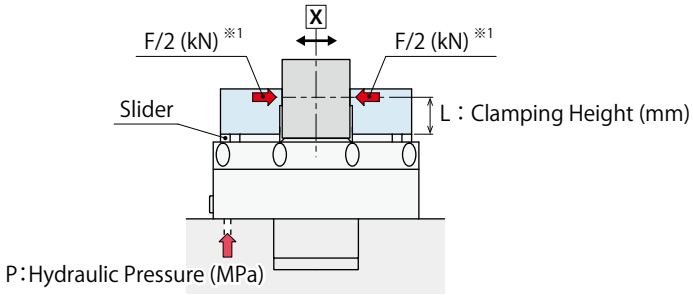
Notes：

1. Adjust the operating speed so that the slider fully strokes within 1~2 seconds.
2. Secure the extra stroke of 1mm or more.

※3. Locating repeatability under the same condition.

MEMO

Clamping Force Curve



Notes：

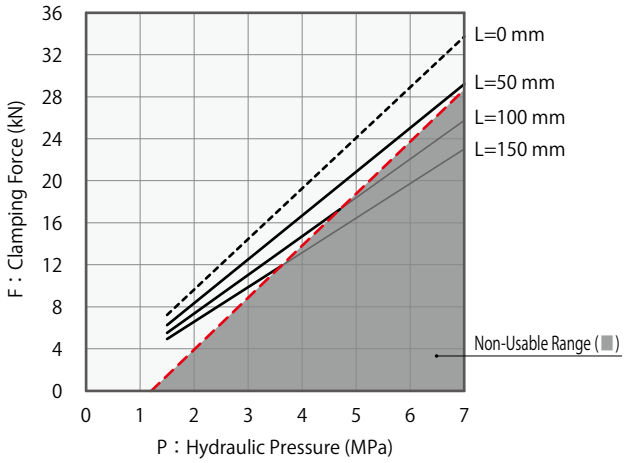
1. This table and graph show the relationship among F：Clamping Force (kN), P：Supply Hydraulic Pressure (MPa), and L：Clamping Height (mm).
2. Using in the non-usable range may damage the product and lead to fluid leakage.
3. When load is applied from the same direction as the slider (X-axis direction), please consider it referring to F/2：clamping force on one side.

※1. F indicates the total value of clamping force (kN) on both sides.
※2. F：Clamping Force (kN), P：Supply Hydraulic Pressure (MPa), L：Clamping Height (mm).

FVD Standard Stroke

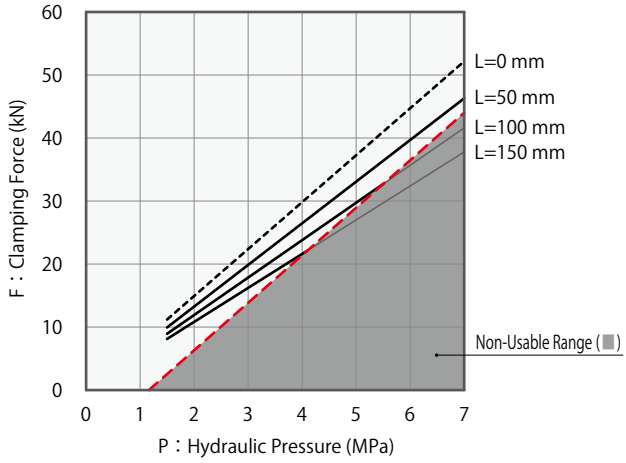
FVD1600

Calculation Formula ※2 (kN)	F=(1556×P) / (323+L)			
Clamping Force (kN)	Non-Usable Range (■)			
Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	0	50	100	150
7	33.72	29.20		
6	28.90	25.03		
5	24.09	20.86		
4	19.27	16.69	14.71	
3	14.45	12.51	11.04	9.87
2	9.63	8.34	7.36	6.58
1.5	7.23	6.26	5.52	4.93



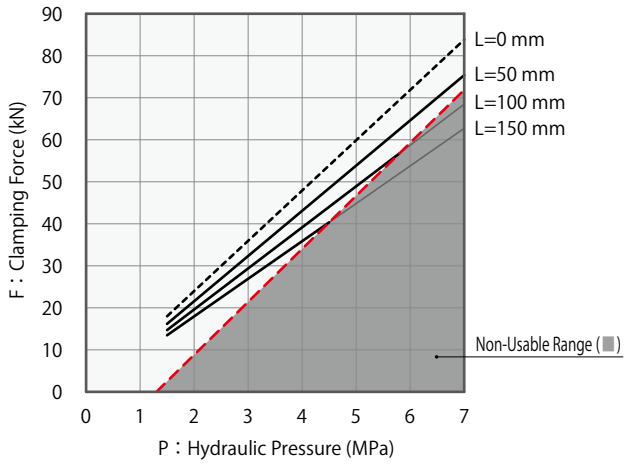
FVD2500

Calculation Formula ※2 (kN)	F=(2936×P) / (394+L)			
Clamping Force (kN)	Non-Usable Range (■)			
Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	0	50	100	150
7	52.16	46.29		
6	44.71	39.68		
5	37.26	33.06	29.72	
4	29.81	26.45	23.77	21.59
3	22.36	19.84	17.83	16.19
2	14.90	13.23	11.89	10.79
1.5	11.18	9.92	8.91	8.10



FVD4000

Calculation Formula ※2 (kN)	F=(5340×P) / (446+L)			
Clamping Force (kN)	Non-Usable Range (■)			
Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	0	50	100	150
7	83.81	75.36		
6	71.84	64.60		
5	59.87	53.83	48.90	
4	47.89	43.06	39.12	35.84
3	35.92	32.30	29.34	26.88
2	23.95	21.53	19.56	17.92
1.5	17.96	16.15	14.67	13.44



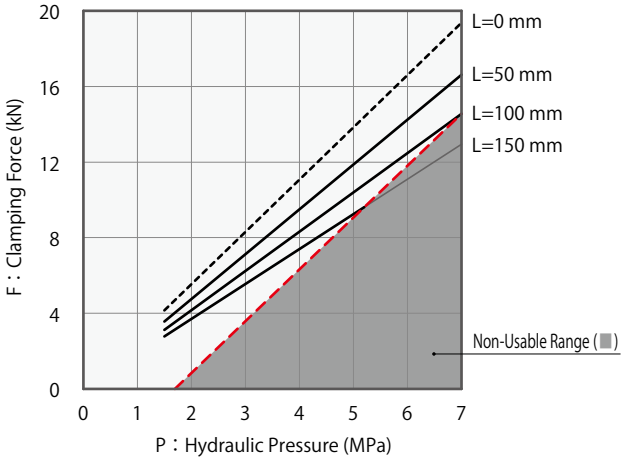
● FVD-L Long Stroke

FVD1600-L

Calculation Formula ※2 (kN) F=(836×P) / (302+L)

Clamping Force (kN) Non-Usable Range (■)

Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	0	50	100	150
7	19.38	16.63	14.56	
6	16.61	14.25	12.48	
5	13.84	11.88	10.40	9.25
4	11.07	9.50	8.32	7.40
3	8.30	7.13	6.24	5.55
2	5.54	4.75	4.16	3.70
1.5	4.15	3.56	3.12	2.77

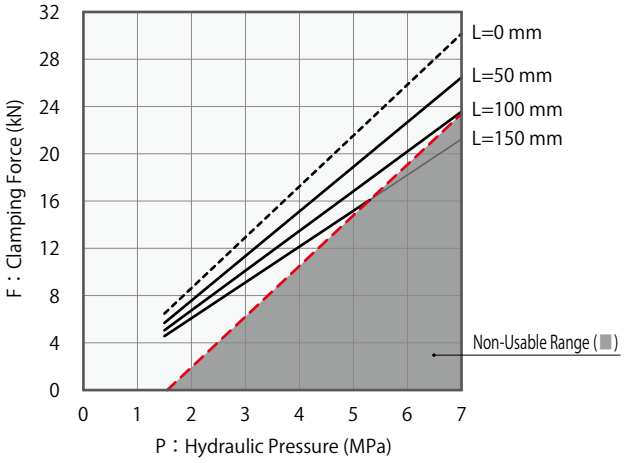


FVD2500-L

Calculation Formula ※2 (kN) F=(1538×P) / (357+L)

Clamping Force (kN) Non-Usable Range (■)

Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	0	50	100	150
7	30.16	26.45	23.56	
6	25.85	22.67	20.19	
5	21.54	18.89	16.83	15.17
4	17.23	15.12	13.46	12.13
3	12.92	11.34	10.10	9.10
2	8.62	7.56	6.73	6.07
1.5	6.46	5.67	5.05	4.55

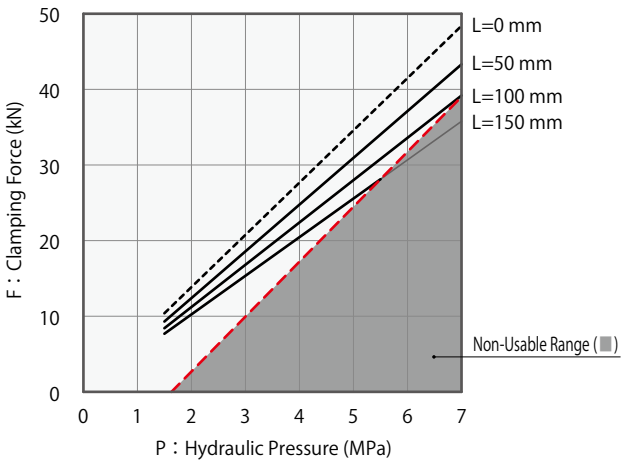


FVD4000-L

Calculation Formula ※2 (kN) F=(2938×P) / (425+L)

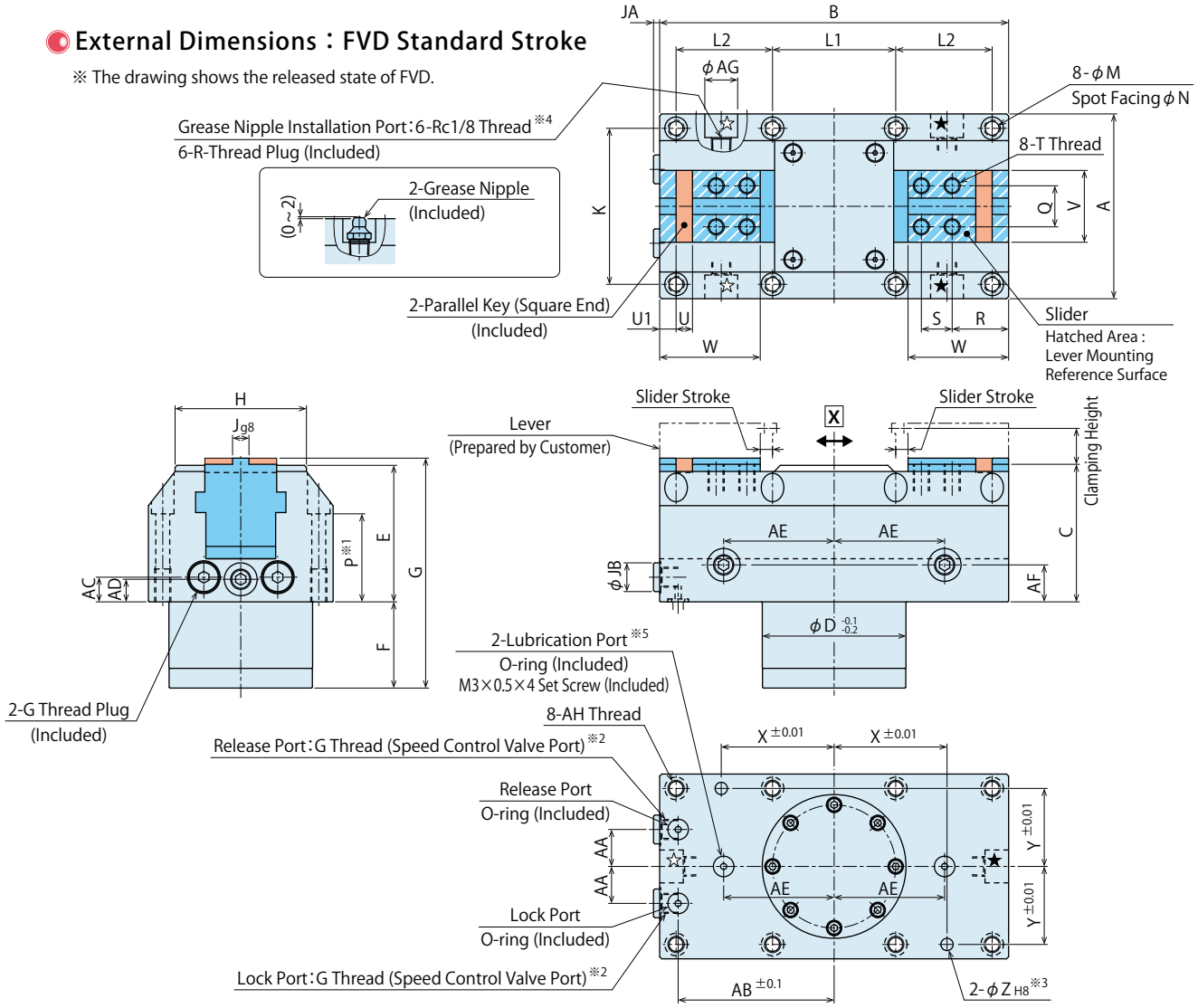
Clamping Force (kN) Non-Usable Range (■)

Hydraulic Pressure (MPa)	Clamping Height L (mm)			
	0	50	100	150
7	48.39	43.30	39.17	
6	41.48	37.11	33.58	
5	34.56	30.93	27.98	25.55
4	27.65	24.74	22.38	20.44
3	20.74	18.56	16.79	15.33
2	13.83	12.37	11.19	10.22
1.5	10.37	9.28	8.39	7.66

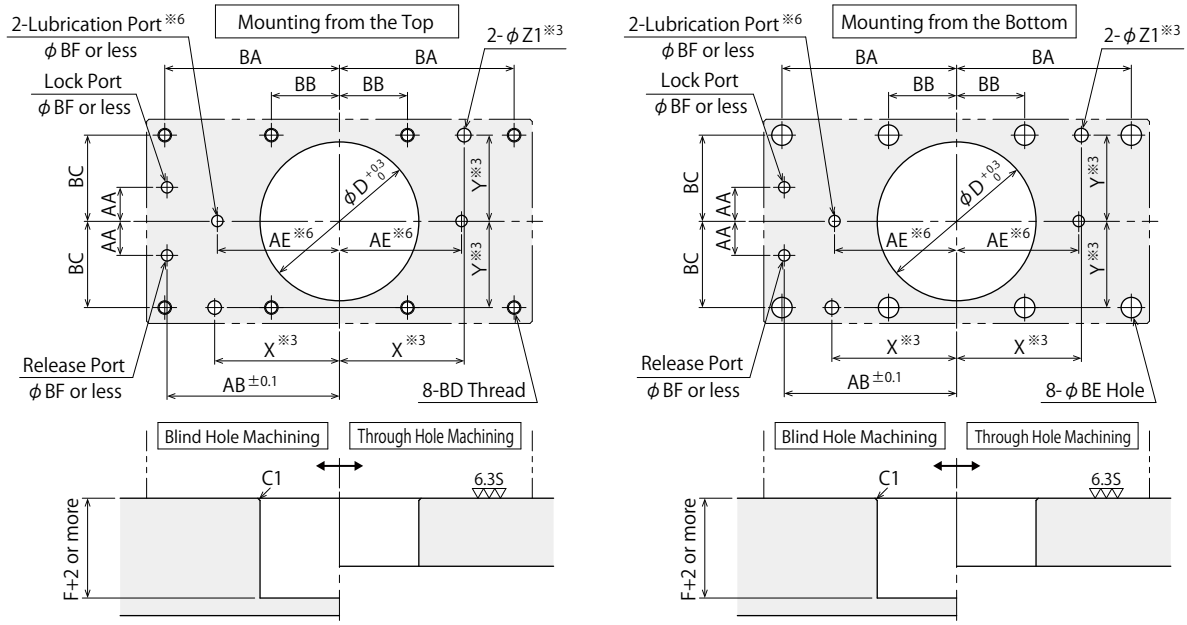


External Dimensions：FVD Standard Stroke

※ The drawing shows the released state of FVD.



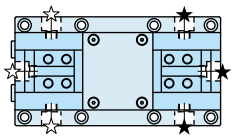
Machining Dimensions of Mounting Area



Notes :

1. Roughness of mounting surface should be 6.3S or better.
2. Install a lever on the top of the slider when in use.

※1. Mounting bolts are not provided with the product.
Please prepare them according to the mounting height referring to dimension 'P'.
※2. Speed control valve is sold separately. Please refer to P.947 for further information.
※3. Able to locate the body of centering vise by using ϕZ hole. Please consider X, Y dimension tolerance and ϕZ1 hole tolerance according to a locating pin. Locating pin is not included.
※4. When shipping, R-thread plugs are mounted to the grease nipple installation port.
Select one port each from ☆ and ★ ports and install the grease nipples to the selected ports.
※5. When using the lubrication port, remove the set screws.
※6. This machining is required only when using the lubrication port.



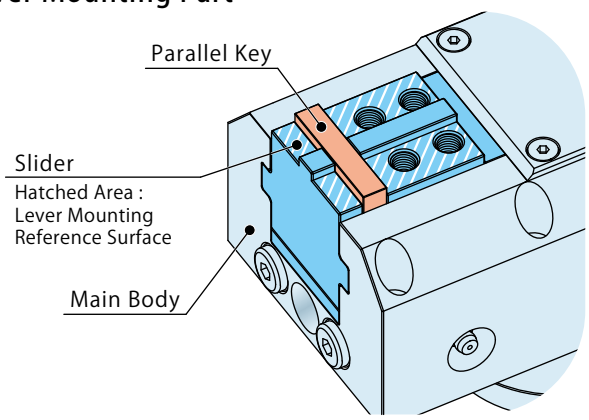
Grease Nipple Installation Port

External Dimensions and Machining Dimensions for Mounting

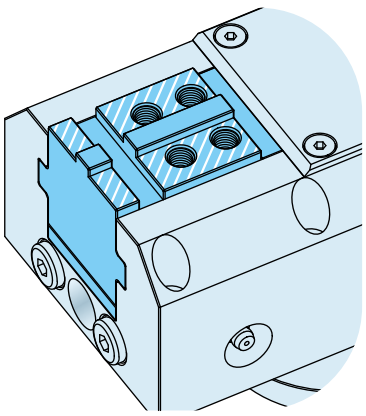
(mm)

Model No.	FVD1600	FVD2500	FVD4000
Slider Stroke (One Side)	6	8	8
A	90	100	118
B	170	206	240
C	67	82	89
D	70	85	110
E	66.5	81.5	88.5
F	42	54	58
G	112	140	151
H	65	70	80
J	$8^{-0.005}_{-0.027}$	$8^{-0.005}_{-0.027}$	$10^{-0.005}_{-0.027}$
K	76	84	98
L1	60	74	90
L2	47	57	64
M	6.8	8.7	10.5
N	11	14	17.5
P	42	50	53
Q	20	22	28
R	27.5	30	34
S	15	18.5	21
T (Nominal×Pitch×Depth)	M8×1.25×12	M10×1.5×15	M12×1.75×18
U	8	10	10
U1	8	10	10
V	40	45	55
W	49	56.5	64
X	55	68	75
Y	38	42	49
Z (Hole Diameter×Depth)	$6^{+0.018}_{0}$×6	$8^{+0.022}_{0}$×8	$8^{+0.022}_{0}$×8
Z1	6	8	8
AA	18	18	21
AB	76	94	108
AC	12	14	15
AD	11	13	15
AE	55	73	90
AF	18	20	23
AG	16	16	16
AH (Nominal×Pitch×Depth)	M8×1.25×16	M10×1.5×20	M12×1.75×24
BA	77	94	109
BB	30	37	45
BC	38	42	49
BD (Nominal×Pitch×Depth)	M6×1×11	M8×1.25×13	M10×1.5×15
BE	9	11	14
BF	5	5	6.8
JA	3	3	4
JB	14	14	19
O-ring	1BP7	1BP7	1BP9
Parallel Key (Width×Height×Length)	$8^{0}_{-0.036}$×7×40	$10^{0}_{-0.036}$×8×45	$10^{0}_{-0.036}$×8×50
G Thread	G 1/8	G 1/8	G 1/4

Lever Mounting Part



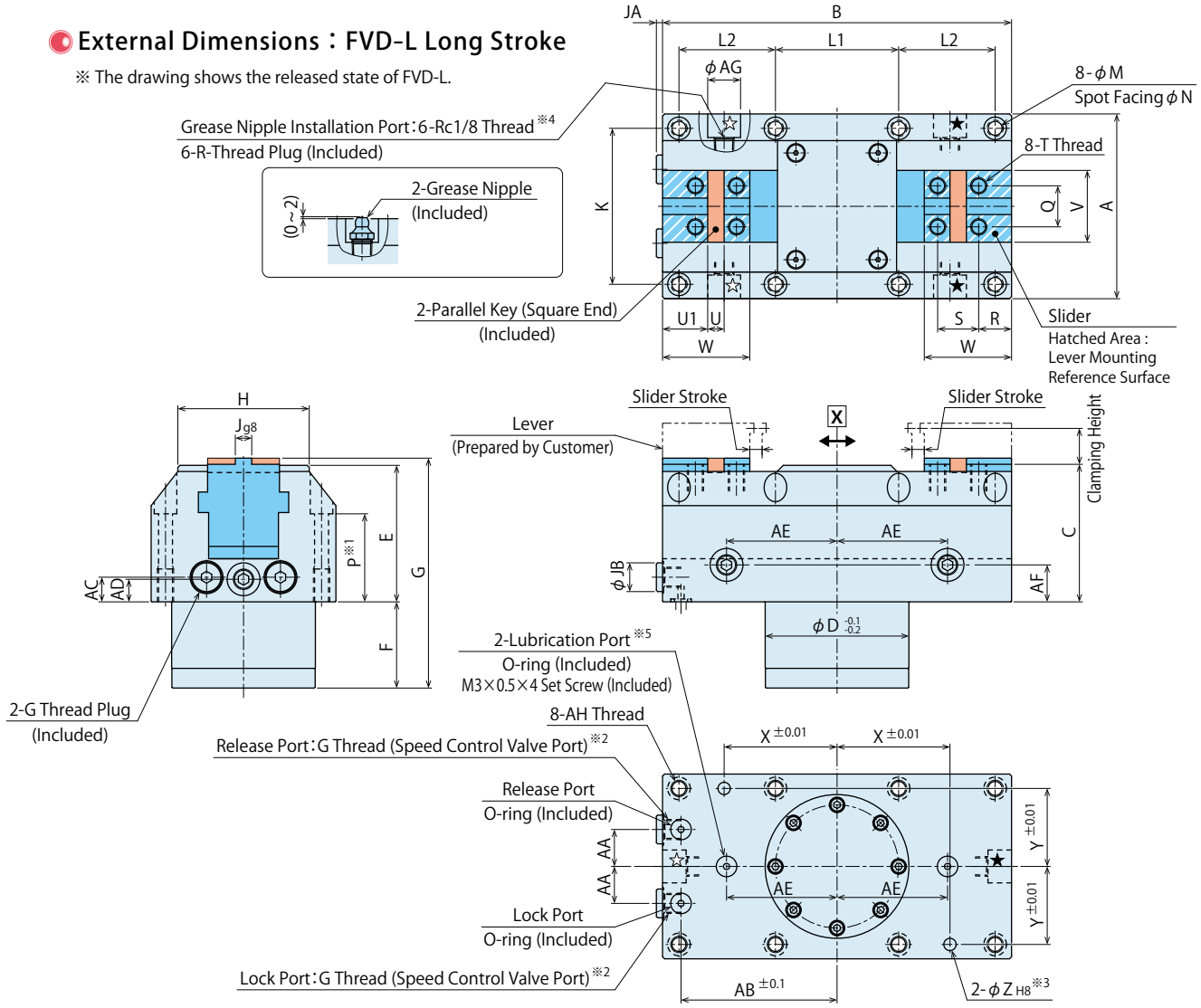
When the parallel key is installed.



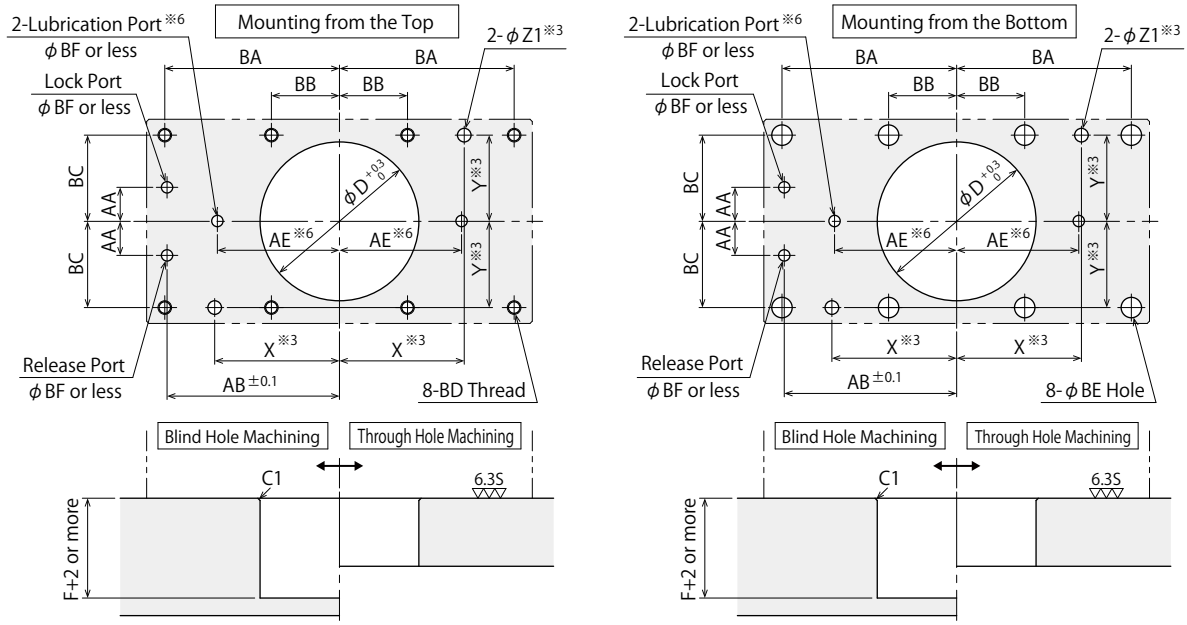
When the parallel key is removed.

External Dimensions：FVD-L Long Stroke

※ The drawing shows the released state of FVD-L.



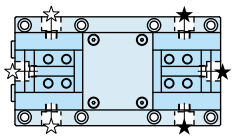
Machining Dimensions of Mounting Area



Notes :

1. Roughness of mounting surface should be 6.3S or better.
2. Install a lever on the top of the slider when in use.

※1. Mounting bolts are not provided with the product.
Please prepare them according to the mounting height referring to dimension 'P'.
※2. Speed control valve is sold separately. Please refer to P.947 for further information.
※3. Able to locate the body of centering vise by using ϕZ hole. Please consider X, Y dimension tolerance and ϕZ1 hole tolerance according to a locating pin. Locating pin is not included.
※4. When shipping, R-thread plugs are mounted to the grease nipple installation port.
Select one port each from ☆ and ★ ports and install the grease nipples to the selected ports.
※5. When using the lubrication port, remove the set screws.
※6. This machining is required only when using the lubrication port.



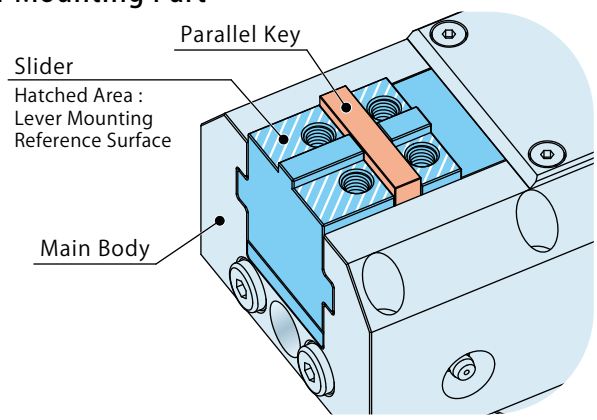
Grease Nipple Installation Port

External Dimensions and Machining Dimensions for Mounting

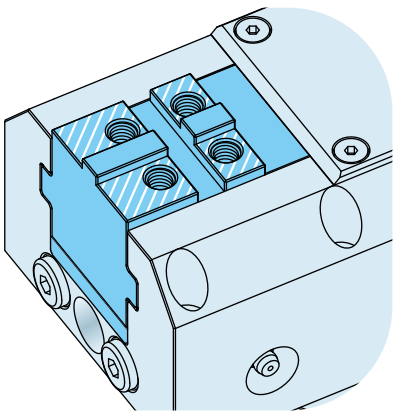
(mm)

Model No.	FVD1600-L	FVD2500-L	FVD4000-L
Slider Stroke (One Side)	12	16	16
A	90	100	118
B	170	206	240
C	67	82	89
D	70	85	110
E	66.5	81.5	88.5
F	42	54	58
G	112	140	151
H	65	70	80
J	$8^{-0.005}_{-0.027}$	$8^{-0.005}_{-0.027}$	$10^{-0.005}_{-0.027}$
K	76	84	98
L1	60	74	90
L2	47	57	64
M	6.8	8.7	10.5
N	11	14	17.5
P	42	50	53
Q	20	22	28
R	16	14	18.5
S	20	26	28
T (Nominal×Pitch×Depth)	M8×1.25×12	M10×1.5×15	M12×1.75×18
U	8	10	10
U1	22	22	27.5
V	40	45	55
W	42.5	48	55.5
X	55	68	75
Y	38	42	49
Z (Hole Diameter×Depth)	$6^{+0.018}_{0}$×6	$8^{+0.022}_{0}$×8	$8^{+0.022}_{0}$×8
Z1	6	8	8
AA	18	18	21
AB	76	94	108
AC	12	14	15
AD	11	13	15
AE	55	73	90
AF	18	20	23
AG	16	16	16
AH (Nominal×Pitch×Depth)	M8×1.25×16	M10×1.5×20	M12×1.75×24
BA	77	94	109
BB	30	37	45
BC	38	42	49
BD (Nominal×Pitch×Depth)	M6×1×11	M8×1.25×13	M10×1.5×15
BE	9	11	14
BF	5	5	6.8
JA	3	3	4
JB	14	14	19
O-ring	1BP7	1BP7	1BP9
Parallel Key (Width×Height×Length)	$8^{0}_{-0.036}$×7×40	$10^{0}_{-0.036}$×8×45	$10^{0}_{-0.036}$×8×50
G Thread	G 1/8	G 1/8	G 1/4

Lever Mounting Part



When the parallel key is installed.



When the parallel key is removed.

Model No. Indication

FVC 100 0

1 2

1 Cylinder Force ※1

063：Cylinder Force 6.6 kN (Hydraulic Pressure 7 MPa)

100：Cylinder Force 11.1 kN (Hydraulic Pressure 7 MPa)

160：Cylinder Force 16.4 kN (Hydraulic Pressure 7 MPa)

Note：

※1. Cylinder force is different from clamping force.
Refer to the clamping force curve for details of clamping force.

2 Design No.

0 ：Revision Number

Specifications

Model No.			FVC0630	FVC1000	FVC1600
Slider Stroke (One Side)		mm	10^{+1}_{0}	15^{+1}_{0}	20^{+1}_{0}
Max. Clamping Height ※2		mm	30	50	100
Cylinder Area cm2	Lock		9.4	15.8	23.4
	Release		12.6	19.6	28.3
Cylinder Capacity cm3	Lock		20.5	46.6	89.0
	Release		27.3	57.7	107.7
Max. Operating Pressure		MPa	7.0		
Min. Operating Pressure		MPa	1.5		
Withstanding Pressure		MPa	10.5		
Air Blow Operating Pressure		MPa	0.4		
Locating Repeatability (X-axis Direction) ※3		mm	±0.03		
Operating Temperature		℃	0 ~ 70		
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG32		
Weight		kg	5.8	11.8	21.2

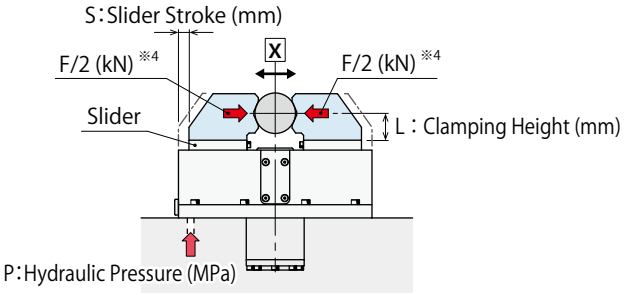
Notes :

1. Adjust the operating speed so that the slider fully strokes within 1~2 seconds.
2. Secure the extra stroke of 1mm or more.

※2. Please contact us when exceeding max. clamping height.

※3. Locating repeatability under the same condition.

Clamping Force Curve



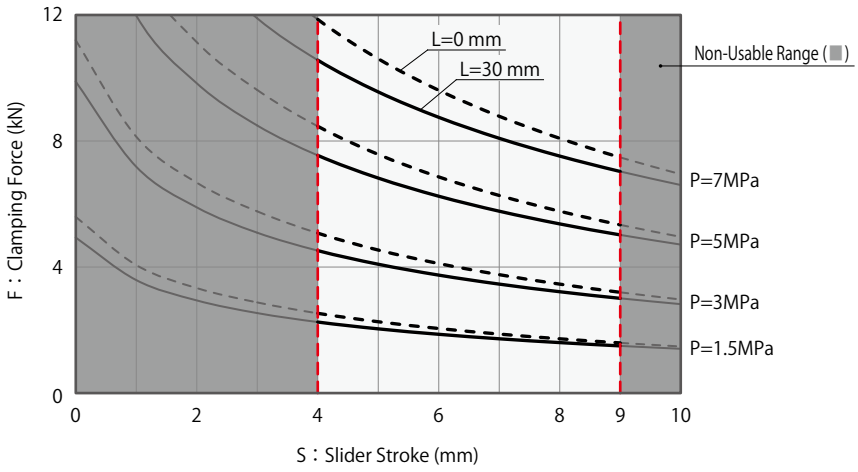
Notes：

1. This graph shows the relationship among F：Clamping Force (kN), P：Supply Hydraulic Pressure (MPa), L：Clamping Height (mm), and S：Slider Stroke (mm).
2. Using in the non-usable range may damage the product and lead to fluid leakage.
3. When load is applied from the same direction (X-axis direction) as the slider, please consider it referring to F/2：clamping force on one side.

※4. F indicates the total value of clamping force (kN) on both sides.

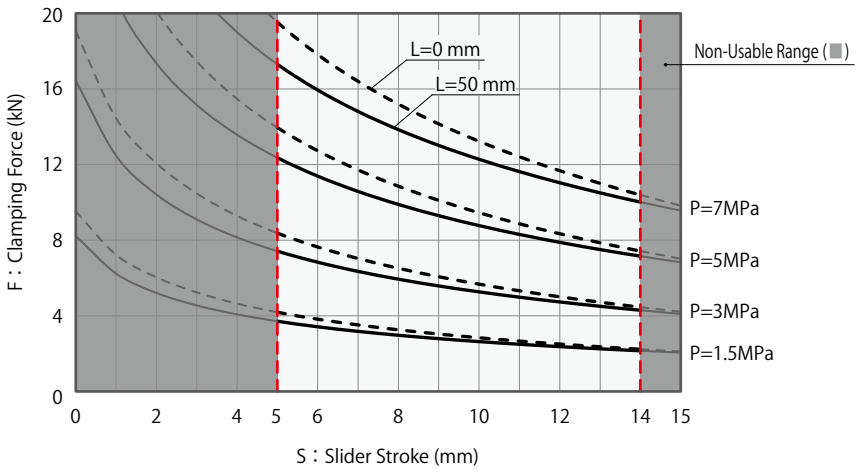
FVC0630

Max. Clamping Height ※2 30 mm



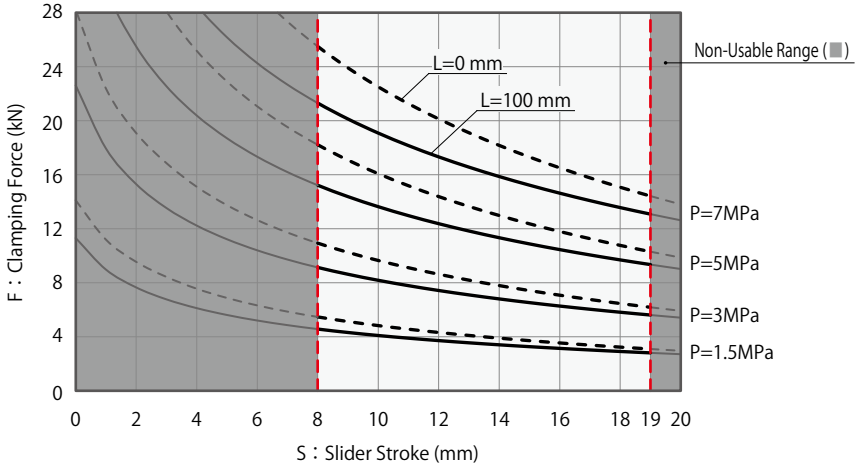
FVC1000

Max. Clamping Height ※2 50 mm



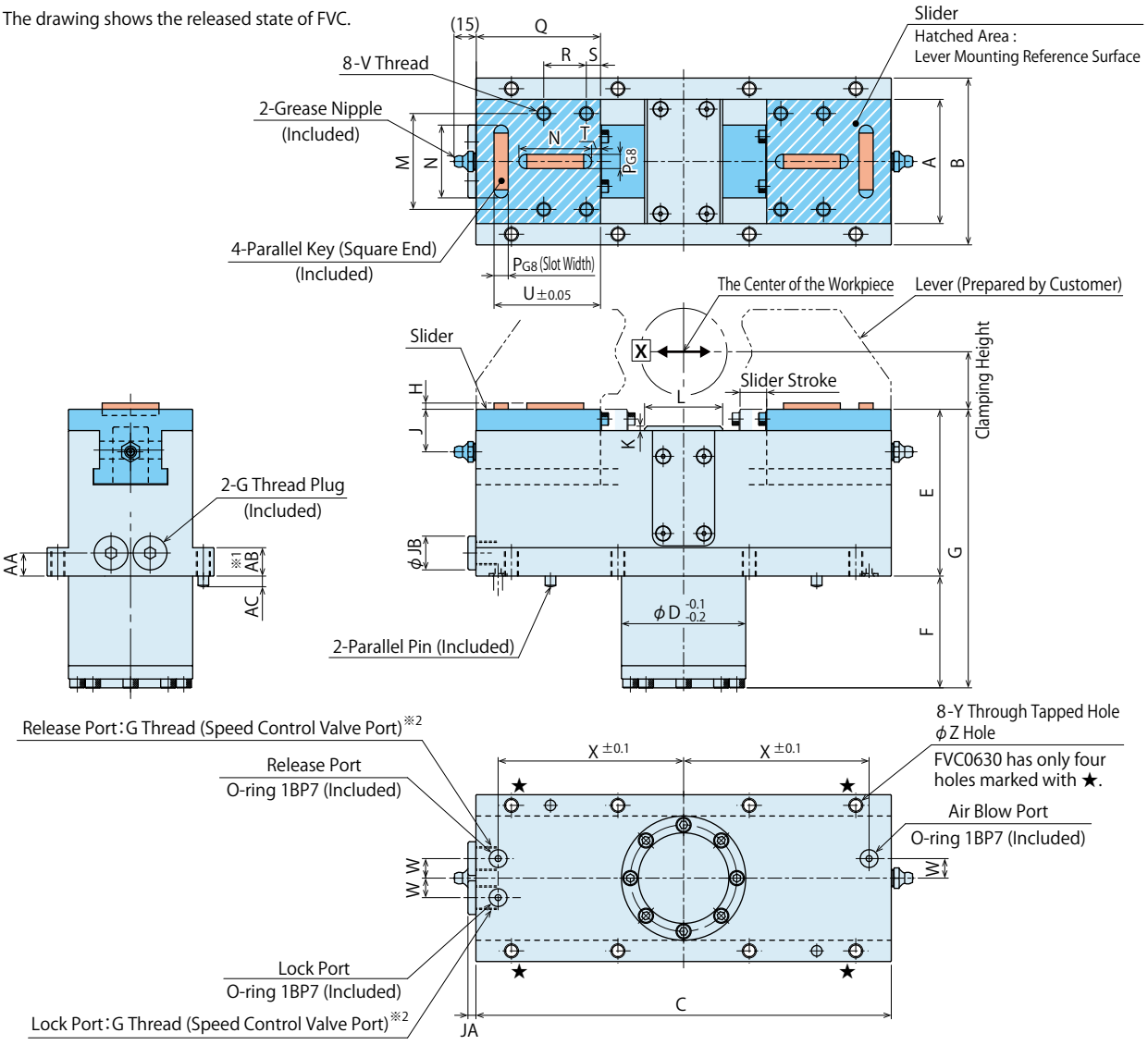
FVC1600

Max. Clamping Height ※2 100 mm

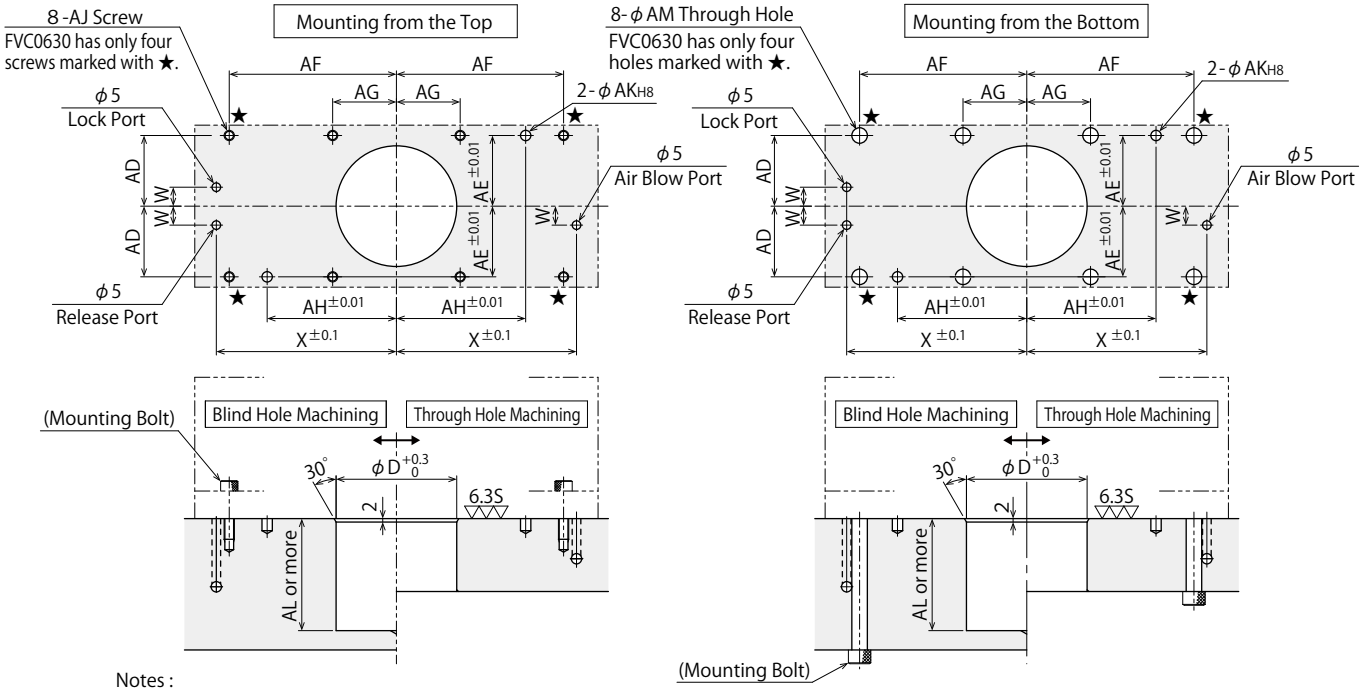


External Dimensions

※ The drawing shows the released state of FVC.



Machining Dimensions of Mounting Area



Notes :

1. Roughness of mounting surface should be 6.3S or better.
2. Install a lever on the top of the slider when in use.

※1. Mounting bolts are not provided with the product. Please prepare them according to the mounting height referring to dimension 'AB'.

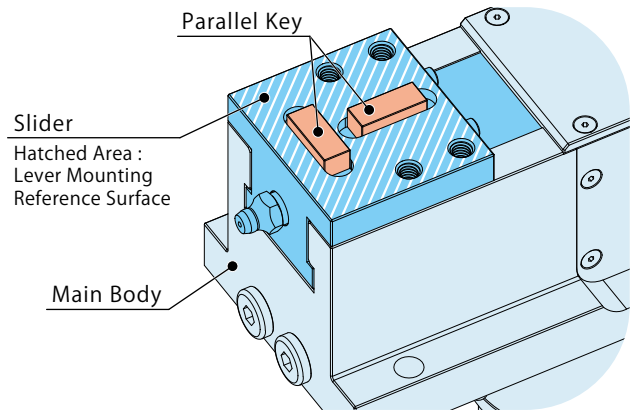
※2. Speed control valve is sold separately. Please refer to P.947 for further information.

External Dimensions and Machining Dimensions for Mounting

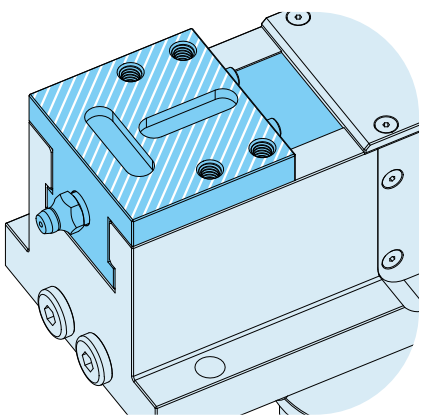
(mm)

Model No.	FVC0630	FVC1000	FVC1600
Slider Stroke (One Side)	10^{+1}_{0}	15^{+1}_{0}	20^{+1}_{0}
A	55	70	82
B	80	94	114
C	182	234	298
D	60	70	82
E	75	94	116
F	54	63	80
G	129	157	196
H	3.5	3.5	4
J	19	24	30
K	2.5	2.5	2.5
L	40	44	57
M	42	54	62
N	29	41	56
P	$8^{+0.027}_{+0.005}$	$8^{+0.027}_{+0.005}$	$10^{+0.027}_{+0.005}$
Q	50	70	90
R	16	24	30
S	6.5	8	10
T	2.5	5	4.5
U	42	60	77
V (Nominal×Pitch×Depth)	M6×1×9	M8×1.25×11	M10×1.5×15
W	10	11	15
X	82	104.5	136.5
Y (Nominal×Pitch)	M8×1.25	M8×1.25	M10×1.5
Z	6.8	6.8	8.5
AA	9	13	16
AB	16	16	20
AC	5	6	8
AD	34	41	49
AE	34	41	49
AF	71	97	130
AG	-	37	50
AH	50	75	90
AJ (Nominal×Pitch×Depth)	M6×1×12	M6×1×12	M8×1.25×16
AK	$5^{+0.018}_{0}$ Depth 6	$6^{+0.018}_{0}$ Depth 7	$8^{+0.022}_{0}$ Depth 9
AL	56	65	82
AM	9	9	11
JA	3.5	4.5	4.5
JB	14	19	19
Parallel Pin	ϕ5×10 (Type B)	ϕ6×12 (Type B)	ϕ8×16 (Type B)
Parallel Key (Width×Height×Length)	$8^{0}_{-0.036}$ ×7×20	$8^{0}_{-0.036}$ ×7×32	$10^{0}_{-0.036}$ ×8×45
Lock Hydraulic Port:G Thread Release Hydraulic Port:G Thread	G1/8	G1/4	G1/4

Lever Mounting Part



When the parallel keys are installed.



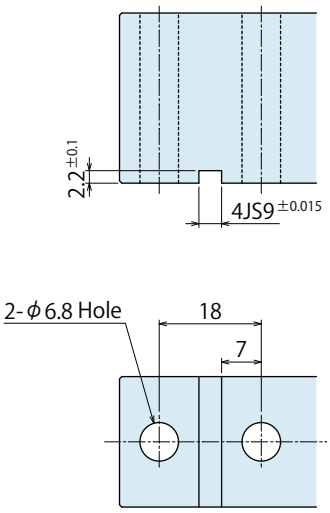
When the parallel keys are removed.

Lever Design Dimensions

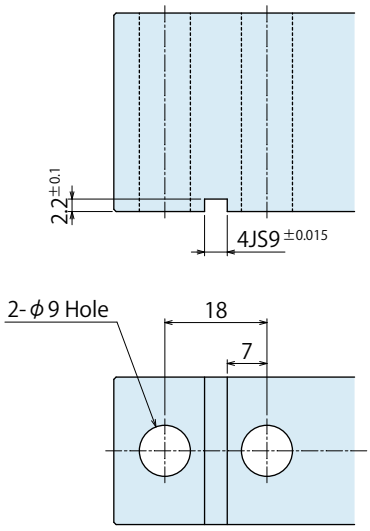
Corresponding Model No. **FVA**

(mm)

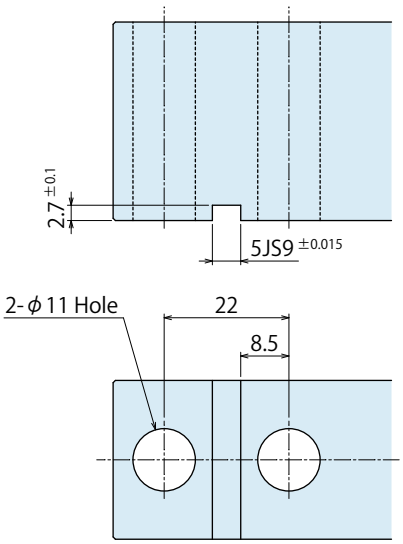
FVA0401



FVA0631



FVA1001



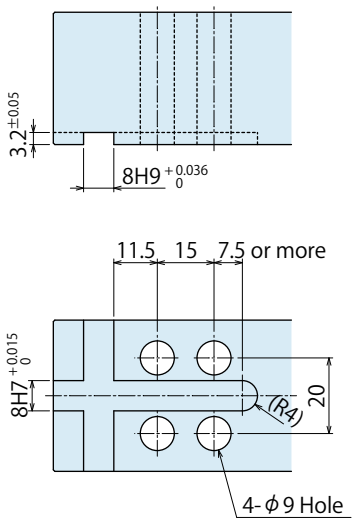
Notes :

1. This drawing shows the design dimensions of the left side lever facing the product.
2. The tolerance of the key slot is a reference. Please change it if necessary.

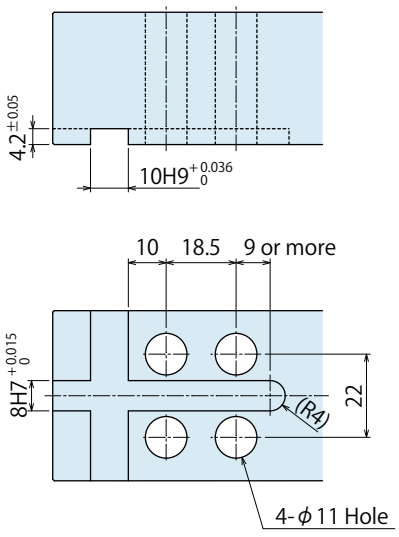
Corresponding Model No. **FVD**

(mm)

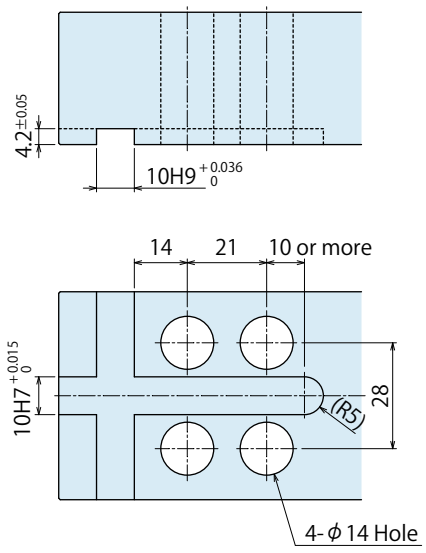
FVD1600



FVD2500



FVD4000



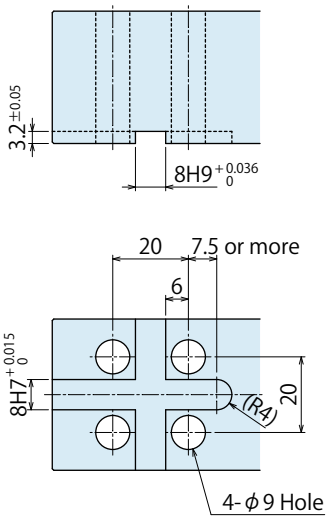
Notes :

1. This drawing shows the design dimensions of the left side lever facing the product.
2. The tolerance of the key slot is a reference. Please change it if necessary.

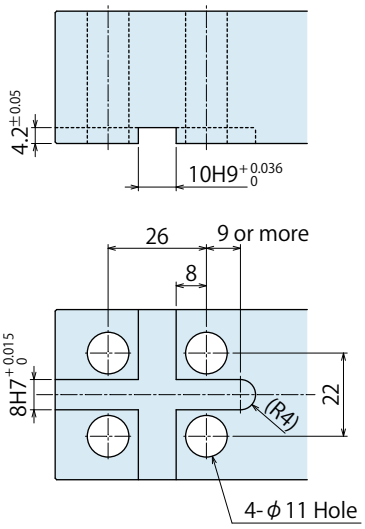
Corresponding Model No. FVD-L

(mm)

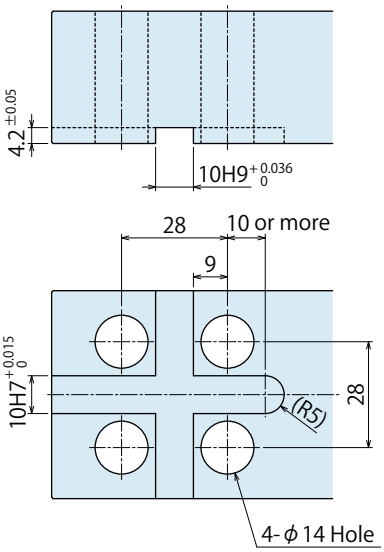
FVD1600-L



FVD2500-L



FVD4000-L



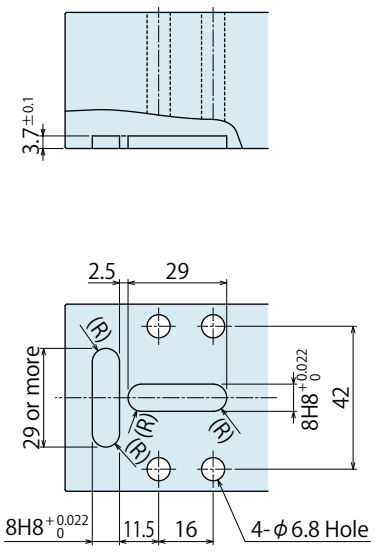
Notes :

1. This drawing shows the design dimensions of the left side lever facing the product.
2. The tolerance of the key slot is a reference. Please change it if necessary.

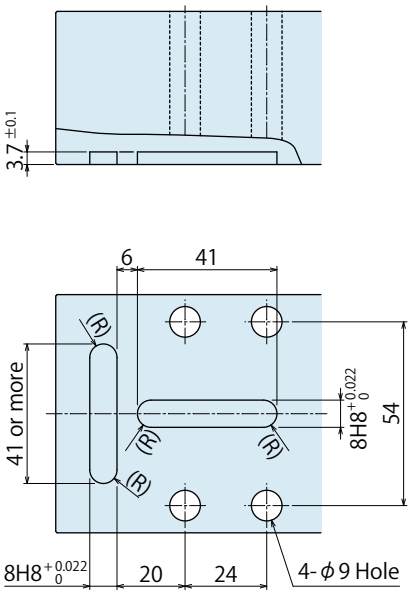
Corresponding Model No. FVC

(mm)

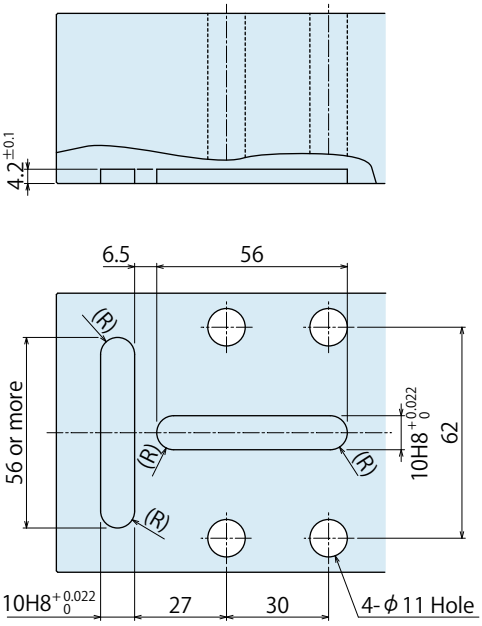
FVC0630



FVC1000



FVC1600



Notes :

1. This drawing shows the design dimensions of the left side lever facing the product.
2. The tolerance of the key slot is a reference. Please change it if necessary.

Cautions

Notes for Design

1) Check Specifications
- Please use each product according to the specifications.

2) Notes for Circuit Design
- Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design. Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
- Ensure there is no possibility of supplying hydraulic pressure to the lock port and the release port simultaneously.
- Air blow passage should be ϕ6mm or more.

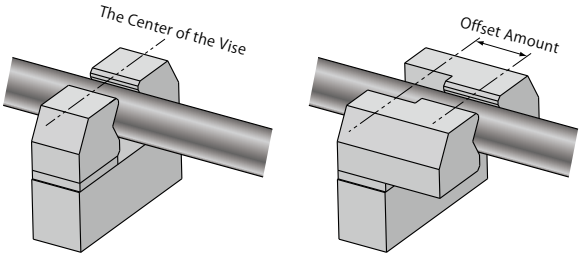
3) Supply air to the air blow port as necessary. (FVA/FVC Only)
- Centering Vise does not have a completely sealed structure. Please use air blow when cutting chips and/or coolant can possibly enter from sliding part or cover gap.

4) Tightening depth of the lever mounting bolt must be less than the maximum tightening depth. (FVC Only)
- Longer lever mounting bolt than the maximum tightening depth causes tightening the body and slider leading to malfunction and decrease of clamping force.

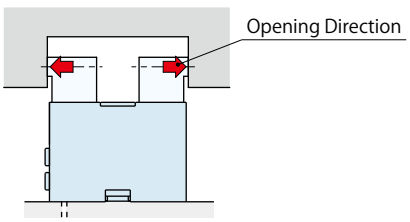
Model No.	Max. Tightening Depth (mm)
FVC0630	9
FVC1000	11
FVC1600	15

5) Do not apply impact on the lever (prepared by customer) when loading a workpiece.
- Otherwise, it leads to malfunction or damage to the lever.

6) Clamp the workpiece at the center of the vise.
- Please contact us for available offset amount. (No offset option for FVA/FVD. Offset is only available for FVC.)



7) Clamping in Opening Direction
- Clamping force curve in this catalog indicates the force in closing direction. When clamping in opening direction as shown below, the clamping force and the usable range are different. Please contact us for further information.



Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1355).

2) Filling the Grease

- Fill the grease from the grease nipple or lubrication port before use, and operate the centering vise 2 or 3 times without a workpiece. Use the grease of lithium soap thickened, mineral oil grease fortified with MoS2. (Recommended Grease：MOLYKOTE® BR-2 PLUS made by TORAY・DOW CORNING) If too much grease is applied it may be overflowed from the gap of the product body and the slider during operation.

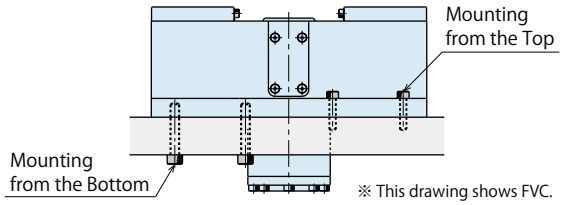
3) Installation/Removal of the Lever (Prepared by Customer)

- Use hexagon socket bolts for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Installation failure causes the deformaiton of lever and decrease of clamping force.

Model No.		Thread Size	Tightening Torque (N·m)
FVA	**FVA0401**	M6×1	10
	FVA0631	M8×1.25	25
	FVA1001	M10×1.5	50
FVC	**FVC0630**	M6×1	10
	FVC1000	M8×1.25	25
	FVC1600	M10×1.5	50
FVD	**FVD1600**	M8×1.25	25
	FVD2500	M10×1.5	50
	FVD4000	M12×1.75	80

4) Installation of the Centering Vise

- When mounting the centering vise, use hexagon socket bolts as multiple bolt holes for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the table below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.



<When Mounting from the Top>

Model No.		Thread Size	Tightening Torque (N·m)
FVA	**FVA0401**	M5×0.8	6.3
	FVA0631	M5×0.8	6.3
	FVA1001	M6×1	10
FVC	**FVC0630**	M6×1	10
	FVC1000	M6×1	10
	FVC1600	M8×1.25	25
FVD	**FVD1600**	M6×1	10
	FVD2500	M8×1.25	25
	FVD4000	M10×1.5	50

<When Mounting from the Bottom>

Model No.		Thread Size	Tightening Torque (N·m)
FVA	**FVA0401**	M8×1.25	25
	FVA0631	M8×1.25	25
	FVA1001	M8×1.25	25
FVC	**FVC0630**	M8×1.25	25
	FVC1000	M8×1.25	25
	FVC1600	M10×1.5	50
FVD	**FVD1600**	M8×1.25	25
	FVD2500	M10×1.5	50
	FVD4000	M12×1.75	80

5) Operating Speed Adjustment

- Excessive operating speed of the centering vise may lead to wear-out or damage the internal components. Please adjust the operating speed so that the slider fully strokes within 1~2 seconds.
- Install a flow control valve and gradually control the flow rate from the low-speed side (small flow) to the designated speed. Controlling from the high-speed side (large flow) causes excessive surge pressure or overload to the centering vise leading to damage of a machine or device.
- When controlling the speed with the flow control valve, make sure there is no excessively high pressure in the hydraulic circuit.
- Speed control may not be conducted if there is excessive air in the hydraulic circuit.
- The viscosity of fluid will decrease when its temperature increases. This will accelerate the operating speed of the centering vise. Adjust the speed under the proper temperature condition.

※ Please refer to P.1355 for common cautions. ・Installation Notes ・Hydraulic Fluid List ・Notes on Hydraulic Cylinder Speed Control Circuit ・Notes on Handling ・Maintenance/Inspection ・Warranty

Cautions

Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
- The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with Kosmek's product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.

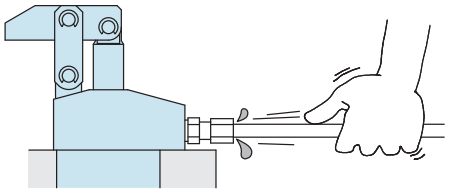
3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- Please implement piping construction in a clear environment to prevent anything getting in products.

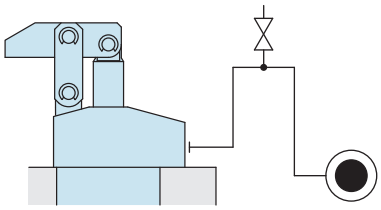
4) Air Bleeding of the Hydraulic Circuit

- If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.

① Reduce hydraulic pressure to less than 2MPa.
② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
③ Shake the pipeline to loosen the outlet of pipe fitting.
Hydraulic fluid mixed with air comes out.



④ Tighten the cap nut after bleeding.
⑤ It is more effective to release air at the highest point inside the circuit or at the end of the circuit.
(Set an air bleeding valve at the highest point inside the circuit.)



5) Checking Looseness and Retightening

- At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

Maker	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New Mighty Super 32
ExxonMobil	Mobil DTE 24	Mobil DTE 24 Light
Matsumura Oil	Hydol AW-32	
Castrol	Hyspin AWS 32	

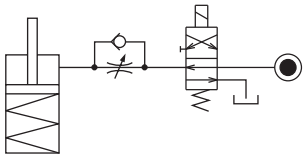
Note : Please contact manufacturers when customers require products in the list above.

Notes on Hydraulic Cylinder Speed Control Unit

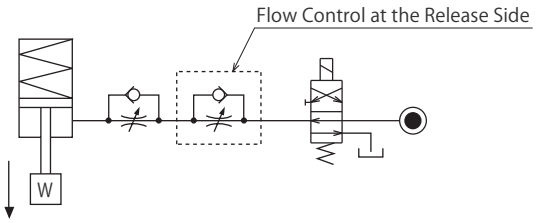
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder

For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.



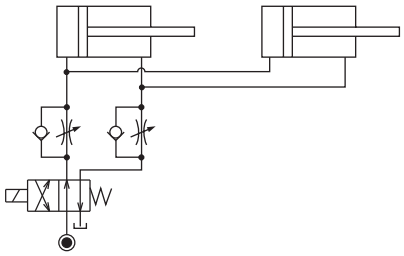
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



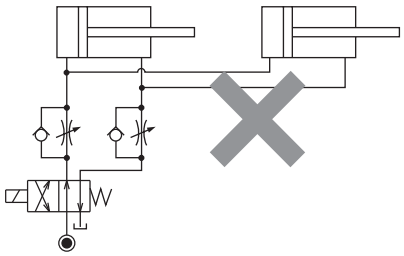
Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.
However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
Refer to P.75 for speed adjustment of LKE.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

【Meter-out Circuit】(Except LKE/TMA/TLA)

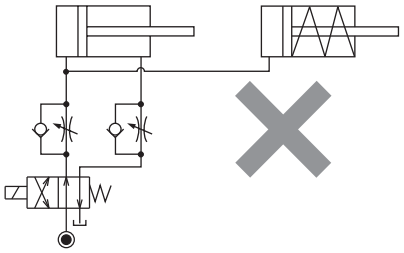


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



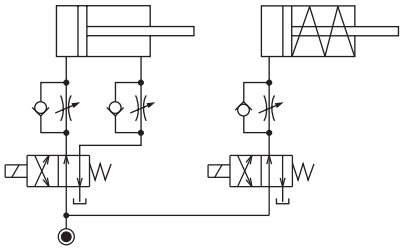
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

① Single acting components should not be used in the same flow control circuit as the double acting components.
The release action of the single acting cylinders may become erratic or very slow.

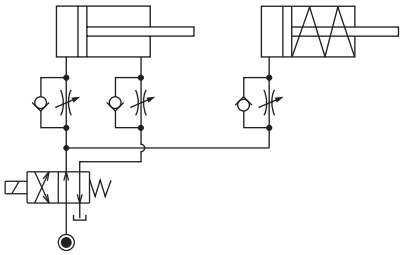


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

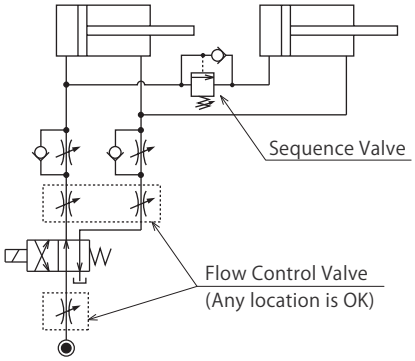
○ Separate the control circuit.



○ Reduce the influence of double acting cylinder control unit.
However, due to the back pressure in tank line, single action cylinder is activated after double action cylinder works.



② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection. If the back pressure is more than the set pressure then the system will not work as it is designed to.



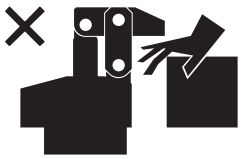
Cautions

Notes on Handling

1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured due to clinching.

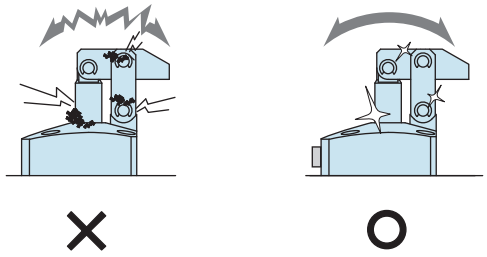


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

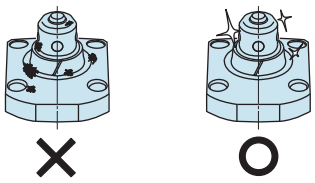
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning and fluid leakage.



3) Please clean out the reference surfaces on a regular basis (taper reference surface and seating surface) of the locating products. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXE/VXF)
- The locating products, except VX/VXE/VXF model, can remove contaminants with cleaning functions. However, hardened cutting chips, adhesive coolant and others may not be removed. Make sure there are no contaminants before installing a workpiece/pallet.
- Continuous use with contaminant on components will lead to locating accuracy failure, malfunction and fluid leakage.



4) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.

5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

8) The products should be stored in the cool and dark place without direct sunshine or moisture.

9) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
  Defects or failures caused by the following are not covered.

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or operated in an inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

Control Valve

Model BZL
Model BZT
Model BZX
Model JZG
Model BZS

Directly-Attached Speed Control Valve, Air Bleed Valve, G-Thread Plug and Sequence Valve

● Directly Attached to Clamps

Control Valves :
Speed control valve, air bleed valve, G-thread plug and sequence valve attached directly into Kosmek hydraulic clamp G-thread piping option.

Speed Control Valve

Speed Control Valve

Model BZL
Model BZT

Air Bleed Valve

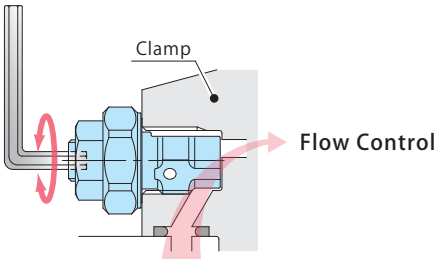
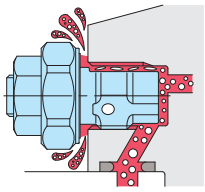
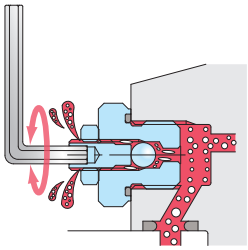
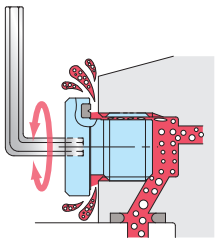
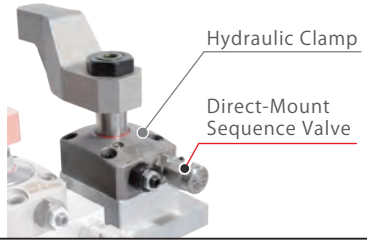
Model BZX

G Thread Plug

Model JZG

Direct-Mount Sequence Valve

Model BZS

	Operating Pressure Range	Action Description
Speed Control Valve (For Low Pressure) Model **BZL** → P.949 	7MPa or less	Adjust the flow rate with a wrench. Able to adjust the clamping speed individually. 
Speed Control Valve (For High Pressure) Model **BZT** → P.953	35MPa or less	Air bleeding in the circuit is possible by loosening the speed control valve. 
Air Bleed Valve Model **BZX** → P.955 	25MPa or less	Air bleeding in the circuit is possible by wrench. 
G Thread Plug Model **JZG** → P.957 	35MPa or less	Air bleeding in the circuit is possible by loosening the G thread plug. 
Direct-Mount Sequence Valve Model **BZS** → P.959 	7MPa or less	Sequence Valve directly attaches to KOSMEK hydraulic clamp's G-thread piping option. Controls the operating sequence of each actuator. 

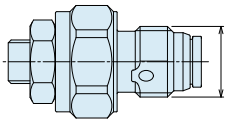
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 1 - B

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread
20 : Thread Part G1/4A Thread
30 : Thread Part G3/8A Thread



2 Design No.

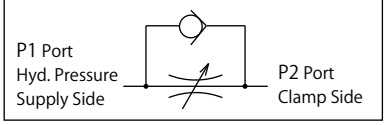
1 : Revision Number

3 Control Method

A : Meter-in
B : Meter-out

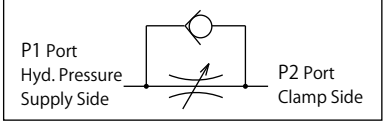
A

Circuit Symbol : Meter-in



B

Circuit Symbol : Meter-out



Specifications

Model No.		BZL0101-A	BZL0201-A	BZL0301-A	BZL0101-B	BZL0201-B	BZL0301-B
Max. Operating Pressure	MPa	7					
Withstanding Pressure	MPa	10.5					
Control Method		Meter-in			Meter-out		
G Thread Size		G1/8A	G1/4A	G3/8A	G1/8A	G1/4A	G3/8A
Cracking Pressure	MPa	0.04			0.12		
Max. Passage Area	mm^2	2.6	5.0	11.6	2.6	5.0	10.2
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32					
Operating Temperature	℃	0 ~ 70					
Tightening Torque for Main Body	N·m	10	25	35	10	25	35
Weight	g	12	26	48	12	26	48

Notes : 1. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
2. Do not attach a used BZL to other clamps. Flow control will not be made because the bottom depth difference of G thread makes metal seal insufficient.

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support
BZL0101-A	(DBA0250-C□) (DBA0320-C□)	(DBC0250-C□) (DBC0320-C□)	(FVA0401) (FVA0631) (FVA1001)	(FVC0630)	(FVD1600) (FVD2500)	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□
BZL0101-B	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500		
BZL0201-A	(DBA0400-C□) (DBA0500-C□)	(DBC0400-C□) (DBC0500-C□)		(FVC1000) (FVC1600)	(FVD4000)	LC0753-C□□-□ LC0903-C□□-□	
BZL0201-B	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000		

Applicable Products

Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
BZL0101-A	(LHA0360-C□□-□) (LHA0400-C□□-□) (LHA0480-C□□-□) (LHA0550-C□□-□)	(LHC0360-C□□-□) (LHC0400-C□□-□) (LHC0480-C□□-□) (LHC0550-C□□-□)	(LHD0400-C□-□) (LHD0480-C□-□) (LHD0550-C□-□)		(LHS0360-C□□-□) (LHS0400-C□□-□) (LHS0480-C□□-□) (LHS0550-C□□-□)	(LHV0400-C□E-□) (LHV0480-C□E-□) (LHV0550-C□E-□)	(LHW0401-C□□-□) (LHW0481-C□□-□) (LHW0551-C□□-□)	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
BZL0101-B	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□		
BZL0201-A	(LHA0650-C□□-□) (LHA0750-C□□-□)	(LHC0650-C□□-□)			(LHS0650-C□□-□) (LHS0750-C□□-□)	(LHV0650-C□E-□) (LHV0750-C□E-□)	(LHW0651-C□□-□) (LHW0751-C□□-□)	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
BZL0201-B	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□		
BZL0301-A	(LHA0900-C□□-□) (LHA1050-C□□-□)				(LHS0900-C□□-□) (LHS1050-C□□-□)				LG0901-C□-□ LG1051-C□-□
BZL0301-B	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				

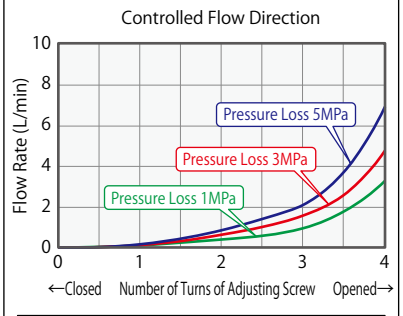
Model No.	LGV (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp
BZL0101-A	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□	(LKA0360-C□□-□) (LKA0400-C□□-□) (LKA0480-C□□-□) (LKA0550-C□□-□)	(LKC0400-C□-□) (LKC0480-C□-□) (LKC0550-C□-□)	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	(LKK0360-C-□) (LKK0400-C-□) (LKK0480-C-□) (LKK0550-C-□)	(LKV0400-C□E-□) (LKV0480-C□E-□) (LKV0550-C□E-□)	(LKW0401-C□□-□) (LKW0481-C□□-□) (LKW0551-C□□-□)	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□
BZL0101-B		LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□		LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□		
BZL0201-A	LGV0650-C□□ LGV0750-C□□	(LKA0650-C□□-□) (LKA0750-C□□-□)	(LKC0650-C□-□)		(LKK0650-C-□)	(LKV0650-C□E-□) (LKV0750-C□E-□)	(LKW0651-C□□-□) (LKW0751-C□□-□)	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□
BZL0201-B		LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□		
BZL0301-A		(LKA0900-C□□-□) (LKA1050-C□□-□)							LJ0902-C□ LJ1052-C□
BZL0301-B		LKA0900-C□□-□ LKA1050-C□□-□							

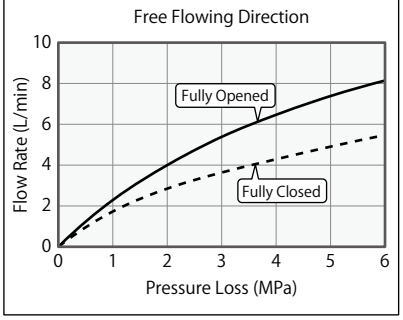
Model No.	LJV (Single Action) Link Clamp	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder
BZL0101-A	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□	(LFW0480-C□J) (LFW0550-C□J)	(LFA0480-C□□) (LFA0550-C□□)	(LSA0360-C-□)	LSE0360-C-□	(LL0360-C□□-□) (LL0400-C□□-□) (LL0480-C□□-□) (LL0550-C□□-□)	(LLR0360-C□□-□-□) (LLR0400-C□□-□-□) (LLR0480-C□□-□-□) (LLR0550-C□□-□-□)	(LLV0360-C□E-□) (LLV0400-C□E-□) (LLV0480-C□E-□)	(LLW0361-C□□-□) (LLW0401C□□-□) (LLW0481-C□□-□)
BZL0101-B		LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□		LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□
BZL0201-A	LJV0650-C□□ LJV0750-C□□	(LFW0650-C□J) (LFW0750-C□J)	(LFA0650-C□□) (LFA0750-C□□)			(LL0650-C□□-□) (LL0750-C□□-□)	(LLR0650-C□□-□-□) (LLR0750-C□□-□-□)		
BZL0201-B		LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□		
BZL0301-A						(LL0900-C□□-□) (LL1050-C□□-□)	(LLR0900-C□□-□-□) (LLR1050-C□□-□-□)		
BZL0301-B						LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□		

Note : 1. Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides (except model LKE/LSE). Meter-in circuits can be adversely affected by any air in the system.

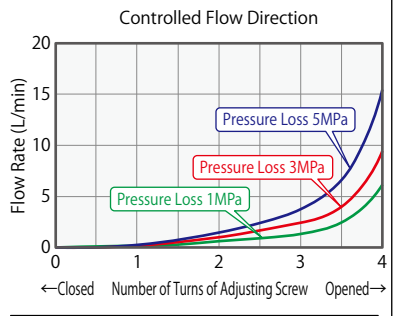
Flow Rate Graph ＜Hydraulic Fluids ISO-VG32（25～35℃）＞

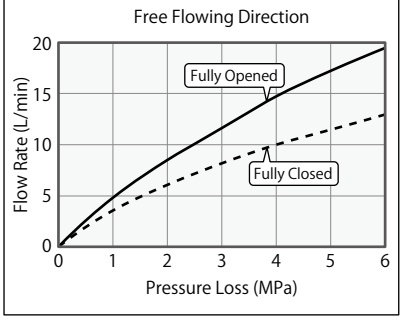
BZL0101-A：Meter-in



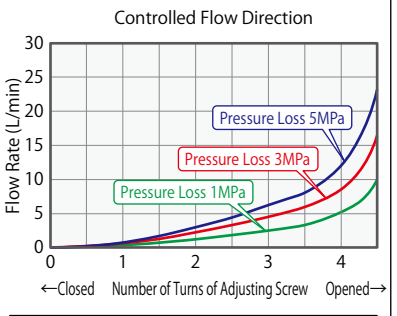


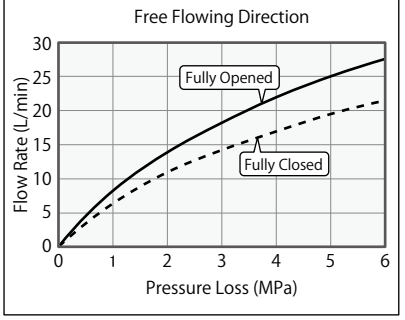
BZL0201-A：Meter-in





BZL0301-A：Meter-in





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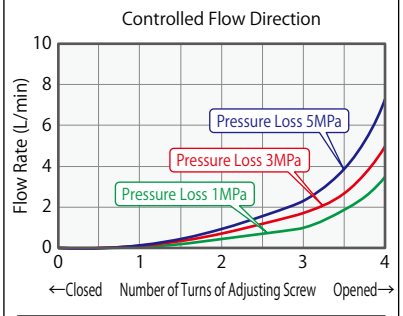
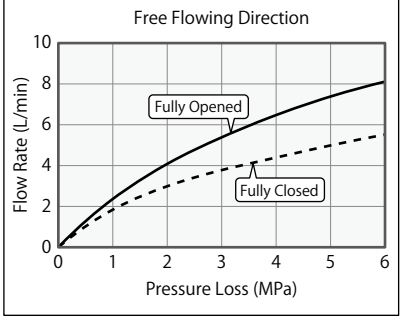
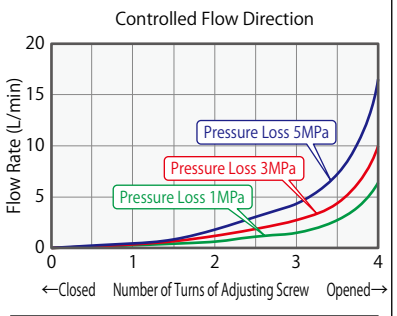
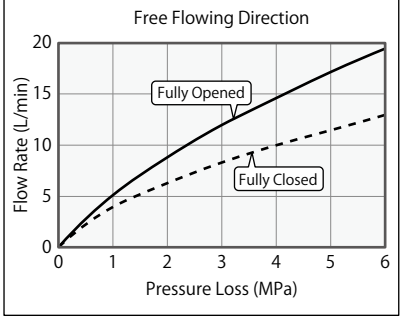


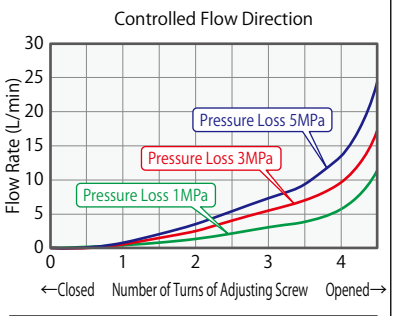


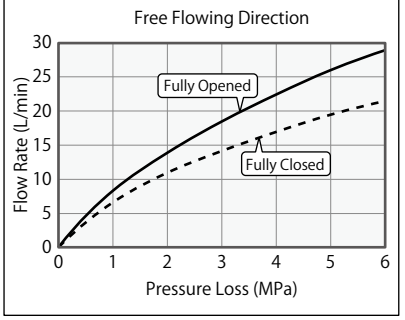
BZL0201-B：Meter-out



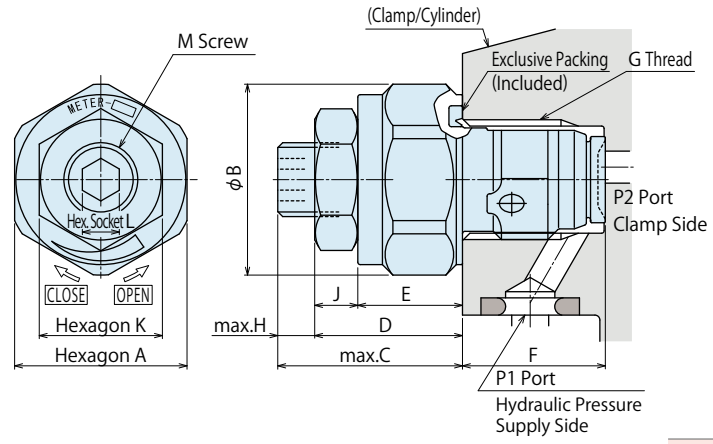


BZL0301-B：Meter-out

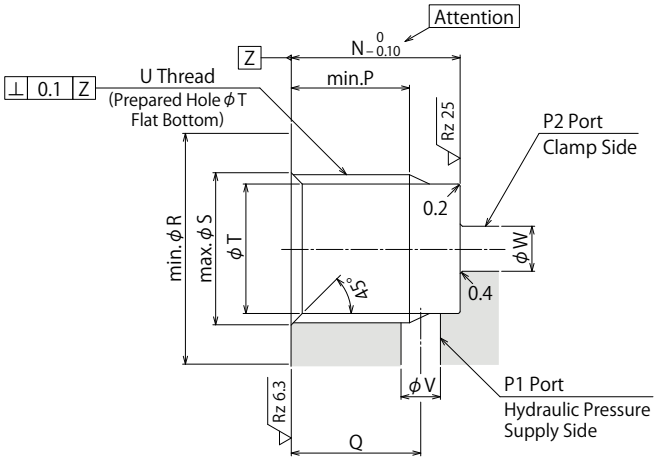




External Dimensions



Machining Dimensions of Mounting Area



(mm)

Model No.	BZL0101-□	BZL0201-□	BZL0301-□
A	14	18	22
B	15.5	20	24
C	15	16	19
D	12	13	16
E	8.5	9.5	11
F	(11.6)	(15.1)	(17.6)
G	G1/8	G1/4	G3/8
H	3	3	3
J	3.5	3.5	5
K	10	10	13
L	3	3	4
M (Nominal×Pitch)	M6×0.75	M6×0.75	M8×0.75
N	11.5	15	17.5
P	8.5	11※1	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2 ~ 3	3 ~ 4	4 ~ 5
W	2.5 ~ 5	3.5 ~ 7	4.5 ~ 9

Notes :

1. Since the ▽Rz 6.3 area is sealing part, be careful not to damage it.
2. Since the ▽Rz 12.5 area is the metal sealing part of BZL, be careful not to damage it. (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply side and P2 port as the clamp side.
5. If mounting plugs or fittings with G thread specification available in the market, the dimension '※1' should be 12.5.

Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design.
   Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
2. It is dangerous to release the air under high pressure. It must be done under lower pressure.
   (For reference : the minimum operating range of the product within the circuit.)

Model No. Indication (Air Bleed Valve)

BZX0 1 0

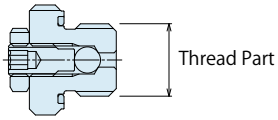
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



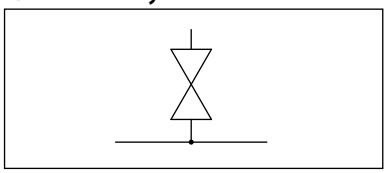
2 Design No.

0 : Revision Number

Specifications

Model No.		BZX010	BZX020	BZX030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body	N·m	10	25	35
Weight	g	12	23	36

Circuit Symbol



Notes : 1. Do not over-loosen the plug during air venting.
(Do not loosen further than 2 turns from the fully closed position.)
2. Air bleeding under high pressure is dangerous. It must be done under lower pressure.
(For reference : the minimum operation pressure range of the product within the circuit)
3. Refer to the machining dimensions of BZL mounting area when installing BZX into a hydraulic circuit.

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support	TC (Single Action) Work Support
BZX010	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□	TC0403-C□-□-□ TC0483-C□-□-□ TC0553-C□-□-□ TC0653-C□-□-□ TC0753-C□-□-□
BZX020	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000	LC0753-C□□-□ LC0903-C□□-□		

Applicable Products

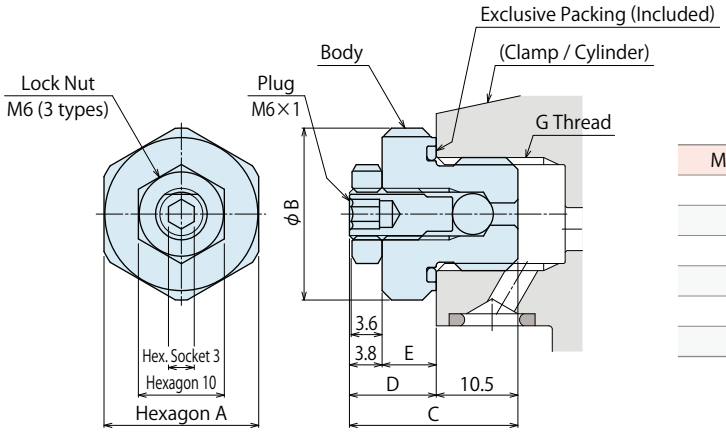
Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
BZX010	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
BZX020	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
BZX030	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□

Model No.	LGV (Single Action) Swing Clamp
BZX010	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□
BZX020	LGV0650-C□□ LGV0750-C□□
BZX030	

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
BZX010	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
BZX020	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
BZX030	LKA0900-C□□-□ LKA1050-C□□-□							LJ0902-C□ LJ1052-C□	

Model No.	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder	TTA (Double Action) Linear Cylinder
BZX010	LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□	LSE0360-C-□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□	TTA0360-C□-□ TTA0400-C□-□ TTA0480-C□-□ TTA0550-C□-□
BZX020	LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□			TTA0650-C□-□
BZX030					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□			

External Dimensions



(mm)

Model No.	BZX010	BZX020	BZX030
A	14	18	22
B	15.5	20	24
C	19.8	20.6	20.6
D	9.3	10.1	10.1
E	5.5	6.3	6.3
G	G1/8	G1/4	G3/8

Model No. Indication (G Thread Plug with Air Bleeding Function) PAT.

JZG0 1 0

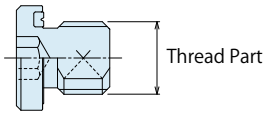
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



2 Design No.

0 : Revision Number

Specifications

Model No.		JZG010	JZG020	JZG030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body N·m	Female Thread Side Material : Steel	10	25	35
	Female Thread Side Material : Aluminum (For LT/LM※1)	8	20	28
Weight	g	7	15	23

Notes : 1. Air bleeding under high pressure is dangerous. It must be done under lower pressure.
(For reference : the minimum operation pressure range of the product within the circuit)
2. Refer to the machining dimensions of BZL mounting area when installing JZG into a hydraulic circuit.
※1. Body material of LT/LM is aluminum alloy, so install it with the tightening torque for aluminum.

Applicable Products

Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
JZG010	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
JZG020	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
JZG030	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□

Model No.	LGV (Single Action) Swing Clamp	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support	TC (Single Action) Work Support
JZG010	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□	TC0403-C□-□-□ TC0483-C□-□-□ TC0553-C□-□-□ TC0653-C□-□-□ TC0753-C□-□-□
JZG020	LGV0650-C□□ LGV0750-C□□	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000	LC0753-C□□-□ LC0903-C□□-□		

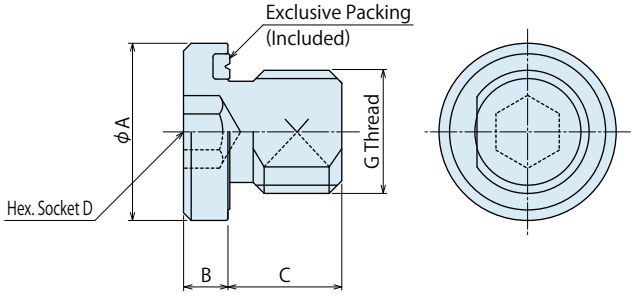
Applicable Products

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
JZG010	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
JZG020	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
JZG030	LKA0900-C□□-□ LKA1050-C□□-□							LJ0902-C□ LJ1052-C□	

Model No.	TLA-1 (Single Action) Swing Clamp	TLA-2 (Double Action) Swing Clamp	TLB-2 (Double Action) Swing Clamp	TLV-2 (Double Action) Swing Clamp	TMA-1 (Double Action) Link Clamp	TMA-2 (Double Action) Link Clamp	TMV-2 (Double Action) Link Clamp
JZG010	TLA0402-1C□ TLA0602-1C□ TLA0802-1C□ TLA1002-1C□ TLA1602-1C□	TLA0401-2C□-□ TLA0601-2C□-□ TLA0801-2C□-□ TLA1001-2C□-□ TLA1601-2C□-□	TLB0401-2C□-□ TLB0601-2C□-□ TLB0801-2C□-□ TLB1001-2C□-□ TLB1601-2C□-□	TLV0800-2C□□ TLV1000-2C□□ TLV1600-2C□□	TMA0250-1C□ TMA0400-1C□ TMA0600-1C□ TMA1000-1C□	TMA0250-2C□ TMA0400-2C□ TMA0600-2C□ TMA1000-2C□	TMV0400-2C□□ TMV0600-2C□□ TMV1000-2C□□
JZG020	TLA2002-1C□ TLA2502-1C□ TLA4002-1C□	TLA2001-2C□-□ TLA2501-2C□-□ TLA4001-2C□-□	TLB2001-2C□-□ TLB2501-2C□-□ TLB4001-2C□-□	TLV2000-2C□□	TMA1600-1C□ TMA2500-1C□ TMA3200-1C□	TMA1600-2C□ TMA2500-2C□ TMA3200-2C□	TMV1600-2C□□

Model No.	LFA (Double Action) Link Clamp	LFW (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder	TTA (Double Action) Linear Cylinder
JZG010	LFA0480-C□□ LFA0550-C□□	LFW0480-C□J LFW0550-C□J	LSA0360-C-□	LSE0360-C-□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□	TTA0360-C□-□ TTA0400-C□-□ TTA0480-C□-□ TTA0550-C□-□
JZG020	LFA0650-C□□ LFA0750-C□□	LFW0650-C□J LFW0750-C□J			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□			TTA0650-C□-□
JZG030					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□			

External Dimensions



(mm)

Model No.	JZG010	JZG020	JZG030
A	14	18	22
B	3.5	4.5	4.5
C	8	9	10
D	5	6	8
G	G1/8A	G1/4A	G3/8A

PAT.P.

Direct-Mount Sequence Valve

Model BZS

Attaches directly into Kosmek hydraulic clamps G-thread piping option.
Easily and securely controls the operating sequence of actuators.

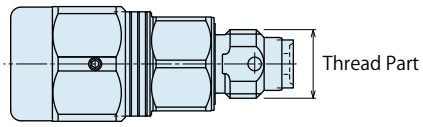
Model No. Indication

BZS 0 10 0

1 2

1 G Thread Size

10 : G1/8A Thread
20 : G1/4A Thread
30 : G3/8A Thread



2 Design No.

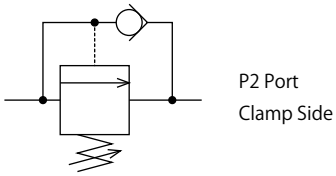
0 : Revision Number

Specifications

Model No.		BZS0100	BZS0200	BZS0300
Sequence Operating Pressure Adjustable Range MPa		1.0 ~ 6.0		
Operating Pressure Range MPa		2.0 ~ 7.0		
Withstanding Pressure MPa		10.5		
G Thread Size		G1/8A	G1/4A	G3/8A
Cracking Pressure MPa		0.03		
Adjusting Screw Turn Ratio:Reference MPa/Rev		1.5	1.3	1.1
Min. Passage Area	P1 → P2	2.0	5.7	8.5
mm^2	P2 → P1	2.0	5.0	8.2
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature ℃		0 ~ 70		
Tightening Torque N·m		10	25	35
Weight g		35	82	155

Notes: 1. Please mount to an actuator using Hex. E shown in External Dimensions on P.961A with the tightening torque shown in the list above. Insufficient or excessive tightening torque leads to malfunction.
2. Do not attach a used BZS to other clamps. Sequence movement may not be done because the bottom depth difference of G thread makes metal sealing insufficient.
3. The difference between the set pressure and the supplying pressure should be 1MPa or more.
4. For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
5. Depending on circuit system (actuator capacity, hydraulic pipe diameter, passage length, etc.), sometimes it is necessary to reduce hydraulic flow rate to achieve proper sequence movement. Make sure you are able to control flow rate. (Since BZS is directly mounted on and used exclusively for one actuator, it is easily affected by hydraulic flow rate.)
6. Filter is not built in this product. Please note that contaminants such as cutting chips and sealing tapes entering into the product cause malfunction. Also when internal parts are damaged, it will not operate properly even after removing contaminants.

Circuit Symbol



※ No built-in filter provided.

What is a Sequence Valve?

The sequence valve controls the clamping and positioning sequence of multiple actuators.

When the incoming side pressure (P1 port) reaches the sequence setting pressure value, the pressure will be supplied to the outgoing side (P2 port). Refer to P.961B for the action description.

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp
BZS0100	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□
BZS0200	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600※1	FVD4000	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□		
BZS0300						LHA0900-C□□-□ LHA1050-C□□-□			

Model No.	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp	LGV (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp
BZS0100	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□
BZS0200	LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□	LGV0650-C□□ LGV0750-C□□	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□	
BZS0300	LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□		LKA0900-C□□-□ LKA1050-C□□-□		

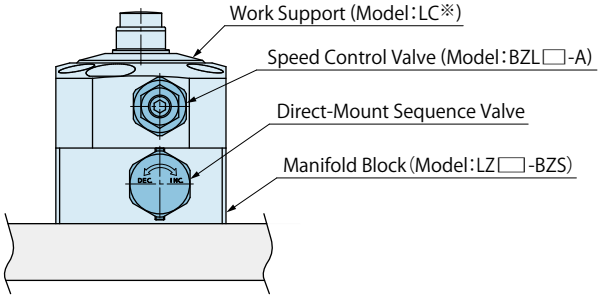
Model No.	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
BZS0100	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
BZS0200	LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
BZS0300					LJ0902-C□ LJ1052-C□	

Model No.	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder
BZS0100	LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□	LSE0360-C-□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□
BZS0200	LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□		
BZS0300					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□		

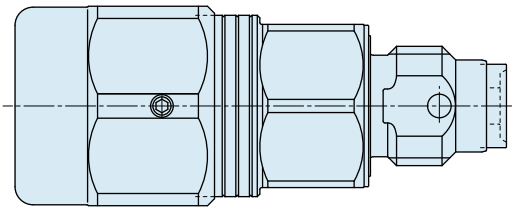
Note : ※1. It is not possible to install two BZS valves to FVC1000.

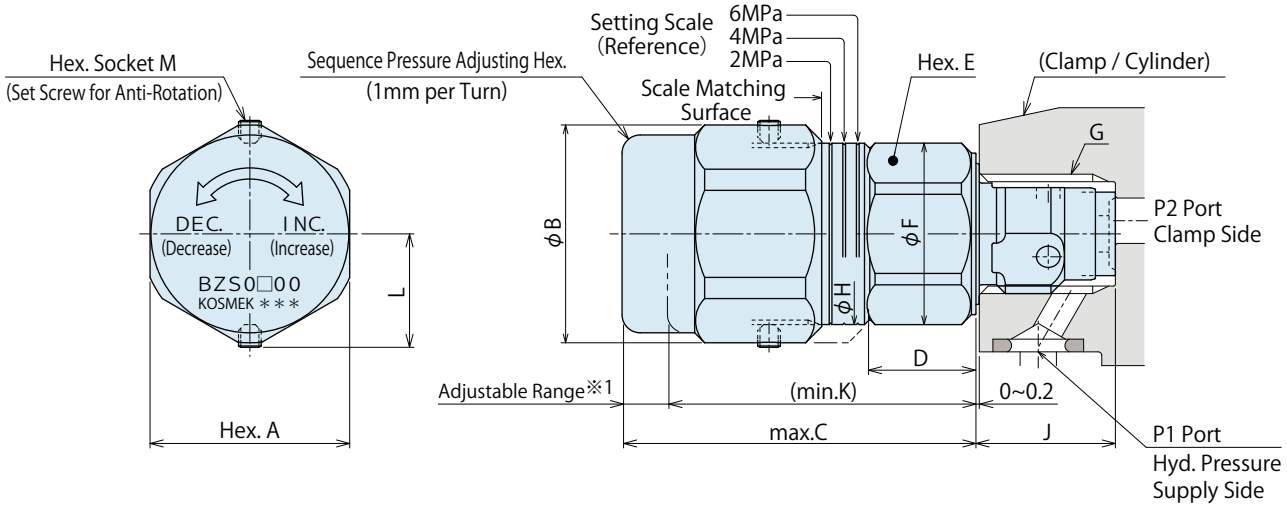
【In case of Work Support】

For using Direct-Mount Sequence Valve for Work Support (Model:LC※), mount Speed Control Valve (Model:BZL□-A) on Work Support and mount Direct-Mount Sequence Valve on the Manifold Block as shown in the drawing below.
Please refer to P.962A for Manifold Block (Model:LZ□-BZS).
※Please contact us when considering the installation to model LCW.

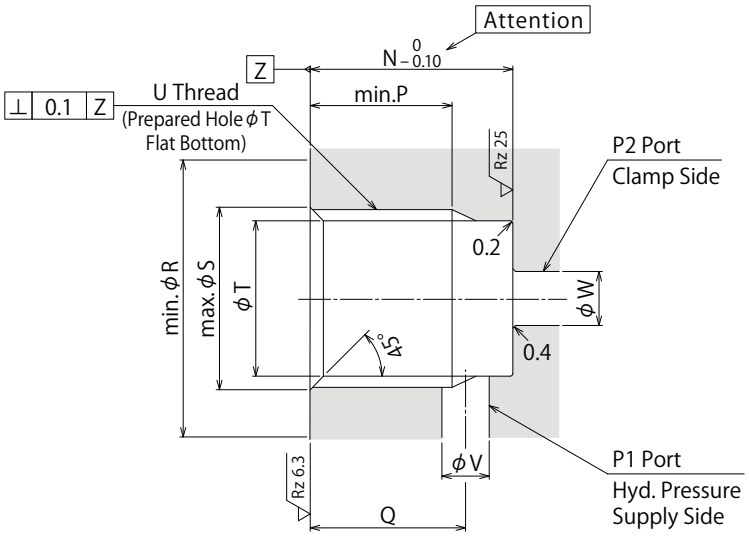


External Dimensions





Machining Dimensions of Mounting Area



(mm)

Model No.	BZS0100	BZS0200	BZS0300
A	16	22	27
B	17.5	24	29.5
C	30.5	39	49.5
D	7.5	12	15
E	14	18	22
F	15.5	20	24
G	G1/8	G1/4	G3/8
H	13.8	20	24
J ※2	(11.6)	(15.1)	(17.6)
K	(26.5)	(34)	(44)
L	9.5	12.5	15
M	1.3	1.3	1.5
N	11.5	15	17.5
P	8.5	11※3	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2 ~ 3	3 ~ 4	4 ~ 5
W	2.5 ~ 5	3.5 ~ 7	4.5 ~ 9

Notes:

1. Since the ▽Rz 6.3 area is sealing part, be careful not to damage it.
2. Since the ▽Rz 12.5 area is the metal sealing part at the edge of BZS, be careful not to damage it (especially when deburring).
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply and P2 port as the clamp side.

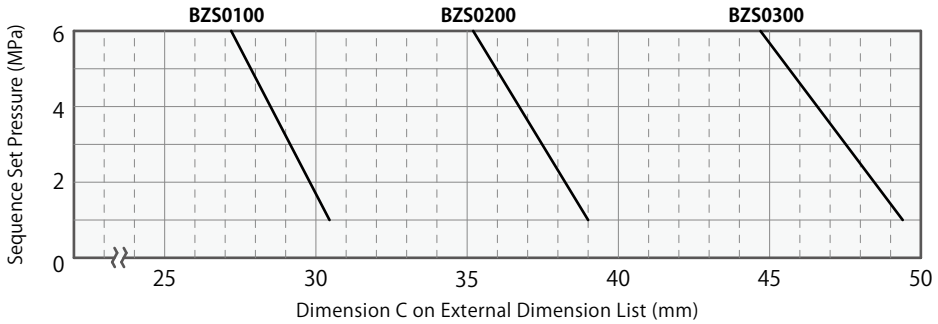
※1. Use the sequence pressure adjusting hex. within the adjustable range of ※2 (the dimensions K~C in the above).
Please note that if it is loosened further than max. C, pressure adjusting hex. part and internal spring will come off.

※2. Dimension when mounted. (+0.5mm before mounted.)

※3. If mounting plugs or fittings with G thread specification available in the market, the dimension '※3' should be 12.5.

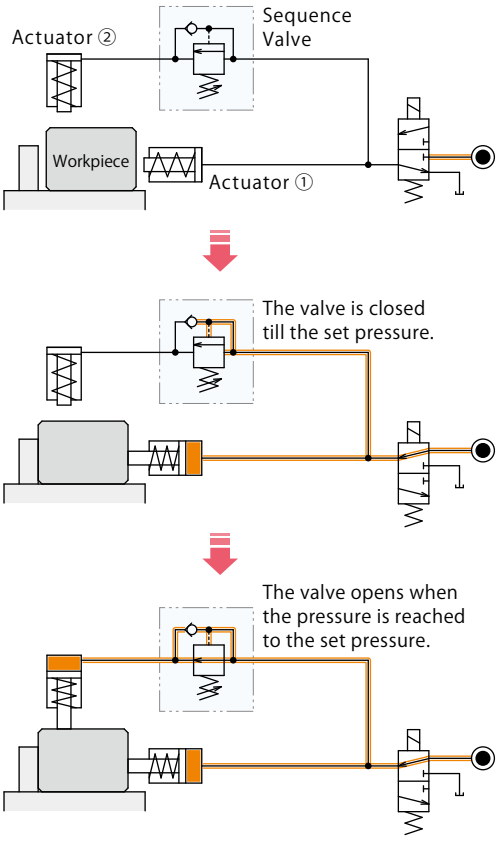
Cautions

1. Please design hydraulic circuit properly. Improper circuit design may lead to malfunctions and damages.
2. Filter is not built in this product. Be aware that contaminants such as cutting chips and sealing tapes entering into the product cause malfunction. Also when internal parts are damaged, it will not operate properly even after removing contaminants.
3. Depending on circuit system (actuator capacity, hydraulic pipe diameter, passage length, etc.), sometimes it is necessary to reduce hydraulic flow rate to achieve proper sequence movement. Make sure you are able to control flow rate. (Since BZS is directly mounted on and used exclusively for one actuator, it is easily affected by hydraulic flow rate.)
4. The difference between the set pressure and the supplying pressure should be 1MPa or more.
5. For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
6. For using multiple sequence valves to operate cylinders simultaneously, adjust them gradually by checking their actions.
7. Please keep in mind that the minimum passage area of each actuator will be decreased by mounting this product and thus operating time may become longer.
8. Please mount to an actuator using Hex. E shown in External Dimensions on P.961 with the tightening torque shown in the specification list on P.959. Insufficient or excessive tightening torque leads to malfunction.
9. Air bleeding is required as air mixed in the circuit causes malfunction.
10. At shipment, sequence pressure is not adjusted. Please adjust it by referring to the graph below. Install a pressure gauge on the circuit to check pressure as necessary. After adjustment, tighten one or more set screw for anti-rotation. (Tightening torque：0.2N･m)



(This graph is a reference, and the values will not be guaranteed.)

Action Description



	Operating Procedure	Note
Locking	Hydraulic pressure is ON.	
	Actuator ① is activated.	
	Pressure increases to the sequence operation set pressure.	The difference between the operating pressure and the sequence operation set pressure should be 1MPa or more.
	The sequence valve circuit opens.	
	Actuator ② is activated.	
	Locking action is completed.	
	Machining, etc.	
Releasing	Hydraulic pressure is OFF.	
	The actuators ① and ② are released almost simultaneously.	The check valve in the sequence valve opens when the incoming side pressure decreases.
	Releasing action is completed.	

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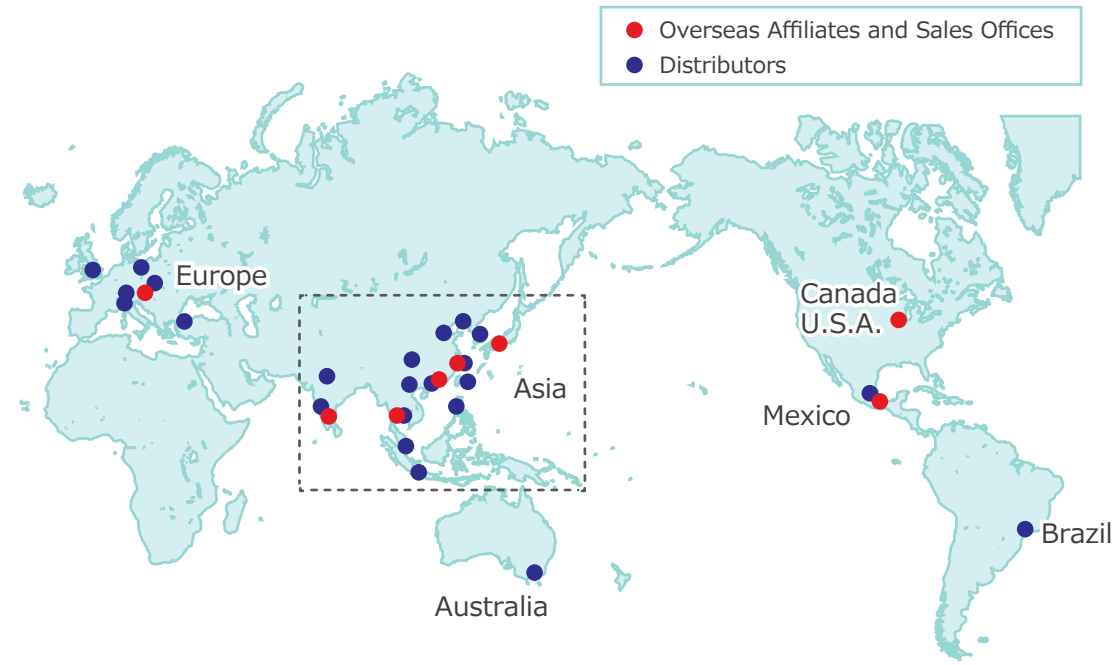
Global Network



Asia Detailed Map

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