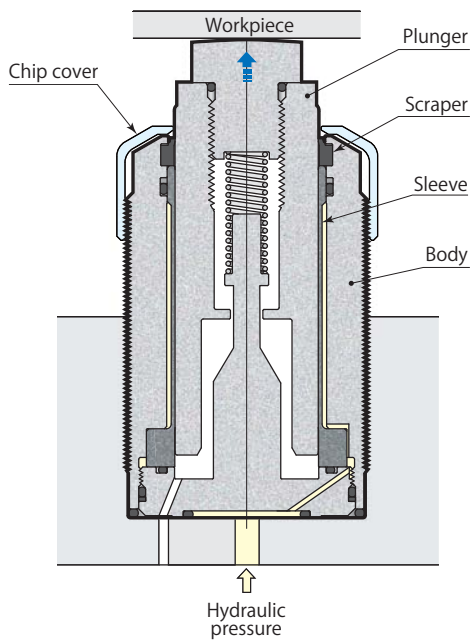
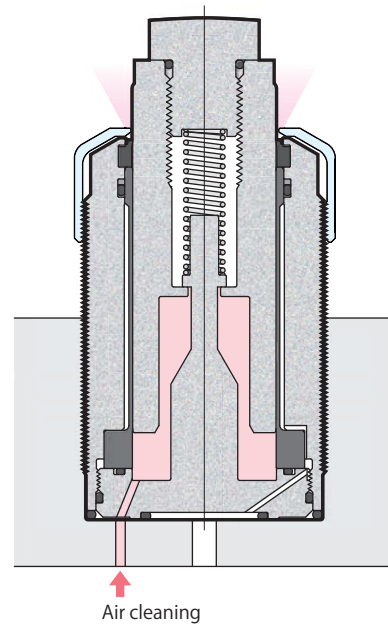


Spring lift
model CSV □ M-L

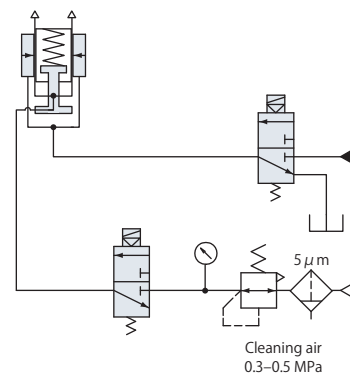


Lock



Unlock

Hydraulic and pneumatic circuit diagram



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- Hydraulic pressure & support force page → 121
- Applied load & deformation page → 121
- Dimensions page → 122
- Mounting details page → 122

Specifications

Size Plunger stroke
 CSV **06** **10** **16** **25** M - **L** : Standard stroke

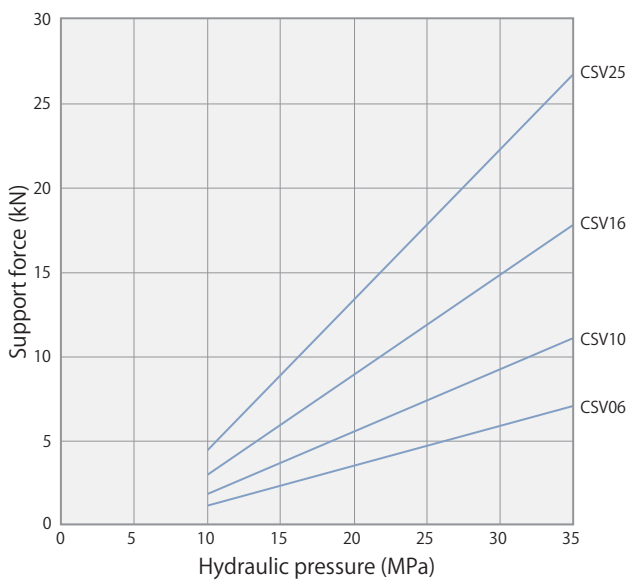
Model		CSV06M-L	CSV10M-L	CSV16M-L	CSV25M-L
Support force (hydraulic pressure 35MPa)*1	kN	7.1	11.1	17.8	26.7
Cylinder capacity	cm ³	1.5	2.9	5.5	5.7
Lift spring force*2	N	6-11	10-16	16-29	25-45
Plunger stroke	mm	8	10	10	13
Max. allowable mass of head cap	kg	0.1	0.1	0.2	0.2
Mass	kg	0.28	0.42	1.02	1.90
Recommended tightening torque of body	N·m	35	60	130	250

- Pressure range: 10-35 MPa ● Proof pressure: 52.5 MPa ● Operating temperature: 0-70°C
- Fluid used: General mineral based hydraulic oil (ISO-VG32 equivalent)
- Seals are resistant to chlorine-based cutting fluid. (not thermal resistant specification)

*1: When work support and clamp are used facing each other, work support and clamp must be selected in such a way that the support force is 1.5 times the applied load (clamping force + machining force).

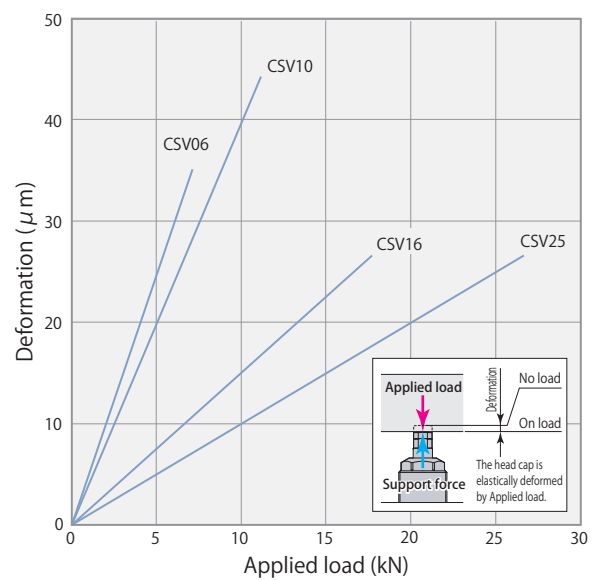
*2: Figures are for "upper end to lower end" of plunger action.

Hydraulic pressure & support force



Hydraulic pressure MPa	Support force kN			
	CSV06	CSV10	CSV16	CSV25
10	1.2	1.9	3.0	4.5
15	2.3	3.7	6.0	8.9
20	3.5	5.6	8.9	13.4
25	4.7	7.4	11.9	17.8
30	5.9	9.3	14.8	22.3
35	7.1	11.1	17.8	26.7

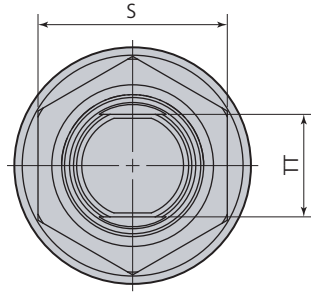
Applied load & deformation



Applied load kN	Deformation μm			
	CSV06	CSV10	CSV16	CSV25
0	0	0	0	0
5	25	20	7.5	5
10	40	40	15	10
15	55	60	22.5	15
20	70	80	30	20
25	85	100	37.5	25
30	100	120	45	30

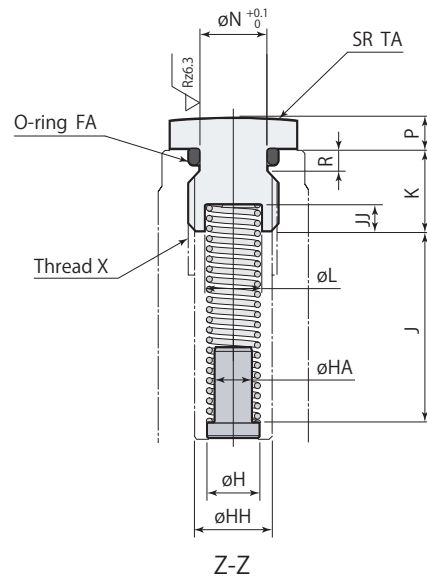
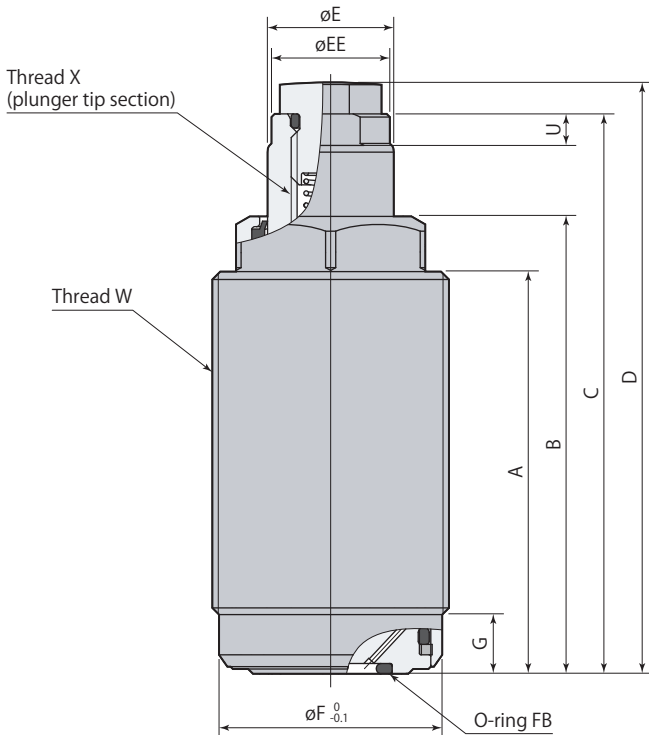
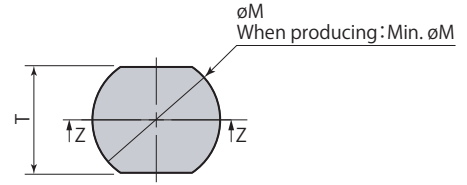
Held with hydraulic pressure of 35 MPa.

Dimensions

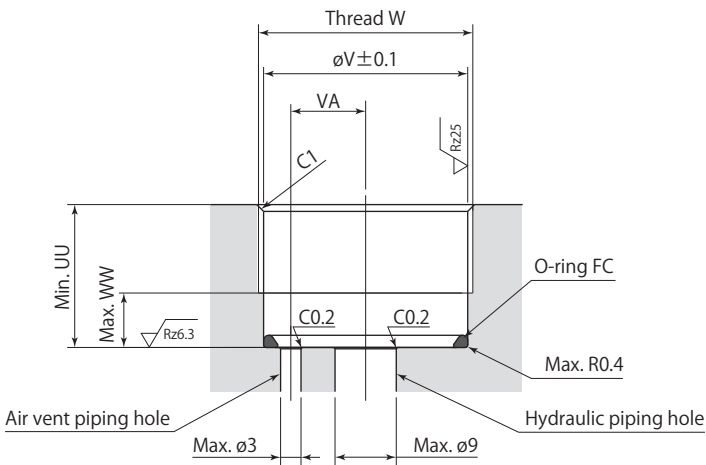


Head cap details

Hardness: HRC52



Mounting details



Rz: ISO4287(1997)

- When fixing the hexagon part of body with a vise, etc., make sure the tightening force is 2.5 kN or less.
- Always attach head cap (lift spring cannot be retained). When fabricating head cap, ensure that O-ring slot, spring spot facing and guide are made by referring to head cap details. Be sure to always use O-ring.
- When fabricating a lift spring, determine dimensions by referring to head cap details. Furthermore, rustproofing must be implemented (however, there is no guarantee for operation).
- Install O-ring FC at the bottom of the hole. The O-ring FC is packed with a work support.
- This diagram indicates a situation where head cap has been fitted into plunger with no pressure applied.

Work support

Spring lift

CSV□M-L	Work support Spring lift	35MPa
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Model	CSV06M-L	CSV10M-L	CSV16M-L	CSV25M-L
A	51	58	59.5	68.5
B	58	67	71.8	82
C	71	83	88	102
D	75	87	94	109
øE	16	20	30	40
øEE	15	19	29	39
øF	28.3	33.2	48.2	63.2
G	7.5	7.5	7.5	8
øH	7	7	8.5	10
øHA	5	5	6	7.5
øHH	8.5	10.3	14	14
J	20.5	25.5	25	32.5
JJ	1.5	3.5	1.5	1.5
K	9	11	12	11
øL	7.4	7.6	9.2	11.2
øM	12.9	16.9	23	30
Min. øM	12.5	16	21	21
øN	7.8	8.9	13.3	13.3
P	4	4	6	7
R	1.9	3	2.4	2.4
S	24	30	41	55
T (width across flats)	12	14	19	24
TA	70	90	110	140
TT (plunger width across flats)	13	17	24	32
U	4	5	5	5.7
UU	15.5	15.5	15.5	20
øV	28.5	33.5	48.5	63.5
VA	11	12	18	23.5
W	M30×1.5	M35×1.5	M50×1.5	M65×1.5
WW	6.5	6.5	6.5	7
X (recommended tightening torque)	M10×1.5 depth 13 (30 N·m)	M12×1.75 depth 16 (50 N·m)	M16×2 depth 20 (100 N·m)	M16×2 depth 20 (100 N·m)
O-ring FA (fluorocarbon hardness Hs70)	S8	P9	AS568-014	AS568-014
O-ring FB (fluorocarbon hardness Hs90)	AS568-014	AS568-015	AS568-019	AS568-022
O-ring FC (fluorocarbon hardness Hs90)	AS568-022	AS568-025	S45	AS568-036

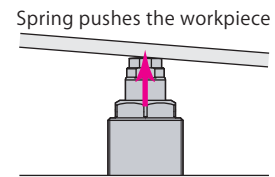
mm

Work support

CSV
Spring lift

Caution in use

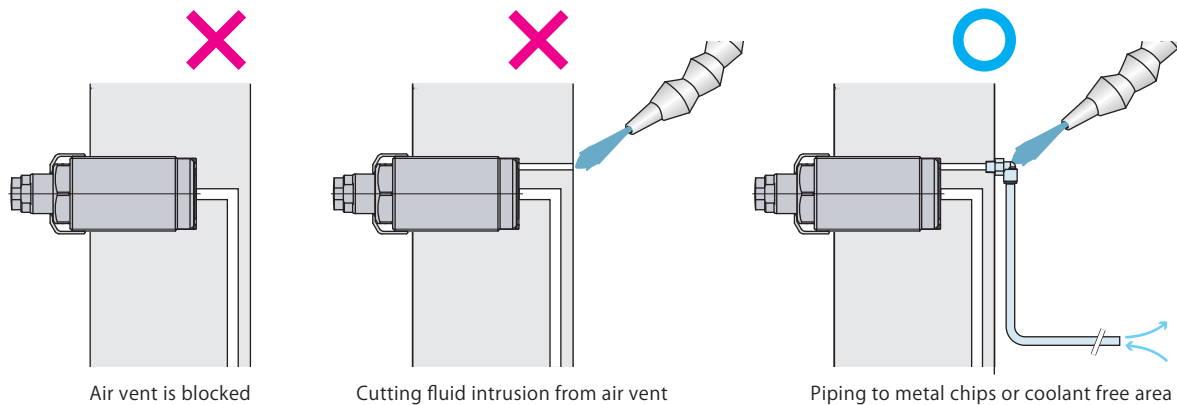
- If the workpiece is light weight, the plunger cannot be pressed down by the weight of workpiece and seating detection cannot be complete. Review the weight of workpiece or lift spring force to make the workpiece seat perfectly, and lock the work support.



- Avoid following usages. These may cause sleeve deformation that could lead to malfunction of plunger or decreased support force.

- ✗ Applying eccentric load on plunger.
- ✗ Applying load that exceeds rated support force.
- ✗ Rotating plunger when locked.

- Air vent must be opened to atmosphere. Any blockage on the vent results in malfunction. Provide the piping if there is a risk of coolant or metal chips intrusion. Allowing intrusion of cutting fluid may cause rusting and other problems.



- Air (oil free) must be fed through a $5\mu\text{m}$ filter that is connected to an air vent port for air cleaning. Perform air cleaning only when replacing workpiece.