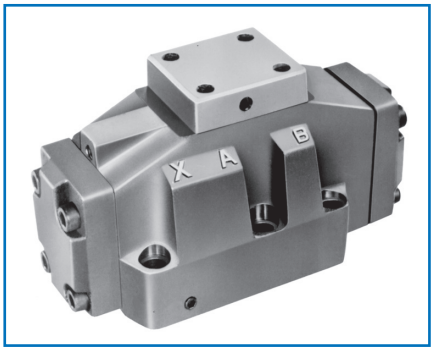
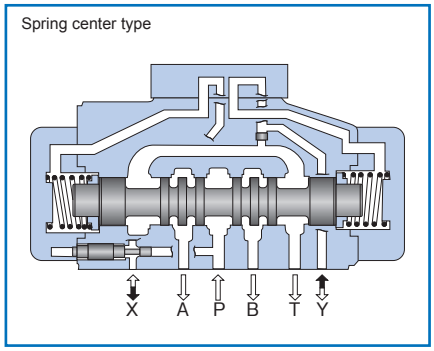
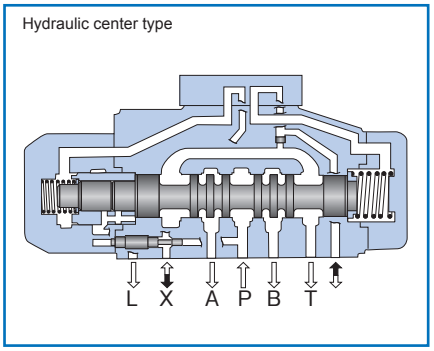
Pilot operated directional valve (2) DH16 to 32







Overview

This pilot operated directional valve is used for controlling start and stop, and movement direction of the hydraulic system with pilot oil pressure.

Features

1. The improvement of internal coring shape and spool shape of the casing has substantially reduced the flow resistance.
2. For return to neutral of the main valve, the spring center type and pressure-centred type are prepared as standard items.
3. A stroke limiter for adjusting spool stroke of the main valve can be installed.
4. The maximum working pressure is 34.3 MPa (350 kgf/cm^2).

Type indication

**DH 16 P - 11 - 2 05 - S1 - **

Pilot operated directional valve

Nominal dimension
16, 22, 32

Connection method
P = Gasket connection type

Series number
without choke valve = 10
with choke valve = 11

Position holding method
2 = 2 position, spring offset type
3 position, spring center type
3 = 2 position, hydraulic offset type
3 position, hydraulic center type

Spool type
* Refer to “Spool type symbols”.

Type of hydraulic oil
No symbol = Mineral based hydraulic oil
V = Phosphate ester based hydraulic oil
W = Fatty ester based hydraulic oil
Water-glycol based hydraulic oil

Accessory parts of cover part provided or not
No symbol = No accessory parts
10 = with stroke limiter
11 = with stroke limiter on port A side
12 = with stroke limiter on port B side

Choke valve provided or not
No symbol = without choke valve
S1 = with meter-in choke valve (Note 1)
S2 = with meter-out choke valve (Note 1)

Drain system
No symbol = External drain
T = Internal drain
(spring offset type only)

* Items in (Note 1) are similar to those of the solenoid controlled pilot operated directional valve (DEH16, 22, 32). Refer to the section of the solenoid controlled pilot operated directional valve (1).

Sub-plate

Valve type	Sub-plate type	Connection diameter	Mass
DH16	P-DEH16R34-0	Rc 3/4	7.0kg
	P-DEH16G34-0	G 3/4	
	P-DEH16R1-0	Rc 1	14.5kg
	P-DEH16G1-0	G 1	
DH22	P-DEH22R1-0	Rc 1	11kg
	P-DEH22G1-0	G 1	
	P-DEH22R54-0	Rc 1 1/4	24kg
	P-DEH22G54-0	G 1 1/4	
	P-DEH22R32-0	Rc 1 1/2	
	P-DEH22G32-0	G 1 1/2	
DH32	P-DEH32R32-0	Rc 1 1/2	19kg
	P-DEH32G32-0	G 1 1/2	

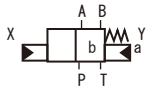
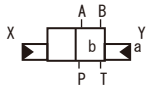
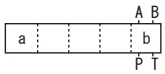
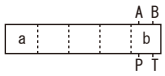
When you use a sub-plate, please place an order for the above sub-plate type.
For the dimension drawing, refer to pages 9,10 and 11 of the appendix.

Accessories

Mounting bolt

Type	Hexagon socket head cap thread	Quantity	Tightening torque N·m (kgf·cm)
DH16	M6×55L	2 pcs.	11.8± 1.7 (120± 18)
	M10×60L	4 pcs.	56.8± 8.5 (580± 87)
DH22	M12×60L	6 pcs.	98.0±14.7 (1000±150)
DH32	M20×80L	6 pcs.	431.2±64.6 (4400±660)

Spool type symbol

Valve type	Spool type	Hydraulic symbols	Transient state
2 position valve		Spring offset type  Hydraulic offset type 	 
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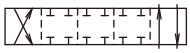
	04		
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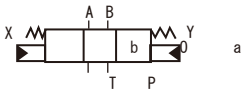
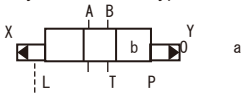
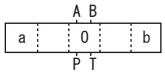
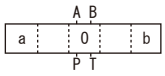
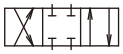
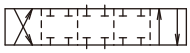
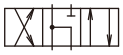
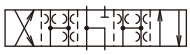
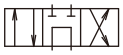
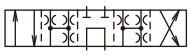
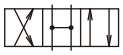
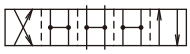
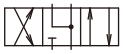
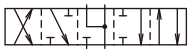
	26		
3 position valve		Spring center type  Hydraulic center type 	 
	05		
	06		
	07		
	08		
	10		
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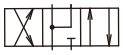
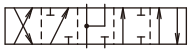
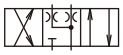
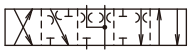
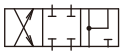
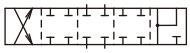
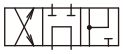
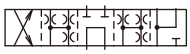
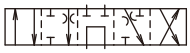
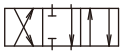
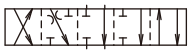
	13		
	17		
	18		
	19		
	20		
	21		
	22		
	23		

Specifications

Nominal dimension			16	22	32
Maximum working pressure MPa (kgf/cm²)	Port A, B, P		34. 3 (350)		
	Port T		24. 5 (250)		
Highest pilot pressure	MPa (kgf/cm²)		24. 5 (250)		
Lowest pilot pressure MPa (kgf/cm²)	3 position valve spring center type 3 position valve hydraulic center type		0. 78 (8. 0)		
	2 position valve spring offset type		0. 98 (10. 0)		
	2 position valve hydraulic offset type		0. 5 (5. 0)		
Stroke volume of pilot part cm³	2 position valve spring offset type 2 position valve hydraulic offset type		8. 9	19. 3	70. 7
	3 position valve spring center type		4. 45	9. 65	35. 35
	3 position valve hydraulic center type	Position "o"→"a"	2. 30	5. 0	17. 25
		Position "a"→"o"	2. 15	4. 65	18. 1
		Position "o"→"b"	4. 45	9. 65	35. 35
		Position "b"→"o"	2. 30	4. 65	17. 25
Opening area at spool neutral position (with spool 10 as 100%)		Spool 17, 22	16%		
		Spool 23	3%		
Mass kg			7. 5	13	49

Maximum flow rate

Maximum flow rate L/min — 2 position valve spring offset type, 3 position valve spring center type

Nominal dimension	Spool type	Working pressure MPa (kgf/cm²)				
		7 (70)	14 (140)	20.6 (210)	27.4 (280)	34.3 (350)
(A) 16	05, 10, 12, 13, 17, 18, 21 22, 23, 03, 04, 11, 26	* 240	240	205	180	170
	06	200	145	115	100	90
	07, 08, 19, 20	220	160	130	110	100
(A) 22	05, 10, 12, 13, 17, 18, 21 22, 23, 03, 04, 11, 26	* 450	450	370	320	300
	06, 07, 08, 19, 20	360	250	210	180	160
(A) 32	05., 10, 12, 13, 17, 18, 21 22, 23, 03, 04, 11, 26	* 1100	1050	860	750	680
	06, 07, 08, 19, 20	820	630	510	450	400

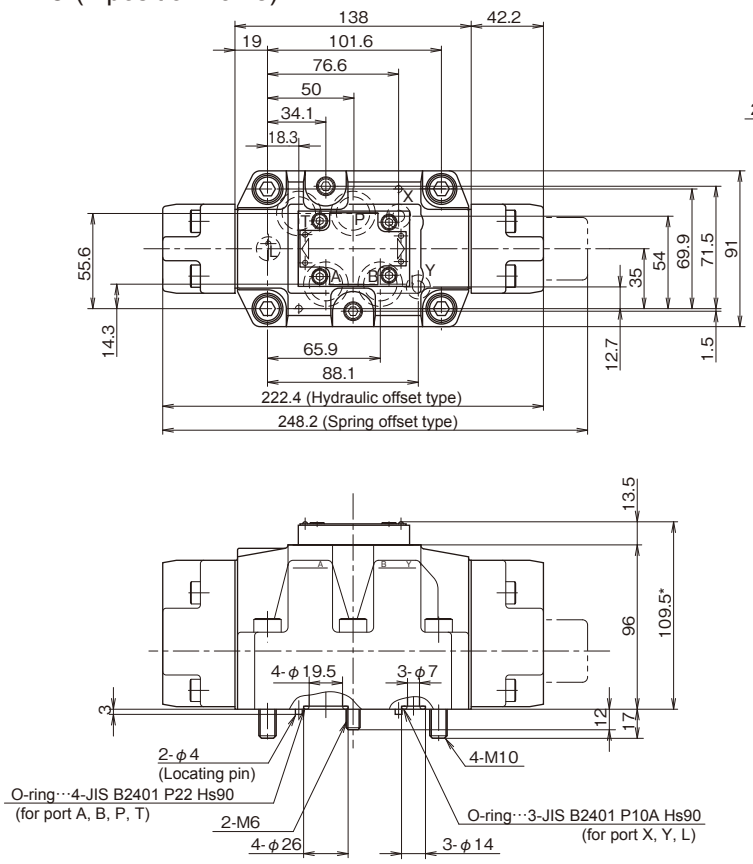
(Note)
- The above table shows numerical values in the case of the lowest pilot pressure.
- The maximum flow rate in the case of the 2 position valve hydraulic offset type and 3 position valve hydraulic center type is the flow rate of stage (A) regardless of the spool type, and is the flow rate marked with * regardless of the spool type and pressure if pilot pressure is 1.5 MPa (15 Kgf/cm²) or higher.

Pressure drop characteristics

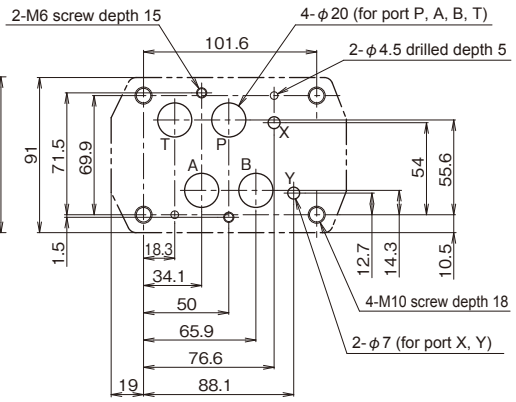
- Similar to those of solenoid controlled pilot operated directional valve (DEH16, 22, 32) Refer to the section of the type number index "DEH16, 22, 32".

Dimension drawing

●DH16 (2 position valve)



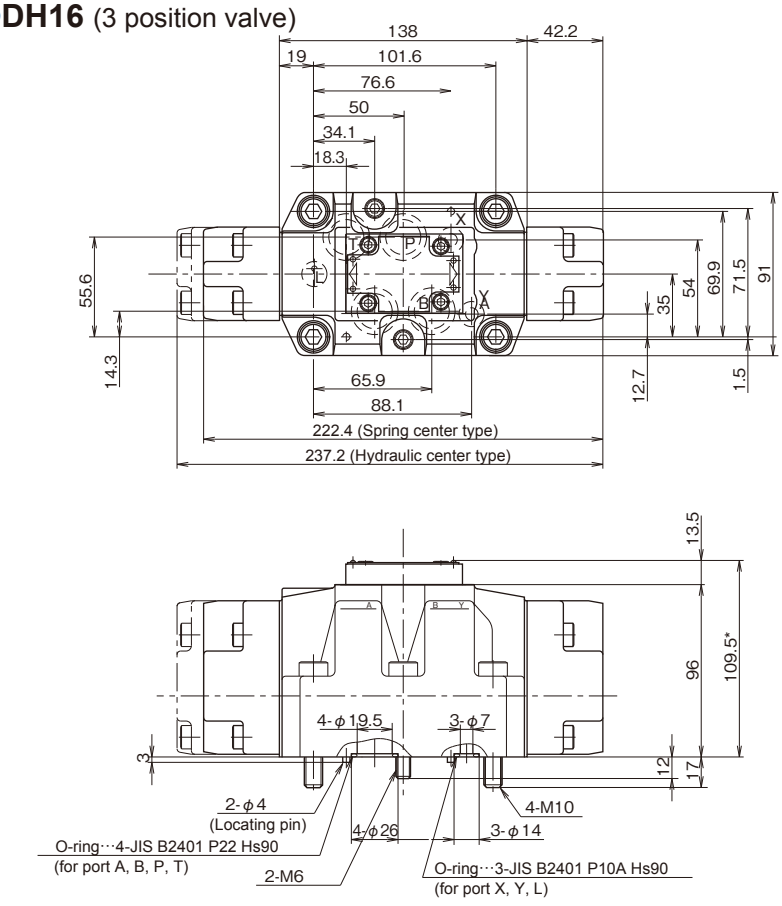
Machining dimension of manifold



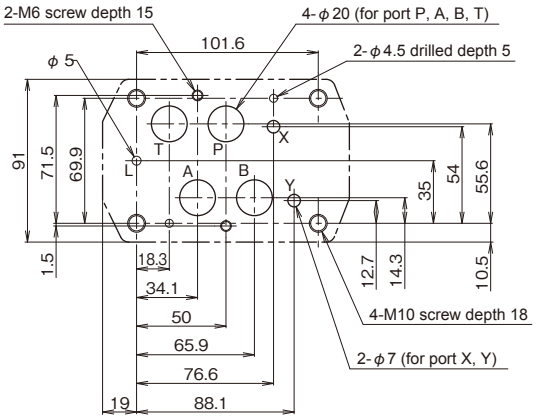
(Note) Port L is not used.

The dimension marked with * differs depending on the type.
With choke valve (S1, S2): +40 mm

●DH16 (3 position valve)



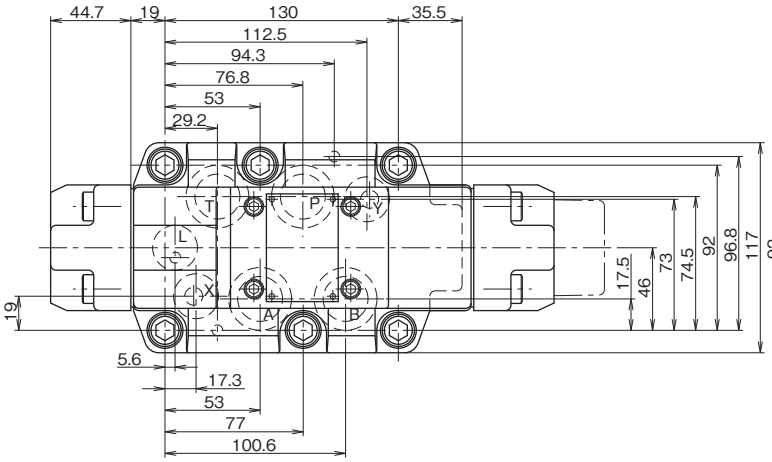
Machining dimension of manifold



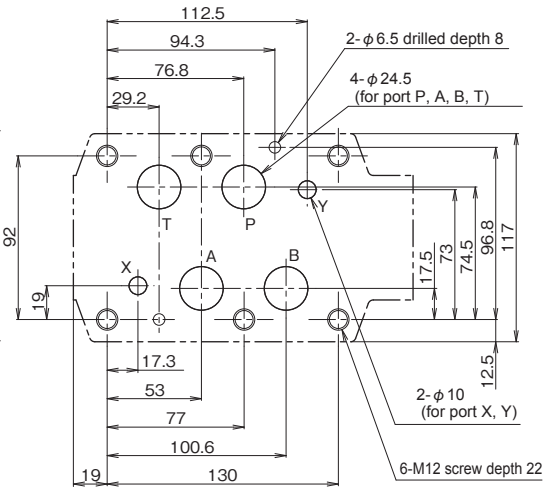
(Note) Port L is not used in the case of the spring center type.
Use port L with tank pressure in the case of the hydraulic center type.

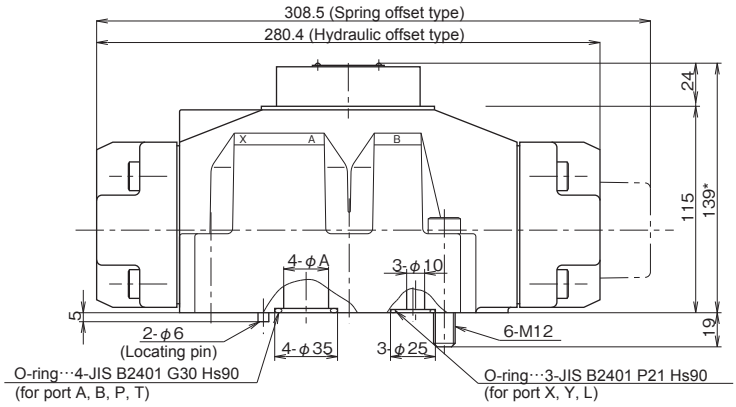
The dimension marked with * differs depending on the type.
With choke valve (S1, S2): +40 mm

●DH22 (2 position valve)



Machining dimension of manifold



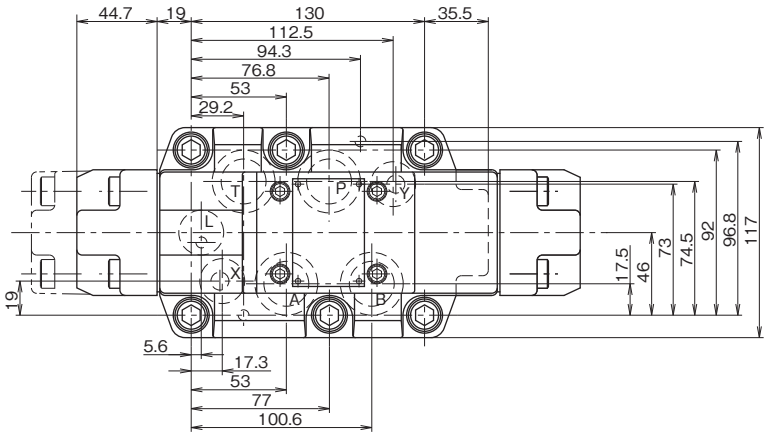


(Note) Port L is not used.

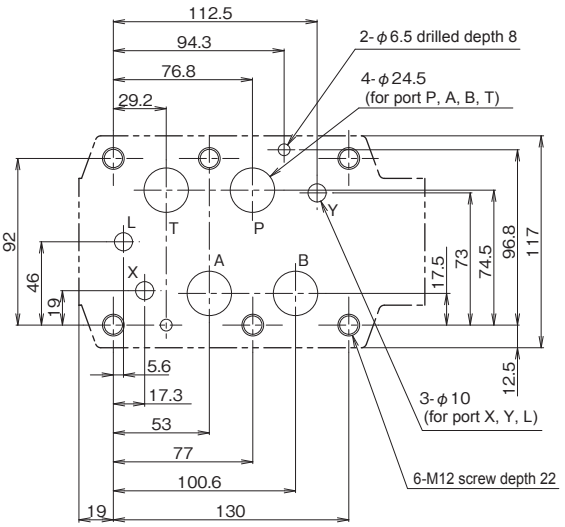
The dimension marked with * differs depending on the type.
With choke valve (S1, S2): +55 mm

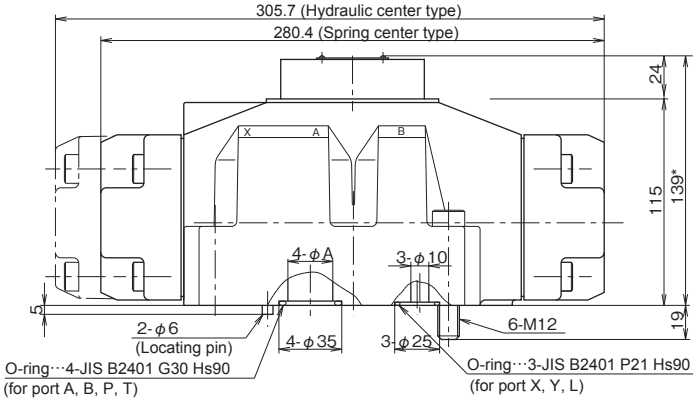
Dimension	φA
Port P	24
Port A, B	24.5
Port T	25

●DH22 (3 position valve)



Machining dimension of manifold



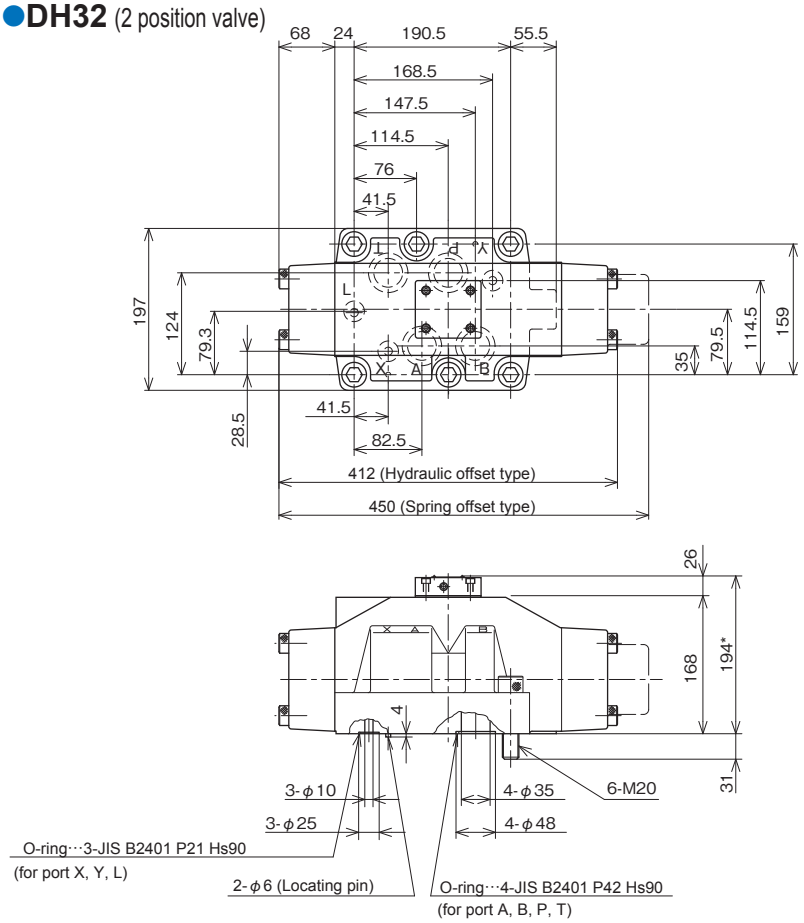


(Note) Port L is not used in the case of the spring center type.
Use port L with tank pressure in the case of the hydraulic center type.

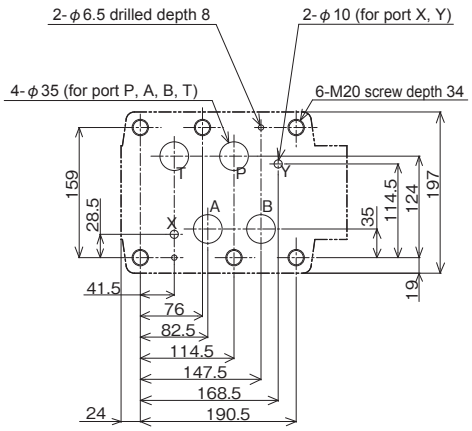
The dimension marked with * differs depending on the type.
With choke valve (S1, S2): +55 mm

Dimension	φA
Port P	24
Port A, B	24.5
Port T	25

●DH32 (2 position valve)



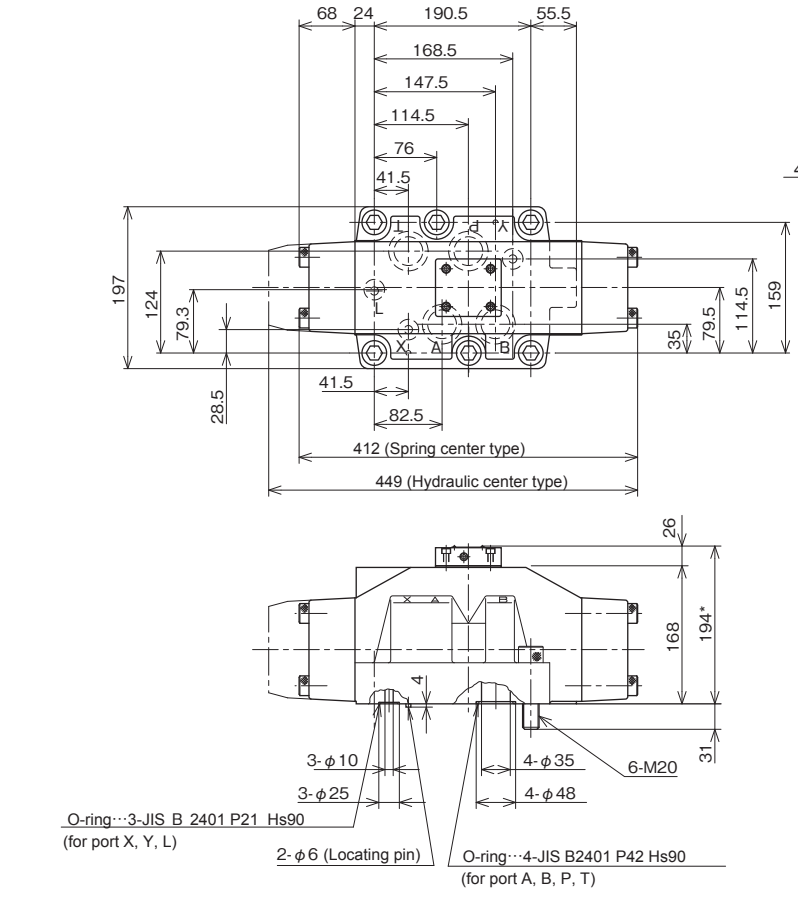
Machining dimension of manifold



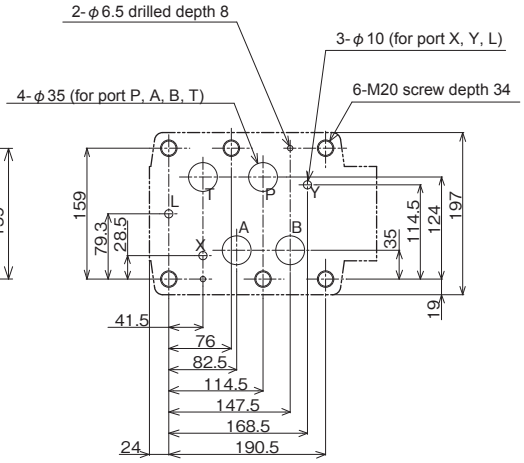
(Note) Port L is not used.

The dimension marked with * differs depending on the type.
With choke valve (S1, S2): +55 mm

●DH32 (3 position valve)



Machining dimension of manifold



(Note) Port L is not used in the case of the spring center type.
Use port L with tank pressure in the case of the hydraulic center type.

The dimension marked with * differs depending on the type.
With choke valve (S1, S2): +55 mm