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# Solenoid Pilot Operated Directional Control Valve



## Features

- Adoption of the shockless spool enables smooth reversal and stopping of the load.
- This model is best suited to integration into European Safety Standard (CE) compliant equipment since it has dust-/water-proof properties that satisfy the IEC Pub529 IP65 ingress protection grade.

## Nomenclature

※ - **JSP** - **G** ※※ - ※※ ※ ※ - **40** - ※  
1      2      3 4      5 6 7      8      9

### 1 Applicable fluid code

No designation: Petroleum-based hydraulic fluid  
 H: Water-glycol hydraulic fluid  
 F: Phosphate ester hydraulic fluid

### 2 Model No.

JSP: J series solenoid pilot operated directional control valve

### 3 Connections

G: Gasket mount type

### 4 Nominal diameter

02: ¼  
 03: ⅜

### 5 Spool type (See the model table)

### 6 Spool operating method (See the model table)

C: Spring center type  
 B: Spring offset type (with B solenoid)  
 N: No-spring type (without detent)

### 7 Voltage code (See the voltage code table)

### 8 Design No. (The design No. is subject to change)

### 9 Option code (See the option code table)

## Specifications

Model No.	Nominal diameter	Maximum operating pressure MPa {kgf/cm <sup>2</sup> }	Maximum flow rate L/min	Pilot pressure MPa {kgf/cm <sup>2</sup> }	Permissible back pressure MPa {kgf/cm <sup>2</sup> }		Fluid drainage volume at spool switching cm <sup>3</sup>	
					External drain type	Internal drain type	Type C	Type B, N
JSP-G02	¼	21 {210}	30	0.45 to 21 {4.5 to 210}	21 {210}	10 {100}	0.66	1.32
JSP-G03	⅜		120				2.2	4.4

Refer to KSO-G02 on Page G-12 for the solenoid specifications.

## 7: Voltage code table

Voltage code	Power supply voltage	Voltage code	Power supply voltage
A	AC 100 V (50/60 Hz), AC 110 V (60 Hz)	N	DC 12 V
B	AC 200 V (50/60 Hz), AC 220 V (60 Hz)	P	DC 24 V
C	AC 110 V (50 Hz)	Q	DC 48 V
D	AC 220 V (50 Hz)	R	DC 100 V
J	AC 240 V (50/60 Hz)	S	DC 110 V
K	AC 120 V (50/60 Hz)	T	DC 200 V
L	AC 115 V (50/60 Hz)	U	DC 220 V
M	AC 230 V (50/60 Hz)	E	AC 100 V (50/60 Hz) with rectifier
		F	AC 110 V (50/60 Hz) with rectifier
		G	AC 200 V (50/60 Hz) with rectifier
		H	AC 220 V (50/60 Hz) with rectifier

See the solenoid specification table for KSO-G02 on Page G-12 for solenoid specifications.

## 9: Option code table

### ● JSP-G02

Code	Option details
No designation*1	Internal pilot, internal drain type
X *2	Internal pilot, internal drain type
Y	External pilot, external drain type
Z	External pilot, internal drain type
E *1	Internal pilot, external drain type
D	No-spring type (with detent)
S	With stroke adjusting structure

### ● JSP-G03

Code	Option details
No code	Internal pilot, external drain type
X	Internal pilot, internal drain type
Y	External pilot, external drain type
Z	External pilot, internal drain type
D	No-spring type (with detent)
S	With stroke adjusting structure
P	With spool lock structure (solenoid valve)

See the option code table of KSO-G02 on Page G-12 for the options for solenoid pilot valves.

Note: ○ If two or more options are selected, sort the option codes in alphabetical order.

\*1 When 3C or 66C is designated for the spool code and spool operating method, code E is not required because the internal pilot and external drain type model is standard.

\*2 When the solenoid pilot option with grounding terminal (code E, EN, ENR, etc.) is selected for an internal pilot and internal drain type model, the option code is "X".

## Mass (kg)

Details		JSP-G02 *3		JSP-G03	
		AC	DC, with rectifier	AC	DC, with rectifier
Terminal box type	Double solenoid	3.5	3.9	6.9	7.3
	Single solenoid	3.2	3.4	6.6	6.8
DIN connector type	Double solenoid	3.5	3.7	6.9	7.2
	Single solenoid	3.1	3.3	6.5	6.7
Lead wire type	Double solenoid	3.4	3.8	6.8	7.1
	Single solenoid	3.1	3.3	6.5	6.6

Note: \*3 The mass is 1 kg larger than the values indicated above when 3C or 66C is designated for the spool type and spool operating method and the option code is Y, Z or E.

## Solenoid pilot valve model code

Model code	Applicable solenoid valve model code (*: Voltage code)
JSP-G**-*-**C*-40	KSO-G02-4C*-30
JSP-G**-*-**B*-40	KSO-G02-2B*-30
JSP-G**-*-**N*-40	KSO-G02-2N*-30
JSP-G**-*-**N*-40-D	KSO-G02-2D*-30

## Sub-plate model code

● The sub-plate is not provided with the valve. Order it separately if required by specifying the model code given in the table below.

Model code	Nominal diameter	Connection port diameter	Mass kg
JS-01M02	1/4	Rc1/4	0.64
JS-02M03		Rc3/8	2.3

Refer to Page S-8 for the dimensions of the sub-plate for G02.

Note: No sub-plate is provided for JSP-G03.

## Accessories

Model No.	Hexagon socket head cap bolt	Quantity	Tightening torque N·m {kgf·cm}
JSP-G02	(1) M5 × 85	4	4 to 5 { 40 to 50 }
	(2) M5 × 125	4	
JSP-G03	M6 × 35	4	10 to 13 {100 to 130}

Note: Basic model (1) Models other than the ones below

(2) Spool type/operating method 3C or 66C and option code Y, Z or E

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## 5 6 : Model table

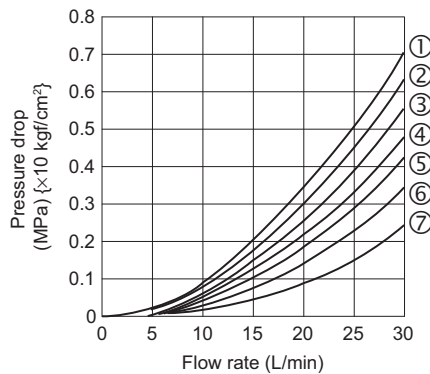
Model code	JIS graphic symbols for hydraulic system		Maximum flow rate L/min		Pressure drop characteristics (See performance curves)					
	JSP-G02	JSP-G03	JSP-G02	JSP-G03	JSP-G02			JSP-G03		
					P → A P → B	A → T B → T	P → T	P → A P → B	A → T B → T	P → T
JSP-G**×-2C			30	120	⑤	②	—	④	⑤ ③	—
JSP-G**×-3C			30	90	⑦	④	⑥	⑤	⑥ ⑤	④
JSP-G02-33C		—	30	—	⑤	②	—	—	—	—
JSP-G**×-4C			30	120	⑤	④	—	④	④ ⑤	—
JSP-G**×-44C			30	120	⑤	②	—	④	⑥ ⑤	—
JSP-G**×-66C			30 (12)*4	100	⑥	③	①	③ ①	③ ②	①
JSP-G**×-2B			30	120	⑤	②	—	④	⑤ ③	—
JSP-G**×-33B			30	120	⑤	②	—	⑤	⑥ ⑤	—
JSP-G**×-2N			30	120	⑤	②	—	④	⑤ ③	—
JSP-G02-33N		—	30	—	⑤	②	—	—	—	—

Note: \*4 The flow rate at 12 MPa {120 kgf/cm<sup>2</sup>} or higher is 12 L/min.

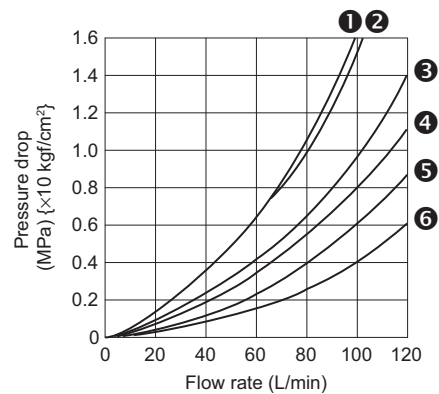
## Performance curves (viscosity: 32 mm<sup>2</sup>/s {cSt})

### ● Pressure drop characteristics

#### JSP-G02



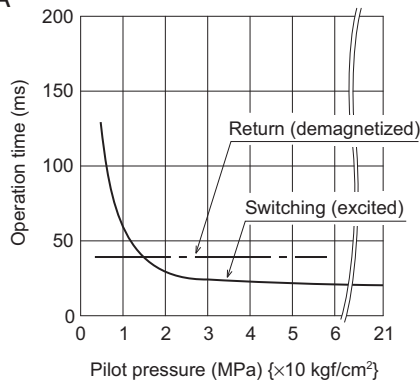
#### JSP-G03



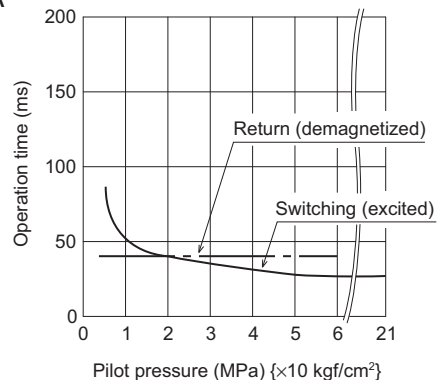
### ● Operation time characteristics

Note: The operation time may change slightly depending on the conditions of use (pressure, flow rate, hydraulic fluid viscosity, etc.).

#### JSP-G02-2CA



#### JSP-G03-2CA



## Handling

● **Pilot**

- With the internal drain type, maintain the pressure difference between the pilot pressure and the back pressure of the tank line no lower than the minimum pilot pressure of 0.45 MPa {4.5 kgf/cm<sup>2</sup>}.
- When using the product with spool type 3 or 66 as the internal pilot type, insert a resistance valve with a cracking pressure of 0.45 MPa {4.5 kgf/cm<sup>2</sup>} minimum in the tank line and set it as the external drain type.

● **Drainage**

- Directly connect the drain piping to the tank without merging it with other tank piping.
- External pilot type products can be used as internal drain type regardless of the model.
- Internal pilot type products can be used as internal drain type when the spool type is 2, 33, 4, or 44.

● **Pilot throttle valve**

To suppress shocks at switching by adjusting the switching speed of the spool, stack one of the 02 size stack valves (MT-02W) below the solenoid pilot valve.

When using stack valves, order mounting bolts separately by referring to the table below since the required mounting bolts vary depending on the stacking height.

Number of stacked valves	JSP-G02			JSP-G03	
	Mounting bolt model code	Hexagon socket head cap bolt	Mounting bolt model code	Hexagon socket head cap bolt	
1	(1)	HB102	M5 × 125, 4 pcs.	HB101	M5 × 85, 4 pcs.
	(2)	HB103	M5 × 165, 4 pcs.		

Note: JSP-G02 (1) Models other than the ones below

(2) Spool type/operating method 3C or 66C and option code Y, Z or E

- Tightening torque of hexagon socket head cap bolts: 6 to 8 N·m {60 to 80 kgf·cm}

## Pilot/drain type setting guide (JSP-G03)

- With JSP-G03, either the internal or external pilot and drain types can be set by fitting/removing plugs. With JSP-G02, the setting cannot be changed.

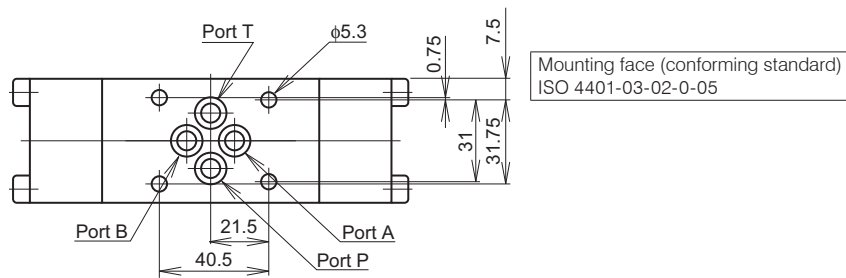
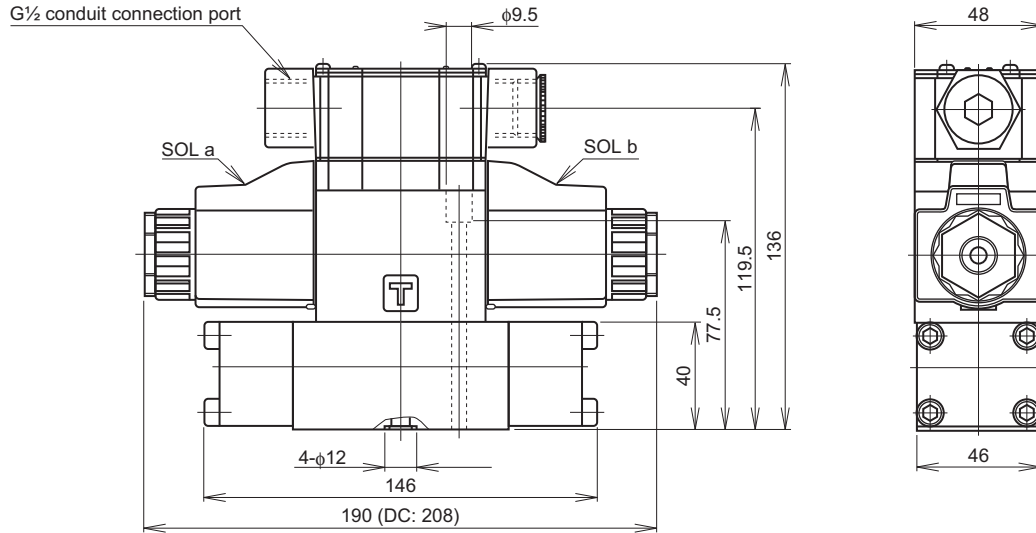
	Pilot type	Plug B	Drain type	Plug A	Hexagon socket taper thread plug	Tightening torque N·m {kgf·cm}
No designation	Internal	Without plug	External	With plug	NPTF <sup>1</sup> / <sub>32</sub>	0.9 to 1.2 {9 to 12}
X	Internal	Without plug	Internal	Without plug		
Y	External	With plug	External	With plug		
Z	External	With plug	Internal	Without plug		
Guide	The pilot type can be set by changing plug B.		The drain type can be set by changing plugs A.			

- See the sectional structural diagram on Page G-36 for the positions of plugs A and B. Do not wrap the plugs with sealing tape.

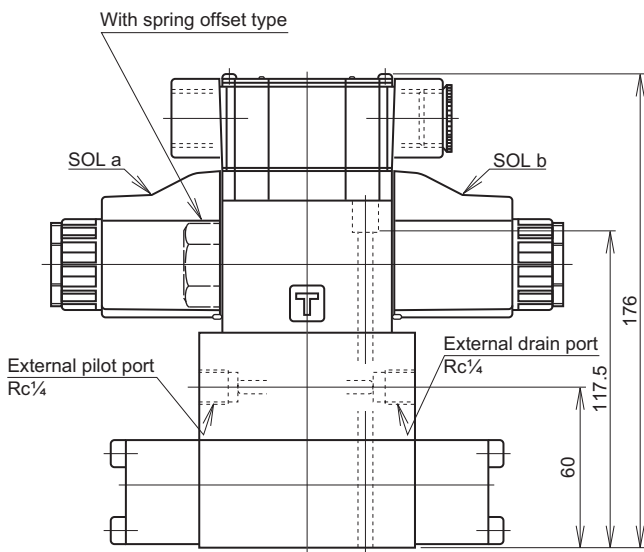
## External dimension diagram

● JSP-G02

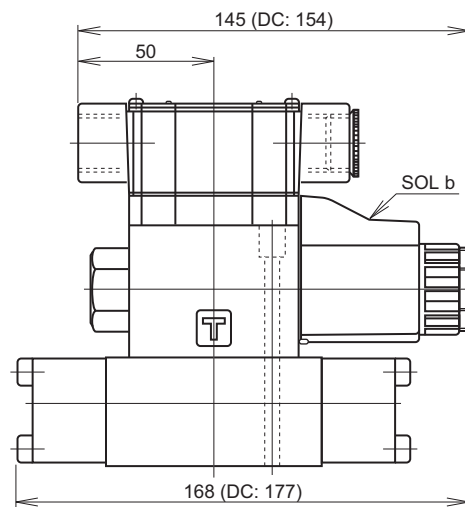
- Spring center type [3C and 66C types excluded]  
No-spring type



● Spring center type [3C and 66C types]



● Spring offset type



Note: Even with types other than 3C and 66C, the external pilot types will have the same geometry.

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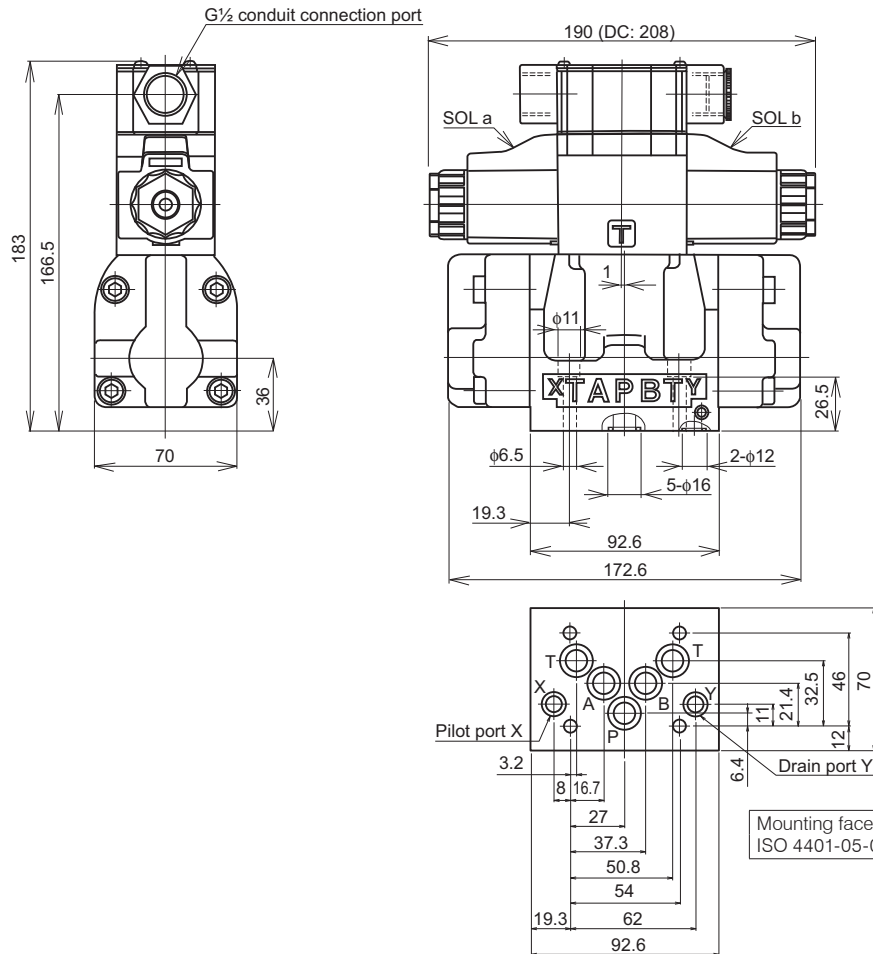
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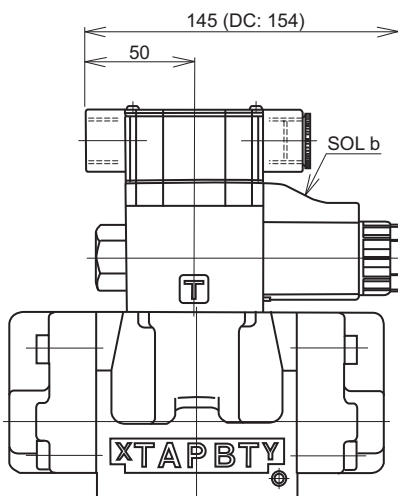
## External dimension diagram

### ● JSP-G03

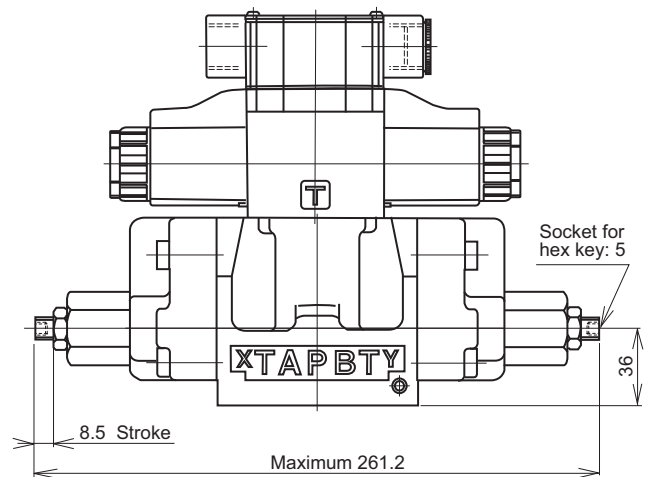
- Spring center type
- No-spring type



- Spring offset type



- Spring center type (with stroke adjusting function)



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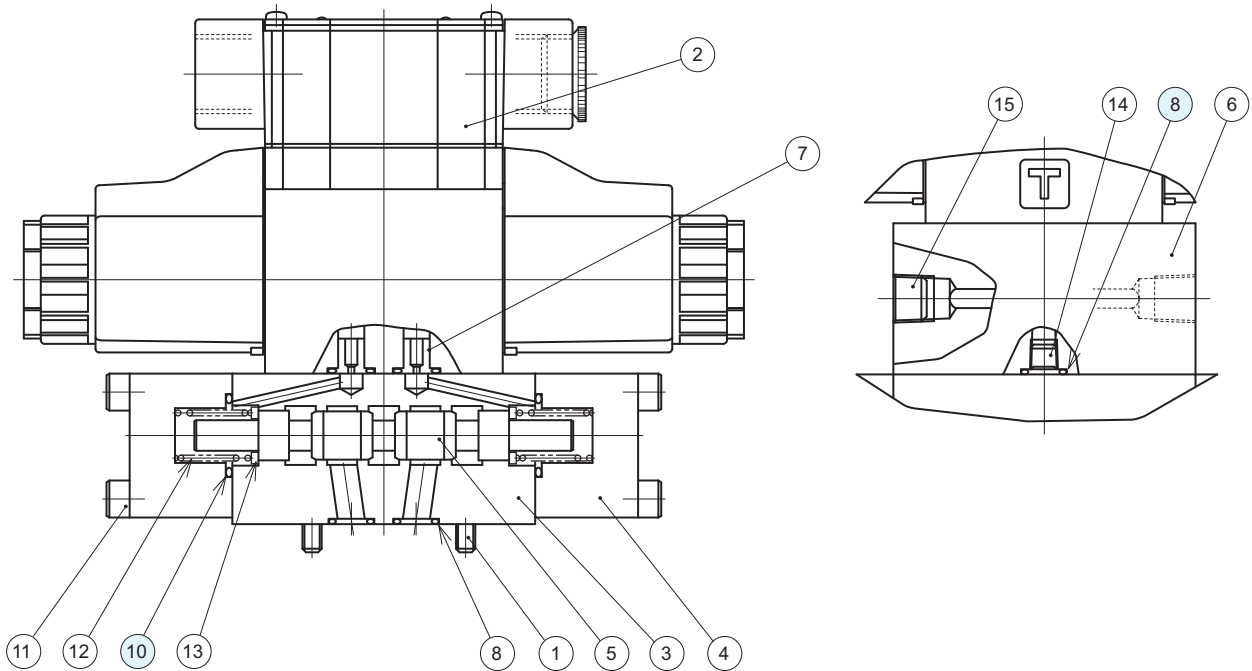
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## Sectional structural diagram

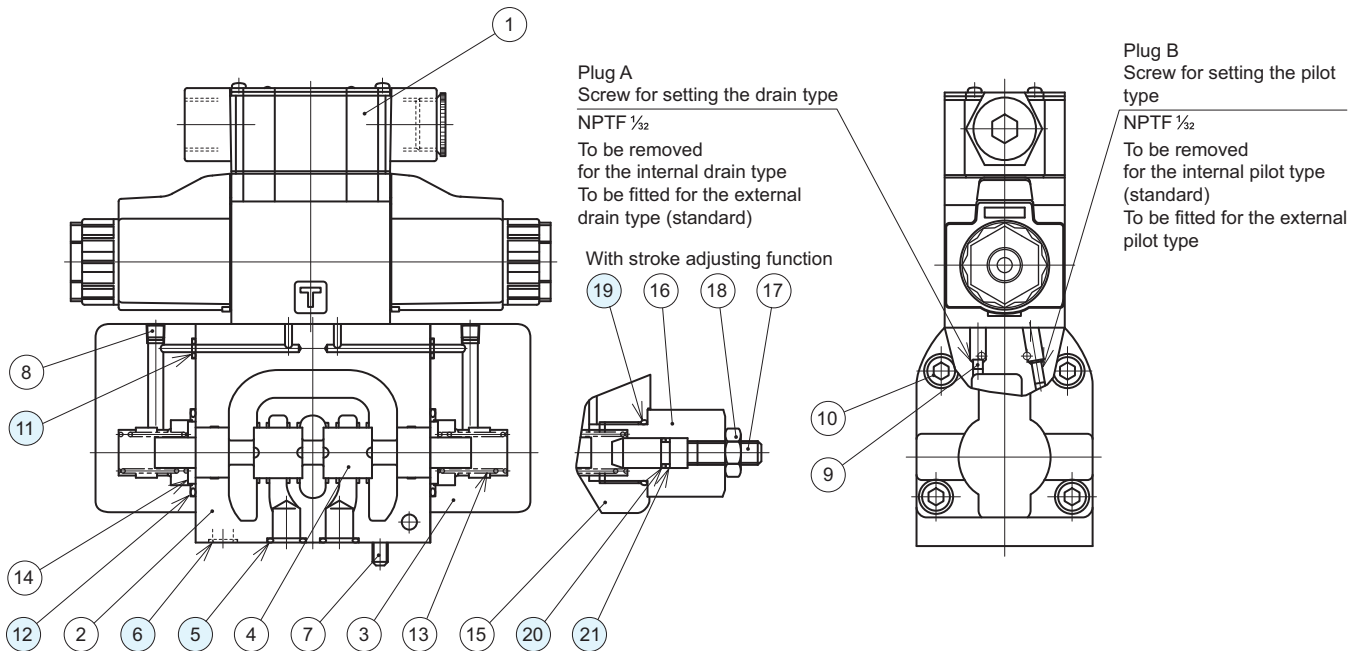
JSP-G02



Sealing part table

Part No.	Name	Quantity	Part specifications
8	O-ring	8	JIS B 2401 1B P9
10	O-ring	2	JIS B 2401 1B P18

JSP-G03



Sealing part table

Part No.	Name	Quantity	Part specifications
5	O-ring	5	JIS B 2401 1 P12
6	O-ring	2	JIS B 2401 1B P9
11	O-ring	4	JIS B 2401 1B P5
12	O-ring	2	AS568-123 (NBR, Hs90)
19	O-ring	2	JIS B 2401 1B P22
20	O-ring	2	JIS B 2401 1B P9
21	Backup ring	2	JIS B 2407 for P9 (bias cut)