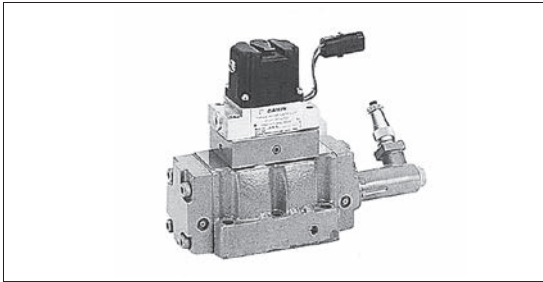


Solenoid Pilot Operated Proportional Directional Control Valve



Features

- These solenoid pilot operated proportional directional control valves use a nozzle flapper valve as pilot valve and perform spool position feedback control by detecting the displacement of the main valve with the differential transformer.

Nomenclature

SEM - **G** ×× - × - **20** - × ×

1 2 3 4 5 6 7

1 Model No.

SEM: Solenoid pilot operated proportional directional control valve

2 Connections

G: Gasket mount type

3 Nominal diameter

03: 3/8
04: 1/2
06: 3/4

**4 Spool type and spool operating method
(See the spool type table)**

5 Design No.

(The design No. is subject to change)

6 Option code I

No designation: Without driver

A: Driver installation type *1

7 Option code II

No designation: With filter block

P: Filter block, with reducing valve (MG-02P-1-55)

Note: *1 The driver installation type applies only to nominal diameters 03 (3/8) and 04 (1/2).

Specifications

Model No.	Nominal diameter	Maximum operating pressure MPa {kgf/cm ² }	Rated flow rate *2 L/min	Permissible back pressure at drainage line MPa {kgf/cm ² }	Hysteresis, resolution, repeatability	Pilot valves		
						Supplied pressure MPa {kgf/cm ² }	Required flow rate L/min	Saturated current mA
SEM-G03-×-20	3/8	21 {210}	100	1.4 {14}	0.5 % maximum	3 to 5 {30 to 50}	2.7 to 3.5	250
SEM-G04-×-20	1/2		170			3 to 7 {30 to 70}	4 to 7	
SEM-G06-×-20	3/4		300					

Note: *2 The rated flow rate indicates the value at 1 land differential pressure: ΔP= 1 MPa {10 kgf/cm²}.

○ Filtration accuracy of filter block: 75 μm

4: Spool type table

Spool type and spool operating method	A	B	C	D
JIS graphic symbols for hydraulic system				

6: Specifications of installation type driver

Power supply voltage	DC ±15 V 1% (ripples included)
Command input	DC 0 to ±10 V
Output current	500 mA or more
Power consumption	Approx. 6 W
Input impedance	17 ±4 kΩ

6: Model code of separate installation type driver

Valve model code	Applicable driver	
	Model code	Power supply voltage
SEM-G××-×-20	KSV-2-10	AC 100, 200, 220 V (Common for 50/60 Hz)

Contact Details

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Mass (kg)

Model No.	(1)	(2)	(3)	(4)
SEM-G03	9.2	9.9	10.4	11.1
SEM-G04	11.7	13.2	12.9	14.4
SEM-G06	16.9	–	18.1	–

Note: Mass (1) Without driver, with filter block
 (2) Driver installation type, with filter block
 (3) Without driver, with filter block, with reducing valve
 (4) Driver installation type, with filter block, with reducing valve

Sub-plate model code

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

Model No.	Model code	Nominal diameter	Connection port diameter	Mass kg
SEM-G06	JS-06M	¾	Rc¾	5.2
	JS-06M08		Rc1	

Refer to Page S-10 for the dimensions of the sub-plate.

Note: No sub-plate is provided for JSP-G03, 04.

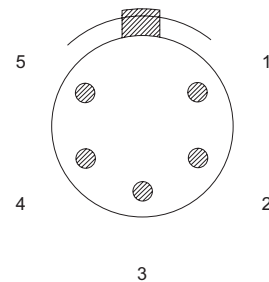
Accessories

Model No.	Hexagon socket head cap bolt	Quantity	Tightening torque N-m {kgf·cm}
SEM-G03	M6 × 35	4	11 to 14 {110 to 140}
SEM-G04	M6 × 40	2	11 to 14 {110 to 140}
	M10 × 45	4	53 to 68 {530 to 680}
SEM-G06	M12 × 60	6	94 to 118 {940 to 1180}

Wiring guide (driver installation type)

Pin No.	Signal name
1	Input voltage: 0 to ±10 V
2	Spool displacement check
3	DC +15 V ±1% (ripples included), 0.5 A minimum [Supplied power]
4	0 V [Supplied power]
5	DC –15 V ±1% (ripples included), 0.5 A minimum [Supplied power]

Pin arrangement (driver installation type)



Handling

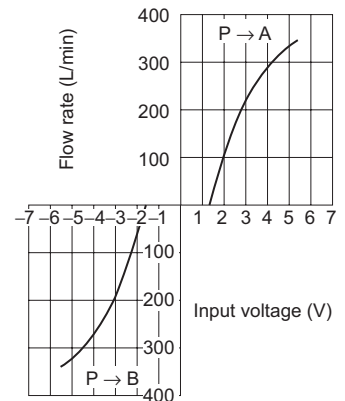
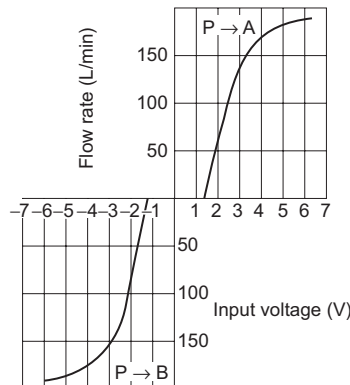
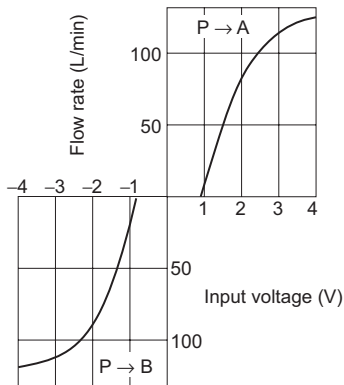
- Directly connect the drain piping to the tank without merging it with other tank piping.
- This valve uses an external pilot and adopts the external drain type.
- This valve is equipped with a filter block (model: MFB-02-75-10) as standard to protect the pilot valve.
- Contamination of the hydraulic fluid causes valve trouble and reduces the service life, so pay due attention to controlling contamination and ensure that it goes no higher than NAS contamination class 9.
- The input voltage - flow rate characteristics vary from valve to valve.
Even when using valves of the same model, the flow rates of individual valves have to be finely adjusted.
- Do not touch the zero adjusting screw of the differential transformer since it is factory adjusted.
- Use shielded cables for connecting the differential transformer. (Applicable cable diameter: φ7)
- For specifications with a reducing valve (option code II: P), the pressure setting at shipment is as shown in the table below.

Model No.	Set pressure MPa {kgf/cm ² }
SEM-G03	5 {50}
SEM-G04	7 {70}
SEM-G06	

Performance curves (viscosity: 32 mm²/s {cSt})

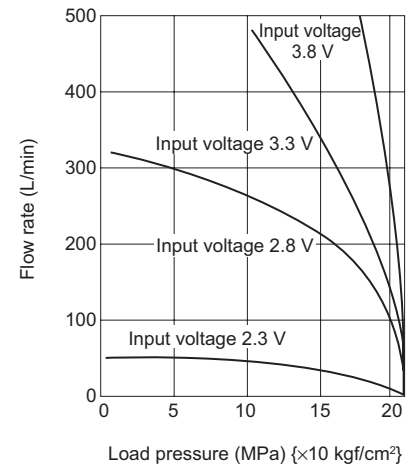
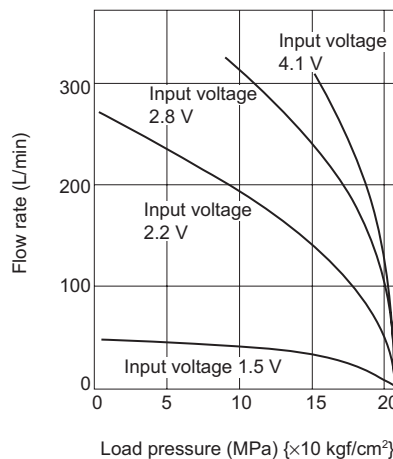
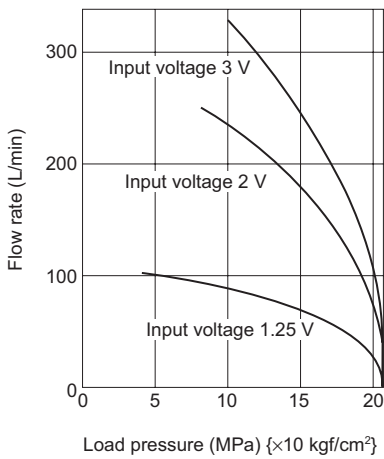
Input voltage - Flow rate characteristics (1 land differential pressure: $\Delta P = 1 \text{ MPa} \{10 \text{ kgf/cm}^2\}$)

SEM-G03-A (driver installation type) SEM-G04-A (driver installation type) SEM-G06 (without driver)



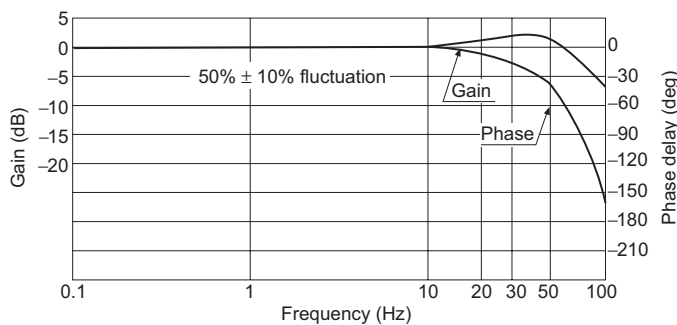
Load pressure - Flow rate characteristics

SEM-G03-A (driver installation type) SEM-G04-A (driver installation type) SEM-G06 (without driver)

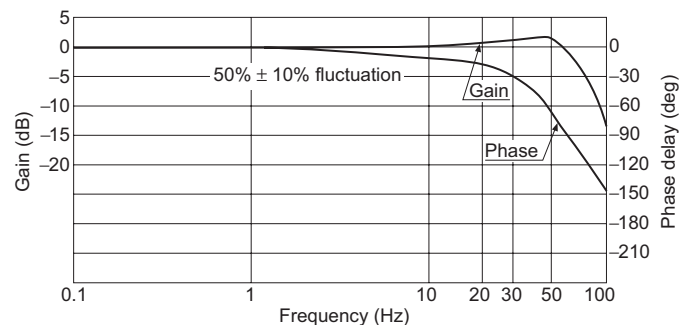


Frequency response characteristics

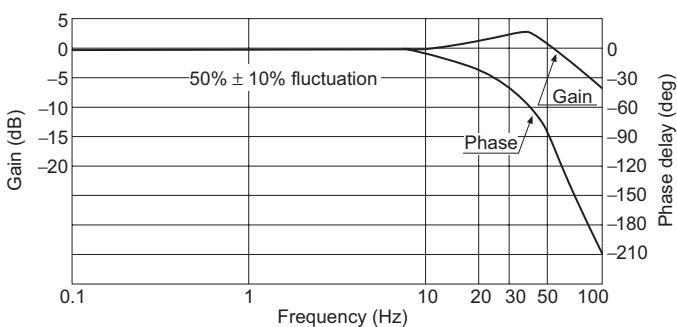
SEM-G03



SEM-G04



SEM-G06



Pilot pressure: 7 MPa {70 kgf/cm²}, 5 MPa {50 kgf/cm²} for G03
Note: Frequency characteristics of the spool displacement voltage in reference to input voltage

Contact Details

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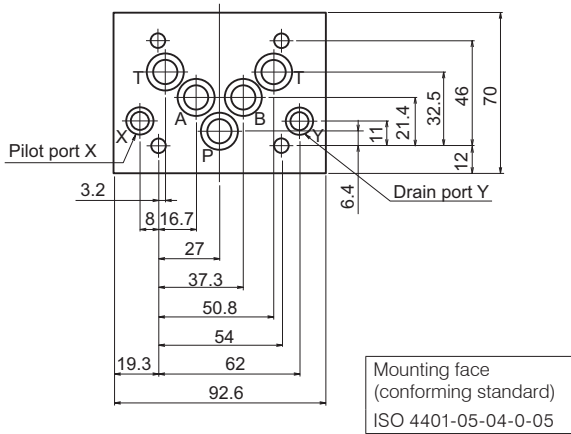
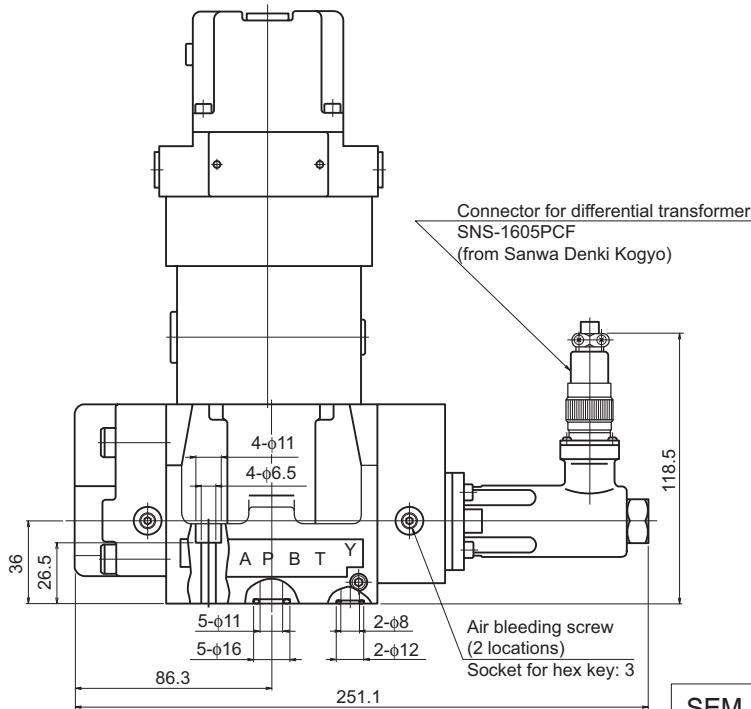
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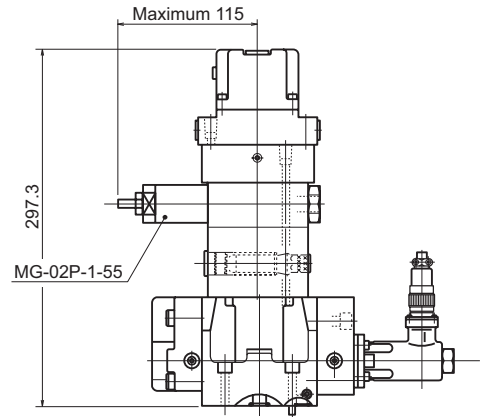
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External dimension diagram

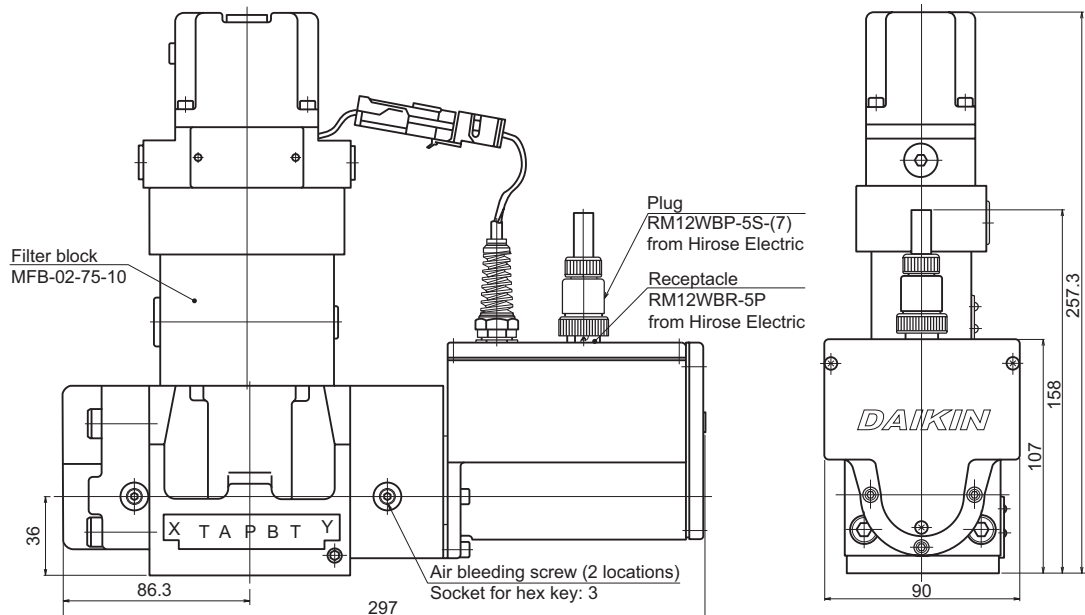
SEM-G03-※-20



SEM-G03-※-20-P



SEM-G03-※-20-A



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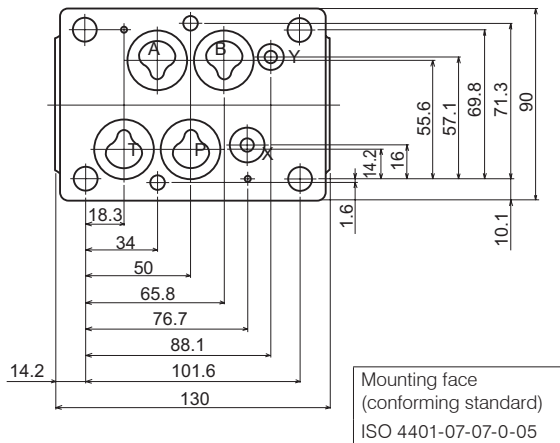
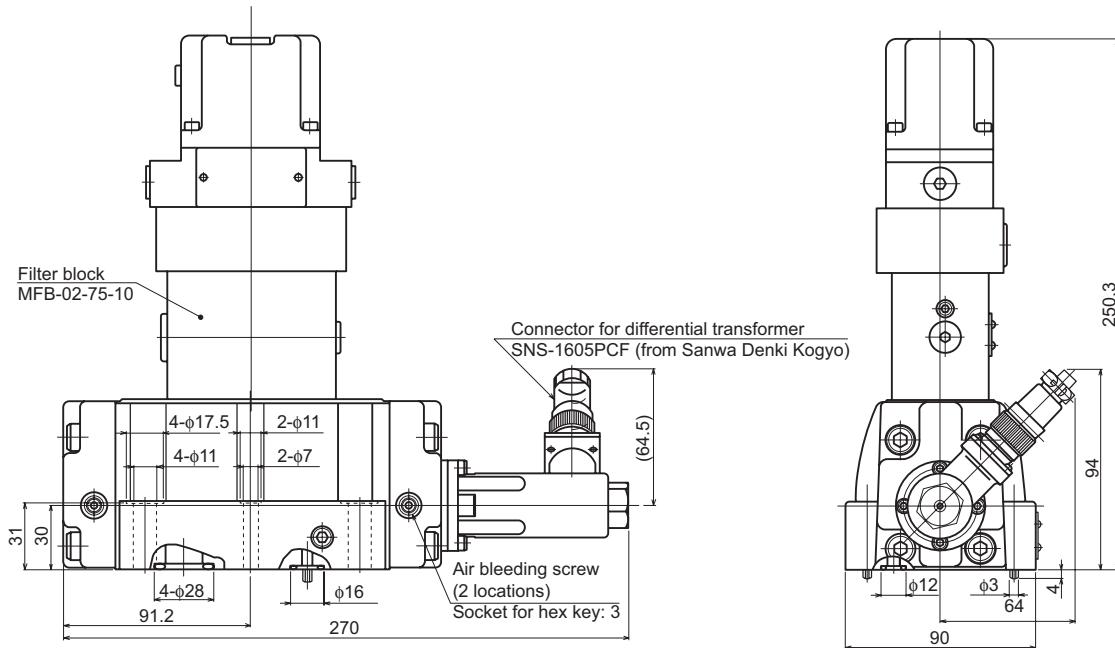
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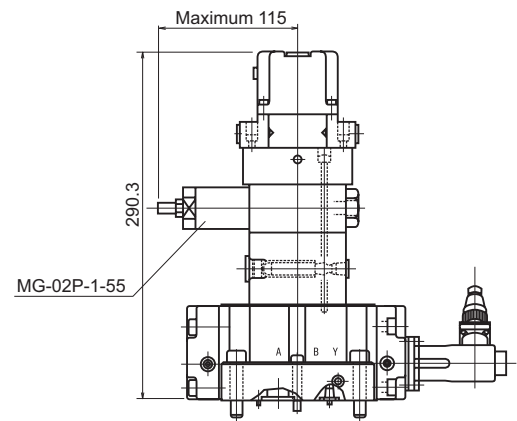
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External dimension diagram

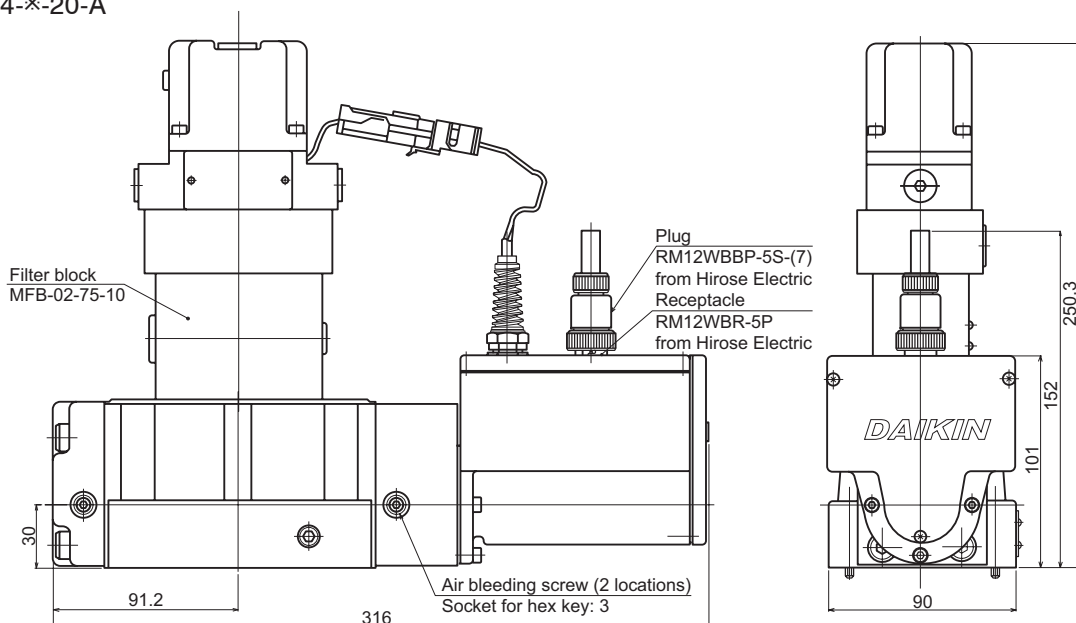
SEM-G04-※-20



SEM-G04-※-20-P



SEM-G04-※-20-A



J
PROPORTIONAL VALVES SERVO VALVES

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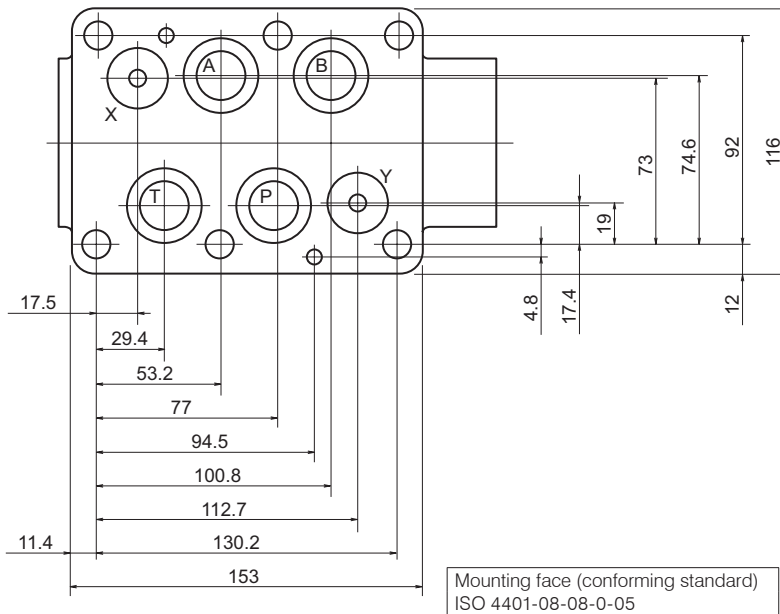
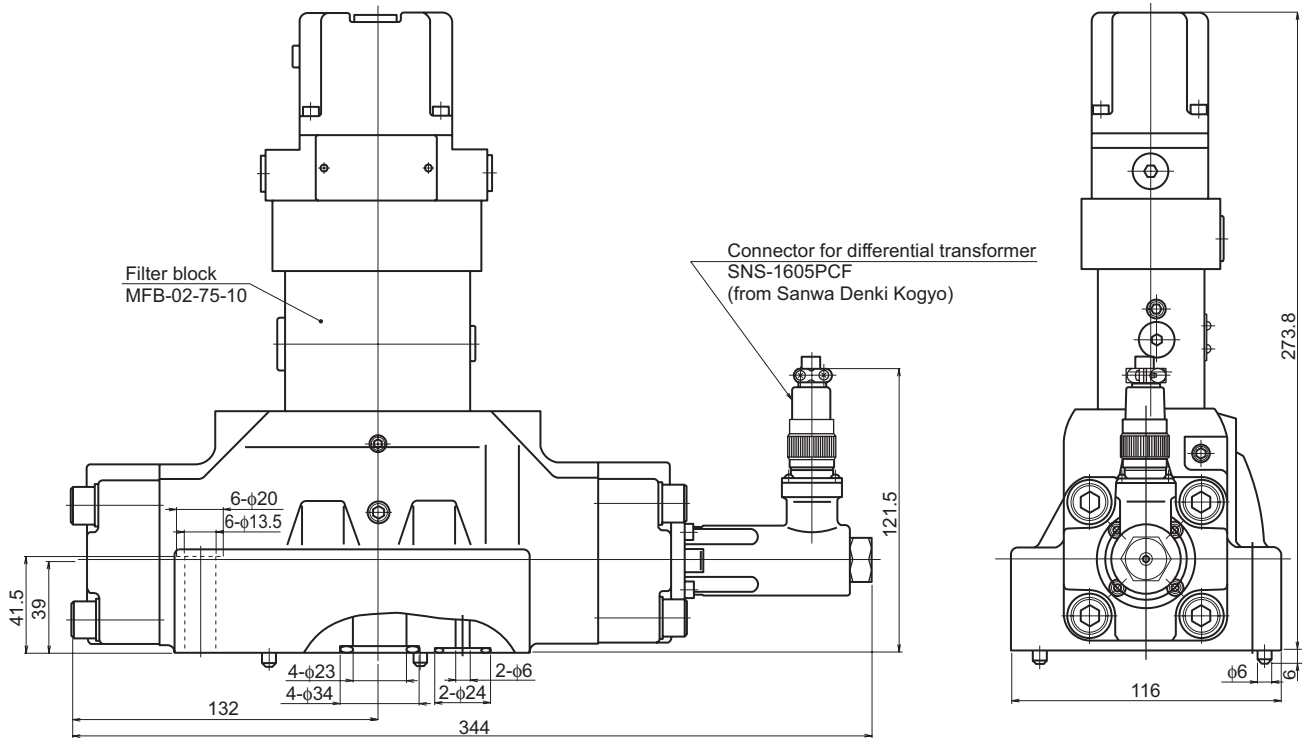
Internet

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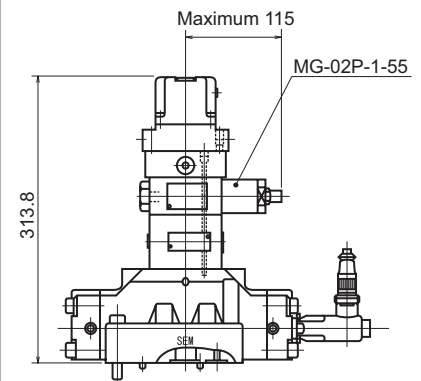
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External dimension diagram

SEM-G06-※-20



SEM-G06-※-20-P



Contact Details

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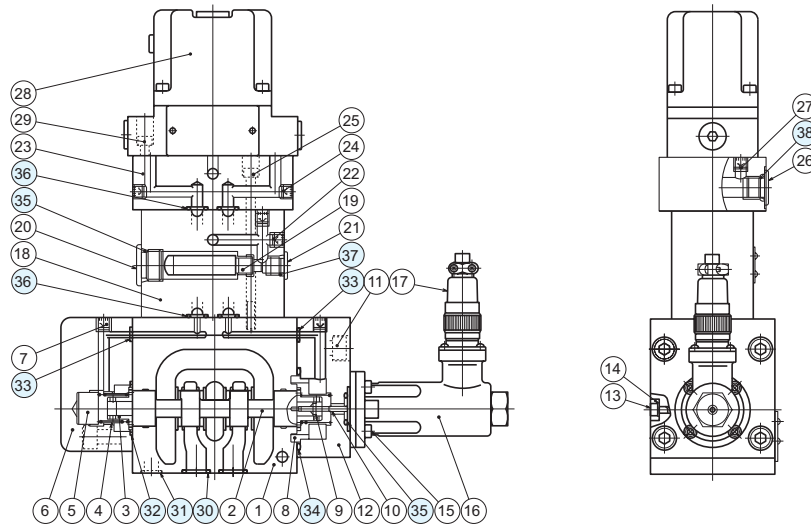
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Sectional structural diagram

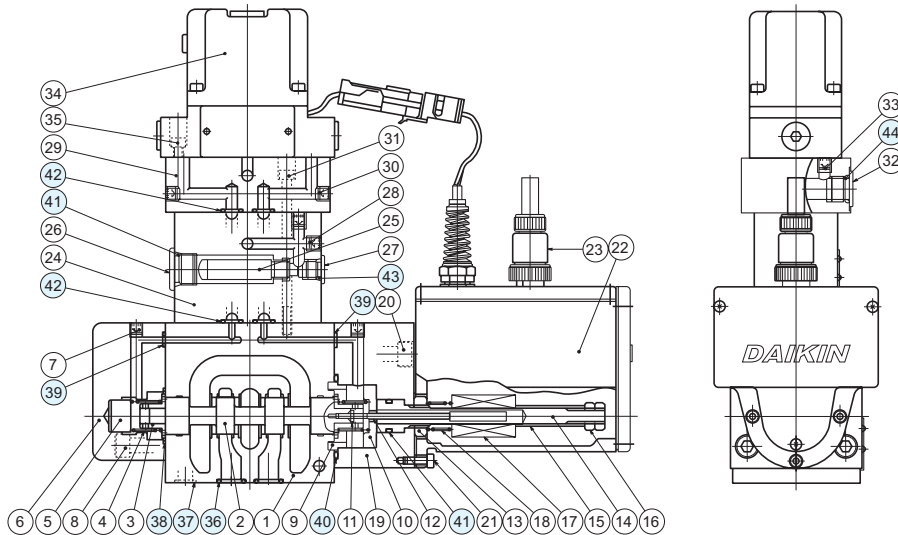
SEM-G**-*-20



Sealing part table

Part No.	Name	SEM-G03		SEM-G04		SEM-G06	
		Quantity	Part specifications	Quantity	Part specifications	Quantity	Part specifications
30	O-ring	5	JIS B 2401 1B P12	4	JIS B 2401 1B P22A	4	JIS B 2401 1B P28
31	O-ring	2	JIS B 2401 1B P9	1	JIS B 2401 1B P9	2	JIS B 2401 1B P20
				1	JIS B 2401 1B P12		
32	O-ring	1	AS568-023 (NBR, Hs90)	1	JIS B 2401 1B P34	1	JIS B 2401 1B P40
33	O-ring	5	JIS B 2401 1B P5	2	JIS B 2401 1B P7		
34	O-ring	1	AS568-130 (NBR, Hs90)	1	JIS B 2401 1B P34	1	JIS B 2401 1B P40
35	O-ring	2	JIS B 2401 1B P14	2	JIS B 2401 1B P14	2	JIS B 2401 1B P14
36	O-ring	8	JIS B 2401 1B P9	8	JIS B 2401 1B P9	8	JIS B 2401 1B P9
37	O-ring	1	JIS B 2401 1B P8	1	JIS B 2401 1B P8	1	JIS B 2401 1B P8
38	O-ring	1	JIS B 2401 1B P11	1	JIS B 2401 1B P11	1	JIS B 2401 1B P11

SEM-G**-*-20-A



Sealing part table

Part No.	Name	SEM-G03		SEM-G04	
		Quantity	Part specifications	Quantity	Part specifications
36	O-ring	5	JIS B 2401 1B P12	4	JIS B 2401 1B P22A
37	O-ring	2	JIS B 2401 1B P9	1	JIS B 2401 1B P9
				1	JIS B 2401 1B P12
38	O-ring	1	AS568-023 (NBR, Hs90)	1	JIS B 2401 1B P34
39	O-ring	5	JIS B 2401 1B P5	2	JIS B 2401 1B P7
40	O-ring	1	AS568-130 (NBR, Hs90)	1	JIS B 2401 1B P34
41	O-ring	2	JIS B 2401 1B P14	2	JIS B 2401 1B P14
42	O-ring	8	JIS B 2401 1B P9	8	JIS B 2401 1B P9
43	O-ring	1	JIS B 2401 1B P8	1	JIS B 2401 1B P8
44	O-ring	1	JIS B 2401 1B P11	1	JIS B 2401 1B P11

Contact Details

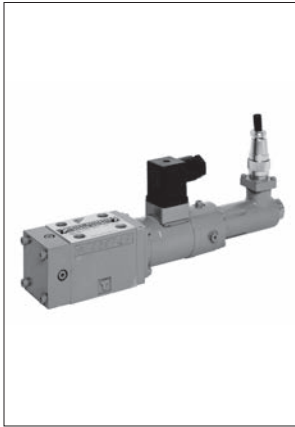
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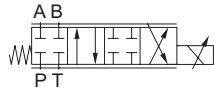
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Direct Operated Servo Valve



JIS graphic symbols for hydraulic system



Features

- Ideal for closed loop control of the position, speed, and pressure of main machine's actuators because of the high responsiveness achieved by combining the valve with the dedicated driver. (Frequency response: 130 Hz/−3 dB ±10% fluctuation)
- Driving the spool directly with a proportional solenoid reduces the amount of leakage compared to nozzle flapper type servo valves.
- When the dedicated driver is used, all ports will be blocked at power off to provide a fail safe function.

Nomenclature

KSPS - **G** **02** - **※** **※** - **10** - **※** **※** **※**

1 2 3 4 5 6 7 8 9

1 Model No.

KSPS: Direct operated servo valve

2 Connections

G: Gasket mount type

3 Nominal diameter

02: ¼

4 Rated flow rate

(1 land differential pressure:
ΔP = 3.5 MPa {35 kgf/cm²})

1: 10 L/min

2: 20 L/min

4: 40 L/min

5 Pressure gain

1: 2% maximum

2: 4% maximum

6 Design No.

(The design No. is subject to change)

7 Drainage code

No designation: Internal drain type

E: External drain type

8 Solenoid installation orientation

No designation: Upward (standard)

R: Rightward (option)

L: Leftward (option)

9 Dedicated driver Front panel EPKS-02-10

No designation: With front panel (standard)

N: With front panel (option)

Specifications

Model code	Maximum operating pressure MPa {kgf/cm ² }	Rated flow rate *1 L/min	T port permissible back pressure MPa {kgf/cm ² }	Pressure gain	Hysteresis, resolution, repeatability	Rated voltage of solenoid V	Maximum current mA	Mass kg
KSPS-G02-1※-10	35 {350}	10	2.5 { 25}	1st pattern: 2% maximum 2nd pattern: 4% maximum	1% or less	DC 12	1700	2.5
KSPS-G02-2※-10		20						
KSPS-G02-4※-10		40						
KSPS-G02-1※-10-E		10	16 {160}					
KSPS-G02-2※-10-E		20						
KSPS-G02-4※-10-E		40						

Note: *1 The rated flow rate indicates the values at 1 land differential pressure: ΔP = 3.5 MPa {35 kgf/cm²}.

Applicable driver model code

EPKS-02-10 (Supplied with the valve)

※ Driver (EPKS-02-10) is not available by itself.