

# Explosion-proof Solenoid Operated Poppet Valve

Model: G-M-SEW10...1X



- ◆ Size 10
- ◆ Maximum working pressure 420/630 bar
- ◆ Maximum working flow 40 L/min

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## Features

- Closed port without leakage
- Switching flexibility even in high-pressure state long periods
- Air-gap DC solenoid with detachable coil
- Solenoid coil can be rotated 90°

3/2-way directional seat valve

General:

The G-M-SEW directional valve is explosion-proof solenoid operated poppet valve. It is used to control the opening, closing and direction of liquid flow.

The valve mainly includes valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element.

Basic function:

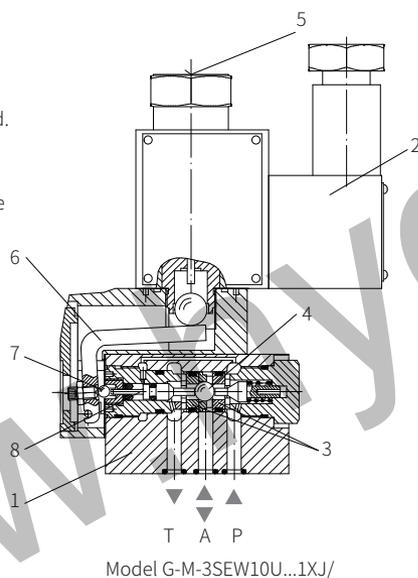
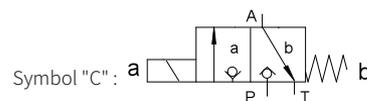
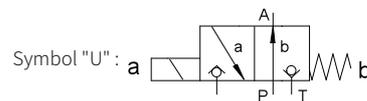
In the initial position, the spool (4) is pushed to the seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod (8) which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to the port P. Therefore, the valve system (3) is pressure compensated based on the actuating force (solenoid or spring). In this way, the valve can be used up to 630bar.

Note:

The 3/2-way poppet directional valve has negative cover function. Therefore, the port T must be always connected.

That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications.

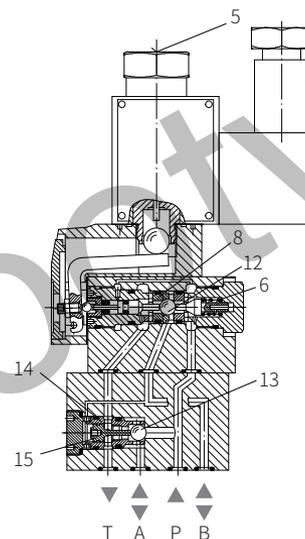
It must ensure that the maximum flow does not exceed the performance limit of the valve. If necessary, the cartridge throttle can be installed to limit flow.



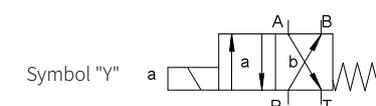
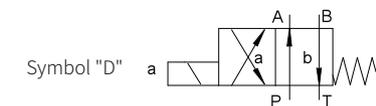
4/2-way poppet directional valve

Initial position: When the solenoid is not energized, the force of the spring (6) holds the ball spool (12) on the left valve seat (8). The port P is connected with A. The pump pressure oil acts on the large area of the control piston (15) through the control line from port A. The steel ball (13) is pushed to the other side of the valve seat (14), so the oil port P is connected to A and B to T.

Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat (14). At this time, the oil port P is connected to B.



The seat valve with plus-1 plate as below:

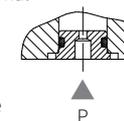


Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.

Example:

- Accumulator operation
- Used as a pilot valve with internal pilot oil supply



3/2-way poppet valve

The throttle is inserted into the port P of the directional valve.

4/2-way poppet valve

The throttle is inserted into the oil port P of the plus-1 plate.

Cartridge check valve

The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

3/2-way poppet valve

The cartridge check valve is inserted into the oil port P of the directional valve.



4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.

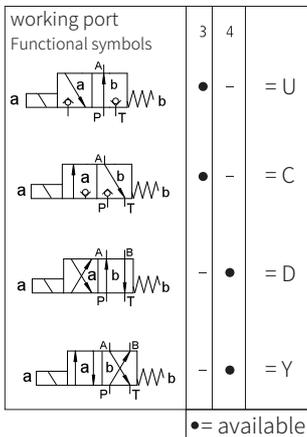
- M SEW 10 -1X / M / \*

explosion -proof class I =G1  
explosion -proof class II=G2

working oil port 3 =3  
working oil port 4 =4

poppet valve

size 10 =10



10 to 19 series =1X  
(10 to 19 series installation and connection size unchanged)

working pressure to 420 bar (fixing screw M5) =420

Working pressure to 630 bar (fixing screw M6) =630

solenoid with detachable coil (air-gap) =M

more information in text

sealing material  
No code= NBR seals  
V= FKM seals  
(consult for other seals)

No code= without cartridge  
check valve and cartridge  
throttle

P= with cartridge check valve  
B12= throttle Ø1.2mm  
B15= throttle Ø1.5mm  
B18= throttle Ø1.8mm  
B20= throttle Ø2.0mm  
B22= throttle Ø2.2mm

N9= with hidden emergency operation

G24= 24 V DC

Note: G1 explosion-proof grade EXD I  
G2 explosion-proof grade EXD II CT4

Overview	
Installation position	Optional
Environment temperature range	°C -30 to +50 (NBR seal) -20 to +50 (FKM seal)
Hydraulic	
Maximum working pressure	bar See characteristic curve
Maximum flow	L/min 40
Hydraulic oil	Mineral oil (HL, HLP) <sup>1)</sup> in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil) <sup>1)</sup> ; HEPG (Polyethyleneglycol) <sup>2)</sup> ; HEES (Synthetic Fats) <sup>2)</sup>
Oil temperature range	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm <sup>2</sup> /s 2,8 to 500
Cleanliness of oil <sup>4)</sup>	The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Electrical	
Voltage type	DC
Available voltage <sup>3)</sup>	V 24
Allowable voltage tolerance (nominal voltage)	% ±10
Power consumption	W 30
Continuous power on time	% 100
Switching time according to ISO 6403	See table below
Switching frequency	times/hour 15000
Protection type to DIN 40 050	IP 65 with plug installed and fixed
Maximum coil temperature	°C 150

1) For NBR seal and FKM seal

2) Only for FKM seal

3) Please inquire for special voltages

4) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

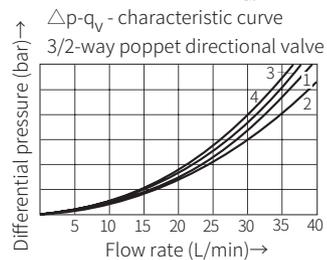
Electrical protective conductor (PE ⚡) must be connected properly as rules

Switching time t<sub>ms</sub>

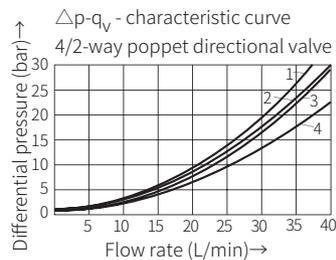
Pressure P bar	Flow q <sub>v</sub> L/min	DC Solenoid Functional symbols U, C, D, Y					
		t <sub>on</sub> No tank pressure				t <sub>off</sub>	
		U	C	D	Y	U/C	D/Y
140	40	20	40	20	40	12	17
280	40	25	45	20	45	12	17
320	40	25	45	20	45	12	17
420	40	30	45	20	50	12	17
500	40	30	45	20	50	12	17
600	40	30	50	20	50	12	17

Characteristic curve

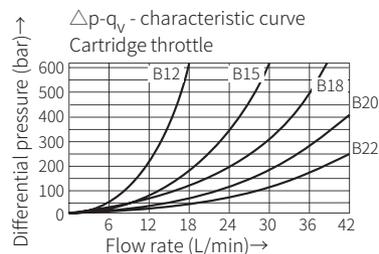
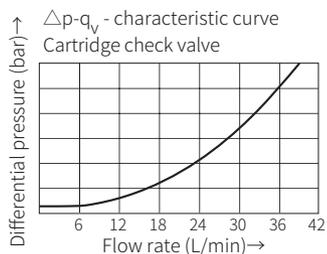
(Measured when using HLP46,  $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )



1 G-M-3SEW10 C..., P to A    3 G-M-3SEW10 U..., P to A  
2 G-M-3SEW10 C..., A to T    4 G-M-3SEW10 U..., A to T



1 G-M-4SEW10<sup>D</sup><sub>Y</sub>..., A to T    3 G-M-4SEW10<sup>D</sup><sub>Y</sub>..., P to B  
2 G-M-4SEW10<sup>D</sup><sub>Y</sub>..., P to A    4 G-M-4SEW10<sup>D</sup><sub>Y</sub>..., B to T



Characteristic limit

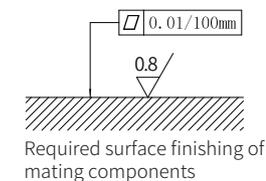
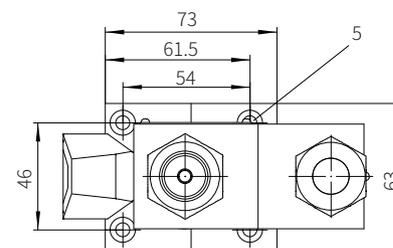
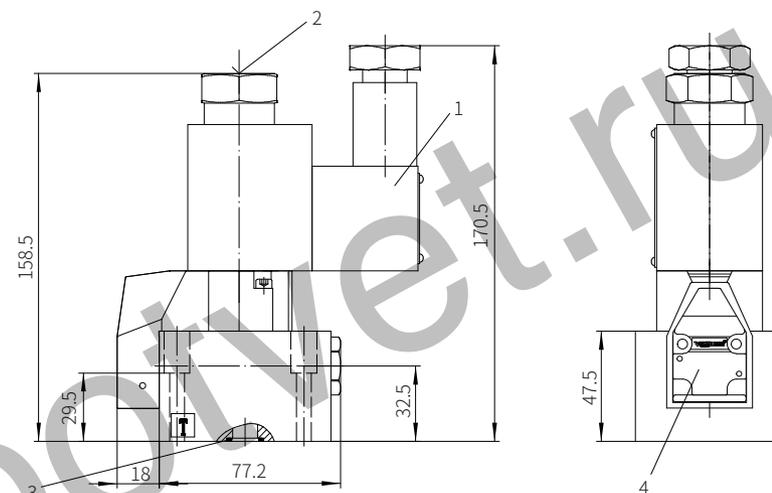
	Functional symbol	comment	Working pressure bar				Flow L/min
			P	A	B	T	
Three-way circuit		Oil port pressure $P \geq A \geq T$	420/630	420/630		100	40
			420/630	420/630		100	40
Two way circuit (Only for unloading function)		Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure $A \geq T$				100	40
		Oil port pressure $A \geq T$				100	40
Four-way circuit (flow only in the direction of arrow's)		Single poppet valve (symbol "U") with the plus-1 plate $P \geq A \geq B \geq T$	420/630	420/630	420/630	100	40
		Double poppet valve (symbol "C") with the plus-1 plate $P \geq A \geq B \geq T$	420/630	420/630	420/630	100	40

The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

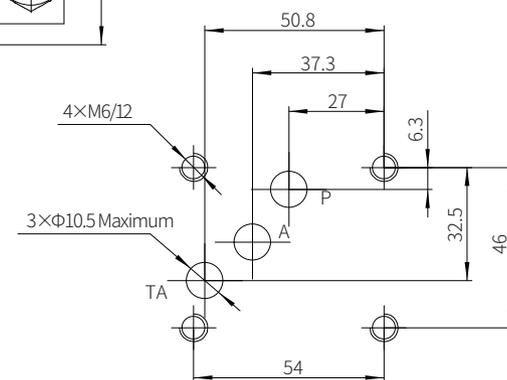
Component size

Size unit: mm

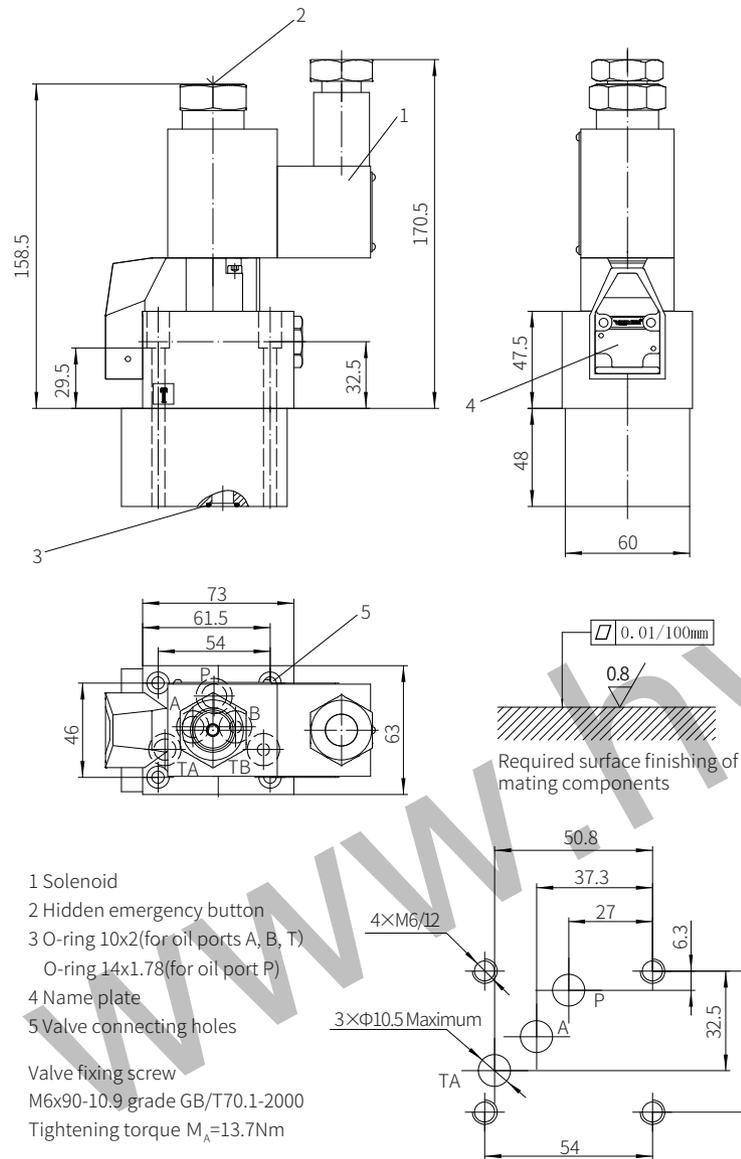
3/2-way poppet directional valve, 420bar



- 1 Solenoid
  - 2 Hidden emergency button
  - 3 O-ring 10x2 (for oil ports A, B, T)  
O-ring 14x1.78 (for oil port P)
  - 4 Name plate
  - 5 Valve connecting holes
- Valve fixing screw  
M6x40-10.9 grade GB/T70.1-2000  
Tightening torque  $M_A=13.7\text{Nm}$

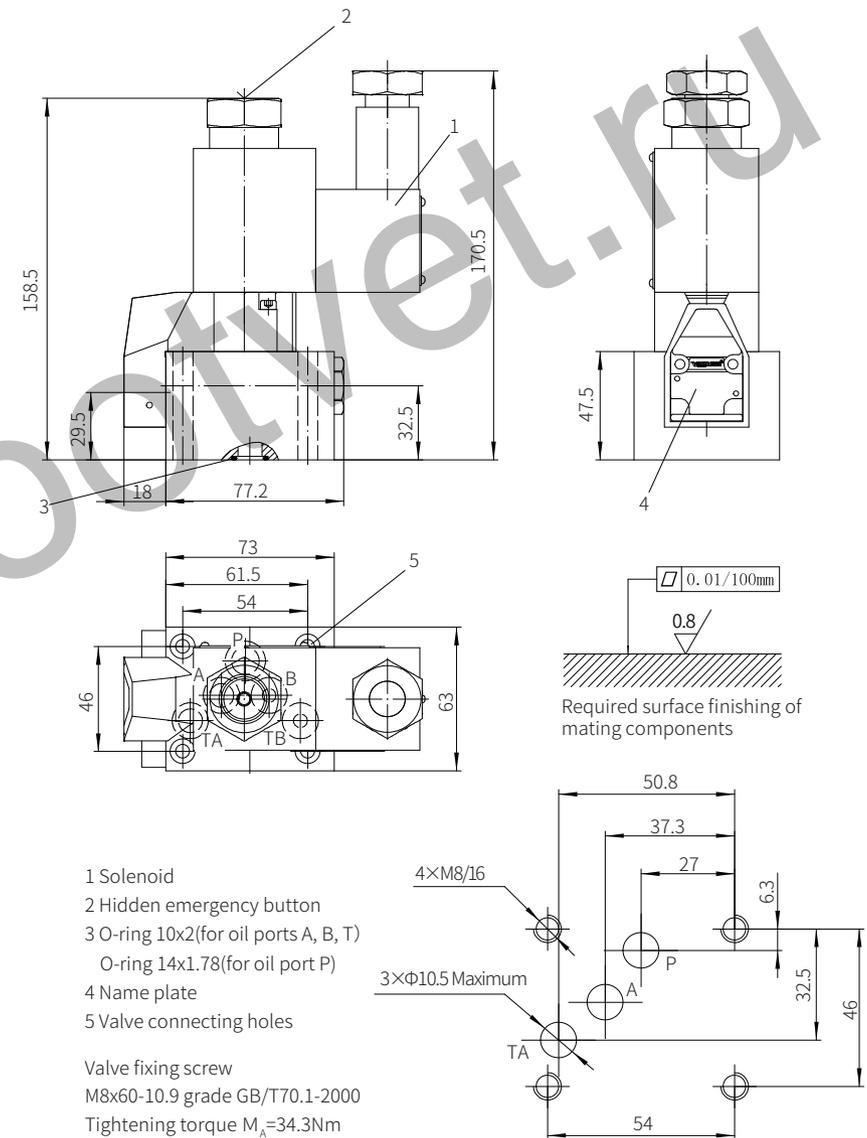


4/2-way poppet directional valve, 420bar



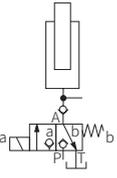
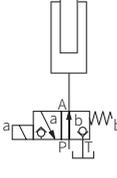
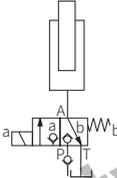
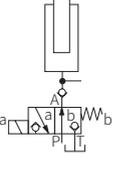
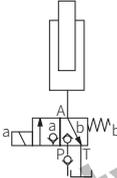
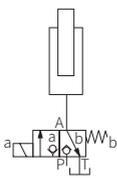
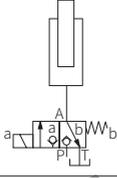
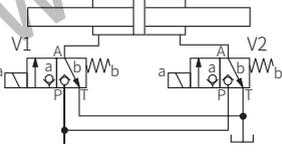
0308

3/2-way poppet directional valve, 630bar



0309

These examples only indicate some applications of the poppet valve but not include all functions.

<p>Symbol C</p> 	<p>Symbol U</p> 	<p>Symbol U</p> 
<p>Symbol U</p> 	<p>Symbol C</p> 	<p>Symbol C</p> 
<p>Symbol C</p> 	<p>Symbol U</p> 	<p>Symbol U</p> 