

TO. 外经部 高融收

BEIJING HUADE HYDRULIC INDUSTRIAL GROUP CO.,LTD.	3/2- and 4/2-way directional poppet valves with solenoid actuation Type HD-M-SED 10			RE 22090
	Size 10	Up to 35MPa	Up to 40L/min	Replaces

- Direct operated directional poppet valve with solenoid actuation
- Closed port is leak-free
- Individual electrical connection
- With protected manual override, optional
- Porting pattern to DIN 24340 form A, ISO 4401 and CETOP-RP 121H

Function

General:

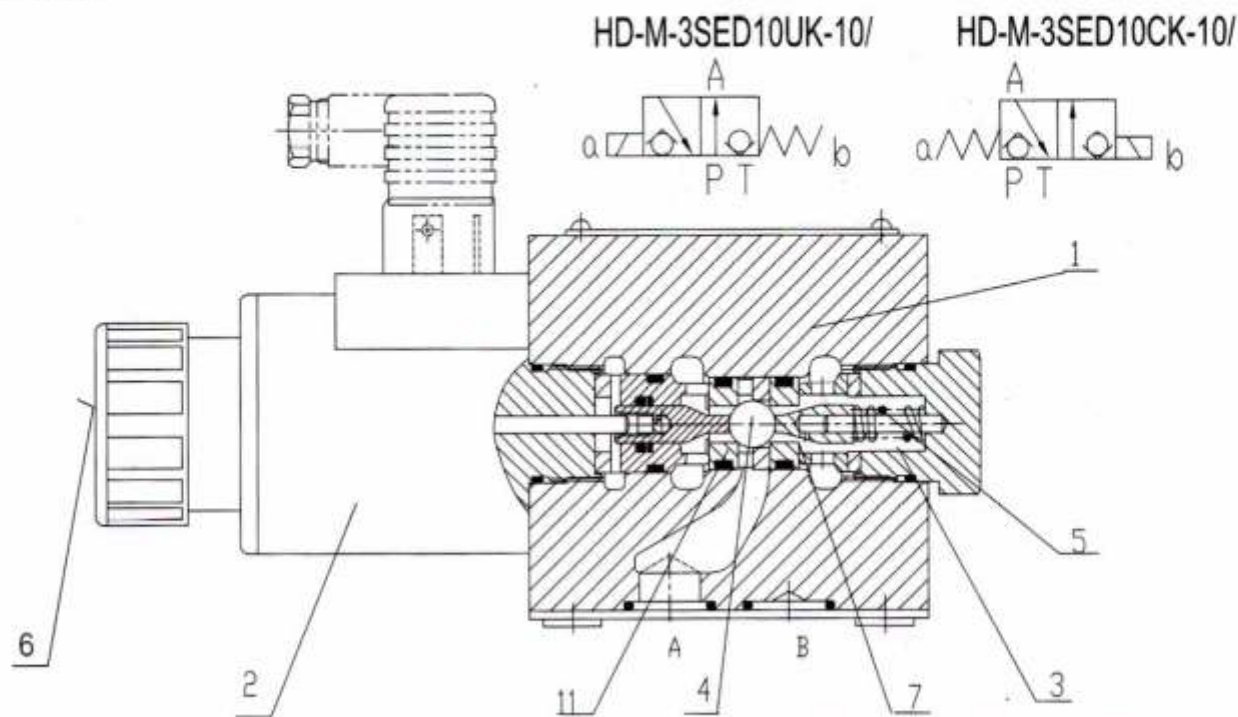
Directional valves type HD-M-SED10 are directly actuated directional poppet valves with solenoid actuation. They control the start, stop and direction of a flow and basically consist of a housing (1), the solenoid (2), and as the closing device (4). The manual override (6) allows the valve to be switched without energising the solenoid.

Basic function:

The arrangement of the spring (5) determines the initial position of the valve (open when de-energised "UK" or closed when de-energised "CK"). The chamber (3) behind the closing element (4) is connected to port P and sealed off from port T. Hence the valve is pressure-balanced with respect to the operating forces (solenoid and spring). Due to the special closing element (4) it is possible to apply the maximum operating pressure (35MPa) to ports P, A and T. The flow can also pass in both directions.

The following possibilities are obtainable via the seat orientation:

	4/2-way poppet valve	3/2-way poppet valve
Symbol		
Initial position	P and A connected B and T connected P and B connected A and T connected	P and A connected T closed leak-free P closed leak-free A and T connected
Switched position		
Symbol		
Initial position	P and B connected A and T connected P and A connected B and T connected	P closed leak-free A and T connected P and A connected T closed leak-free
Switched position		



Ordering details

HD M SED 10 10 / C / *

Huade Hydraulic =HD

Further details
in clear text

3 actuator ports = 3

4 actuator ports = 4

No code = NBR seals
V = FKM seals

Nominal size 10 = 10

Actuator ports	3	4	
	•	-	=UK
	•	-	=CK
	-	•	=D
	-	•	=Y
•	= available		

No code = without cartridge
check valve,
without throttle insert
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

Electrical connection
K4¹⁾ = individual connection;
with component

Series 10 to 19 = 10
(10 to 19: unchanged installation and connection dimensions)

N9 = with protected manual override
No code = without manual override

Operating pressure 35MPa = 350

G24 = 24V DC
G205²⁾ = 205V DC

C = Wet-pin solenoid with removable coil

AC supply (permissible voltage tolerance ±10%)	Nominal voltage of the DC solenoid when used with an AC voltage	Order detail
110V - 50/60Hz	96V	G96
120V - 60Hz	110V	G110
230V - 50/60Hz	205V	G205

Note: Other types of actuators e.g. pneumatic, hydraulic,
rotary knob, rotary knob with lock, plunger, lever, roller
lever) on request!

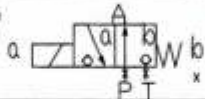
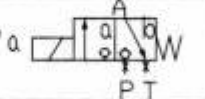
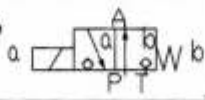
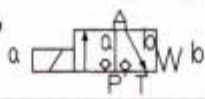
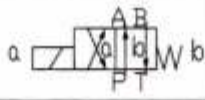
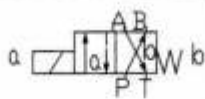
1) Plug-in connectors have to be ordered separately (see
below).

2) For the connection to an AC supply a DC solenoid **must** be
used which is controlled via a rectifier (see table on the left).
For individual connections a large plug-in connector with
integrated rectifier can be used (separate order, see below).

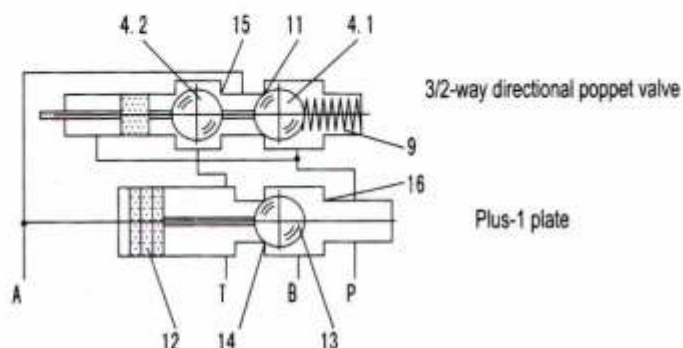
Ordering details: plug-in connector

		DIN 43 650 ISO 4400				
			Without indicator light	With indicator light	Without indicator light	With indicator light and Z-diode protective circuit
a grey	Material no.	074 683	008 616	313 923/24V 313 926/180-240V	313 932	3310 994

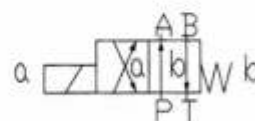
Performance limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50^\circ \text{C}$)

	Symbol	Description	Operating pressure in (MPa)				Flow in L/min
			P	A	B	T	
2-way circuit	"UK" 	with a 2/2-way circuit ports P or T has to be plugged by the customer!	35	35		35	40
	"CK" 		35	35		35	40
3-way circuit	"UK" 		35	35		35	40
	"CK" 		35	35		35	40
4-way circuit	"D" 	symbol "UK" in conjunction with a plus1-plate: P, A, B, T.	35	35	35	P/A/B-4	40
	"Y" 	symbol "CK" in conjunction with a plus1-plate: P, A, B, T.	35	35	35	P/A/B-4	40

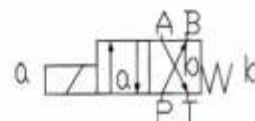
Attention: The performance limit was determined with the solenoids at operating temperature, 10% under voltage and with the tank not pressurised.



Symbol "D":



Symbol "Y":



Cartridge throttle

The use of the cartridge throttle is necessary when, due to operational conditions during the switching process, flows can occur that exceed the valve performance limits.

Example:

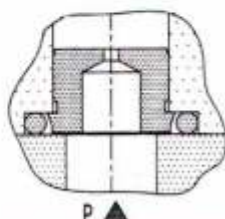
- Accumulator operation,
- Use as a pilot valve with internal pilot oil supply.

3/2-way poppet valve

The cartridge throttle is fitted into port P of the poppet valve.

4/2-way poppet valve

The cartridge throttle is fitted into port P of the plus-1 plate.



Cartridge check valve

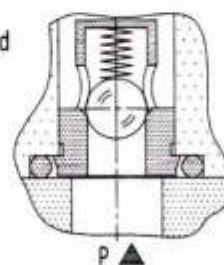
The cartridge check valve allows free flow from P to A and provides leak-free closure from A to P.

3/2-way poppet valve

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

4/2-way poppet valve (see page 4)

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



Technical data (for applications outside these parameters, please consult us!)

General

Installation		optional
Max. ambient temperature	(°C)	-30~+50
Weight	3/2-way poppet valve	(kg) 2.6
	4/2-way poppet valve	(kg) 3.9

Hydraulic data

Max. operating pressure	(MPa)	see table on page 3
Max. flow	(L/min)	40
Pressure fluid		Mineral oil or Phosphate ester
Pressure fluid temperature range	(°C)	-30 to +80 (with NBR seals) -20 to +80 (with FKM seals)
Viscosity range	(mm ² /s)	2.8 to 500
Degree of contamination	(μ m)	Degree of contamination Maximum permissible degree of contamination of the pressure is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.

Electrical data

Type of voltage		DC	AC
Available voltages ¹⁾	(V)	12, 24, 42, 96, 110, 205, 220	only possible via rectifier
Voltage tolerance (nominal voltage)	(%)	± 10	
Power consumption	(W)	30	
Duty		continuous	
Switching time to ISO 6403		see table below	
Switching frequency	(cycles/h)	15000	
Protection to DIN 40 050		IP65	
Max. coil temperature	(°C)	150	

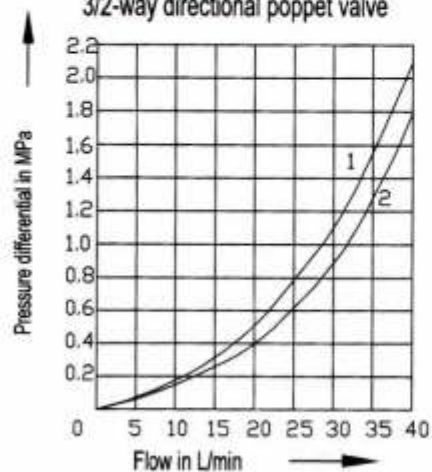
1) Special voltages on request

When connecting the electrics, the protective conductor (PE $\equiv$) must be connected according to the relevant regulations.

Switching time t in ms (installation: solenoid vertical)

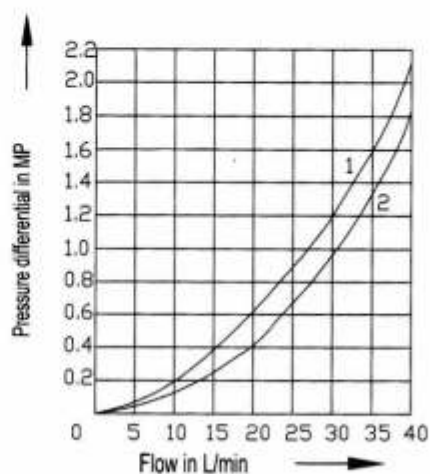
Pressure p in MPa	Flow q _v in L/min	DC solenoid						DC solenoid + rectifier						
		Symbols UK, CK, D, Y						Symbols UK, CK, D, Y						
		t _{on}				t _{off}		t _{on}				t _{off}		
		Without tank pressure				U _k	D	Without tank pressure				U _k	D	
		U _k	C _k	D	Y	C _k	Y	U _k	C _k	D	Y	C _k	Y	
7	40	40	30	40	35	10	10	35	30	40	35	40	40	
14								40						
21		45	35	45				50	45	35				45
28									50	40				40
31.5		50	45	50				45	50	40	50			45
35										45	45			

Δp -q-characteristic curves
3/2-way directional poppet valve



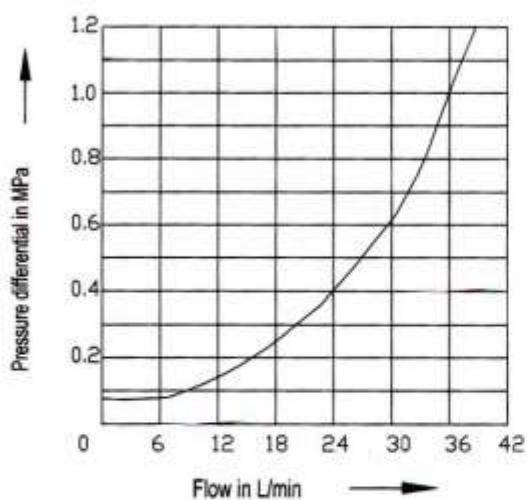
- 1 HD-M-3SED10^{UK}_{CK} ... P to A
- 2 HD-M-3SED10^{UK}_{CK} ... A to T

Δp -q-characteristic curves
4/2-way directional poppet valve

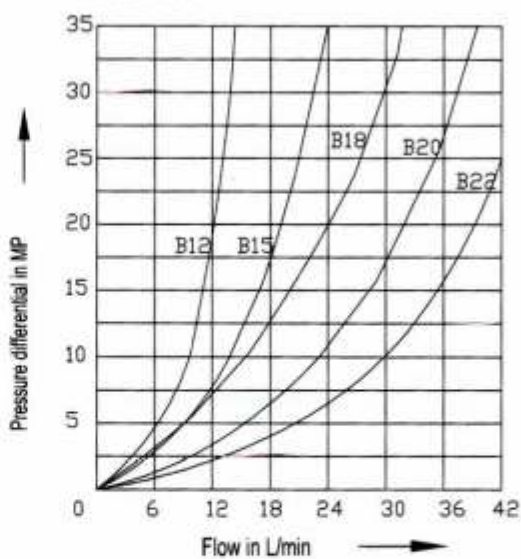


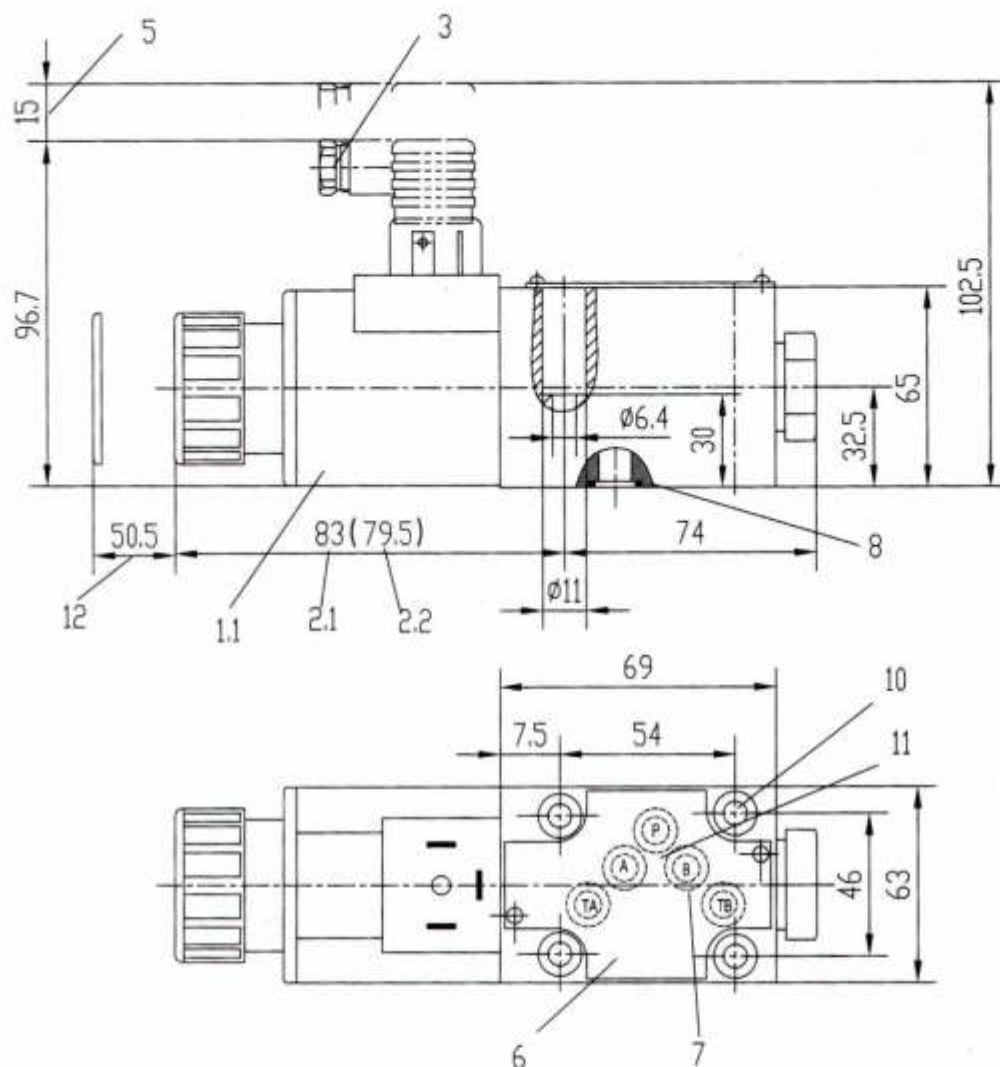
- 1 HD-M-4SED10^D_V ... P to B and A to T
- 2 HD-M-4SED10^D_V ... B to T and P to A

Δp -q-characteristic curve
Cartridge check valve



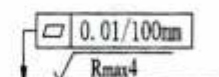
Δp -q-characteristic curves
Throttle insert



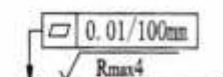
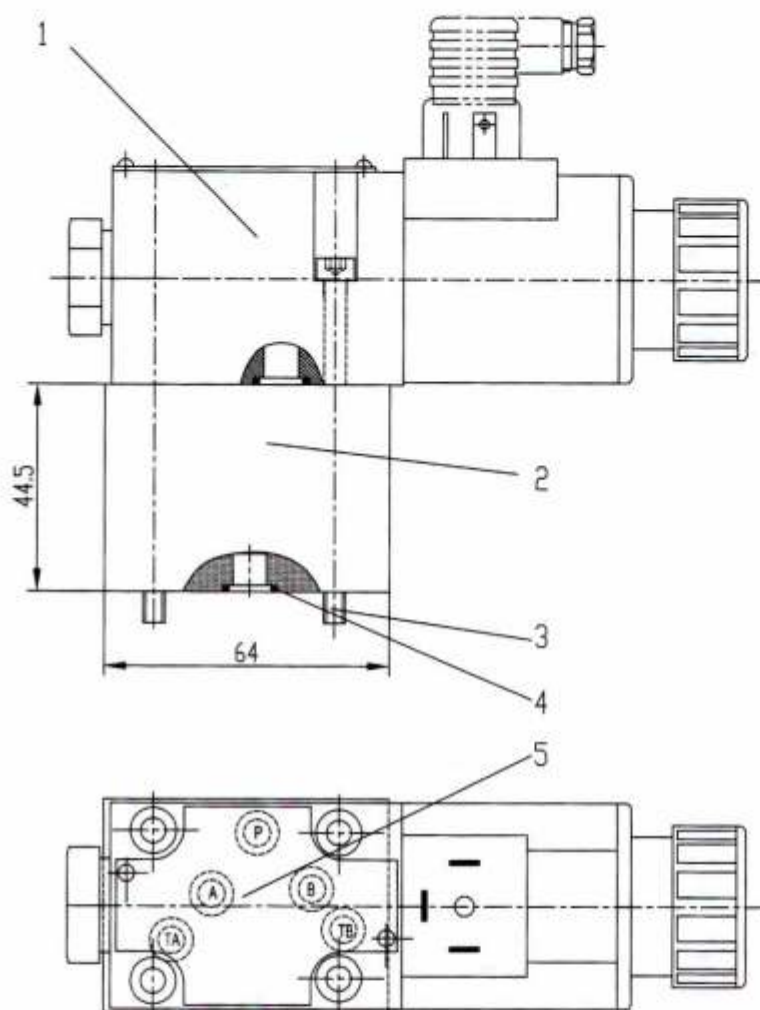


- 1.1 Solenoid "a" (plug-in connector colour grey)
- 1.2 Solenoid "b" (plug-in connector colour black)
- 2.1 Protected manual override "N9"
- 2.2 Without manual override
- 3 Plug-in connector without circuitry to DIN 43 650
- 4 Plug-in connector with circuitry to DIN 43 650
- 5 Space required to remove the plug-in connector
- 6 Nameplate

- 7 Attention! On 3/2-way directional poppet valves, port B is a blind counterbore.
- 8 O-rings 12X2 for port A, B, T
O-rings 14X1.78 for port P
- 10 Valve fixing screws 4 off M6 x 40 (GB70-85-10.9)
MA = 15.5 Nm, must be ordered separately.
- 11 Subplates
G 66/01 (G3/8)
G 67/01 (G1/2)
- 12 Space required to remove the coil



Required surface finish of the mating piece



Required surface finish of
the mating piece

1 3/2-way directional poppet valve

2 Plus-1 plate

3 Valve fixing screws

4 off, M6 x 90 GB70-85-10.9,

M A = 15.5 Nm

are included within the scope of supply.

4 O-rings 12X2 for port A, B and T

O-rings 14X1.78 for port P

5 Porting pattern to DIN 24 340 form A,

ISO 4401 and CETOP-RP 121 H

Subplates

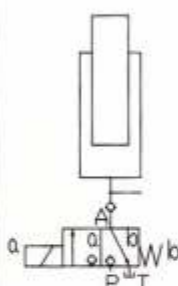
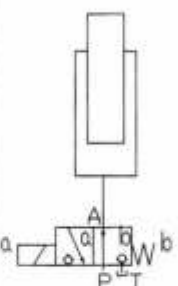
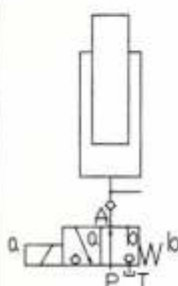
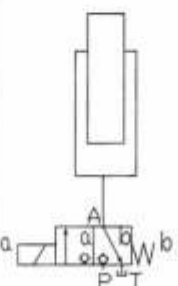
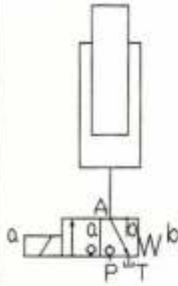
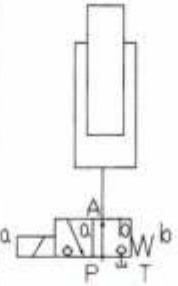
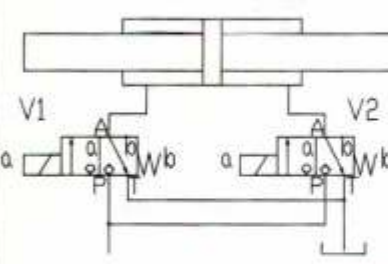
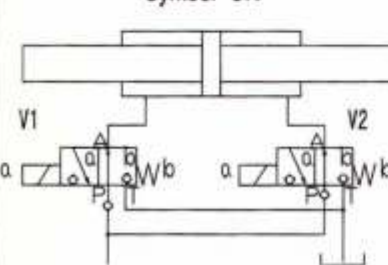
G 66/01 (G3/8)

G 67/01 (G1/2)

must be ordered separately.

Application examples

These examples serve **only to explain** the possibilities offered by the poppet valve. They do not include the complete function.

Symbol "CK" 	2/2-way circuit with a two poppet valve and check valve at port A The check valve must be installed in the pipework. Initial position: Flow blocked, maximum pressure permissible. Pressure is held in the actuator, even when the pump is switched off, due to the check valve at port A. Switched position: Free-flow, maximum pressure permissible. Leakage drained via port T. The only leakage occurring is that which flows to T during the switching process.	Symbol "UK" 	3/2-way circuit with a single poppet valve Initial position: Lifting Holding only due to limitation of travel and pressure in port P. Switched position: Lowering
Symbol "UK" 	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be fitted in the pipework. Initial position: Free-flow, maximum pressure permissible. Pressure is held in the actuator, even when the pump is switched off, due to the check valve at port A. Switched position: Flow blocked, maximum pressure permissible. Leakage drained via port T. The only leakage occurring is that which flows to T during the switching process.	Symbol "CK" 	3/2-way circuit with a two poppet valve and cartridge check valve in port P The check valve is fitted in the P port of the 3/2-way poppet valve. Initial position: Lowering Switched position: Lifting The load can be held in any position while the pump is switched off and the solenoid energised.
Symbol "CK" 	3/2-way circuit with a two poppet valve Initial position: Lowering Switched position: Lifting Holding only due to limitation of travel and pressure in port P.	Symbol "UK" 	3/2-way circuit with a single poppet valve and cartridge check valve in port P The check valve is fitted into the P port of the 3/2-way poppet valve. Initial position: Lifting The load can be held in any position while the pump is switched off. Switched position: Lowering
Symbol "CK" 	4/3- (4/4-) way circuit with a 2 two poppet valves V1 and V2 in the initial position: Both cylinder sides are connected to the tank port. V2 in the switched position: The piston moves to the left V1 in the switched position: The piston moves to the right V1 and V2 in the switched position: Both cylinder sides are connected to the pump port. Rapid traverse is possible when a single rod cylinder with an area ratio of 2 : 1, is used. Attention! When using single rod cylinders, the performance limit (double flow) and the maximum permissible operating pressure (pressure intensification) of the valve must be taken into account.		
Symbol "UK" 	4/3- (4/4-) way circuit with a 2 two poppet valves and cartridge check valve in port P of the 3/2-way poppet valves V1 and V2 in the initial position: The piston is locked externally to prevent movement. V2 in the switched position: The piston moves to the right V1 in the switched position: The piston moves to the left V1 and V2 in the switched position: Both cylinder sides are connected to the tank port. Attention! When using single rod cylinders, the performance limit (double flow) and the maximum permissible operating pressure (pressure intensification) of the valve must be taken into account!		

Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\sqrt{\text{ }}$.
6. Surface finish of mating piece is required to 0.01/100mm.

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