



Directional control valves – size 10

Data Sheet



A range of high quality direct operating directional control spool valves. Porting is to CETOP 5 size 10 for subplate mounting. They are used to control start, stop and the direction of fluid flow. Valve actuation is by single or double solenoid.

Technical specification

Maximum operating pressures

Ports A, B, P _____ 315 bar

Port T with dc solenoid _____ 210 bar

Port T with ac solenoid _____ 160 bar

Maximum ambient temperature _____ +50°C

Maximum flow _____ 120 litres/min

Seals _____ NBR

Fluid _____ Mineral oils to (HL HLP) to DIN 51 524

Fluid working temperature range _____ -30°C to +80°C

Viscosity range _____ 2.8 to 500mm²/s

Weight: Single solenoid dc _____ 4.5 kg

ac _____ 3.7kg

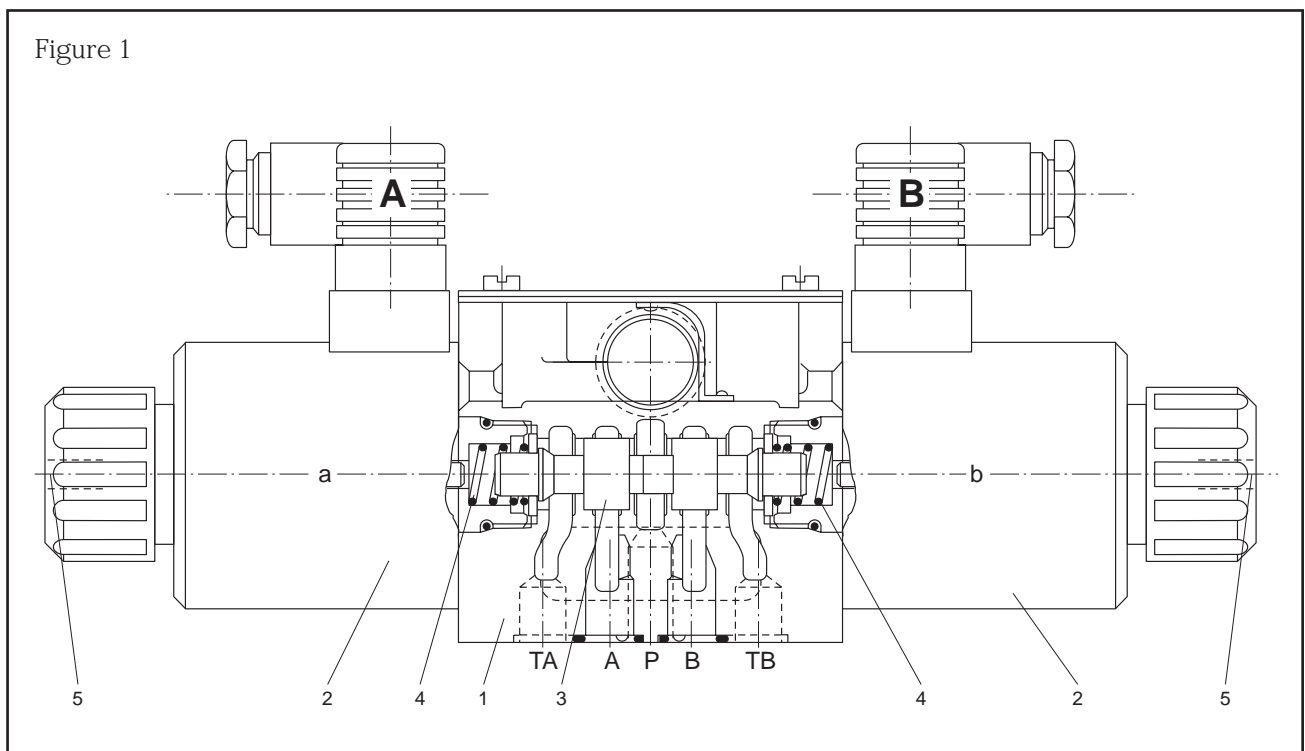
Double solenoid dc _____ 6.1kg

ac _____ 4.5kg

Fluid cleanliness – Maximum permissible degree of contamination of fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $B_{10} \geq 75$.

For filters and elements see Hydraulics section, Part 3 of the **RS** Catalogue.

Figure 1



Description of function

Directional valves basically comprise housing (1), one or two solenoids (2), control spool (3) and one or two return springs (4).

At rest, control spool (3) is held in its central or initial position by means of return springs (4).

Control spool (3) is operated by wet pin solenoids (2).

In order to ensure correct functioning, care must be taken, that the solenoid armature sleeve is filled with oil.

Force of solenoid (2) acts on control spool (3) and moves it from its rest position to the desired position. This permits flow from P to A and B to T or P to B and A to T.

On de-energising solenoid (2) control spool (3) is returned to its initial position by return spring (4).

Emergency operation (5) permits control spool (3) to be moved without the solenoids being energised.

Electrical specification

Ensure earth is correctly connected

Voltage		24Vdc	110Vac
Power required	W	35	–
Holding power	VA	–	90
Pull-in power	VA	–	550
Duty		Continuous	Continuous
Switching time to On	MS	45 to 60	15 to 25
ISO 6403 Off	MS	20 to 30	20 to 30
Switching frequency	SW/h	15000	7200
Insulation to DIN 40 050		IP65	IP65
Insulation class VDE 0580		F	H
Coil temperature	°C	Up to +150	Up to +180

Symbols key (Figure 2)

P = Pressure port (Pump port)

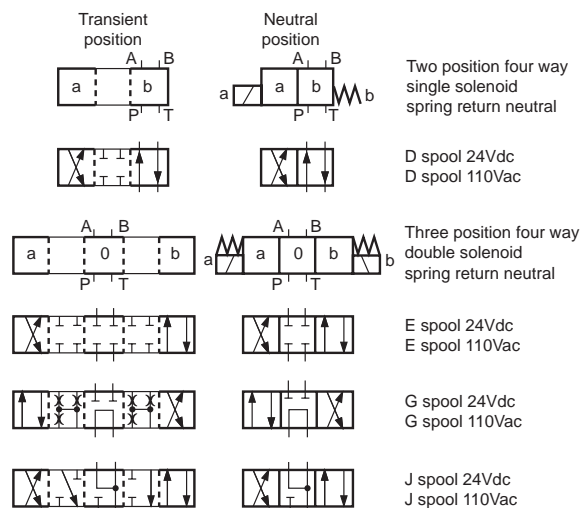
T = Tank port (Drain port)

A and B = Working ports

a and b = Spool positions and the corresponding operating elements

O = Rest or neutral position

Figure 2



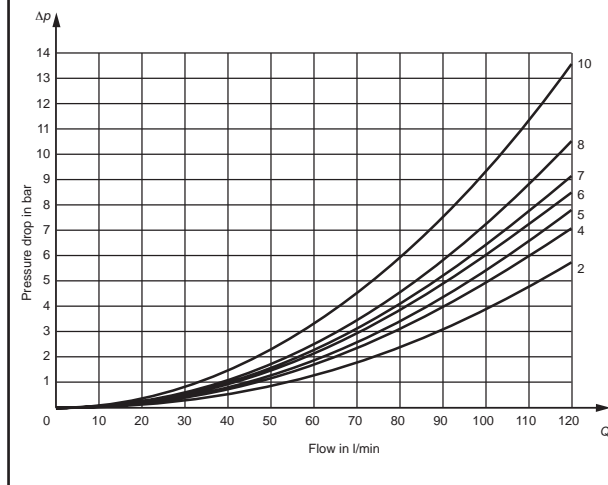
The transient position shows the valves' condition when switching from one position to another.

Key to Figure 2

Type	Manufacturer's part no.	RS stock no.
D spool 24Vdc	4WE10D3X/CG24N9Z4	122-699
D spool 110Vac	4WE10D3X/CW110N9Z4	122-706
E spool 24Vdc	4WE10E3X/CG24N9Z4	122-712
E spool 110Vac	4WE10E3X/CW110N9Z4	122-728
G spool 24Vdc	4WE10G3X/CG24N9Z4	122-734
G spool 110Vac	4WE10G3X/CW110N9Z4	122-740
J spool 24Vdc	4WE10J3X/CG24N9Z4	122-756
J spool 110Vac	4WE10J3X/CW110N9Z4	122-762

Δp - Q Operating Curves (measured at $v = 41\text{mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

Figure 3



Key to Figure 3

Spool type	Direction of flow				
	P-A	P-B	A-T	B-T	P-T
D	6	6	7	7	—
E	2	2	5	5	—
G	4	4	7	8	10
J	2	2	4	4	—

Performance limits

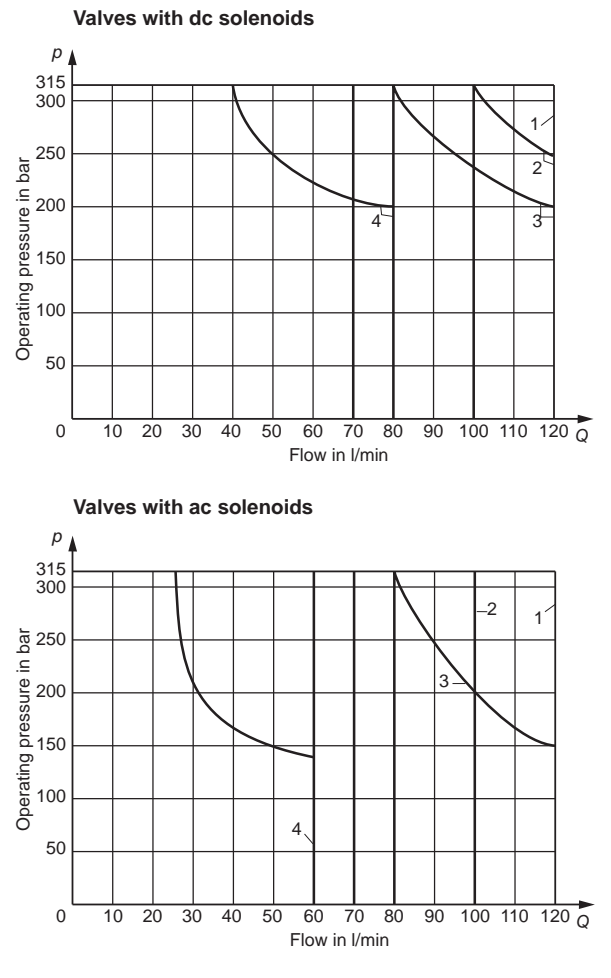
(Measured at $v = 41\text{mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

The performance limits shown apply when the valve is subject to simultaneous flow in two directions (eg. from P to A and at the same time B to T).

Due to the flow forces occurring within the valve, the permissible performance limit for one direction of flow (eg. P to A with plugged port B) may be considerably reduced!

These performance limits were determined using operationally warm solenoids, 10% reduced voltage and with no tank pressure.

Figure 4



Key to Figure 4

	dc solenoid				ac solenoid			
Curve no.	1	2	3	4	1	2	3	4
Spool type	D	E	J	G	D	E	J	G

Figure 5

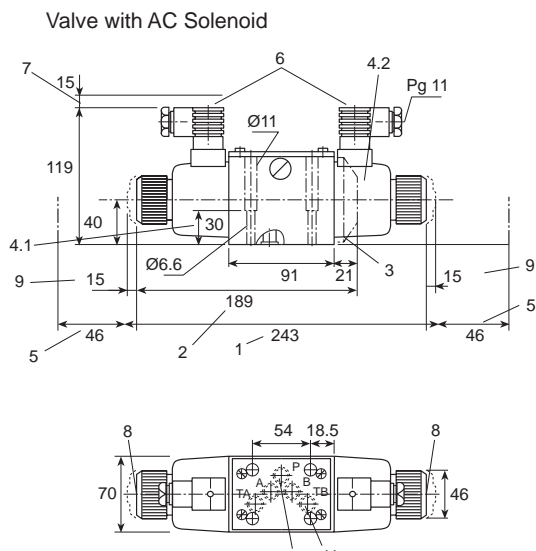
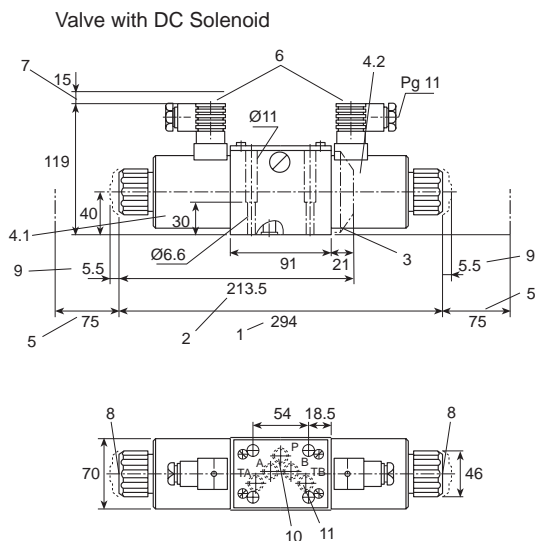
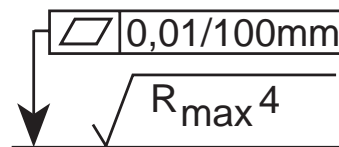


Figure 6



Key to Figure 5

1. 3 position valve, double solenoid with emergency operation
2. 2 position valve, single solenoid with emergency operation
3. Cover for valve with one solenoid
- 4.1. Solenoid a, grey plug
- 4.2. Solenoid b, black plug
5. Space required to remove solenoid
6. Plug-in connector to DIN 43 650 (may be rotated in 90° increments)
7. Space required to remove plug
8. Emergency operation
9. Dimension for emergency operation
10. R ring 13mm × 1.6mm × 2mm
11. Additional T port (TB) may be used where valve is mounted on suitably drilled manifold

Note:

Valve fixing screws M6 to DIN 912 – 10.9

Tightening torque = 15.5Nm
(not supplied).