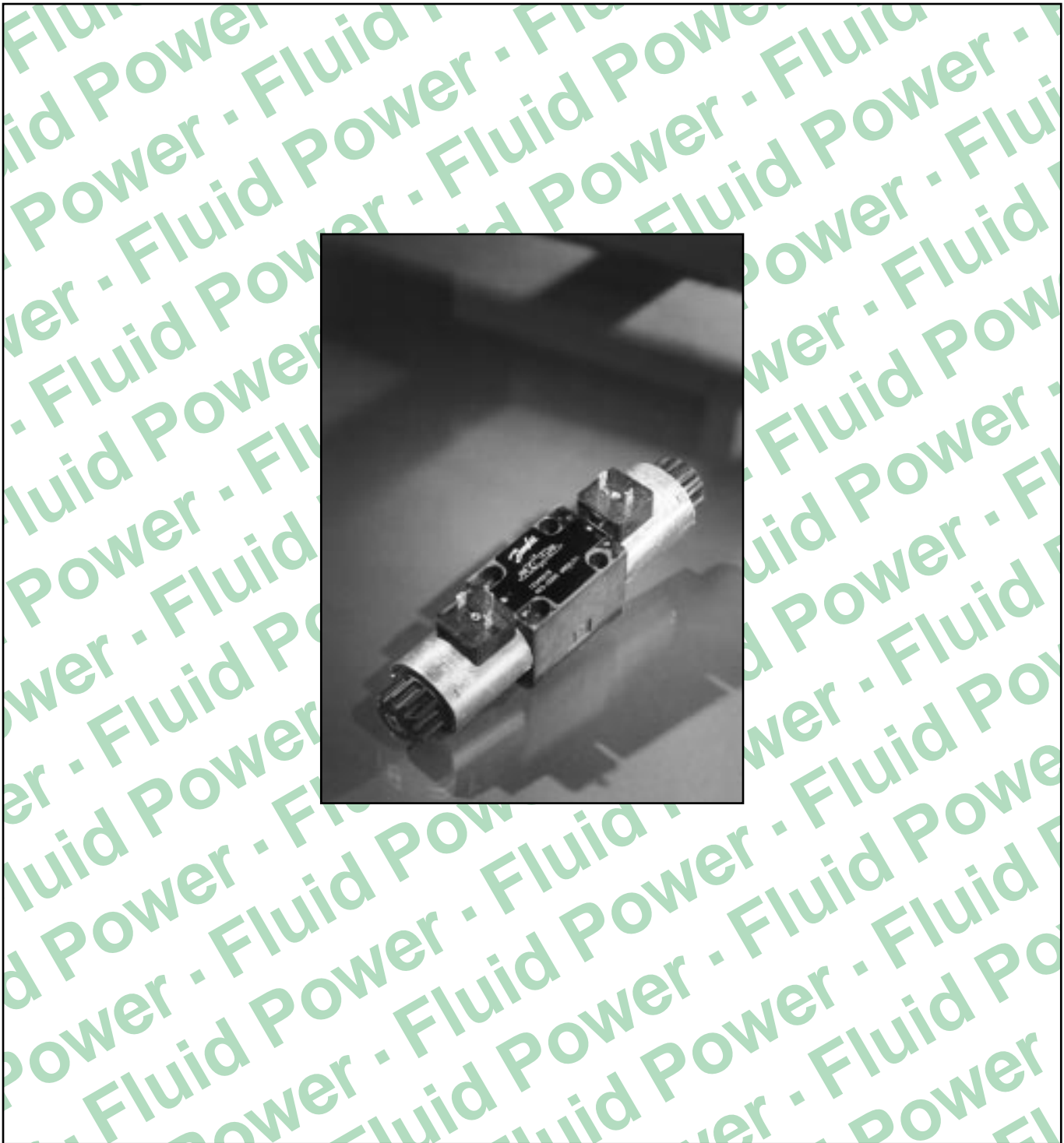
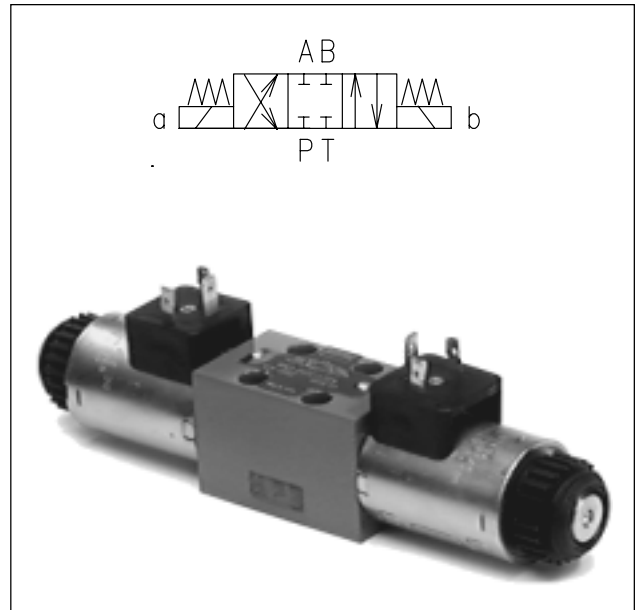


Directional Cetop Valves DCV 03



- ❑ 4/3-, 4/2- and 3/2-way directional valves
- ❑ Cylindrical operating solenoids with separate operating coils – connector can be turned in either direction by 90°
- ❑ Four-land spool – reduced functional dependence on fluid viscosity
- ❑ Push button manual override
- ❑ Installation dimensions to ISO 4401-03-02-0-94 and DIN 24340-A6



Functional Description

The directional control valves DCV 03 consist of housing (1), a control spool (5) with two centering springs (4) and cylindrical operating solenoids (2, 3).

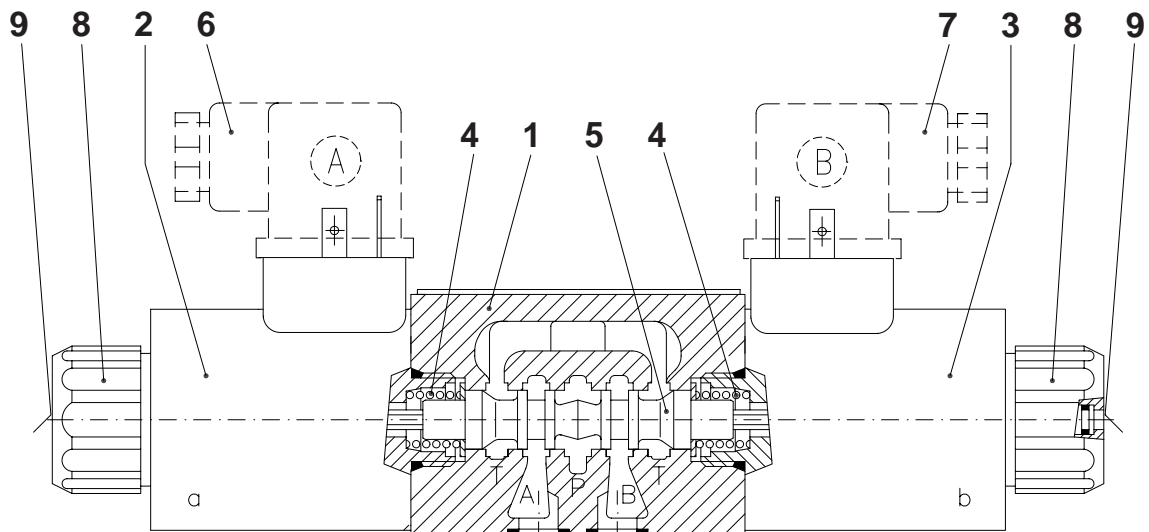
The three-position directional valves are fitted with two solenoids and two springs. Two-position directional valves have either one solenoid and one return spring or two solenoids and a detent assembly.

The operating solenoids are d.c. solenoids. For a.c. supply the solenoids are provided with a rectifier, which is integrated directly into the connectors.

The plug connectors (6, 7) can be turned by 90°. By loosening the fixing nut (8), the solenoids can be turned arbitrarily in the range of 360°, or replaced. This enables the operating coils to be replaced without opening the pressure-tight spaces.

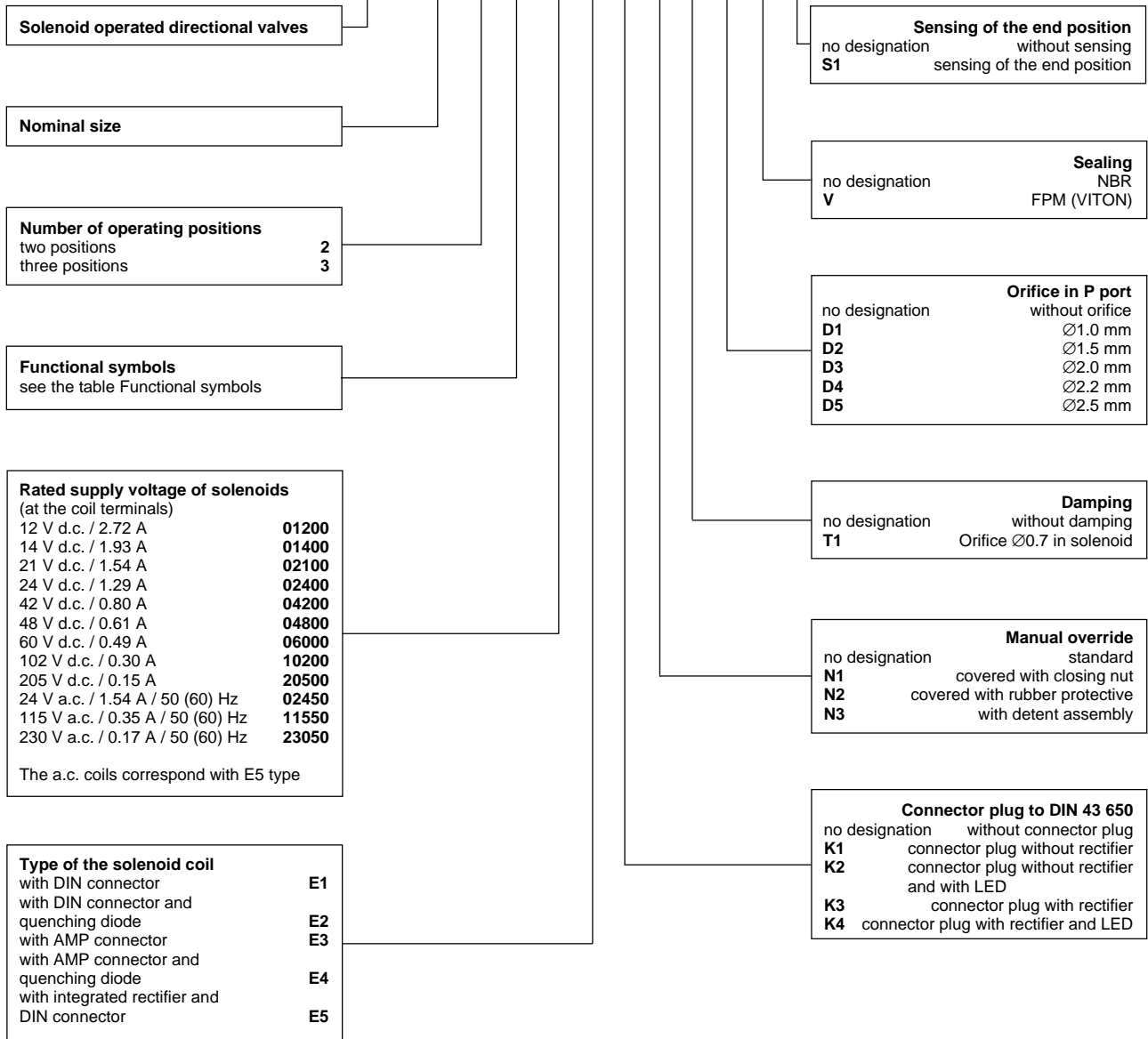
In the case of solenoid malfunction or power failure, the spool of the valve can be repositioned by manual override (9), provided the pressure in T-port does not exceed 25 bar.

The basic surface treatment of the valve housing (1) is phosphate coated and the operating solenoids (2, 3) are zinc coated.



Ordering Code

DCV 03



Recommended solenoid coils used with connector plugs with rectifiers – type designation K3, K4	
Rated supply source voltage (permissible rated voltage variation ±10%)	Type designation of the solenoid voltage
24 V a.c. / 1.54 A / 50 (60) Hz	02100
115 V a.c. / 0.35 A / 50 (60) Hz	10200
230 V a.c. / 0.17 A / 50 (60) Hz	20500

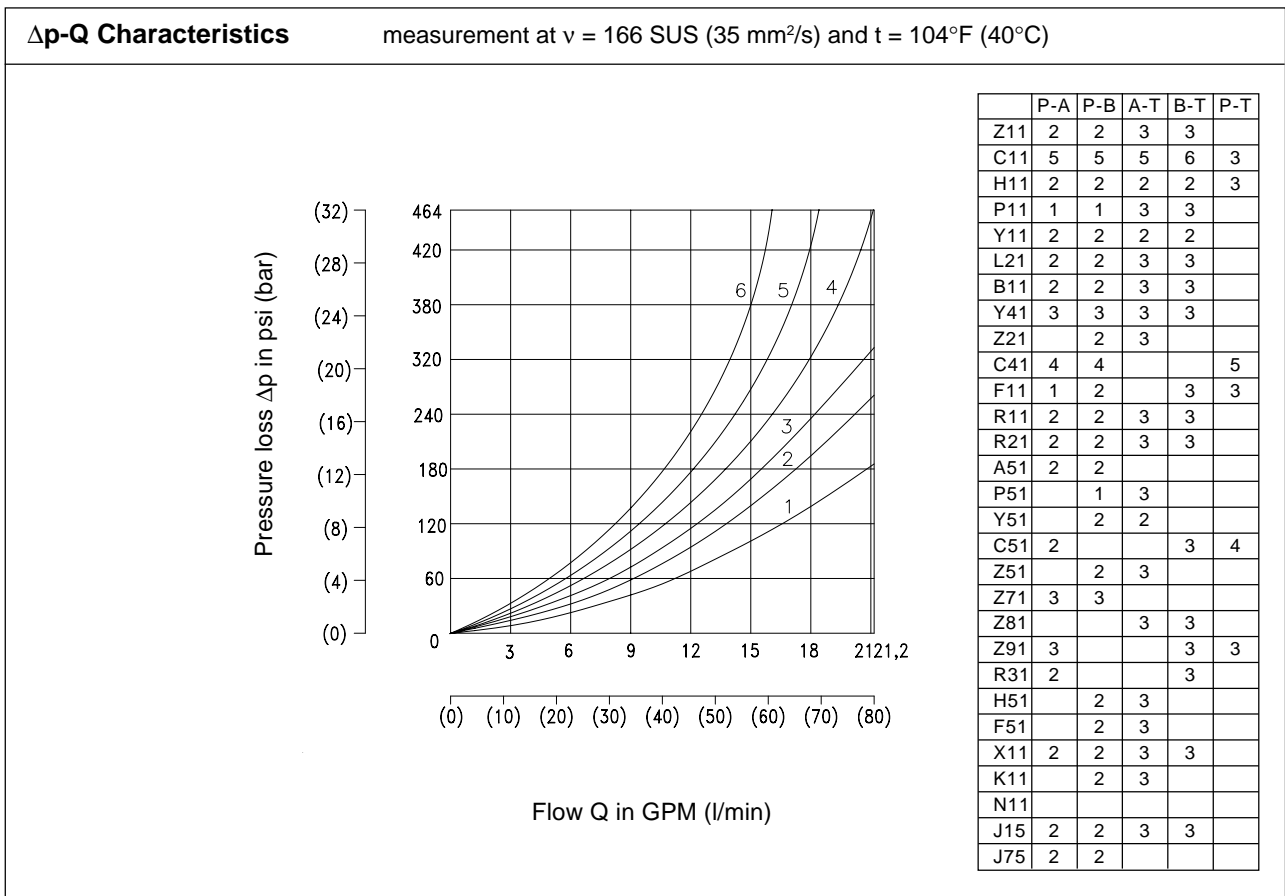
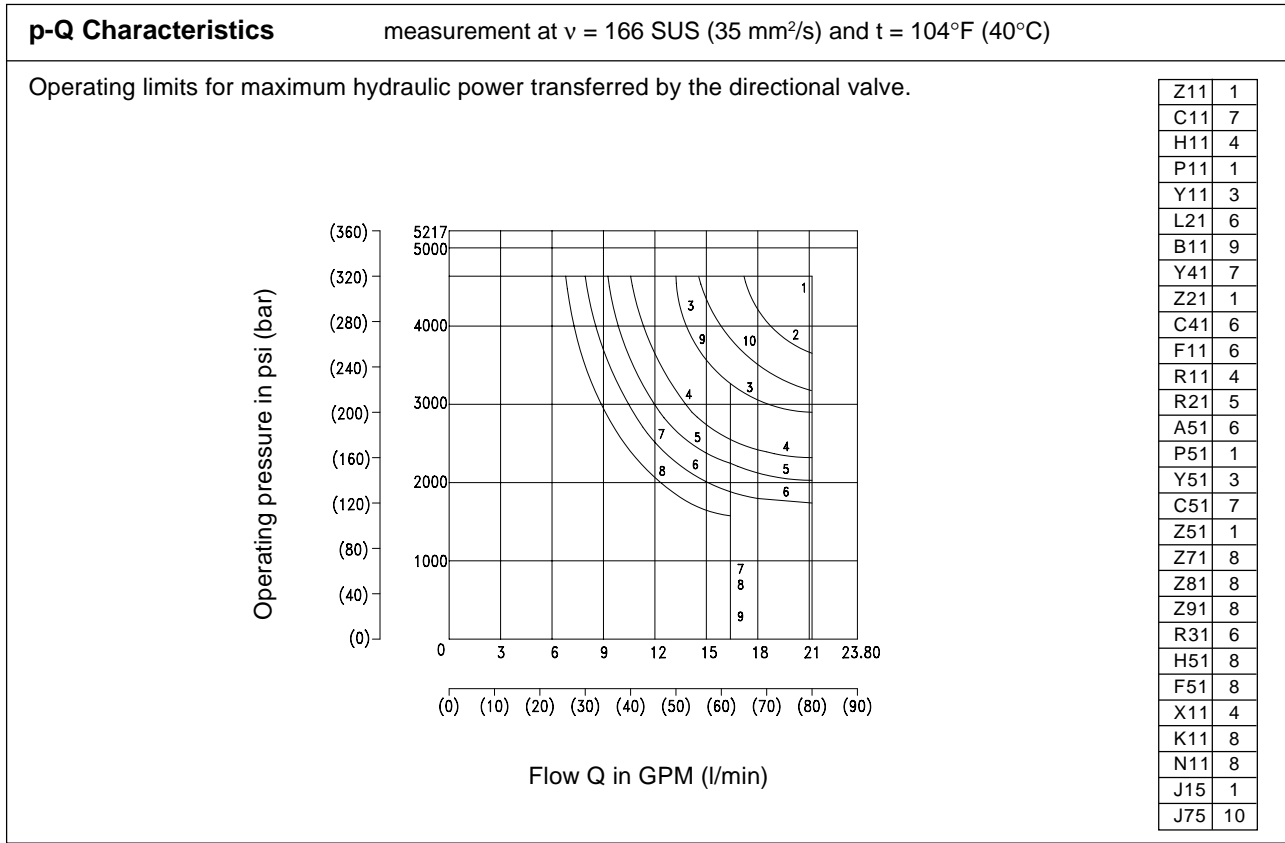
Technical Data

Nominal size	(mm)	6	
Maximum flow	US GPM (l/min)	See p-Q characteristics	
Max. operating pressure at ports P, A, B	psi (bar)	4641 (320)	
Max. operating pressure at port T	psi (bar)	2320 (160)	
Pressure losses	psi (bar)	see Δ p-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes HM, HV to CETOP RP91 H in viscosity classes ISO VG 32, 46 and 68	
Fluid temperature range	°F (°C)	-13... +158 (-25... +70)	
Ambient temperature range	°F (°C)	-13... +122 (-25... +50)	
Viscosity range	SUS (mm ² /s)	98... 1840 (20... 400)	
Maximum degree of fluid contamination		Class 18/15 to ISO 4406. Therefore we recommend a filter with a retention rate $\beta_{10} \geq 75$	
Permissible rated voltage variation	%	d.c.: -10... +6	a.c.: ± 10
Max. switching frequency	1/h	15.000	
Switching time, on: at v = 98 SUS (20 mm ² /s)	ms	d.c.: 30... 50	a.c.: 30... 40
Switching time, off: at v = 98 SUS (20 mm ² /s)	ms	d.c.: 10... 50	a.c.: 30... 70
Duty cycle	%	100	
Service life	cycles	10 ⁷	
Enclosure type to DIN 40050		IP 65	
Weight – valve with 1 solenoid valve with 2 solenoids	LB (kg)	3.52 (1.6) 4.84 (2.2)	
Mounting position		optional	

Functional Symbols

Designation	Symbol	Interposition	Designation	Symbol	Interposition
Z11			Z51		
C11			Z71		
H11			Z81		
P11			Z91		
Y11			R31		
L21			H51		
B11			F51		
Y41			Z11		
Z21			X11		
C41			C11		
F11			H11		
R11			K11		
R21			N11		
A51			F11		
P51			J15		
Y51			J75		
C51					

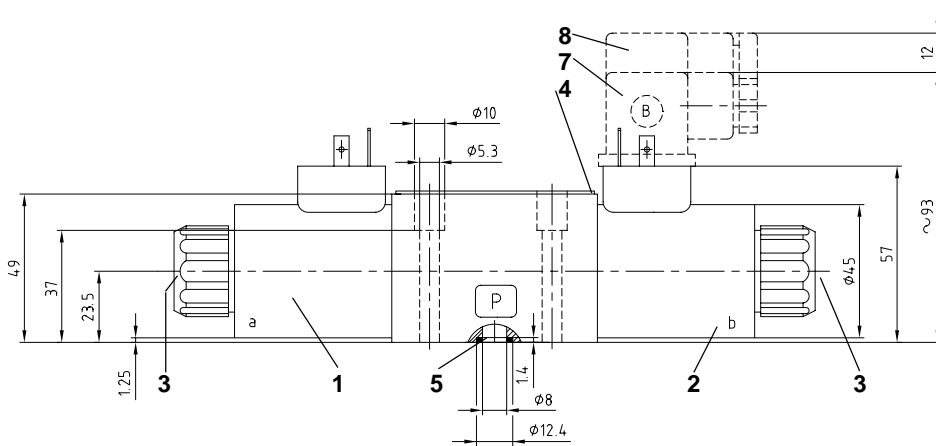
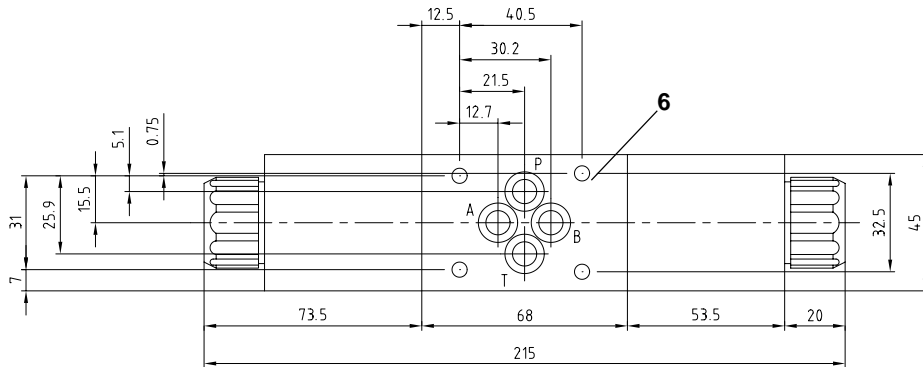
Characteristics



Valve dimensions

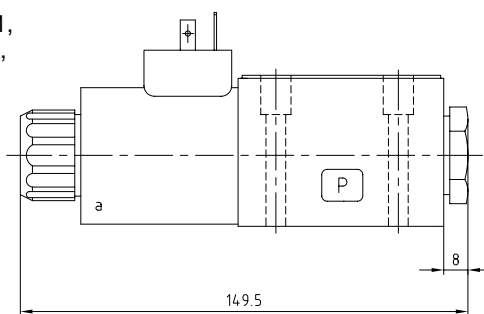
Dimensions in millimeters

Valve with two solenoids



Valve with one solenoid

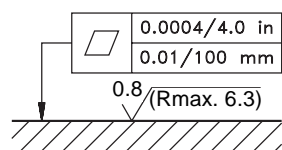
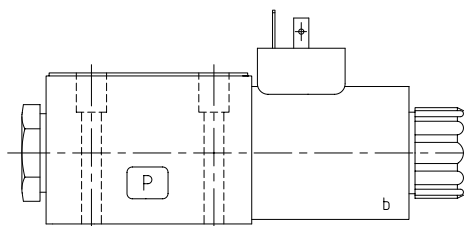
Functional symbols
R11, R21, A51, P51, Y51,
Z51, C51, Z71, Z81, Z91,
R31, H51, F51



- 1 Solenoid a
- 2 Solenoid b
- 3 Manual override
- 4 Name plate
- 5 Square ring
9.25 × 1.68 × 1.68
supplied in delivery packet
- 6 4 mounting holes
- 7 Connector plug to DIN 43650
- 8 Distance required to remove plug

Valve with one solenoid

Functional symbols
X11, Z11, C11, H11, K11,
N11, F11



Required surface finish of interface

Type of the solenoid coil

Designation	Dimensional sketch	Description
E1		Solenoid coil with terminal for the connector plug to DIN 43 650.
E2		Solenoid coil with integrated quenching diode and terminal for the connector plug to DIN 43 650.
E3		Solenoid coil with terminal for AMP connector plug.
E4		Solenoid coil with integrated quenching diode and terminal for AMP connector plug.
E5		Solenoid coil with integrated rectifier and terminal for the connector plug to DIN 43 650.

Connector plug to DIN 43650

	Designation	Type	Model	Max. input voltage
	K1	Plug B (black)	without rectifier	250 V d.c.
		Plug A (grey)	without rectifier	230 V a.c.
	K2	Plug B (black)	without rectifier and with LED	12... 30 V d.c.
		Plug A (grey)	without rectifier and with LED	230 V a.c.
	K3	Plug B (black)	with rectifier	12... 30 V d.c.
		Plug A (grey)	with rectifier	230 V a.c.
	K4	Plug B (black)	with rectifier and with LED	250 V a.c.
		Plug A (grey)	with rectifier and with LED	250 V a.c.

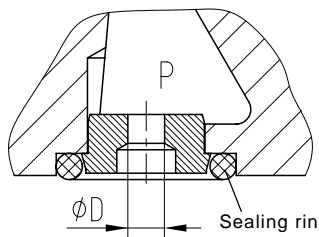
Manual override

Standard	Closing Nut
<p>Without designation Dimensional sketch</p> <p>Description Standard model of the manual override. Standard fixing nut of the solenoid.</p>	<p>Designation N1 Dimensional sketch</p> <p>Description Manual override with closing nut. Can be used after removing the nut.</p>
Rubber cap	Detent Assembly
<p>Designation N2 Dimensional sketch</p> <p>Description Manual override protected by rubber cap.</p>	<p>Designation N3 Dimensional sketch</p> <p>Description Manual override enabling spool arrestment in the charged position.</p>

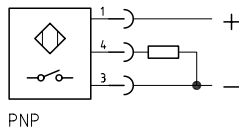
Cushioned spool shifting

Designation	Dimensional sketch	Description
T1		<p>This directional valve provides cushioned control spool shifting by means of orifice situated in the solenoid armature. To ensure the proper function of the valve, perfect air bleeding of the solenoid is required (by means of bleeding plugs (1)). The plugs are accessible after removing the rubber cap (2) from the solenoid fixing nut (3).</p>
Switching times		
Total switching time, on	ms	300 ... 500
Total switching time, off	ms	400 ... 800
Time of the pressure change, switching on	ms	80 ... 200
Time of the pressure change, switching off	ms	80 ... 400
<p>The switching times shown are valid for viscosity $\nu = 166 \text{ SUS}$ ($35 \text{ mm}^2/\text{s}$), valve temperature $t = 140^\circ\text{F}$ (40°C) and nominal voltage. They are dependent upon working pressure and flow rate of the directional valve.</p>		

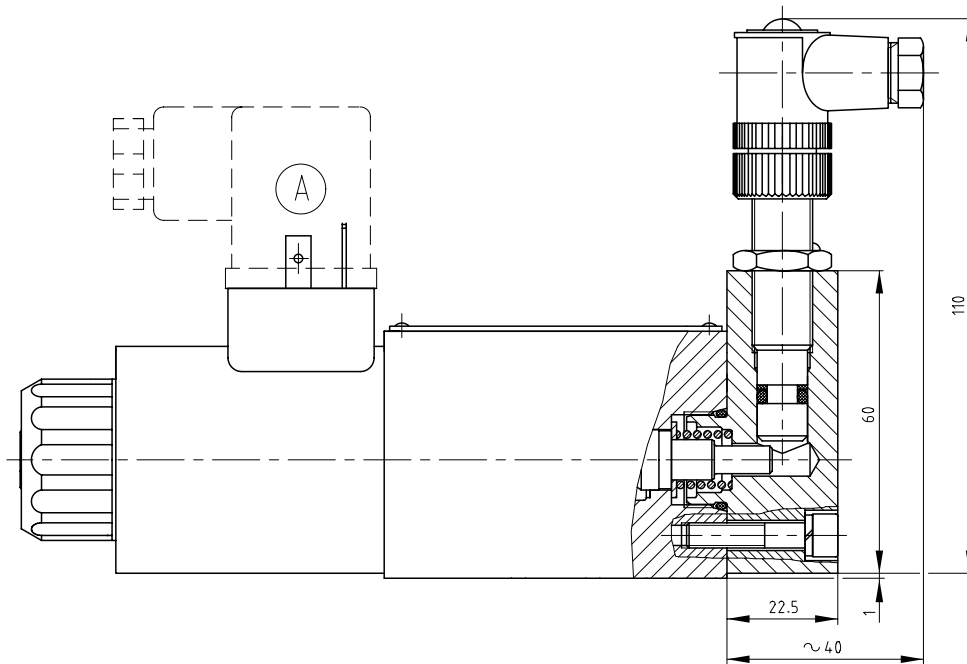
Orifice in P port

Designation	Ø D [mm]		Description
D1	1.0		<p>The orifice installed into P port throttles the flow inputting the directional valve</p>
D2	1.5		
D3	2.0		
D4	2.2		
D5	2.5		

Sensing of the End Position

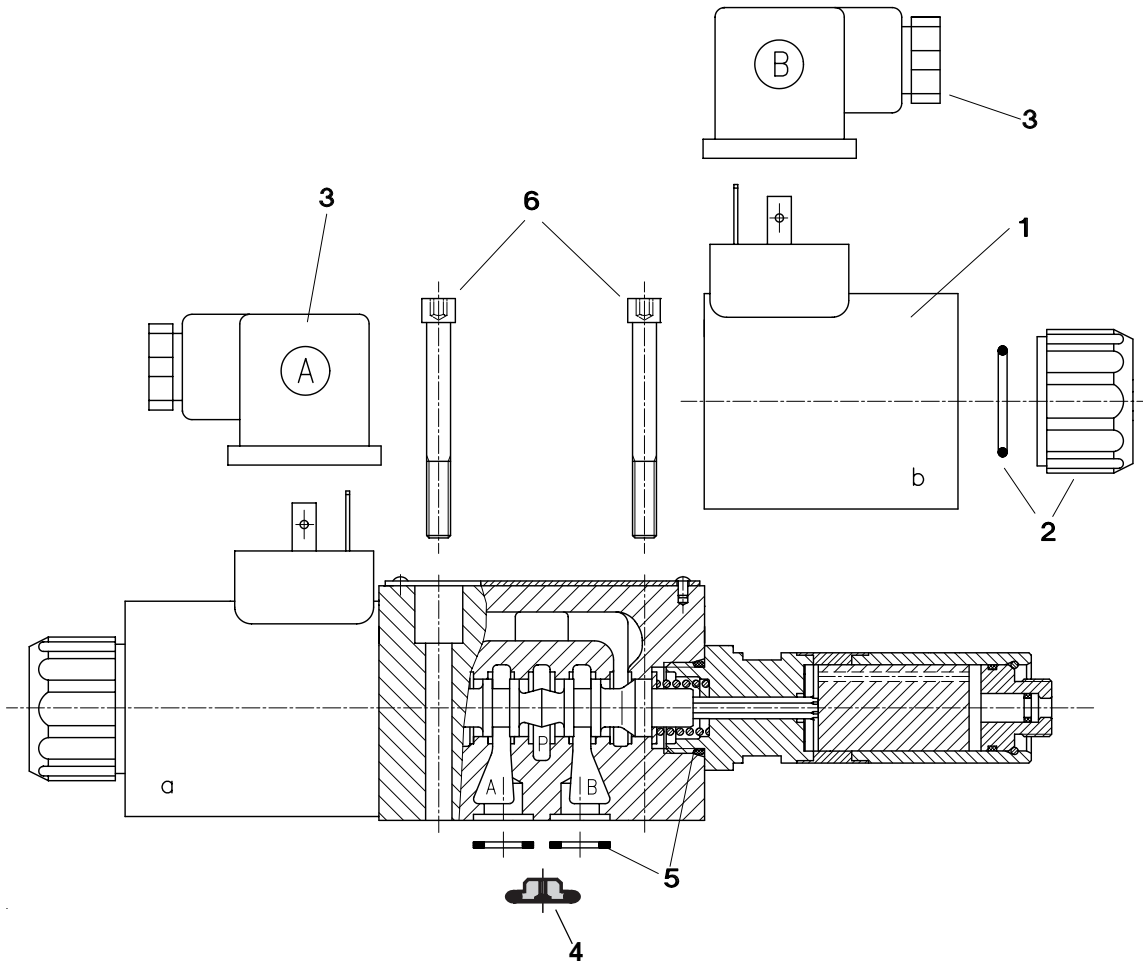
Designation		Description
S1		<p>The contactless sensor transforms the spool position into an electrical step signal. Can be used only with directional valves with one solenoid.</p>

Dimensional sketch



Spare parts

- 1. Solenoid coil
- 2. Nut + sealing ring
- 3. Connector plug
- 4. Orifice in P port + sealing ring
- 5. Set of sealing
- 6. Mounting bolts



Solenoid coil

Type designation of the coil voltage	Type of the coil				
	E1	E2	E3	E4	E5
	Ordering number				
01200	936-0062	936-6200	936-4306	936-4305	
01400	936-0063	936-6201	–	–	
02100	–	–	–	–	
02400	936-0066	936-6204	936-4327	936-4325	
04200	–	–	–	–	
04800	936-0071	936-6208	–	–	
06000	936-0073	–	–	–	
10200	936-0076	–	–	–	
20500	936-0078	–	–	–	
02450					936-2325
11550					936-2375
23050					936-2385

Solenoid fixing nut + sealing ring

Type of the nut	Sealing ring	Ordering number
Standard nut	22 × 2	484-9951
Closing nut		484-9952
Nut with rubber cap		484-9953
Nut with detent assembly		484-9954

Connector plug to DIN 43 650

Type designation	Model	Max. input voltage	Connector plug A grey	Connector plug B black
			Ordering number	
K1	without rectifier	0... 250 V d.c.	936-9902	936-9901
		0... 230 V a.c.		
K2	without rectifier and with LED	12... 30 V d.c.	936-9908	936-9907
		0... 230 V a.c.	936-9906	936-9905
K3	with rectifier	0... 250 V a.c.	936-9904	936-9903
K4	with rectifier and with LED	250 V a.c.	936-9910	936-9909

Orifice in P-port

Type designation	∅ D [mm]	Sealing ring	Ordering number
D1	1.0	9.25 × 1.78	484-9973
D2	1.5		484-9974
D3	2.0		484-9975
D4	2.2		484-9977
D5	2.5		484-9976

Set of the seal

Type	Dimensions, number		Ordering number
Standard – NBR 70	9.25 × 1.68 × 1.68 (4 pcs.)	17 × 1.8 (2 pcs.)	484-9961
Viton	9.25 × 1.78 (4 pcs.)	17.17 × 1.78 (2 pcs.)	484-9971

Mounting bolts – set

Dimensions, number	Tightening torque	Ordering number
M5 × 45 DIN 912 - 10.9 (4 pcs.)	6.5 lb-ft (8.9 Nm)	484-9958

Danfoss Hydraulics

ISO 9001

Danfoss Mobile Hydraulics have been manufactured to meet the quality demands specified by ISO 9001

ISO
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INTERNATIONAL STANDARD



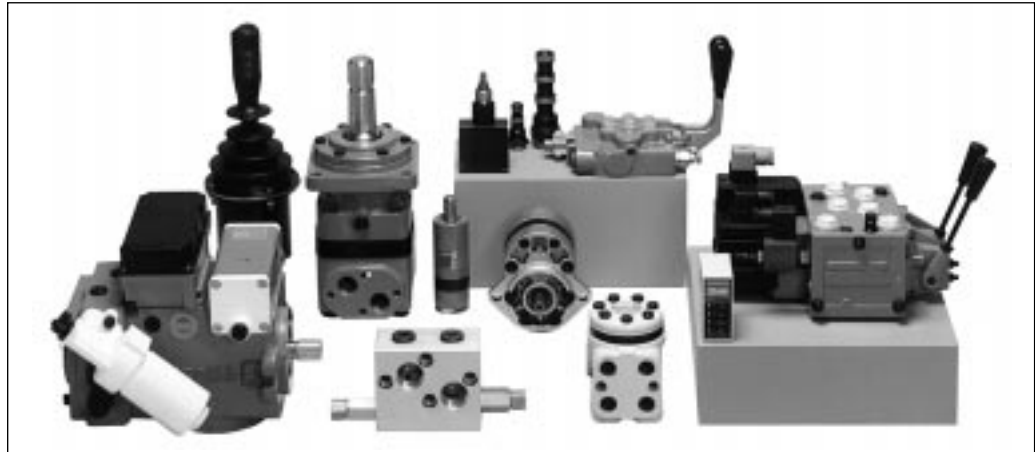
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
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Quality management and quality assurance standards

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- Remote control units
- Electronics for hydr. components
- Rotary actuators
- Gear wheel motors
- Gear wheel pumps
- Cartridge valves
- Directional control valves

Please contact the Danfoss Sales Organization for Hydraulics for further information.



Caution

- With functional symbols A51 and J75 for pressure exceeding 2331 psi (160 bar), the T-port should be connected directly to the tank.
- For directional valves with two solenoids, one solenoid must be without charge before the other solenoid can be charged. Switching time for directional valves with detent assembly (impulse control) should not be shorter than 60 ms.
- With directional valves with cushioned spool shifting the switching time must correspond with the shifting time.
- Other functional symbols on request.
- The packing foil is recyclable.
- The transport plate is to be returned to the supplier.
- Mounting bolts M5 × 45 must be ordered separately. Tightening torque of the screws is 6.5 lb-ft (9 Nm).

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