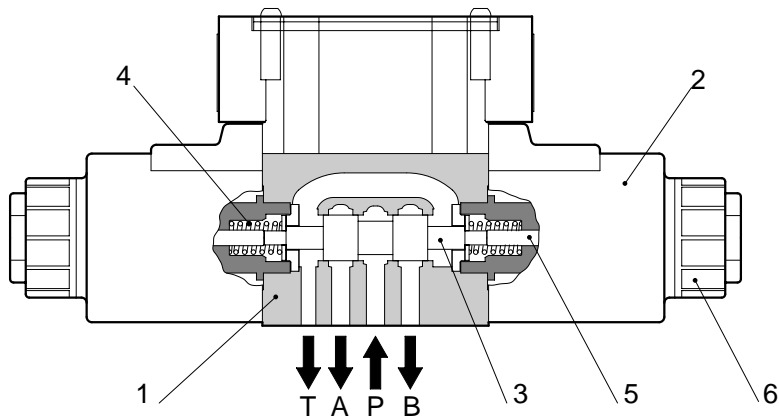


Size 6 up to 315 bar up to 63 L/min	Directional Spool Valve Sub-plate Mounted Type DE6, Series 20	Data Sheet D-1001/06.99 GB
<p><b>Features</b></p> <ul style="list-style-type: none"> <li>◇ Direct operated directional spool valve with solenoid operation.</li> <li>◇ High durability.</li> <li>◇ Various options.</li> <li>◇ Oil immersed type valve with no oil leakage from solenoid pin.</li> <li>◇ Porting pattern to DIN 24 340 form A ISO 4401 and CETOP-RP 121H.</li> <li>◇ Wet pin AC &amp; DC solenoids with removable coil.</li> <li>◇ Individual electrical connection and central connections.</li> <li>◇ Manual override (standard).</li> <li>◇ Solenoid coil can be rotated through 90°.</li> <li>◇ Coils can be replaced without releasing any fluid.</li> </ul> <div data-bbox="885 342 1476 689" style="text-align: right;"> </div>		
Model DE6	Page 1.18	Data Sheet D-1001/06.99



Valve DE6

### Functional Description

Type DE6 Directional Spool Valves are solenoid operated directional spool valves that are used to control (start, stop and direction) fluid flow.

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

When de-energised, the control spool (3) is held by the return springs (4) in a central or in the initial position (except for detented spools). The control spool (3) is actuated via wet pin solenoids (2).

**Note:** The pressure chamber must be filled with oil to ensure trouble free operation.

The force of the solenoid (2) acts on the plunger (5) causing the control spool (3) to move from its rest position to its desired end position. Thus, the required flow pattern from P to A and B to T or P to B, and A to T is selected.

A manual override (6), (standard), is provided for emergency operation of the control spool (3) without energising the solenoid.

**Type DE 6..20 - 0\*\*** (only with spool type 001, 003 and 004) - directional valve with 2 switching positions and 2 solenoids without detent, and no defined switching position in the de-energised condition.

**Type DE 6..20 - 1\*\*** (detent spool only with spools type 101, 103 and 104) - directional valve with 2 switching positions, 2 solenoids and a detent. Relevant switching positions are fixed and continuous solenoid energization is not necessary.

**Throttle Inserts** (type DE6..20..-P) - throttle inserts are required, if, due to the operating conditions, flows are expected to be higher than the stated maximum performance limits of the valve. Throttle inserts are inserted in the P channel of the directional valve.

**Ordering Code – Directional Spool Valve, Direct Operated**

DE 6 P 20 1 04 W D 24 AL PO8 V

**Directional Valve,  
Solenoid Operated**

**Size**  
6

**Type of Mounting**  
P: Sub-plate Mounting

**Series Number**  
20

**Spool Return**  
0: 2-position without Spring Return  
1: 2-position without Spring Return with detent  
2: 2-position with Spring Return  
**OR**  
3-position with Spring Return

**Spool Types**  
See spool symbols

**Solenoid Type**  
W: Wet pin solenoids (with manual overrides)

**Electrical supply**  
A: Alternating current (AC)  
D: Direct current (DC)  
R: Independent of frequency with built-in rectifier for AC

**Voltage**  
12: 12V  
24: 24V  
100: 100V  
200: 200V

**Suitable Oil**  
No Code: Mineral Oil, Fatty Acid Ester, Water Glycol  
V: Phosphate Ester

**Plug-in Throttle in P Port**  
No code No plug-in throttle  
P08: Ø0.8 mm  
P10: Ø1.0 mm  
P12: Ø1.2 mm  
P15: Ø0.8 mm  
P20: Ø2.0 mm  
P25: Ø0.8 mm  
P30: Ø3.0 mm  
P40: Ø4.0 mm

**Electrical Connections**

Code	Function	Electrical supply		
		A	D	R
AL	Central terminal and lamp	0	0	0
B	Angled plug to DIN 43650	0	0	-
C	Large angled plug	0	0	0
CL	Large angled plug with lamp	0	0	-



Spool types			
2-Position Valve			
Spool return	Spool type	Hydraulic Symbol	Transient condition
Spring Return			
	201		
	203		
	204		
	202		
	225		
Without spring return			
Without spring return	001		
	003		
	004		
Without spring return with detent			
Without spring return with detent	101		
	103		
	104		
<p><b>⚠ Attention!</b> -Take the pressure intensification into account when using differential cylinders!</p>			
Model DE6	Page 4.18	Data Sheet D-1001/06.99	

Spool types (continued)			
3-Position Valve			
Spool return	Spool type	Hydraulic Symbol	Transient condition
Spring Return	205		
	206		
	207		
	208		
	210		
	212		
	213		
	216		
	217		
	221		
	222		
	223		
<p> <b>Attention!</b> -Take the pressure intensification into account when using differential cylinders!</p>			
Model DE6	Page 5.18	Data Sheet D-1001/06.99	

Spool types (continued)

3-Position Valve (using one switching position)

Spool return	Spool type	Hydraulic Symbol	Transient condition
	205A		
	205B		
	206A		
	206B		
	207A		
	207B		
	208A		
	208B		
	210A		
	210B		

**Attention!** -Take the pressure intensification into account when using differential cylinders!



**Technical Data**

For applications outside the following parameters, please consult Kawasaki Precision Machinery (UK) Ltd.

**General**

Installed Position Optional  
Ambient Temperature Up to 50°C

Weight

Valve Type	AC Solenoid	DC Solenoid
Single solenoid valve	1.45 kg	1.6 kg
Valve with 2 solenoids	1.9 kg	2.2 kg

**Hydraulic Data**

Pressure Fluid Mineral oil, phosphate ester, fatty acid ester and water glycol.  
Phosphate ester is only suitable for use with FPM seals.

Pressure Fluid Temperature Range -20°C to +70°C

Degree of Contamination Maximum permissible degree of contamination of fluid is to NAS 1638 class 9. Kawasaki recommend a filter with a retention rate of  $\beta_{10} \geq 75$ .

Viscosity Range 3 to 380cSt

Operating Pressure

Ports A, B, P	Up to 315 bar (250 bar for spool type 07)
Port T	Up to 160 bar

With spool types 01, 02 and 03, Port T must be used as a drain port if the operating pressure is above the permitted tank pressure.

Flow Rate Up to 63 L/min

**Technical Data (continued)****Electrical**

Type of Voltage	DC	AC
Available Voltages	12, 24	120, 240 (50/60Hz)
Voltage Tolerance (nominal voltage)	±10%	±10% (50Hz) ±20% (60Hz)
Power Consumption	30 W	-
Holding current	-	50 VA
Startup current	-	240 VA
Duty Cycle	100%	100%
Switching Time	ON: 45 mS OFF: 20 mS	ON: 15 mS OFF: 25 mS
Switching Frequency	Up to 18,000 cycles/hour	Up to 18,000 cycles/hour
Insulation to DIN 40 050	IP65	IP65
Coil Temperature	Up to 180°C	Up to 180°C

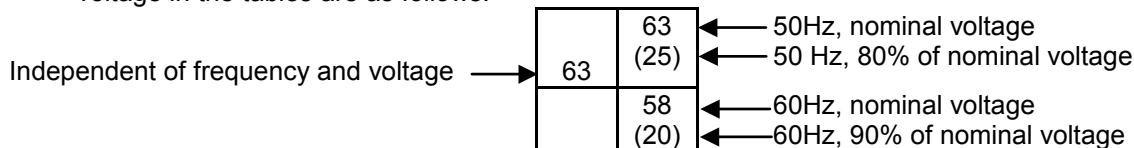
Note: With electrical connections the earth (PE) must be correctly connected.





**Switching Data for AC solenoid Valve**

Note: The maximum flow VS frequency and voltage in the tables are as follows:



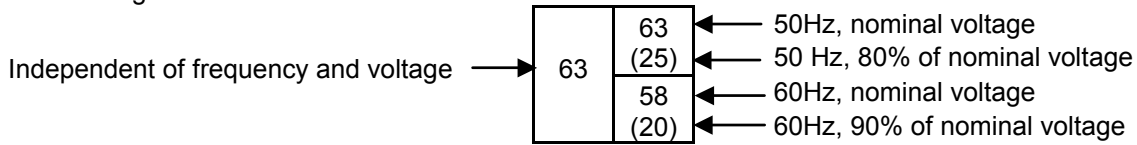
**Three Position valves**

		Maximum flow (L/min)														
Spool type	Direction P - A - B - T Of flow P - B - A - T					Direction P - A Of flow					Direction P - B Of flow					
	Operating pressure (bar)					Operating pressure (bar)					Operating pressure (bar)					
	50	100	160	250	315	50	100	160	250	315	50	100	160	250	315	
205	63	63	63	63	63	63 (30)	62 (23)	63 (15)	50 (10)	40 (10)	63 (30)	62 (23)	63 (15)	50 (10)	40 (10)	
						45 (25)	33 (18)	20 (10)	13 (5)	13 (5)	45 (25)	33 (18)	20 (10)	13 (5)	13 (5)	
208	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
210	63	63	63	63	63	63 (48)	63 (25)	63 (23)	63 (20)	55 (13)	63 (25)	63 (23)	63 (20)	63 (13)	55 (10)	
						63 (43)	58 (20)	48 (18)	35 (15)	20 (8)	13 (5)	58 (20)	48 (18)	35 (15)	20 (8)	13 (5)
223	63	63	63	63	63	63 (30)	62 (23)	63 (15)	50 (10)	40 (10)	63 (30)	62 (23)	63 (15)	50 (10)	40 (10)	
						45 (25)	33 (18)	20 (10)	13 (5)	13 (5)	45 (25)	33 (18)	20 (10)	13 (5)	13 (5)	
207	45	43	40	40	-	45	43	40	40	-	45	43	40	40	-	
213	63	63	63	63	63	28	20	15	10	10	28	20	15	10	10	
221	63	63	63	63	63	63 (38)	63 (30)	63 (25)	63 (15)	63 (13)	63 (38)	63 (30)	63 (25)	63 (15)	63 (13)	
						63 (33)	45 (25)	30 (20)	20 (10)	15 (18)	63 (33)	45 (25)	30 (20)	20 (10)	15 (8)	
212	63	63	63	63	63	63 (30)	63 (28)	63 (23)	63 (18)	63 (15)	63 (30)	63 (28)	63 (23)	63 (18)	63 (15)	
						63 (25)	35 (23)	25 (18)	18 (13)	15 (10)	63 (25)	35 (23)	25 (18)	18 (13)	15 (10)	



**Switching Data for AC solenoid Valve (Continued)**

Note: The maximum flow VS frequency and voltage in the tables are as follows:



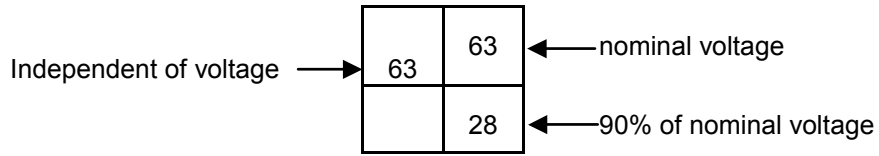
**Two Position valves**

Maximum flow (L/min)																
Spool type	Direction P - A - B - T Of flow P - B - A - T					Direction P - A Of flow					Direction P - B Of flow					
	Operating pressure (bar)					Operating pressure (bar)					Operating pressure (bar)					
	50	100	160	250	315	50	100	160	250	315	50	100	160	250	315	
204	63	63	63	63	63	63	63	63	63	63	63	63	63 (55)	63 (50)	63 (50)	63 (45)
													63 (50)	63 (45)	63 (45)	63 (40)
203	63	63 (60)	63 (60)	63 (60)	63 (60)	50	50	50	50	50	63 (55)	63 (55)	63 (55)	63 (55)	63 (55)	
		63	63	63	63						63	63	63	63	63	
201	-	-	-	-	-	25	13	10	10	10	63 (28)	63 (25)	63 (20)	63 (13)	50 (10)	
											63 (32)	35 (23)	23 (15)	15 (8)	10 (5)	
104	63	63	63	63	63	45	45	45	45 (35)	45 (25)	45	45	45	45 (35)	45 (25)	
									45 (30)	30 (20)				45 (30)	30 (20)	



**Switching Data for DC solenoid and AC/DC solenoid Valves**

Note: The maximum flow VS voltage in the tables are as follows:

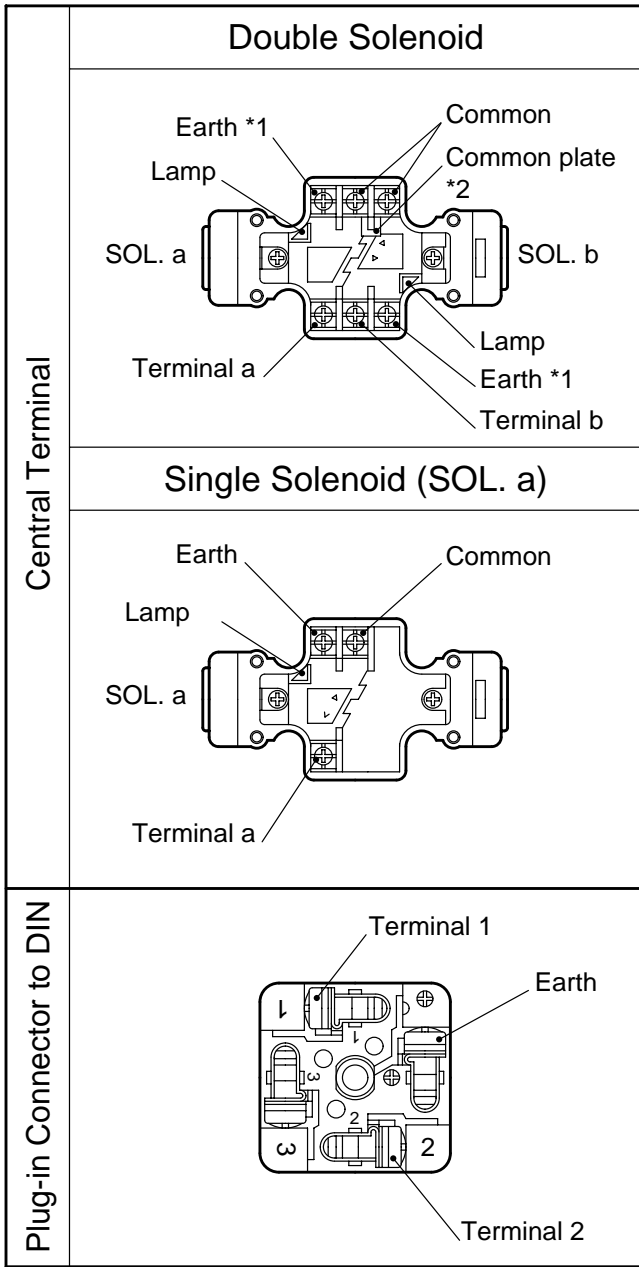


**Three Position valves**

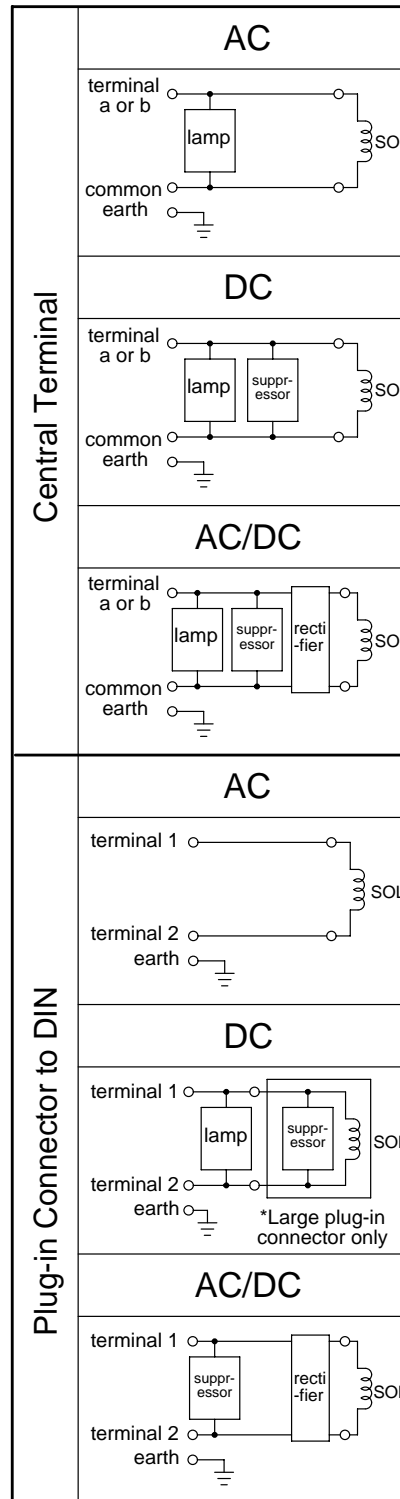
Spool type	Maximum flow (L/min)														
	Direction P - A - B - T Of flow P - B - A - T					Direction P - A Of flow					Direction P - B				
	Operating pressure (bar)					Operating pressure (bar)					Operating pressure (bar)				
	50	100	160	250	315	50	100	160	250	315	50	100	160	250	315
205	63	63	63	63	63	45	30	20	15	13	63	30	20	15	13
						33	23	15	10	10					
208	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
210	63	63	63	63	35	63	45	35	30	28	63	45	35	30	28
				28	23										
223	63	63	63	63	63	45	30	20	15	13	63	30	20	15	13
						33	23	15	10	10					
207	45	43	40	40	-	45	43	40	40	-	45	43	40	40	-
213	63	63	63	63	63	28	20	15	10	10	28	20	15	10	10
221	63	63	63	63	45	63	45	55	40	28	63	55	40	28	20
				33	23										
212	63	63	63	63	38	63	60	40	25	20	63	60	40	25	20
				30	23										
204	63	63	63	63	63	20	18	18	18	18	63	58	40	30	50
	53	53	53	53	53										
203	38	38	38	38	38	48	48	45	45	40	63	63	63	63	63
	28	28	28	28	28										
201	-	-	-	-	-	25	13	10	8	8	63	48	28	15	15
	30	20	13	10											
104	63	63	63	63	63	45	45	45	40	30	45	45	45	40	30
	58	55	55	55	55				30	25				30	25



Valve wiring details

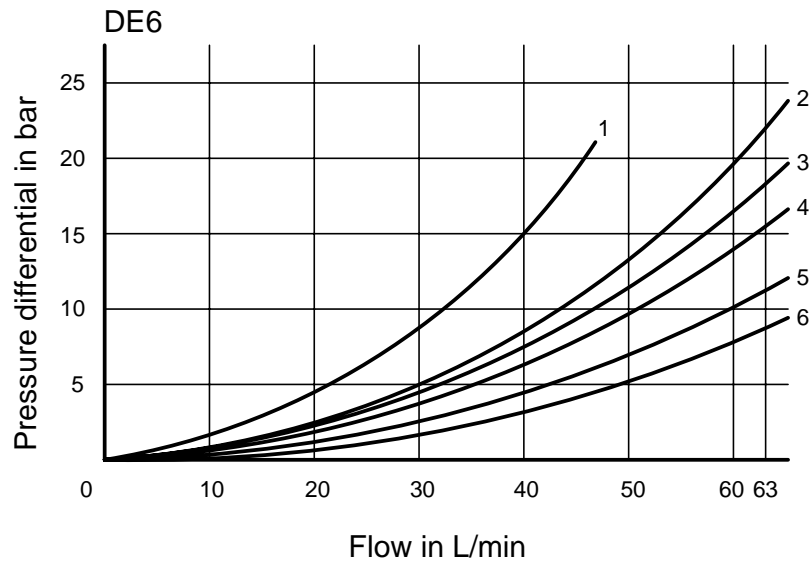


- Note:
- \*1. Either earth terminal can be used.
  - \*2. When common plate is unnecessary (4 wires for 3 solenoids), it can be removed.
  - \*3. No polarity in DC solenoid.



**Characteristic Curves**

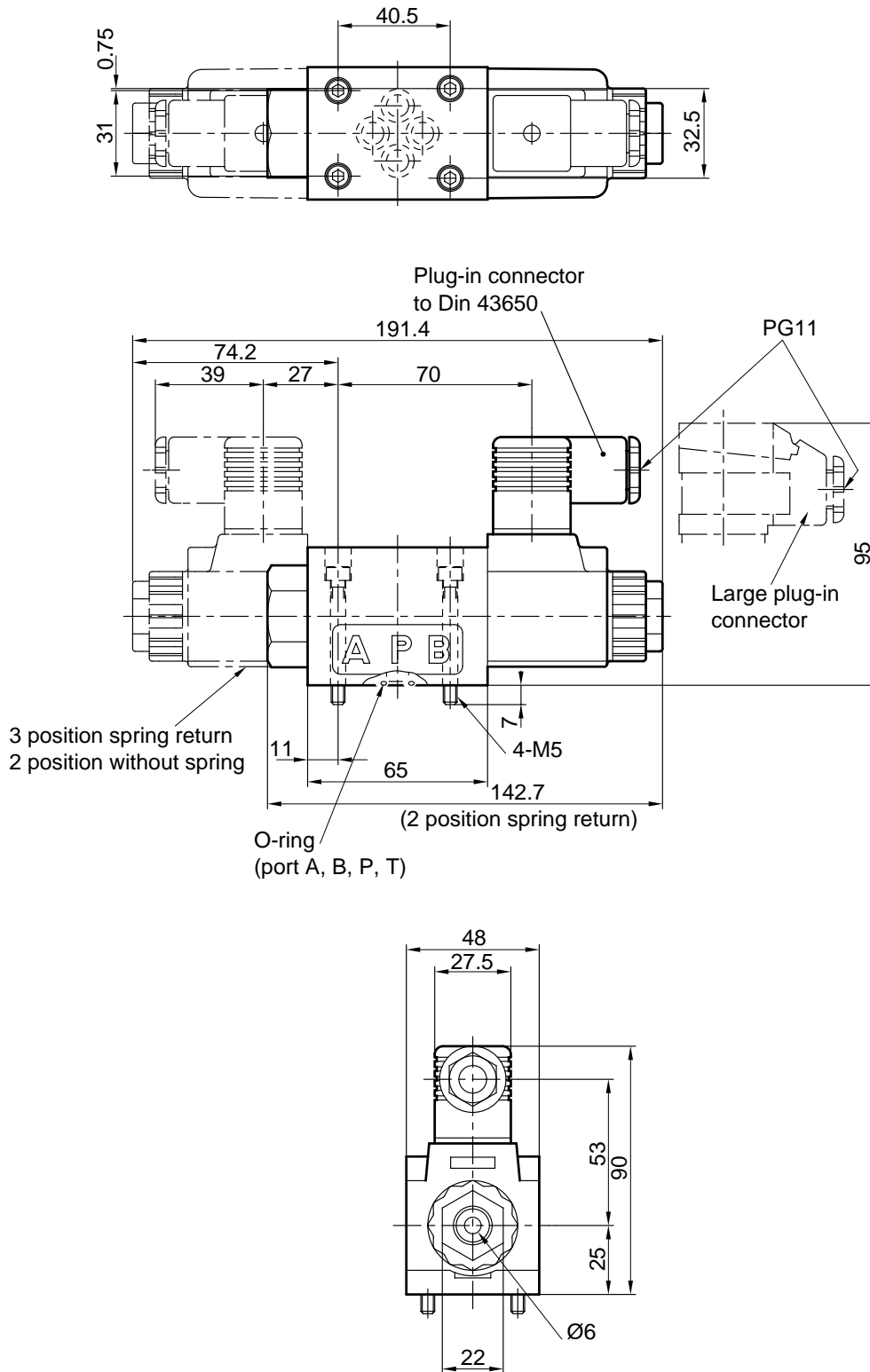
Measured at  $\nu = 36\text{cSt}$  and  $t = 50^\circ\text{C}$



Spool type	Direction of flow				
	P → A	B → T	P → B	A → T	P → T
205	5	5	5	5	-
208	6	6	6	6	4
210	5	6	5	6	-
223	5	5	5	5	-
207	1	1	1	1	4
213	6	5	6	5	-
221	5	6	5	5	-
212	5	5	5	6	-
104	5	2	5	2	-
204	2	2	5	5	-
203	3	3	5	6	-
201	5	-	5	-	-



**Unit Dimensions – Plug-in connector- AC solenoid (dimensions in mm)**

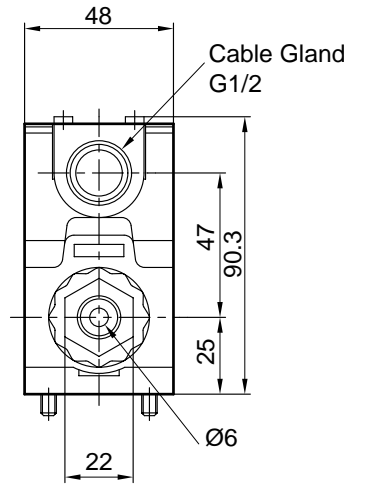
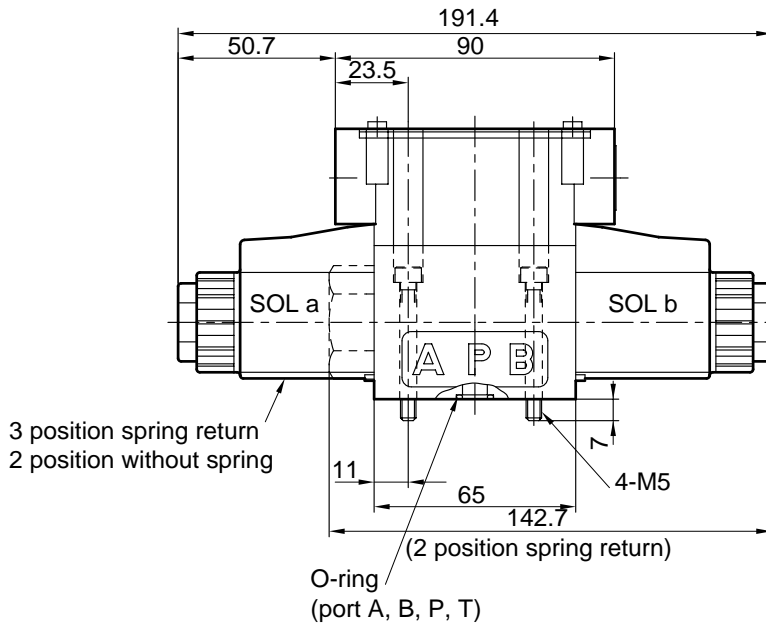
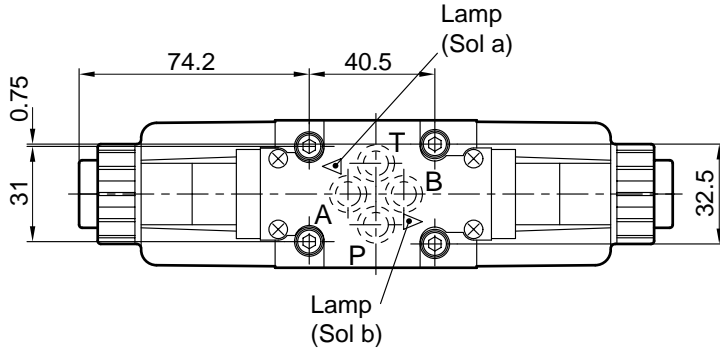


Model  
DE6

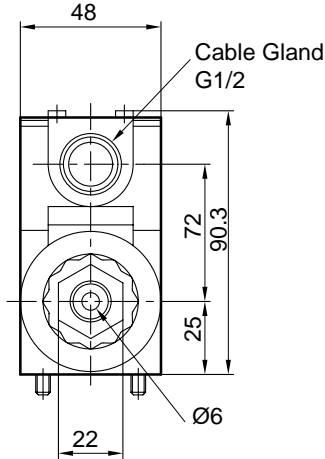
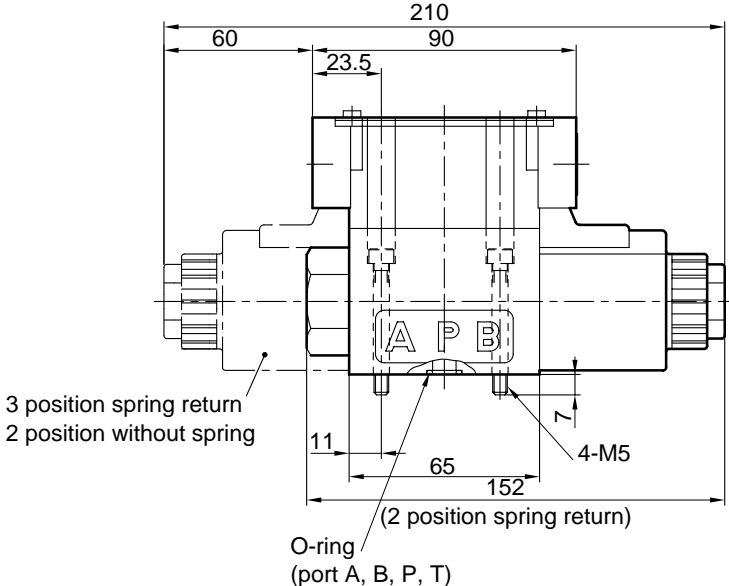
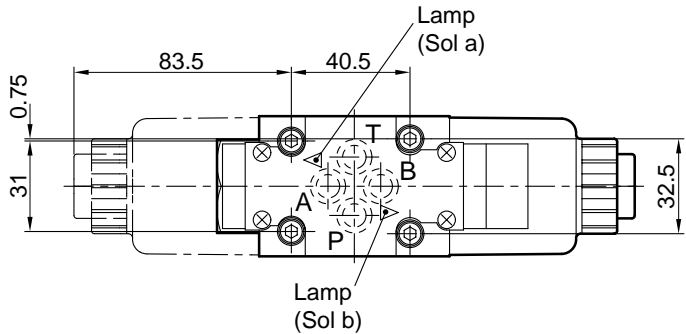
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**Unit Dimensions – Central Terminal- AC solenoid (dimensions in mm)**

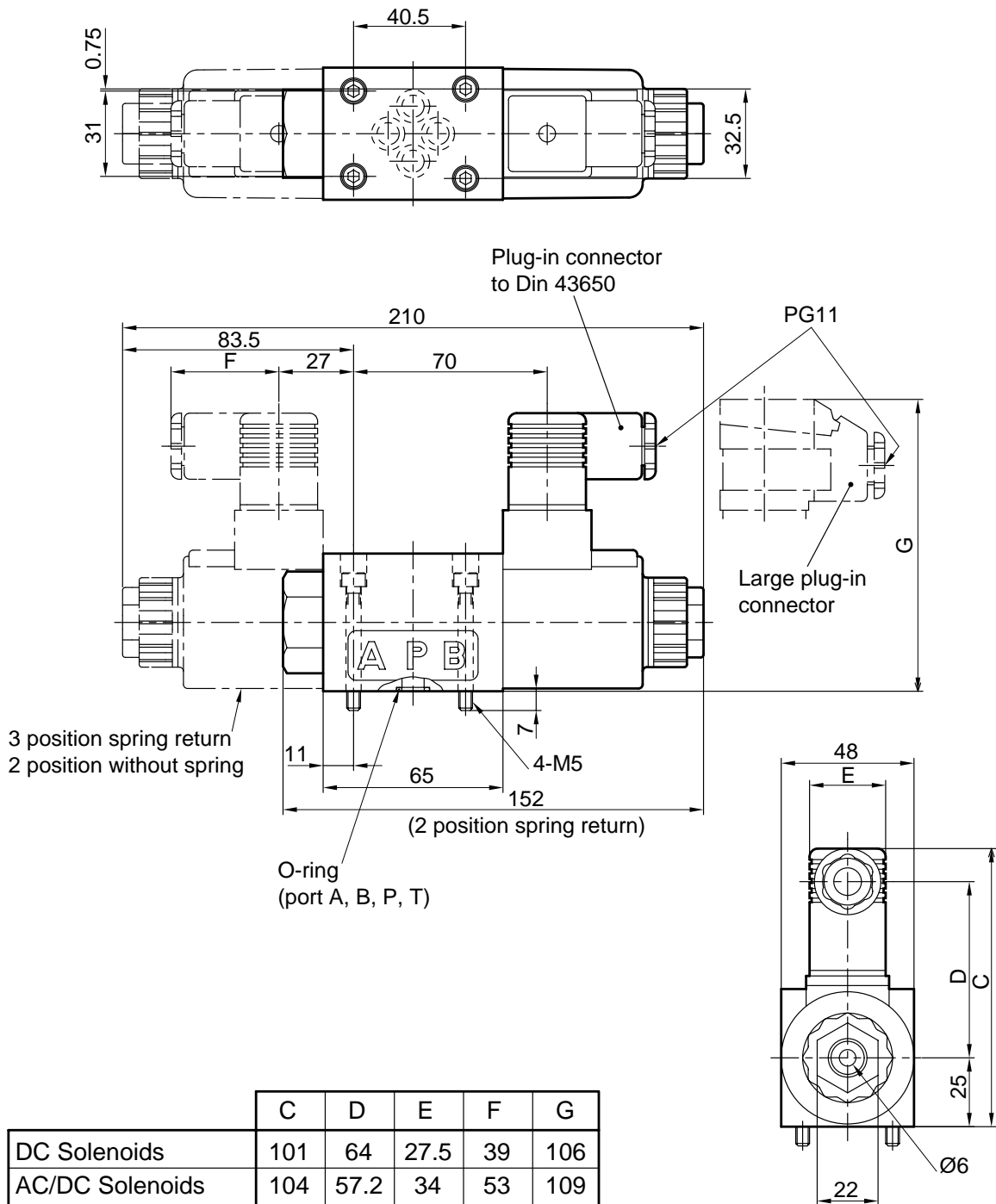


Unit Dimensions – Central terminal, DC, AC/DC Solenoid (dimensions in mm)





**Unit Dimensions – Plug-in connector, DC, AC/DC Solenoid (dimensions in mm)**



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