

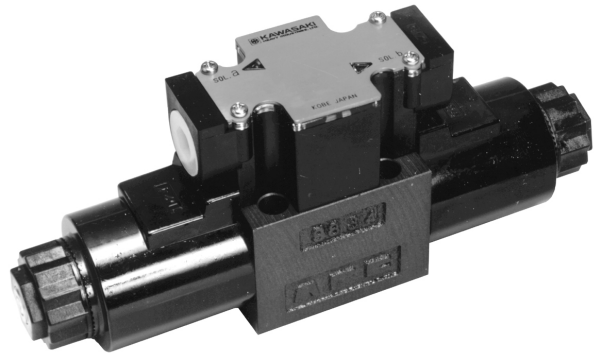
0 up to 315 bar
up to 120 L/min

Directional Spool Valve
Sub-plate Mounted
Type DE10, Series 10

Data Sheet
D-1002/06.99
GB

Features

- ◇ Direct operated directional spool valve with solenoid operation.
- ◇ High durability.
- ◇ Various options.
- ◇ Oil immersed type valve with no oil leakage from solenoid pin.
- ◇ Porting pattern to DIN 24 340 form A ISO 4401 and CETOP-RP 121H.
- ◇ Wet pin AC & DC solenoids with removable coil.
- ◇ Individual electrical connection and central connections.
- ◇ Manual override (standard).
- ◇ Solenoid coil can be rotated through 90°.
- ◇ Coils can be replaced without releasing any fluid.

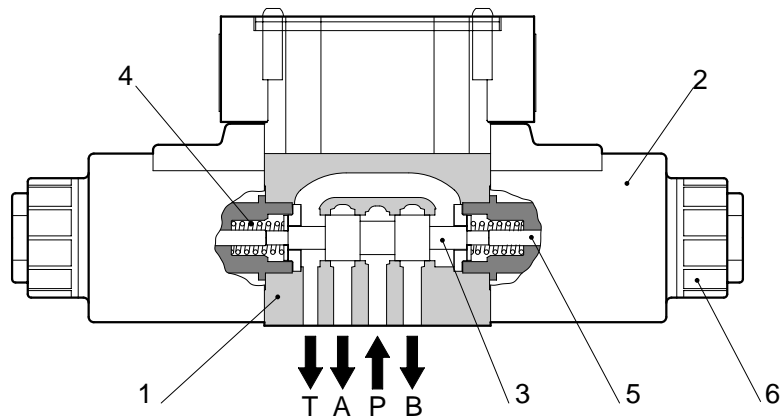


Model
DE10

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Kawasaki
Hydraulic Products



Valve DE10

Functional Description

Type DE10 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 10..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 10..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 DE10..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 10 P 10 1 04 W D 24 AL PO8 V

**Directional Valve,
Solenoid Operated**

Size
10

Type of Mounting

P: Sub-plate Mounting

Series Number
10

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
- 120: 120V
- 240: 240V

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 with detent			
	101		
	103		
104			

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



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> Attention! -Take the pressure intensification into account when using differential cylinders!</p>			
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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 (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	38 W	-
Holding current	-	90 VA
Startup current	-	540 VA
Duty Cycle	100%	100%
Switching Time	ON: 95 mS OFF: 30 mS	ON: 25 mS OFF: 20 mS
Switching Frequency	Up to 14,400 cycles/hour	Up to 14,400 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:

Independent of frequency and voltage →	63	63	← 50Hz, nominal voltage
		(25)	← 50 Hz, 80% of nominal voltage
		58	← 60Hz, nominal voltage
		(20)	← 60Hz, 90% of nominal voltage

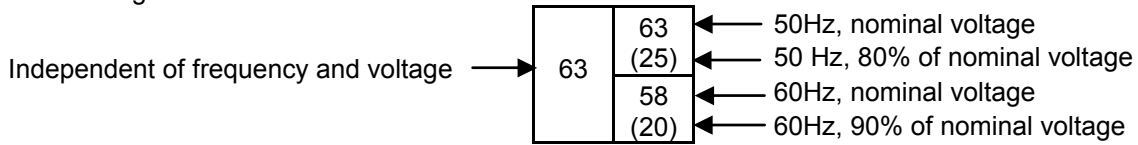
Three Position valves

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	100	100	100	100	100	100	100	100	96	65	100	100	100	96	65
						(70)	(70)	(48)	(28)	(24)	(70)	(70)	(48)	(28)	(24)
208	90	90	90	90	90	90	90	53	34	26	90	90	53	34	26
						(49)	(49)	(30)	(19)	(15)	(48)	(48)	(30)	(19)	(15)
210	80	80	80	80	80	100	100	100	76	46	100	100	100	76	46
				(65)	(25)	(58)	(58)	(33)	(22)	(19)	(58)	(58)	(33)	(22)	(19)
223	100	100	100	100	100	100	100	100	84	48	100	100	100	84	48
					(75)	(62)	(62)	(39)	(21)	(18)	(62)	(62)	(39)	(21)	(18)
207	70	70	70	70	-	100	100	100	100	-	100	100	100	100	-
213	100	100	100	100	100	60	60	60	60	60	60	60	60	60	60
221	80	80	80	80	80	100	100	100	60	34	100	100	100	60	34
				(30)	(20)	(55)	(55)	(36)	(21)	(16)	(55)	(55)	(36)	(21)	(16)
212	90	90	90	90	90	100	100	100	60	34	100	100	100	60	34
				(30)	(20)	(55)	(55)	(36)	(21)	(16)	(55)	(55)	(36)	(21)	(16)



Switching Data for AC solenoid Valve (Continued)

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



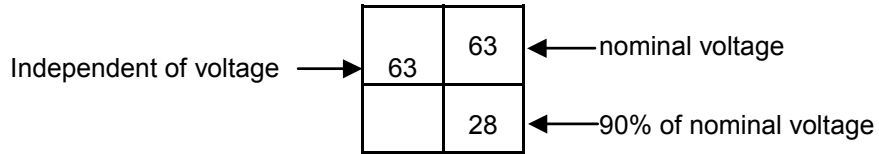
Two Position valves

		Maximum flow (L/min)																
Spool type	Direction Of flow	P - A - B - T P - B - A - T					Direction Of flow	P - A					Direction Of flow	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			
204	100	100	100	100	100	34	34	34	20	19	100	100	100	100	94			
	(90)	(90)	(90)	(90)	(90)						(62)	(62)	(62)	(44)	(37)	80	80	73
203	100	100	100	100	100	57	57	57	57	57	100	100	100	100	100			
	(75)	(75)	(75)	(75)	(75)						(79)	(79)	(72)	(64)	(59)	92	92	89
201	-	-	-	-	-	26	26	19	18	16	100	100	87	61	49			
											(35)	(35)	(15)	(9)	(7)	45	45	34
104	100	100	100	100	100	40	40	40	38	28	60	60	60	40	35			



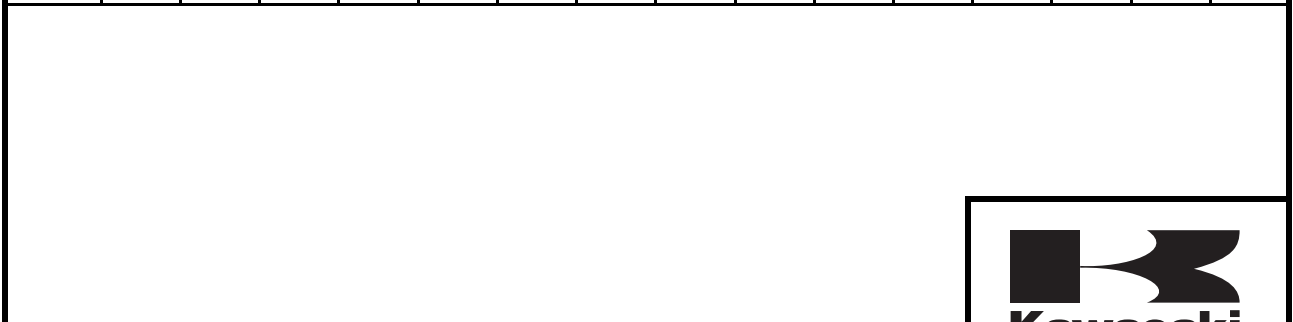
Switching Data for DC solenoid and AC/DC solenoid Valves

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

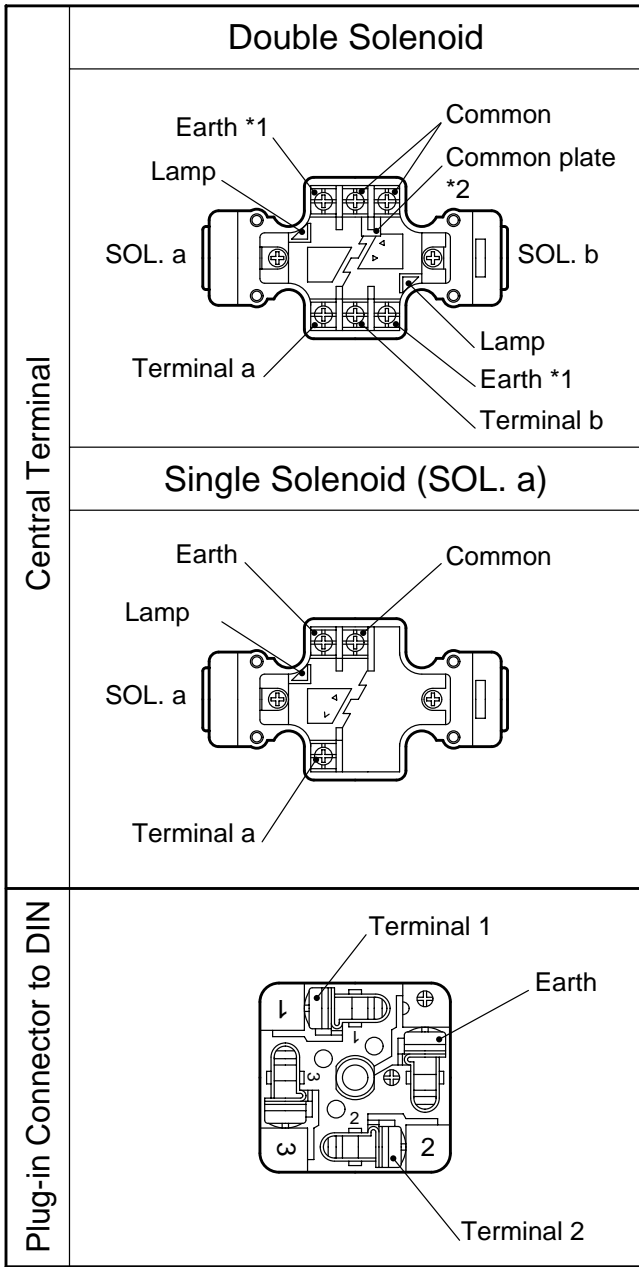


Three Position valves

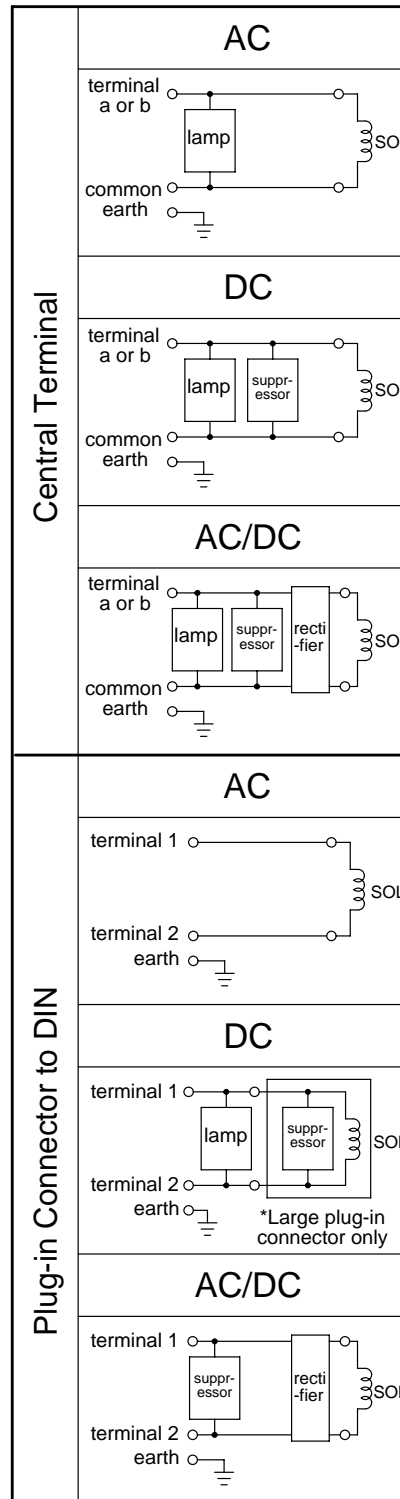
Spool type	Maximum flow (L/min)																
	Direction P - A - B - T Of flow P - B - A - T					Direction P - A Of flow					Direction P - B Of flow						
	Operating pressure (bar)					Operating pressure (bar)					Operating pressure (bar)						
	50	100	160	250	315	50	100	160	250	315	50	100	160	250	315		
205	120	120	120	120	120	120	120	120	80	55	120	120	120	80	55		
									100	54	43				100	54	43
208	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120		
210	120	120	120	120	120	120	120	120	84	64	120	120	120	84	64		
									65	53				65	53		
223	120	120	120	120	120	120	120	120	120	62	49	120	120	120	62	49	
									104	57	42				104	57	42
207	120	120	120	120	-	120	120	120	120	-	120	120	120	120	-		
213	120	120	120	120	120	100	100	100	100	100	100	100	100	100	100		
221	120	120	120	120	65	120	120	120	112	60	51	120	120	120	112	60	51
				65	50				69	46	40				69	46	40
212	120	120	120	120	65	120	120	120	120	62	51	120	120	120	62	51	
				65	50				86	47	40				86	47	40
204	110	110	110	110	110	68	68	68	47	38	38	120	120	120	114	75	63
	100	100	100	100	100										83	58	48
203	120	120	120	120	120	77	77	77	77	77	120	120	120	120	120		
															120	103	
201	-	-	-	-	-	53	53	53	33	24	23	120	120	120	62	47	
															62	40	37
104	120	120	120	120	120	45	45	45	37	30	28	60	60	60	40	35	



Valve wiring details

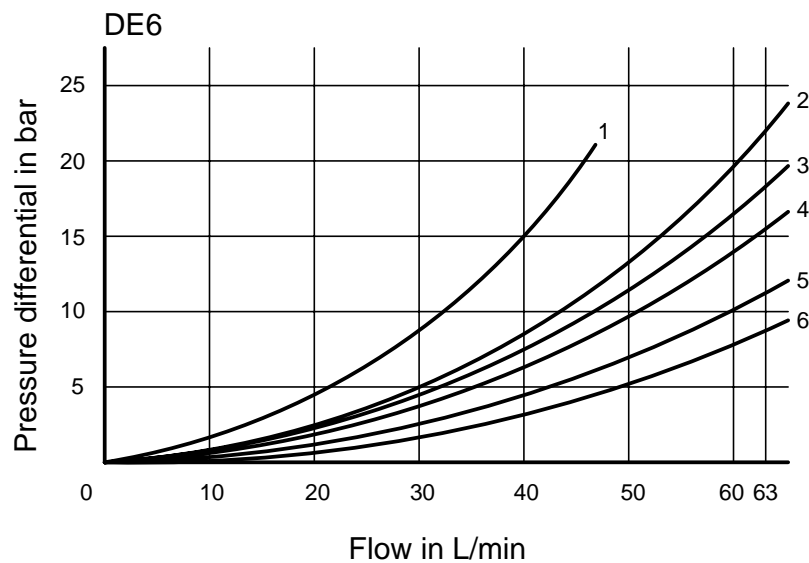


- Note:
- *1. Either earth terminal can be used.
 - *2. When common plate is unnecessary (4 wires for 3 solenoids), it can be removed.
 - *3. No polarity in DC solenoid.



Characteristic Curves

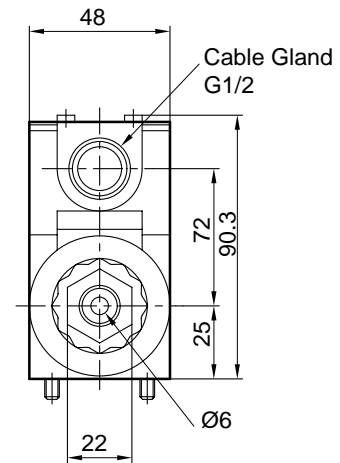
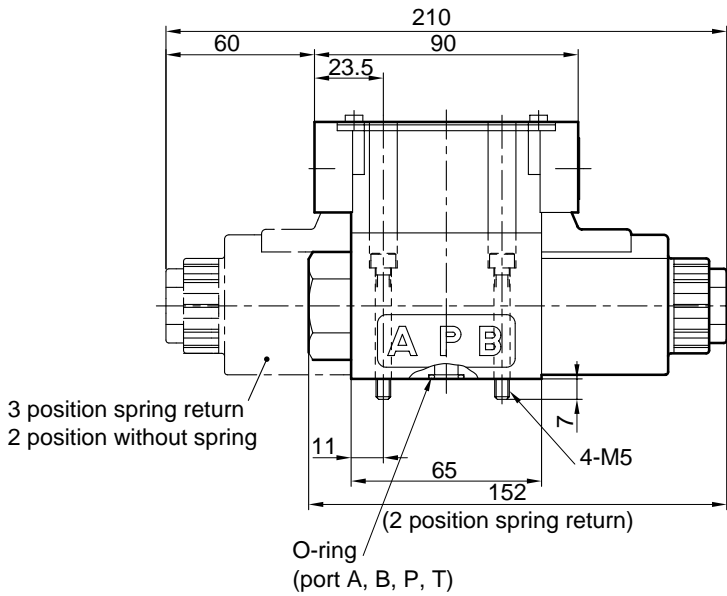
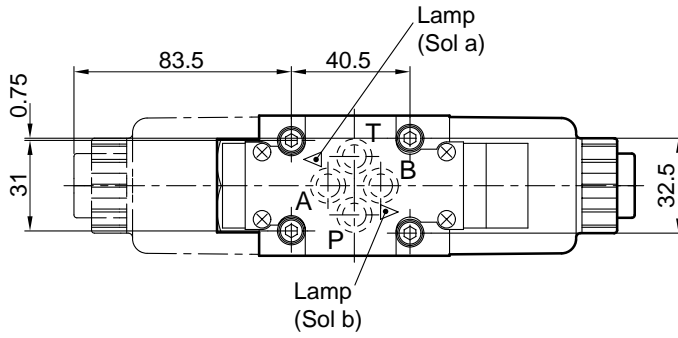
Measured at $v = 36\text{cSt}$ and $t = 50^\circ\text{C}$



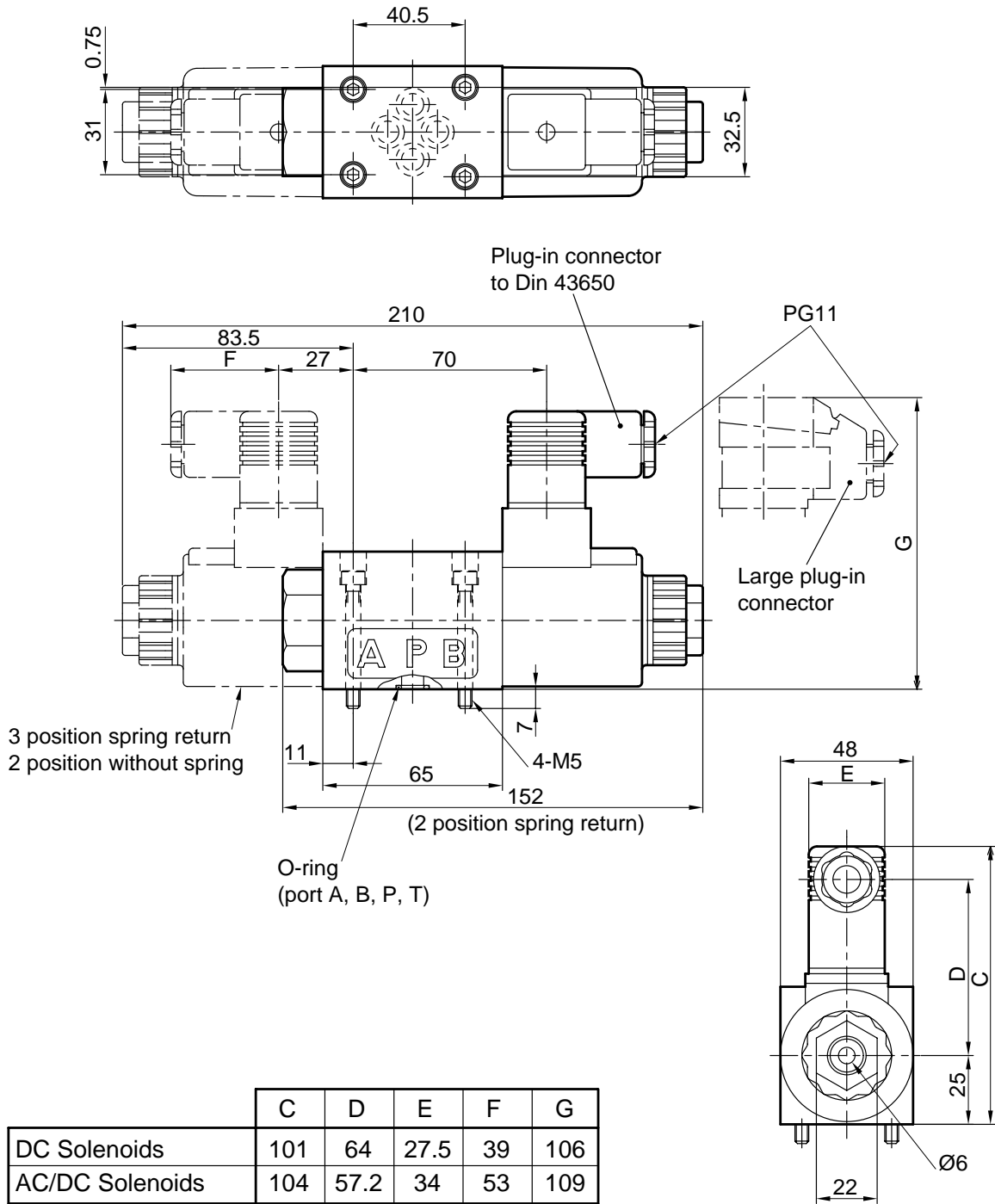
Spool type	Direction of flow				
	P → A	B → T	P → B	A → T	P → T
205	5	5	5	5	-
208	6	6	6	6	4
210	5	6	5	6	-
223	5	5	5	5	-
207	1	1	1	1	4
213	6	5	6	5	-
221	5	6	5	5	-
212	5	5	5	6	-
104	5	2	5	2	-
204	2	2	5	5	-
203	3	3	5	6	-
201	5	-	5	-	-



Unit Dimensions – 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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