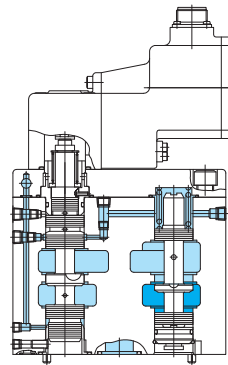
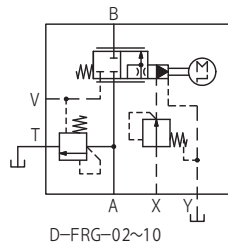
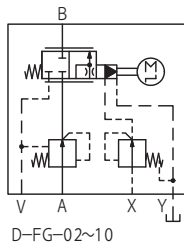
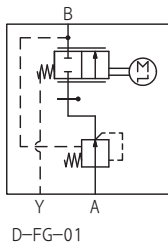


Digital flow control valves D-F(R)G series



Functional Symbols



Note:
The D-F(R)G-10 does not have a V port (vent).

Model Code

D-F(R)G-03-EX-130-250-20

1 2 3 4 5 6

- 1 Digital flow control valve
D-FG: Series type with built-in pressure compensating valve
(The D-FG-01 is a direct-operated, temperature-compensation type of valve.)
D-FRG: Built-in bypass type pressure compensating valve
- 2 Size
See "Specifications"
- 3 Pilot
Omit: direct-operated type (applicable only to the D-FG-01)

- EX: External pilot operation type (with built-in pressure reducing valve)
- 4 Maximum control flow
See "Specifications"
- 5 Maximum number of steps
100: 100 or 200 steps (2-phase motor)*1
250: 250 steps (5-phase motor)
- 6 Design no.
Design no. 10 for D-FG-01 only; 20 for all others

Specifications

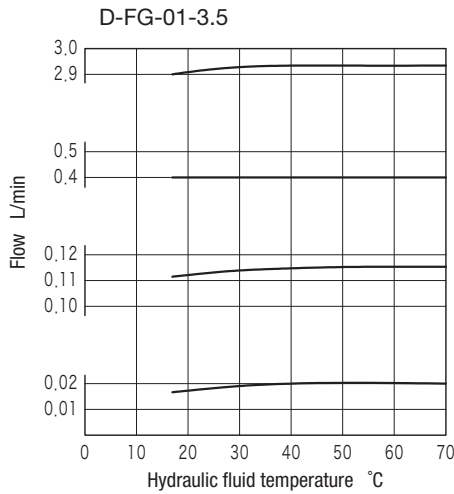
Size	01								02								03				06				10						
	D-FG								D-FG				D-FRG				D-FG		D-FRG		D-FG		D-FRG								
Maximum working pressure MPa	21								21								21				21				21						
Maximum control flow L/min	0.3	1	2.5	3.5	6	8	10	6	15	25	40	65	6	15	25	40	65	90	130	90	130	130	170	250	170	250	375	500	500	1000	
Minimum control flow L/min	0.03 (*2 0.02)								0.2	0.2	0.2	0.4	0.6	0.7	0.7	0.7	0.9	1.1	1.4	1.8	0.9	1.2	2	2.5	3	1.7	2.5	5	6	6	8
Pilot pressure MPa	—								2 to 21 (set to 3 MPa for pressure reducing valve built into valve)																						
Pilot flow L/min (at a pilot pressure of 3 MPa)	—								1.2								1.8				2.5				3.5						
Hysteresis, repeatability	Less than 0.5% of maximum control flow								Less than 0.1% of maximum control flow																						
Temperature drift (ISO VG 32 hydraulic fluid or equivalent; 30°C to 60°C)	Refer to characteristics curves.								Less than 2% of maximum control flow																						
Resolution (maximum no. of steps)	2-phase energization system																100 (2-phase motors)*1														
	1-2-phase energization system																200 (2-phase motors)*1														
	4-phase energization system																250 (5-phase motors)														
Response	The valve response is significantly affected by the performance of the controller and driver used. For further details, refer to the operating instructions of our controllers and drivers.																														
Valve to valve variation	Less than ±3% of maximum control flow																														
Drain allowable back pressure MPa	0.1 or less								0.35 or less																						
Filter (filtration grain size)	10 μm (absolute)								25 μm (nominal)																						
Weight kg	6								10.5								18.5				34				68						

*1: This was previously referred to as a 4-phase motor (the motor itself has remained unchanged).

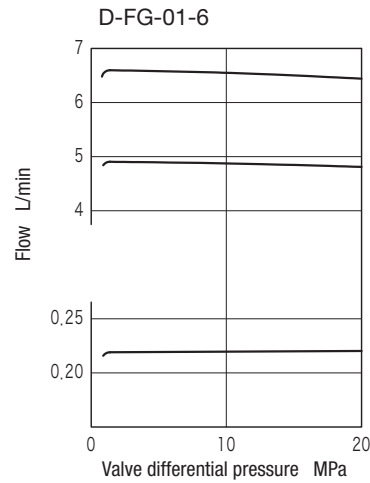
*2: The minimum control flow of the D-FG-01 is 0.02 L/min when the valve differential pressure is 10 MPa or less.

Characteristics curves (at 20 mm²/s) (typical examples)

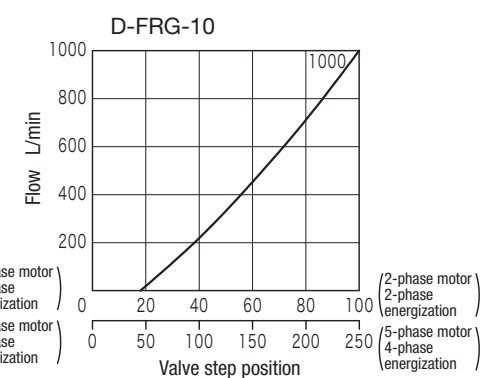
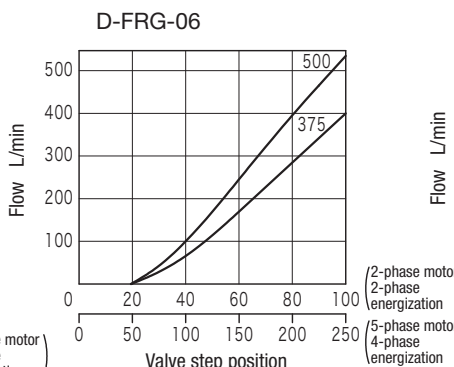
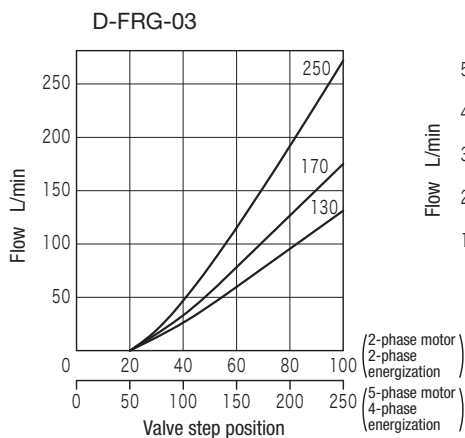
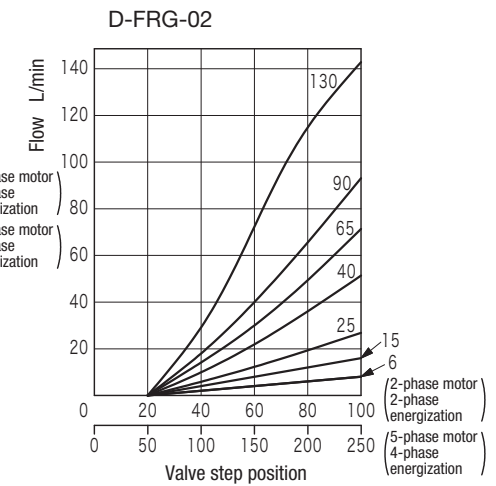
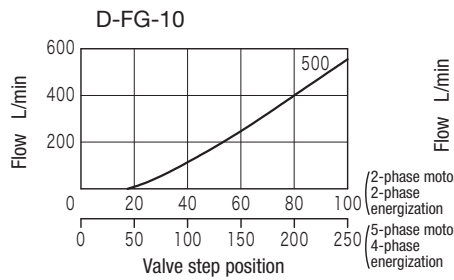
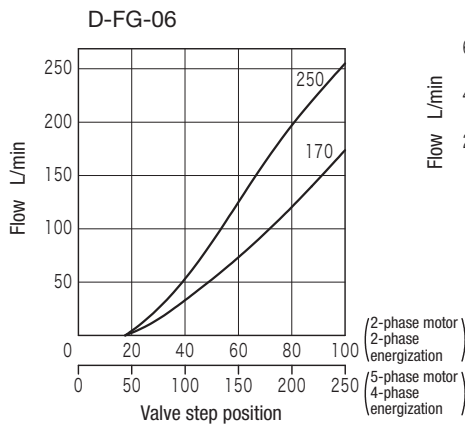
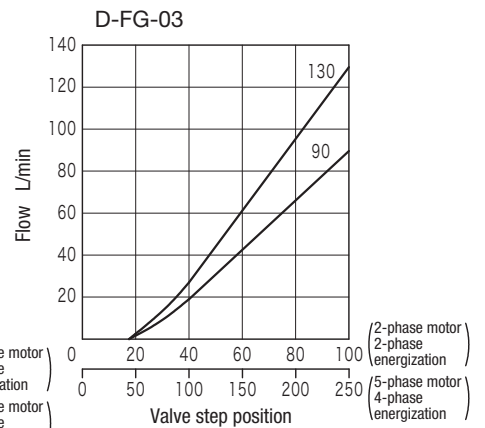
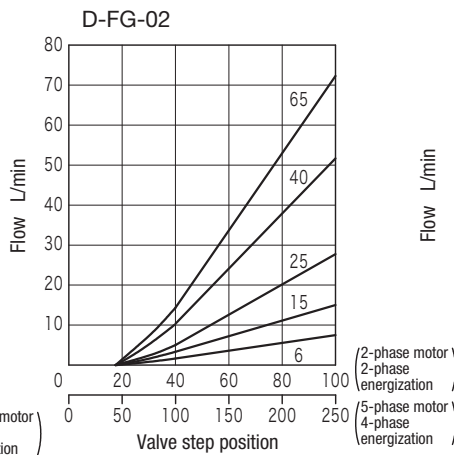
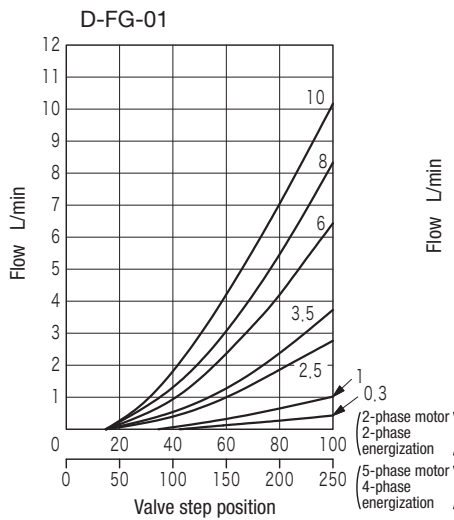
Hydraulic fluid (VG32) temperature – flow characteristics



Valve differential pressure – flow characteristics



Valve step position – flow characteristics



Notes on Operation

- When the reset signal is input, the valve spool is returned to the origin point by the reset mechanism which is built into the valve. Always supply the pilot pressure for sizes 02 and above. When the pump is to be started up, input the reset signal to the controller or driver to set the valve to the reset status, and then start up the pump, and when the pump is running normally, release the reset signal.
- An origin point adjustment mechanism is provided on the outside of the valve, but the re-adjustment is not necessary since the adjustment was completed prior to shipment from the factory.
- In order to maintain a constant control flow regardless of fluctuations in the load pressure, the D-FG type valve

has a built-in series type pressure compensating valve. In order to ensure that the pressure compensating valve will operate satisfactorily, set the differential pressure before and after the valve to 1 MPa or more. The D-FRG type valve incorporates a bypass type pressure compensating valve to compensate for the fluctuations in the control flow that result from fluctuations in the load pressure, and the load sensing function tracks the pump pressure during operation using a pressure obtained by adding 0.6 MPa to the load pressure.

- Connect the drain pipe directly to the tank. The allowable back pressure is 0.35 MPa or less.

Mounting Bolts (JIS B 1176 Strength Grade 12.9) and Subplates

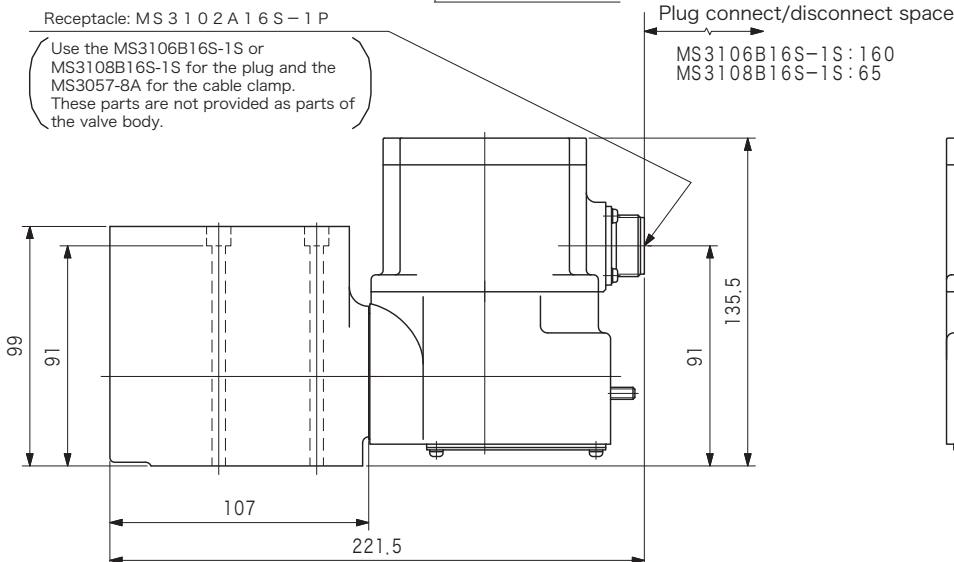
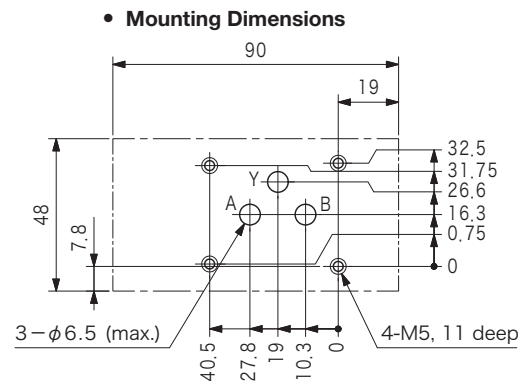
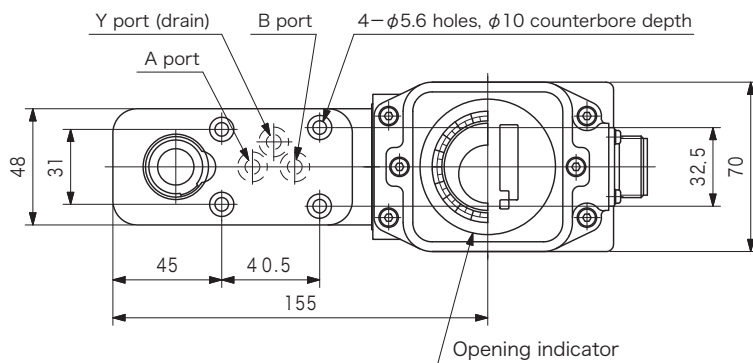
Valve	Mounting Bolts	No. of Bolts	Subplate	Connection Port Diameter Rc
D-FG-01	M5 x100	4	DGMS-3-1E-10-T-JA-J*	3/8
			DGVM-3-10-T-JA-J*	
D-F (R) G-02	M10x70	4	D-FRGM-02-10	3/4
D-F (R) G-03	M12x 90	2	D-FRGM-03-10	1-1/4
	M12x110	2		
D-F (R) G-06	M20x110	2	D-FRGM-06-10	1-1/2
	M20x150	2		
D-F (R) G-10	M20x130	2	_____	_____
	M20x190	2		

- The mounting bolts are not provided with the valve bodies and must be ordered separately.
- Subplate must be ordered separately. Mounting bolts are provided. (Not applicable to models indicated with*)
- For further details of the dimensions, refer to pages R6-6 and R6-9.

- Mounting bolt tightening torque
 D-FG-01: 7~8 N·m
 D-F (R) G-02: 50~60 N·m
 D-F (R) G-03: 75~81 N·m
 D-F (R) G-06: 230~290 N·m
 D-F (R) G-10: 230~290 N·m

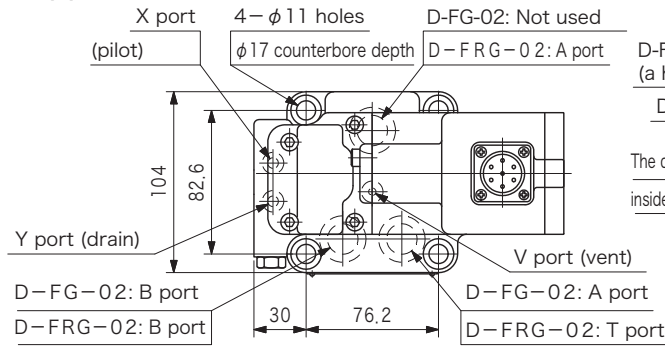
Dimensions

D-FG-01

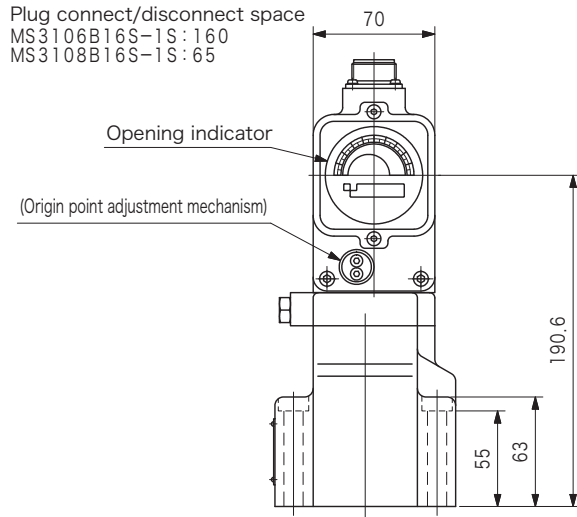
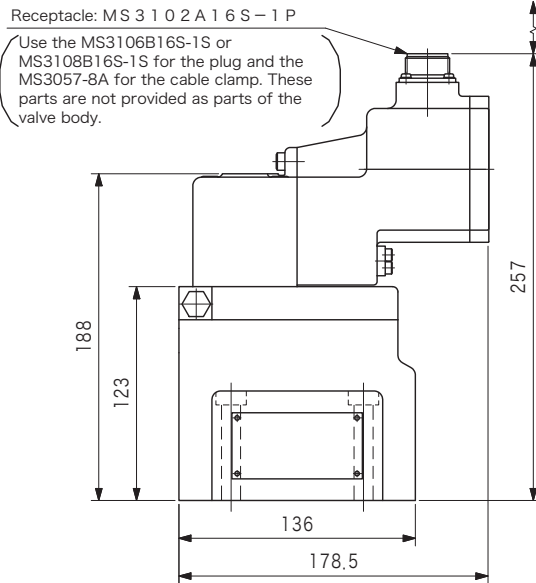
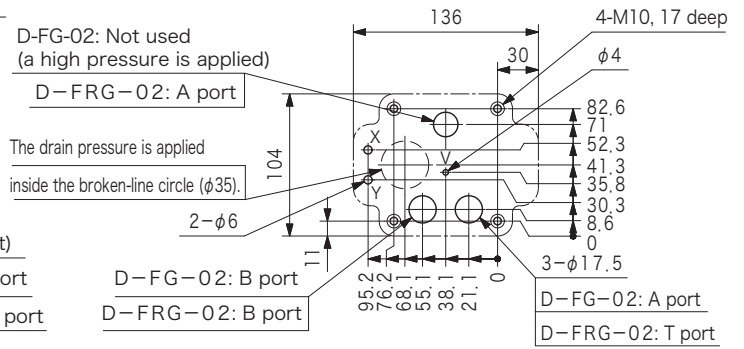


Dimensions

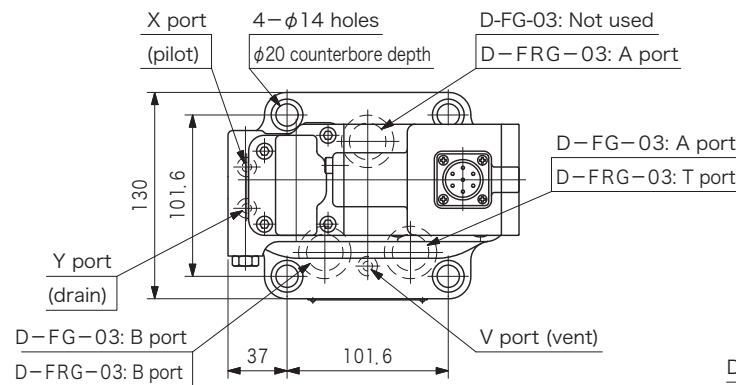
D-F(R)G-02



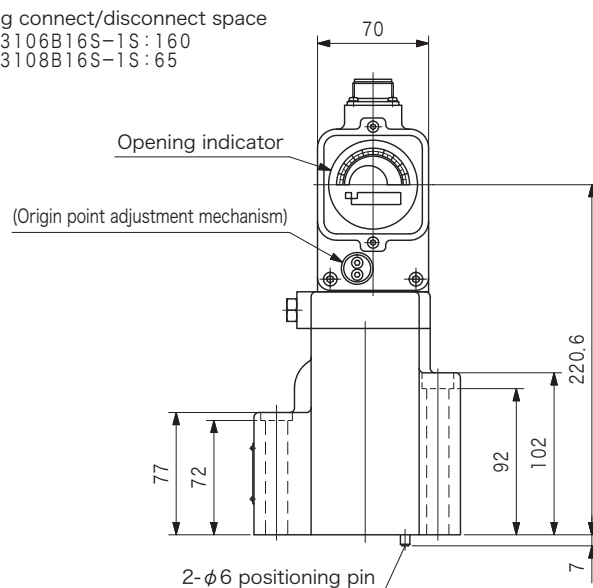
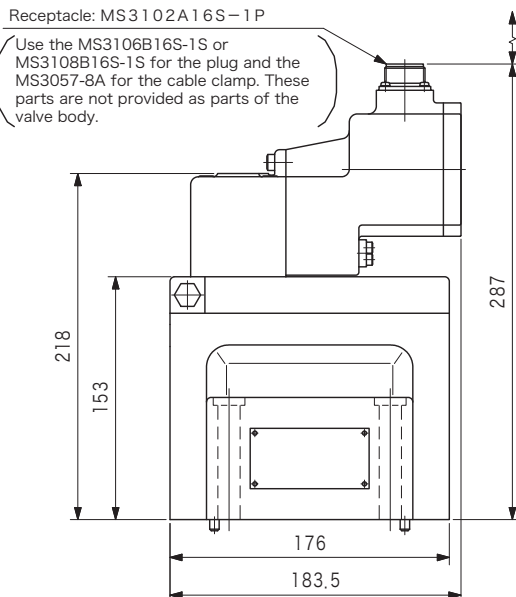
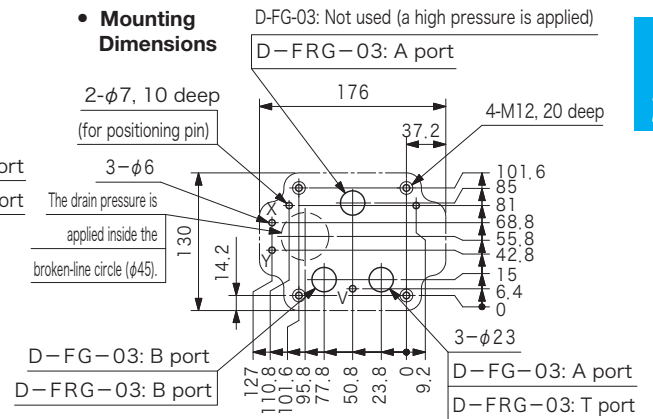
Mounting Dimensions



D-F(R)G-03

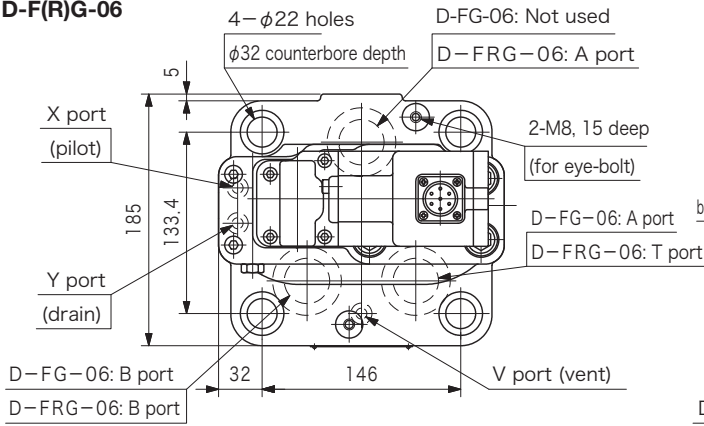


Mounting Dimensions

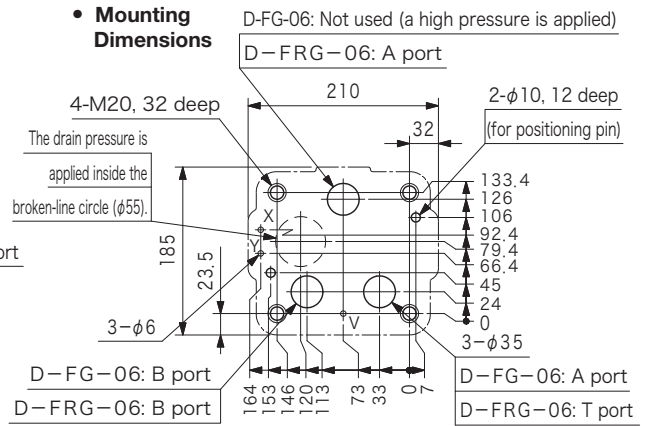


Dimensions

D-F(R)G-06



Mounting Dimensions

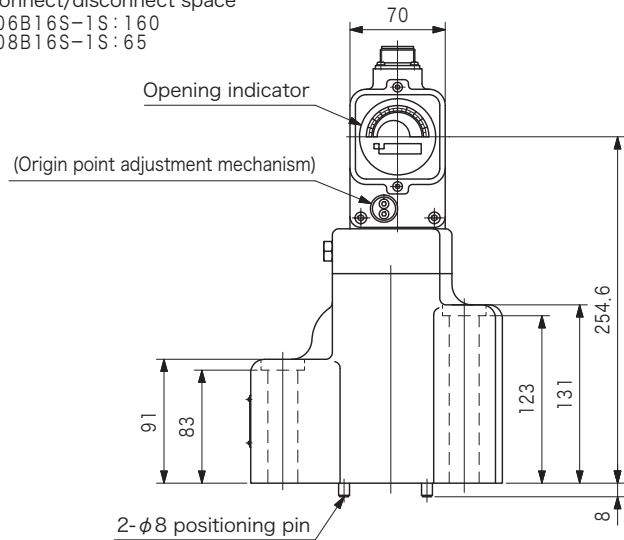
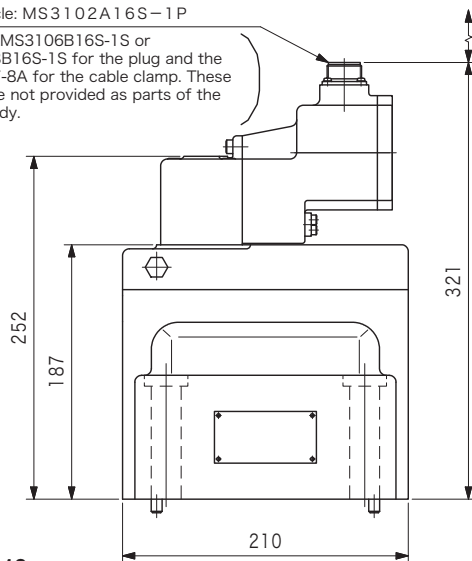


Receptacle: MS3102A16S-1P

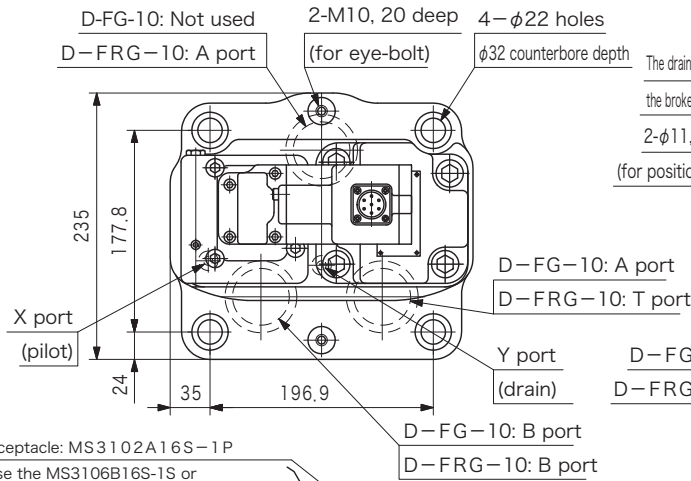
Use the MS3106B16S-1S or MS3108B16S-1S for the plug and the MS3057-8A for the cable clamp. These parts are not provided as parts of the valve body.

Plug connect/disconnect space

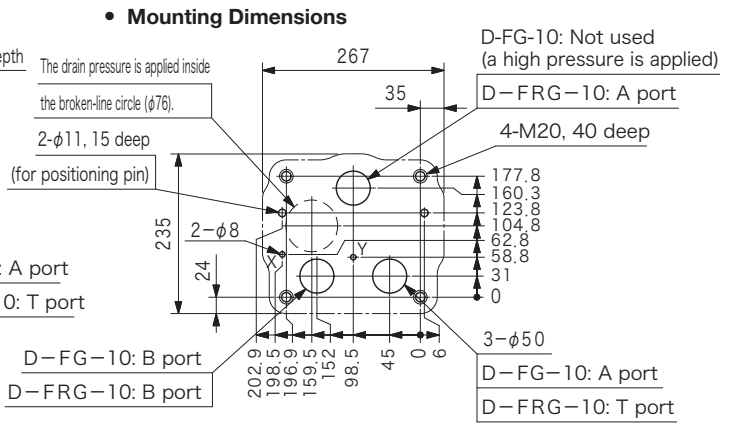
MS3106B16S-1S: 160
 MS3108B16S-1S: 65



D-F(R)G-10

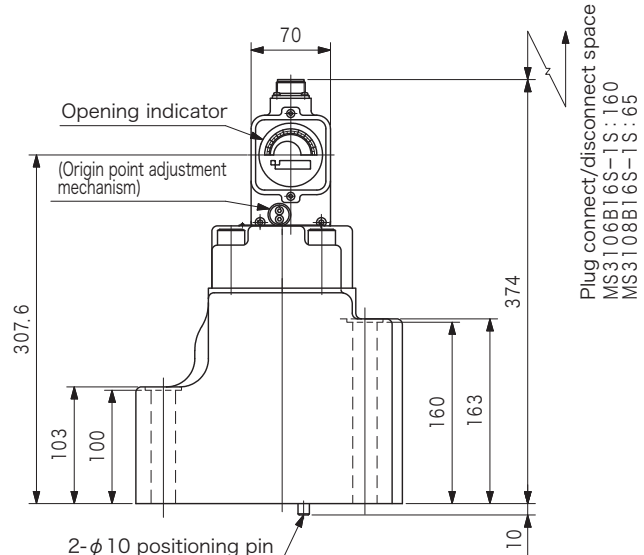
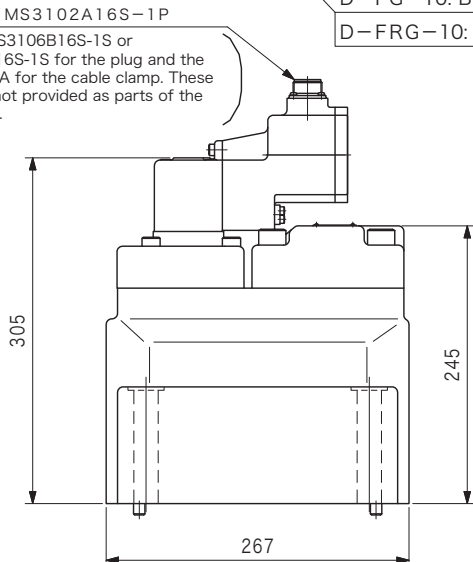


Mounting Dimensions



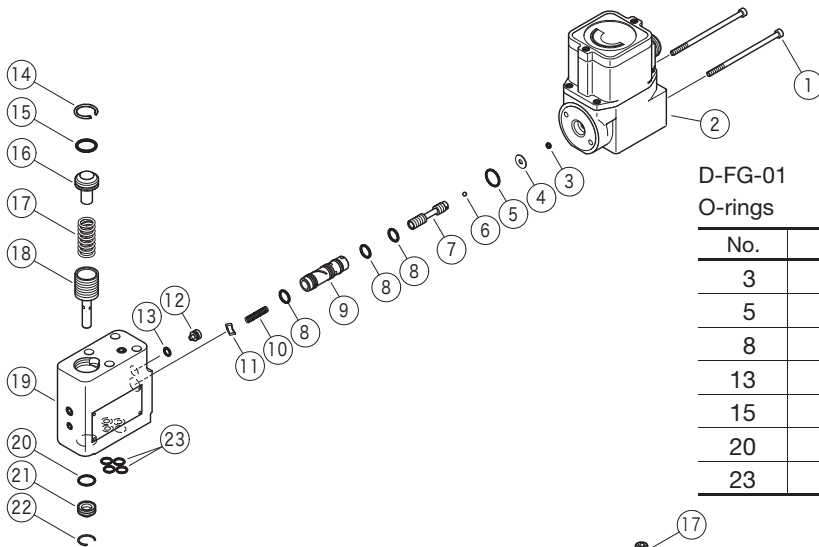
Receptacle: MS3102A16S-1P

Use the MS3106B16S-1S or MS3108B16S-1S for the plug and the MS3057-8A for the cable clamp. These parts are not provided as parts of the valve body.



K
 2-5

Digital Valve Control Systems

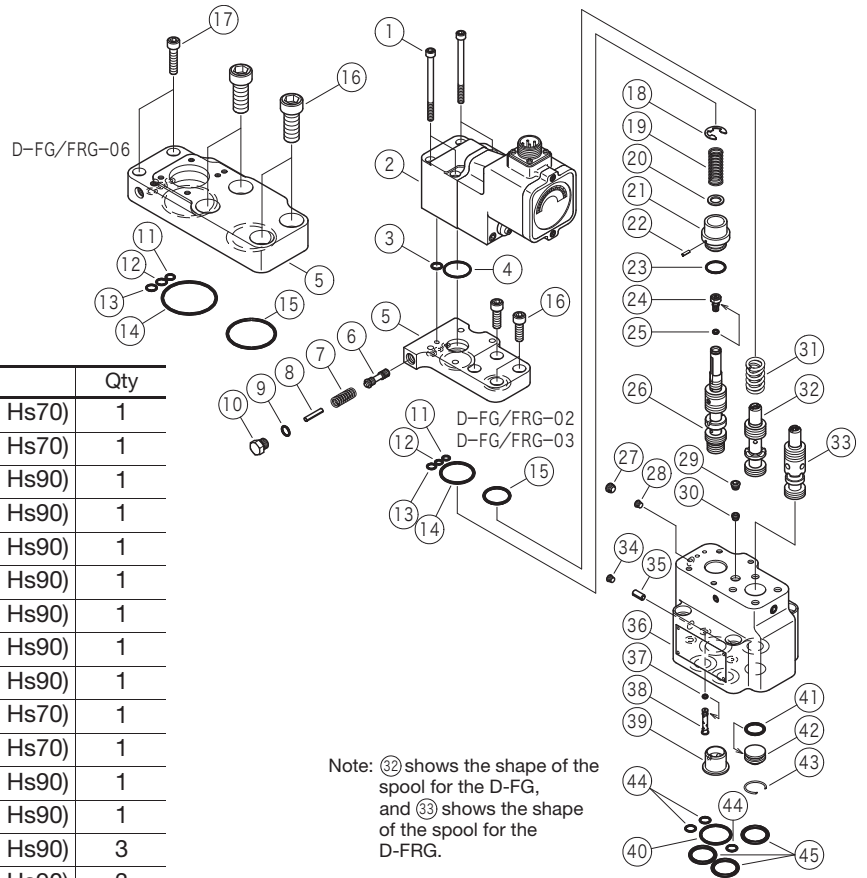


D-FG-01
O-rings

No.	Part Number	Standard	Qty
3	007900717	AS568-007 (NBR, Hs70)	1
5	007901717	AS568-017 (NBR, Hs70)	1
8	007901419	AS568-014 (NBR, Hs90)	3
13	008000519	JIS B 2401 1B-P7	1
15	008001917	JIS B 2401 1A-P21	1
20	007901617	AS568-016 (NBR, Hs70)	1
23	007901217	AS568-012 (NBR, Hs70)	4

D-FG/FRG-02
O-rings

No.	Part Number	Standard	Qty
3	007901217	AS568-012 (NBR, Hs70)	1
4	007902317	AS568-023 (NBR, Hs70)	1
9	007901219	AS568-012 (NBR, Hs90)	1
11	007901019	AS568-010 (NBR, Hs90)	1
12	007901019	AS568-010 (NBR, Hs90)	1
13	007901119	AS568-011 (NBR, Hs90)	1
14	007912519	AS568-125 (NBR, Hs90)	1
15	007912019	AS568-120 (NBR, Hs90)	1
23	007901819	AS568-018 (NBR, Hs90)	1
25	007900717	AS568-007 (NBR, Hs70)	1
37	007900617	AS568-006 (NBR, Hs70)	1
40	007912319	AS568-123 (NBR, Hs90)	1
41	007911519	AS568-115 (NBR, Hs90)	1
44	007901219	AS568-012 (NBR, Hs90)	3
45	007921119	AS568-211 (NBR, Hs90)	3



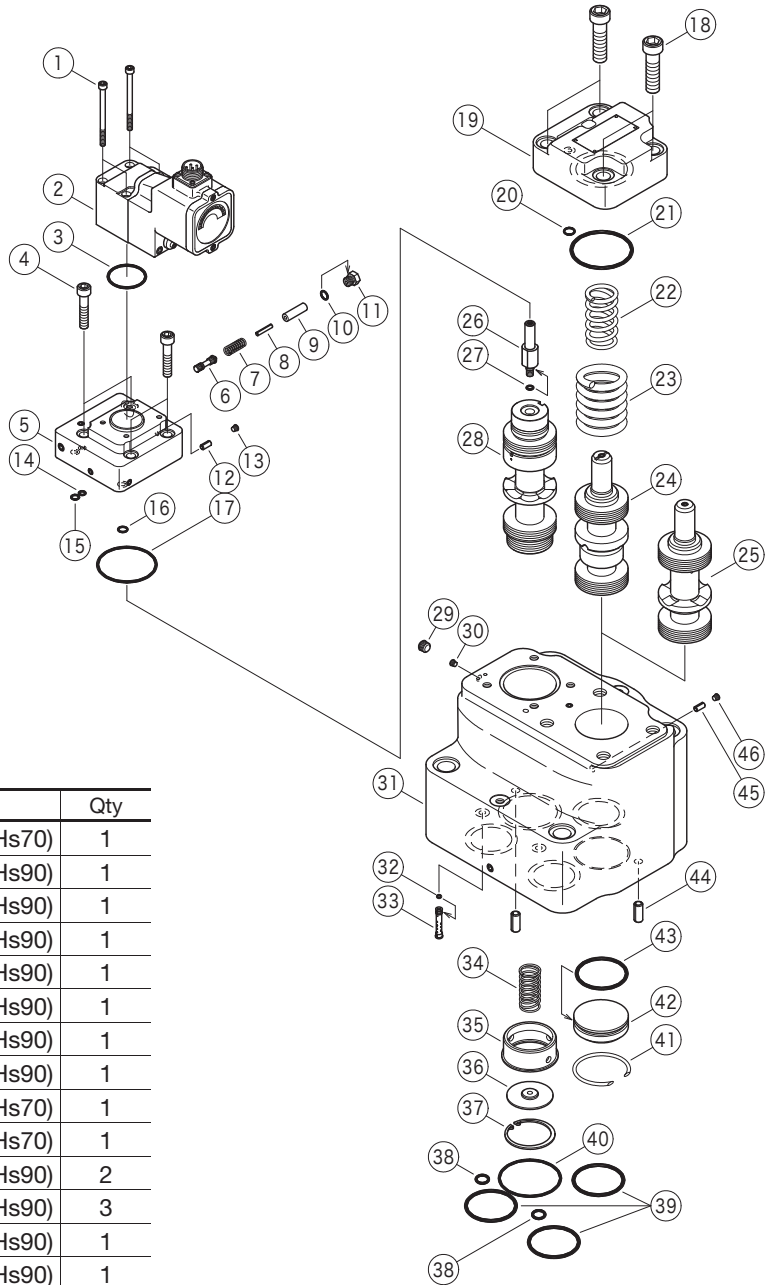
Note: ③② shows the shape of the spool for the D-FG, and ③③ shows the shape of the spool for the D-FRG.

D-FG/FRG-03
O-rings

No.	Part Number	Standard	Qty
4	007912817	AS568-128 (NBR, Hs70)	1
9	007901219	AS568-012 (NBR, Hs90)	1
11	007901019	AS568-010 (NBR, Hs90)	1
12	007901019	AS568-010 (NBR, Hs90)	1
13	007901119	AS568-011 (NBR, Hs90)	1
14	007913119	AS568-131 (NBR, Hs90)	1
15	007912719	AS568-127 (NBR, Hs90)	1
23	007912119	AS568-121 (NBR, Hs90)	1
25	007900717	AS568-007 (NBR, Hs70)	1
37	007900617	AS568-006 (NBR, Hs70)	1
40	007912919	AS568-129 (NBR, Hs90)	1
41	007912119	AS568-121 (NBR, Hs90)	1
44	007901219	AS568-012 (NBR, Hs90)	3
45	007921519	AS568-215 (NBR, Hs90)	3

D-FG/FRG-06
O-rings

No.	Part Number	Standard	Qty
4	007913317	AS568-133 (NBR, Hs70)	1
9	007901219	AS568-012 (NBR, Hs90)	1
11	007901119	AS568-011 (NBR, Hs90)	1
12	007901219	AS568-012 (NBR, Hs90)	1
13	007901219	AS568-012 (NBR, Hs90)	1
14	007913919	AS568-139 (NBR, Hs90)	1
15	007913519	AS568-135 (NBR, Hs90)	1
23	007912919	AS568-129 (NBR, Hs90)	1
25	007900717	AS568-007 (NBR, Hs70)	1
37	007900717	AS568-007 (NBR, Hs70)	1
40	008050619	JIS B 2401 1B-G50	1
41	007912919	AS568-129 (NBR, Hs90)	1
44	007911119	AS568-111 (NBR, Hs90)	3
45	007922419	AS568-224 (NBR, Hs90)	3



D-FG/FRG-10

O-rings

No.	Part Number	Standard	Qty
3	007913117	AS568-131 (NBR, Hs70)	1
10	007901219	AS568-012 (NBR, Hs90)	1
14	007901019	AS568-010 (NBR, Hs90)	1
15	007901119	AS568-011 (NBR, Hs90)	1
16	007901219	AS568-012 (NBR, Hs90)	1
17	007914719	AS568-147 (NBR, Hs90)	1
20	007901319	AS568-013 (NBR, Hs90)	1
21	007923219	AS568-232 (NBR, Hs90)	1
27	007901017	AS568-010 (NBR, Hs70)	1
32	007900717	AS568-007 (NBR, Hs70)	1
38	007911219	AS568-112 (NBR, Hs90)	2
39	007922819	AS568-228 (NBR, Hs90)	3
40	007914919	AS568-149 (NBR, Hs90)	1
43	007922819	AS568-228 (NBR, Hs90)	1