



FLOW CONTROL (AND CHECK) VALVES

FG -01/02/03/06/10 (1/8,1/4,3/8,3/4,1-1/4)
FCG

PILOT OPERATED FLOW CONTROL (AND CHECK) VALVES

FHG -02/03/06/10 (1/4,3/8,3/4,1-1/4)
FHCG

Sub-plate Mounting

FLOW CONTROLS

Up to 21 MPa (3050 PSI), 500 L/min (132 U.S.GPM)

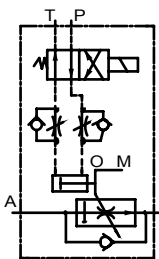
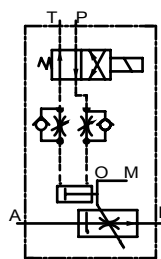
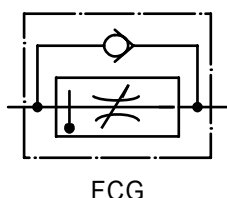
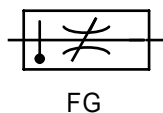
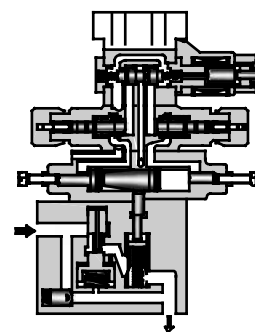
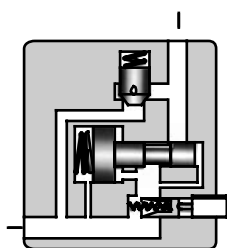
■ **Flow Control and Check Valves** Page 2

These valves are pressure and temperature compensating type valves and maintain a constant flow rate independent of change in system pressure (load) and temperature (viscosity of the fluid). They control flow rate of the hydraulic circuit and eventually control speed of the actuator precisely.

Valves with an integral check valve allow a controlled flow and reverse free flow. Repeated resetting can be made easily with a digital readout.

■ **Pilot Operated Flow Control and Check Valves** Page 14

Flow control of these valves is continuously made by a hydraulically operated pilot piston mechanism which controls opening area of the orifice of the valve. With the use of these valves, shockless operation either in acceleration or deceleration can be obtained. With the compensator for the pressure and temperature, stable flow control can be obtained regardless of the changes in the pressure (load) and temperature (oil viscosity).



■ **Hydraulic Fluids**

● **Fluid Types**

Any type of hydraulic fluids listed in the table below can be used.

| | |
|-------------------------|--|
| Petroleum base oils | Use fluids equivalent to ISO VG 32 or VG 46. |
| Synthetic fluids | Use phosphate ester or polyol ester fluid. When phosphate ester fluid is used, prefix "F-" to the model number because the special seals (fluororubber) are required to be used. |
| Water containing fluids | Use water-glycol fluid. |

Note: For use with hydraulic fluids other than those listed above, please consult your Yuken representatives in advance.

● **Recommended Viscosity and Oil Temperatures**

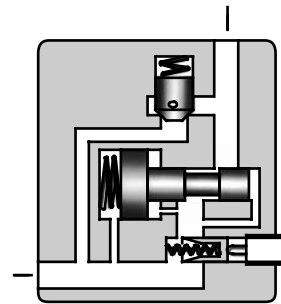
Viscosity ranging between 15 - 400 mm²/s (77 - 1800 SSU).

Oil temperatures between -15/+70°C (5 - 158°F).

Use hydraulic fluids which satisfy the recommended viscosity and oil temperatures given above.

● **Control of Contamination**

Due caution must be paid to maintaining control over contamination of the hydraulic fluids which may otherwise lead to breakdowns and shorten the life of the valves. Please maintain the degree of contamination within NAS 1638-Grade 12. Use 25 µm or finer line filter.



Specifications

| Model Numbers | Max. Metred Flow Capacity L/m in (U.S.GPM) | Min. Metred Flow Capacity L/m in (U.S.GPM) | Max. Operating Pressure MPa (PSI) | Approx. Mass kg (lbs.) |
|----------------------------|---|---|--------------------------------------|---------------------------|
| FG -01-4 FCG -01-8*-11* | 8 (2.1) | 0.02 (.005) {0.04 (.011)} * | 14 (2030) | 1.3 (2.9) |
| FG -02-30*-30* | 30 (7.9) | 0.05 (.013) | 21 (3050) | 3.8 (8.4) |
| FG -03-125*-30* | 125 (33) | 0.2 (.053) | | 7.9 (17.4) |
| FG -06-250*-30* | 250 (66) | 2 (.53) | | 23 (50.7) |
| FG -10-500*-30* | 500 (132) | 4 (1.06) | | 52 (115) |

★ The figures in the brace are for pressures above 7 MPa (1020 PSI).

Model Number Designation

| F- | FC | G | -01 | -8 | -N | -11 | * |
|---|---|---------------------------------|---|---|---|---|------------------|
| Special Seals | Series Number | Type of Mounting | Valve Size | Max. Metred Flow Capacity L/m in (U.S.GPM) | Pres. Compensator Stroke Adjustment | Design Number | Design Standards |
| F: Special Seals for Phosphate Ester Type Fluids (Omit if not required) | F: Flow Control Valves FC: Flow Control and Check Valves | G: Sub-plate Mounting | 01 02 03 06 10 | 4 : 4 (1.06) 8 : 8 (2.1) 30 : 30 (7.9) 125 : 125 (33) 250 : 250 (66) 500 : 500 (132) | N: Applicable only for Pres. Compensator Stroke Adjustment (Option - Om it if not required) | 11 30 30 30 30 | Refer to ★ |

★ Design Standards: None Japanese Standard "JIS" and European Design Standard
90 N. American Design Standard

Attachment

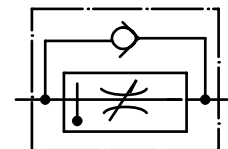
● Mounting Bolts

| Valve Model Numbers | Socket Head Cap Screw | | Qty. |
|---------------------|--|--------------------------|------|
| | Japanese Std. "JIS" & European Design Std. | N. American Design Std. | |
| FG/FCG-01 | M5 ×55 Lg. | No.10-24 UNC × 2-1/4 Lg. | 4 |
| FG/FCG-02 | M8 ×50 Lg. | 5/16-18 UNC × 2 Lg. | 4 |
| FG/FCG-03 | M10 ×75 Lg. | 3/8-16 UNC × 3 Lg. | 4 |
| FG/FCG-06 | M16 ×130 Lg. | 5/8-11 UNC × 5 Lg. | 4 |
| FG/FCG-10 | M20 ×160 Lg. | 3/4-10 UNC × 6-1/2 Lg. | 4 |

Graphic Symbols



FG



FCG

Option

● Pres. compensator stroke adjustment

Can reduce jumping at the start of the actuator.

■ Sub-plate

| Valve Model Numbers | Japanese Standard "JIS" | | European Design Std. | | N. American Design Std. | | Approx. Mass kg (lbs.) |
|---------------------|-------------------------|-------------|----------------------|-------------|-------------------------|-------------|---------------------------|
| | Sub-plate Model No. | Thread Size | Sub-plate Model No. | Thread Size | Sub-plate Model No. | Thread Size | |
| FG FCG-01 | FGM-01X-10 | Rc 1/4 | FGM-01X-1080 | 1/4 BSP.F | FGM-01X-1090 | 1/4 NPT | 0.8 (1.8) |
| FG FCG-02 | FGM-02-20 | Rc 1/4 | FGM-02-2080 | 1/4 BSP.F | FGM-02-2090 | 1/4 NPT | 2.3 (5.1) |
| | FGM-02X-20 | Rc 3/8 | FGM-02X-2080 | 3/8 BSP.F | FGM-02X-2090 | 3/8 NPT | 2.3 (5.1) |
| | FGM-02Y-20 | Rc 1/2 | FGM-02Y-2080 | 1/2 BSP.F | FGM-02Y-2090 | 1/2 NPT | 3.1 (6.8) |
| FG FCG-03 | FGM-03-20 | Rc 3/8 | FGM-03-2080 | 3/8 BSP.F | FGM-03-2090 | 3/8 NPT | 3.9 (8.6) |
| | FGM-03X-20 | Rc 1/2 | FGM-03X-2080 | 1/2 BSP.F | FGM-03X-2090 | 1/2 NPT | 3.9 (8.6) |
| | FGM-03Y-20 | Rc 3/4 | FGM-03Y-2080 | 3/4 BSP.F | FGM-03Y-2090 | 3/4 NPT | 5.7 (12.6) |
| | FGM-03Z-20 | Rc 1 | FGM-03Z-2080 | 1 BSP.F | FGM-03Z-2090 | 1 NPT | 5.7 (12.6) |
| FG FCG-06 | FGM-06X-20 | Rc 1 | FGM-06X-2080 | 1 BSP.F | FGM-06X-2090 | 1 NPT | 12.5 (27.6) |
| | FGM-06Y-20 | Rc 1-1/4 | FGM-06Y-2080 | 1-1/4 BSP.F | FGM-06Y-2090 | 1-1/4 NPT | 16 (35.3) |
| | FGM-06Z-20 | Rc 1-1/2 | FGM-06Z-2080 | 1-1/2 BSP.F | FGM-06Z-2090 | 1-1/2 NPT | 16 (35.3) |
| FG FCG-10 | FGM-10Y-20* | 1-1/2, 2 | FGM-10Y-20* | 1-1/2, 2 | FGM-10Y-2090* | 1-1/2, 2 | 37 (81.6) |

● Sub-plates are available. Specify the sub-plate model number from the table above. When sub-plates are not used, the mounting surface should have a good machined finish.

★FGM-10Y is special type sub-plate to be used with pipe flange. When ordering FGM-10Y, specify pipe flange kit in addition to FGM-10Y referring to F3 pipe flange kits Catalogue (No. Pub. EC-3001).

■ Instructions

● Min. required pressure difference

The minimum differential pressure between inlet and outlet port is required to obtain the optimum pressure compensation. It varies according to the flow rate to be set. For details, please refer to the performance curves.

● Free flow

Check valve pressure drops vary with flow rates. If models with check valves are used, see free flow pressure drop characteristics.

● Flow adjustment

[F*G-01]

Loosen the locking screw and turn the flow adjustment dial clockwise for increase, and anti-clockwise for decrease. The dial makes about 4 revolutions from zero to full flow and the valve opening is indicated on the revolution indicator. (Refer to characteristics of "Metred Flow vs. Dial Position").

After flow adjustments, tighten the locking screw.

[F*G-02, 03, 06, 10]

Loosen the locking screw and turn the flow adjustment handle clockwise for increase, and anti-clockwise for decrease. Open condition is indicated in digital-scale in built-in revolution indicator (Refer to the characteristics of "Metred Flow vs. Dial Position").

After flow adjustments, tighten the locking screw.

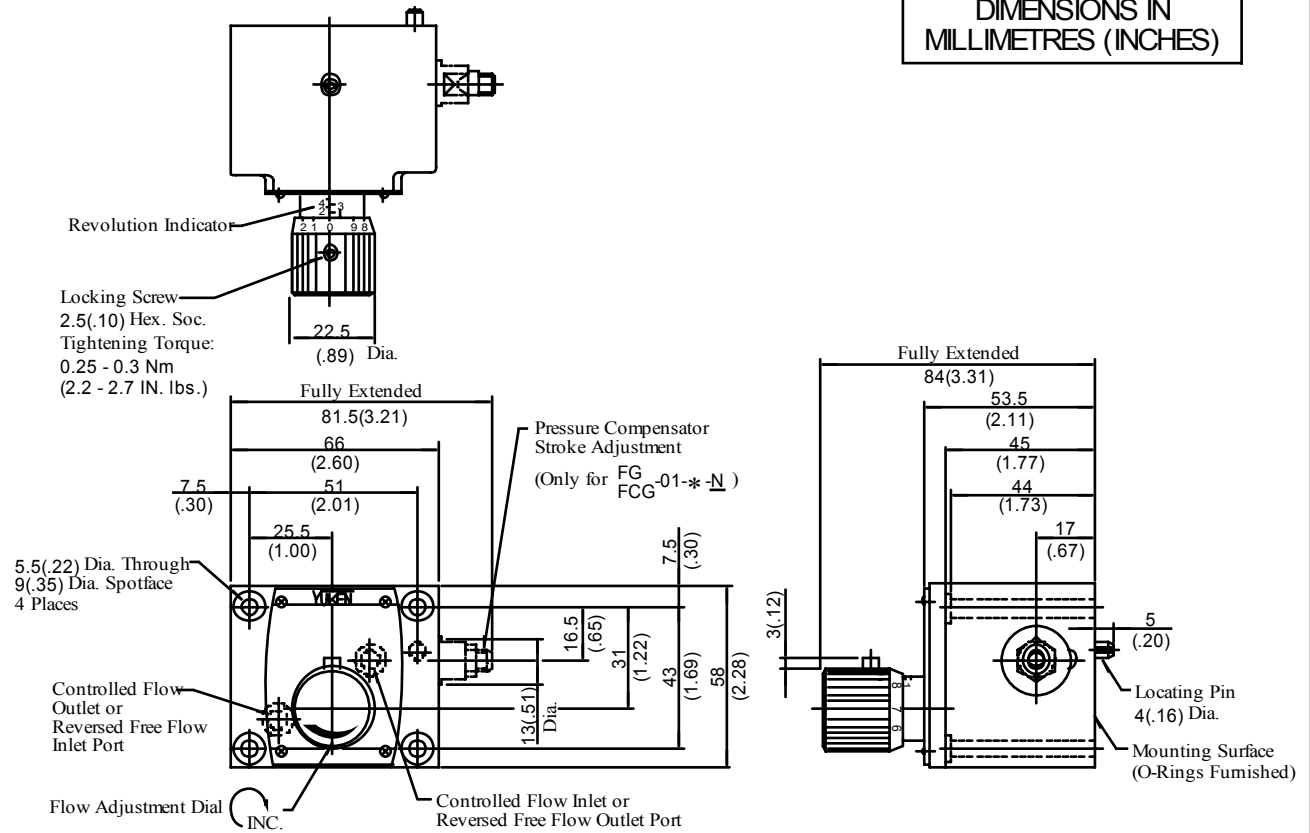
● Line filter

To carry out flow adjustments by as small degree as 2 L/min (.53 U.S.GPM) or less, be sure to use a line filter of 10 μm or finer and install it near the valve inlet.



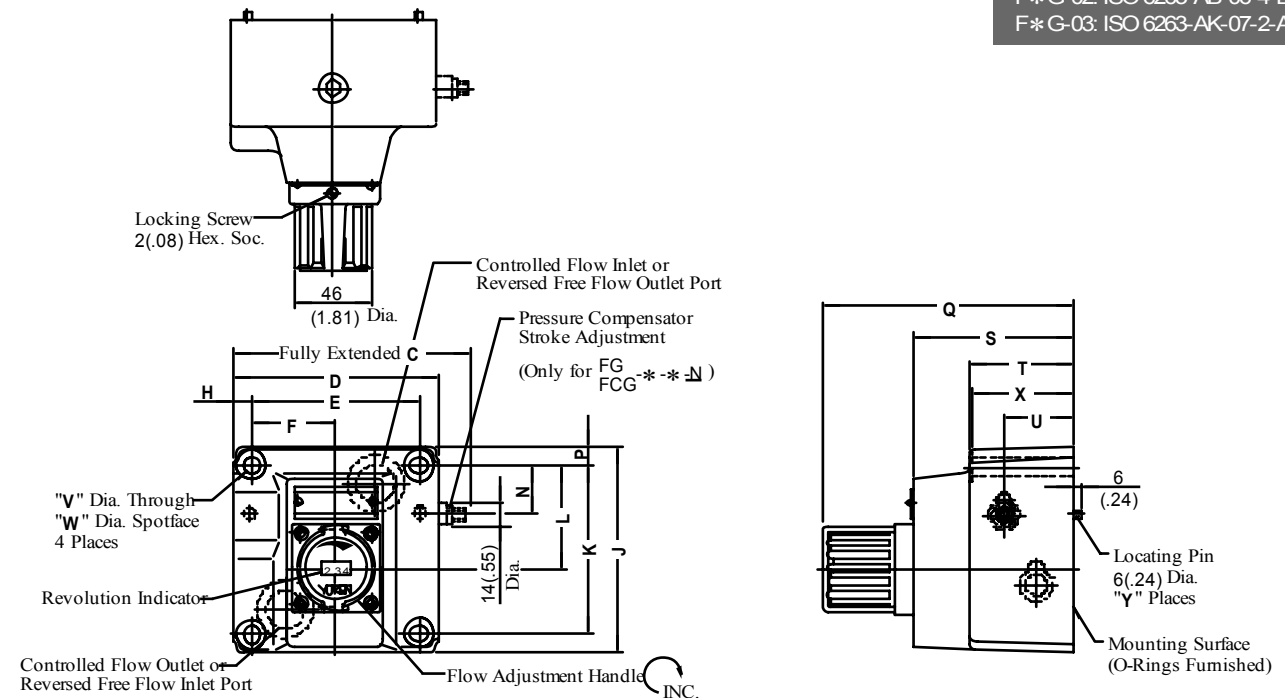
FG/FCG-01-*-*-11/1190

DIMENSIONS IN
MILLIMETRES (INCHES)



FG/FCG-02-30-*-*30/3090, FG/FCG-03-125-*-*30/3090

Mounting surface:
F* G-02: ISO 6263-AB-06-4-B
F* G-03: ISO 6263-AK-07-2-A

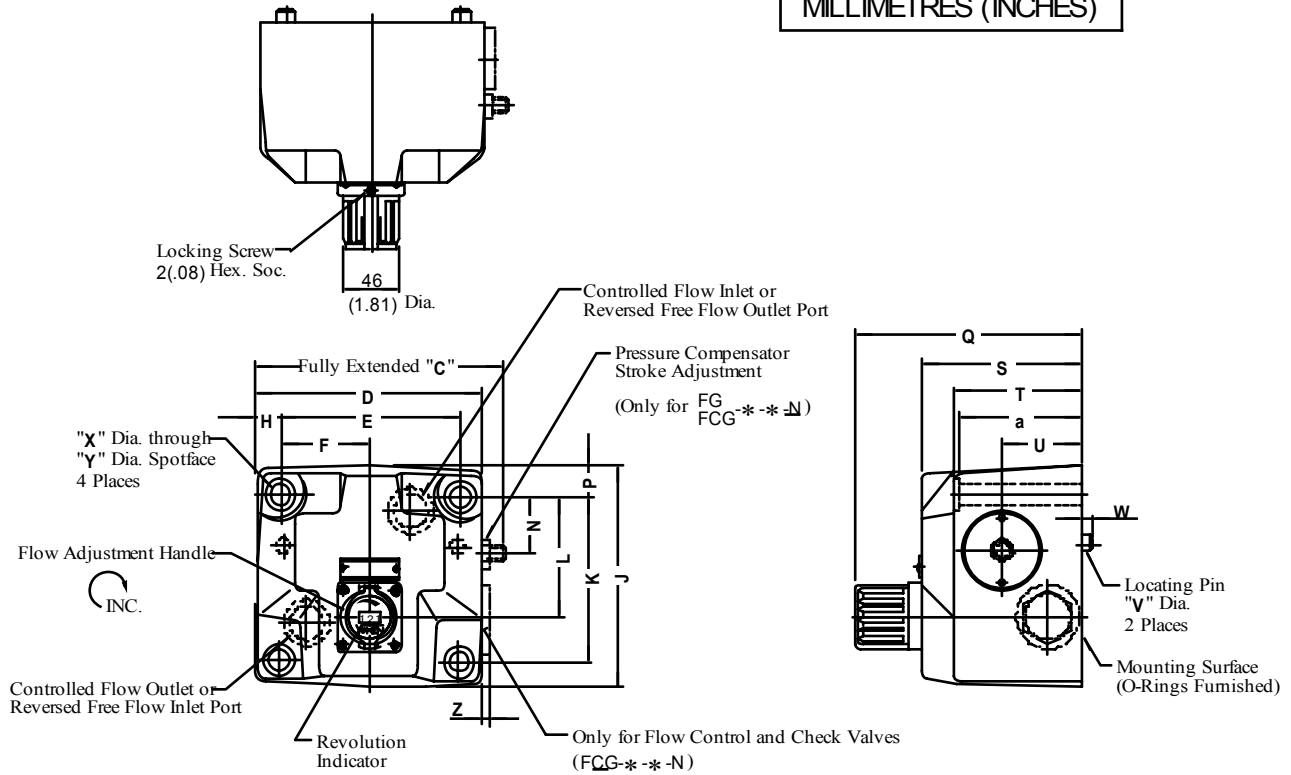


| Model No. | Dimensions mm (Inches) | | | | | | | | | | | | | | | | | Y |
|--------------|------------------------|---------------|-----------------|----------------|---------------|-----------------|-----------------|----------------|----------------|---------------|---------------|--------------|--------------|--------------|--------------|---------------|--------------|---|
| | C | D | E | F | H | J | K | L | N | P | Q | S | T | U | V | W | X | |
| FG FCG-02 | 116 (4.57) | 96 (3.78) | 76.2 (3.00) | 38.1 (1.50) | 9.9 (.39) | 104.5 (4.11) | 82.6 (3.25) | 44.3 (1.74) | 24 (.94) | 9.9 (.39) | 123 (4.84) | 69 (2.72) | 40 (1.57) | 23 (.91) | 8.8 (.35) | 14 (.55) | 39 (1.54) | 1 |
| FG FCG-03 | 145 (5.71) | 125 (4.92) | 101.6 (4.00) | 50.8 (2.00) | 11.7 (.46) | 125 (4.92) | 101.6 (4.00) | 61.8 (2.43) | 29.8 (1.17) | 11.7 (.46) | 152 (5.98) | 98 (3.86) | 64 (2.52) | 41 (1.61) | 11 (.43) | 17.5 (.69) | 63 (2.48) | 2 |

FG/FCG-06-250-* -30/3090
FG/FCG-10-500-* -30/3090

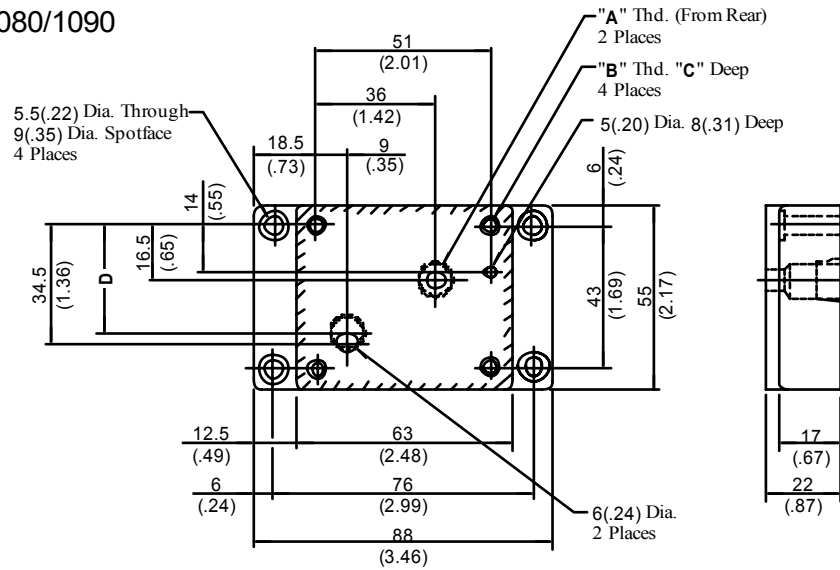
Mounting surface:
F*G-06: ISO 6263-AP-08-2-A

DIMENSIONS IN
MILLIMETRES (INCHES)



| Model No. | Dimensions mm (Inches) | | | | | | | | | | | | | | | | | | | |
|-----------|------------------------|---------------|-----------------|----------------|---------------|---------------|-----------------|-----------------|--------------|---------------|---------------|---------------|---------------|--------------|-------------|-------------|---------------|--------------|--------------|---------------|
| | C | D | E | F | H | J | K | L | N | P | Q | S | T | U | V | W | X | Y | Z | a |
| FG/FCG-06 | 198 (7.80) | 180 (7.09) | 146.1 (5.75) | 73 (2.87) | 17 (.67) | 174 (6.85) | 133.4 (5.25) | 99 (3.90) | 44 (1.73) | 20.3 (.80) | 184 (7.24) | 130 (5.12) | 105 (4.13) | 65 (2.56) | 16 (.63) | 7 (.28) | 17.5 (.69) | 26 (1.02) | 9 (.35) | 103 (4.06) |
| FG/FCG-10 | 267 (10.51) | 244 (9.61) | 196.9 (7.75) | 98.5 (3.88) | 23.5 (.93) | 228 (8.98) | 177.8 (7.00) | 144.5 (5.69) | 61 (2.40) | 25 (.98) | 214 (8.43) | 160 (6.30) | 137 (5.39) | 85 (3.35) | 18 (.71) | 10 (.39) | 21.5 (.85) | 32 (1.26) | 7.5 (.30) | 135 (5.31) |

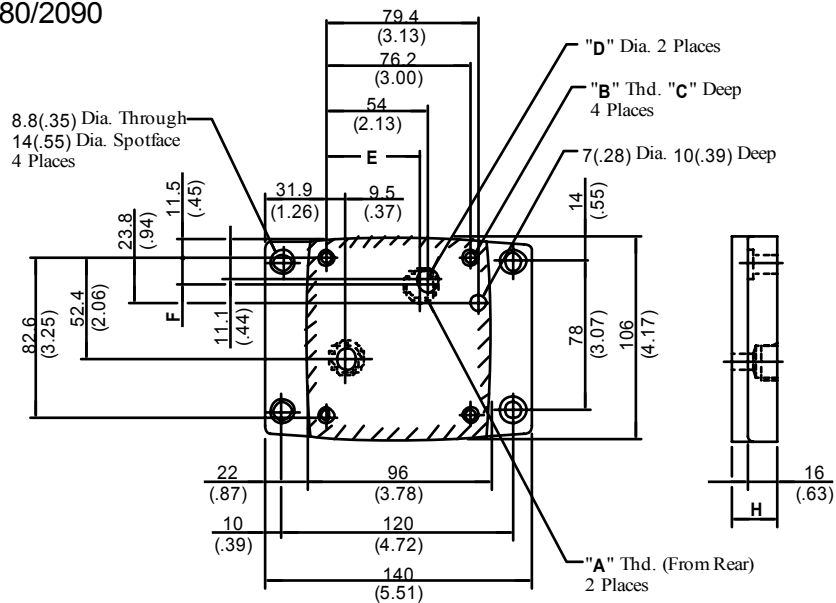
FGM-01X-10/1080/1090



| Sub-plate Model Numbers | "A" Thd. | "B" Thd. | C | D |
|-------------------------|-----------|--------------|----------|-------------|
| FGM-01X-10 | Rc 1/4 | M5 | 14 (.55) | 34.5 (1.36) |
| FGM-01X-1080 | 1/4 BSP.F | M5 | 14 (.55) | 30.0 (1.18) |
| FGM-01X-1090 | 1/4 NPT | No.10-24 UNC | 15 (.59) | 34.5 (1.36) |

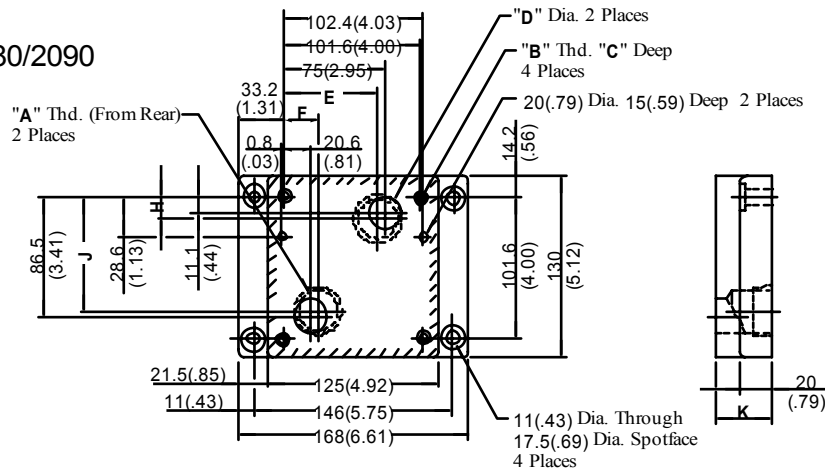
DIMENSIONS IN MILLIMETRES (INCHES)

02
FGM-02X-20/2080/2090
02Y



| Sub-plate Model Numbers | "A" Thd. | "B" Thd. | C | D | E | F | H | | | |
|-------------------------|-----------|-------------|----------|-------------|--------------|---------------|-------------|--------------|-------------|--------------|
| FGM-02-20 | Rc 1/4 | M8 | 14 (.55) | 11.0 (.43) | 54 (2.13) | 11.1 (.44) | 25 (.98) | | | |
| FGM-02-2080 | 1/4 BSP.F | | | 11.7 (.46) | | | | | | |
| FGM-02-2090 | 1/4 NPT | 5/16-18 UNC | 18 (.71) | 11.0 (.43) | | | | | | |
| FGM-02X-20 | Rc 3/8 | M8 | 14 (.55) | 14.0 (.55) | | | | | | |
| FGM-02X-2080 | 3/8 BSP.F | | | 15.2 (.60) | | | | | | |
| FGM-02X-2090 | 3/8 NPT | | | 5/16-18 UNC | | | | 18 (.71) | 14.0 (.55) | |
| FGM-02Y-20 | Rc 1/2 | M8 | 14 (.55) | 14.0 (.55) | | | | 51 (2.01) | 14 (.55) | 35 (1.38) |
| FGM-02Y-2080 | 1/2 BSP.F | | | 15.0 (.59) | | | | | | |
| FGM-02Y-2090 | 1/2 NPT | | | 5/16-18 UNC | 18 (.71) | 14.0 (.55) | | | | |

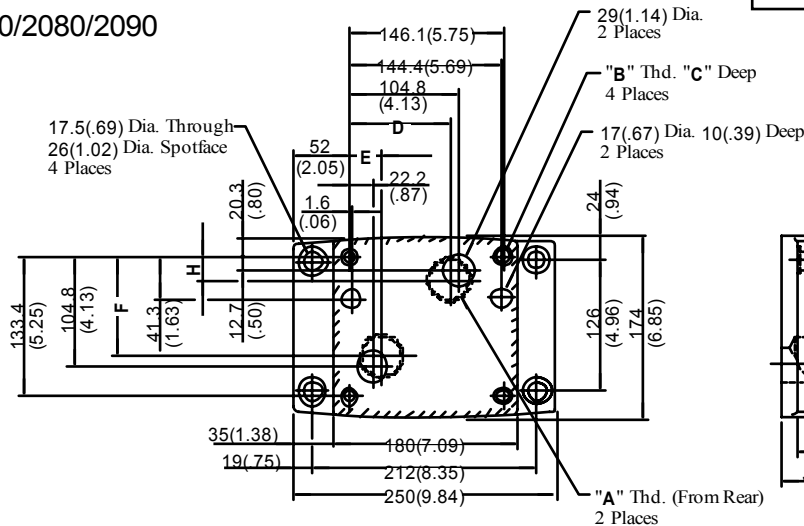
03
FGM-03X-20/2080/2090
03Y
03Z



| Sub-plate Model Numbers | "A" Thd. | "B" Thd. | C | D | E | F | H | J | K |
|-------------------------|-----------|------------|----------|------------|--------------|----------------|----------------|----------------|----------------|
| FGM-03-20 | Rc 3/8 | M10 | 18 (.71) | 14.0 (.55) | 75 (2.95) | 20.6 (.81) | 11.1 (.44) | 86.5 (3.41) | 25 (.98) |
| FGM-03-2080 | 3/8 BSP.F | | | 15.0 (.59) | | | | | |
| FGM-03-2090 | 3/8 NPT | 3/8-16 UNC | 21 (.83) | 14.0 (.55) | 75 (2.95) | 20.6 (.81) | 11.1 (.44) | 86.5 (3.41) | 25 (.98) |
| FGM-03X-20 | Rc 1/2 | M10 | 18 (.71) | 17.5 (.69) | | | | | |
| FGM-03X-2080 | 1/2 BSP.F | | | 19.0 (.75) | | | | | |
| FGM-03X-2090 | 1/2 NPT | 3/8-16 UNC | 21 (.83) | 17.5 (.69) | 70 (2.76) | 25.6 (1.01) | 16.1 (.63) | 81.5 (3.21) | 40 (1.57) |
| FGM-03Y-20 | Rc 3/4 | M10 | 18 (.71) | 23.0 (.91) | | | | | |
| FGM-03Y-2080 | 3/4 BSP.F | | | | 21 (.83) | | | | |
| FGM-03Y-2090 | 3/4 NPT | 3/8-16 UNC | 21 (.83) | 23.0 (.91) | | 70 (2.76) | 25.6 (1.01) | 16.1 (.63) | 81.5 (3.21) |
| FGM-03Z-20 | Rc 1 | M10 | 18 (.71) | | | | | | |
| FGM-03Z-2080 | 1 BSP.F | | | 21 (.83) | | | | | |
| FGM-03Z-2090 | 1 NPT | 3/8-16 UNC | 21 (.83) | | 23.0 (.91) | 70 (2.76) | 25.6 (1.01) | 16.1 (.63) | 81.5 (3.21) |

DIMENSIONS IN
MILLIMETRES (INCHES)

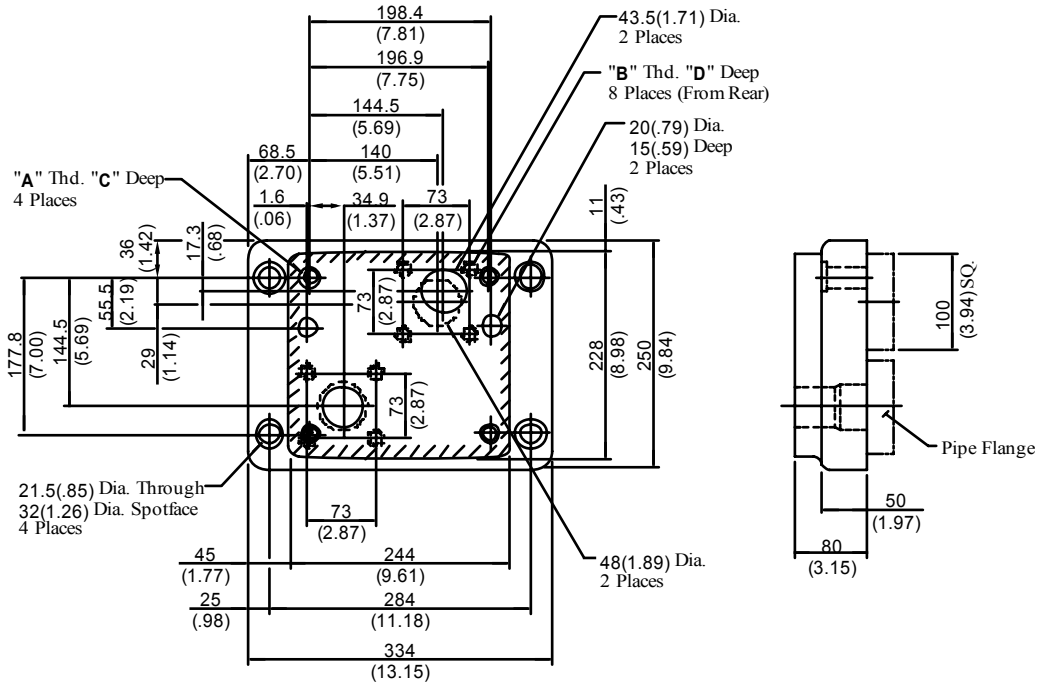
06X
FGM-06Y-20/2080/2090
06Z



| Sub-plate Model Numbers | "A" Thd. | "B" Thd. | C | D | E | F | H | J | K |
|-------------------------|-------------|------------|-----------|-----------------|---------------|-----------------|--------------|--------------|--------------|
| FGM-06X-20 | Rc 1 | M16 | 30 (1.18) | 104.8 (4.13) | 22.2 (.87) | 104.8 (4.13) | 18 (.71) | 45 (1.77) | 35 (1.38) |
| FGM-06X-2080 | 1 BSP.F | | | | | | | | |
| FGM-06X-2090 | 1 NPT | 5/8-11 UNC | 35 (1.38) | 99 (3.90) | 34 (1.34) | 99 (3.90) | 23 (.91) | 60 (2.36) | 40 (1.57) |
| FGM-06Y-20 | Rc 1-1/4 | M16 | 30 (1.18) | | | | | | |
| FGM-06Y-2080 | 1-1/4 BSP.F | | | 35 (1.38) | | | | | |
| FGM-06Y-2090 | 1-1/4 NPT | 5/8-11 UNC | 35 (1.38) | | 99 (3.90) | 34 (1.34) | 99 (3.90) | 23 (.91) | 60 (2.36) |
| FGM-06Z-20 | Rc 1-1/2 | M16 | 30 (1.18) | | | | | | |
| FGM-06Z-2080 | 1-1/2 BSP.F | | | 35 (1.38) | | | | | |
| FGM-06Z-2090 | 1-1/2 NPT | 5/8-11 UNC | 35 (1.38) | | 99 (3.90) | 34 (1.34) | 99 (3.90) | 23 (.91) | 60 (2.36) |

FGM-10Y-20/2090

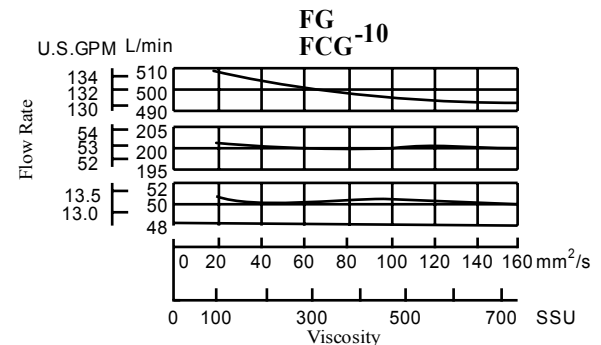
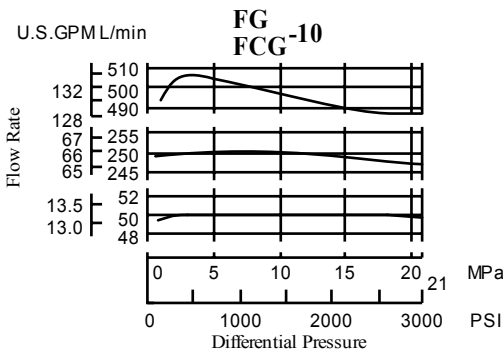
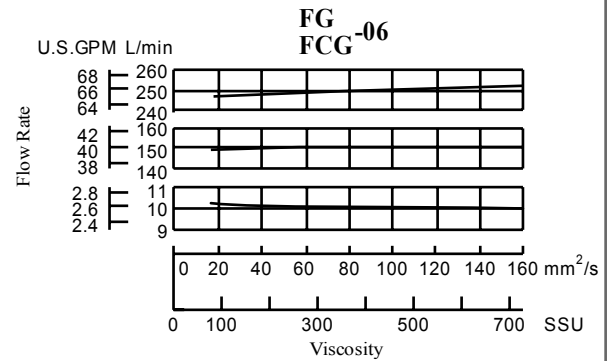
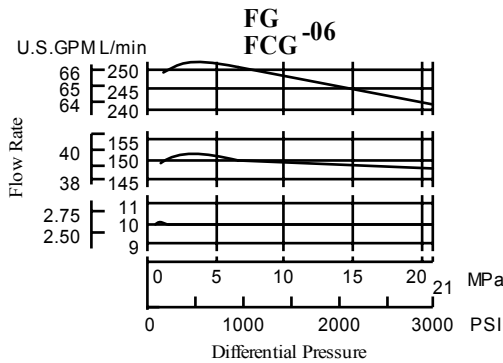
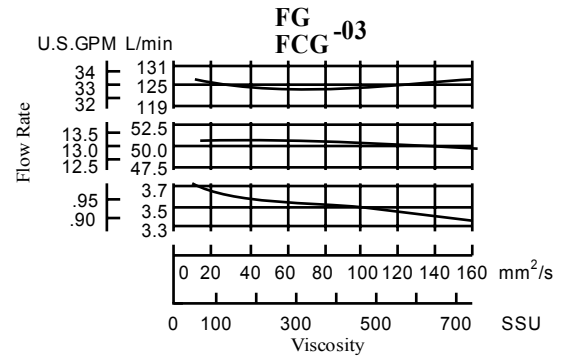
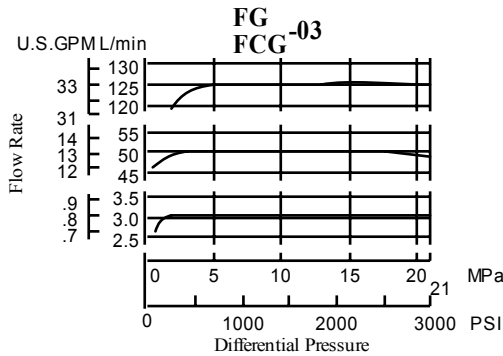
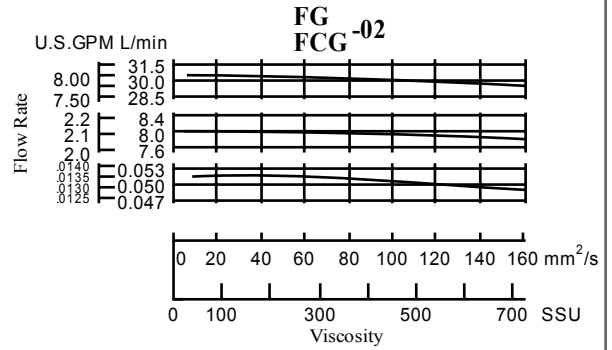
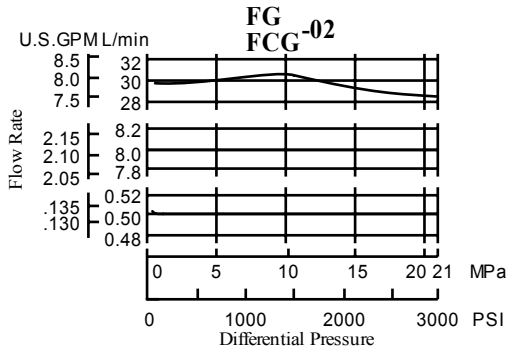
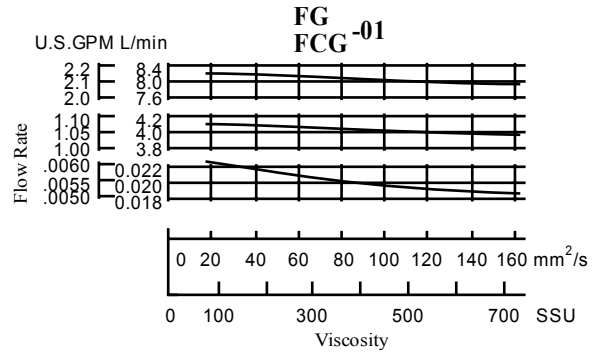
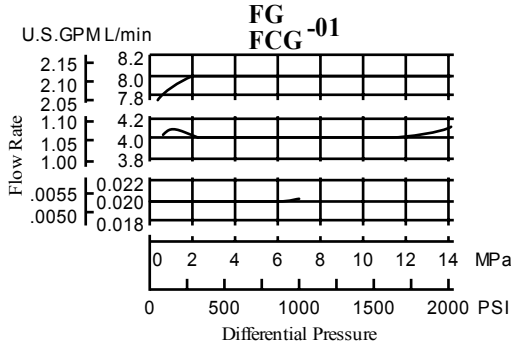
DIMENSIONS IN
MILLIMETRES (INCHES)



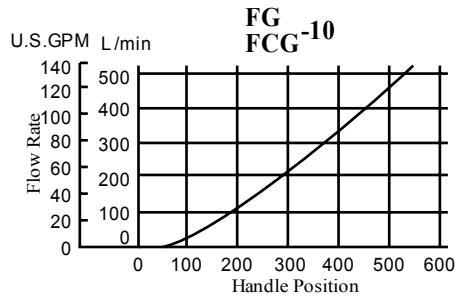
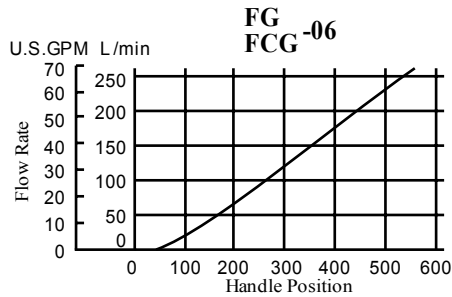
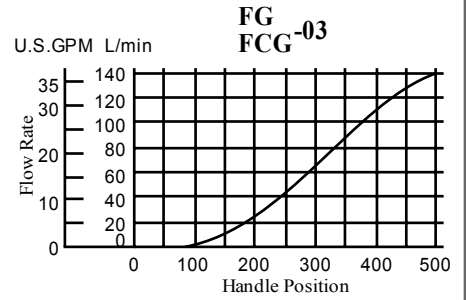
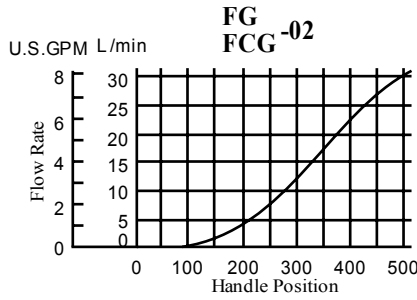
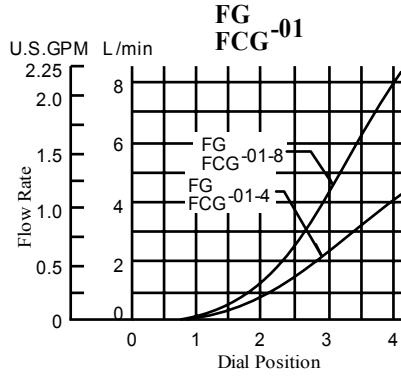
| Sub-plate Model Numbers | "A" Thd. | "B" Thd. | C | D |
|-------------------------|------------|------------|-----------|-----------|
| FGM-10Y-20 | M20 | M16 | 32 (1.26) | 32 (1.26) |
| FGM-10Y-2090 | 3/4-10 UNC | 5/8-11 UNC | 32 (1.26) | 34 (1.34) |

Metred Flow vs. Differential Pressure

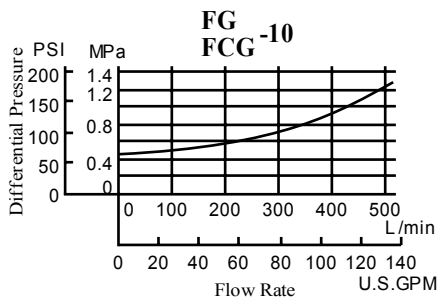
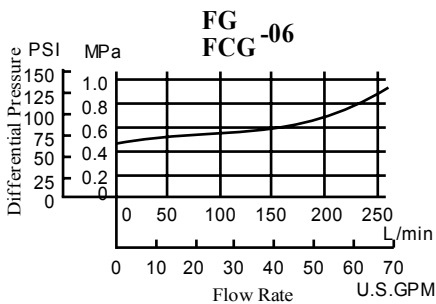
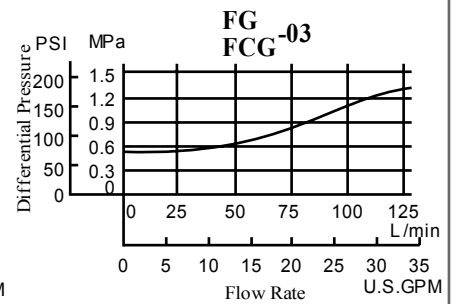
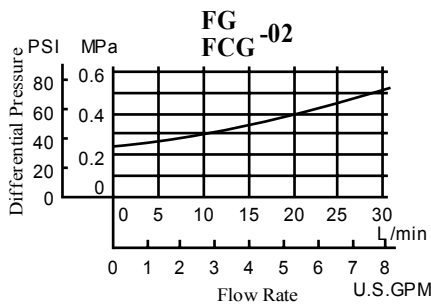
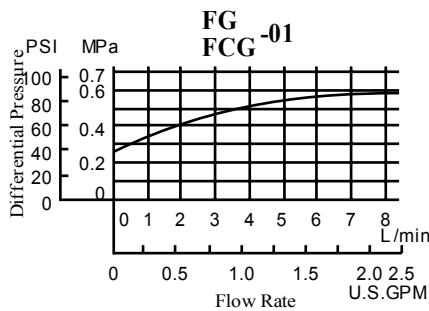
Metred Flow vs. Viscosity



Metred Flow vs. Dial Position



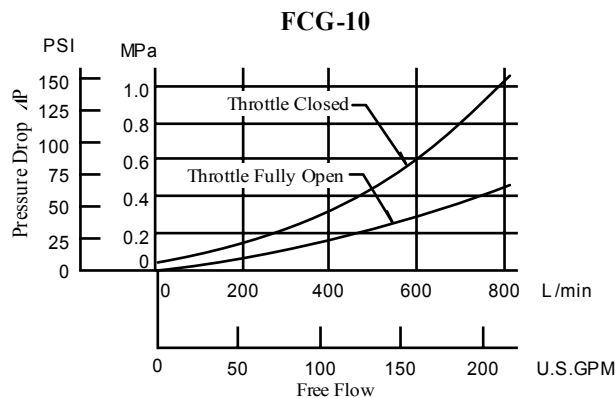
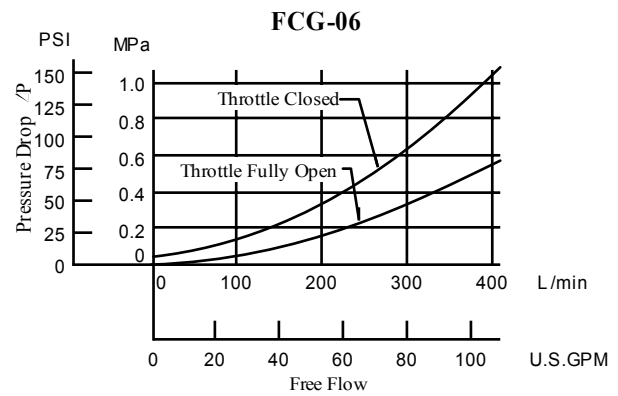
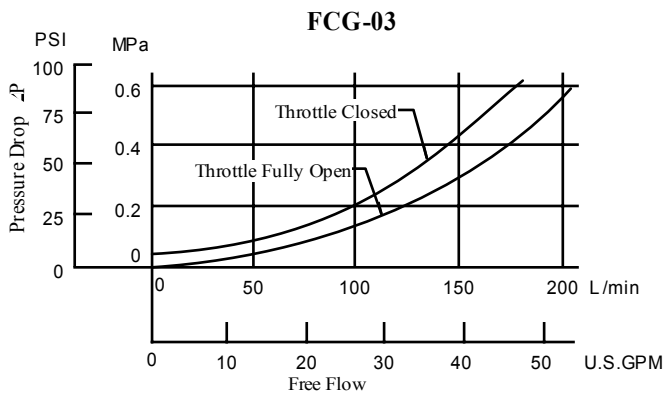
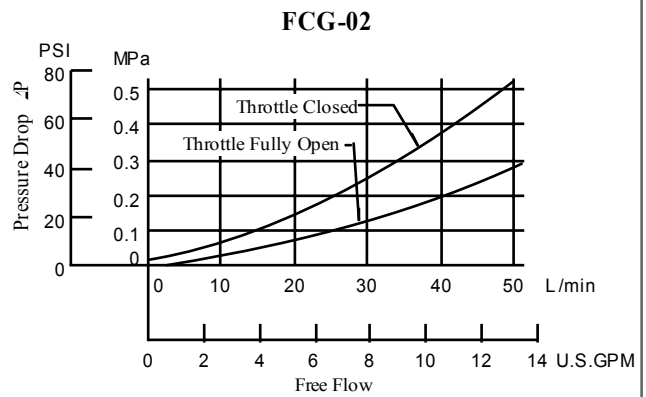
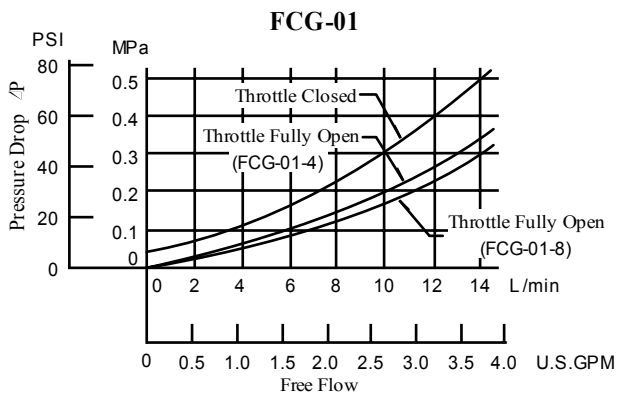
Min. Required Pressure Difference



Performance Characteristics

■ Pressure Drop for Reversed Free Flow

Hydraulic Fluid: Viscosity 35 mm²/s (164 SSU), Specific Gravity 0.850



- For any other viscosity, multiply the factors in the table below.

| | | | | | | |
|-----------|--------------------|------|------|------|------|------|
| Viscosity | mm ² /s | 20 | 40 | 60 | 80 | 100 |
| | SSU | 98 | 186 | 278 | 371 | 464 |
| Factor | | 0.87 | 1.03 | 1.14 | 1.23 | 1.30 |

- For any other specific gravity (G'), the pressure drop ($\Delta P'$) may be obtained from the formula below.

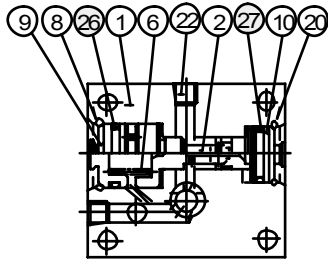
$$\Delta P' = \Delta P (G'/0.850)$$



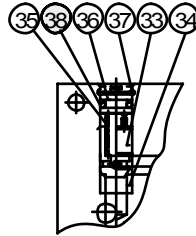
FG
FCG-01-*-*-11/1190

CAUTION

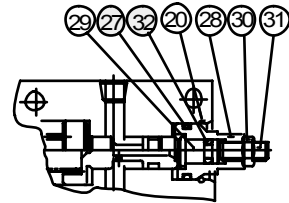
When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.



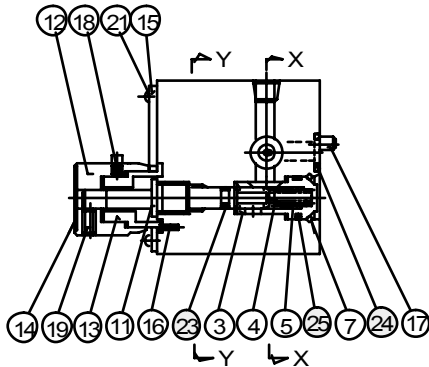
Section X-X
(FG-01 Type)



Section Y-Y
(FCG-01 Type)



Section X-X
(FG/FCG-01-*-N Type)



● List of Seals

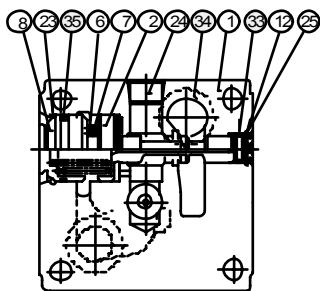
| Item | Name of Parts | Part Numbers | Qty. |
|------|---------------|--------------|------|
| 23 | O-Ring | SO-NA-P4 | 1 |
| 24 | O-Ring | SO-NB-P9 | 2 |
| 25 | O-Ring | SO-NB-P10 | 1 |
| 26 | O-Ring | SO-NB-P16 | 1 |
| 27 | O-Ring | SO-NB-P14 | 1 |
| 32 | O-Ring | SO-NA-P5 | 1 |
| 38 | O-Ring | SO-NB-P7 | 1 |

Note: When ordering the seals, please specify the seal kit number from the table below.

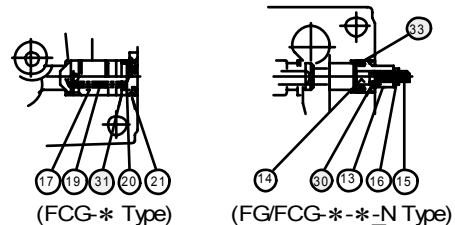
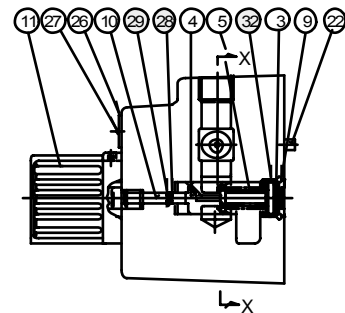
● List of Seal Kits

| Model Numbers | Seal Kit Numbers |
|---------------|------------------|
| FG-01 | KS-FG-01-11 |
| FCG-01 | KS-FCG-01-11 |

FG/FCG-02-30-* -30/3090
FG/FCG-03-125-* -30/3090



Section X-X
(FG-* Type)



Section X-X

● List of Seals

| Item | Name of Parts | Part Numbers | | Qty. |
|------|---------------|--------------|--------------|------|
| | | FG FCG-02 | FG FCG-03 | |
| 28 | O-Ring | SO-NA-P4 | SO-NA-P4 | 1 |
| 29 | Back Up Ring | SO-BB-P4 | SO-BB-P4 | 1 |
| 30 | O-Ring | SO-NB-P5 | SO-NB-P5 | 1 |
| 31 | O-Ring | SO-NB-P10A | SO-NB-P16 | 1 |
| 32 | O-Ring | SO-NB-P12 | SO-NB-P18 | 1 |
| 33 | O-Ring | SO-NB-P14 | SO-NB-P14 | 1 |
| 34 | O-Ring | SO-NB-P18 | SO-NB-P28 | 2 |
| 35 | O-Ring | SO-NB-G25 | SO-NB-G35 | 1 |

Note: When ordering the seals, please specify the seal kit number from the table right.

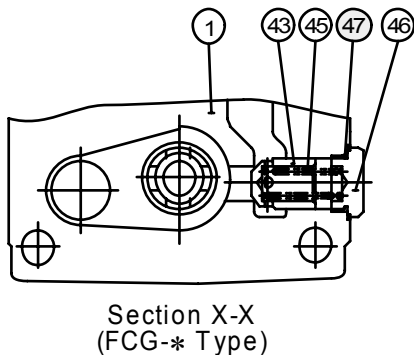
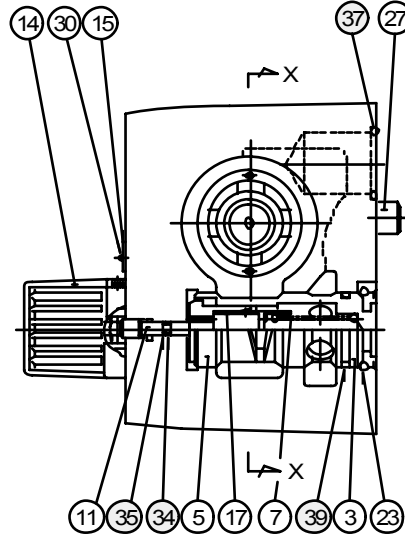
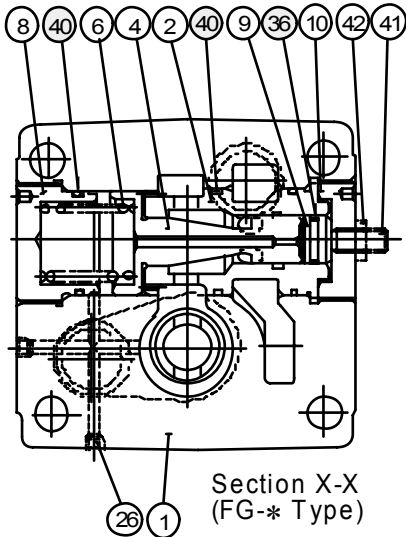
● List of Seal Kits

| Model Numbers | Seal Kit Numbers |
|---------------|------------------|
| FG-02 | KS-FG-02-30 |
| FCG-02 | KS-FCG-02-30 |
| FG-03 | KS-FG-03-30 |
| FCG-03 | KS-FCG-03-30 |

FG/FCG-06-250-* -30/3090
FG/FCG-10-500-* -30/3090

CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.



● List of Seals

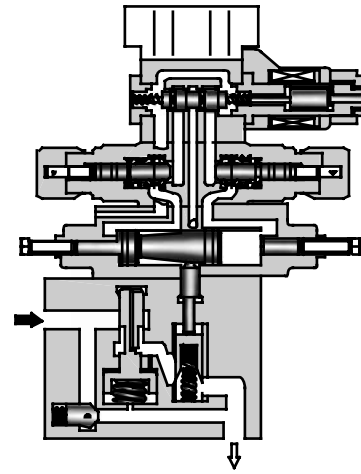
| Item | Name of Parts | Part Numbers | | Qty. |
|------|---------------|--------------|--------------|------|
| | | FG FCG-06 | FG FCG-10 | |
| 34 | O-Ring | SO-NA-P4 | SO-NA-P4 | 1 |
| 35 | Back Up Ring | SO-BB-P4 | SO-BB-P4 | 1 |
| 36 | O-Ring | SO-NB-P21 | SO-NB-P34 | 1 |
| 37 | O-Ring | SO-NB-P32 | SO-NB-P48 | 2 |
| 39 | O-Ring | SO-NB-P34 | SO-NB-P50 | 1 |
| 40 | O-Ring | SO-NB-P50 | SO-NB-G75 | 3 |
| 47 | O-Ring | SO-NB-P24 | SO-NB-P32 | 1 |

Note) When ordering the seals, please specify the seal kit number from the table right.

● List of Seal Kits

| Model Numbers | Seal Kit Numbers |
|---------------|------------------|
| FG-06 | KS-FG-06-30 |
| FCG-06 | KS-FCG-06-30 |
| FG-10 | KS-FG-10-30 |
| FCG-10 | KS-FCG-10-30 |

D



Specifications

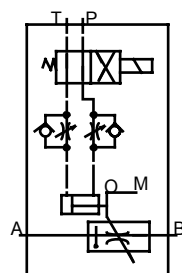
| Model Numbers | Max. Metred Flow Capacity L/min (U.S.GPM) | Min. Metred Flow Capacity L/min (U.S.GPM) | Max. Operating Pressure MPa (PSI) | Min. Pilot Pressure MPa (PSI) | Approx. Mass kg (lbs.) |
|------------------------|--|--|--------------------------------------|----------------------------------|---------------------------|
| FHG/FHCG-02-30-* -12* | 30 (7.9) | 0.05 (.013) | 21 (3050) | 1.5 (220) | 13 (28.7) |
| FHG/FHCG-03-125-* -12* | 125 (33) | 0.2 (.053) | | | 17 (37.5) |
| FHG/FHCG-06-250-* -12* | 250 (66) | 2 (.53) | | | 32 (70.6) |
| FHG/FHCG-10-500-* -12* | 500 (132) | 4 (1.06) | | | 61 (135) |

Model Number Designation

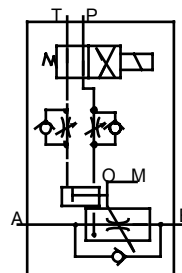
| F- | FHC | G | -02 | -30 | -N | -O | -A100 | -N | -12 | * |
|--|---|------------------------------|------------------------|----------------------------------|---|----------------------------------|--|--|---------------|--|
| Special Seals | Series Number | Type of Mounting | Valve Size | Max. Metred Flow L/min (U.S.GPM) | Pressure Compensator Stroke Adj. | With No Pilot Valve [△] | Coil Type | Type of Electrical Connections | Design Number | Design Standards |
| F: Special Seals for Phosphate Ester Type Fluids (Omit if not required) | FH: Pilot Operated Flow Control Valves | G: Sub-plate Mounting | 02 | 30 : 30 (7.9) | N: Applicable only for Pres. Compensator Stroke Adjustment (Option - Omit if not required) | O: Without Pilot Valve | AC: A100 A120 A200 A240 DC: D12 D24 D48 AC →DC: R100 R200 | None: Terminal Box Type N: With Plug-in Connector (Din) | 12 | None: Japanese Std. "JIS" 90: N.American Design Std. 80: European Design Std. |
| | | | 03 | 125 : 125 (33) | | | | | 12 | |
| | 06 | | 250 : 250 (66) | 12 | | | | | | |
| | 10 | | 500 : 500 (132) | 12 | | | | N: With Plug-in Connector (Din) | | |

★ Either solenoid operated directional valve (DSG-01) or modular valve (MSW-01) can be used as a pilot valve.
If no pilot valve is required, there is no needs to specify the coil type and the electrical connection type of solenoid operated directional valve.

Graphic Symbols



FHG



FHCG

Solenoid Ratings

| Electric Source | Coil Type | Frequency (Hz) | Voltage (V) | | Current & Power at Rated Voltage | | |
|-----------------|-----------|----------------|---------------|-------------------|----------------------------------|-------------|-----------|
| | | | Source Rating | Serviceable Range | Inrush (A)* | Holding (A) | Power (W) |
| AC | A100 | 50 | 100 | 80 - 110 | 2.42 | 0.51 | — |
| | | 60 | 100 | 90 - 120 | 2.14 | 0.37 | |
| | | | 110 | | 2.35 | 0.44 | |
| | A120 | 50 | 120 | 96 - 132 | 2.02 | 0.42 | |
| | | 60 | | 108 - 144 | 1.78 | 0.31 | |
| | A200 | 50 | 200 | 160 - 220 | 1.21 | 0.25 | |
| | | 60 | | 200 | 180 - 240 | 1.07 | |
| | | | 220 | 1.18 | | 0.22 | |
| A240 | 50 | 240 | 192 - 264 | 1.01 | 0.21 | | |
| | 60 | | 216 - 288 | 0.89 | 0.15 | | |
| DC (K Series) | D12 | — | 12 | 10.8 - 13.2 | — | 2.45 | 29 |
| | D24 | | 24 | 21.6 - 26.4 | | 1.23 | |
| | D48 | | 48 | 43.2 - 52.8 | | 0.61 | |
| AC→DC Rectified | R100 | 50/60 | 100 | 90 - 110 | — | 0.33 | 29 |
| | R200 | | 200 | 180 - 220 | | 0.16 | |

★ Inrush current in the above table shows rms values at maximum stroke.

The coil type numbers in the shaded column are handled as optional extras. In case these coils are required to be chosen, please confirm the time of delivery with us before ordering.

Attachment
● Mounting Bolts

| Valve Model Numbers | Socket Head Cap Screw | | Qty. |
|---------------------|--|-------------------------|------|
| | Japanese Std. "JIS" & European Design Std. | N. American Design Std. | |
| FHG/FHCG-02 | M8 × 50 Lg. | 5/16-18 UNC × 2 Lg. | 4 |
| FHG/FHCG-03 | M10 × 75 Lg. | 3/8-16 UNC × 3 Lg. | 4 |
| FHG/FHCG-06 | M16 × 130 Lg. | 5/8-11 UNC × 5 Lg. | 4 |
| FHG/FHCG-10 | M20 × 160 Lg. | 3/4-10 UNC × 6-1/2 Lg. | 4 |

Option
● Pres. compensator stroke adjustment

Can reduce jumping at the start of the actuator.

Sub-plate

| Valve Model Numbers | Japanese Standard "JIS" | | European Design Std. | | N. American Design Std. | | Approx. Mass kg (lbs.) |
|---------------------|-------------------------|-------------|----------------------|-------------|-------------------------|-------------|------------------------|
| | Sub-plate Model No. | Thread Size | Sub-plate Model No. | Thread Size | Sub-plate Model No. | Thread Size | |
| FHG FHCG -02 | FGM-02-20 | Rc 1/4 | FGM-02-2080 | 1/4 BSP.F | FGM-02-2090 | 1/4 NPT | 2.3 (5.1) |
| | FGM-02X-20 | Rc 3/8 | FGM-02X-2080 | 3/8 BSP.F | FGM-02X-2090 | 3/8 NPT | 2.3 (5.1) |
| | FGM-02Y-20 | Rc 1/2 | FGM-02Y-2080 | 1/2 BSP.F | FGM-02Y-2090 | 1/2 NPT | 3.1 (6.8) |
| FHG FHCG -03 | FGM-03-20 | Rc 3/8 | FGM-03-2080 | 3/8 BSP.F | FGM-03-2090 | 3/8 NPT | 3.9 (8.6) |
| | FGM-03X-20 | Rc 1/2 | FGM-03X-2080 | 1/2 BSP.F | FGM-03X-2090 | 1/2 NPT | 3.9 (8.6) |
| | FGM-03Y-20 | Rc 3/4 | FGM-03Y-2080 | 3/4 BSP.F | FGM-03Y-2090 | 3/4 NPT | 5.7 (12.6) |
| | FGM-03Z-20 | Rc 1 | FGM-03Z-2080 | 1 BSP.F | FGM-03Z-2090 | 1 NPT | 5.7 (12.6) |
| FHG FHCG -06 | FGM-06X-20 | Rc 1 | FGM-06X-2080 | 1 BSP.F | FGM-06X-2090 | 1 NPT | 12.5 (27.6) |
| | FGM-06Y-20 | Rc 1-1/4 | FGM-06Y-2080 | 1-1/4 BSP.F | FGM-06Y-2090 | 1-1/4 NPT | 16 (35.3) |
| | FGM-06Z-20 | Rc 1-1/2 | FGM-06Z-2080 | 1-1/2 BSP.F | FGM-06Z-2090 | 1-1/2 NPT | 16 (35.3) |
| FHG FHCG -10 | FGM-10Y-20* | 1-1/2, 2 | FGM-10Y-20* | 1-1/2, 2 | FGM-10Y-2090* | 1-1/2, 2 | 37 (81.6) |

● Sub-plates are available. Specify the sub-plate model number from the table above. When sub-plates are not used, the mounting surface should have a good machined finish.

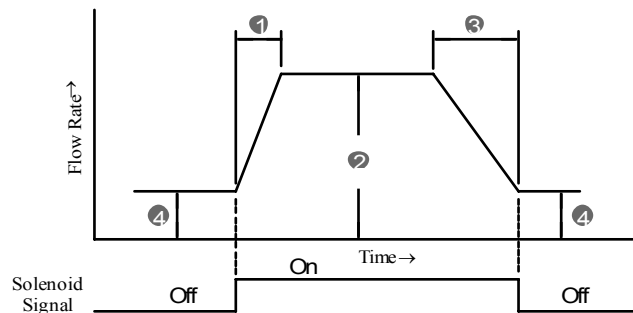
● Sub-plates are common with flow control valves. For dimensions, see pages 6 to 8.

★ FGM-10Y is special type sub-plates to be used with pipe flange. When ordering FGM-10Y, specify the pipe flange kit in addition to FGM-10Y referring to F3 pipe flange kits Catalogue (No. Pub. EC-3001).

■ Instructions

● Control patterns and flow rate adjustment

- While the solenoid operated directional valve on (② shown below), the flow rate is at the level set by the maximum flow adjustment screw and the actuator operates at the maximum speed setting. Turning the adjustment screw clockwise causes the flow rate to decrease.
- While the solenoid operated directional valve off (④ shown below), the flow rate is set by the minimum flow adjustment screw and the actuator operates at the minimum speed setting. Turning the adjustment screw clockwise causes the flow rate to increase.
- When the solenoid operated directional valve is turned on (① shown below), the flow rate is shifted from minimum to maximum and the actuator speed is also shifted likewise. The switching time can be set by the pilot flow adjustment dial (for acceleration). Turning the adjustment dial clockwise causes the pilot flow rate to decrease.
- When the solenoid operated directional valve is turned off (③ shown below), the flow rate is shifted from maximum to minimum and the actuator speed is also shifted likewise. The switching time can be set by the pilot flow adjustment dial (for deceleration). Turning the adjustment dial clockwise causes the pilot flow rate to decrease.



● Tightening of flow adjustment screws and dials

To adjust flow rates, slacken the lock nut or the dial setting screw. After adjustments, tighten the lock nut or the dial.

● Min. required pressure difference

The minimum differential pressure between inlet and outlet port is required to obtain the optimum pressure compensation. It varies according to the flow rate to be set. For details, please refer to the performance curves.

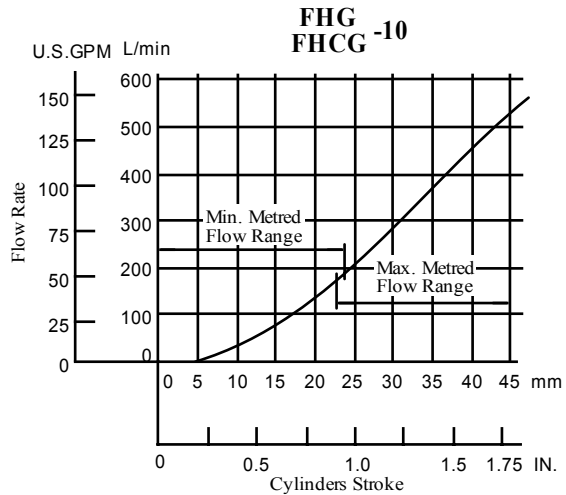
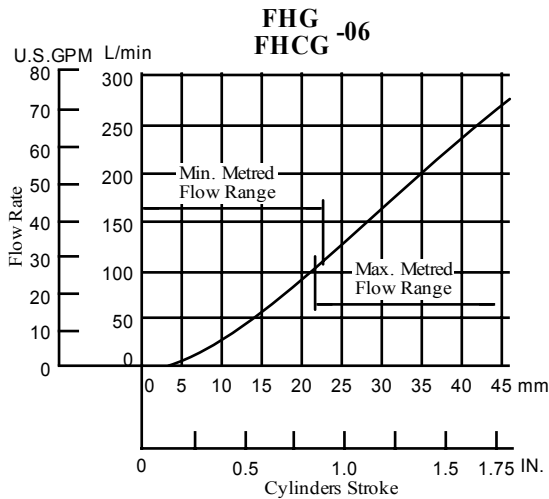
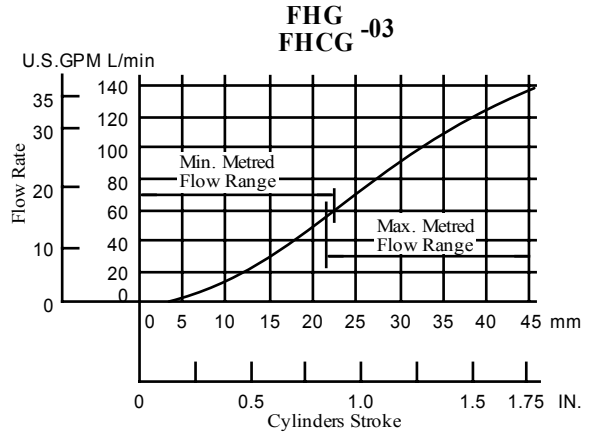
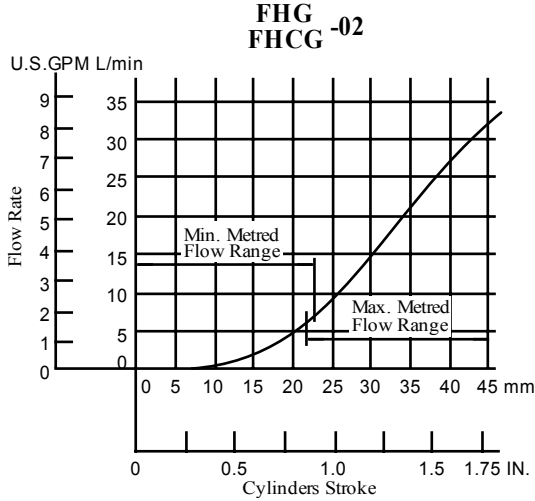
● Free flow

Check valve pressure drops vary with flow rates. If models with check valves are used, see free flow pressure drop characteristics.

● Line filter

To carry out flow adjustments by as small degree as 2 L/min (.53 U.S.GPM) or less, be sure to use a line filter of 10 μ m or finer and install it near the valve inlet.

Metred Flow vs. Cylinders Stroke



Other Characteristics

The following characteristics are the same as for flow control valves;

- Metred Flow vs. Differential Pressure
- Metred Flow vs. Viscosity
- Min. Required Pressure Difference
- Pressure Drop for Reversed Free Flow (only for models with check valves)

See pages 9 to 11. For reference, the corresponding model No. of the flow control valves are shown below.

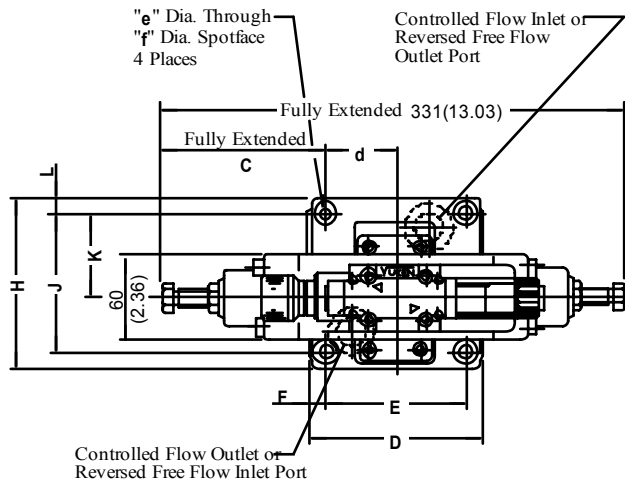
| Valve Model No. | Model No. |
|-----------------|---------------|
| FHG FHCG -02 | FG FCG -02 |
| FHG FHCG -03 | FG FCG -03 |
| FHG FHCG -06 | FG FCG -06 |
| FHG FHCG -10 | FG FCG -10 |

● Terminal Box Type

FHG/FHCG-02-30-*-*-12/1290

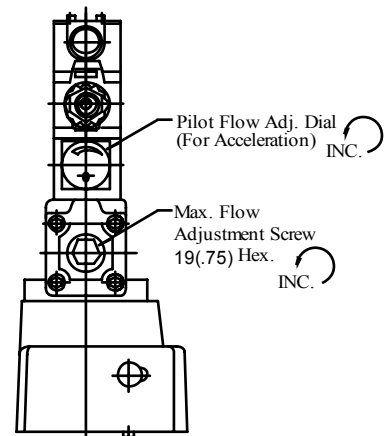
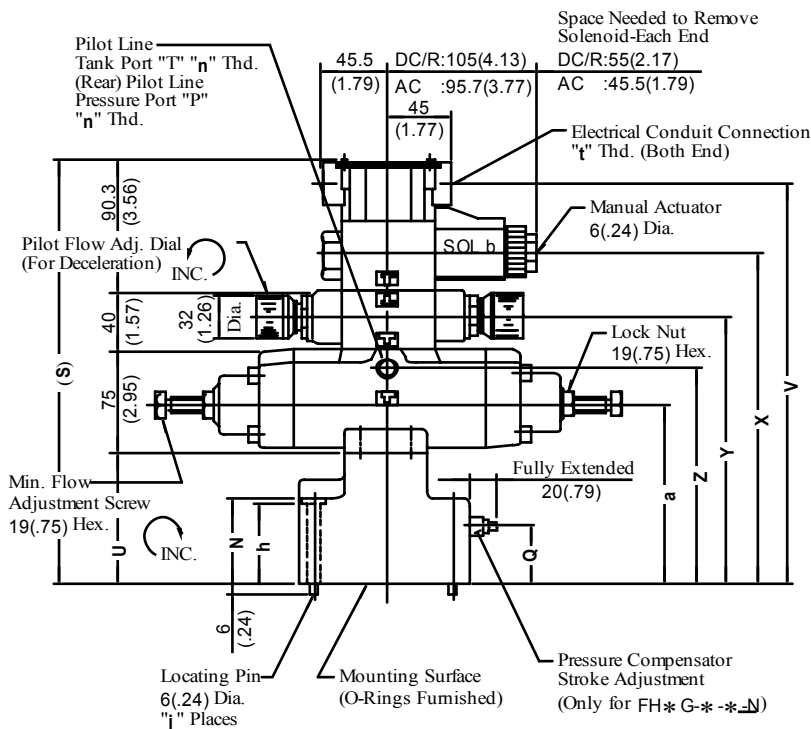
FHG/FHCG-03-125-*-*-12/1290

 Mounting surface:
 FH*G-02: ISO 6263-AK-06-2-A
 FH*G-03: ISO 6263-AM-07-2-A

 DIMENSIONS IN
 MILLIMETRES (INCHES)


| Model Numbers | n | t |
|--------------------------|---------|---------|
| FHG/FHCG-02-30-*-*-12 | Rc 1/4 | G 1/2 |
| FHG/FHCG-02-30-*-*-1290 | 1/4 NPT | 1/2 NPT |
| FHG/FHCG-03-125-*-*-12 | Rc 1/4 | G 1/2 |
| FHG/FHCG-03-125-*-*-1290 | 1/4 NPT | 1/2 NPT |

Note: For dimensions of the valve mounting surface, see the installation drawing (P. 6 and 7) of the sub-plate used together.



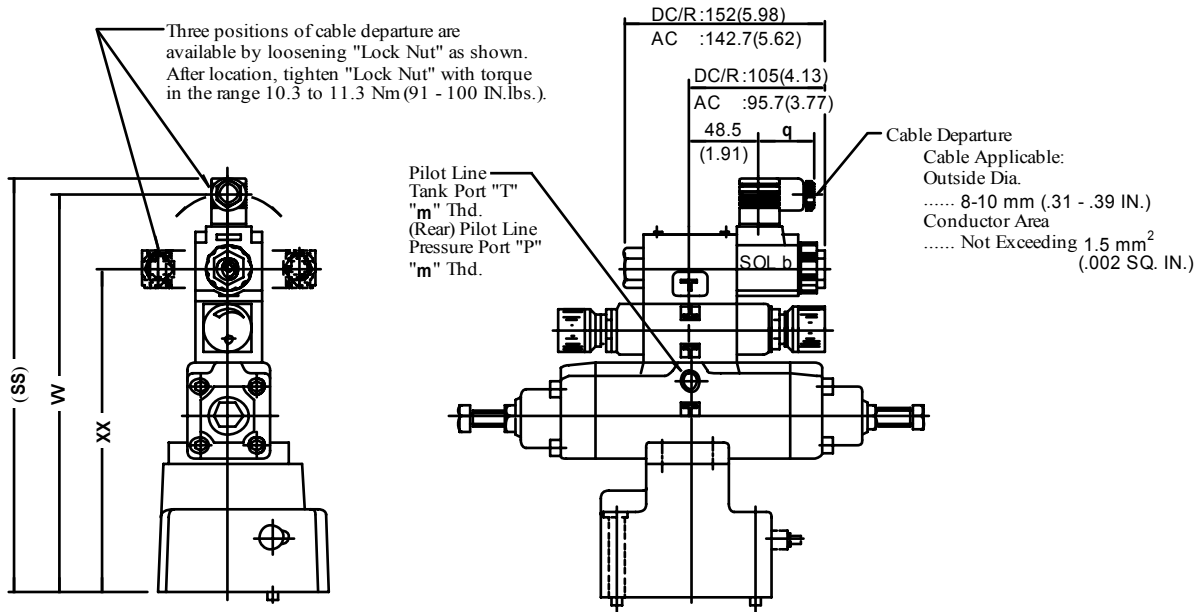
| Model Numbers | Dimensions mm (Inches) | | | | | | | | | | | | | | | |
|---------------|------------------------|---------------|-----------------|---------------|-----------------|-----------------|----------------|---------------|--------------|--------------|------------------|--------------|----------------|---------------|---------------|---------------|
| | C | D | E | F | H | J | K | L | N | Q | S | U | V | X | Y | Z |
| FHG -02 | 127.4 (5.02) | 96 (3.78) | 76.2 (3.00) | 9.9 (.39) | 100.6 (3.96) | 82.6 (3.25) | 44.3 (1.74) | 9 (.35) | 40 (1.57) | 23 (.91) | 274.3 (10.80) | 69 (2.72) | 256 (10.08) | 209 (8.23) | 162 (6.38) | 129 (5.08) |
| FHG -03 | 114.7 (4.52) | 125 (4.92) | 101.6 (4.00) | 11.7 (.46) | 125 (4.92) | 101.6 (4.00) | 61.8 (2.43) | 11.7 (.46) | 64 (2.52) | 41 (1.61) | 303.3 (11.94) | 98 (3.86) | 285 (11.22) | 238 (9.37) | 191 (7.52) | 158 (6.22) |

| Model Numbers | Dimensions mm (Inches) | | | | | j |
|---------------|------------------------|----------------|--------------|---------------|--------------|---|
| | a | d | e | f | h | |
| FHG -02 | 104 (4.09) | 38.1 (1.50) | 8.8 (.35) | 14 (.55) | 39 (1.54) | 1 |
| FHG -03 | 133 (5.24) | 50.8 (2.00) | 11 (.43) | 17.5 (.69) | 63 (2.48) | 2 |

● Models with Plug-in Connector

FHG/FHCG-02-30-*-*-N-12/1280/1290

FHG/FHCG-03-125-*-*-N-12/1280/1290



DIMENSIONS IN
MILLIMETRES (INCHES)

| Model Numbers | Dimensions mm (Inches) | | | | Remarks |
|--------------------------|------------------------|------------------|---------------|--------------|---------------------|
| | SS | W | XX | q | |
| FHG/FHCG-02-30-*-*-A*-N | 274 (10.79) | 262 (10.31) | 209 (8.23) | 39 (1.54) | with AC Solenoid |
| FHG/FHCG-03-125-*-*-A*-N | 303 (11.93) | 291 (11.46) | 238 (9.37) | | |
| FHG/FHCG-02-30-*-*-D*-N | 285 (11.22) | 273 (10.75) | 209 (8.23) | 39 (1.54) | with DC Solenoid |
| FHG/FHCG-03-125-*-*-D*-N | 314 (12.36) | 302 (11.89) | 238 (9.37) | | |
| FHG/FHCG-02-30-*-*-R*-N | 288 (11.34) | 266.2 (10.48) | 209 (8.23) | 53 (2.09) | with AC→DC Solenoid |
| FHG/FHCG-03-125-*-*-R*-N | 317 (12.48) | 295.2 (11.62) | 238 (9.37) | | |

| Model Numbers | Thread Size | | |
|-----------------------|-------------------------------|----------------------------------|------------------------------------|
| | Japanese Std. "JIS" Design 12 | European Design Std. Design 1280 | N.American Design Std. Design 1290 |
| | "n" Thd. | "n" Thd. | "n" Thd. |
| FHG/FHCG-02-30-*-*-N | Rc 1/4 | 1/4 BSP.F | 1/4 NPT |
| FHG/FHCG-03-125-*-*-N | | | |

● For other dimensions, refer to "Terminal Box Type".

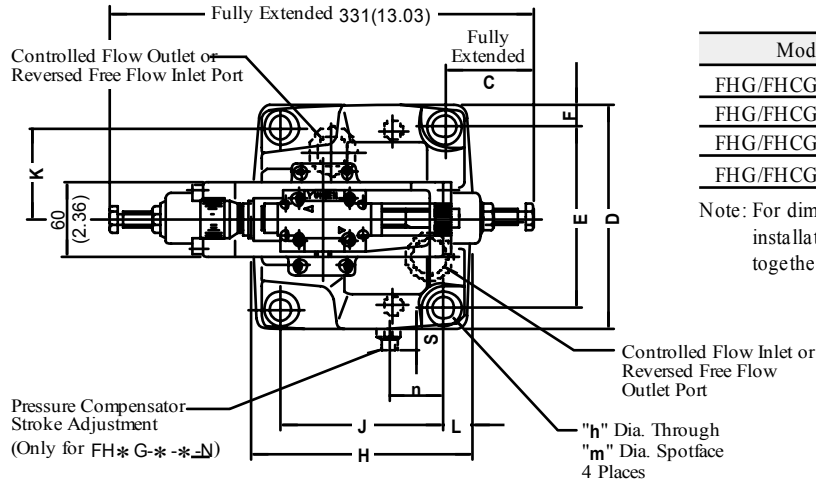


● Terminal Box Type

FHG/FHCG-06-250-*-*-12/1290
FHG/FHCG-10-500-*-*-12/1290

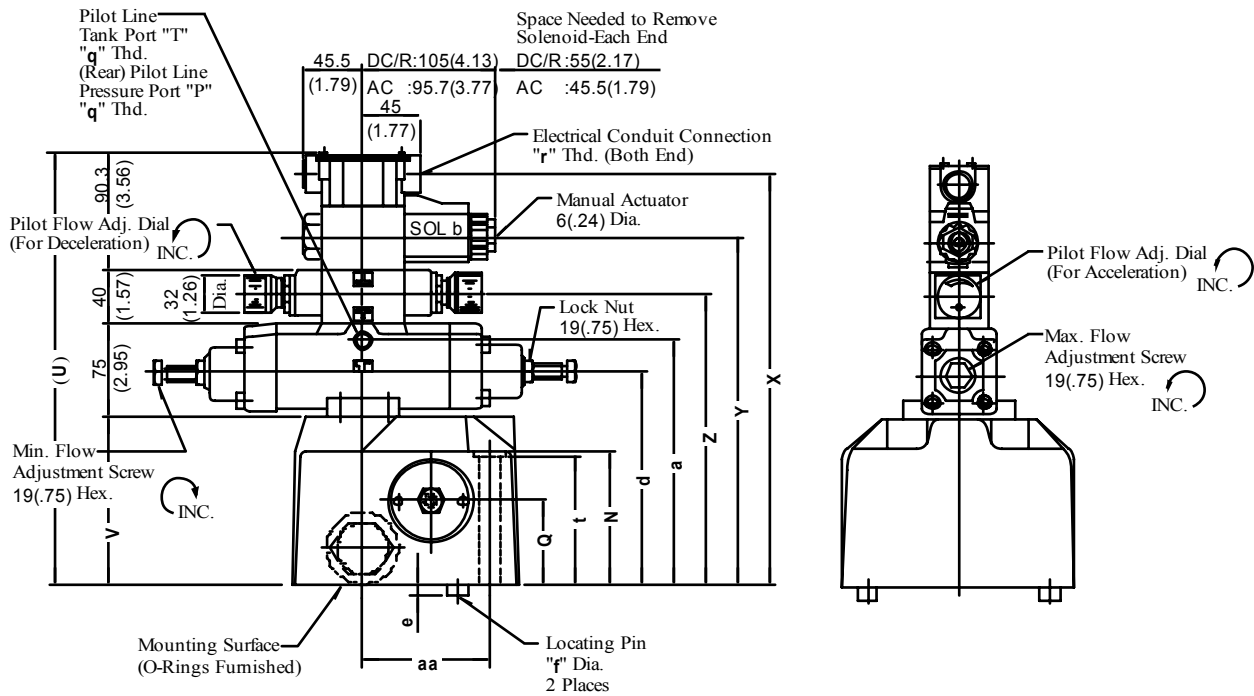
Mounting surface:
FH*G-06: ISO 6263-AP-08-2-A

DIMENSIONS IN
MILLIMETRES (INCHES)



| Model Numbers | q | r |
|--------------------------|---------|---------|
| FHG/FHCG-06-250-*-*-12 | Rc 1/4 | G 1/2 |
| FHG/FHCG-06-250-*-*-1290 | 1/4 NPT | 1/2 NPT |
| FHG/FHCG-10-500-*-*-12 | Rc 1/4 | G 1/2 |
| FHG/FHCG-10-500-*-*-1290 | 1/4 NPT | 1/2 NPT |

Note: For dimensions of the valve mounting surface, see the installation drawing (P. 7 and 8) of the sub-plate used together.



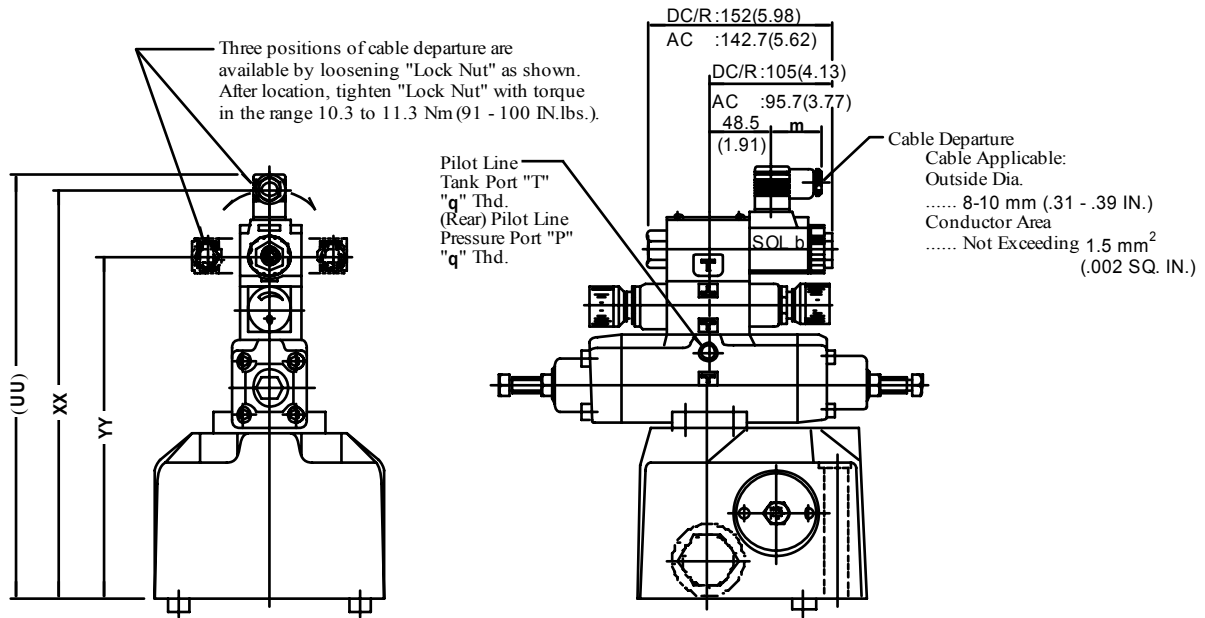
| Model Numbers | Dimensions mm (Inches) | | | | | | | | | | | | | | | |
|-----------------|------------------------|---------------|-----------------|---------------|---------------|-----------------|----------------|---------------|---------------|--------------|-------------|------------------|---------------|----------------|----------------|---------------|
| | C | D | E | F | H | J | K | L | N | Q | S | U | V | X | Y | Z |
| FHG FHCG -06 | 66.5 (2.62) | 180 (7.09) | 146.1 (5.75) | 17 (.67) | 174 (6.85) | 133.4 (5.25) | 73.1 (2.88) | 20.3 (.80) | 105 (4.13) | 65 (2.56) | 18 (.71) | 335.3 (13.20) | 130 (5.12) | 317 (12.48) | 270 (10.63) | 223 (8.78) |
| FHG FHCG -10 | 21 (.83) | 244 (9.61) | 196.9 (7.75) | 23.5 (.93) | 228 (8.98) | 177.8 (7.00) | 98.5 (3.88) | 25.1 (.99) | 137 (5.39) | 85 (3.35) | 23 (.91) | 365.3 (14.38) | 160 (6.30) | 347 (13.66) | 300 (11.81) | 253 (9.96) |

| Model Numbers | Dimensions mm (Inches) | | | | | | | | |
|-----------------|------------------------|---------------|-------------|-------------|---------------|--------------|--------------|---------------|-----------------|
| | a | d | e | f | h | m | n | t | aa |
| FHG FHCG -06 | 190 (7.48) | 165 (6.50) | 7 (.28) | 16 (.63) | 17.5 (.69) | 26 (1.02) | 44 (1.73) | 103 (4.06) | 99 (3.90) |
| FHG FHCG -10 | 220 (8.66) | 195 (7.68) | 10 (.39) | 18 (.71) | 21.5 (.85) | 32 (1.26) | 61 (2.40) | 135 (5.31) | 144.5 (5.69) |

● Models with Plug-in Connector

FHG/FHCG-06-250-*-*-N-12/1280/1290

FHG/FHCG-10-500-*-*-N-12/1280/1290



DIMENSIONS IN
MILLIMETRES (INCHES)

| Model Numbers | Dimensions mm (Inches) | | | | Remarks |
|--------------------------|------------------------|------------------|----------------|--------------|---------------------|
| | UU | XX | YY | m | |
| FHG/FHCG-06-250-*-*-A*-N | 335 (13.19) | 323 (12.72) | 270 (10.63) | 39 (1.54) | with AC Solenoid |
| FHG/FHCG-10-500-*-*-A*-N | 365 (14.37) | 353 (13.90) | 300 (11.81) | | |
| FHG/FHCG-06-250-*-*-D*-N | 346 (13.62) | 334 (13.15) | 270 (10.63) | 39 (1.54) | with DC Solenoid |
| FHG/FHCG-10-500-*-*-D*-N | 376 (14.80) | 364 (14.33) | 300 (11.81) | | |
| FHG/FHCG-06-250-*-*-R*-N | 349 (13.74) | 327.2 (12.88) | 270 (10.63) | 53 (2.09) | with AC→DC Solenoid |
| FHG/FHCG-10-500-*-*-R*-N | 379 (14.92) | 357.2 (14.06) | 300 (11.81) | | |

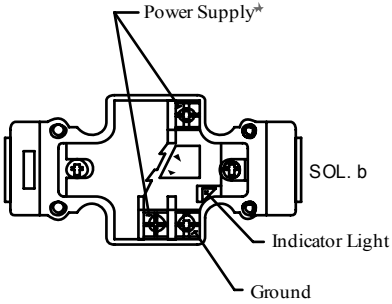
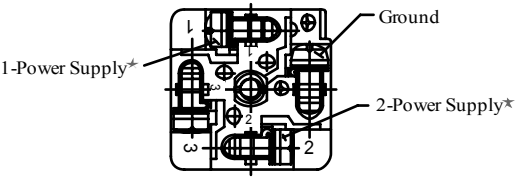
| Model Numbers | Thread Size | | |
|-----------------------|-------------------------------|----------------------------------|------------------------------------|
| | Japanese Std. "JIS" Design 12 | European Design Std. Design 1280 | N.American Design Std. Design 1290 |
| | "q" Thd. | "q" Thd. | "q" Thd. |
| FHG/FHCG-06-250-*-*-N | Rc 1/4 | 1/4 BSP.F | 1/4 NPT |
| FHG/FHCG-10-500-*-*-N | | | |

● For other dimensions, refer to "Terminal Box Type".



Lead Wire Connection

Details of Receptacle

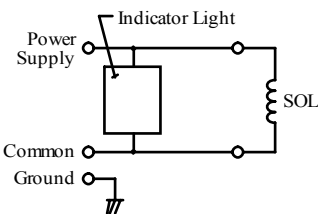
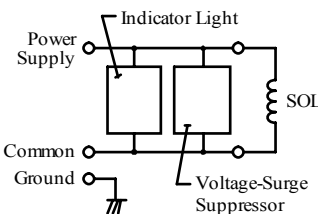
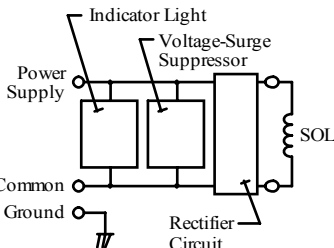
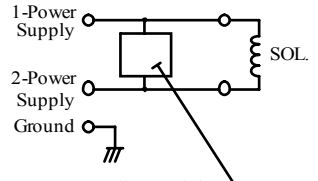
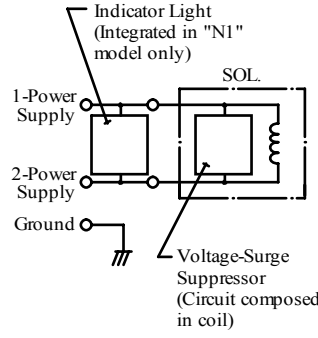
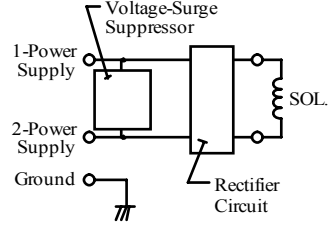
| Terminal Box Type | Plug-in Connector Type |
|---|--|
|  <p>Power Supply*</p> <p>SOL. b</p> <p>Indicator Light</p> <p>Ground</p> |  <p>1-Power Supply*</p> <p>Ground</p> <p>2-Power Supply*</p> |

★ With DC solenoids, polarity is no question.

DANGER

- Do not perform wiring while the power is on. Doing so may result in electric shock, burns or death.
- Make the wiring properly. Improper wiring will cause an irregular movement of the machine, resulting in a grave accident.

Electrical Circuit

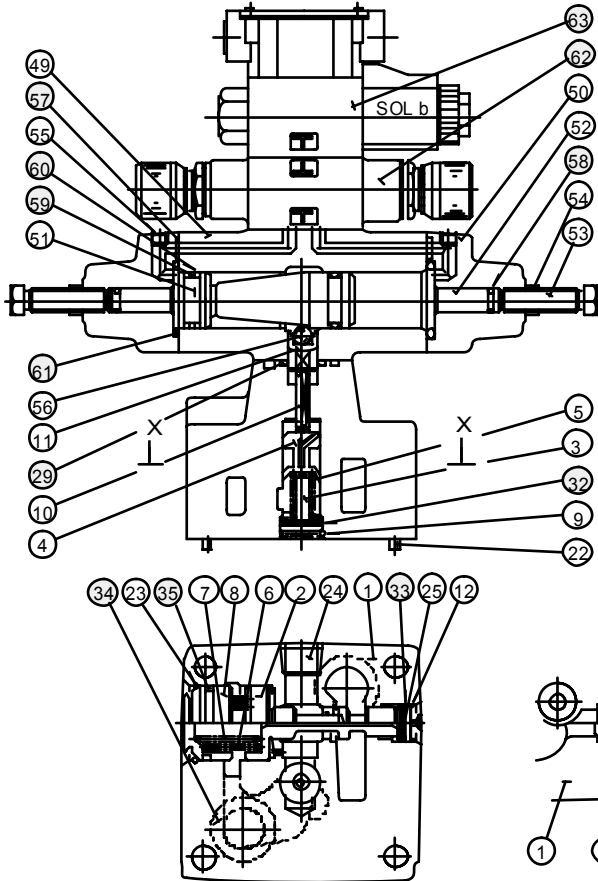
| Type of Electrical Conduit Connection | Electric Source | | |
|---------------------------------------|--|--|---|
| | AC | DC | AC →DC Rectified |
| Terminal Box Type |  <p>Indicator Light</p> <p>Power Supply</p> <p>Common</p> <p>Ground</p> <p>SOL.</p> |  <p>Indicator Light</p> <p>Power Supply</p> <p>Common</p> <p>Ground</p> <p>Voltage-Surge Suppressor</p> <p>SOL.</p> |  <p>Indicator Light</p> <p>Power Supply</p> <p>Common</p> <p>Ground</p> <p>Voltage-Surge Suppressor</p> <p>Rectifier Circuit</p> <p>SOL.</p> |
| Plug-in Connector Type |  <p>1-Power Supply</p> <p>2-Power Supply</p> <p>Ground</p> <p>Indicator Light (Integrated in "N1" model only)</p> <p>SOL.</p> |  <p>Indicator Light (Integrated in "N1" model only)</p> <p>1-Power Supply</p> <p>2-Power Supply</p> <p>Ground</p> <p>Voltage-Surge Suppressor (Circuit composed in coil)</p> <p>SOL.</p> |  <p>Voltage-Surge Suppressor</p> <p>1-Power Supply</p> <p>2-Power Supply</p> <p>Ground</p> <p>Rectifier Circuit</p> <p>SOL.</p> |

CAUTION

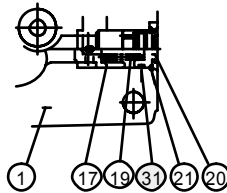
When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

● Terminal Box Type

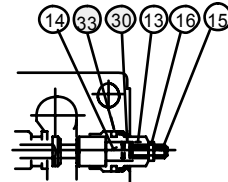
FHG/FHCG-02-30-*-*/-12/1290
FHG/FHCG-03-125-*-*/-12/1290



(FHG-* Type)



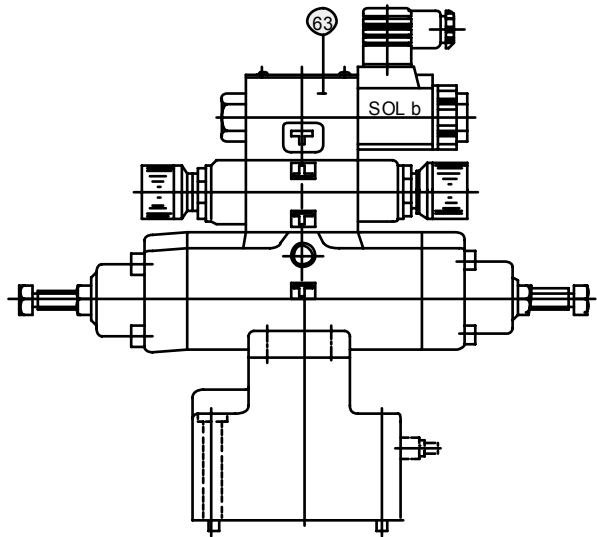
(FHCG-* Type)
Section X-X



(FHG/FHCG-*-*/-N Type)

● Models with Plug-in Connector

FHG/FHCG-02-30-*-*/-N-12/1280/1290
FHG/FHCG-03-125-*-*/-N-12/1280/1290



● List of Seals

| Item | Name of Parts | Part Numbers | | Qty. |
|------|---------------|-----------------|-----------------|------|
| | | FHG FHCG -02 | FHG FHCG -03 | |
| 29 | O-Ring | SO-NB-P20 | SO-NB-P20 | 1 |
| 30 | O-Ring | SO-NB-P5 | SO-NB-P5 | 1 |
| 31 | O-Ring | SO-NB-P10A | SO-NB-P16 | 1 |
| 32 | O-Ring | SO-NB-P12 | SO-NB-P18 | 1 |
| 33 | O-Ring | SO-NB-P14 | SO-NB-P14 | 1 |
| 34 | O-Ring | SO-NB-P18 | SO-NB-P28 | 2 |
| 35 | O-Ring | SO-NB-G25 | SO-NB-G35 | 1 |
| 57 | O-Ring | SO-NB-P9 | SO-NB-P9 | 2 |
| 58 | O-Ring | SO-NB-P10A | SO-NB-P10A | 2 |
| 59 | O-Ring | SO-NA-P26 | SO-NA-P26 | 2 |
| 60 | Back Up Ring | SO-BB-P26 | SO-BB-P26 | 4 |
| 61 | O-Ring | SO-NB-P38 | SO-NB-P38 | 2 |

Note) When ordering the seals, please specify the sealkit number from the table right. In addition to the above seals, seals for pilot valves are included in the seal kit.

● Pilot Valves

See page 25 for the pilot valve model numbers to be used.

● List of Seal Kits

| Model Numbers | Seal Kit Numbers |
|---------------|------------------|
| FHG-02 | KS-FHG-02-12 |
| FHCG-02 | KS-FHCG-02-12 |
| FHG-03 | KS-FHG-03-12 |
| FHCG-03 | KS-FHCG-03-12 |

D



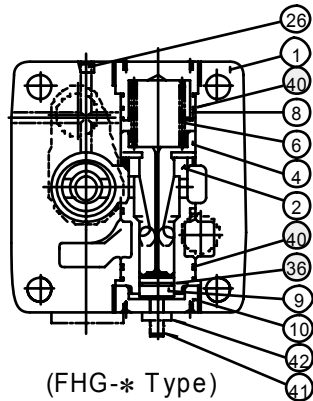
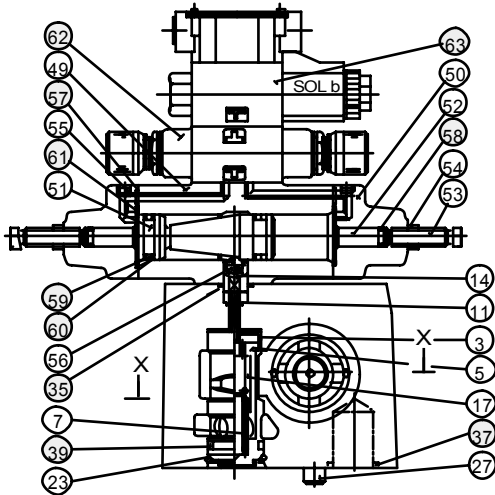
CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

● Terminal Box Type

FHG/FHCG-06-250-*-*/12/1290

FHG/FHCG-10-500-*-*/12/1290

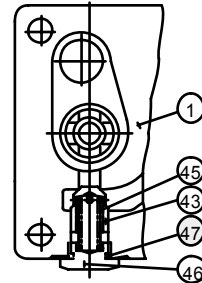
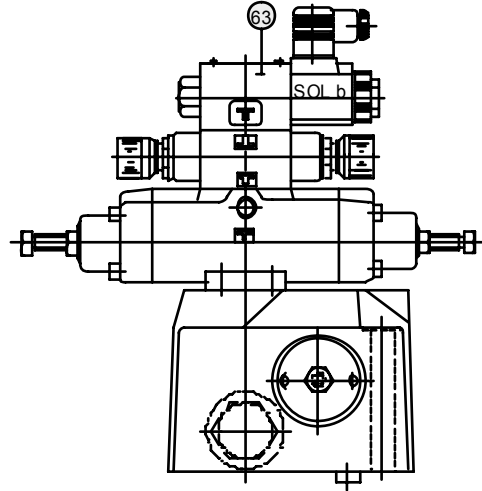


(FHG-* Type)
Section X-X

● Models with Plug-in Connector

FHG/FHCG-06-250-*-*/N-12/1280/1290

FHG/FHCG-10-500-*-*/N-12/1280/1290



(FHCG-* Type)
Section X-X

● List of Seals

| Item | Name of Parts | Part Numbers | | Qty. |
|------|---------------|----------------|----------------|------|
| | | FHG FHCG-06 | FHG FHCG-10 | |
| 35 | O-Ring | SO-NB-P20 | SO-NB-P20 | 1 |
| 36 | O-Ring | SO-NB-P21 | SO-NB-P34 | 1 |
| 37 | O-Ring | SO-NB-P32 | SO-NB-P48 | 2 |
| 39 | O-Ring | SO-NB-P34 | SO-NB-P50 | 1 |
| 40 | O-Ring | SO-NB-P50 | SO-NB-G75 | 3 |
| 47 | O-Ring | SO-NB-P24 | SO-NB-P32 | 1 |
| 57 | O-Ring | SO-NB-P9 | SO-NB-P9 | 2 |
| 58 | O-Ring | SO-NB-P10A | SO-NB-P10A | 2 |
| 59 | O-Ring | SO-NA-P26 | SO-NA-P26 | 2 |
| 60 | Back Up Ring | SO-BB-P26 | SO-BB-P26 | 4 |
| 61 | O-Ring | SO-NB-P38 | SO-NB-P38 | 2 |

Note) When ordering the seals, please specify the seal kit number from the table right. In addition to the above seals, seals for pilot valves are included in the seal kit.

● Pilot Valves

See page 25 for the pilot valve model numbers to be used.

● List of Seal Kits

| Model Numbers | Seal Kit Numbers |
|---------------|------------------|
| FHG-06 | KS-FHG-06-12 |
| FHCG-06 | KS-FHCG-06-12 |
| FHG-10 | KS-FHG-10-12 |
| FHCG-10 | KS-FHCG-10-12 |

● List of Pilot Valves

| Type of Electrical Conduit Connections | Valve Model Numbers | Pilot Valve Model Numbers | | Remarks |
|--|---|--|---|-------------------------|
| | | Item No.62 Throttle and Check Modular Valves | Item No.63 Solenoid Operated Directional Valves | |
| Terminal Box Type | FHG/FHCG-02- 30-*-* -12 FHG/FHCG-03- 125-*-* -12 FHG/FHCG-06- 250-*-* -12 FHG/FHCG-10- 500-*-* -12 | MSW-01-X-50 | DSG-01-2B2-* -60 | Japanese Std. "JIS" |
| | FHG/FHCG-02- 30-*-* -1290 FHG/FHCG-03- 125-*-* -1290 FHG/FHCG-06- 250-*-* -1290 FHG/FHCG-10- 500-*-* -1290 | MSW-01-X-5090 | DSG-01-2B2-* -6090 | N. American Design Std. |
| Plug-in Connector Type | FHG/FHCG-02- 30-*-* -N-12 FHG/FHCG-03- 125-*-* -N-12 FHG/FHCG-06- 250-*-* -N-12 FHG/FHCG-10- 500-*-* -N-12 | MSW-01-X-50 | DSG-01-2B2-* -N-60 | Japanese Std. "JIS" |
| | FHG/FHCG-02- 30-*-* -N-1280 FHG/FHCG-03- 125-*-* -N-1280 FHG/FHCG-06- 250-*-* -N-1280 FHG/FHCG-10- 500-*-* -N-1280 | MSW-01-X-50 | DSG-01-2B2-* -N-60 | European Design Std. |
| | FHG/FHCG-02- 30-*-* -N-1290 FHG/FHCG-03- 125-*-* -N-1290 FHG/FHCG-06- 250-*-* -N-1290 FHG/FHCG-10- 500-*-* -N-1290 | MSW-01-X-5090 | DSG-01-2B2-* -N-6090 | N. American Design Std. |

Note: 1. Fill a coil type (a symbol representing current/voltage) in section marked * .
 2. For the detail of the MSW-01 valve O-rings, see the Catalogue No. Pub. EC-1402.
 3. For the detail of the DSG-01 valve O-rings, see the Catalogue No. Pub. EC-0402.

