

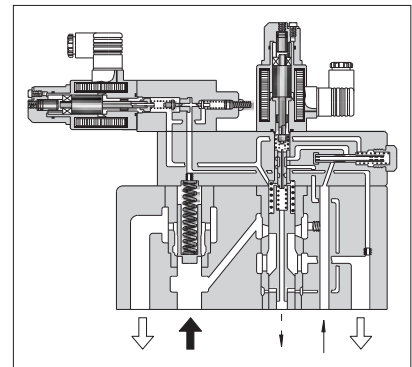
## 10Ω-10Ω Series Proportional Electro-Hydraulic Flow Control and Relief Valves

This flow control and relief valve is an energy-saving valve that supplies the minimum pressure and flow necessary for actuator drive. Since this valve controls the pump pressure by following the load pressure while keeping the differential pressure minimized, it serves as a low power-consumption energy-saving, metre-in, controlled flow control valve. Further, since a temperature compensation function is incorporated, this valve provides consistent flow control without respect to the fluid temperature.

### Specifications

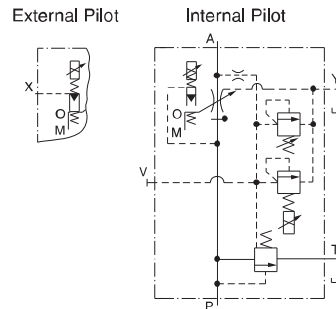
Model Numbers		EFBG-03 -125-*-*-61*	EFBG-06 -250-*-*-61*	EFBG-10 -500-*-*-51*
Description				
Max. Operating Pressure MPa (PSI)		24.5 (3550)	24.5 (3550)	24.5 (3550)
Max. Flow L/min (U.S.GPM)		125 (33)	250 (66)	500 (132)
Metred Flow Adjustment Range L/min (U.S.GPM)		1-125 (.26-33)	2.5-250 (.66-66)	5-500 (1.32-132)
Min. Pilot Pressure MPa (PSI)		1.5 (220)	1.5 (220)	1.5 (220)
Pilot Flow L/min (U.S.GPM)		at Normal 1 (.26)	at Normal 1 (.26)	at Normal 1 (.26)
		at Transition 3 (.79)	at Transition 4 (1.06)	at Transition 6 (1.59)
Flow Controls	Rated Current	800 mA	750 mA	900 mA
	Coil Resistance	10 Ω	10 Ω	10 Ω
	Differential Pressure MPa (PSI)	0.7 (100)	0.7 (100)	0.9 (130)
	Hysteresis	3% or less	3% or less	3% or less
	Repeatability	1% or less	1% or less	1% or less
Pressure Controls	Pres. Adj. Range MPa (PSI)	C: 1.4-15.7 (200-2275) H: 1.4-24.5 (200-3550)	C: 1.4-15.7 (200-2275) H: 1.4-24.5 (200-3550)	C: 1.5-15.7 (220-2275) H: 1.5-24.5 (220-3550)
	Rated Current	C: 890 mA H: 930 mA	C: 820 mA H: 880 mA	C: 800 mA H: 900 mA
	Coil Resistance	10 Ω	10 Ω	10 Ω
	Hysteresis	3% or less	3% or less	3% or less
	Repeatability	1% or less	1% or less	1% or less
	Approx. Mass kg (lbs.)	Refer to <a href="#">page 724 to 726</a>		

- ★1. The specifications for pressure controls are applied to models with proportional pilot relief valve. (Ex. EFBG-03-125-C-\*-61)
- ★2. The maximum pressure adjustment range of the models without proportional pilot relief valves is 24.5 MPa (3550 PSI).

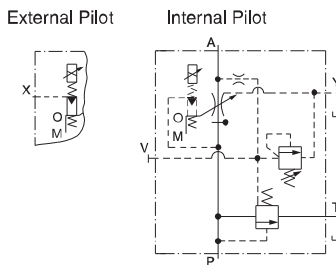


### Graphic Symbols

With Proportional Pilot Relief Valve



Without Proportional Pilot Relief Valve



**Model Number Designation**

F-	EFB	G	-03	-125	-C	-E	-61	*
Special Seals	Series Number	Type of Mounting	Valve Size	Max. Metred Flow L/min (U.S.GPM)	Proportional Pilot Relief Valve Pressure Adj. Range	Pilot Connection	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluid (Omit if not required)	EFB: Proportional Electro-Hydraulic Flow Control and Relief Valve	G: Sub-plate Mounting	03	125: 125 (33)	C, H: See Specifications None: Without Proportional Pilot Relief Valve	None: Internal Pilot E: External Pilot	61	Refer to *
			06	250: 250 (66)			61	
			10	500: 500 (132)			51	

★ 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" and European Design Std.	N. American Design Std.	
EFBG-03	M10 × 65 Lg.	3/8-16 UNC × 2-1/2 Lg.	4
EFBG-06	M16 × 100 Lg.	5/8-11 UNC × 4 Lg.	4
EFBG-10	M20 × 130 Lg.	3/4-10 UNC × 5 Lg.	4

**Applicable Power Amplifiers**

For stable performance, it is recommended that Yuken's applicable power amplifiers be used (for details see [page 767, 780](#)).

Valve Model Numbers	Power Amplifier Model Numbers	
	For Flow Control	For Pres. Control
EFBG-03-125(-E)-61/6190 EFBG-06-250(-E)-61/6190 EFBG-10-500(-E)-51/5190	AME-D-10*-20 AMN-D-10 (For DC Power Supply)	—
EFBG-03-125-C/H(-E)-61/6190 EFBG-06-250-C/H(-E)-61/6190 EFBG-10-500-C/H(-E)-51/5190	AME-D2-1010-11	

**Sub-plate**

Valve Model Numbers	Japanese Standard "JIS"		European Design Standard		N. American Design Standard		Approx. Mass kg (lbs.)
	Sub-plate Model Numbers	Thread Size	Sub-plate Model Numbers	Thread Size	Sub-plate Model Numbers	Thread Size	
EFBG-03	EFBGM-03Y-20	Rc 3/4	EFBGM-03Y-2080	3/4 BSP.F	EFBGM-03Y-2090	3/4 NPT	6 (13.2)
	EFBGM-03Z-20	Rc 1	EFBGM-03Z-2080	1 BSP.F	EFBGM-03Z-2090	1 NPT	
EFBG-06	EFBGM-06X-20	Rc 1	EFBGM-06X-2080	1 BSP.F	EFBGM-06X-2090	1 NPT	12.5 (27.6)
	EFBGM-06Y-20	Rc 1-1/4	EFBGM-06Y-2080	1-1/4 BSP.F	EFBGM-06Y-2090	1-1/4 NPT	16 (35.3)
EFBG-10	EFBGM-10Y-20★	1-1/2, 2 Flange Mounting	EFBGM-10Y-2080★	1-1/2, 2 Flange Mounting	EFBGM-10Y-2090★	1-1/2, 2 Flange Mounting	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.

★ When ordering the EFBGM-10Y, see Type F3 Pipe Flange Kits on [page 821](#) and order an appropriate pipe flange kit also.

**Instructions**

**Drain Back Pressure**

Check that the drain back pressure dose not exceed 0.2 MPa (29 PSI).

**When Relief Valve Passing Flow Rate is Low in Pressure Control State**

To avoid preselected pressure instability, use a passing flow rate of 15 L/min (4.0 U.S.GPM) or higher. Further, check that the tank-line back pressure dose not exceed 0.5 MPa (70 PSI).

**Safety Valve Pressure Setting**

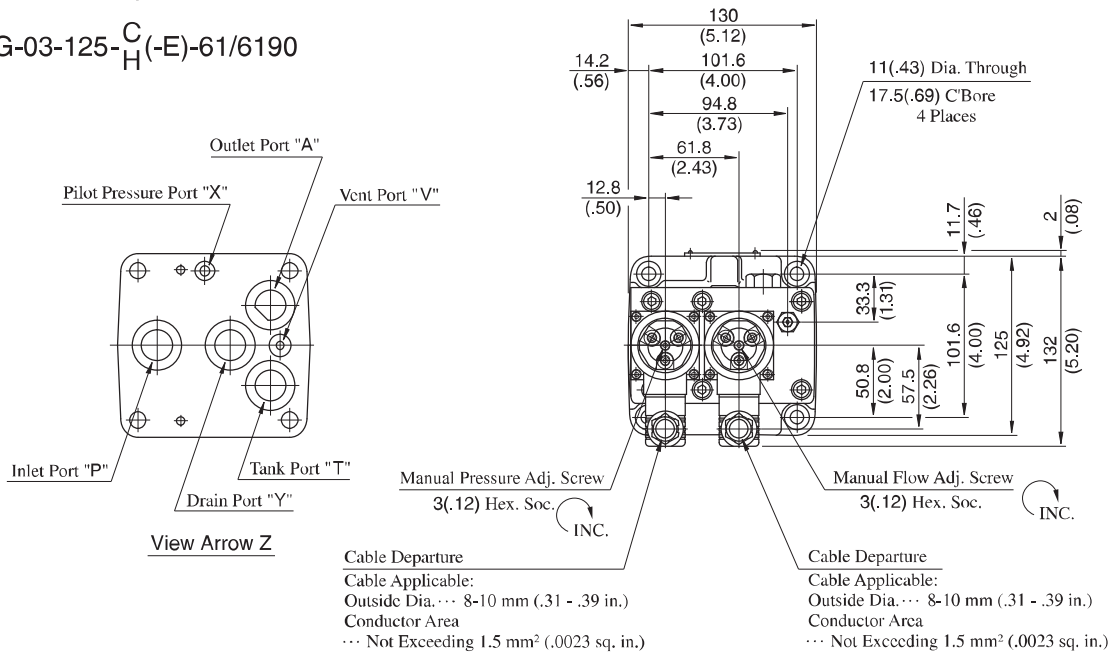
The pressure of the saffety valve is preset at the value equal to the upper limit of the pressure adjustment rengen plus 2 MPa (290 PSI). Please adjust the pressure of the valve so preset to meet the pressure to be used actually.

To lower the pressure setting, turn the safety valve pressure adjustment screw anti-clockwise. After adjustment, be sure to tighten the lock nut.



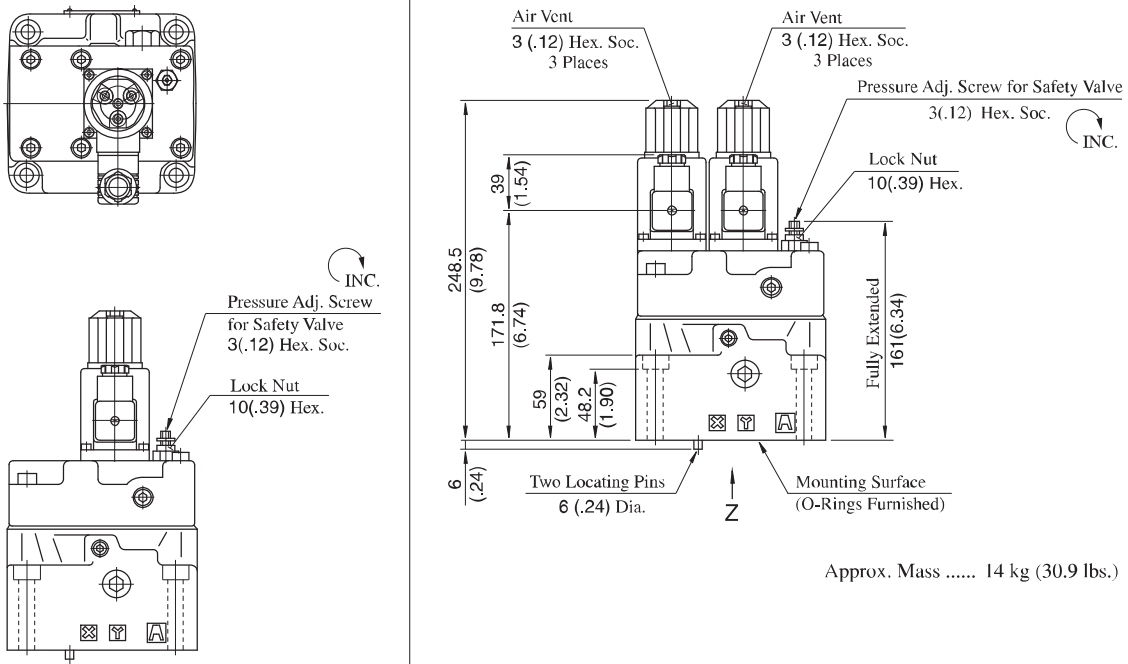
**Models with Proportional Pilot Relief Valve**

EFBG-03-125-<sup>C</sup><sub>H</sub>(-E)-61/6190



**Models without Proportional Pilot Relief Valve**

EFBG-03-125(-E)-61/6190



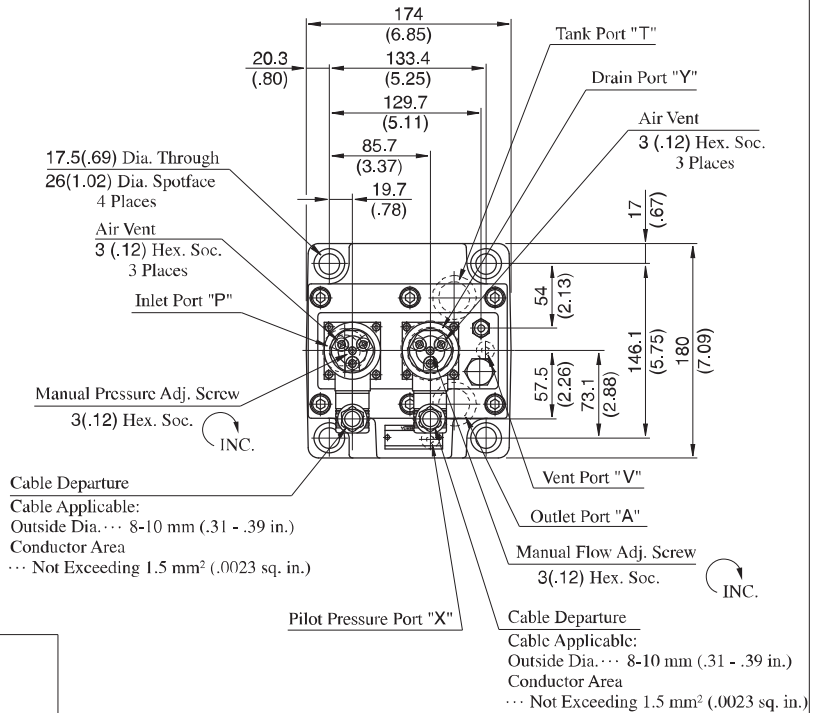
• For other dimensions, please refer to the models with Proportional Pilot Relief Valve.

Approx. Mass ..... 13.3 kg (29.3 lbs.)

**DIMENSIONS IN MILLIMETRES (INCHES)**

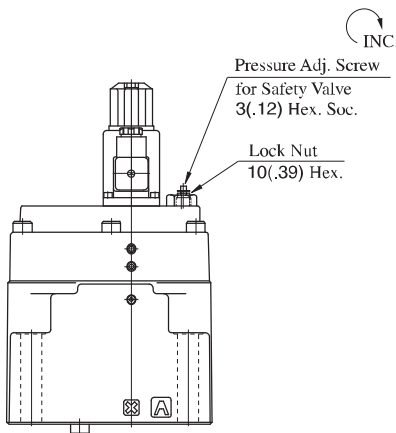
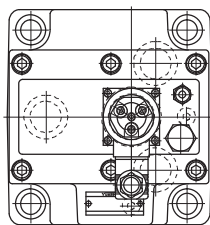
Models with Proportional Pilot Relief Valve

EFBG-06-250-<sup>C</sup><sub>H</sub>(-E)-61/6190



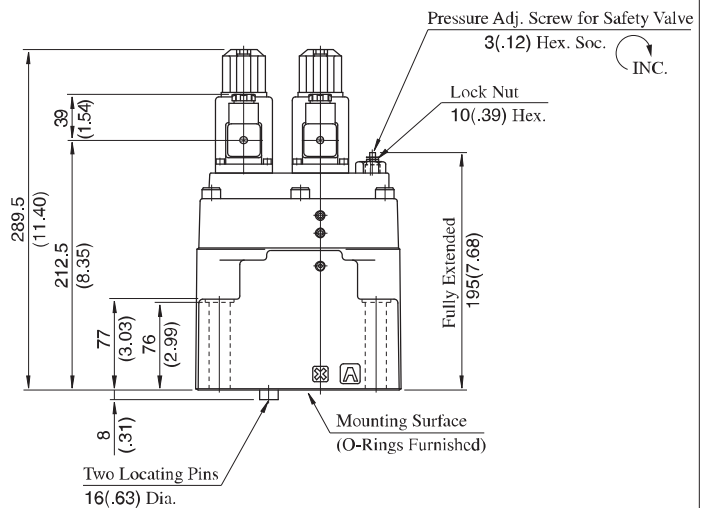
Models without Proportional Pilot Relief Valve

EFBG-06-250(-E)-61/6190



• For other dimensions, please refer to the models with Proportional Pilot Relief Valve.

Approx. Mass ..... 21.3 kg (47.0 lbs.)



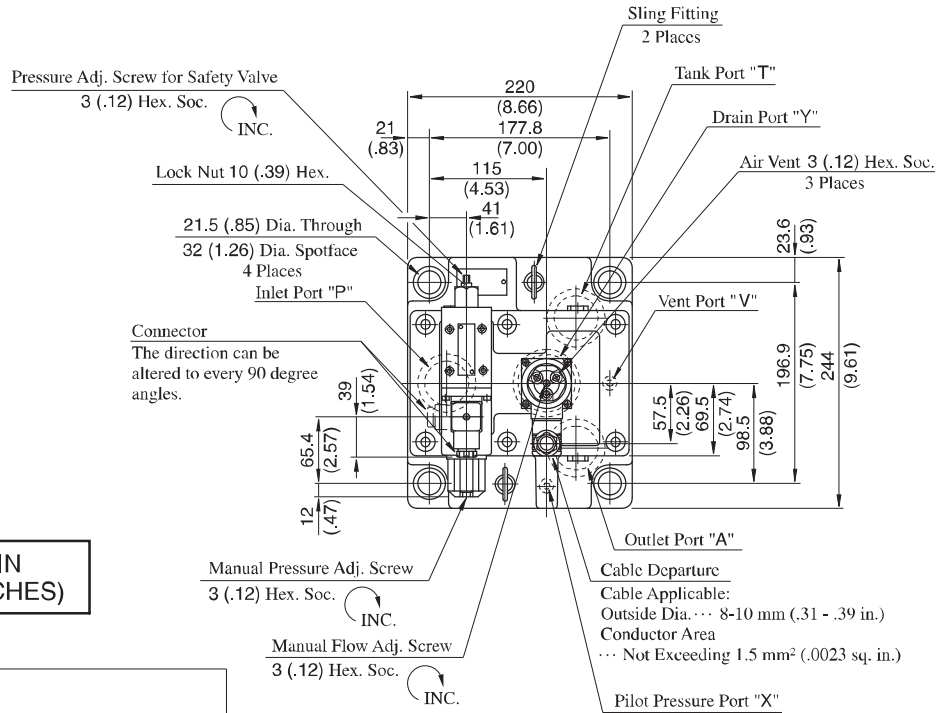
Approx. Mass ..... 22 kg (48.5 lbs.)

**DIMENSIONS IN MILLIMETRES (INCHES)**

**H**  
E Series  
10Ω-10Ω Series Flow Control and Relief Valves

Models with Proportional Pilot Relief Valve

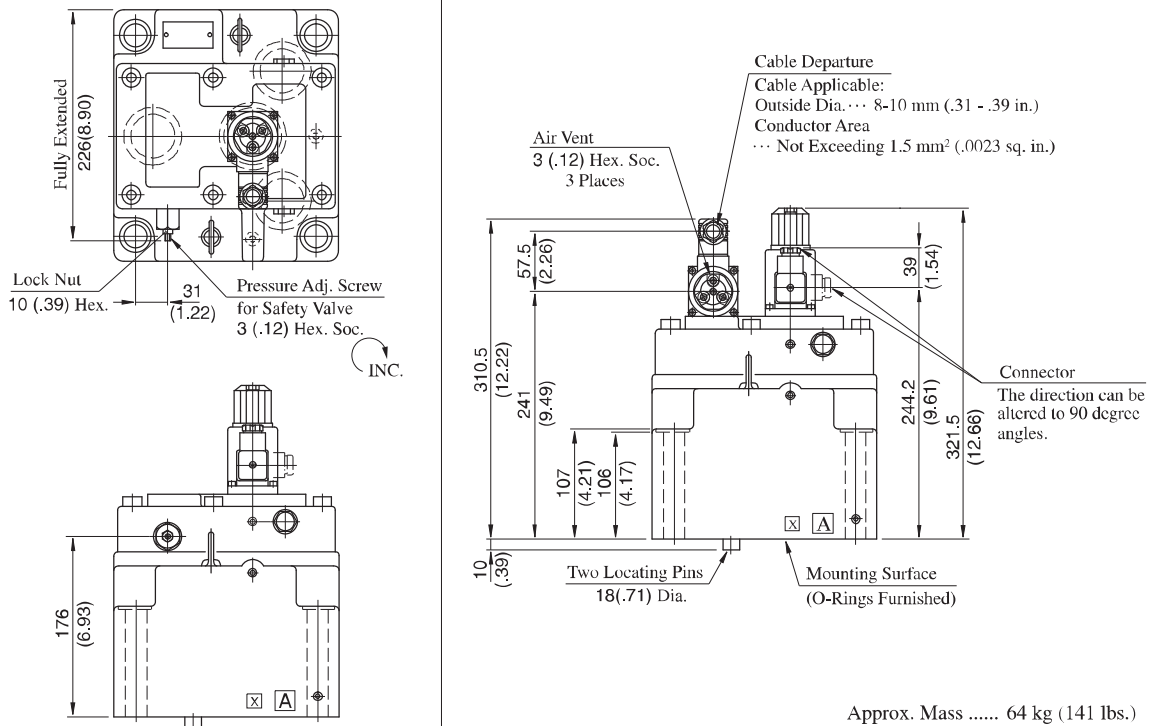
EFBG-10-500- $C_H$ (-E)-51/5190



**DIMENSIONS IN MILLIMETRES (INCHES)**

Models without Proportional Pilot Relief Valve

EFBG-10-500(-E)-51/5190

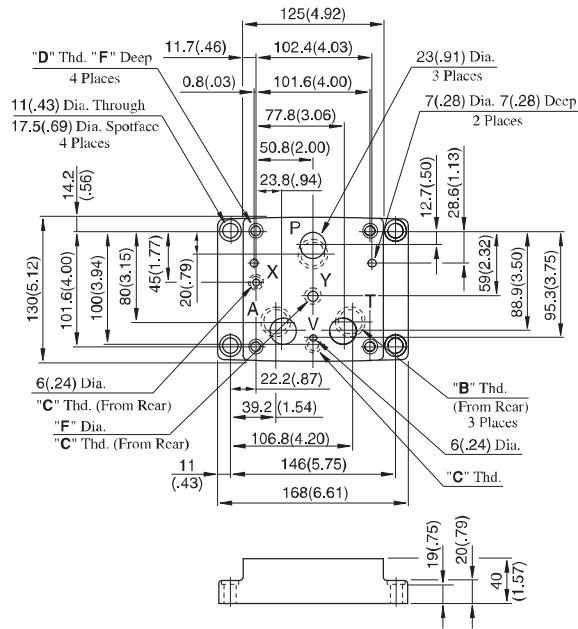


Approx. Mass ..... 64 kg (141 lbs.)

• For other dimensions, please refer to the models with Proportional Pilot Relief Valve.

Approx. Mass ..... 62 kg (137 lbs.)

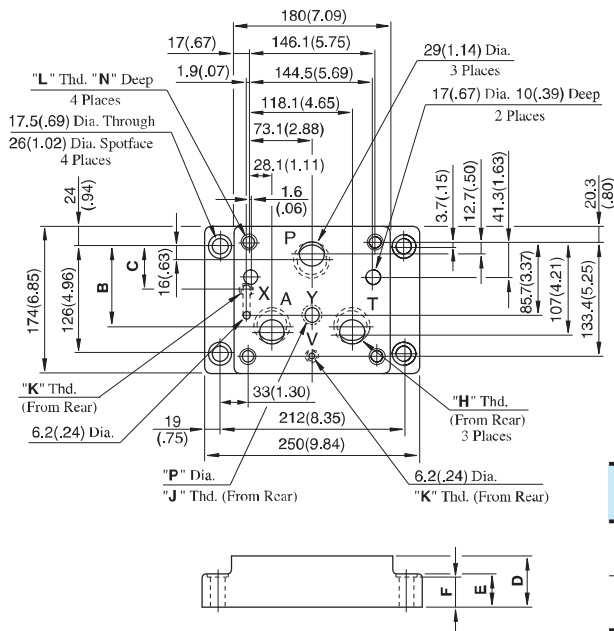
**Sub-plate**  
**EFBGM-03Y-20/2080/2090**  
**03Z**



Sub-plate Model Numbers	Thread Size			mm (in.)		
	"B" Thd.	"C" Thd.	"D" Thd.	E	F	
EFBGM-03Y-20	Rc 3/4	Rc 1/4	M10	18 (.71)	11 (.43)	
EFBGM-03Z-20	Rc 1				11.7 (.46)	
EFBGM-03Y-2080	3/4 BSP.F	1/4 BSP.F		3/8-16 UNC	21 (.83)	11 (.43)
EFBGM-03Z-2080	1 BSP.F					11 (.43)
EFBGM-03Y-2090	3/4 NPT	1/4 NPT	3/8-16 UNC		21 (.83)	11 (.43)
EFBGM-03Z-2090	1 NPT					11 (.43)

**DIMENSIONS IN MILLIMETRES (INCHES)**

**EFBGM-06X-20/2080/2090**  
**06Y**



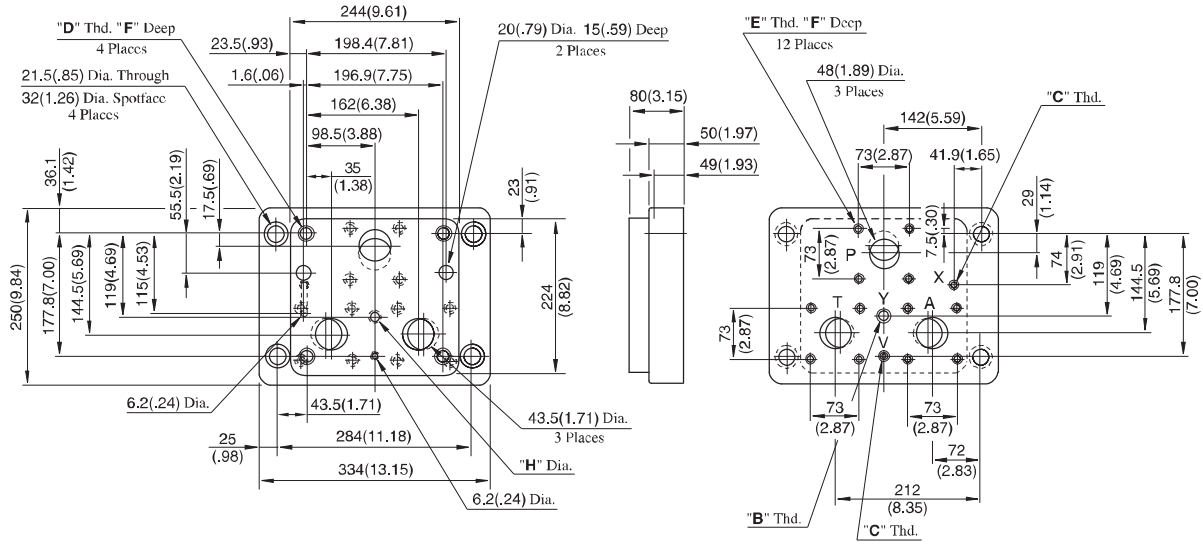
Sub-plate Model Numbers	Dimensions mm (in.)				
	B	C	D	E	F
EFBGM-06X	103.3 (4.07)	63.3 (2.49)	45 (1.77)	35 (1.38)	34 (1.34)
EFBGM-06Y	95 (3.74)	53.3 (2.10)	60 (2.36)	40 (1.57)	39 (1.54)

Sub-plate Model Numbers	Thread Size				mm (in.)	
	"H" Thd.	"J" Thd.	"K" Thd.	"L" Thd.	N	P
EFBGM-06X-20	Rc 1	Rc 3/8	Rc 1/4	M16	30 (1.18)	14 (.55)
EFBGM-06Y-20	Rc 1-1/4					
EFBGM-06X-2080	1 BSP.F	3/8 BSP.F	1/4 BSP.F		30 (1.18)	15.2 (.60)
EFBGM-06Y-2080	1-1/4 BSP.F					
EFBGM-06X-2090	1 NPT	3/8 NPT	1/4 NPT	35 (1.38)		14 (.55)
EFBGM-06Y-2090	1-1/4 NPT					

**H**  
**E Series**  
**10Ω-10Ω Series Flow Control and Relief Valves**

EFBGM-10Y-20/2080/2090

**DIMENSIONS IN MILLIMETRES (INCHES)**



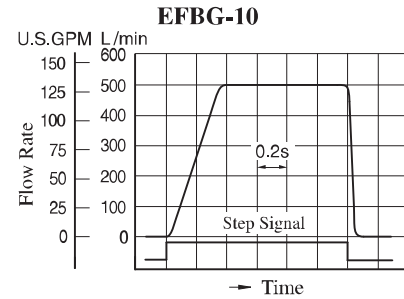
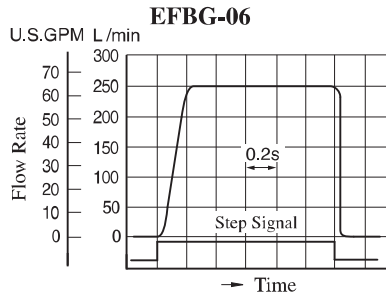
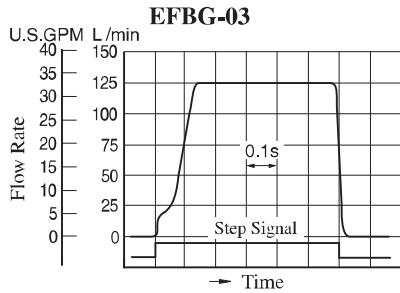
Sub-plate Model Numbers	Thread Size				mm (in.)	
	"B" Thd.	"C" Thd.	"D" Thd.	"E" Thd.	F	H
EFBGM-10Y-20	Rc 3/8	Rc 1/4	M20	M16	32(1.26)	14(.55)
EFBGM-10Y-2080	3/8 BSPF	1/4 BSPF				15.2(.60)
EFBGM-10Y-2090	3/8 NPT	1/4 NPT	3/4-10 UNC	5/8-11 UNC	34(1.34)	14(.55)

**Step Response**

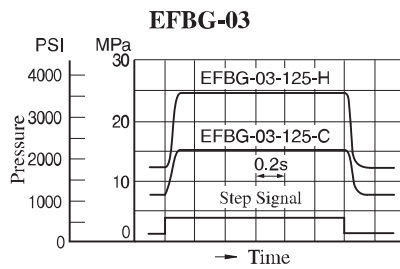
These characteristics have been obtained by measuring on each valve. Therefore, they may vary according to a hydraulic circuit to be used.

Viscosity: 30 mm<sup>2</sup>/s (141 SSU)

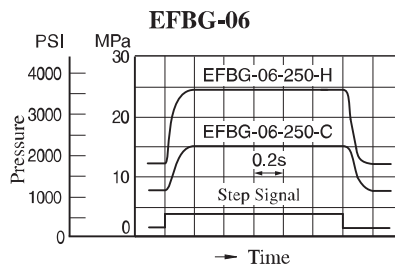
**Flow Controls**



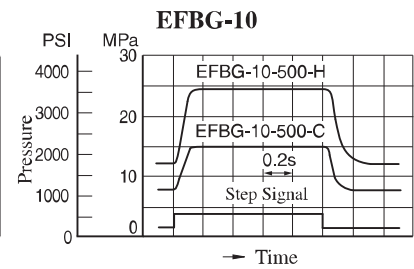
**Pressure Controls**



Flow Rate : 125 L/min (33 U.S.GPM)  
Trapped Oil Volume : < 1 L (.264 U.S.Gallons)



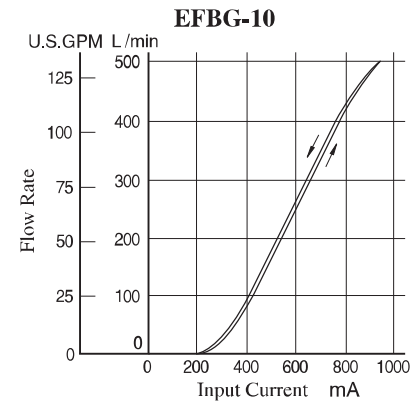
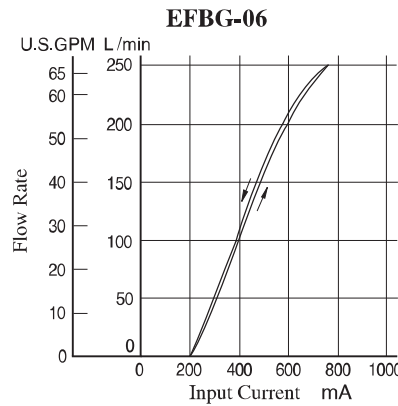
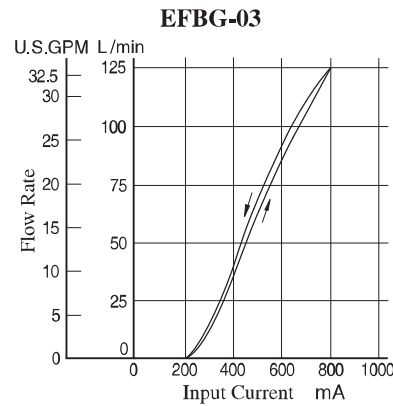
Flow Rate : 250 L/min (66 U.S.GPM)  
Trapped Oil Volume : < 1 L (.264 U.S.Gallons)



Flow Rate : 500 L/min (132 U.S.GPM)  
Trapped Oil Volume : < 1 L (.264 U.S.Gallons)

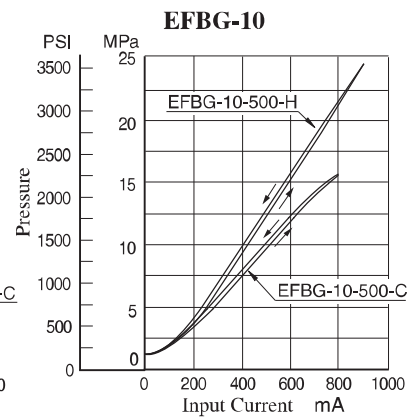
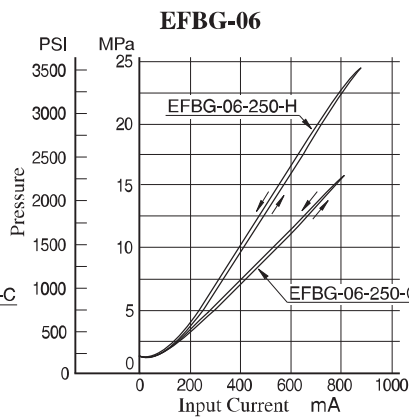
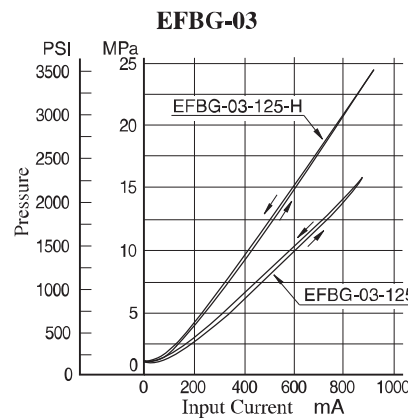
**Input Current vs. Flow**

Viscosity: 30 mm<sup>2</sup>/s (141 SSU)



**Input Current vs. Pressure**

Viscosity: 30 mm<sup>2</sup>/s (141 SSU)

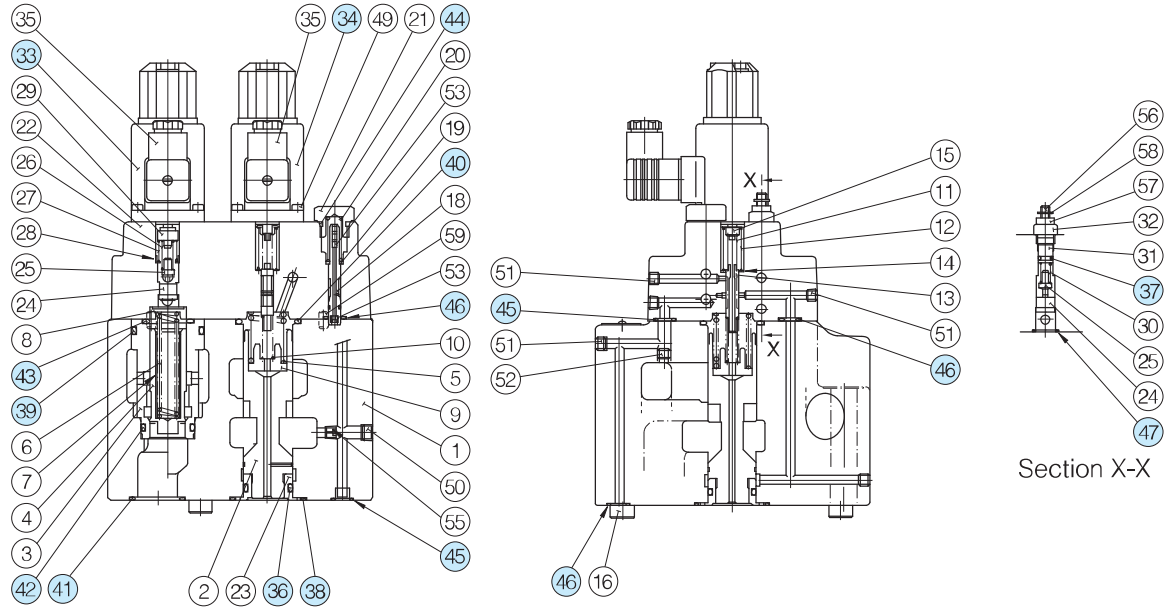


**E Series**  
10Ω-10Ω Series Flow Control and Relief Valves



■ List of Seals and Solenoid Ass'y

EFBG-03-125-\*-61/6190  
 EFBG-06-250-\*-61/6190



● List of Seals

Item	Name of Parts	EFBG-03		EFBG-06	
		Part Numbers	Qty.	Part Numbers	Qty.
36	O-Ring	SO-NA-A016	1	SO-NA-P26	1
37	O-Ring	SO-NA-P6	1	SO-NA-P6	1
38	O-Ring	SO-NB-P28	1	SO-NB-P44	1
39	O-Ring	SO-NB-P32	1	SO-NB-P42	1
40	O-Ring	SO-NB-P28	1	SO-NB-P36	1
41	O-Ring	SO-NB-P28	3	SO-NB-P32	3
42	O-Ring	SO-NB-G30	1	SO-NB-P30	1
43	O-Ring	SO-NB-P28	1	SO-NB-P28	1
44	O-Ring	SO-NB-P15	1	SO-NB-P15	1
45	O-Ring	SO-NB-P11	2	SO-NB-P11	2
46	O-Ring	SO-NB-P9	5	SO-NB-P11	4
47	O-Ring	SO-NB-A016	1	SO-NB-A016	1

● List of Seal Kits

Valve Model Numbers	Seal Kit Numbers
EFBG-03-125-61*	KS-EFBG-03-61
EFBG-03-125-C/H-61*	KS-EFBG-03-C-61
EFBG-06-250-61*	KS-EFBG-06-61
EFBG-06-250-C/H-61*	KS-EFBG-06-C-61

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

In addition to the above o-rings, seals for solenoid ass'y are included in the seal kit.

For the details of seals for solenoid ass'y (33) and (34) see page 674.

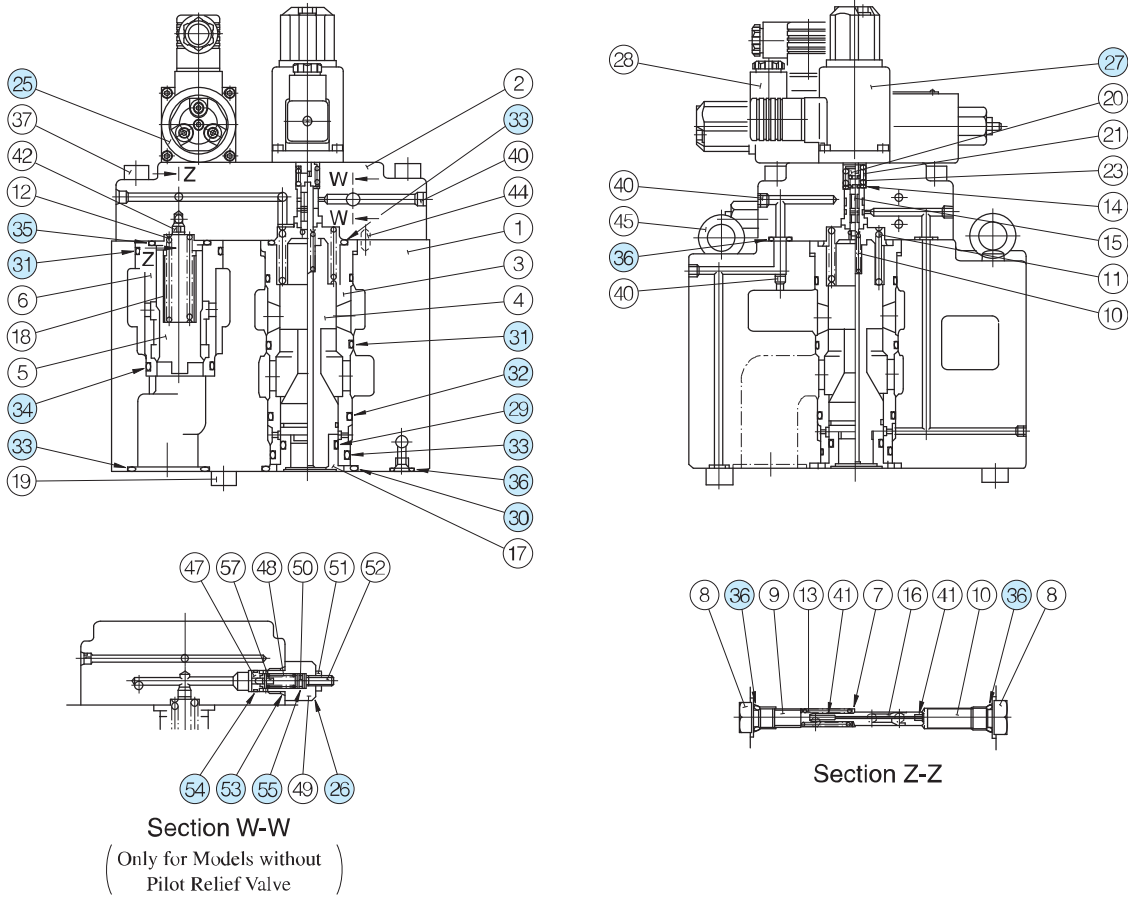
● Solenoid Ass'y

Valve Model Numbers	(33) Solenoid Ass'y Model Numbers	(34) Solenoid Ass'y Model Numbers
EFBG-03-125-C/H(-E)-61/6190	E318-Y06M1-04-61	E318-Y06M1-28-61
EFBG-06-250-C/H(-E)-61/6190		
EFBG-03-125(-E)-61/6190 EFBG-06-250(-E)-61/6190	—	

Note: The connector assembly GDM-211-B-11 (Item 35) is not included in the solenoid assembly.

■ List of Seals, Pilot Valves, Solenoid Ass'y and Safety Valve

EFBG-10-500-\*\*-51/5190



● List of Seals

Item	Name of Parts	Part Numbers	Qty.	
			Models with Pilot Relief Valve	Models without Pilot Relief Valve
29	O-Ring	SO-NA-P34	1	1
30	O-Ring	SO-NB-G60	1	1
31	O-Ring	SO-NB-G55	3	3
32	O-Ring	SO-NB-P50	1	1
33	O-Ring	SO-NB-P48	5	5
34	O-Ring	SO-NB-P42	1	1
35	O-Ring	SO-NB-P36	1	1
36	O-Ring	SO-NB-P11	8	8
53	O-Ring	SO-NB-P14	—	1
54	O-Ring	SO-NB-A013	—	1
55	O-Ring	SO-NA-P6	—	1

● List of Seal Kits

Valve Model Numbers	Seal Kit Numbers
EFBG-10-500-51*	KS-EFBG-10-51
EFBG-10-500-C/H-51*	KS-EFBG-10-C-51

Note: When ordering seals, please specify the seal kit number from the table right. In addition to the above o-rings, seals for pilot valve and solenoid ass'y are included in the seal kit. For the detail of the pilot valve and solenoid ass'y seals, see [page 674](#).

● Pilot Valve, Solenoid Ass'y and Safety Valve

Valve Model Numbers	②⑤ Pilot Valve Model Numbers	②⑦ Solenoid Ass'y Model No.	②⑥ Safety Valve Model No.
EFBG-10-500-C(-E)-51/5190	EDG-01V-C-1-PNT12-5103	E318-Y06M1-28-61	—
EFBG-10-500-H(-E)-51/5190	EDG-01V-H-1-PNT12-5103		—
EFBG-10-500(-E)-51/5190	—		SB1094-2002

Note: The connector assembly GDM-211-B-11 (Item 28) is not included in the solenoid assembly.

### Interchangeability between Current and New Design

Model changes have been made from 50, 51 to 61 design in the EFBG-03/06 because of changes in the pilot valve building-in method and model changes have been made from 50 to 51 design in the EFBG-10 because of improvement in Solenoid Ass'y.

- Specification and Characteristics**

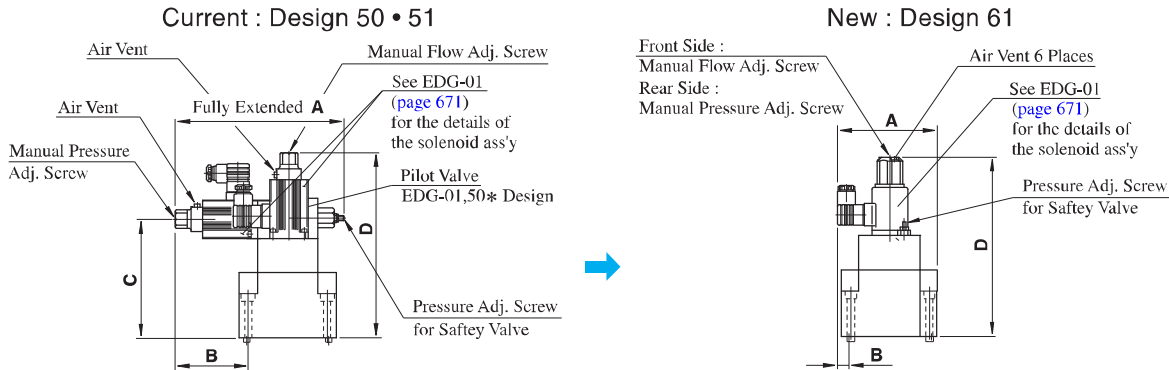
No changes in specifications and characteristics between current and new design

- Interchangeability in Installation**

- EFBG-03/06

50\* • 51\* Design → 61\* Design

The mounting surface are interchangeable. However, the method of building in the pilot valve has been changed, bringing about changes in the appearance shapes and dimensions as shown below.



Model Numbers	A	B	C	D
(Current) EFBG-03-125-*-* 50/5090 51/5190	217 (8.54)	93.2 (3.67)	155 (6.10)	236.5 (9.31)
(New) EFBG-03-125-*-* 61/6190	132 (5.20)	18.7 (.74)	—	248.5 (9.78)
(Current) EFBG-06-250-*-* 50/5090 51/5190	217 (8.54)	53.3 (2.10)	196 (7.72)	277.5 (10.93)
(New) EFBG-06-250-*-* 61/6190	180 (7.09)	—	—	289.5 (11.40)

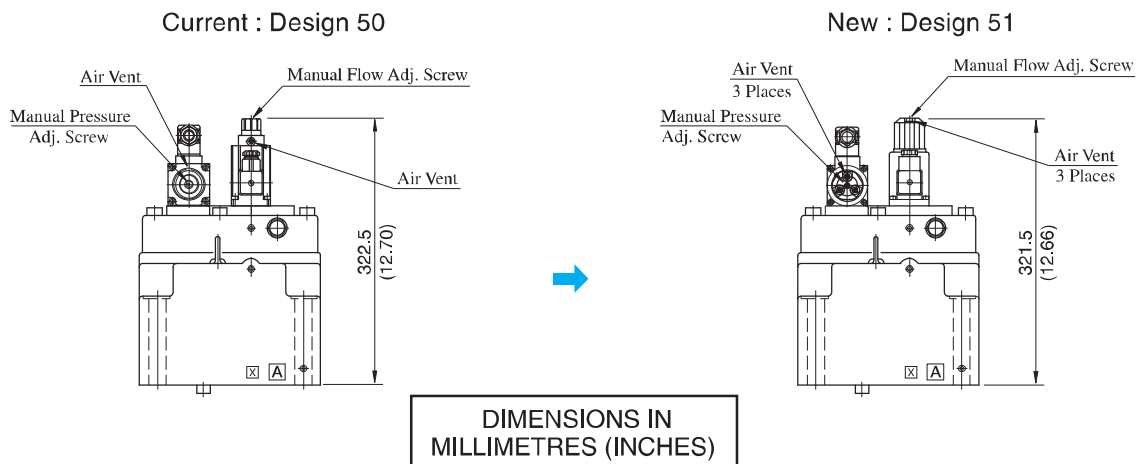
60\* Design → 61\* Design

The mounting surface are interchangeable. There are no changes in the appearance shapes and dimensions.

- EFBG-10

Mounting compatibility is provided.

Note that because of improvements made on the solenoids, the overall shapes have been changed as shown below.



# High Flow Series Proportional Electro-Hydraulic Flow Control and Relief Valves

This flow control and relief valve is an energy-saving valve that supplies the minimum pressure and flow necessary for actuator drive.

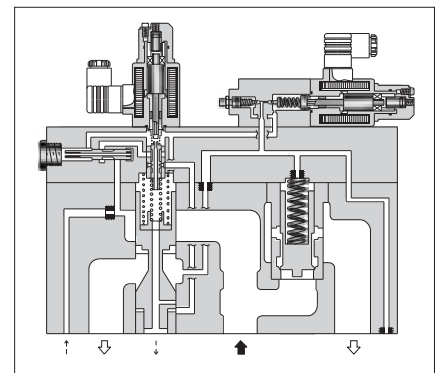
For the High Flow Series, double maximum flow rate [03 size: 125→250 L/min (33.03→66.05 U.S.GPM), 06 size: 250→500 L/min (66.05→132.1 U.S.GPM), 10 size: 500→1000 L/min (132.1→264.2 U.S.GPM)] enables a smaller valve size than conventional products; compact-sized devices can be provided.

## Specifications

Model No.		EFBG-03 -250-*-*-51*	EFBG-06 -500-*-*-51*	EFBG-10 -1000-*-*-51*
Description				
Max. Operating Pressure MPa (PSI)		24.5 (3550)	24.5 (3550)	24.5 (3550)
Max. Flow L/min (U.S.GPM)		250 (66)	500 (132)	1000 (264)
Metred Flow Adjustment Range L/min (U.S.GPM)		2.5-250 (.66-66)	5-500 (1.32-132)	10-1000 (2.64-264)
Min. Pilot Pressure MPa (PSI)		1.5 (220)	1.5 (220)	1.5 (220)
Pilot Flow L/min (U.S.GPM)		at Normal 1 (.26)	at Normal 1 (.26)	at Normal 4.5 (1.19)
		at Transition 4 (1.06)	at Transition 6 (1.59)	at Transition 10.0 (2.64)
Flow Controls	Rated Current	830 mA	780 mA	830 mA
	Coil Resistance	10 Ω	10 Ω	10 Ω
	Differential Pressure MPa (PSI)	0.8 (115)	0.9 (130)	1.2 (174)
	Hysteresis	3% or less	3% or less	3% or less
	Repeatability	1% or less	1% or less	1% or less
Pressure Controls *1	Pres. Adj. Range MPa (PSI)	C: 1.6-15.7 (230-2275) H: 1.8-24.5 (260-3550)	C: 1.5-15.7 (220-2275) H: 1.5-24.5 (220-3550)	C: 1.1-15.7 (160-2275) H: 1.1-24.5 (160-3550)
	Rated Current	C: 850 mA H: 870 mA	C: 800 mA H: 900 mA	C: 900 mA H: 950 mA
	Coil Resistance	10 Ω	10 Ω	10 Ω
	Hysteresis	3% or less	3% or less	3% or less
	Repeatability	1% or less	1% or less	1% or less
	Approx. Mass kg (lbs.)	Refer to <a href="#">page 735 to 737</a>		

★1. The specifications for pressure controls are applied to models with proportional pilot relief valve. (Ex. EFBG-03-250-C-\*-51)

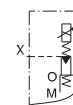
★2. The maximum pressure adjustment range of the valves without proportional pilot relief valves is 24.5 MPa (3550 PSI).



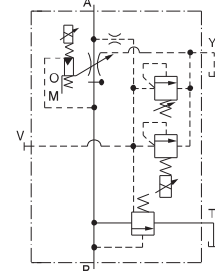
## Graphic Symbols

With Proportional Pilot Relief Valve

External Pilot

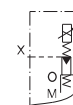


Internal Pilot

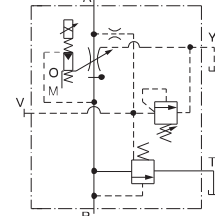


Without Proportional Pilot Relief Valve

External Pilot



Internal Pilot



H  
**E Series**  
 High Flow Series Flow Control and Relief Valves