

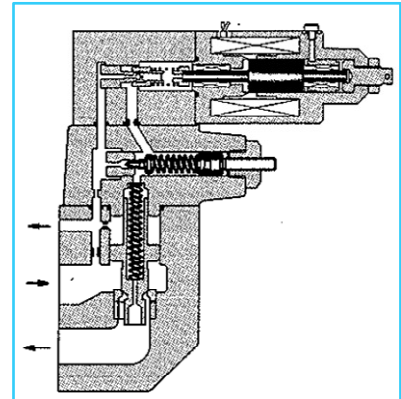
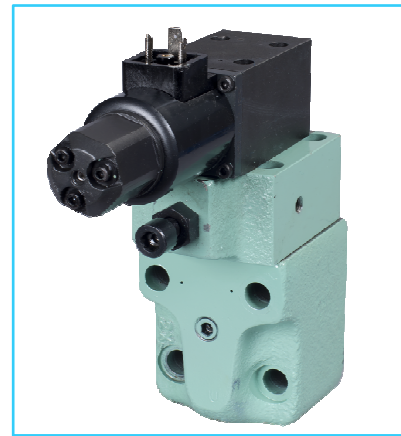
■ Proportional Electro-Hydraulic Relief Valves

The electro hydraulic relief valve is designed for compactness and high efficiency. The valve provides fast proportional response to the input current. For linear pressure control a special venting feature is incorporated with good stability & low hysteresis.

■ Specification

Model Number		EBG-03	EBG-06
Item			
Max. Operating Pres.	Kgf/cm ²	210	
Rated Flow	L/min.	80	170
Pressure Adjustment Range	Kgf/cm ²	Refer Model No. Designation	
Rated Current	mA	EBG-03-C : 750 EBG-03-H : 850	EBG-06-C : 700 EBG-06-H : 800
Coil Resistance	Ω	10	10
Hysteresis *1		Less than 3%	Less than 3% (Note1)
Repeatability *2		Less than 1%	
Frequency Response	Hz	Refer Page 561	
Mass (Approx.)	Kg.	5.6	6.3

Note : 1. Under the condition of using with YUKEN amplifier.
2. The figure is only valve under the same condition.



■ Model Number Designation

EB	G	-03	-C	-11
Series No.	Type of Mounting	Valve Size	Pr. Adjustment Range Kgf/cm ² *1	Design No.
EB: Prop. Electro Hydraulic Relief Valve	G: Sub Plate Mounting	03	Note C: ※ ~ 140 H: ※ ~ 210	11
		06		11

*1. For Min. Adj. Pressure Please refer Page No.561

■ Attachment

● Mounting Bolts

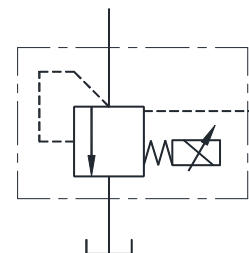
Model No.	Socket Head Cap Screw	Qty.	Bolt Kit Ordering Code
EBG-03	M12 x 70Lg.	02	BKBG-03-10
	M12 x 95Lg.	02	
EBG-06	M16 x 60Lg.	02	BKBG-06-10
	M16 x 80Lg.	02	

■ Power Amplifier For EBG

Model No.

- PW100-※-H11 (YIL make) Refer EIC-H-1008
- AME-D-10-※-20
- AME-D2-1010-11
- SK1022-※-※-11
- SK1015-11 (For DC Power supply)
- AMN-D-10 (For DC Power supply)

Graphic Symbol



● Sub-Plate

Valve Model Number	Sub-Plate Model number.	Piping BSP.F	Mass Kg.
EBG-03	BGM-03-30	3/8	2.4
	BGM-03x-30	1/2	3.1
EBG-06	BGM-06-30	3/4	4.7
	BGM-06x-30	1	5.7

- When ordering , please specify model number according to the above table. When not using sub-plate, please make suitable mounting surface.
- Sub-Plates are same as applicable to pilot operated relief valve. Ref. EIC-C-1002.

● **Note**

● **Mounting**

Air vent should be in the top position
(Bleed position of air vent can be changed.
Refer below drawing).

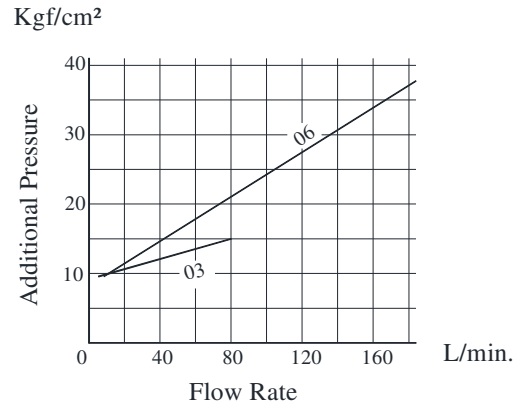
● **Air Vent**

The valve solenoid is of oil immersed design. To give better flow rate stability, fill the oil cavity in the solenoid body by loosening the air vent. Bleed all air from the inside of the solenoid.

● **Low Flow Rates**

A flow rate of 6 L/min or higher should be used to avoid preselected pressure instability.

- Safety valve setting pressure is given additional pressure 15 Kgf/cm² (03 size) or 39 Kgf/cm². (06 size) Max. at rated flow when maximum operation pressure. Further safety valve setting pressure is determined by max. operation pressure plus additional pressure in the graph.

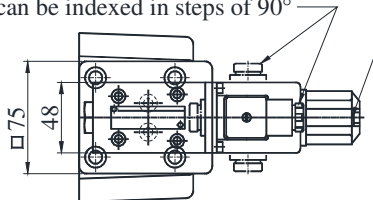


● **Tank Piping**

Do not connect to the other tank line. Connect directly to the tank and end of piping should be immersed in the oil.

● **EBG-03**
EBG-06

Positions of Cable outlets can be indexed in steps of 90°



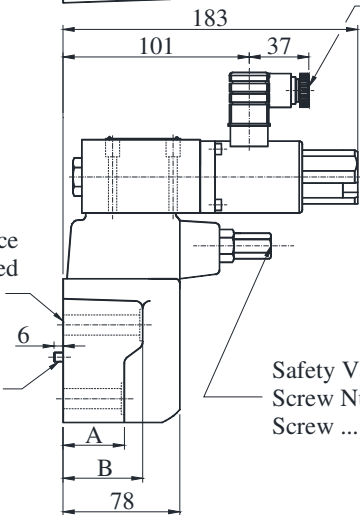
Manual Pressure Adjustment Screw 3 Hex. Soc.

Cable Outlets Suitable Cable OD...8 Dia. ~ 10 Dia.

Air Vent and Cable Connection can be indexed in Steps of 90° Increments when changing. Remove 4Nos. of Solenoid Mounting Bolt and then set in New Positions

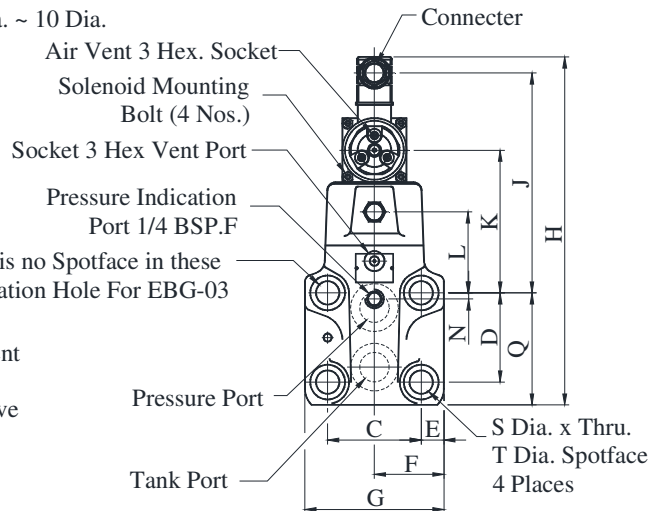
Mounting Surface O-Ring Furnished

Locating Pin 6 Dia.



Safety Valve Adjustment Screw Nut ... 14 Hex Screw 16mm Groove

There is no Spotface in these Installation Hole For EBG-03



Model No.	A	B	C	D	E	F	G	H	J	K	L	N	Q	S	T
EBG - 03	57	78	53.8	53.8	14.1	41	82	231.5	142	85	40	22	77	13.5	21
EBG - 06	40	60	70	66.7	17	52	104	225.5	159.5	102.5	57.5	4.5	88.5	17.5	26

Note : Valve Mounting Surface Dimension is the same as BG-03, BG-06

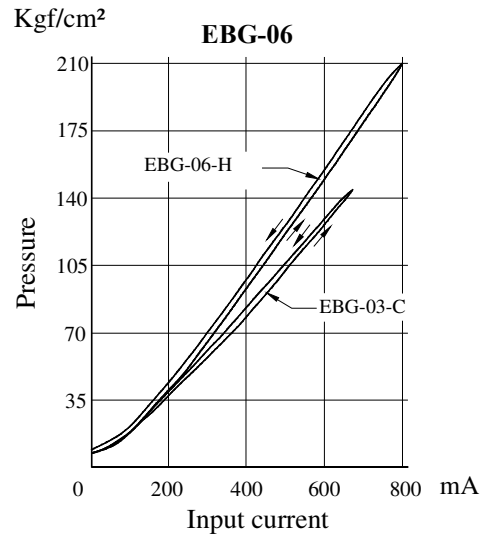
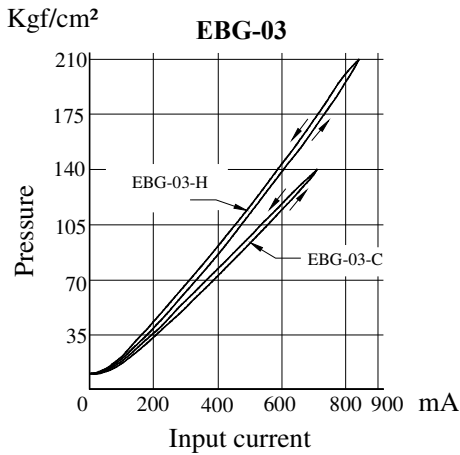
Sub Plate for EBG-03 ----- BGM-03 or 03X

EBG-06 ----- BGM-06 or 06X

E Series

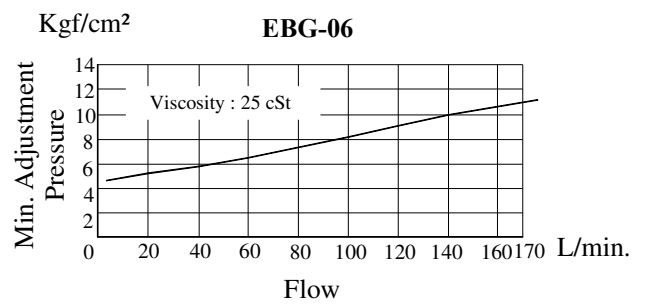
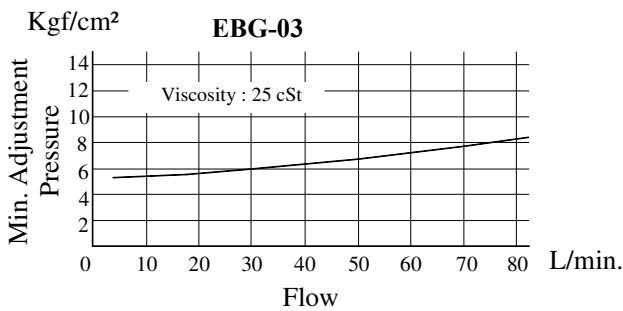
Proportional Electro-Hydraulic Relief Valve

Input Current vs Pressure

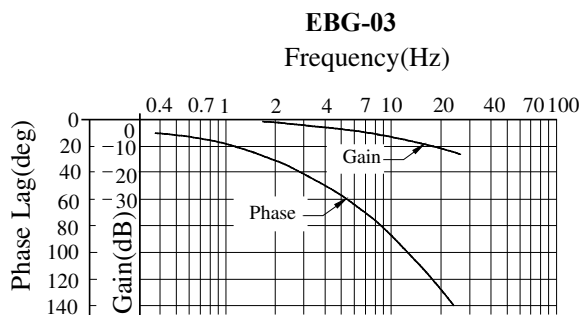


Note : Input current Error : Rating Input Current
50 mA at Rated Flow

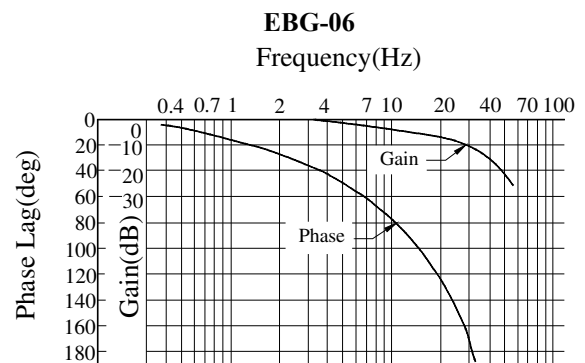
Min. Adjustment Pressure



Frequency Response



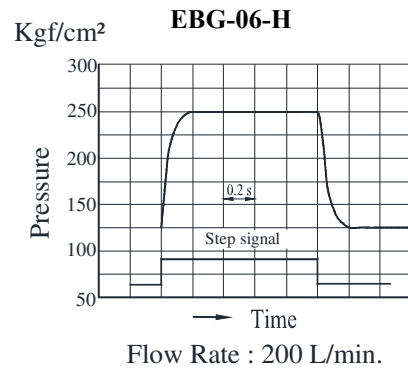
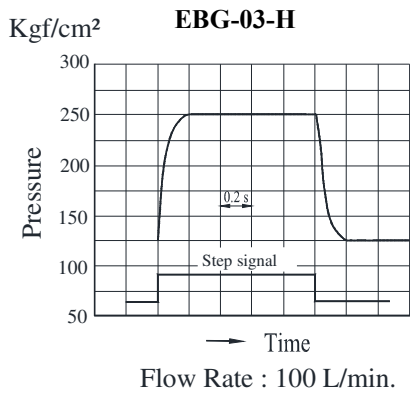
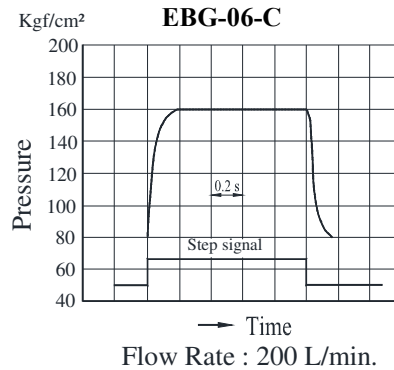
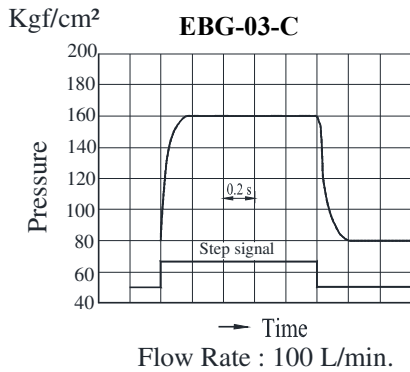
Input Current : 430 mA ± 80 mA
Loading Flow : 80 L/min.
Loading Volume : 3/4" Rubber Hose 1.5 m



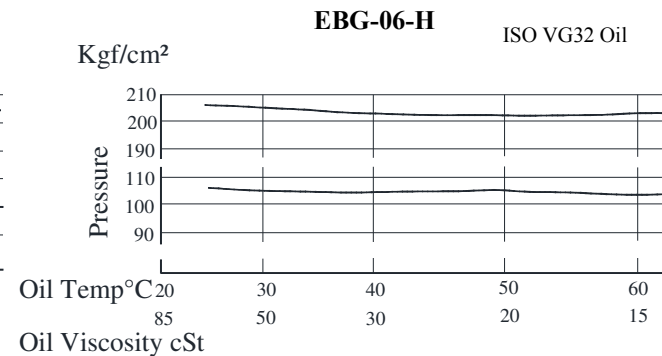
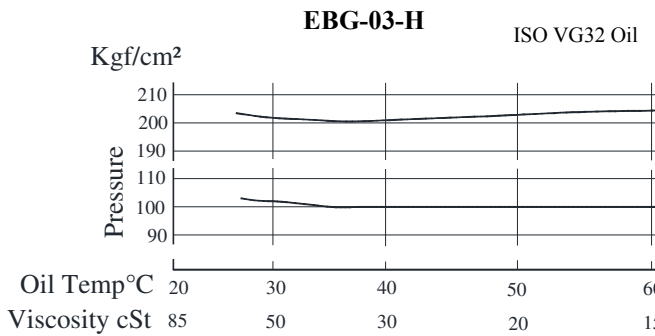
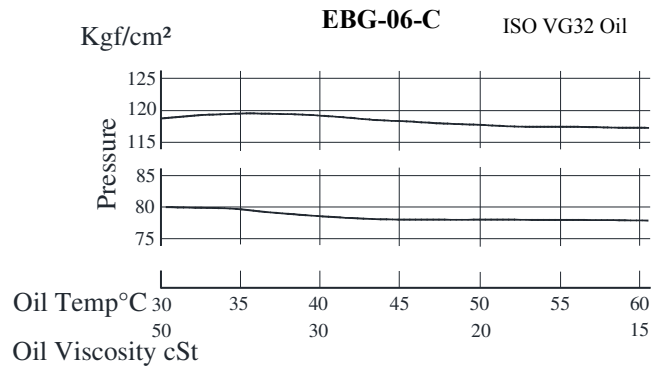
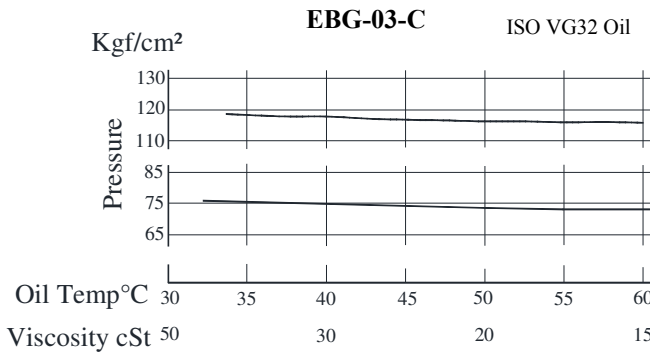
Input Current : 430 mA ± 80 mA
Loading Flow : 80 L/min.
Loading Volume : 3/4" Rubber Hose 1.5 m

Step Response Characteristic (Example)

(These characteristics are measured for valve itself so it is not much different in different circuit)



Viscosity vs Pressure Characteristic



■ Spare Parts List

● List of Seals

Sl. No.	Name of Parts	Part Number	Quantity	
			EBG-03	EBG-06
1	O-Ring	SO-NA-P9	1	1
2	O-Ring	SO-NB-P9	3	2
3	O-Ring	SO-NB-P11	-	1
4	O-Ring	SO-NB-P18	2	-
5	O-Ring	SO-NB-P28	-	2
6	O-Ring	SO-NB-P32	1	1

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

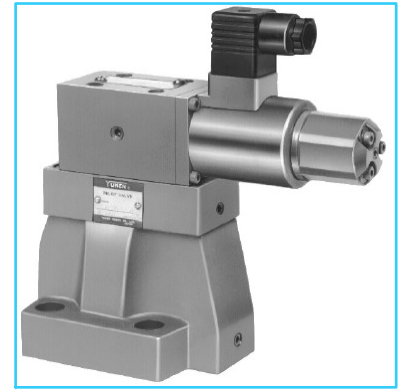
● List of Seal Kit

Model Numbers	Seal Kit Numbers
EBG-03	KS-EBG-03-11
EBG-06	KS-EBG-06-11

Proportional Electro-Hydraulic Relief Valves

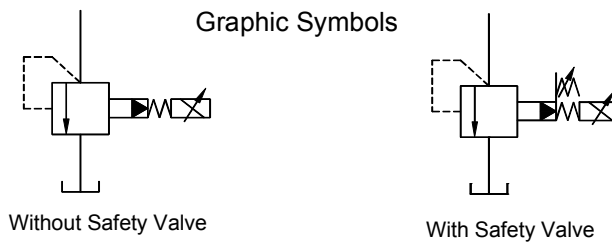
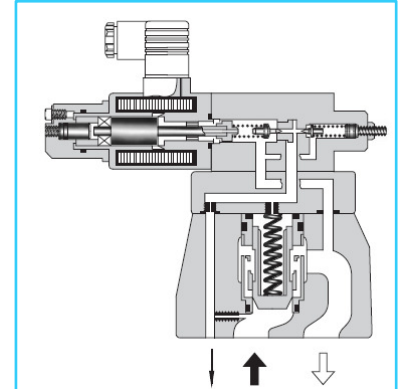
This valve is derived by combining a small, high-performance 1/8 proportional electro-hydraulic pilot relief valve with a specially developed low-noise relief valve.

With this valve, it is possible to regulate the system pressure in proportion to the input current. Note that this valve is used in conjunction with the applicable power amplifier.



Specification

Model Numbers		EBG-03	EBG-06	EBG-10
Description				
Max. Operating Pres.	Kgf/cm ²	250		
Max. Flow	L/min.	100	200	400
Min. Flow	L/min.	3		
Pressure Adj. Range	Kgf/cm ²	Refer to Model Number Designation		
Rated Current	mA	C : 770 H : 820	C : 750 H : 800	C : 730 H : 780
Coil Resistance	Ω	10		
Hysteresis		3% or less		
Repeatability		1% or less		
Approx. Mass	Kg.	5.6	6.3	10



Model Number Designation

F-	EB	G	-03	-C	-T	-51
Special Seals	Series Number	Type of Mounting	Valve Size	Pressure Adj. Range Kgf/cm ²	Safety Valve	Design Number
F: Special Seals for Phosphate Ester Type Fluid (Omit if not required)	EB: Proportional Electro-Hydraulic Relief Valve	G: Sub-Plate Mounting	03 06 10	C: ※ ^{*1} - 160 H: ※ ^{*1} - 250	None: With Safety Valve T: Without Safety Valve	51

*1. Min. adjustment pressure shall be referred to the curves on page no. 568.

Attachment

Mounting Bolts

Valve Model Numbers	Socket Head Cap Screw	Bolt Kit Model Number	Qty.
EBG-03	M12 x 40Lg.	BKEBG-03-51	4
EBG-06	M16 x 50Lg.	BKEBG-06-51	4
EBG-10	M20 x 60Lg.	BKEBG-10-51	4

Applicable Power Amplifiers

For stable performance, it is recommended that Yuken’s applicable power amplifiers be used (for details see page no. 697, 701, 710)

Model Numbers: AME-D-10-*-20
 AME-D2-1010-11
 SK1022-*-*-11

SK1015-11 (For DC power supply)
 AMN-D-10 (For DC power supply)

Sub-plate

Valve Model Numbers	Sub-Plate Model Numbers	Thread Size	Approx. Mass Kg
EBG-03	BGM-03-3080	3/8 BSP.F	2.4
	BGM-03X-3080	1/2 BSP.F	3.1
EBG-06	BGM-06-3080	3/4 BSP.F	4.7
	BGM-06X-3080	1 BSP.F	5.7
EBG-10	BGM-10-3080	1-1/4 BSP.F	8.4
	BGM-10X-3080	1-1/2 BSP.F	10.3

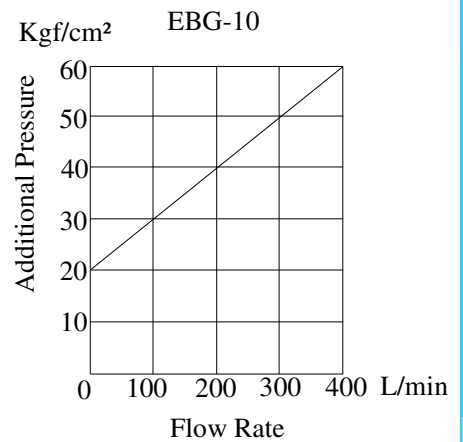
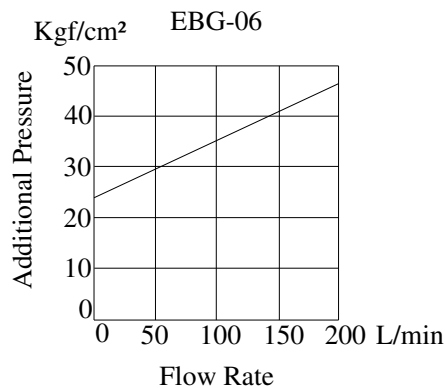
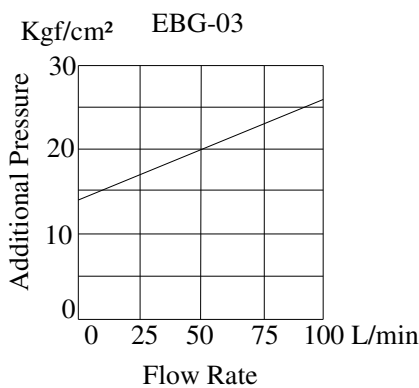
- Sub-plates are available. Specify the sub-plate model numbers from table above. When sub-plates are not used, the mounting surface should have a good machined finish.
- Sub-plates are those for pilot operated relief valves. Dimensions, see page 272.

Instructions

Safety valve

The pressure of the safety valve for EBG-03 is preset at the value equal to the upper limit of the pressure adjustment range plus 20 Kgf/cm² subject to a flow rate of 50 L/min.
 The same for EBG-06 is preset at the value equal to the upper limit of the pressure adjustment range plus 35 Kgf/cm² subject to a flow rate of 100 L/min.
 The same for EBG-10 is preset at the value equal to the upper limit of the pressure adjustment range plus 40 Kgf/cm² subject to a flow rate of 200 L/min.
 In case where the upper limit of operating pressure is low or the upper limit of flow rate to be used is different from the specified maximum flow, please adjust and determine the setting pressure of the safety valve at the value calculated from the following formula.

$$\text{Setting pressure} = (\text{Operating pressure upper limit}) + (\text{Additional pressure indicated below})$$



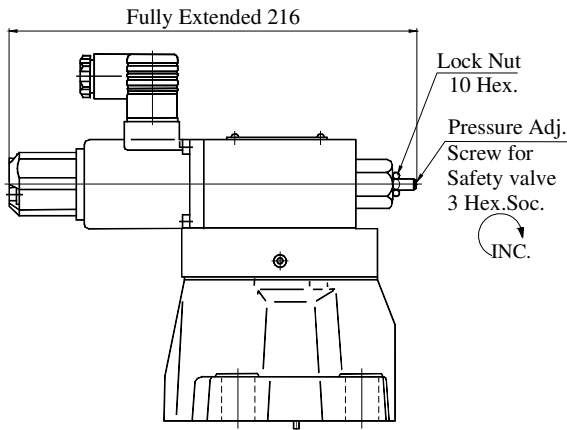
To lower the setting pressure, turn the safety valve pressure adjustment screw anti-clockwise. After adjustment, be sure to tighten the lock nut.

● **EBG-03-06** *-51

With Safety Valve

Mounting Surface
 EBG-03 : ISO 6264-AR-06-2-A
 EBG-06 : ISO 6264-AS-08-2-A

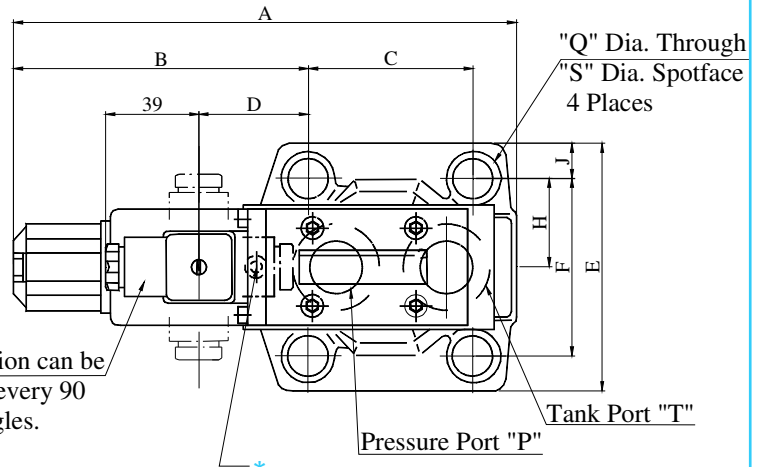
DIMENSIONS IN MILLIMETRES



*For other dimensions, refer to the without safety valve

● **EBG-03-06** *-T-51

Without Safety Valve

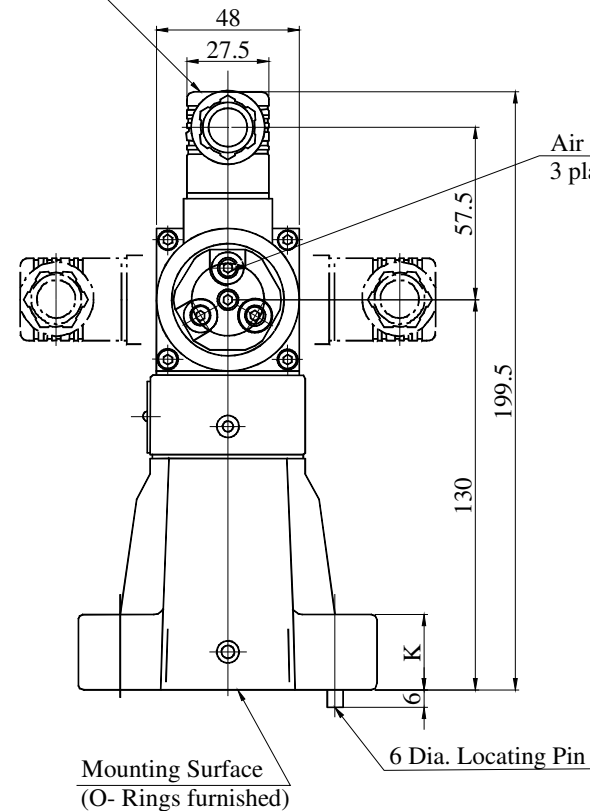


The direction can be altered to every 90 degree angles.

* This port is not used. It is provided because of the common use of the body with the low-noise type pilot operated relief valve. On the sub-plate, plug the port which corresponds to this port.

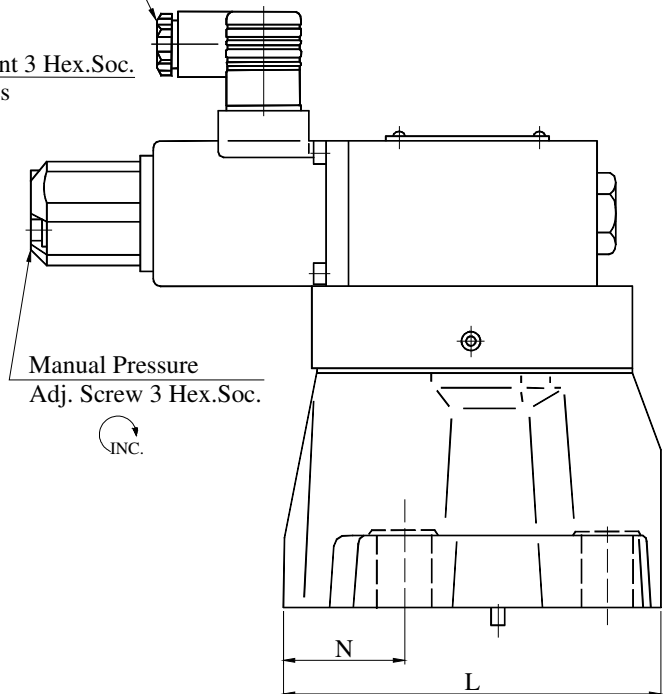
Connector

(The direction can be altered to every 90 degree angles.)



Cable Departure

Cable Applicable : Outside Dia. 8-10mm
 Conductor Area : Not Exceeding 1.5mm²



Model No.	Dimensions mm												
	A	B	C	D	E	F	H	J	K	L	N	Q	S
EBG - 03	197.5	117.6	53.8	40.3	76	53.8	26.9	11.1	21.5	106	26.1	13.5	21
EBG - 06	205.5	119.5	66.7	42.1	98	70	35	14	26	122	36	17.5	26

Note: For valve mounting surface dimensions, see the dimensional drawings of sub-plates (p.272) in common use.

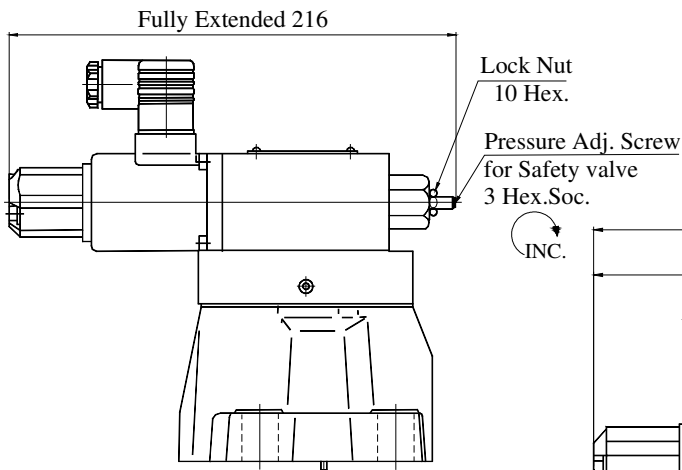
E Series

Proportional Electro-Hydraulic Relief Valves

● **EBG-10-*51**
With Safety Valve

Mounting Surface:
ISO 6264-AT-10-2-A

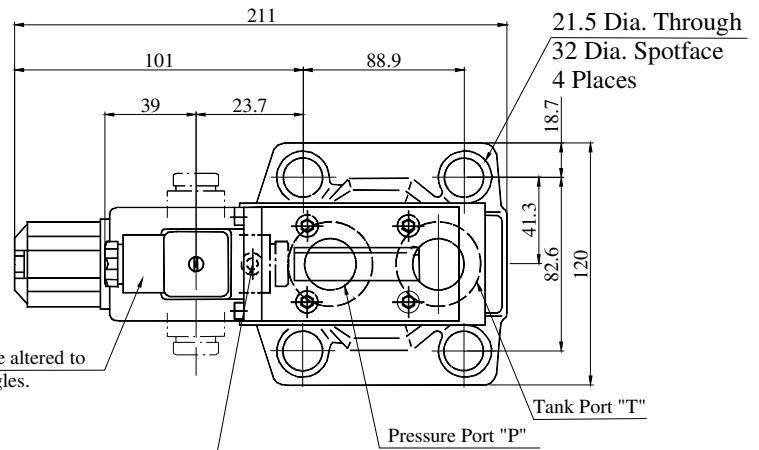
DIMENSIONS IN
MILLIMETRES



*For other dimensions, refer to the without safety valve

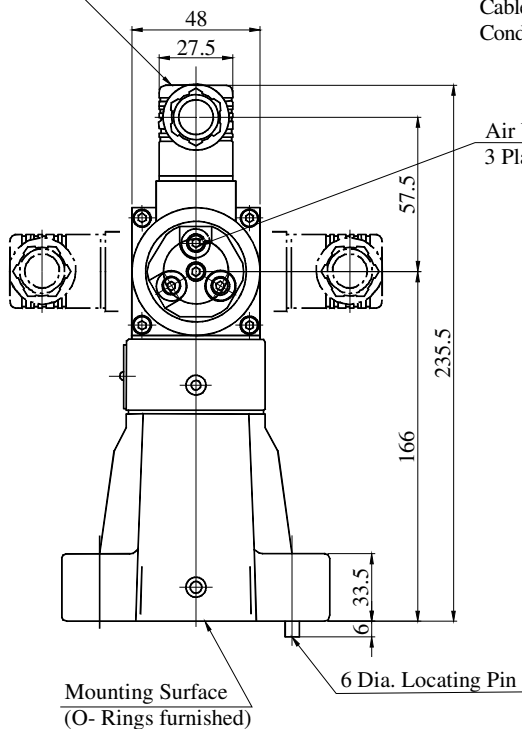
The direction can be altered to every 90 degree angles.

● **EBG-10-*T-51**
Without Safety Valve



* This port is not used. It is provided because of the common use of the body with the low-noise type pilot operated relief valve. On the sub-plate, plug the port which corresponds to this port.

Connector
(The direction can be altered to every 90 degree angles.)



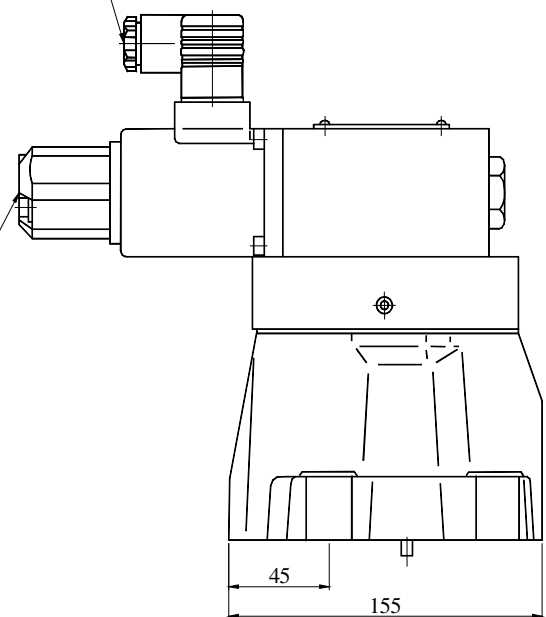
Mounting Surface
(O-Rings furnished)

Cable Departure
Cable Applicable : Outside Dia. 8-10mm
Conductor Area : Not Exceeding 1.5mm²

Air Vent 3 Hex.Soc.
3 Places

Manual Pressure
Adj. Screw 3 Hex.Soc.

INC.

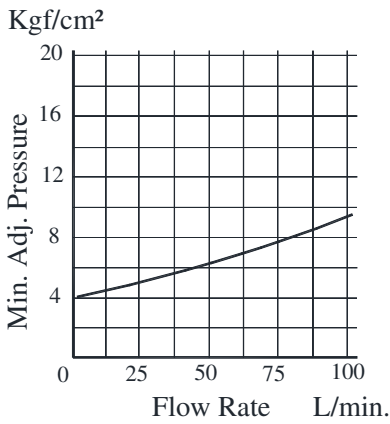


Note: For valve mounting surface dimensions, see the dimensional drawings of sub-plates(p.272) in common use.

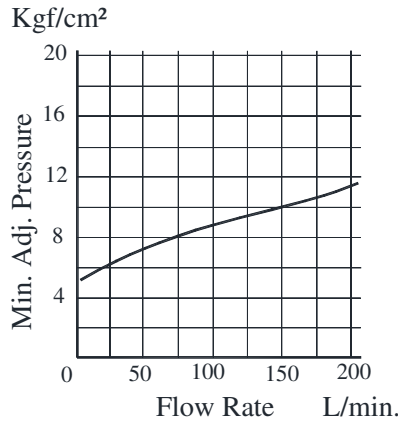
Min. Adjustment Pressure

Viscosity : 30mm²/s

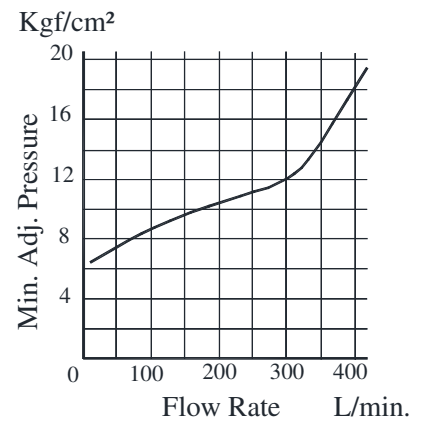
EBG-03



EBG-06



EBG-10

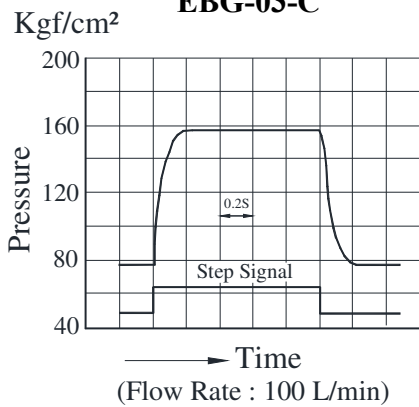


Step Response (Example)

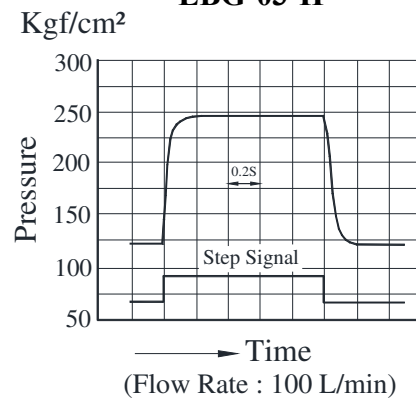
These characteristics have been obtained by measuring on each valve. Therefore, they may vary according to a hydraulic circuit to be used.

Trapped Oil Volume : 1L
Viscosity : 30mm²/s

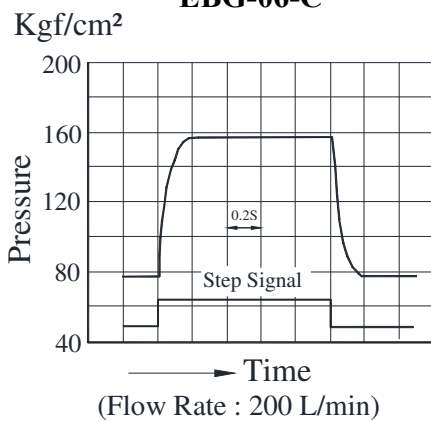
EBG-03-C



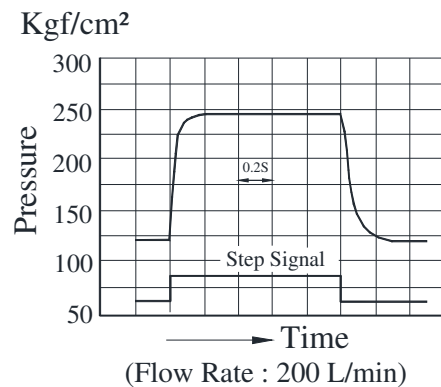
EBG-03-H



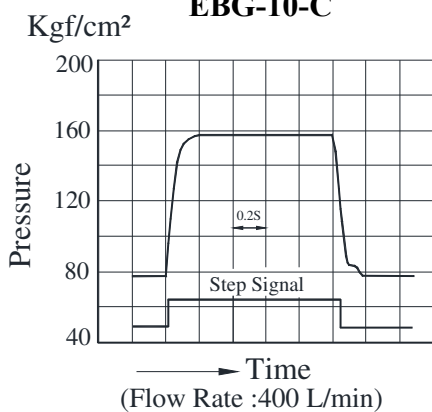
EBG-06-C



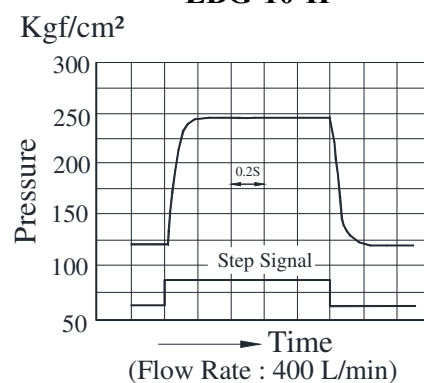
EBG-06-H



EBG-10-C



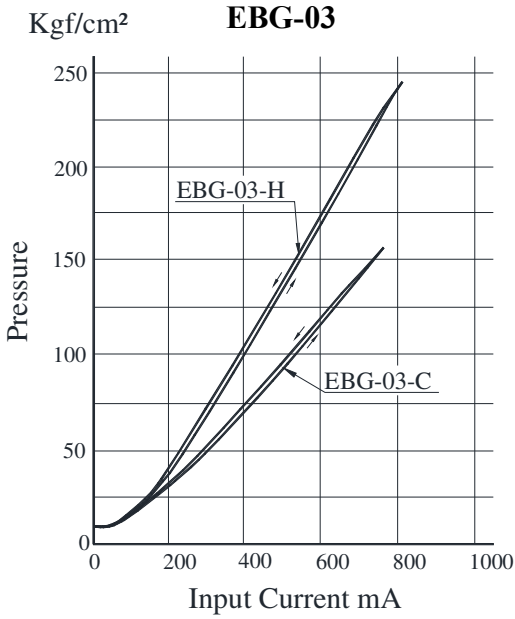
EBG-10-H



E Series

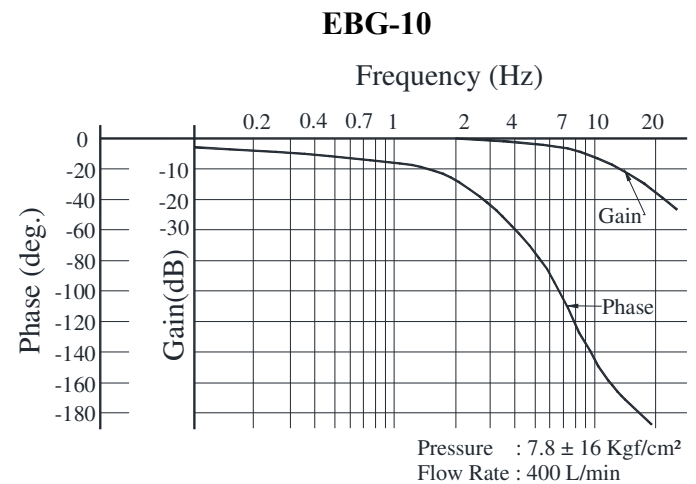
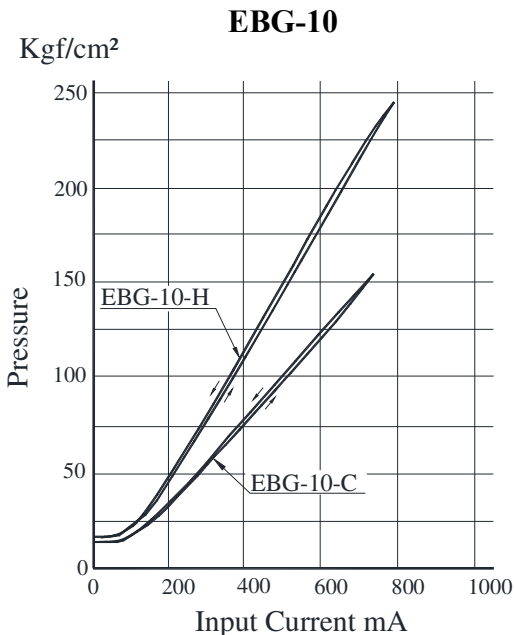
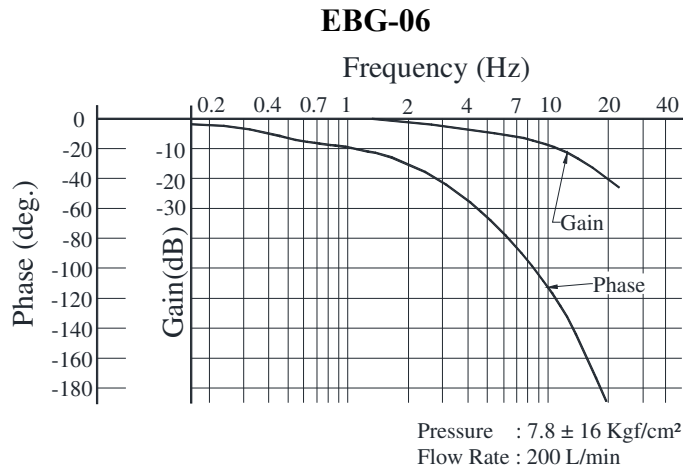
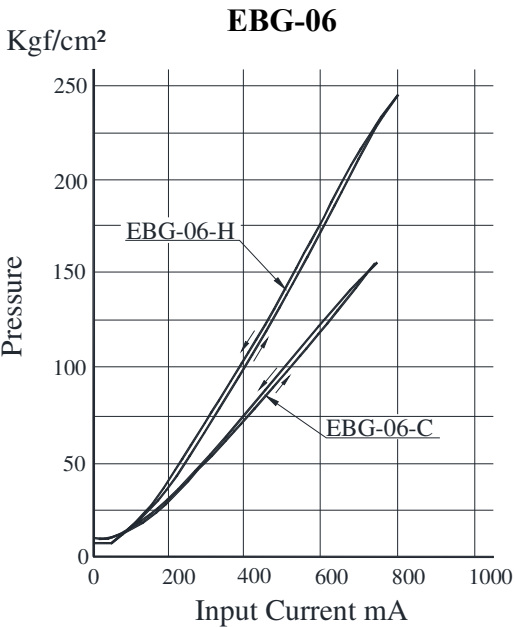
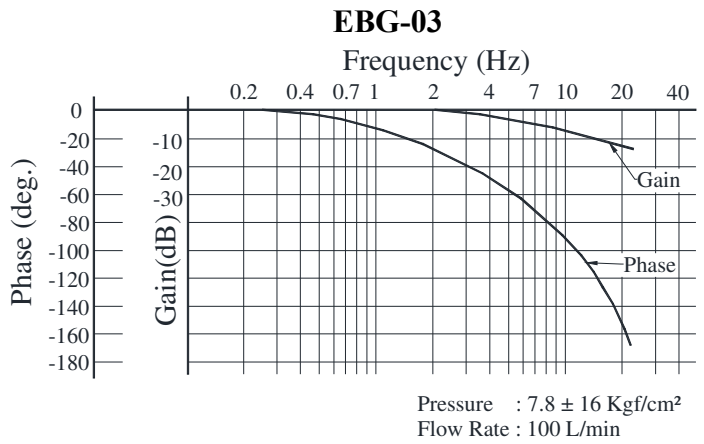
Proportional Electro-Hydraulic Relief Valves

Input Current vs. Pressure



Frequency Response

Trapped Oil Volume : 1L
Viscosity : 30 mm²/s



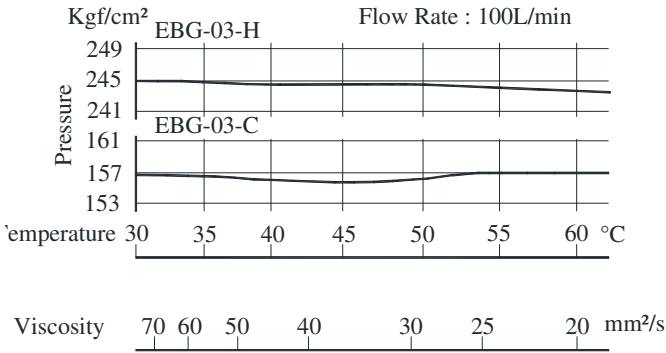
E Series

Proportional Electro-Hydraulic Relief Valves

Viscosity vs. Pressure

Oil : ISO VG 46 Oil

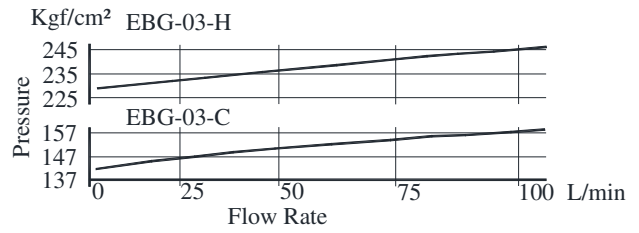
EBG-03



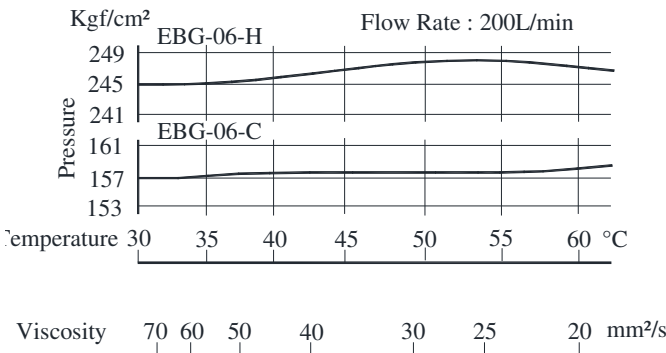
Flow Rate vs. Pressure

Viscosity : 30 mm²/s

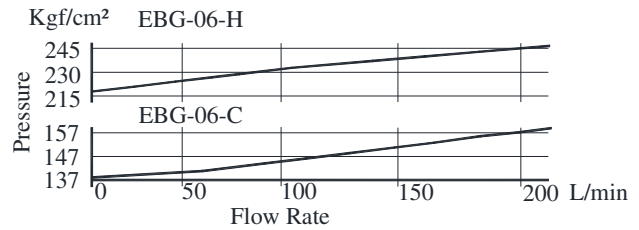
EBG-03



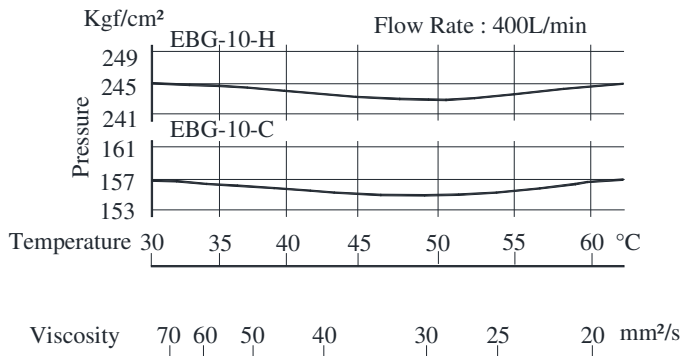
EBG-06



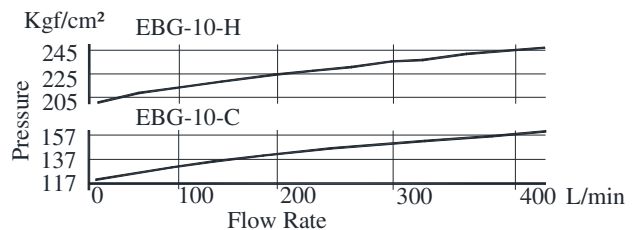
EBG-06



EBG-10



EBG-10



List of Seals and Pilot Valves

List of Seals

Sl. No.	Name of Parts	Part Numbers			Quantity
		EBG-03	EBG-06	EBG-10	
1	O-Ring	SO-NB-P32	SO-NB-P32	SO-NB-P42	1
2	O-Ring	SO-NB-P28			1
3	O-Ring	SO-NB-P9	SO-NB-P11	SO-NB-P9	1
4	O-Ring	SO-NB-P9			2
5	O-Ring	SO-NB-A024	SO-NB-A024	SO-NB-A128	1
6	O-Ring	SO-NB-P18	SO-NB-P28	SO-NB-P32	2

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

In addition to the above O-rings, seals for pilot valve are included in the seal kit.

For the details of the pilot valve seals, see page 555.

List of Seal Kit

Model Numbers	Seal Kit Numbers
EBG-03	KS-EBG-03-51
EBG-06	KS-EBG-06-51
EBG-10	KS-EBG-10-51

Pilot Valve

Valve Model Numbers	Pilot Valve Model Numbers
EBG-03-C-51	EDG-01V-C-1-PNT09-51
EBG-03-H-51	EDG-01V-H-1-PNT09-51
EBG-03-C-T-51	EDG-01V-C-PNT09-51
EBG-03-H-T-51	EDG-01V-H-PNT09-51
EBG-06-C-51	EDG-01V-C-1-PNT10-51
EBG-06-H-51	EDG-01V-H-1-PNT10-51
EBG-06-C-T-51	EDG-01V-C-PNT10-51
EBG-06-H-T-51	EDG-01V-H-PNT10-51
EBG-10-C-51	EDG-01V-C-1-PNT11-51
EBG-10-H-51	EDG-01V-H-1-PNT11-51
EBG-10-C-T-51	EDG-01V-C-PNT11-51
EBG-10-H-T-51	EDG-01V-H-PNT11-51

Note: For the details of pilot valves, refer to “Pilot Relief Valves” on page 555.