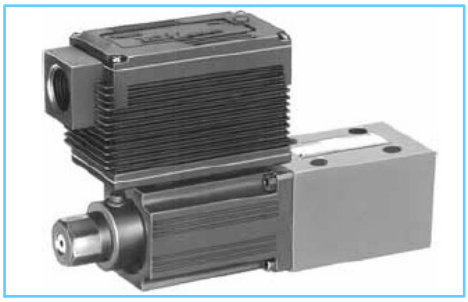
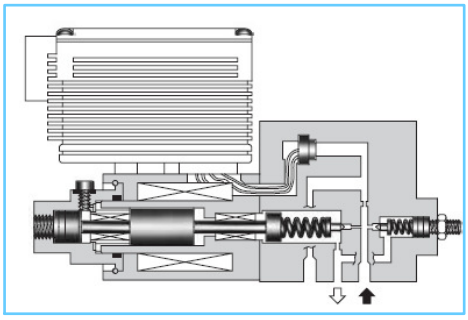
Proportional Electro-Hydraulic Pilot Relief Valves

The valve can be used as a pilot valve of the Proportional Electro-Hydraulic Control valves.
The valve can also be used as a relief valve for the hydraulic system where a small flow rate and continuous pressure control are required.



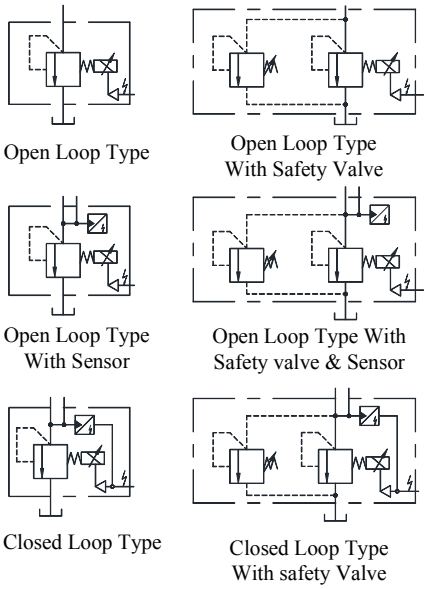


Specification

Descriptions \ Model Number	EHDG-01-※
Max. Operating Pres. Kgf/cm^2	250
Max. Flow L/min.	2
Min. Flow L/min.	0.3
Pres. Adj. Range Kgf/cm^2	Refer to Model No. Designation
Coil Resistance	10Ω
Hysteresis	Less than 3% (1%) *1
Repeatability	Less than 1% *2
Frequency Response Hz	Refer to frequency Response on page 642
Supply Electric Power	24V DC (21 to 28V DC included Ripple)
Power Input (Max.)	28 W
Input Signal Voltage	B: 70 Kgf/cm² / 5V DC C: 160 Kgf/cm² / 5V DC H: 250 Kgf/cm² / 5V DC
Input Impedance	10 kΩ
Alarm Signal Output (Open Collector)	Voltage: Max. 30V DC Current: Max. 40 Ma
Pressure Signal Output	B: 5V DC / 70 Kgf/cm² C: 5V DC / 160 Kgf/cm² H: 5V DC / 250 Kgf/cm²
Ambient Temperature	0 – 50°C (With Circulated Air)

*1 The value in () is for the closed-loop type.
*2 The repeatability of the valve is obtained by having it tested independently on the conditions similar to its original testing.

Graphic Symbols



Model Number Designation

F-	EHD	G	-01	V	-B	-S	-1	-PN	T15	M10	-50
Special Seals	Series Number	Type of Mounting	Valve Size	Applicable Control	Pressure Adj. Range Kgf/cm^2	Control Type	Safety Valve	P-Line Orifice	T-Line Orifice	P-B Line Orifice	Design Number
F: Special Seals for Phosphate Ester Type Fluid (Omit if not required)	**EHD:** Proportional Electro-Hydraulic Pilot Relief Valve	**G:** Sub-Plate Mounting	**01**	**None:** For General Use **V:** Vent Control Of Relief Valve (Omit if not required)	**B:** 5 – 70 **C:** 10 – 160 **H:** 12 – 250	**None:** Open Loop **S:** Open Loop with Sensor **L:** *1 Closed Loop	**None:** Without Safety Valve **1:** With Safety Valve	**PN:** Without Orifice (Standard)	**T15** **T13** **T11**	-- **M10:** Standard	**50**

*1 For Closed-Loop models, specify applicable control code "V" even though the valve may not be used as vent control of relief valve.

Mounting Bolts

Model Numbers	Socket Head Cap Screw	Qty	Bolt Kit Model Number
EHDG-01※-※-※-PNT※	M5 x 45Lg.	4	BKDSG-01-50
EHDG-01※-S※-※-※-PNT※M10	M5 x 75Lg.		BKEHDG-01-50
EHDG-01V-※-L※-※-PNT※M10			

Sub-Plate

Sl. No.	Sub-Plate Model Numbers	Thread size	Mass Kg.
1	DSGM-01-3080	1/8 BSP.F	0.8
2	DSGM-01X-3080	1/4 BSP.F	
3	DSGM-01Y-3080	3/8 BSP.F	

- Sub-plates are available. Specify sub-plate model number from the table above. When sub-plates are not used, the mounting surface should have a good machined finish.
- For Sub-plates details please refer page no. 358.

Spare Parts List

- **List of Seals**

Sl. No.	Name of Parts	Part No.	Qty.	
			Without Safety Valve	With Safety Valve
1	O-Ring	SO-NB-P9	2	
2	O-Ring	SO-NB-A013	-	1
3	O-Ring	SO-NA-P6		
4	O-Ring	SO-NB-P14	1	

- **List of Seal Kits**

Model Numbers	Seal Kit Numbers
EHDG-01-50	KS-EHDG-01-50
EHDG-01-1-50	KS-EHDG-01-1-50

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

Instructions

- **Piping to the Reservoir**

  The tank port should be connected directly to the reservoir with a back pressure of not more than 2 Kgf/cm². Be sure the end of pipe is dipped in to the oil in the reservoir.

- **Vent control**

  When this valve is to be used as a relief valve or for other valve vent control purposes, use 6mm ID, 300mm or less long pipes for piping connections. If pressure instability is encountered, provide a 1-1.5mm diameter orifice for the relief or other valve vent port.

- **Circuit Pressure Control**

  When circuit pressure is directly controlled by this valve, make sure that the trapped oil volume is exceeding 40 cm^3.

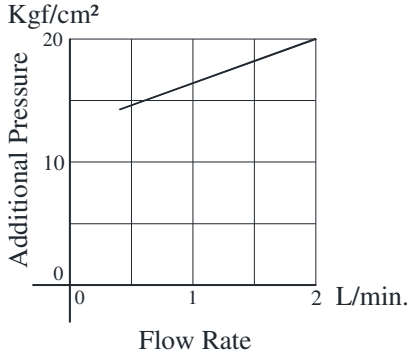
- **Low Flow Rate**

  The preselected pressure may become instable. To avoid such pressure instability, the flow rate should not be lower than 0.3 L/min.

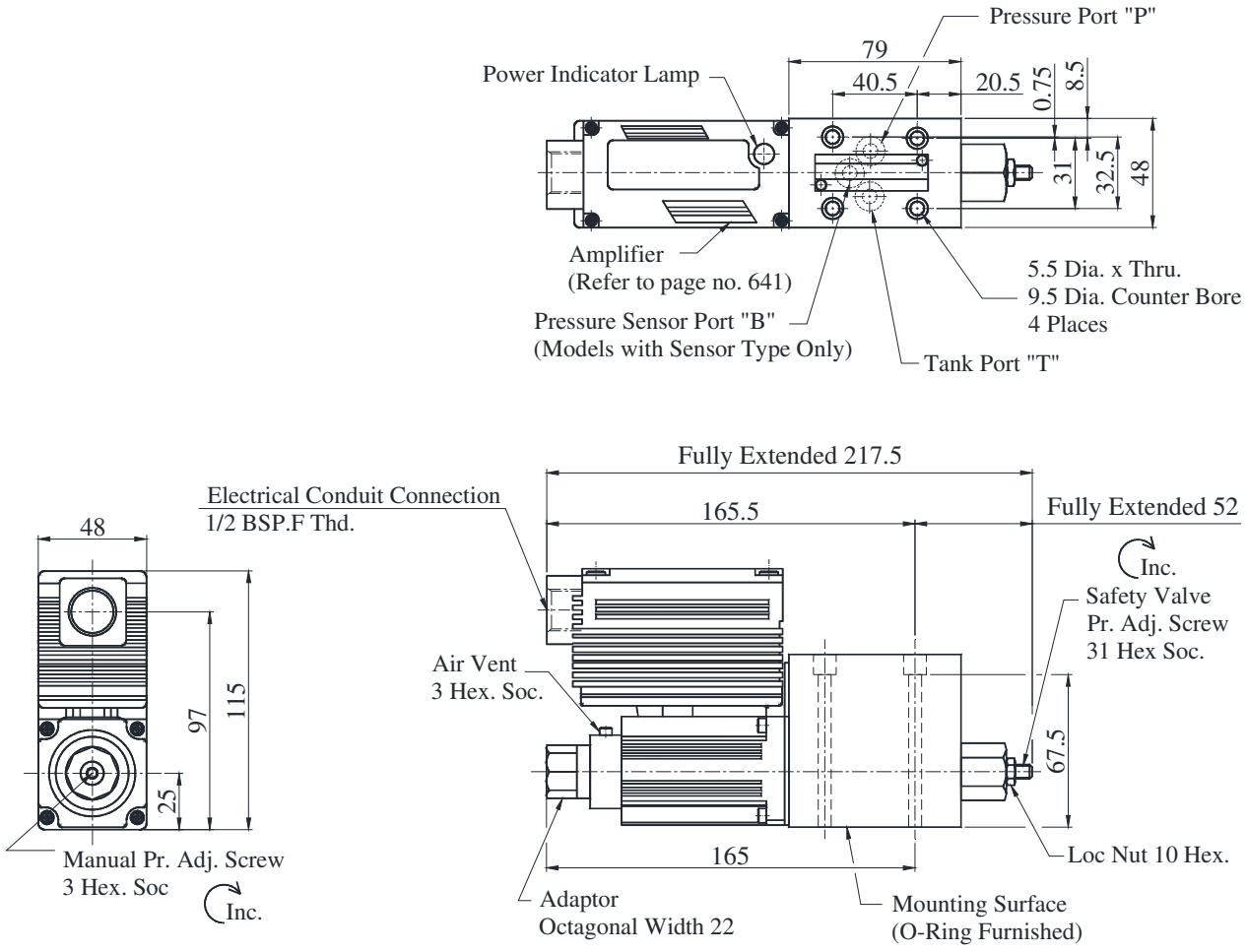
- **Safety Valve Pressure Setting**

  The safety valve pressure setting at the maximum flow rate is preset to a level that is 20 Kgf/cm^2 higher than the pressure adjustment range upper limit.
  If the operating pressure upper limit is low or a different flow rate upper limit is used, make adjustment after calculating the safety valve pressure setting from the following equation:
  Pressure setting=(Operating pressure upper limit) + (Additional pressure indicated below).

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



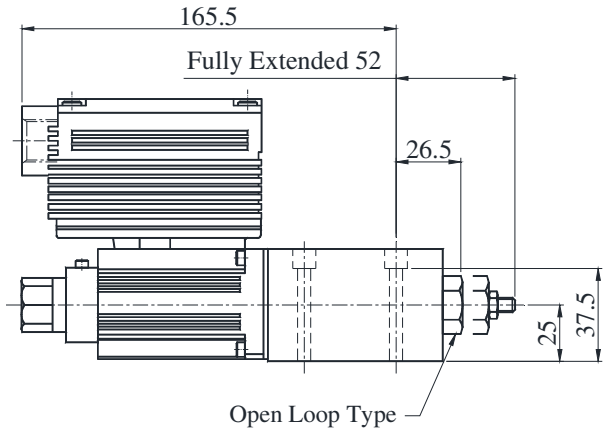
- **EHDG-01※-※-S-1-PNT※M10-50**
  Open-Loop Type with Sensor and Safety Valve
- **EHDG-01※-※-L-1-PNT※M10-50**
  Closed-Loop Type with Safety Valve



Mass …….. 2.9 Kg.

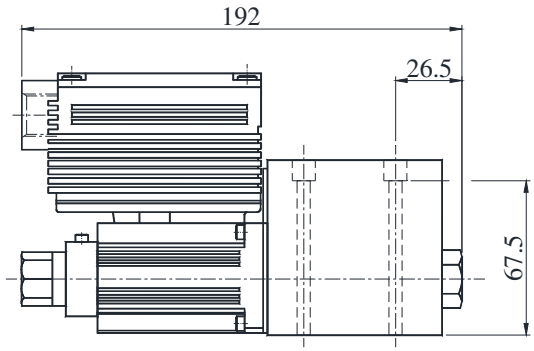
DIMENSIONS IN MILLIMETRES

- **EHDG-01※-※-PNT※50**
  Open-Loop Type
- **EHDG-01※-※-1-PNT※50**
  Open-Loop Type with Safety Valve



Mass …….. 2.2 Kg.

- **EHDG-01※-※-S-PNT※M10-50**
  Open-Loop Type with Sensor
- **EHDG-01※-※-L-PNT※M10-50**
  Closed-Loop Type

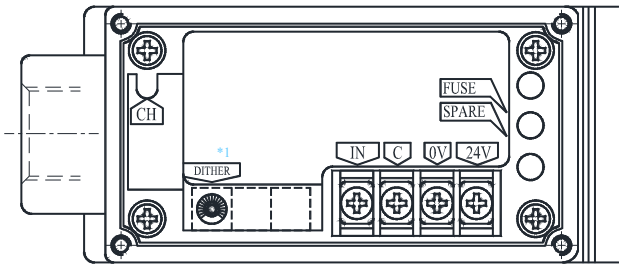


Mass …….. 2.9 Kg.

Detail of Amplifier

Connecting Terminal

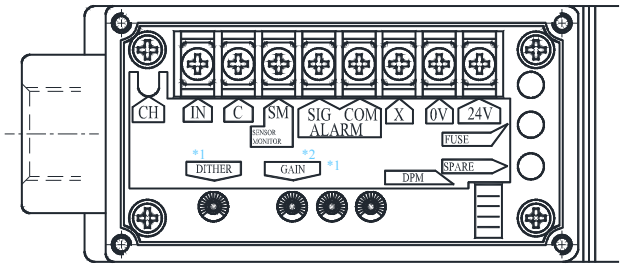
Open-Loop Type



Terminal	Name
IN	Input Signal (+)
C	Input Signal (COM)
0 V	} Power Supply
24 V	
CH	Output Current Check (to C)

*1 **DITHER/GAIN**
Use as they are since they are factory-preset to the optimum position. (Do not touch them in normal condition)

Closed-Loop Type with Sensor
Open-Loop Type with Sensor

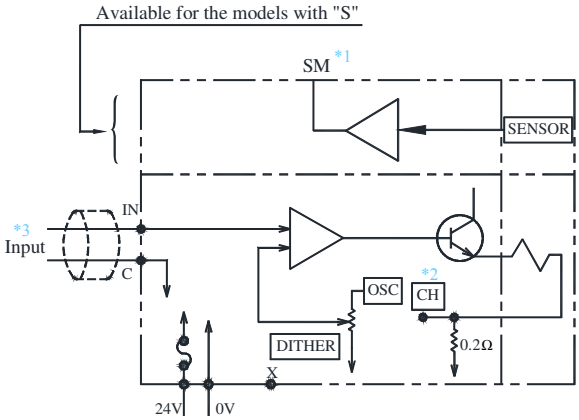


Terminal		Name
IN		Input Signal (+)
C		Input Signal (COM)
SM		Sensor Monitor (to C)
ALARM	SIG	Alarm Output *2
	COM	
X		(Open)
0 V		} Power Supply
24 V		
CH		Output Current Check (to C)

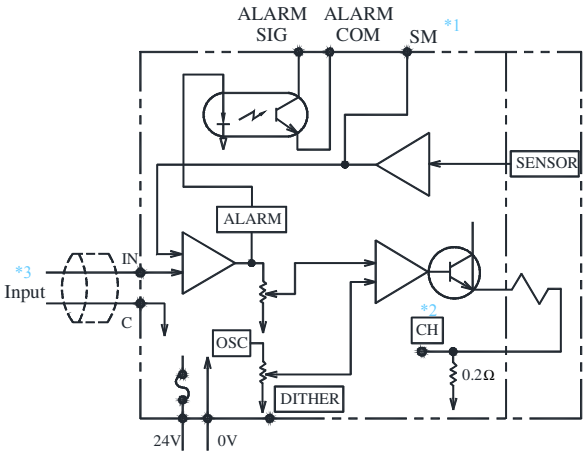
*2 **GAIN/ALARM**
GAIN adjusting volume is not available for Open-Loop type with sensor.

Circuit Schematic

Open-Loop Type
Open-Loop Type with Sensor



Closed-Loop Type with Sensor
Open-Loop Type with Sensor

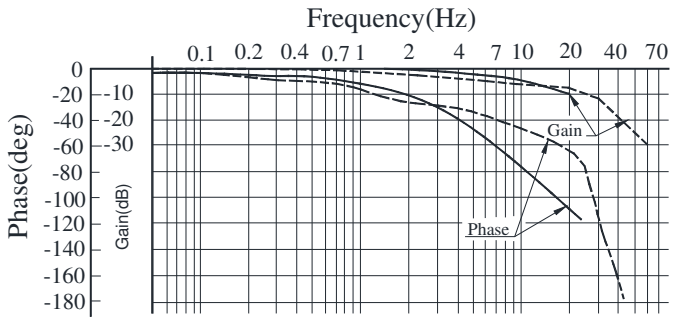


*1 For "SM" terminal, external instruments should have input impedance of more than 10 kΩ.
*2 For "CH" terminal, external instruments should have input impedance of more than 10 kΩ.
*3 Use shielded cable for "Input" connection. The ground of the shielded cable must be connected to input signal side.

Frequency Response

——— Open Loop Type

- - - - - - Closed Loop Type



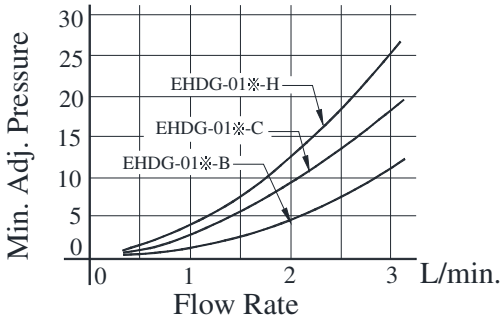
Flow Rate : 2 L/min.
Pressure : 80 Kgf/cm^2±16 Kgf/cm^2
Trapped oil volume : 40 cm^2
Viscosity : 30 cSt

Min. Adjustment Pressure

● EHDG-01※-C$^{B}_{H}$

Kgf/cm²

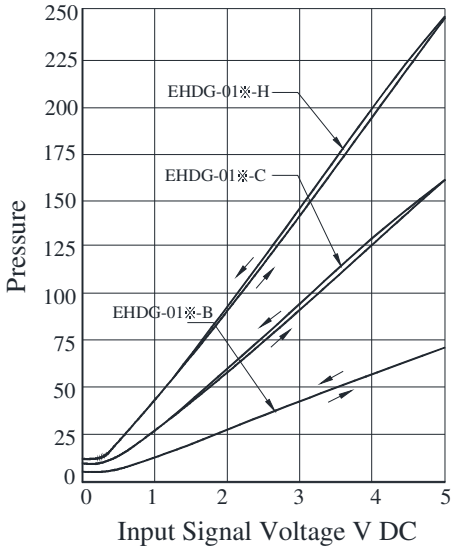
Viscosity: 30 cSt



Input Signal Voltage Vs. Pressre

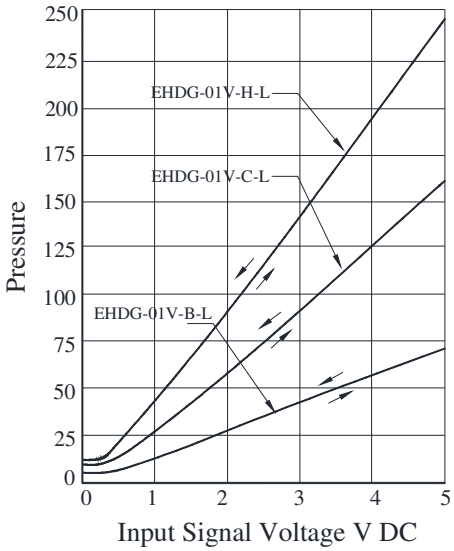
● Open Loop Type

Kgf/cm²



● Closed Loop Type

Kgf/cm²

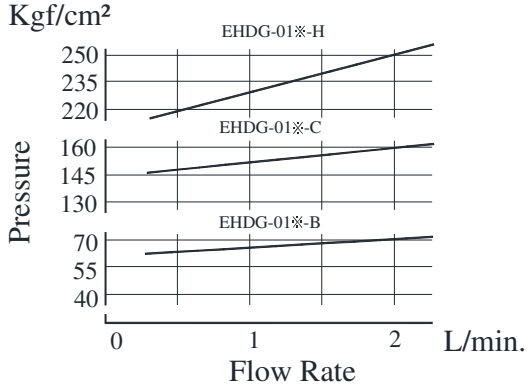


Flow Rate Vs. Pressure

Viscosity : 30 cSt

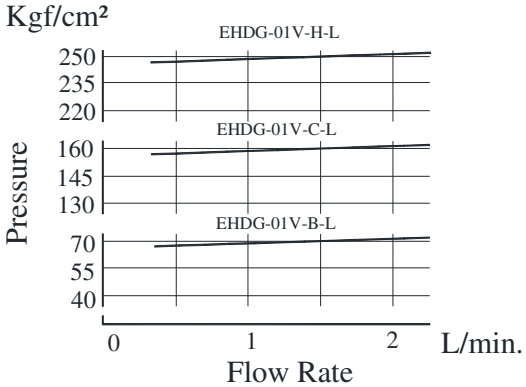
● Open Loop Type
EHDG-01※-※

Kgf/cm²



● Closed Loop Type
EHDG-01V-※-L

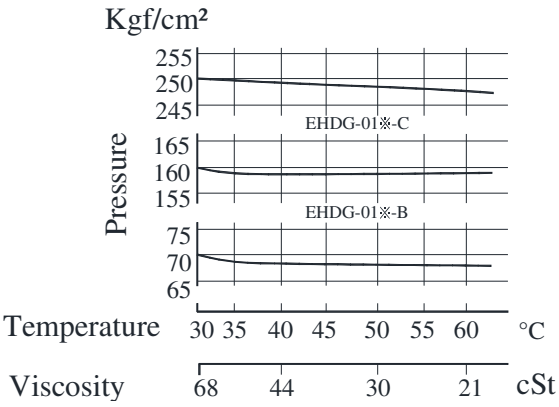
Kgf/cm²



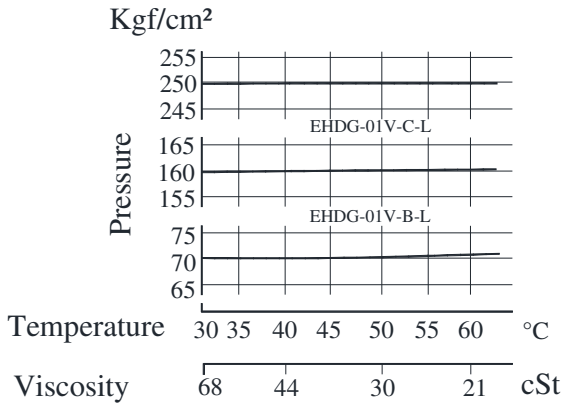
Viscosity Vs. Pressure

Flow Rate : 2 L/min.
Oil : ISO VG 46 Oil

Open Loop Type
EHDG-01※-※



Closed Loop Type
EHDG-01V-※-L



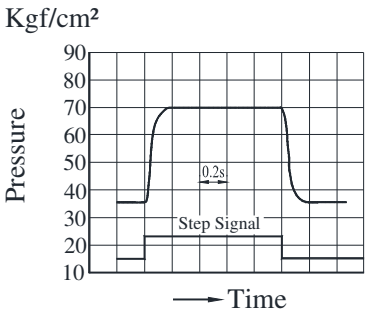
Step Response (Example)

The step responses below are those obtained when the valve it-self is tested independently.
The step responses may differ from them when the valve is used in combinations with other control valves.

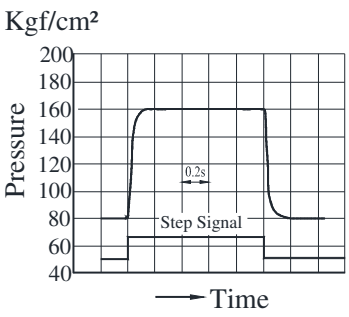
Flow Rate : 2 L/min.
Trapped oil volume : 40 cm³
Viscosity : 30 cSt

Open Loop Type

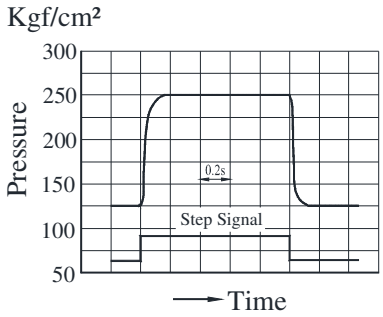
EHDG-01※ -B



EHDG-01※ -C

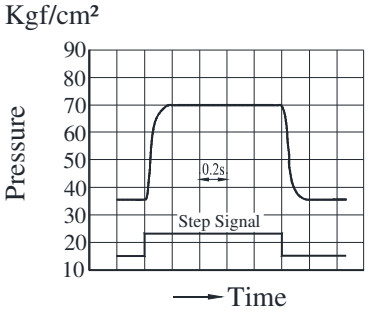


EHDG-01※ -H

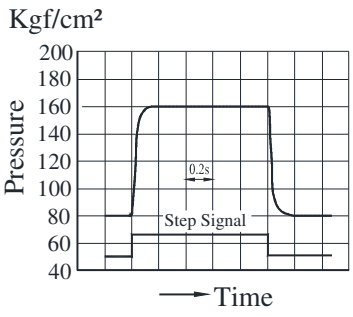


Closed Loop Type

EHDG-01V-B-L



EHDG-01V-C-L



EHDG-01V-H-L