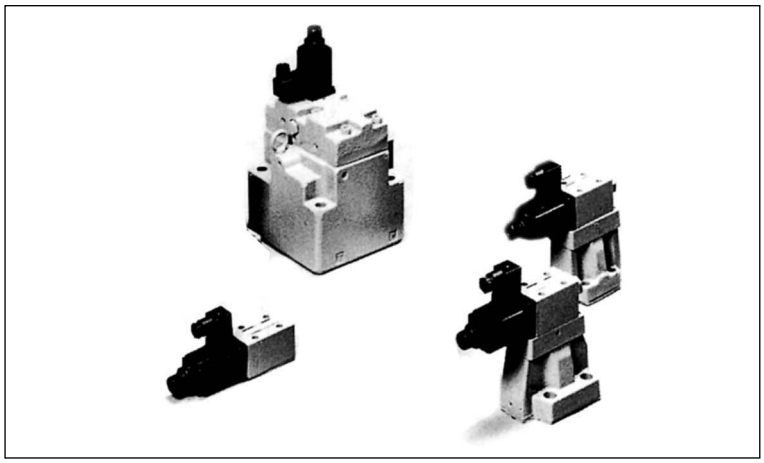
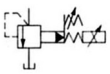
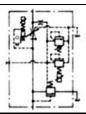
H

PROPORTIONAL ELECTRO-HYDRAULIC CONTROLS



E Series Proportional Electro-Hydraulic Controls

Proportional Electro-Hydraulic Controls

Types	KS Graphic Symbols	Max. Operating Pressure MPa	Maximum Flow L/min (1 2 3 5 10 20 30 50 100 200 300 500 1000)	Page
Pilot Relief Valves		24.5 {250}	EDG 01	H-5
Relief Valves		24.5 {250}	EBG 03 06	H-10
10Ω-10Ω Series Flow Control and Relief Valves		24.5 {250}	EFBG 03 06	H-16

Power Amplifiers H-22

Hydraulic Fluids

1. Fluid Types

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

Petroleum Base Oils	Use fluids equivalent to ISO VG 32 or VG46.
Synthetic Fluids	Use phosphate ester or polyol ester fluids. 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.

2. Recommended Fluid Viscosity and Temperature

Use hydraulic fluids which satisfy the both recommended viscosity and oil temperatures given in the table below.

Name	Viscosity	Temperature
Pilot Relief Valves Relief Valves	15~400mm²/s (cSt)	-15~+70℃
Flow Control and Relief Valves	20~200mm²/s (cSt)	

3. 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 valve. Please maintain the degree of contamination within NAS 1638-Grade 11. Use 20 m or finer line filter.

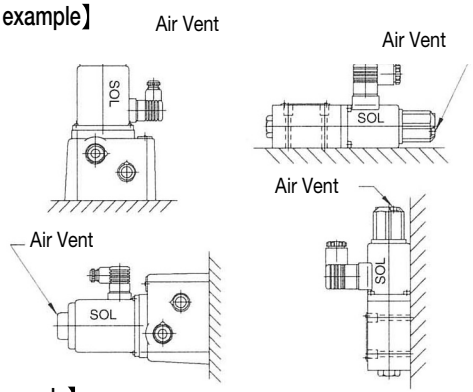
Instructions

Mounting Positioning

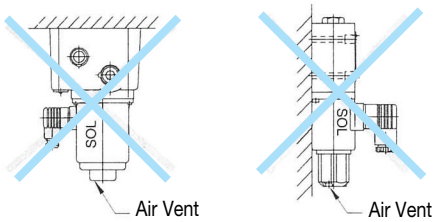
Be sure that the air vent faces up.

In addition, if the valve is mounted vertically, the minimum adjustment pressure is 0.2 MPa {20.4kgf/cm²} or higher.

【Good example】



【Bad example】



Air Bleeding

To ensure stable control, bleed the air from solenoid completely and fill its core with oil.

Bleeding can be done by slowly loosening one of the airvents at the end of the solenoid. Choose one of the three air vents which is expected to work most effectively.

Tank and Drain Piping

The tank-line back pressure and drain back pressure directly affect the minimum adjustment pressure. Therefore, do not connect the tank or drain pipes to other lines, but connect them directly to the reservoir maintaining the back pressure as low as possible.

Be sure that the tank and drain pipe ends are immersed in fluid.

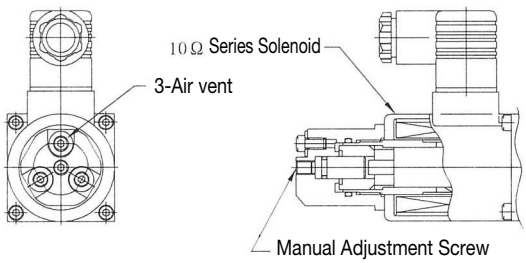
Hyseresis and Repeatability Value Indicatios

The hysteresis and repeatability values indicated in the specifications for each control valve are determined under the following conditions:

- Hysteresis Value: Obtained when SEWON's applicable power amplifier is used.
- Repeatability Value : Obtained when SEWON's applicable power amplifier is used under the same conditions.

Manual Adjustment Screw

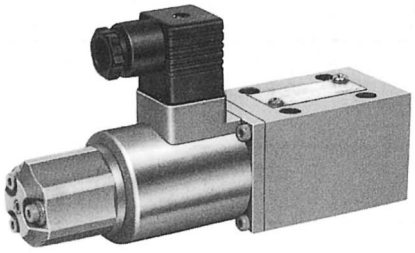
When initial adjustments are to be made or when no current is supplied to the valve due to electrical failure or other problem, turn the manual adjustment screw to temporatily set the valve pressure / flow rate. In that case, when turn the manual adjustment screw clockwise, the valve pressure / flow rate increases. Under normal condition, however, this screw must be kept in its original position (see the figure to the below).

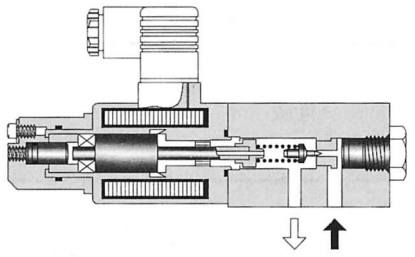


10Ω Series Solenoid

Proportional Electro-Hydraulic Pilot Relief Valves

This valve consists of a DC solenoid and a direct-acting relief valve. It serves as a pilot valve for a low flow rate hydraulic system or a proportional electro-hydraulic control valve and controls the pressure in proportional to the input current. Note that this valve is used in conjunction with the applicable power amplifier.





Ratings

Description \ Model Numbers	EDG-01※-※-※P※T※-51
Max. Operating Pres. MPa{kgf/cm²}	24.5{250}
Max. Flow L/min	2
Min. Flow L/min	0.3
Pressure Adj. Range MPa{kgf/cm²}	Refer to Model Number Designation
Rated Current mA	**B** : 800 **C** : 900 **H** : 950
Coil Resistance Ω	10
Hysteresis	3% or less
Repeatability	1%
Approx. Mass kg	2

Model Number Designation

ED	G	-01	V	-C	-1	-PN	T13	-51
Series Number	Type of Mounting	Valve Size	Applicable Control	Pressure Adj. Range MPa{kgf/cm²}	Safety Valve	P-Line Orifice	T-Line Orifice	Design Number
ED : Proportional ElectroHydraulic Pilot Relief Valve	**G** : Sub-Plate Mounting	**01**	**None** : General use **V** : Vent Control of Relief Valve★1 (Omit if not required)	**B** : 0.5~ 6.9 { 5~ 70} **C** : 1.0~ 15.7 { 10~ 160} **H** : 1.2~ 24.5 { 12~ 250}	**None**: Without Safety Valve **1** : With Safety Valve	**PN**: Without Orifice (Standard)	**T15** ★2 **T13** **T11**	**51**

★1. When the valve is to be used for vent control purpose, orifice adjustment is required due to piping capacity limitations. Therefore, consult your SEWON representative in advance.

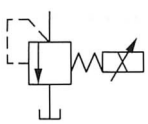
★2. Standard of T-line Orifice. Pres. Adj. Range B : T15, C : T13, H : T11
The orifice used as the pilot valve may differ from the standard orifice.

Sub-Plate

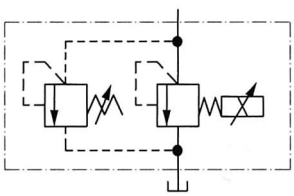
Sub-plate Model Numbers	Thread Size Rc	Approx. Mass kg
DSGM-01-30	1/8	0.8
DSGM-01X-30	1/4	
DSGM-01Y-30	3/8	

- Please order the sub-plate using above the model number when you see it.
  The mounting surface should be used roughly 6-S after grind when you made it yourself.
- Sub-plate are shared with those for DSG-01 series solenoid operated valve.
  Please refer to page E-18 for dimension.

KS Graphic Symbols



Without Safety Valve



With Safety Valve

Appilcable Power Amplifiers

For stable performance, it is rrecommended that SEWON's applicable power amplifiers be used (for details see page E-22).
Model Number : AMN-D-10 (For DC power supply)

Attachment

Mounting Bolts

soket head cap screw : M5 ×45L ..... 4 Pcs

Instructions

Tank-Line Back Pressure

Check that the tank line back pressure does not exceed 0.2 MPa {2.0kgf/cm²}

Vent Control

When the valve is used for vent control of relief valves or for other valve vent control purposes, use the pipes of Dia. 6 mm, 300mm or less length for piping connection. If the pressure is instable, provide a 1.0 to 1.5 mm diameter orifice to the vent port of the relief valves or others.

Circuit Pressure Control

When the pressure in a circuit is directly controlled with this valve, set the trapped oil volume being more than 40cm³.

Low Flow Rates

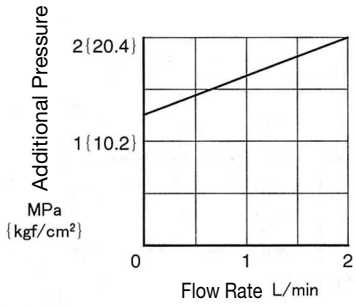
The preselected pressure may become instable. To avoid such pressure instability, the flow rate should not be lower than 0.3 L/min.

Safety Valve Pressure Setting

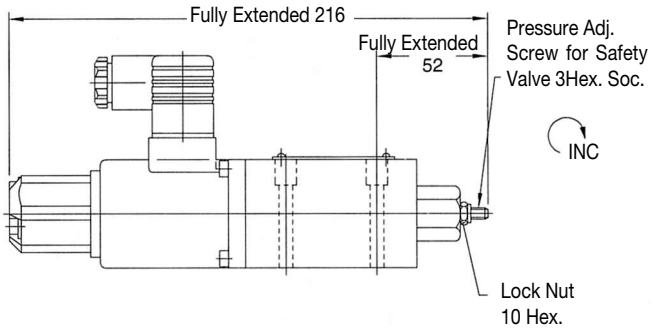
The pressure of the safety valve at the maximum flow is preset at the value equal to the upper limit of the pressure adjustment range plus 2 MPa.{2.0kgf/cm²} In case where the upper limit of operating pressure is low or the upper limit of flow rate to be used is different from the specified maximum flow, please adjustand determine the setting pressure of the safety valve at the value calculated from the following formula.

Setting pressure = (Operating pressure upper limit) + (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.

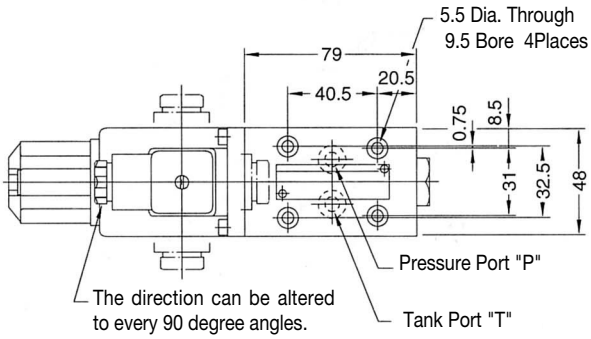


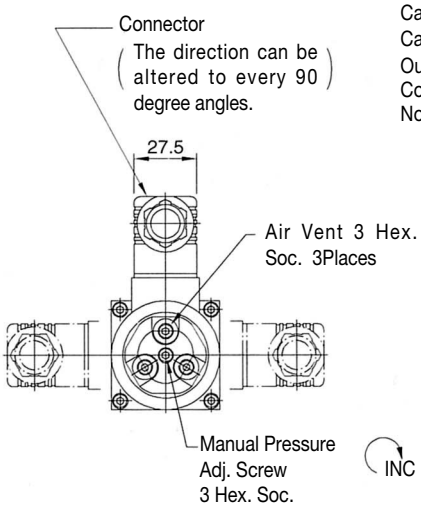
EDG-01※-※-1-P※T※-51
With Safety Valve

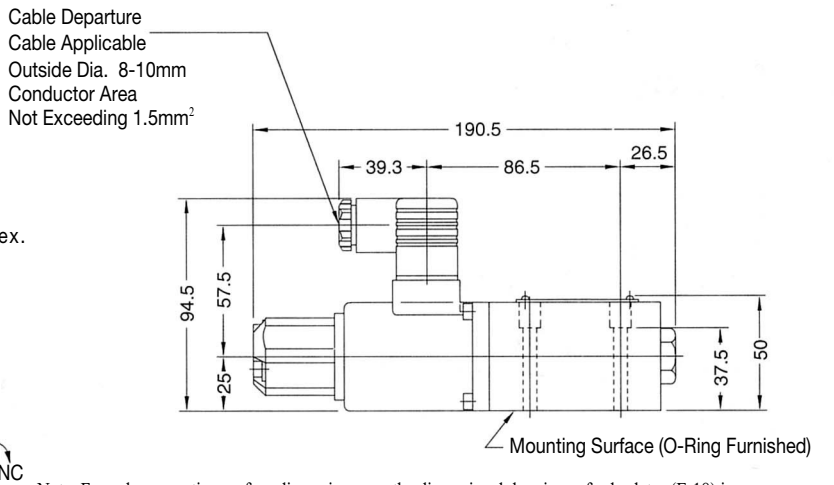


For other dimensions, refer to the without safety valve.

EDG-01※-※-P※T※-51
Without Safety Valve





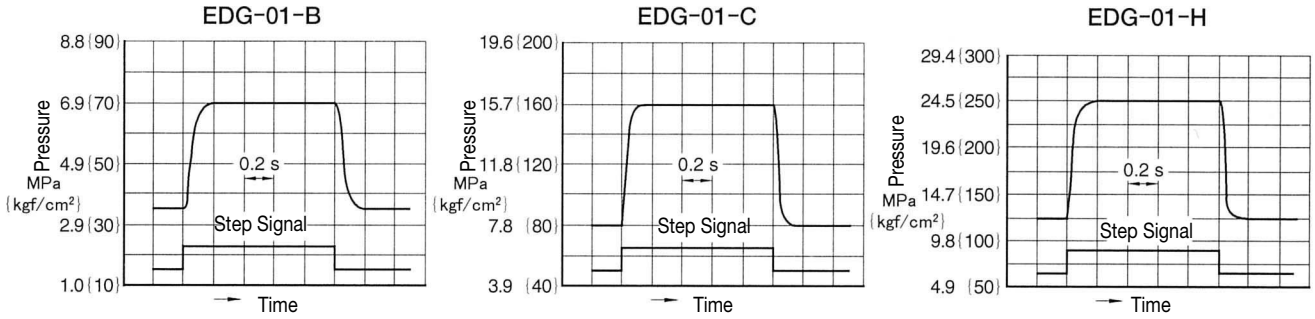


Note: For valve mounting surface dimensions, see the dimensional drawings of sub-plates (E-18) in common use.

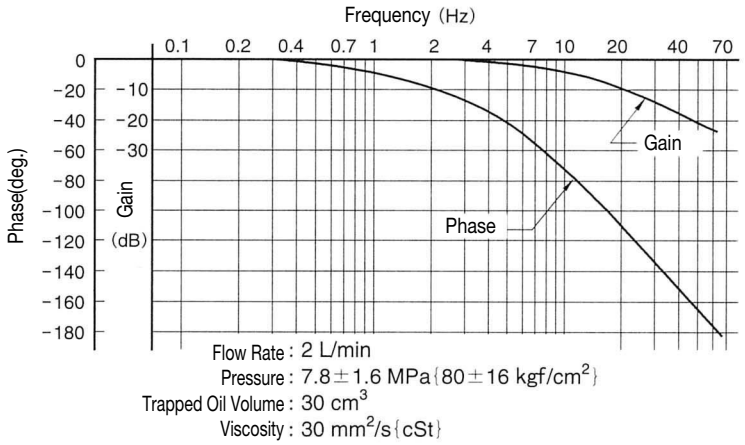
Step Response(Example)

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

Flow Rate : 2L/min
Trapped Oil Volume : 40cm³
Viscosity : 30mm²/s{cSt}

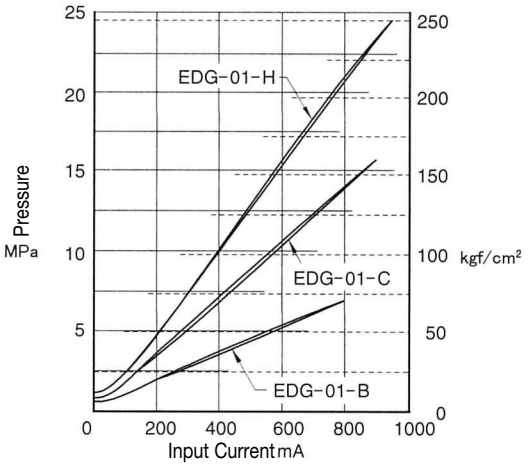


Frequency Response

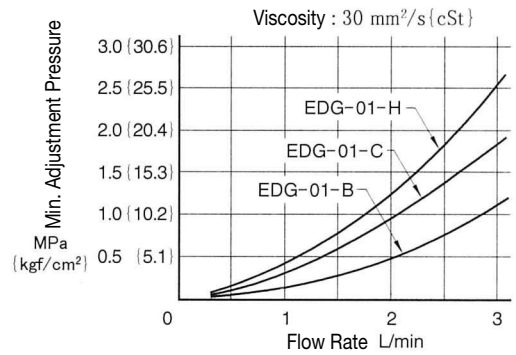


Flow Rate : 2 L/min
Pressure : 7.8±1.6 MPa{80±16 kgf/cm²}
Trapped Oil Volume : 30 cm³
Viscosity : 30 mm²/s{cSt}

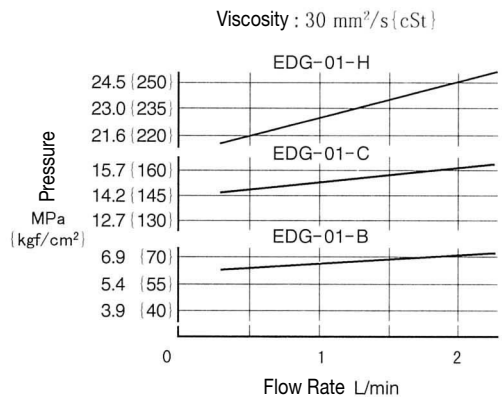
Control Pressure vs. Input Current



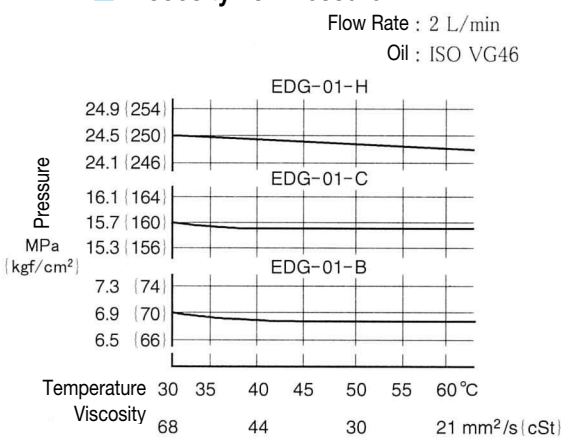
Min. Adjustment Pressure



Flow Rate vs. Pressure



Viscosity vs. Pressure



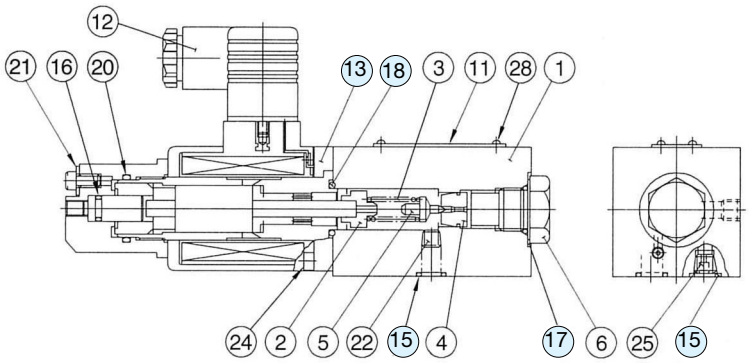
CAUTION

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

List of Seals and Solenoid Ass'y

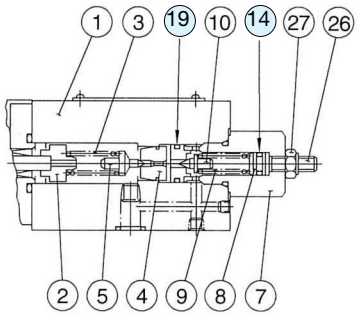
Without Safety Valve

EDG-01※-※-P※T※-51



With Safety Valve

EDG-01※-※-1-P※T※-51



List of Seals

Item	Name of Parts	Part Numbers	Qty.
14	O-Ring	JIS B 2401-1A-P6	1
15	O-Ring	JIS B 2401-1B-P9	2
16	O-Ring	JIS B 2401-1B-P7	1
17	O-Ring	JIS B 2401-1B-P14	1
18	O-Ring	JIS B 2401-1B-P18	1
19	O-Ring	AS568-013 (NBR, Hs90)	1
20	O-Ring	JIS B 2401-1B-P22	1
21	Fastener Seal	SG-FCF-4	1

Note) O-Ring(Item 16, 18, 20) and the fastener seal(Item 21) are included in the solenoid assmbly.

Solenoid Ass'y

Model Numbers	⑬ Solenoid Ass'y
EDG-01-※-※-P※T※-51	E318-Y06M1-28-61
EDG-01V-※-※-P※T※-51	E318-Y06M1-05-61

Note) The connector assembly GDM-211-B-11(Item ⑫) is not included in the solenoid assmbly. Ass'y.

Pilot Valve

This table shows the proportional electro-hydraulic control valve which uses this valve(EDG-01※) for the pilot valve, the valve model number, and the solenoid assembly number.

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

■Interchangeability between Old and New Design

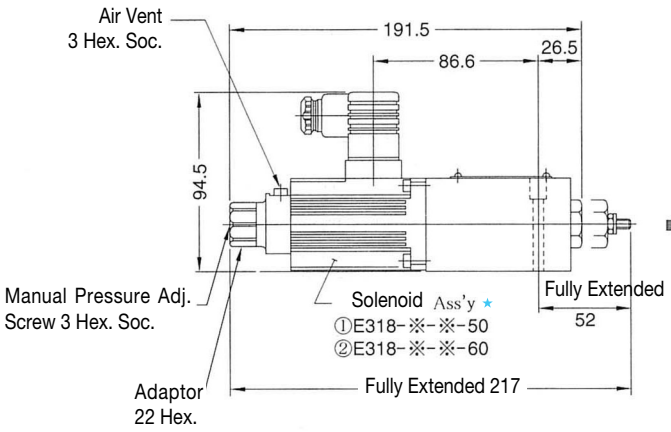
●Specifications and Characteristics

The Specification are not changed except as Input Current vs. Pressure Characteristics. For details contact us.

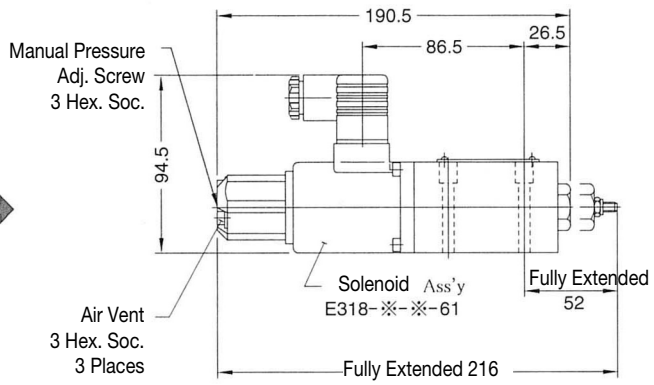
●Mounting Inerchangeability

There is an inerchangeability in the mounting dimensions, however, the outside shape and dimensions are changed as shown below due to pilot valve improvement and other modifications.

Old : Design 50



New : Design 51



★ The solenoid assembly current design comes in two types: ① E318-50 design and ② 60 design.
See the figure on the left for an external view of type. ①.
See the figure on the right for type.②.

Model Numbers	Additional Pressure MPa{kgf/cm²}
EBG-03	2.0 {20.4} (At Flow rate 50 L/min)
EBG-06	3.5 {35.7} (At Flow rate 100 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.
Setting pressure = (Operating pressure upper limit) +(Additional pressure indicated below)