

## High Response Type Proportional Electro-Hydraulic Directional and Flow Control Valves

High response, high precision and high reliability are achieved by a combination of compact and powerful solenoid and spool-position-detection LVDT.

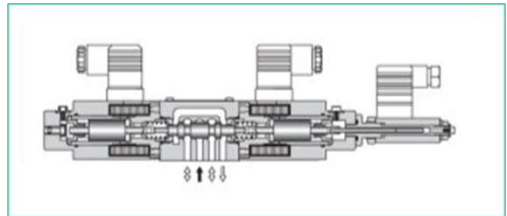
Direct type ELDFG-01/03 and two stage type ELDFHG-04/06 (which use the ELDFG-01 as a pilot) are available.

## Direct Operated Type Directional and Flow Control Valves

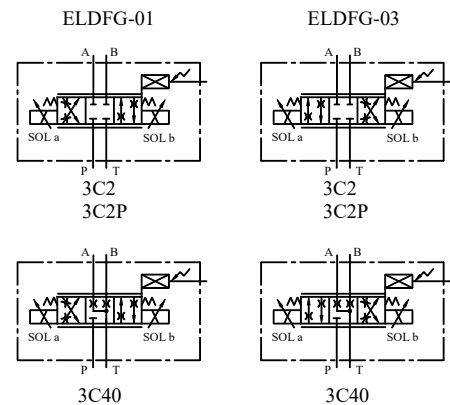
This product can be interchanged with the simplified servo valve to perform position control and pressure control. Compared to nozzle flapper type of servo valve, this product is more contamination resistant.

## Specification

Model Numbers		ELDFG-01	ELDFG-03
Description			
Max. Operating Pressure	Kgf/cm <sup>2</sup>	315	
Max. Tank Line Pres.	Kgf/cm <sup>2</sup>	210	
Rated Flow	L/min.	10 : 10 20 : 20 35 : 35	40 : 40 80 : 80
[Valve ΔP : 150 Kgf/cm <sup>2</sup> ]			
Hysteresis		0.5% or less	
Repeatability		0.5% or less	
Step Response (Typical Rating)	0 → 100 %	30 ms	3C2, 3C40: 29 ms 3C2P: 25 ms
	100 → 0 %	38 ms	3C2, 3C40: 26 ms 3C2P: 23 ms
Frequency Response (0 ±25 %V)	Phase -90 Degree	48 Hz	3C2, 3C40: 36 Hz 3C2P: 41 Hz
	Gain -3dB	52 Hz	3C2, 3C40: 35 Hz 3C2P: 38 Hz
Rated Current		Max. 2.5 A	Max. 3A
Coil Resistance [20°C]		3.9 Ω	3 Ω
Power Input		Max. 25 W	Max. 27 W
Approx. Mass	Kg.	3.2	7.5



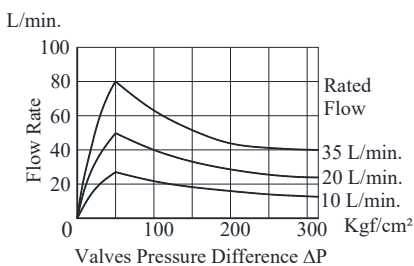
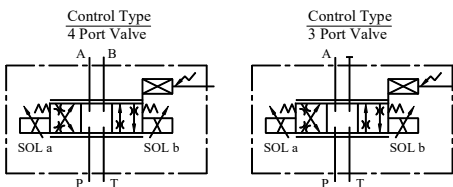
Graphic Symbol



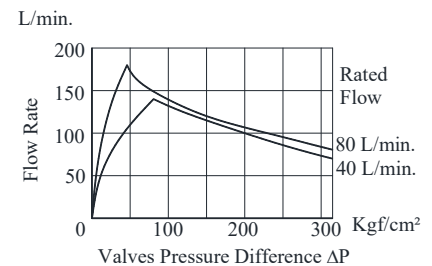
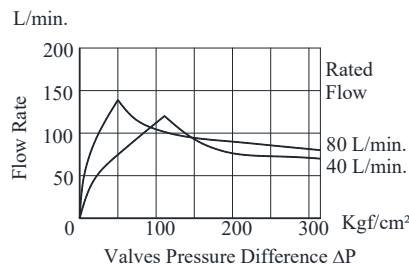
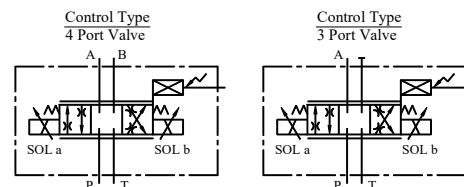
## Range of Flow Control

See “Valve Pres. Difference vs. Flow Rate” below characteristics for the appropriate range.

### ELDFG-01






### ELDFG-03



\* Valve pressure difference “ΔP” is reference by follows. In addition, “P”, “A”, “B”, “T” are pressure of each port.  
 4 Port Valve: ΔP = [(P-A) + (B-T)] or [(P-B) + (A-T)]  
 3 Port Valve: ΔP = (P-A) or (A-T)

**Model Number Designation**

F-	ELDF	G	-01	-35	-3C2	-XY	-10
Special Seals**	Series Number	Type of Mounting	Valve Size	Rated Flow L/min.	Spool	Direction of Flow	Design Number
<b>F:</b> Special Seals For Phosphate Ester Type Fluid (Omit if not required)	<b>ELDF:</b> Proportional Electro-Hydraulic Direct Operated Type Directional and Flow Control Valves	<b>G:</b> Sub-Plate Mounting	01	10:10 20:20 35:35	3C2 	<b>XY:</b> Metre-Out Metre-In	10
			03	40:40 80:80	3C40  3C2P  (Zero Lap)		10

\*\* Before ordering the Special seals, consult YUKEN representative

**Attachment**

**Mounting Bolts**

Model number	Socket Head Cap Screw	Qty.	Bolt Kit Model Number
ELDFG-01	M5x45Lg.	4	BKELDFG-01-10
ELDFG-03	M6x35Lg.	4	BKELDFG-03-10

**Sub-Plate**

Valve Model No.	Sub Plate Model No.	Pipe Connection Thd.	Mass Kg.
ELDFG-01	DSGM-01-3080	1/8 BSP.F	0.8
	DSGM-01X-3080	1/4 BSP.F	
	DSGM-01Y-3080	3/8 BSP.F	
ELDFG-03	DSGM-03-2180	3/8 BSP.F	3
	DSGM-03X-2180	1/2 BSP.F	
	DSGM-03Y-2180	3/4 BSP.F	4.7

- Sub plates are available. Specify the sub plate model number from the table. When sub plates are not used, the mounting surface should have a good machined finish.
- Sub plates are same as those for 1/8 and 3/8 solenoid operated directional valves conforming to ISO 4401-AB-03-4-A and ISO 4401-AC-05-4-A mounting

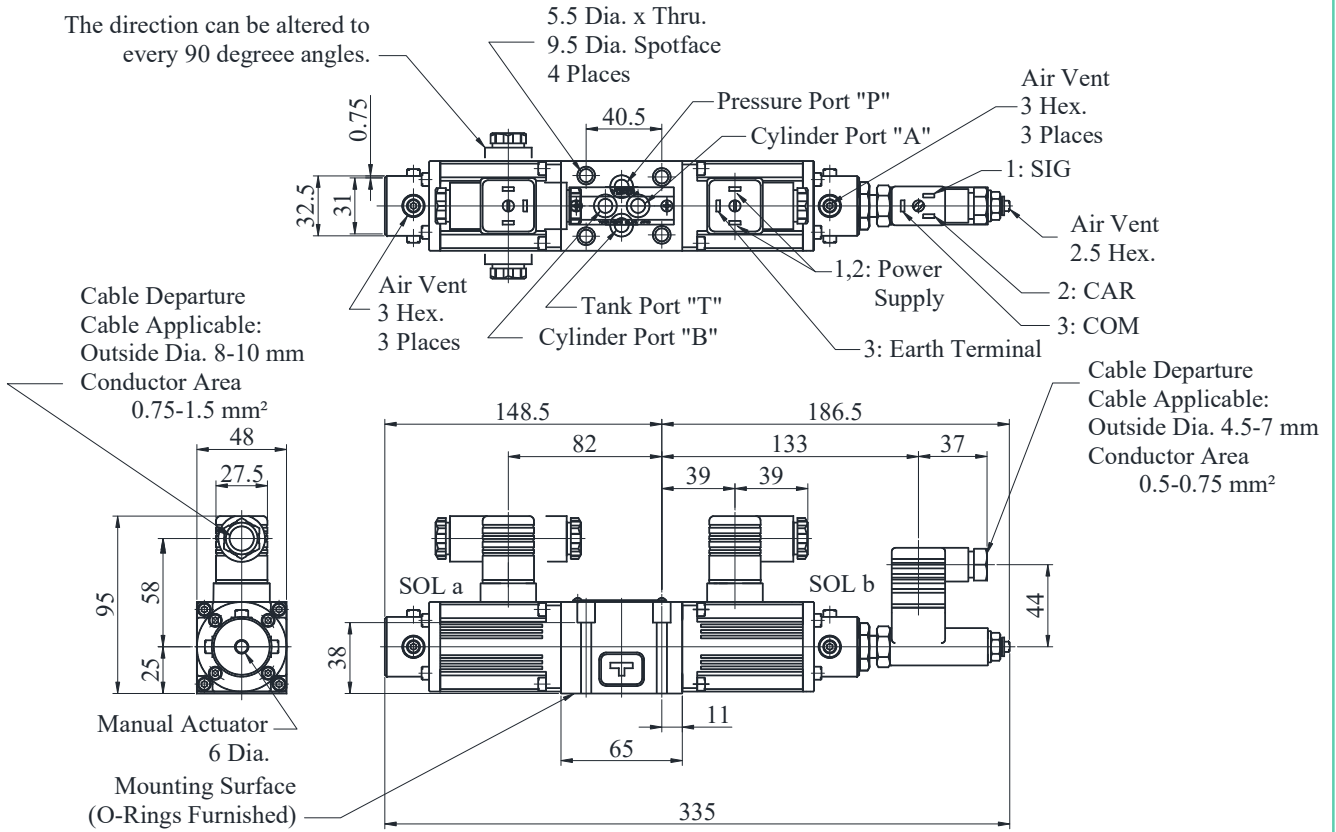
**Applicable Power Amplifiers**

For stable performance, it is recommended that Yuken's applicable power amplifiers be used.

Valve Model Numbers	Power Amplifier Model Numbers
ELDFG-01-※-3C2 3C40	AMN-L-01-1-10
ELDFG-01-※-3C2P	AMN-L-01-3-2P-10
ELDFG-03-※-3C2 3C40	AMB-EL-03-1-10
ELDFG-03-※-3C2P	AMB-EL-03-2P-1-10

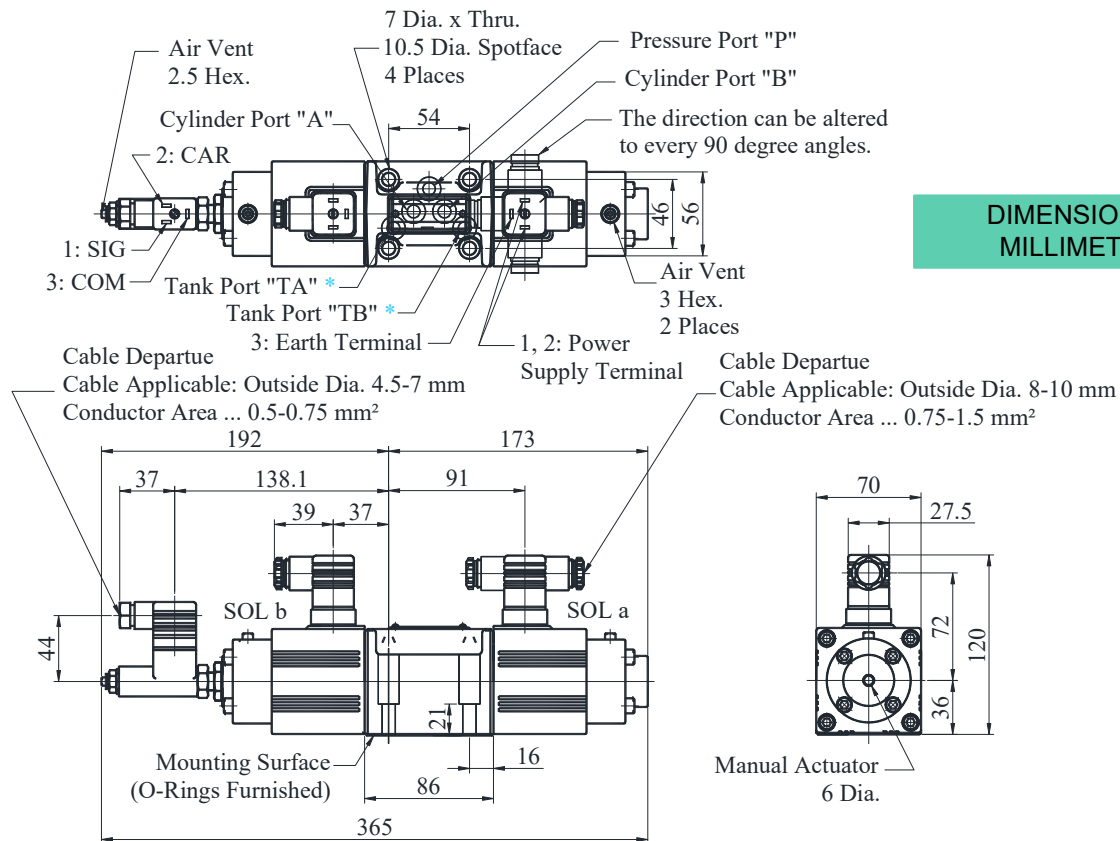
**ELDFG-01-※-※-XY-10**

The direction can be altered to every 90 degree angles.



Note : For valve mounting surface dimensions, see the dimensional drawing of sub-plates of EIC-E-1001.

**ELDFG-03-※-※-XY-10**



**DIMENSIONS IN MILLIMETRES**

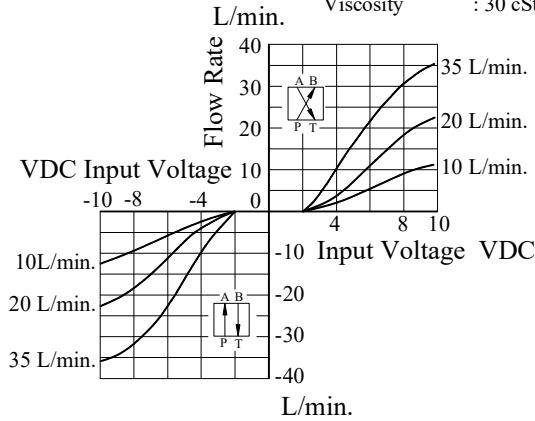
Note : For valve mounting surface dimensions, see the dimensional drawing of sub-plates of EIC-E-1002.

**E Series  
Proportional Electro-Hydraulic High Response Type  
Directional and Flow Control Valve**

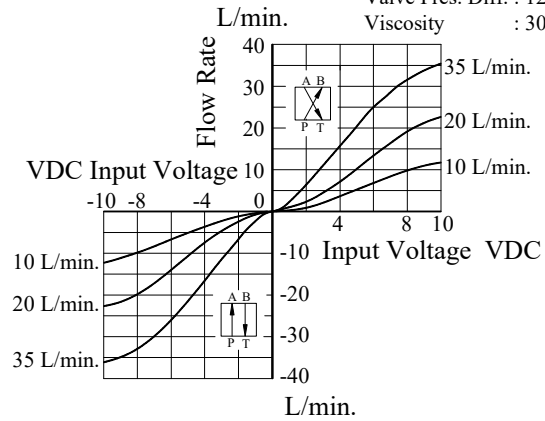
H  
Proportional Electro-Hydraulic  
Dir. & Flow Control Valve

**Input Voltage vs. Flow Rate**

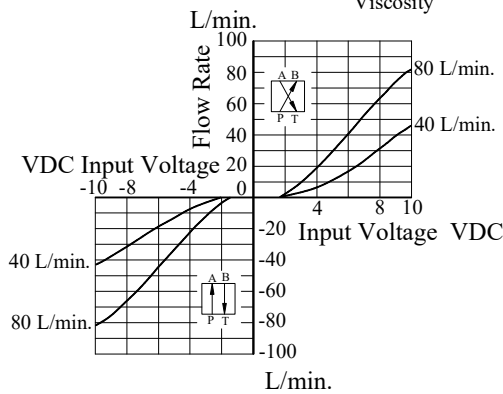
● **ELDFG-01-※-3C2/3C40** Valve Pres. Diff. : 12 Kg/cm<sup>2</sup>  
Viscosity : 30 cSt



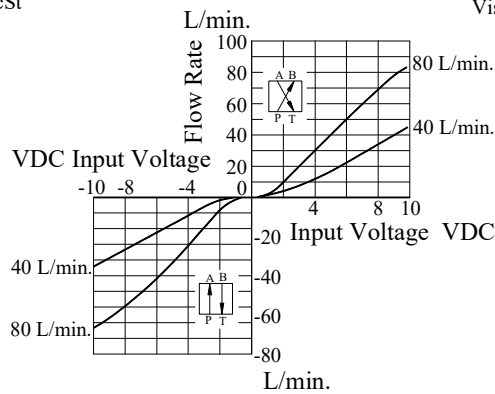
● **ELDFG-01-※-3C2P** Valve Pres. Diff. : 12 Kg/cm<sup>2</sup>  
Viscosity : 30 cSt



● **ELDFG-03-※-3C2/3C40** Valve Pres. Diff. : 15 Kg/cm<sup>2</sup>  
Viscosity : 30 cSt

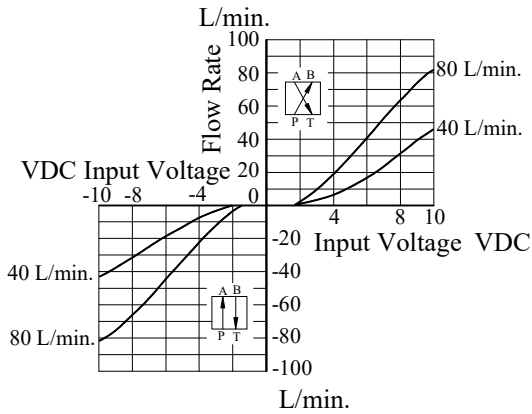


● **ELDFG-03-※-3C2P** Valve Pres. Diff. : 15 Kg/cm<sup>2</sup>  
Viscosity : 30 cSt

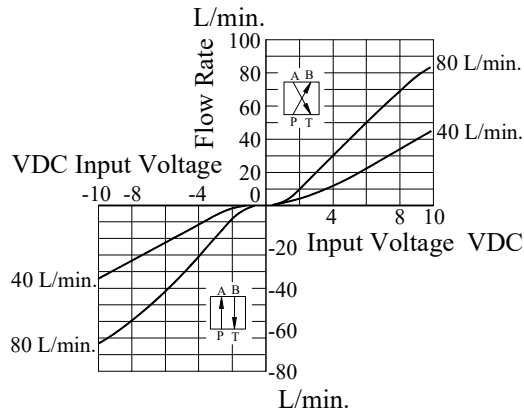


**Input Voltage vs. Spool St.**

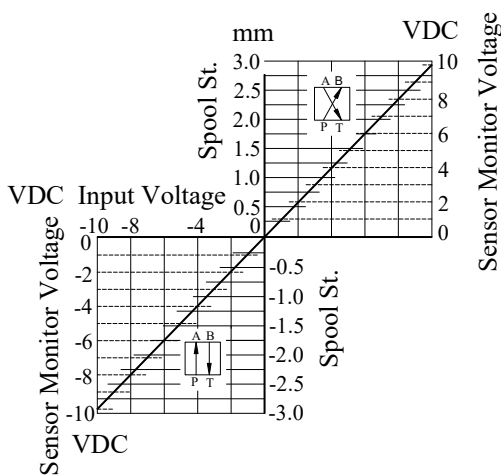
● **ELDFG-01-※-3C2/3C40**



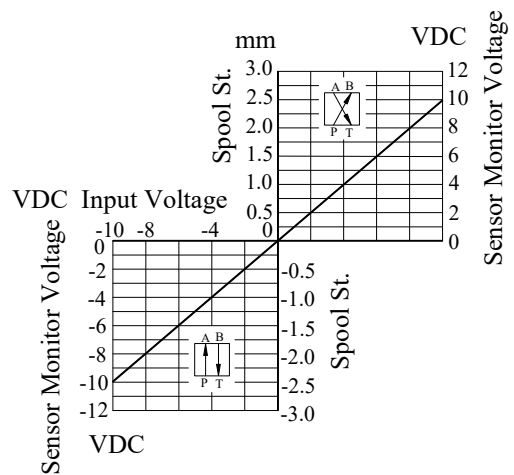
● **ELDFG-01-※-3C2P**



● **ELDFG-03-※-3C2/3C40**



● **ELDFG-03-※-3C2P**



E Series

Proportional Electro-Hydraulic High Response Type  
Directional and Flow Control Valve

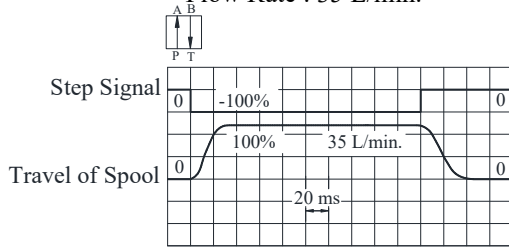
**Step Response**

Viscosity : 30 mm<sup>2</sup>/s

The values were measured on independent valves. They vary by circuit.

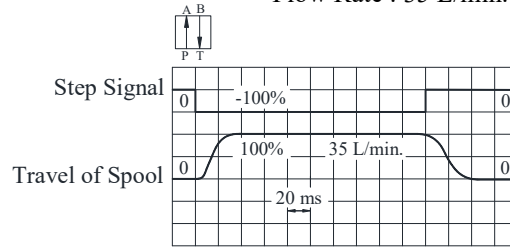
● **ELDFG-01-35-3C2/3C40**

Supply Pressure : 20 Kgf/cm<sup>2</sup>  
Flow Rate : 35 L/min.



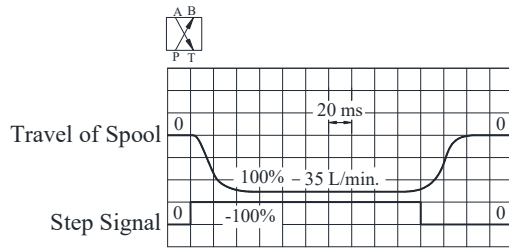
● **ELDFG-01-35-3C2P**

Supply Pressure : 20 Kgf/cm<sup>2</sup>  
Flow Rate : 35 L/min.



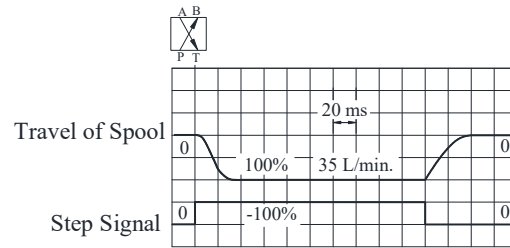
● **ELDFG-03-80-3C2/3C40**

Supply Pressure : 40 Kgf/cm<sup>2</sup>  
Flow Rate : 35 L/min.



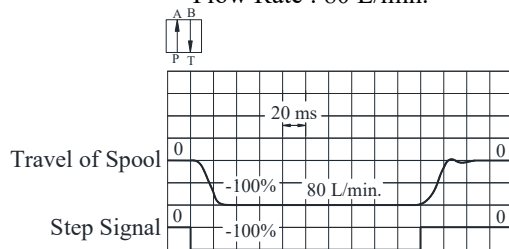
● **ELDFG-03-80-3C2P**

Supply Pressure : 40 Kgf/cm<sup>2</sup>  
Flow Rate : 35 L/min.



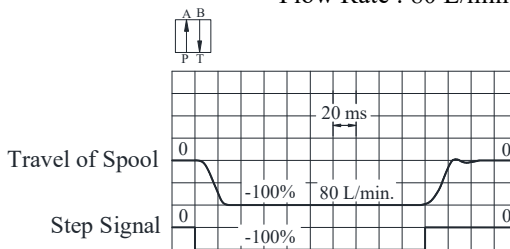
● **ELDFG-03-80-3C2/3C40**

Supply Pressure : 40 Kgf/cm<sup>2</sup>  
Flow Rate : 80 L/min.



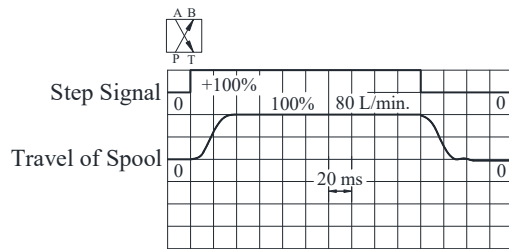
● **ELDFG-03-80-3C2P**

Supply Pressure : 40 Kgf/cm<sup>2</sup>  
Flow Rate : 80 L/min.



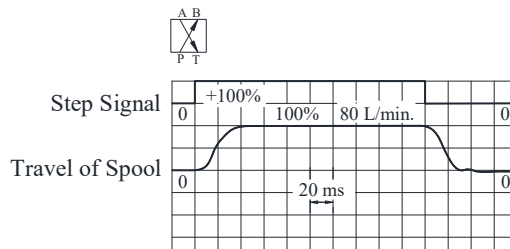
● **ELDFG-03-80-3C2/3C40**

Supply Pressure : 40 Kgf/cm<sup>2</sup>  
Flow Rate : 80 L/min.



● **ELDFG-03-80-3C2P**

Supply Pressure : 40 Kgf/cm<sup>2</sup>  
Flow Rate : 80 L/min.



**Frequency Response**

Input Signal : 0±25 %V

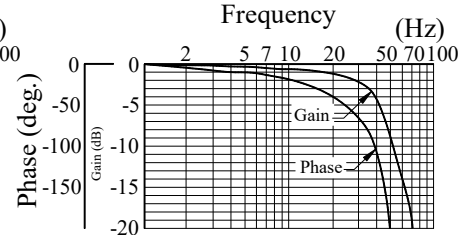
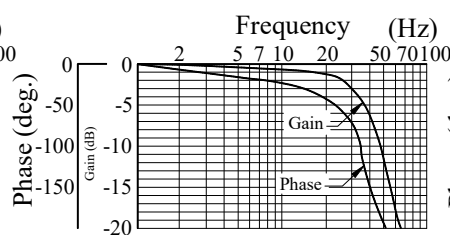
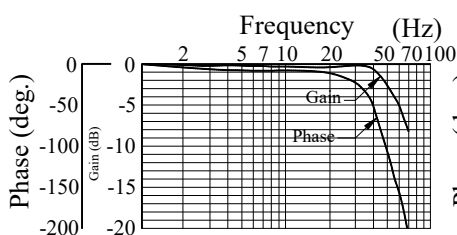
Primary Pressure : 140 Kgf/cm<sup>2</sup>

Viscosity : 30 mm<sup>2</sup>/s

● **ELDFG-01-35-3C2/3C40/3C2P**

● **ELDFG-03-80-3C2/3C40**

● **ELDFG-03-80-3C2P**



## ■ Spare Parts List

### ● List of Seals

Name of Parts	Part Numbers		Qty.	
	ELDFG-01-	ELDFG-03-	ELDFG-01-	ELDFG-03-
O-Ring	SO-NB-P18	SO-NB-A128	2	2
Fastner Seal	SG-FCF-4	SG-FCF-4	2	2
Fastner Seal	TK280152-0	TK280152-0	1	1
O-Ring	SO-NB-P9	SO-NB-A014	4	4

### ● List of Seal Kits

Model Numbers	Seal Kit Number
ELDFG-01	KS-ELDFG-01-10
ELDFG-03	KS-ELDFG-03-10




## ■ Solenoid Assembly

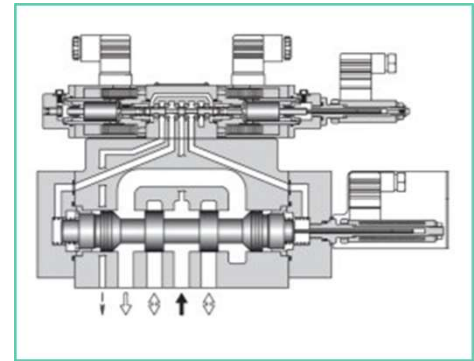
Valve Model Number	Solenoid Assy.	Qty.
ELDFG-01-※-※-XY-10	E318-Y06M2-14-5007	1
	E318-Y06M2-14-L-5007	
ELDFG-03-※-※-XY-10	E324-Y12M2-28-10	1
	E324-Y12M2-28-L-10	

Note: The connector assembly GDM-211-※-11 is not included in the solenoid assembly.

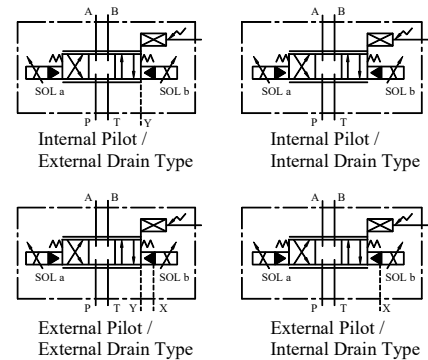
Two Stage Type Directional and Flow Control Valves

Specification

Model Numbers		ELDFHG-04	ELDFHG-06
<b>Description</b>			
Max. Operating Pres.	Kgf/cm <sup>2</sup>	350	350: 350 500: 500
Rated Flow Valve	L/min.	280	350: 350 500: 315
Pres. Difference: 15 Kgf/cm <sup>2</sup>			
Proof Pressure at Return Port (External Drain)	Kgf/cm <sup>2</sup>	“T” Port : 315 “Y” Port : 210	350 “T” Port : 350 “Y” Port : 210 500 “T” Port : 250 “Y” Port : 210
Proof Pressure at Return Port (Internal Drain)	Kgf/cm <sup>2</sup>	210	
Pilot Pressure	Kgf/cm <sup>2</sup>	15 - 315	
Pilot Flow		16 L/min. or more	350 : 16 L/min. or more 500 : 19 L/min. or more
Null Leakage	Ps = 140 Kgf/cm <sup>2</sup> Pp = 140 Kgf/cm <sup>2</sup>	3C2: 3 L/min. or less 3C2P: 10 L/min. or less	3C40: 4 L/min. or less
Step Response (0 ↔ 100%) Pp = 140 Kgf/cm <sup>2</sup>	(Typical Rating)	13 ms	350: 15 ms 500: 18 ms
Frequency Response (0±25% V, Phase) Pp = 140 Kgf/cm <sup>2</sup>		46 Hz (-90 degrees)	350: 66Hz 500: 39 Hz (-90 degrees)
Water - Proofness		IP64	
Operating Temperature Type		-15 to +60 °C	
Spool Type		3C2:  3C2P:  3C40:  (Zero Rap)	
Approximate Spool Stroke to Stops		±5 mm	350: ±5 mm 500: ±7 mm
Main Spool End Area	cm <sup>2</sup>	7.1	8
Rated Current		Max. 2.5 A	
Coil Resistance	20 °C	3.9 Ω	
Approx. Mass	Kg.	10	350: 18 500: 19






Graphic Symbols



- \*1 Return pressure should be less than the actual supply pressure.
- \*2 Pilot pressure should be between 15 Kgf/cm<sup>2</sup> and 35 Kgf/cm<sup>2</sup>, and should exceed 60% of the actual supply pressure to main valve.
- \*3 Pilot flow is calculated with the above step response time at pilot pressure 140 Kgf/cm<sup>2</sup>.
- \*4 Added up leakage of main and pilot spools are stated.

Model Number Designation

F-	ELDFH	G	-04	-280	-3C2P	-XY	-E	T	-10
Special Seals **	Series Number	Type of Mounting	Valve Size	Rated Flow L/min.	Spool Type <sup>1</sup>	Direction of Flow	Pilot Connection	Drain Connection	Design Number
<b>F:</b> Special Seals for Phosphate Ester Type Fluids (Omit if not required)	<b>ELDFH:</b> High Response (Two Stage) Type Proportional Electro-Hydraulic Directional and Flow Control Valves	<b>G:</b> Sub-Plate Mounting	<b>04</b>  <b>06</b>	<b>280 : 280</b>  <b>350 : 350</b> <b>500 : 500</b>	    (Zero Lap)	<b>XY:</b> Meter-In Meter-Out	<b>None:</b> Internal Pilot  <b>E:</b> External Pilot	<b>T:</b> Internal Drain  <b>None:</b> External Drain	<b>10</b>

\*\* Before ordering the Special seals, consult YUKEN representative

E Series  
Proportional Electro-Hydraulic High Response Type  
Directional and Flow Control Valve

**Applicable Power Amplifiers**

For stable performance, it is recommended that Yuken's applicable power amplifiers be used.

Model Number : AMB-EL-※-※-※-10

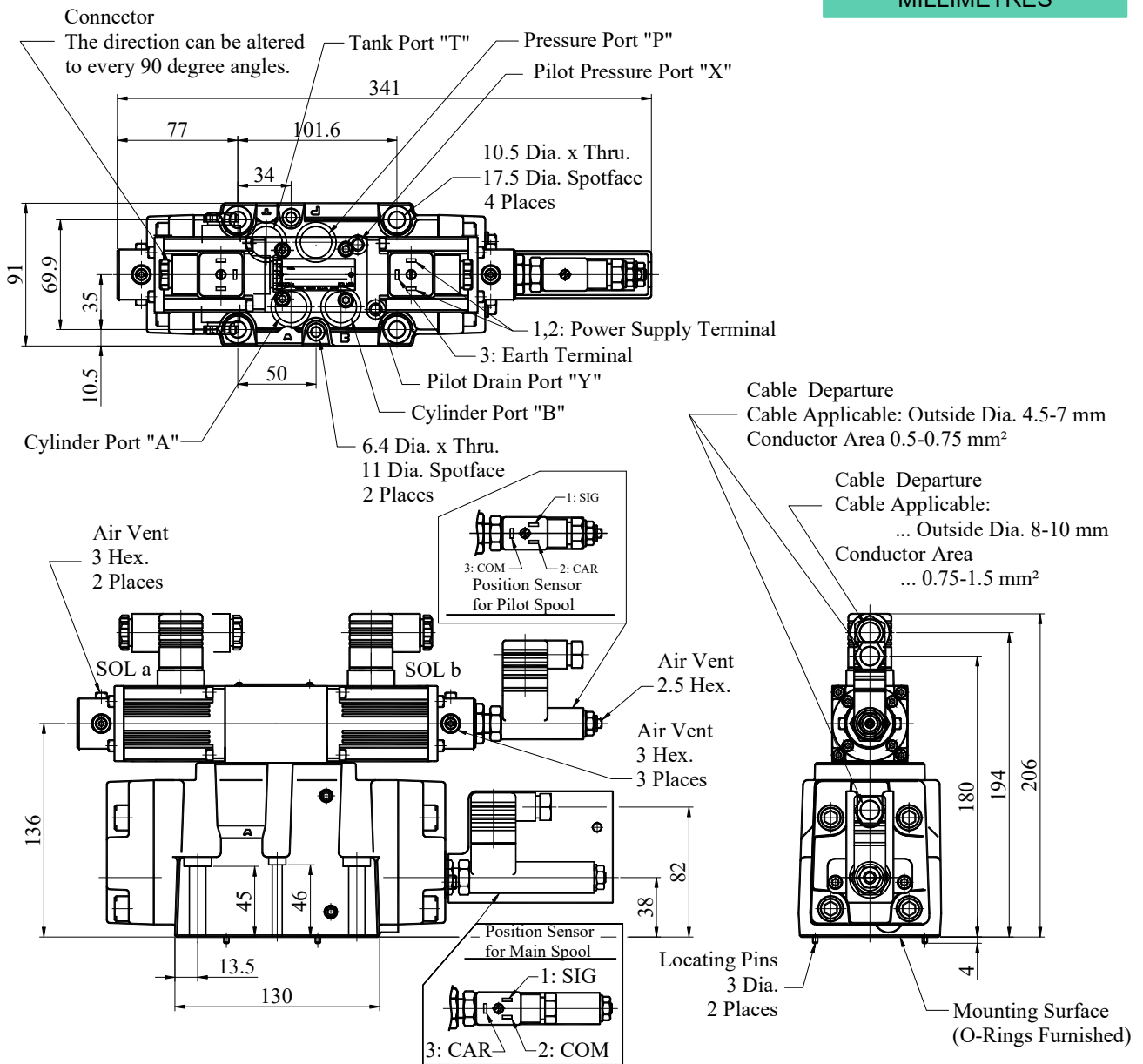
**Attachment**

**Installation condition**

Model Numbers	Socket Head Cap Screw	Qty.
ELDFHG-04	M6x55Lg.	2
	M10x60Lg.	4
ELDFHG-06	M12x85Lg.	6

**ELDFHG-04-280-※-XY-※-※-10**

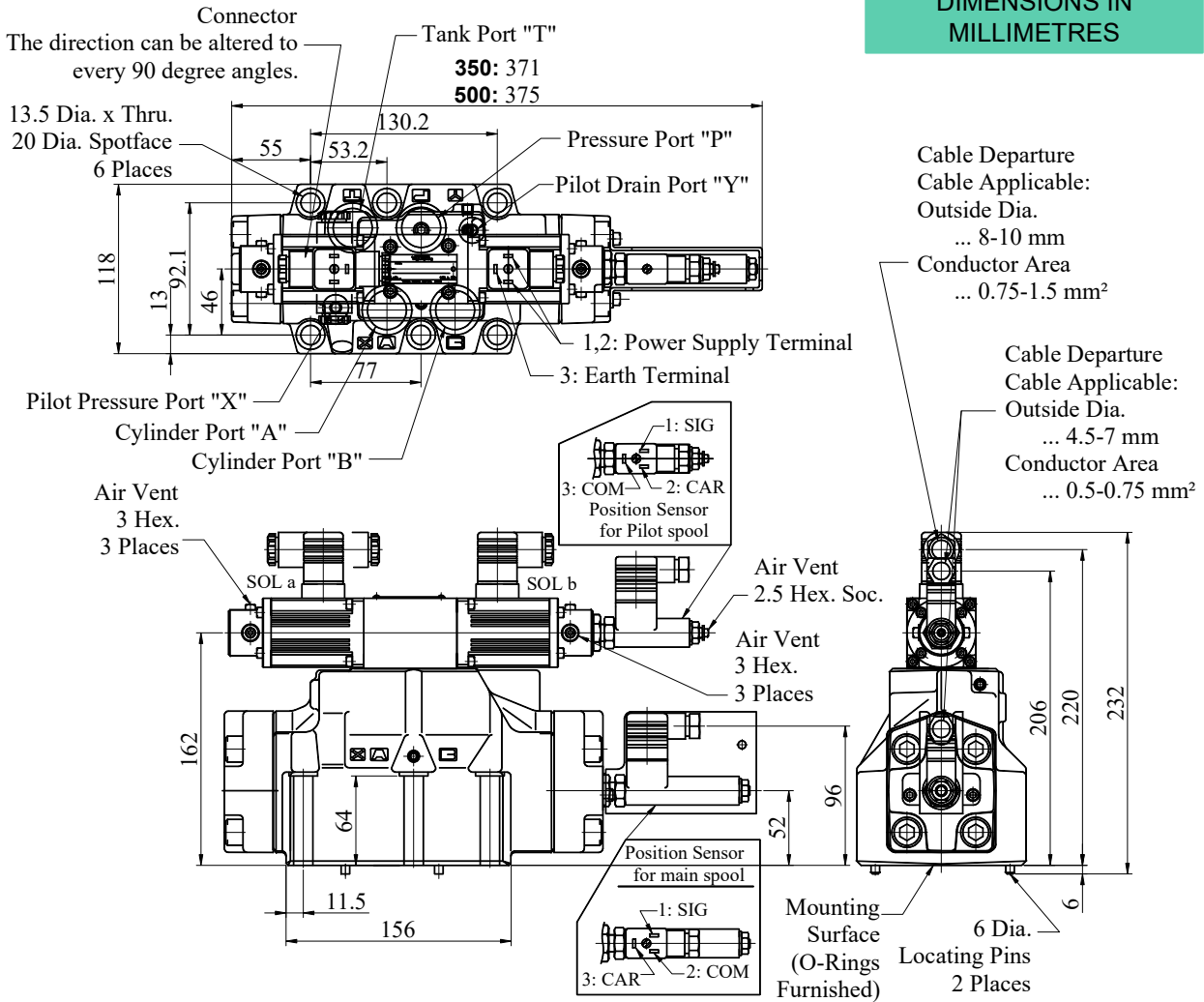
**DIMENSIONS IN MILLIMETRES**



**E Series**  
**Proportional Electro-Hydraulic High Response Type**  
**Directional and Flow Control Valve**



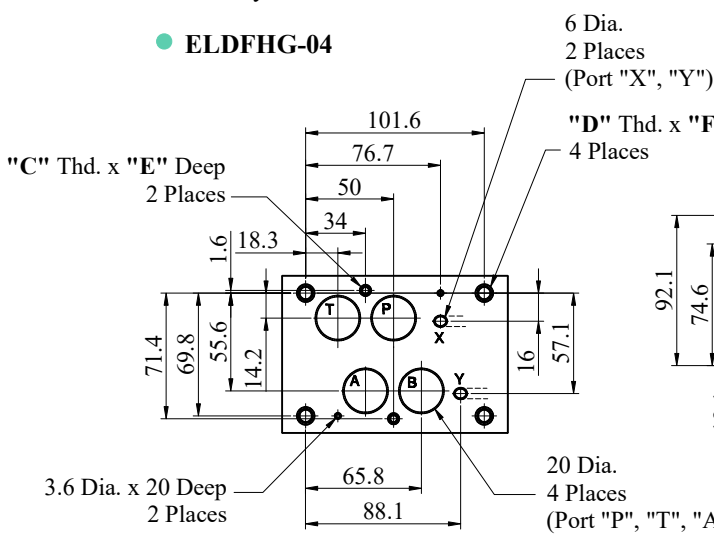
● ELDFHG-06-※-※-XY-※-※-10



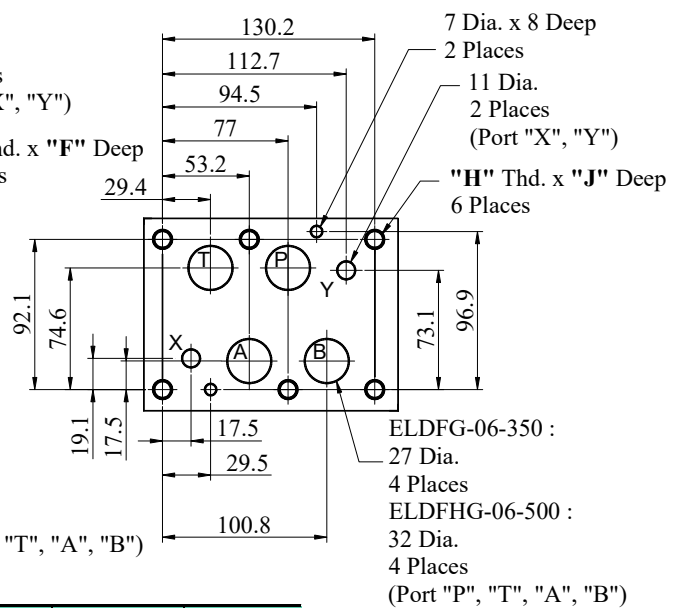
■ Dimensions of valve mounting surface

Prepare a mounting surface as shown to the below.  
Also finish it finely.

● ELDFHG-04



● ELDFHG-06



Model Numbers	"C" Thd.	"D" Thd.	"E" mm	"F" mm	"H" Thd.	"J" mm
ELDFHG-04	M6	M10	12	17	—	—
ELDFHG-06	—	—	—	—	M12	24

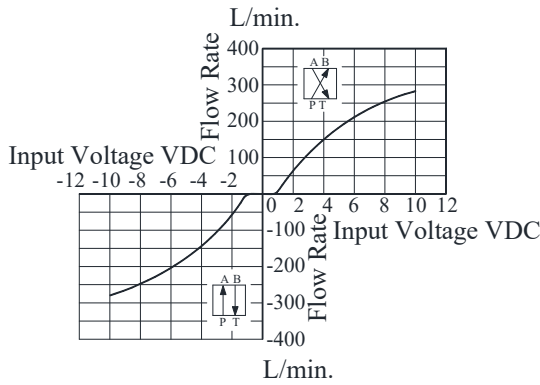
E Series

Proportional Electro-Hydraulic High Response Type  
Directional and Flow Control Valve

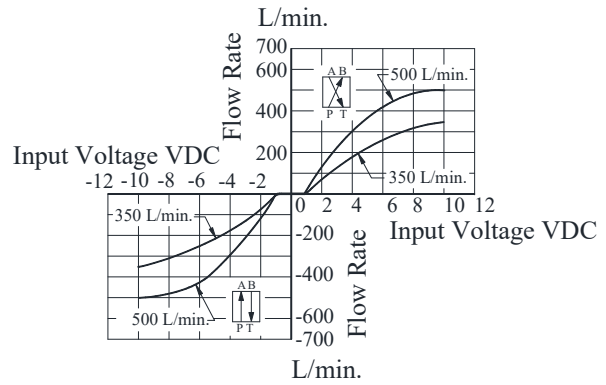
Valve Pres. Diff. : 10 Kg/cm<sup>2</sup>  
 Viscosity : 30 cSt

**Input Voltage vs Flow Rate**

● **ELDFHG-04**



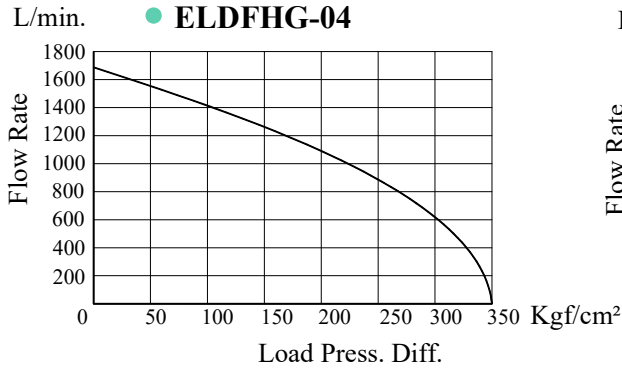
● **ELDFHG-06**



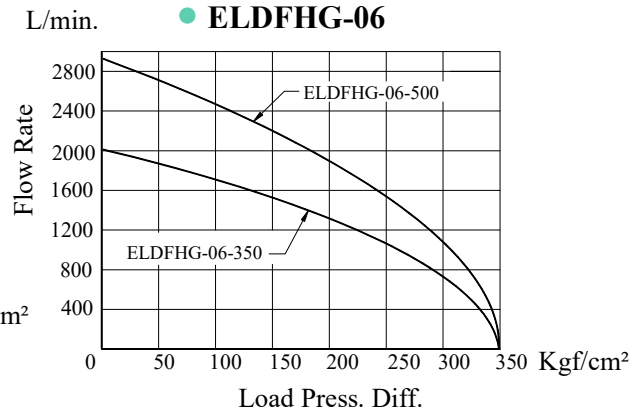
**Load Flow Characteristics**

Viscosity : 30 cSt

● **ELDFHG-04**



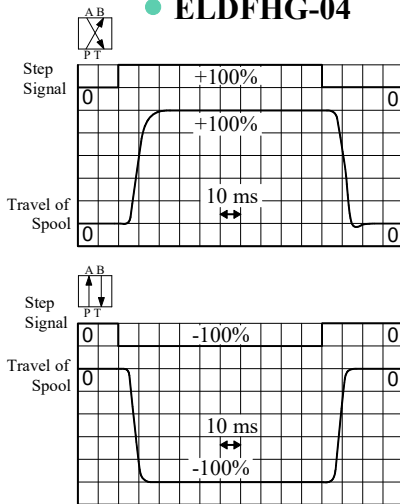
● **ELDFHG-06**



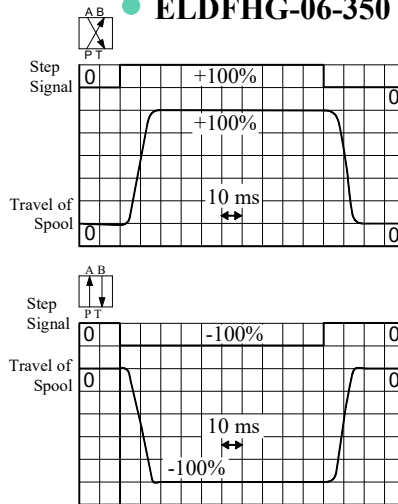
**Step Response (Example)**

Viscosity : 30 cSt

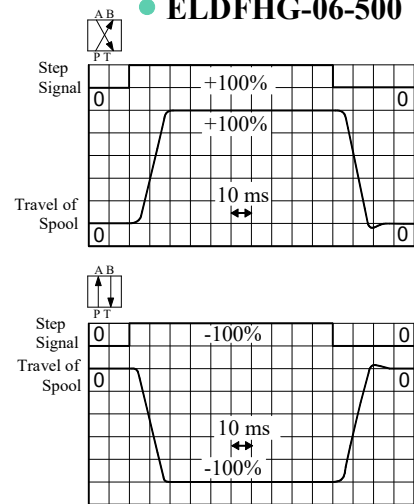
● **ELDFHG-04**



● **ELDFHG-06-350**



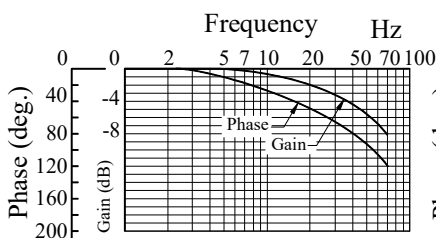
● **ELDFHG-06-500**



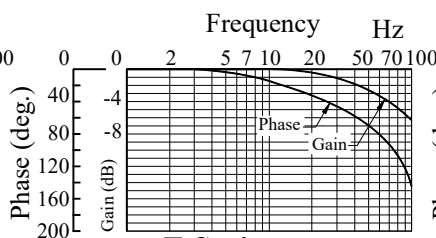
**Frequency Response**

Input Signal : 0±25 %  
 Hydraulic Circuit : Port A/B Closed  
 Supply and Pilot Pressure : 140 Kg/cm<sup>2</sup>  
 Viscosity : 30 mm<sup>2</sup>/s

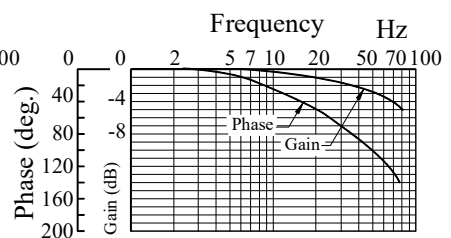
● **ELDFHG-04**



● **ELDFHG-06-350**



● **ELDFHG-06-500**



E Series

Proportional Electro-Hydraulic High Response Type  
 Directional and Flow Control Valve

## ■ Spare Parts List

### ● List of Seals for ELDFHG-04

Name of Parts	Part Numbers	Qty.
O-Ring	SO-NB-P39	1
O-Ring	SO-NB-P22	4
O-Ring	SO-NB-P9	2
O-Ring	SO-NB-A029	1
O-Ring	SO-NB-A012	2

### ● List of Seals for ELDFHG-06

Name of Parts	Part Numbers		Qty.
	ELDFHG-06-350-	ELDFHG-06-500-	
O-Ring	SO-NB-P40	SO-NB-A135	1
O-Ring	SO-NB-P14		2
O-Ring	SO-NB-P10		2
O-Ring	SO-NB-A123	SO-NB-A126	4
O-Ring	SO-NB-A030	SO-NB-A135	1

### ● List of Seal Kits

Model Numbers	Seal Kit Number
ELDFHG-04	KS-ELDFHG-04-10
ELDFHG-06-350	KS-ELDFHG-06-350-10
ELDFHG-06-500	KS-ELDFHG-06-500-10

Note: when ordering the seals, please specify the seal kit number from the table above.  
In addition to the above O-Rings, seals for pilot valve are in the seal kit. For the detail of the pilot valve seals, see page no. 588.

### ● Pilot Valve

Model Numbers	Solenoid Ass'y Model Number
ELDFHG-04	ELDFG-01-30-3C2P-XY-1004
ELDFHG-06	ELDFG-01-30-3C2P-XY-1006

Note: See ELDFG-01-※-※-XY-10 on page no. 583 for the corresponding seal and solenoid assembly for the pilot valve.