

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

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

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

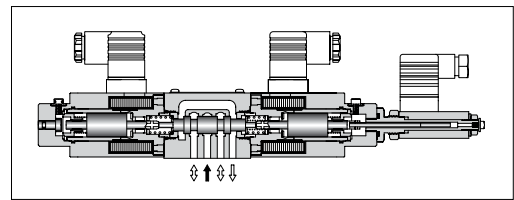
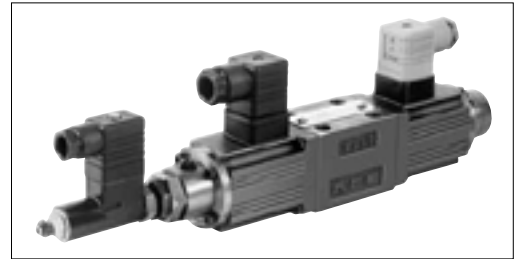
Direct Operated Type Directional and Flow Control Valves

This product can be interchanged with the simplified servo valve to perform position control and pressure control.

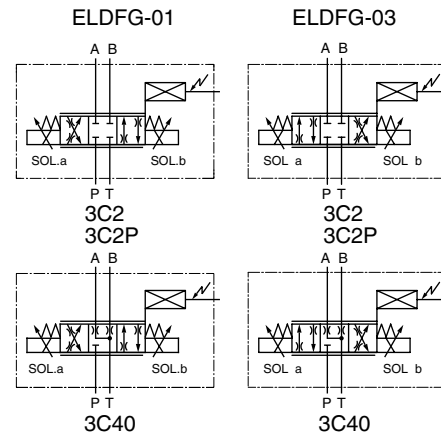
Compared to nozzle flapper type servo valve, this product has excellent contamination-related problems.

Specifications

Description		Model No.	ELDFG-01	ELDFG-03
Max. Operating Pressure		MPa (PSI)	31.5 (4570)	
Max. Tank Line Back Pressure		MPa (PSI)	21 (3050)	
Rated Flow	L/min (U.S.GPM)		10: 10 (2.6)	40: 40 (10.6)
	Valve Pres. Diff. : 1.5 MPa (220 PSI)		20: 20 (5.3)	80: 80 (21.1)
			35: 35 (9.2)	
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 -3 dB		52 Hz	3C2, 3C40: 35 Hz 3C2P: 38 Hz
Rated Current			Max. 2.5 A	Max. 3 A
Coil Resistance [20°C (68°F)]			3.9 Ω	3 Ω
Power Input			Max. 25 W	Max. 27 W
Approx. Mass		kg (lbs.)	3.2 (7.1)	7.5 (16.5)



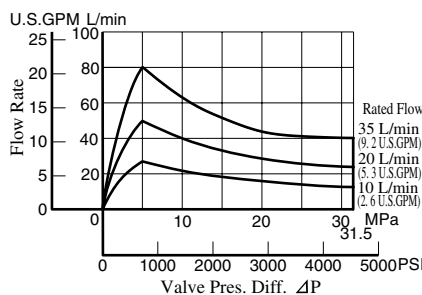
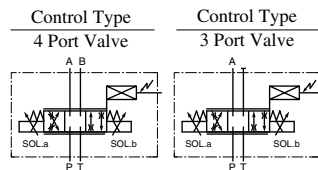
Graphic Symbols



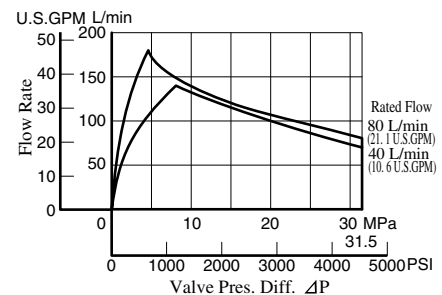
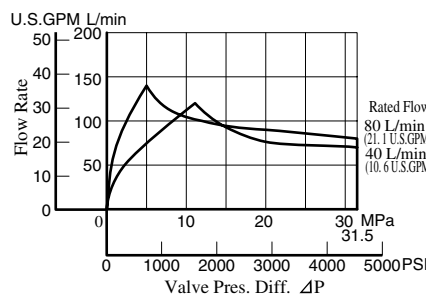
Range of Flow Control

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 (U.S.GPM)	Spool Type	Direction of Flow	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluid (Omit if not required)	ELDF: High Response (Direct) Type Proportional Electro-Hydraulic Directional and Flow Control Valves	G: Sub-plate Mounting	01	10: 10 (2.6) 20: 20 (5.3) 35: 35 (9.2)	   (Zero Lap)	XY: Metre-In·Metre-Out	10	Refer to 
			03	40: 40 (10.6) 80: 80 (21.1)			10	

★ Design Standards: None..... Japanese Standard "JIS" and European Design Standard 90 N. American Design Standard

Attachment

Mounting Bolts

Four socket head cap screws in the table below are included.

Model No.	Descriptions	Soc. Hd. Cap Screw (4 pcs.)	Tightening Torque
ELDFG-01	Japanese Standard "JIS" European Design Standard	M5 × 45 Lg.	5 - 7 Nm (43 - 60 in. lbs.) [Applicable to working pressure more than 25 MPa (3630 PSI): 6 - 7 Nm (52 - 60 in. lbs.)]
	N. American Design Standard	No. 10-24 UNC × 1-3/4 Lg.	
ELDFG-03	Japanese Standard "JIS" European Design Standard	M6 × 35 Lg.	12 - 15 Nm (106 - 133 in. lbs.)
	N. American Design Standard	1/4-20 UNC × 1-1/2 Lg.	

Sub-plate

Valve Model Numbers	Piping Size	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	
ELDFG-01	1/8	DSGM-01-31	Rc 1/8	DSGM-01-3180	1/8 BSP.F	DSGM-01-3190	1/8 NPT	0.8 (1.8)
	1/4	DSGM-01X-31	Rc 1/4	DSGM-01X-3180	1/4 BSP.F	DSGM-01X-3190	1/4 NPT	0.8 (1.8)
	3/8	DSGM-01Y-31	Rc 3/8	—	—	DSGM-01Y-3190	3/8 NPT	0.8 (1.8)
ELDFG-03	3/8	DSGM-03-40	Rc 3/8	DSGM-03-2180	3/8 BSP.F	DSGM-03-2190	3/8 NPT	3.0 (6.6)
	1/2	DSGM-03X-40	Rc 1/2	DSGM-03X-2180	1/2 BSP.F	DSGM-03X-2190	1/2 NPT	3.0 (6.6)
	3/4	DSGM-03Y-40	Rc 3/4	DSGM-03Y-2180	3/4 BSP.F	DSGM-03Y-2190	3/4 NPT	4.7 (10.4)

- 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.
- The Sub-plates are those for 1/8 and 3/8 solenoid operated directional valves. For dimensions, see [page 356 and 373](#).

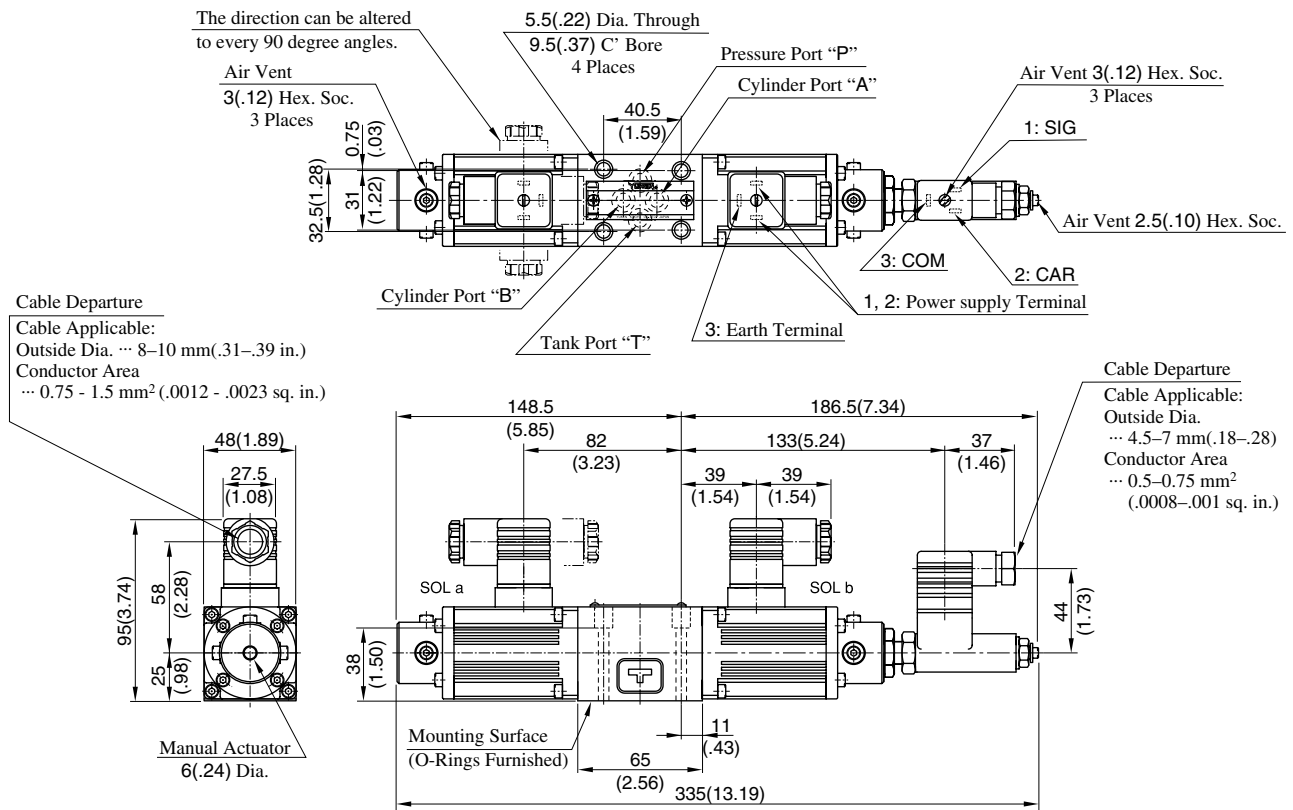
Applicable Power Amplifiers

For stable performance, it is recommended that Yuken's applicable power amplifiers be used (for details see [page 786](#)).

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-10/1090**

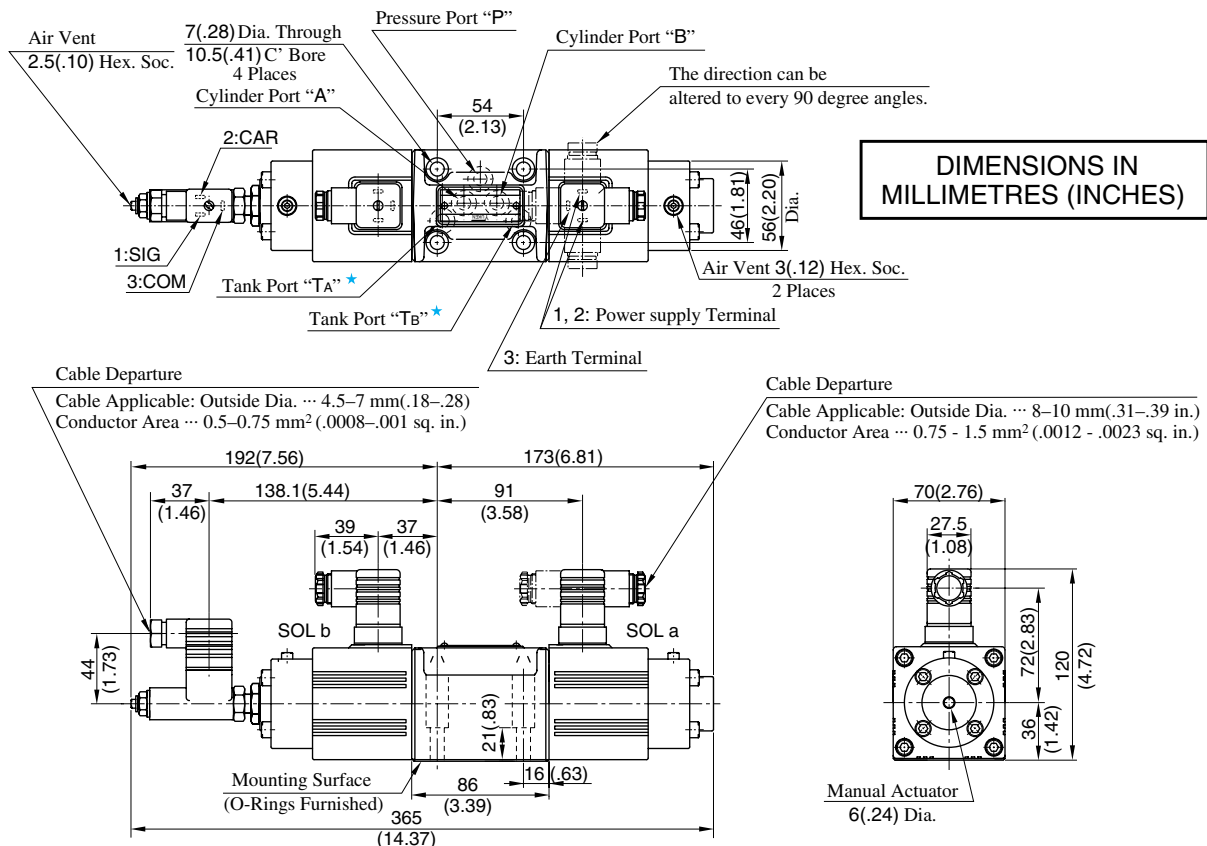
Mounting surface: Conform to ISO4401-AB-03-4-A.



Note: For valve mounting surface dimensions, see the dimensional drawings of sub-plates (p.356) in common use.

ELDFG-03--XY-10/1090**

Mounting surface: Conform to ISO4401-AC-05-4-A.

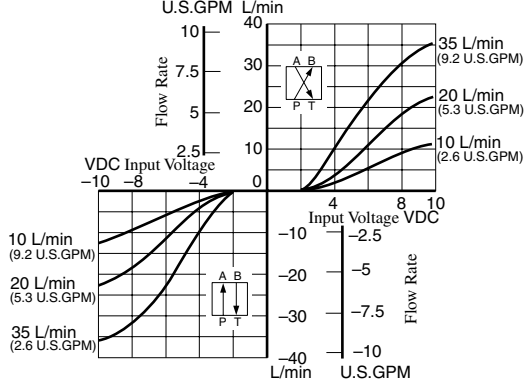


Note: For valve mounting surface dimensions, see the dimensional drawings of sub-plates (p.373) in common use.

Input Voltage vs. Flow Rate

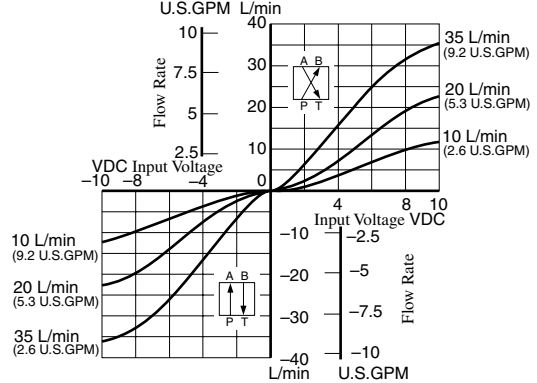
ELDFG-01-* -3C2/3C40

Valve Pres. Diff. : 1.2 MPa (174 PSI)
 Viscosity : 30 mm²/s (141 SSU)



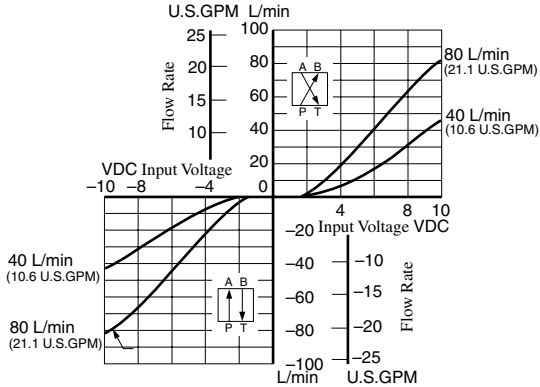
ELDFG-01-* -3C2P

Valve Pres. Diff. : 1.2 MPa (174 PSI)
 Viscosity : 30 mm²/s (141 SSU)



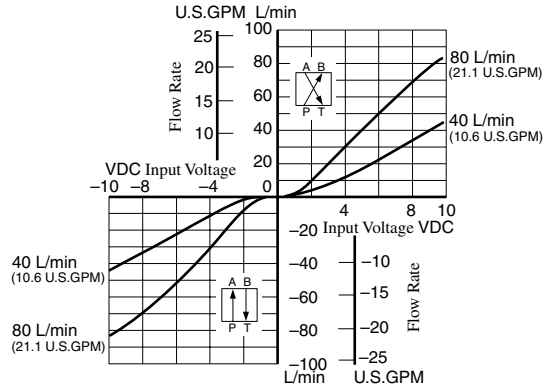
ELDFG-03-* -3C2/3C40

Valve Pres. Diff. : 1.5 MPa (218 PSI)
 Viscosity : 30 mm²/s (141 SSU)



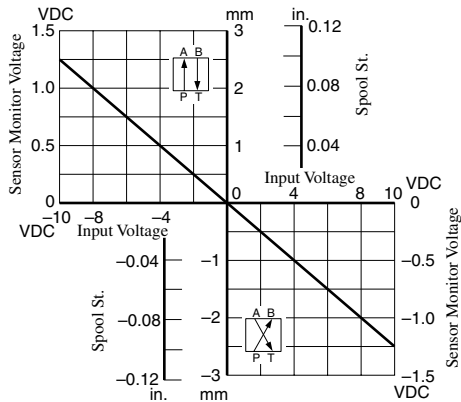
ELDFG-03-* -3C2P

Valve Pres. Diff. : 1.5 MPa (218 PSI)
 Viscosity : 30 mm²/s (141 SSU)

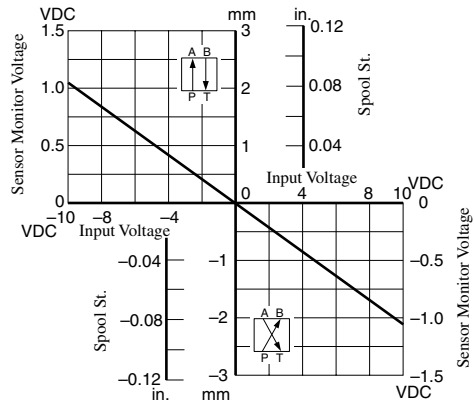


Input Voltage vs. Spool St.

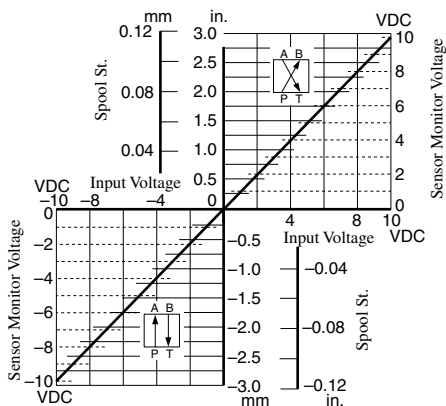
ELDFG-01-* -3C2/3C40



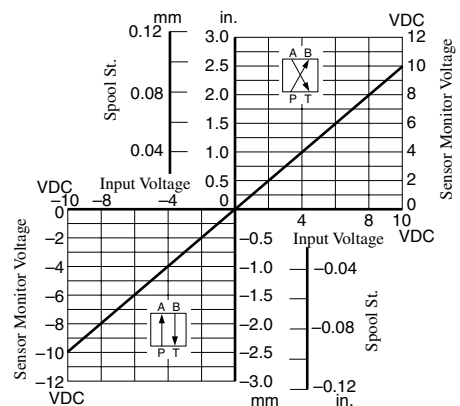
ELDFG-01-* -3C2P



ELDFG-03-* -3C2/3C40



ELDFG-03-* -3C2P



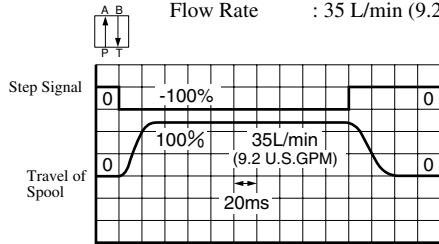
Step Response (Example)

Viscosity : 30 mm²/s (140 SSU)

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

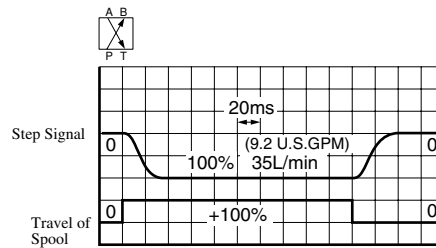
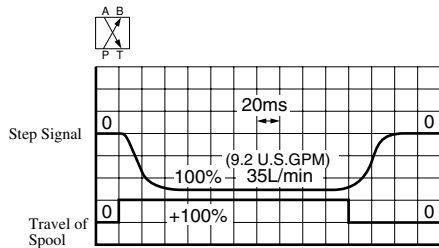
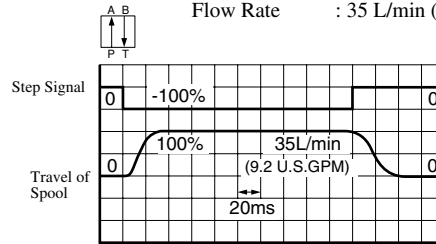
ELDFG-01-35-3C2/3C40

Supply Pressure : 2 MPa (290 PSI)
Flow Rate : 35 L/min (9.2 U.S.GPM)



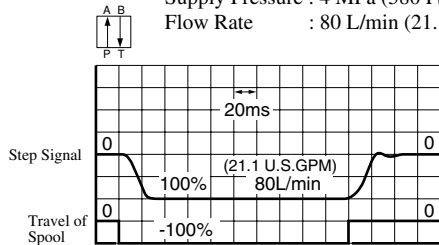
ELDFG-01-35-3C2P

Supply Pressure : 2 MPa (290 PSI)
Flow Rate : 35 L/min (9.2 U.S.GPM)



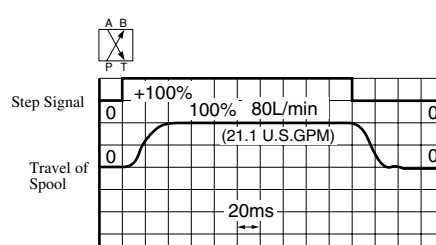
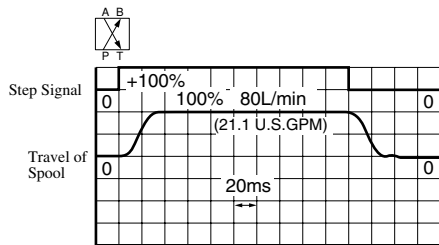
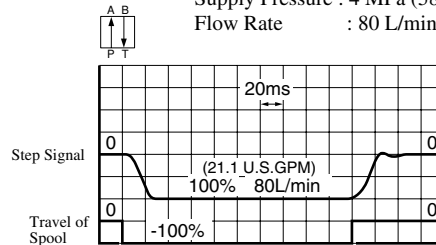
ELDFG-03-80-3C2/3C40

Supply Pressure : 4 MPa (580 PSI)
Flow Rate : 80 L/min (21.1 U.S.GPM)



ELDFG-03-80-3C2P

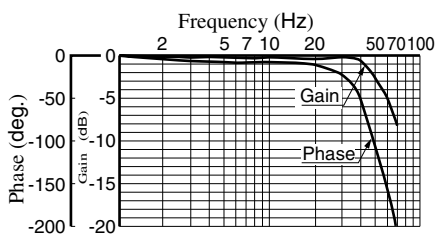
Supply Pressure : 4 MPa (580 PSI)
Flow Rate : 80 L/min (21.1 U.S.GPM)



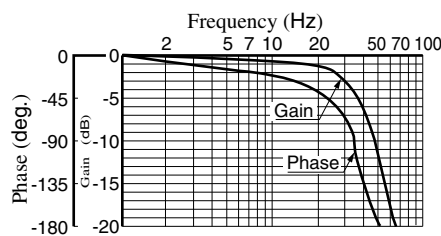
Frequency Response

Input Signal : 0 ±25 %V
Primary Pressure : 14 PMa (2030 PSI)
Viscosity : 30 mm²/s (140 SSU)

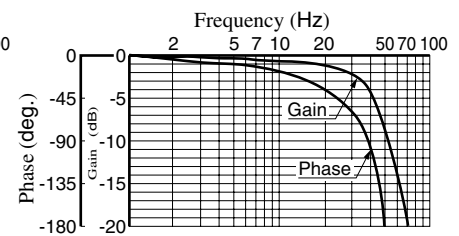
ELDFG-01-35-3C2/3C40/3C2P



ELDFG-03-80-3C2/3C40

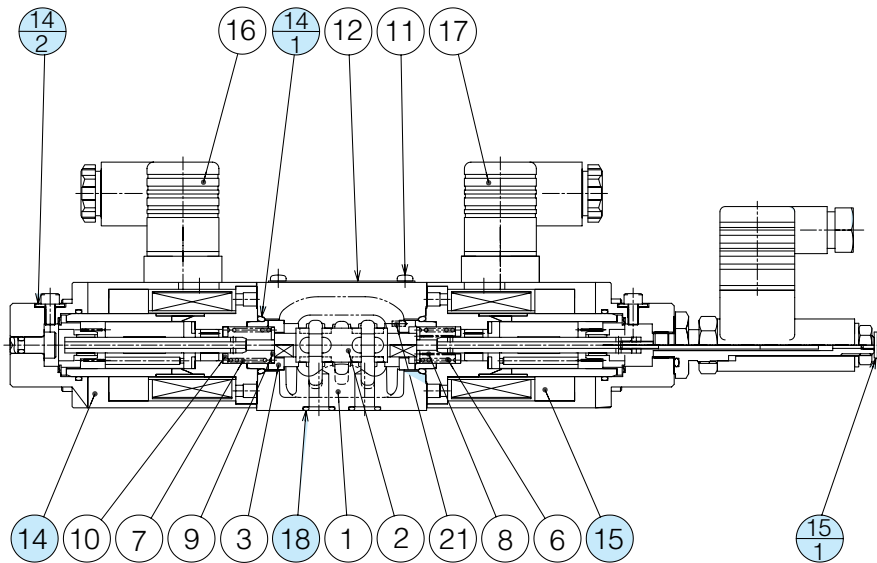


ELDFG-03-80-3C2P



■ List of Seals and Solenoid Ass'y

ELDFG-01-*-*-XY-10/1090



● List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
14-1	O-Ring	SO-NB-P18	2	Included in Seal Kit Kit No.: KS-ELDFG-01-10
14-2	Fastner Seal	SG-FCF-4	2	
15-1	Fastner Seal	TK280152-0	1	
18	O-Ring	SO-NB-P9	4	

Note) O-ring (Item 14-1) and the fastner sael (Item 14-2, 15-1) are included in the solenoid assembly.

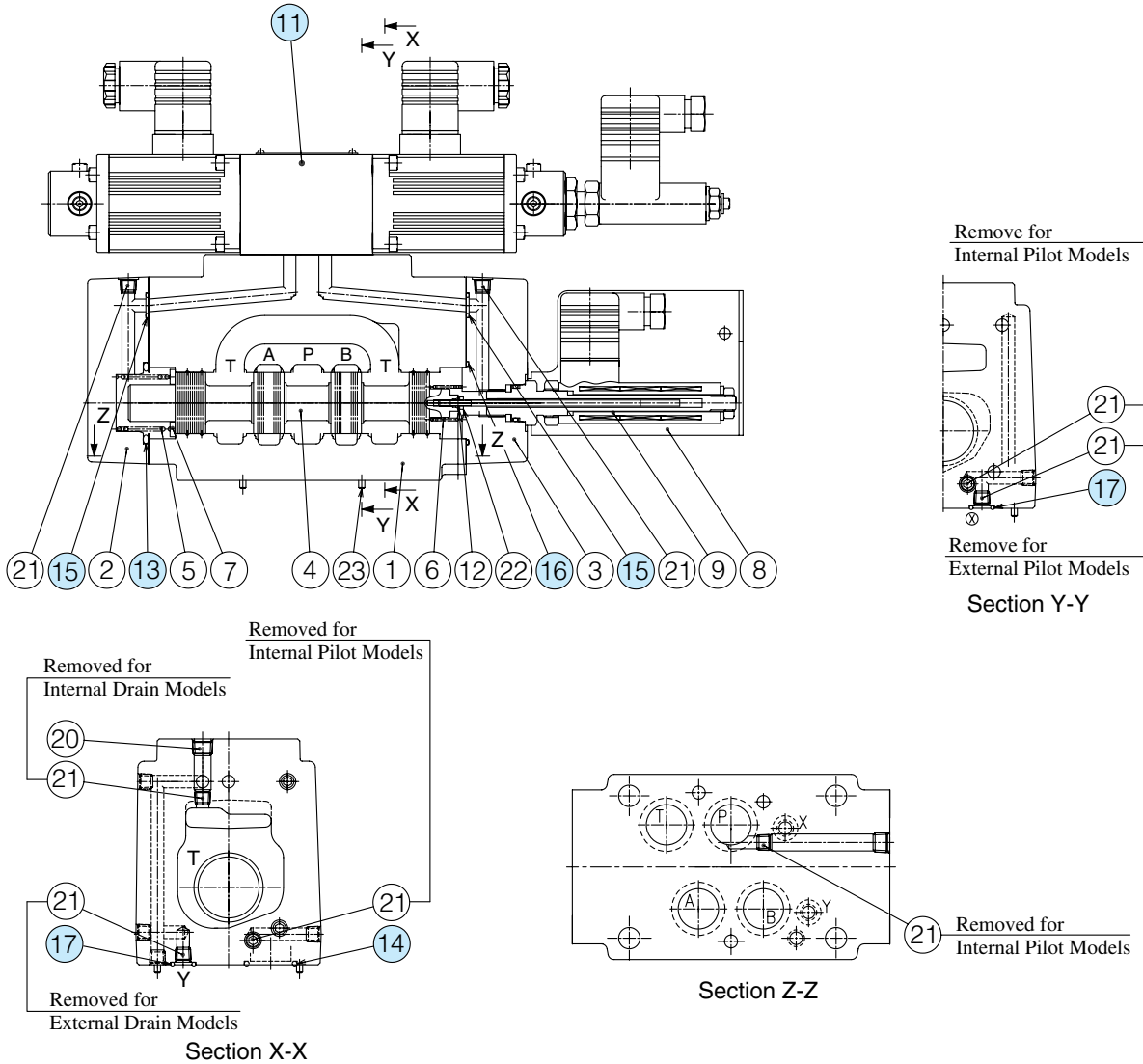
● Solenoid Ass'y

Valve Model Numbers	Item	Solenoid Ass'y	Qty.
ELDFG-01-*-*-XY-10/1090	14	E318-Y06M2-14-5007	1
	15	E318-Y06M2-14-L-5007	1

Note) The connector assembly GDM-211-*-11 (Item 16, 17) is not included in the solenoid assembly.

■ List of Seals and Pilot Valve

ELDFHG-04-280-*-XY-**-10/1090



● List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
13	O-Ring	SO-NB-P39	1	Included in Seal Kit Kit No.: KS-ELDFHG-01-10
14	O-Ring	SO-NB-P22	4	
15	O-Ring	SO-NB-P9	2	
16	O-Ring	SO-NB-A029	1	
17	O-Ring	SO-NB-A012	2	

● Pilot Valve

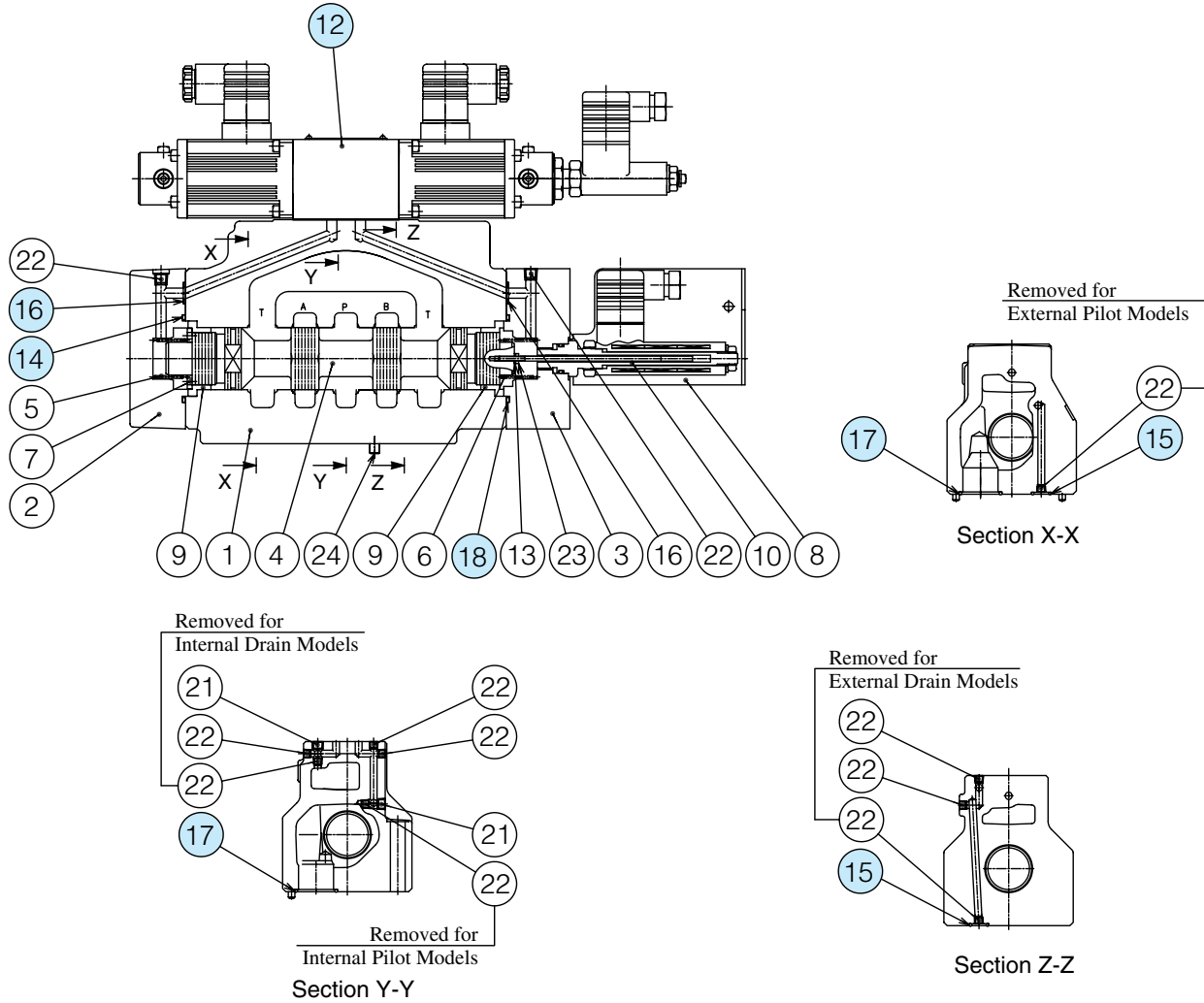
Valve Model No.	⑪ Pilot Valve Model No.
ELDFHG-04	ELDFG-01-30-3C2P-XY-1004

Note) See ELDFG-01-*-XY-10/1090 on page 758 for the corresponding seal and solenoid assembly for the pilot valve.

Note: When ordering seals, please specify the seal kit number from the table above. In addition to the above o-rings, seals for pilot valve are included in the seal kit. For the detail of the pilot valve seals, see page 758.

List of Seals and Pilot Valve

ELDFHG-06-**-*-XY-**-10/1090



List of Seals

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

Note: When ordering seals, please specify the seal kit number from the table above. In addition to the above o-rings, seals for pilot valve are included in the seal kit. For the detail of the pilot valve seals, see page 758.

Pilot Valve

Valve Model No.	⑫ Pilot Valve Model No.
ELDFHG-06	ELDFG-01-30-3C2P-XY-1006

Note) See ELDFG-01-**-*-XY-10/1090 on page 758 for the corresponding seal and solenoid assembly for the pilot valve.

Seal Kit Numbers

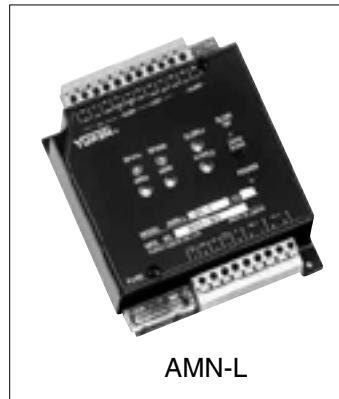
Valve Model Numbers	Seal Kit Numbers
ELDFHG-06-350-**-XY-**-10/1090	KS-ELDFHG-06-350-10
ELDFHG-06-500-**-XY-**-10/1090	KS-ELDFHG-06-500-10

Power Amplifiers For High Response Type Directional and Flow Control Valves

These power amplifiers are used to drive the high response type proportional electro-hydraulic directional and flow control valves.

A compact AMN-L model and a euro card type AMB-EL model are available.

The single height [3U: 100 × 160 mm (3.94 × 6.30 in.)] is employed for the euro card size of the AMB-EL model.



AMN-L



AMB-EL

Model Number Designation

AMN-L

AMN	-L	-01	-3	-2P	-10
Series Number	Type of Function	Size of Applicable Valve	Compensation	Applicable Spool Type	Design Number
AMN	L: DC Input Type Directional and Flow Control with Miner feedback	01: 01 Size	1: Type 1 3: Type 3	None: 3C2, 3C40 2P: 3C2P	10

AMB-EL

AMB	-EL	-03	-2P	-1	-10
Series Number	Type of Function	Size of Applicable Valve	Applicable Spool Type	Compensation	Design Number
AMB	EL: DC Input Type Directional and Flow Control with Miner feedback	01: 01 Size 03: 03 Size 04: 04 Size 06: 06 Size	None: 3C2, 3C40 2P: 3C2P	★ 1 1: For flow rate 40/80 L/min (10.6/21.1 U.S.GPM) 2: For flow rate 280 L/min (74.0 U.S.GPM) 3: For flow rate 350 L/min(92.5 U.S.GPM) 4: For flow rate 500 L/min(132 U.S.GPM)	10

Please refer to us for ★1.

Specifications

Model Numbers	AMN-L-01-1	AMN-L-01-3-2P	AMB-EL-01	AMB-EL-03	AMB-EL-04	AMB-EL-06
Description						
Max. Output Current	2.5 A (3.9 Ω Solenoid)		2.5 A (3.9 Ω Solenoid)	3.0 A (3 Ω Solenoid)	2.5 A (3.9 Ω Solenoid)	
Max. Input Voltage	+10 V DC: P→B→A→T -10 V DC: P→A→B→T		±10 V / ±5 V			
Input Impedance	10 kΩ or more		100 kΩ (50 kΩ in single-end mode)			
Slope-off input	Terminal Number 13-14 Short	—	4 – 28 V			
Slope Adjust Time	0.03 – 5 s	—	0.05 – 5 s (Slope Adjustment function is not available with “AMB-EL-*-2P”)			
Monitor Voltage	±1.5 V / ±3 mm st.		±10 V / rated st.			
Alarm	Open Collector (30 V DC, 10 mA Max.)		Open Collector (30 V DC, 10 mA Max.)			
Supply Voltage Range	24 V DC (20 – 30 V DC)		24 V DC (21 – 28 V DC)			
Power Input	75 W		30 W	40 W	30 W	
Ambient Temperature	0 – 50 °C (32 – 122 °F)		0 – 50 °C (32 – 122 °F)			
Ambient Humidity	90 % RH or less		85 % RH or less			
Connector	—		DIN 41612 – F32			
Approx. Mass	0.3 kg (.66 lbs.)		0.28 kg (.62 lbs.)		0.34 kg (.75 lbs.)	

Applicable to Valve

Power Amplifiers Model Numbers	Valve Model Numbers
AMN-L	ELDFG-01
AMB-EL	ELDFG-01/03 ELDFHG-04/06

Instructions

Power Switch

The power amplifier has no power supply switch. As soon as it is connected to a power supply, it comes to be alive.

Provide a power switch externally.