

LSV(H)G Series High-speed Linear Servo Valves

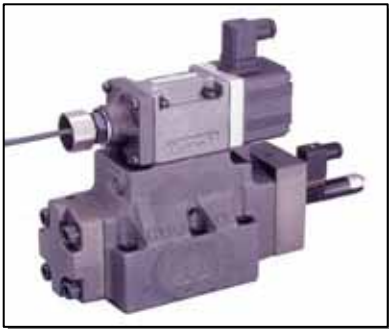
LSVG-03 (3/8) & LSVHG-04/06/10 (1/2,3/4,1) Sub-plate Mounting

LSVG/LSVHG Series High-Speed Linear Servo Valves offer extremely high response and excellent anti-contamination characteristics.

- An intensified small linear motor drives the spool directly.
- A differential transducer electrically detects spool position for feedback control.

These valves are suitable for the following machines which require high speed & high precision control.

- High Speed Nibbling Machine
- High Speed Injection Molding Machine
- Die Casting Machine
- Steel Mill Equipment
- Vibration Testing Machine
- Various Testing Equipment



LSVHG-06



AMLS

Features

High response characteristics

LSVG-03 : 450Hz/-90°(±25% Amplitude), step response 2 ms (0-100%)
 LSVHG-10 : 100Hz/-90°(±25% Amplitude), step response 8 ms (0-100%)

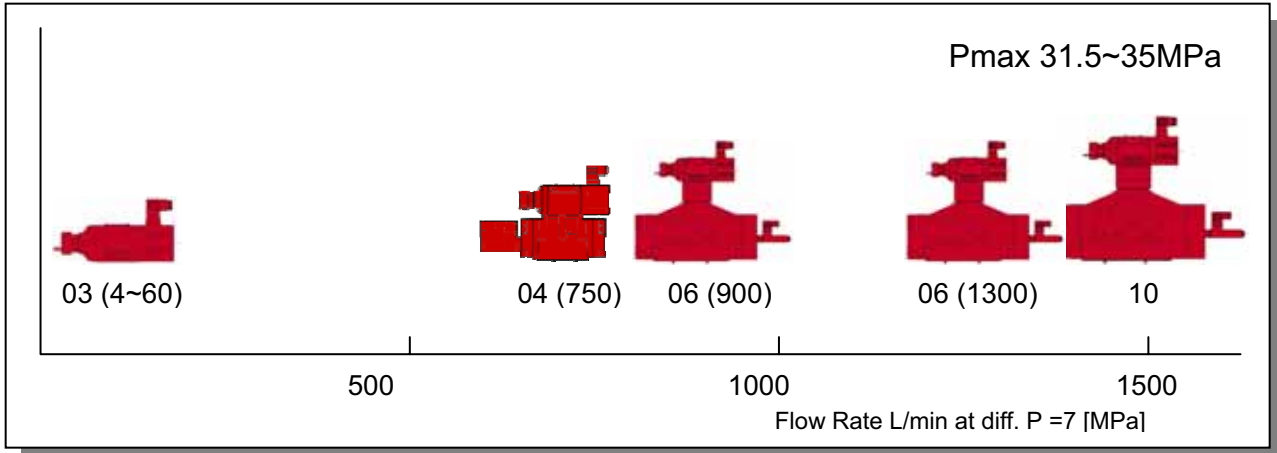
Excellent anti-contamination characteristics

The valves can be used with fluid of which contamination grade is **NAS class 10**.

Wide range selection

High-Speed Linear Servo Valves.
 High performance will be obtained effectively to use these new products.

Line up

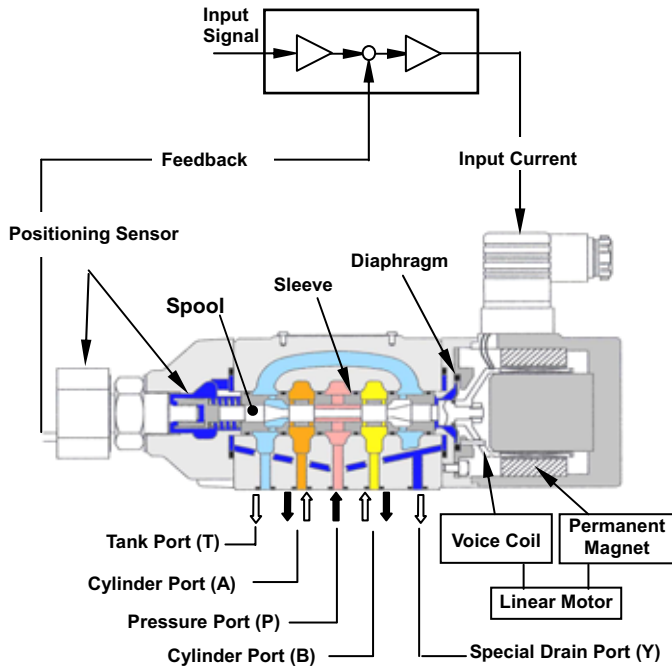


Linear Servo Valve

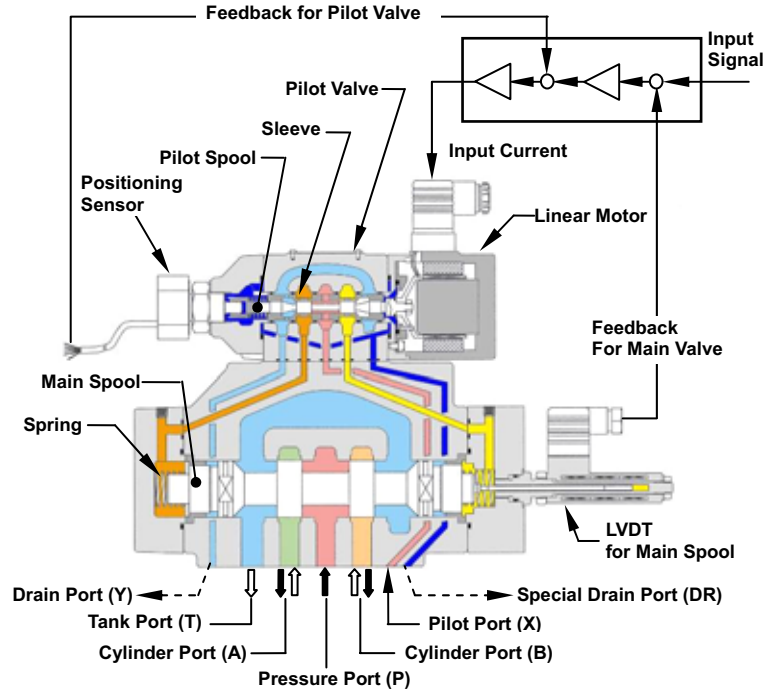
•LSVG-03-4/10/20/40/60-10

•LSVHG-04/06/10-**-10

Power Amplifier: AMLS-A/B-**-10



Power Amplifier: AMLS-C/C2/D-**-10

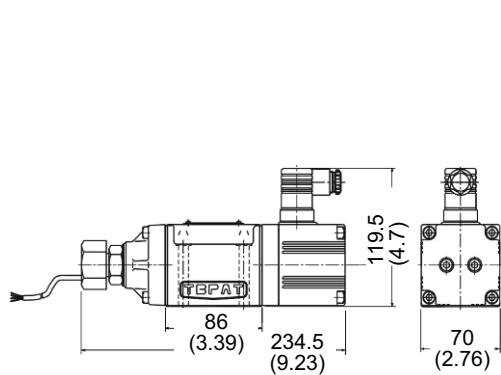


Applications

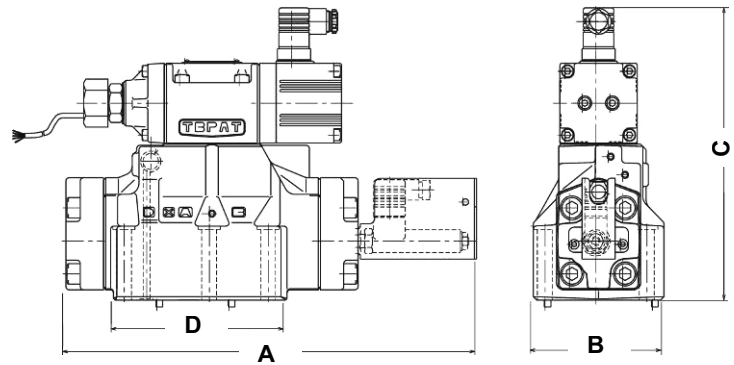
- Nibbling Machine
- Injection Molding Machine
- Horizontal Crash Simulator
- Die Casting Machine
- Steel Mill Equipment
- Vibration Testing Machine



Dimensions






LSVG-03



LSVHG-04/06/10

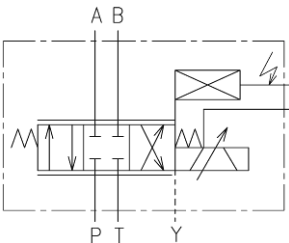
Design Number	Dimensions mm (inch)			
	A	B	C	D
LSVHG-04- 750	335 (13.19)	91 (3.58)	230.5 (9.07)	128.4 (5.06)
LSVHG-06- 900	367.5 (14.47)	118 (4.65)	256.5 (10.1)	156 (6.14)
LSVHG-06-1300	371.5 (14.63)	118 (4.65)	256.5 (10.1)	156 (6.14)
LSVHG-10-1500	484.5 (19.07)	198 (7.8)	352.5 (13.88)	233.8 (9.20)

Model Number Designation

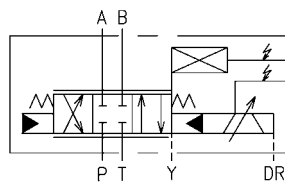
LSV(H)G	- 06	- 900	- 2P	- E	T	- R	- 10
Series Number	Valve Size	Rated Flow at diff.P=7 MPa (1015 psi)	Spool Type at neutral position	Pilot Type	Drain Type	Electrical Connector Position	Design Number
LSVG: Direct Type Linear Servo Valves	03	4: 4 L/min (1.05 gpm) 10: 10 L/min (2.64 gpm) 20: 20 L/min (5.3 gpm) 40: 40 L/min (10.5 gpm) 60: 60 L/min (15.8 gpm)	—	—	—	Viewed from Linear Motor end	10: Standard
LSVHG: Pilot Operated Linear Servo Valves	04	750: 750 L/min (198 gpm)	2: 10%Over-lap 	None: Internal Pilot E: External Pilot	None: External Drain T: Internal Drain	None: Upward (Standard) R: Right L: Left	1090: North American Design Standard
	06	900: 900 L/min (238 gpm) 1300: 1300 L/min (344 gpm)	40: A,B,T Connection  2P: Zero-lap  (Dual Flow Gain)				
	10	1500: 1500 L/min (396 gpm)					

Graphic Symbol

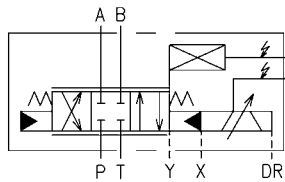
LSVG-03-*-10



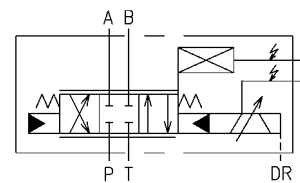
LSVHG-04/06/10-*-10



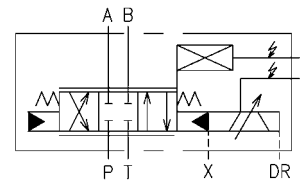
Internal Pilot/
External Drain Type



External Pilot/
External Drain Type

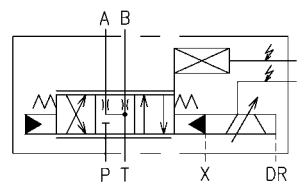


Internal Pilot/
Internal Drain Type



External Pilot/
Internal Drain Type

Graphic symbols shown above are Spool type "2" or "2P",
Graphic symbols shown on right is Spool type "40".
(E.G. External Pilot, Internal Drain)



Direct Type Linear Servo Valves

■ Specifications

Specifications in the below table are what used with Yuken 48VDC type amplifier. Figures in { } are with 24VDC type amplifier.

Model Number		LSVG-03-4/10/20/40	LSVG-03-60
Rated Flow (@diff.P =7 MPa (1015psi)) (1)		4,10,20,40 L/min(1.05,2.64,5.3,10.5 gpm)	60 L/min (15.8 gpm)
Max. Operating Pressure		35 MPa (5075 psi)	
Tank Line Back Pressure		35 MPa (5075 psi)	
DR Port Permissible Back P. (2)		0.05 MPa (7.25 psi)	
Internal Leakage (Ps=14 MPa (2030psi))		less than 1.7 L/min (0.45 gpm)	
Hysteresis		≤0.1%	
Step Response (0-100%) (Typical) (3)		2 ms {3 ms}	3 ms {4 ms}
Frequency Response (Typical) (3) ±25%Amplitude	Gain -3 dB	350 Hz {300 Hz}	330 Hz {240 Hz}
	Phase -90°	450 Hz {330 Hz}	410 Hz {330 Hz}
Vibration Proof (4)		Frequency:10-60 Hz, Amplitude:4 mm, Acceleration:7.8-282 m/s ² Frequency:61-2000 Hz, Amplitude:4-0.0038 mm, Acceleration:294 m/s ²	
Degree of Protection		Equivalent to IP64	
Ambient Temperature		from -15 to +60 °C (from 5 to 140 °F)	
Spool Type		Zero-lap at neutral position	
Rated Spool Stroke		± 0.5 mm (± 0.02 inch)	± 0.75 mm (± 0.03 inch)
Linear Motor Specification	Current	2 A (MAX. 6 A)	
	Coil Resistance	4.5 Ω at 20 °C (68 °F)	
Approx. Mass		5 kg (11 lbs.)	
Power Amplifier		AMLS-A-D48-* -10	AMLS -B-D48-* -10
Mounting Pattern		Standard : Special Mounting Pattern (on Request : ISO 4401-05-04-0-94)	

Note (1) Operate the valve within the control flow range shown below.

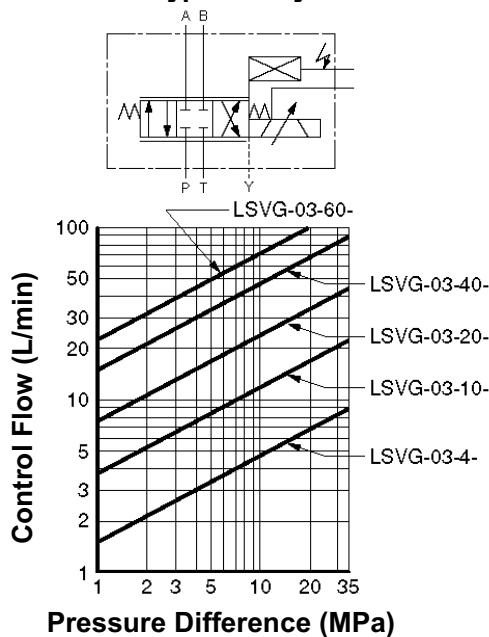
(2) Back pressure for drain port should be less than 0.05MPa (7.3psi) and also not to be vacuum pressure.

(3) The above specifications are measured with individual valve component, it may vary depending on the hydraulic system circuit.

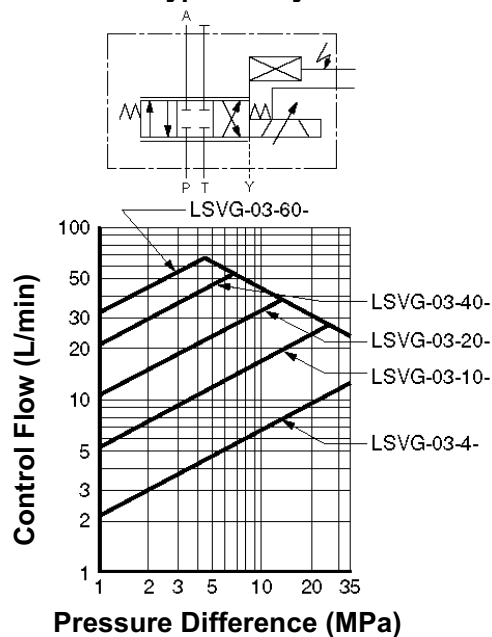
(4) There is restriction on installation directions. Please ask us for details.

■ Control Flow Range

Control Type: 4 way valve



Control Type: 3 way valve



Pilot Operated Type Linear Servo Valves

■ Specifications

Specifications in the below table are what used with Yuken 48VDC type amplifier. Figures in { } are with 24VDC type amplifier.

Model Number		LSVHG-04-750	LSVHG-06-900	LSVHG-06-1300	LSVHG-10-1500								
Rated Flow (@diff.P=7MPa(1015psi))		750 L/min (198 gpm)	900 L/min (238 gpm)	1300 L/min (344 gpm)	1500 L/min (396 gpm)								
Max. Operating Pressure		35 MPa (5075 psi)	35 MPa (5075 psi)	31.5 MPa (4568 psi)	31.5 MPa (4568 psi)								
Proof Press.	External Drain	31.5 MPa (4568 psi)	35 MPa (5075 psi)	25 MPa (3625 psi)	21 MPa (3045 psi)								
	Return Port Internal Drain (1)	31.5 MPa (4568 psi)	35 MPa (5075 psi)	25 MPa (3625 psi)	21 MPa (3045 psi)								
DR Port Permissible Back P. (2)		0.05 MPa (7.25 psi)											
Pilot Pressure (3)		1.5-35 MPa (218-5075 psi)			1.5-25 MPa (218-3625 psi)								
Pilot Flow Rate (4)		more than 27 L/min	more than 30 L/min	more than 34 L/min	more than 30 L/min								
		more than 7.2 gpm	more than 8 gpm	more than 9 gpm	more than 8 gpm								
Leakage of Pilot Valve	Ps=Pp=14MPa(2030psi)	less than 1.7 L/min (0.45 gpm)											
Leakage of Main Valve	Spool Type :	-2-	-40-	-2P-	-2-	-40-	-2P-	-2-	-40-	-2P-	-2-	-40-	-2P-
	Max. Leakage(L/min)	0.8	1.6	6.8	0.9	1.8	7	1	2	8	3	6	10
	(gpm)	0.21	0.42	1.8	0.24	0.48	1.86	0.27	0.53	2.1	0.8	1.6	2.65
Hysteresis		≤0.1%											
Step Response (0-100%) (Typical) (5)		8 ms {10 ms}	8 ms {10 ms}	10 ms {13 ms}	8 ms {8 ms}								
Frequency Response (Typical) ±25% Amplitude (5)	Gain -3 dB	150 Hz {140 Hz}	160 Hz {130 Hz}	150 Hz {110 Hz}	160 Hz {150 Hz}								
	Phase -90°	110 Hz {100 Hz}	105 Hz {100 Hz}	100 Hz {100 Hz}	100 Hz {100 Hz}								
Vibration Proof (6)		Frequency:10-60 Hz, Amplitude:4 mm, Acceleration:7.8-282 m/s ² Frequency:61-2000 Hz, Amplitude:4-0.0038 mm, Acceleration:294 m/s ²											
Degree of Protection		Equivalent to IP64											
Ambient Temperature		from -15 to +60 °C (from 5 to 140 °F)											
Rated Spool Stroke		±5 mm (±0.2 inch)	±5 mm (±0.2 inch)	±7 mm (±0.28 inch)	±5 mm (±0.2 inch)								
Spool End Area		7.1 cm ² (1.09 inch ²)	8 cm ² (1.24 inch ²)	8 cm ² (1.24 inch ²)	8 cm ² (1.24 inch ²)								
Linear Motor Specification	Current	2A (MAX. 6A)											
	Coil Resistance	4.5 Ω at 20 °C (68 °F)											
Approx. Mass		12 kg (26.5 lbs.)	20 kg (44.1 lbs.)	21 kg (46.3 lbs.)	54 kg (119 lbs.)								
Power Amplifier		AMLS-C2-D48*-10	AMLS-C-D48*-10	AMLS-D-D48*-10	AMLS-C-D48*-10								
Mounting Pattern		ISO4401-07-06-0-94	ISO4401-08-07-0-94		ISO4401-10-08-0-94								

Note (1) Max. T-Line Back Pressure should be less than actual supply pressure.

(2) Back Pressure for drain port should be less than 0.05MPa (7.3psi) and also not to be vacuum pressure.

(3) Supply Pressure of Pilot Valve should be 1.5-35MPa (218-5075psi) (LSVHG-10 1.5-25MPa (218-3625psi)) and should also be more than 60% of actual supply pressure when valve is used.

(4) Pilot Flow Rate is calculated based on 14MPa (2030psi) of Pilot Pressure and the above Step response.

(5) The above specifications are measured with individual valve component, it may vary depending on the hydraulic system circuit.

(6) There is restriction on installation directions. Please ask us for details.

Power Amplifier

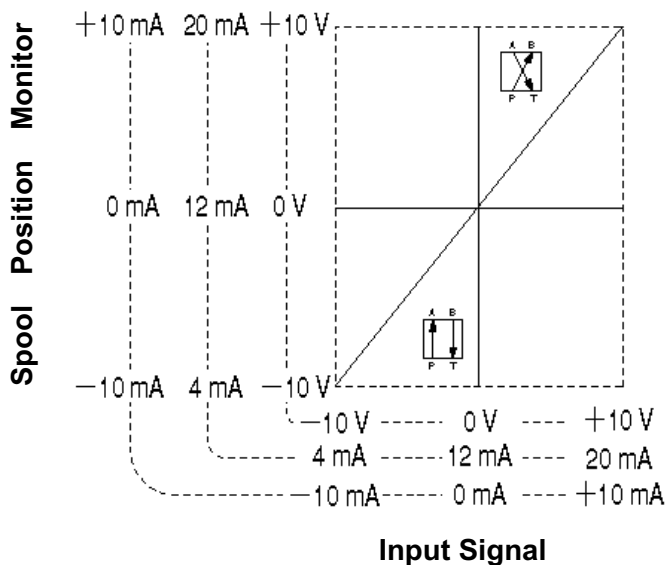
Specifications

Model Number	AMLS*-D48*-10	AMLS*-D24*-10
Power Supply	DC48V±2.4V (±5%)	DC24V±1.2V (±5%)
Rated Output Current	Continuous ±2A (4A Peak)	Continuous ±2A (3A Peak)
Input Signal and Output Signal	Output Signal = Spool Position Monitor	
AMLS*-D48/D24-A1-	Voltage Signal ±10V (Ri=100kΩ, RL□10kΩ)	
AMLS*-D48/D24-B1-	Current Signal 4 to 20mA (Ri=200Ω, RL=100~500Ω)	
AMLS*-D48/D24-C1-	Current Signal ±10mA (Ri=200Ω, RL=100~500Ω)	
Control Input / Output Signal	a) Servo "ON" Input and Alarm Reset Input : Photocoupler Input Voltage Range: DC+15V to +28V, Input Impedance : 2.2kΩ b) Overcurrent Output (Curr.AL.) and Deviation Alarm Output : Photocoupler Input Voltage : Max. DC50V Current : Max. 30mA	
Ambient Temperature	from 0 to 50 °C (from 32 to 122 °F)	
Ambient Humidity	20 ~ 90%Rh (Bedewing must be avoided)	
Approx. Mass	1.8 kg	

Model Number Designation

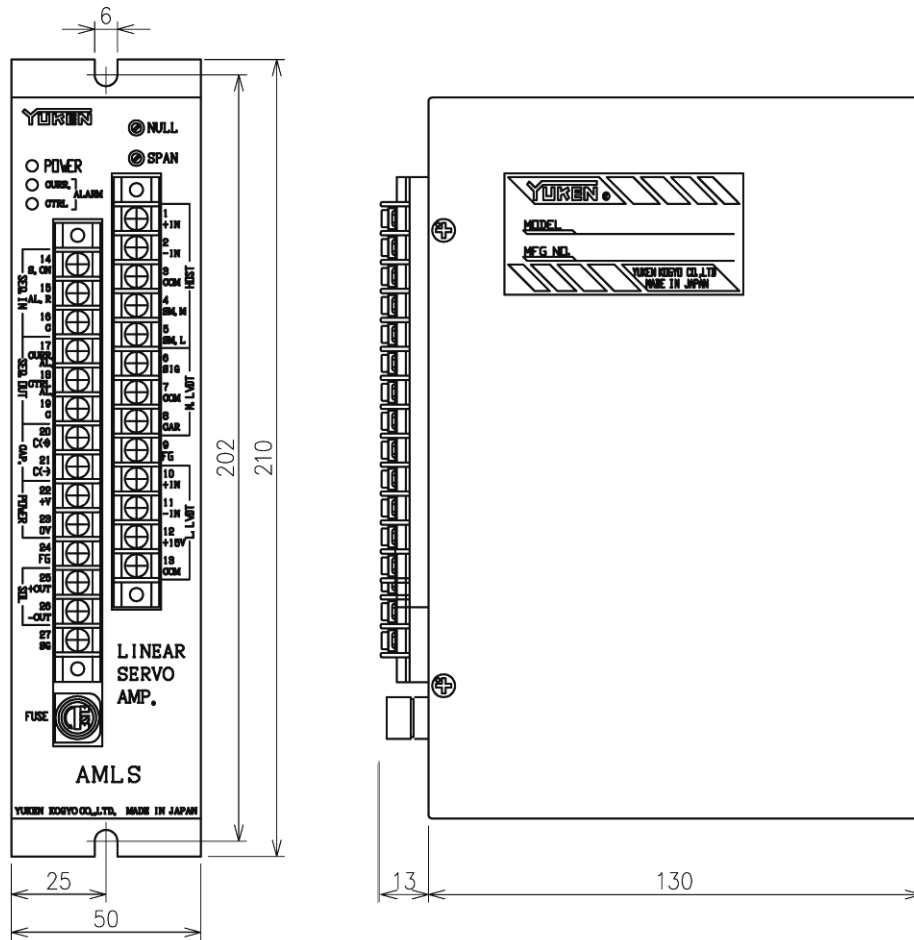
AMLS	- A	- D48	- A1	- 10
Series Number	Applicable Valve Type	Power Supply	Input Signal and Spool Position Monitor	Design Number
AMLS: Linear Servo Amplifier	A : LSVG-03-4/10/20/40 B : LSVG-03-60 C : LSVHG-06-900 & LSVHG-10-1500 C2: LSVHG-04 D : LSVHG-06-1300	D48: DC48V D24: DC24V	A1: Voltage Signal ±10V B1: Current Signal 4 to 20mA C1: Current Signal ±10mA	10

Input Signal vs Output Signal (Spool Position Monitor)

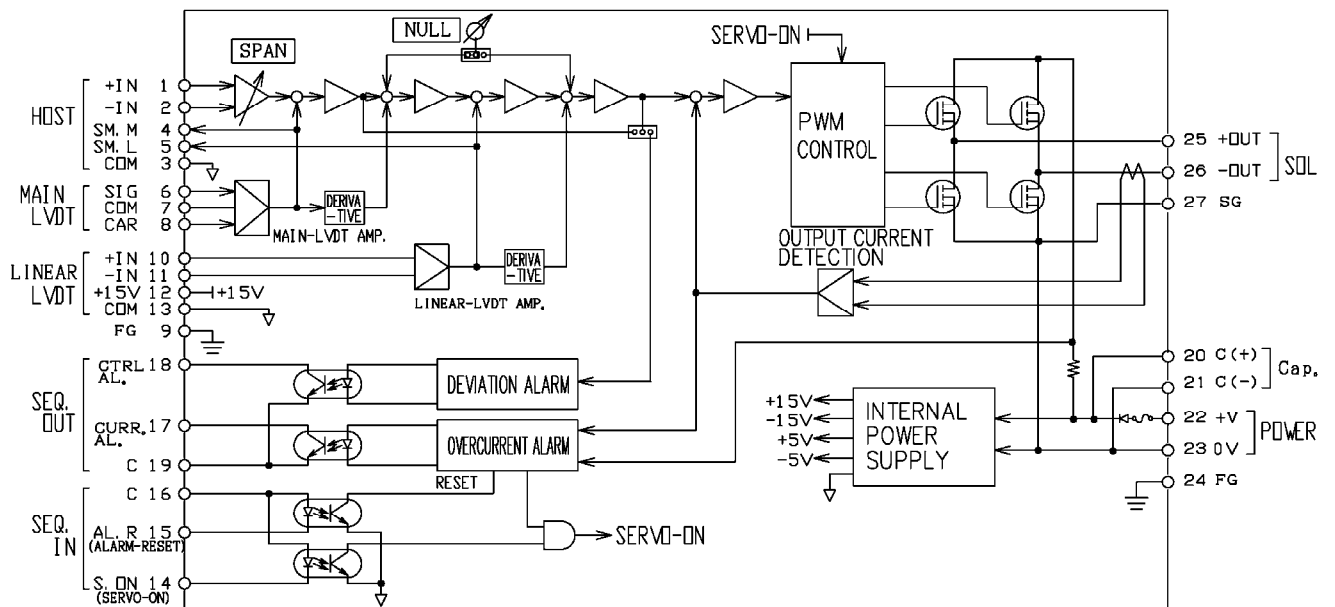


Installation drawing

DIMENSIONS IN MILLIMETERS



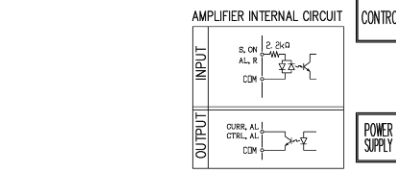
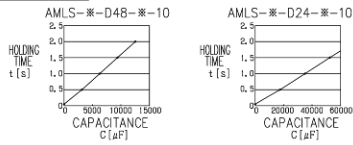
Diagram



■Wiring Diagram

●For LSVG-03-**-10

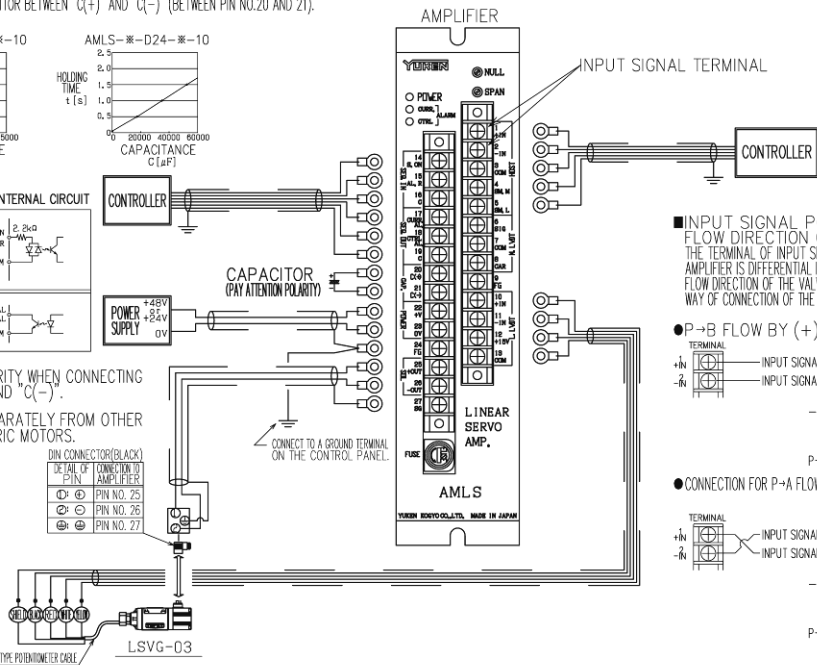
★IN CASE THE SPOOL CENTER POSITION MUST BE KEPT FOR A FEW SECONDS WHEN IT IS POWER FAILURE OR AFTER THE POWER IS CUT OFF, CONNECT A CAPACITOR BETWEEN "C(+)" AND "C(-)" (BETWEEN PIN NO.20 AND 21).
HOLDING TIME VS. CAPACITANCE



- ★PAY ATTENTION TO CAPACITOR POLARITY, WHEN CONNECTING THE CONDENSER BETWEEN "C(+)" AND "C(-)".
- ★WIRE THE POWER SUPPLY LINE SEPARATELY FROM OTHER POWER LINES SUCH AS FOR ELECTRIC MOTORS.

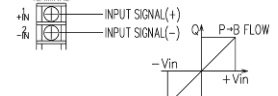
DIN CONNECTOR (BLACK)	
DETAIL OF CONNECTION TO PIN	CONNECTION TO AMPLIFIER
①	PIN NO. 25
②	PIN NO. 26
③	PIN NO. 27

DETAIL OF WIRE TYPE CONNECTION TO POSITIONING CABLE	
YELLOW	ANALOG OUTPUT (+) PIN NO. 10
WHITE	ANALOG OUTPUT (-) PIN NO. 11
RED	+15 V DC PIN NO. 12
BLACK	0 (V) PIN NO. 13

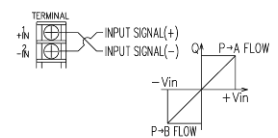


■INPUT SIGNAL POLARITY AND FLOW DIRECTION OF THE VALVE. THE TERMINAL OF INPUT SIGNAL FOR THE SERVO AMPLIFIER IS DIFFERENTIAL INPUT TYPE. THEREFORE FLOW DIRECTION OF THE VALVE CAN BE CHANGED BY WAY OF CONNECTION OF THE INPUT SIGNAL POLARITY.

- P→B FLOW BY (+) INPUT SIGNAL

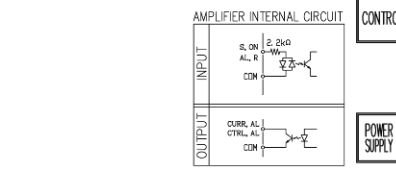
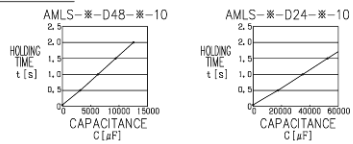


- CONNECTION FOR P→A FLOW BY (+) INPUT SIGNAL



●For LSHVG-04/06/10-**-10

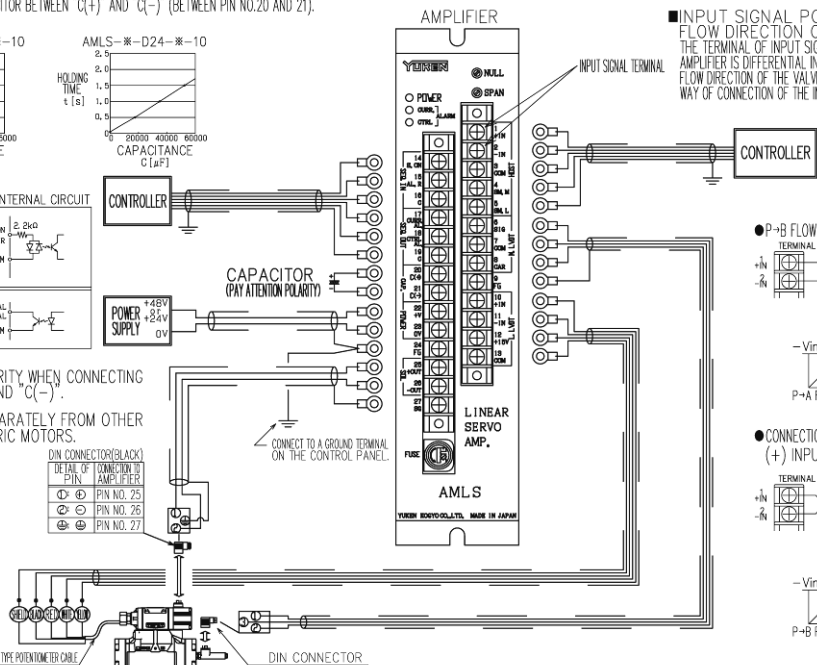
★IN CASE THE SPOOL CENTER POSITION MUST BE KEPT FOR A FEW SECONDS WHEN IT IS POWER FAILURE OR AFTER THE POWER IS CUT OFF, CONNECT A CAPACITOR BETWEEN "C(+)" AND "C(-)" (BETWEEN PIN NO.20 AND 21).
HOLDING TIME VS. CAPACITANCE



- ★PAY ATTENTION TO CAPACITOR POLARITY, WHEN CONNECTING THE CONDENSER BETWEEN "C(+)" AND "C(-)".
- ★WIRE THE POWER SUPPLY LINE SEPARATELY FROM OTHER POWER LINES SUCH AS FOR ELECTRIC MOTORS.

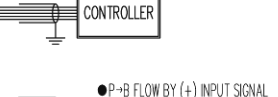
DIN CONNECTOR (BLACK)	
DETAIL OF CONNECTION TO PIN	CONNECTION TO AMPLIFIER
①	PIN NO. 25
②	PIN NO. 26
③	PIN NO. 27

DETAIL OF WIRE TYPE CONNECTION TO POSITIONING CABLE	
YELLOW	ANALOG OUTPUT (+) PIN NO. 10
WHITE	ANALOG OUTPUT (-) PIN NO. 11
RED	+15 V DC PIN NO. 12
BLACK	0 (V) PIN NO. 13

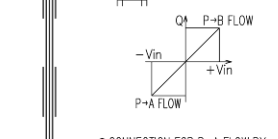


■INPUT SIGNAL POLARITY AND FLOW DIRECTION OF THE VALVE. THE TERMINAL OF INPUT SIGNAL FOR THE SERVO AMPLIFIER IS DIFFERENTIAL INPUT TYPE. THEREFORE FLOW DIRECTION OF THE VALVE CAN BE CHANGED BY WAY OF CONNECTION OF THE INPUT SIGNAL POLARITY.

- P→B FLOW BY (+) INPUT SIGNAL



- CONNECTION FOR P→A FLOW BY (+) INPUT SIGNAL



DIN CONNECTOR	
DETAIL OF PIN CONNECTION FOR LSHVG AMPLIFIER	
①	:SIG PIN NO. 6
②	:COM PIN NO. 7
③	:CAR PIN NO. 8

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LSV(H)G Series High-speed Linear Servo Valves

LSVG-03 (3/8) & LSVHG-04/06/10 (1/2,3/4,1) Sub-plate Mounting

Appendix

Installation Drawings

page




LSVG-03-4/10/20/40/60-10	DIMENSIONS IN MILLIMETERS	2/22
LSVG-03-4/10/20/40/60-1090	DIMENSIONS IN INCHES	3/22
LSVHG-04-750-(2P)-(E)(T)-10	DIMENSIONS IN MILLIMETERS	4/22
LSVHG-04-750-(2P)-(E)(T)-1090	DIMENSIONS IN INCHES	5/22
LSVHG-06-900/1300-(2P)-(E)(T)-10	DIMENSIONS IN MILLIMETERS	6/22
LSVHG-06-900/1300-(2P)-(E)(T)-1090	DIMENSIONS IN INCHES	7/22
LSVHG-10-1500-(2P)-(E)(T)-10	DIMENSIONS IN MILLIMETERS	8/22
LSVHG-10-1500-(2P)-(E)(T)-1090	DIMENSIONS IN INCHES	9/22

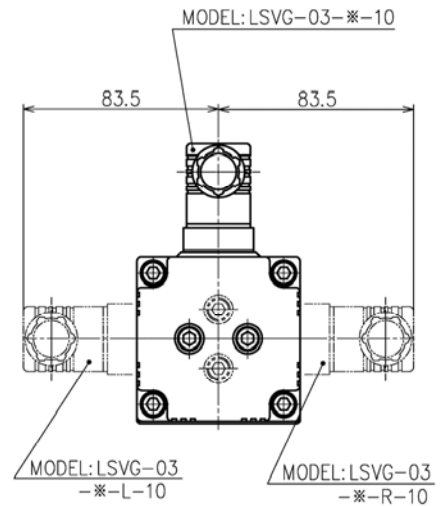
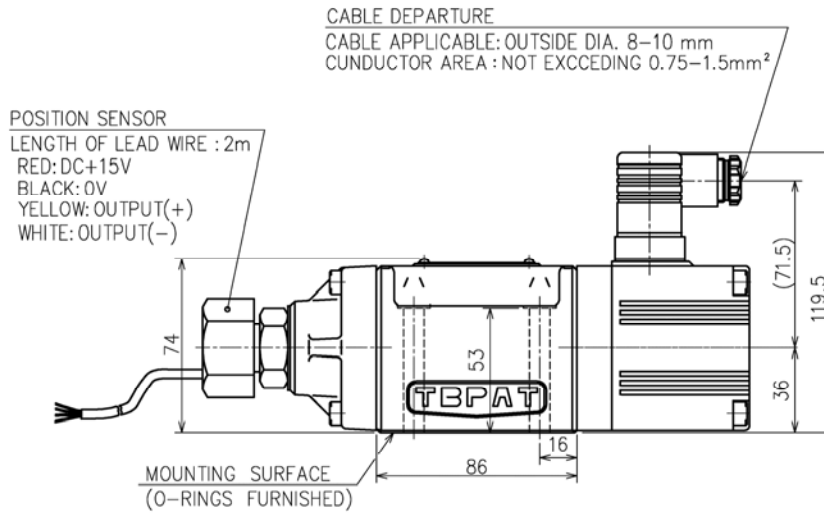
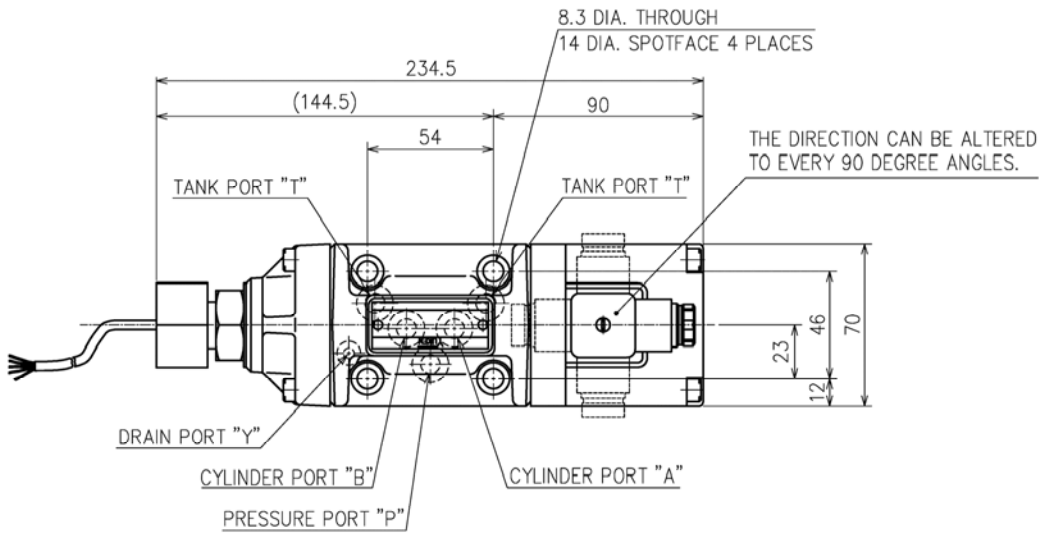
Typical Performance Characteristics

page

LSVG-03-4/10/20/40/60-10	10/22
LSVHG-04-750-(2P)-(E)(T)-10	14/22
LSVHG-06-900/1300-(2P)-(E)(T)-10	16/22
LSVHG-10-1500-(2P)-(E)(T)-10	20/22

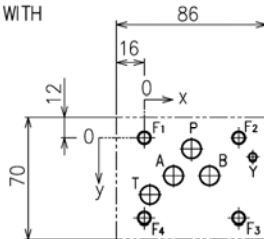
Model Number Designation

LSV(H)G	- 06	- 900	- 2P	- E	T	- 10
Series Number	Valve Size	Rated Flow at diff.P=7 MPa (1015 psi)	Spool Type at neutral position	Pilot Type	Drain Type	Design Number
LSVG: Direct Type Linear Servo Valves	03	4: 4 L/min (1.05 gpm) 10: 10 L/min (2.64 gpm) 20: 20 L/min (5.3 gpm) 40: 40 L/min (10.5 gpm) 60: 60 L/min (15.8 gpm)	—	—	—	10: Standard
LSVHG: Pilot Operated Linear Servo Valves	04	750: 750 L/min (198 gpm)	2: 10%Over-lap  40: A,B,T Connection  2P: Zero-lap  (Dual Flow Gain)	None: Internal Pilot E: External Pilot	None: External Drain T: Internal Drain	1090: North American Design Standard



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



■ MOUNTING SURFACE

THIS VALVE CAN BE INSTALLED ON THE MOUNTING SURFACE CONFORMING TO ISO 4401-05-04-0-94

■ ATTACHMENT

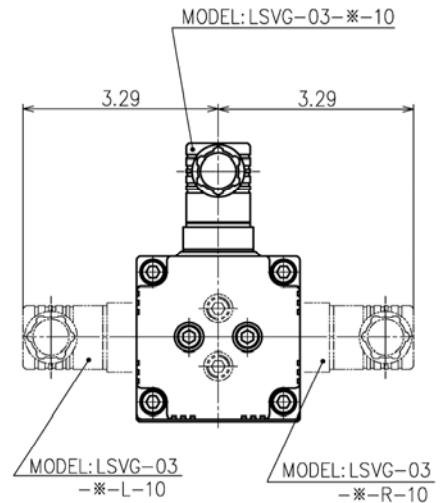
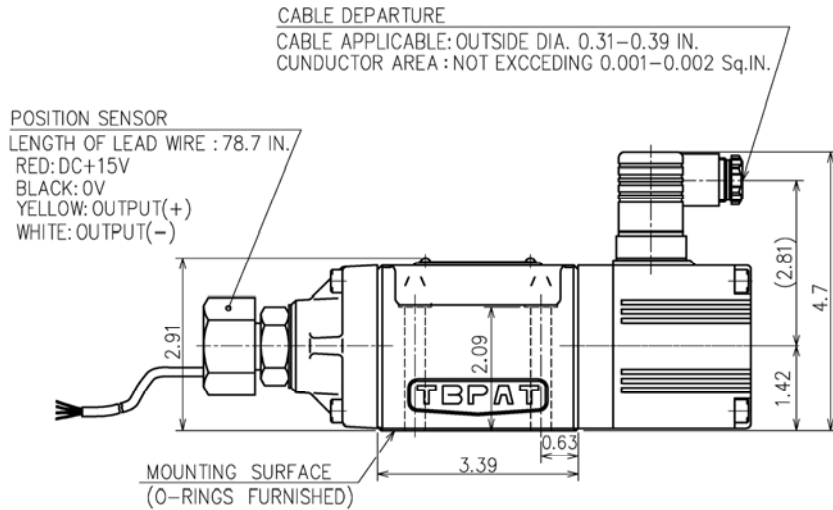
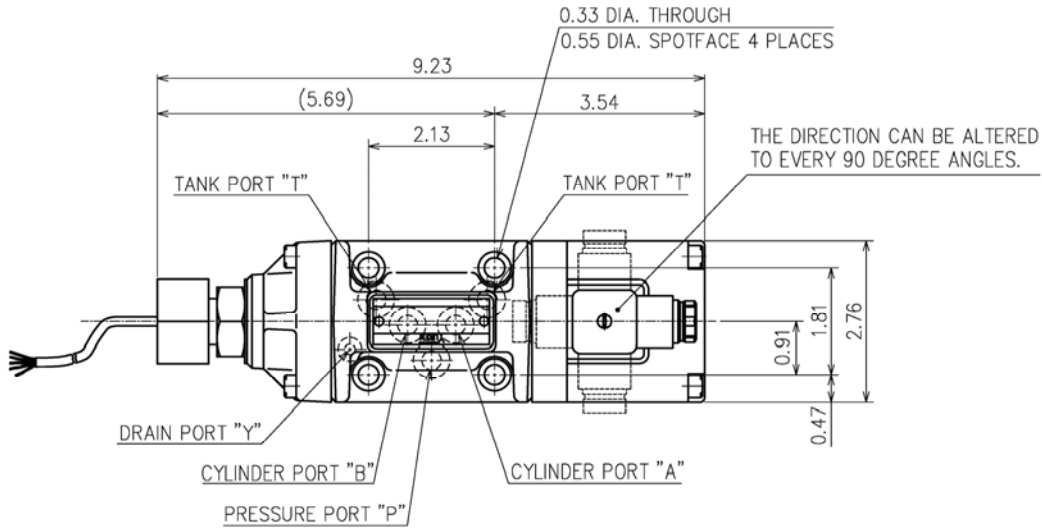
MOUNTING BOLTS : SOC. HD. CAP SCREW M8x65L . . . 4PCS.
O-RING (P,A,B,T PORT) : AS568-014 (NBR,Hs90) . . . 5PCS.
O-RING (Y PORT) : JIS B2401-1B-P7 . . . 1PCS.

Axis	P	A	T	B	F ₁	F ₂	F ₃	F ₄	Y
		11DIA.				M8 THD. 17 DEEP			
x	27	16.7	3.2	37.3	0	54	54	0	62
y	6.4	21.4	32.5	21.4	0	0	46	46	11

Installation Drawings

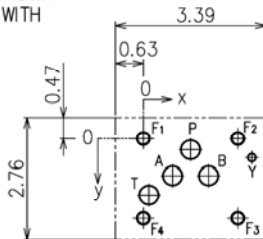
LSVG-03--1090**

DIMENSIONS IN INCHES



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



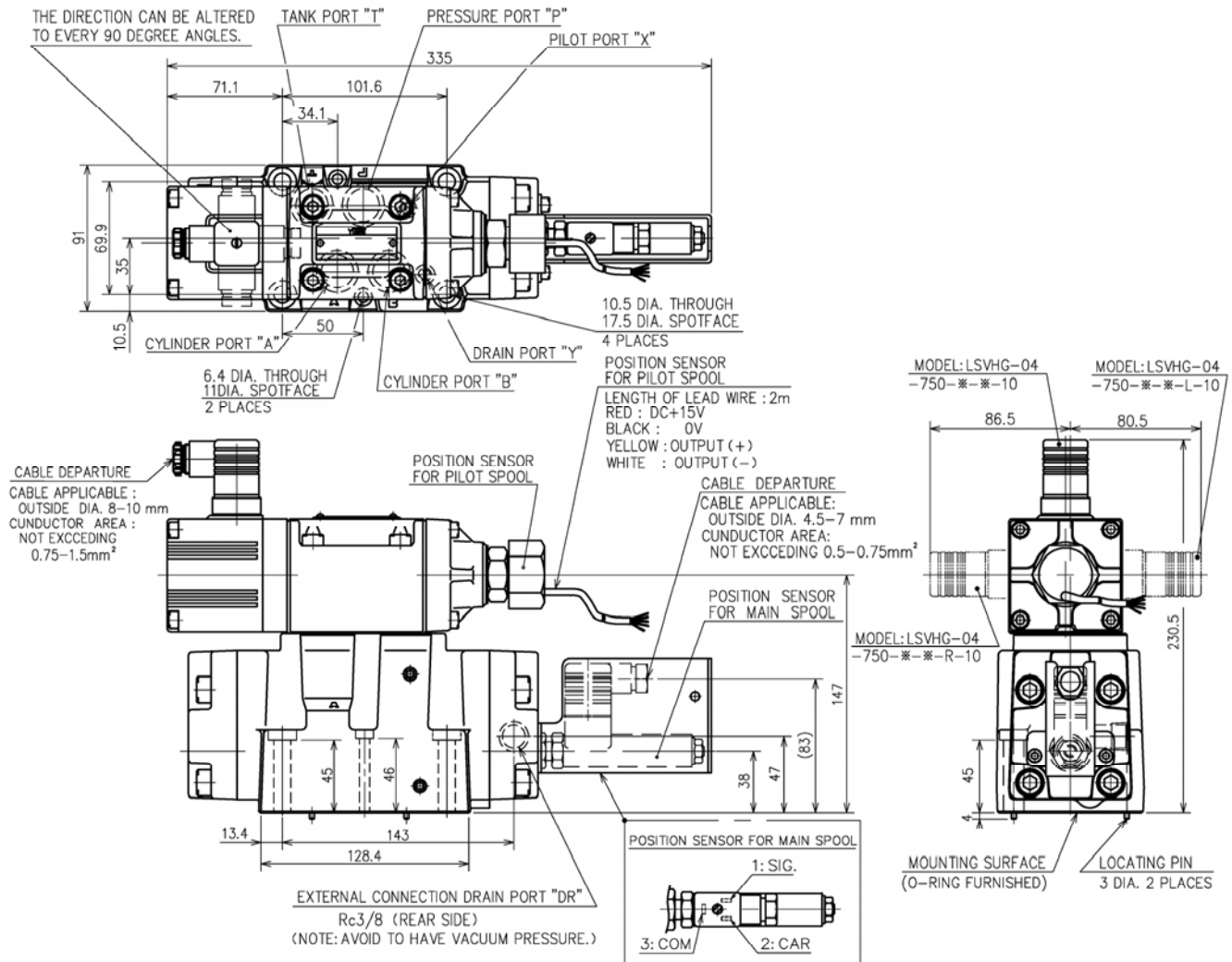
■ MOUNTING SURFACE

THIS VALVE CAN BE INSTALLED ON THE MOUNTING SURFACE CONFORMING TO ISO 4401-05-04-0-94

■ ATTACHMENT

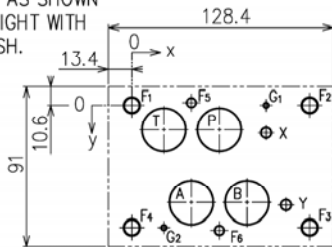
MOUNTING BOLTS : SOC. HD. CAP SCREW 5/16-18 UNC×2-1/2 Lg. . . . 4PCS.
O-RING (P,A,B,T PORT) : AS568-014 (NBR,Hs90) 5PCS.
O-RING (Y PORT) : JIS B2401-1B-P7 1PCS.

Axis	P	A	T	B	F1	F2	F3	F4	Y
		0.43 DIA.				5/16-18 UNC THD. 0.67 DEEP			
x	1.06	0.66	0.13	1.47	0	2.13	2.13	0	2.44
y	0.25	0.84	1.28	0.84	0	0	1.81	1.81	0.43



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



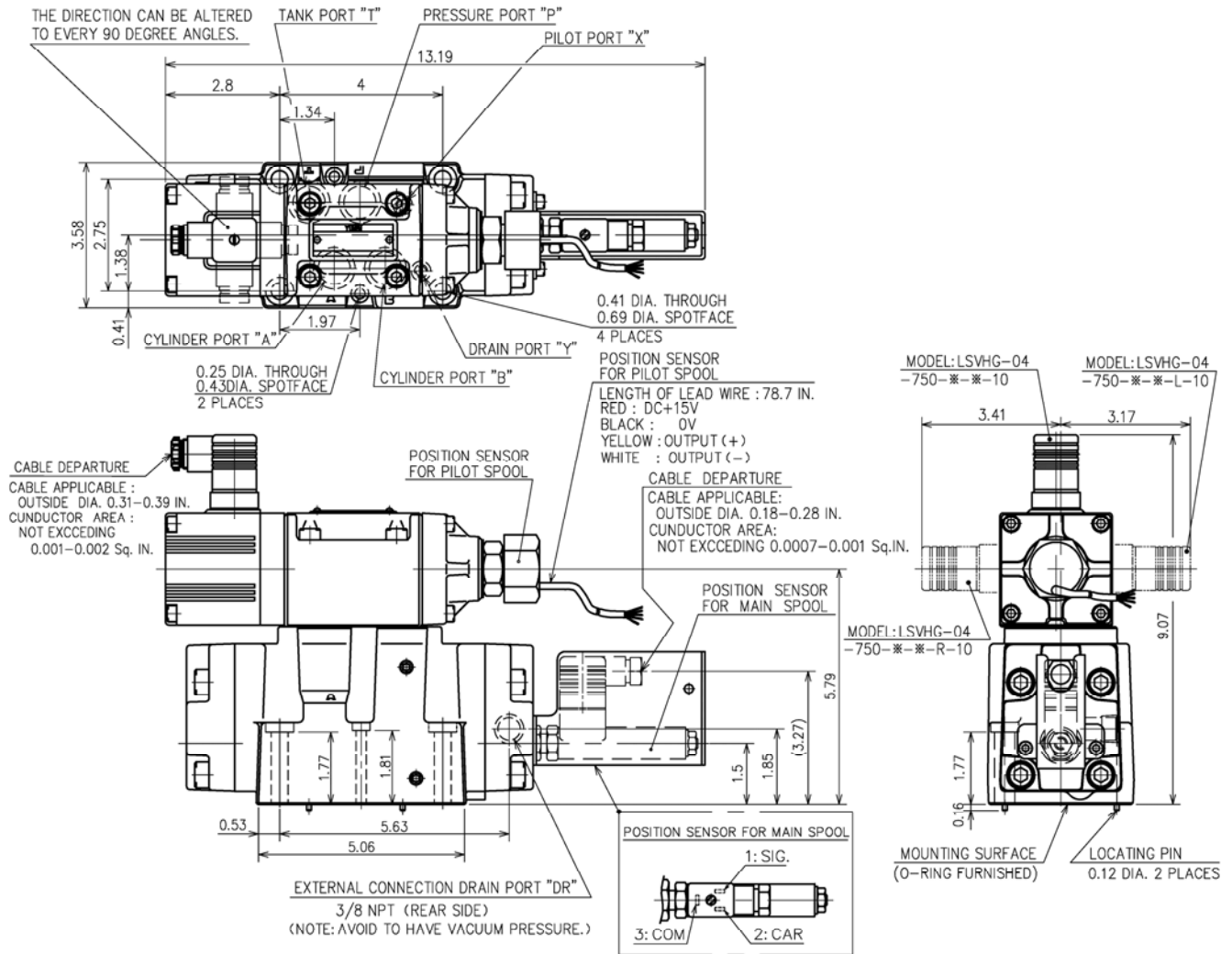
■ MOUNTING SURFACE

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 20 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-07-06-0-94)

■ ATTACHMENT

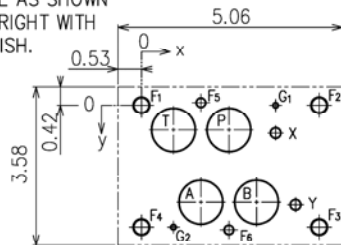
- MOUNTING BOLTS : SOC. HD. CAP SCREW M10×60L . . . 4PCS
- : SOC. HD. CAP SCREW M6×55L . . . 2PCS
- O-RING (P,A,B,T PORT) : JIS B2401-1B-P22 . . . 4PCS
- O-RING (X,Y PORT) : AS568-012 (NBR,Hs90) . . . 2PCS

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
	20DIA.				6DIA.		3.6 DIA. 5 DEEP		M10 THD. 17 DEEP			M6 THD. 12 DEEP		
x	50	34	18.3	65.8	76.7	88.1	76.7	18.3	0	101.6	101.6	0	34	50
y	14.2	55.6	14.2	55.6	16	57.1	0	69.8	0	0	69.8	69.8	-1.6	71.4



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



■ MOUNTING SURFACE

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 0.79 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-07-06-0-94)

■ ATTACHMENT

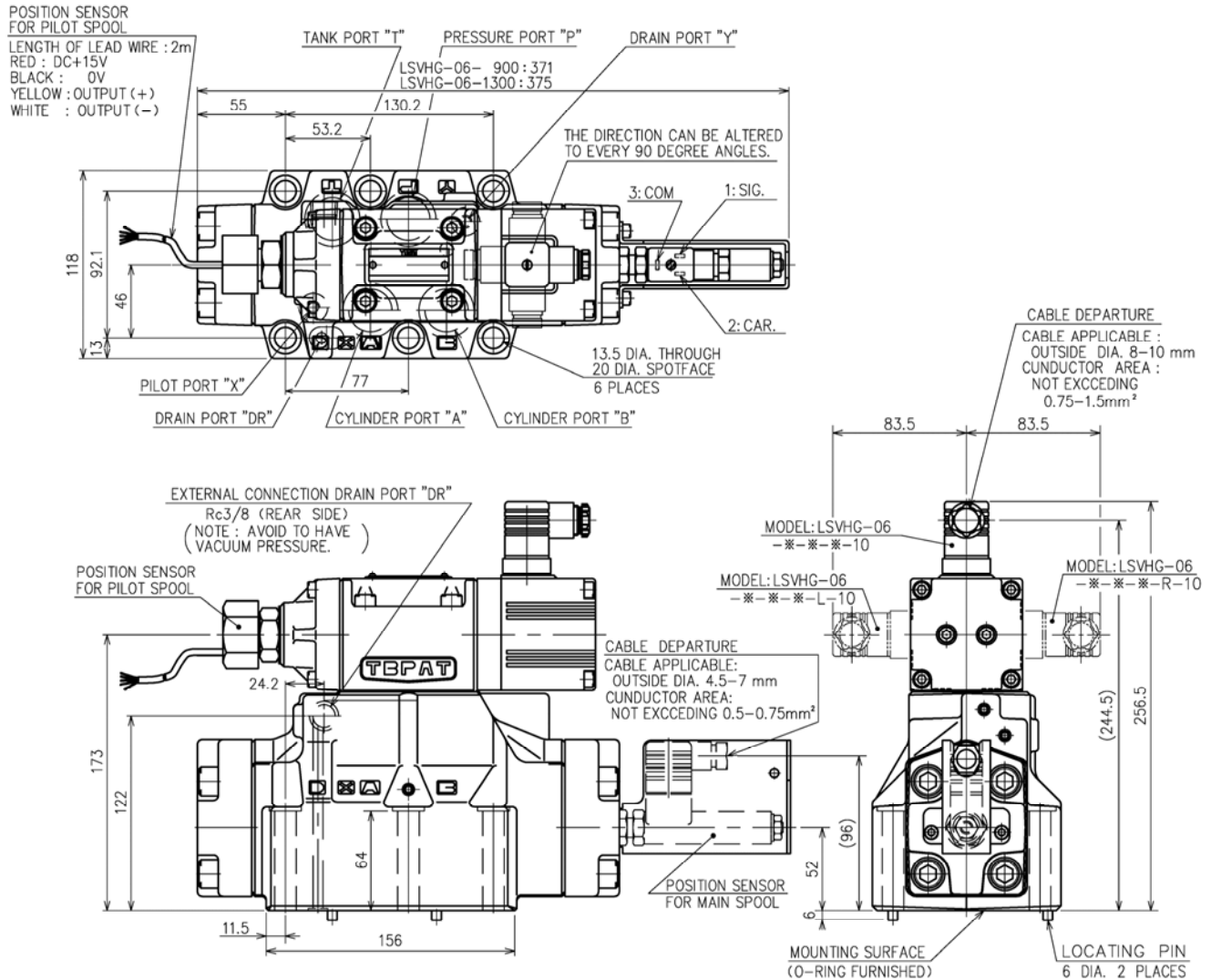
MOUNTING BOLTS : SOC. HD. CAP SCREW 3/8-16 UNC×2-1/4 Lg. ... 4PCS
 : SOC. HD. CAP SCREW 1/4-20 UNC×2-1/4 Lg. ... 2PCS
 O-RING (P,A,B,T PORT) : JIS B2401-1B-P22 ... 4PCS
 O-RING (X,Y PORT) : AS568-012 (NBR,Hs90) ... 2PCS

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
	0.79 DIA.				0.24 DIA.		0.14 DIA. 0.2 DEEP		3/8-16 UNC THD. 0.67 DEEP				1/4-20 UNC THD. 0.47 DEEP	
x	1.97	1.34	0.72	2.59	3.02	3.47	3.02	0.72	0	4	4	0	1.34	1.97
y	0.56	2.19	0.56	2.19	0.63	2.25	0	2.75	0	0	2.75	2.75	-0.06	2.81

Installation Drawings

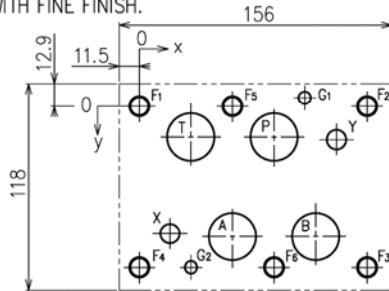
LSVHG-06-**-10

DIMENSIONS IN MILLIMETERS



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



■ MOUNTING SURFACE

LSVHG-06EH-900

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 27 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-08-07-0-94)

LSVHG-06EH-1300

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 32 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-08-07-0-94)

■ ATTACHMENT

MOUNTING BOLTS : SOC. HD. CAP SCREW M12×85L ... 6PCS.

O-RING (P,A,B,T PORT)

LSVHG-06-900 : AS568-123 (NBR,Hs90) ... 4PCS.

LSVHG-06-1300 : AS568-126 (NBR,Hs90) ... 4PCS.

O-RING (X,Y PORT) : JIS B2401-1B-P14 ... 2PCS.

■ LSVHG-06EH-900

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
		27DIA.				11DIA.		7 DIA. 8 DEEP		M12 THD. 24 DEEP				
x	77	53.2	29.4	100.8	17.5	112.7	94.5	29.5	0	130.2	130.2	0	53.2	77
y	17.5	74.6	17.5	74.6	73	19	-4.8	92.1	0	0	92.1	92.1	0	92.1

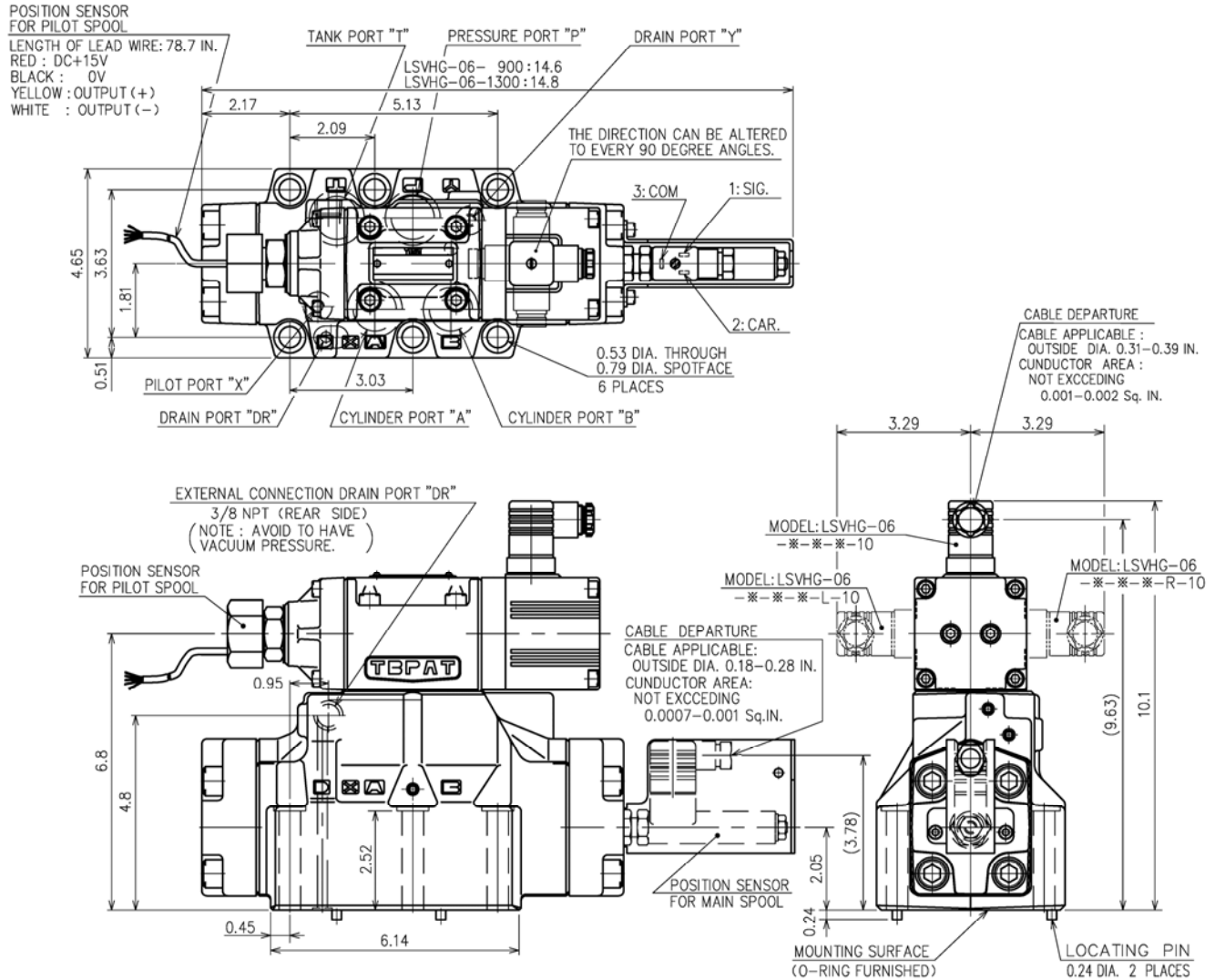
■ LSVHG-06EH-1300

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
		32DIA.				11DIA.		7 DIA. 8 DEEP		M12 THD. 24 DEEP				
x	77	53.2	29.4	100.8	17.5	112.7	94.5	29.5	0	130.2	130.2	0	53.2	77
y	17.5	74.6	17.5	74.6	73	19	-4.8	92.1	0	0	92.1	92.1	0	92.1

Installation Drawings

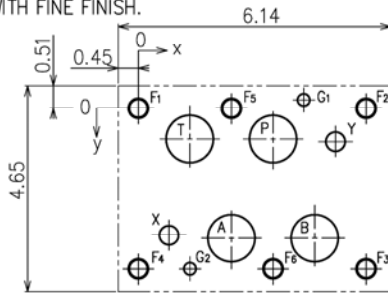
LSVHG-06-**-1090

DIMENSIONS IN INCHES



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



■ MOUNTING SURFACE

LSVHG-06EH-900

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 1.06 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-08-07-0-94)

LSVHG-06EH-1300

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 1.26 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-08-07-0-94)

■ ATTACHMENT

MOUNTING BOLTS : SOC. HD. CAP SCREW 1/2-13 UNC x 3-1/4 Lg. . . . 6PCS.

O-RING (P, A, B, T PORT)

LSVHG-06-900 : AS568-123 (NBR, Hs90) . . . 4PCS.

LSVHG-06-1300 : AS568-126 (NBR, Hs90) . . . 4PCS.

O-RING (X, Y PORT) : JIS B2401-1B-P14 . . . 2PCS.

■ LSVHG-06EH-900

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
		1.06 DIA.				0.43 DIA.		0.28 DIA. 0.31 DEEP		1/2-13 UNC THD. 0.94 DEEP				
x	3.03	2.09	1.16	3.97	0.69	4.44	3.72	1.16	0	5.13	5.13	0	2.09	3.03
y	0.69	2.94	0.69	2.94	2.87	0.75	-0.19	3.63	0	0	3.63	3.63	0	3.63

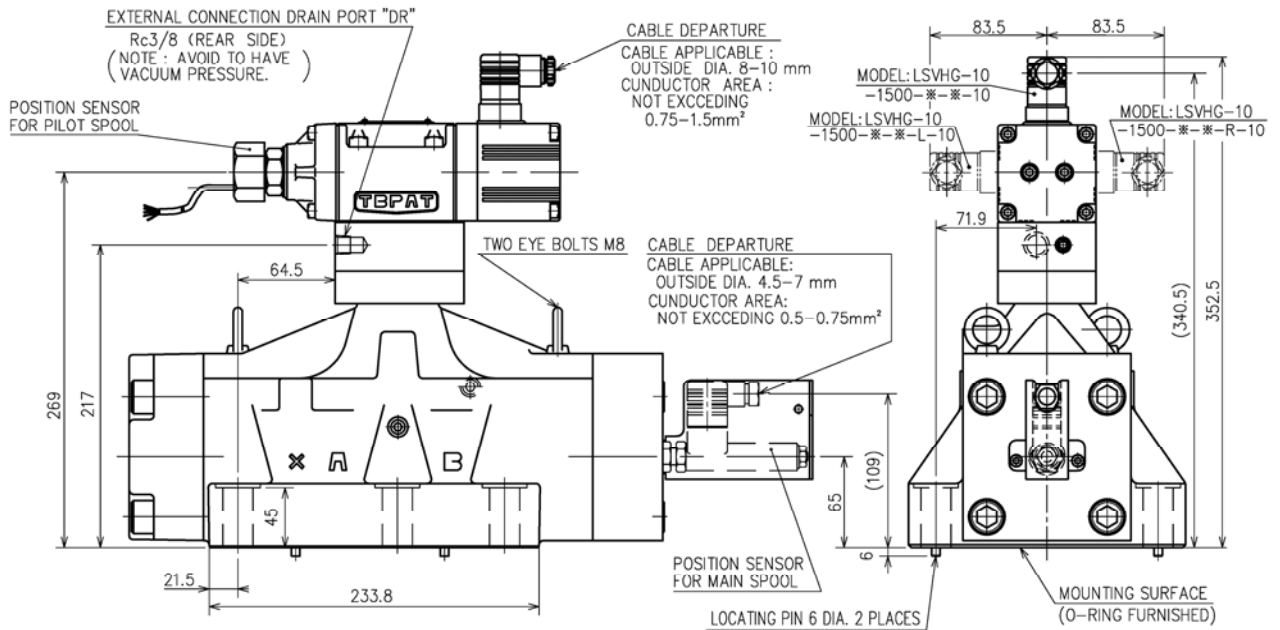
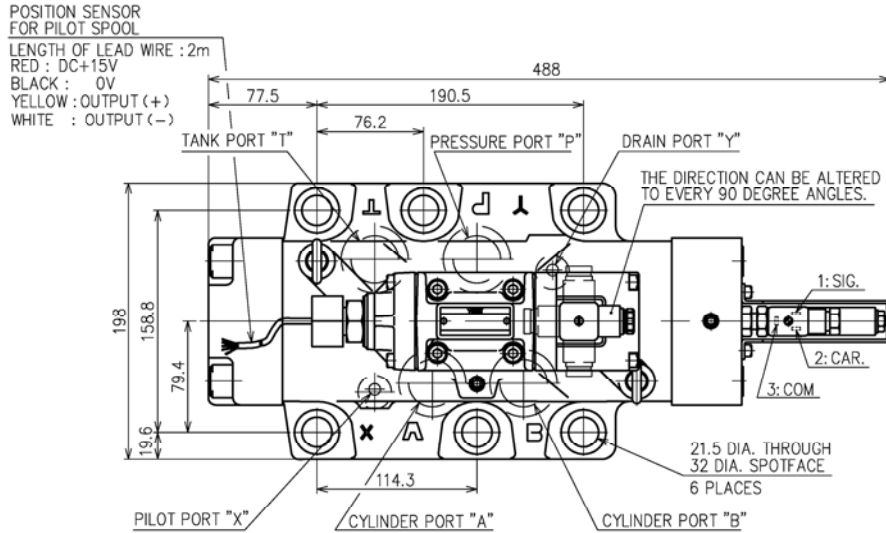
■ LSVHG-06EH-1300

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
		1.26 DIA.				0.43 DIA.		0.28 DIA. 0.31 DEEP		1/2-13 UNC THD. 0.94 DEEP				
x	3.03	2.09	1.16	3.97	0.69	4.44	3.72	1.16	0	5.13	5.13	0	2.09	3.03
y	0.69	2.94	0.69	2.94	2.87	0.75	-0.19	3.63	0	0	3.63	3.63	0	3.63

Installation Drawings

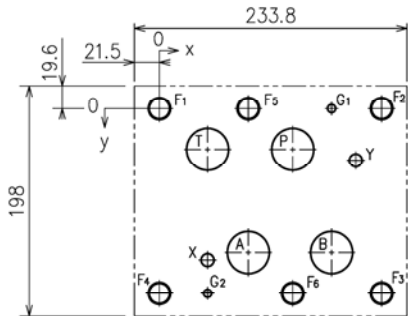
LSVHG-10-**-10

DIMENSIONS IN MILLIMETERS



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



■ MOUNTING SURFACE

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 36 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-10-08-0-94)

■ ATTACHMENT

- MOUNTING BOLTS : SOC. HD. CAP SCREW M20×75L . . . 6PCS.
- O-RING (P,A,B,T PORT) : JIS B2401-1B-P42 . . . 4PCS.
- O-RING (X,Y PORT) : JIS B2401-1B-P20 . . . 2PCS.

Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
	36DIA.				11DIA.		7 DIA. 8 DEEP		M20 THD. 34 DEEP					
x	114.3	82.5	41.3	147.6	41.3	168.3	147.6	41.3	0	190.5	190.5	0	76.2	114.3
y	35	123.8	35	123.8	130.2	44.5	0	158.8	0	0	158.8	158.8	0	158.8

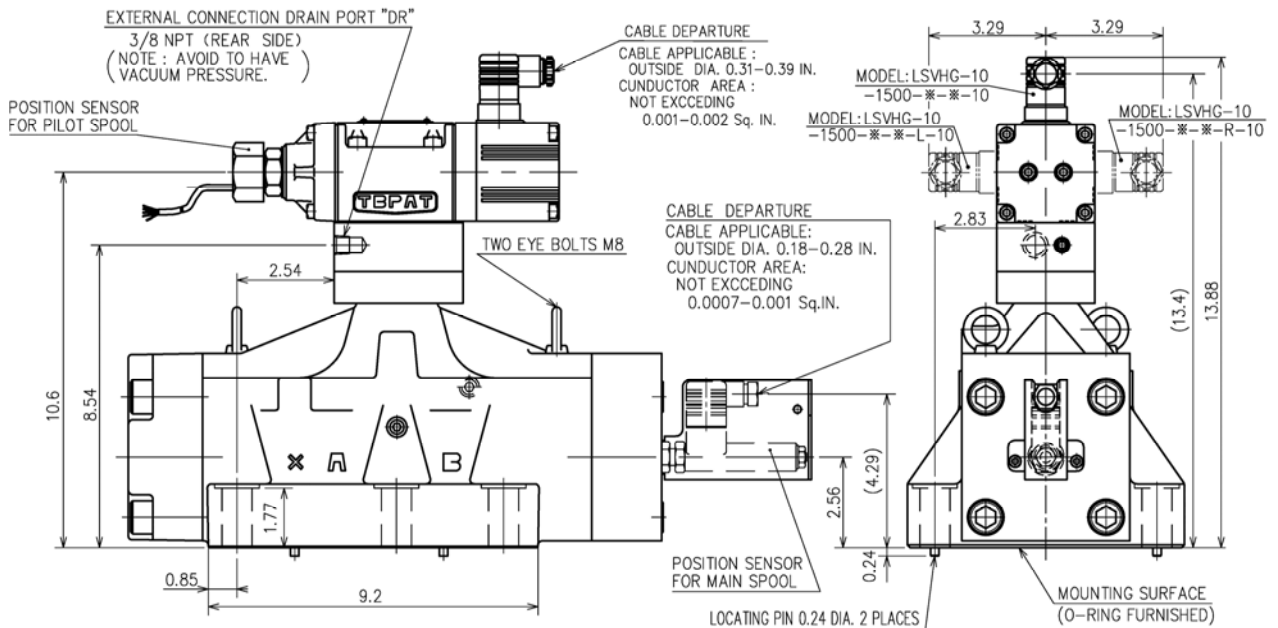
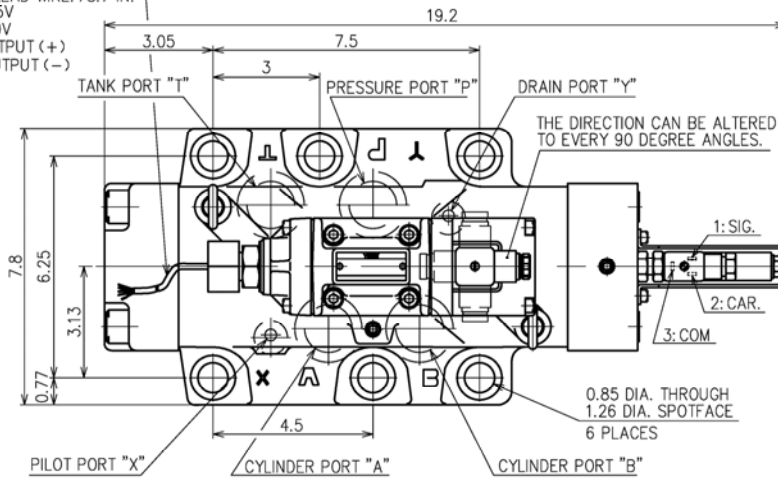
Installation Drawings

LSVHG-10-*-1090

DIMENSIONS IN INCHES

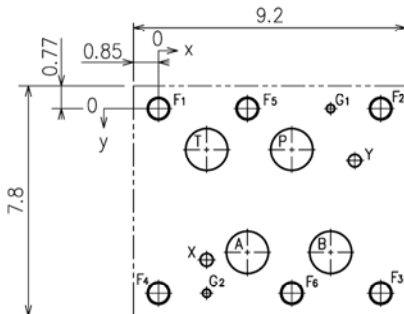
POSITION SENSOR
FOR PILOT SPOOL

LENGTH OF LEAD WIRE: 78.7 IN.
RED : DC+15V
BLACK : 0V
YELLOW : OUTPUT (+)
WHITE : OUTPUT (-)



■ DIMENSIONS OF VALVE MOUNTING SURFACE

PREPARE MOUNTING SURFACE AS SHOWN TO THE RIGHT WITH FINE FINISH.



■ MOUNTING SURFACE

TO SECURE THE MAXIMUM FLOW CAPACITY, PREPARE P, A, B AND T PORTS WITH 1.42 DIA. (P, A, B AND T PORTS ARE THE ONLY DIFFERENCE FROM ISO 4401-10-08-0-94)

■ ATTACHMENT

MOUNTING BOLTS : SOC. HD. CAP SCREW 3/4-10UNCx3 Lg. . . . 6PCS.
O-RING (P,A,B,T PORT) : JIS B2401-1B-P42 4PCS.
O-RING (X,Y PORT) : JIS B2401-1B-P20 2PCS.

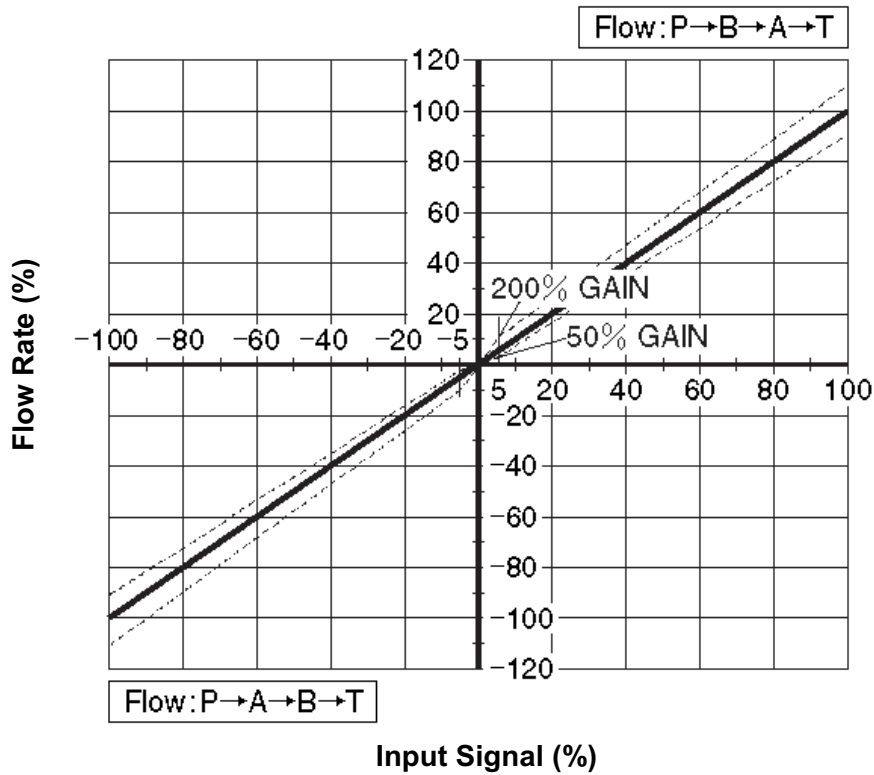
Axis	P	A	T	B	X	Y	G1	G2	F1	F2	F3	F4	F5	F6
	1.42 DIA.				0.43 DIA.		0.28 DIA.	0.31 DEEP	3/4-10 UNC THD. 1.34 DEEP					
x	4.5	3.25	1.63	5.81	1.63	6.63	5.81	1.63	0	7.5	7.5	0	3	4.5
y	1.38	4.87	1.38	4.87	5.13	1.75	0	6.25	0	0	6.25	6.25	0	6.25

Typical Performance Characteristics

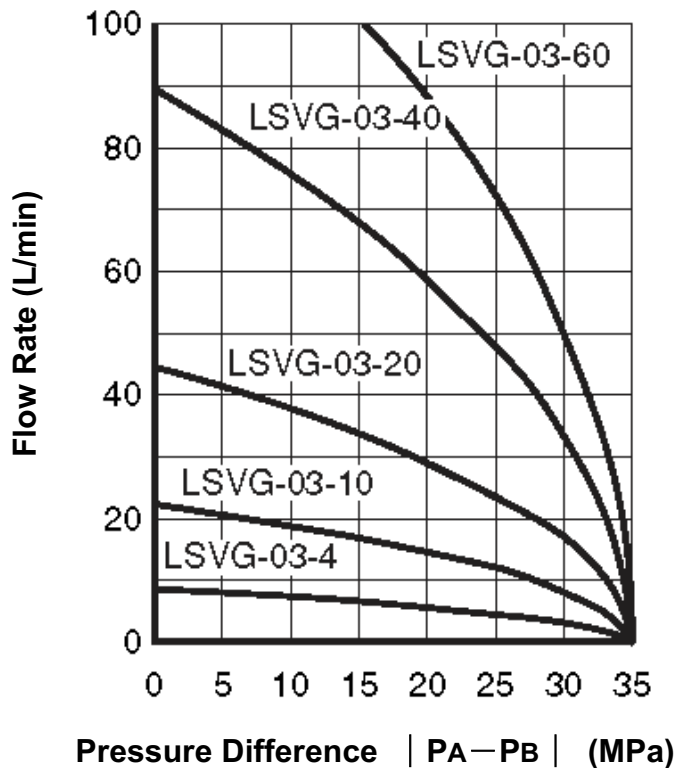
LSVG-03-4/10/20/40/60-10

■ Input Signal - Flow Characteristics (Flow Gain)

Pressure Difference: 7 MPa
Viscosity: 30 mm²/s



■ Flow Characteristics, Loaded



Tolerance: ±10%

LSVG-03-4/10/20/40/60-10

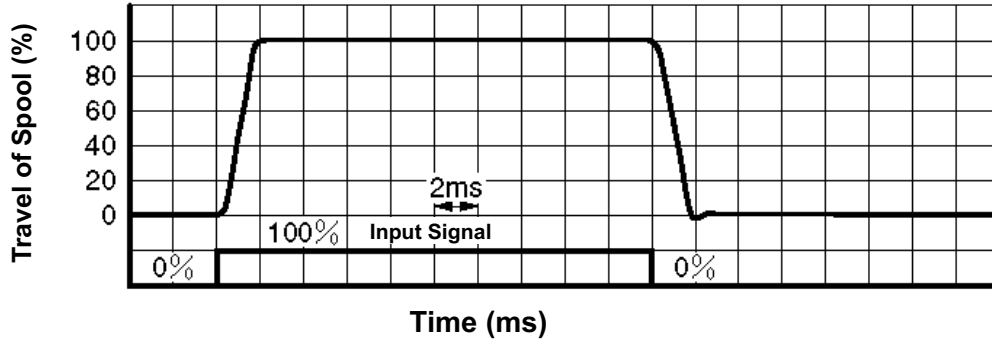
■ Step Response Characteristics (Travel of Spool)

● LSVG-03-4/10/20/40-10

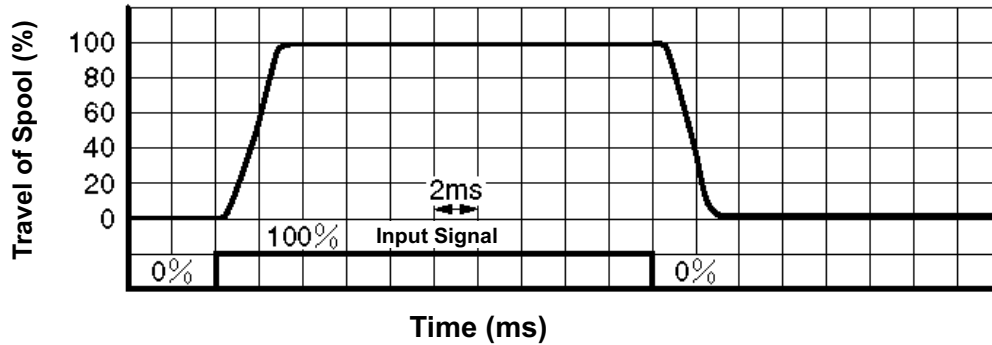
○ Power Amplifier : AMLS-A-D48-※-10 (Power Supply:DC48V)

Supply Pressure: 14MPa

Viscosity: 30 mm²/s

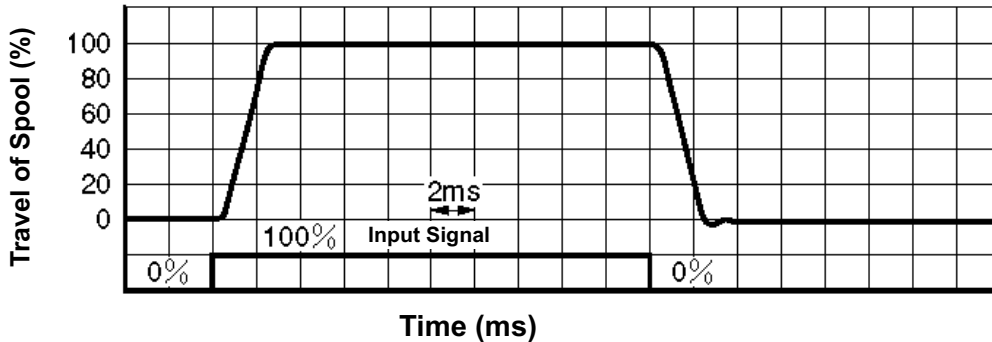


○ Power Amplifier : AMLS-A-D24-※-10 (Power Supply:DC24V)

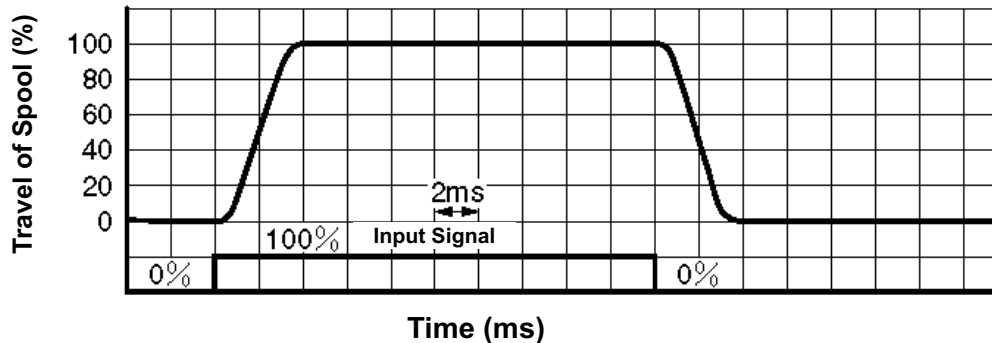


● LSVG-03-60-10

○ Power Amplifier : AMLS-B-D48-※-10 (Power Supply:DC48V)



○ Power Amplifier : AMLS-B-D24-※-10 (Power Supply:DC24V)



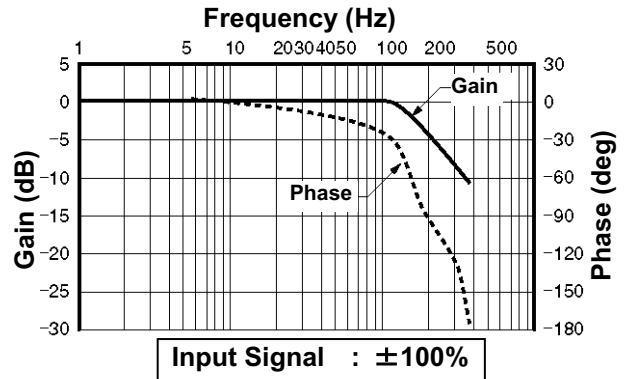
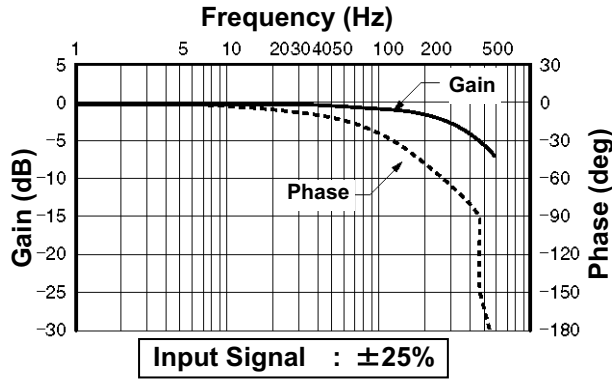
LSVG-03-4/10/20/40/60-10

Frequency Response Characteristics

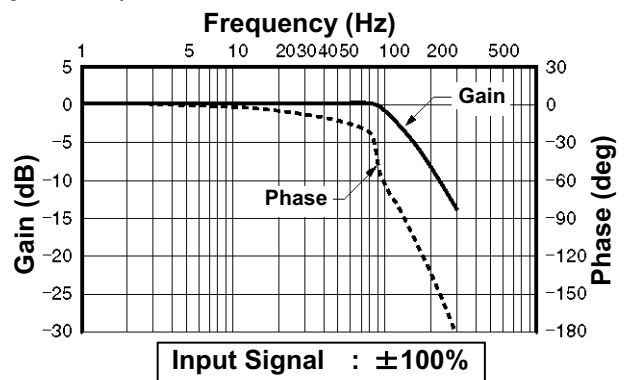
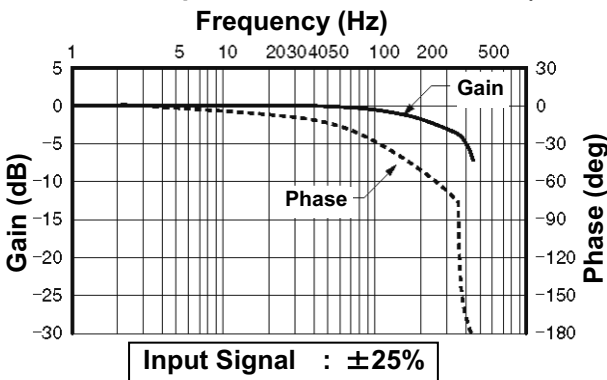
LSVG-03-4/10/20/40-10

Supply Pressure: 14MPa
Viscosity : 30mm²/s

Power Amplifier : AMLS-A-D48-~~※~~-10 (Power Supply:DC48V)

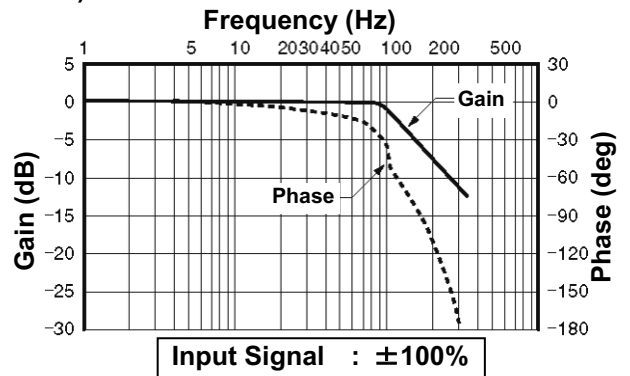
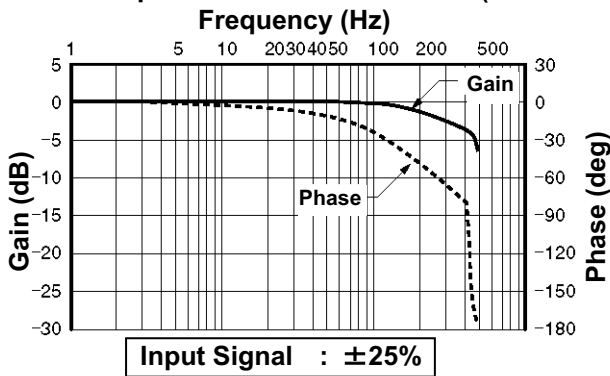


Power Amplifier : AMLS-A-D24-~~※~~-10 (Power Supply:DC24V)

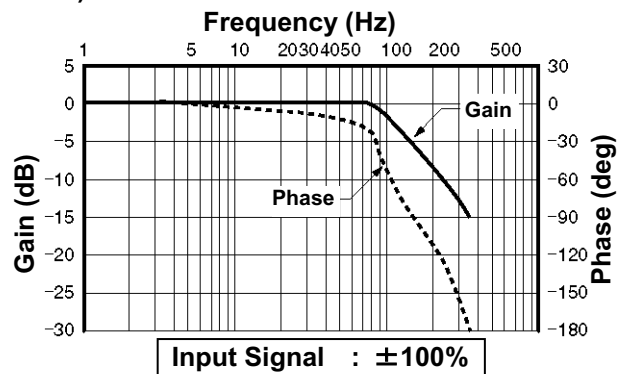
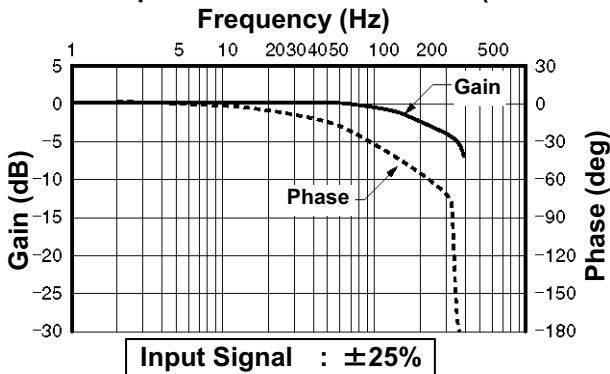


LSVG-03-60-10

Power Amplifier : AMLS-B-D48-~~※~~-10 (Power Supply:DC48V)

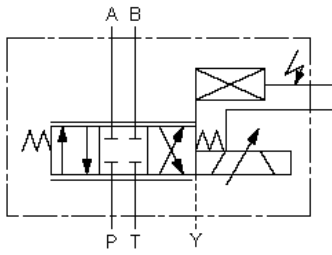


Power Amplifier : AMLS-B-D24-~~※~~-10 (Power Supply:DC24V)

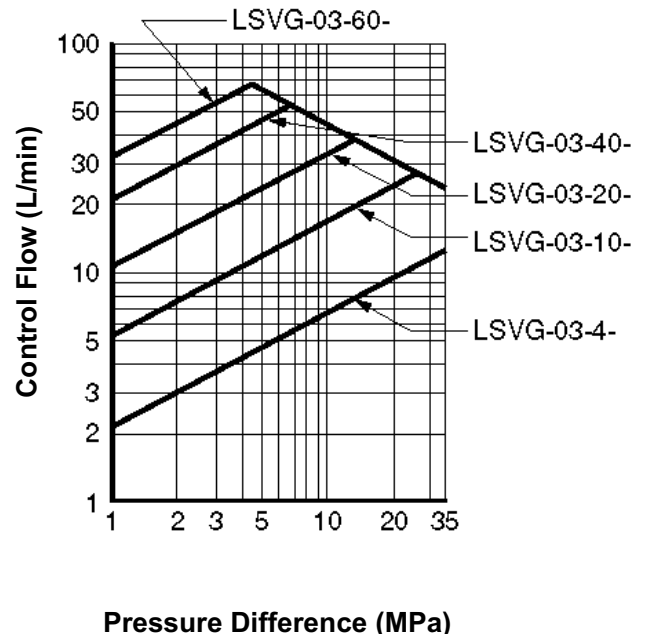
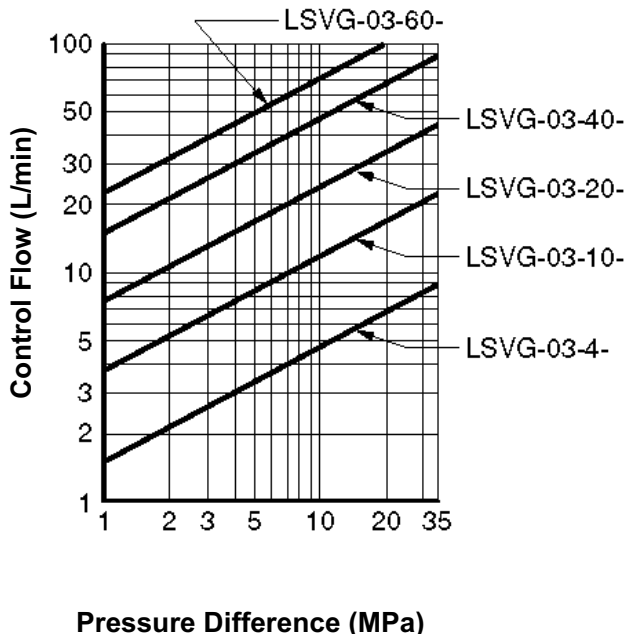
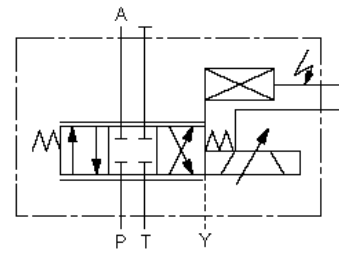


■ **Control Flow Range**

Control Type: 4 way



Control Type: 3 way



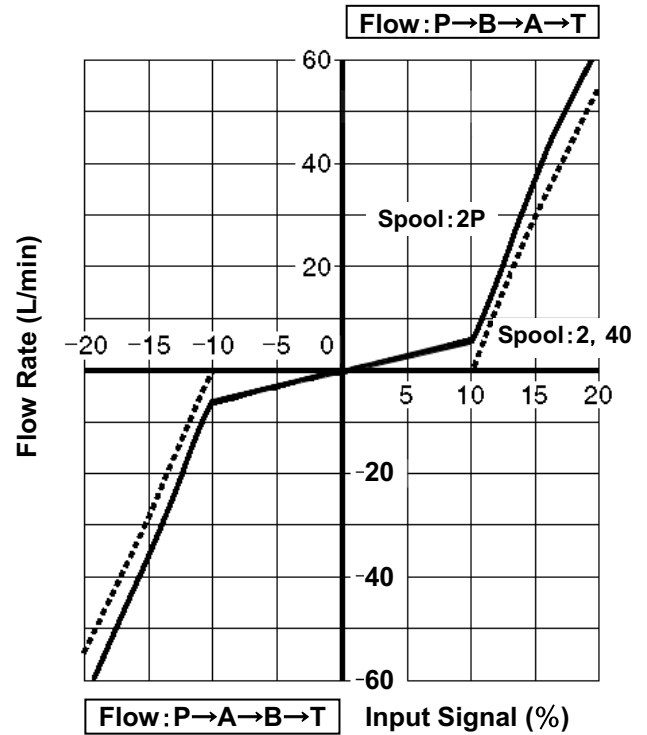
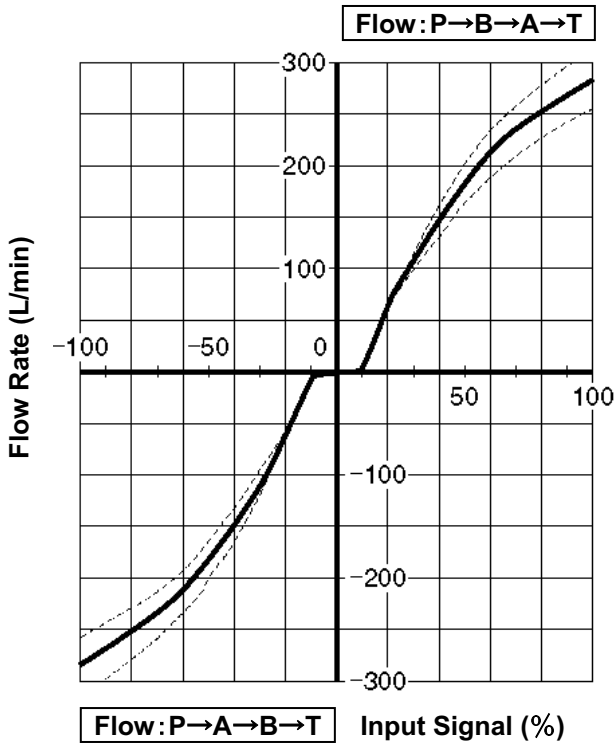
Typical Performance Characteristics

LSVHG-04-750-(2P)-(E)(T)-10

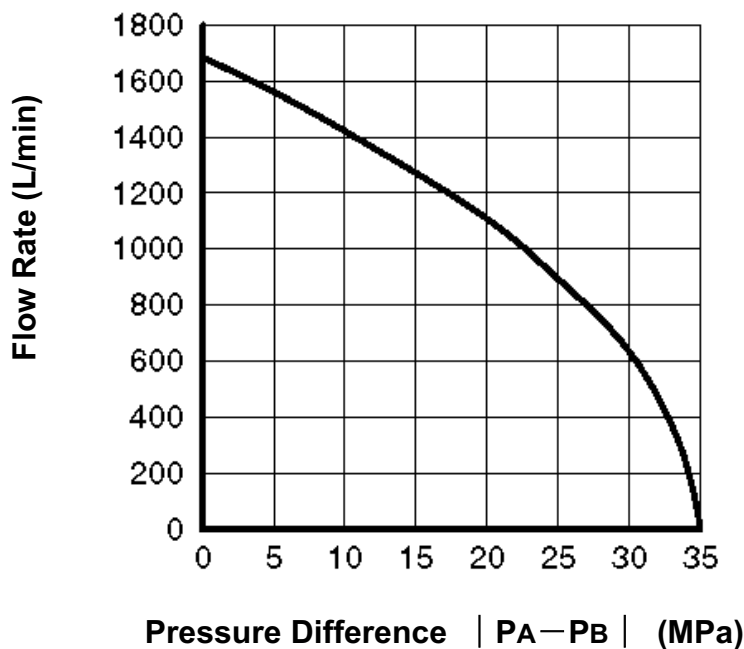
■ **Input Voltage - Flow Characteristics (Flow Gain)**

Pressure Difference: 1MPa
Viscosity: 30mm²/s

○ **Details of Input Signal -20% ⇔ +20%**



■ **Flow Characteristics, Loaded**



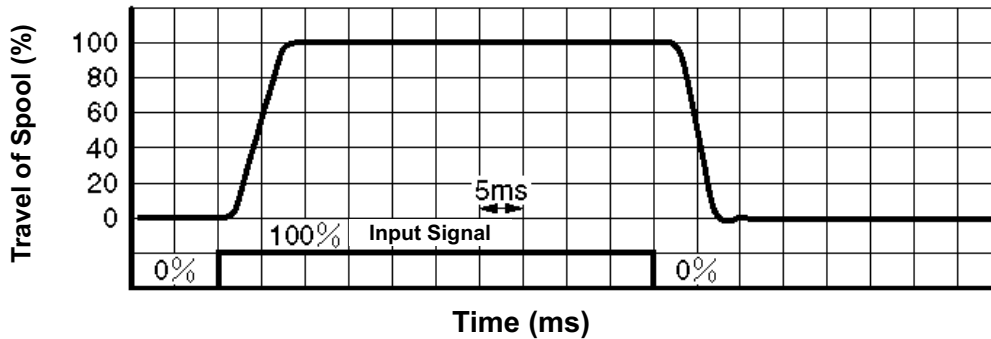
Tolerance: ±10%

LSVHG-04-750-(2P)-(E)(T)-10

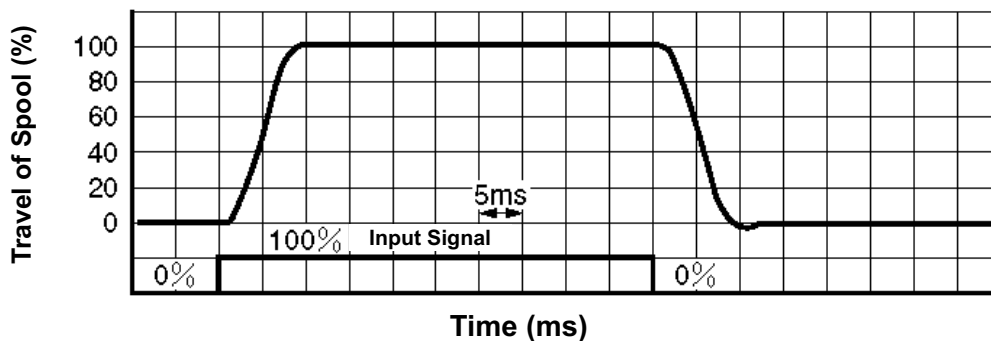
■ Step Response Characteristics (Travel of Spool)

Supply Pressure: 14MPa
 Pilot Pressure : 14MPa
 Viscosity : 30mm²/s

○Power Amplifier : AMLS-C2-D48-※-10 (Power Supply:DC48V)



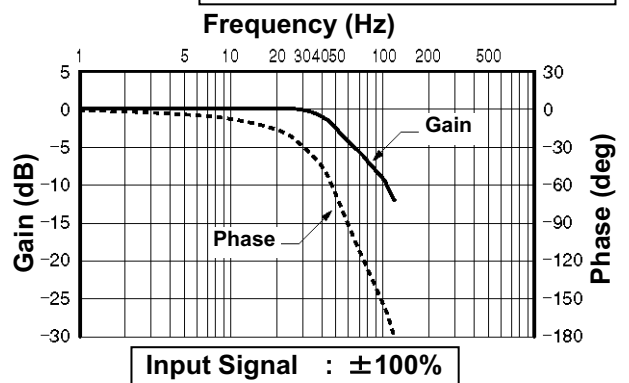
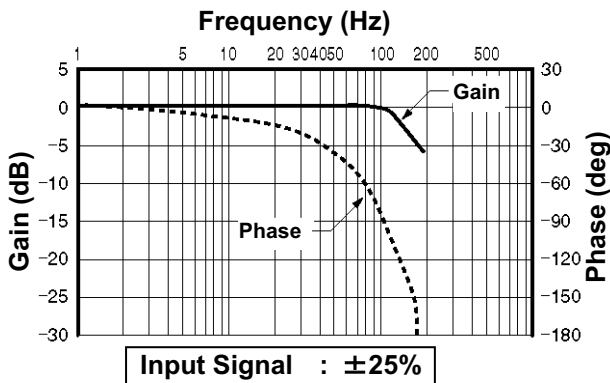
○Power Amplifier : AMLS-C2-D24-※-10 (Power Supply:DC24V)



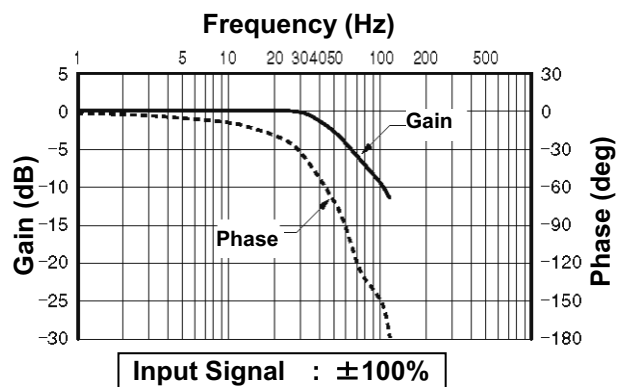
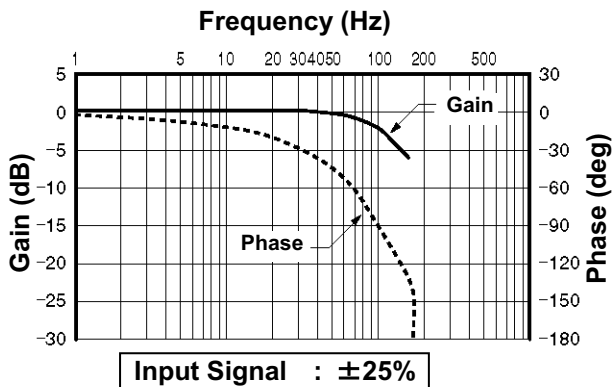
■ Frequency Response Characteristics

Supply Pressure : 14MPa
 Pilot Pressure : 14MPa
 Viscosity : 30mm²/s

○Power Amplifier : AMLS-C2-D48-※-10 (Power Supply:DC48V)



○Power Amplifier : AMLS-C2-D24-※-10 (Power Supply:DC24V)



Typical Performance Characteristics

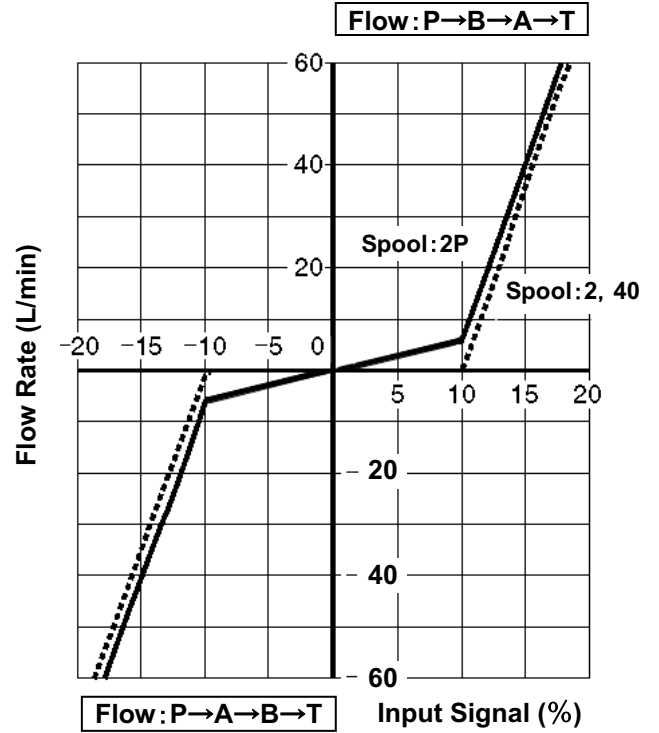
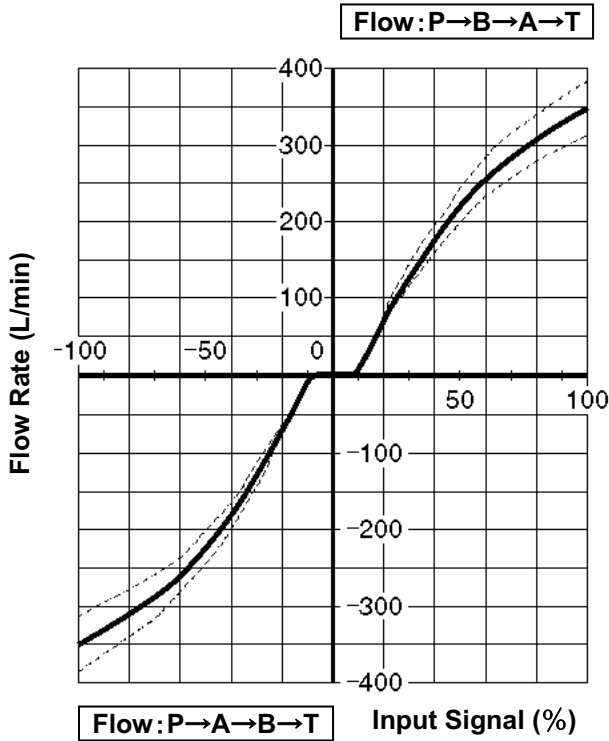
LSVHG-06-900/1300-(2P)-(E)(T)-10

■ Input Voltage - Flow Characteristics (Flow Gain)

● LSVHG-06-900

Pressure Difference: 1MPa
Viscosity: 30mm²/s

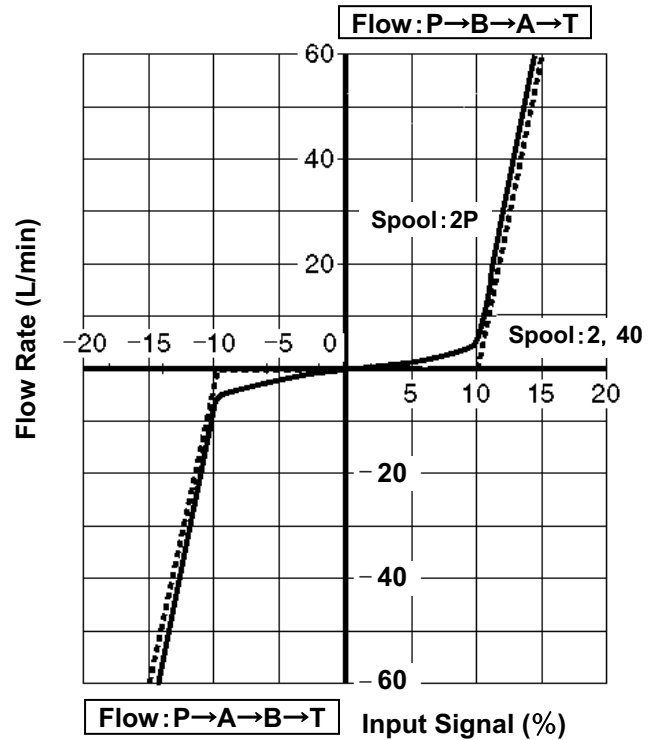
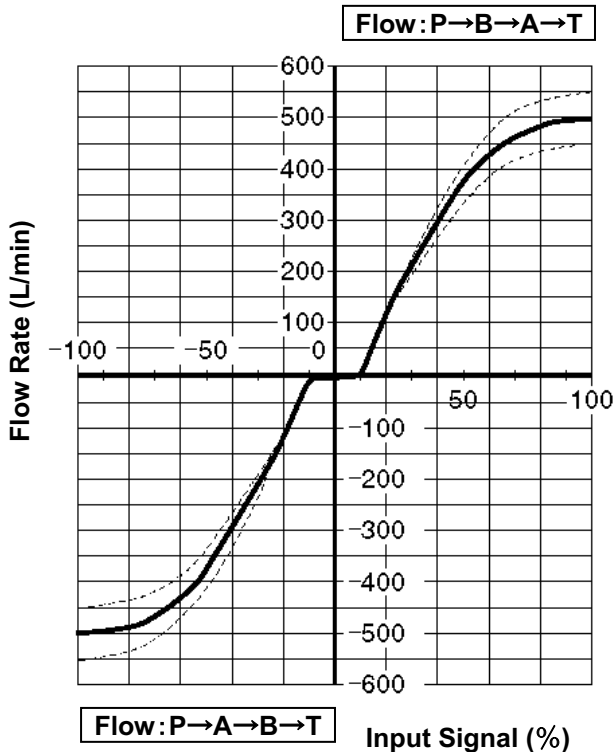
○ Details of Input Signal -20% ⇔ +20%

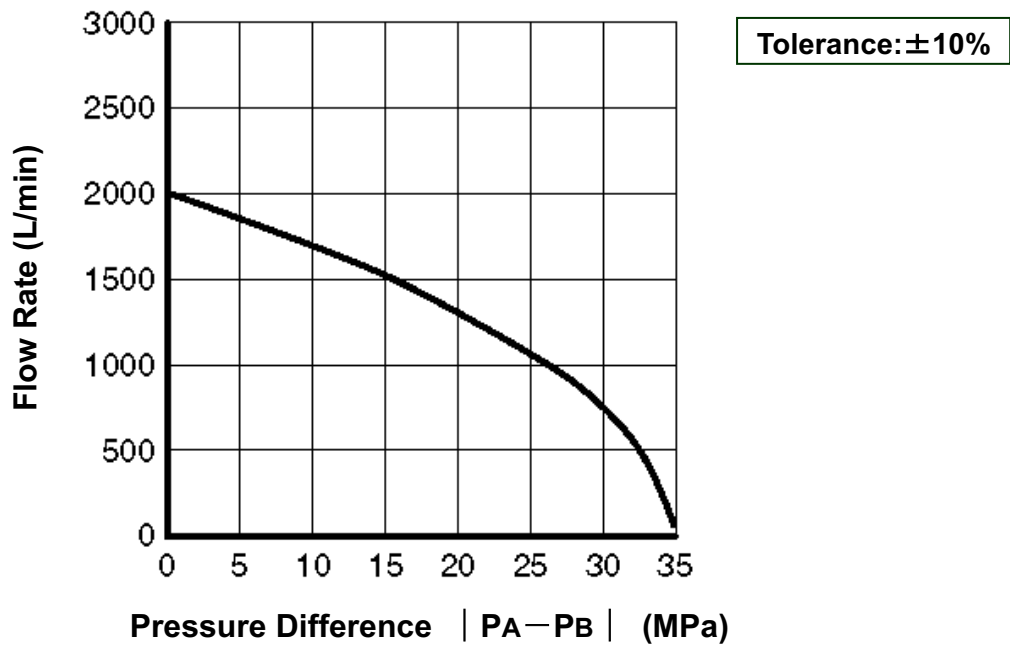
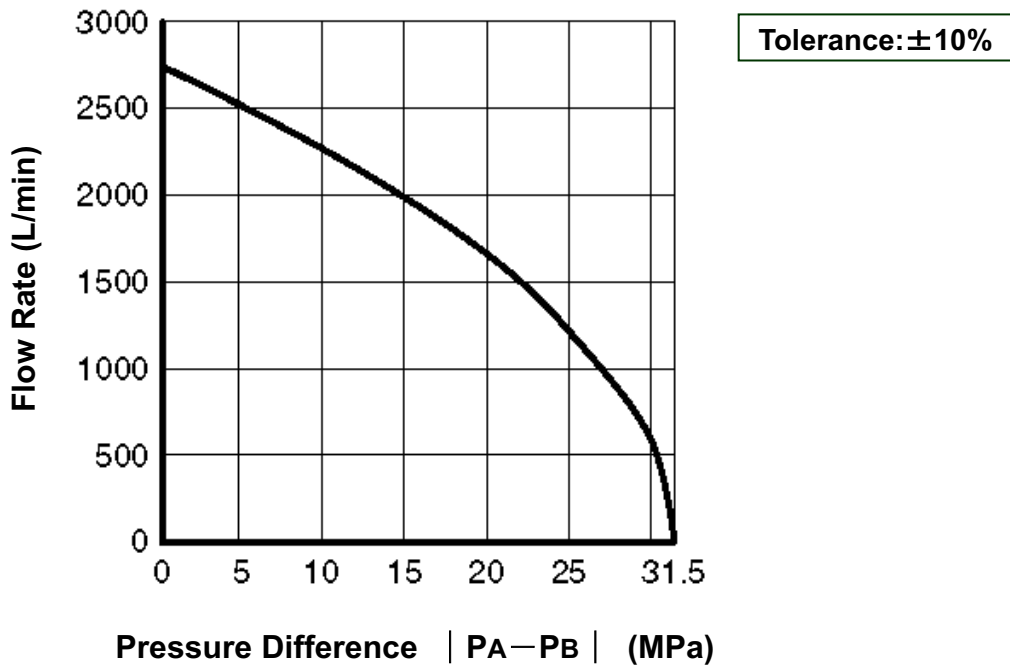


● LSVHG-06-1300

Pressure Difference: 1MPa
Viscosity: 30mm²/s

○ Details of Input Signal -20% ⇔ +20%



LSVHG-06-900/1300-(2P)-(E)(T)-10**■ Flow Characteristics, Loaded****● LSVHG-06-900****● LSVHG-06-1300**

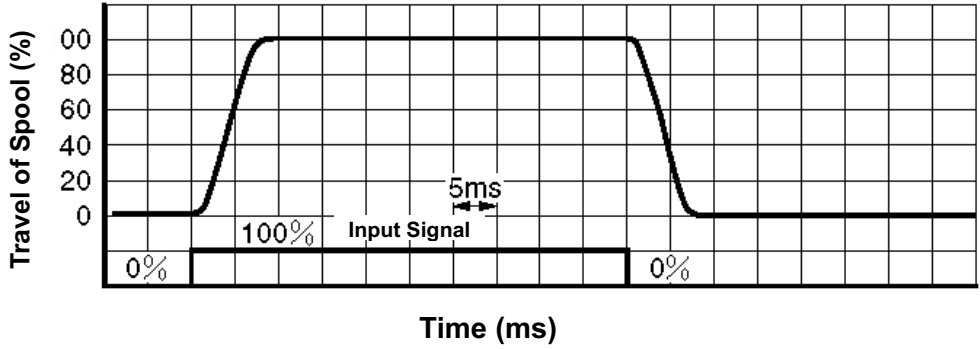
LSVHG-06-900/1300-(2P)-(E)(T)-10

■ Step Response Characteristics (Travel of Spool)

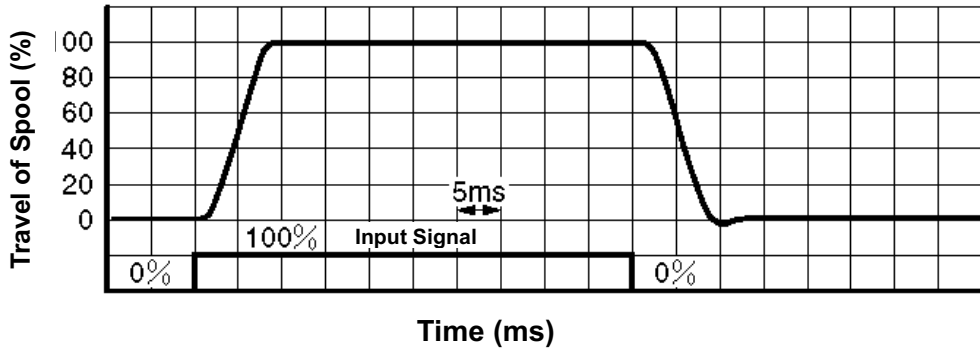
● LSVHG-06-900

○ Power Amplifier : AMLS-C-D48-※-10 (Power Supply:DC48V)

Supply Pressure:	14MPa
Pilot Pressure :	14MPa
Viscosity :	30mm ² /s



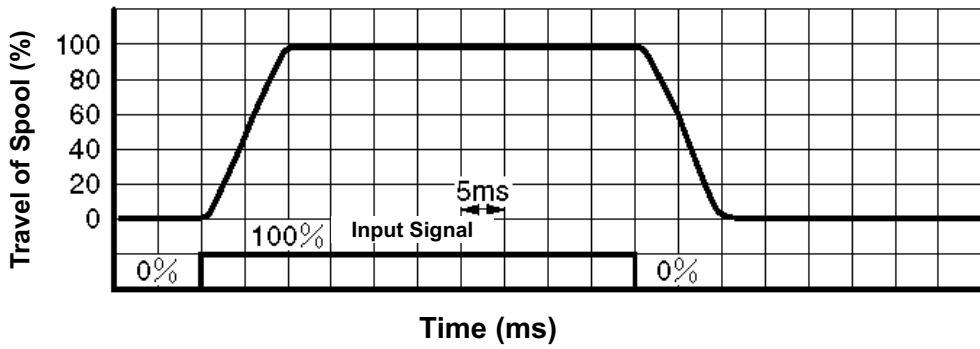
○ Power Amplifier : AMLS-C-D24-※-10 (Power Supply:DC24V)



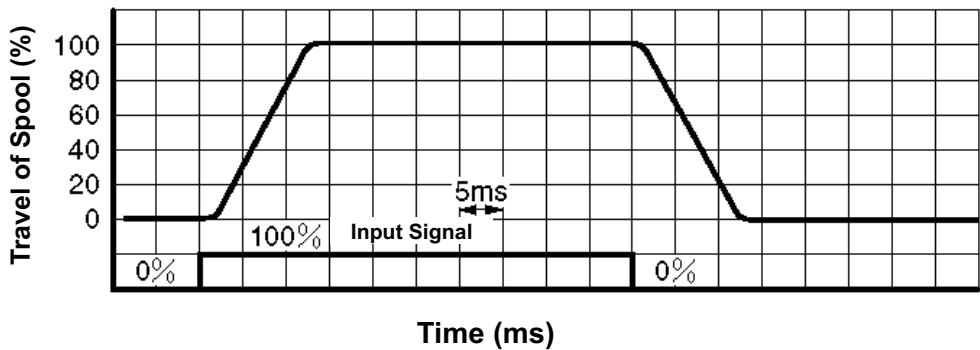
● LSVHG-06-1300

○ Power Amplifier : AMLS-D-D48-※-10 (Power Supply:DC48V)

Supply Pressure:	14MPa
Pilot Pressure :	14MPa
Viscosity :	30mm ² /s



○ Power Amplifier : AMLS-D-D24-※-10 (Power Supply:DC24V)



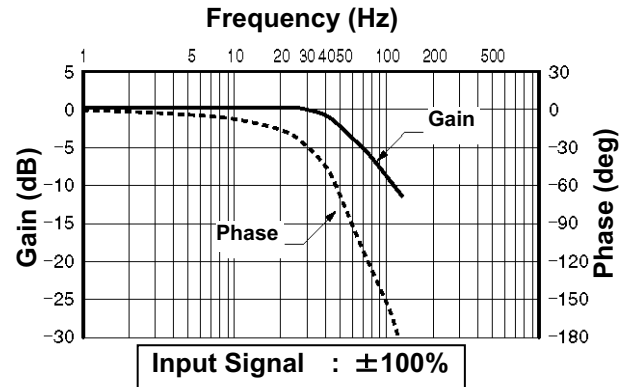
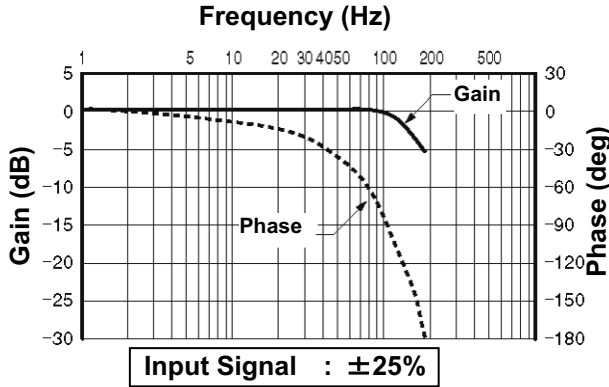
LSVHG-06-900/1300-(2P)-(E)(T)-10

■ Frequency Response Characteristics

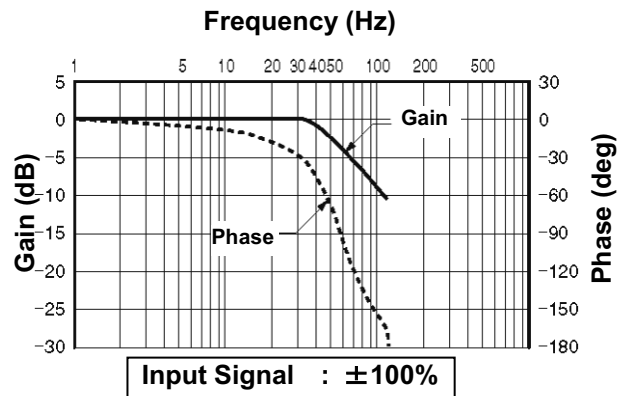
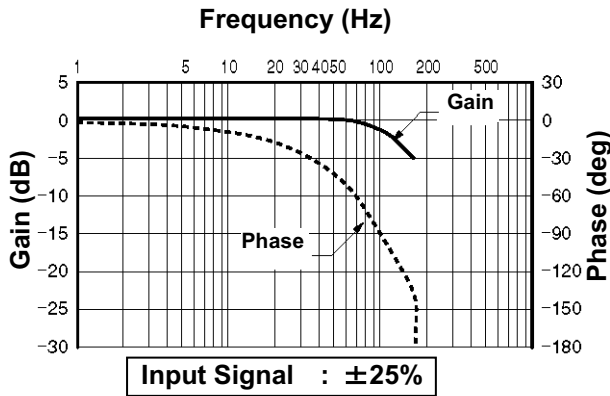
● LSVHG-06-900

Supply Pressure: 14MPa
Pilot Pressure : 14MPa
Viscosity : 30mm ² /s

○ Power Amplifier : AMLS-C-D48-~~※~~-10 (Power Supply:DC48V)

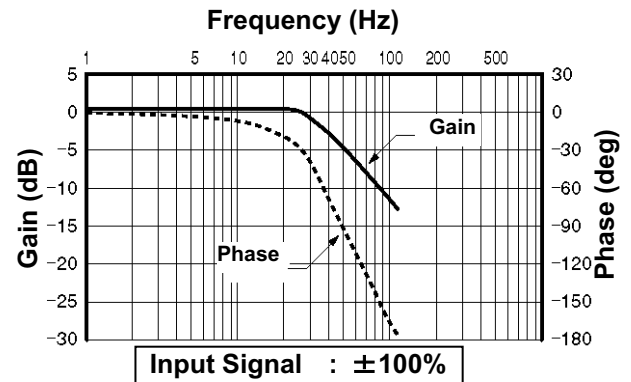
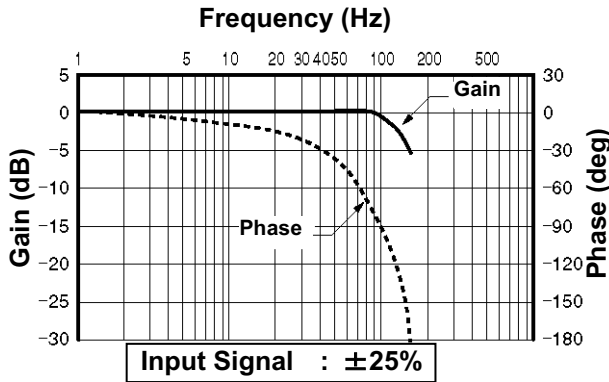


○ Power Amplifier : AMLS-C-D24-~~※~~-10 (Power Supply:DC24V)

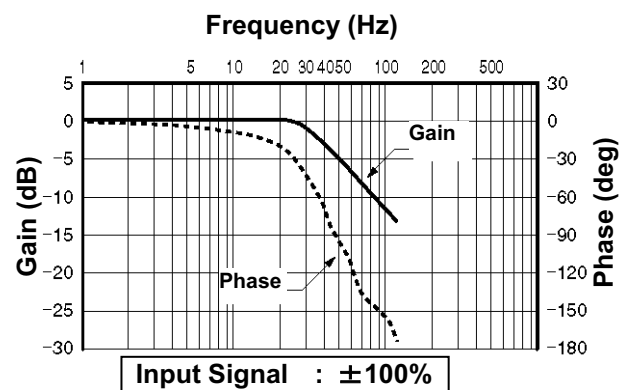
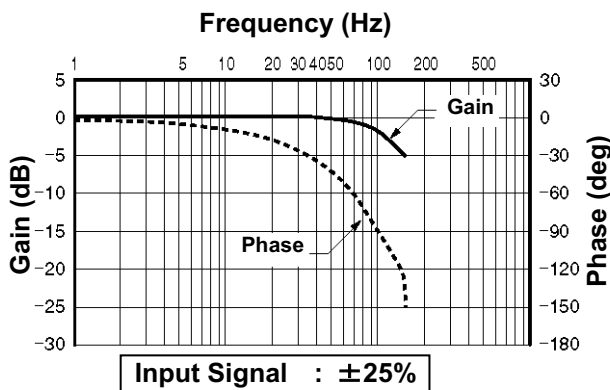


● LSVHG-06-1300

○ Power Amplifier : AMLS-D-D48-~~※~~-10 (Power Supply:DC48V)



○ Power Amplifier : AMLS-D-D24-~~※~~-10 (Power Supply:DC24V)



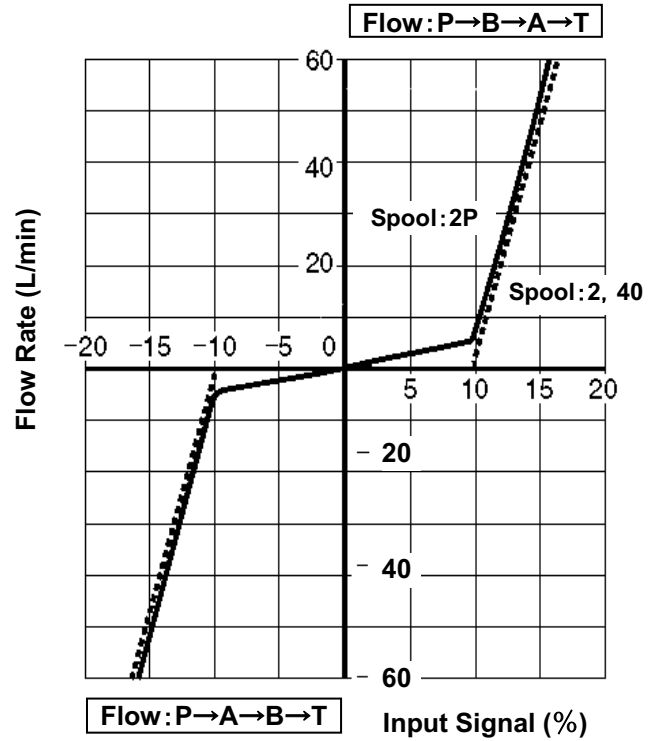
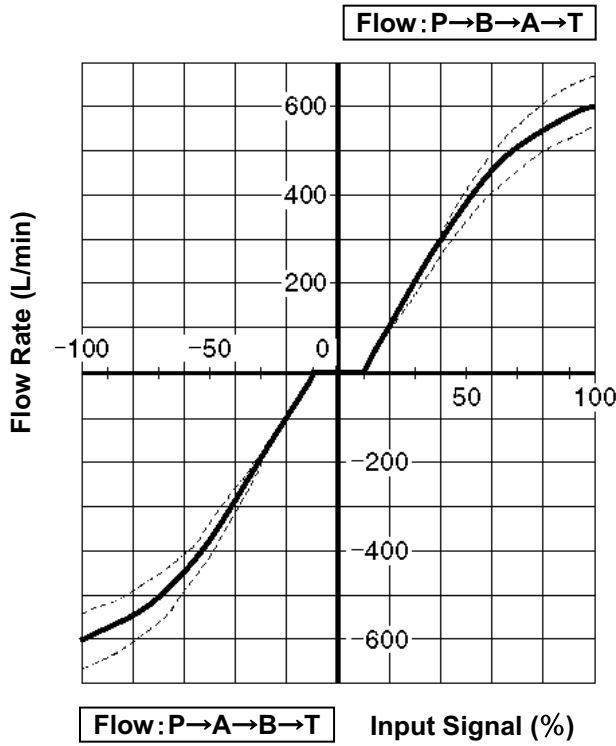
Typical Performance Characteristics

LSVHG-10-1500-(2P)-(E)(T)-10

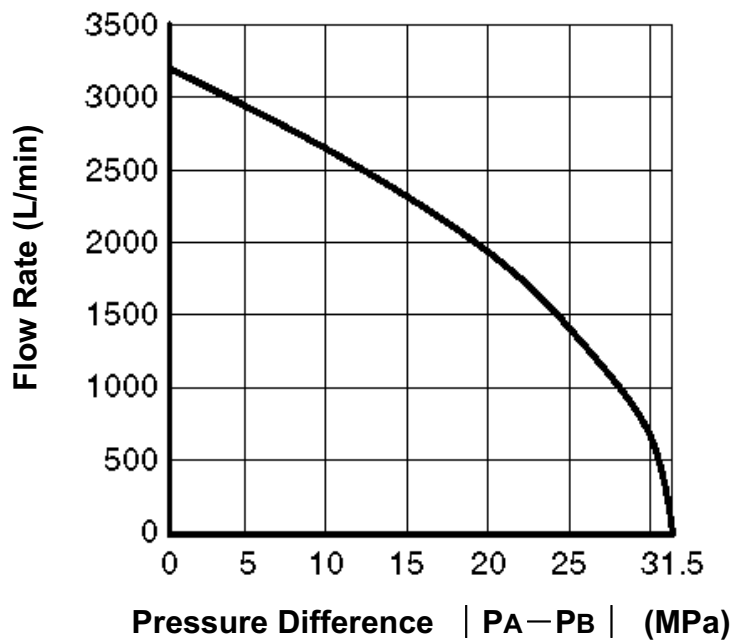
Input Voltage - Flow Characteristics (Flow Gain)

Pressure Difference: 1MPa
Viscosity: 30mm²/s

Details of Input Signal -20% ⇔ +20%



Flow Characteristics, Loaded



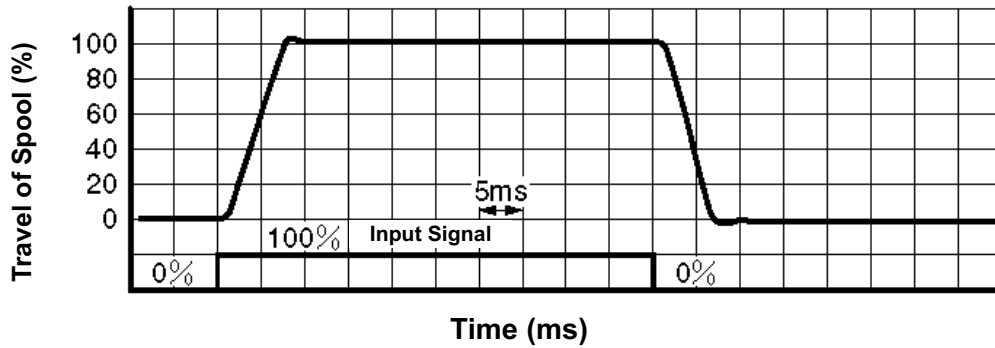
Tolerance: ±10%

LSVHG-10-1500-(2P)-(E)(T)-10

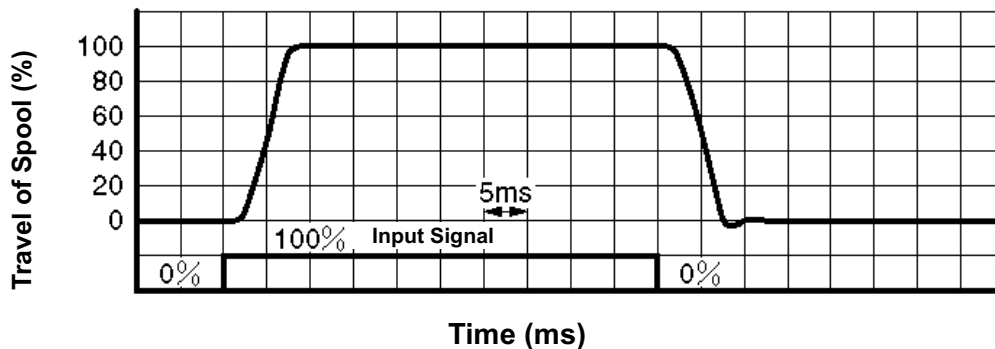
■ Step Response Characteristics (Travel of Spool)

○Power Amplifier : AMLS-C-D48-※-10 (Power Supply:DC48V)

Supply Pressure: 14MPa
 Pilot Pressure : 14MPa
 Viscosity : 30mm²/s



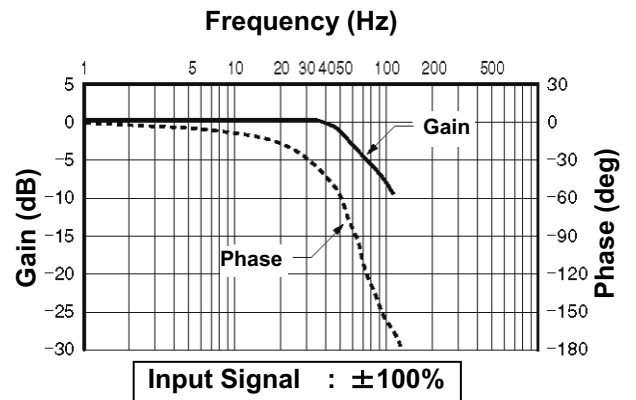
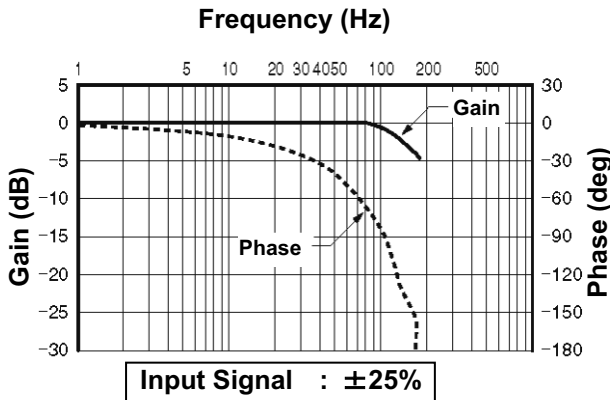
○Power Amplifier : AMLS-C-D24-※-10 (Power Supply:DC24V)



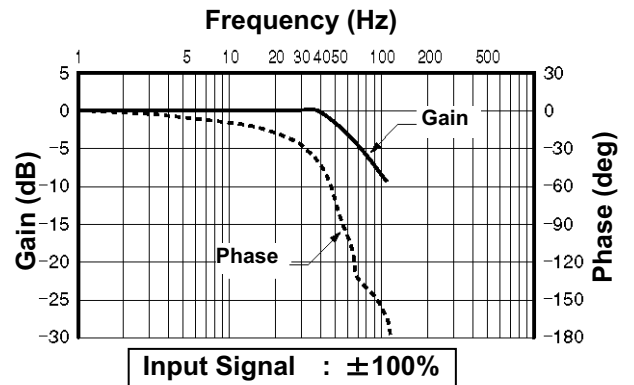
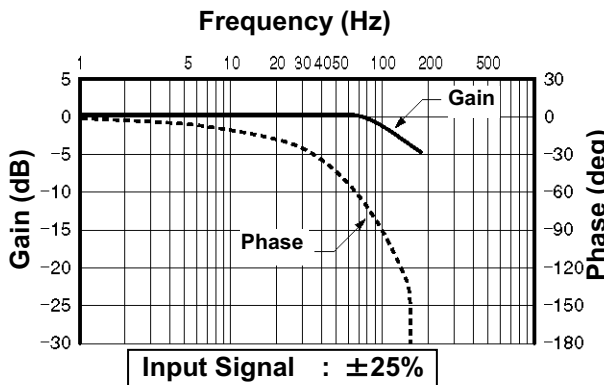
■ Frequency Response Characteristics

○Power Amplifier : AMLS-C-D48-※-10 (Power Supply:DC48V)

Supply Pressure: 14MPa
 Pilot Pressure : 14MPa
 Viscosity : 30mm²/s



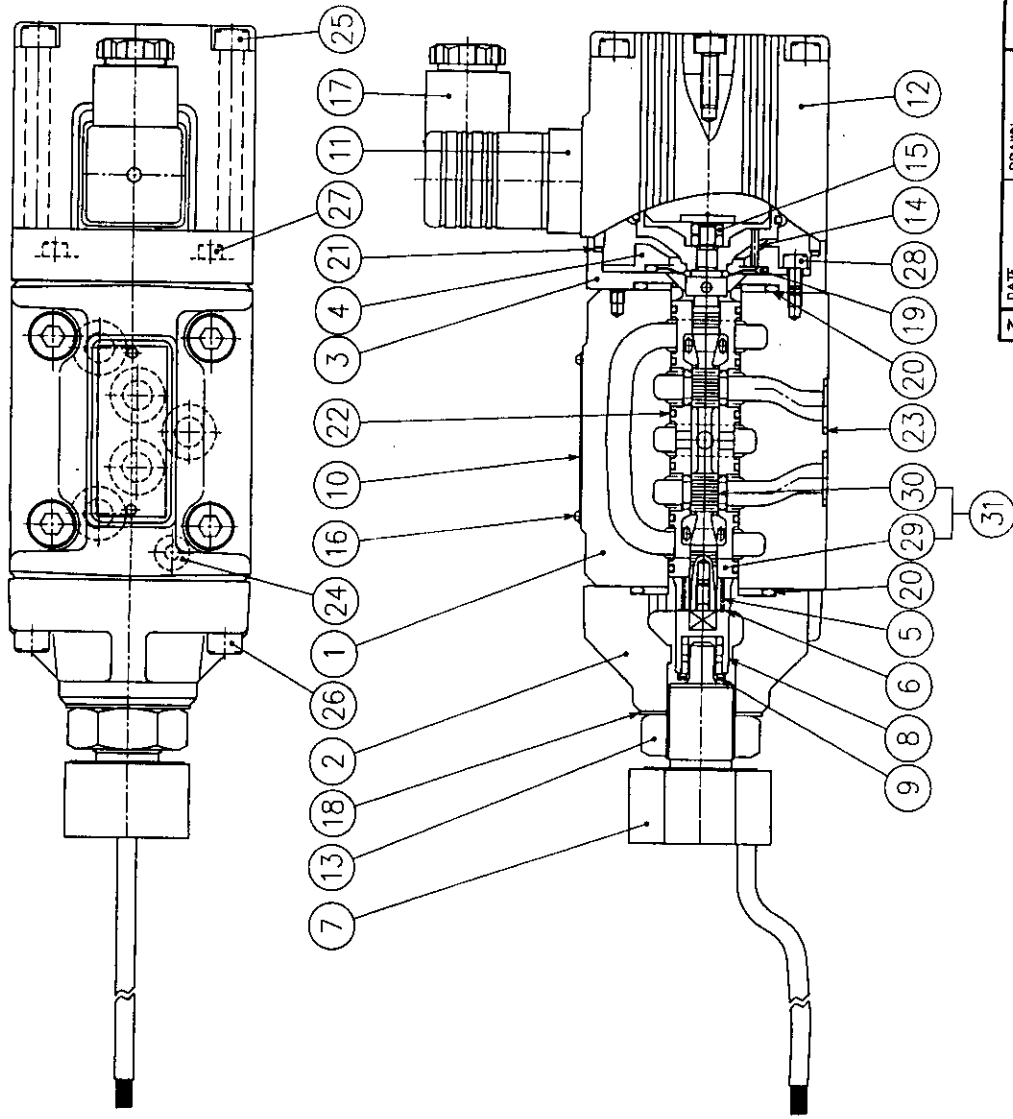
○Power Amplifier : AMLS-C-D24-※-10 (Power Supply:DC24V)



Pub.No : EL-0610-5(Appendix)
Title : LSV(H)G High-speed
Linear Servo Valves
Date of issue :12/04/2002
Date of revision: 4/10/2007
Published in Japan

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油研工業株式会社
 01. 8. 24
 研究開発部

DATE	'01-08-23	DRAWN	M.G	MODEL NO.	YUKEN KOYO CO., LTD.
APPROVED	<i>S. Ochiai</i>	CHECKED	<i>M. Ide</i>	NAME	LSVG-03-※-10
THIRD ANGLE PROJECTION	三角法	FILE NO.	E241	DWG NO.	3/8 高速リニアサーボ弁
SYM	REVISIONS	DATE	SIGN	3/8 HIGH SPEED LINEA SERVO VALVES	
				VA326005-6-0	
				1/2	

10 D

表 1 TABLE 1

照号 ITEM	部品番号 PART NUMBERS	部品名称 NAME OF PARTS	個数 QTY	備考 REMARKS	照号 ITEM	部品番号 PART NUMBERS	部品名称 NAME OF PARTS	個数 QTY	備考 REMARKS
1	E241-VK11912-2	ボデー BODY	1		17	GDM-211-B-1107	DIN コネクタ DIN CONNECTOR	1	
2	SE1012-VK316869-7	カバー COVER	1		18	SG-FDN-20	タイスレッド FASTENER SAEL	1	
3	E241-VK317339-0	センターブロック CENTER BLOCK	1		19	SE1012-VK418993-2	ダイヤフラム DIAPHRAGM	1	
4	SE1012-VK316420-9	ダイヤフラム押え DIAPHRAGM SET PLATE	1		20	SO-NB-A128	O-RING	2	JIS B 2401-1B-A128
5	E241-VK420840-1	ばね SPRING	1		21	SO-NB-A037	O-RING	1	JIS B 2401-1B-A037
6	E241-VK420680-1	シム SHIM	1		22	SO-NB-A017	O-RING	6	JIS B 2401-1B-A017
7	E241-VK317338-2	磁気ポテンショ MAGNETIC POTENTIO	1		23	SO-NB-A014	O-RING	5	JIS B 2401-1B-A014
8	E241-VK420678-5	ホルダー HOLDER	1	磁気ポテンショに含まれます。 INCLUDED IN MAGNETIC POTENTIO	24	SO-NB-P7	O-RING	1	JIS B 2401-1B-P7
9	SE1012-VK418976-7	ストッパー STOPER	1		25	TB-SM-6x75	六角穴付きボルト SOC. HD. CAP SCREW	4	
10	900-VK312767-7	鉛板 NAME PLATE	1		26	TB-SM-6x20	六角穴付きボルト SOC. HD. CAP SCREW	4	
11	SE1012-VK316541-2	端子台 TERMINAL	1		27	TB-SM-4x8	六角穴付きボルト SOC. HD. CAP SCREW	2	
12	E323-10	リニアモータ LINEAR MOTOR	1		28	TB-SM-4x6	六角穴付きボルト SOC. HD. CAP SCREW	3	
13	TK130031-8	六角板ナット HEX, NUT (H=10)	1		29	表 2 ★A 参照 SEE ★A IN TABLE 2	スリーブ SLEEVE	1	スリーブASS'Yに含まれます。 INCLUDED IN SLEEVE ASS'Y
14	PN-PA-2x10	スプリングピン SPRING PIN	1		30	表 2 ★B 参照 SEE ★B IN TABLE 2	スプール SPOOL	1	
15	TN-CB-5	六角ナット HEX, NUT	2		31	表 2 ★C 参照 SEE ★C IN TABLE 2	スリーブASS'Y SLEEVE ASS'Y	1	
16	RV-A-7	打込みびょう RIVET	2						

表 2 TABLE 2

モデル番号 MODEL NUMBERS	★A(29) スリーブ SLEEVE	★B(30) スプール SPOOL	★C(31) スリーブASS'Y SLEEVE ASS'Y
LSVG-03-4-10	E241-VK212056-6		E241-VK420681-9
LSVG-03-10-10	E241-VK212057-4	SE1012-VK211851-1	E241-VK420682-7
LSVG-03-20-10	E241-VK212058-2		E241-VK420683-5
LSVG-03-40-10	E241-VK212190-3	E241-VK212191-1	E241-VK421329-4
LSVG-03-60-10			

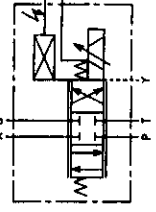
DATE	DRAWN
APPROVED	CHECKED
THIRD ANGLE PROJECTION	
FILE NO.	E241

SYN	REVISIONS	DATE	BY
△X5	04	2/26	KT
VA	04		
X5	04		

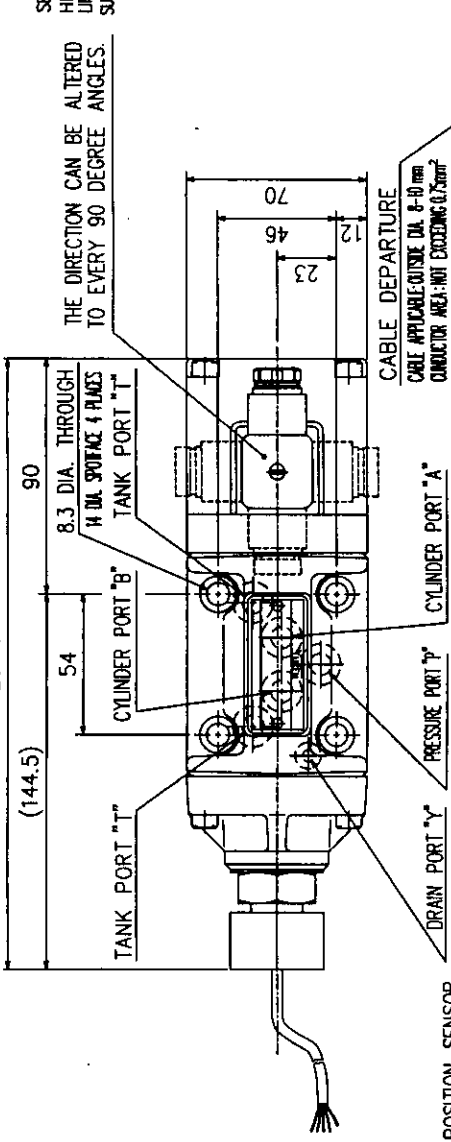
YUKEN KOGYO CO., LTD.
MODEL NO. LSVG-03-※-10
NAME 3/8 高速リニアサーボ弁
DWG NO. 3/8 HIGH SPEED LINEA SERVO VALVES
VA326005-6-1
2/2

MODEL NUMBER DESIGNATION
 LSV G-03-40-10

SERIES NO. HIGH SPEED LINEAR SERVO VALVE SUB-PLATE MOUNTING
 VALVE SIZE
 DESIG. NUMBER
 RATED FLOW (VALVE PRES. DIFF. AT 7 MPa)
 4: 4 L/min
 10: 10 L/min
 20: 20 L/min
 40: 40 L/min
 60: 60 L/min



THE DIRECTION CAN BE ALTERED TO EVERY 90 DEGREE ANGLES.

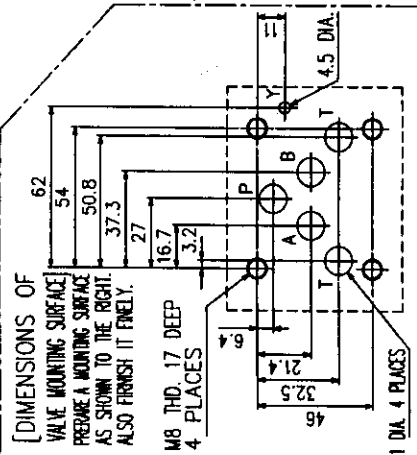


POSITION SENSOR
 LENGTH OF LEAD WIRE: 2m
 RED: DC+15V
 BLACK: 0V
 YELLOW: OUTPUT(+)
 WHITE: OUTPUT(-)

MOUNTING SURFACE
 (O-RINGS FURNISHED)

HYDRAULIC FLUIDS
 PETROLEUM BASE OILS:
 USE FLUIDS EQUIVALENT TO ISO VG32 OR VG46.
 RECOMMENDED FLUID VISCOSITY AND TEMPERATURE
 VISCOSITY: 15-400 mm²/s
 TEMPERATURE: -15-+60 °C

OPERATING LIMITS FOR CONTROL FLOW
 OPERATE THE VALVE WITHIN THE LIMIT RANGE SHOWN BELOW.



SPECIFICATIONS

DESCRIPTION	MODEL NO.	LSVG-03-20	LSVG-03-40	LSVG-03-60
RATED FLOW (ΔP=7MPa)		4, 10, 20, 40 L/min	20	60 L/min
MAX. OPERATING PRESSURE		35 MPa	35	35 MPa
PROOF PRESSURE AT RETURN PORT		35 MPa	35	35 MPa
DRAIN PORT BACK PRESSURE		0.05 MPa (ΔP)	0.05	0.05 MPa (ΔP)
NULL LEAKAGE		Ps=14MPa	1.7 L/min (ΔP)	3 ms
STEP RESPONSE (0-100%)		★2	2 ms	3 ms
FREQUENCY RESPONSE GAIN		-3 dB	★2	350 Hz
(±25% F.S.)		-90 DEG.	★2	450 Hz
VIBRATION-RESISTANCE				FREQUENCY: 10-60Hz FREQUENCY: 61-2000Hz AMPLITUDE: 4mm AMPLITUDE: 4-0.0038mm ACCELERATION: 0.8-28.8G ACCELERATION: 30G
WATER-PROOFNESS				IP64
OPERATING TEMPERATURE RANGE				-15-+60°C
SPOOL TYPE				ZERO LAP AT SPOOL IS CENTERED
APPROXIMATE SPOOL STROKE TO STOPS				±0.5 mm
LINEAR MOTOR CURRENT SPECIFICATIONS				2 A (MAX. 6A)
COIL RESISTANCE				4.5 Ω (at 20°C)
APPROX. MASS				5 kg

*1. BACK PRESSURE FOR DRAIN PORT SHOULD BE LESS THAN 0.05MPa AND ALSO NOT TO BE VACUUM PRESSURE.
 *2. THE ABOVE CHARACTERISTICS WERE MEASURED WITH EACH VALVE SO THEY MAY VARY DEPENDING UPON HYDRAULIC CIRCUIT MOUNTING SURFACE

THE FOLLOWING SIZES DIFFER FROM THOSE OF ISO 4401-AC-05-4.
 SCREW SIZE: M8 THD. 4 PLACES
 DRAIN PORT: 4.5 DIA.

AMPLIFIERS
 THE FOLLOWING AMPLIFIERS ARE RECOMMENDED.
 MODEL NO.: SK1119-A-★-20 (LSVG-03-4, 10, 20, 40)
 SK1119-B-★-20 (LSVG-03-60)

ATTACHMENT
 MOUNTING BOLTS: SOC. HD. CAP SCREW ... M8 X 6SL
 O-RING: P.A.B.T. PORT AS 568-014 (NBR, Hs90) ... 5PCS.
 O-RING: Y PORT JS B 2401-1B-P7 ... 1PCS.

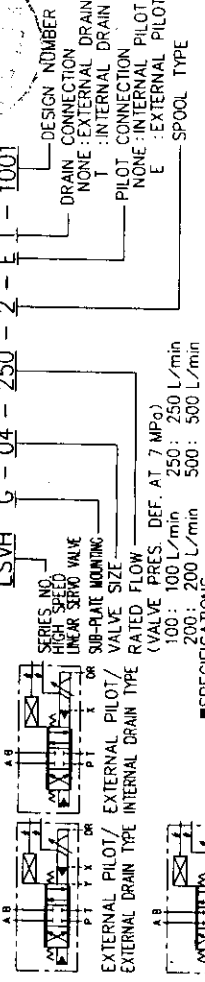
CONTROL OF CONTAMINATION
 DUE CAUTION MUST BE PAID TO MAINTAIN CONTROL OVER CONTAMINATION OF THE HYDRAULIC FLUIDS WHICH MAY OTHERWISE LEAD TO BREAKDOWNS AND SHORTEN THE LIFE ON THE VALVE. PLEASE MAINTAIN THE DEGREE OF CONTAMINATION WITHIN WAS 1638-GRADE 10. USE 20 μm ON FINER LINE FILTER. 10

DATE	03-01-16	DRAWN	m.g
APPROVED	<i>M. Odo</i>	CHECKED	
REVISIONS		DATE	
FILE NO.	E241	MODEL NO.	LSVG-03-★-10
		NAME	HIGH SPEED LINEAR SERVO VALVES
			3/8, SUB-PLATE MOUNTING
		DWG. NO.	VA326113-8-0

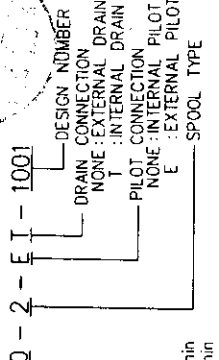
YUKEN KOGYO CO., LTD.

11

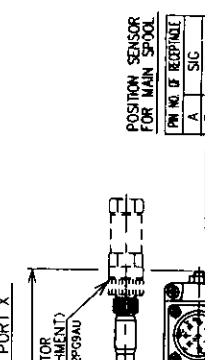
GRAPHIC SYMBOLS



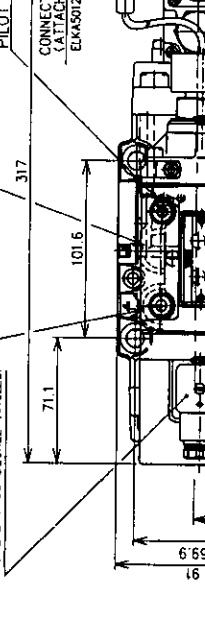
MODEL NUMBER DESIGNATION



POSITION SENSOR FOR MAIN SPOOL



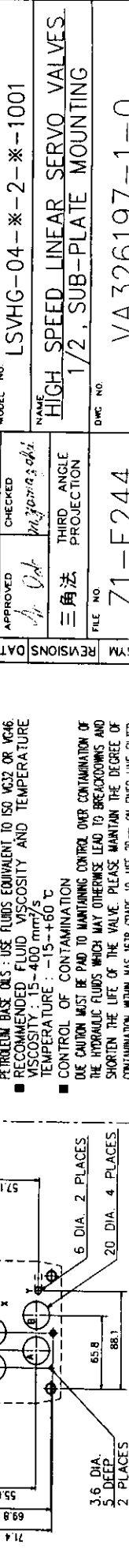
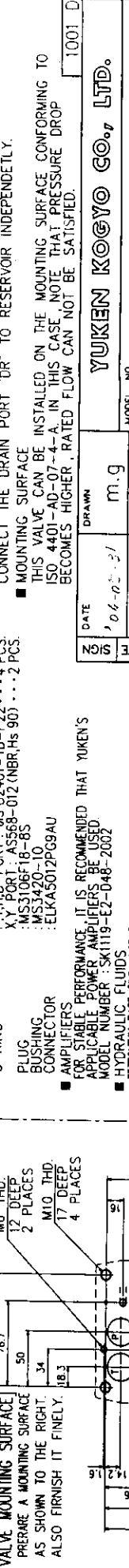
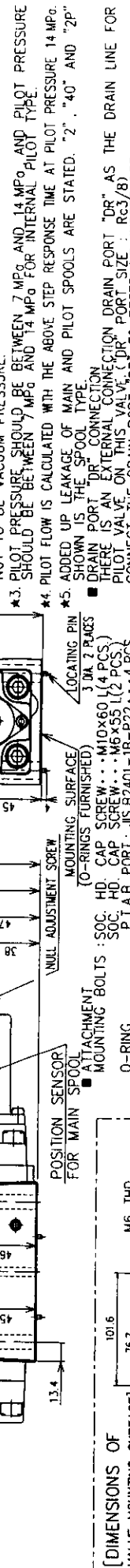
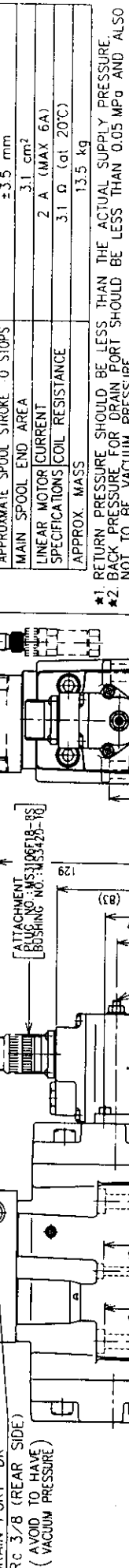
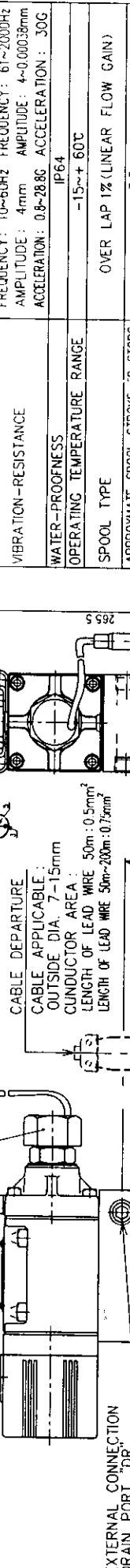
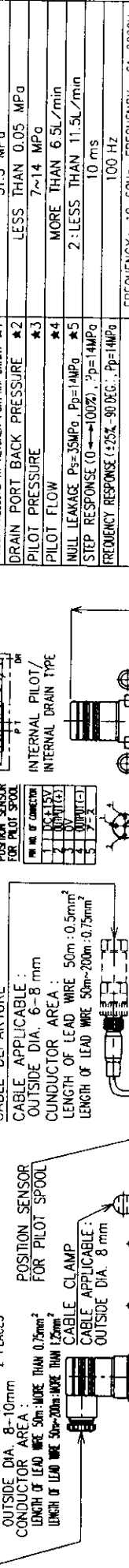
POSITION SENSOR FOR PILOT SPOOL



EXTERNAL CONNECTION DRAIN PORT 'DR'



DESCRIPTION	MODEL NO.
RATED FLOW (ΔP=7MPa)	LSVHG-04-2-2-1001
MAX. OPERATING PRESSURE	100: 100L/min (±10%), 200: 200L/min (±10%) 250: 250L/min (±20%), 500: 500L/min (±10%)
PROOF PRESSURE AT RETURN PORT (EX. DRAIN)	35 MPa
PROOF PRESSURE AT RETURN PORT (ON DRAIN) *1	31.5 MPa
DRAIN PORT BACK PRESSURE *2	LESS THAN 0.05 MPa
PILOT PRESSURE *3	7~14 MPa
PILOT FLOW *4	MORE THAN 6.5L/min
NULL LEAKAGE P₀=35MPa, P₀=14MPa *5	2: LESS THAN 11.5L/min
STEP RESPONSE (0→100%) P₀=14MPa	10 ms
FREQUENCY RESPONSE (±2%·90 DEG.) P₀=14MPa	100 Hz
VIBRATION-RESISTANCE	FREQUENCY: 10~60Hz FREQUENCY: 61~2000Hz AMPLITUDE: 4mm AMPLITUDE: 4~0.0003mm ACCELERATION: 0.8~28.8G ACCELERATION: 30G
WATER-PROOFNESS	IP64
OPERATING TEMPERATURE RANGE	-15~+60°C
SPOOL TYPE	OVER LAP 1/2 (LINEAR FLOW GAIN)
APPROXIMATE SPOOL STROKE 0 STOPS	±3.5 mm
MAIN SPOOL END AREA	3.1 cm ²
LINEAR MOTOR CURRENT	2 A (MAX 6A)
SPECIFICATIONS COIL RESISTANCE	3.1 Ω (at 20°C)
APPROX. MASS	13.5 kg



- *1 RETURN PRESSURE SHOULD BE LESS THAN THE ACTUAL SUPPLY PRESSURE.
- *2 BACK PRESSURE FOR DRAIN PORT SHOULD BE LESS THAN 0.05 MPa AND ALSO NOT TO BE VACUUM PRESSURE.
- *3 PILOT PRESSURE SHOULD BE BETWEEN 7 MPa AND 14 MPa AND PILOT PRESSURE SHOULD BE BETWEEN 7 MPa AND 14 MPa FOR INTERNAL PILOT TYPE
- *4 PILOT FLOW IS CALCULATED WITH THE ABOVE STEP RESPONSE TIME AT PILOT PRESSURE 14 MPa.
- *5 ADDED UP LEAKAGE OF MAIN AND PILOT SPOOLS ARE STATED. "2", "40" AND "2p".
- DRAIN PORT "DR" CONNECTION THERE IS AN EXTERNAL CONNECTION DRAIN PORT "DR" AS THE DRAIN LINE FOR PILOT VALVE ON THIS VALVE. "DR" PORT SIZE: P₀ 3/8" CONNECT THE DRAIN PORT "DR" TO RESERVOIR INDEPENDENTLY.
- MOUNTING SURFACE THIS VALVE CAN BE INSTALLED ON THE MOUNTING SURFACE CONFORMING TO ISO 4401-AD-07-4-A. IN THIS CASE, NOTE THAT PRESSURE DROP BECOMES HIGHER, RATED FLOW CAN NOT BE SATISFIED.

FOR STABLE PERFORMANCE IT IS RECOMMENDED THAT YUKEN'S APPLICABLE POWER AMPLIFIERS BE USED

MODEL NUMBER: SK1119-E2-048-2002

HYDRAULIC FLUIDS

PETROLEUM BASE OILS: USE FLUIDS EQUIVALENT TO ISO VG32 OR VG46

RECOMMENDED FLUID VISCOSITY AND TEMPERATURE

VISCOSITY: 15~400 mm²/s

TEMPERATURE: -15~+60 °C

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 MAX 163B-GRADE 10: 20µm ON FINER LINE FILTER.

DATE	DRAWN	MODEL NO.	YUKEN KOYO CO., LTD.
10-05-31	m.g	LSVHG-04-2-2-1001	
APPROVED	CHECKED	NAME	HIGH SPEED LINEAR SERVO VALVES
			1/2, SUB-PLATE MOUNTING
REVISIONS	DATE	REVISIONS	FILE NO.
三角法		THIRD ANGLE PROJECTION	Z1-E244
			VA326197-1-0

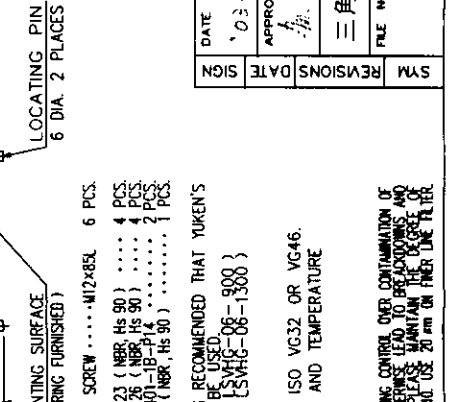
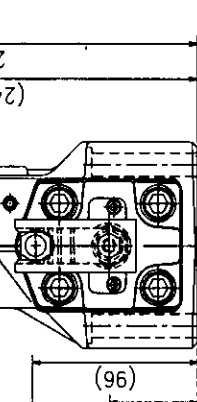
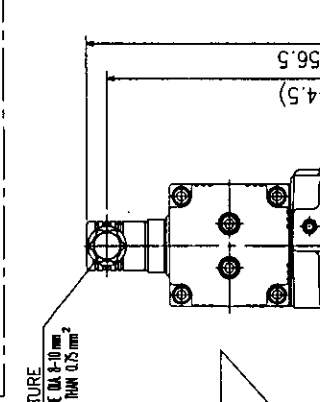
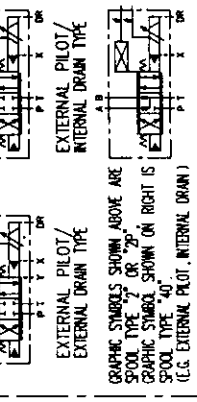
10-10-10
10-10-10

MODEL NUMBER DESIGNATION
 LSVH G-06-900-2P-EI-10
 SERIES NO. : HIGH SPEED
 SUB-PLATE MOUNTING : INTERNAL DRAIN
 VALVE SIZE : 1/2" (Ø 12.7 mm)
 RATED FLOW (W/VA PRES. OFF. AT 7 MPa)
 900 : 900 L/min
 1300 : 1300 L/min

GRAPHIC SYMBOLS
 INTERNAL PILOT/EXTERNAL DRAIN TYPE
 INTERNAL PILOT/INTERNAL DRAIN TYPE
 EXTERNAL PILOT/EXTERNAL DRAIN TYPE
 EXTERNAL PILOT/INTERNAL DRAIN TYPE

SPECIFICATIONS
 MODEL NO. : LSVHG-06-900
 DESCRIPTION : LSVHG-06-1300
 RATED FLOW (ØAP=7MPa) : 900 L/min
 MAX. OPERATING PRESSURE : 35 MPa
 PIPOT PRESSURE AT RETURN PORT (INTERNAL DRAIN) : 15 MPa
 PIPOT PRESSURE AT RETURN PORT (EXTERNAL DRAIN) : 25 MPa
 DRAIN PORT BACK PRESSURE : 2 MPa
 PILOT FLOW : 30 L/min
 NULL LEAKAGE (Ps=14MPa, Pp=14MPa) : 4
 STEP RESPONSE (0→100% Pp=14 MPa) : 5
 FREQUENCY RESPONSE (1/2→1/2) : 10 Hz
 VIBRATION-RESISTANCE : FREQUENCY: 10-60Hz FREQUENCY: 60-2000Hz
 AMPLITUDE: 4mm AMPLITUDE: 4-4000/36mm
 ACCELERATION: 0.8-28.8G ACCELERATION: 30G
 WATER-PROOFNESS : IP64
 OPERATING TEMPERATURE RANGE : -15~+60°C
 SPOOL TYPE : 2 : 2P (Ø 20 RAPI) 40 : 40
 APPROXIMATE SPOOL STROKE TO STEPS : ±5 mm
 MAIN SPOOL END AREA : 8 cm²
 LINEAR MOTOR CURRENT SPECIFICATIONS : 2 A (MAX. 6A)
 APPROX. MASS : 20 kg

POSITION SENSOR FOR PILOT SPOOL
 LENGTH OF LEAD WIRE: 2 m
 RED : DC+15V
 BLACK : 0V
 YELLOW : OUTPUT (+)
 WHITE : OUTPUT (-)

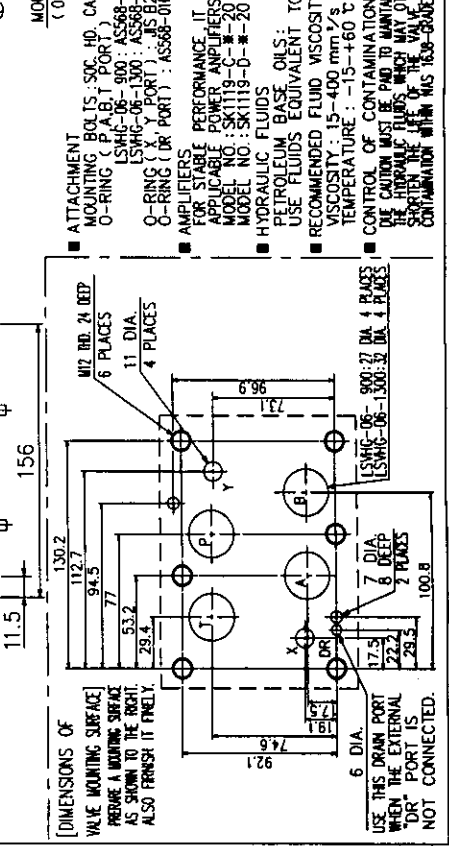
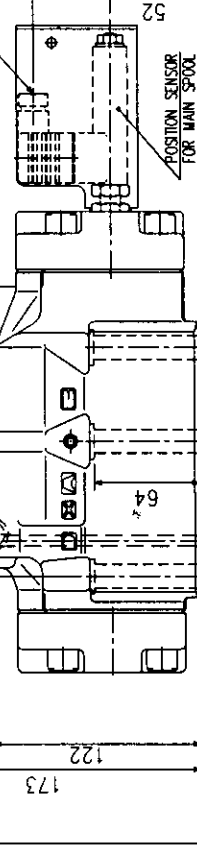
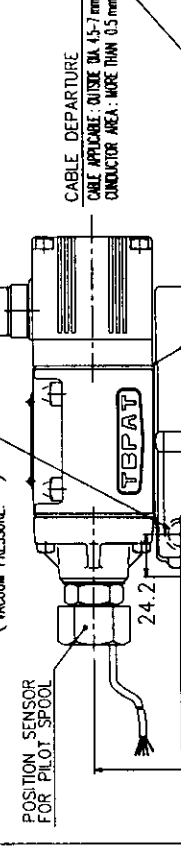


MODEL NUMBER DESIGNATION
 LSVH G-06-900-2P-EI-10
 SERIES NO. : HIGH SPEED
 SUB-PLATE MOUNTING : INTERNAL DRAIN
 VALVE SIZE : 1/2" (Ø 12.7 mm)
 RATED FLOW (W/VA PRES. OFF. AT 7 MPa)
 900 : 900 L/min
 1300 : 1300 L/min

GRAPHIC SYMBOLS
 INTERNAL PILOT/EXTERNAL DRAIN TYPE
 INTERNAL PILOT/INTERNAL DRAIN TYPE
 EXTERNAL PILOT/EXTERNAL DRAIN TYPE
 EXTERNAL PILOT/INTERNAL DRAIN TYPE

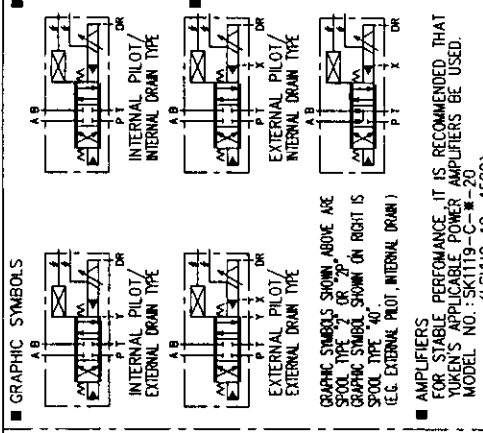
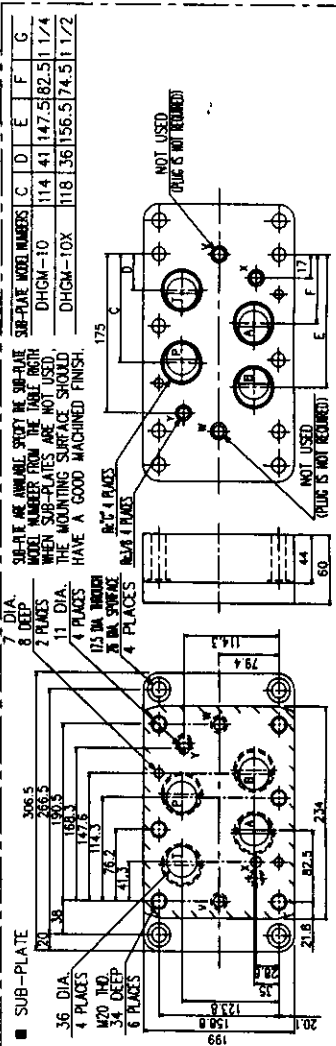
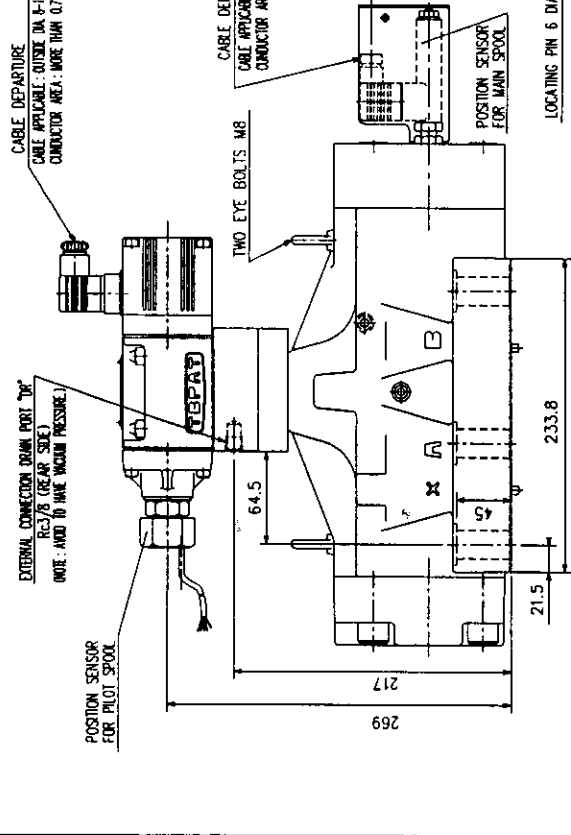
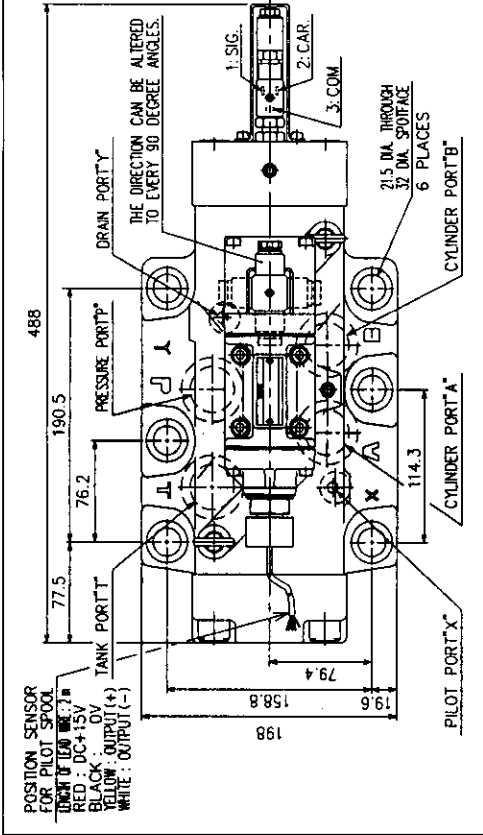
SPECIFICATIONS
 MODEL NO. : LSVHG-06-900
 DESCRIPTION : LSVHG-06-1300
 RATED FLOW (ØAP=7MPa) : 900 L/min
 MAX. OPERATING PRESSURE : 35 MPa
 PIPOT PRESSURE AT RETURN PORT (INTERNAL DRAIN) : 15 MPa
 PIPOT PRESSURE AT RETURN PORT (EXTERNAL DRAIN) : 25 MPa
 DRAIN PORT BACK PRESSURE : 2 MPa
 PILOT FLOW : 30 L/min
 NULL LEAKAGE (Ps=14MPa, Pp=14MPa) : 4
 STEP RESPONSE (0→100% Pp=14 MPa) : 5
 FREQUENCY RESPONSE (1/2→1/2) : 10 Hz
 VIBRATION-RESISTANCE : FREQUENCY: 10-60Hz FREQUENCY: 60-2000Hz
 AMPLITUDE: 4mm AMPLITUDE: 4-4000/36mm
 ACCELERATION: 0.8-28.8G ACCELERATION: 30G
 WATER-PROOFNESS : IP64
 OPERATING TEMPERATURE RANGE : -15~+60°C
 SPOOL TYPE : 2 : 2P (Ø 20 RAPI) 40 : 40
 APPROXIMATE SPOOL STROKE TO STEPS : ±5 mm
 MAIN SPOOL END AREA : 8 cm²
 LINEAR MOTOR CURRENT SPECIFICATIONS : 2 A (MAX. 6A)
 APPROX. MASS : 20 kg

POSITION SENSOR FOR PILOT SPOOL
 LENGTH OF LEAD WIRE: 2 m
 RED : DC+15V
 BLACK : 0V
 YELLOW : OUTPUT (+)
 WHITE : OUTPUT (-)



DATE	10-10-10	DRAWN	M.G
APPROVED		CHECKED	
REVISIONS	三角法	THIRD ANGLE PROJECTION	
SYN	E242	FILE NO.	

YUKEN KOGYO CO., LTD.
 MODEL NO. : LSVHG-06-900-2P-EI-10
 NAME : HIGH SPEED LINEAR SERVÖ VALVES
 3/4, SUB-PLATE MOUNTING
 DWG NO. : VA326125-2--0



MODEL NUMBER DESIGNATION: LSVH G - 10 - 1500 - 2P - E I - 10

SERIES No. LSVH G - 10 - 1500 - 2P - E I - 10

DESIGN NUMBER: NONE

DRAIN CONNECTION: INTERNAL DRAIN

INTERNAL DRAIN: NONE

EXTERNAL DRAIN: NONE

PILOT CONNECTION: INTERNAL

INTERNAL PILOT: NONE

EXTERNAL PILOT: E

SPOOL TYPE: 2P (ZERO RPI) 40 (E)

VALVE SIZE: 2 (E) 2P (ZERO RPI) 40 (E)

RATED FLOW: 1500 L/min

VALVE PRES. (REF. AT 7MPa): 1500 L/min

SPECIFICATIONS:

DESCRIPTION	MODEL No.
RAISED FLOW CAP = 2MPa	LSVHG-10-1500
MAX OPERATING PRESSURE	1500 L/min
MAX. FLOW RATE AT 10MPa	31.5 MPa
MAX. FLOW RATE AT 7MPa	31.5 MPa
MAX. FLOW RATE AT 5MPa	31.5 MPa
MAX. FLOW RATE AT 3MPa	31.5 MPa
MAX. FLOW RATE AT 1MPa	31.5 MPa
PILOT FLOW PRESSURE	0.02 MPa
PILOT FLOW RATE	1.5-2.0 MPa
PILOT FLOW PRESSURE	1.5-2.0 MPa
PILOT FLOW RATE	1.5-2.0 MPa
PILOT LEAKAGE (P=14MPa, P=14MPa)	5 L/min, 40, 6 L/min, 2P, 12 L/min
STEP RESPONSE (0-100%) P=14MPa	100 Hz
PILOT LEAKAGE (P=14MPa, P=14MPa)	100 Hz
FREQUENCY RESPONSE (20% - 90% BAND)	15-160°C
VIBRATION - RESISTANCE	
WATER-PROOFNESS	
OPERATING TEMPERATURE RANGE	
SPOOL TYPE	
APPROXIMATE SPOOL STROKE TO SIDES	
MAIN SPOOL END AREA	
LINEAR MOTOR CURRENT	
SPECIFICATIONS COIL RESISTANCE	
APPROX. MASS	

★ 1 RETURN PRESSURE SHOULD BE LESS THAN THE ACTUAL SUPPLY PRESSURE
 ★ 2 BACK PRESSURE FOR DRAIN PORT SHOULD BE LESS THAN 0.05MPa AND ALSO NOT TO BE VACUUM PRESSURE
 ★ 3 PILOT PRESSURE SHOULD BE BETWEEN 1.5MPa AND 3.5MPa, AND SHOULD EXCEED 60% OF THE ACTUAL SUPPLY PRESSURE
 ★ 4 PILOT FLOW IS CALCULATED WITH THE ABOVE STEP RESPONSE TIME AT PILOT PRESSURE 14MPa
 ★ 5 ADDED UP LEAKAGE OF MAIN AND PILOT SPOOLS ARE STATED. "2", "40" OR "2P" SHOWN IS THE SPOOL TYPE

- ATTACHMENT: MOUNTING BOLTS (SOC. HD. CAP SCREW... M20X75L 6 PCS. O-RING EYE BOLTS: P.A.B.T PORT: JS B2401-1B-P42 4 PCS. O-RING X.Y. PORT: JS B2401-1B-P20 2 PCS. HYDRAULIC FLUIDS: PETROLEUM BASE OILS - USE FLUIDS EQUIVALENT TO ISO VG32 OR VG46. RECOMMENDED FLUID VISCOSITY AND TEMPERATURE: VISCOSITY: 15-400 mm²/s. TEMPERATURE: -15-+60 °C
- RATED FLOW FOR REQUEST OF SPECIAL FLOW AND SPOOL FUNCTION, CONSULT YOUR YUKEN REPRESENTATIVES.
- 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 10. USE 20 μm ON FINER LINE FILTER.

DATE: 03-10-19

APPROVED: [Signature]

DESIGNED: [Signature]

THIRD ANGLE PROJECTION

FILE NO. E243

SYM	REVISIONS	DATE	SIGN	DRAWN	CHECKED	MODEL NO.
				M.G.		LSVHG-10-1500-※-※-10

YUKEN KOGYO LTD.

NAME: HIGH SPEED LINEAR SERVO VALVES

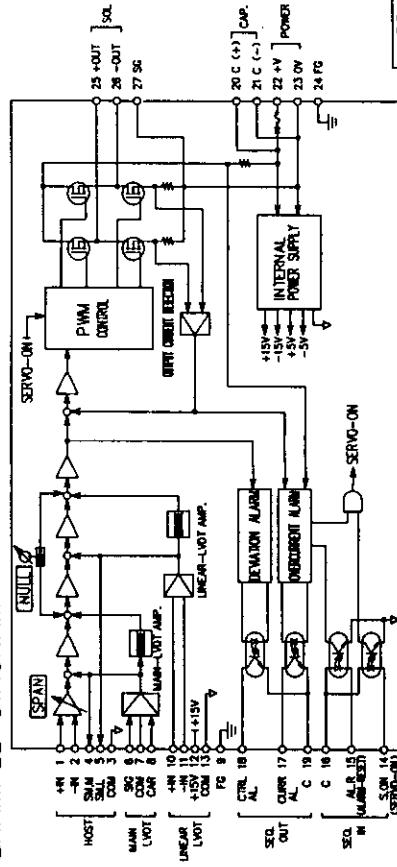
1 1/4, SUB-PLATE MOUNTING

DWG. NO. VA326126-0-0

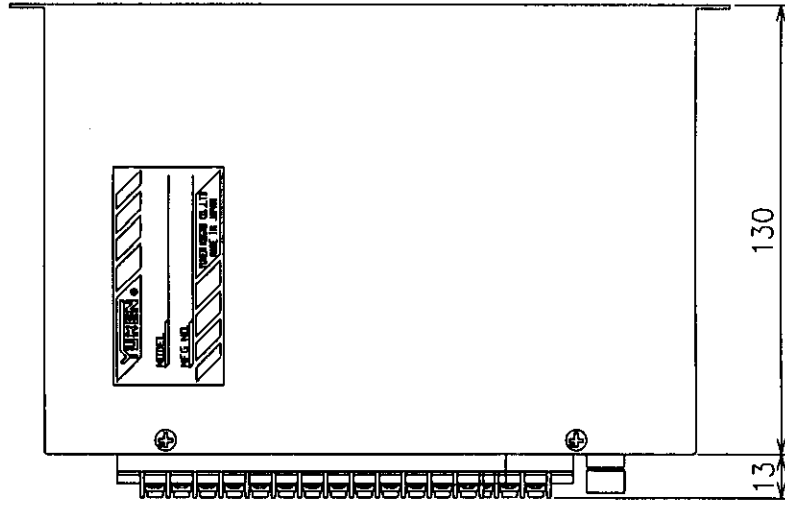
■ SPECIFICATIONS

DESCRIPTION	MODEL No	SK1119-**-D48-20	SK1119-**-D24-20
REF INPUT SIGNAL		± 10V (RATED OUTPUT)	
RATED OUTPUT CURRENT		CONTINUOUS ±2A (±4A PEAK) CONTINUOUS ±2A (±3A PEAK)	
POWER SUPPLY		DC+48V±5% 2A (4A PEAK) DC+24V±5% 2A (3A PEAK)	
CONTROL INPUT/OUTPUT SIGNAL		• SERVO "ON" INPUT • ALARM RESET INPUT • PHOTOCOUPLER INPUT • PHOTOCOUPLER OUTPUT (CURR. AL.) • OVERCURRENT OUTPUT (CURR. AL.) • DEVIATION ALARM OUTPUT (CTRL. AL.) • PHOTOCOUPLER OUTPUT VOLTAGE: MAX. DC 50V CURRENT: MAX. 30mA	
SENSOR MONITOR OUTPUT SIGNAL	MODEL NUMBERS	CONTENTS	OUTPUT VOLTAGE
	PILOT VALVE / LINER SERVO VALVE SPOOL DISPLACEMENT MONITOR MAIN VALVE SPOOL DISPLACEMENT MONITOR	SK1119-A-**-20 SK1119-B-**-20 EXCEPT THE ABOVE MODELS SK1119-A-**-20 SK1119-B-**-20 EXCEPT THE ABOVE MODELS	OUTPUT SPOOL POSITION OF LINER SERVO VALVE OUTPUT ± 2.5V OUTPUT SPOOL POSITION OF PILOT VALVE N/A OUTPUT SPOOL POSITION OF MAIN VALVE OUTPUT ± 2.5V AGAINST RATED SPOOL STROKE
AMBIENT TEMPERATURE		0 ~ 50°C	
AMBIENT HUMIDITY		20 ~ 90%RH (BEDEWING MUST BE AVOIDED)	
APPROX. MASS		1.8 kg	

■ EXAMPLE DIAGRAM



DATE	DRAWN	MODEL NO.	YUKEN KOYO CO., LTD.
1/03-08-29	M.G	SK1119-**-**-20	
APPROVED	CHECKED	NAME	LINER SERVO AMPLIFIER
<i>An. Odo Yamaguchi</i>			
REVISIONS	DATE	DESCRIPTION	
1		THIRD ANGLE PROJECTION	
FILE NO.			EA313740-3-0
			SK1119



■ TERMINAL BOARD

TERMINAL NUMBER	NAME	FUNCTION	NAME
1	REF INPUT SIGNAL	+ IN	SERVO "ON" S.O.N
2	COMMON	- IN	ALARM RESET AL.R
3	SENSOR MAIN SPOOL / PILOT VALVE / LINER SERVO VALVE SPOOL	COM	INPUT COMMON C
4	MONITOR	SM,M	OVERCURRENT ALARM CURR.AL
5	MONITOR	SM,L	DEVIATION ALARM CTRL.AL
6	MAIN SPOOL DISPLACEMENT SENSOR	SIG	OUTPUT COMMON C
7	GROUND	COM	CAP. (+)
8	GROUND	CAR	CAP. (-)
9	GROUND	FG	+V
10	PILOT VALVE / LINER SERVO VALVE SPOOL DISPLACEMENT SENSOR	+ IN	0V
11	PILOT VALVE / LINER SERVO VALVE SPOOL DISPLACEMENT SENSOR	- IN	FG
12	PILOT VALVE / LINER SERVO VALVE SPOOL DISPLACEMENT SENSOR	+15V	+OUT
13	PILOT VALVE / LINER SERVO VALVE SPOOL DISPLACEMENT SENSOR	COM	-OUT
			SG

■ MODEL NUMBER DESIGNATION

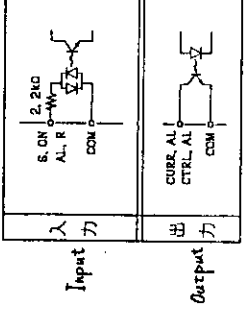
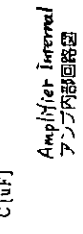
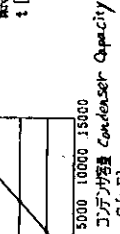
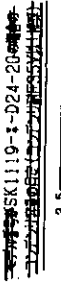
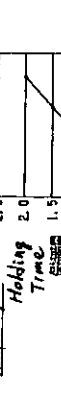
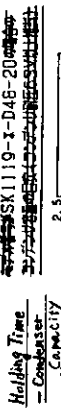
SK1119-**-**-20

SERIES NO. | DESIGN NUMBER | POWER SUPPLY
 D48 : DC48V
 D24 : DC24V

APPLICABLE VALVE TYPE
 A : LSVG-03-4,10,20,40
 B : LSVG-03-60
 C : LSVHG-06-900
 C2 : LSVHG-10-1500
 D : LSVHG-06-1300

NOTE: POWER SUPPLY IS RESTRICTED ONLY 48V/DC ACCORDING TO THE APPLICABLE VALVE TYPE.

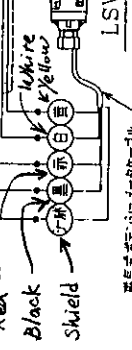
* In case the power OFF後に数秒間バルブスプール変位を中立に保持しておきたい場合には、C (+) - C (-) 間 (端子台20-21間) にコンデンサを接続してください。
 * 電源OFF後、このコンデンサは数秒間バルブスプール変位を中立に保持して、その後電源ONになると、バルブスプールが元の位置に戻ります。



* C (+) - C (-) 間 (端子台20-21間) にコンデンサを接続する場合には、極性に注意してください。Pay attention to Condenser Polarity when connecting the condenser between "C+" and "C-".
 * 電線などの動力線とは別ラインで配線して下さい。Wiring the Power Supply line separately from other power lines such as for Electric Motors.

DINコネクタ (黒色)	①: ④	25番端子
DINコネクタ (青色)	②: ⑤	26番端子
③: ⑥	27番端子	

①: ④	25番端子
②: ⑤	26番端子
③: ⑥	27番端子

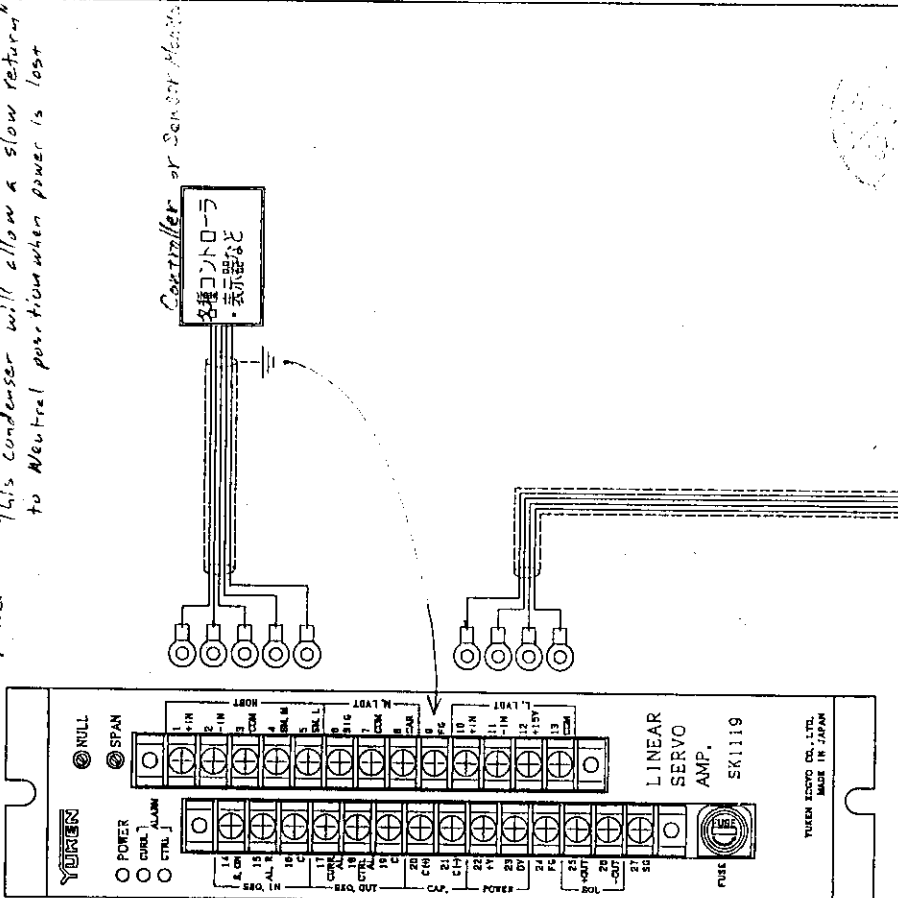


黒色 (Black)	①	25番端子
白色 (White)	②	26番端子
黄色 (Yellow)	③	27番端子

黒色 (Black)	①	25番端子
白色 (White)	②	26番端子
黄色 (Yellow)	③	27番端子

接続例: ①: 25番端子, ②: 26番端子, ③: 27番端子

リニアサーボアンプ Amplifier " This condenser will allow a slow return to Neutral position when power is lost after the power is cut off, Connect a Condenser between "C+" and "C-" (between pin No. 20 and 21).
 YUKEN
 各種コントローラ
 ・ 各種コントローラ
 ・ 各種コントローラ



日付 DATE	型式 MODEL NO.	YUKEN KOYO CO., LTD.
'02-10-10	SK1119-A-B-X-20	
承認 APPROVED	名称 NAME	リニアサーボアンプ
大場		
三角法 THIRD ANGLE PROJECTION	図号 DWG NO.	SK1119
REV. NO.	FILE NO.	E A 3 1 3 5 0 2-7-0