

Products News



OBE (On-Board Electronic) Type Linear Servo Valves: LSVHG-03/04/06EH-**-**-**-**-20 Launch of New Models

We are pleased to announce the launch of new models of the LSVHG series for offering a wider range of high response and high accuracy OBE (on-board electronic) type linear servo valves.

[Description of Newly Added Models]

The spool type “4J” is additionally available for the valve size “03”; the spool types “2L” and “4J” are additionally available for the valve sizes “04” and “06” .



[Model Number Designation]

F-	LSVHG	-06	EH	-900	-2P	-E	T	-W	A	-A	1	-20		
Fluid Type	Series Number	Valve Size	Amplifier Type	Rated Flow at ΔP=7MPa	Spool Type *1	Pilot Type	Drain Type	DR Port and Permissible Back Pres.	Fail-safe Function *1	Input Signal/ Spool Travel Monitoring *1	Connector Type	Design Number		
F: Special Seals for Phosphate Ester Type Fluid(omit if not required)	LSVHG: Two Stage Linear Servo Valves	03	EH: OBE Type	230: 230 L/min	2L	None: Internal Pilot	None: External Drain	None: With DR Port (Permissible Back Pres.: 0.05 MPa) (Dry Type Pilot Valve)	None: P→B→A→T Position Valve Opening: Full A: P→A→B→T Position Valve Opening: Full	A: Voltage Signal ±10 V (P→B→A→T Flow with Input Signal (+)) B: Current Signal 4-20 mA (P→B→A→T Flow with Current Signal 12-20mA) C: Current Signal ±10mA (P→B→A→T Flow with Input Signal (+)) D: Voltage Signal ±10 V (P→A→B→T Flow with Input Signal (+)) E: Current Signal 4-20 mA (P→A→B→T Flow with Current Signal 12-20 mA) F: Current Signal ±10mA (P→A→B→T Flow with Input Signal (+))	1: 6 + PE Pole 2: *3 11 + PE Pole	20		
				270: 270 L/min	2, 40, 2P									
				210: *4 210 L/min	4J: A, B, T Connection (Neutral) 2L: 2, 40, 2P									
				750: 750 L/min	2L: 2% Overlap (Linear Flow Gain)									
				580: *4 580 L/min	4J: A, B, T Connection (Neutral) 2L: 2, 40, 2P									
				900: 900 L/min 1300: 1300 L/min	2L: 2% Overlap (Linear Flow Gain)									
		06		820: *4 820 L/min 1300: 1300 L/min	4J: A, B, T Connection (Connection)				E: External Pilot	T: Internal Drain			W: *2 Without DR Port (Wet Type Pilot Valve)	None: With Solenoid Operated Valve P→A→B→T Position Valve Opening: 10% EB: With Solenoid Operated Valve P→B→A→T Position Valve Opening: 10% EC: With Solenoid Operated Valve Neutral Position

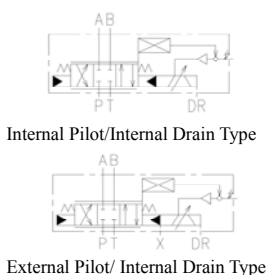
- *1. The available combinations of the spool type, fail-safe function, and input signal/spool travel monitoring are limited. For details, refer to the table at right.
- *2. The valves with the model number “W” (without DR port) cannot use water-glycol fluids.
- *3. For the valves with the fail-safe function “EC,” select “2” only for the connector type.
- *4. For the spool type “4J,” the rated flow is a value obtained with +100% signal input and P → A flow (for the spool travel monitoring types “A,” “B,” and “C”) or P → B flow (for “D,” “E,” and “F”)
- *5. The shaded area () indicates the newly added models.

Spool Type	Fail-safe Function	Input Signal/Spool Travel Monitoring	
2 40	With Solenoid Operated Valve: EC	All (A, B, C, D, E, F)	
	Without Solenoid Operated Valve: None/A		
2L 2P	With Solenoid Operated Valve: EA/EB		
	Without Solenoid Operated Valve: None/A		
4J	With Solenoid Operated Valve: EC		D, E, F
	Without Solenoid Operated Valve: None		A, B, C
	Without Solenoid Operated Valve: A		

The characteristics of the new models are described on page 2 and subsequent pages. For information not covered by this publication, refer to the catalogue (Pub. EC-0612) or the relevant installation drawings.

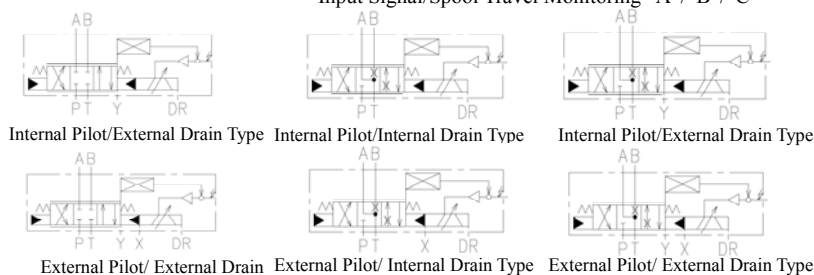
[Graphic Symbols]

- Spool Type "2L"

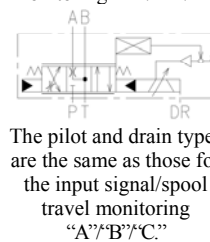


- Spool Type "4J"

Input Signal/Spool Travel Monitoring "A"/"B"/"C"

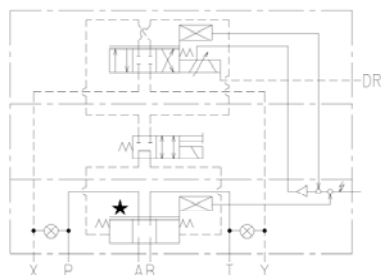


Input Signal/Spool Travel Monitoring "D"/"E"/"F"

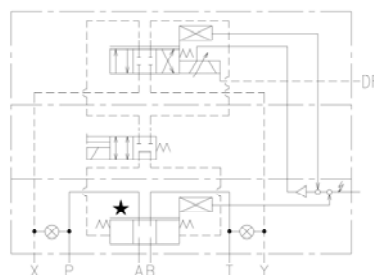


- Detailed Graphic Symbols (With Fail-safe Solenoid Operated Valve)

LSVHG-03/04EH-*-*EA/*EB/*EC



LSVHG-06EH-*-*EA/*EB/*EC



⊗: Plugs for selecting the pilot and drain types
★: Depending on the spool type.
(Same as the graphic symbols shown above)

- Fail-safe Function of the Valves

With reference to the information given below, select the option for the fail-safe function according to the use of applications. The valves have a fail-safe function, but a separate safety circuit should be provided if the hydraulic actuator must be reliably held or stopped to ensure safety in the event of electric failure (power failure, power cable disconnection, etc.) or upon startup.

1) Electric System: OFF and Hydraulic System: ON (Power Failure/Power Cable Disconnection)

No.	Model Number	Fail-safe Function ★
1	(F-)LSVHG-**EH-*-2L(-E)(T)(-W)	P→B→A→T Position Valve Opening: Full
2	(F-)LSVHG-**EH-*-2L(-E)(T)(-W)A	P→A→B→T Position Valve Opening: Full
3	(F-)LSVHG-**EH-*-4J(-E)(T)(-W)	P→B→A→T Position Valve Opening: Full
4	(F-)LSVHG-**EH-*-4J(-E)(T)(-W)A	P→A→B→T Position Valve Opening: Full
5	(F-)LSVHG-**EH-*-2L(-E)(T)(-W)EA (With Fail-safe Solenoid Operated Valve)	P→A→B→T Position Valve Opening: 10%
6	(F-)LSVHG-**EH-*-2L(-E)(T)(-W)EB (With Fail-safe Solenoid Operated Valve)	P→B→A→T Position Valve Opening: 10%
7	(F-)LSVHG-**EH-*-4J(-E)(T)(-W)EC-A*/B*/C* (With Fail-safe Solenoid Operated Valve)	A, B, T Connection (Neutral)
8	(F-)LSVHG-**EH-*-4J(-E)(T)(-W)EC-D*/E*/F* (With Fail-safe Solenoid Operated Valve)	A, B, T Connection (Neutral)

★ The fail-safe activation time depends on the electric and hydraulic conditions.

2) Electric System: OFF and Hydraulic System: OFF (Startup)

For Models No. 1 and 2 in the table above, the fail-safe function holds the spool at its neutral position. For Models No. 5 and 6, the function is the same as that for "Electric System: OFF and Hydraulic System: ON." For Models No. 3, 4, 7, and 8, the function is based on with A, B, T connection (neutral).

[Specifications]

- Spool Type “2L” A value in parentheses () in the specification table below is applicable to the models of LSVG-*EH*-2L-W* (without DR port).

Item		Model Number	LSVHG-04EH-750-2L	LSVHG-06EH-900-2L	LSVHG-06EH-1300-2L
Spool Type		2L: 2% Overlap (Linear Flow Gain)			
Rated Flow (±10%)	At ΔP = 7 MPa (4-Way Valve)	750 L/min	900 L/min	1300 L/min	
	At ΔP = 0.5 MPa (per Land)	283 L/min	340 L/min	490 L/min	
Max. Operating Pres.		35 MPa			31.5 MPa
Proof Pres. at Return Port ⁽¹⁾	External Drain	T Port	31.5 MPa	35 MPa	25 MPa
		Y Port	21 (7) MPa		
	Internal Drain	T & Y Port	21 (7) MPa		
DR Port Permissible Back Pres. ⁽²⁾		0.05 MPa or less (The valves with the model number “W” have no DR port.)			
Pilot Pres. ⁽³⁾		1.5 - 21 MPa			
Pilot Flow Rate ⁽⁴⁾		20 (17) L/min or more	22 (19) L/min or more	23 (19) L/min or more	
Internal Leakage Pres.: P _s = 14 MPa P _p = 14 MPa Viscosity: 32 mm ² /s	Pilot Valve	1.2 L/min or less			
	Main Valve	2.1 L/min or less	2.5 L/min or less		
Hysteresis		0.1% or less			
Step Response (0↔100%) P _p = 14 MPa (Typical) ⁽⁵⁾		11 (13)			15 (18)
Frequency Response (±25% Amplitude) P _p = 14 MPa (Typical) ⁽⁵⁾		Gain = -3 dB: 100 (90) Hz Phase = -90°: 90 (90) Hz			Gain = -3 dB: 75 (70) Hz Phase = -90°: 70 (75) Hz
Vibration Proof ⁽⁶⁾		100 m/s ²			
Protection		Equivalent to IP 65			
Ambient Temperature		0 - +50 °C			
Spool Stroke to Stops		±5 mm			±7 mm
Spool End Area		7 cm ²	8 cm ²		
Polarity		Refer to page 23 of the catalogue for high-speed linear servo valves/OBE type linear servo valves (Pub. EC-0612).			
Linear Motor Specification	Current	Max. 2.1 A			
	Coil Resistance at 20 °C	9.6 Ω			
Approx. Mass ⁽⁷⁾		14 kg [16 kg]	20 kg [24 kg]		
Electric Connection		6 + PE or 11 + PE Connector [EN175201 Part 804]			

Note

- ⁽¹⁾ Pressure at the return port should be the actual supply pressure or less.
⁽²⁾ Back pressure at the DR port should be 0.05 MPa or less and not be a negative pressure.
⁽³⁾ Supply pressure for the pilot valve should be 1.5 - 21 MPa and should also be 60% of the actual supply pressure or more.
⁽⁴⁾ The pilot flow is calculated based on a pilot pressure of 14 MPa and the above step response.
⁽⁵⁾ This value is measured for each valve based on a pilot pressure of 14 MPa; it may differ depending on the actual circuit/operation conditions.
⁽⁶⁾ There are restrictions on the mounting position; refer to page 1 of the catalogue for high-speed linear servo valves/OBE type linear servo valves (Pub. EC-0612).
⁽⁷⁾ A value in brackets [] indicates the mass of a valve with a fail-safe solenoid operated valve.

● Spool Type “4J”

A value in parentheses () in the specification table below is applicable to the models of LSVG-*EH-*-2L-W* (without DR port).

Model Number		LSVHG-03EH-210 -4J-*-A*/B*/C*	LSVHG-04EH-580 -4J-*-A*/B*/C*	LSVHG-06EH-820 -4J-*-A*/B*/C*	LSVHG-06EH-1300 -4J-*-A*/B*/C*	
Item						
Spool Type		4J: A, B, T Connection (Neutral) P→B Flow: 10% Overlap, A→Flow: 50% Underlap P→A Flow: 60% Overlap, B→T Flow: 5% Underlap				
Rated Flow (±10%)	At ΔP = 3.5 MPa (per Land)	P→B Flow: 210 L/min A→T Flow: 235 L/min P→A Flow: 95 L/min B→T Flow: 240 L/min	P→B Flow: 580 L/min A→T Flow: 675 L/min P→A Flow: 255 L/min B→T Flow: 660 L/min	P→B Flow: 820 L/min A→T Flow: 950 L/min P→A Flow: 370 L/min B→T Flow: 940 L/min	P→B Flow: 1300 L/min A→T Flow: 1440 L/min P→A Flow: 660 L/min B→T Flow: 1375 L/min	
	At ΔP = 0.5 MPa (per Land)	P→B Flow: 79 L/min A→T Flow: 89 L/min P→A Flow: 36 L/min B→T Flow: 91 L/min	P→B Flow: 219 L/min A→T Flow: 255 L/min P→A Flow: 96 L/min B→T Flow: 249 L/min	P→B Flow: 310 L/min A→T Flow: 359 L/min P→A Flow: 140 L/min B→T Flow: 355 L/min	P→B Flow: 491 L/min A→T Flow: 544 L/min P→A Flow: 249 L/min B→T Flow: 520 L/min	
Max. Operating Pres.		31.5 MPa	35 MPa	35 MPa	31.5 MPa	
Proof Pres. at Return Port (1)	External Drain	T Port	21 MPa	31.5 MPa	35 MPa	25 MPa
		Y Port	21 (7) MPa			
	Internal Drain	T & Y Port	21 (7) MPa			
DR Port Permissible Back Pres. (2)		0.05 MPa or less (The valves with the model number “W” have no DR port.)				
Pilot Pres. (3)		1.5 - 21 MPa				
Pilot Flow (4)		9 (8) L/min or more	20 (17) L/min or more	22 (19) L/min or more	23 (19) L/min or more	
Internal Leakage Pres.: Ps = 14 MPa Pp = 14 MPa Viscosity: 32 mm ² /s	Pilot Valve	0.8 L/min or less	1.2 L/min or less	1.2 L/min or less		
	Main Valve	0.7 L/min or less	1.1 L/min or less	1.2 L/min or less		
Hysteresis		0.1% or less				
Step Response (0 ↔ 100%) Pp = 14 MPa (Typical) (5)		7 (9) ms	11 (13) ms	11 (13) ms	15 (18) ms	
Frequency Response (±25% Amplitude) Pp = 14 MPa (Typical) (6)		Gain = -3 dB: 125 (110) Hz Phase = -90°: 110 (100) Hz	Gain = -3 dB: 100 (90) Hz Phase = -90°: 90 (90) Hz	Gain = -3 dB: 100 (90) Hz Phase = -90°: 90 (90) Hz	Gain = -3 dB: 75 (70) Hz Phase = -90°: 70 (75) Hz	
Vibration Proof (6)		100 m/s ²				
Protection		Equivalent to IP 65				
Ambient Temperature		0 - +50 °C				
Spool Stroke to Stops		±3.5 mm	±5 mm	±5 mm	±7 mm	
Spool End Area		3 cm ²	7 cm ²	8 cm ²	8 cm ²	
Polarity		Refer to page 23 of the catalogue for high-speed linear servo valves/OBE type linear servo valves (Pub. EC-0612).				
Linear Motor Specification	Current	Max. 2.1 A				
	Coil Resistance (at 20 °C)	9.6 Ω				
Approx. Mass (7)		8.5 kg [11 kg]	14 kg [16 kg]	20 kg [24 kg]		
Electric Connection		6 + PE or 11 + PE Connector [EN175201 Part 804]				

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Model Number		LSVHG-03EH-210 -4J-*-D*/E*/F*	LSVHG-04EH-580 -4J-*-D*/E*/F*	LSVHG-06EH-820 -4J-*-D*/E*/F*	LSVHG-06EH-1300 -4J-*-D*/E*/F*	
Item		4J: A, B, T Connection (Neutral) P→A Flow: 10% Overlap, B→T Flow: 50% Underlap P→B Flow: 60% Overlap, A→T Flow: 5% Underlap				
Rated Flow (±10%)	At ΔP = 3.5 MPa (per Land)	P→A Flow: 210 L/min B→T Flow: 235 L/min P→B Flow: 95 L/min A→T Flow: 240 L/min	P→A Flow: 580 L/min B→T Flow: 675 L/min P→B Flow: 255 L/min A→T Flow: 660 L/min	P→A Flow: 820 L/min B→T Flow: 950 L/min P→B Flow: 370 L/min A→T Flow: 940 L/min	P→A Flow: 1300 L/min B→T Flow: 1440 L/min P→B Flow: 660 L/min A→T Flow: 1375 L/min	
	At ΔP = 0.5 MPa (per Land)	P→A Flow: 79 L/min B→T Flow: 89 L/min P→B Flow: 36 L/min A→T Flow: 91 L/min	P→A Flow: 219 L/min B→T Flow: 255 L/min P→B Flow: 96 L/min A→T Flow: 249 L/min	P→A Flow: 310 L/min B→T Flow: 359 L/min P→B Flow: 140 L/min A→T Flow: 355 L/min	P→A Flow: 491 L/min B→T Flow: 544 L/min P→B Flow: 249 L/min A→T Flow: 520 L/min	
Max. Operating Pres.		31.5 MPa	35 MPa	35 MPa	31.5 MPa	
Proof Pres. at Return Port (1)	External Drain	T Port	21 MPa	31.5 MPa	35 MPa	25 MPa
		Y Port	21 (7) MPa			
	Internal Drain	T & Y Port	21 (7) MPa			
DR Port Permissible Back Pres. (2)		0.05 MPa or less (The valves with the model number "W" have no DR port.)				
Pilot Pres. (3)		1.5 - 21 MPa				
Pilot Flow (4)		9 (8) L/min or more	20 (17) L/min or more	22 (19) L/min or more	23 (19) L/min or more	
Internal Leakage Pres.: Ps = 14 MPa Pp = 14 MPa Viscosity: 32 mm ² /s	Pilot Valve	0.8 L/min or less	1.2 L/min or less	1.2 L/min or less		
	Main Valve	0.7 L/min or less	1.1 L/min or less	1.2 L/min or less		
Hysteresis		0.1% or less				
Step response (0 <=> 100%) Pp = 14 MPa (Typical) (5)		7 (9) ms	11 (13) ms	11 (13) ms	15 (18) ms	
Frequency Response (±25% Amplitude) Pp = 14 MPa (Typical) (5)		Gain = -3 dB: 125 (110) Hz Phase = -90°: 110 (100) Hz	Gain = -3 dB: 100 (90) Hz Phase = -90°: 90 (90) Hz	Gain = -3 dB: 100 (90) Hz Phase = -90°: 90 (90) Hz	Gain = -3 dB: 75 (70) Hz Phase = -90°: 70 (75) Hz	
Vibration Proof (6)		100 m/s ²				
Protection		Equivalent to IP 65				
Ambient Temperature		0 - +50 °C				
Spool Stroke to Stops		±3.5 mm	±5 mm	±5 mm	±7 mm	
Spool End Area		3 cm ²	7 cm ²	8 cm ²	8 cm ²	
Polarity		Refer to page 23 of the catalogue for high-speed linear servo valves/OBE type linear servo valves (Pub. EC-0612).				
Linear Motor Specification	Current	Max. 2.1 A				
	Coil Resistance at 20 °C	9.6 Ω				
Approx. Mass (7)		8.5 kg [11 kg]	14 kg [16 kg]	20 kg [24 kg]		
Electric Connection		6 + PE or 11 + PE Connector [EN175201 Part 804]				

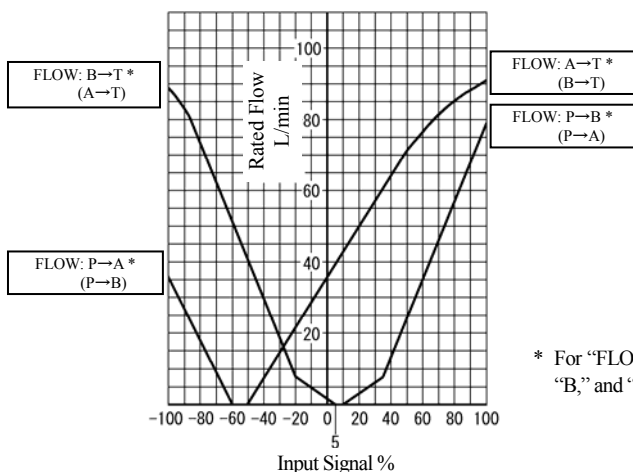
Note

- (1) Pressure at the return port should be the actual supply pressure or less (for the operation of the external pilot type with the size "03" at 21 MPa or more, the pressure at the T/Y port should be 7 MPa or less).
- (2) Back pressure at the DR port should be 0.05 MPa or less and not be a negative pressure.
- (3) Supply pressure for the pilot valve should be 1.5 - 21 MPa and should also be 60% of the actual supply pressure or more.
- (4) The pilot flow is calculated based on a pilot pressure of 14 MPa and the above step response.
- (5) This value is measured for each valve based on a pilot pressure of 14 MPa; it may differ depending on the actual circuit/operation conditions.
- (6) There are restrictions on the mounting position; refer to page 1 of the catalogue for high-speed linear servo valves/OBE type linear servo valves (Pub. EC-0612).
- (7) A value in brackets [] indicates the mass of a valve with a fail-safe solenoid operated valve.

Characteristics of LSVHG-03EH-210-4J (Fluid Viscosity 30 mm²/s)

■ No-Load Flow Characteristics

<Conditions> Valve Pressure Difference: $\Delta P = 0.5$ MPa (per Land)

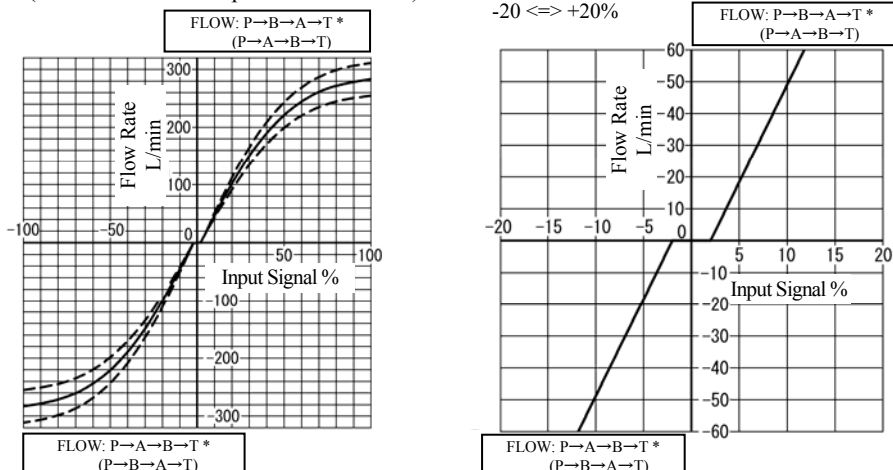


* For "FLOW," the symbol outside parentheses represents the input signal type "A," "B," and "C"; the symbol in parentheses represents "D," "E," and "F."

Characteristics of LSVHG-04EH-750-2L (Fluid Viscosity 30 mm²/s)

■ No-Load Flow Characteristics

<Conditions> Valve Pressure Difference: $\Delta P = 1$ MPa (4-Way Valve)
(Pressure Difference per Land: 0.5 MPa)



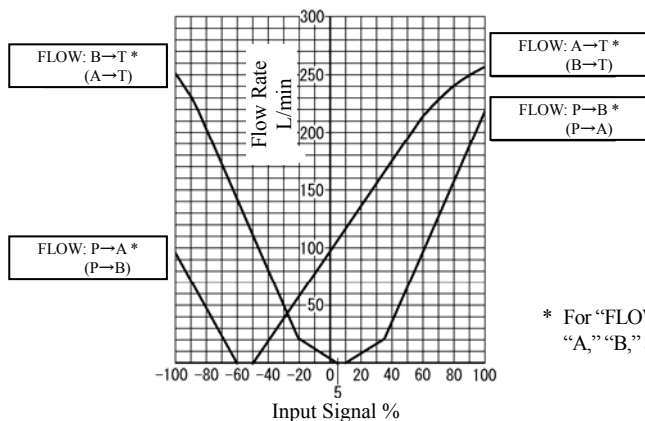
The load flow characteristics, step response, and frequency response are the same as those of the existing standard models.

* For "FLOW," the symbol outside parentheses represents the input signal type "A," "B," and "C"; the symbol in parentheses represents "D," "E," and "F."

Characteristics of LSVHG-04EH-580-4J (Fluid Viscosity 30 mm²/s)

■ No-Load Flow Characteristics

<Conditions> Valve Pressure Difference: $\Delta P = 0.5$ MPa (per Land)

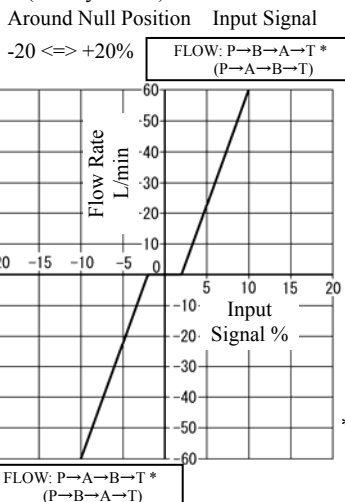
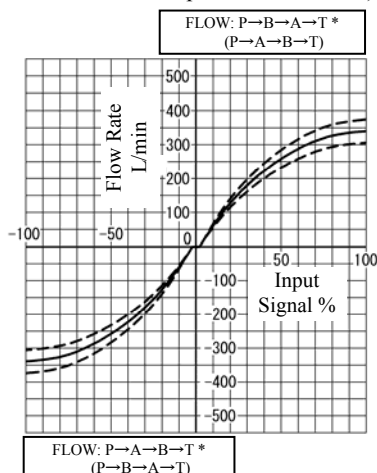


* For "FLOW," the symbol outside parentheses represents the input signal type "A," "B," and "C"; the symbol in parentheses represents "D," "E," and "F."

Characteristics of LSVHG-06EH-900-2L (Fluid Viscosity 30 mm²/s)

No-Load Flow Characteristics

<Conditions> Valve Pressure Difference: $\Delta P = 1$ MPa (4-Way Valve)
(Pressure Difference per Land: 0.5 MPa)



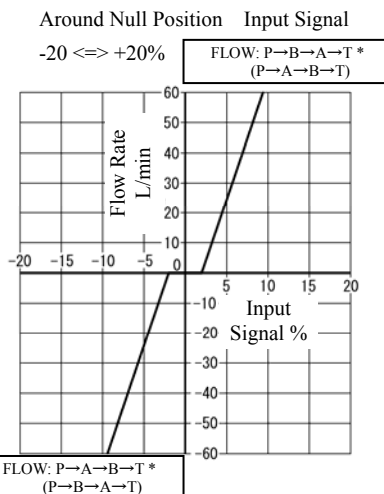
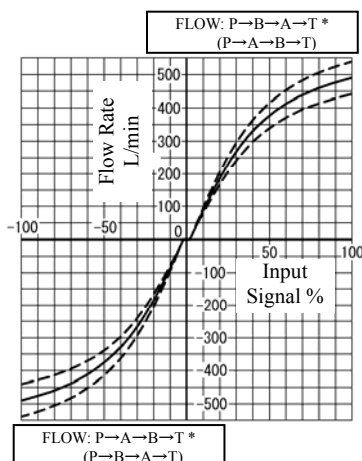
The load flow characteristics, step response, and frequency response are the same as those of the existing standard models.

* For "FLOW," the symbol outside parentheses represents the input signal type "A," "B," and "C"; the symbol in parentheses represents "D," "E," and "F."

Characteristics of LSVHG-06EH-1300-2L (Fluid Viscosity 30 mm²/s)

No-Load Flow Characteristics

<Conditions> Valve Pressure Difference: $\Delta P = 1$ MPa (4-Way Valve)
(Pressure Difference per Land: 0.5 MPa)



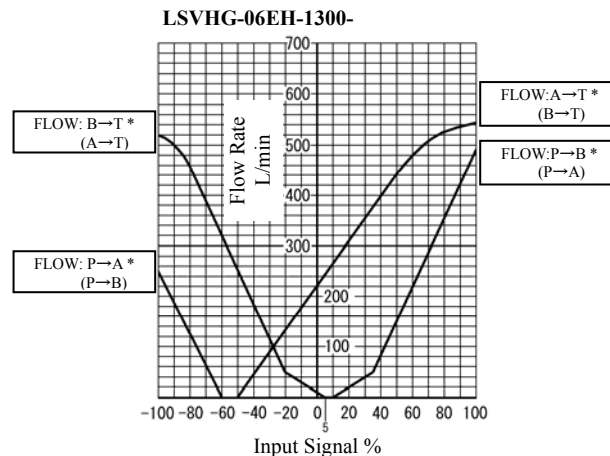
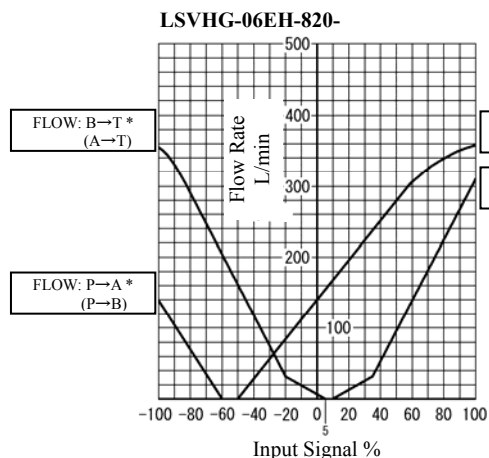
The load flow characteristics, step response, and frequency response are the same as those of the existing standard models.

* For "FLOW," the symbol outside parentheses represents the input signal type "A," "B," and "C"; the symbol in parentheses represents "D," "E," and "F."

Characteristics of LSVHG-06EH-820/1300-4J (Fluid Viscosity 30 mm²/s)

No-Load Flow Characteristics

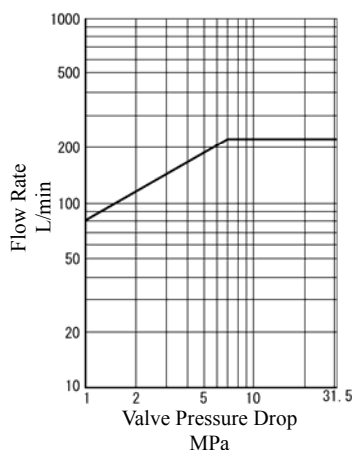
<Conditions> Valve Pressure Difference: $\Delta P = 0.5$ MPa (per Land)



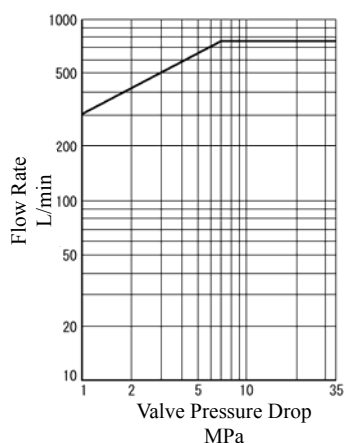
* For "FLOW," the symbol outside parentheses represents the input signal type "A," "B," and "C"; the symbol in parentheses represents "D," "E," and "F."

Effective Range of the Fail-safe Function for OBE (On-Board Electronic) Type Linear Servo Valves

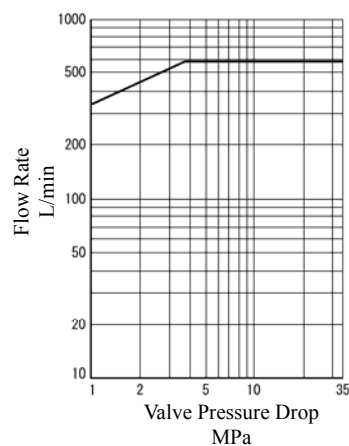
● LSVHG-03EH-210-4J



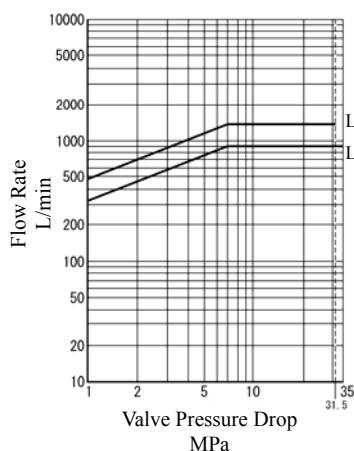
● LSVHG-04EH-750-2L



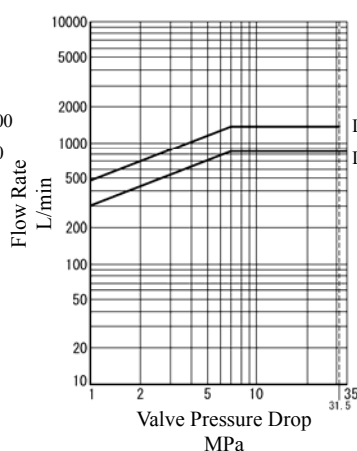
● LSVHG-04EH-580-4J



● LSVHG-06EH-900/1300-2L



● LSVHG-06EH-820/1300-4J



[Application]

Systems requiring high response, including high speed injection moulding machines, various test equipment, and steel mill equipment.

[Sales Material]

Model Number	Installation Drawing	Catalogue (Reference)
(F-)LSVHG-03EH-210-4J-	E251-VA330402-9	Pub. EC-0612 High-Speed Linear Servo Valves/OBE (On-Board Electronic) Type Linear Servo Valves
(F-)LSVHG-04EH-750-2L-	E252-VA330116-5	
(F-)LSVHG-04EH-580-4J-	E252-VA330403-7	
(F-)LSVHG-06EH-900/1300-2L-	E253-VA330117-3	
(F-)LSVHG-06EH-820/1300-4J-	E253-VA330404-5	

[Product Release]

Orders will be accepted from May 2011.

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