

# New Global Standard — YUKEN Linear Servo Valve

The World Fastest & High Accuracy

**Off-board Elec.**

Fastest Servo Valves!

**OBE type**

More user friendly OBE type is now available on sale.

**Fastest!!**  
Step Response  
(0 → 100%)

**2ms**

Direct Servo Valve  
**LSVG-03**

Max. Pressure 35 MPa  
Flow 4-60 L/min



**2 ms**  
**450 Hz**

Direct Servo Valve  
**LSVG-01EH&03**

Max. Pressure 35 MPa  
Flow 4,10,20,40,60 L/min



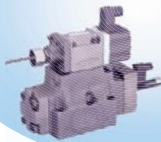
**2 ms**  
**450 Hz**

**NEW**  
**Coming Up**  
**Soon**

**Fastest in**  
**Dual stage**

Dual Stage  
**LSVHG-04&06**

Max. Pressure 35 MPa  
Flow 750-1300 L/min



**8~10 ms**  
**100~110 Hz**

**Linear**  
**Servo**  
**Valves**

Dual Stage  
**LSVHG-03EH**

Max. Pressure 31.5-35 MPa  
Flow 230-1300 L/min



**7~15 ms**  
**70~110 Hz**

**Friendly!**

**Amplifier**

Power Supply DC24V/DC48V  
Input Signal ±10V 4-20mA ±10mA

**AMLS**



Dual Stage  
With E-Stop

**LSVHG-03EH6**

Max. Pressure 31.5-35 MPa  
Flow 230-1300 L/min



**7~15 ms**  
**70~110 Hz**

**NEW**  
**Safety!**

**NEW** Additional Series in Short Future

**Compact !**

Direct *mini*  
**LSVG-00**

Max. Pressure 21 MPa  
Flow 6 L/min



**Greater Flow !**

Dual Stage Large Flow  
**LSVHG-010**

Max. Pressure 35 MPa  
Flow 3800 L/min



**High Durability !**

Dual Stage, Sleeved Spool  
**LSVHG-03EH**

Max. Pressure 31.5-35 MPa  
Flow 230-1300 L/min



## Particularity

### □ High Response

The quickest response time was realized due to compact voice coil type linear motor.

LSVG-03 Direct Type : Step Resp. **2ms** (0-100%). Freq. Resp. **450Hz/-90°** (± 25%)

LSVHG-06 Dual Stage : Step Resp. **8ms** (0-100%). Freq. Resp. **110Hz/-90°** (± 25%)

### □ High Accuracy

Our own Electronics Technology in combination with Closed Loop control realized **hysteresis within 0.1% !!**

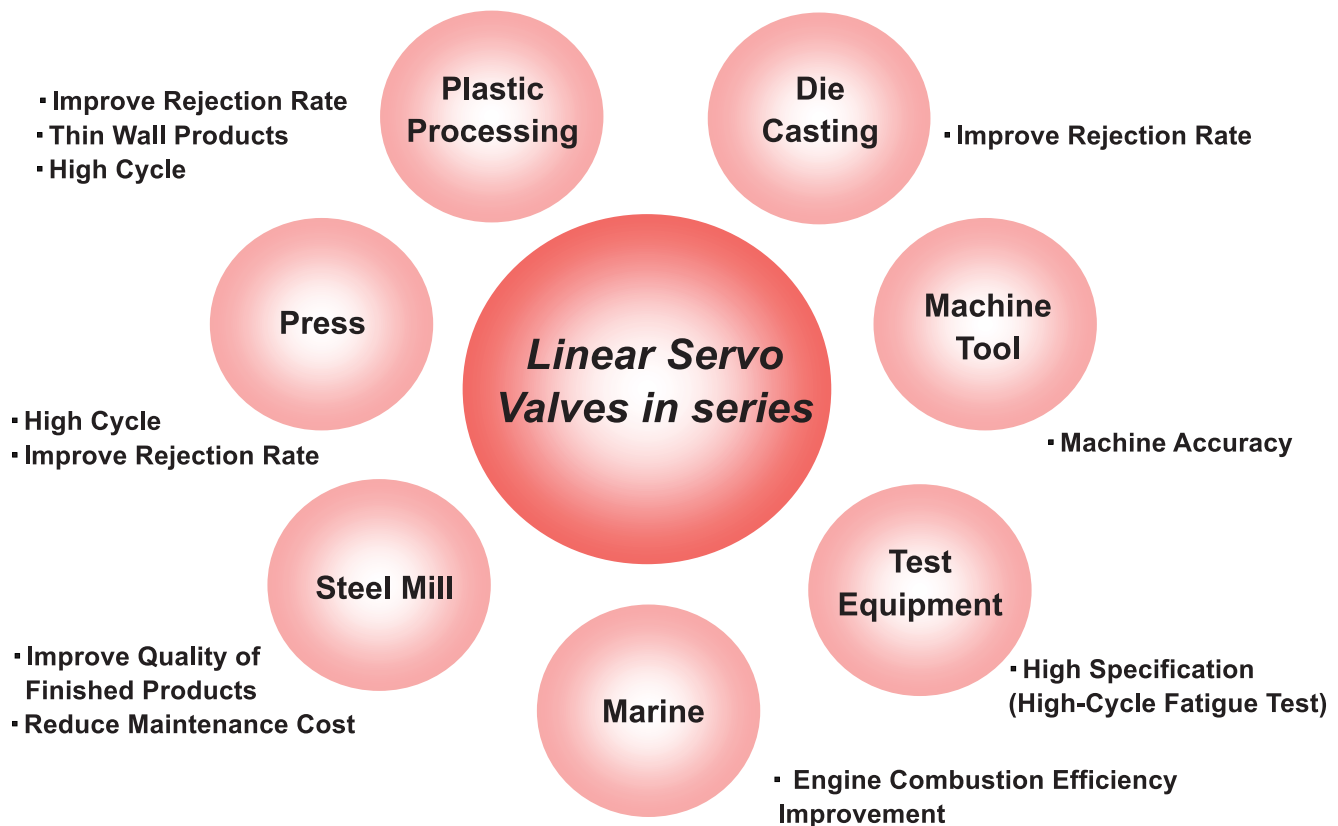
### □ Convenient

In addition to ordinal alarm output, OBE type has LED indicator for visual check and diagnosis at site.

### □ Anti Contamination

Direct Spool Drive construction enabled valve operation with **NAS grade 10 or ISO4406 21/19/16** hydraulic fluid.

## Globalized application for Linear Servo Valves



## 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 Moulding 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

We are now developing Built-in Amplifier type High-Speed Linear Servo Valves.

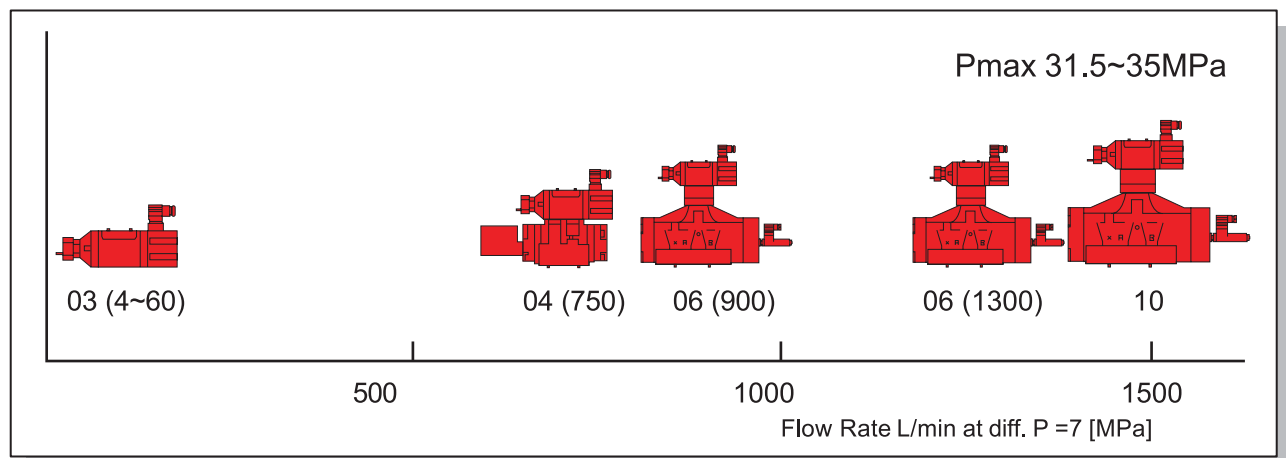
High performance will be obtained effectively to use these new products.

**NEW**



LSVHG-03EH Proto Type

### Line up



## Specifications

		LSVG-03-4/10/20/40	LSVG-03-60
Rated Flow (@diff.P =7 MPa)		4, 10, 20, 40 L/min	60 L/min
Max. Operating Pressure		35 MPa	
Tank Line Back Pressure		35 MPa	
DR Port Permissible Back P.(1)		0.05 MPa	
Internal Leakage (Ps=14 MPa)		less than 1.7 L/min	
Step Response (0-100%) (2)		2 ms (Typical)	3 ms (Typical)
Frequency Response(2) ±25%Amplitude	Gain -3 dB	350 Hz (Typical)	350 Hz (Typical)
	Phase -90°	450 Hz (Typical)	350 Hz (Typical)
Vibration Proof		Frequency:10-60 Hz, Amplitude:4mm, Acceleration:7.8-282m/s <sup>2</sup> Frequency:61-2000Hz, Amplitude:4-0.0038 mm, Acceleration:294m/s <sup>2</sup>	
Degree of Protection		Equivalent to IP64	
Ambient Temperature		from -15 to +60 deg	
Spool Type		Zero-lap at neutral position	
Rated Spool Stroke		±0.5mm	±0.75mm
Linear Motor Specification	Current	2 A (MAX. 6 A)	
	Coil Resistance	4.5 ohm (@20 deg)	
Approx. Mass		5 kg	
Power Amplifier		AMLS-AD48-10	AMLS-B-D48-10

Note (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 depend upon hydraulic circuit of actual machine.

Model Number		LSVHG-04-750	LSVHG-06-900	LSVHG-06-1300	LSVHG-10-1500
Rated Flow (@diff.P=7 MPa)		750 L/min	900 L/min	1300 L/min	1500 L/min
Max. Operating Pressure		35 MPa	35 MPa	31.5 MPa	31.5 MPa
Proof Press.	External Drain	31.5 MPa	35 MPa	25 MPa	21 MPa
	Return Port Internal Drain <sup>(1)</sup>	31.5 MPa	35 MPa	25 MPa	21 MPa
DR Port Permissible Back P.(2)		0.05 MPa			
Pilot Pressure (3)		1.5-35 MPa	1.5-35 MPa	1.5-35 MPa	1.5-25 MPa
Pilot Flow Rate (4)		more than 27 L/min	more than 30 L/min	more than 34 L/min	more than 30 L/min
Internal Drain (Ps=14 MPa, Pp=14 MPa) (5)		Spool Type "2" : less than 5 L/min Spool Type "40" : less than 6.5 L/min Spool Type "2P" : less than 12 L/min			
Step Response (0-100%)		8 ms (Typical)	8 ms (Typical)	10ms (Typical)	8 ms (Typical)
Frequency Response, Phase -90°(±25% Amplitude)		100 Hz (Typical)	100 Hz (Typical)	100 Hz (Typical)	100 Hz (Typical)
Vibration Proof		Frequency:10-60 Hz, Amplitude:4mm, Acceleration:7.8-282m/s <sup>2</sup> Frequency:61-2000Hz, Amplitude:4-0.0038 mm, Acceleration:294m/s <sup>2</sup>			
Degree of Protection		Equivalent to IP64			
Ambient Temperature		from -15 to +60 deg			
Rated Spool Stroke		±5mm	±5mm	±7mm	±5mm
Spool End Area		7.1 cm <sup>2</sup>	8 cm <sup>2</sup>	8 cm <sup>2</sup>	8 cm <sup>2</sup>
Linear Motor Specification	Current	2 A (MAX. 6 A)			
	Coil Resistance	4.5 ohm (@20deg)			
Approx. Mass		12 kg	20 kg	21 kg	54 kg
Power Amplifier		AMLS-C2-D48-10	AMLS-C-D48-10	AMLS-D-D48-10	AMLS-C-D48-10

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 and also not to be vacuum pressure.

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

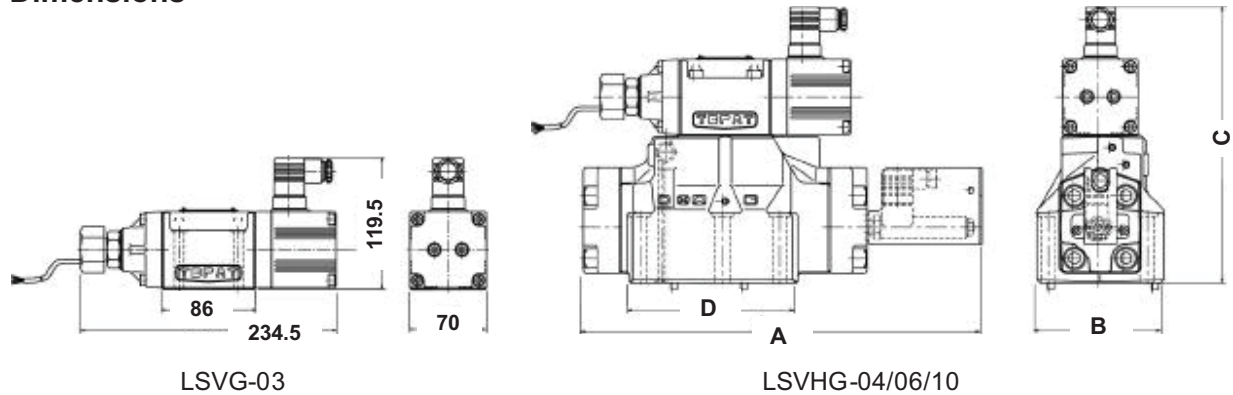
(4) Pilot Flow is calculated based on 14MPa of Pilot Pressure and the above Step response.

(5) Volume of Internal Drain is total volume from main and pilot spools.

## Model Number Designation

	- 06	- 900	- 2P	- E	T	- 10
Series Number	Valve Size	Rated Flow at diff.P=7 MPa	Spool Type at neutral position	Pilot Type	Drain Type	Design Number
LSVHG	04	750:750 L/min	2:Over-lap 	None: Internal Pilot  E: External Pilot	None: External Drain  T: Internal Drain	10
	06	900: 900 L/min 1300:1300 L/min	40:A,B,T Connection 			
	10	1500:1500 L/min	2P:Zero-lap 			
LSVG	03	4:4 L/min 10:10 L/min 20:20 L/min 40:40 L/min 60:60 L/min				10

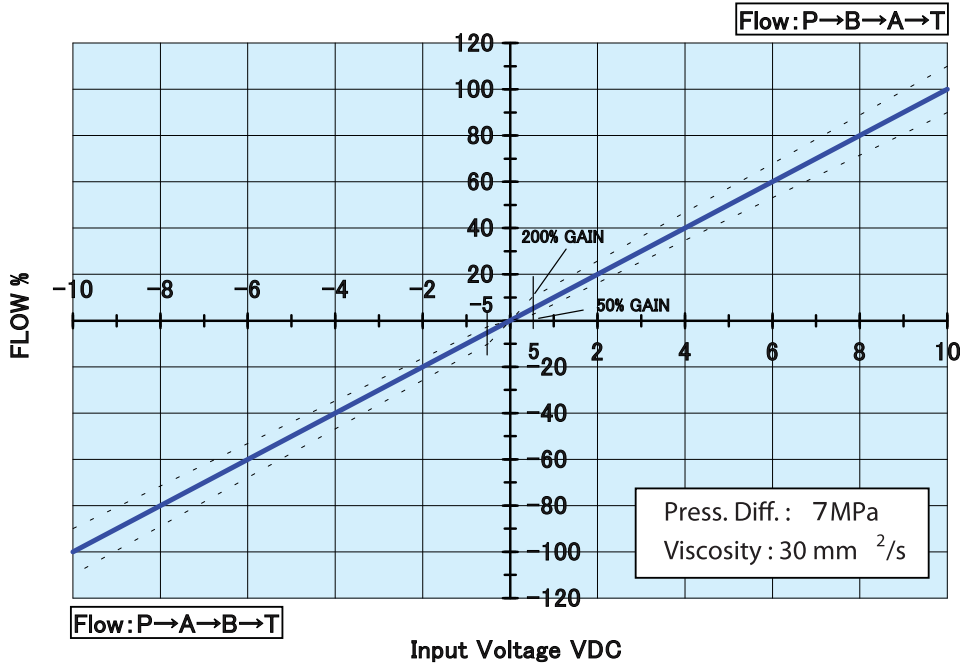
## Dimensions



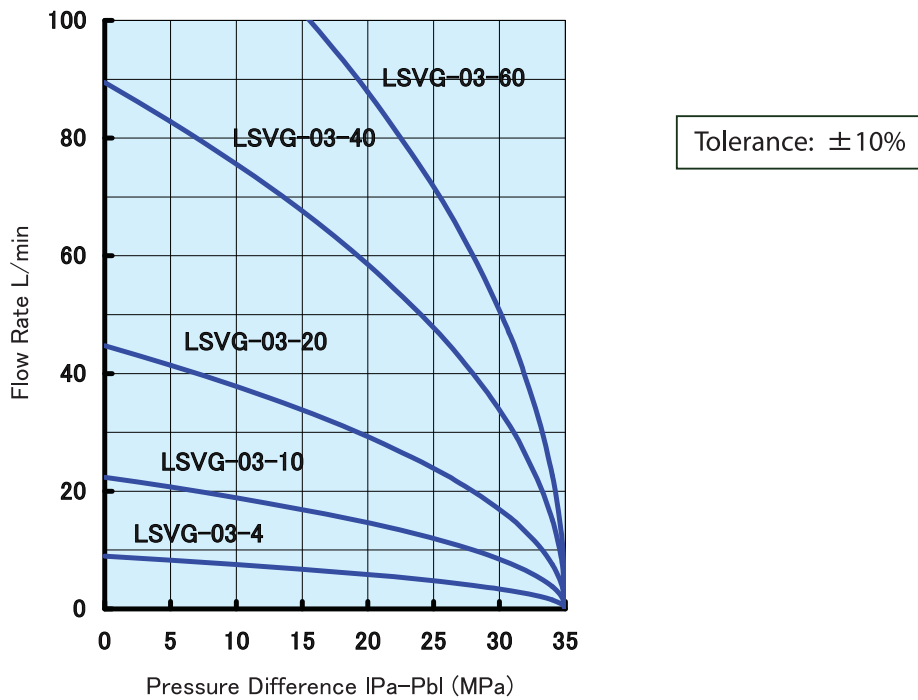
Design Number	Dimensions mm			
	A	B	C	D
LSVHG-04- 750	335	91	230.5	128.4
LSVHG-06- 900	367.5	118	256.5	156
LSVHG-06-1300	371.5	118	256.5	156
LSVHG-10-1500	484.5	198	352.5	233.8

Typical Performance Characteristics  
**LSVG-03-4/10/20/40/60-10**

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



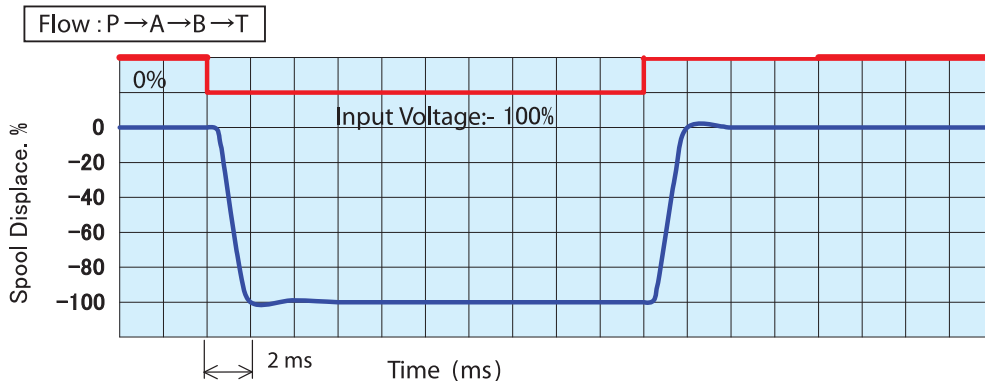
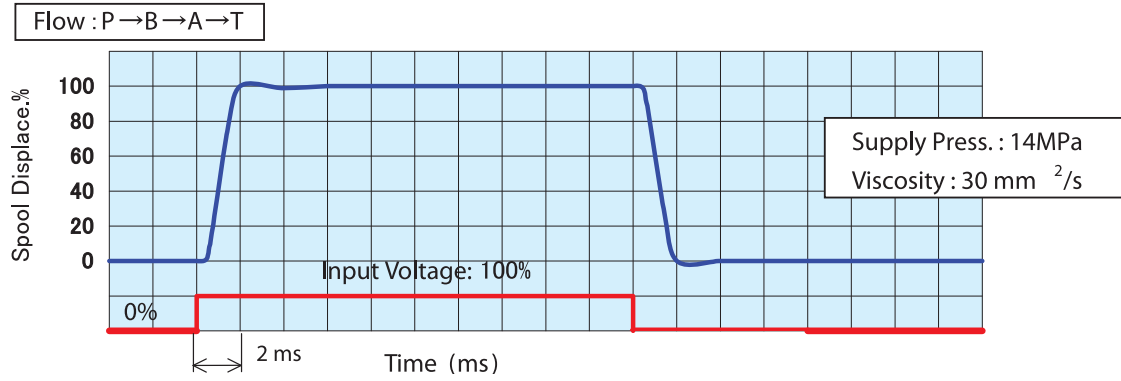
■ **Flow Characteristics, Loaded**



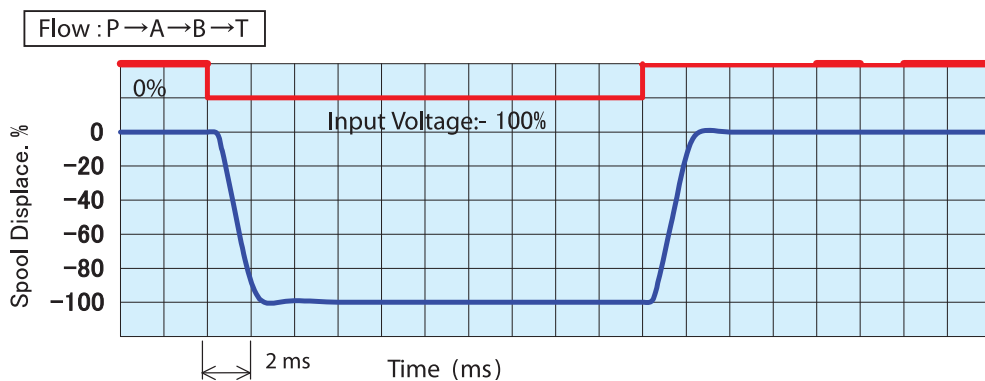
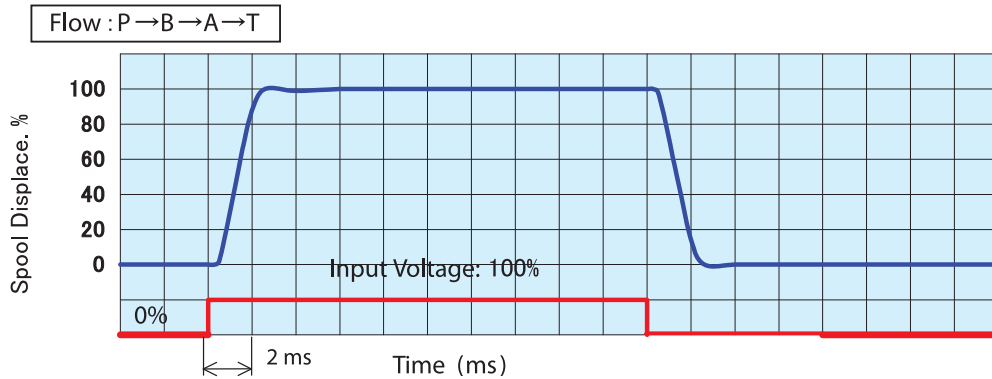
## LSVG-03-4/10/20/40/60-10

### ■ Step Response Characteristics (Spool Displacement %)

#### ● LSVG-03-4/10/20/40-10



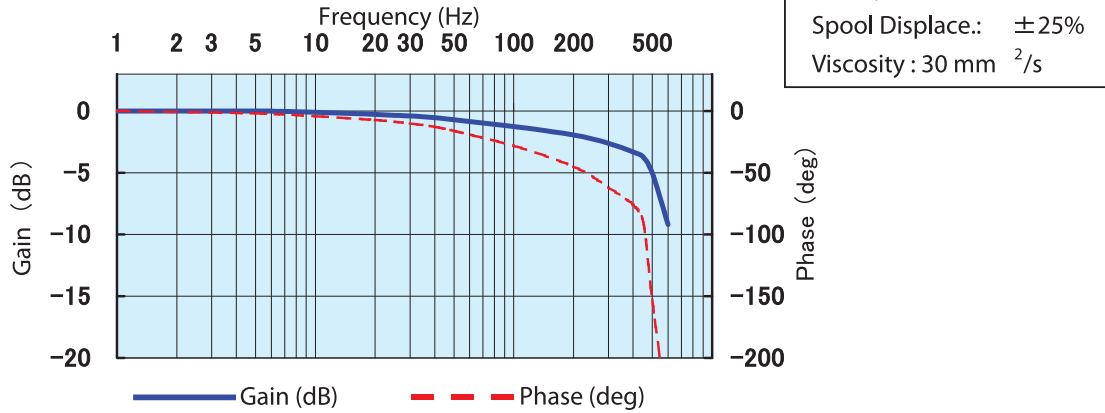
#### ● LSVG-03-60-10



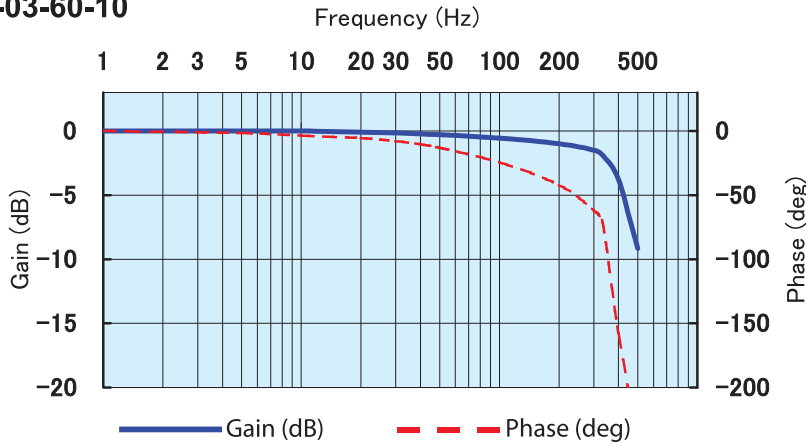
# LSVG-03-4/10/20/40/60-10

## Frequency Response Characteristics

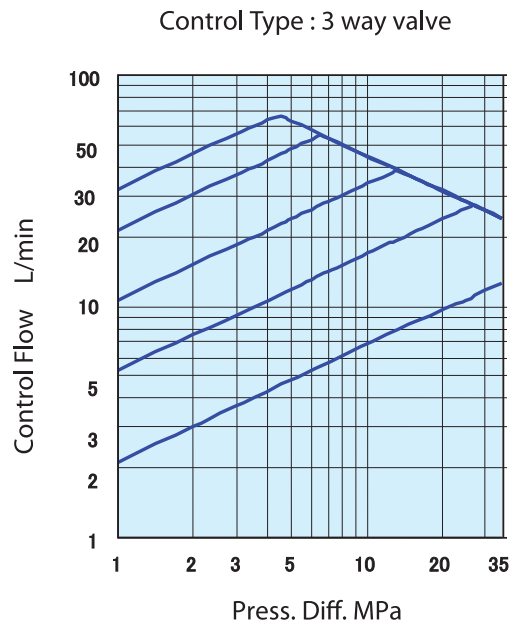
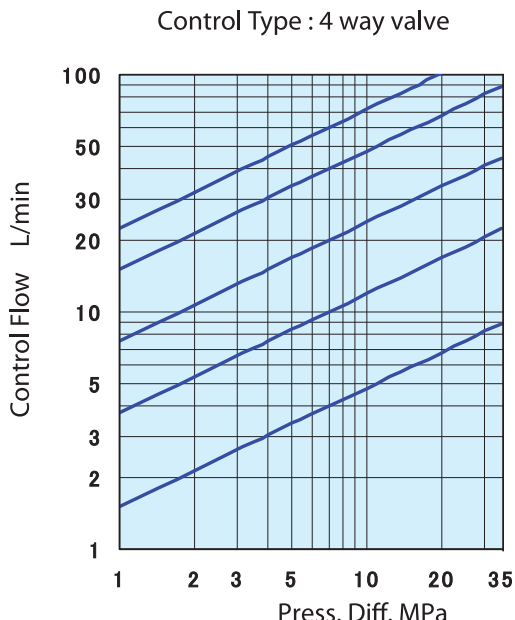
### ●LSVG-03-4/10/20/40-10



### ●LSVG-03-60-10



## Control Flow Range

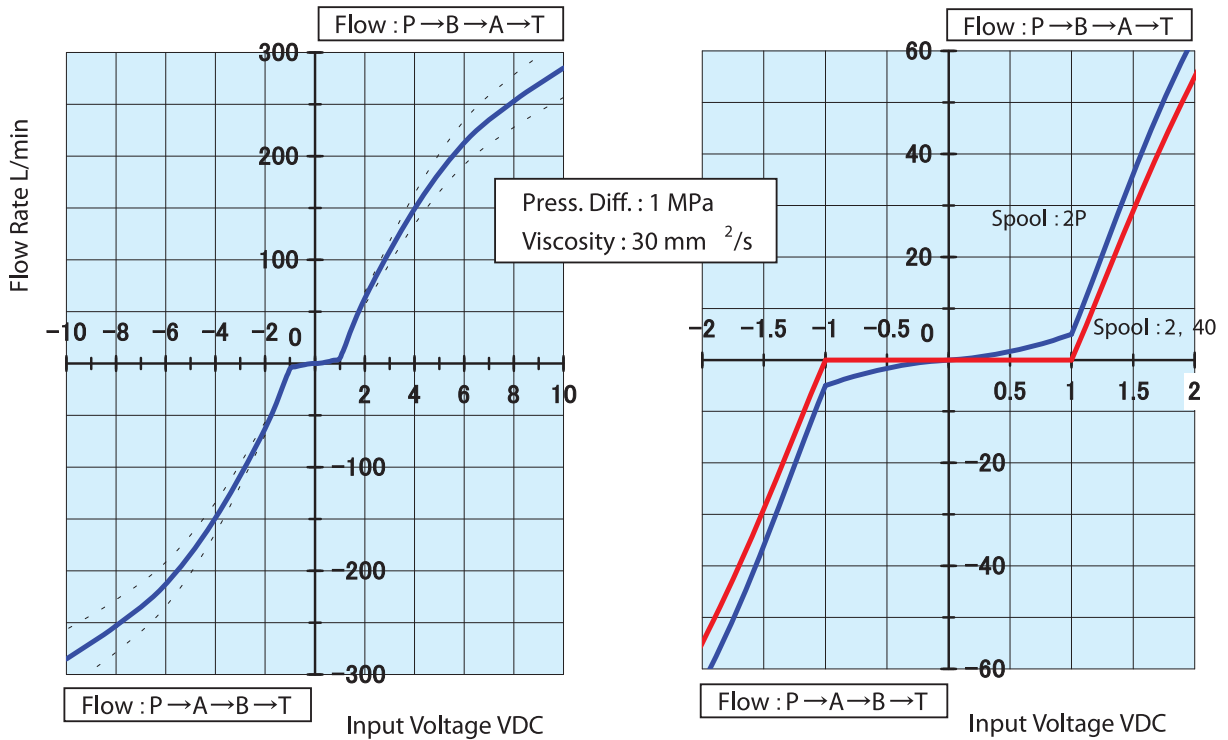




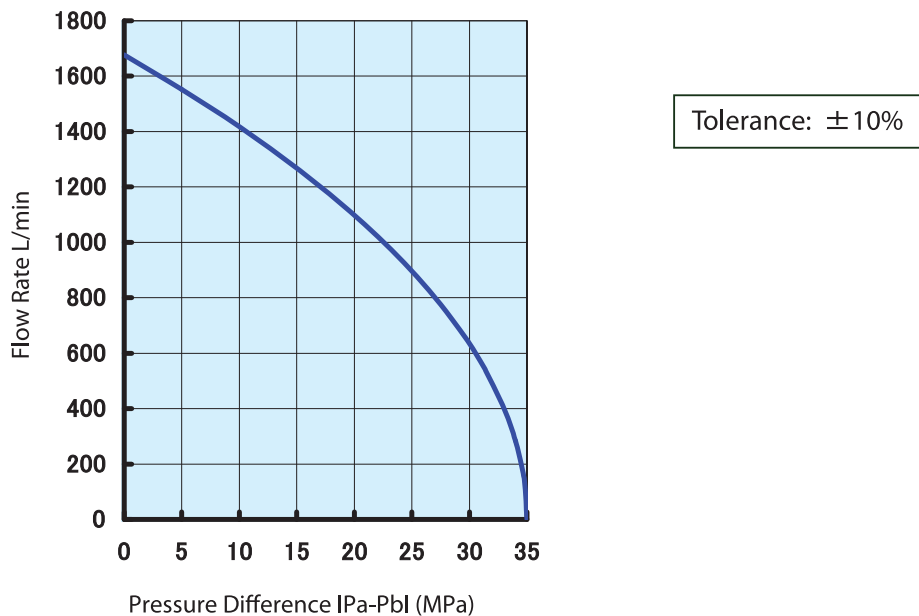
Typical Performance Characteristics

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

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

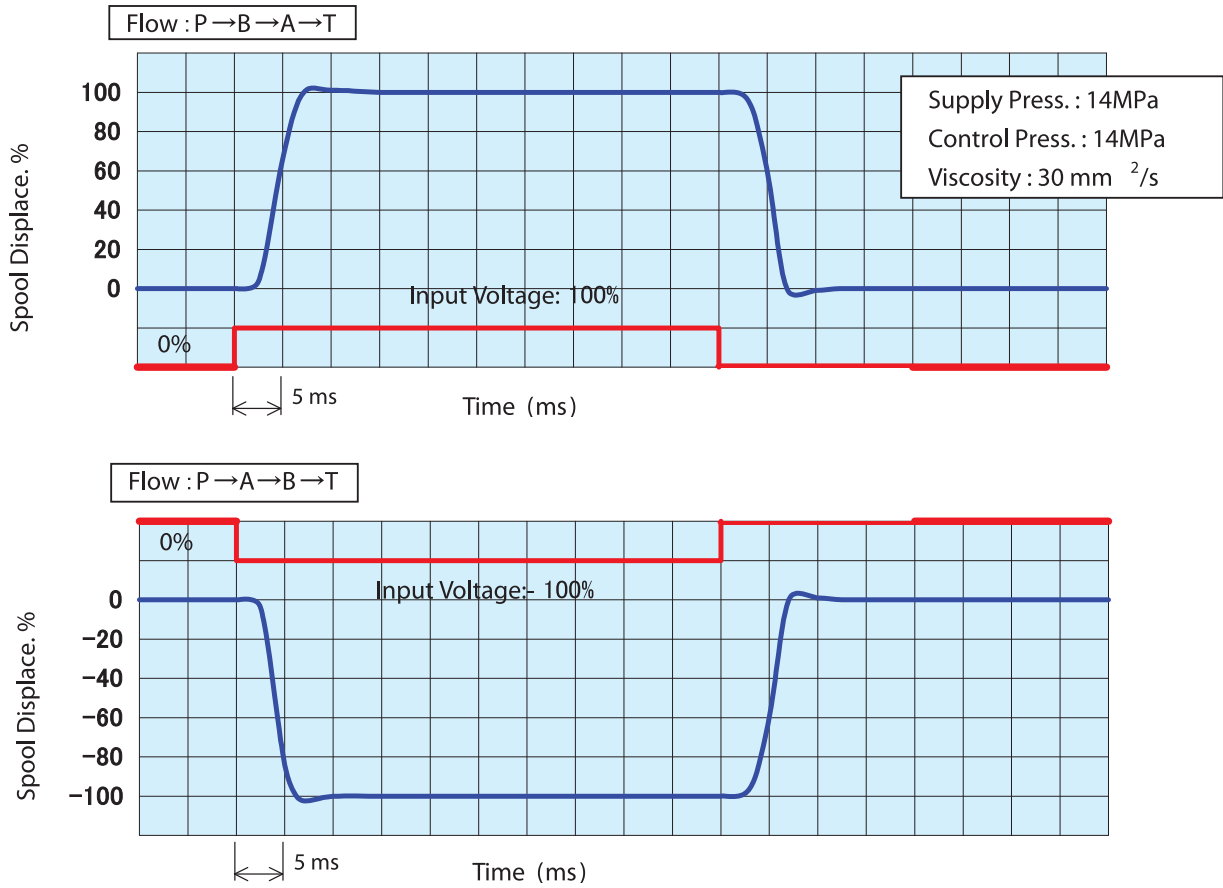


■ **Flow Characteristics, Loaded**

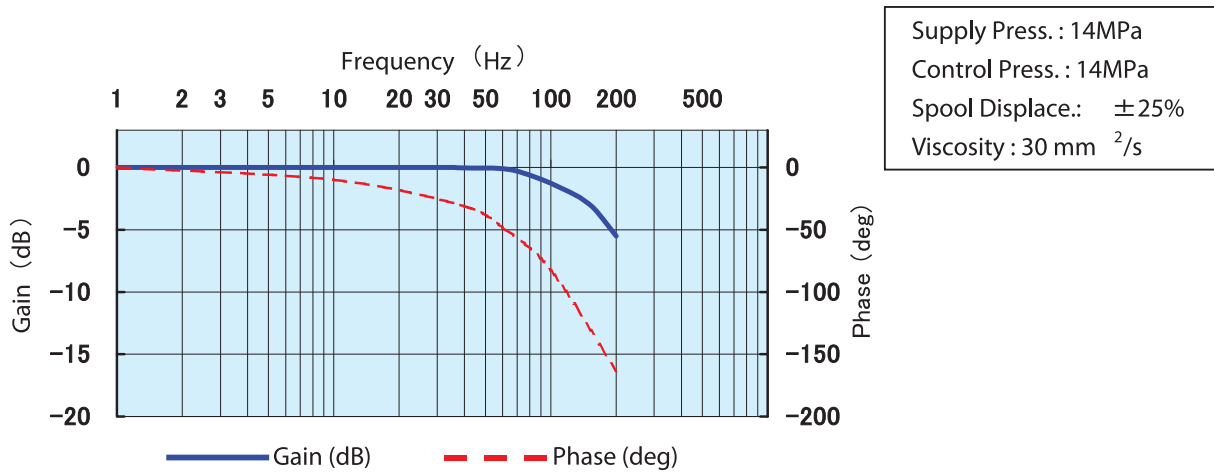


# LSVHG-04-750-(2P)-(E)(T)-10

## Step Response Characteristics (Spool Displacement %)



## Frequency Response Characteristics

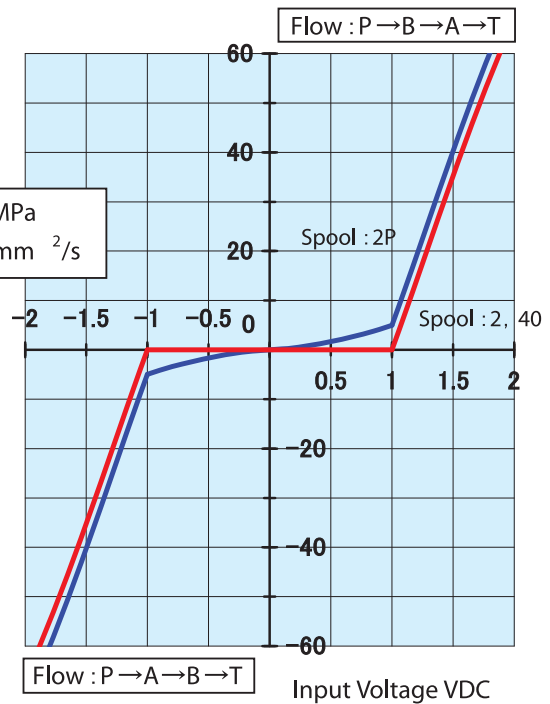
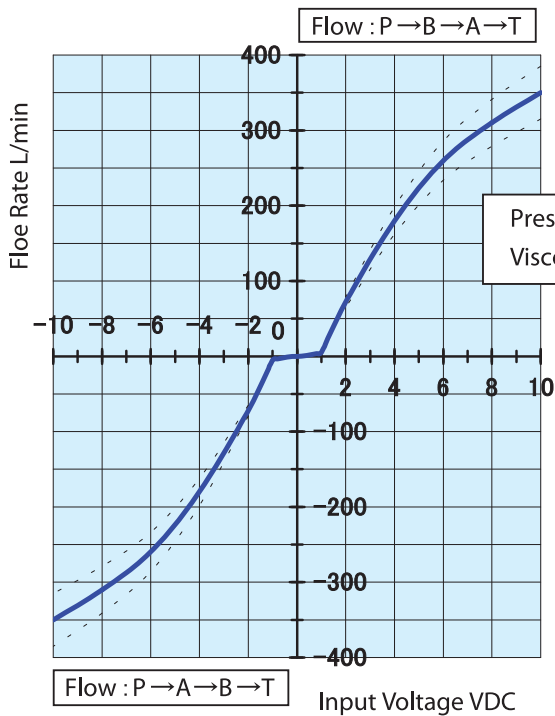


Typical Performance Characteristics

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

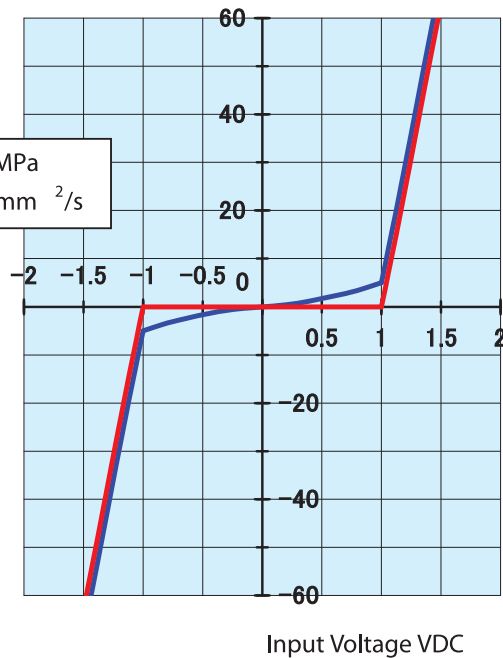
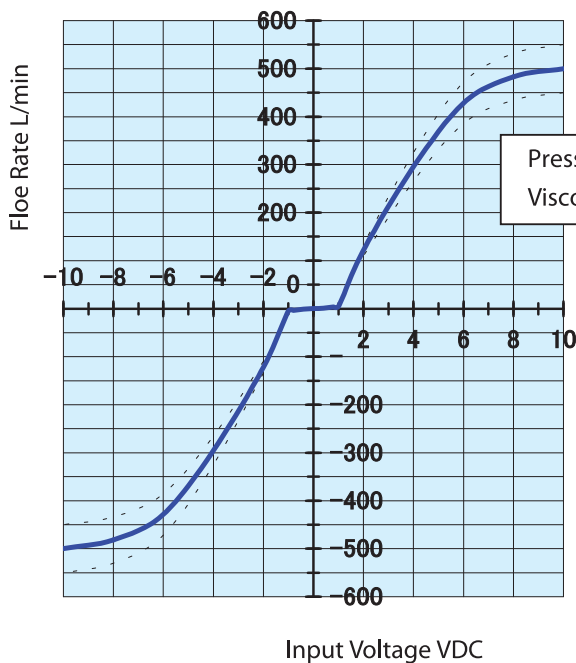
■ **Input Voltage - Flow Characteristics (Flow Gain)**

● **LSVHG-06-900**



Press. Diff. : 1 MPa  
Viscosity : 30 mm<sup>2</sup>/s

● **LSVHG-06-1300**



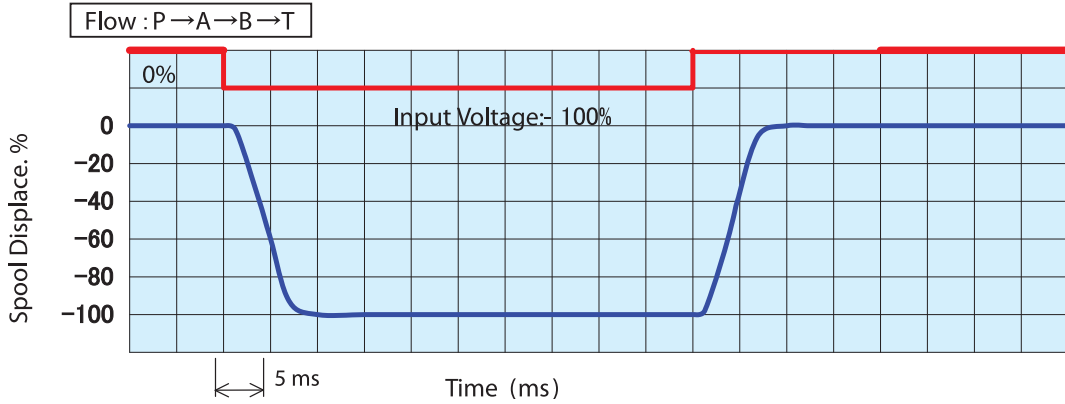
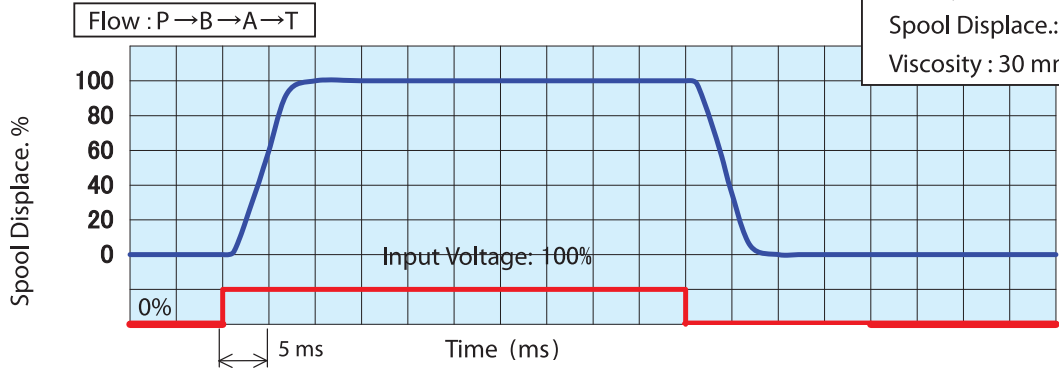
Press. Diff. : 1 MPa  
Viscosity : 30 mm<sup>2</sup>/s

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

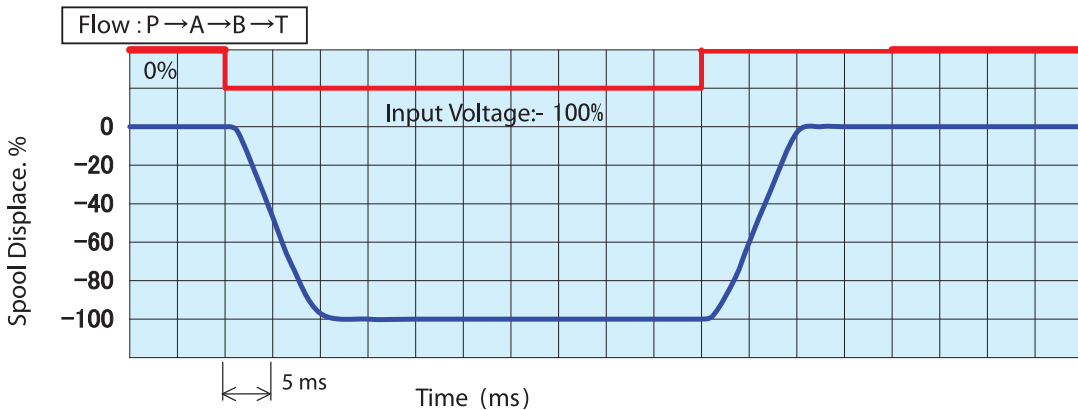
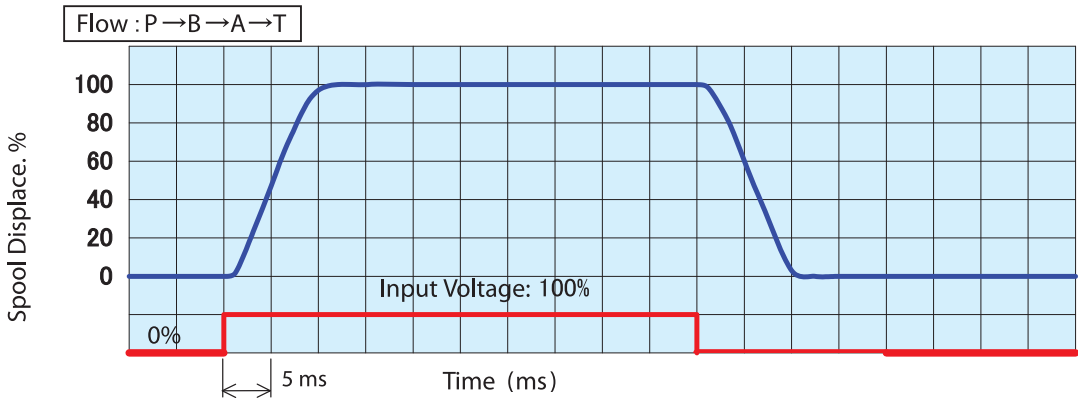
## ■ Step Response Characteristics (Spool Displacement %)

### ● LSVHG-06-900

Supply Press.: 14MPa  
 Spool Displace.: ±25%  
 Viscosity : 30 mm<sup>2</sup>/s



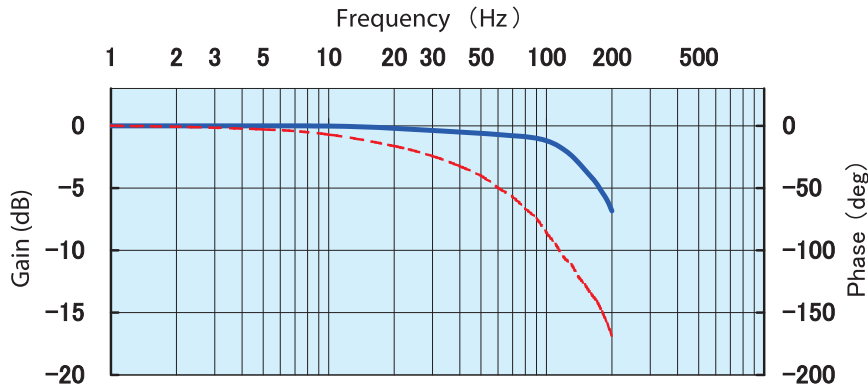
### ● LSVHG-06-1300



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

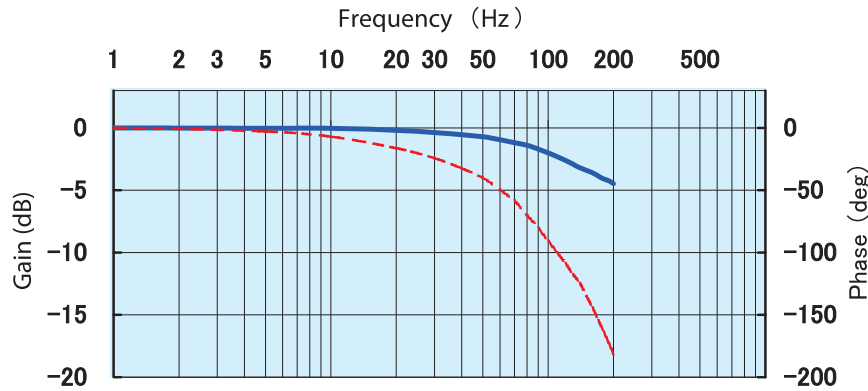
## ■ Frequency Response Characteristics

### ● LSVHG-06-900



Supply Press. : 14MPa  
Spool Displace.: ±25%  
Viscosity : 30 mm<sup>2</sup>/s

### ● LSVHG-06-1300

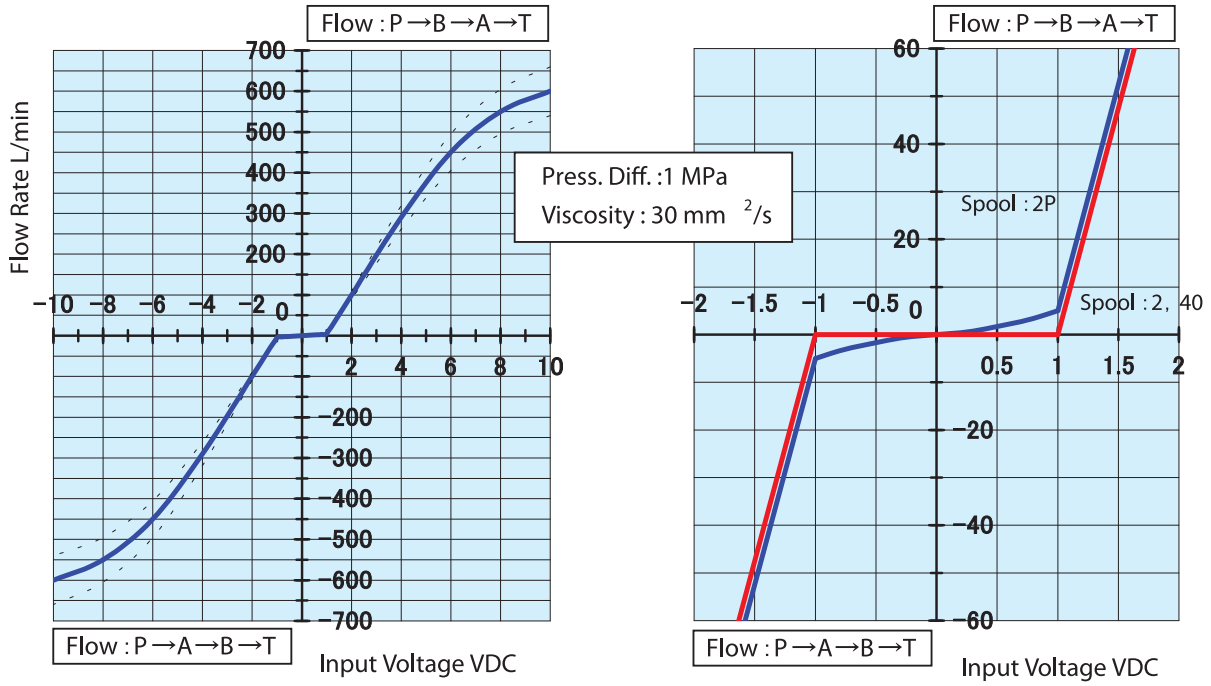


Supply Press. : 14MPa  
Control Press. : 14MPa  
Spool Displace.: ±25%  
Viscosity : 30 mm<sup>2</sup>/s

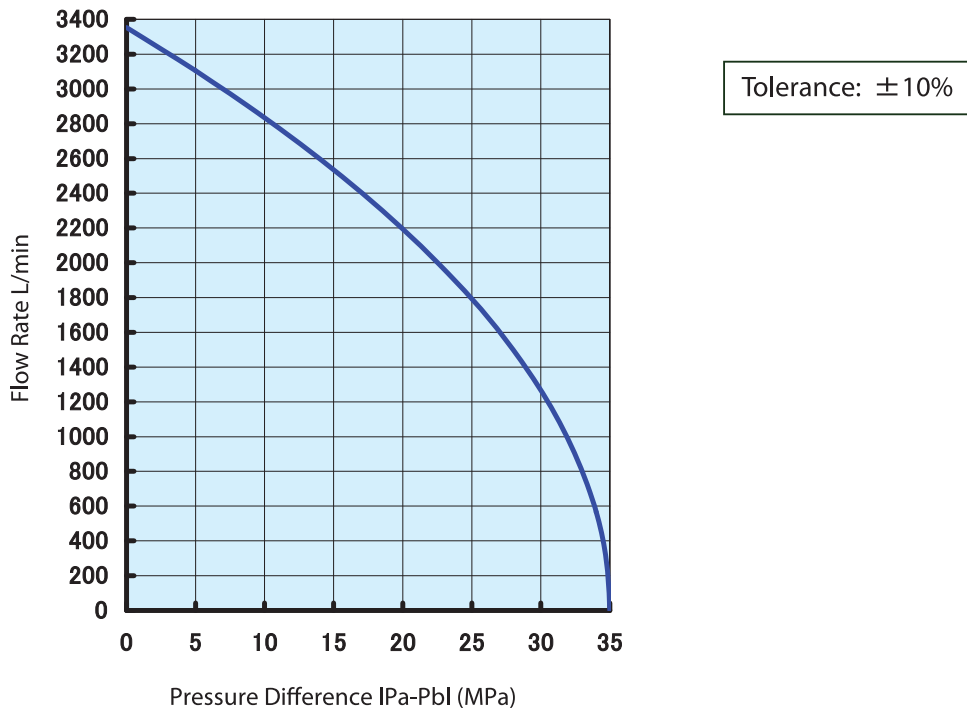
Typical Performance Characteristics

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

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

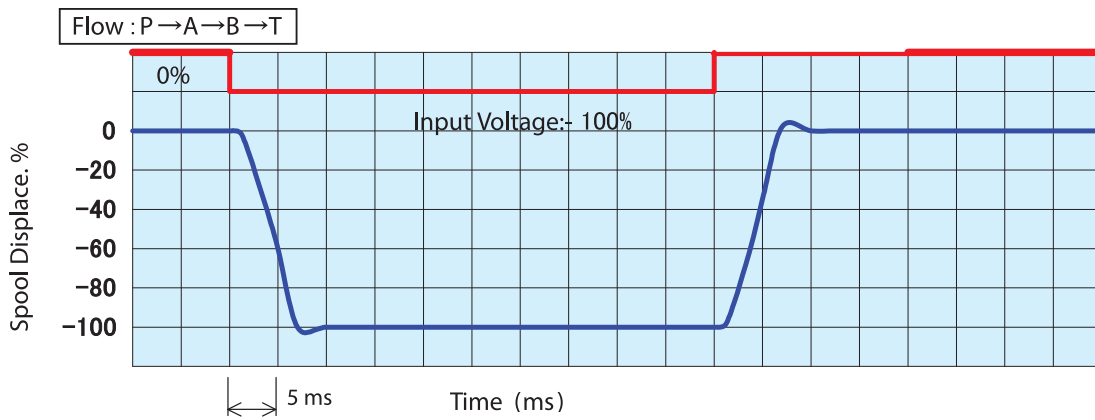
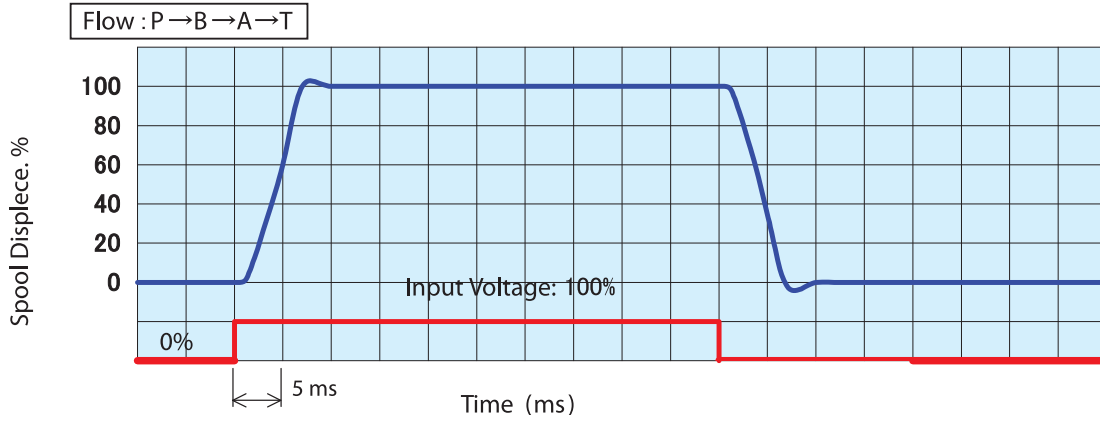


■ **Flow Characteristics, Loaded**

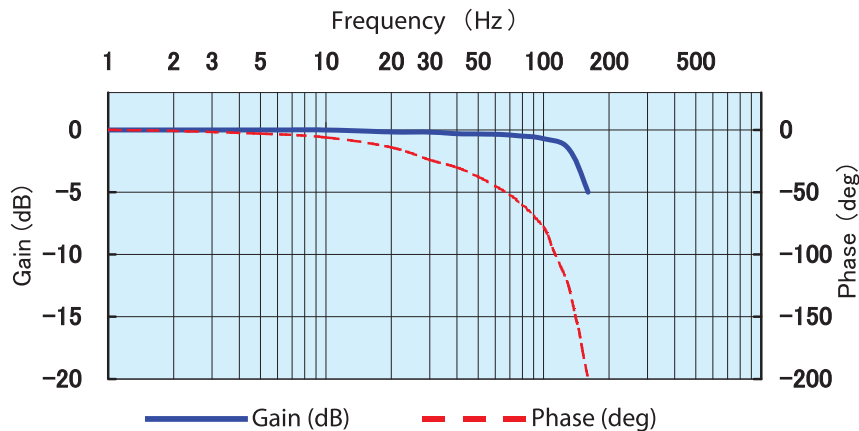


# LSVHG-10-1500-(2P)-(E)(T)-10

## Step Response Characteristics (Spool Displacement %)



## Frequency Response Characteristics



Supply Press. : 14MPa  
 Control Press. : 14MPa  
 Spool Displace.: ±25%  
 Viscosity : 30 mm<sup>2</sup>/s