

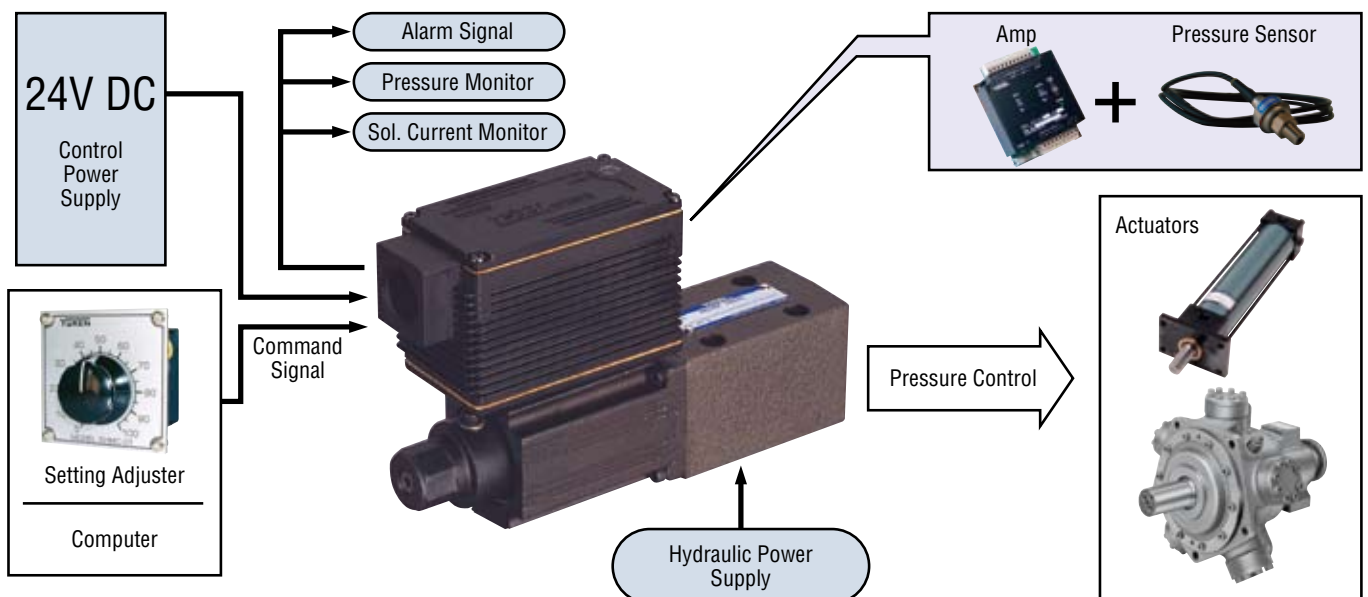
# Proportional Electro-Hydraulic Controls

## **EH** Series Proportional Electro-Hydraulic Control Valves

The EH Series on-board electronic proportional controls are compound electro-hydraulic products which merge the latest electronic and sensor technology with Yuken's reputable E Series proportional controls. Yuken has realized an industry leading position by creating compact hydraulic equipment that features high precision and reliability by unifying the amplifier, and sensor, all of which are required for proportional or servo control systems.



- Proportional control systems or servo systems can be easily structured by simply preparing the power source (DC) for controls and command signals along with the hydraulic source.  
Amplifiers exclusively used for the system or separately installed control panels are unnecessary.
- By using built-in sensors;
  - (1) pressure and orifice openness, which can be converted to flow rate, can be detected and controlled remotely.
  - (2) along with a compound amplifier, a closed loop system can be structured.
  - (3) sensor output signals or deviation signals at structuring closed loop system can be monitored.
- Disadvantages seen in ordinary hydraulic systems in which hydraulic components, sensors and amplifiers are interconnected with each other but installed separately are eliminated.



Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min															
		1	2	3	5	10	20	30	50	100	200	300	500	1000			
Pilot Relief Valves	24.5	EHDG-01															
Pressure Control Valves	SB1110 : 24.5 SB1190 : 7.0								SB1110	SB1190							
Relief Valves	24.5	EHBG									03	06	10				
Reducing & Relieving Valves	24.5	EHRBG										06	10				
Flow Control (& Check) Valves	03 : 20.6 06 : 24.5	EHFG/EHFCG										03	06				
Flow Control & Relief Valves	24.5	EHFBG										03	06	10			
High Flow Series Flow Control & Relief Valves	24.5	EHFBG											03	06			
Directional & Flow Cont. Valves	25	EHDG							01	03							
High Response Type Directional & Flow Cont. Valves	15.7	EHDG											04	06			

Note) Setting adjusters are also available.

## Series Proportional Electro-Hydraulic Control Valves

Proportional valves are able to control the system pressure or flow proportionally through a controlled input current from the amplifier.

Our product line includes “high response type valves” that provide ultimately improved response using closed loop control that proportional control valves can offer.



Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min												
		1	2	3	5	10	20	30	50	100	200	300	500	1000
Pilot Relief Valves	24.5	EDG-01												
Relief Valves	24.5	EBG 03 06 10												
Reducing & Relieving Valves	24.5	ERBG 06 10												
Flow Control (& Check) Valves	20.6	EFG/EFCG (40Ω Series) 02 03 06 10												
	24.5	EFG/EFCG (10Ω Series) 03 06												
Flow Control & Relief Valves	24.5	EFBG (40Ω-10Ω Series) 03 06 10												
		EFBG (10Ω-10Ω Series) 03 06 10												
		EFBG (High Flow Series) 03 06												
High Response Type Flow Control & Relief Valves	25	ELFBG-03												
Directional & Flow Cont. Valves	25	EDFG-01												
Directional & Flow Cont. Valves	25	EDFHG 03 04 06												
High Response Type Proportional Directional and Flow Control Valves	31.5	ELDFG 01 03												
	35	ELDFHG 03 04 06												

Note) Power amplifiers and setting adjusters are also available.

## Amplifiers

Amplifier Type	Model Numbers	Applicable to Control Valve
DC Input	AME-D-10-※-20	Pressure or Flow Control (For 10Ω Sol.)
	AME-D-40-※-40	Flow Control (For 40Ω Sol.)
	AME-D2-H1-※-12	Flow Control and Relief (For 40Ω -10Ω Sol.)
	AME-D2-1010-※-11	Flow Control and Relief (For 10Ω -10Ω Sol.)
DC Input-Feedback	SK1022-※-※-11	Pressure or Flow Control (For 10Ω Sol.)
	AME-DF-S-※-22	Flow Control (For 10Ω Sol.)
Slow Up-Down	AME-T-S-※-22	Flow Control (For 40Ω Sol.)
DC Input For DC Power 24V DC	SK1015-11	Pressure or Flow Control (For 10Ω Sol.)
	AMN-D-10	
	AMN-W-10	
	SK1091-D24-10	Directional and Flow Control
DC Input with Minor Feedback	AMN-L-01-※-※-10	High Response Type Directional and Flow Control
	AMB-EL-※-※-※-※-10	
Shockless	AMN-G-10	Shockless Directional and Flow Control

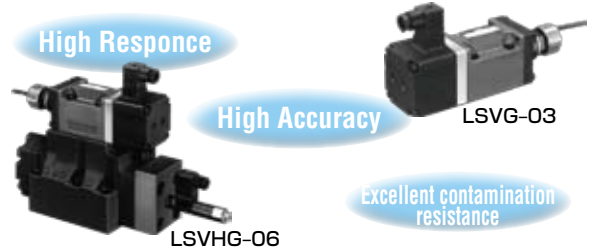


Friendly, Intelligent, Powerful

# Linear Servo Valves

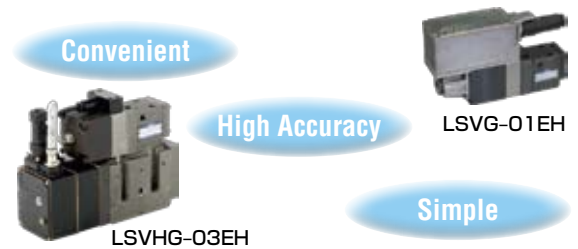
## High-speed Linear Servo Valves/Servo Amplifiers

High-speed linear servo valves have outstanding features of high response and exceptional contamination resistance. These features are achieved by the compact and powerful linear motor which directly drives the spool and gives electric feedback of the spool position. These valves have garnered an excellent reputation since their launch by Yuken in 2001.



## On-board Electronics Type Linear Servo Valves

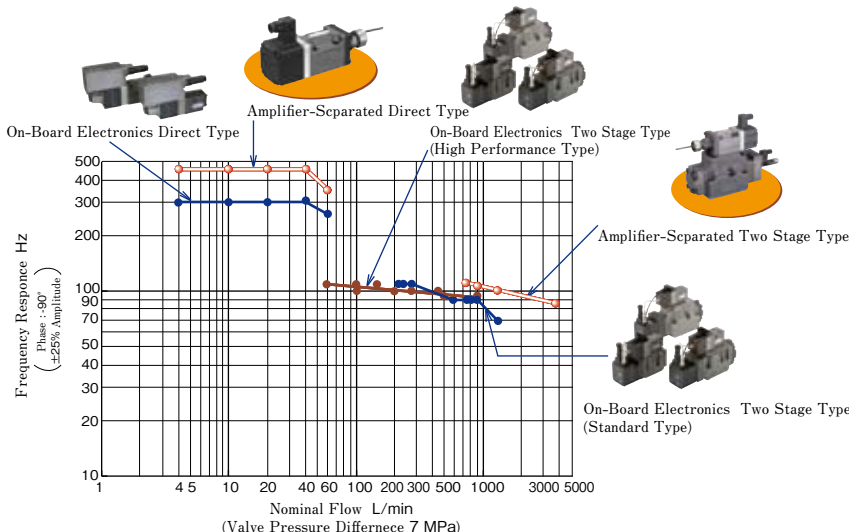
On-board electronics type linear servo valves have been developed based on high-speed linear servo valves, but with a focus on downsizing the pilot valve. The integration of the exclusive amplifier and the linear servo valve create a high performance valve in a compact package which greatly improves user-friendliness.



## Specifications

Valve Type	Max. Operating Press. MPa	Nominal Flow L/min (Valve Pressure Difference 7 MPa)											Frequency Response ±25% Amplitude 90° Phase Hz	Step Response 0→100% ms	Spool Type	
		1	2	5	10	20	30	40	60	750	900	1300				3800
High-Speed Linear Servo Valves (Amplifier-Separated Type)	Direct Type	35	LSVG-03 4, 10, 20, 40, 60											450, 350	2,3	Neutral Zero lap
	Two Stage Type	35	LSVHG-04 750											110	8	2:10% Overlap 2P: Zero lap (Dual Flow Gain) 4O:A,B,T Connection
		900:35 1300:31.5	LSVHG-06 900, 1300											105, 100	8,10	
On-Board Electronic Type Linear Servo Valves (Standard Type)	Direct Type	35	LSVHG-10 3800											85	15	Neutral Zero lap
		35	LSVG-01EH 4, 10, 20											300	3	
	Two Stage Type	35	LSVG-03EH 40, 60											310, 260	3,4	2:10% Overlap 2L:2% Overlap (Linear Flow Gain) 2P:Zero lap (Dual Flow Gain) 4O:A,B,T Connection 4J:A,B,T Connection (Neutral)
		31.5	LSVHG-03EH 210, 270											110	7,8	
		35	LSVHG-04EH 580, 750											90	11	
On-Board Electronic Type Linear Servo Valves (High Performance Type)	Two Stage Type	820,900:35 1300:31.5	LSVHG-06EH 820, 1300											90, 70	11,15	S:1% Overlap
		31.5	LSVHG-03EH-※-S 60, 100, 160											110	7	
		35	LSVHG-04EH-※-S 100, 200, 280, 450											100	11	
		35	LSVHG-06EH-※-S 500, 900											95	12	

## Frequency Response Chart



\* The Japan Society of Mechanical Engineers

## High-speed Linear Servo Valves/Servo Amplifiers

Linepu covering a high response of 450 Hz (direct type)/a high flow of 3800 L/min (two stage type) !

High precision and fast responsiveness are achieved by driving the spool directly using a compact, powerful linear motor as well as by feedback of the spool position.

### ● High accuracy

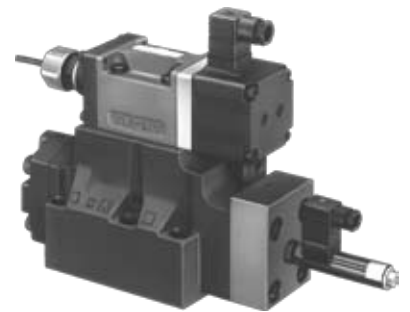
These valves have a low hysteresis of 0.1 % or less, achieving high accuracy. They allow the main unit to operate with much higher repeatability.

### ● High response characteristics

The valves provide significantly high levels of step and frequency responses; the step response is 2 ms, and the frequency response is 450 Hz (for LSVG-03). Thus, the valves ensure that the main unit can achieve unprecedented high response.

### ● Excellent contamination resistance

Compared to conventional servo valves for which the permissible contamination level is up to NAS 1638 class 7, the direct type servo valves can accept the contamination level of up to class 10.



Two Stage Type — LSVHG-06



Direct Type — LSVG-03

Linear Servo Amplifiers — AMLS

## On-board Electronics Type Linear Servo Valves

Introducing new direct type models (LSVG-01EH/03EH): Wider range of products !

On-board electronics type linear servo valves have been developed based on the high-speed linear servo valves while aiming at downsizing the pilot valve and improving user-friendliness by integrating the exclusive amplifier and the high-speed linear servo valve compactly.

### ● High accurate, simple and convenient — Ideal on-board electronics type linear servo valves

#### Convenient

Fault diagnosis is easy to conduct with the alarm indication when the command signal and the spool position differ due to abnormality in the system.

Colour	Description of Alarm Indicator
Green	Indication of power supply (Normal operation)
Red	Deviation alarm for the pilot valve
Yellow	Deviation alarm for the main valve

#### High Accuracy

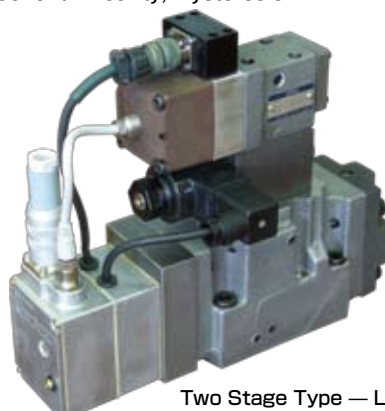
Closed loop control by the combination of the position sensors for the pilot valve and the main valve in the compact amplifiers ensures excellent linearity, hysteresis and stability on control.

#### Simple

Highly accurate hydraulic control can be obtained only by supplying 24 V DC power and inputting a command signal voltage of 0 to  $\pm 10V$ , 0 to  $\pm 10mA$  and 4 to 20 mA.



Direct Type — LSVG-01EH



Two Stage Type — LSVHG-04EH  
with Fail-Safe Solenoid Operated Valve

