

# Hydraulic Servo Valve

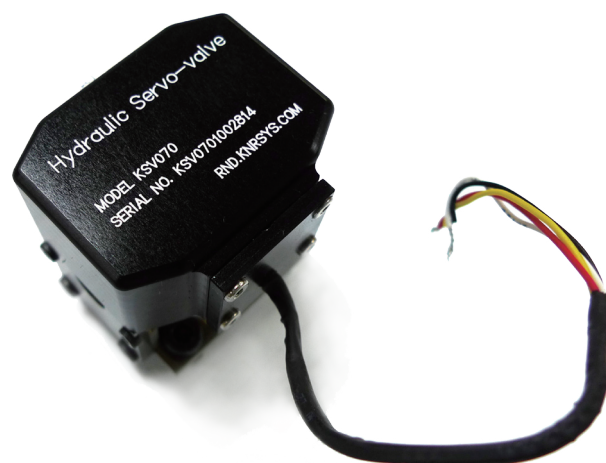


## Overview

KNR Systems develops its own nozzle-flapper-type servo valve, specifically for use in hydraulic robots. The valve operates at a bandwidth over 60 Hz. We provide product specification, such as frequency response and Internal leakage, in order to help developers establish a dynamics system model.

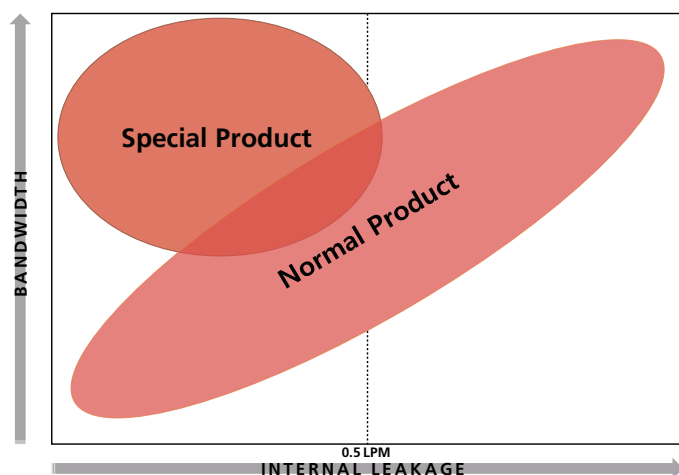
The servo valve can be easily applied to a system, similar to the method of the servo-motor, with the use of KNR's HAC board as well as other valve control boards. Simply connect the valve to a control board, and the valve-actuator system can be controlled like a motor.

While miniature servo valves generally cost a lot, KNR's ability to customize and to optimize presents economically priced custom-manufactured servo valves. Our customization categories include underlap, overlap, internal leakage, etc.



## FEATURES

- ☛ Customization
- ☛ High-Response Characteristics
- ☛ Miniature Design for Robots



# Hydraulic Servo Valve



## Technical Data

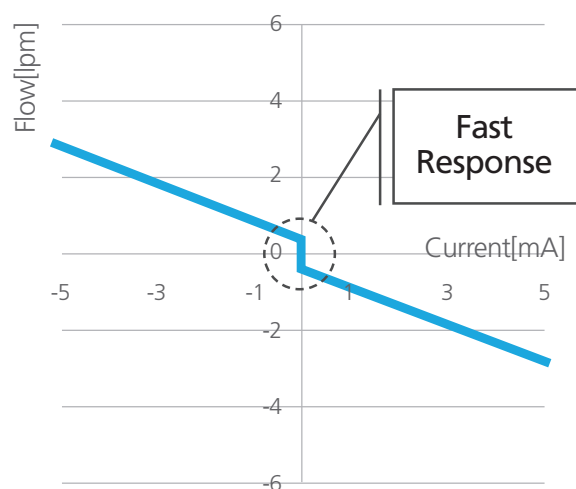
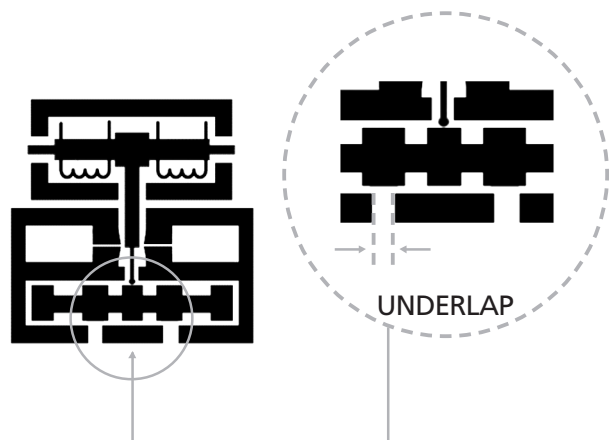
Nominal flow ratings	5.5ℓ/min at $\Delta P$ 70bar
Hysteresis	< 3% without dither
Threshold	< 1.0%
Null Bias	< 0.2mA
Seal materials available	VITON
Operating temperature range	30°C ~ 60°C
Proof pressure	< 150% max supply pressure
Burst pressure	< 250% max supply pressure
External leakage	Zero
Weight	178g
Supply filtration	10 micron
Fluid cleanliness level	NAS 1638-CLASS 4
Supply pressure	Max continuous 210bar
Viscosity	ISO VG32

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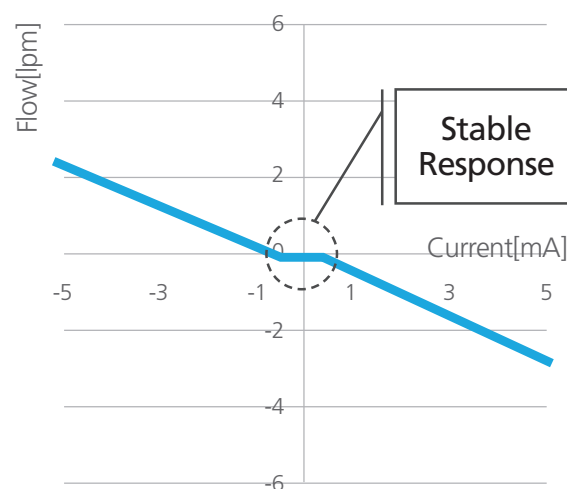
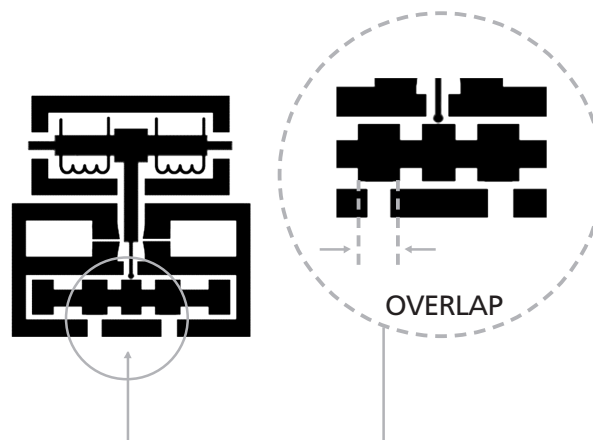
## Customization Service - Spool Option

### UNDERLAP



- ❖ High internal leakage
- ❖ High Bandwidth

### OVERLAP

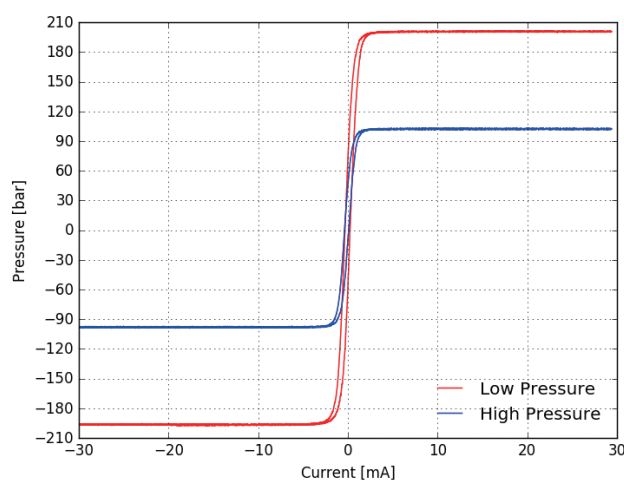


- ❖ Low internal leakage
- ❖ Low Bandwidth

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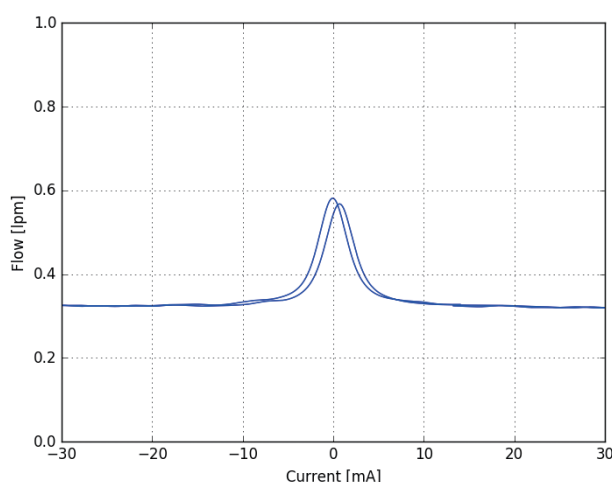
## Performance Graph



The figure shows the change in the load pressure over input current while the bidirectional control ports are closed and the flow rate is zero. The Null Bias in two different conditions (100bar/210bar) can be seen.

- ✦ Null Bias < 0.2mA
- ✦ Threshold < 1.0%

## Pressure Gain



The figure shows the internal leakage curve of a valve. The maximum leakage is effected by the type of the spool used, which can be customized between underlap and overlap.

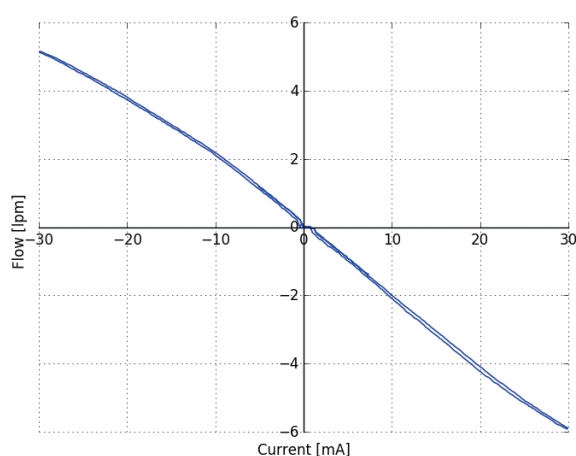
- ✦ Internal Leakage < 1ℓ/min
- ✦ Null Bias < 0.2mA

## Internal Leak

# Hydraulic Servo Valve



## Performance Graph

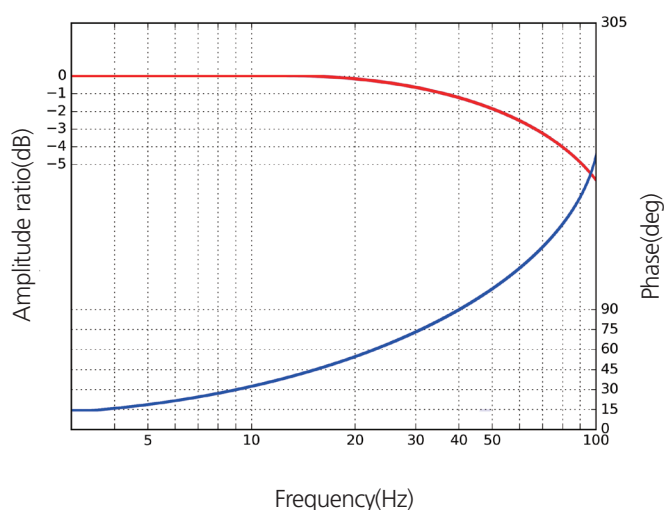


The figure shows control flow rate over input current. The data was repeatedly recorded over full current range from positive to negative at a frequency of 0.01Hz, independent from the dynamic characteristics.

- ✦ Hysteresis < 3%
- ✦ Null Bias < 0.2mA

## Hysteresis

Amplitude & phase spectrum



The figure shows the frequency response at an input pressure of 210 bar. Upon request, the valve can be customize to perform over 90 Hz.

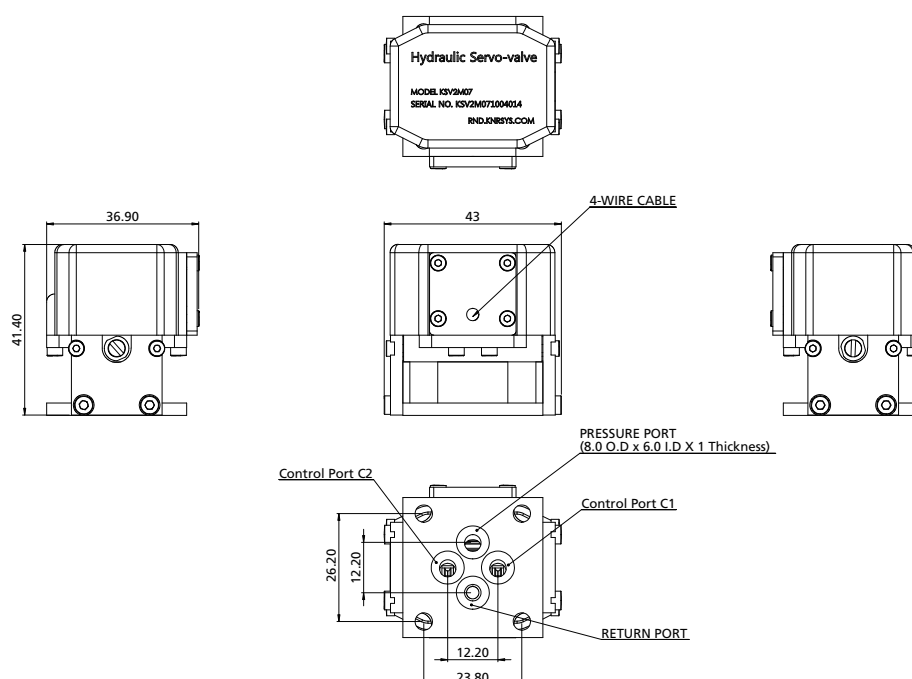
- ✦ Frequency Response  $\geq 60\text{Hz}$  @-3dB
- ✦ Phase lag  $\geq 40\text{Hz}$  @90deg
- ✦ Rated Signal : 25%
- ✦ System Pressure : 200bar

## Frequency Response

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## Dimension



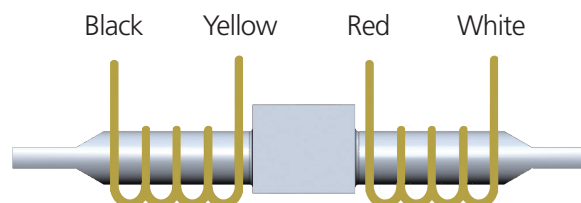
## Electrical Detail

Rated Current : 30mA

Coil Resistance : 300  $\Omega$

Connection : Black & White (+)

Yellow & Red (-)



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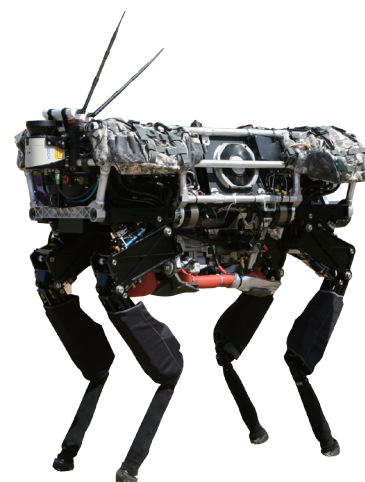
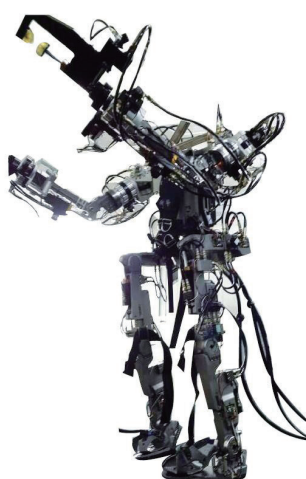
## Application



## Manipulator



## Robot



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MAY, 2016



## Contact

### R&D Center

159, Wonam-ro, Namsa-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17124, Korea  
Tel 82. 31. 326. 3500  
Fax 82. 31. 326. 3519

#### E-mail

- Technical Support : [rnd@knrsys.com](mailto:rnd@knrsys.com)
- Quotation : [quotation@knrsys.com](mailto:quotation@knrsys.com)

#### Website

- [rnd.knrsys.com](http://rnd.knrsys.com)

#### SNS

- Youtube : <https://www.youtube.com/user/knrrnd>
- Twitter : <https://twitter.com/knrrnd>

### Head Office

1, Cheondeoksan-ro 482beon-gil, Namsa-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17124, Korea  
Tel 82. 31. 330. 2500  
Fax 82. 31. 330. 2519

Website [www.knrsys.com](http://www.knrsys.com)