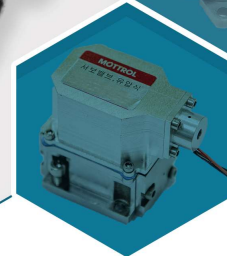
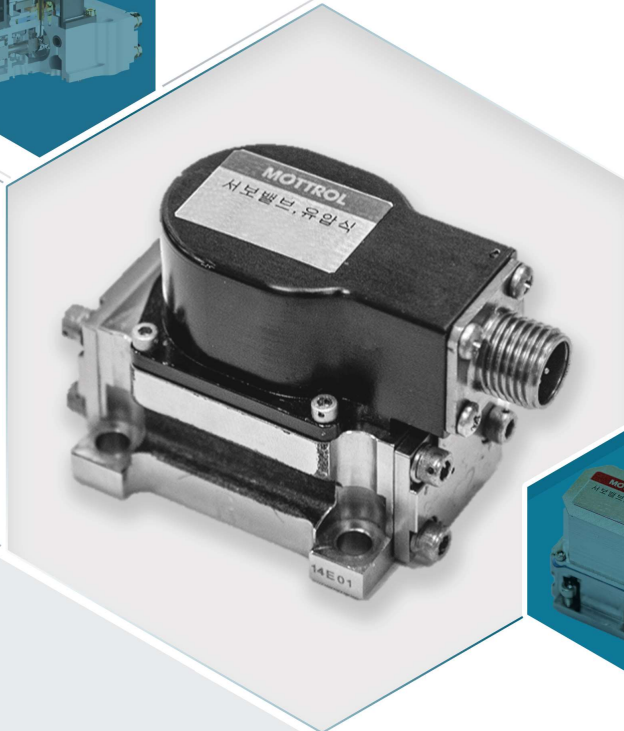
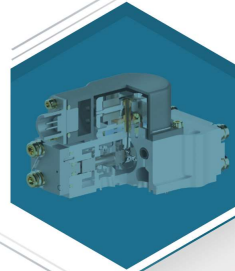


MOTTROL

SERVO VALVE (NF Series)

We create and precisely control movement anywhere
in the ground, sea, sky and space.



MOTTROL
Creating Motion & Control

Mottrol Co., LTD

171, Wanam-ro, Seongsan-gu, Changwon-si, Gyengsangnam-do, Korea (51528)

☎ +82 55 269 5541 📠 +82 55 269 5224

www.mottrol.com

SERVO VALVE

Servo valve can make accuracy pressure and flow control using the low current electric signal and are suitable for electro-hydraulic position, speed, pressure or force control systems with high dynamic response requirements.

Applications



Defense



Steel/Power plant



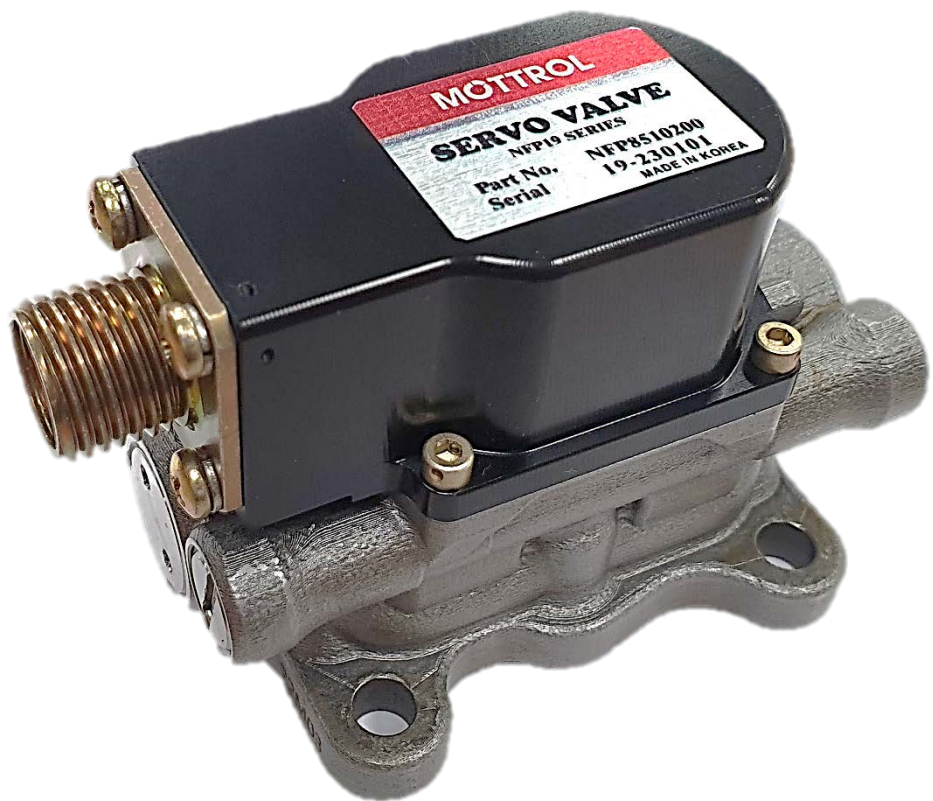
Aerospace



Test equipment



Robot



Mottrol Servo Valves

For over 20 years, We have been manufacturing of servo valves for defense application. Base on these experience Mottrol now offers servo valve technology covering a range of flows from 3 to 44 gpm at 3000 psi valve pressure drop.

We supply a wide range of high quality servo valves



NF 03



NF 03



NF 03



NF 03



NF 14



NF 19



NF 44



JP 03



NFP 19



NFP 44

Model	Rated Flow (@3000 psi, gpm)	Maximum Leakage (@3000 psi, gpm)	Frequency of Phase Point(Hz)	Maximum Amplitude Ratio(dB)
NF03	3.0	< 0.2	> 200	< 2
NF08	8.0	< 0.3	> 170	< 2
NF14	14.0	< 0.4	> 160	< 2
NF19	19.0	< 0.6	> 110	< 2
NF44	44.0	< 0.8	> 80	< 2

Hydraulic Characteristics

We developed, manufactured and tested servo valves in compliance with the ARP 490 standard

© Supply Pressure

- 500 psi to 4000 psi for standard designs
 - Valves are set up and tested at supply pressure specified
 - Valves can be used at other supply pressures, but some null shift may occur
 - Lower and higher pressures available on special order
- Valves supplied for pressures below 500 psi should be specially designed
 - Type NF Servo valves can function with supply pressures as low as 50 psid
 - Servo valve performance, especially threshold and dynamic response, is degraded with low supply pressure

© Proof and Burst Pressures

- Proof pressure capability
 - at supply and control ports = 1.5 Ps
 - at return port = 1.0 Ps
- Burst pressure capability
 - at supply and control ports = 2.5 Ps
 - at return port = 1.5 Ps or 5000 psi maximum

© Static Performance

- Rated flow tolerance $\pm 10\%$
- Linearity $\langle \pm 7\%$
- Symmetry $\langle \pm 5\%$
- Null region $\langle \pm 3\%$
- Null bias
 - Initial $\langle \pm 2\%$
 - Long-term $\langle \pm 5\%$
- Hysteresis $\langle 3\%$
- Threshold
 - Supply pressures 1000 psi and above $\langle 0.5\%$
 - Supply pressures below 1000 psi $\langle 1.0\%$
- Pressure gain 40% supply pressure at $\langle 1.6\%$
- Coil resistance tolerance $\pm 10\%$
- External leakage None

Standard Series NF

© Rated Flow(gpm)

Model	1000psi	1500psi	2000psi	2500psi	3000psi	3500psi	4000psi
NF03	1.8	2.2	2.5	2.9	3.1	3.4	3.6
NF08	4.0	4.9	5.6	6.3	6.8	7.3	7.8
NF14	8.0	9.8	11.0	13.0	14.0	15.0	16.0
NF19	11.0	14.0	16.0	17.0	19.0	20.0	22.0
NF44	26.0	31.0	36.0	40.0	44.0	48.0	51.0

© Maximum Leakage(gpm, at 3000psi)

Model	Tare Leakage	Null Leakage
NF03	< 0.1	< 0.2
NF08	< 0.13	< 0.3
NF14	< 0.15	< 0.4
NF19	< 0.17	< 0.6
NF44	< 0.2	< 0.8

© Pressure Gain(psi/mA , ± 1200psi)




Model	Pressure Gain(min)
NF03	> 7500.0
NF08	> 7500.0
NF14	> 7500.0
NF19	> 7500.0
NF44	> 7500.0

– Maximum leakage available depending upon operating requirements

© Dynamic Performance(Response Limits at ±25% Input Current)

Model	Frequency of 90° Phase Point(Hz)			Maximum Amplitude Ratio(db)		
	1000psi	2000psi	3000psi	2500psi	3000psi	3500psi
NF03	150	170	200	< 2		
NF08	150	170	170	< 2		
NF14	110	140	160	< 2		
NF19	80	95	110	< 2		
NF44	55	65	80	< 2		

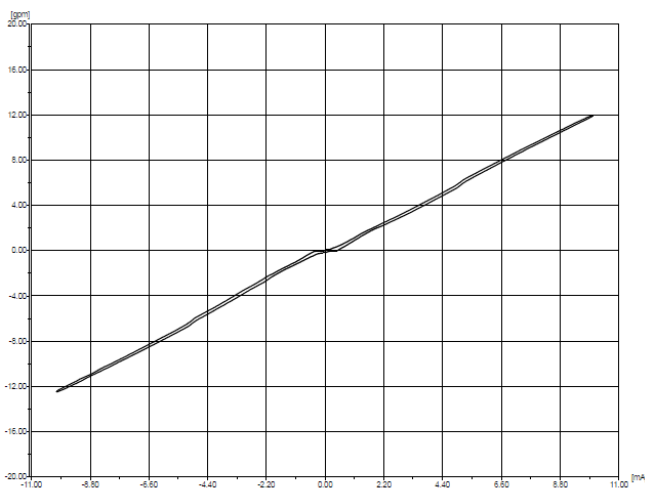
© Standard Coil Configurations

Model	P	S	I
Coil Configuration	Parallel Coils 	Series Coils 	Individual Coils 
Pin(If Connector)	B A	B A	B A D C
Colors(If Cable)	grn red	grn red	grn red yel blu
Coil Resistance(Ω)	200, 400, 1000		

The following performance reports are provided for each model

- Static Characteristic : Flow Gain, Internal Leakage, Pressure Gain, Null Bias, Hysteresis, threshold
- Dynamic Characteristic : Frequency of 90 ° Phase Point(Hz), Maximum Amplitude Ratio(dB)

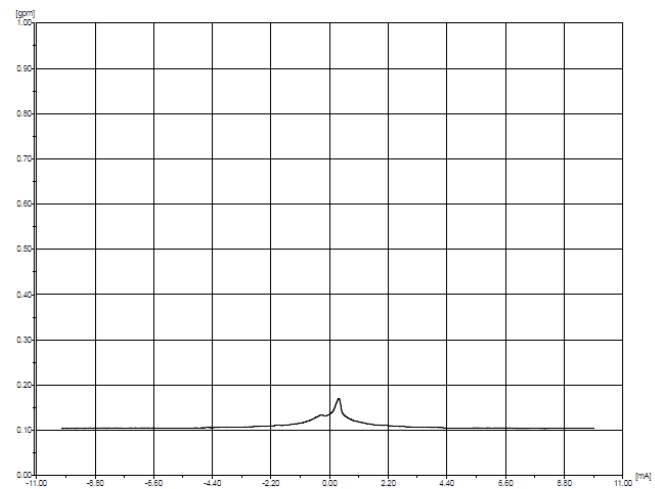
Flow Gain Plot



Allowable **Actual**

Rated Flow	11.900 to 15.400 gpm	-12.494 gpm (left)	PASS
	11.900 to 15.400 gpm	11.938 gpm (right)	PASS

Internal Leakage Plot



Allowable **Actual**

Internal Leakage	0.840 gpm (max)	0.170 gpm	PASS
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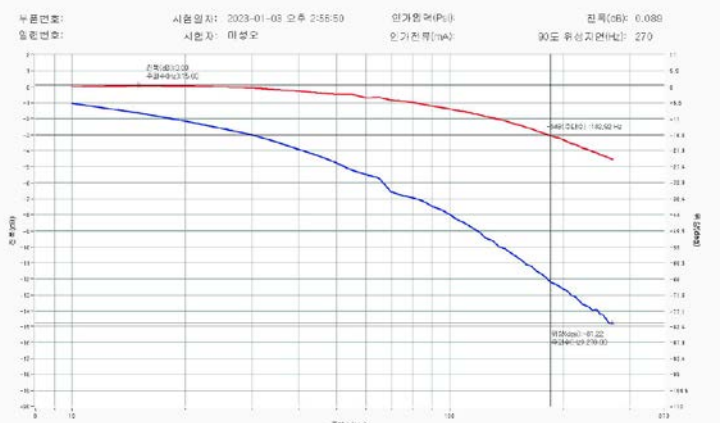
Pressure Gain Plot



Allowable **Actual**

Pressure Gain	7500.0 psi/mA (min)	11479.7 psi/mA	PASS
Null Bias	+/- 0.200 mA (max)	-0.024 mA	PASS
Hysteresis	0.300 mA (max)	0.226 mA	PASS
Threshold	0.050 mA (max)	0.009 mA	PASS

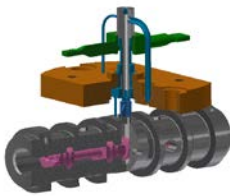
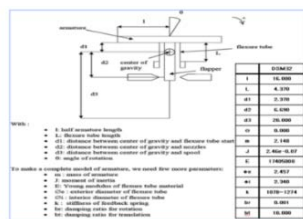
시험성적서




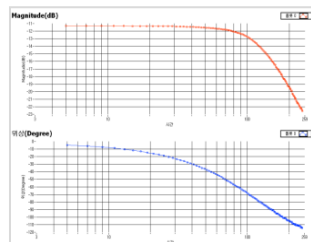
Continuous R&D and business expansion

Mottrol developed and produced various types of servo valves applying to applications through continuous R&D investment. And, Mottrol is expanding business area into the servo driving systems based on accumulated technologies.



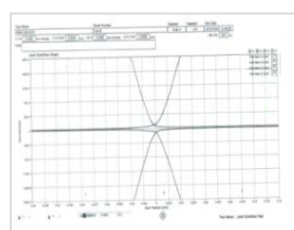

Design and testing technologies

ITEM NO.	DESCRIPTION	UNIT	VALUE
1	1. 16.000		
2	2. 8.500		
3	3. 2.500		
4	4. 6.500		
5	5. 20.000		
6	6. 2.100		
7	7. 2.000-0.500		
8	8. 1.000.000		
9	9. 2.000		
10	10. 1.000-1.014		
11	11. 0.001		
12	12. 0.001		
13	13. 10.000		

High-precision machining technologies

Jet pipe type of Servo Valve

- Has a structure for resistant to contamination of hydraulic oil
- Applicable to aviation actuators and fuel control devices that requires reliability



Key features

- ✓ Structure in which nozzle flow is sprayed from the armature assembly.
- ✓ Simple structure operated by differential pressure between nozzle and receiver

3D printing tech. of Servo Valve

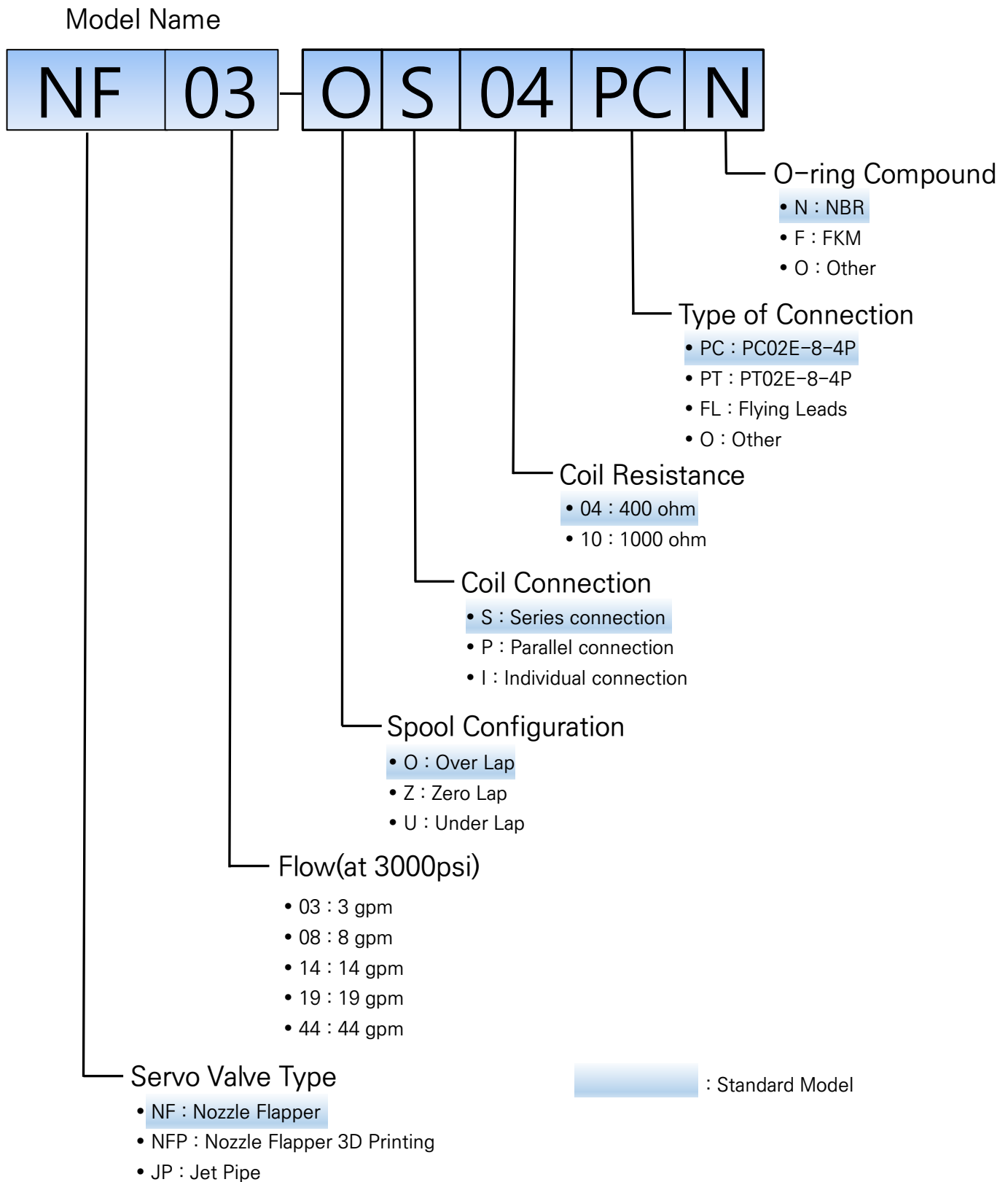
- By using the advantages of 3D printing technology, designed and analyzed inside of housing and sleeve suitable for 3D printing
- Developed servo valves that realized parts simplification and weight reduction



Key features

- ✓ Integrated housing and sleeve
- ✓ Reduced the number of parts
- ✓ Light weight (33% lighter than before)

Mode Naming and Order No.



Special Order

- We can develop and manufacture servo valves various requirements according to temperature, pressure and fluid used
- Contact Mottrol Sales

Vision

mottrol vision

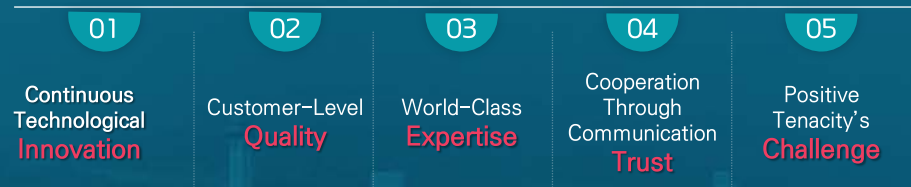


Core values

core values

Since its foundation in 1974, Mottrol have manufacturing high-quality products that meets the requirements of our clients and their trust through continuous technological innovations. These two values of technological innovation and quality control are of the highest priority and critical to the future growth of Mottrol Co., Ltd.

Mottrol Core Values



Work place

workplace

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