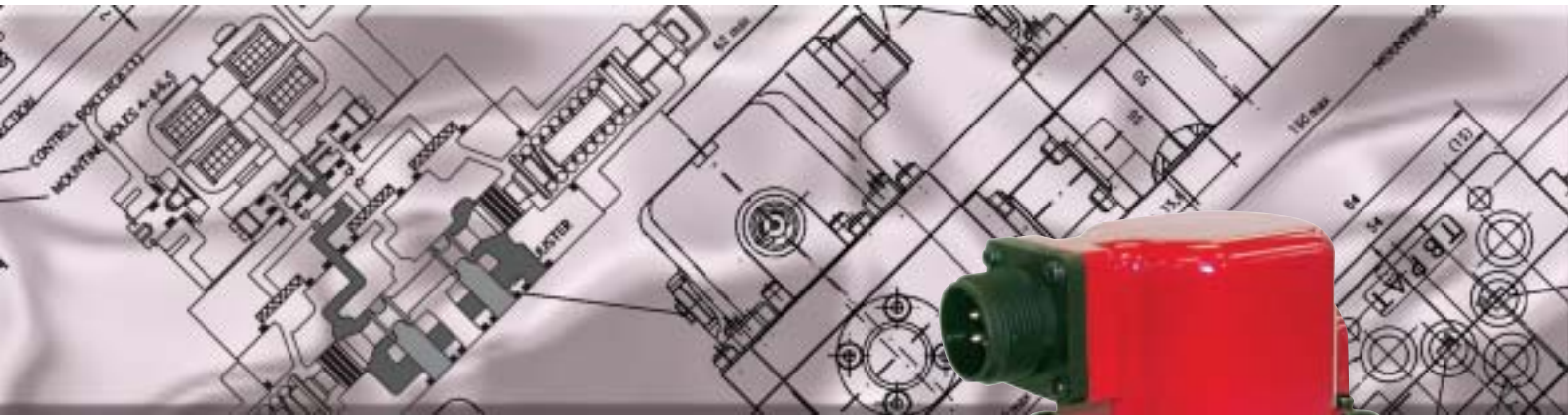


MOOG

Flow Control Proportional Valves J866 Series



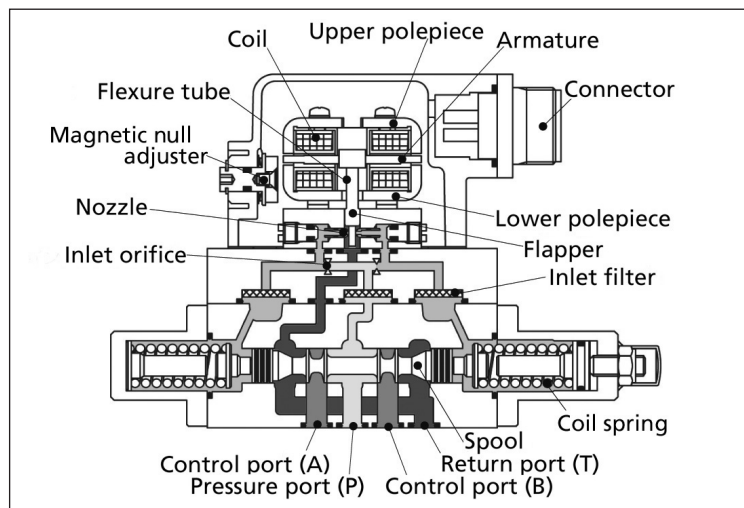
J866 Series

Two Stage Proportional Valves for Industrial applications

866 Series flow control proportional valves are throttle valves for 3- and preferably 4-way applications. They are a high performance, two-stage design that covers the range of rated flows from 10 to 80 L/min at 7.0MPa valve drop. The output stage is a closed center, four-way, sliding spool. The pilot stage is a symmetrical double-nozzle and flapper, driven by a double air gap, dry torque motor. Mechanical feedback of the spool position is provided by a cantilever spring. The valve design is simple and rugged for dependable, long life operation. These valves are suitable for Industrial Robots and Manipulators application with high stability and high repeatability.

Principle of operation

- * An electrical command signal is applied to the torque motor coils and creates a magnetic force, which acts on the ends of the pilot stage armature.
- * This causes a deflection of armature/flapper assembly within the flexure tube. Deflection of the flapper restricts fluid flow through one nozzle, which is carried through to one spool end, displacing the spool.
- * Movement of the spool opens the supply pressure port (P) to one control port while simultaneously opening the tank port(T) to the other control port. The spool motion also applies a force to the coil spring.
- * Once the coil spring force becomes equal to one nozzle pressure, and the spool is held open in a state of equilibrium until the command signal changes to a new level.
- * In summary, the spool position is proportional to the input current. With constant pressure drop across the valve, flow to the load is proportional to the spool position.



Valve Features

- 2-stage design with dry torque motor
- Low friction double nozzle pilot stage
- High spool control forces
- Rugged, long-life design
- High resistance to contamination by larger internal clearance & longer spool stroke

The actual flow is dependent upon electrical command signal and valve pressure drop. The flow for a given valve pressure drop can be calculated using the square root function for sharp edge orifices:

$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

Q L/min = calculated flow

Q_N L/min = rated flow

Δ P MPa = actual valve pressure drop

Δ P_N MPa = rated valve pressure drop

J866 Series

General Technical Data

Proof Pressure

P,A and B port 31.5 MPa (Static pressure)
 T port 21.0 MPa (Static pressure)

Temperature Range

Fluid -10~80°C
 Ambient -10~80°C

Seal Material * NBR

Operating Fluid

Compatible with common hydraulic fluids, other fluids on request.

Recommended Viscosity 10~400mm²/S

System Filtration

High pressure filter (without bypass, but with dirt alarm) mounted in the main flow and if possible, directly upstream of the valve. Refer to Moog filtration catalog for recommended filtration scheme.

Class of Cleanliness

The cleanliness of the hydraulic fluid greatly effects the performance (spool positioning, high resolution) and wear (metering edges, pressure gain, leakage) of the valve.

Recommended Cleanliness Class For normal operation : ISO 4406 < 14 / 11
 For longer life : ISO 4406 < 13 / 10

Filter Rating Recommended
 For normal operation : $\beta_{10} \geq 75$ (10 μm absolute)
 For longer life : $\beta_5 \geq 75$ (5 μm absolute)

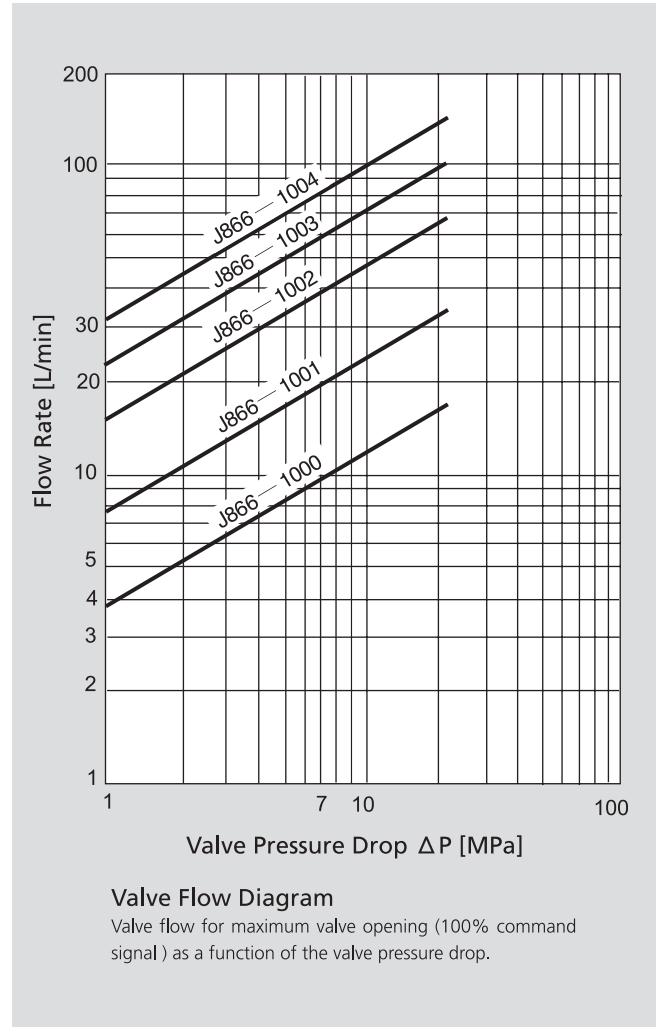
Installation Operations Any position, fixed or movable

Vibration 10 g, 3 axes

Weight 2.1 kg

Shipping Plate Delivered with an oil sealed shipping plate.

* Other seal material upon request

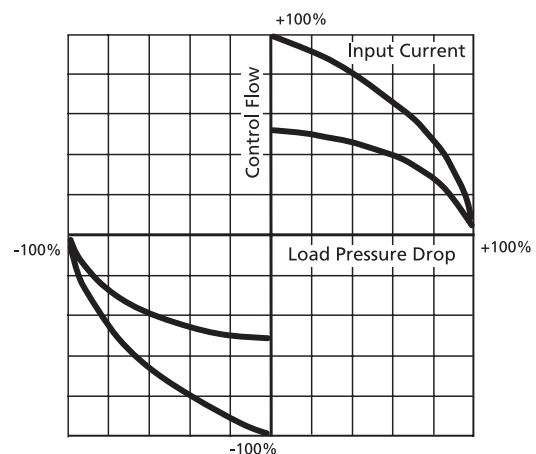
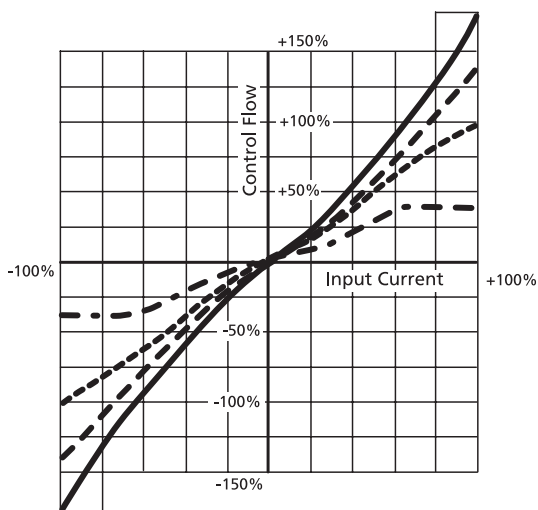


J866 Series Technical Data

	Condition	Unit	Specification
Rated Supply Pressure		MPa	21.0
Operating Pressure Range		MPa	7~21.0
Proof Pressure (Supply)		MPa	31.5
Proof Pressure (Return)		MPa	21.0
Rated Current (Series connection)		mA	±10
Nominal Coil Resistance		Ω/coil	200
Null Bias	@21MPa	%	< ±3%
Null Shift	Temperature (ΔT=30°C: 25°C~55°C)	%	< 3.0
	Supply Pressure (30% of Rated Pressure)	%	< 3.0
Hysteresis	@Dither 200Hz 20% P-P	%	< 4.0
Frequency Response @21MPa, ±25% input	Amplitude Ratio -3dB	Hz	> 30
	90° phase lag	Hz	> 50
Temperature Range		°C	-10~80
Operating Fluid	petroleum base hydraulic fluid		
Viscosity Range of Operating Fluid	petroleum base hydraulic fluid	mm ² /s	10~400
Connector Direction			B Port
Weight		kg	2.1

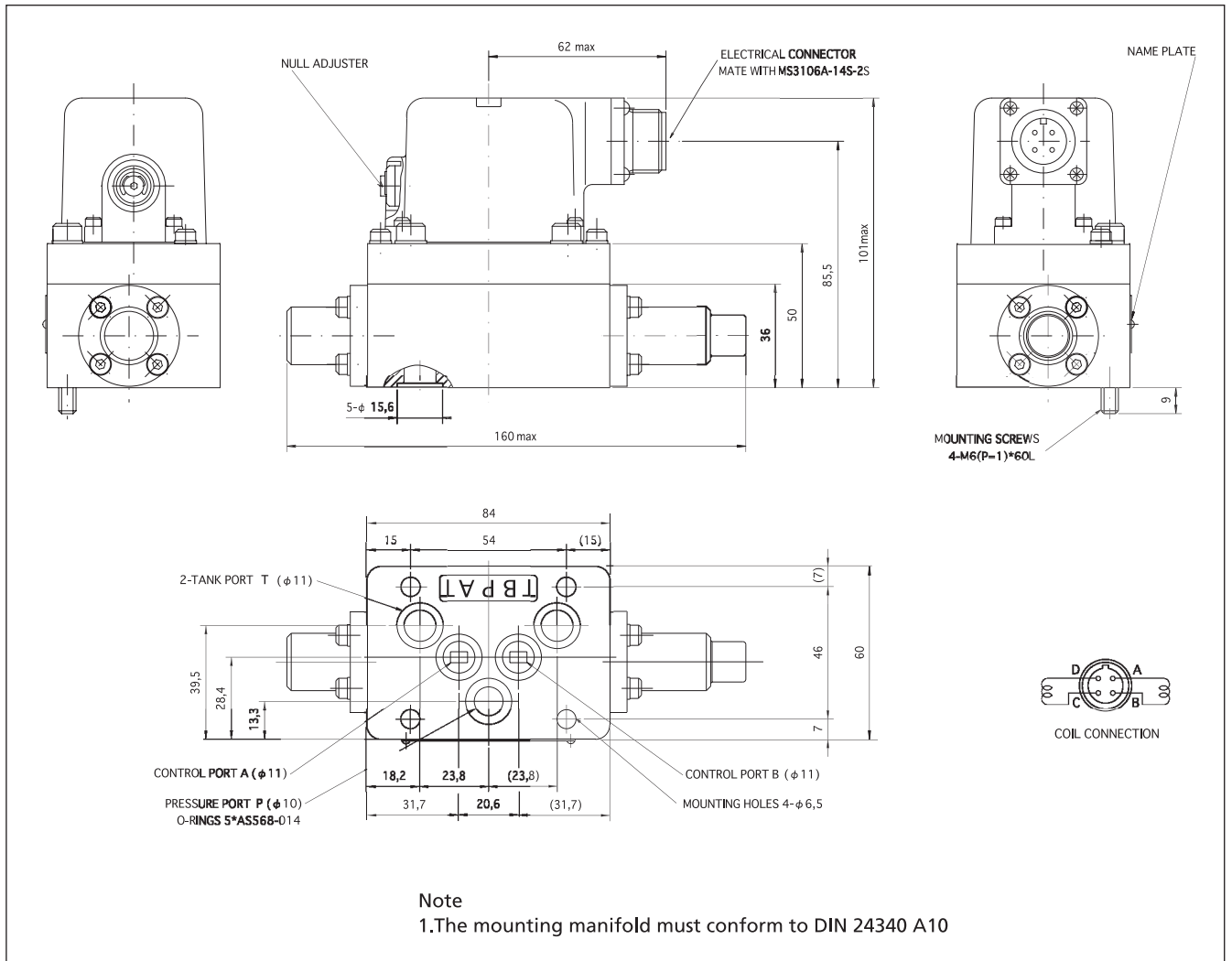
■ No-Load Flow Gain characteristic

■ Change in Control Flow with Current and Load Pressure

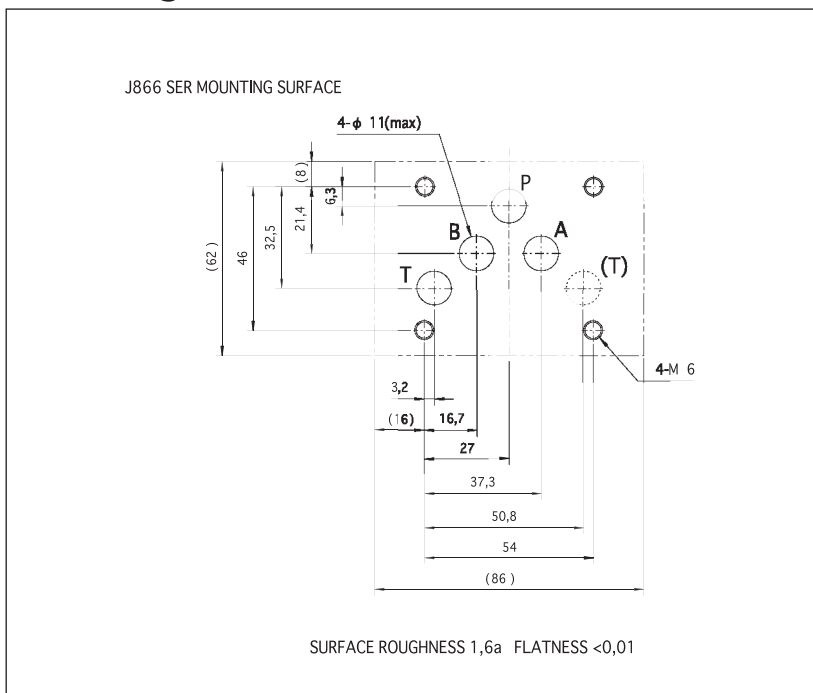


■ Supply Pressure : ——— 21MPa - - - 14MPa - · - · 7MPa · · · 3.5MPa
 ■ Dither Signal : 200Hz, 4mA p-p

Installation Drawing



Mounting Manifold



Electrical Connections

■ Rated current and coil resistance

Only one type is available for J866 Series Proportional valves.

■ Coil connections

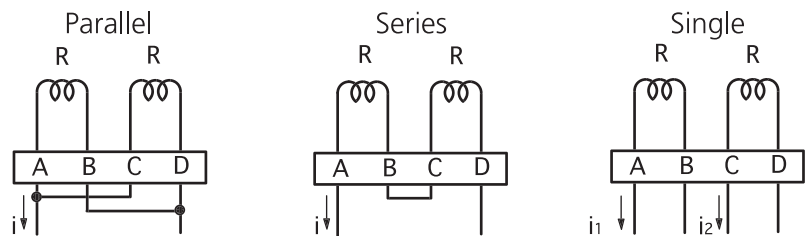
A four-pin electrical box connector (that mates with an MS3106A-14S-2S cable connector) is standard. All four torque motor leads are available at the connector so external connection can be made for series, parallel or single coil operation.

■ Servoamplifier

The servoamplifier responds to input current, so a servoamplifier that has high internal impedance (as obtained with current feedback) should be used. This will reduce the effects of coil inductance.

Electrical Connections

(Examples with typical J866 Series coil)



Coil Resistance	[Ω]	100	400	200
Rated Current	[mA]	± 20	± 10	± 20
Coil Inductance	[H]	1.5	4.7	1.6
Electrical Power	[W]	0.04	0.04	0.08
Polarity for valve opening		A and C(+) B and D(-)	A(+), D(-)	A(+), B(-) or C(+), D(-)
		P→A, B→T		

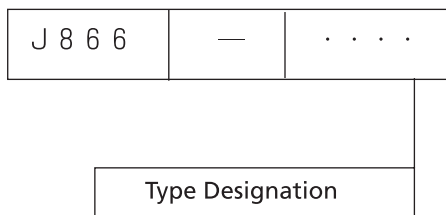
J866 Series

Ordering Information

Standard Model

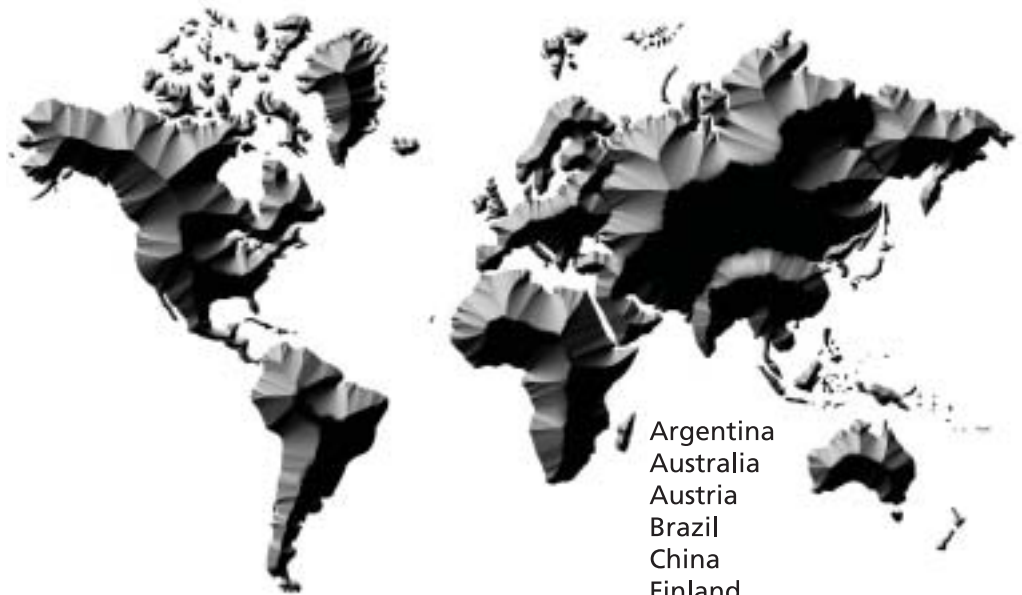
Model	Rated Flow (Valve Drop 7.0MPa)	Internal Leakage (System Pressure 21.0MPa)	Rated Current (Series Connection)	Nominal Coil Resistance
	(L/min)	(L/min)	(mA)	(Ω)
J866-1000	10	1.3	10	200
J866-1001	20	1.6	10	200
J866-1002	40	2.2	10	200
J866-1003	60	2.8	10	200
J866-1004	80	3.4	10	200

Model Number

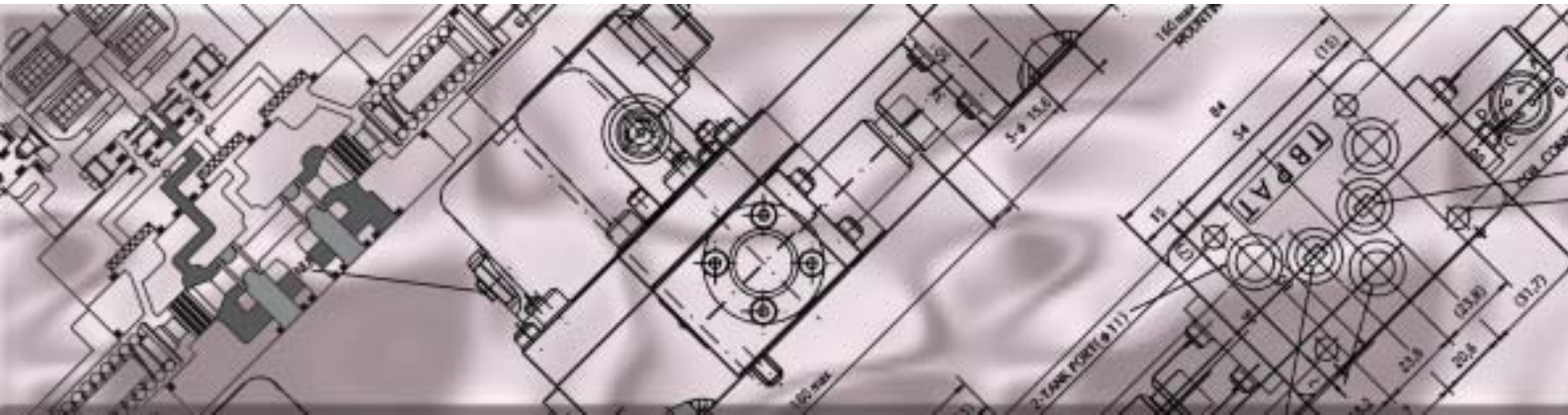


Spare parts and Accessories

Part	Size	Part Number
O-Rings (included in delivery) P,A,B,T	AS568-014	A47622-004
Mounting Bolts (included in delivery)	M6×60mm (4pieces)	A04001-006-060
Mating Connector (not included in delivery)		MS3106A14S2S (MS3106A-14S-2S)
Clamp for Mating Connector (not included in delivery)		MS3057-6A
Flushing Block (not included in delivery)		C92092-001



Argentina
Australia
Austria
Brazil
China
Finland
France
Germany
India
Ireland



Italy
Japan
Korea
Luxembourg
Norway
Russia
Singapore
South Africa
Spain
Sweden
United Kingdom
USA

MOOG

Moog Japan Ltd.
1-8-37 Nishi Shinndo, Hiratsuka,
Kanagawa-ken, Japan 254-0019
Tel : +81-463-55-3615
Fax: +81-463-54-4709
For the location nearest you, contact
www.moog.com