

MOOG

62 Series
Servovalves
ISO 10372 Size 04



62 SERIES TWO STAGE SERVOVALVES

62 SERIES SERVOVALVES

The 62 Series flow control servovalves are throttle valves for 3- and preferably 4-way applications. They are a standard performance, two-stage design that covers the range of rated flows from 2.5 to 20 gpm at 1000 psi 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 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 electrohydraulic position, speed, pressure or force control systems with high dynamic response requirements.

Principle of operation

An electrical command signal (flow rate set point) 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 the armature/flap

per 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 cantilever spring, creating a restoring torque on the armature/flapper assembly.

Once the restoring torque becomes equal to the torque from the magnetic forces, the armature/flapper assembly moves back to the neutral position, 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 and 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
- > High dynamics
- > Low cost design
- > Rugged, long-life design
- > High resolution, low hysteresis
- > Completely set-up at the factory

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 [gpm] = calculated flow
- Q_N [gpm] = rated flow
- Δp [psi] = actual valve pressure drop
- Δp_N [psi] = rated valve pressure drop



This catalog is for users with technical knowledge. To ensure that all necessary characteristics for function and safety of the system are given, the user has

to check the suitability of the products described here. In case of doubt, please contact Moog Inc.

62 SERIES
GENERAL TECHNICAL DATA

Operating Pressure

ports P,A and B up to 3,000 psi
port T up to 2,000 psi

Temperature Range

Fluid 0°F to 200°F
Ambient 0°F to 200°F

Seal Material

Viton, others on request
Compatible with common hydraulic fluids, other fluids on request.

Operating Fluid

Recommended viscosity 60-450 SUS @ 100°F

System Filtration: High pressure filter (without bypass, but with dirt alarm) mounted in the main flow and if possible, directly upstream of the valve.

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 servovalve.

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 moveable.

Vibration

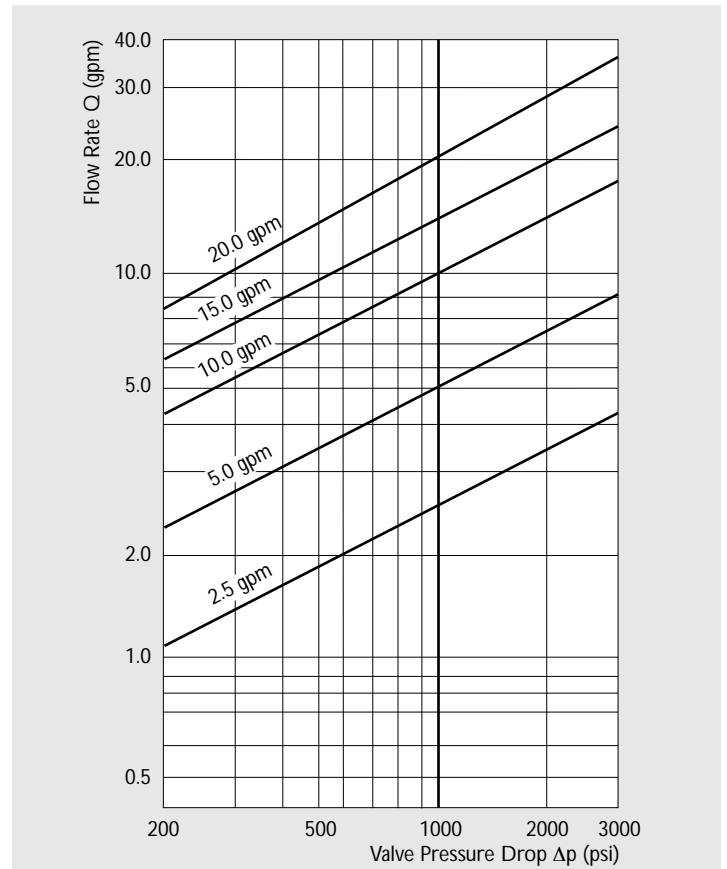
30 g, 3 axes

Weight

2.7 lb. (1.2 kg)

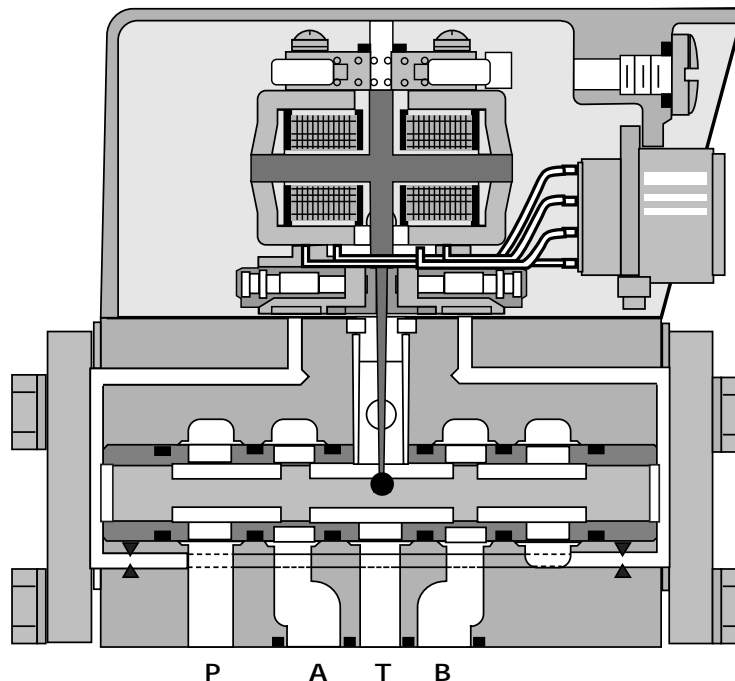
Shipping Plate

Delivered with an oil sealed shipping plate.



Valve Flow Diagram

Valve flow for maximum valve opening (100% command signal) as a function of the valve pressure drop.



62 SERIES
TECHNICAL DATA

Model ... Type
Mounting Pattern
Valve Body Version

Pilot Stage
Pilot Connection

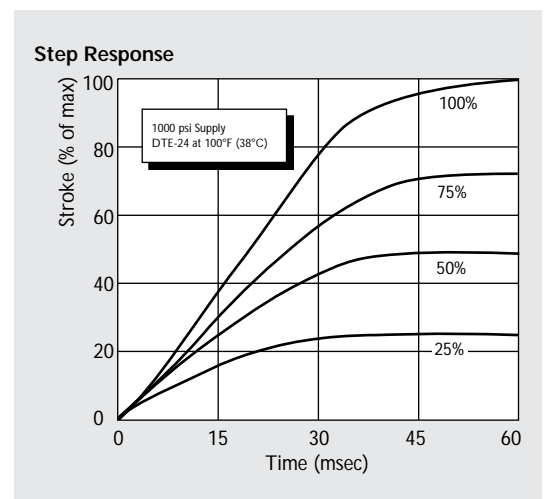
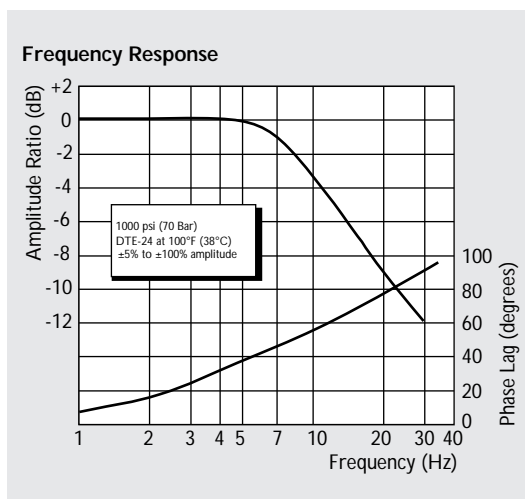
| | | | | | | | |
|--------------------|------------------------------------|-------|-----|-----|--------------|------|------|
| Rated Flow | (±10%) at $\Delta p_N = 1,000$ psi | [gpm] | 2.5 | 5.0 | 10.0 | 15.0 | 20.0 |
| Response Time* | | [ms] | 60 | 60 | 60 | 60 | 60 |
| Threshold* | | [%] | | | < 1% | | |
| Hysteresis* | | [%] | | | < 5% | | |
| Null Shift | at $\Delta T = 100^\circ F$ | [%] | | | < 5% | | |
| Null Leakage Flow* | max. | [gpm] | | | 0.35 to 0.55 | | |

* Measured at 1,000 psi operating pressure

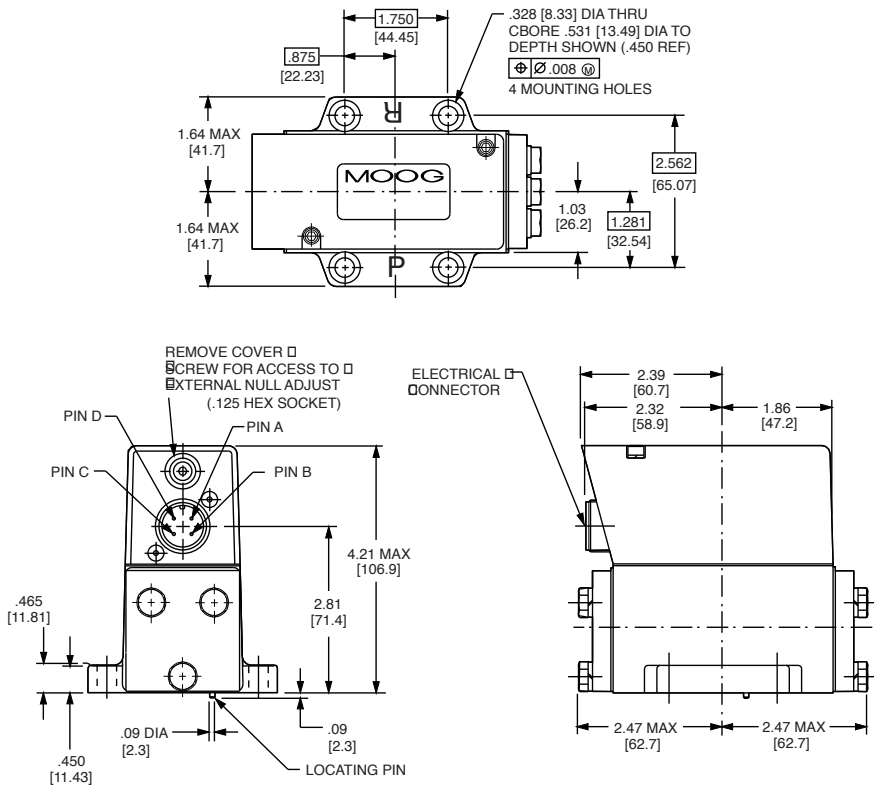
62

ISO 10362 - 04 - 04 - 0 - 92
4-way
2-stage with spool bushing design
Nozzle/Flapper, High flow
Internal only

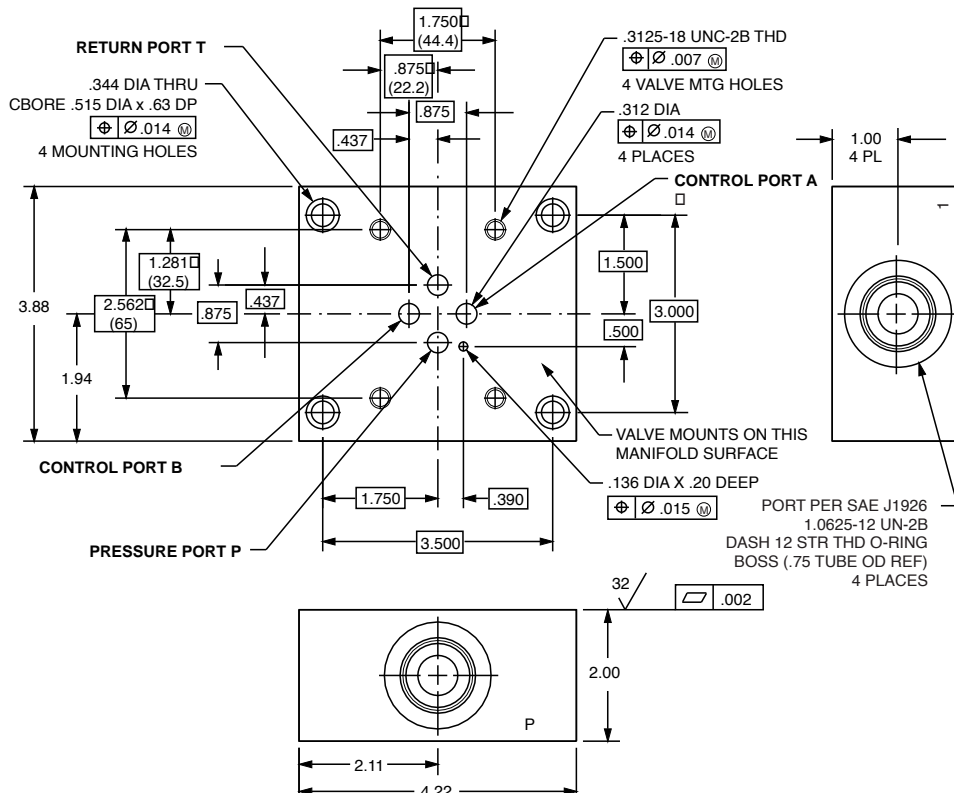
Typical characteristic curves with ±5% to ±100% input signal, measured at 1,000 psi operating pressure.



62 SERIES INSTALLATION DRAWINGS



TYPICAL SUBPLATE MANIFOLD



Null Adjust: Flow out of Control Port B will increase with clockwise rotation of null adjust screw (1/8 hex key).

The mounting manifold must conform to ISO 10372-04-04-0-92 Surface to which valve is mounted requires a $\sqrt{32}$ [$\Delta\Delta$] finish, flat within 0.002 [0.05] TIR.

62 SERIES ELECTRICAL CONNECTIONS

Rated current and coil resistance

Two different coil designs are available for 62 Series Servovalves. See Table 1.

Coil connections

A four-pin electrical connector (that mates with an MS3106R14S-2S) is standard. All four torque motor leads are available at the connector so external connections can be made for series, parallel or differential operation.

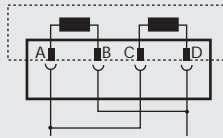
Servoamplifier

The servovalve responds to input current, therefore a servoamplifier that has high internal impedance (as obtained with current feedback) should be used. This will reduce the effects of coil inductance and will minimize changes due to coil resistance variations.

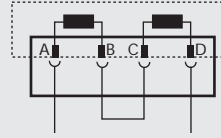
ELECTRICAL CONNECTIONS

(Example with typical 62 series coils)

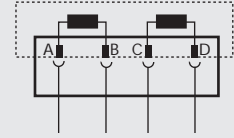
Parallel



Series



Single



| | | | | |
|--|--------------|-------------|-------------------|-----------------|
| Coil Resistance | [Ω] | 14 | 56 | 28 |
| Rated Current | [mA] | ± 100 | ± 50 | ± 100 |
| Electrical Power | [W] | .14 | .14 | .28 |
| Connections for Valve Opening | | A and C (+) | A (+), D (-) | A (+), B (-) |
| P \blacktriangleright B, A \blacktriangleright T | | B and D (-) | B and C connected | or C (+), D (-) |

Note: Before applying electrical signals, the pilot stage has to be pressured.

TABLE 1

| Nominal Resistance Per Coil at 77°F (25°C) Ω | Recommended Rated Current—mA | | Approximate Coil Inductance*—Henrys | | |
|---|---|--------------|-------------------------------------|--------------|----------------|
| | Parallel, Differential or Single Coil Operation | Series Coils | Single Coils | Series Coils | Parallel Coils |
| 28 | 100 | 50 | 0.2 | 0.8 | 0.2 |
| 300 | 30 | 15 | 2 | 7 | 2 |

* Measured at 50 Hz.

62 SERIES
ORDERING INFORMATION
SPARE PARTS AND ACCESSORIES

| Model Number | | Type Designation | |
|---|--|---|--|
| 62 | • • • • • | • • • • • | • • • • • |
| Optional Feature | | Signals for 100% Spool Stroke | |
| | Series specification | N | ±15 mA Series (±30 mA parallel) |
| K | Intrinsically safe | Z | ±50 mA Series (±100 mA parallel) |
| | | Y | Special signal (see spec sheet)* |
| Model Designation | | Valve Connector | |
| | Assigned at the factory | A | Connector C1 (A) – side (RH) |
| | | B | Connector C2 (B) – side (LH) |
| Factory Identification (Revision Level) | | Seal Material | |
| | | V | Viton |
| | | N | NBR (Buna) |
| | | | Others on request* |
| Value Version | | Pilot Connection and Pressure | |
| S | Standard response | | Pressure [psi] Supply |
| | | A | 250 to 3,000 internal |
| Rated Flow | | Spool Position without Electrical Signal | |
| | Q_N [gpm] at Δp_N = 1,000 psi | M | Mid position |
| 10 | 2.5 | Pilot Stage | |
| 20 | 5.0 | F | Standard dynamics |
| 40 | 10.0 | | |
| 60 | 15.0 | | |
| 80 | 20.0 | | |
| Maximum Operating Pressure P_P and Body Material | | | |
| F | 3,000 psi aluminum | | |
| Main Spool Type | | | |
| O | 4-way / axis cut / linear | | |
| D | 4-way / +/-10% overlap / linear | | |
| X | Special* | | |

Preferred configurations highlighted.
 All combinations may not be available.
 Options may increase price and delivery.
 Technical changes are reserved.

* Optional designs are available with intrinsically safe coils (FM approved), and/or special spool bushing lap configuration. Available seal materials: VITON (Std.), BUNA or EPR.

SPARE PARTS AND ACCESSORIES

| | | |
|---|---------------------------------|-----------------------------|
| O-Rings (included in delivery) for P,T,A and B | FPM 85 Shore 1D 0.426 x .070 | Moog P/N 42082-22 |
| Mating Connector, waterproof IP 65 (not included in delivery) | | 49054F14S2S (MS3106F14S-2S) |
| Flushing Block | | 23718-1K1 |
| Mounting Bolts (not included in delivery) 5/16 - 18 NC x 1.0 long (4 pieces) | | A31324-216B |
| Orifice Assembly with Filter (2 required) | | 70714 |
| Filter Replacement Kit | | B52555RK36K1 |



| | |
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