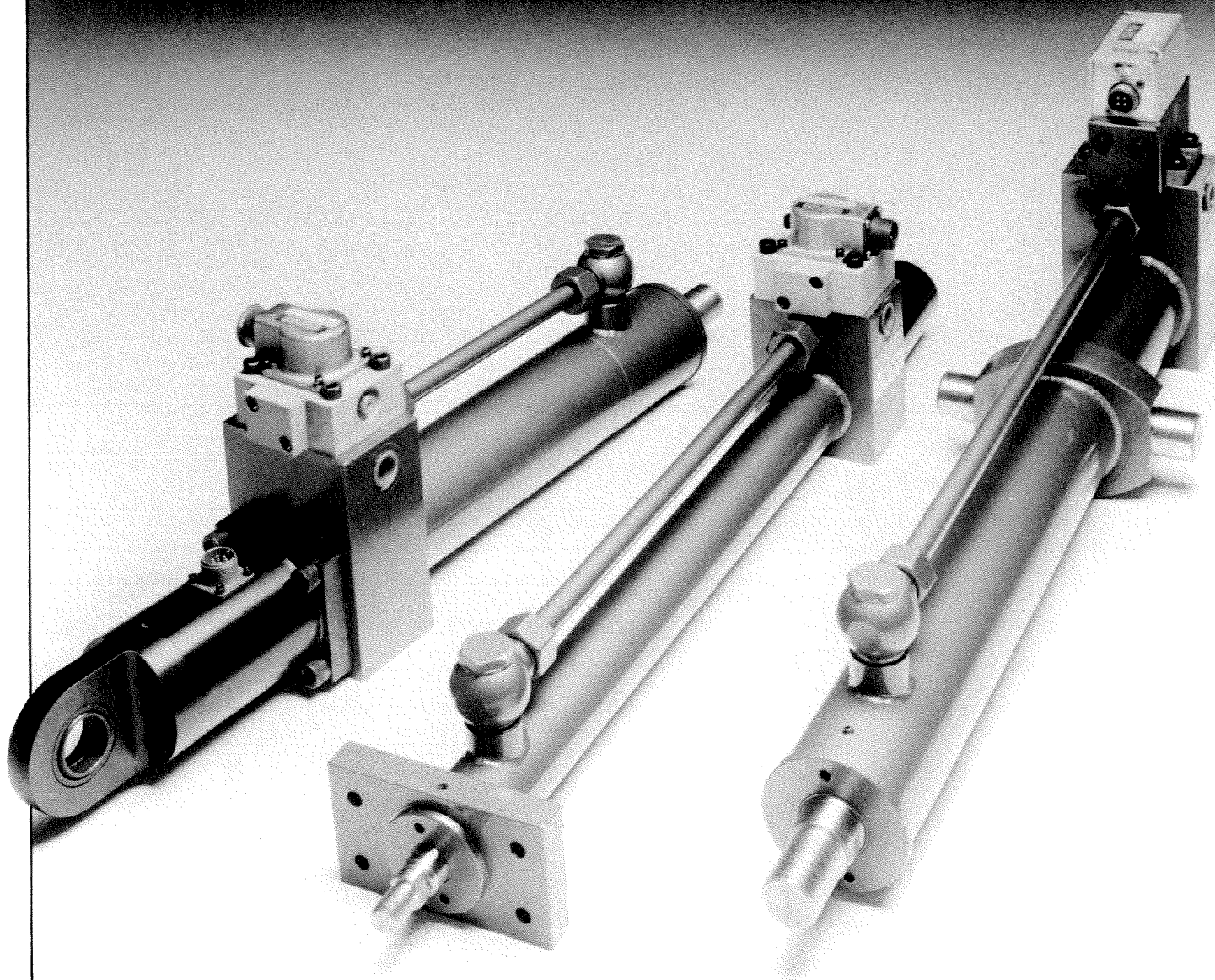


# MOOG

## **E852 Servoactuators**

Moog E852 Servoactuators are high performance long stroke cylinder and transducer assemblies specifically designed for industrial servo applications. They offer the advantages of a fully engineered design readily available at low cost. The choice of areas, strokes and servovalves will satisfy the majority of control requirements.

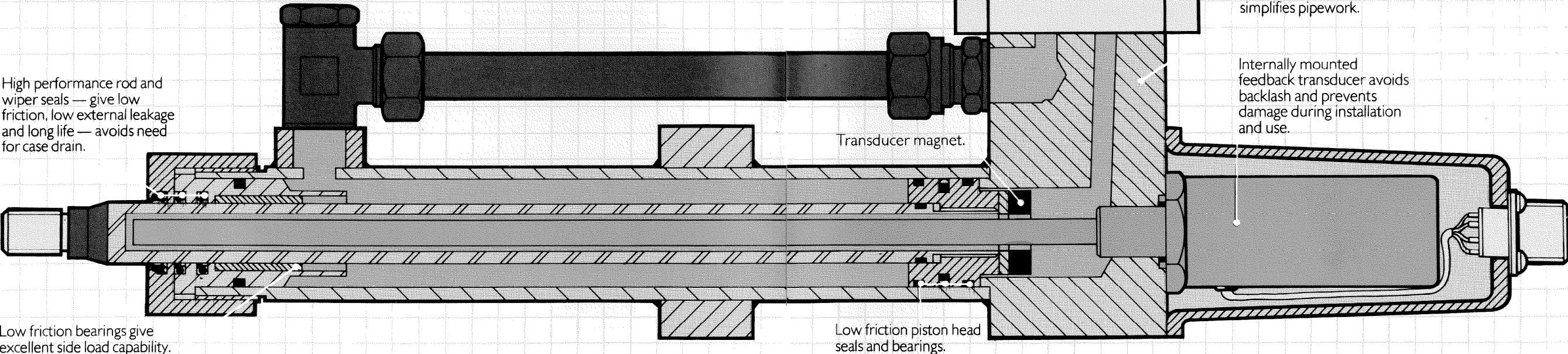


# Features of the E852 range

- Integral contactless transducer.
- Low breakout friction.
- Low leakage.
- The pre-engineered assembly eliminates plumbing between servovalve and cylinder, and avoids the need for transducer mounting brackets and other nuisances associated with using separate components.
- The position transducer is internally mounted and coaxially connected to eliminate backlash and prevent damage during installation and use.
- Rear cylinder end cap provides integral manifold for mounting a choice of Moog servovalves.
- Long life seals and bearings minimise maintenance.
- Field serviceable.

## Benefits

- The pre-engineered assembly eliminates plumbing between servovalve and cylinder, and avoids the need for transducer mounting brackets and other nuisances associated with using separate components.
- The position transducer is internally mounted and coaxially connected to eliminate backlash and prevent damage during installation and use.



# Specifications

## General specifications

Supply pressure	210 bar maximum
Operating temperature range	−40°C to 85°C
Fluid	petroleum base, hydraulic fluid
Supply filtration required	25 µm absolute or better
External leakage	typically 1 drop/5000 cycles at 100 bar
Breakout force	typically 50N (12 lbf)
Actuator orientation	any

## Cylinder specifications

Cylinder bore size (mm)	40	63	80	100
Piston head area (mm <sup>2</sup> )	1260	3120	5000	7850
Annulus area (mm <sup>2</sup> )	880	2100	3440	5400

Cylinder strokes from 216 up to 1000mm are available as standard. Longer strokes are available on special order.

## Position transducer

E852 Servoactuators use a full stroke contactless position transducer coaxially mounted on the piston centreline. A protective tube isolates the transducer sensing elements from the hydraulic fluid.

The physical length of the transducer is approximately 1.7 times the working stroke which keeps the overall size of the actuator to a minimum.

## Electronics specifications

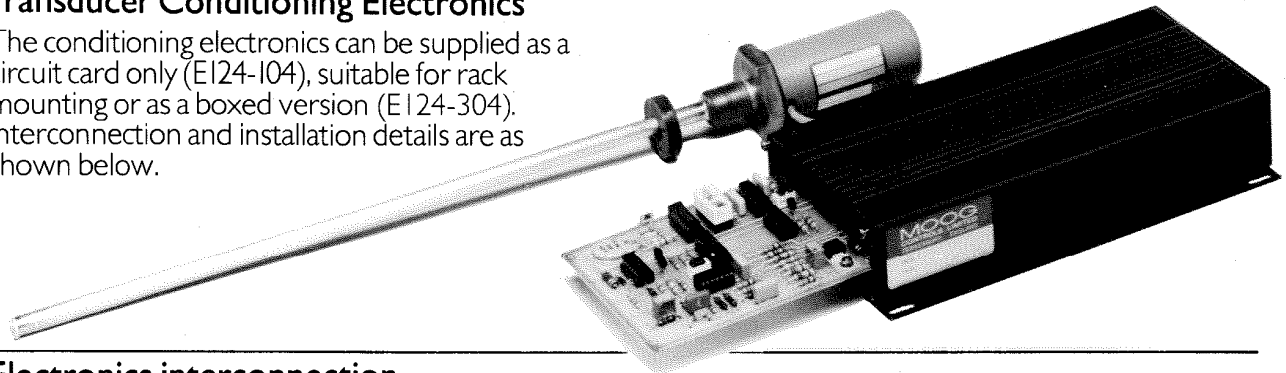
Temperature range	0 to 50°C
Temp coefficient	0.13% per °C
Zero adjustment	Nominal 2% of full stroke
Ripple	Less than 0.8% of full output
Linearity	Less than ± 0.05% of full stroke
Repeatability	Better than ± 0.002% of full stroke
Frequency response	Typical 400Hz, for 200mm stroke
Output voltage	0 to +10V DC (bipolar also available)
Zero output	Either end of transducer (factory set)
Power consumption	150mA from +15V plus 50mA from −15V

# Position transducer & electronics

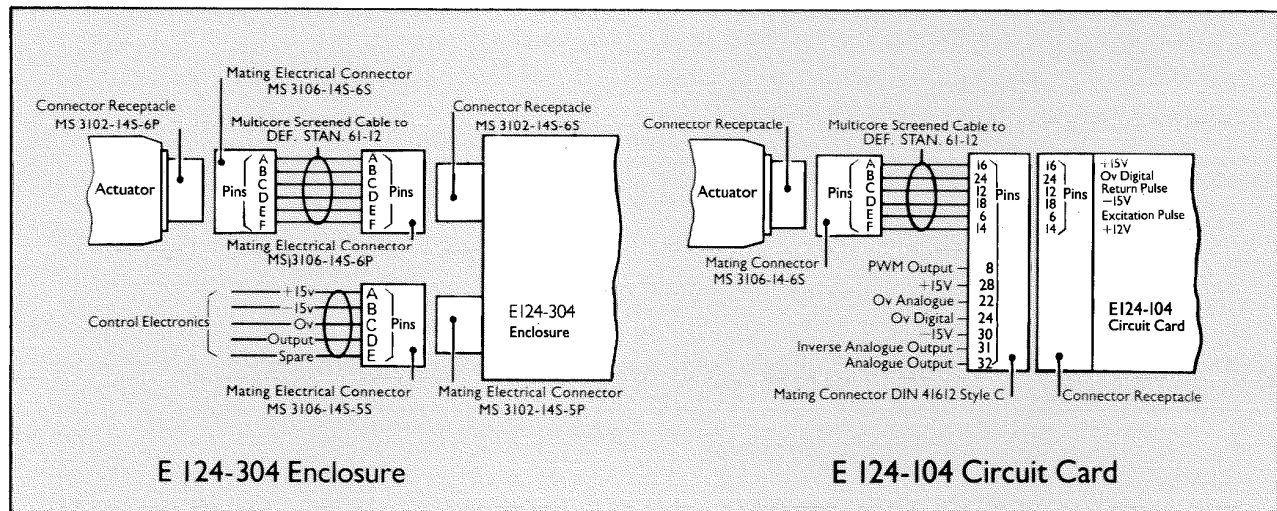
The sensing elements of the position transducer consist of a wire stretched inside a ferromagnetic tube which is attached to the transducer housing. A permanent magnet attached to the piston head creates a radial magnetic field around the tube. A crystal controlled sequence of current pulses are transmitted down the wire. When a pulse passes the radial magnetic field a torsional strain is induced in the ferromagnetic tube. The basic transducer output is a pulse-width modulated signal in which the pulse-width is the time between sending a current pulse and receiving a corresponding pulse of torsional strain. A DC output is obtained by filtering the pulse-width modulated signal using the conditioning electronics.

## Transducer Conditioning Electronics

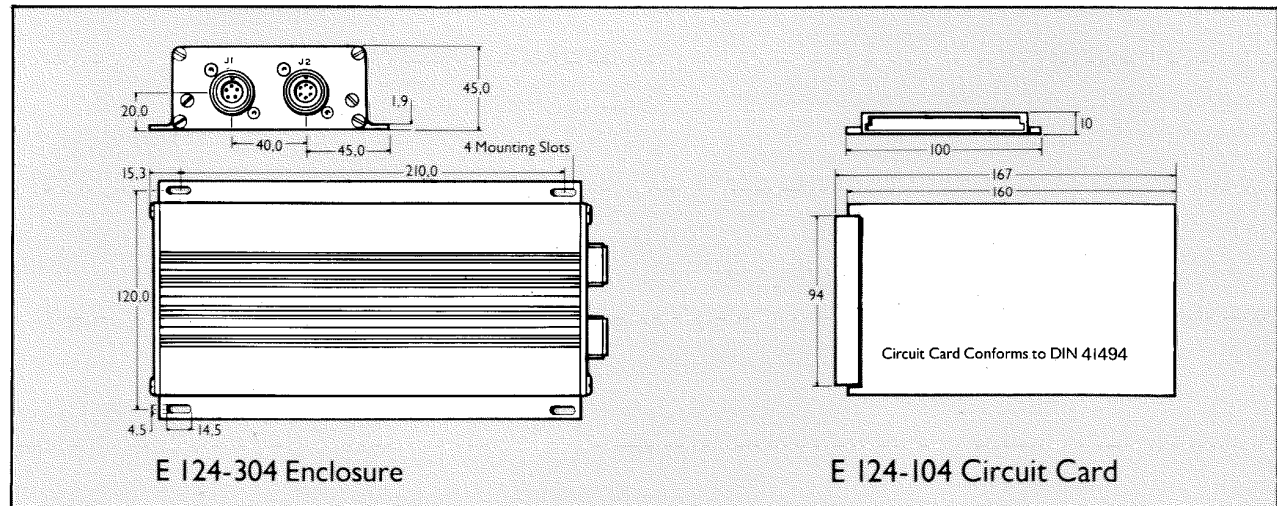
The conditioning electronics can be supplied as a circuit card only (E124-I04), suitable for rack mounting or as a boxed version (E124-304). Interconnection and installation details are as shown below.



## Electronics interconnection.

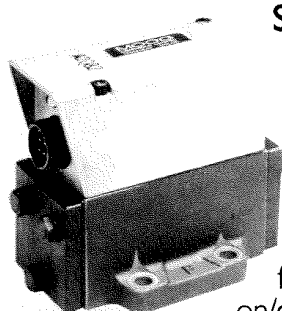


## Electronics installation.



# Servovalves

The E852 servoactuator provides an integral manifold for mounting a servo valve and for connecting the supply and return hydraulic lines. The 40mm and 63mm bore units accept either the low cost Series 62 or the higher performance Series 760, whereas the 80mm and 100mm accept the higher flow Series 78. Moog servo valves can be supplied intrinsically safe.



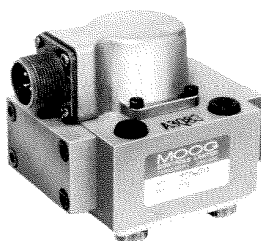
## Series 62 (low cost)

A fully-fledged, two stage, proportional flow control servo valve with mechanical feedback, dry torque motor and other features found only in higher cost servo valves. The Series 62 fills the gap between crude on/off controls and conventional, high performance servo valves.

Available with rated capacities of 10, 20, 40, 60 and 77 L/min., at 70 bar drop and supply pressures to 210 bar.

## Series 760 (high performance)

A two stage, mechanical feedback, flow control servo valve with high frequency response. Reliable mechanical feedback design having



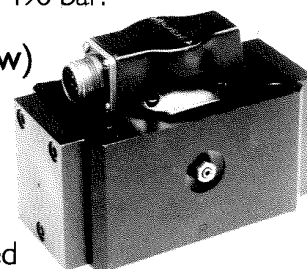
a dry, double air gap, torque motor.

Available with rated capacities of 5, 10, 20, 40, and 63 L/min. at 70 bar drop and supply pressures to 210 bar. Alternative models available for supply pressures up to 490 bar.

## Series 78 (medium flow)

Two stage, mechanical feedback, flow control servo valve with the advantages of the Series 760 but higher flow rates.

Available with rated capacities of 77, 115 and 150 L/min. at 70 bar drop and supply pressures to 210 bar. Typical frequency response is 90° phase lag at 25Hz. Higher response versions are also available.



# Optional manifolds

A range of manifolds which can be directly mounted between the servo valve and cylinder to satisfy differing control requirements is available. These include:

## ● Adjustable metering orifice manifold (AMO)

An adjustable bleed between the control ports can be used to improve stability in position or load systems.

## ● Pressure transducer manifold (PT)

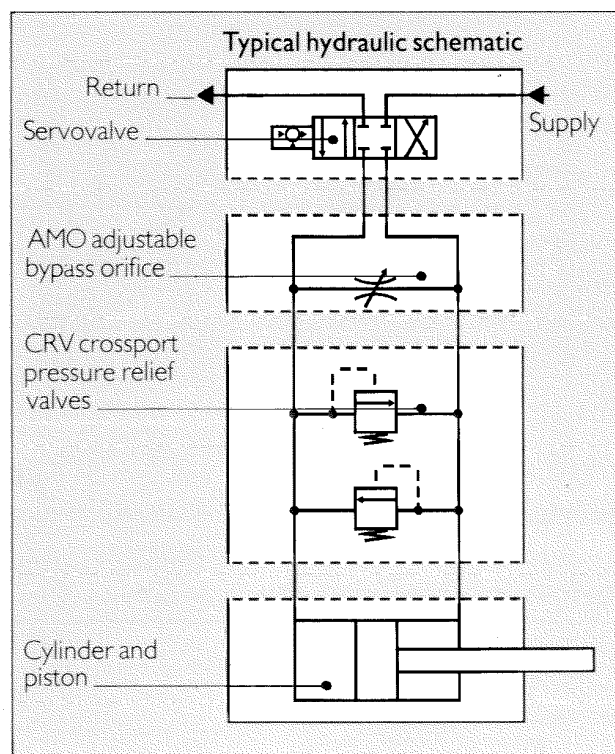
This manifold provides  $\frac{3}{8}$  BSP tapings into the control ports. Pressure transducers can be then fitted to measure control port pressures for load control loops or for load monitoring in position loops.

## ● Cross port relief manifold (CRV)

Cross port relief valves can be used to limit differential pressures. These can be used to prevent overstressing of the load or overpressurising the cylinder by sudden acceleration of a high inertia load.

## ● 3-way manifold (3W)

Where high output force is not necessary, a 3-way manifold can be used to reduce the

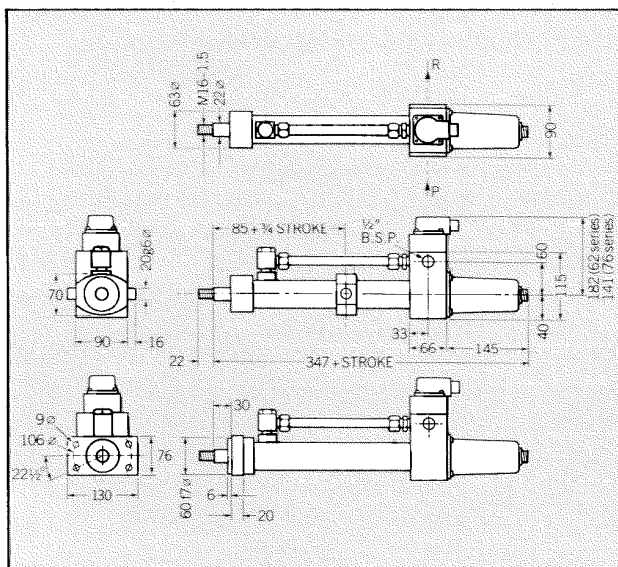


power consumption of the power pack. The 3-way manifold connects the rod end of the actuator to the pressure line and blocks the corresponding servo valve control port.

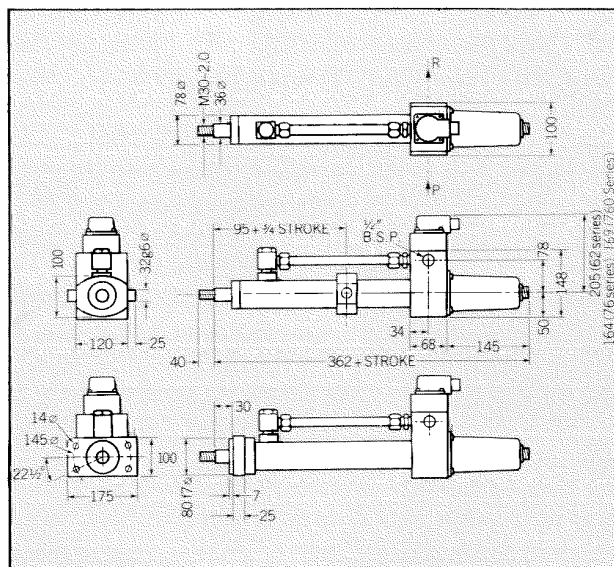


# Actuator dimensions

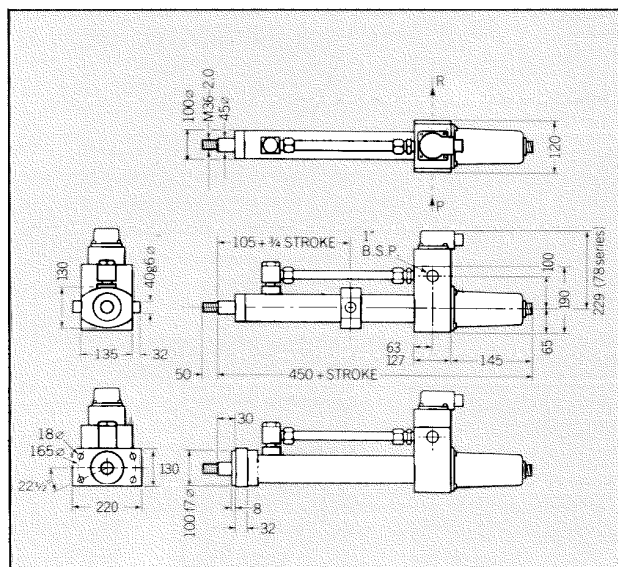
## 40mm bore



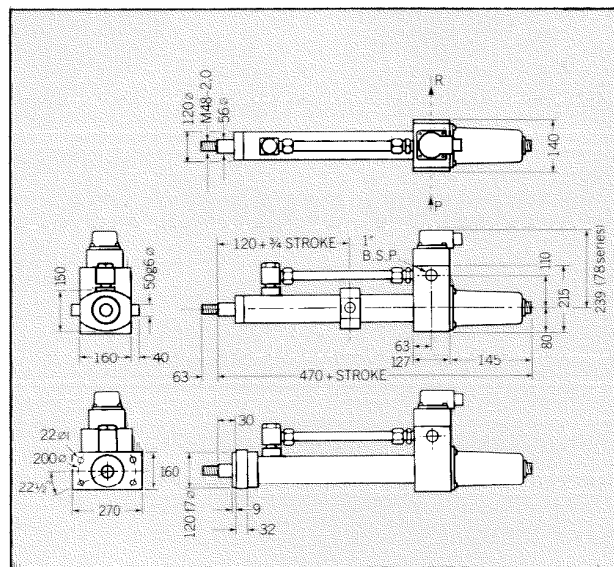
## 63mm bore



## 80mm bore



## 100mm bore



**For full installation details consult Moog.**

Standard strokes are: 216, 320, 400, 500, 600, 800 and 1000mm.

For longer strokes please consult the factory.

**Format for specifying actuator size.**

E852	40	100	FF	00
Factory identification	Bore	Stroke	Mounting	Standard configuration
	040 = 40mm	216 = 216mm	FF = Front Flange	
	063 = 63mm	500 = 500mm	MT = Mid-Trunnion	
	080 = 80mm	800 = 800mm	RE = Rear Eye	
	100 = 100mm			

**Note.** Servovalve, electronics, mating connectors and other accessories to be ordered separately.

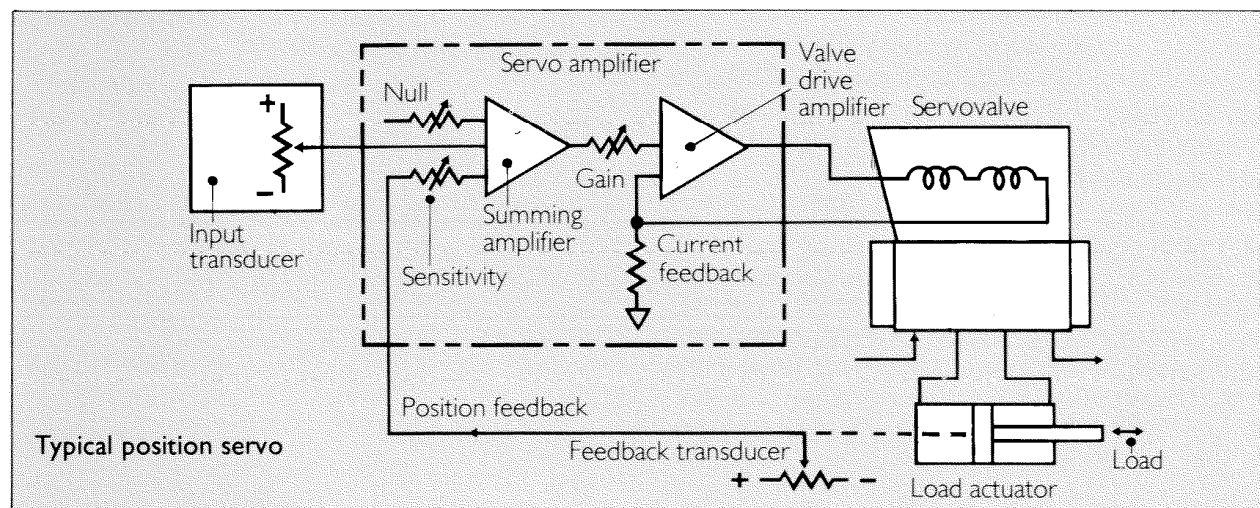
# Position servo

A position control servo can be created with an E852 actuator, a servovalve and a servoamplifier.

The position transducer within the E852 produces a DC voltage proportional to the position of the piston. The servoamplifier compares this voltage to that of a command signal, and the amplified difference is fed to the

servovalve coils. The flow of oil from the servovalve to the piston is proportional to this difference or 'error' signal.

Moog supplies servoamplifiers specifically designed for electrohydraulic servos. These vary from simple single-channel amplifiers to rack-mounted, multi-channel systems.



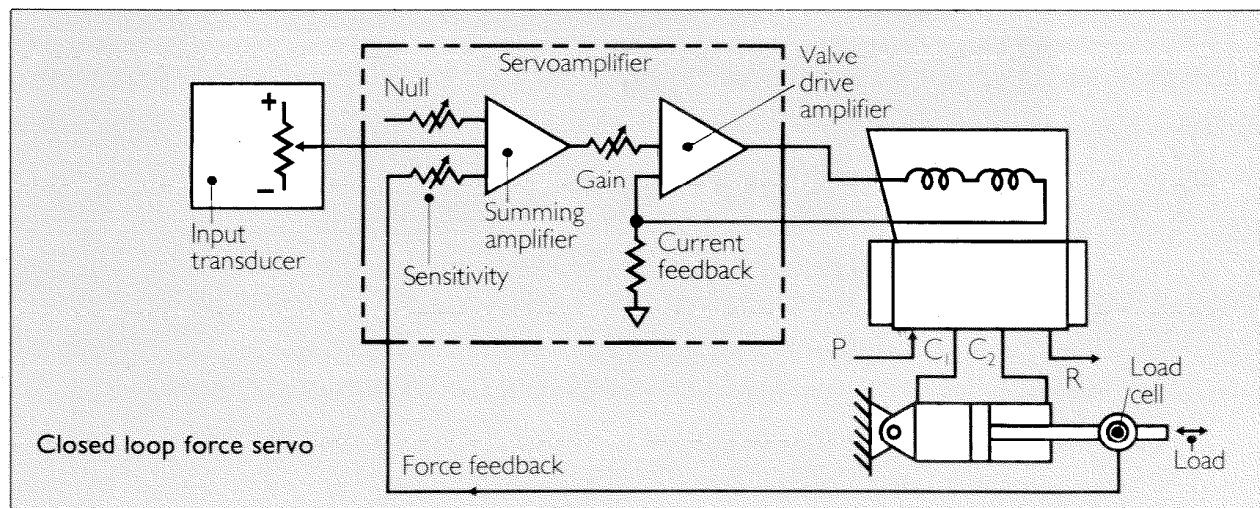
# Force servo

E852 actuators can be used in force control loops. Instead of using the position potentiometer, either a load cell or differential pressure transducers are used to measure the force exerted by the actuator.

In most force loops, an integrating amplifier is used. This maintains the signal to the servovalve

when the command and load cell signals are equal. An adjustable metering orifice bleed between the control ports is normally used to improve the stability of the system.

Moog can supply sandwich manifolds which incorporate the adjustable metering orifice or tappings for pressure transducers.



# Accessories

## Fluid Supply Filtration

Good filtration will extend the life and reliability of E852 servoactuators as well as that of other components within the hydraulic system.

The recommended arrangement is for a  $15\text{ }\mu\text{m}$  ( $\beta_{15} \geq 75$ ) to  $30\text{ }\mu\text{m}$  full flow, non by-pass filter immediately upstream of the actuator with a  $3\text{ }\mu\text{m}$  ( $\beta_3 \geq 75$ ) in the return line.

Moog can supply filters to meet these requirements. Elements on high pressure filters will withstand 210 bar (3000 psi) differential pressure without collapsing. Electrical dirt alarms are supplied as standard.

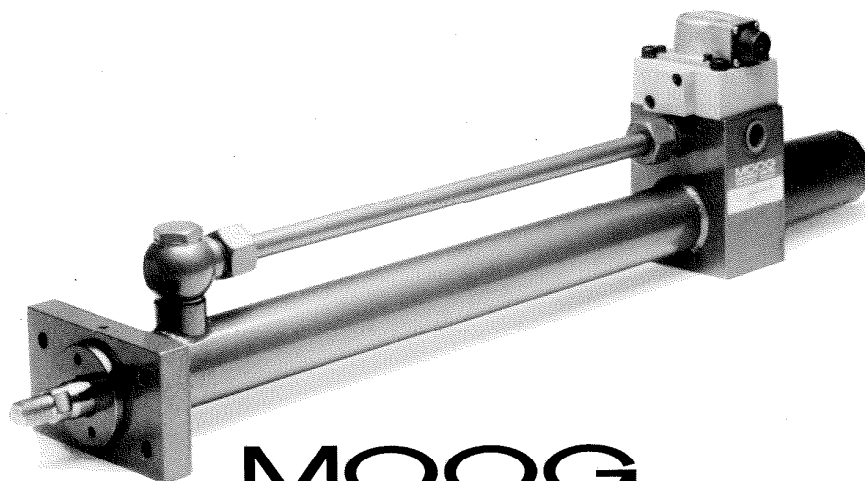
## Servocontrollers

Several types of servocontrollers specifically designed for closed loop electrohydraulic systems that control position, velocity or force are available. Systems which require just a few servoloops can be economically built using the well proven 82-300 servocontroller. Systems with multiple channels of control are better handled by System 127 modular electronics. A variety of standard cards are available which enable complex systems to be built with the minimum of cost.

## Cylinder seal kits

Actuator bore	Part number
40mm	A56664
63mm	A56665
80mm	A56666
100mm	A56667

Servovalve connector 49054F 014S 002S



# MOOG

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Moog Controls Limited pursue a policy of continuous development and reserve the right to alter designs and specifications without prior notice.