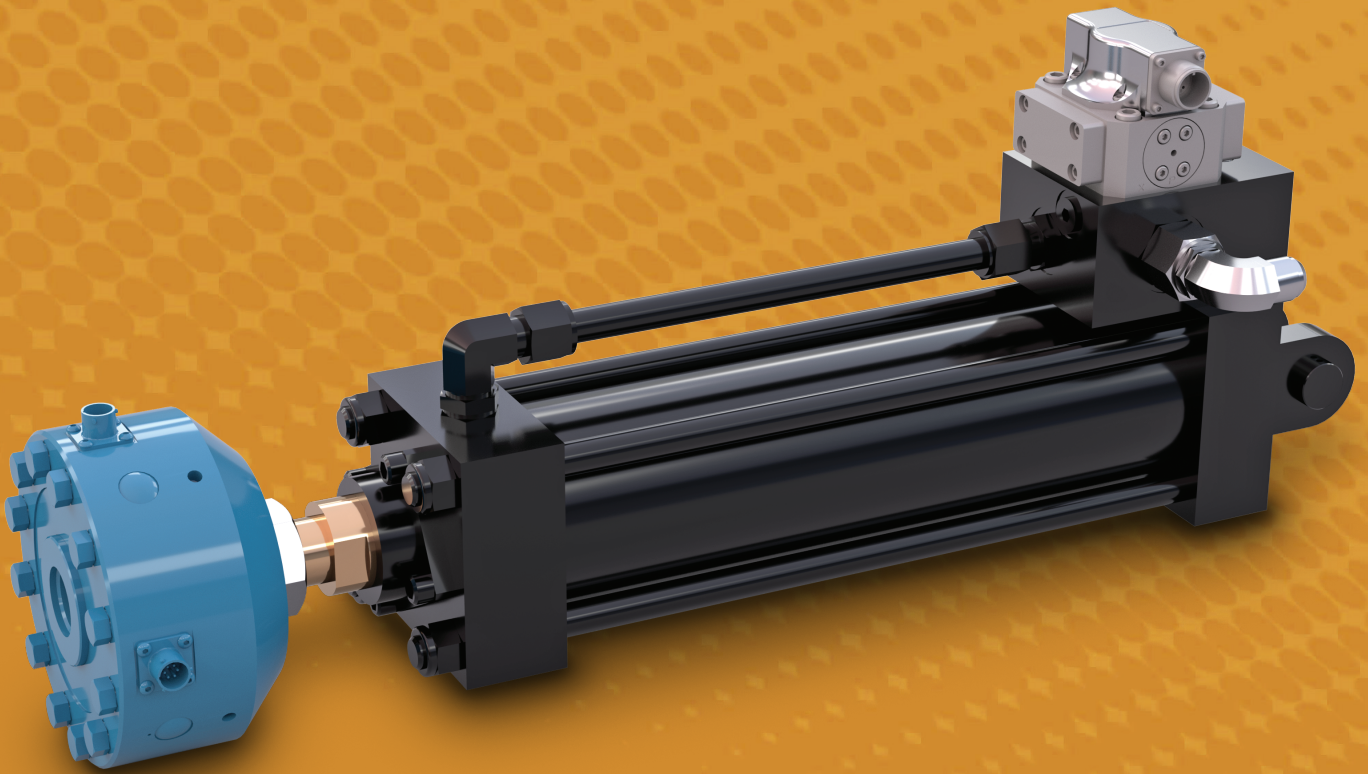


HYDRAULIC TEST ACTUATOR

SINGLE-ENDED



Rev. C, May 2026

DELIVERING FLEXIBILITY AND
RELIABILITY FOR A RANGE OF SINGLE
AND MULTIPLE CHANNEL TEST SYSTEMS

SHAPING THE WAY OUR WORLD MOVES™

MOOG

Whenever the highest levels of motion control performance and design flexibility are required, you'll find Moog expertise at work. Through collaboration, creativity and world-class technological solutions, we help you overcome your toughest engineering obstacles. Enhance your machine's performance, achieve greater efficiencies and help take your thinking further than you ever thought possible.

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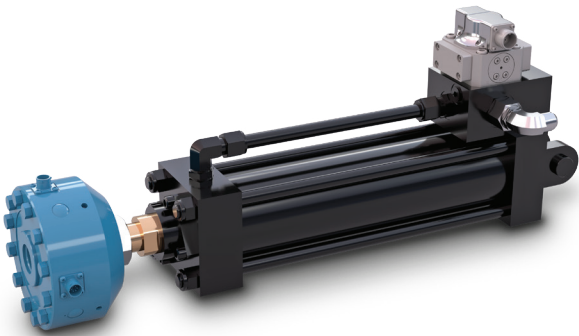
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This catalog is for users with technical knowledge. To ensure that all necessary characteristics for function and safety of the system are given, the user has to check the suitability of the products described herein. The products described herein are subject to change without notice. In case of doubt, please contact Moog.

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OVERVIEW

Actuators are at the heart of high-performance test systems such as those used for aerospace structural testing. For years, test engineers have been looking for actuators that deliver dependability, less maintenance and high performance, yet are available at an affordable price. Their expectation has been to expedite tests to obtain accurate test results more efficiently.

With deep roots in electro-hydraulic servo control expertise and global test experience, Moog has designed

servo actuators for some of the world’s most demanding applications – from Primary Flight Control System Actuators to Automatic Gap Control Actuators used in steel mill production line.

Today, Moog engineers have further developed a new series of Actuators, the -086-3 Single-Ended Hydraulic Test Actuator to meet the critical test needs of test engineers.

Actuator Series Code: C086A3

Features	Benefits
8 force sizes (tension/compression) • 4.9 / 9.4 kip (22.1 / 41.9 kN) • 10.2 / 14.7 kip (45.7 / 65.5 kN) • 17.6 / 24.8 kip (78.6 / 110.7 kN) • 22.9 / 37.6 kip (102.2 / 167.7 kN) • 37.6 / 58.9 kip (167.7 / 262 kN) • 55.9 / 84.8 kip (248.9 / 377.3 kN) • 103 / 150.7 kip (458.5 / 670.8 kN) • 187.9 / 235.6 kip (835.8 / 1048.1 kN) • 223.8 / 339.2 kip (995.7 / 1509.2 kN) Available stroke lengths from 12 inches to 999 inches in one-inch increments	Wide array of sizes and flexibility Easy to size and fit the applications
• Direct mount manifold for single servovalve with • S04 mounting pattern (ISO 10372-004-04-0-92)	Wide Moog servo valve selection – meet the speed and response required
“Building Block” concept and COTS (Commercial-Off-The-Shelf) components	Quick selection and short lead time; lower acquisition cost
High accuracy loadcell, dual bridge	Higher test accuracy and test safety
Multiple mounting options	Wider mounting options to ease the selection and adaptation to application
Multiple hydraulic porting • JIC and Quick Disconnect	Flexibility to adapt to specific application scenarios

Solutions Built Around You

Moog Single-Ended Hydraulic Test Actuator delivers higher reliability, less maintenance and cost-effective performance for test labs seeking the competitive edge.

Typical Applications:

- Aerospace structural static and fatigue testing
- Civil engineering testing
- General industrial servo control applications

SPECIFICATIONS

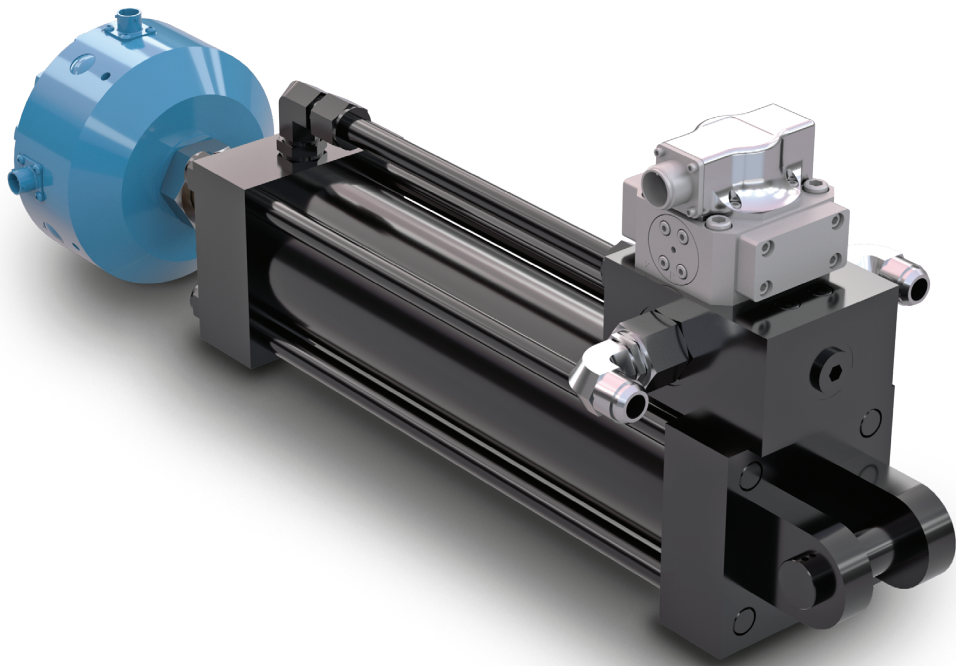
Model Number	Compression	Tension	Actuator Rod and Bore Sizes			
			Bore Dia	Rod Dia	Bore Area	Rod Area
	kN (lb)	kN (lb)	mm (in)	mm (in)	mm ² (in ²)	mm ² (in ²)
-086-31	41.9 (9425)	22.1 (4970)	50.80 (2)	34.93 (1.375)	2026.83 (3.14)	1068.84 (1.66)
-086-32	65.5 (14726)	45.7 (10272)	63.50 (2.5)	34.93 (1.375)	3166.92 (4.91)	2208.93 (3.42)
-086-33	110.7 (24887)	78.6 (17671)	82.55 (3.25)	44.45 (1.75)	5352.10 (8.30)	3800.31 (5.89)
-086-34	167.7 (37699)	102.2 (22973)	101.60 (4)	63.50 (2.5)	8107.32 (12.57)	4940.40 (7.66)
-086-35	262.0 (58905)	167.7 (37699)	127.00 (5)	76.20 (3)	12667.69 (19.63)	8107.32 (12.57)
-086-36	377.3 (84823)	248.9 (55960)	152.40 (6)	88.90 (3.5)	18241.47 (28.27)	12034.30 (18.65)
-086-37	670.7 (150796)	458.5 (103084)	203.20 (8)	114.30 (4.5)	32429.28 (50.27)	22168.45 (34.36)
-086-38	1048.0 (235619)	835.8 (187907)	254.00 (10)	114.30 (4.5)	50670.75 (78.54)	40409.92 (62.64)
-086-39	1509.2 (339292)	995.6 (223838)	304.80 (12)	177.80 (7)	72965.88 (113.10)	48137.21 (74.61)

Forces are calculated at 3,000 psi (210 bar)

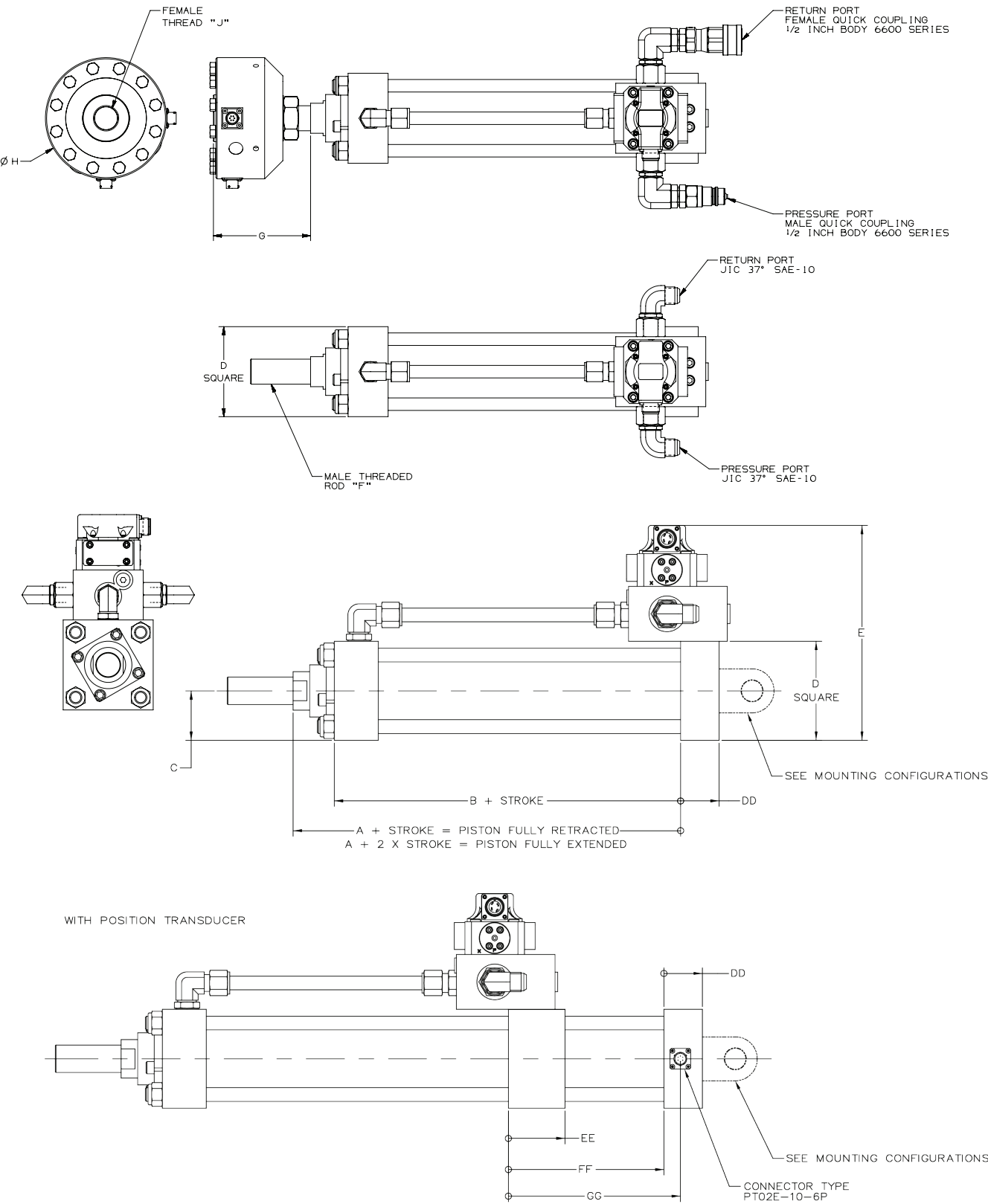


Additional Actuator Specifications

Pressure	
Operating pressure	3,000 psi (210 bar)
Maximum return pressure	200 psi (0.14 bar)
Seals and Wear Bands	
O-rings	90 durometer Buna-N Nitrile
Wear bands (piston and rod gland)	Low friction
Asymmetrical twin lip piston seal with backup	Provides static and dynamic sealing
Urethane H type wiper seal	Keeps contaminants off the rod
Hydraulic Interface	
Pressure line	JIC Flare SAE -10 or Male quick coupling
Return	JIC Flare SAE -10 or Female quick coupling
Operation Temperature Range	
Hydraulic oil temperature	24 °C (75 °F) to 57 °C (134 °F)
Oil Requirements	
System fluid	Hydraulic oil as per DIN 51524 parts 1 to 3 and ISO VG 32, 46 or equivalent
Cleanliness level	ISO 4406 (SAE J1165) 15/14/11 (NAS 5)
Standard electrical connector mates with following, or equivalent (IP65)	
G761 servo valve	MS3106F14S-2S
Position transducer and load cell	PT06A-10-6S

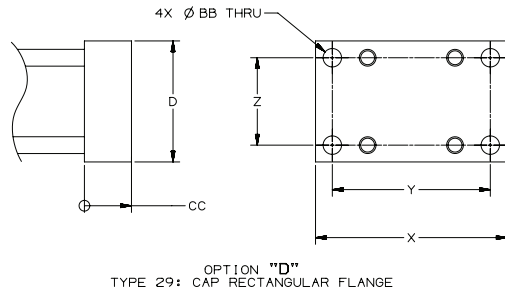
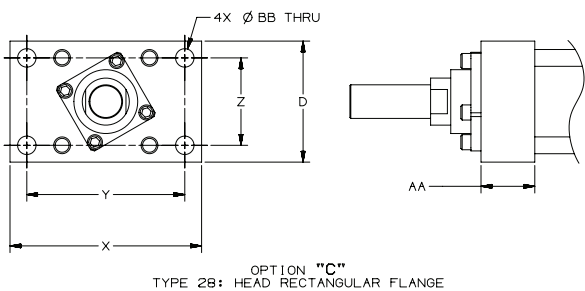
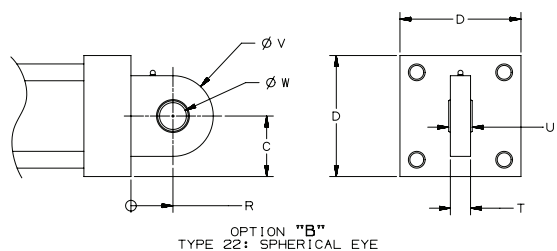
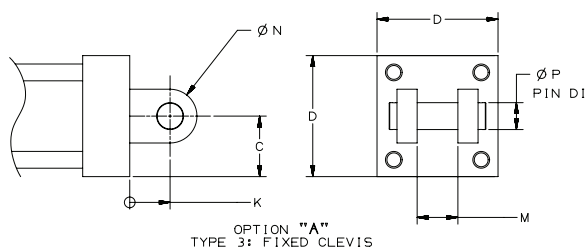


DIMENSIONS -086-31 / 32 / 33 / 34 / 35 / 36

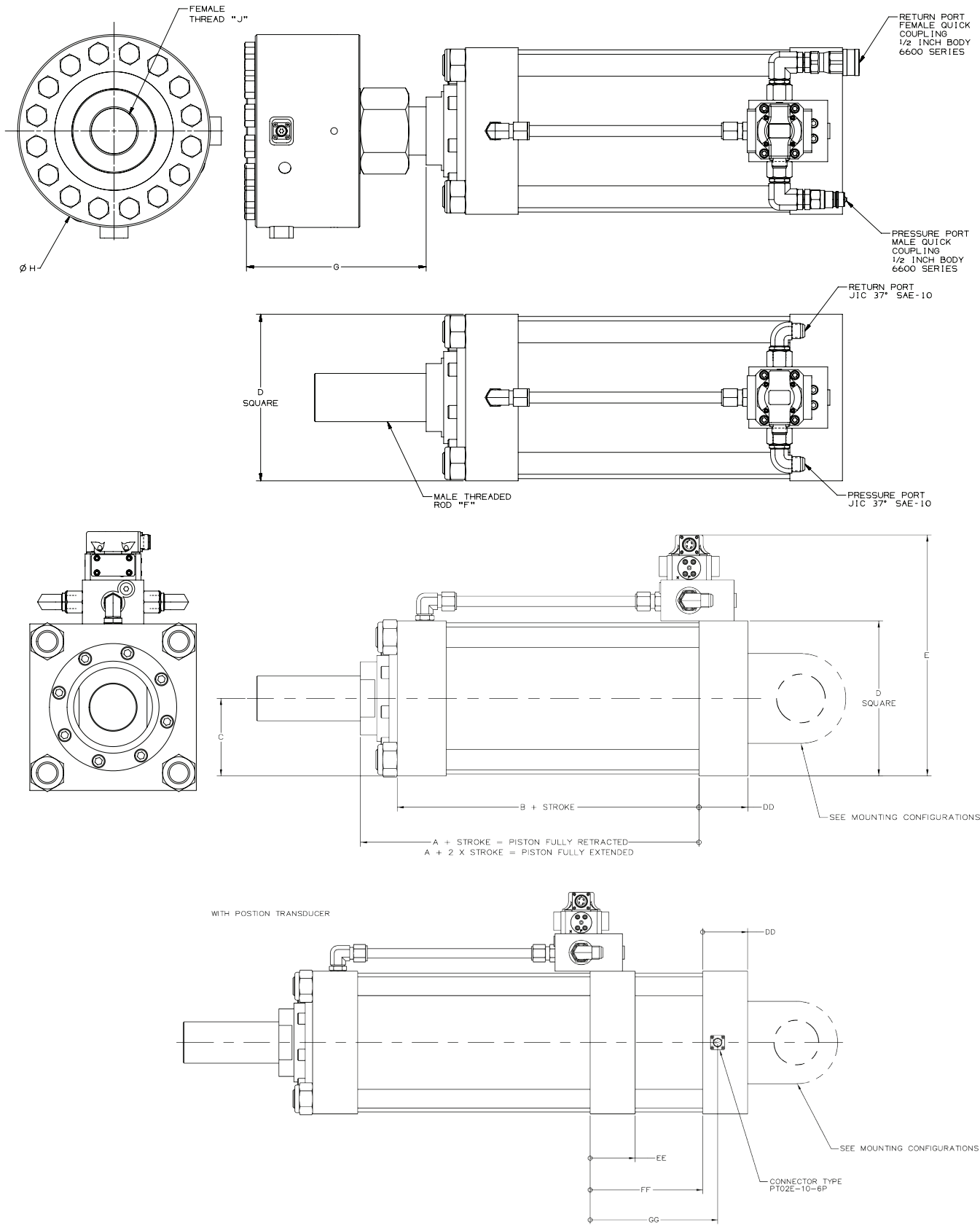


DIMENSIONS -086-31 / 32 / 33 / 34 / 35 / 36 *continued*

MOUNTING CONFIGURATIONS

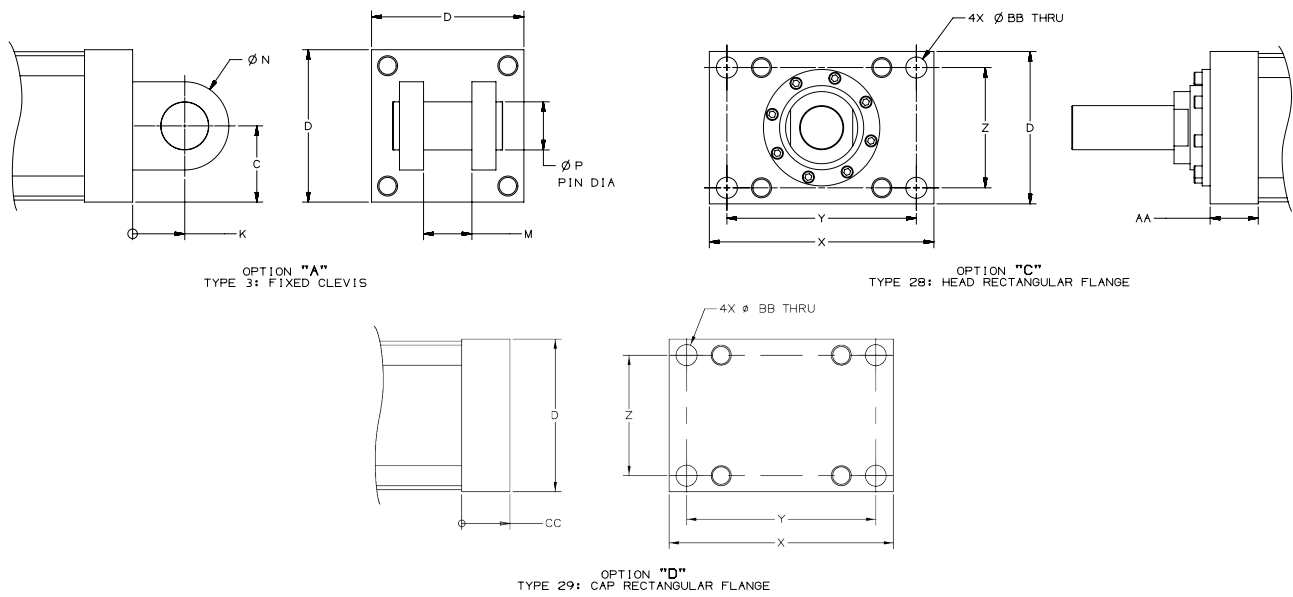


DIMENSIONS - -086-37 / 38 / 39



DIMENSIONS - -086-37 / 38 / 39 continued

MOUNTING CONFIGURATIONS



Model Number	Nominal Force		A	B	C	D	E	F	
	kip	kN	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	Thread	
-086-31	4.9 / 9.4	22.1 / 41.9	158.8 (6.25)	117.6 (4.63)	38.1 (1.5)	76.2 (3)	210.1 (8.27)	0.625-18 x 2.5L	
-086-32	10.2 / 14.7	45.7 / 65.5	161.9 (6.375)	120.7 (4.75)	44.5 (1.75)	88.9 (3.5)	222.8 (8.77)	1.25-12 X 3L	
-086-33	17.6 / 24.8	78.6 / 110.7	187.5 (7.38)	139.7 (5.5)	57.2 (2.25)	114.3 (4.5)	248.2 (9.77)	1.25-12 X 3L	
-086-34	22.9 / 37.6	102.2 / 167.7	203.2 (8)	146.1 (5.75)	63.5 (2.5)	127 (5)	260.9 (10.27)	1.25-12 X 3L	
-086-35	37.6 / 58.9	167.7 / 262	215.9 (8.5)	158.8 (6.25)	82.6 (3.25)	165.1 (6.5)	299 (11.77)	1.5-12 X 3.75L	
-086-36	55.9 / 84.8	248.9 / 377.3	244.6 (9.63)	187.5 (7.38)	95.3 (3.75)	190.5 (7.5)	324.4 (12.77)	1.75-12 X 4.12L	
-086-37	103 / 150.7	458.5 / 670.8	298.5 (11.75)	241.3 (9.5)	120.7 (4.75)	241.3 (9.5)	375.2 (14.77)	2.75-8 X 6.38L	
-086-38	187.9 / 235.6	835.8 / 1048.1	382.5 (15.06)	307.9 (12.12)	160.3 (6.31)	320.6 (12.62)	454.4 (17.89)	2.75-8 X 6.38L	
-086-39	223.8 / 339.2	995.7 / 1509.2	455.7 (17.94)	368.3 (14.5)	189 (7.44)	378 (14.88)	511.6 (20.14)	3.0-12 X 6.12L	
Model Number	G	H	J	K	M	N	P	R	T
	mm (in)	mm (in)	Thread	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
-086-31	95 (3.74)	104.6 (4.12)	0.625-18 x 1.5 Dp	31.8 (1.25)	32 (1.26)	38.1 (1.5)	19.1 (0.75)	30.2 (1.19)	14.2 (0.56)
-086-32	127.5 (5.02)	153.9 (6.06)	1.25-12 X 1.5 Dp	31.8 (1.25)	31.8 (1.25)	38.1 (1.5)	19.1 (0.75)	30.2 (1.19)	14.2 (0.56)
-086-33	123.4 (4.86)	153.9 (6.06)	1.25-12 X 1.5 Dp	38.1 (1.5)	38.6 (1.52)	50.8 (2)	25.4 (1)	39.6 (1.56)	19.1 (0.75)
-086-34	127.5 (5.02)	153.9 (6.06)	1.25-12 X 1.5 Dp	53.8 (2.12)	51.3 (2.02)	69.9 (2.75)	35.1 (1.38)	49.3 (1.94)	26.2 (1.03)
-086-35	160 (6.3)	153.9 (6.06)	1.5-12 X 2.0 Dp	57.2 (2.25)	64 (2.52)	88.9 (3.5)	44.5 (1.75)	62 (2.44)	33.3 (1.31)
-086-36	175 (6.89)	203.2 (8)	1.75-12 X 2.2 Dp	63.5 (2.5)	64 (2.52)	101.6 (4)	50.8 (2)	68.3 (2.69)	38.1 (1.5)
-086-37	260.4 (10.25)	279.4 (11)	2.75-8 X 3.2 Dp	82.6 (3.25)	76.7 (3.02)	139.7 (5.5)	76.2 (3)	N/A	N/A
-086-38	273.8 (10.78)	279.4 (11)	2.75-8 X 3.7 Dp	101.6 (4)	102.1 (4.02)	177.8 (7)	88.9 (3.5)	N/A	N/A
-086-39	278.9 (10.98)	311.2 (12.25)	3.0-12 X 4.0 Dp	114.3 (4.5)	114.8 (4.52)	203.2 (8)	101.6 (4)	N/A	N/A
Model Number	U	V	W	X	Y	Z	AA	BB	CC
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
-086-31	16.8 (0.66)	63.5 (2.5)	19.1 (0.75)	130 (5.12)	104.6 (4.12)	52.1 (2.05)	44.5 (1.75)	14.2 (0.56)	38.1 (1.5)
-086-32	16.8 (0.66)	63.5 (2.5)	19.1 (0.75)	142.7 (5.62)	117.3 (4.62)	64.8 (2.55)	44.5 (1.75)	14.2 (0.56)	38.1 (1.5)
-086-33	22.4 (0.88)	76.2 (3)	25.4 (1)	180.8 (7.12)	149.4 (5.88)	82.6 (3.25)	50.8 (2)	17.5 (0.69)	44.5 (1.75)
-086-34	30.2 (1.19)	88.9 (3.5)	35.1 (1.38)	191 (7.52)	162.1 (6.38)	97 (3.82)	50.8 (2)	17.5 (0.69)	44.5 (1.75)
-086-35	38.9 (1.53)	114.3 (4.5)	38.1 (1.5)	247.7 (9.75)	208 (8.19)	125.7 (4.95)	50.8 (2)	23.9 (0.94)	44.5 (1.75)
-086-36	44.5 (1.75)	139.7 (5.5)	50.8 (2)	285.8 (11.25)	239.8 (9.44)	145.5 (5.73)	57.2 (2.25)	26.9 (1.06)	57.2 (2.25)
-086-37	N/A	N/A	N/A	355.6 (14)	300 (11.81)	190.5 (7.5)	76.2 (3)	33.3 (1.31)	76.2 (3)
-086-38	N/A	N/A	N/A	482.6 (19)	403.4 (15.88)	244.3 (9.62)	93.7 (3.69)	46 (1.81)	93.7 (3.69)
-086-39	N/A	N/A	N/A	558.8 (22)	469.9 (18.5)	290.8 (11.45)	112.8 (4.44)	52.3 (2.06)	112.8 (4.44)

Model Number	DD	EE	FF	GG
	mm (in)	mm (in)	mm (in)	mm (in)
-086-31	38.1 (1.5)	65.5 (2.58)	179.8 (7.08)	198.9 (7.83)
-086-32	38.1 (1.5)	65.5 (2.58)	179.8 (7.08)	198.9 (7.83)
-086-33	44.5 (1.75)	65.5 (2.58)	179.8 (7.08)	196.3 (7.73)
-086-34	44.5 (1.75)	65.5 (2.58)	179.8 (7.08)	198.9 (7.83)
-086-35	44.5 (1.75)	65.5 (2.58)	179.8 (7.08)	198.9 (7.83)
-086-36	57.2 (2.25)	57.2 (2.25)	171.5 (6.75)	190.5 (7.5)
-086-37	76.2 (3)	76.2 (3)	190.5 (7.5)	215.9 (8.5)
-086-38	93.6 (3.69)	93.6 (3.69)	207.9 (8.19)	233.3 (9.19)
-086-39	112.7 (4.44)	112.7 (4.44)	227.0 (8.94)	258.7 (10.19)

CONFIGURATION ACTUATOR TO MEET YOUR NEEDS

A variety of building blocks are available to configure the exact actuator per test rig design or application requirements (see illustrative drawing at right). Various Moog high performance servo valves and load cells are provided to help application engineer to pick up the right one for a specific actuator to avoid oversizing or under-sizing. Mounting joints and bases are also provided to adapt to the installation requirements.

OPTIONS

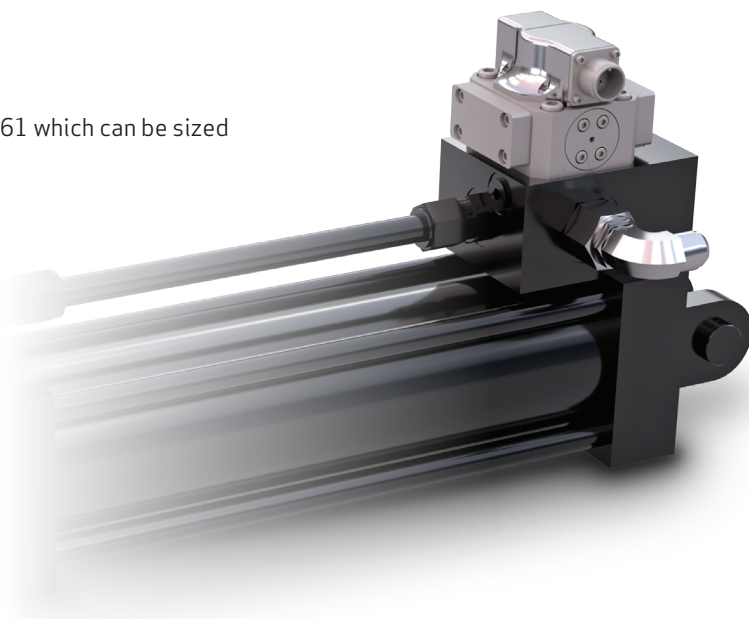
Servo valve block allows the direct mounting of a single G761 which can be sized to meet the application needs.

Five available servo valve flows are available:

- 1 gpm (3.78 lpm)
- 2.5 gpm (9.46 lpm)
- 5 gpm (18.9 lpm)
- 10 gpm (37.8 lpm)
- 16.5 gpm (62.4 lpm)

Two porting styles:

- JIC 37° flare
- Quick Coupling

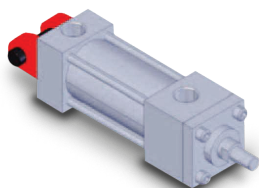


Mounting Interface

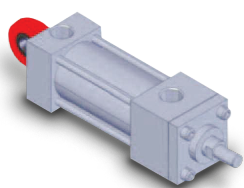
Four mounting options are available to adapt to different application needs. Note that the spherical eye connection is not available for models -086-37 / 38 / 39.

- Fixed Clevis Type 3
- Spherical Eye Type 22
- Head Rectangular Flange Type 28
- Cap Rectangular Flange Type 29

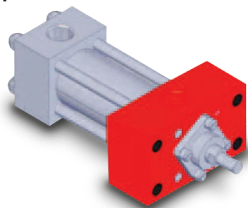
Fixed Clevis Type 3



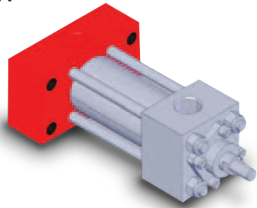
Spherical Eye Type 22



Head Rectangular Flange Type 28



Cap Rectangular Flange Type 29



Load Cell

High performance load cell can be adapted to the actuators to provide force feedback to a closed loop control.

Dual bridge.

Jam nut for ease of disassembly.

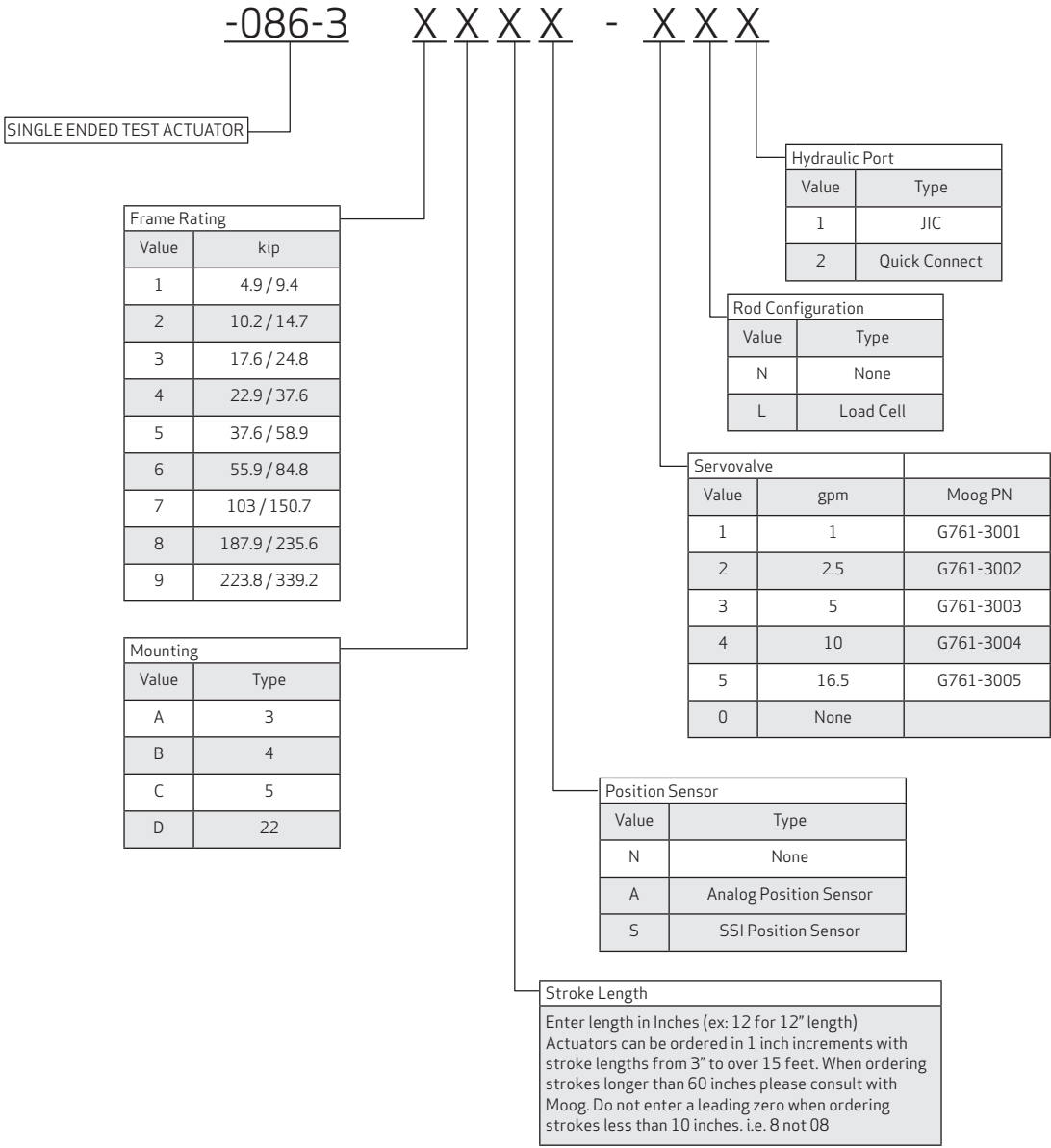
Load cell Accuracy $\leq 0.1\%$ F.S. depending upon force rating .

Position Sensor

Although in some applications the position feedback is not a must, sensing the position is always adding an extra dimension to know the status of the actuator beyond the loadcell itself.

- Contact-less style
- Internal, co-axial installed position sensor as standard configuration
- Signal type:
 - Analog voltage signal outputs as standard
 - SSI signal output is also available
- Repeat accuracy: $\leq \pm 10\mu\text{m}$
- Non-linearity: $\leq \pm 0.01\%$ F.S.

ORDERING CODE



A HIGHER LEVEL OF SUPPORT

The actuator was designed to provide long life, and inexpensive, fast and easy repair when it is finally necessary. Moog can provide the typical wear items such as a replaceable bearing and the seals for your own repair. Or you can have Moog repair the actuator to a like-new condition.

Five Point Inspection Process

Our number one goal is to eliminate downtime and make repairs that will deliver reliability and cost savings for years to come. When you send in your repair, it must work like new when you get it back. This is the Moog Global Support promise.

- Incoming inspection will provide the customer details on the performance of the actuator assembly such as leakage and response. The inspection will also provide details to our technicians in regards to critical performance specs that need to be addressed.
- Technicians will then review engineering notes for any design improvements that may have been initiated since inception.
- Actuator assembly will get completely disassembled to piece parts. Aqueous Ultrasonic cleaners are used to thoroughly clean each component before inspection and dimensional checks. Any components found too worn will be replaced with OEM parts. Critical components such as fitted rod and bearings will be dimensionally checked to ensure the component meets the print criteria. A complete seal kit replacement will be installed to ensure integrity of the structure.
- The servo valve will be removed and sent through the same rigorous evaluation, disassembly and test.
- Finally, the assembly will be tested to original specs to ensure the overhauled unit meets all design and performance criteria as if it were new.

Moog Engineering On Call For You

Delivering world-class motion control products and solutions means taking customer support far beyond the initial sale. It requires a dedicated approach to solving your problems, addressing your machine challenges and helping you achieve maximum productivity on a daily basis. In today's competitive manufacturing environment, machine performance plays a significant role in determining your bottom line. Moog Global Support is key to achieving cost-effective machine operation, day in and day out.

Actuator Repair Capabilities

Moog Global Support is designed to keep your critical machines up and running at peak performance with only 100% genuine Moog replacement parts. Only Moog replacement parts can deliver the reliability, versatility and long life that you would expect from a world leader in motion control solutions. Each Moog part delivers essential components with precise dimensions, close tolerances and specific materials specifications. Because we understand the key role our parts play in the overall operation of your machine, we carefully inspect and test each repair to identify only those components that need replacement.

Take The Next Step

Isn't it time you worked with a partner who can offer both the world-class products and collaborative expertise you need to reach the next level of performance? Contact us today and see for yourself the difference the right partner can make.



MOOG TEST PRODUCTS-FOR EVERY TESTING NEED

Moog engineers are always ready to meet your unique application needs with building blocks or complete turnkey systems that include hydraulic or electric test actuators, servo valves, hydraulic service manifolds, test controllers, software and more.

Test Controllers and Software

The Moog Test Controller is a real-time modular control system that can control or collect data from any hydraulic or electromechanical test system. The robust and compact modules have a wide range of transducer inputs and control outputs that can be easily configured for optimum use. The Moog Test Software allows the end user to control and record all of these signals in an easy to use format providing maximum value for many years of reliable usage.



The Moog Aerospace Test Software is the result of close and ongoing cooperation with leading aerospace OEMs and independent test laboratories, as well as research and development centers. This software remains the best-in-class option to successfully run both simple and complex solutions for aerospace static and dynamic tests.

Hydraulic Service Manifolds

The Moog Hydraulic Service Manifold (HSM) provides on/off hydraulic pressure with an adjustable transition from off to high pressure. Filters protect sensitive servo valves and accumulators provide instantaneous flow or pressure damping when needed. Several flow-rating sizes with 1 to 4 station options are available.



Moog Servo Valves

Because we design our renowned Moog Servo Valves - the world standard in performance and durability - you're assured of a system tailored to your exacting requirements.



TAKE A CLOSER LOOK.

Moog designs a range of products that complement the performance of those featured in this catalog. Visit our website for more information or contact the Moog facility nearest you.

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Moog Hydraulic Test Actuator Single-Ended Brochure
MCM/Rev. C, May 2026, Id. CDL54621 - en

SHAPING THE WAY OUR WORLD MOVES™

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