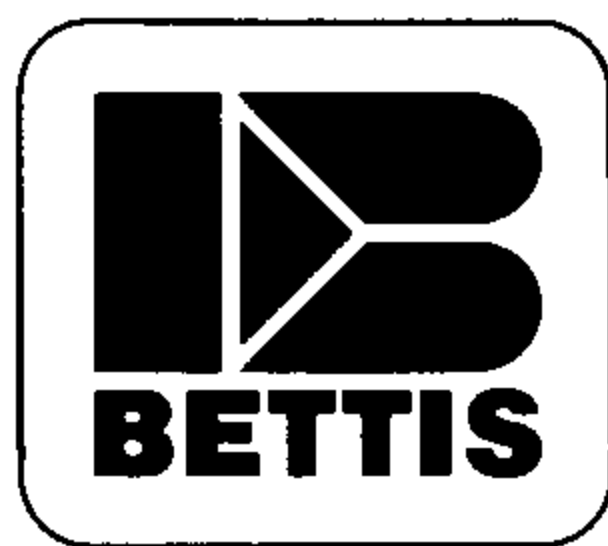


Bettis Valve Actuators

HD Series



HD Series

Bettis actuators are ideal for remote control of ball, butterfly or plug valves and many other 90° rotating mechanisms. These rugged and uncomplicated actuators provide a practical and reliable method for opening and closing valves by remote control without the need for expensive and unnecessary gearing, hydraulic pumps or other complicated motor-driven devices.

Body—A totally enclosed center housing on all HD series actuators completely protects all internal moving parts, minimizes the possibility of injury to operating personnel. Field-adjustable valve travel stops are provided as an integral part of the actuator to assure precise valve travel.

Bearings—Oversize bearing surfaces in the housing and cover assure proper alignment of the yoke and minimize side-thrust on the valve stem. Bearing surfaces and cylinder bores are coated with a baked-on dry-film lubricant and corrosion inhibitor which extends service life resulting in low maintenance costs. Bronze rod bushings support and guide the piston rod.

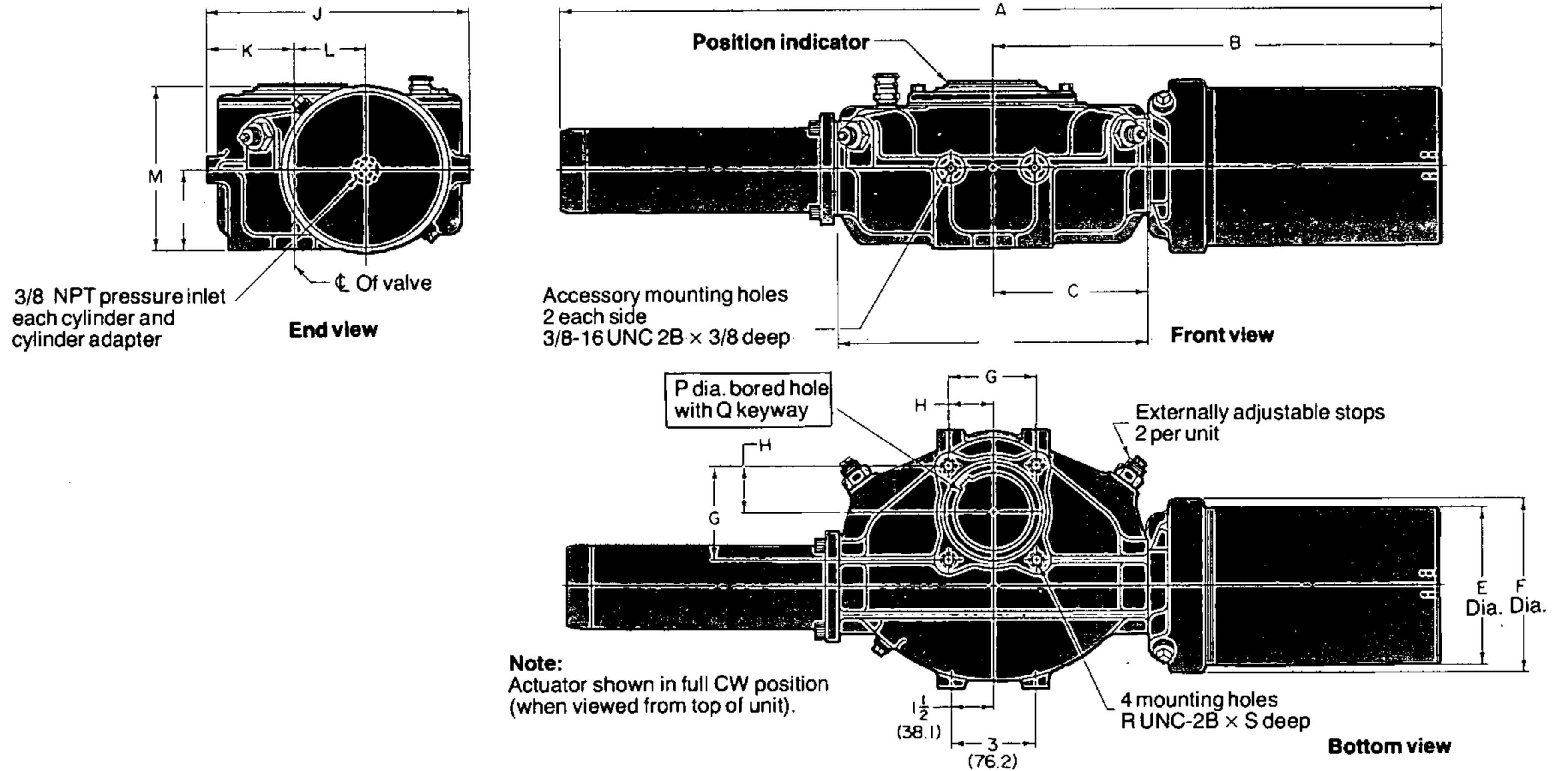
Models and sizes—Double acting HD series actuators are available for torque outputs of 2,000 to 60,000 lb.-in. Fail-safe, spring return actuators are available for torque outputs of 800 to 15,000 lb.-in.

Service temperature—The range for standard HD series actuators is -20°F to $+200^{\circ}\text{F}$. Seals are available for temperatures beyond these limits.

Permanent lubrication—For additional protection, a generous coating of suitable lubricants is applied during assembly. For extreme service conditions, the housing may be partially filled with lubricating oil. Housing capacities are shown on page 5. A vented fill-plug is provided. It is important that the attitude of the installed actuator is specified so that the vented fill-plug can be properly positioned.

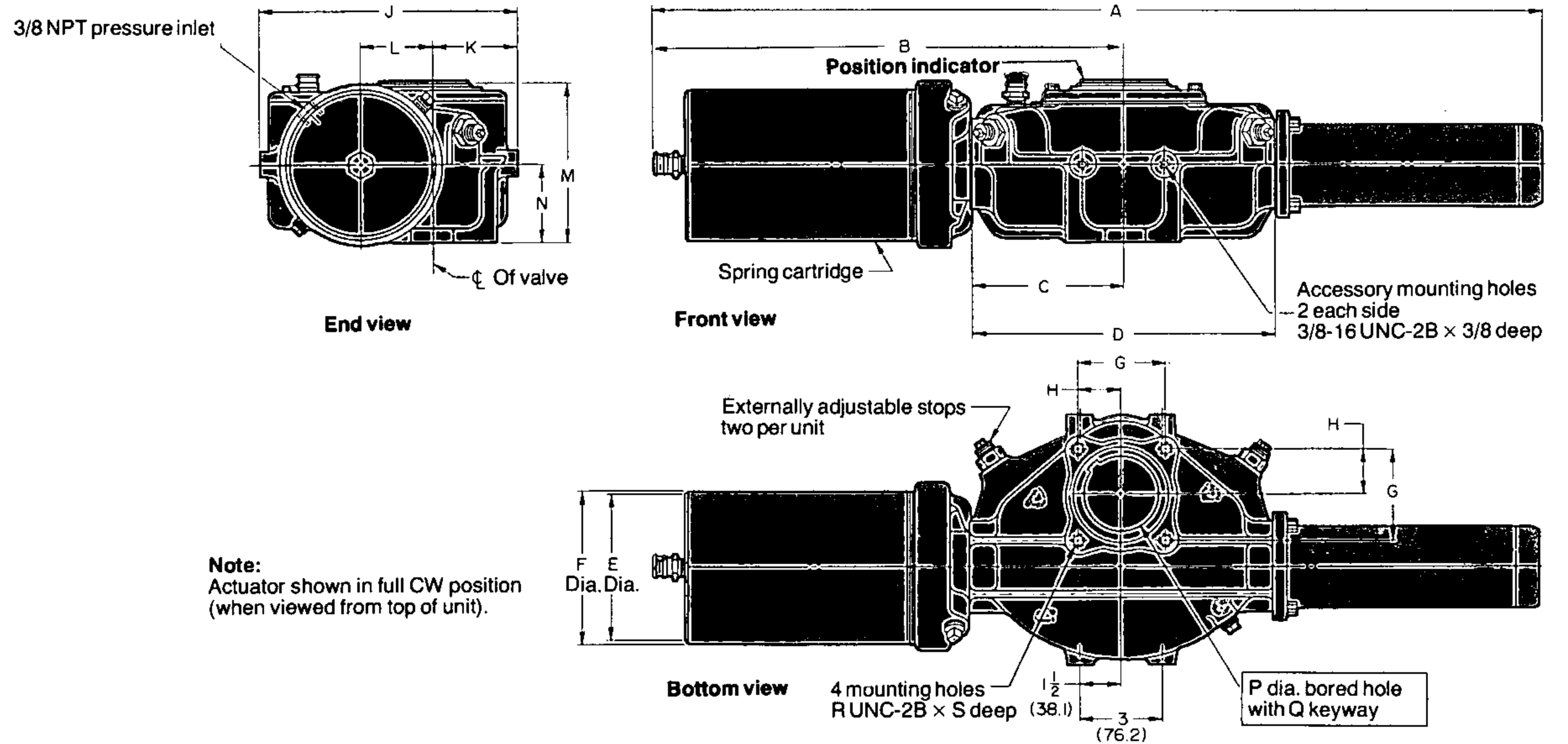
Spring return actuators—Bettis actuators can be assembled to either fail open or fail close on loss of operating pressure, to suit the application. Springs may be safely changed or replaced in the field without the use of special tools. It is important that the assembly and disassembly procedures be closely observed to avoid injury to personnel.

Models 521C, 721C, 731C



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
521C	31 ¹ / ₁₆	16 ¹ / ₁₆	5 ⁵ / ₁₆	11 ¹ / ₈	5 ⁵ / ₈	5 ¹ / ₁₆	3 ³ / ₁₆	1 ¹ / ₃₂	8 ²⁹ / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4
721C	31 ¹ / ₁₆	16 ¹ / ₁₆	5 ⁵ / ₁₆	11 ¹ / ₈	7 ¹ / ₂	8 ¹ / ₈	3 ³ / ₁₆	1 ¹ / ₃₂	8 ²⁹ / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4
731C	38 ¹ / ₂	21	6 ³ / ₁₆	13 ³ / ₈	7 ¹ / ₂	8 ¹ / ₈	4 ¹ / ₁₆	2 ¹ / ₃₂	11 ⁷ / ₁₆	3 ³ / ₈	3 ³ / ₈	7 ¹ / ₁₆	3 ³ / ₁₆	3 ³ / ₄	1/2 x 3/16	3/4-10	1

Models 521C-SR, 721C-SR



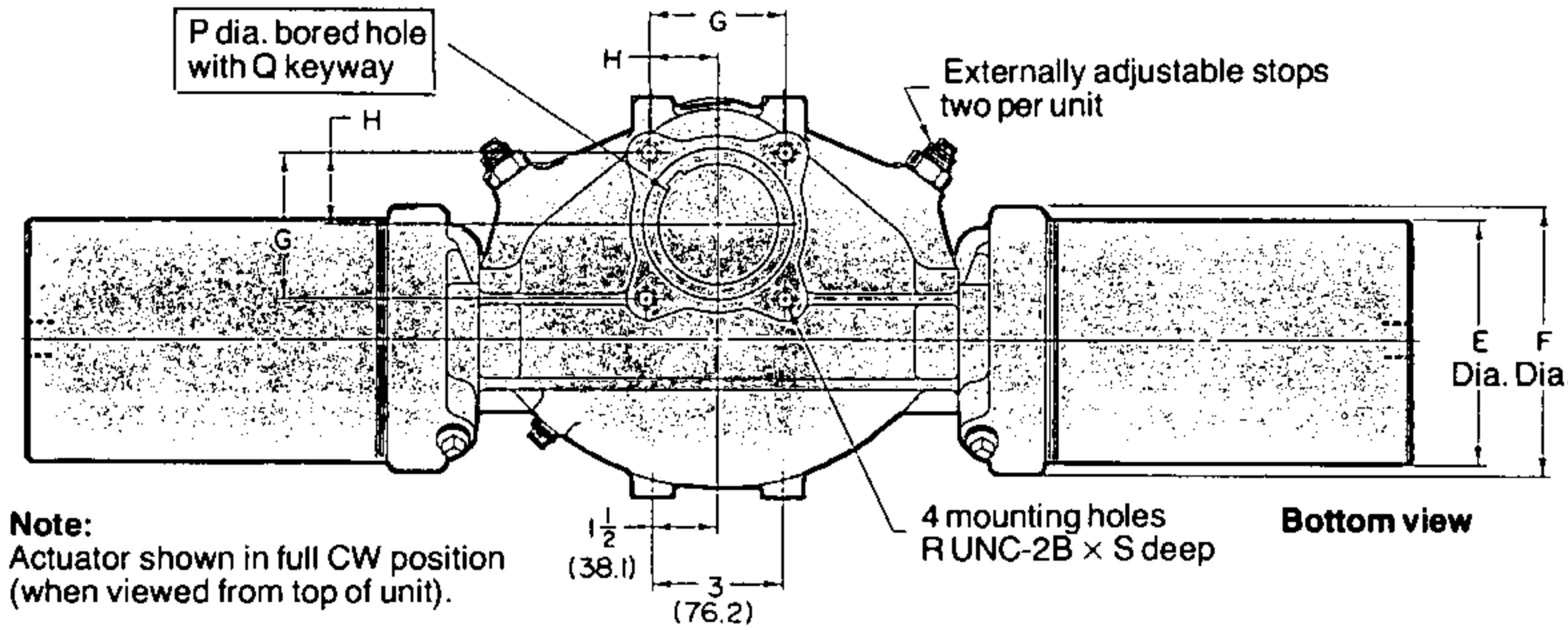
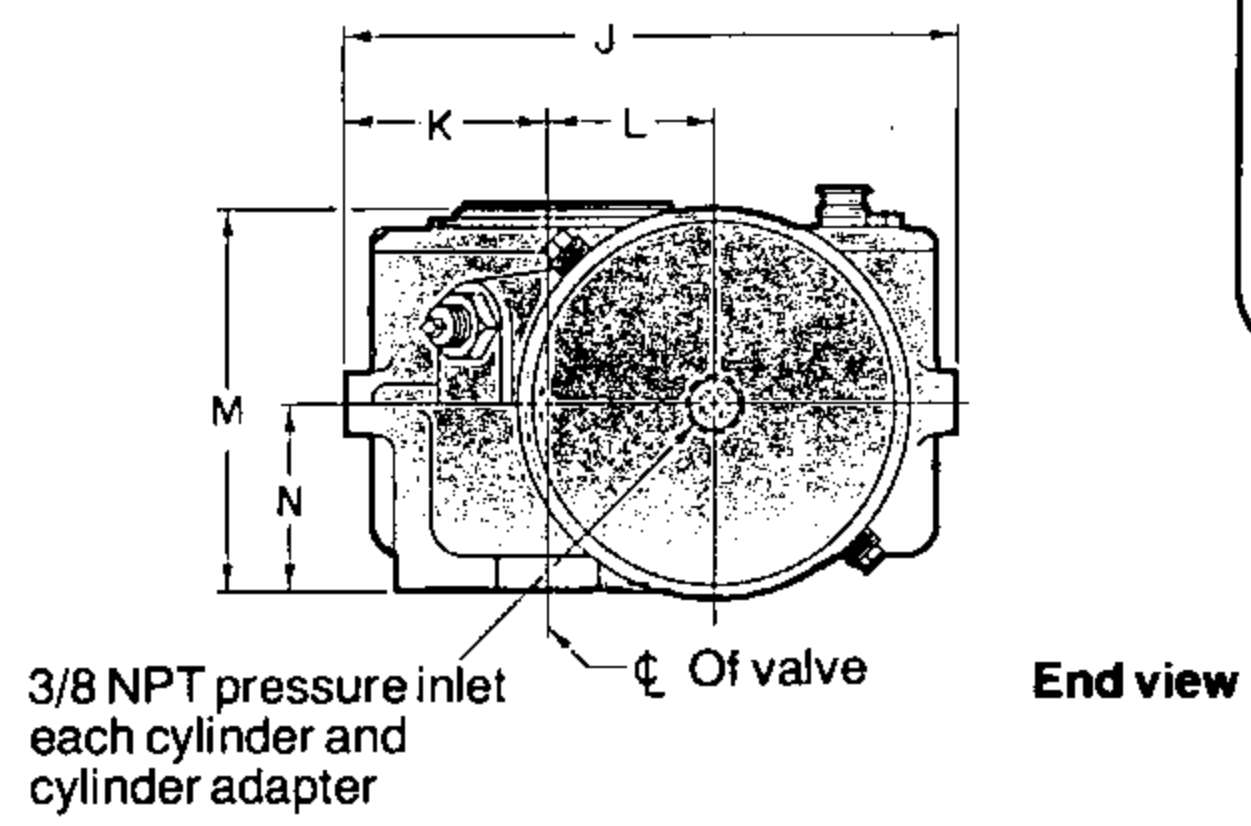
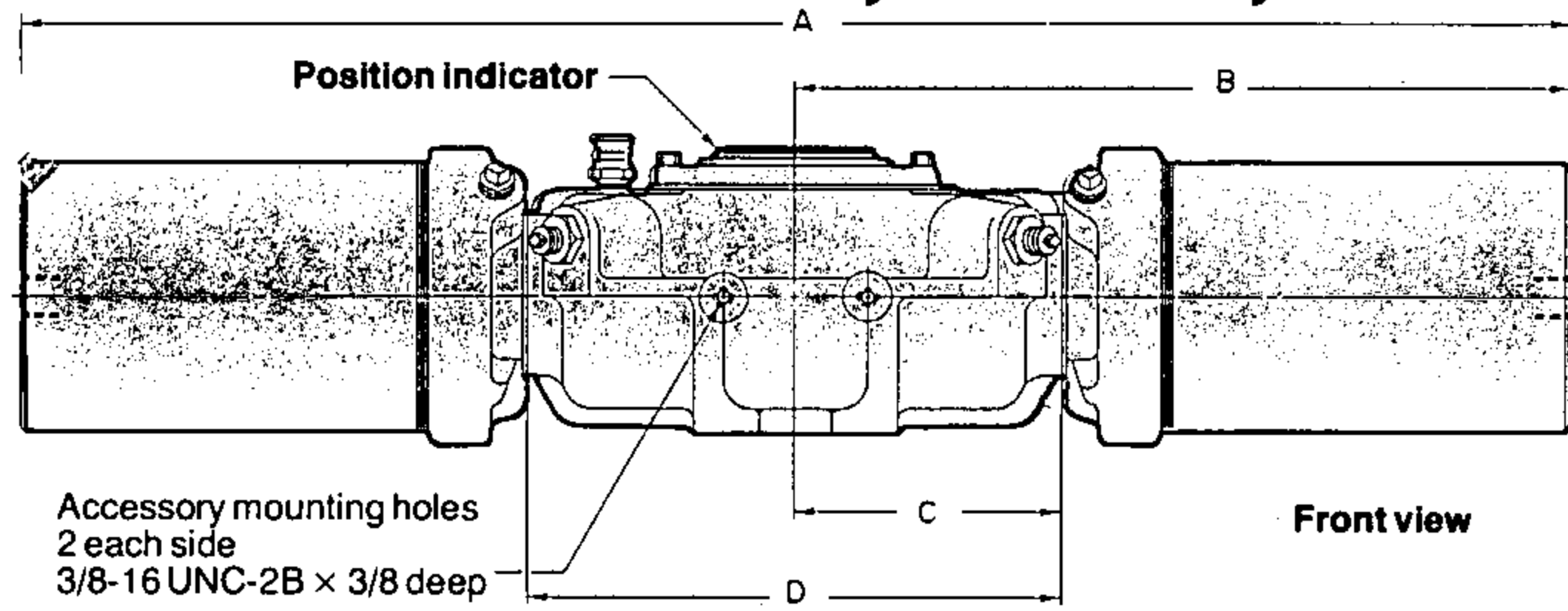
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
521C-SR			5 ⁵ / ₁₆	11 ¹ / ₈	5 ⁵ / ₈	5 ¹ / ₁₆	3 ³ / ₁₆	1 ¹ / ₃₂	8 ²⁹ / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4
721C-SR			5 ⁵ / ₁₆	11 ¹ / ₈	7 ¹ / ₂	8 ¹ / ₈	3 ³ / ₁₆	1 ¹ / ₃₂	8 ²⁹ / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4

MODEL	A	B
521C-SR-40	43 ¹ / ₂	28 ¹ / ₂
521C-SR-60	49 ¹ / ₂	28 ¹ / ₂
521C-SR-80	43 ¹ / ₂	28 ¹ / ₂
521C-SR-100	49 ¹ / ₁₆	34 ¹ / ₁₆
521C-SR-125	49 ¹ / ₁₆	34 ⁵ / ₁₆

MODEL	A	B
521C-SR-150	49 ⁹ / ₁₆	34 ⁹ / ₁₆
521C-SR-200	52 ¹ / ₂	37 ¹ / ₂
721C-SR-40	42 ⁷ / ₁₆	27 ⁷ / ₁₆
721C-SR-60	42 ⁷ / ₁₆	27 ⁷ / ₁₆
721C-SR-80	44 ¹ / ₄	29 ¹ / ₄

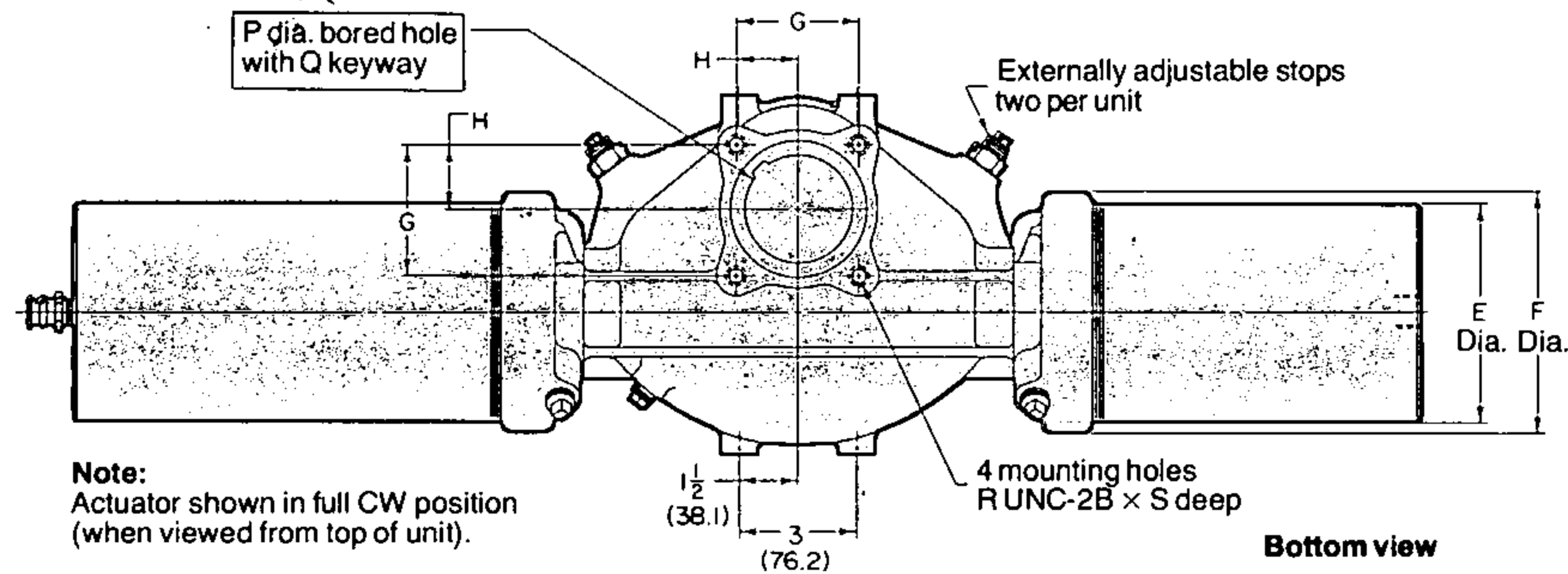
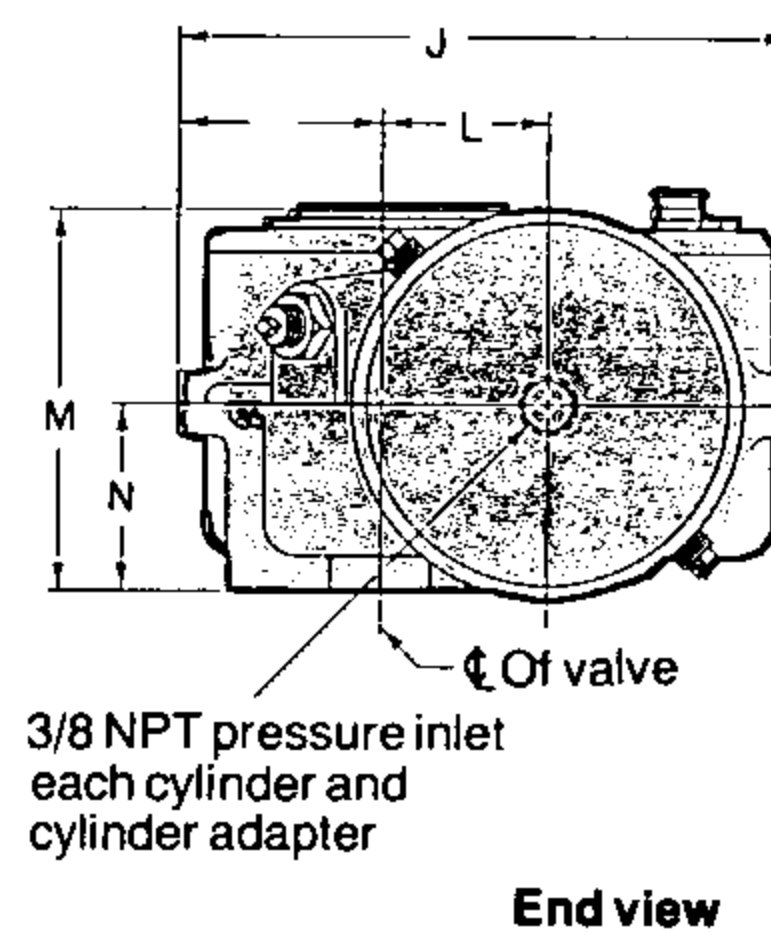
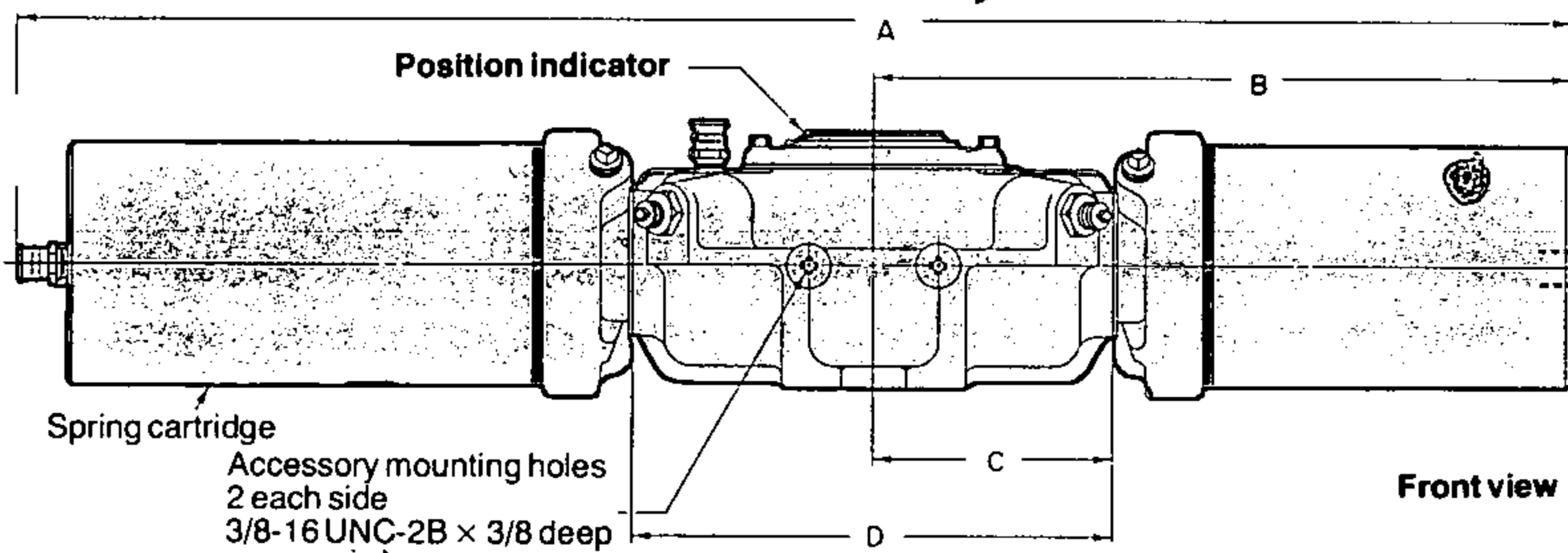
MODEL	A	B
721C-SR-100	44 ¹ / ₄	29 ¹ / ₄
721C-SR-125	49 ¹ / ₁₆	34 ¹ / ₁₆
721C-SR-150	49 ⁹ / ₁₆	34 ⁹ / ₁₆

Models 522C, 722C, 732C



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
522C	33 ³ / ₈	16 ¹ / ₁₆	5 ⁵ / ₁₆	11 ¹ / ₈	5 ³ / ₈	5 ⁵ / ₁₆	3 ³ / ₁₆	1 ¹ / ₃₂	8 ² / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4
722C	33 ³ / ₈	16 ¹ / ₁₆	5 ⁵ / ₁₆	11 ¹ / ₈	7 ¹ / ₂	8 ¹ / ₈	3 ³ / ₁₆	1 ¹ / ₃₂	8 ² / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4
732C	42	21	6 ³ / ₁₆	13 ³ / ₈	7 ¹ / ₂	8 ¹ / ₈	4 ¹ / ₁₆	2 ¹ / ₃₂	11 ³ / ₁₆	3 ³ / ₈	3 ³ / ₈	7 ⁵ / ₁₆	3 ³ / ₁₆	3 ¹ / ₄	1/2 x 3/16	3/4-10	1

Models 722C-SR, 732C-SR



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
722C-SR		16 ¹ / ₁₆	5 ⁵ / ₁₆	11 ¹ / ₈	7 ¹ / ₂	8 ¹ / ₈	3 ³ / ₁₆	1 ¹ / ₃₂	8 ² / ₃₂	2 ⁷ / ₈	2 ¹ / ₂	5 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₂	1/2 x 3/16	1/2-13	3/4
732C-SR		21	6 ³ / ₁₆	13 ³ / ₈	7 ¹ / ₂	8 ¹ / ₈	4 ¹ / ₁₆	2 ¹ / ₃₂	11 ³ / ₁₆	3 ³ / ₈	3 ³ / ₈	7 ⁵ / ₁₆	3 ³ / ₁₆	3 ¹ / ₄	1/2 x 3/16	3/4-10	1

MODEL	A
722C-SR-40	48 ³ / ₄
722C-SR-60	48 ³ / ₄
722C-SR-80	52 ³ / ₄
722C-SR-100	52 ³ / ₄

MODEL	A
732C-SR-40	59 ⁷ / ₁₆
732C-SR-60	59 ⁷ / ₁₆
732C-SR-80	64 ⁷ / ₁₆
732C-SR-100	64 ⁷ / ₁₆

MODEL	A
732C-SR-125	68 ¹ / ₁₆
732C-SR-150	68 ¹ / ₁₆



Actuator Data

Torque output

All published torques are guaranteed minimum values

Double acting

Actuator Model	TORQUE OUTPUT INCH-LBS.	OPERATING PRESSURE—LBS./SQ. INCH												
		40	50	60	70	80	90	100	125	150	175	200	225	250
521C	BREAK	2200	3000	3700	4500	5400	6600	7000	9000	11000	13000	15000	16875	18750
	RUNNING	1600	2000	2400	2800	3200	3600	4000	5000	6000	7000	8000	9000	10000
522C	BREAK	4400	6000	7400	9000	10800	13200	14000	17500	21000				
	RUNNING	3200	4000	4800	5600	6400	7200	8000	10000	12000				
721C	BREAK	5400	7000	8600	10200	11800	13400	15000	18750	22500				
	RUNNING	3100	4000	4900	5800	6700	7600	8500	10625	12750				
722C	BREAK	11000	14300	17160	20020									
	RUNNING	6300	8200	9840	11480									
731C	BREAK	7500	9500	11400	13400	15400	17400	19400	24200	29000	34000	39000	44500	48300
	RUNNING	4300	5500	6600	7800	8900	10100	11500	14200	17000	20000	23000	25900	28800
732C	BREAK	13600	17000	20400	23800	27200	30600	34000	42500	51000				
	RUNNING	8160	10200	12240	14280	16320	18360	20400	25500	30600				

Double acting with hydraulic manual control or speed control

Actuator Model	TORQUE OUTPUT INCH-LBS.	OPERATING PRESSURE—LBS./SQ. INCH												
		40	50	60	70	80	90	100	125	150	175	200	225	250
522C-H	BREAK	2200	3000	3700	4500	5400	6600	7000	9000	11000	13000	15000	16875	18750
	RUNNING	1600	2000	2400	2800	3200	3600	4000	5000	6000	7000	8000	9000	10000
722C-H	BREAK	5400	7000	8600	10200	11800	13400	15000	18750	22500				
	RUNNING	3100	4000	4900	5800	6700	7600	8500	10625	12750				
732C-H	BREAK	7500	9500	11400	13400	15400	17400	19400	24200	29000	34000	39000	44500	48300
	RUNNING	4300	5500	6600	7800	8900	10100	11500	14200	17000	20000	23000	25900	28800

Spring return

Actuator Model	TORQUE OUTPUT INCH-LBS.	OPERATING PRESSURE—LBS./SQ. INCH												
		40	50	60	70	80	90	100	125	150	175	200	225	250
521C-SR	END	830	830	1250	1250	1660	1660	2080	2600	3130	3130	4170	4170	4170
721C-SR	END	1710	1710	2570	2570	3420	3420	4280	5350	6420	6420	7900	7900	7900
722C-SR	END	3150	3150	4750	4750	6300	6300	7900	7900					
732C-SR	END	3500	3500	6150	6150	8200	8200	9500	10300	14250	15400	15400	15400	

Spring return with hydraulic manual control or speed control

Actuator Model	TORQUE OUTPUT INCH-LBS.	OPERATING PRESSURE—LBS./SQ. INCH												
		40	50	60	70	80	90	100	125	150	175	200	225	250
722C-SR-H	END	1710	1710	2570	2570	3420	3420	4280	5350	6420	6420	7900	7900	7900
732C-SR-H	END					3500			6150		8200	9500	10200	10200

All Model "C" Actuators listed in this Bulletin are designed and manufactured to rigid standards to insure maximum efficiency. Bettis Corporation certifies that the Torque Output Values published above represent true, tested and measured

torque capabilities. When you purchase a Bettis Actuator you can be certain that your Actuator will develop the published torque. A properly applied and maintained Actuator will continue to produce the advertised torques throughout a long service life.

Actuator Data

ACTUATOR MODEL	OIL CAPACITY		DISPLACEMENT PER STROKE	MAX. OPER. PRESSURE	MAX. ALLOW. WORK. PRESS.	APPROX. WEIGHT
	HORIZ.	VERTICAL				
521C	2½ PTS.	2 PTS.	118 CU. IN.	0.068 CU. FT.	300 PSIG	73 LBS.
721C	2½ PTS.	2 PTS.	231 CU. IN.	0.134 CU. FT.	150 PSIG	93 LBS.
731C	4 PTS.	3 PTS.	298 CU. IN.	0.172 CU. FT.	250 PSIG	162 LBS.
521C-SR	2½ PTS.	2 PTS.	118 CU. IN.	0.068 CU. FT.	330 PSIG	114 LBS.
721C-SR	2½ PTS.	2 PTS.	231 CU. IN.	0.134 CU. FT.	180 PSIG	155 LBS.
522C	2½ PTS.	2 PTS.	225 CU. IN.	0.130 CU. FT.	150 PSIG	92 LBS.
722C	2½ PTS.	2 PTS.	560 CU. IN.	0.324 CU. FT.	75 PSIG	123 LBS.
732C	4 PTS.	3 PTS.	680 CU. IN.	0.394 CU. FT.	150 PSIG	200 LBS.
722C-SR	2½ PTS.	2 PTS.	560 CU. IN.	0.324 CU. FT.	105 PSIG	185 LBS.
732C-SR	4 PTS.	3 PTS.	680 CU. IN.	0.394 CU. FT.	160 PSIG	285 LBS.

Maximum operating pressure is the pressure required to produce the maximum rated torque of a double acting actuator. Maximum allowable working pressure is the maximum static pressure that may be applied to a fully stroked actuator against the travel stops.

NOTE: Pressures applied to only one end of the cylinder in excess of the maximum allowable working pressure may result in permanent deformation of the torque producing mechanism of the actuator. Test pressure is 1.25 times the maximum allowable pressure when applied to both sides of the cylinder simultaneously.

The following formula may be used to determine the (FREE AIR CONSUMPTION) for each actuator.

$$Q = V \times \frac{P + 14.7}{14.7} \times \frac{60}{T}$$

Where: Q = Free air Consumption per minute (SCFM)
V = Actuator displacement (Ft³)
P = Gauge Pressure (PSIG)
T = Operating Pressure (SEC)

Heavy duty manual controls

M3—Jackscrew Manual is available on double acting and spring return units. The Jackscrew is an integral part of the actuator.

***M4**—Hydraulic Manual Control is a bi-directional hydraulic manual with speed control, available on double acting units. (522C, 722C & 732C)

***M7A**—Hydraulic Manual Control is a uni-directional hydraulic manual with dual speed control, available on spring return units. (722C-SR & 732C-SR)

Hydraulic speed control

***M8A**—Hydraulic Speed Control for operation in

either direction is available on double acting and spring return units except the 521C, 721C & 731C.

Hydraulic dampening loop

Hydraulic Dampening Loop is available for smoother operation on double acting and spring return units. (522C, 722C, 732C, 722C-SR & 732C-SR)

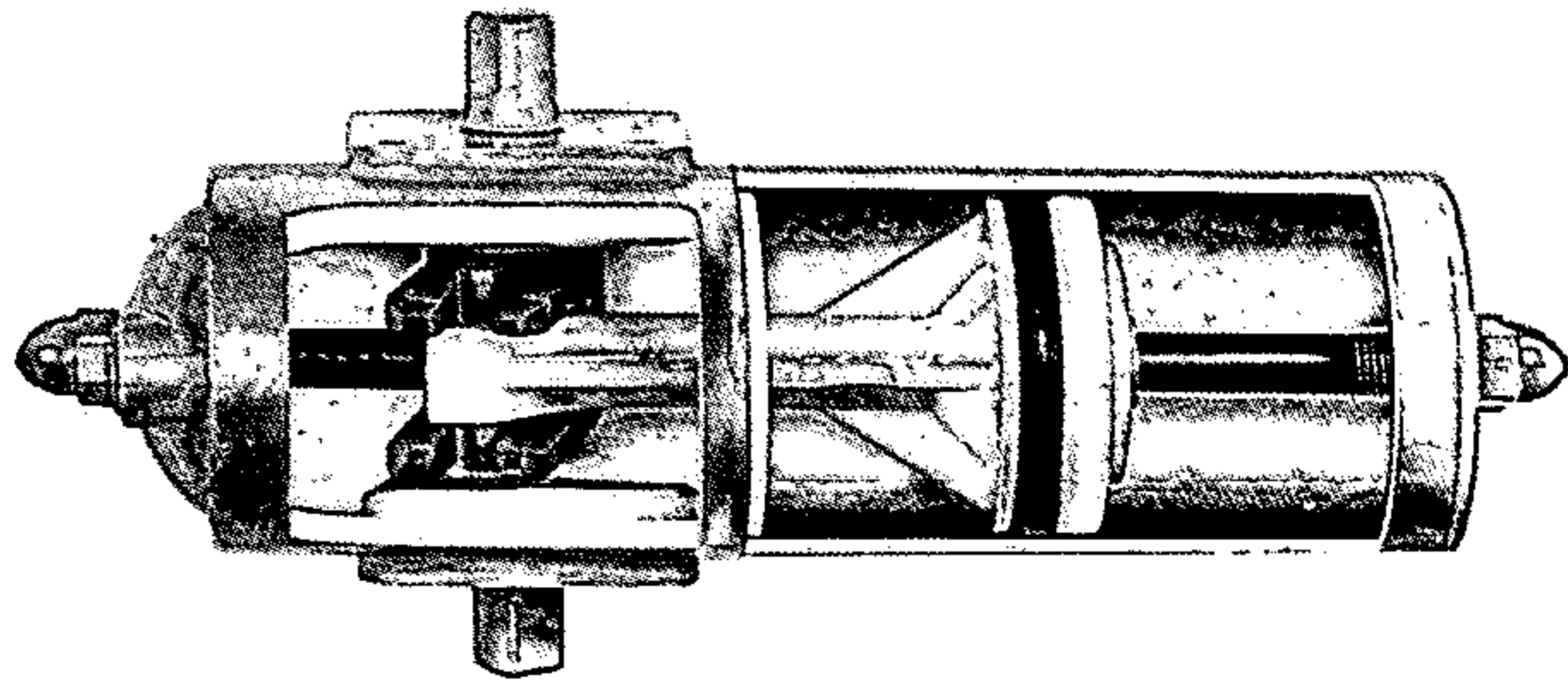
***Note:** Hydraulic cylinder required on M4, M7A and M8A hydraulic controls.

Details and technical data shown in this catalog were correct at time of printing. Due to continual improvements, equipment may vary slightly from details shown.

We make every effort to make sure catalogue information is correct but you are encouraged to take advantage of our application specialists to verify data and assure your having the latest specifications.

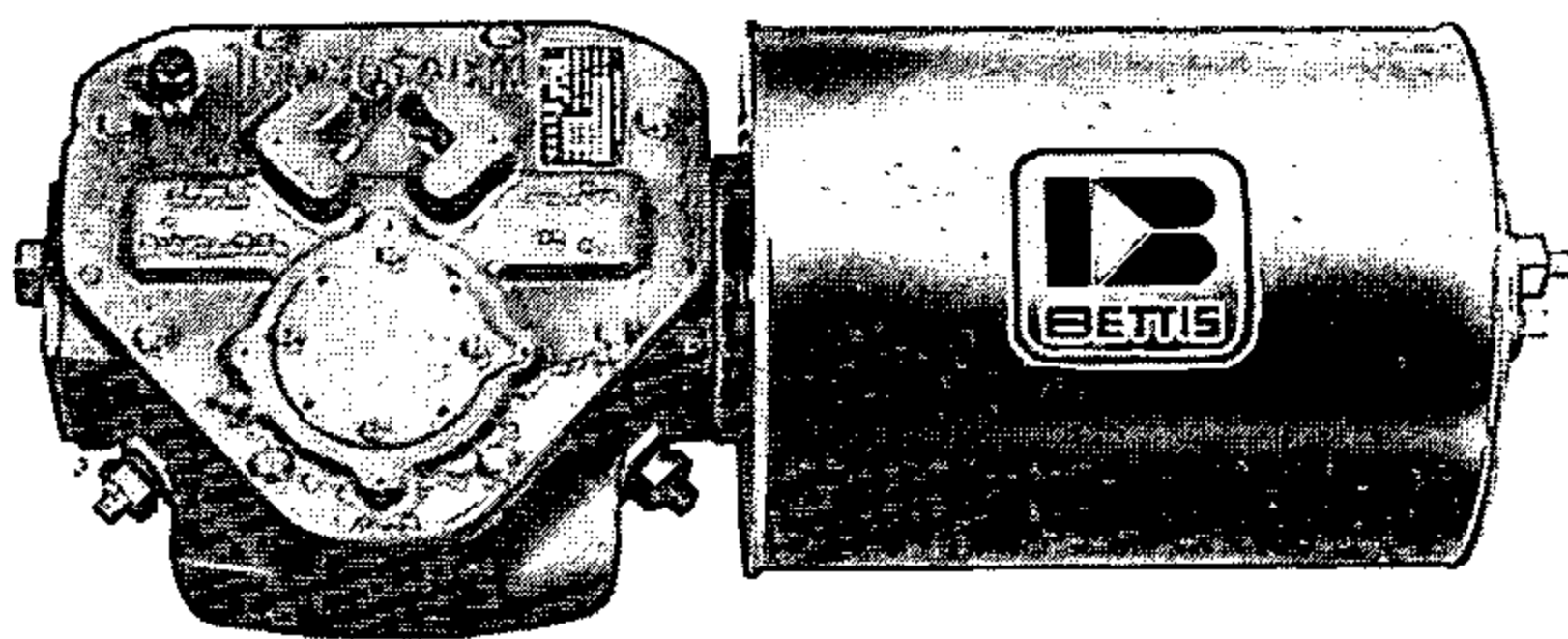
Other Bettis Products

"CB" Series



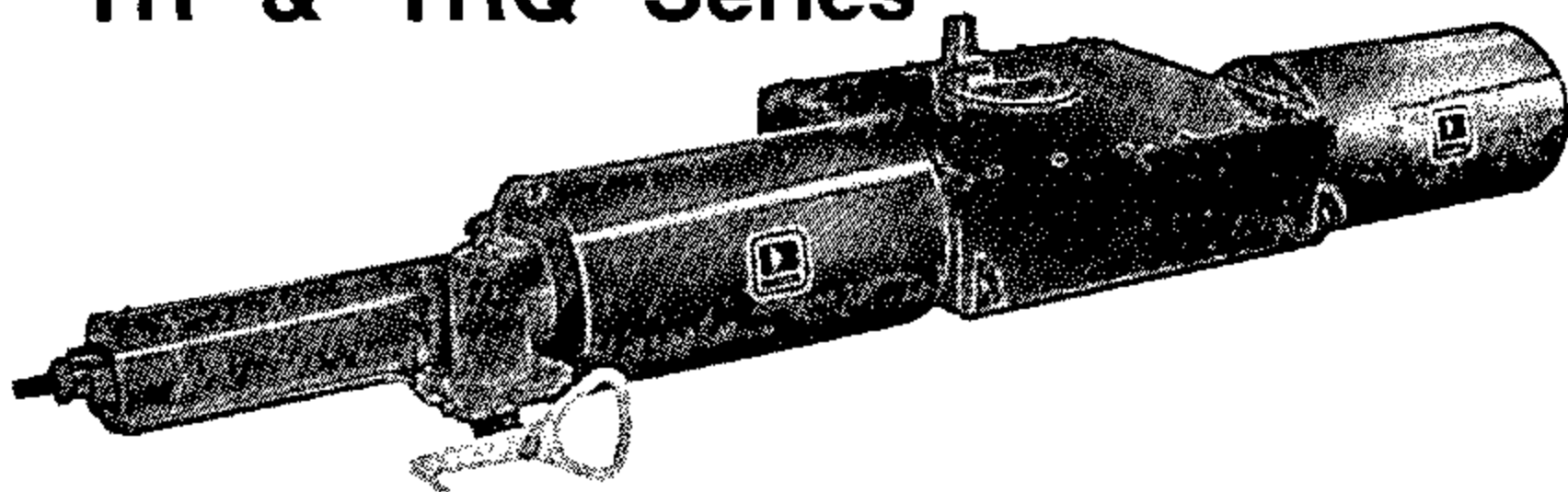
The "CB" Series are scotch yoke type valve actuators for 90° rotary operation. These are economical and compact actuators capable of producing torques to 9,240 lb.-in. All "CB" Series are available in spring return models with torque capability up to 3,800 lb.-in.

"T" Series



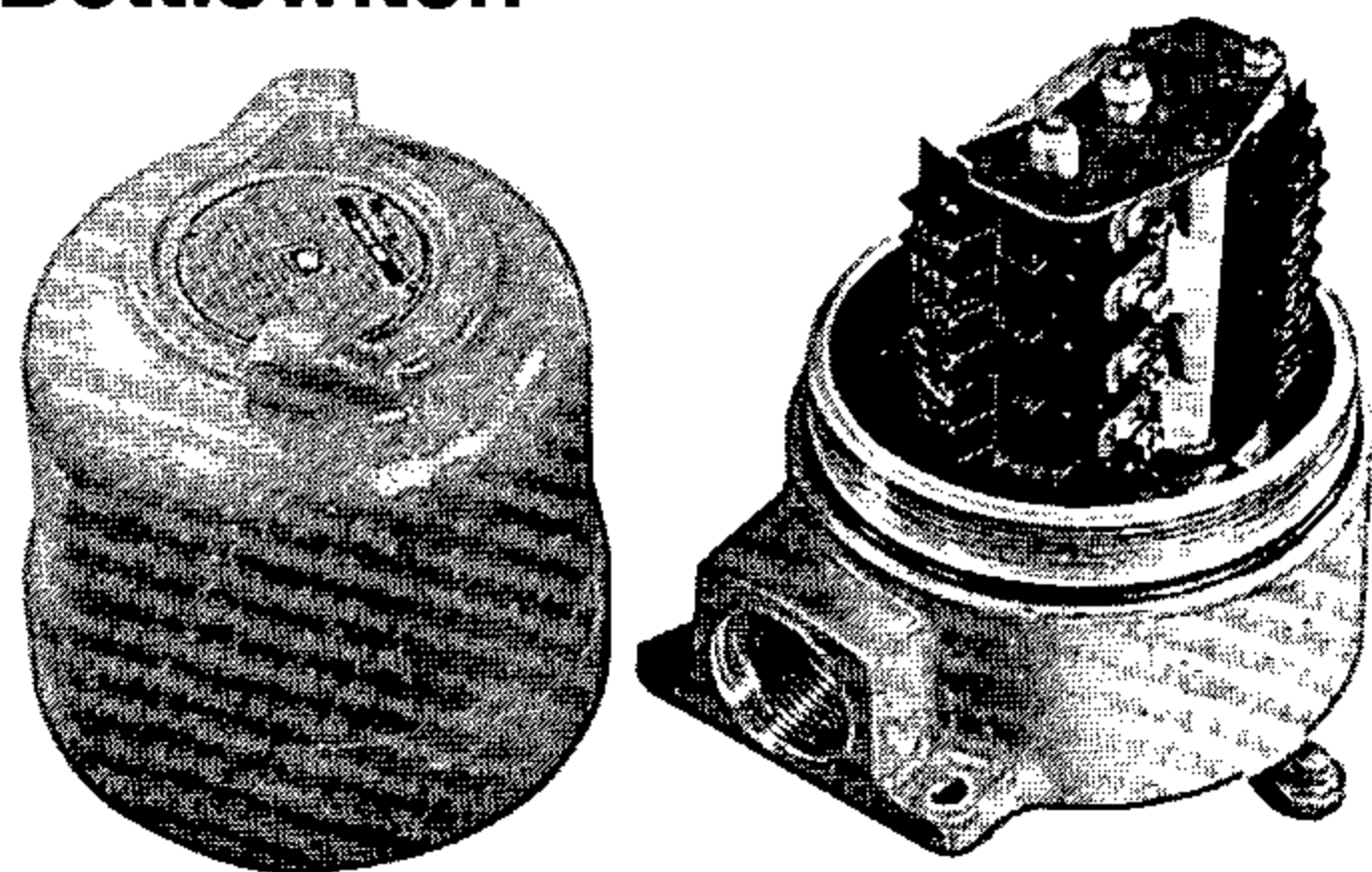
The "T" (Track-Hi-Torque) Series actuators are designed and engineered to meet the torque requirements of larger, higher pressure ball, plug, and butterfly valves. The rugged "T" Series features greater torque output at lower operating pressures resulting in dependable rotary valve operation. Use of the highly efficient guided track principle provides precise on-off service or valve positioning in both double acting and spring return models. Double acting up to 450,000 and spring return units up to 177,000 lb.-in. ending torque.

"TR" & "TRQ" Series



The "TR" (Track-Guide Rail) and "TRQ" (Track-Guide Rail-Quad Body) Series represents a further extension of our line of high torque actuators. Designed with the same quality and rugged features as the other series Bettis actuator, these units are available for torques up to 2,000,000 lb.-in.

Bettiswitch



The Bettiswitch is a versatile position-indicating switch designed primarily for use with Bettis valve actuators. It is especially adaptable to sequence cycling or automated systems, with a choice of operating mechanisms, direct-coupled or three position lever/roller operations. All switches are weatherproof and explosion proof designed to meet NEMA I, III, IV, VII, IX, XIII requirements.



THE STANDARD OF THE WORLD®

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