5 Bray Controls



Electric Actuators & Accessories

Series 70 Sizes 003-065 Series 70 Sizes 130-181



ELECTRIC ACTUATORS

Series 70	Torque Output			
Pgs 4-11	Lb-Ins	N-m		
003	300	34		
005	500	57		
008	800	90		
012	1200	136		
020	2000	226		
030	3000	339		
050	5000	565		
065	6500	735		
130/131	13000	1469		
180/181	18000	2034		
S70 - Explosion Proof Models				
708	800	90		
712	1200	136		
720	2000	226		

Series 73 Pgs 12-13	Torque Output		
	Lb-Ins	N-m	
S73-1	100	11	
S73-3	300	34	
S73-6	600	68	

Butterfly Valve Summary: Pgs 14-15



8 Bray CONTROLS

INTRODUCTION

Through years of field application experience, research and development, we have designed products that meet the stringent requirements of today's process industries. Bray has earned a reputation of excellence by creating products of superior value and quality, providing personalized customer service and on-time deliveries. Our success has always been the direct result of our fully integrated, full range butterfly valve and control product lines. Rugged and reliable, our products are engineered to provide years of trouble free service.

Bray products are used in a wide range of industries worldwide including:

- Chemical
- Beverages
- Pharmaceuticals
- Food Processing
- Petroleum Refining & Oilfield,
- Transportation
- Microprocessors
- Marine
- Pulp & Paper
- Mining
- Power/FGD
- Irrigation
- Water & Wastewater Treatment
- Textile
- Desalination
- Steel Production
- Sugar/Ethanol
- HVAC
- Breweries/Wineries



PRODUCT QUALITY & PRECISION

Assuring product quality, precision manufacturing and internal process integrity, Bray Controls has been certified to ISO 9001 quality standard. The certification of compliance was issued by Lloyd's Register Quality Assurance (LQRA), a worldwide independent certifier. The basis for Bray Controls high level of quality assurance are the quality control guidelines and procedures submitted, reviewed and approved in accordance with criteria established within ISO 9001:2008 and EU Directives.

"Bray Controls is focused on and committed to meeting the expectations and needs of our customers while continually improving the effectiveness of our quality management."

- All Bray valves are pressure tested to 110% of rated pressure to assure bubble tight shutoff.
- All Actuators are calibrated and cycle tested before shipment. Pneumatic actuators are also pressure tested to assure no leakage.
- Material Traceability Certification is provided for all valves upon request for all pressure retaining components.
- Positive Material Identification PMI testing is used to verify material acceptance criteria.

ELECTRIC ACTUATOR

Output Torque 300 Lb-in (34 Nm) to 18,000 Lb-in (2,034 Nm)

Bray Controls' years of proven success in electric actuation, combined with innovative engineering, has produced the Series 70. The Series 70 features on-off or modulating control.

Bray's Series 70 electric actuator has many advantages over other actuators including:

- UL, CSA and CE certification of most units
- Wiring directly to the terminal strip without interference from other components
- Simple and unique manual override handwheel system
- · Lowest profile and lightest weight actuator on the market
- Simple finger or screw driver adjustment of travel limit cams without interference from other components
- Highly visible valve status display on most units

Designed like a junction box, the Series 70 offers by far the easiest access to terminal block wiring, cam adjustments and switch installation. Therefore, the time required for field start-up and adjustment is greatly reduced, and maintenance can be performed with assured ease and safety.

TRAVEL LIMIT SPDT SWITCHES: Bray has provided two SPDT mechanical switches as standard. These durable, high quality switches are mechanically isolated and electrically independent. The dedicated circuits eliminate any voltage crossover between the switches. This switch combination is used for both open and closed positions of the valve and requires only one cam for each direction of valve travel. Bray's design provides

synchronicity between motor control and position display. Switches are easily accessible without interference from other components. Each switch is marked with open or close labels and the cams are color coded, green for open and red for close, eliminating the possibility of incorrect wiring.



Bray's patented cam design is an outstanding feature of the Series 70. Cams for each switch are

infinitely adjustable by finger touch or screwdriver with no special tools needed. The adjustment knobs rotate the specially formed cams. Each cam is color coded – the red adjustment knob controls the red cam (close position), and the green knob controls the green cam (open position). Standard factory setting allows 90° travel between open and closed positions.

CONDUIT ENTRIES: Two connections in either NPT or metric threads. One entry is for power, the other for control wiring.

EXPLOSION

PROOF ENCLOSURE

The Series 70 optional waterproof/ explosion proof unit is UL NEMA 4,4x listed and certified to specifications for USA & Canadian hazardous locations Class-I C&D Div 1&2; Class-II GRPS EF&G Div 1&2. The rugged, heavy duty housing contains precision machined bores and flanges to meet flame path requirements. Waterproof/Explosion proof models are currently available with 800 to 2,000 lb.-in. output torque, continuous or intermittent duty.





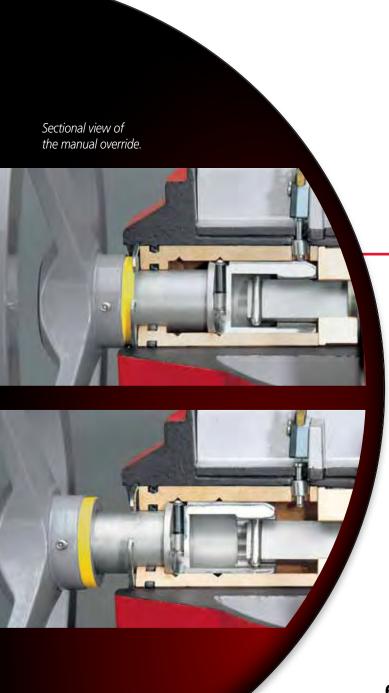


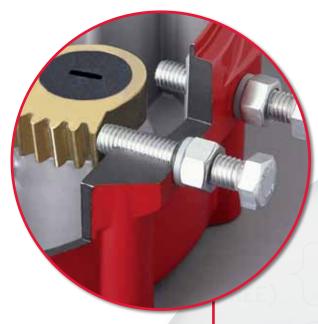


POWER CENTER

Bray designed the Series 70 to completely separate the Control Center from the Power Center. The Power Center, located in the actuator base, consists of motor, gear train, capacitor, output drive and heater. This design protects the power drive system as each component has been engineered to require no customer servicing. The Power Center components have been uniquely configured to maintain the extremely low profile of the Series 70.

SELF-LOCKING OUTPUT DRIVE ASSEMBLY: The output drive assembly features a self-locking worm and worm gear drive which holds the valve in the desired position without the need for electro-mechanical braking systems. The worm shaft directly drives the worm gear.





MECHANICAL TRAVEL STOPS

Stainless steel mechanical travel stops are field adjustable to prevent over travel when manual override is in use. The travel stops are located outside the base for easy readjustment without removing the cover. Stainless steel lock nuts with O-ring seals hold the travel stops securely in place. The travel stops are normally set at the factory to allow 0° and 90° travel.

MANUAL OVERRIDE HANDWHEEL ASSEMBLY

- Pull to engage for manual operation.
- Rotate handwheel to position valve.
- Push to return power operation.

The Bray manual override system ensures positive and fast manual operation without the use of extra tools or levers. When the hand-wheel is engaged, the electrical power to the motor is cut off by means of the Automatic Power Cutout Switch. When engaged, the manual override shaft is held in position by a Ball Detent. The Ball Detent also holds the shaft in position when the hand-wheel is pushed in to disengage the override. The Drive Pin engages and disengages the manual override shaft from the worm and segmented worm gear output shaft. When the handwheel is pushed or pulled, the drive pin smoothly engages the worm shaft.

ONE PIECE WORM GEAR, DRIVE SHAFT

The drive shaft is the driving member that positions the valve. The worm gear drives the valve status display shaft which operates the infinitely adjustable cams to limit the electrical travel of the actuator.



MOTOR: 115 or 220 VAC single phase permanent split-capacitor reversible induction motor The motor features a built-in thermal overload protector of a bi-metallic strip in the windings set at 275°F(135°C) with automatic reset.

WORM SHAFT

DISC SPRINGS

GEAR TRAIN: The heavy-duty spur gear train is composed of precision cut, multi-staged gears and shafts. The gears and shafts are heat treated high alloy steel. The gear train is permanently lubricated at the factory.

MODULATING ACTUATOR - SERVO PRO

For precision control of valve position. The Bray Series 70 Electric Actuator can be equipped with a Servo for precise control of valve position. The Servo consists of a microprocessor controlled circuit board and a feedback potentiometer assembly, which both fit entirely within the standard Series 70 actuator housing. The circuit board has terminal blocks for customer field wiring, and other terminals for internal connections to the actuator components. The feedback potentiometer is driven by a gear set connected to the actuator output drive. Also available are Servos capable of serial BUS communication, such as DeviceNet.

VOLTAGE SPIKE PROTECTION: Voltage spikes that can damage electrical equipment are very common in industrial locations. Large voltage spikes can be caused by switching power loads, such as large motor drives, at the customer location. The output stage triacs of the Servo Pro are protected against damage from voltage spikes by a special combination of:

- Limit Switch Circuitry
- Metal Oxide Varistor (MOV)
 For Transient Voltage Suppression
- Zero Crossing Detection

DeviceNet Servo PRO: Bray also offers the Series 70 with the most advanced serial BUS communication Servo on the market. The Bray DeviceNet Servo Pro is fully ODVA (Open DeviceNet Vendor Association) compliant. Benefits include greatly simplified field wiring and installation, advanced control and diagnostics in real-time from a remote location, and full network integration. Please contact your Bray representative for more information.

SERVO PRO FEATURES / SPECIFICATIONS

Servo is available for modulating service, continuous duty actuators only.

Power Input	24 , 120 or 220 VAC, 50/60 Hz (power must match motor)	
Power Consumption	2 Watts (not including actuator power)	
Input Signal	Standard: 4-20 mADC	
	Configurable: 1. 0-10 VDC 2. 2-10 VDC 3. 10K Ohm or greater potentiometer,	
Calibration	Single Button Autocalibration	
Indicators	Power: Green LED Status: Flashing Red / Green LED Motor: Red LED (Close), Green LED (Open)	
Control Modes	Standard: Full Range, Direct Acting	
	Configurable: Reverse Acting, Split Range	
Fail Position	Standard: Fail Closed	
(Loss Of Input Signal)	Configurable: Fail Open	
Control Characteristic	Linear	
Duty Cycle	100%	
Internal Feedback	10K Ohm Potentiometer, gear driven	
Retransmission Output	Standard: 4-20 mADC	
	Configurable: 0-5 VDC, 0-10 VDC, 2-10 VDC Retransmission Output is designed to drive an isolated 250–500 Ohm resistive load.	
Speed Control	Standard: Full Speed (Speed Control is Disabled)	
	Configurable: Bidirectional–Independent Open and Close Trim Pots adjustment	

[&]quot;Standard" is the way the Servo is set at the factory.

[&]quot;Configurable" means the customer, or the factory, can modify the Servo by setting DIP switche(s).





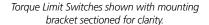




AUXILIARY SWITCHES: Independent dry-contact (voltage free) SPDT mechanical switches are available to indicate travel position to remote customer control systems.



HEATER: A self regulating heater can be added to prevent possible damage to electrical components due to condensation build-up inside the actuator. Mounted in the actuator top plate for easy accessibility.





MECHANICAL TORQUE LIMITING SYSTEM - optional

The mechanical torque limiting system consists of a Worm Shaft, a Worm, a set of Torque Disc Springs and a Shaft Groove for torque limiting switches. The torque disc springs, located on each side of the worm, resist the linear movement of the worm shaft. The worm shaft is driven against the torque disc springs in response to output torque. The shaft groove actuates the torque limiting switches, located above in the Control Center, to start and stop the motor. Two SPDT mechanical switches and two factory calibrated set screws independently respond to predetermined loads in both the open and closed travel directions by sensing the movement of the worm shaft, and interrupting the electrical power to the motor. The switches operate at any point of actuator travel. The precisely controlled movement of this system is the main torque limiting element of the Series 70.



ELECTRICAL CABLE CONNECTIONS

A multi-pin, watertight cable receptacle offers full compatibility with today's industrial wiring systems. Factory pre-wiring prevents errors and allows quick-connect field installation. Cord sets with connection/flying leads or extension cords with connections on both ends can plug directly into the receptacle.

RUGGED, LOW COST ELECTRIC ACTUATORS FOR ROTARY VALVES

THREE ON-OFF MODELS WITH UP TO 600 LB-IN (68 N-m) OUTPUT TORQUE

Bray Controls' generations of innovative electric actuators have a proven record of success. Building on this record, Bray has combined engineering expertise and years of field experience to produce the Series 73. This electric actuator for rotary valves delivers highly reliable service at a reduced price. The Series 73 meets the needs of 21st Century industrial applications at a price that is unmatched.







CAMS/CAMS ADJUSTMENT Cams are infinitely adjustable by the hex key with no special tools needed. Standard factory setting allows 90° reversible rotation between open and closed positions. Extended rotation such as 180°, 270° or beyond can be achieved simply by adjusting the cams.



The Bray Series 73 Electric Actuator on Bray butterfly valve and Flow-Tek ball valve.

Torque Value lb/in (Nm)	S7 :	3-1	S7 :	3-3	S7 :	3-6
lorque value ib/iii (iviii)	100	(11)	300	(34)	600	(68)
MOTOR CURRENT RATING						
VAC 50-60 Hz	120	220	120	220	120	220
Amps	0.4	.02	0.9	0.4	1.1	0.6
Speed in Seconds 90° Rotation	2/5	/10	5/10)/15	10/15	/30/60

Temperature Range	-20°F (-29°C) to +150°F (+65°C)
Limit Switch Rating	250 VAC, 10A 1/2 HP
Terminal Switch Wiring	14-28 AWG, 221°F (105°C), 300V minimum rated wire

MANUAL OVERRIDE: Bray's manual override with double "D" flats is easily accessible by removing the position indicator. By pushing the indicator shaft down, the spring loaded output shaft disengages from the output gear. The Manual Override allows manual rotation of valve position when electrical power is off. To return, apply power and the motor will re-engage the gearing.

SERIES 73 - OPTION

HEATER: A self regulating heater can be added to prevent possible damage to electrical components due to condensation build-up inside the actuator.

ENCLOSURE: Die-cast aluminum cover and base are waterproof and designed to meet NEMA 4, 4X and IP 65 specifications. The enclosure features a high-quality polyester powder coating offering exceptional corrosion, wear, impact and ultraviolet resistance.

TRAVEL LIMIT SWITCHES: Bray has provided two SPDT switches as standard. The 10A, 220 VAC switches are used for AC motor control. Two optional auxiliary switches are available to signal a low wattage AC lamp or a DC controller input. Switches are easily accessible without interference from other components.

TERMINAL BLOCK: The actuator switches are connected to a terminal block. The block has been designed for ease of customer wiring without interference from other components and features clearly marked terminal numbers. The screw clamp terminal block is rated at 10A, 250VAC. The block has been placed near the two conduit entries with ample room for running wire leads. A wiring diagram is included inside the enclosure cover for easy reference.

MOTOR BRAKE: All AC motors feature an internal break. When power to the actuator is cut off, the brake stops the motor and holds the valve in position until power is restored.

MOTOR & CAPACITOR: The Series 73 has a 115 or 220 VAC single phase permanent split-capacitor reversible induction motor. 12 or 24 VDC motors are available upon request. The UL listed motor features a built-in thermal overload protector of a bi-metallic strip in the windings set at 230°F (110°C) with automatic reset.

SPUR GEAR SYSTEM: The heavyduty spur gear train is composed of precision cut, multi-staged gears and shafts. The gears and shafts are heat treated high alloy steel and will withstand locked rotor conditions. The spur gear system is permanently lubricated at the factory.

HOUSING SEAL: The large -O-ring seal between the cover and base provides a waterproof enclosure and prevents ingress of moisture. This seal is far superior to commonly used gaskets.

CONDUIT ENTRIES: The Series 73 features two conduit connections with inherent stops. Entries are available in either 1/2" NPT or metric threads. One entry is for power, one for control wiring.

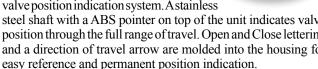
ACTUATOR MOUNTING: A double "D" bore is standard. A double square (star) bore is available. Bray actuators mount directly to Bray valves without using external linkages.

ON/OFF LED INDICATORS:

Two LEDs, one for open and one for closed, are located on the unit side. The LEDs light up either red or green when the valve reaches the open and closed positions. Beside each LED, graphic icons indicating open and closed have been molded into the housing.

VALVE POSITION INDICATION:

valve position indication system. A stainless steel shaft with a ABS pointer on top of the unit indicates valve position through the full range of travel. Open and Close lettering and a direction of travel arrow are molded into the housing for





















Series 20 wafer	1"-20" (25mm-500mm)	150 psi (10.3 Bar)
Series 21 lug	1"-20" (25mm-500mm)	150 psi (10.3 Bar)
Series 22 wafer	2"-20" (50mm-500mm)	150 psi (10.3 Bar)
Series 23 lug	2"-24" (50mm-600mm)	150 psi (10.3 Bar)
Series 30 wafer	2"-12" (50mm-300mm)	175 psi (12 Bar)
Series 30 water	14"-20" (350mm-500mm)	150 psi (10.3 Bar)
6 . 541	2"-12" (50mm-300mm)	175 psi (12 Bar)
Series 31 lug	14"-20" (350mm-500mm)	150 psi (10.3 Bar)
Series 31H lug	2"-20" (50mm-500mm)	250 psi (17.2 Bar)
Series 31U lug	2"-20" (50mm-500mm)	285 psi (20 Bar)
Series 3A	2"-12" (50mm-300mm)	175 psi (12 Bar)
double flanged	14"-20" (350mm-500mm)	150 psi (10.3 Bar)
Series 3AH double flanged	2"-20" (50mm-500mm)	250 psi (17.2 Bar)
Series 32 wafer	22"-36" (550mm-900mm)	75 psi (5.2 Bar)
Series 33 wafer	22"-36" (550mm-900mm)	150 psi (10.3 Bar)
Series 35 double flanged	22"-120" (550mm-3000mm	n) 75 psi (5.2 Bar)
Series 36 double flanged	22"-120" (550mm-3000mm	n) 150 psi (10.3 Bar)
Series 36H double flanged	24"-54" (600mm-1400mm)	232 psi (16 Bar)
Series 35F double flanged	32"-60" (800mm-1500mm)) 75 psi (5.2 Bar)







High Performance Butterfly Valves

BRAY / McCANNALOK High Pressure & Temperature

The Bray/McCannalok's innovative design offers rugged reliability and extremely easy maintenance in the field. Independent and internal tests prove Bray/McCannalok's superior service life capability, with zero-leakage shut-off. The Bray/McCannalok High Performance Valve delivers the highest quality and highest value available for meeting today's demanding requirements.

Available with proven bidirectional fire safe seats for reliable control of flammable and hazardous fluids in petroleum, petrochemical, chemical and other high-risk applications. The fire safe design combines superior performance, extended service life and compliance with the most demanding worldwide fire-test standards — before, during and after a fire!

Size Range: 2 1/2" – 60" (65mm – 1500mm)

Body Style Wafer, Lug & Double Flanged Style

Temperature Range: -20°F to 500°F (-29°C to 260°C)

Pressure Rating: ASME Class 150, 300 and 600

TRIPLE OFFSET QUARTER TURN VALVES

High Pressure Zero Leakage METAL TO METAL Sealing

Bray TriLok Series Triple Offset Valve – the ultimate critical service quarter turn valve. Bray's TriLok is the only triple offset built with 21st Century innovation.

- Seat/Seal system features field replaceable body seats and disc seals.
- Splined Disc/Stem Connection facilitates self-alignment of the disc seal with the seat and eliminates the requirements of external pins, keyways and other types of fasteners.
- Hub & Bearing System provides maximum stem support whilepreventing media ingress.

Size Range: 3" – 60" (80mm – 1500mm)

Body Style Wafer, Lug & Double Flanged Style

Temperature Range: -425°F to +1,200°F (-254°C - +650°C)

Pressure Rating: ASME Class 150, 300, 600 and 900

and PN10 to 140





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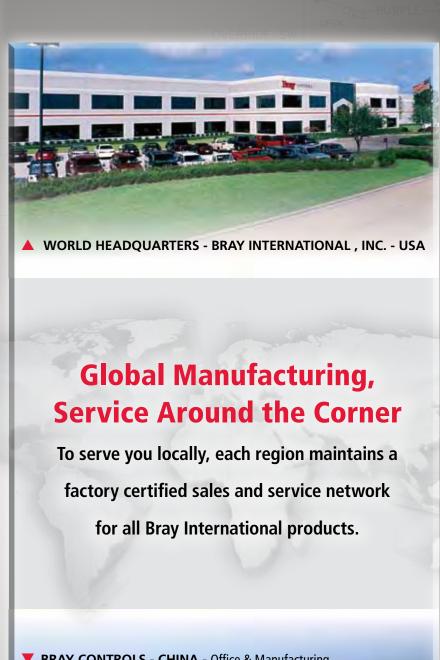
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