
SERIES 92/93

PNEUMATIC ACTUATORS AND ACCESSORIES



 **Bray**[®]

BRAY.COM

THE HIGH PERFORMANCE COMPANY



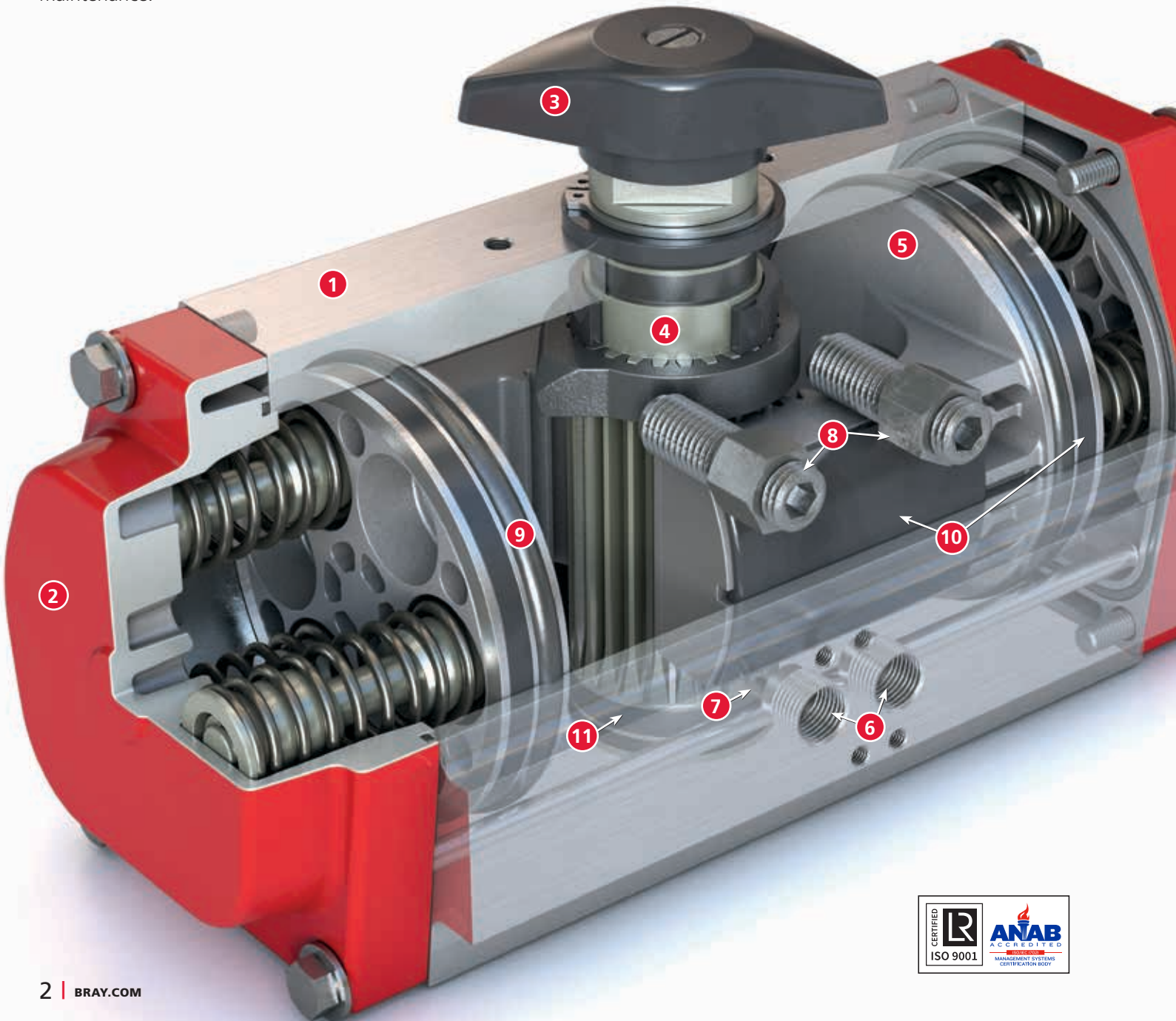
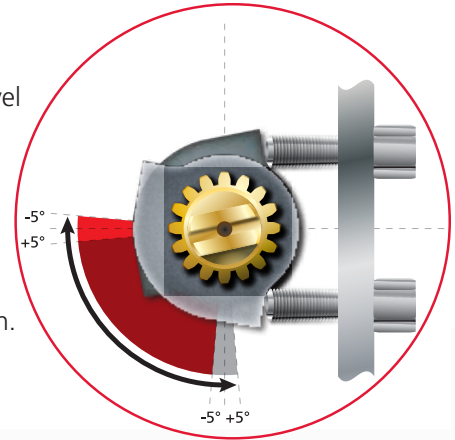
DIRECT MOUNTING

Bray actuators comply with ISO 5211 dimensions and mount directly to Bray valves without using external linkages. Field installation is simple, misalignment is minimized and contamination buildup between valve and actuator is reduced.

Series 92/93 actuators are completely enclosed and self contained, with permanently lubricated bearings and guides which minimize maintenance.

TRAVEL STOP ADJUSTMENT

The 0° and 90° travel positions have travel adjustments of +5° maximum to -5° minimum. Extended travel stops are also offered as an option.



- 1 Body**
- 2 End Caps**
- 3 Position Indicator**
- 4 Output Shaft and Pinion Gear**
- 5 Pistons**
- 6 Pneumatic Supply Ports**
Available imperial or metric. NAMUR interface for accessory mounting is standard on all actuator sizes.
- 7 Integral Porting**
Reduces the cost of external tubing that is also easily damaged.
- 8 Travel Stops**
Adjusting screws limit the travel of the actuator to specific degrees of rotation in both open and closed directions.
- 9 Piston O-Ring Seals**
- 10 Piston Guides and Rings**
Provide low coefficient of friction and absorb the side thrusts of the pistons.
- 11 Output Shaft Bearings**
Top and bottom of the pinion.

STANDARD MATERIALS SELECTION

Body	Extruded aluminum alloy, anodized 316 Stainless Steel
End Caps	Die cast aluminum alloy with corrosion resistant polyester coating 316 Stainless Steel
Pistons	Die cast aluminum alloy
Output Shaft/Pinion	Carbon steel, zinc plated
Travel Stop	Alloy steel
Shaft Bearings	Acetal
Piston Guides	Acetal
Fasteners	Stainless steel
Springs	Spring steel, protective coating
Piston O-Ring Seals	Buna-N
Options	Polyester coated body exterior Electroless nickel plated body exterior Hard anodized body exterior Seacorr coated body exterior Stainless steel pinion

OPERATING CONDITIONS

Output Torque	Up to 44,130 Lb-in (4,986 N-m)
Pressure Range	40 - 140 psi (2.8 - 10 bar)
Media	Dry Compressed Air/Inert Gas
Temperature Range	Standard: -4°F to 200°F (-20°C to 93°C)
	Low: -40°F to 176°F (-40°C to 80°C)
	High: 0°F to 300°F (-18°C to 149°C)
	Extreme: Up to 482°F (250°C)

Note: Cycle life on low and high temperature seal kits reduced compared to standard Buna-N seals

Series 92 Double Acting	Available in 90°, 135°, 180° rotation
Series 93 Spring Return	Available in 90° Rotation

PNEUMATIC ACTUATOR OPTIONS



Series 05 - Declutchable Gear Operator



Stainless Steel



Extended travel stops

SERIES 63 SOLENOIDS

PILOT OPERATED SPOOL CONTROL

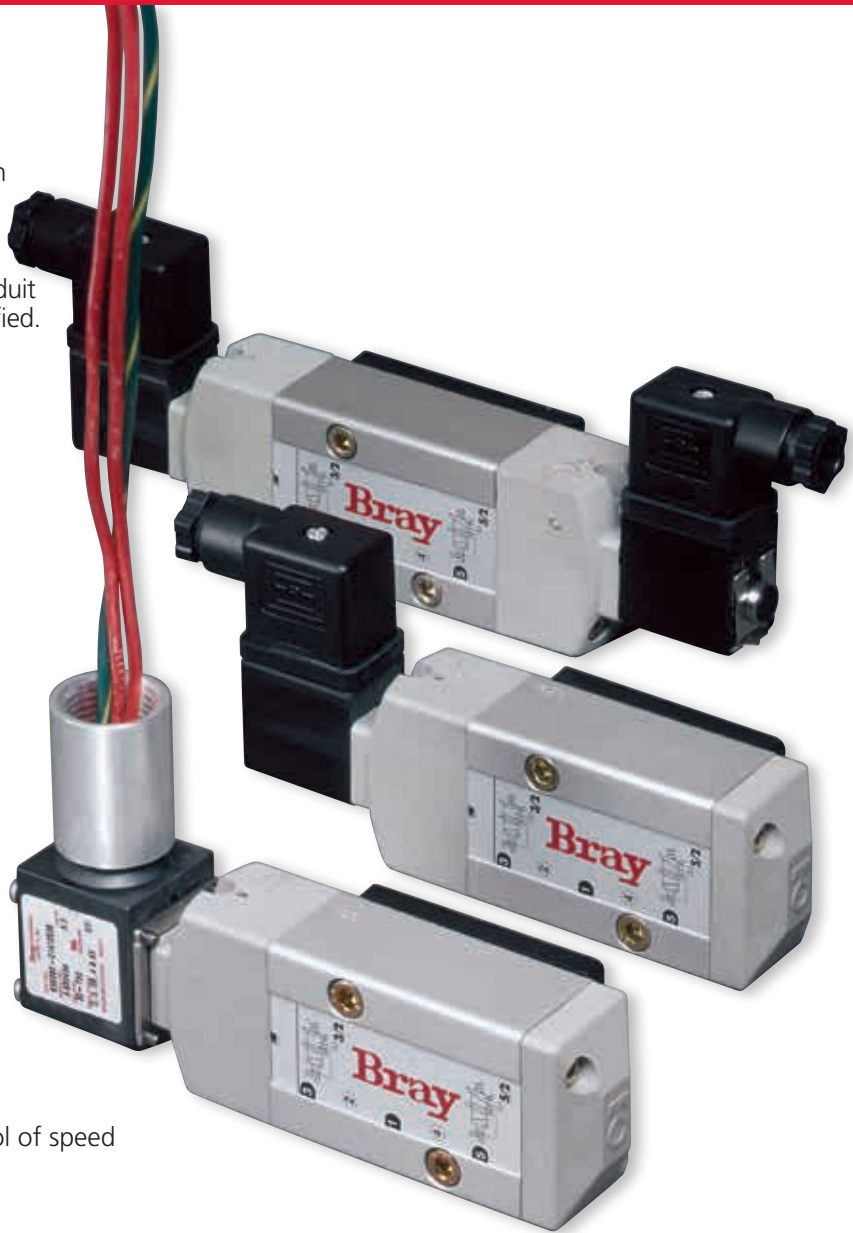
These units can be used with either spring return or double acting actuators where on/off electrical operation is required. Units have 1/2" NPT conduit connections and IP65 DIN units have cable gland PG9 connectors, also available with 1/2" NPT conduit adapters. The coils are UL recognized and CSA certified. All Series 63 solenoids carry the CE mark.

FEATURES

- Compact
- Modular
- Pilot Operated
- Spool Control Valve
- Convertible From 3-Way (3/2) to 4-Way (5/2)
- Spring Return or Double Acting

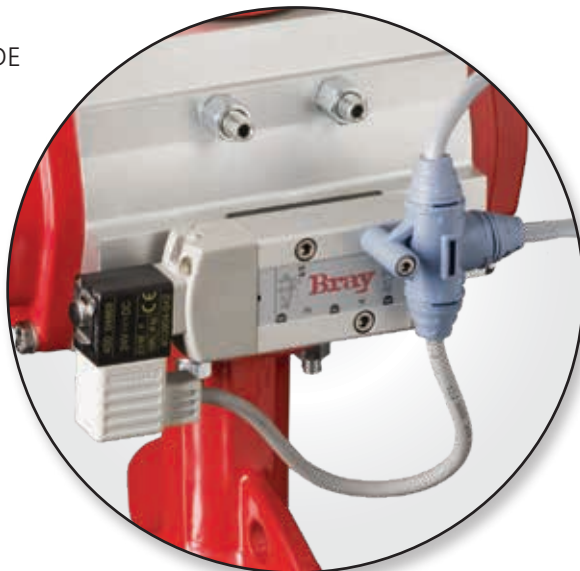
SOLENOID OPTIONS

- Stainless steel housings
- Low-powered units
- Intrinsically safe units
- BUS solenoids are available for DeviceNet and Profibus-PA protocols
- AS-I Interface solenoids with IP65 DIN/PG9 cable gland connectors are available
- All direct mount to Bray pneumatic actuators
- Speed controls that allow independent control of speed in both directions



DIRECT MOUNTING

Meeting NAMUR (VDI/VDE 3845) standards, all Bray Series 63 solenoid valves direct mount to the integral porting system of Bray Series 92/93 pneumatic actuators. No external piping is required. Bray's direct mounting permits quick and simple field installation.



MANUAL OVERRIDE

Each unit contains as standard a mechanical manual override located on the solenoid valve block. In the event of electrical power failure, over-riding is accomplished by rotating the manual override screw which will divert the air from one chamber of the pneumatic actuator to the other.

VALVE DESIGN

Pilot Operated Spool

MEDIA

Dry or lubricated air or inert gases

COIL HOUSINGS

Three standard coil housings are offered.

1. Watertight (NEMA 4, 4x) housing with flying leads offers a molded and potted coil with UL recognized components and CSA certification.
2. Watertight & Explosion Proof (NEMA 4, 4x, 7, 9) housing with flying leads is UL listed and C.S.A. certified for hazardous locations Class I, Div.1 (Groups A-D) and Class II, Div.1 (Groups E-G).
3. IP65 DIN coil housing.

Standard solenoid valves are supplied as single coil units. Dual coil units are also available for customers who require actuators to remain in last position during electrical power failure.

SPRING RETURN ACTUATORS

The Series 63 Solenoid Valve fills the spring chamber with supply air rather than drawing air from the surrounding atmosphere. This keeps the spring chamber clean and dry, and improves the performance and service life of the actuator.

STANDARD MATERIALS SELECTION

Body	Anodized Aluminum
Spring	Phosphate treated Black Steel
Shading Coil	Copper
Seals	NBR + PUR
Core / Tube	Stainless / Brass
End Covers & Plate	6/6 glass filled polyamide (PA/FV)
Spool	Aluminum
Internal Parts	Zamak, Steel, Acetal
Pneumatic Ports	1/4" NPT
Electrical Connections	NEMA Housings: 1/2" NPT DIN Housing: Cable Gland PG9

MECHANICAL CHARACTERISTICS	
Mounting	NAMUR (VDI/VDE 3845), mountable in any position, hardware included.
CONSTRUCTION	
Standard construction is molded and potted coil with 18" leads, Class F insulation. Other insulation classes available. The IP65 DIN coil and magnet structure are epoxy encased. Molded cordsets and connectors are available for IP65 DIN coil housings, please consult Bray representative or factory for further information.	
NORMAL AMBIENT TEMPERATURE RANGE	
NEMA Housings	AC: -13°F (-25°C) to +140°F (+60°C) DC: -13°F (-25°C) to +77°F (+25°C)
ELECTRICAL COIL	
NEMA Housings with flying leads	12, 24, 120, 220 VAC, 50-60 HZ 12, 24, 120 VDC
IP65 DIN Housings Type "I" Connection	24, 120, 240 VAC, 50-60 HZ 24 VDC
NEMA & IP65 DIN Coil Insulation-Class F Max Temperature Rating: 311°F (155°C) Max Ambient Temperature Rating: 158°F (70°C)	
FLOW	
1/4" (6.35 mm) PIPE CV = .7	Flow = 30 scfm, 150 psi (10.4 bar) max.
Bray S92/93 actuation times are very dependent on the flow capacity of their air supply. It is strongly recommended that only the Bray S63 high flow solenoid be used with the Bray S92/93 actuators. The use of smaller port solenoids, solenoid manifolds, small I.D. air supply tubing and/or extended lengths of tubing can significantly reduce the actuation time and/or the initial response to the command signal. Please see TB-1140 for pneumatic flow testing recommendations.	
NOMINAL POWER	
NEMA Housing	AC - 6.3W, DC - 6.9W
DIN Housing	AC - 2.5W, DC - 3.0W
Operating Speed	10 cycles per minute - with more if needed
Duty Cycle	Continuous

SERIES 6P P/P POSITIONER

DOUBLE ACTING AND SPRING RETURN ACTUATORS



The Bray Series 6P positioner provides outstanding control for a wide range of quarter-turn valves. This design provides fast, sensitive response characteristics to meet the most demanding control objectives using a 3-15 psi pneumatic control signal. A

high visibility dome position indicator and 3 gauges are provided as standard.

APPLICATIONS

Bray Series 6P positioners are used to control quarter-turn control valves such as butterfly and ball valves (standard and segmented) and its sensitive two-stage relay makes it ideal for precise damper control applications. Specify Bray Series 6P whenever valve positioning and sensitivity is critical.

For modulating control of valve positions, the Series 6P automatically positions the valve to precise angles between 0° and 90° in response to a pneumatic input signal. The standard positioner is Double Acting but can be easily converted to Single Acting/Spring Return. The 6P also has Split Range capabilities and an easy to adjust Span and Zero.

MOUNTING & MATERIALS

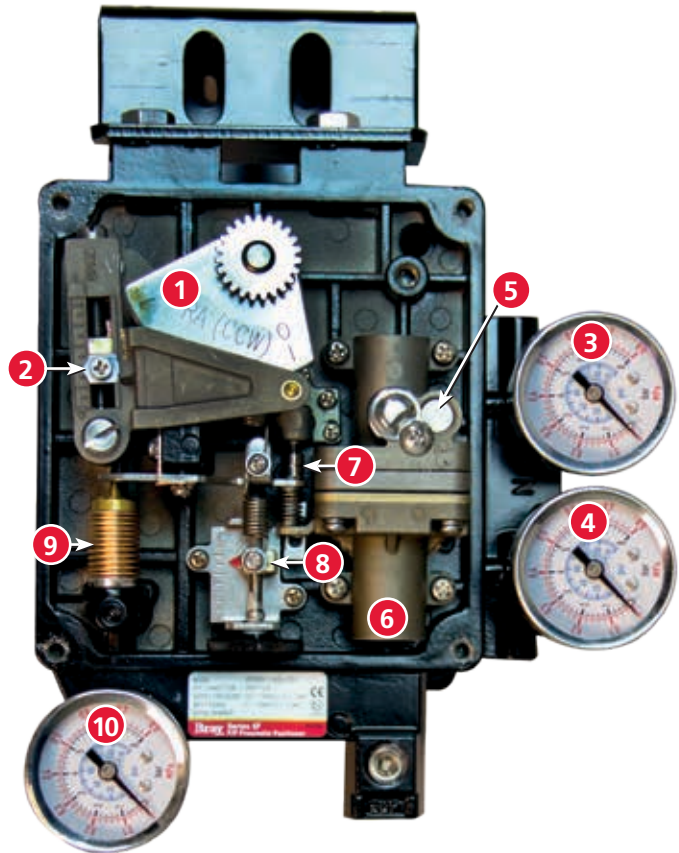
The Series 6P can be installed directly on any quarter-turn valve actuator conforming to the NAMUR standard. Contact your local Bray Distributor for information about mounting the 6P on non-NAMUR actuators.

The Series 6P housing is constructed from durable die-cast aluminum that is first anodized for internal corrosion resistance, then powder coated for external resistance to harsh environments.

OPTIONS / ACCESSORIES

Special Cams: Special cams for non-standard ranges may be modified by the factory or customer.

Air Filter: A coalescing air filter is recommended for all positioners to eliminate dust, moisture, and oil particles from contaminating the unit.



- | | |
|--------------------------|-------------------------|
| 1 Feedback Cam | 6 Two-Stage Pilot Relay |
| 2 Span Adjustment | 7 Flapper/Nozzle |
| 3 Output 1 Gauge | 8 Zero Adjustment |
| 4 Output 2 Gauge | 9 Input Signal Bellows |
| 5 Auto/Manual Adjustment | 10 Input Signal Gauge |

STANDARD FEATURES

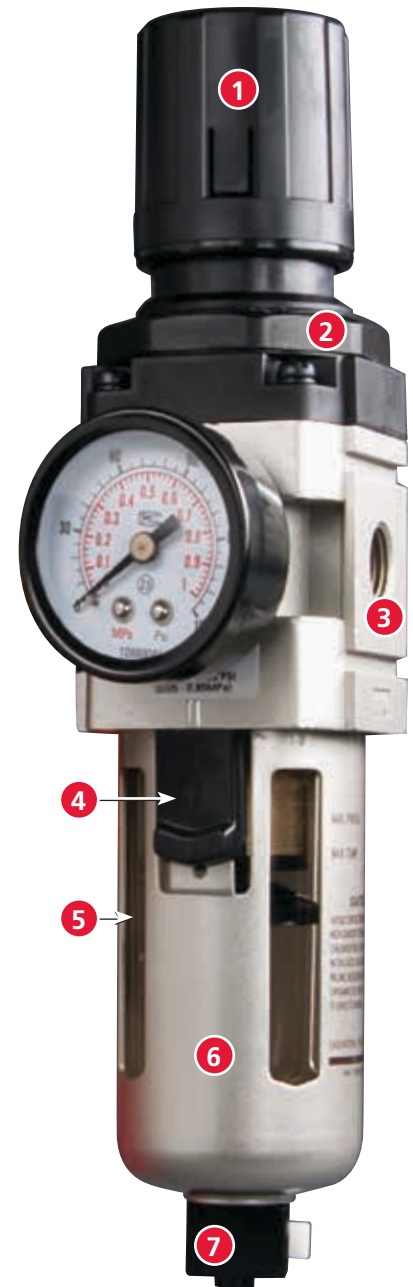
- **Two-Stage Pilot Relay** Provides fast, sensitive response characteristics for precise control of critical control valves and dampers.
- **Corrosion Resistant Materials** All exposed parts are either stainless steel or powder coated anodized aluminum to permit use in corrosive environments.
- **High Visibility Dome Position Indicator** Provides high-contrast, full-angle viewing of valve position.
- **Vibration Resistant** High natural frequency and pneumatic dampening make the Series 6P resistant to vibration.
- **Gauge Manifold** 3 gauges are provided for Signal, OUT 1, and OUT 2 ports.
- **Double or Single Acting**
- **Adjustable NAMUR Mounting Bracket**

SERIES 55 FILTER REGULATORS

FEATURES & BENEFITS

The Bray Series 55 Filter Regulator is a 5 micron filter designed to provide nominal filtration removal of solids and liquids from the compressed air with accurate control to any pneumatic control device and are strongly recommended for use with the Bray Series 6A and 6P positioners.

- 1 Locking Knob**
Allows for downstream pressure adjustment and locks the pressure setting in place.
- 2 Threaded Collar**
Permits easy attachment of bracket for panel mounting.
- 3 Pressure Ports**
1/4" NPT or G 1/4 Metric
- 4 Bowl Quick Release**
Allows for easy removal of the bowl and guard for access to the filter element without the need for special tools.
- 5 Transparent Polycarbonate Bowl**
Provides easy view of liquid levels.
- 6 Metal Bowl Guard**
Provides sturdy breakage protection from external environmental factors.
- 7 Push button Drain**
Allows for easy removal of liquid from the bowl.



SERIES 55 FILTER REGULATORS	
Pressure Ports	1/4" NPT or G 1/4
Gauge Ports	G 1/8
Flow (SCFM)*	30
Set Pressure	7 – 125 PSIG (0.05 - 0.85 MPa) (0.5 - 8.6 Bar)
Filter Regulator Body	Zinc / Non-Removable Rising Knob
Bonnet	Plastic
Springs	Steel
Bowls (2 Ounce)	Transparent Polycarbonate with Metal Guard Metal (Zinc) w/Sight Gauge
Filter Element	5 Micron Standard – Plastic
Pressure Ratings**	0 – 250 PSIG (0 - 1.70 MPa) (0 – 17.2 bar)
Temperature Ratings	32°F - 175°F (0°C - 80°C)

*SCFM - Standard cubic feet per minute at 100 psig inlet, 90 psig no flow secondary setting and 10 psig pressure drop.

**Do not attach to pressurized gas bottles.



SERIES 6A ELECTRO-PNEUMATIC POSITIONERS

Precision digital control with proven reliability Bray's Series 6A positioners were designed with ease of installation, simple calibration, efficiency and economy in mind. Units for rotary single acting and double acting actuators are offered as standard. Intrinsically safe versions are also available.

Bray's BUS positioners offer all Series 6A features plus increased network communication and remote access to positioner parameters and diagnostics.

On-Line Adaptive Control: During operation, the unit continually optimizes control behaviors and travel times in response to changes in line media pressure.

Diagnostics: Bray's Series 6A positioners feature corrective and preventative maintenance self-diagnostic checks. All diagnostics run constantly, may be continually monitored, and recorded.

Air Supply Monitor: An additional feature of the Series 6A is an internal monitor that transmits a fault signal alarm if the air supply fails. The alarm is shown locally on the LCD and may be sent to the remote control panel.

Local Position Adjustment: Valve position can be manually adjusted locally by removing the housing cover, then using the push buttons to override the remote command signal.

Flow Restrictors: Precise control of even the smallest pneumatic actuators through internal flow restrictors.

Position Indicator: In addition to the LCD display, valve position is clearly shown over a distance by a yellow indicator.

Locking Device: For high vibration applications, the Series 6A features, as standard, a friction clutch locking device.

EXPLOSION PROOF UNITS

Designed for hazardous and severe applications, Series 6A explosion proof positioners offer all the features of the waterproof units in a flame-proof enclosure.

The automatic calibration keypad push buttons in the explosion proof units are externally mounted and easily accessible behind a flap. The units can be controlled locally, even during operation, without removing the housing cover. The LCD display is viewed from behind a sodium glass explosion proof window.

Waterproof/Explosion Proof enclosures meet NEMA 4, 4x, 7 & 9 specifications. These enclosures are constructed of die cast aluminum with an epoxy coating for chemical and corrosion protection. A waterproof Stainless Steel enclosure is available upon request.



MODULAR ACCESSORIES

Gauge Manifold: An externally mounted gauge manifold is offered with up to three gauges to measure air supply and the actuator input and output pressures.

Volume Boosters: These modules increase air volume output and decrease response time.

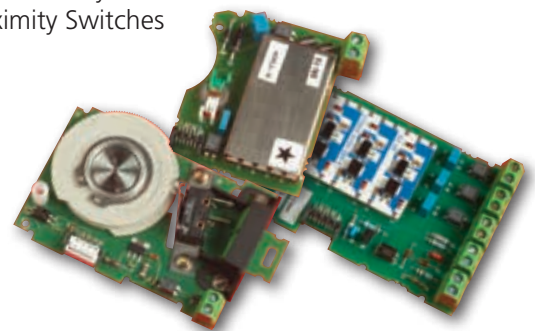
OPTIONAL BOARDS

These optional boards provide additional information and features and can be easily installed in the field.

Retransmission Module (IY): This 4-20 mA DC output board indicates valve position to the control room.

Programmable Electronic Switches (Alarm): Two semiconductor switch outputs and one alarm output may be programmed to activate at various travel positions. One digital input is also included.

Limit Switches: For cam activated indication of actuator travel limits, two output formats are offered: Mechanical Switches or Intrinsically Safe Inductive Proximity Switches (SIA).

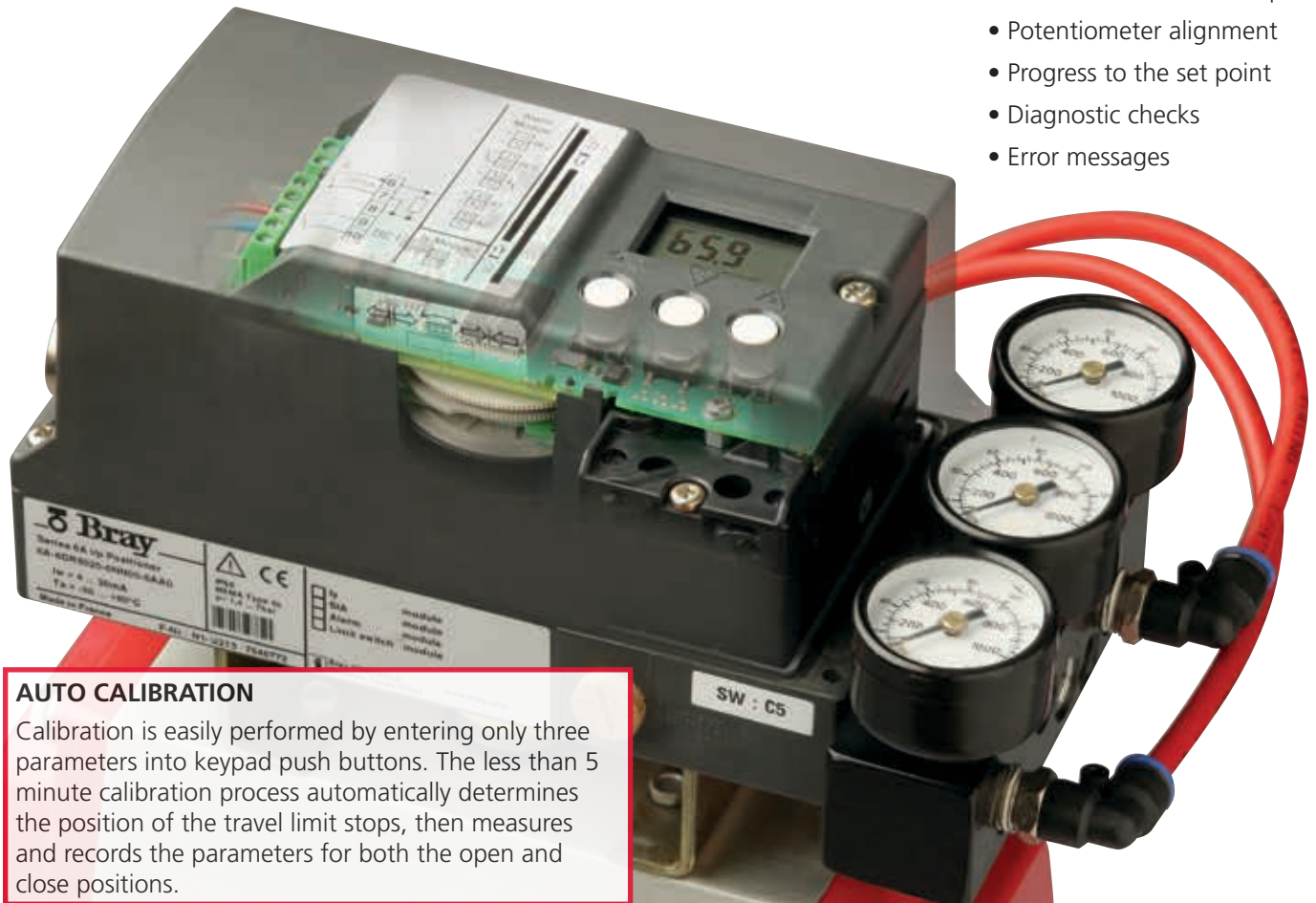


Enclosures: The standard waterproof enclosure is constructed of a durable, lightweight polymer, providing excellent chemical and corrosion resistance.

LCD Display & Keypad: Provides visual confirmation of valve position in precise one degree increments, operating status and keypad entries with the housing cover in place. The positioner operating mode (automatic or manual) and alarm messages are also shown.

With the housing cover removed, the keypad push buttons are accessible to perform a variety of functions:

- Confirmation of the set point
- Potentiometer alignment
- Progress to the set point
- Diagnostic checks
- Error messages



AUTO CALIBRATION

Calibration is easily performed by entering only three parameters into keypad push buttons. The less than 5 minute calibration process automatically determines the position of the travel limit stops, then measures and records the parameters for both the open and close positions.

SERIES 6A WATERPROOF UNITS - SPECIFICATIONS

Supply Pressure [Max]	20 - 102psi (1.4-7Bar)	
Air Consumption (80psi)	<0.00035 scfm (.00275 sccm)	
Input Signal	Analog	4-20 mADC
	BUS	HART, Foundation Fieldbus, Profibus PA
Connections	Supply	¼" NPT (G ¼")
	Signal	2 conduit entries 1/2" NPT (M20x1.5)
Resolution	<0.05%	
Repeatability	0.32%	
Hysteresis	<0.2%	
Temperature Range	-22°F to +176°F (-30°C to +80°C)	
Weight	2.0 lbs. (0.9 kg)	

Control Element Type	Piezoelectric	
EMC Requirements	EN 61326/A1 Appendix A.1 NAMUR NE21 August 98	
Protection Class	NEMA 4, 4x and IP66	
Materials	Housing	Fiberglass reinforced polymer with metalized coated interior for EMC protection
	Housing Fasteners	Stainless Steel
	Position Indicator	ABS polymer
Positioner Mounting	VDI/DE 3845 (NAMUR)	
Available Approvals	FM, CSA, CE, ATEX	

SERIES 5A, 5B & 5C VALVE STATUS MONITORS



The Bray Series 5A, 5B and 5C Valve Status Monitors (VSM) provide visual and electrical indication of position on any VDI/VDE 3845 compliant quarter-turn device. Our solutions enable end users to better monitor their process no matter the conditions.

1 - Enclosure

The compact weatherproof VSM is UL certified NEMA Type 4, 4x and IP66/67/68. The VSM is also available with an explosion-proof enclosure (5C) certified by UL, ATEX and IECEx. A die-cast aluminum cover and base coated with a polyester powder coat provide exceptional corrosion, wear, impact and ultraviolet resistance.

2 - High Visibility Position Indicator

Visual open and closed indication is provided with an impact resistant dome style indicator. Inverting the open and closed visual output is easily done by removing the cover and rotating it 90 degrees. There is no need to remove the cover and expose internal wiring of the VSM to change position indication.

3 - Stub Shaft Secondary Seal

Ensures indicator area is separate from the VSM's internals. Provides a secondary seal to prevent water ingress should the dome or dome seal become compromised due to adverse site conditions.

4 - Captive Cover Bolts

The cover is attached to the base by captive stainless steel bolts placed outside the sealing area.

5 - Protective Washers

Clear, nonmetallic, corrosion resistant washers are used to ensure coating integrity when cover bolts are tightened.

6 - O-Ring Seal For Watertight Enclosure

The O-ring seal between the cover and base provides a weatherproof seal preventing internal corrosion.

7 - Sensor Cams

Splined cam design allows for easy and accurate setting of switch activation without the use of tools.

8 - Limit Switches

Multiple switch options and configurations to meet connectivity requirements.

9 - Terminals

Clearly marked terminal blocks are angled towards the user to ensure easy access.

10 - Conduit Entries

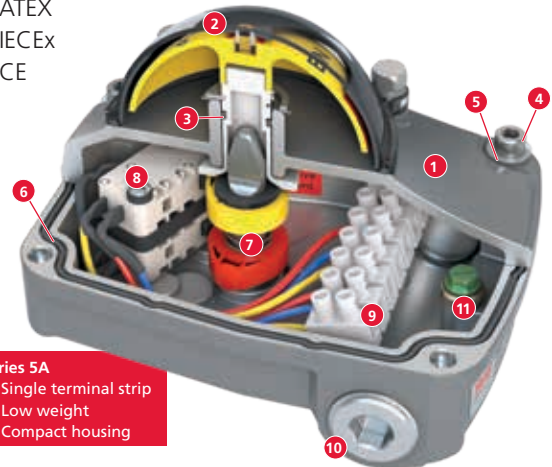
Two conduit entries available in either imperial or metric threads.

11 - Grounding

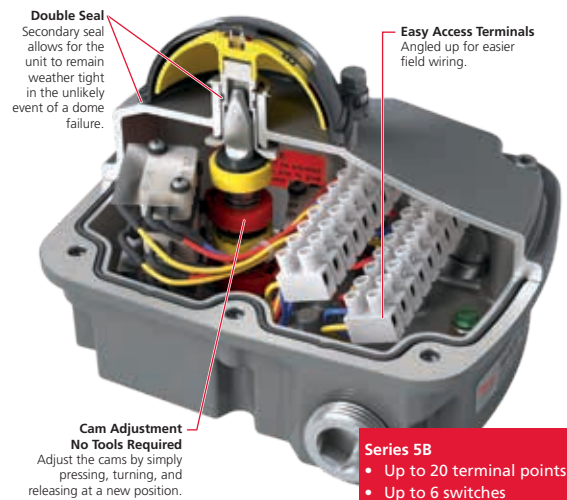
Green color-coded, easy-access grounding bolt.

Certifications

- IP66/67/68
- NEMA Type4, 4X
- cULus
- UL50E Salt Spray
- ATEX
- IECEx
- CE



- Series 5A**
- Single terminal strip
 - Low weight
 - Compact housing

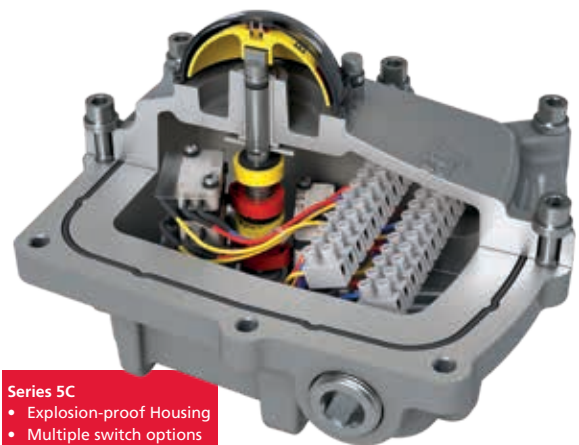


Double Seal
Secondary seal allows for the unit to remain weather tight in the unlikely event of a dome failure.

Easy Access Terminals
Angled up for easier field wiring.

Cam Adjustment No Tools Required
Adjust the cams by simply pressing, turning, and releasing at a new position.

- Series 5B**
- Up to 20 terminal points
 - Up to 6 switches



- Series 5C**
- Explosion-proof Housing
 - Multiple switch options

SERIES 54 PROXIMITY SENSORS

The Series 54 inductive proximity sensor provides position indication for quarter turn valves.

The superior design offers reliable and durable valve monitoring and control solutions for efficient plant operation.

The compact Series 54 directly mounts to VDI/VDE 3845 compliant actuators resulting in a smaller actuator profile while saving on cost.

Various electrical output options allow integration of the Series 54 into all standard process control environments.

1 - Sensor

Extremely low profile with direct mounting to VDI/VDE 3845 compatible actuators.

2 - Sensing Face

Compact concave design for protection of sensor targets.

3 - Bright LED

Indication to display sensor power and switch status.

4 - Activator

Low resistivity material prevents electrostatic discharge. Contains two stainless steel targets for CW or CCW operation.

5 - Indicator

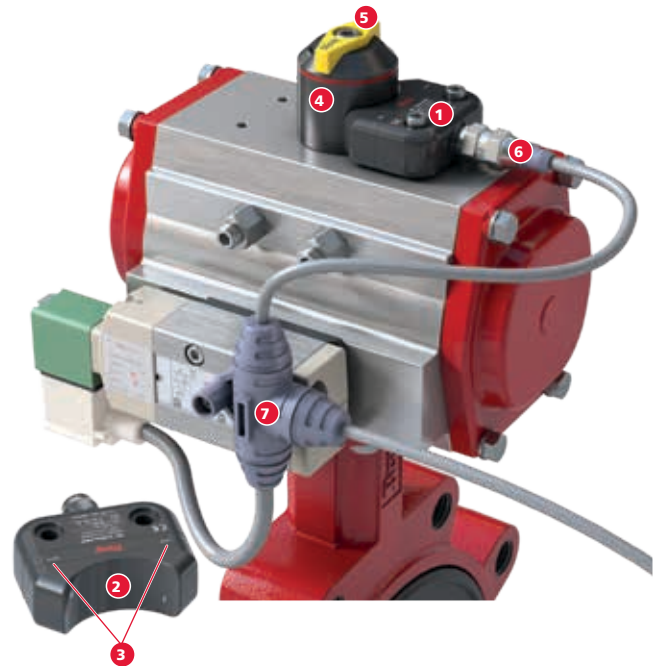
Bright yellow for improved visibility of valve position.

6 - Connection

Sensor connectivity includes single pin connector or cable gland.

7 - Y-Connector (optional)

Reduces site cable requirements while decreasing installation time for sensor and valve solenoid. Allows power and signal on a single cable for the sensor and solenoid.



	GENERAL SERVICE	INDUSTRIAL SERVICE	HAZARDOUS LOCATION	
Design	Extreme low profile	Compact	Intrinsically Safe	Non-Sparking
Housing material	Thermoplastic PBT	Thermoplastic PBT	Thermoplastic PBT	Powder coated aluminum and polycarbonate (PC)
Mounting	30x80mm 30x130mm	30x80mm 30x130mm	30x80mm 30x130mm	30x80mm 30x130mm
Connectivity	Connector Cable gland	Connector Cable gland	Connector Cable gland	Cable gland
Temperature range	-25 to 70°C -13 to 158°F	-25 to 70°C -13 to 158°F	-25 to 100°C -13 to 212°F	-40 to 75°C -40 to 167°F
Ingress protection	IP66/67	IP66/67	IP66/67	IP66/67/69K
Electrical Output	2-wire DC 3-wire DC PNP	3-wire DC PNP 3-wire DC PNP with output AS-i with output AC/DC	NAMUR IS NAMUR IS with output	2-wire DC
Solenoid outputs	None	One	One	One
Activator	Non adjustable	Standard adjustable High visibility adjustable	Standard adjustable High visibility adjustable	High visibility adjustable
Certifications				



BRAY FLOW CONTROL SOLUTIONS ARE AVAILABLE FOR A VARIETY OF INDUSTRIES.

ENERGY

Mining
Oil & Gas
Power / FGD
Nuclear Power

WATER

Water / Wastewater
Ultra Pure Water
Desalination
Irrigation

INDUSTRIAL

Chemical
Pulp & Paper
Textile
Marine

INFRASTRUCTURE

Beverage & Food
Transportation
Heating, Ventilation & Air Conditioning (HVAC)



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