



ANALOG

DIGITAL
SMART

BusSMART
INTELLIGENT

BrayLINE
ACCESSORIES

E/P-I/P POSITIONERS

ELECTRO-PNEUMATIC INTELLIGENCE

SERIES 67
FOR DOUBLE & SINGLE ACTING
PNEUMATIC ACTUATORS

INTELLIGENCE

Bray Controls introduces the Series 67 Intelligent Electro-Pneumatic Positioner Family, the future of digitally controlled pneumatic positioning.

The Bray Series 67 electro-pneumatic positioners offer precise valve positioning and innovative, high performance features – delivering superior flow control. Three versions are available – *BusSmart* Intelligent, Digital Smart and Analog.

The compact product line allows for easy interchange of function modules. Upgrading throughout the family is simply a matter of exchanging advanced circuit boards within the common body enclosure. All versions feature the same high-quality internal mechanical components and the same rugged reliability.

SERIES 67 COMMON FEATURES

The positioners function as an I/P device with a pneumatic amplifier and a binary encoder position feedback module. Units are available as Single Acting for spring return actuators with one 3 position 3-Way valve, Double Acting for air to air actuators with two 3 position 3-Way valves, and a High Capacity double acting unit with one 3 position 4-Way valve. The Single and Double Acting units have a 235 SCFH air flow capacity at 80 psig. The High Capacity unit has a 1,345 SCFH capacity. The Series 67 eliminates easily damaged, hard to adjust mechanical springs, levers, cams and balance beams.

All Series 67 positioner enclosures are purged and waterproof to NEMA 4, 4x (IP65) standards. Explosion proof enclosures are available. The positioners are FM, CSA, CE and CENELEC approved. With a low air consumption of 1.9 SCFH at 90 psi, Bray's electro-pneumatic positioners are very efficient to operate. The positioners respond to a 4-20 mA input command signal and each positioner has a mechanical travel position indicator. Modular accessories offered include a gauge manifold for single and double acting models, a booster relay and inductive limit switches.



BusSmart Positioner with housing cover and switch plate removed.

BusSmart Intelligent Positioner

The Bray Series 67 *BusSmart* Intelligent Electro-Pneumatic Positioner is microprocessor controlled and serial bus connected to deliver all the benefits of advanced digital electronics and communication to a pneumatic actuator. The microprocessor digitally communicates over a serial bus network, but can be configured to accept a 4-20 mA input command signal. *BusSmart* protocols offered are Foundation Fieldbus, Profibus PA, FoxCom and HART. Other features include travel limit stops, power cut off and split range adjustments. Characteristic curve functions can be freely defined with 22 setpoints.

FUNCTIONS

The *BusSmart* Positioner offers the following ten menu functions: setting of actuator type and mounting, AutoStart, valve function, valve characteristic, valve limits with alarms and split range, adjustable control parameters, maintenance test of pneumatic output, manual setting of valve position, calibration functions and short AutoStart (determines the mechanical stops).

DIAGNOSTICS

The *BusSmart* Positioner features corrective and preventative maintenance self-diagnostics checks that reduce operating costs by identifying potential problems. Diagnostic results are indicated both via a PC connection and local LEDs. The data can be continually monitored and recorded via a PC.

Corrective maintenance self-diagnostics functions aid in finding the cause of a problem. Direct control of the pneumatic output from 0 to 100% of the air supply allows verification of the pneumatic portion of the positioner and the possible jam of the valve or actuator. Manual entry of the setpoint can be made in local mode.

Preventative maintenance self-diagnostics functions include control deviation of setpoint versus valve position in terms of seconds and percent of travel from setpoint, cycle count and full stroke limits reached, monitoring of the air supply and air output pressures through optional pressure sensors, and monitoring of positioner temperature.

STATUS MESSAGES

Status and diagnostic messages include: write protection, invalid or undefined parameter values, incomplete configuration, input current outside of operating range, position sensor input error, faulty I/P converter connection to circuit board, failure of air supply, failure to complete AutoStart, remaining control deviation (i.e. valve blocked), configured opening and closing limits has been reached, maintenance required, and error in option board.



AutoStart Configuration

Both the *BusSmart* Positioner and the Digital Positioner feature AutoStart with self-calibration and configuration by means of local push buttons and LEDs. Complicated potentiometer and switch settings are eliminated – configuration is simply a matter of pushing buttons. AutoStart automatically determines the mechanical travel limit stops, records the parameters and continually optimizes control behaviors and travel times bidirectionally by applying and analyzing setpoint jumps. Control behavior parameters are gain, damping and delay on positioning time. These parameters are automatically set for open and close differences and are user adjustable. The settings are then stored in non-volatile memory to prevent loss due to power failure. After performing the AutoStart procedure, the positioner is ready for operation.



AutoStart Push Button Configuration



4-20 mA
Position
Feedback
Board

OPTIONAL BOARDS

These options provide additional information and features and can be easily installed in the field. The interchangeable boards are available for the *BusSmart* and Digital Positioners.

- 4-20 mA Position Feedback board indicates valve position and provides a binary output for alarm. Calibration is automatic. An additional binary output to indicate remaining control difference, I/P module error and potentiometer error is available.
- Two Binary Inputs to directly control valve position.
- Two Binary Alarm Outputs to indicate valve travel limits.



Digital Smart Positioner
with housing cover
removed.

Digital Smart Positioner

The Bray Series 67 Digital Smart Electro-Pneumatic Positioner is microprocessor controlled to deliver all the benefits of digital electronics to a pneumatic actuator, while responding to a traditional 4-20 mA analog command signal. The microprocessor constantly compares the command signal to the actual valve position and makes precise adjustments until the two measurements match within the user-selectable deadband. Calibration and configuration procedures are automatically performed with AutoStart push buttons.

The Digital Positioner features self-diagnostics checks which run constantly. The self-diagnostics, that are visually indicated by local LEDs, reduce operating and maintenance costs by identifying problems as they occur. Diagnostics include all the corrective maintenance functions of the *BusSmart* Positioner. Preventative maintenance diagnostics are not included.

Other features include travel limit stops, power cut off, split range and characteristic curve functions.



Analog Positioner with
housing cover removed.

Analog Positioner

The Bray Series 67 Analog Positioner offers solid state sensing and functions as an integrated I/P converter, amplifier and controller. Configuration is made by adjustment of switches and potentiometers. Separate potentiometers allow zero point and stroke range to be independently adjusted. Gain and stroke time are also user adjustable. A pneumatic test can be performed. Open and close speed control parameters are adjustable.

The Analog Positioner accepts input signals in either 4-20, 4-12, 12-20, 20-4, 20-12 or 12-4 mA. Clockwise or counterclockwise actuator rotation can be set. Additional features include reverse polarity protection and an interlock diode.

EXPLOSION PROOF *BusSmart*

The *BusSmart* Foundation Fieldbus and Profibus explosion proof units are intrinsically safe to FM and CSA standards and meet II 2 G EEx ia IIB/IIC, II 2 G EEx ib IIB/IIC specifications. HART and FoxCom explosion proof units are intrinsically safe to FM and CSA standards and meet EEx ia IIC T4 specifications.

EXPLOSION PROOF Digital

Digital Positioner explosion proof units are available that meet intrinsically safe FM and CSA standards and meet EEx ia IIC T4 specifications.

EXPLOSION PROOF Analog

Digital Positioner explosion proof units are available that meet intrinsically safe FM, CSA and CENELEC standards.

Modular Accessories



INDUCTIVE PROX LIMIT SWITCH

For indication of mechanical travel limits independent of electronics, inductive proximity switches are available for all Series 67 Positioners. Internally mounted and easy to calibrate, the switches allow adjustment from 0 to 100% of travel. Switches are intrinsically safe to EEx ia specifications and have two wires to NAMUR standards.



GAUGE MANIFOLD

An externally mounted gauge manifold is offered with up to three gauges which measure the air supply and actuator input and output pressures. Available for all Series 67 Positioners.

BOOSTER RELAY

These external modules increase air volume output and decrease response time. Available for all Series 67 Positioners. [not shown]



Specifications

Supply Pressure [Max]	20-90psi(1.4-6bar)	MATERIALS Housing Aluminum, DD varnish finish Position Indicator Impact resistant polyester Spool / Cam System Stainless Steel Diaphragm Buna-N
Air Consumption (80psi)	.32 scfm Single Acting .48 scfm Double Acting	
Input Signal		
Single Range	0/4 to 20 mADC	
Split Range	4-12 mADC 12-20 mADC	
Connections		
Supply	1/4" NPT	
Signal	1/2" NPT Conduit Entry	
Sensitivity	0.1%	
Hysteresis	0.5%	
Linearity / Non-linearity	1.0%	
Temperature Range	-40°F(-40°C) to +176°F(+80°C)	
Weight	5.5 lbs.	
Control Element Type	Moving Coil & Flapper/Nozzle	

DISTRIBUTOR



All statements, technical information, and recommendations in this bulletin are for general use only. Consult Bray representatives or factory for the specific requirements and material selection for your intended application. The right to change or modify product design or product without prior notice is reserved.

Patents applied for worldwide.

Bray CONTROLS

A Division of BRAY INTERNATIONAL, Inc.
 13333 Westland East Blvd. Houston, Texas 77041
 281/894-5454 FAX 281/894-9499 www.bray.com

Bray® is a registered trademark of BRAY INTERNATIONAL, Inc.

© 2002 Bray International. All rights reserved.

B-1029 12/02