


PA Series PA(M) Series Pressure Independent Control Valve Actuators

Starting at 27 lb-force and up to 112 lb-force

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Application

The PA(M) Series is a line of linear motor actuators to be used primarily on Bray PIC Valves utilized in Building Automation Systems. These actuators are available with a multitude of options for On/Off/ Floating or Modulating with or without electronic Failsafe.

These actuators automatically calibrate to the stroke of the valve as soon as power is applied and are field selectable direct or reverse acting.

A simple, reliable, versatile solution for your Bray Commercial Simple Set pressure Independent control valves!



PA Series Actuators - Specifications

Technical Specifications - Actuators						
Actuator Models	For Valves Sizes 1/2" to 1-1/4"				For Valves Sizes 1.5" to 2"	
	PA24-27	PA24-27-FS	PAM24-27	PAM24-27-FS	PAM24-100	PAM24-100-FS
	On/Off & Floating		Modulating		On/Off, Floating & Modulating	
	Non-Fail Safe	Fail Safe	Non-Fail Safe	Fail Safe	Non-Fail Safe	Fail Safe
Supply Voltage	22 to 26 AC/DC				22 to 26 VAC or 28 to 32 VDC	
Power Consumption	5VA	10VA	5VA	10VA	6VA	6VA, 20VA Start Up
Control Signal	2 Position On/Off or 3-Point Floating		Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor		2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA	
Input Impedance	4.7 K		10.0 K	100.0 K	100.0 K	
Feedback Signal	No		0-10VDC or 2-10VDC		4 to 20 mA or 2 to 10VDC adjustable	
Failsafe Function	No	Yes (60 Sec. Runtime)	No	Yes (60 Sec. Runtime)	No	Yes (60 Sec. Runtime)
Anti-Stick	No		Optional ¹		Yes	
Operation Time	120 Seconds				90 Seconds	
Enclosure Rating	NEMA type 3R (Equivalent to IP54)					
Ambient Temperature	36°F to 122°F (2°C to 50°C)				0°F to 122° (-18°C to 50°C)	
Humidity Rating	5 to 95% RH Non Condensing					
Connection	3 wires 18 AWG halogen free cable, 3.2 ft.	4 wires 18 AWG halogen free cable, 3.2 ft.			Terminal Connection. Use 18 AWG Minimum	
Noise Rating	>35dBA					
Dimensions	(L) 4.09" x (W) 2.08" x (H) 3.62"			(L) 4.09" x (W) 2.08" x (H) 4.18"	(L) 4.80" x (W) 3.60" x (H) 6.93"	
Weight	0.9 lb. (0.4 kg)				2.0 lb. (0.9 kg)	
Warranty	5 Years limited from time of shipment					
Agency Listing	UL, C E					

¹Anti-Stick Option

With the anti-stick option activated, the actuator will make one full cycle every 24 hours, if the actuator constantly has been in fully open or fully closed position during the previous 24 hours. This operation will clear up any possible impurities accumulated in the valve, and re-calculate the end positions.

PA Series Actuators - Model Number Matrix

PA24-27	24V On/Off & Floating - Non-Fail Safe
PA24-27-FS	24V On/Off & Floating - Fail Safe
PAM24-27	24V Modulating - Non-Fail Safe
PAM24-27-FS	24V Modulating - Fail Safe
PAM24-100	24V On/Off, Floating & Modulating - Non-Fail Safe
PAM24-100-FS	24V On/Off, Floating & Modulating - Fail Safe
PAM24-112	24V On/Off, Floating & Modulating - Non-Fail Safe



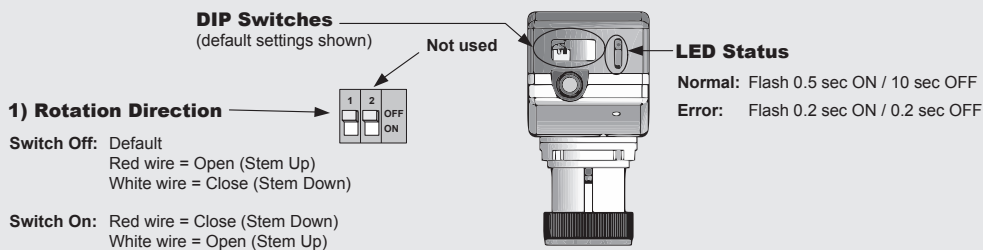
PA Series Actuators - PA24-27

Technical Specifications - PA24-27 Actuator		
Electrical	Actuator Model	PA24-27 For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	On/Off and Floating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	5 VA
	Input Signal	Digital, 2 positions or 3 point floating
	Input Impedance	4.7 K
Operation	Electrical Connection	3-wire halogen free cable 18 AWG (0.8 mm ²), 3.2 feet (1M) long)
	Fail Safe	No
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Cycle Life	30,000
Environmental	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	Operating — 36°F to 122°F (2°C to 50°C) Media Temp. — 36°F to 248°F (2°C to 120°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
Misc	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
	Weight	0.9 lb. (0.4 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

WIRING - (CABLE)



DIP SWITCHES



NOTE: For additional operating information consult PA24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application in conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

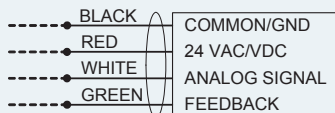
PA Series Actuators - PAM24-27



Technical Specifications - PAM24-27 Actuator		
Electrical	Actuator Model	PAM24-27 For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	Modulating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	5 VA
	Input Signal	Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor
	Feedback Signal	0-10VDC or 2-10VDC
	Input Impedance	10.0 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm ²), 3.2 feet (1M) long)
	Fail Safe	No
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
	Cycle Life	30,000
Environmental	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	Operating — 36°F to 122°F (2°C to 50°C) Media Temp. — 36°F to 248°F (2°C to 120°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
Misc	Weight	0.9 lb. (0.4 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

WIRING - (CABLE)

PAM24-27 (27 lb force)
MODULATING (ANALOG), NON-FAILSAFE



DIP SWITCHES

1) Rotation Direction

Switch Off: Default
Valve Open
(Stem Up) - (0 VDC)

Switch On: Valve Closed
(Stem Down) - (0 VDC)

DIP Switches
(default settings shown)

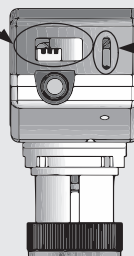


2) Anti-Stick System

Switch Off: Deactivated
Switch On: Activated

3) Input Analog -

Signal & Feedback
Switch Off: 2-10 VDC
Switch On: 0-10 VDC



LED Status

Normal: Flash 0.5 sec ON / 10 sec OFF
Error: Flash 0.2 sec ON / 0.2 sec OFF
Auto stroke: Continuous ON

NOTE: For additional operating information consult PAM24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.



PA Series Actuators - PA24-27-FS

Technical Specifications - PA24-27-FS Actuator

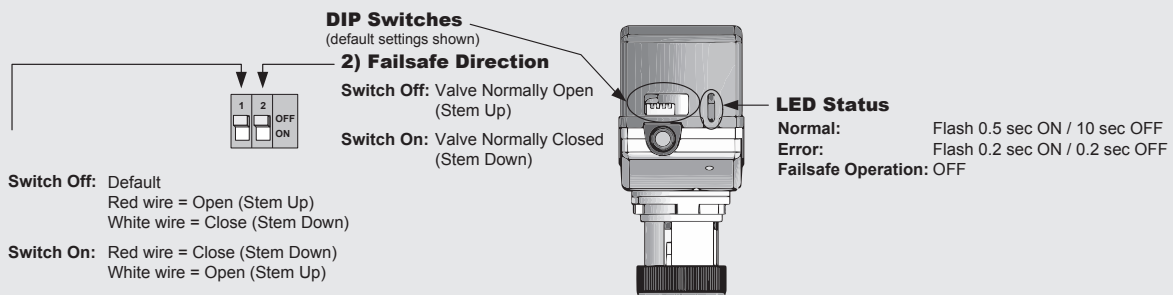
Actuator Model		PA24-27-FS	For Simple Set PIC Valve sizes 1/2" to 1-1/4"
Electrical	Type	On/Off and Floating	
	Force	27 lb-force	
	Operating Voltage	22 to 26 AC/DC	
	Power Consumption	10 VA	
	Input Signal	Digital, 2 positions or 3 point floating	
	Input Impedance	4.7 K	
	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm ²), 3.2 feet (1M) long)	
Operation	Fail Safe	Yes - 60 Seconds Runtime	
	Fail Safe Function	Electronic - Enerdrive ¹	
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck	
	Runtime	120 Seconds	
	Direction	Reversible. Default - Up to Open	
	Cycle Life	30,000	
Environmental	Manual Override	Yes	
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.	
	Ambient Conditions	Operating — 36°F to 122°F (2°C to 50°C) Media Temp. — 36°F to 248°F (2°C to 120°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing	
	Audible Noise Rating	>35 dBA	
	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"	
	Weight	0.9 lb. (0.4 kg)	
Misc	Agency Certifications	UL, CE	
	Warranty	5 Years limited from time of shipment.	

Note: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to its failsafe position during a power failure. For additional operating information consult PA24-27-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING - (CABLE)



DIP SWITCHES



NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to its failsafe position during a power failure. For additional operating information consult PA24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

PA Series Actuators - PAM24-27-FS

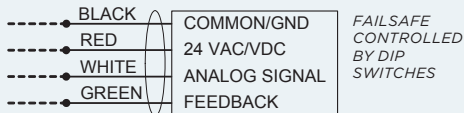


Technical Specifications - PAM24-27-FS Actuator		
Electrical	Actuator Model	PAM24-27-FS For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	Modulating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	10 VA
	Input Signal	Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor
	Feedback Signal	0-10VDC or 2-10VDC
	Input Impedance	100 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm ²), 3.2 feet (1M) long)
	Fail Safe	Yes - 60 Seconds Runtime
	Fail Safe Function	Electronic - Enerdrive ¹
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
Environmental	Cycle Life	30,000
	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	Operating — 36°F to 122°F (2°C to 50°C) Media Temp. — 36°F to 248°F (2°C to 120°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
Misc	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
	Weight	0.9 lb. (0.4 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

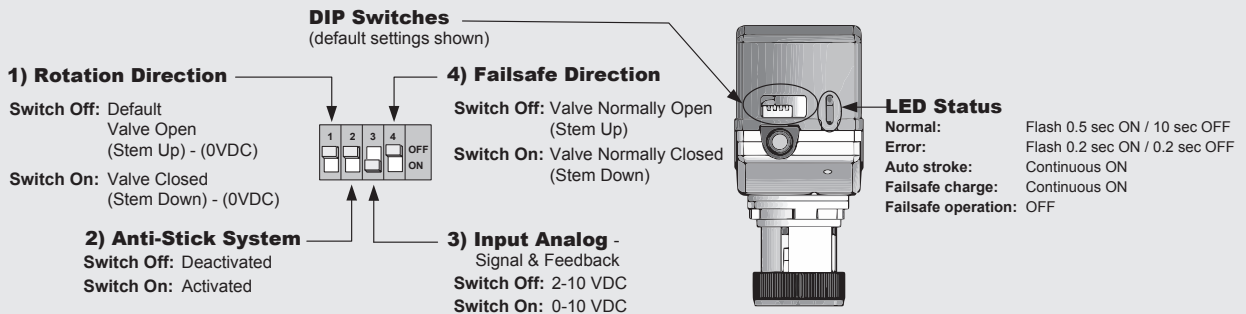
Note¹: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-27-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING - (CABLE)

PAM24-27-FS (27 lb force)
MODULATING (ANALOG), FAILSAFE



DIP SWITCHES



NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

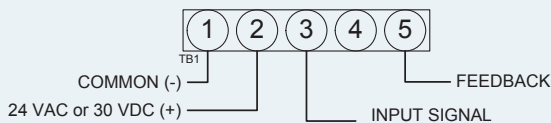


PA Series Actuators - PAM24-100

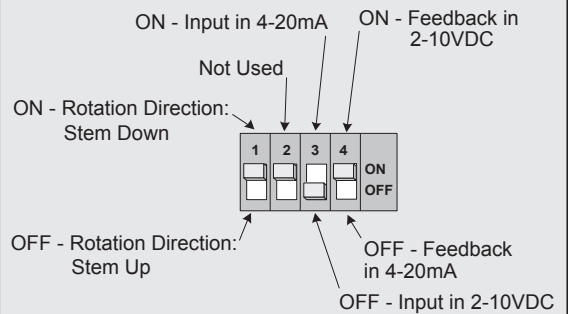
Technical Specifications - PAM24-100 Actuator		
Electrical	Actuator Model	PAM24-100 For Simple Set PIC Valve sizes 1-1/2" to 2"
	Type	On/Off, Floating and Modulating
	Force	100 lb-force
	Operating Voltage	22 to 26VAC / 28 to 32 VDC
	Power Consumption	6 VA
	Input Signal	2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA
	Feedback Signal	4 to 20 mA or 2 to 10 VDC adjustable (factory set 2-10 VDC)
	Input Impedance	100 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm ²), 3.2 feet (1M) long) Terminal Connection. Use 18AWG [0.8mm ²] minimum
	Fail Safe	No
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	90 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
	Cycle Life	60,000
	Manual Override	Yes
Environmental	Enclosure Rating	NEMA Type 2 - Not intended for outdoor use without additional protection.
	Ambient Conditions	Operating — 0°F to 122°F (-18°C to 50°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.80"x (W) 3.60"x (H) 6.93"
	Weight	2.0 lb. (0.9 kg)
Misc	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

WIRING - (TERMINAL)

PAM24-100 (100 lb force)
ON/OFF, FLOATING & MODULATING (ANALOG), NON-FAILSAFE

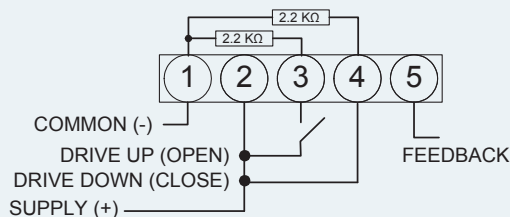


DIP SWITCHES - DIGITAL SIGNAL

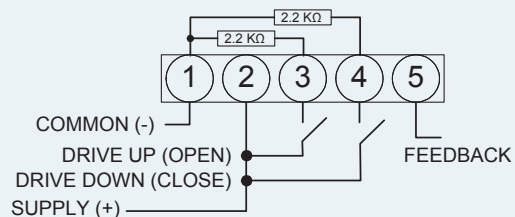


DIGITAL SIGNAL

3 WIRE / 2 POSITION ON/OFF



4 WIRE / 3 POINT FLOATING



Special Consideration for Digital Control

In this mode, the actuator is sensitive to induced electrical voltages from external sources. To prevent such interference, if the signal on pins 4 and 3 on TB1 are from an external 24VAC source, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2k ohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

NOTE: For additional operating information consult PAM24-100 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

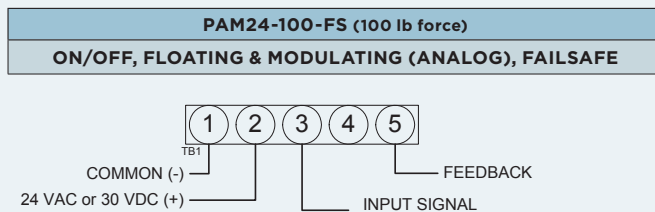
PA Series Actuators - PAM24-100-FS



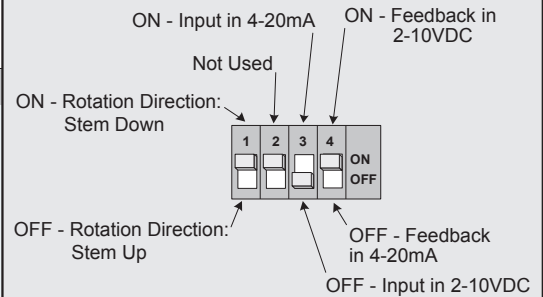
Technical Specifications - PAM24-100-FS Actuator		
Electrical	Actuator Model	PAM24-100-FS For Simple Set PIC Valve sizes 1-1/2" to 2"
	Type	On/Off, Floating and Modulating
	Force	100 lb-force
	Operating Voltage	22 to 26VAC / 28 to 32 VDC
	Power Consumption	6 VA, 20VA Start Up
	Input Signal	2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA
	Feedback Signal	4 to 20 mA or 2 to 10 VDC adjustable (factory set 2-10 VDC)
	Input Impedance	100 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm ²), 3.2 feet (1M) long) Terminal Connection. Use 18AWG [0.8mm ²] minimum
	Fail Safe	Yes
	Fail Safe Function	Electronic - Enerdrive ¹
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	90 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
Environmental	Cycle Life	60,000
	Enclosure Rating	NEMA Type 2 - Not intended for outdoor use without additional protection.
	Ambient Conditions	Operating — 0°F to 122°F (-18°C to 50°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.80"x (W) 3.60"x (H) 6.93"
Misc	Weight	2.0 lb. (0.9 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

Note: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-100-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING - (TERMINAL)

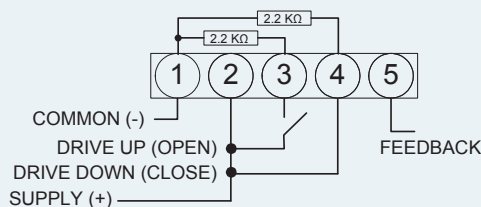


DIP SWITCHES - DIGITAL SIGNAL

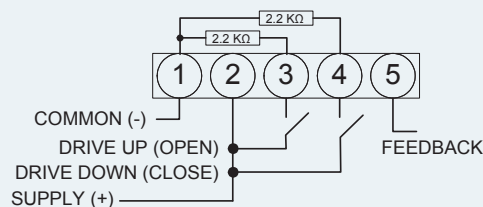


DIGITAL SIGNAL

3 WIRE / 2 POSITION ON/OFF



4 WIRE / 3 POINT FLOATING



Special Consideration for Digital Control

In this mode, the actuator is sensitive to induced electrical voltages from external sources. To prevent such interference, if the signal on pins 4 and 3 on TB1 are from an external 24VAC source, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2k ohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

NOTE: For additional operating information consult PAM24-100-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

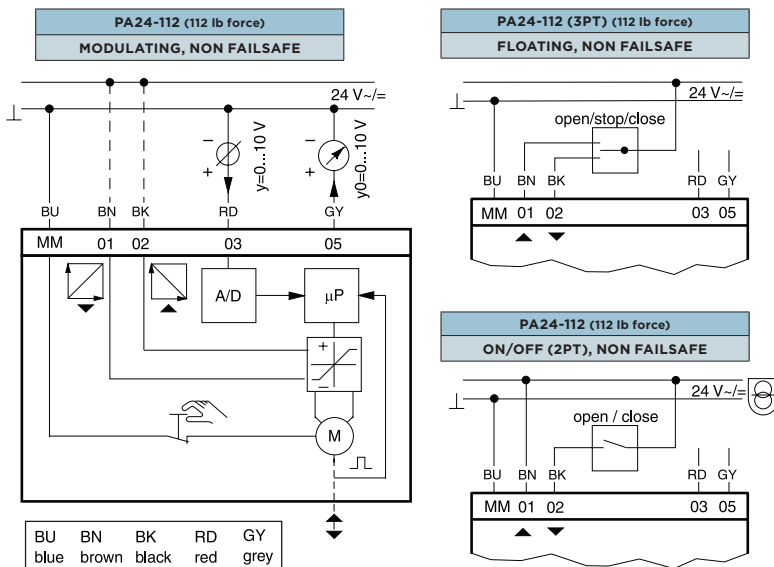
PA Series Actuators - PAM24-112

Technical Specifications - PAM24-112 Actuator

		Actuator Model	PAM24-112	For Simple Set 2" High Flow Valves & Simple Set Max PIC Valve sizes 2-1/2" to 3"
Electrical	Type	On/Off, Floating and Modulating		
	Force	112 lb-force		
	Operating Voltage	24 VAC (+/-20%) at 50/60 Hz or 24 VDC (+20%, -10%)		
	Power Consumption	3.5 W, 6.6 VA		
	Input Signal	On/Off, Floating and Modulating - 0 to 10 V, Ri> 100kΩ		
	Feedback Signal	0 to 10 V, Load> 10 kΩ	Starting Point U ₀	0 or 10 V
			Control Span ΔU	10 V
		Switching Range Xsh	200 mV	
	Electrical Connection	5 x 20 AWG (0.20 mm ²)		
Operation	Fail Safe	No		
	Action	Direct or Reverse Acting		
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck		
	Runtime	150 Seconds default (DIP switch adjustable) at full stroke for Simple Set Max 2-1/2" & 3"		
	Response Time	200 ms		
	Stroke	0.31 to .78 inches (8 to 20mm)		
	Cycle Life	80,000		
Manual Override	Yes			
Environmental	Enclosure Rating	IP54 (NEMA 3S Equivalent); Flame Retardent Plastic - Not intended for outdoor use without additional protection.		
	Ambient Conditions	Ambient Temperature — 14° to 131°F (-10° to 55°C) Max. Media Temperature — 212°F (100°C) Humidity Rating — 5 to 85% RH Non Condensing		
	Dimensions	(L) 6.40"x (W) 2.80"x (H) 7.90"		
	Weight	2.1 lb. (1 kg)		
	Agency Certifications	CE		
Misc	Warranty	5 Years limited from time of shipment.		

Note: For additional operating information consult PAM24-112 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

PAM24-112 (112 lb force) ON/OFF, FLOATING & MODULATING, NON-FAILSAFE



DIP SWITCHES			
Running Time per mm	Switch Coding	Running Time for 8 mm of Stroke	Running Time for 20 mm of Stroke
7.5 s Default Setting for SS PIC Valve	Run Time - Switch (1) Characteristic - Switches (2) & (3)	60 s ± 2	150 s ± 5
15 s	Run Time - Switch (1) Characteristic - Switches (2) & (3)	120 s ± 4	300 s ± 10

Bray COMMERCIAL

Bray Commercial provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

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