



PAM-100 Series - Actuator — Installation & Operating Instructions

12/10/19

Specifications:

Power Supply	Operating Voltage	22 to 26VAC / 28 to 32 VDC
	Power Consumption	PAM24-100 — 6 VA
	Power Consumption	PAM24-100-FS — 6VA, 20VA Start Up
Control Signal		Analog, Digital or Pulse width modulation (PWM) programmable (factory set width Analog control signal)
Feedback Signal		4 to 20 mA or 2 to 10 Vdc adjustable (factory set 4 to 20 mA)
Input Impedance		100 K
Run Time		90 Seconds
Force		100 lb. [450 N] at rated voltage
Failsafe Function		PAM24-100-FS model only — Electronic - Enerdrive ¹
Direction		Reversible, Up to Open - Default
Stall Protection		Auto Shutoff for end of travel and jammed/stuck
Auto Stroke		Yes
Enclosure Rating		NEMA Type 2
Manual Override		Yes
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
Connection		Terminal Connection. Use 18AWG [0.8mm2] minimum
Life Cycle		60,000
Audible Noise Rating		<35 dBA
Agency Certification		cULus, cCSAus, CE
Dimensions		(L) 4.80" x (W) 3.60" x (H) 6.93
Weight		2.0 lb. (0.9 kg)

NOTE: ¹The 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. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray shall not be liable for damages resulting from misapplication or misuse of its products.

Warning - Do not use automatic screw driver on manual override

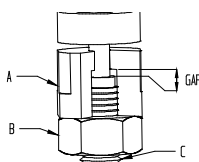
Caution

We strongly recommend that this product be wired to a separate transformer and that transformer shall service only Bray® products. This precaution will prevent interference with, and/or possible damage to incompatible equipment. When multiple actuators are wired on a single transformer, polarity must be observed. Long wiring runs create voltage drop which may affect the actuator performance.

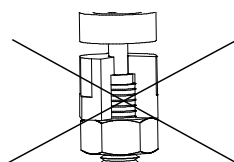
Mechanical installation:

Mounting of the actuator on valve

Correct mounting



Non Correct mounting



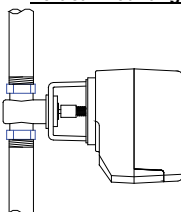
1. Screw completely the valve shaft (C) unto the coupling of the actuator (A).
2. Unscrew the coupling (A) for 1/2 of turn in order to leave a functional play.
3. Screw the counter nut (B).

Warning:

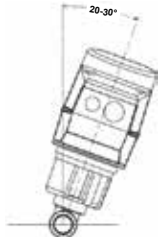
Do not over tight coupling of the actuator on the shaft of the valve.

Mounting of the actuated valve on system

Vertical mounting



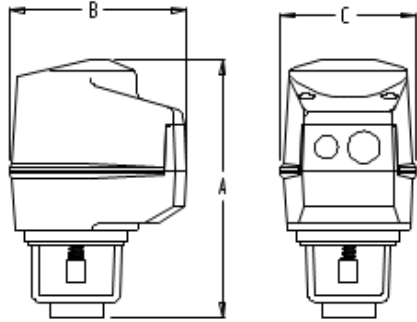
Horizontal mounting



1. Pay attention to system particularity; be sure that the expansions, contractions of the system and its medium as well as operating pressures are within the tolerances
2. When plumbing, the motorized valve should be situated in an easily accessible place and sufficient space should be allowed for the removal of the actuator.
3. To prevent moisture from collecting in the motor casing, install the motorized valve such that the actuator is superior to the valve, at 20-30° / at vertical. Avoid mounting the valve so that the valve stem is below horizontal.



Dimensions



Dimension	Imperial (in)	Metric (mm)
A	8.75	222.3
B	4.80	121.9
C	3.60	91.4

Wiring: (Terminal)

Analog - Modulating

Digital signal

Digital - 3 wire / 2 position On/Off

Digital - 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 24 Vac source**, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2kohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

DIP Switches:

PAM24-100
DIP Switches - (Default shown)

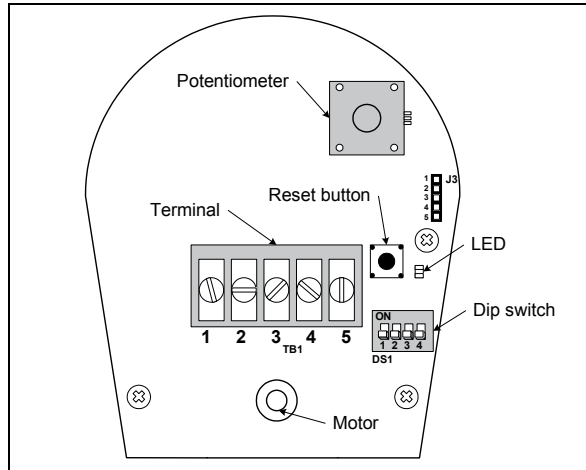
PAM24-100-FS
DIP Switches - (Default shown)

Input Signal and Feedback Setup

	Input Signal	Feedback
Analog Mode	Input Signal is set with Dip Switch # 3 DS1-3 at OFF = 2 – 10Vdc (default setting) DS1-3 at ON = 4 – 20mA	Feedback is set with Dip Switch #4 DS1-4 at OFF = 4 – 20mA DS1-4 at ON = 2 – 10Vdc (default setting)
Digital & PWM Mode	No Input Signal Setting DS1-3 MUST be at OFF	



PC Board



Stroke Adjustment - No Control Signal Change

1. Apply power and, **WAIT FOR LED TO BE OFF (around 10 seconds)**.
2. Press and release the reset button to start the auto-stroke process. The LED should be illuminated.
 - **First option:**
The actuator will then travel in both directions to find its limit and position itself according to the demand. The LED will extinguish, the process is complete.
 - **Second option:**
When the desired end position is reached, press and release the reset button. The actuator will now go the start position. (you can also press and release the reset button when it's reaches the start position) The LED will extinguish, the process is complete.

Programming - Change of Control Signal

1. Remove power and put all dip switches "OFF" (Default).
2. Apply power and, **within 10 seconds**, press and release the reset button. The LED should be blinking.
3. Select the control signal with dip switches:

	Digital or Analog Modes	PWM Mode <i>refer to PWM Mode section below to program in this mode.</i>
Move switch No1 "ON" and then "OFF".	Digital (On/Off or 3 point floating)	Set 5s pulse (Default)
Move switch No2 "ON" and then "OFF".	Analog (Default)	Set 25s pulse

Stroke Adjustment

see the stroke adjustment section above.

PWM Mode & Speed Selection

To enable or disable the PWM mode on the actuator, do as follow:

1. Remove power from the actuator
2. Jump pin 3 & 4 of J3 (instead of 4 & 5)
3. Select the desired action using the dipswitches (DS1):

DS1-1	DS1-2	
OFF	OFF	90 sec. 1/2"
OFF	ON	Enable PWM Mode
ON	OFF	Disable PWM Mode
ON	ON	90 sec. 1"

4. Power on the actuator
5. Wait 5 seconds
6. Remove power from the actuator
7. Change jumper position from J3 3 & 4 to 4 & 5.
8. Re-apply power supply to actuator *PWM is factory preset at 5 sec. pulse, refer to Programming section above to change pulse setting.*

Zero and Span Calibration

This feature is applicable to analog control signal only.

1. Remove power and put all dip switches "OFF". (factory preset).
2. Apply power and, **within 10 seconds** press and **hold** the reset button until the LED blinks once. The Zero and span calibration process then start.
3. Release the reset button. The LED is now constantly illuminated.
4. Apply new minimum voltage.
It can be any value between 0 to 7 Vdc, with an external 0 to 10 volt supply (ex : MEP).
5. Press and release the reset button to memorize the new minimum voltage. The LED blinks.
6. Apply new maximum voltage.
It can be any value between 3 to 10 Vdc, this value should be greater than the new minimum value.
7. Press and release the reset button to memorize the new maximum voltage. The LED blinks. The Zero and span calibration process is complete.

Note: To reset zero and span to 2 to 10 Vdc (factory value). You just have to re-select the analog control signal mode, see Programming.