Features:

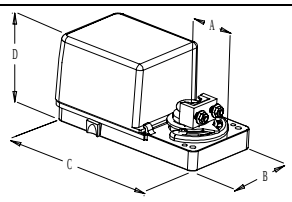
- Mounts easy on round & square shaft (with option –8).
- External clutch for manual adjustments.
- Maintenance free.
- Position indicator.
- Control signal fully programmable.
- The fastest actuator of the world (model BM_ _ _FF).
- Fail safe by *Enerdrive System* [1] (on model 060 & 080).
- Auxiliary switches (on model 020 & 080).

Old Number	
BBM2000A	*BM000*
BBM2021A	*BM020*
BBM2060A	*BM060*
BBM2080A	*BM080*
BBMF2000A	*BM000F*
BBMF2021A	*BM020F*
BBMF2060A	*BM060F*
BBMF2080A	*BM080F*
BBMFF2000A	*BM000FF*
BBMFF2021A	*BM020FF*
BBMFF2060A	*BM060FF*
BBMFF2080A	*BM080FF*

Technical Data

	BM000 ***BBM 2000A***	**BM060** ***BBM 2060A***	**BM000F** ***BBMF 2000A***	**BM060F** ***BBMF 2060A***	**BM000FF** ***BBMFF 2000A***	**BM060FF** ***BBMFF 2060A***	**BM020** ***BBM 2021A***	**BM080** ***BBM 2080A***	**BM020F** ***BBMF 2021A***	**BM080F** ***BBMF 2080A***	**BM020FF** ***BBMFF 2021A***	**BM080FF** ***BBMFF 2080A***
Fail safe - *Enerdrive*	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Power consumption	6 VA	15VA Peak,6VA	15 VA	24VA Peak,15VA	15 VA	24VA Peak,15VA	6 VA	15VA Peak,6VA	15 VA	24VA Peak,15VA	15 VA	24VA Peak,15VA
Torque	50 in.lb. [5,6 Nm] at rated voltage		35 in.lb. [3,9 Nm] at rated voltage		25 in.lb. [2,8 Nm] at rated voltage		50 in.lb. [5,6 Nm] at rated voltage		35 in.lb. [3,9 Nm] at rated voltage		25 in.lb. [2,8 Nm] at rated voltage	
Running time through 90º	20 to 30 sec torque dependant		3.5 to 4.5 sec torque dependant		1.5 to 2.5 sec torque dependant		20 to 30 sec torque dependant		3.5 to 4.5 sec torque dependant		1.5 to 2.5 sec torque dependant	
Auxiliary switches	No						Yes (2)					
Ingress protection	IP22 equivalent to Nema type 2, IP54 equivalent to Nema type 3R if water tight inlet bushings (not supplied NEP617) are installed						IP22 equivalent to Nema type 2					
Feedback	4 to 20 mA or 2 to 10 Vdc adjustable											
Power supply	22 to 26 Vac or 28 to 32 Vdc											
Electrical connection	18 AWG [0.8 mm^2] minimum											
Inlet bushing	2 inlet bushing of 5/8 in [15.9 mm] & 7/8 in [22.2 mm]											
Control signal	Analog, Digital or Pulse with modulation (PWM) programmable (factory set with Analog control signal)											
Angle of rotation	0 to 90 degrees, mechanically adjustable (factory set with 90º stroke)											
Direction of rotation	Reversible, Clockwise (CW) or Counterclockwise (CCW) (factory set with CW direction)											
Ambient temperature	-22ºF to 122ºF [-30ºC to 50ºC]											
Storage temperature	-22ºF to 122ºF [-30ºC to 50ºC]											
Relative Humidity	5 to 95 % non condensing.											
Weight	3 lbs. [1.4 kg]											
⚠ Warning	Risk of malfunction: Do not press the clutch when actuator is powered.											
	Risk of malfunction: When adjusting limit screws a stroke adjustment must be performed. Refer to stroke adjustment section.											

Dimensions



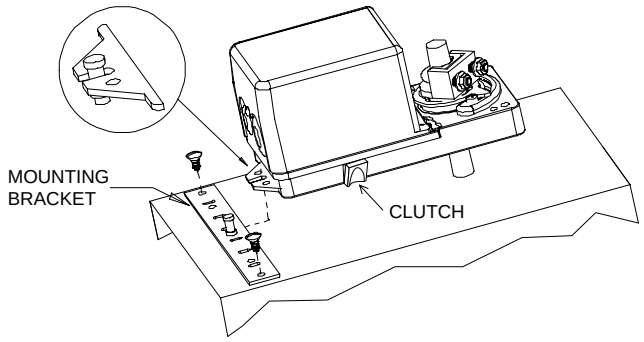
Dimension		Imperial (in)	Metric (mm)
A		1.50	38.1
B		3.26	82.8
C		6.60	167.5
D	model 000 & 060	3.01	76.4
	model 020 & 080	3.72	94.5

Caution

We strongly recommend that all Neptronic® products be wired to a separate transformer and that transformer shall service only Neptronic® 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.

[1] *Enerdrive System* U.S.A. Patent #5,278,454

Mechanical Installation

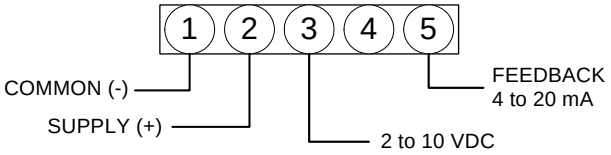


1. Manually close the damper blades and positioned the actuator at 0º or 90º.
2. Slide the actuator onto the shaft.
3. Tighten the nuts on the “U” bolt to the shaft with a 8mm wrench to a torque of 60 in.lb. [6,7 Nm].
4. Slide the mounting bracket under the actuator. Ensure free movement of the slot at the base of the actuator. The bracket pin must be placed in the mid distance of the slot.
5. Fix the bracket to the ductwork with #8 self-tapping screws.

⚠ Risk of malfunction: When adjusting limit screws a stroke adjustment must be performed. Refer to stroke adjustment section.

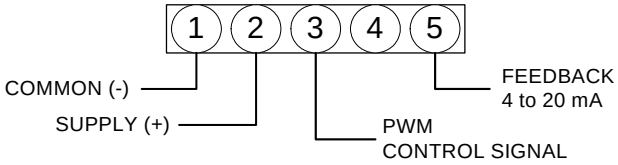
Wiring Diagrams

Analog

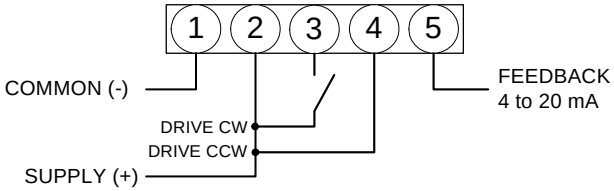


For 4 to 20 mA control signal
Connect one of the supplied 500 ohm resistors between pins 1 and 3.

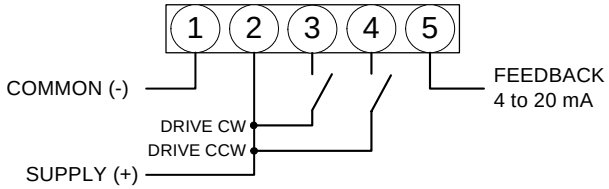
PWM



Digital – 3 wire / 2 position



Digital – 4 wire / 3 point floating

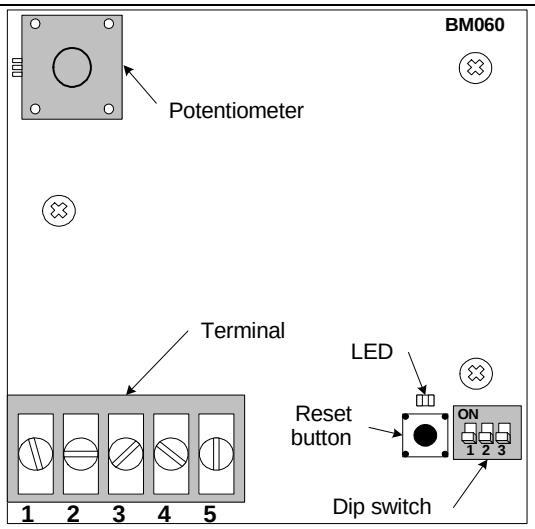


Special consideration for Digital control
In this mode, actuator is sensitive to induced electrical voltages from other sources. To prevent such interference, wire one 2.2k ohm 0.5W resistor between pins 4 and 1 and a second 2.2k ohm 0.5W resistor between pins 3 and 1. These resistors are supplied.

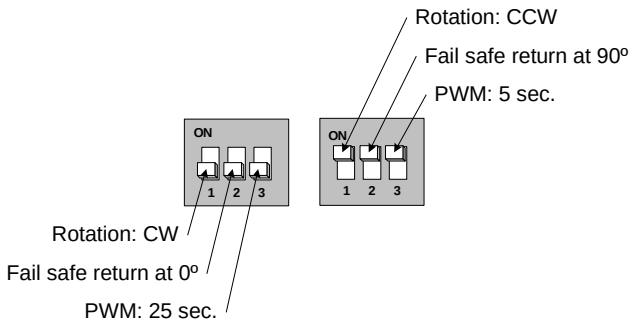
For 2 to 10 VDC output feedback

For any of above wiring configurations, connect one of the supplied 500 ohm resistors between pins 1 and 5.

PC Board



Dip switch settings



Stroke Adjustment – No control signal change

1. Apply power and, **wait for at least 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 it's 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 return back to its original position. (you can also press and release the reset button when It's reaches the original position)
     The LED will extinguish, the process is complete.

Programming – Change of control signal

1. Remove power and put all dip switches "OFF". (factory preset).
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** (On/Off or 3 point floating)
     move switch **No1** "ON" and then "OFF".
   - **PWM**
     move switch **No2** "ON" and then "OFF".
   - **Analog** (factory preset)
     move switch **No3** "ON" and then "OFF".
4. Stroke adjustment
   see the stroke adjustment section above.

Note, If PWM mode is selected:

- Time base : When programming is done,
  if switch No3 is "on" time base is 0.1 to 5 sec. (resolution 20 msec.)
  if switch No3 is "off" time base is 0.1 to 25 sec. (resolution 100 msec.)
  * For 5 sec. time base, we strongly recommend a switch common connection for better position stability.
- Switch 24 VAC: Triac or dry contact, 40mA maximum switching current.
- Switch common: NPN transistor, SCR, Triac or dry contact 75mA maximum switching current.

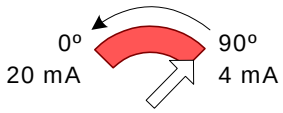
Feedback Selection (CCW direction)

To select CCW direction put switch No1 "ON".

In Analog or 3 point floating mode you can program the feedback control.

If switch No3 is "OFF":

The feedback control is automatically reverse to 4 to 20 mA for 90 to 0 degrees.



If switch No3 is "ON":

The feedback control is to 20 to 4 mA for 90 to 0 degrees.

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 once.
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 once.
   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.