

# [ B i s t a b l e   r o t a r y   s o l e n o i d s ]

## Bistable Rotary Solenoids

[The Bistable Rotary Solenoid can be driven electrically in either direction and can hold in either of 2 user-determined ends with no power applied.

In the de-energised state, the solenoid rotor develops torque acting away from a neutral center position (shown as a round dot in drawings) towards a stable position at 90° from this (for a 2-pole device) represented by the black arrows in drawing.

When the solenoid is forward energized, the rotor develops torque acting in a constant sense away from one of the 'stable' positions towards the other as represented by the red arrows in the lower drawing.

If the solenoid is energized in the reverse sense, it will develop torque similar to the forward energized condition, but acting in the opposite direction of rotation.

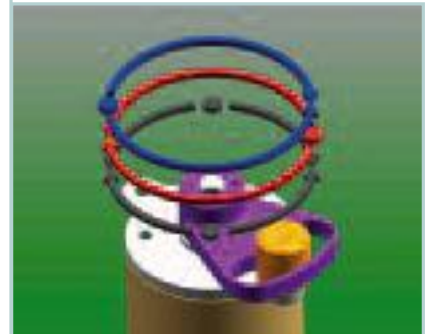
The ability to hold in either end position, facilitates a reduction in power consumption and / or heat dissipation.

The ability to drive in either direction obviates the need for a return spring. The fully developed torque is available to accelerate the load for fast operation. For fastest operation, a high power pulse is applied to obtain maximum torque and speed, power to the solenoid is then cut, and it holds the end position without any power being required.

In most cases, the bistable rotary solenoids do not incorporate mechanical end stops.

For fastest operation, bipolar drive should be used (see latching solenoid section for an explanation of drive circuit for this), and the end-stops should be located to either side of the neutral (centralized) position. Note the position of flat on the solenoid shaft related to this position in the illustration below.

It is possible to use the solenoid in monostable mode if both end-stops are positioned to the same side of the neutral position. The solenoid can be driven towards the neutral position with unipolar excitation current and when de-energised, the torque, due to permanent magnet rotor, will drive it to the other end position. Monostable drive will yield slower response, but may be preferred due to simple drive, or to fail-safe requirement in some applications.]



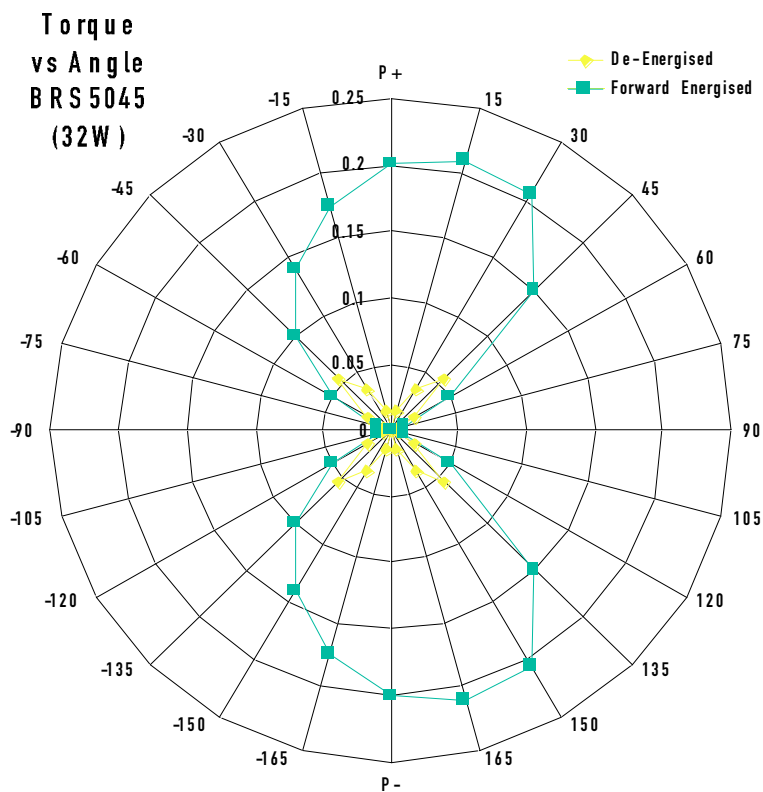
Bistable (shown in neutral centralised position)



Monostable (shown de-energised in stable end position)

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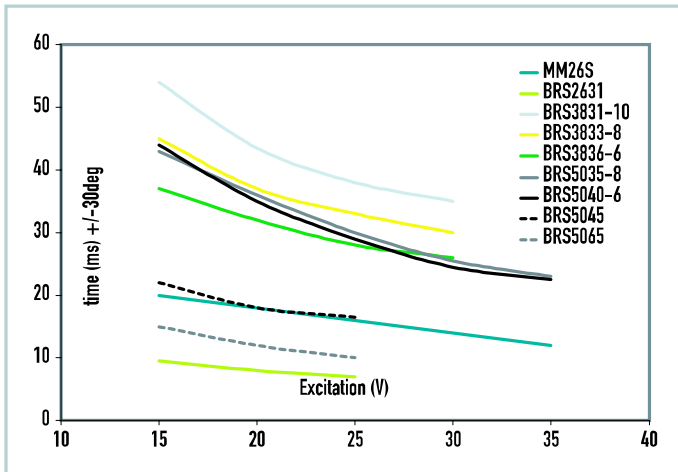
[Operation is described in relation to the graph shown for a 2-pole device. In the de-energised condition, the rotor will try to turn so that its magnetic poles are aligned with the stator poles ( $90^\circ$  and  $-90^\circ$  positions on the graph). If the rotor is turned away from this position, a torque is developed which tends to return the rotor to one of these two end positions. This torque increases initially as the rotor is turned further from the stable position, then decreases towards zero as it approaches the position P+ or P- midway between the stable positions. As the rotor passes through this position, the torque reverses direction and acts towards the other stable position. In the energised condition (forward energised state shown), the rotor will try to drive towards the  $90^\circ$  position from any other angular position (the  $-90^\circ$  position is an unstable equilibrium point where zero torque is developed).]



# [ Bistable rotary solenoids ] (All dimensions are in mm, unless otherwise stated)

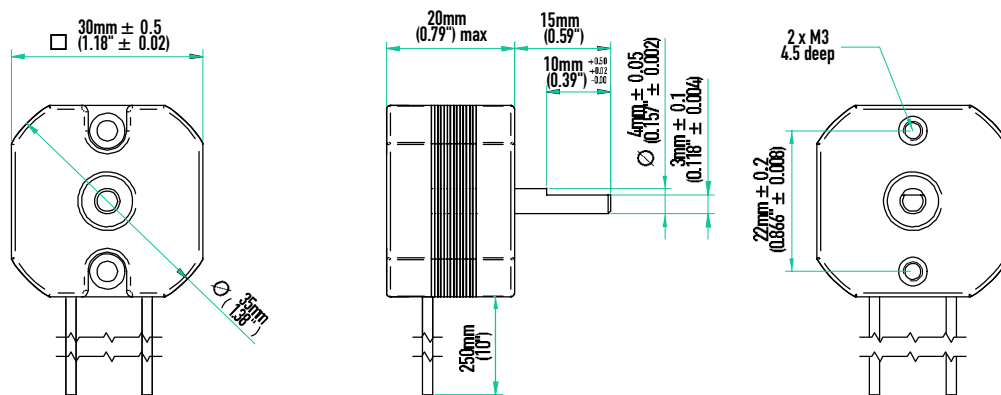
## Specifications

Part Number	Coil Resistance (Ω)	Coil Inductance (mH)	Mass (g)	P100 (W)	Bearings
RM301-4P	9.0		60	4W	Ball
BRS2631	15.6	3.8	66	4W	Ball
BRS3831-10	10.0		125	6W	Ball
BRS3833-8	8.0		150	6W	Ball
BRS3836-6	6.0		165	6W	Ball
BRS5035-8	8.0		280	9W	Ball
BRS5040-6	6.0		330	10W	Ball
BRS5045	6.2	15.0	280	9W	Ball
BRS5065					Ball



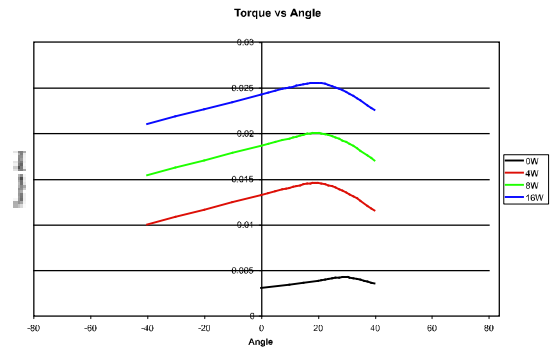
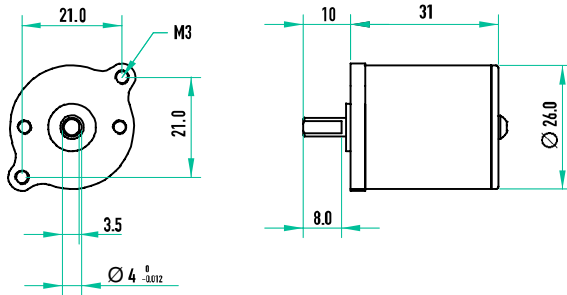
## Rotary Solenoids

### RM301

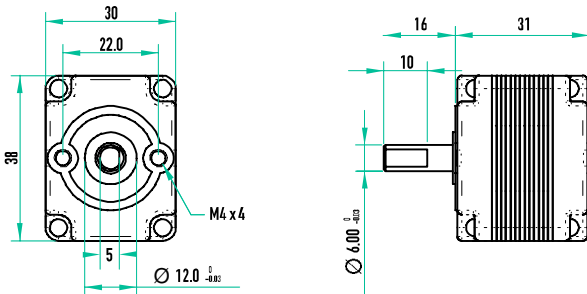


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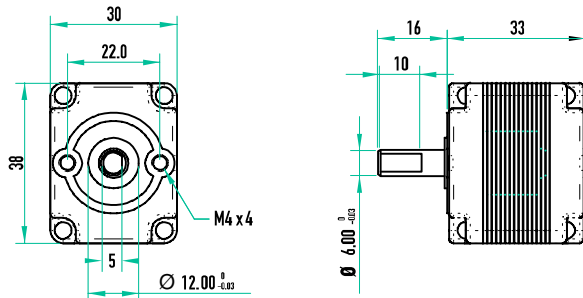
**BRS2631**



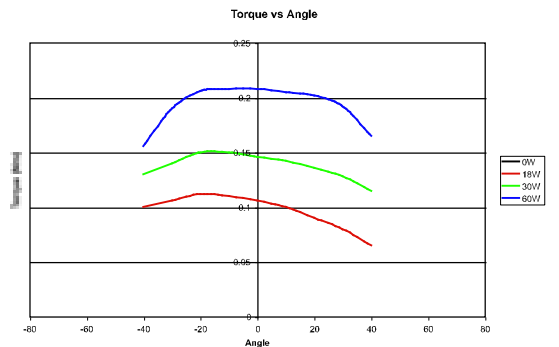
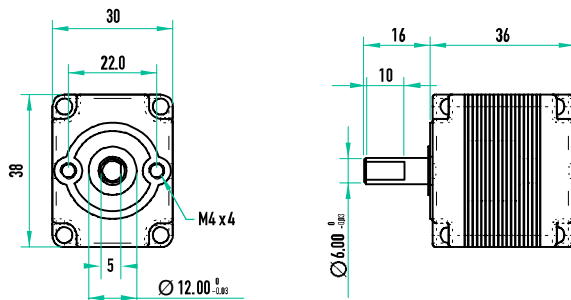
**BRS3831-10**



**BRS3833-8**

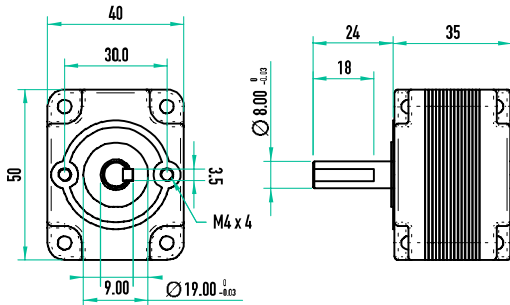


**BRS3836-6**

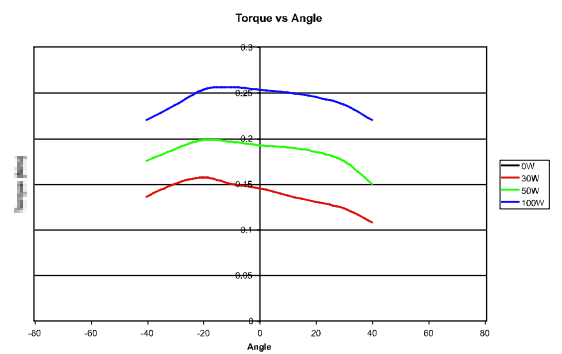
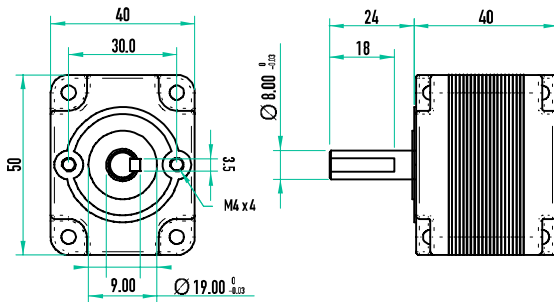


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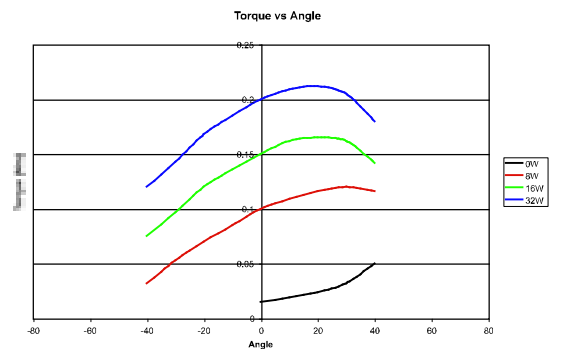
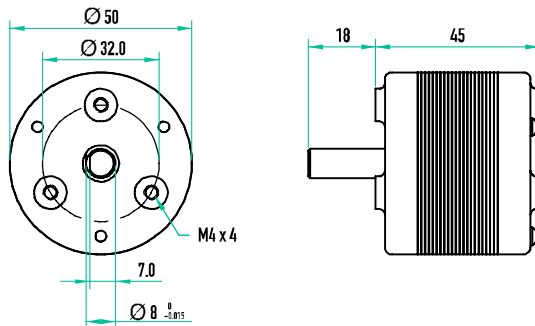
BRS5035-8



BRS5040-6



BRS5045



BRS5065

