


# 20M SERIES

SMALL BUT POWERFUL

**GENERAL SPECIFICATIONS**

Step Angle	18°
Step Accuracy	± 1.5°
Operating Temperature	100°C Max
Ambient Temperature Range	-20°C ~ +70°C
Insulation Resistance at 500Vdc	100MΩ
Dielectric Withstanding Voltage	450 ± 50 VRMS, 2 sec

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The specifications in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Portescap products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

Portescap Danaher Motion motors will not be CE marked where the Low Voltage Directive, the Electro-Magnetic Compatibility or other appropriate EU directives are not applicable - this is an EU legal requirement.

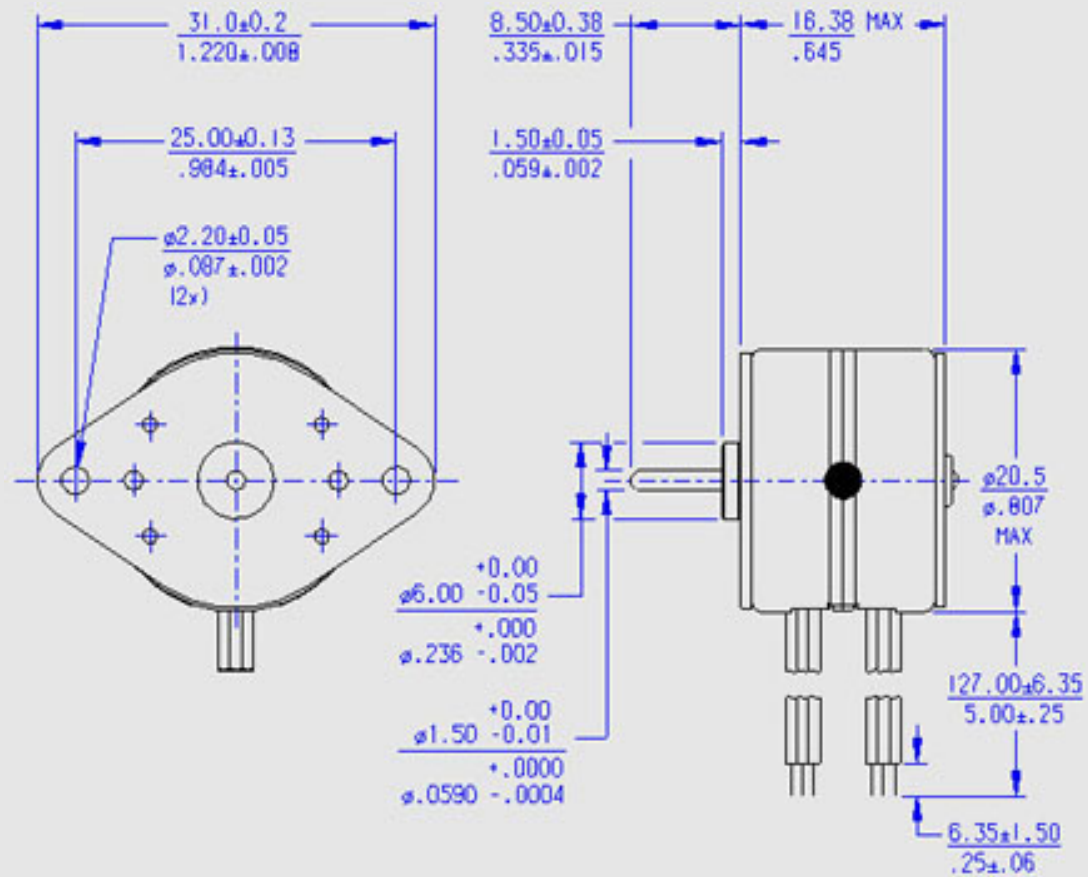
## TECHNICAL SPECIFICATIONS

	UNIPOLAR		BIPOLAR	
Part Number	20M020D1U	20M020D2U	20M020D1B	20M020D2B
DC Operating Voltage	5	12	5	12
Resistance per Winding (ohms)	20	115.2	20	115.2
Inductance per Winding (mH)	3.9	20.3	7.8	52.8
Holding Torque* (mNm/oz-in)	7.77 / 1.10	7.77 / 1.10	11.30 / 1.60	11.30 / 1.60
Rotor Moment of Inertia (g.m <sup>2</sup> )	4.1 x 10 <sup>-5</sup>	4.1 x 10 <sup>-5</sup>	4.1 x 10 <sup>-5</sup>	4.1 x 10 <sup>-5</sup>
Detent Torque (mNm/oz-in)	3.53 / 0.50	3.53 / 0.50	3.53 / 0.50	3.53 / 0.50
Step Angle	18°	18°	18°	18°
Step Angle Tolerance*	± 1.5°	± 1.5°	± 1.5°	± 1.5°
Steps per Revolution*	20	20	20	20
Max. Operating Temperature	100°C	100°C	100°C	100°C
Ambient Temperature Range				
Operating	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C
Storage	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Bearing Type	Sintered bronze sleeve	Sintered bronze sleeve	Sintered bronze sleeve	Sintered bronze sleeve
Insulation Resistance at 500Vdc	100 megohms	100 megohms	100 megohms	100 megohms
Dielectric Withstanding Voltage	450 ± 50 VRMS, 2 sec	450 ± 50 VRMS, 2 sec	450 ± 50 VRMS, 2 sec	450 ± 50 VRMS, 2 sec
Weight (g/oz)	23.5 / 0.83	23.5 / 0.83	23.5 / 0.83	23.5 / 0.83
Leadwires	28 AWG, UL Style 1429	28 AWG, UL Style 1429	28 AWG, UL Style 1429	28 AWG, UL Style 1429

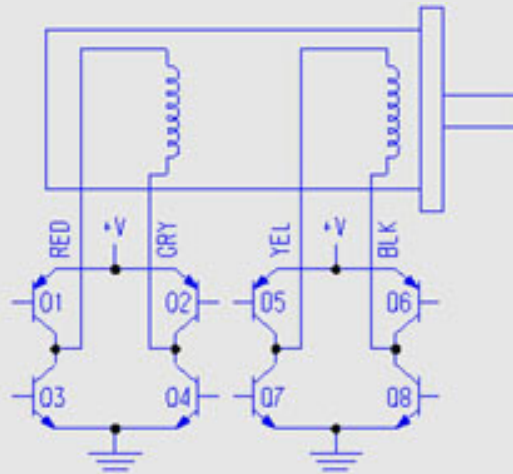
\* Measured with 2 phases energized

## MECHANICAL DIMENSIONS

UNITS = MM / INCHES



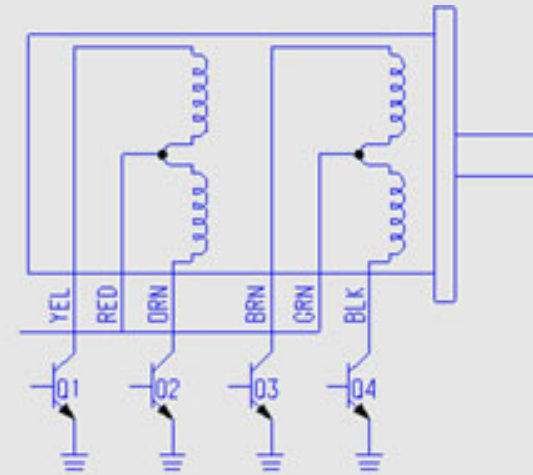
## WIRING DIAGRAM



BIPOLAR

STEP	01-04	02-03	05-08	06-07
1	ON	OFF	ON	OFF
2	ON	OFF	OFF	ON
3	OFF	ON	OFF	ON
4	OFF	ON	ON	OFF
1	ON	OFF	ON	OFF

↓  
CCW ROTATION
↑  
CW ROTATION



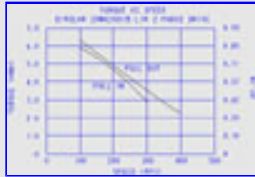
UNIPOLAR

STEP	01	02	03	04
1	ON	OFF	ON	OFF
2	ON	OFF	OFF	ON
3	OFF	ON	OFF	ON
4	OFF	ON	ON	OFF
1	ON	OFF	ON	OFF

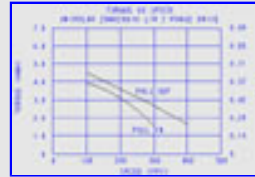
↓  
CCW ROTATION
↑  
CW ROTATION

# MOTOR DYNAMICS

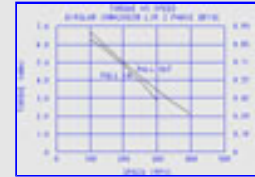
CLICK ON A THUMBNAIL TO MAGNIFY



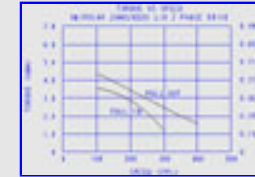
20M020D1B, Bipolar,  
L/R Drive



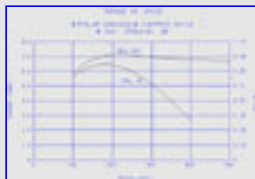
20M020D1U, Unipolar,  
L/R Drive



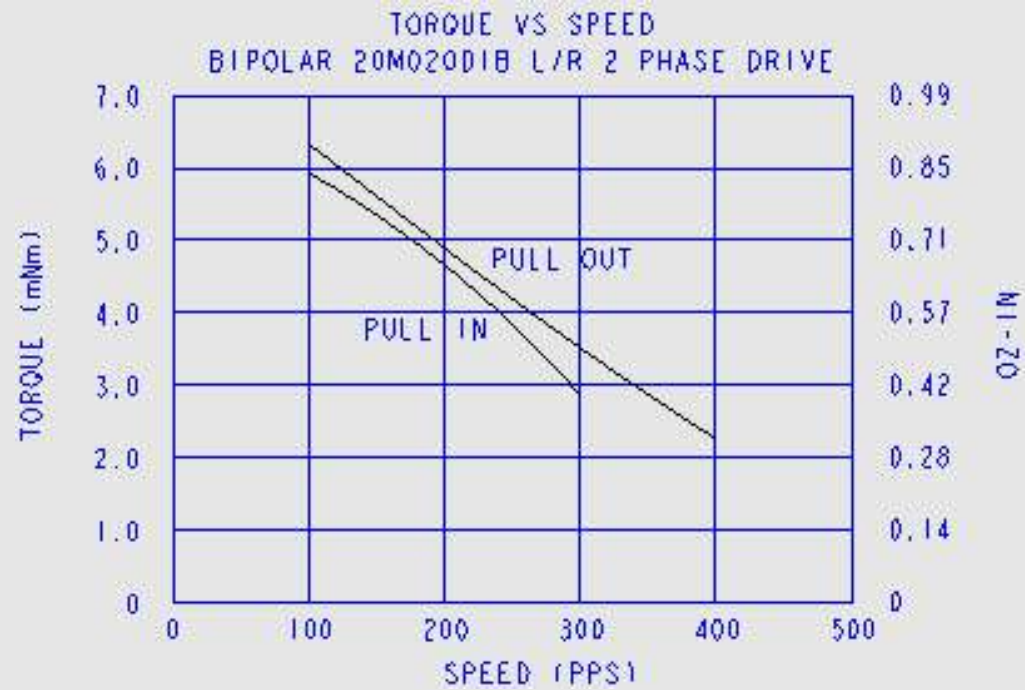
20M020D2B, Bipolar,  
L/R Drive



20M020D2U, Unipolar,  
L/R Drive



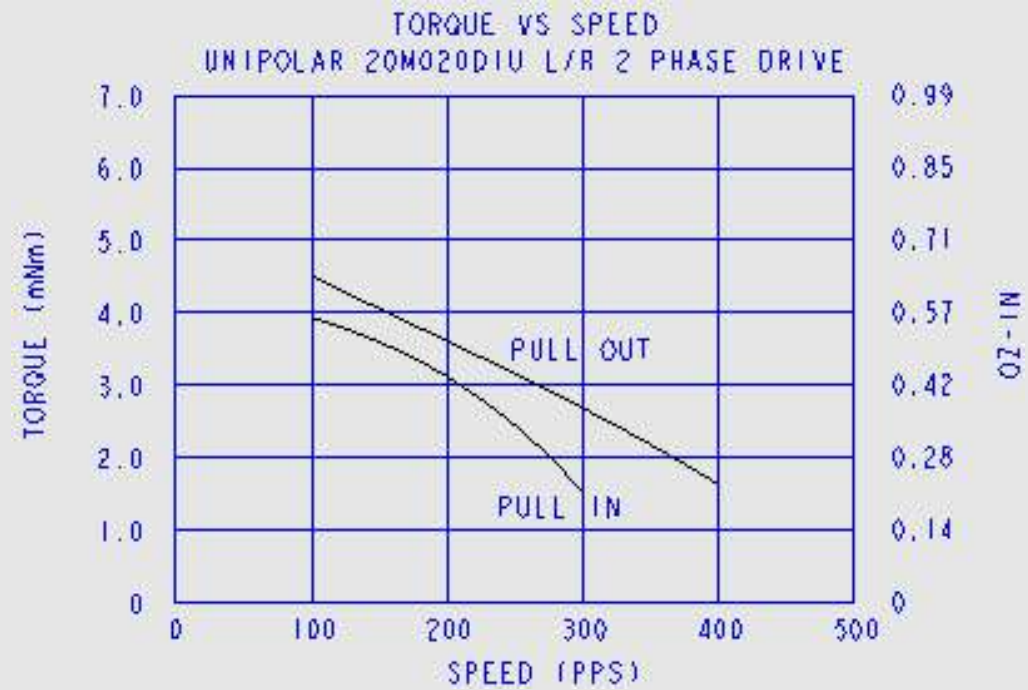
20M020D1B, Bipolar,  
Chopper Drive



## MOTOR DYNAMICS



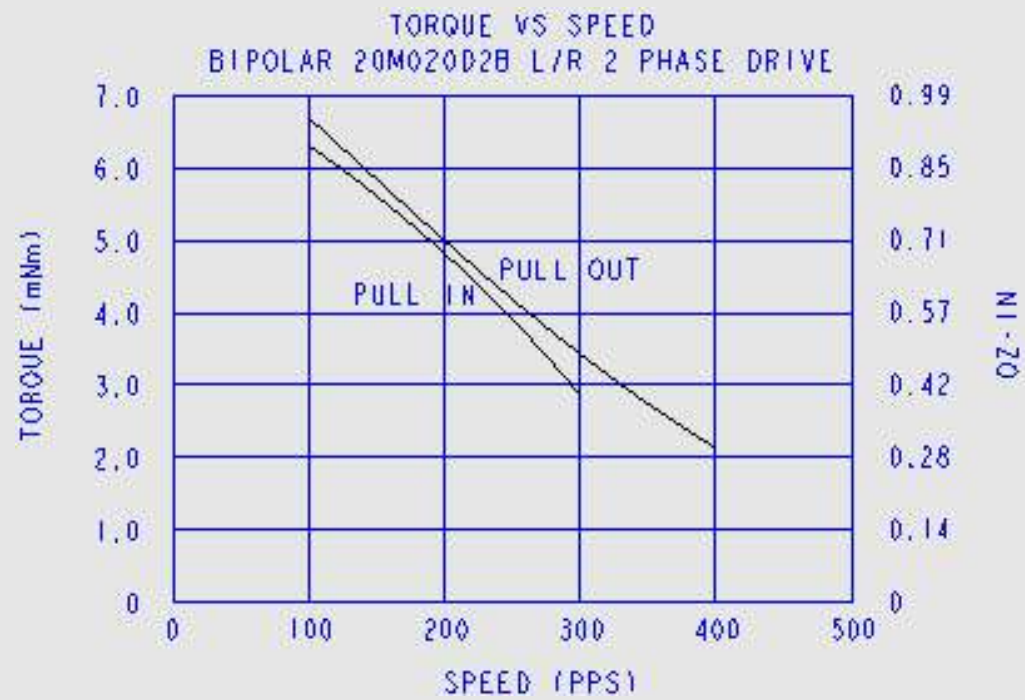
CHART INDEX



## MOTOR DYNAMICS



CHART INDEX

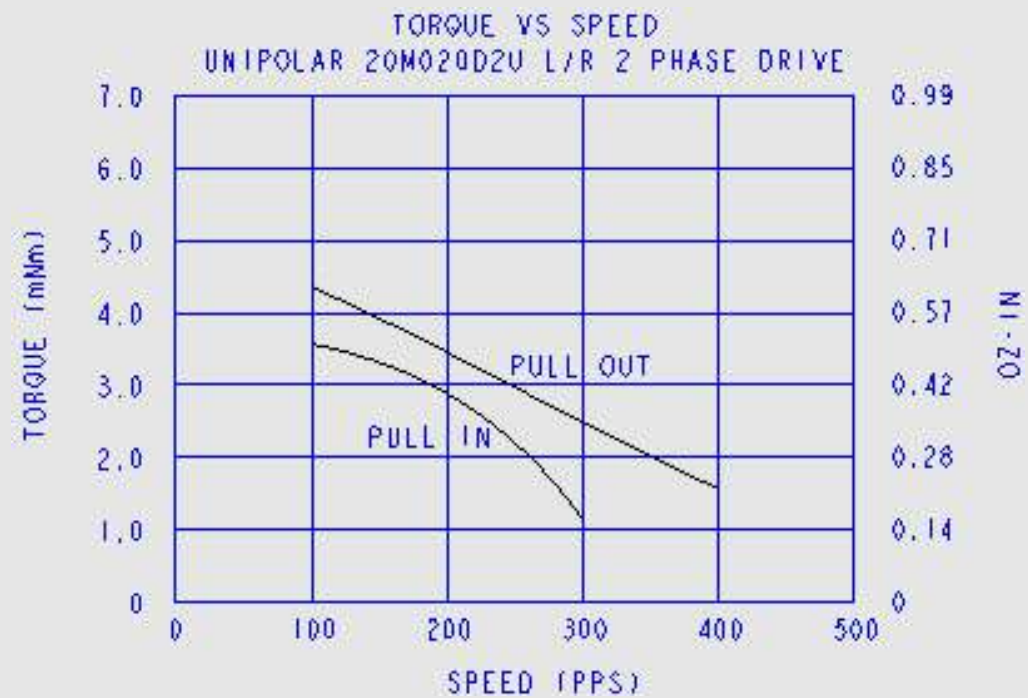




## MOTOR DYNAMICS



CHART INDEX





## TORQUE VS SPEED

BIPOLAR 20M020D1B CHOPPER DRIVE  
@ 36V, 250mA/Ø, 2Ø

