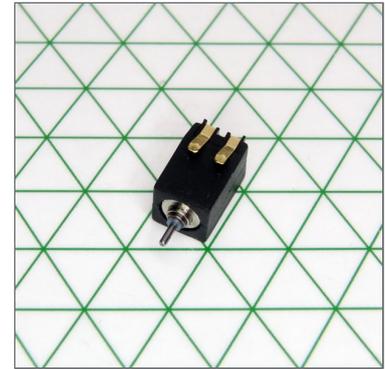


# Product Data Sheet

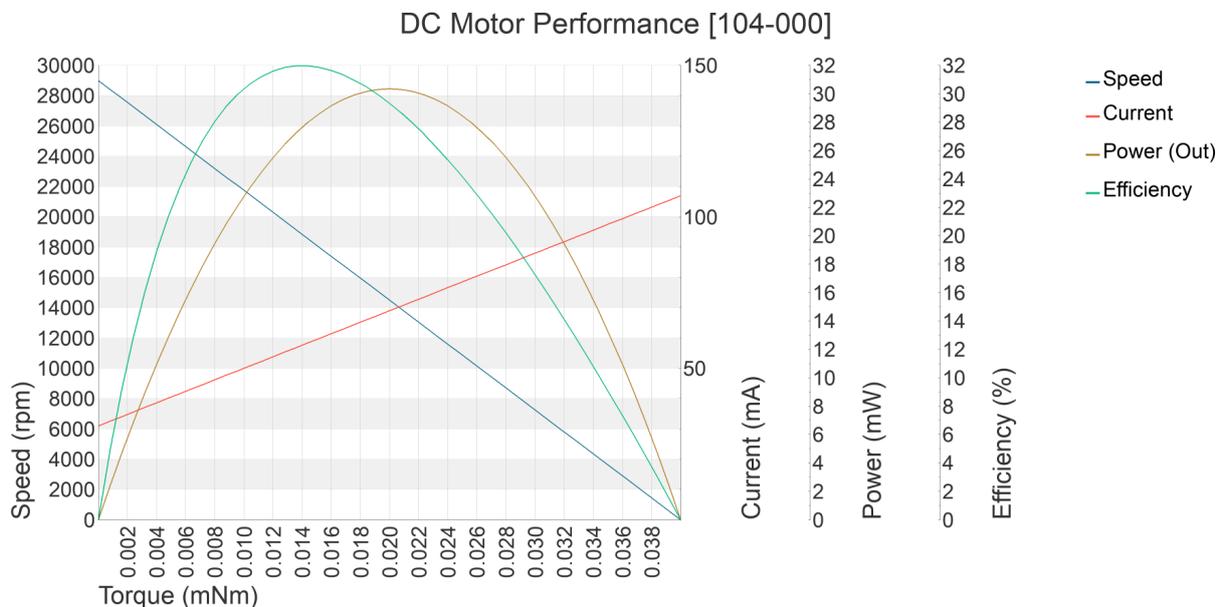
Range: Nano Coreless  
 Title: 4mm DC Motor  
 Type: Undefined  
 Model: 104-000

4mm DC Motor  
 9mm Type  
 Shown on 6mm Isometric Grid



KEY FEATURES	
Body Diameter	4 mm [+/- 0.2]
Body Length	8.6 mm [+/- 0.2]
Shaft Orientation	Inline
Rated Operating Voltage	1.5 V
Rated Load	0.01 mNm
Rated Load Speed	21,300 rpm [+/- 3,300]
Torque Constant (Kt)	0.23 mNm/A
Back EMF Constant (Ke)	0.23 mV/rad.sec-1
Speed Constant (Kv)	43,300 rpm/V
Typical Max. Output Power	29 mW

## TYPICAL DC MOTOR PERFORMANCE CHARACTERISTICS



## ORDERING INFORMATION

The model number fully defines the model, variant and additional features of the product. Please quote this number when ordering. For stocked types, testing and evaluation samples can be ordered directly through our

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### DESIGN FOR APPLICATION CASE STUDIES



#### ENCAPSULATED VIBRATION MOTOR FOR A CPR TRAINING DUMMY

- Low volume, high value manufacturing
- Custom CNC machined enclosure
- Optimised haptic performance
- Custom PCB including EMI filters
- Part no. 334-401.001



#### VIBRATION MOTOR HIGHLY OPTIMISED FOR RUGGEDISED FIRE AND POLICE EMERGENCY RADIOS

- High volume production
- Optimised for emergency services application
- Ruggedised design with custom rubber 'suspension' cover
- Custom PCB with spring legs for simplified production assembly times
- Part no. 308-104.001



#### PRECISION SPEED AND TORQUE CONTROLLED SERVO WITH INTEGRATED TUNABLE PID LOOP FOR SINGLE-USE SCIENTIFIC INSTRUMENT.

- Medium volume, high value assembly
- Proprietary PID controller converts cost-effective motor design into a precision servo
- Adapted control software including digital IO (to customer's specification)
- Part no. 132-100.001



#### CUSTOMISED PRECISION GEAR MOTOR WITH ROBUST OPTICAL ENCODER

- High volume production
- Application specific output shaft
- Tailored motor performance curves
- Rear motor shaft with noise resistant optical encoder
- Part no. 212-116.001

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**PHYSICAL SPECIFICATION**

PARAMETER	CONDITIONS	SPECIFICATION
Body Diameter	Max body diameter or max face dimension where non-circular	4 mm [+/- 0.2]
Body Length	Excl. shafts, leads and terminals	8.6 mm [+/- 0.2]
Unit Weight		0.6 g
Mounting	See drawing for details	Spring Terminals
No. of Output Shafts		1
Shaft Diameter		0.7 mm [+ 0 /- 0.02]
Shaft Length	Measured from motor body face	3.4 mm [+/- 0.3]
Shaft Orientation		Inline

**CONSTRUCTION SPECIFICATION**

PARAMETER	CONDITIONS	SPECIFICATION
Motor Construction		Coreless
Commutation		Precious Metal Brush
Rotation Direction	As viewed from the primary shaft end / or motor top	CCW
No. of Poles		3
Bearing Type		Sintered Bronze

**OPERATIONAL SPECIFICATION**

PARAMETER	CONDITIONS	SPECIFICATION
Rated Operating Voltage		1.5 V
Rated Load	Maximum continuous torque	0.01 mNm
Rated Load Speed	At rated voltage under fixed torque at rated load	21,300 rpm [+/- 3,300]
N/L Speed	Measured at rated voltage	29,100 rpm [+/- 4,800]
Max. Start Voltage	Measured at no load	0.9 V
Max. N/L Current	Measured at rated voltage	55 mA
Max. Operating Voltage		1.8 V
Max. Start Current	At rated voltage	140 mA
Max. Rated Load Current	At rated voltage under fixed torque at rated load	85 mA
Min. Insulation Resistance	At 50V DC between motor terminal and case	10 MOhm

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**Important:** The characteristics of the motor is the typical operating parameters of the product. The data herein offers design guidance information only and supplied batches are validated for conformity against the specifications on the previous page.

## TYPICAL PERFORMANCE CHARACTERISTICS

PARAMETER	CONDITIONS	SPECIFICATION
Typical Rated Load Power Consumption	At rated voltage and load	78 mW
Torque Constant (Kt)		0.23 mNm/A
Back EMF Constant (Ke)		0.23 mV/rad.sec-1
Speed Constant (Kv)		43,300 rpm/V
Typical N/L Current	At rated voltage	32 mA
Typical Peak Efficiency		30.1 %
Typical Start Current	At rated voltage	107 mA
Typical Peak Eff. Torque		0.0134 mN·m
Typical Peak Eff. Speed		18,900 rpm
Typical Peak Eff. Current		58 mA
Typical Peak Eff. Power Out	Power out at rated voltage at the peak efficiency torque point	26 mW
Typical Max. Output Power		29 mW
Typical Terminal Resistance		13 Ohm
Typical Terminal Inductance		36 uH

## ENVIRONMENTAL CHARACTERISTICS

PARAMETER	CONDITIONS	SPECIFICATION
Max. Operating Temp.		60 Deg.C
Min. Operating Temp.		-20 Deg.C
Max. Storage & Transportation Temp.		80 Deg.C
Min. Storage & Transportation Temp.		-40 Deg.C

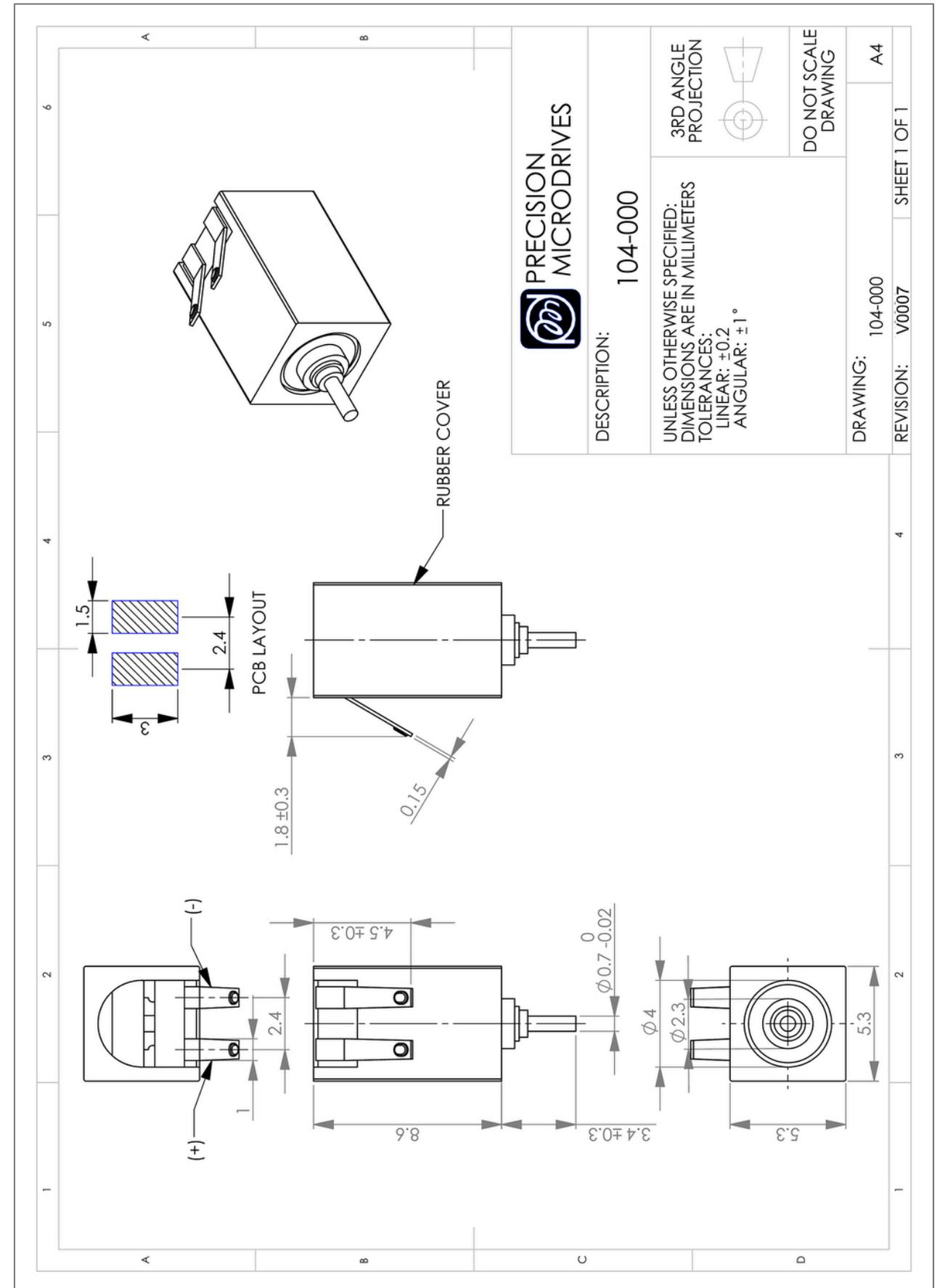
## TYPICAL PACKING CONDITIONS

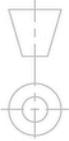
PARAMETER	CONDITIONS	SPECIFICATION
Carton Type		Boxed Trays

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PRODUCT DIMENSIONAL SPECIFICATION



 <b>PRECISION MICRODRIVES</b>	<b>DESCRIPTION:</b> 104-000	3RD ANGLE PROJECTION 	DO NOT SCALE DRAWING A4
		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES: LINEAR: ±0.2 ANGULAR: ±1°	
<b>DRAWING:</b> 104-000		<b>REVISION:</b> V0007 SHEET 1 OF 1	

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## HOW TO ORDER

Call or email us with your order requirements at:

Email: [enquiries@precisionmicrodrives.com](mailto:enquiries@precisionmicrodrives.com)

Phone: **+44 (0) 1932 252482**

Please quote the full part number when ordering or making an enquiry. Some products can be ordered in smaller volumes directly from our website: [www.precisionmicrodrives.com](http://www.precisionmicrodrives.com)

## DATASHEET REVISION AND VERSION NUMBERING

We aim to provide our customer with the most detailed product information available. Sometimes changes are necessary, and these will be controlled by our engineering change request and notification process. To track datasheet versions we use both a 'production revision number' and a 'document version number'. These can be found at the bottom of every page. In some cases, such as documentation errors, the document version number can increase without triggering a product revision.

## LIFE SUPPORT AND MISSION CRITICAL APPLICATION POLICY

PRECISION MICRODRIVES PRODUCTS ARE NOT AUTHORISED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR OTHER CRITICAL APPLICATION SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF PRECISION MICRODRIVES LIMITED.

As used herein:

1. Life support devices or systems are devices or systems which,
  - 1.1. are intended for surgical implant into the body, or
  - 1.2. support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user or a third party.
2. A critical component is any component of a life support device or any other system or machine whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

## BATCH NUMBERING, MANUFACTURING, TRACEABILITY AND LABELLING

Every part manufactured by Precision Microdrives is at minimum identified and traced via a batch number. Where physically practical, we try to make each part with a batch number. In addition, some parts carry a lot code or barcode serial numbers. If traceability is a core requirement for your purchase, let us know and we'll outline the production options for you.

## STANDARD QUALITY CONTROLS AND ISO 9001

Precision quality control is one of our 3 key competitive advantages. All motors that we produce undergo 100% line inspection followed by strict and detailed batch sample testing in accordance with ISO 2859. All of the processes operated at Precision Microdrives are managed within our ISO 9001 quality system.



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