WB 23 High-Speed Eddy-Current Dynamometer

Preliminary

FEATURES

- Torque: 80 mNm
- Speed: up to 100,000 rpm
- Power: 50 W continuous; 300 W intermittent
- Very low moment of inertia
- Very low residual torque
- Operation in either rotational direction
- Braking torque measurement included
- Stable braking torque, without shock
- Integrated, highly accurate optical speed sensor
- Data acquisition via DSP6001 Controller and M-TEST Software

WB 23 Dynamometer shown with AMF 23 Motor Fixture

DESCRIPTION

Magtrol's new WB 23 Eddy-Current Brake Dynamometer is designed for very-high-speed motor and engine testing applications. By providing a braking torque that is proportional to the rotational speed, peak torque (and full braking power) is reached at the rated speed of 100,000 rpm.

The WB 23 Dynamometer features a low level of inertia, due to small rotor dimensions, and brake cooling is provided by an air passage inside the dynamometer housing. This results in the dynamometer's ability to dissipate 50 watts of power (continuous duty), 100 watts for a maximum of 150 seconds or 300 watts for a maximum of 60 seconds.

The PT 1000 temperature sensor is another integral component of the dynamometer. It continuously measures the brake temperature and alarms the DSP6001 Controller to immediately stop the brake excitation current to protect the dynamometer from overheating.

Magtrol offers three types of dynamometer brakes to absorb load: Hysteresis, Eddy-Current and Magnetic Powder. Each type of Dynamometer has advantages and limitations and choosing the correct one will depend largely on the type of testing to be performed. With over 50 models to choose from, Magtrol Sales professionals are readily available to assist in selecting the proper Dynamometer to meet your testing needs.

OPERATING PRINCIPLES

Torque is measured by a reaction-force transducer placed on the stator. The dynamometer has a torque measuring accuracy rating of ±1% full scale. The speed is measured by an optical sensor and a 6-bit encoder disc. This sensor measures engine/motor speeds between 10 and 100 000 rpm with a full scale accuracy of ± 0.06 % (using a DSP6001).

COMPLETE PC CONTROL

Magtrol's M-TEST 5.0 Software is a state-of-the-art motor testing program for Windows®-based data acquisition. Used with a Magtrol DSP6001 Programmable Dynamometer Controller, Magtrol M-TEST 5.0 Software provides the control of any Magtrol Eddy-Current or Powder Brake Dynamometer and runs test sequences in a manner best suited to the overall accuracy and efficiency of the Magtrol Motor Test System. The data that is generated by Magtrol's Motor Testing Software can be stored, displayed and printed in tabular or graphic formats, and can be easily imported into a spreadsheet.

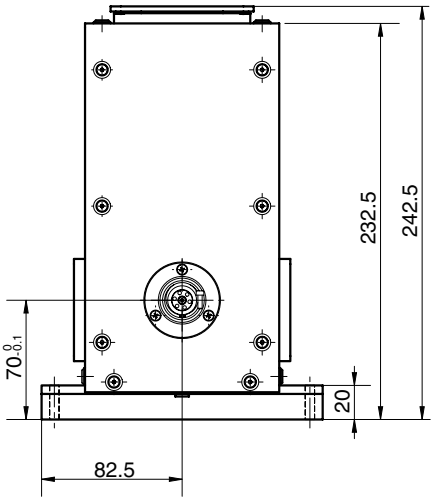
Written in LabVIEW™, M-TEST 5.0 has the flexibility to test a majority of motor types in a variety of ways. Because of LabVIEW's versatility, obtaining data from other sources (e.g. thermo torques), controlling motor power and providing audio/visual indicators is relatively easy.

Magtrol's M-TEST 5.0 Software is ideal for simulating loads, cycling the unit under test and motor ramping. Because it is easy to gather data and duplicate tests, the software is ideal for use in engineering labs. Tests can be programmed to run on their own and saved for future use allowing for valuable time savings in production testing and incoming/outgoing inspection.

RATINGS

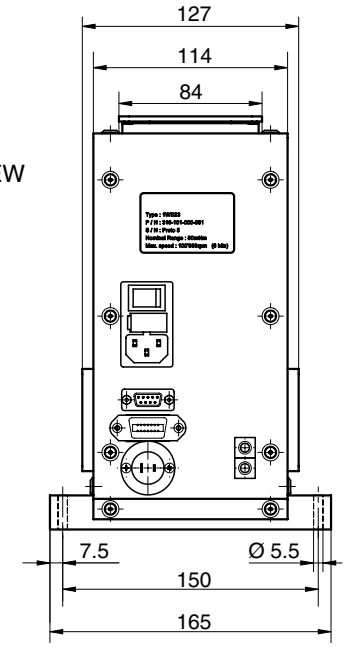
Model	Rated Power	Duration at Rated Power	Rated Torque	Rated Speed	Maximum Speed	Drag Torque De-energized at 100,000 rpm	Nominal Input Inertia	Excitation Current
	W	*s*	*mNm*	*rpm*	*rpm*	*mNm*	*kgm²*	*A*
WB 23	50	steady operation	30	10,000	100,000	2	3.2×10^{-6}	0.8
	100	150	48	20,000				
	300	60	80	20,000				

DIMENSIONS

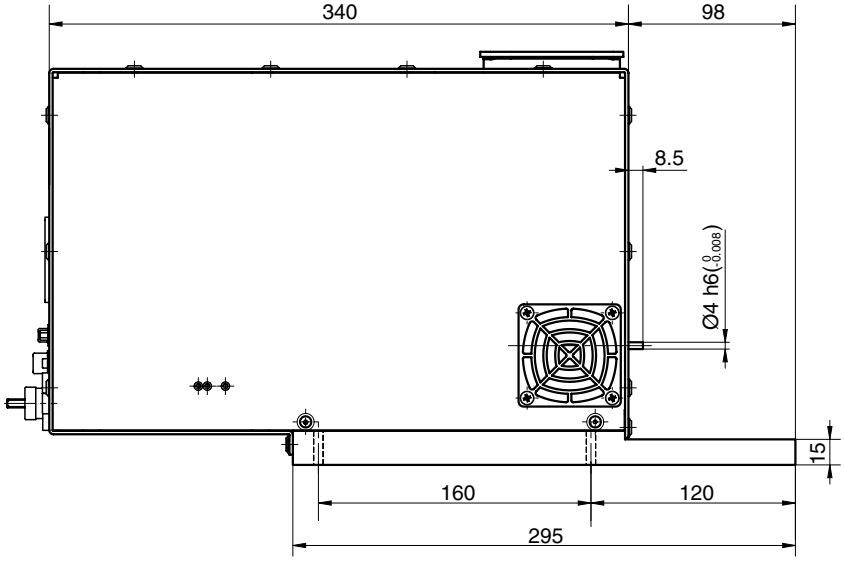


FRONT VIEW

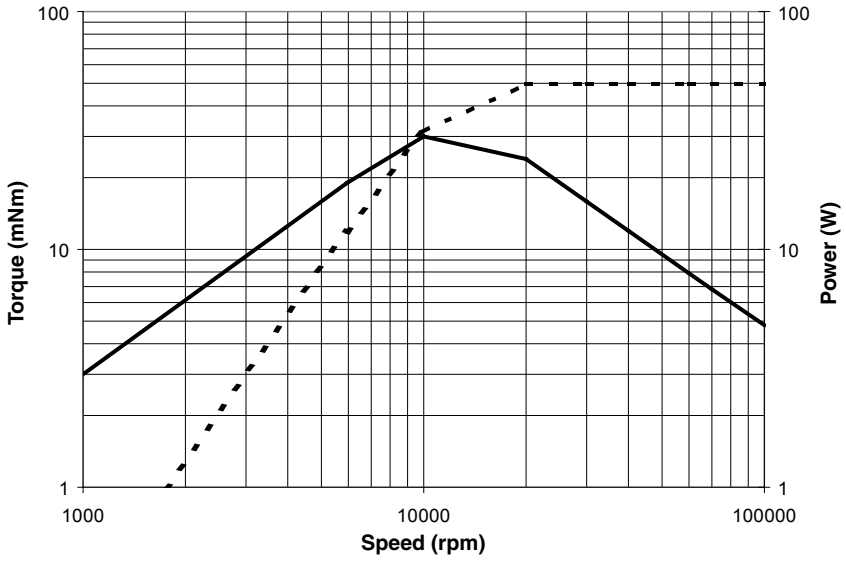
REAR VIEW



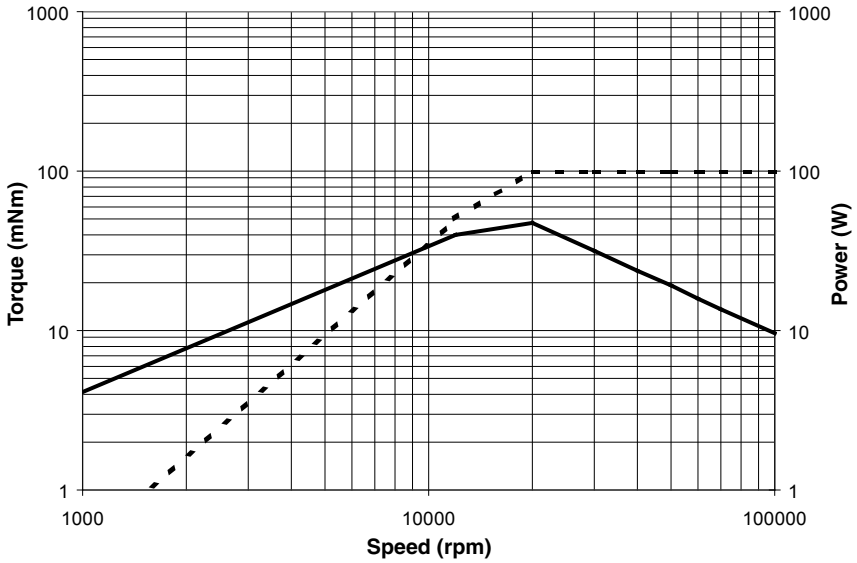
SIDE VIEW



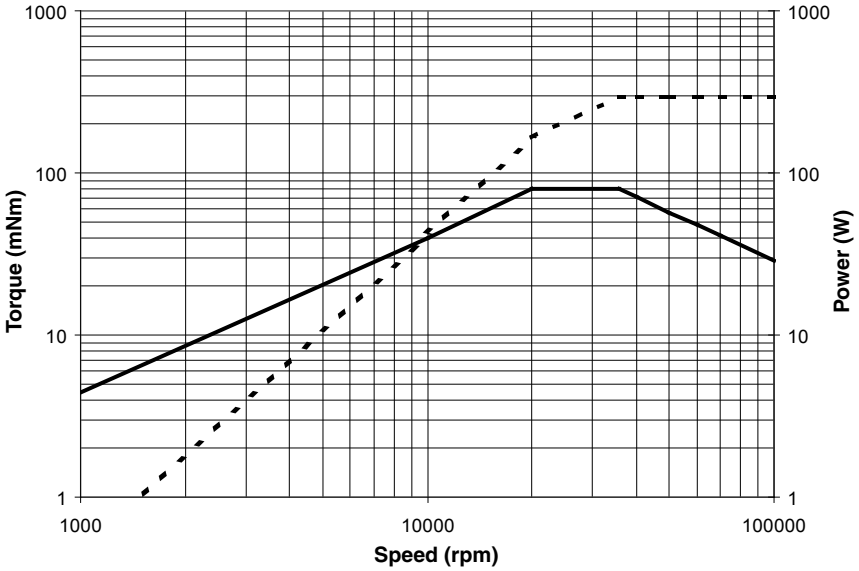
Rated Power	50 W
Duration at Rated Power	steady operation
Rated Torque	30 mNm
Rated Speed	10,000 rpm
Maximum Speed	100,000 rpm



Rated Power	100 W
Duration at Rated Power	150 s
Rated Torque	48 mNm
Rated Speed	20,000 rpm
Maximum Speed	100,000 rpm



Rated Power	300 W
Duration at Rated Power	60 s
Rated Torque	80 mNm
Rated Speed	20,000 rpm
Maximum Speed	100,000 rpm

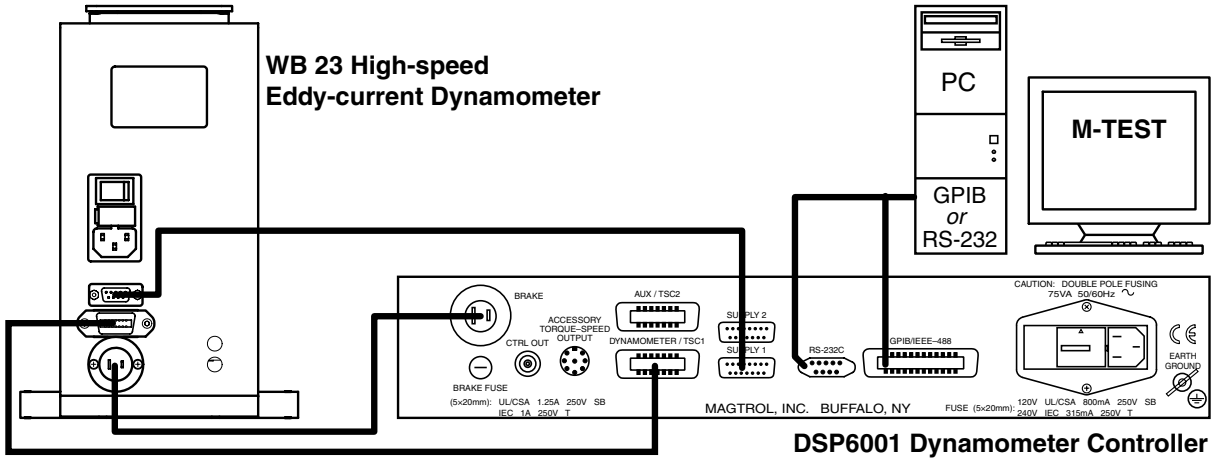


Torque (mNm)
Power (W)

SYSTEM CONFIGURATION

The WB 23 Dynamometer must be used with a Magtrol DSP6001 Programmable Dynamometer Controller in order to supply the necessary excitation current and closed-loop control of the test system. In addition, the DSP6001 displays the measured torque, rotation speed and mechanical power of the motor under test and features a built-in alarm system for user-defined limits.

A Single or Three-phase Power Analyzer, a required component in a test system measuring motor efficiency, can be integrated into this system as well as Magtrol's Temperature Testing Hardware.



SYSTEM OPTIONS AND ACCESSORIES

CATEGORY	DESCRIPTION	MODEL / PART #
CONTROLLERS	High-Speed Programmable Dynamometer Controller	DSP6001
POWER ANALYZERS	High-Speed Single-Phase Power Analyzer	6510*e*
	High-Speed Three-Phase Power Analyzer	6530
SOFTWARE*	M-TEST 5.0 Motor Testing Software	SW-M-TEST5.0-WE
	Temperature Testing Hardware	HW-TTEST-FP
MOUNTING	Adjustable Motor Fixture	AMF-23
CALIBRATION	Calibration Beam Assemblies and Calibration Weights	316-101-960-011

* *For more information regarding software and temperature testing hardware options, refer to the M-TEST 5.0 data sheet.*

Due to the continual development of our products, we reserve the right to modify specifications without forewarning.

www.magtrol.com

MAGTROL INC
70 Gardenville Parkway
Buffalo, New York 14224 USA
Phone: +1 716 668 5555
Fax: +1 716 668 8705
E-mail: magtrol@magtrol.com

MAGTROL SA
Centre technologique Montena
1728 Rossens/Fribourg, Switzerland
Phone: +41 (0)26 407 3000
Fax: +41 (0)26 407 3001
E-mail: magtrol@magtrol.ch

Subsidiaries in:
- Germany
- France
- Great Britain
- China

Worldwide Network of Sales Agents

ISO 9001:2000 BUREAU VERITAS Certification

WB23 05/07