

PRECISION TORSION/FRICTION ANALYZER

MPFA-Series

Introduction: MPFA series of precision differential torsion analyzer(static/dynamic) up are available in more than ten different models virtually offering tribological measurement solutions for fabric,polymer,metal, ceramic ,rubber, Printed cartons ,Flexible packaging, Printing, Rubber, Paper, coating, composite, leather etc in Cartesian/radian co-ordinate system with facility to measure peak/average torsion & friction at different radial velocity/torque simulated under different thermal conditions. It can effectively measures static/dynamic torsion sample 9.0000 to 9999.9100.0 mili Newton.sec/rad under varied temperature, humidity conditions. These torsion analyzer meters are offered . On account of above, these torsion/friction analyzer are first choice for paper, polymers, cosmetic, foam, leather, PVC, wood, cotton, insulator material, laminates, filters, civil structure, soil, fins, food items etc medical diagnostic, agro, biomedical, petrochemical, automobile, organic/inorganic chemical, milk plant, sugar, textiles, beverages, water management/treatment, academic and defense. These torsion analyzer are available for various functions namely.....

1. Low Torque/low R.P.M. 2. High Torque/Low R.P.M. 3. Low Torque/High R.P.M. 4. High Torque/High R.P.M.

Operating Principle: Sample under examination is place on rotary disc and clamped. Sensing finger coupled to torque sensor(strain gauge/electromagnetic type) measures the torsion force/friction between sensing finger and sample. Such result may be conducted at different speed. Ratio of Torsion force to Axial force is C.O.F. Such set-up can static/dynamic torsion at different r.p.m./torque..

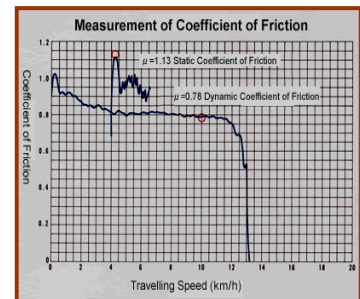
$\mu = T_f/T_1$ -- where μ = static/dynamic torsion value T_f =Torsion force, T_1 : weight of sample



MPFA-09901



MPFA-00102



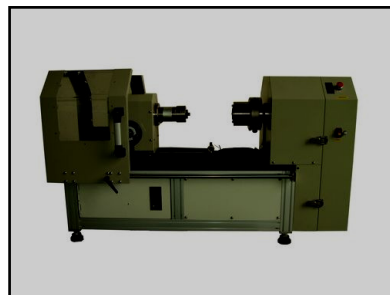
friction vs Speed behaviour

ELECTRICAL/MECHANICAL Specifications OF Low Torque/low R.P.M. Torsion Analyzer:

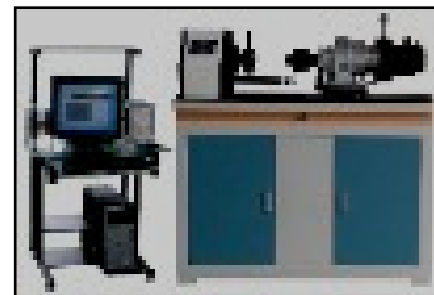
MODEL	Torque N.m.	Angular Velocity R.P.M./option	Ave-Torsion/Peak Torsion range p.u.	Accuracy / Repeatability	Burdon	Accuracy Restricted to Resolution level	Resolution Quantified/ optional	interface
MPFA-00011	0.01-0.100	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro-N.m	99.999999%	1/2/5	RS-232
MPFA-00011	0.01-1.000	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro-N.m	99.999999%	1/2/5	RS-232
MPFA-00021	0.01-2.000	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-00041	0.01-4.000	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-00071	0.01-7.000	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-00101	0.01-10.00	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-00201	0.01-20.00	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-00501	0.01-50.00	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-00801	0.01-80.00	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232
MPFA-09901	0.01-99.00	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.999999%	1/2/5	RS-232



MPFA-00071



MPFA-00501



MPFA-00801

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PRECISION TORSION/FRICTION ANALYZER

Electrical/Mechanical Specification of low torque /high R.P.M.. Torsion Analyzer:

MPFA-Series

MODEL	Torque N.m.	Angular Velocity R.P.M./option	Ave-friction/Peak friction range p.u.	Accuracy / Repeatability	Burdon	Accuracy Restricted to Resolution level	Resolution Quantified/ optional	interface
MPFA-00012	0.01-0.100	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro-N.m	99.99999%	1/2/5	RS-232
MPFA-00022	0.01-1.000	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00042	0.01-2.000	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00072	0.01-4.000	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00102	0.01-7.000	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00202	0.01-10.00	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00502	0.01-20.00	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-01002	0.01-50.00	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-02002	0.01-80.00	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232

Electrical/Mechanical Specification of High Torque/low R.P.M. Torsion Analyzer:

MPFA-Series

MODEL	Torque Psi	Angular Velocity R.P.M./option	Ave-friction/Peak friction range p.u.	Accuracy / Repeatability	Burdon	Accuracy Restricted to Resolution level	Resolution Quantified/ optional	interface
MPFA-00013	001.0-100.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro-N.m	99.99999%	1/2/5	RS-232
MPFA-00023	001.0-200.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00043	001.0-400.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00053	001.0-500.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00063	001.0-600.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00083	001.0-800.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00093	001.0-0900.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00103	001.0-1000.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00203	001.0-2000.0	0.0001.0-001.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232

ELECTRICAL/MECHANICAL Specifications OF High Torque/High R.P.M. Torsion analyzer

PFA-Series

MODEL	Torque N.m.	Angular Velocity R.P.M./option	Ave-friction/Peak friction range p.u.	Accuracy / Repeatability	Burdon	Accuracy Restricted to Resolution level	Resolution Quantified/ optional	interface
MPFA-00013	001.0-100.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro-N.m	99.99999%	1/2/5	RS-232
MPFA-00023	001.0-200.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00043	001.0-400.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00053	001.0-500.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00063	001.0-600.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00083	001.0-800.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00093	001.0-0900.0	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00103	001.0-1000	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232
MPFA-00203	001.0-2000	0.10.0-01000.0	0.0001- 99.9999	99.9/100	< 100 micro N.m	99.99999%	1/2/5	RS-232

Company may offer tailor made solution to the requirement.

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PRECISION TORSION/FRICTION ANALYZER

(PULSE TECHNIQUE)

MPFA-Series

General electrical/mechanical specifications of Torsion/Friction analyzer:

Operating voltage: 220 volt A.C. (50-20,000 Hz)
 Measurement range (full scale): as above in different model.
 Sample size: 0.1-1000 M.M. diameters in different ranges of torque
 Torsion range: Range: 0.0001 – 99.999 p.u.
 Torque range: 0.00 to 1000.0 N.m.
 Friction: 0.001-99.999
 Differential Torque: upto 100 psi
 R.P.M. range: 0.01 TO 1000 R.P.M.
 Grip for round diameter sample: option m.m.
 Grip for flat sample: thick ness: option
 Distance between grips: upto 2000 m.m.
 Operation humidity: 10-100%
 Operation temperature: -10 °C to +60 °C
 Sample size: DIAMETER: 1"/2"/3"/4"/5"/6" or option
 Response time: 1000 sample/sec
 Torque drop Burden: less than 100 micro1.9999 Pa x sec / c.m or better
 Accuracy for R.P.M./Torque: 0.5/1.0/2.0 % reading
 Repeatability torque/R.P.M.: 100 of reading
 Resolution torque/R.P.M.: 1/5 count and may be altered based on
 time behaviour of signal
 Linearity adjustment: upto 100 count
 Input imedence: ultra low (<1000 count),
 Filtering: low pass (adjustable)
 Offset: variable upto 10,000 count (manual/auto)
 CMMR: >80 db at 50-60 Hz
 Isolation: > 100 giga ohm
 Connector: BNC-9 pinx2 and BNC-25 pinx2
 Size: 5X8X8 inches/rack mounted or portable
 Interface: RS-232
 Option: ADDITIOL SOFTWARE to plot T/Rh/Torsion analyzer, fabric thickness.
 Or other inferential parameter.
 Company may dedicate instruments to meet specific requirement. /
 NOTES: The numeral after product code indicates the torsion analyzer to be measured



ELECTROMAGNETIC TORQUE SENSOR & CONTROLLERS

MRRR-Series

Introduction:

MHDM series of magnetic torque sensor are available in more than 20 different models (0.0001 to 1000.0N.m.), virtually offering solutions to any torque measurement application like applications in captive power plant, paper, machine-tools, plastic/yarn, milk/brewery plant, petrochemical industry, organic/inorganic chemical, rubber, medicine, sugar, textiles, heavy electrical/mechanical industries, research and development organizations and many defense applications. Special sensor design ensures light weight, least torsionless motion and efficient operation. Updated design topology and material ensures better controllability and efficiency. Company offers tailor made solution to / requirement.

Operating Principle:

These torque/force sensors Operating works on Fleming principle of electromagnetic force, where a current (I) carrying conductor of length (L) experience force (F) when placed in a magnetic field (B). This force is balanced by incremental weight under measurement using sensitive feedback controlled D.S.P. system and is converted into equivalent signal. These measurement systems are immune to any climatically, mechanical, tribological, rheological, chemical constraints and displays very consistently with high level of accuracy.

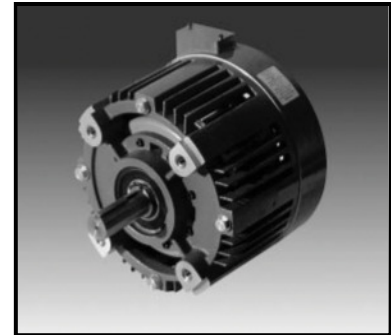
$F = I \times B \times L$, where I=current, B= magnetic field, L= conductor length, k1 = spring factors



MRRR-01015



MRRR-003010



MRRR-001515

Electrical Specifications of Torque sensor:

Rotary Actuator

Rotary Actuator

Model	Power Watts	Torque n.m. x10-2	rpm x100 (max)	Angular Stoke degree	Tc Milli sec	Vexc/ lexc D.C.	Model	Power Watts	Torque n.m. x10-2	rpm X100 max	Linear stroke m.m.	Tc mili.s ec	Vexc/ lexc D.C.
MREMT-000130	001.0	0.031	300	120o	<2.0	24/0.5	MLEMT-007510	075.0	04.77	100	20.0	<10	110/0.2
MREMT-000230	002.0	0.062	300	120	<2.0	24/0.6	MLEMT-010010	100.0	06.35	100	22.0	<10	110/0.4
MREMT-000325	003.0	0.114	250	120	<2.0	24/0.8	MLEMT-012010	120.0	07.62	100	25.0	<10	110/0.6
MREMT-000520	005.0	0.238	200	120	<2.0	32/0.5	MLEMT-015010	150.0	09.52	100	30.0	<10	110/0.8
MREMT-001015	010.0	0.636	150	120	<2.0	32/0.6	MLEMT-020010	200.0	12.70	100	35.0	<10	110/1.0
MREMT-001515	015.0	95.52	150	120	<2.0	36/0.5	MLEMT-050010	500.0	39.68	080	40.0	<10	110/1.2
MREMT-002015	020.0	01.27	150	120	<2.0	36/0.8	MLEMT-075008	750.0	59.53	080	42.0	<10	110/1.4
MREMT-002510	025.0	01.59	100	120	<2.0	36/0.5	MLEMT-100008	1000.0	79.37	080	45.0	<10	110/1.6
MREMT-003010	030.0	01.91	100	120	<2.0	48/0.5	MLEMT-200006	2000.0	211.6	060	50.0	<10	110/1.8
MREMT-004010	040.0	02.54	100	120	<2.0	48/0.6	MLEMT-500006	5000.0	52.91	060	60.0	<10	110/2.0
MREMT-005010	050.0	03.17	100	120	<2.0	48/0.8	MLEMT-999905	10000.0	105.8	050	70.	<10	110/2.2

General electrical/mechanical specifications:

Operating voltage: 220 volt A.C. (50-20,000 Hz)/ 12 volts D.C.

Measurement range (full scale): as above in different model.

Torque signal: 10-6/10-3/10-01 N.m.AC/DC (optional)

Input capacitance: 10 nF

Response time: 1000 sample/sec

Burden: less than 100 micro volt/full scales current or better

Accuracy: 0.5/1.0/2.0 % reading

Repeatability: 100 of reading

Resolution: 1/5 nV & 1/5 nano amps or optional and may be altered based on time behavior of signal

Linearity adjustment: upto 100 nano volt

Input impedance: ultra low(<1000 nano volt burden),

Filtering: low pass(adjustable)

Offset: variable upto 10,000 nano volts (manual/auto)

CMMR: >80 db at 50-60 Hz

Isolation: > 100 giga ohm

Connector: BNC-9 pinx2 and BNC-25 pinx2

Size: 5X8X8 inches/rack mounted or portable

Interface: RS-232

Option : ADDITIONAL SOFTWARE to plot V/I OR ANY DESIRED INFERENTIAL PARAMETER.

THESE SPECIFICATIONS OR PART THERE OF MAY BE MODIFIED TO MEET ANY TAILOR MADE SOLUTIONS.

NOTES: The numeral after product code indicates the (ampere meter) range and last digit corresponds to size (5x5x8, 8x8x12)

Note: First four numeral after product code MREMT, indicates watts, and last numeral indicates R.P.M.x100.

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