

Optical transmission method flange type torque meter TMHSA series

2024/02/28

Appearance



- Compact size and light weight. Available for high speed measurement by bearing-free structure. (25 000 rpm: 100 Nm ~ 300 Nm, 22 000 rpm: 500 Nm, 1 kNm, 16 000 rpm: 2 kNm, 3 kNm, 14 000 rpm: 5 kNm, 12 000 rpm: 10 kNm)
- Measurement accuracy of ± 0.02 %R.O. in frequency output and ± 0.03 %R.O. in voltage output is achieved.
- Stator antenna has a split configuration to facilitate mounting and detachment.
- Special transmitter OPT-563B is provided.

The operation without this transmitter is available and the stator outputs ± 10 V.

- Calibraton software provided transfers commands between TMHSA and a PC, and allows users to read TMHSA setting parameter, proceed calibration, or write the number of moving average and the analog filter frequency.
- The detector for rotation speed and rotational direction is prepared as an option.
- High accuracy and low noise are achieved by the digital signal transmission by the optical transmission method of the patent.

(USA PAT No. US6.472.656.B2, Japanese PAT No.3448738, PAT No.3453654)

Specification

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Specification

Specification name	Specification contents
Rated output	Voltage output: ± 10 VDC, Frequency output: $10 \text{ kHz} \pm 5 \text{ kHz}$ (Resistive load: $2 \text{ k}\Omega$ or more, Output capacitance load: $0.1 \mu\text{F}$ or less.)
Measurement accuracy	Frequency output: $\pm 0.02 \%$ R.O., Voltage output: $\pm 0.03 \%$ R.O. (including linearity, hysteresis and repeatability.)
Zero adjustment range	$\pm 2 \%$ R.O.
Symmetry correction range	$\pm 10 \%$ R.O.
Moving average	Selectable from 1 time, 2 times, 4 times, 8 times, 16 times, 32 times, 64 times, 128 times, 256 times and 512 times (Default: 1 time)
Low pass filter	Selectable from 1 Hz, 10 Hz, 30 Hz, 50 Hz, 100 Hz, 300 Hz, 500 Hz, and 1 kHz. (Default: 1 kHz)
Output polarity inversion	Output polarity is inverted relative to the direction of torsion.
Temp. range, safe	$-10 \text{ }^\circ\text{C} \sim 70 \text{ }^\circ\text{C}$
Temp. range, compensated	$0 \text{ }^\circ\text{C} \sim 60 \text{ }^\circ\text{C}$ (non-condensing)
Temp. effect on zero balance	0.02% R.O./ $10 \text{ }^\circ\text{C}$
Temp. effect on output	0.03% LOAD/ 10°C
Zero shift by rotation	0.5% R.O.p-p (WB=1 kHz)
Class of protection	IP54 or equivalent
Material (Rotor part)	Alloy steel
Material (Stator part)	Aluminium alloy

Table of P/N

Parts No.	Rated capacity [N·m]	Rated capacity [kN·m]	Maximum rotation speed [rpm]	Zero shift by rotation [%R.O.p-p]	Mechanical characteristics Inertia moment [kg·cm ²]	Mechanical characteristics Torsional rigidity [kN·m/rad]
TMHSA-100NM	± 100		25000	0.5	13.79	325
TMHSA-200NM	± 200		25000	0.5	13.8	371.4
TMHSA-300NM	± 300		25000	0.5	13.82	472.7

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Parts No.	Accuracy	Resolution	Rated Capacity	Rated Capacity Error	Rated Capacity Error	Rated Capacity Error
TMHSA-500NM	±500		22000	0.5	19.77	660.7
TMHSA-1KNM		±1	22000	0.5	26.86	909.8
TMHSA-2KNM		±2	16000	0.5	107.6	1515
TMHSA-3KNM		±3	16000	0.5	107.8	1881
TMHSA-5KNM		±5	14000	0.5	260.3	2647
TMHSA-10KNM		±10	12000	0.5	668.4	4043

Parts No.	Mechanical characteristics Torsional peculiar pitch [KHz]	Mechanical characteristics Bending peculiar pitch Torsional rigidity [KHz]	Mechanical characteristics Bending peculiar pitch Thrust direction [KHz]	Mechanical characteristics Twist angle at rated capacity [°]	Mechanical characteristics Twist angle at rated capacity [N]	Mechanical characteristics Accuracy safe thrust load [N]	Weight (Approx.) [kg]
TMHSA-100NM	4.757	2.821	3.458	0.018	75	65	1
TMHSA-200NM	5.161	2.911	3.528	0.031	150	130	1
TMHSA-300NM	5.882	3.073	3.656	0.036	225	195	1
TMHSA-500NM	5.701	3.135	3.715	0.043	375	325	1.2
TMHSA-1KNM	5.899	3.492	4.519	0.063	750	650	1.6
TMHSA-2KNM	3.801	1.763	2.38	0.076	800	3750	3.5
TMHSA-3KNM	4.258	1.995	2.59	0.091	1000	12000	3.5
TMHSA-5KNM	3.233	1.857	2.356	0.108	1650	20000	6
TMHSA-10KNM	2.489	1.368	1.67	0.142	2750	22000	10.

Parts No.	Weight (Approx.) [kg]	CAD files [DXF]	CAD files [DXF] with detector for rotation speed and rotational direction RPM	3D CAD files [STEP]
TMHSA-100NM	1.5	tmhsa-100-300NM.dxf	tmhsa_RPM-100.dxf	TMHSA-100NM.STEP
TMHSA-		tmhsa-100-		TMHSA-

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TMHSA-200NM	1.5	tmhsa-100-300NM.dxf	tmhsa_RPM-100.dxf	TMHSA-200NM.STEP
TMHSA-300NM	1.5	tmhsa-100-300NM.dxf	tmhsa_RPM-100.dxf	TMHSA-300NM.STEP
TMHSA-500NM	1.5	tmhsa-500NM.dxf	tmhsa_RPM-500.dxf	TMHSA-500NM.STEP
TMHSA-1KNM	1.5	tmhsa-1KNM.dxf	tmhsa_RPM-1K.dxf	TMHSA-1KNM.STEP
TMHSA-2KNM	1.5	tmhsa-2-3KNM.dxf	rpm2K.dxf	TMHSA-2KNM.STEP
TMHSA-3KNM	1.5	tmhsa-2-3KNM.dxf	rpm2K.dxf	TMHSA-3KNM.STEP
TMHSA-5KNM	1.7	tmhsa-5KNM.dxf	tmhsa_RPM-5K.dxf	TMHSA-5KNM.STEP
TMHSA-10KNM	1.7	tmhsa-10KNM.dxf	tmhsa_RPM-10K.dxf	TMHSA-10KNM.STEP

* Accuracy safe bending load and accuracy safe thrust load are the load (actual measurement value) which generate output error of 0.05%R.O.

* Accuracy safe bending load is the result of applying the load at the position of 200 mm from the flange edge.

* All are the gurantee over static load.

Associated Specification sheet

Specification sheet

Rotation detector for rotation speed and rotational direction : RPM

[Rotation detector RPM No.KT53515-2](#)

Specification sheet

Cable

[Connecting cable CAC-176C No.KT54323-1](#)

Options

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Dedicated cable: CAC-176C-*M (ϕ 11/ 10-cores shielded cable with connector at the both end). (Selectable from 10 m/ 20 m or 30 m)

Dedicated transmitter: OPT-563B

Rotation detector for rotation speed and rotational direction : RPM