

Rotary transformer method torque transducer

TMNR series

2024/02/28

Features



- TMNR type Torque meter is a highly effective rotary transformer to transmit the electric signal that the sensing point of torque detected.
Therefore, the steady performance is gotten as for the measurement for a long time, because driving side and the measurement side are noncontact.
It is used for the instrumentation control only for the measurement.
It is possible to use it for not only the torque measurement but also the instrumentation control field, For instance, control of stir power and kneading power in food chemical industry etc., because of the efficient rotary transformer adoption.
- The horsepower measurement on motors can be done, because the rotational speed can be measured by installing rotation detector (Options).

Specification

Specification name	Specification contents
Rated capacity	$\pm 10 \text{ N}\cdot\text{m} \sim \pm 10\text{kN}\cdot\text{m}$
Safe overload	120 %R.C.
Ultimate overload	200 %R.C.
Rated output	1.6 mV/V \pm 0.32 mV/V (TMNR-10NM \sim 20NM : 0.75mV/V \pm 0.15 mV/V)
Measurement accuracy	± 0.05 %R.O.(including linearity, hysteresis and repeatability.)
Excitation, recommended	2 VAC
Insulation resistance	500 M-ohm or more (DC50 V)(between bridge and main body)
Temp. range, safe	0 °C \sim 90 °C(Operating temperature range : 0°C \sim 40 °C)
Temp. effect on zero balance	0.2 %R.O./10 °C

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Temp. effect on output	0.2 %LOAD/10 °C
Zero shift by rotation	0.3 %R.O.(TMNR - 10NM~200NM : 0.5 %R.O.)
Temperature rise by rotation	TMNR-10NM ~ 1KNM : 40°C or less at the maximum rotation, TMNR-2KNM ~ 10KNM : 50°C or less at the maximum rotation
Cable	φ10, 4 cores shielded 5 m cable with connector to the both ends. (P/N : CAC-160-5M)
Connector	1108-12A10-7M10.0, PRC03-12A10-7M10.5
Class of protection	IP40 or equivalent
Gear for rotation detector	S45C black coated

Table of P/N

Parts No.	Rated capacity [N·m]	Rated capacity [kN·m]	Rated output [mV/V]	Tolerance of rated output [mV/V]	Maximum rotation speed [rpm]	Zero shift by rotation [%R.O.p-p]
TMNR-10NM	±10		±0.75	±0.15	10000	0.5
TMNR-20NM	±20		±0.75	±0.15	10000	0.5
TMNR-50NM	±50		±1.6	±0.32	10000	0.5
TMNR-100NM	±100		±1.6	±0.32	10000	0.5
TMNR-200NM	±200		±1.6	±0.32	10000	0.5
TMNR-500NM	±500		±1.6	±0.32	8000	0.3
TMNR-1KNM		±1	±1.6	±0.32	8000	0.3
TMNR-2KNM		±2	±1.6	±0.32	5000	0.3
TMNR-3KNM		±3	±1.6	±0.32	5000	0.3
TMNR-5KNM		±5	±1.6	±0.32	5000	0.3
TMNR-10KNM		±10	±1.6	±0.32	4000	0.3

Difference of temp.	Mechanical	Mechanical	Mechanical	Mechanical
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Parts No.	rise by rotation / at maximum speed [deg.C]	characteristics Inertia moment [kg·cm ²]	characteristics Torsional rigidity [kN·m/rad]	characteristics Torsional peculiar pitch [KHz]	characteristics Twist angle at rated capacity [°]	Mechanical characteristics [N]	Cable
TMNR-10NM	40	2.864	1.912	2.8	0.294	9.807	φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C 5M)
TMNR-20NM	40	2.864	3.128	3.6	0.359	14.71	φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C 5M)
TMNR-50NM	40	2.864	4.080	4.0	0.689	14.71	φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C 5M)
TMNR-100NM	40	2.873	6.296	3.9	0.892	29.42	φ10, 4 cores shielded 5 m cab with connect to the both ends.

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TMNR-200NM	40	3.011	11.21	5.2	1.003	34.32	(P/N : CAC-16C5M) φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C5M)
TMNR-500NM	40	16.38	48.90	3.3	0.575	49.03	φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C5M)
TMNR-1KNM	40	16.48	63.98	3.8	0.878	98.07	φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C5M)
TMNR-2KNM	50	123.6	319.5	2.7	0.352	245.2	φ10, 4 cores shielded 5 m cab with connect to the both ends. (P/N : CAC-16C5M)

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TMNR-3KNM	50	124.5	384.5	3.0	0.438	294.2	φ10, 4 cores shielded 5 m cab with connectors to the both ends. (P/N : CAC-16C5M)
TMNR-5KNM	50	124.5	446.9	3.2	0.629	441.3	φ10, 4 cores shielded 5 m cab with connectors to the both ends. (P/N : CAC-16C5M)
TMNR-10KNM	50	193.2	744.8	2.5	0.754	980.7	φ10, 4 cores shielded 5 m cab with connectors to the both ends. (P/N : CAC-16C5M)

Parts No.	ConnectorParts No.	Gear for rotation detector	Weight(Approx.) [kg]	CAD files[DXF]	3D CAD files [STEP]
TMNR-10NM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1, width 8 mm	3	tmnr_10nm.dxf	TMNR-10NM.STEP
TMNR-20NM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1, width 8 mm	3	tmnr_10nm.dxf	TMNR-20NM.STEP
TMNR-50NM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1, width 8 mm	3	tmnr_10nm.dxf	TMNR-50NM.STEP

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TMNR-100NM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1, width 8 mm	3	tmnr_100nm.dxf	TMNR-100NM.STEP
TMNR-200NM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1, width 8 mm	3	tmnr_100nm.dxf	TMNR-200NM.STEP
TMNR-500NM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1.25, width 10 mm	7.5	tmnr_500nm.dxf	TMNR-500NM.STEP
TMNR-1KNM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 60 tooth, Module 1.25, width 10 mm	7.5	tmnr_500nm.dxf	TMNR-1KNM.STEP
TMNR-2KNM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 120 tooth, Module 1, width 10 mm	21	tmnr_2knm.dxf	TMNR-2KNM.STEP
TMNR-3KNM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 120 tooth, Module 1, width 10 mm	21	tmnr_2knm.dxf	TMNR-3KNM.STEP
TMNR-5KNM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 120 tooth, Module 1, width 10 mm	21	tmnr_2knm.dxf	TMNR-5KNM.STEP
TMNR-10KNM	1108-12A10-7M10.0,PRC03-12A10-7M10.5	S45C black coated 120 tooth, Module 1, width 10 mm	32	tmnr_10knm.dxf	TMNR-10KNM.STEP

Associated Specification sheet

Specification sheet

Rotation detector for rotation speed and rotational direction : RPM

[Rotation detector MP-981 No.EN265981](#)

Specification sheet Cable

[Fixing base NRBS No.KT50334-2](#)

Options

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Base

Rotation detector

Cable for rotation detector

Transmitter for torque transducer