

INSTRUCTION MANUAL

FOR

NON-CONTACT ROTATING SHAFT TORQUE SENSOR

TYPE: TMNR

MINEBEA CO. , LTD.
MEASURING COMPONENTS DIVISION.

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1. GENERAL

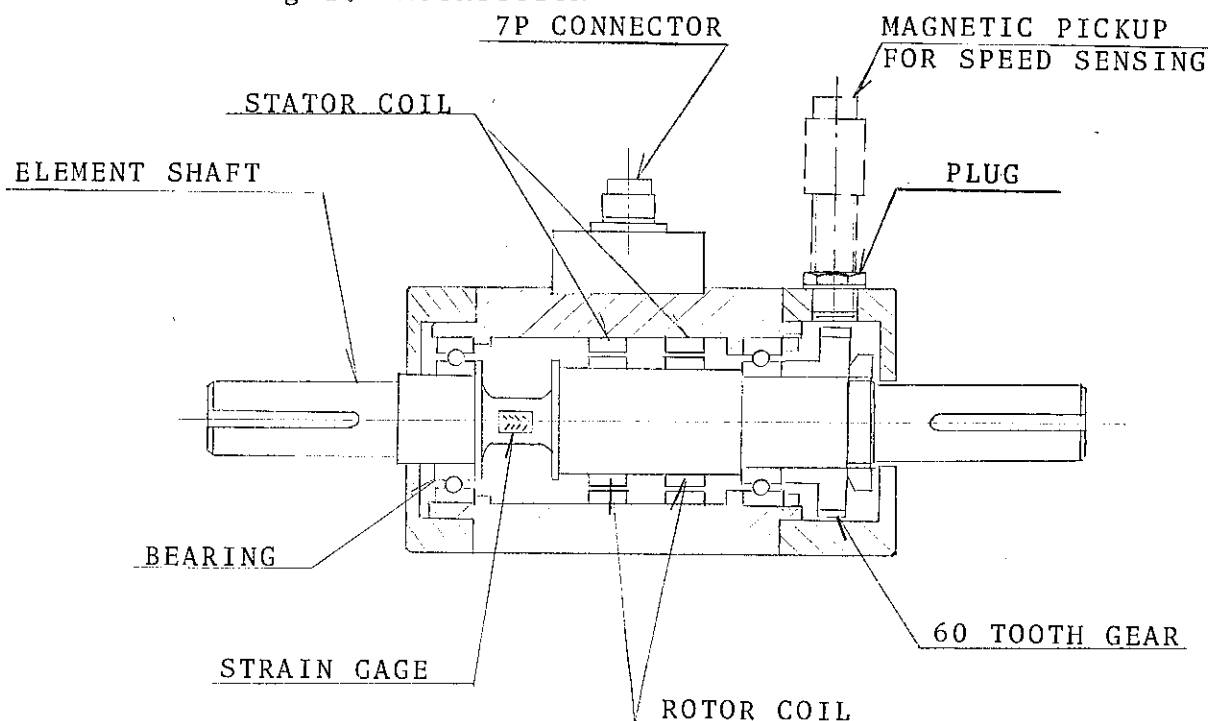
The TMNR type torque meter is designed for accurately and easily measuring dynamic or static torque.

In this type the torque is detected by strain gages, and the electrical signal is transferred through the rotating transformer. And the TMNR torque meter is to enable to be measured rotating speed by the optional speed sensor mounted on the housing.

2. CONSTRUCTION

This type of torque meter is composed of the stator and rotor. Please refer Fig 1 .

Fig 1. CONSTRUCTION



SPECIFICATIONS

TYPE: Rotary Transformer System

RATED OUTPUT

10, 20 N · m	0.75 mV/V ± 0.15 mV/V
50 to 10k N · m	1.3 mV/V ± 0.26 mV/V

NONLINEARITY: 0.3 %R.O.

HISTERESIS: 0.2 %R.O.

REPEATABILITY: 0.3 %R.O.

ZERO SHIFT ON ROTATING 0.5 %R.O. (10, 200 N · m)
0.3 %R.O. (500 to 10k N · m)

TEMPERATURE

EFFECT ON ZERO BALANCE ± 0.2 %R.O./10°C

TEMPERATURE

EFFECT ON RATED OUTPUT ± 0.2 % LOAD/10°C

COMPENSATED TEMPERATURE RANGE 0°C to 90°C
ARISE IN TEMPERATURE BY ROTATION LESS THAN 40°C

SAFE OVERLOAD 120 % RATED CAPACITY.

ULTIMATE OVERLOAD 200 % RATED CAPACITY.

MAXIMUM NUMBER OF ROTATION

10 to 200 N · m	10000 rpm
500, 1k N · m	8000
2k to 5k N · m	5000
10k N · m	4000

3. CONNECTION

Circuit is shown in Fig 2 .

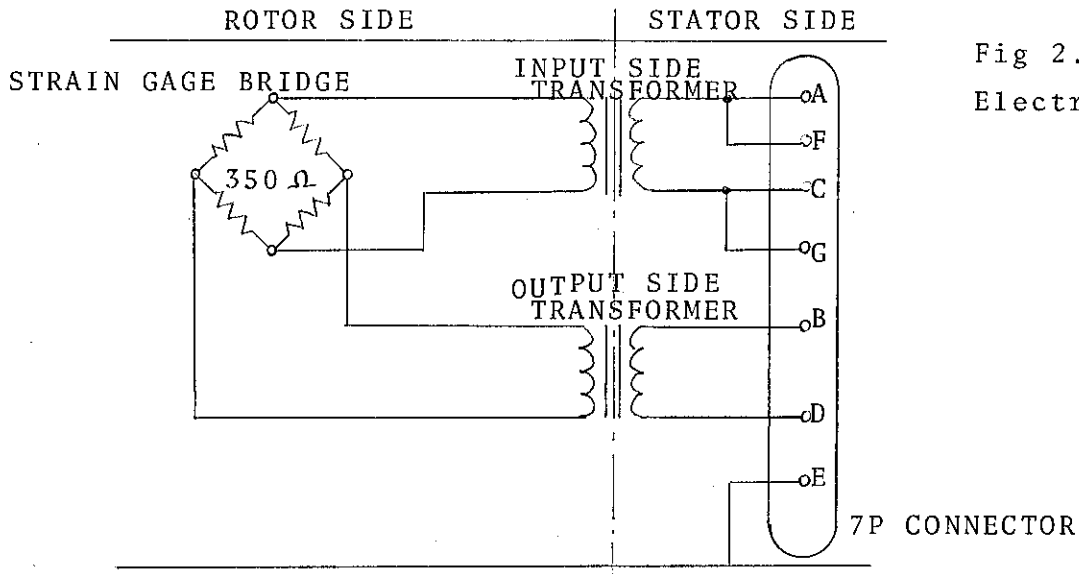


Fig 2.
Electrical circuit

4. OPERATING INSTRUCTIONS

4-a) KEY FITTING

The dimension of accessory key is shown in TABLE 1.

TABLE 1 : ACCESSORY KEY LIST	
RATED CAPACITY (N · m)	KEY DIMENSION (mm)
10, 20, 50	6 +0.020 +0.000
100, 200	8 +0.025 +0.000
500, 1k	10 +0.025 +0.000
2k, 3k, 5k	18 +0.030 +0.000
10k	22 +0.030 +0.000

Please keep the clearance between key and keyseats less than 10 micron. Especialy for high capacity torque transducer we recomend interference fit.

4-b) DIRECTION OF SETTING

Please follow the direction of setting by the arrow mark on name plate (" ← TEST DEVICE SIDE ").

4-c) COUPLING

Please use the following coupling.

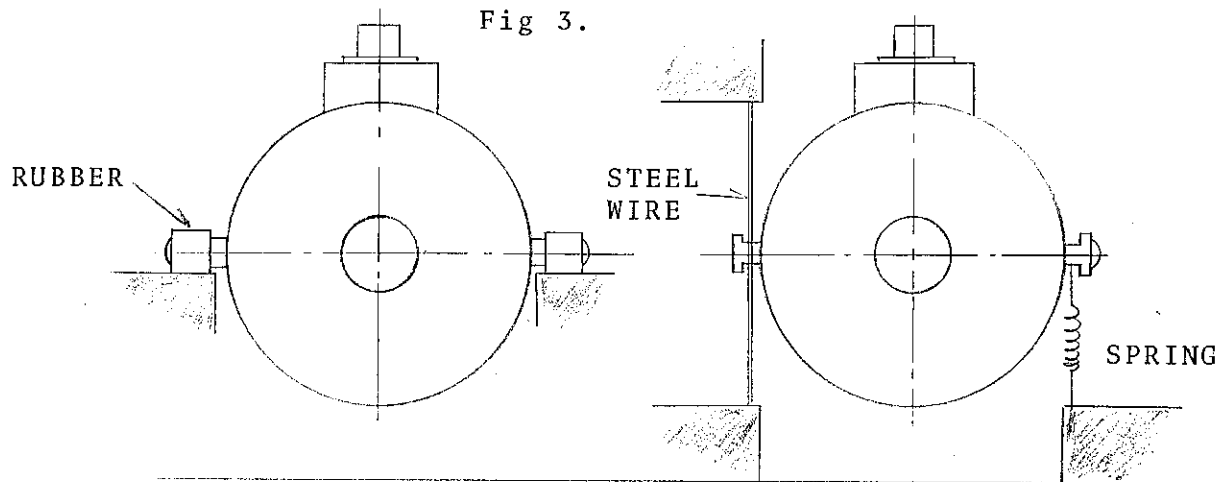
Flange coupling
Flexible coupling

And take care following points.

- i) Keep run-out of shaft less than 30 micron.
- ii) Avoid to give thrust loading or vending for the rated capacity 10, 20 N·m TMNR.

4-d) HOLDING OF STATOR

Please set up stator as follows, or use the FOOT MOUNT.



4-e) OPERATING

- 1) Connect the amplifier with accessory cable.
- 2) Adjust the zero balance at no-loading state.
- 3) Calibrate the output.
- 4) Check the output and rotation noise.

5. REMARKS

- a) Take care for handling of torque shaft of which rated capacity 10, 20 N·m
- b) This torque transducer is calibrated by the amplifier which is shown at the calibration certificate.

If you use other type amplifier, this torque transducer need to be re-calibrate.

- c) Keep the excitation voltage less than 6 volts(AC).
- d) SPEED SENSOR

When the SPEED SENSOR "MP-981" is utilized, please mount it as followings.

1. Fit MP-981 to the stator(Please refer the relation of detectable distance and module.).

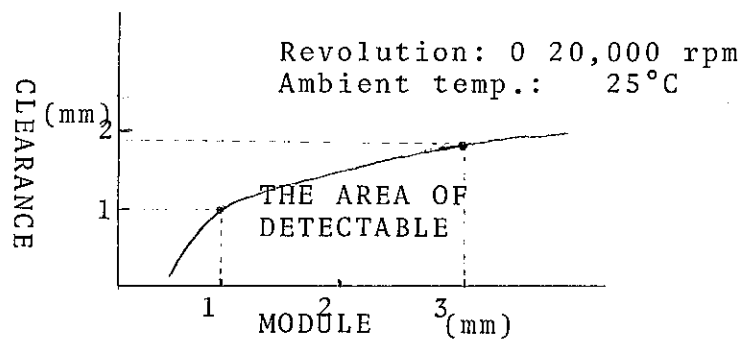


Fig 4.

2. Be parallel the location mark face to shaft of TMNR.

5. MAINTENANCE

It is very easy to maintain the TMNR type torque meter. But please avoid to use and leave at following condition.

- a) Strong magnetic field
- b) Wet condition

6. ACCESSORIES AND OPTIONS

ACCESSORIES

Cable (4core ϕ 10mm 5m)	1
Parallel key	1 set

OPTIONS

SPEED SENSOR (MP-981)

FOOT MOUNT

- The contents of this manual may subject to change without notice.

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