The Torque Station Pro is designed to automatically measure motor torque characteristics. The compact configuration includes a built-in brake control amplifier and user-friendly application software for easy computer operation.
Overview

The Torque Station Pro TS-7700B System is designed to measure motor torque characteristics. The TS-7700B main unit can be combined with a computer and an MT Series torque detector to measure the torque characteristics of various types of motors.

System Configuration

- Motor power supply
- Power meter
- Printer, etc.

- Torque Detector MT Series

- Computer

Equipment that must be provided by the customer
- Motor coupling
- Motor metal fitting
- Motor XY table
- Personal computer, display monitor
- Current/Voltage detector
- Large-capacity brake control amplifier

Options sold separately
**Functions**

- **Auto-measurement of motor characteristics**
  Torque-revolution characteristics, torque ripple, and cogging torque are automatically measured to create graphs*.
  *Depending on the detector in combination with. Please refer to the next page.

- **Automatic Saving of Measurement Results**
  The measurement results are saved automatically to a file without file-saving operations. Eliminating the need to input a file name shortens the overall measurement time.

- **Data output of Specified Value**
  The measured value at specified points can be displayed in a list format. This display method is faster than using cursors on a graph to select data for display, and therefore enables faster confirmation of measured values.

- **Component Analysis of Torque Ripple and Cogging Torque**
  This function analyzes the size of the cyclic variations that occur during one revolution, for each cycle, and identifies the primary factor influencing the overall torque variations.

- **Data utilization on Microsoft® Excel®**
  Numerical data table is exported to Microsoft® Excel® sheet with one-click operation. Graph image is easily pasted also.

- **Comparator Function**
  This function enables comparison and judgment of the upper and lower limits. The judgment results are displayed on the screen, and can be output externally if required.

- **Measurement Data Secondary Processing Functions**
  Several processing functions, such as the smoothing of data fluctuations during low revolutions, the combining data of 16 times of measurement operations, and the addition of no-load data, are provided.

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**Efficiency calculation display enabled**
- Some models require a separately sold current/voltage detector.

**Data can be edited with word-processing and spreadsheet software.**

**Motor torque detector switching functions are built in.**
- Two channels are provided as standard, and can be increased up to a maximum of four channels.

**A wide variety of detectors are provided for use with various types of motors.**
- There are 3 series and 28 models, such as for high-speed motors, large-capacity motors, torque ripple measurement, and cogging torque measurement.
Motor Torque Detectors **MT Series**

**MT Series Common Specification**

- **Torque detection method**: Magnetic phase-differential principle
- **Shaft mounting method**: Ball-bearing type
- **Torque measurement accuracy**: ±0.2%/full scale (When the N-0 compensation function is used together with the TS-7700B.)
- **Current/voltage detection accuracy**: ±0.5%/full scale (The current/voltage detector is provided as an option with some models.)
- **Motor power supply**: Not included
- **Options**: 1. Motor coupling
  2. Motor metal fitting
  3. Motor XY table
  4. Large current detector (Exceeds the ranges covered by each detector. (MT-0710 series))
  5. AC power supply / Power meter for 3-phase power measurement
- **Operating temperature range**: 0 to +40°C
- **Power supply**: 100 VAC ±10%, 50/60 Hz
- **Brake functions**: Can be used within the ranges indicated by the areas shaded by diagonal lines in the diagrams below.

**Example of measurement data**

- **Revolution-torque characteristics**
- **Torque ripple measurement data**
  [When MT-6253B is used.]

*MT-6400B/6500B series can be used within the shaded area, and it must also be used within the range of braking capacity W. Braking capacity W= Torque N·m x Revolution r/min x 0.10472*

- In addition to the MT series, we also provide detectors with various revolution ranges and torque ranges. Please consult to your nearest distributor or Ono Sokki sales office nearby.
MT-6200B Series  Torque Detectors for Torque Ripple and Cogging Torque

Features
- Can measure torque ripple when the motor is excited, and cogging torque when the motor is in the non-excited state.
- Constant control measurement is possible at intervals of 0.5 to 5 r/min.

Specification
- Measurement parameters: Torque, revolution, current, voltage
- Current measurement range: 10 A / 2 A: MT-6221B to 6253B
- Voltage measurement range: 50 V / 10 V: MT-6221B to 6253B
- Weight: Varies according to the model selected.

Note 1: Resonance may influence the measurement. Please consult to your nearest distributor or Ono Sokki sales office nearby.

MT-6400B Series  Torque Detectors Equipped with a Hysteresis Brake

Features
- Can measure high speed motors.
- When combined with the TS-7700B, enable automatic measurement of motor revolutions and torque characteristics.
- Perform both torque and revolution control, and are suitable for the measurement of both AC and DC motors.

Specification
- Measurement parameters: Torque, revolution, current, voltage
- Current and voltage measurement are options for the MT-6424B or higher torque capacity models
- Current measurement range: 10A/2A: MT-6422B to MT-6414B
- Voltage measurement range: 50V/10V: MT-6422B to MT-6414B
- Weight: Varies according to the model selected

Note 1: Drag torque may occur in the brake, and cannot be measured under no-load conditions.
Note 2: An XY table is provided as standard with MT-6514B to 6525B.
Note 3: Please consult to your nearest distributor or Ono Sokki sales office nearby for made-to-order large capacity detector.

MT-6500B Series  Torque Detectors Equipped with a Powder Brake

Features
- Can measure comparatively high-capacity low-revolution motors such as gear motors.
- When combined with the TS-7700B, enables automatic measurement of motor revolution and torque characteristics.
- A movable support stand with an X-Y table is provided as a standard accessory.

Specification
- Measurement parameters: Torque, revolution, current, voltage
- Brake power: Please refer to the table on the right (when used continuously).
- Weight: Varies according to the model selected

Note 1: Drag torque may occur in the brake, and cannot be measured under no-load conditions.
Note 2: An XY table is provided as standard with MT-6514B to 6525B.
Note 3: Please consult to your nearest distributor or Ono Sokki sales office nearby for made-to-order large capacity detector.
**Specification**

- Applicable motors: DC motors, AC motors (stepping motors excluded)
- Measurement parameters: Torque, revolution, voltage signal input data
- Torque input: Use signals from Ono Sokki’s dedicated detectors.
- Revolution input: Use signals from Ono Sokki’s MP-981 or RP series detectors.
- Analog input: 0 to ±10 VDC
  - 16 channels with 16-bit A/D converters
- Measurement accuracy: Torque ±0.2%/full scale
  - Revolution ±0.02%/full scale
  - Analog ±0.2%/full scale
- Computation settings: 4 user-specified settings (four arithmetic operations)
  - Based on the input signals and existing computed data.
- Measurement condition: Torque detector and tachometer settings
  - Control method: Revolution/torque control
  - Measurement mode: Automatic/manual
  - All these settings can be assigned a file name and saved.
- Measurement functions: Sweep: Measurement time: 2 to 1,000 seconds
  - No. of data: 512 or 1,024
  - Constant: Measurement time: 2 to 100,000 seconds
  - No. of data: 512 or 1,024
  - Step: No. of steps: Max. 128
  - Step time: 5 to 100 seconds
  - Pattern: No. of patterns: Max. 128
  - Switching time: 0 to 100 seconds
  - Overlaid measurement
  - 4-point measurement
- Monitor display: Numeric values; A maximum of 23 data display items can be displayed simultaneously.
- Trend display: Time axis display

**Graph display**
- Specified X-axis and Y-axis display from the measured data
- Graph enlargement/reduction display, line colors and line widths can be specified.
- Comment input (Text can be displayed on the graph and saved).
- Cursor, peak search functions
- Overlaid display function of up to a maximum of 16 files

**Table display**
- List display of measured values

**Comparator**
- Upper/lower limit specification of specified parameters, up to a maximum of 20 points
- Display and output of the judgment results

**MT Series detector**
- 2 channels, an additional two channels available as an option

**Saving of measurement**
- Data saved in the computer’s own results proprietary format or as a text format.

**Compatible computers**
- Operating system:
  - Windows® 7 Professional Edition (32 bit / 64 bit)
  - Windows® 10 Pro (64 bit)
- Interface required:
  - USB (2.0) x 1
- CD-ROM drive (for installing the application software)

Recommended specifications:
- CPU: Pentium 4 or higher
- Memory: 512 MB or more
- Display resolution: 1280 x 1024, 1600 x 1200, 1920 x 1440
  - 1280 x 800 (laptop)
- *The performance of the above specification is not guaranteed in all types of PCs.

**Operating temperature**
- 5 to +35°C range

**Operating power supply**
- 100 to 240 VAC, 50/60 Hz

**Power consumption**
- 130 VA (100 VAC) or less

**Weight**
- Approx. 14 kg

**Standard accessories**
- Instruction manual, AC power cable, application software (CD-ROM), 2 m USB cable

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**TS-7700B System Configuration**

**Display /Control**
- Computer
  - TS-7700B
  - TS-0771: Torque analog output
  - TS-0772: Revolution analog output
  - TS-0773: Revolution pulse output
  - TS-0774: Additional detector interface
  - TS-0775: Interface for BA-910A

**Detector**
- Torque ripple - cogging torque
  - MT-6200B series (6221B to 6253B)
  - MT-6200B series (6214B to 6225B)
- Hysteresis brake
  - MT-6400B series (6422B to 6414B)
- Poweder brake
  - MT-6500B series (6514B to 6525B)

**Support Stand**
- MT-0094B or MT-0095B + MT-0002

**Current/Voltage Detector**
- MT-0710 series
  - (Attached to the detector)
  - Consultation required

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**TS-7700B**  
**Torque Station Pro**
### Options Sold Separately

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-0771</td>
<td>Torque Analog Output</td>
<td>Output format: Voltage 0 to ±10V /full scale Response: 16 ms to 1 s</td>
</tr>
<tr>
<td>TS-0772</td>
<td>Revolution analog output</td>
<td>Output format: Voltage 0 to ±10V /full scale Response: 16 ms to 1 s</td>
</tr>
<tr>
<td>TS-0773</td>
<td>Revolution pulse output</td>
<td>Output format: Output has converted revolution input signals. Output format: Output by pulling up the open collector output to ±5 V with 340Ω resistance.</td>
</tr>
<tr>
<td>TS-0774</td>
<td>Additional detector interface</td>
<td>This interface adds two channels to the detector connector, and enables computer switching of the connector used.</td>
</tr>
<tr>
<td>TS-0775</td>
<td>Interface for BA-910A</td>
<td>This interface is required when using the made-to-order large capacity detector or when using TS-7700B with brake control amplifier.</td>
</tr>
</tbody>
</table>

### MT-0094B Motor support table

XY axis is adjustable by a micro meter. Table top: 80-square mm Moving quantity: X (left and right) ±12.5 mm Y (back and forth) ±12.5 mm Z (up and down) 45 mm

### V Block

The V-Block is a jig to fix the motor in place. The motor is held in place between the upper and lower blocks. The V block can be used with several different motors. *Dimensions: consultation required.*

### MT-0095B Movable stand with XY Table

Used for motors with a large diameter. Casters supplied. Table load bearing: approx. 5 kg Table top: 200-square mm Moving quantity: X (left and right) ±10 mm Y (back and forth) ±15 mm Z (up and down) 70 mm

### L-Bracket

The L-bracket is a jig to fix the motor in place. The motor is fastened by the jig, and then attached to a support stand. If the mounting holes are in the same location, the jig can be used with several different motors by machining the screw hole. *Dimensions: consultation required.*

### MT-0002 Base plate

Required for the use in combination of MT-6221B to 6253B, MT-6422B to 6414B and MT-0095B Movable stand with XY table.

### MT-0710 series Voltage current detector

For DC measurement. Used by setting between a motor and power source device. Voltage: 50 V

<table>
<thead>
<tr>
<th>Model</th>
<th>Current Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT-0712</td>
<td>(for 30A)</td>
</tr>
<tr>
<td>MT-0713</td>
<td>(for 50A)</td>
</tr>
<tr>
<td>MT-0715</td>
<td>(for 100A)</td>
</tr>
<tr>
<td>MT-0717</td>
<td>(for 200A)</td>
</tr>
</tbody>
</table>

*MT-0710 series: RoHS non-compliant

### MT-0100 series Torque calibrator

Calibrator with a wide selection from 50 mN-m to 20 N-m. Calibration accuracy: ±0.5%; 50 mN-m to 200 mN-m ±0.4%; 500 mN-m to 20 N-m Used for checking torque value at measurement site.

### Brake control amplifier

Requires for the use of made-to-order large capacity detector. The TS-0775 (sold separately) is required for the TS-7700B.

* *Weight for the MT-0100 series: RoHS non-compliant. Please consult to your nearest distributor or OnoSokki sales office nearby for RoHS compliant weight.*
## MT-0100 series Torque Calibrator

1. Highly accurate calibrator for MT series torque detector.
2. Easy to use size. Enables calibration in the condition that the XY table is attached.
3. Subdivided weight has been adopted, which enables calibration of the intermediate torque. (The number of divisions: 4 or 5)
4. Supports torsion of a detection shaft. Highly accurate calibration is possible even though the angle of an arm is changed due to calibration weights.
5. Storage box provided.

### Specifications

<table>
<thead>
<tr>
<th>Torque (mN·m)</th>
<th>Model name</th>
<th>Applicable detector</th>
<th>Effective length*1</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>MT-0152</td>
<td>MT-A series, MT-6100</td>
<td>50.985 mm, ø5 mm</td>
<td>50 g×5</td>
</tr>
<tr>
<td>100</td>
<td>MT-0113</td>
<td>MT-6152</td>
<td>50.985 mm, ø5 mm</td>
<td>50 g×4</td>
</tr>
<tr>
<td>200</td>
<td>MT-0123</td>
<td>MT-623A</td>
<td>100 g×4</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>MT-0153</td>
<td>MT-625A</td>
<td>200 g×4</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>MT-0114K</td>
<td>MT-645A</td>
<td>500 g×4</td>
<td></td>
</tr>
</tbody>
</table>

1. Effective length includes the 1/2 thickness of the ribbon (metal fitting for hanging the weight) to the arm length of one side.

2. You can select a calibrator for 1 N·m torque from two types, depending on the shaft diameter and shaft shape of the MT series detector. Please check the model name of the detector.

The MT series detector from 2 to 20 mN·m should be calibrated at factory of Ono Sokki in Japan. Please consult to your nearest distributor or Ono Sokki sales office nearby.

### Other Features

- Highly accurate calibrator for MT series torque detector.
- Easy to use size. Enables calibration in the condition that the XY table is attached.
- Subdivided weight has been adopted, which enables calibration of the intermediate torque. (The number of divisions: 4 or 5)
- Supports torsion of a detection shaft. Highly accurate calibration is possible even though the angle of an arm is changed due to calibration weights.
- Storage box provided.

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