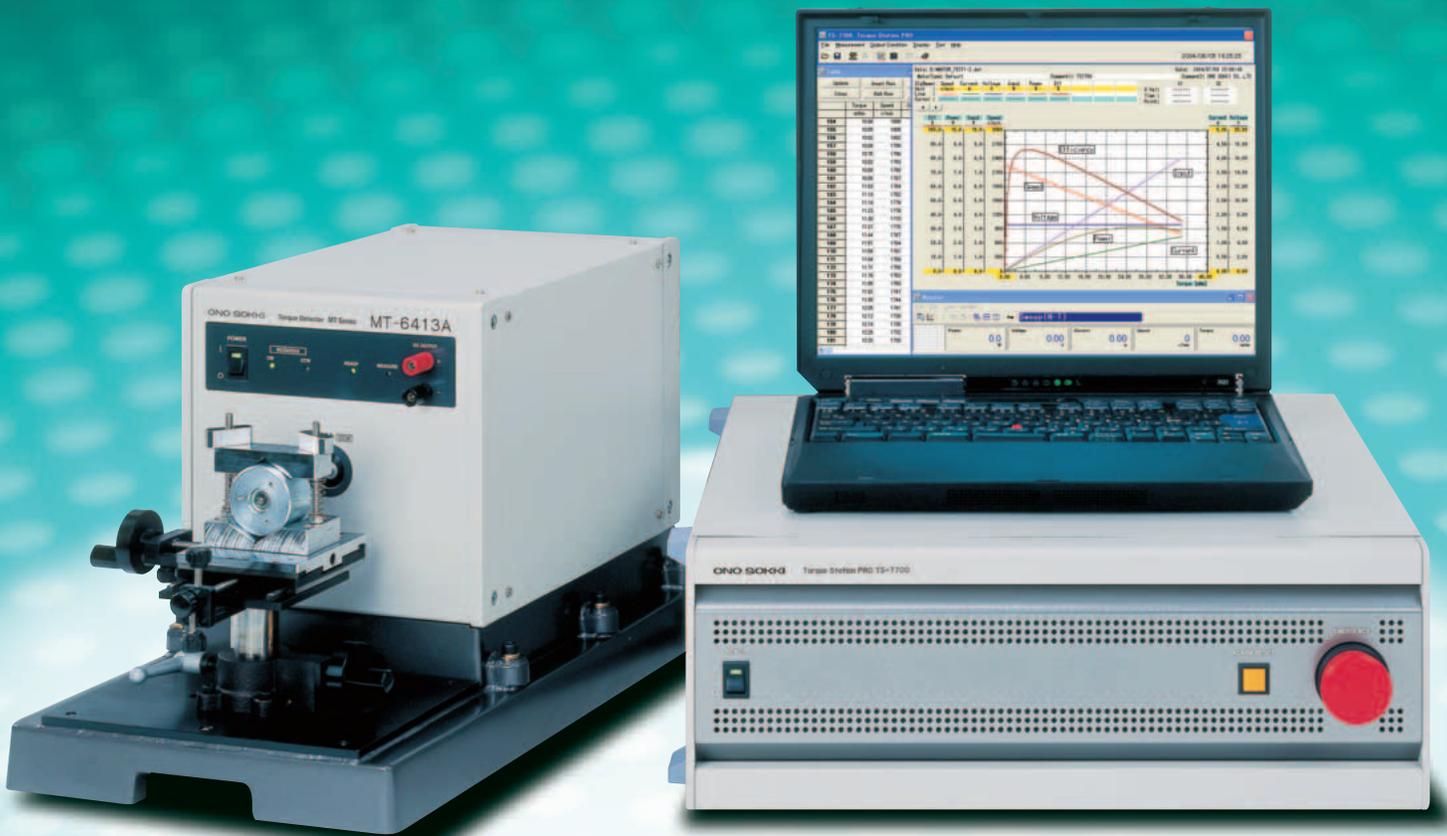


For Motor Torque Measurement

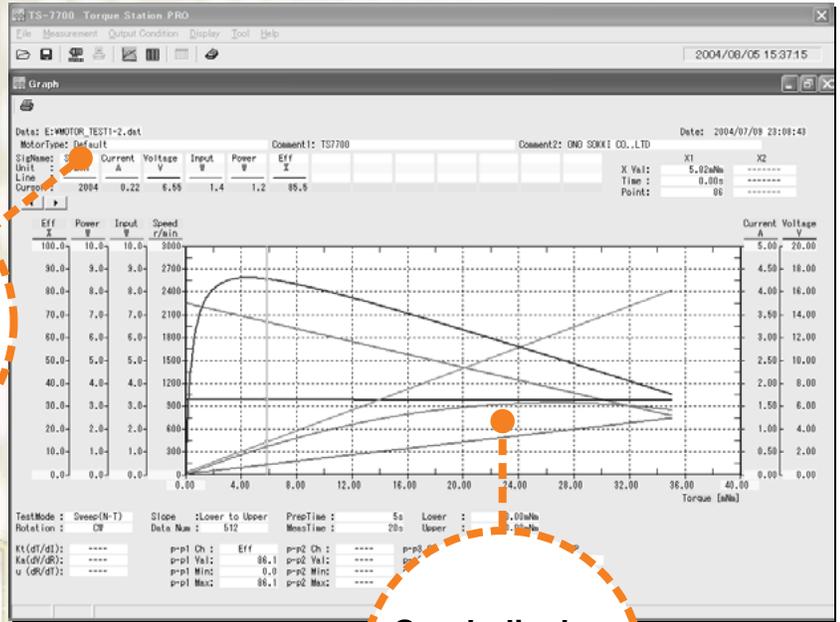
# Torque Station Pro

## TS-7700 System

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.



ONO SOKKI



**Easy-to-read display**

**Graph display of motor characteristics**

**Overview**

The Torque Station Pro TS-7700 System is designed to measure motor torque characteristics. The TS-7700 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**

**Torque Detector MT Series**



**Operation / Data Processing Computer**

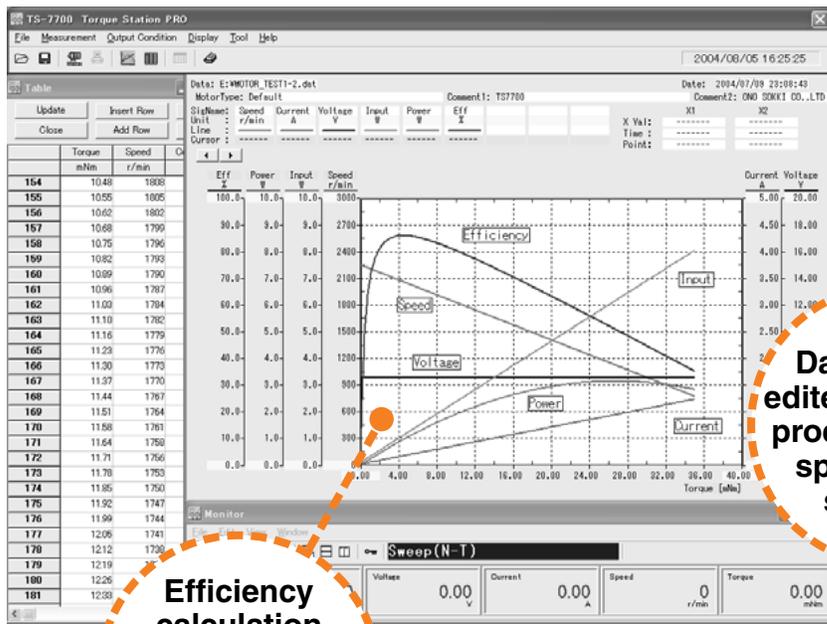


**Control / Measurement TS-7700**

- Equipment that must be provided by the customer**
- Motor power supply
  - Power meter
  - Printer, other

- Options sold separately**
- Motor coupling
  - Motor fixture
  - Motor XY table
  - Personal computer, display monitor
  - Current/Voltage detector\*1
  - Large-capacity brake control amplifier\*2

\*1 Provided as standard for some torque detector models. Please refer to the drawing of the TS-7700 System Configuration on Page 6.  
 \*2 Required depending on the system specification.



	Torque	Speed	Current	Voltage	Input	Power	Eff
	mNm	r/min	A	V	W	W	%
114	7.74	1923	0.28	6.55	1.9	1.6	83.6
115	7.81	1920	0.29	6.55	1.9	1.6	83.5
116	7.88	1917	0.29	6.55	1.9	1.6	83.4
117	7.95	1914	0.29	6.55	1.9	1.6	83.3
118	8.01	1912	0.29	6.55	1.9	1.6	83.2
119	8.08	1909	0.30	6.55	1.9	1.6	83.1
120	8.15	1906	0.30	6.55	2.0	1.6	83.0
121	8.22	1903	0.30	6.55	2.0	1.6	83.0
	8.29	1900	0.30	6.55	2.0	1.6	82.9
	8.36	1897	0.31	6.55	2.0	1.7	82.8
	8.42	1894	0.31	6.55	2.0	1.7	82.7
	8.49	1891	0.31	6.55	2.0	1.7	82.6
	8.55	1888	0.31	6.55	2.1	1.7	82.5
	8.62	1886	0.32	6.55	2.1	1.7	82.4
	8.68	1883	0.32	6.55	2.1	1.7	82.3
	8.75	1880	0.32	6.55	2.1	1.7	82.2
	8.81	1877	0.32	6.55	2.1	1.7	82.1
	8.88	1874	0.33	6.55	2.1	1.7	82.0

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

Efficiency calculation display enabled  
(a separately-available current/voltage detector required for some models)

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 range of detectors has been provided for use with various types of motors. There are many models, from six series, for high-speed motors, large-capacity motors, torque ripple measurement, and cogging torque measurement.

# TORQUE STATION Pro TS-7700 system

## Functions

- Automatic Saving of Measurement Results**  
 The measurement results can be saved automatically to a file without any need for file-saving operations. Eliminating the need to input a file name shortens the overall measurement time.
- Output of Specified Value Data**  
 The measured data 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.
- Test Voltage Setting Function**  
 The DC power supply voltage can be set remotely via the RS-232C interface\*1.

- Power Meter Setting Function**  
 The power meter measurement range can be set remotely via the RS-232C interface\*1.
- 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 of data from several measurement operations, and the addition of no-load data, are provided.

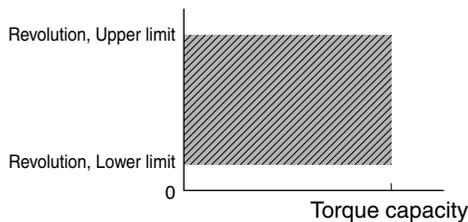
\*1 Please consult us or your nearest distributor about compatible models.

# Motor Torque Detectors **MT Series**

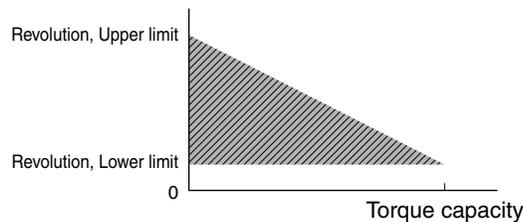
## MT Series Common Specifications

- Torque detection method : Magnetic phase-differential principle  
 Shaft mounting method : Ball-bearing type  
 Torque measurement accuracy :  $\pm 0.2\%$ /full scale (when the N-0 compensation function is used together with the TS-7700.)  
 Current/voltage detection accuracy :  $\pm 0.5\%$ /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 fixture  
 3. Motor XY table  
 4. Large current detector (exceeds the ranges covered by each detector.)  
 5. AC power supply / Power meter for 3-phase power measurement  
 Operating temperature range : 0 to +40°C  
 Power supply : 100 VAC  $\pm 10\%$ , 50/60 Hz (other voltages up to 240 VAC can be specified.)  
 Brake functions : Can be used within the ranges indicated by the areas shaded by diagonal lines in the diagrams below.

MT-6200, 7200



Other MT Series Models



Note: For the MT-6400A and 6500, in addition to the range being within the shaded area, 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

## MT-A Series Micro Torque Detectors



### Features

- When combined with the TS-7700, 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.
- Braking by the motor enables the measurement of no-load revolutions.

### Specifications

Current measurement range : 5A/1A ; MT-201A to MT-103A  
 10A/2A ; MT-203A  
 Voltage measurement range : 50V/10V  
 Weight : 7 kg ; MT-201A to MT-103A  
 23 kg ; MT-203A

Model MT	Torque Capacity (mN·m)	Revolution Measurement Range (r/min)
201A	2	200 to 10,000
501A	5	200 to 10,000
102A	10	200 to 8,000
202A	20	200 to 8,000
502A	50	200 to 6,000
103A	100	200 to 6,000
203A	200	200 to 8,000

Note: The MT-103A must be combined with BA-910A

## MT-6100 Series Torque Detectors for High-Speed Revolutions



### Features

- Can measure higher speed motors than the MT-A Series can.
- When combined with the TS-7700, 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.
- Braking by the motor enables the measurement of no-load revolutions.

### Specifications

Measurement parameters : Torque, revolution, current, voltage  
 Current measurement range : 10A/2A  
 Voltage measurement range : 50V/10V  
 Weight : 23 kg

Model MT	Torque Capacity (mN·m)	Revolution Measurement Range (r/min)
6112	10	600 to 25,000
6122	20	600 to 25,000
6152	50	600 to 25,000
6113	100	500 to 20,000

## MT-6200 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.
- Control and measurement can be performed at intervals of from 0.5 to 5 r/min.

### Specifications

Measurement parameters : Torque, revolution, current, voltage  
 Current measurement range : 5A/1A ; MT-6221 to MT-6213  
 10A/2A ; MT-6223 to MT-6215  
 Voltage measurement range : 50V/10V  
 Weight : 7 kg ; MT-6221 to MT-6213  
 15 kg ; MT-6223 to MT-6224  
 23 kg ; MT-6254 to MT-6215

Model MT	Torque Capacity (mN·m)	Revolution Measurement Range (r/min)
6221	2	0.5 to 5
6251	5	0.5 to 5
6212	10	0.5 to 5
6222	20	0.5 to 5
6252	50	0.5 to 5
6213	100	0.5 to 5
6223	200	0.5 to 5
6253	500	0.5 to 5
6214	1000	0.5 to 5
6224	2000	0.5 to 5
6254	5000	0.5 to 5
6215	10000	0.5 to 5

## MT-7200 Series Standing Type Torque Detectors for Torque Ripple and Cogging Torque



### Features

- Can perform measurement when the motor is positioned horizontally.
- Misalignment can be minimized. The coupling does not put any load on the motor to be measured.
- Measurement is possible at the stabilized revolution status by the gear motor without backlash.

### Specifications

Measurement parameters : Torque, revolution  
 Weight : 25 kg

Model MT	Torque Capacity (mN·m)	Revolution Measurement Range (r/min)
7221	2	0.5 to 5
7251	5	0.5 to 5
7212	10	0.5 to 5
7222	20	0.5 to 5
7252	50	0.5 to 5
7213	100	0.5 to 5

## MT-6400A Series Torque Detectors Equipped With a Hysteresis Brake



### Features

- Can measure higher speed motors than the MT-A Series can.
- When combined with the TS-7700, 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.

### Specifications

Measurement parameters : Torque, revolution, current, voltage  
 Current and voltage measurement are options for the MT-6424A or higher torque capacity models  
 Current measurement range : 10A/2A ; MT-6413A to MT-6414A  
 Voltage measurement range : 50V/10V ; MT-6413A to MT-6414A  
 Weight : Varies according to the model selected

Model MT	Torque Capacity (mN·m)	Brake Power (W)	Revolution Measurement Range (r/min)
6422A	0.02	5	100 to 20,000
6452A	0.05	8	100 to 20,000
6413A	0.1	27	100 to 20,000
6423A	0.2	35	100 to 15,000
6453A	0.5	75	100 to 12,000
6414A	1	75	100 to 12,000
6424A	2	160	100 to 10,000
6454A	5	200	100 to 10,000
6415A	10	350	100 to 7,000
6425A	20	600	100 to 7,000

Note 1 : Drag torque may occur in the brake, and cannot be measured under no-load conditions.

## MT-6500 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-7700, enables automatic measurement of motor revolutions and torque characteristics.
- A movable support stand with an X-Y table is provided as a standard accessory.

### Specifications

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

Model MT	Torque Capacity (mN·m)	Brake Power (W)	Revolution Measurement Range (r/min)
6514	1	20	5 to 1800
6524	2	50	5 to 1800
6554	5	130	5 to 1800
6515	10	320	5 to 1800
6525	20	450	5 to 1800
6555	50	1500	5 to 1800
6516	100	2200	5 to 1800
6526	200	3200	5 to 1800

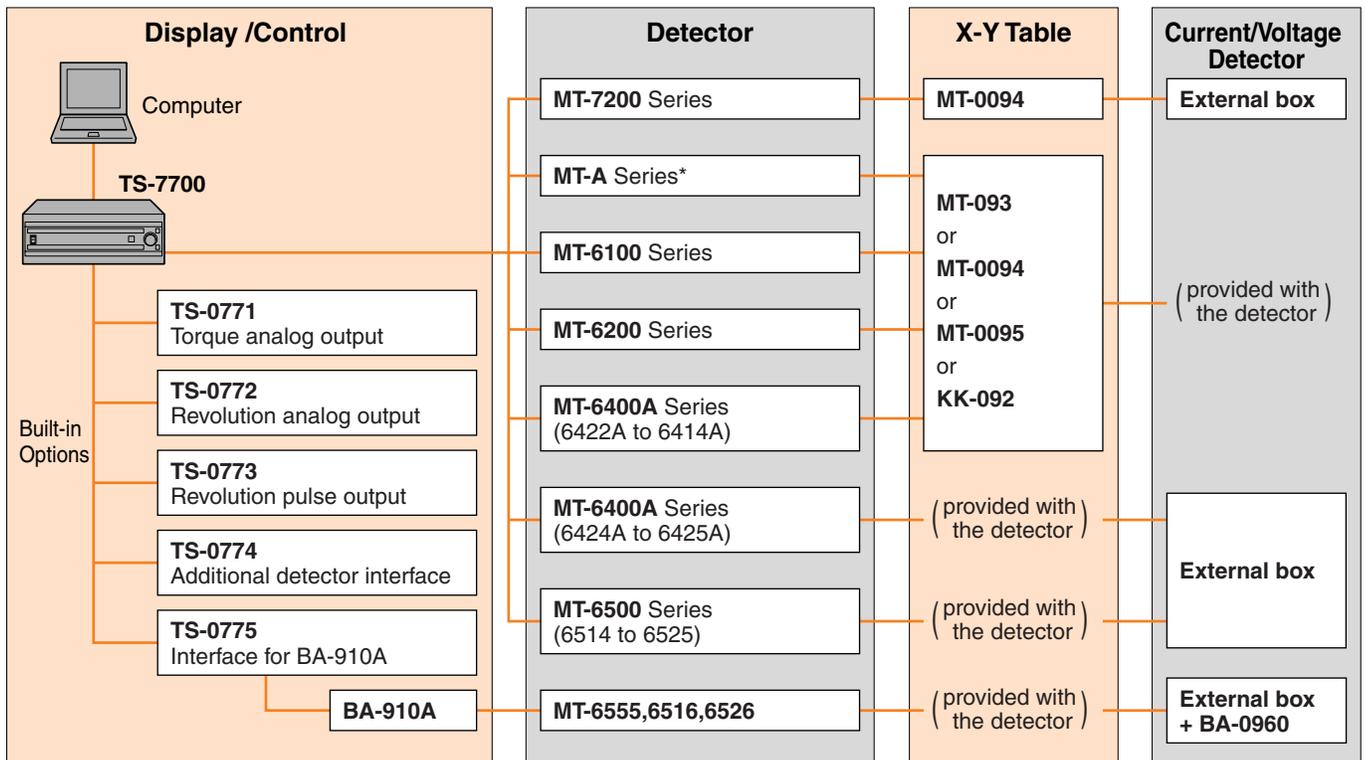
Note 1 : Drag torque may occur in the brake, and cannot be measured under no-load conditions.

# TS-7700 Torque Station Pro

## Specifications

Applicable motors	: DC motors, AC motors (stepping motors excluded)	Graph display	: Specified X-axis and Y-axis display from the measured data Graph enlargement/reduction, line colors and line widths specifiable Comment input, text can be displayed on the graph and saved. Cursor, peak search functions Overlaid display function of up to a maximum of 10 files
Measurement parameters	: Torque, revolution, voltage signal input data	Table display	: List display of measured values Data editing function
Torque input	: Use signals from Ono Sokki's dedicated detectors.	Comparator	: Upper/lower limit specification of specified parameters, up to a maximum of 20 points Display and output of the judgment results
Revolution input	: Use signals from Ono Sokki's MP-981 or RP Series detectors.	MT Series detector interface	: 2 channels, an additional two channels available as an option
Analog input	: 0 to $\pm 10$ VDC 16 channels with 16-bit A/D converters	Saving of measurement results	: Data saved in the computer's own proprietary format or as a text format.
Measurement accuracy (1-second averaged values)	: Torque $\pm 0.2\%$ /full scale Revolutions $\pm 0.02\%$ /full scale Analog $\pm 0.2\%$ /full scale	Compatible computers	: Operating system; Windows XP Professional Edition Interface required; USB (2.0) x 1 CD-ROM drive (for installing the application software) Recommended specifications; CPU: Pentium 4 or higher Memory: At least 512 MB
Computation settings	: 4 user-specified settings (arithmetic operations only) based on the input signals and existing computed data.	Operating temperature range	: 5 to $+35^{\circ}\text{C}$
Measurement condition settings	: Torque meter and tachometer settings Control method ; Revolution/torque control Measurement mode ; Automatic/manual All these settings can be assigned a file name and saved.	Operating power supply	: 100 to 240 VAC, 50/60 Hz
Measurement functions	: Sweep ; Measurement time: 2 to 1000 seconds No. of data: 512 or 1024 Constant ; Measurement time: 2 to 100,000 seconds No. of data: 512 or 1024 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	Power consumption	: 100 VA (when 100 VAC) or less
Monitor display	: Numeric values display ; A maximum of 23 data items can be displayed simultaneously. Trend display ; Time axis display	Weight	: Approx. 14 kg
		Standard accessories	: User's manual, AC power cable, application software (CD-ROM), 2 m USB cable

## TS-7700 System Configuration



\*The MT-103A detector requires BA-910A.

## Options Sold Separately

### TS-0771 Torque Analog Output

Output format:  
Voltage 0 to  $\pm 10V$   
/full scale  
Response: 16 ms to 1 s

### TS-0772 Revolution analog output

Output format:  
Voltage 0 to  $+10V$   
/full scale  
Response: 16 ms to 1 s

### TS-0773 Revolution pulse output

Output: Outputs converted  
revolution input  
signals.  
Output format: TTL level

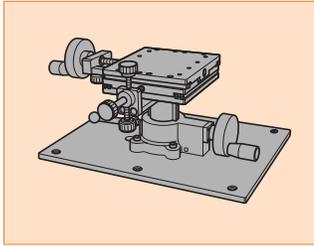
### TS-0774 Additional detector interface

This interface adds  
two channels to the  
detector connector,  
and enables computer  
switching of the  
connector used.

### TS-0775 Interface for BA-910A

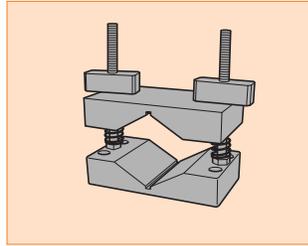
This interface is  
required when using  
the MT-6555, 6516,  
6526 and MT-103A  
torque detectors.

### MT-093 Motor Support Stand



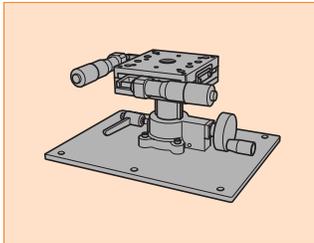
XYZ table. Used for motors with  
a small torque and a small  
diameter.

### V Block



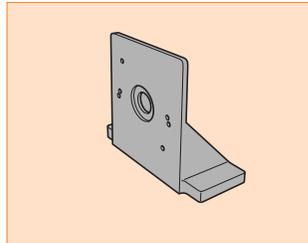
The V-Block is a jig used to fix  
the motor in place. The motor is  
held in place between the  
upper and lower blocks. The V  
block can be used with several  
different motors.

### MT-0094 Motor Support Stand



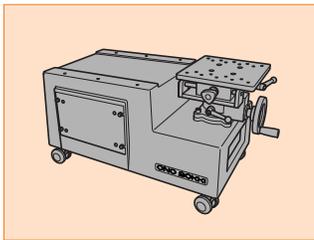
XYZ table. Used for motors with  
a micro torque and a small  
diameter.

### L-Bracket



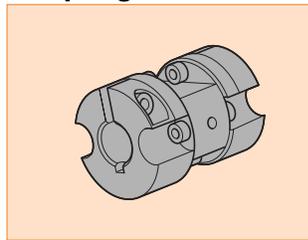
The L-bracket is a jig used to fix  
the motor in place. The motor is  
stopped by the jig, and then  
attached to a support stand.  
Please contact Ono Sokki for  
the dimensions. If the mounting  
holes are in the same location,  
the jig can be used with several  
different motors if the screw  
holes are adapted.

### MT-0095 Movable Stand with XY Table



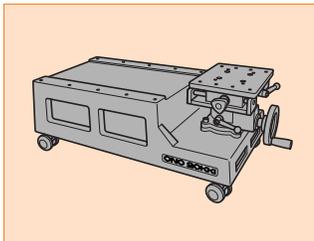
Used for motors with a large  
diameter. Casters supplied.

### Coupling



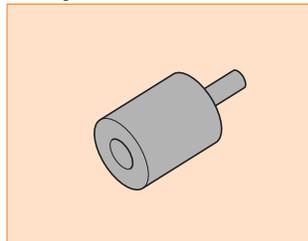
The coupling is used to connect  
the detector to the shaft. A  
different coupling is required for  
each diameter.

### KK-092 Movable Stand with XY Table



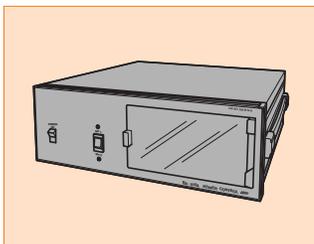
This stand is larger than the MT-  
0095. Used for motors with a  
large diameter. Casters supplied.

### Adapter



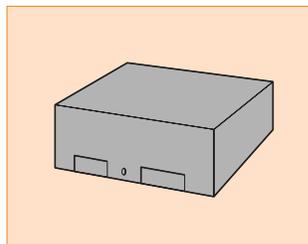
This is a jig used to convert a  
shaft of an unusual shape to a  
round shaft. Please use a  
drawing or similar to indicate  
the shape of the shaft.

### BA-910A Brake Control Amplifier



This amplifier is required when  
using the MT-6555, 6516, 6526  
and MT-103A torque detectors.  
Includes the BA-0960 unit when  
used as a current/voltage  
detector.

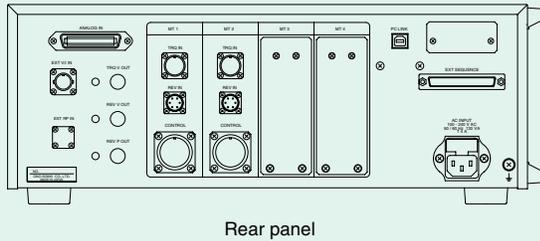
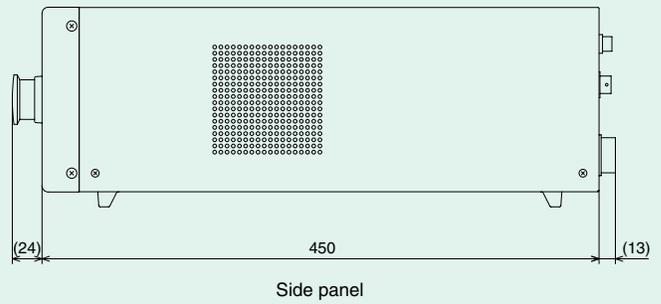
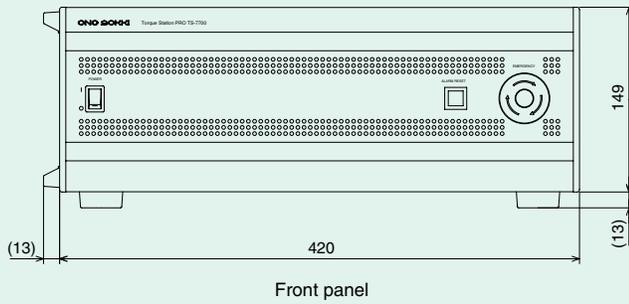
### External Current/Voltage Detector (External Box)



This box is used for DC  
measurement. Place the box  
between the motor and the  
power supply unit.  
Current: Select from 15A, 30A, 50A,  
75A, 100A, 200A, 300A  
Voltage: 1V to 100V, must be specified.  
Note: The TS-7700 and TS-7100 signal  
cable connectors are different. Please  
make sure that you have the correct  
equipment.

## TS-7700 External Dimensions

Unit: mm



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URL: <http://www.onosokki.co.jp/English/english.htm>

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