



**IST-DTTXX
DIGITAL TORQUE TESTERS
OPERATION MANUAL**



OVERVIEW

1.1 Specifications

Accuracy	± 0.3% (Range:5%~100% capacity)
Selectable Units	N.m, N.cm, kgf.cm, lbf.in,lbf.ft (Selectable)
Display	160*128 dot matrix LCD with LED Backlight
Overload	120% of F.S. (LCD flashes beyond 110%FS)
Measurement Mode	Track, Peak, Auto Peak, First Peak,Auto FirstPeak, Preset
Sampling Rate	1000 Hz
Memory	1000 data
Power	3.6VDC Ni-MH rechargeable batteries
Battery Life	Approx. 12 hours continuous use per full charge
Charger / Adaptor	Universal USB/BM charger, Input:110~240VAC
Outputs	USB, RS232, Set points output
Environment : Operating	-10 to 40°C, 20 to 80% RH
Storage	-20 to +50°C , 5 to 95%RH

Power

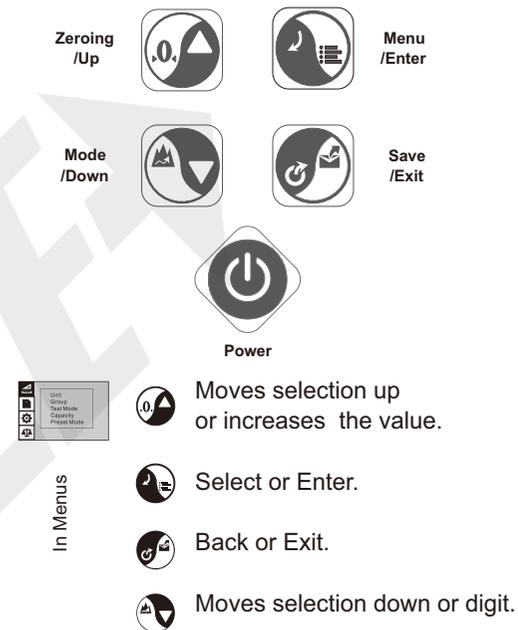
Push for 2 seconds to power On or Off.



During Measurement

-  Zeroing.
-  Enter the menus.
-  Print the current value or store data (depending on setting).
-  Changes Test Mode.

1.2 Keystroke



Zeroing /Up **Menu /Enter**

Mode /Down **Save /Exit**

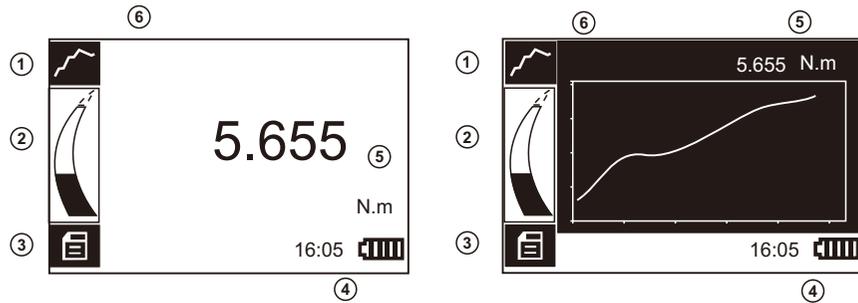
Power

In Menu

-  Moves selection up or increases the value.
-  Select or Enter.
-  Back or Exit.
-  Moves selection down or digit.

In the first use, it may be necessary to activate the display unit by plugging in the power adapter.

1.3 LCD Screen



③ Storage/Print setting



Storage

Print

⑥ Prompt

First Peak: Drop ratio

Preset:

- Under lower limit;
- Between lower limit and upper limit ;
- Over upper limit

④ Time and Power

⑤ Torque Value and Unit

1.4 Sensor

The display unit can be equipped with a variety of torque sensors, their capacity can be identified automatically with the ID IC.

① Test Mode



Track



Peak



Auto Peak



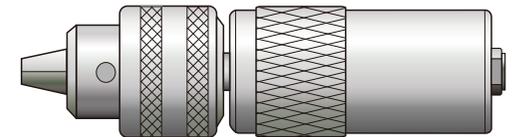
First Peak



AutoFirstPeak

② Analog bar and Direction

Indicates current position in whole capacity.
When the bar enters the area enclosed by dotted line, means overload.



OPERATION

2.1 Test Preparation

2.1.1 Choose model

This series of torque gauges can be selected in a variety of models, different models corresponding to different capacity and resolution, as shown in table on back cover. DO NOT exceed the capacity of the gauge, or may cause permanent damage.

2.1.2 Choose adapters

The sensor has a drill chuck, but other adapters may be needed if the specimen can not be clamped directly.

2.1.3 Test stand

For high capacity test, some kind of test stand may be necessary. And it will significantly increase the stability of test operation.

2.2 Power on/off

Touch  for 2 seconds to power On or Off.

The indicator can identify the load cell. You should check the model wheith it is needed. Check Battery Icon. If the power is low, should be recharged.

2.3 Testing

After completion of the test preparation, testing can be done.

2.3.1 Select Units

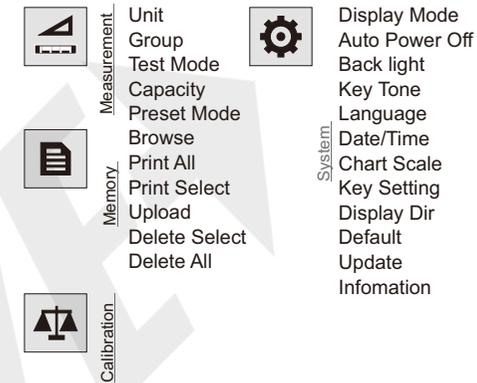
The torque gauge has a variety of measurement units, select the appropriate unit.

2.3.2 Select Test Mode

This series torque gauge has 5 kinds of measurement test mode can choose. It can be selected by touching under the measure interface, or in menus.

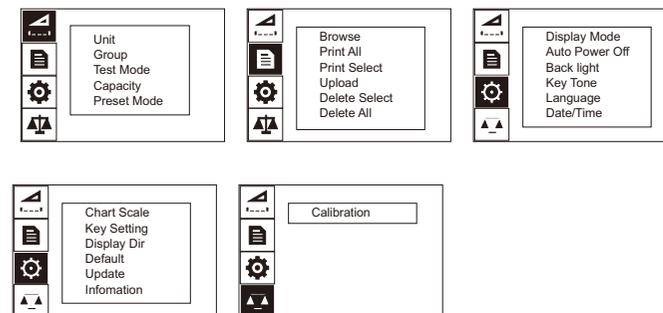
MENU

3.1 Menu Structure



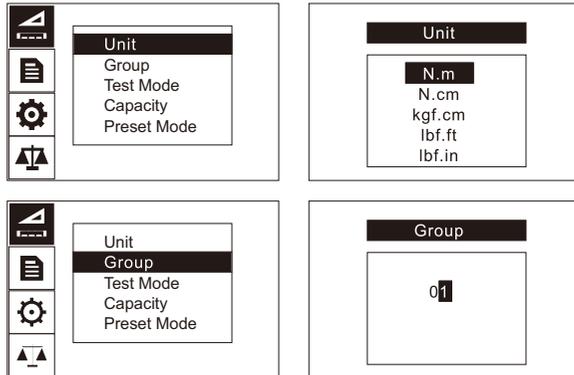
3.2 Basic Operation

- From the home screen, touch  to enter the Menu.
- Touch  or  move selection. Then touch  enter the next layer of menus.
- Touch  cancel the setting or exit.
- In number input: touch  increase or decrease the number, and touch  can change to another digit or item.



3.3 Measurement

1. Unit



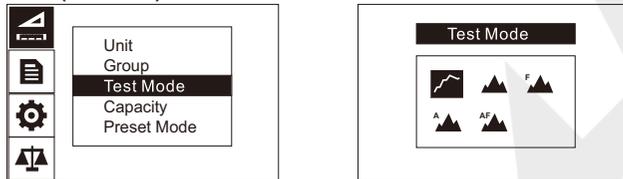
2. Group

When several test samples need to be measured, the samples can be coded into groups. The range is 01-99.

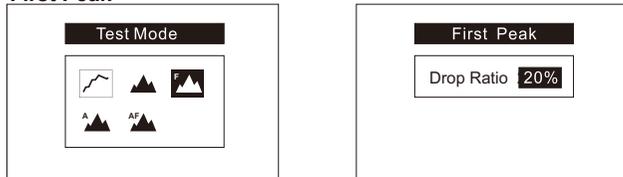
3. Test Mode

There are 5 types of test mode. Some of them is selected, needs confirm of input its parameters.

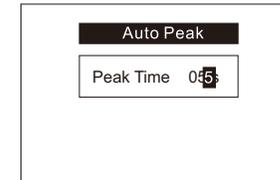
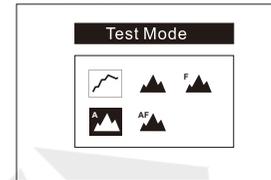
Track(Realtime)



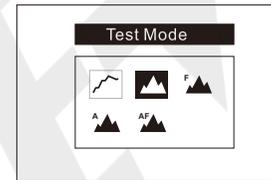
First Peak



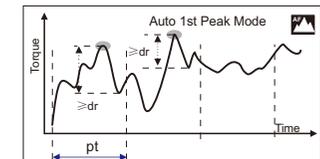
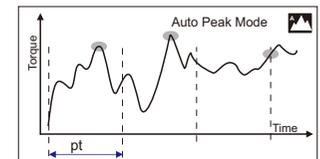
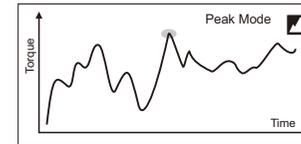
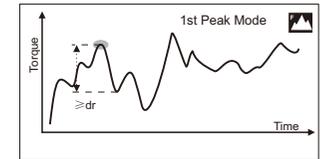
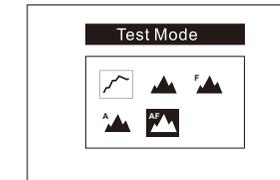
Auto Peak



Peak



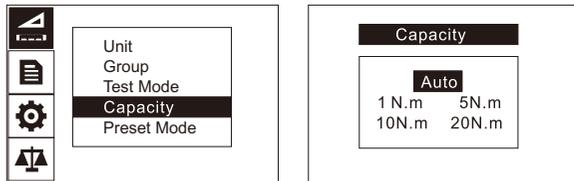
Auto FirstPeak



dr:drop ratio
pt:peak time

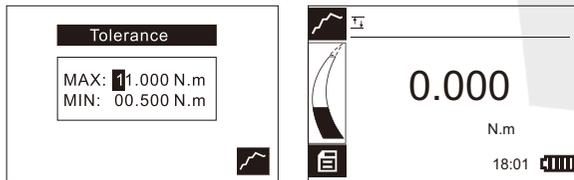
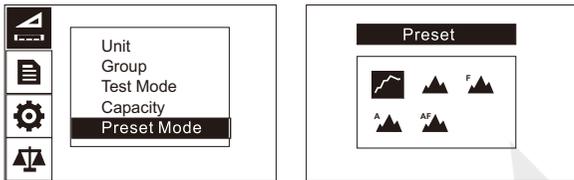
4. Capacity

The capacity of sensor can be identified if there is a ID IC on it. Just to set to "AUTO" for automatic identification. When the sensor connected has no ID IC, setting its capacity is needed.



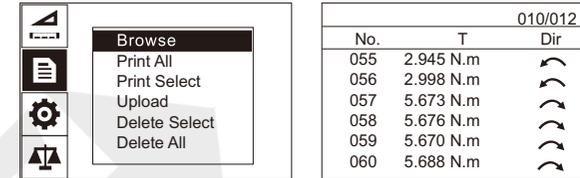
5. Preset Mode

A tolerance can be preset for every mode, for GO/NG Measurement. For different test modes, the measured values are of different types. The preset values for the various test modes are stored separately, and sometimes only need to be confirmed.



3.4 Memory

1.Data Browse



Touch or to page up or down.

Touch to enter the in-page data browsing.

Touch or to move the selection. Then

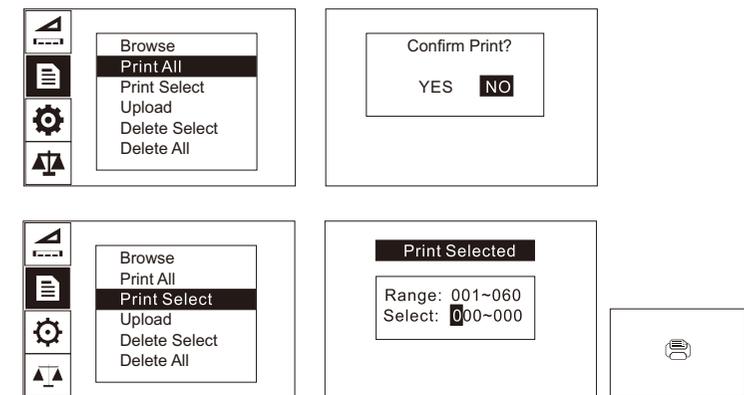
touch to display its date/time and measuring

mode Touch to return to page browsing.

010/012		
No.	T	Dir
055	2.945 N.m	↶
056	2.998 N.m	↶
057	5.673 N.m	↶
058	5.676 N.m	↶
059	5.670 N.m	↶
060	5.688 N.m	↶

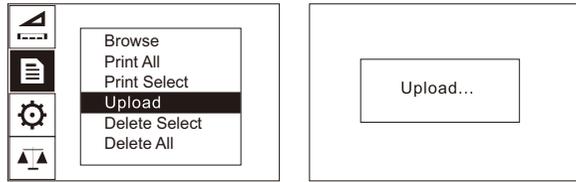
2.Data Print

If a printer is connected with printer cable, the measured value can be printed.

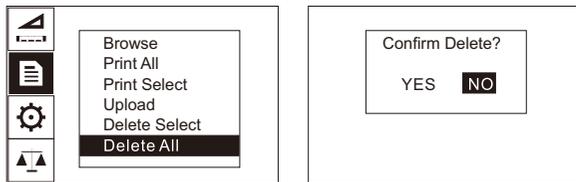
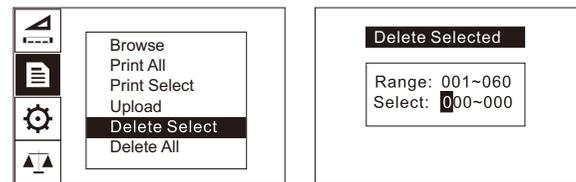


3.Upload Data in Memory

To upload the data in memory to a PC. To select Upload, screen will appear during transmission. A data acquisition software needs to be run on PC. For details, see the manual of software.



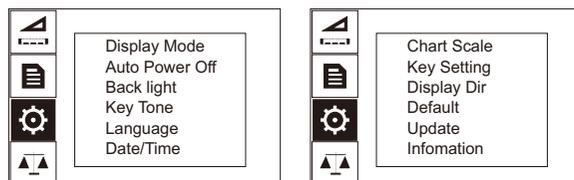
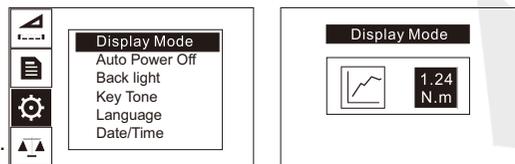
4.Data Delete



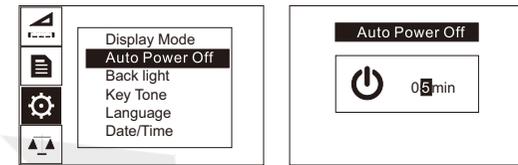
3.5 System

1.Display Mode

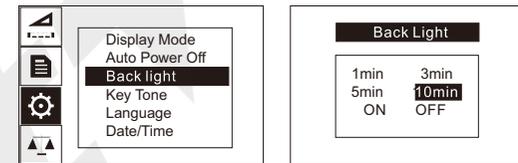
There are two display modes: Digital and Graphic.



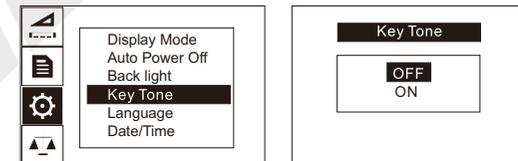
2 Auto power off



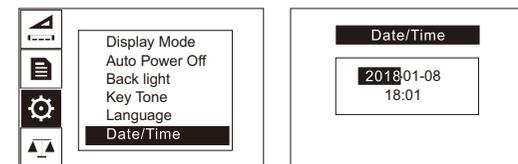
3. Back Light



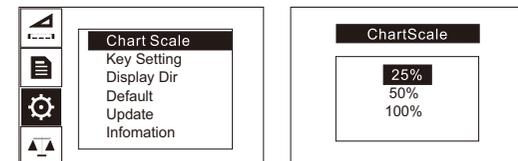
4.Key Tone



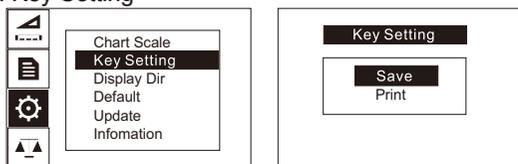
5. Date/Time



6.Disagram Scale

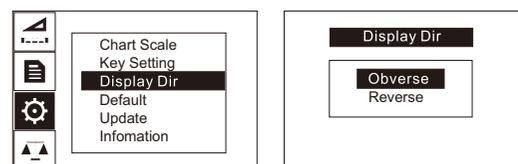


7. Key Setting

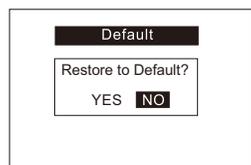
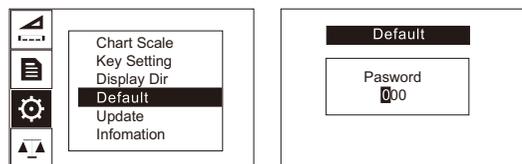


To set the torque coordinate axis of graphic printing. Set key's function on measuring interface.

8. Display Direction

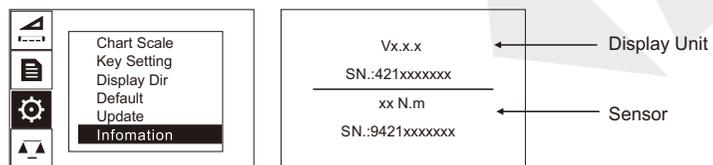


9. Default

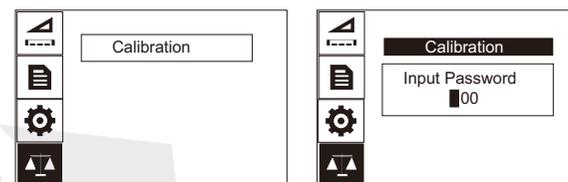


When the artificial error, and do not know how to restore, the gauge can be restored to factory settings. The calibration data and some parameter set by custom will lose after performing Default. The password is "1 2 3".

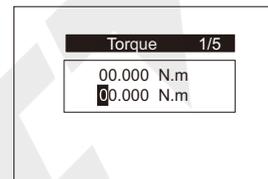
10. Information



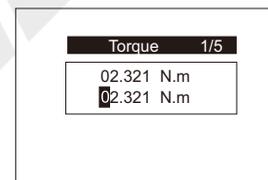
4. Calibration



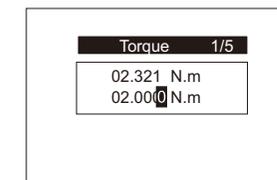
Password : 123



Enter the calibration



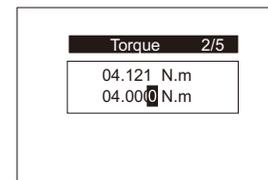
Loading a standard torque



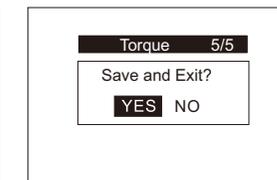
Input standard value, Touch to enter the next

Touch to change value

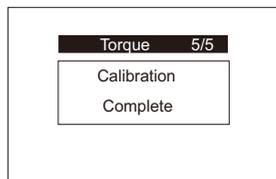
Touch to move digit



Calibrate next point. Or press to exit



Confirm calibration



The standard torque can be loaded by a standard torque machine, a lever and weight or other known standard torque values.

Multi-point calibration generally used 20% C, 40% C, 60% C, 80% C, 100% C (C:capacity) .

Performing all five-point calibration usually significantly improves the measurement accuracy.

5. Communication Ports

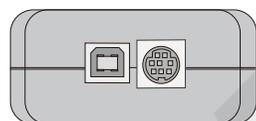
There are two kinds of port for recharging and communicating with PC or the other equipment.

5.1 USB/Recharge

This port can connect to PC for transform data with USB2.0. Or, recharge the instrument. After installation of a data acquisition software, the realtime data or the records in memory can be uploaded. To upload records in memory only through USB port.



Pin	Description
1	VBUS, Recharge V+
2	D+
3	D-
4	GND, Recharge GND



USB Multifunction

After installation of a data acquisition software, the realtime data or the records in memory can be uploaded.

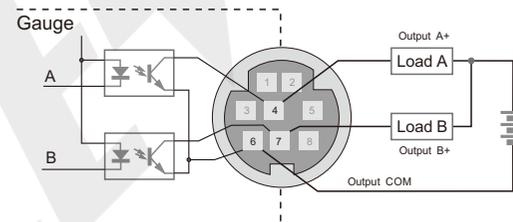
To upload records in memory only through USB port.

5.2 Multifunction Port

This port is used to connect with a printer, RS232 equipment and output the set point (alarm) signals. The setpoint signal port is in MD8 port. It includes two switches to output the overload or over tolerance limit alarm signals. To connect it with an external indication or actuating device to avoid damage due to overload. It can also be used as a Go/NG check indicator after setting the tolerance.



Pin	Description
1	RS232 Transmit(TX)
2	RS232 Receive(RX)
3	RS232 Ground
4	Output A+
5	Reserved
6	Output COM-
7	Output B+
8	Reserved



The setpoint signal port is optically isolated from the inside, and external interference does not easily affect the instrument. But itself is not very complete protection, therefore, when connecting external devices, some restrictions should be strictly observed to avoid damage.

Maximum permissible voltage

- pin 7 to pin 6, pin 4 to pin 6: 35V;
- pin 6 to pin 7, pin 6 to pin 4: 6V.

This port is used to connect with a printer, RS232 equipment and output the set point (alarm) signals. The setpoint signal port is in MD8 port. It includes two switches to output the overload or over tolerance limit alarm signals. To connect it with an external indication or actuating device to avoid damage due to overload. It can also be used as a Go/NG check indicator after setting the tolerance.

Appendix

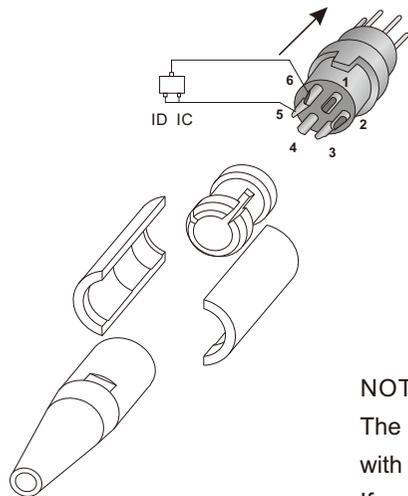
A-1 Parameters of Sensor

The display unit can also be equipped with sensors provided by other suppliers, if its parameters meet the requirements and the correct connection to work properly. It must be calibrated, and we cannot guarantee that it can achieve the stated accuracy and performance specifications.

Main parameters of sensor

Specifications	Technique
Rated Output(mV / V)	2.0±10%
Zero Balance(F.S.)	<±2%
Non-linearity(F.S.)	<0.5%
Hysteresis(F.S.)	<0.3%
Repeatability(F.S.)	<0.1%
Creep [30min](F.S.)	<0.5%
Temp. Effect(F.S./10°C)	<0.05 %
Output Impedance(Ω)	345~1000

Sensor plug connection

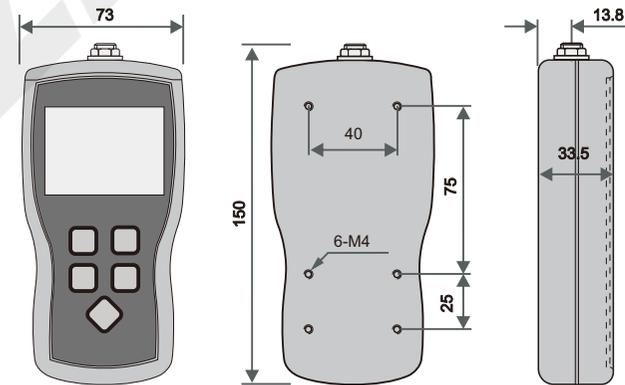
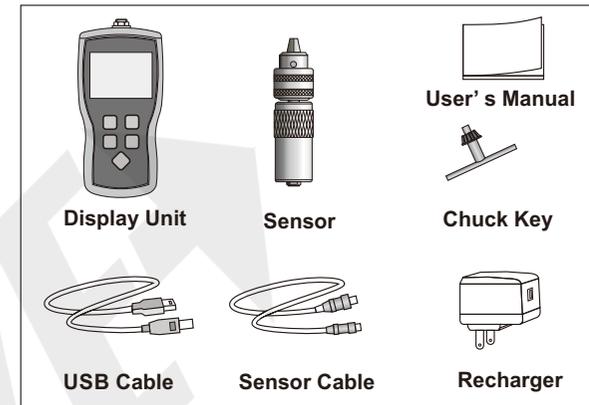


Pin	Description
1	Excitation Power +
2	Sensor signal +
3	Sensor signal -
4	Excitation Power GND
5	Identify-GND
6	Identify-I/O

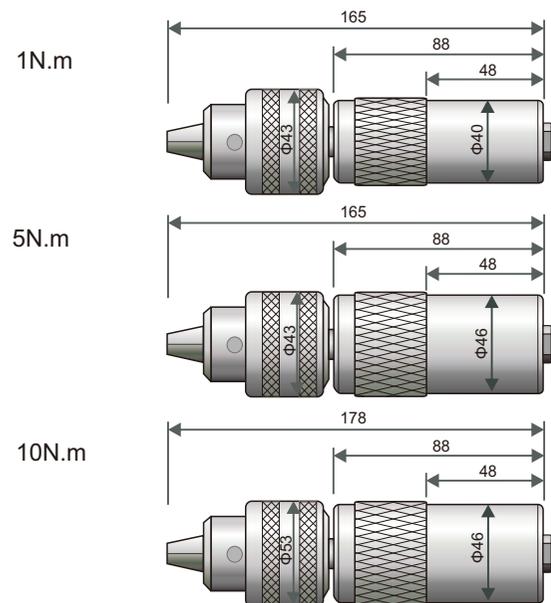
NOTE:

The display unit can identify the sensor with a identify IC.
 If some older version of the sensor is used, its capacity cannot be recognized automatically and therefore needs to be set in the menu.

A-2 Packing List



A-3 Dimensions



SPECIFICATION

Code	IST-DTT1	IST-DTT5	IST-DTT10
Load capacity	1N.m	5N.m	10N.m
Resolution	0.001N.m	0.001N.m	0.01N.m
Max. clamping diameter	Ø10mm	Ø10mm	Ø13mm
Sample frequency	2000Hz		
Accuracy	±0.3% (of load capacity)		
Output	USB, RS232, alarm signal		
Power supply	built-in rechargeable battery		
Dimension	145x73x34mm		
Weight	1.4kg		