Force Gauge

MTS Series

Model MTS

SCHMIDT
control instruments

Edition *MTS 01.0.E*

Operating Instructions

Valid as of: 01.07.2015 • Please keep the manual for future reference!

CE

Introduction

Thank you for choosing IMADA products. This product easily realizes open or close motorized screw cap test for drink or cosmetic bottles by combining IMADA screw cap tester DTXA/DTXS (Written torque gauge in this manual). The high repeatability is expectable due to stable torque with the motorized movement. Also, large torque is easy to measure.

It is possible to measure various measurement mode such as simple use Manual mode and Automatic mode that repeats applying setting torque and automatically stops after screw cap opening.

To take full advantage of this product, please read through and keep this instruction manual.

Although produced and shipped under severe quality control and inspection, if there is a doubtful point, if possible, please inform to your local dealer or us.

The following categories show the levels of danger.

DANGER	If not follow the direction, it causes the breakdown of products, and it may cause vital injury including death.
WARNING	If not follow the direction, it may cause not only the breakdown of products but also vital injury including death.
CAUTION	If not follow the direction, it may cause the breakdown of products.

DANGER

- Do not use this product without protections under expecting dangerous situations, especially, liquid, debris and danger chemicals spattering situations.
- Pay much attentions to use the product.
- Follow company safety regulations.

WARNING

- Do not use AC adapter other than we provide. It may cause break down and fire.
- Do not use the product out door and keep away from water.
- Do not use the product for the purposes besides measurement of torque.
- Do not apply over load to torque gauges. It cause break down.
- This product is activated Automatic mode and Overload preventing function by connecting the torque gauge with the included cable however, do not guarantee protection from breakdown of torque gauges.

Overload preventing function is valid while the communication with the torque gauge is working correctly. The operation of this product is necessary after the torque gauge turning on. Besides, during the measurements, the gauge should connect with AC adapter and the off timer setting should be [off] to prevent the communication interruption.

- Do not disassemble products and accessories.

CAUTION

- This product is precision instrument. Please pay attention to deal with and use with care.

Caution on Over Load of Torque Gauges

- Applying torque exceeding capacity causes over load regardless power on / off.
- It maybe cause the break down when the huge compression or tensile force is applied on the torque gauge.
- Make sure to follow each instruction manual when use torque gauges.

Caution on Storage

- Avoid oil, dust, high temperature and humidity
- Store torque gauges, protecting measuring torque sensor from shock.
- Do not use organic solvents, such as thinner, to remove dirt.

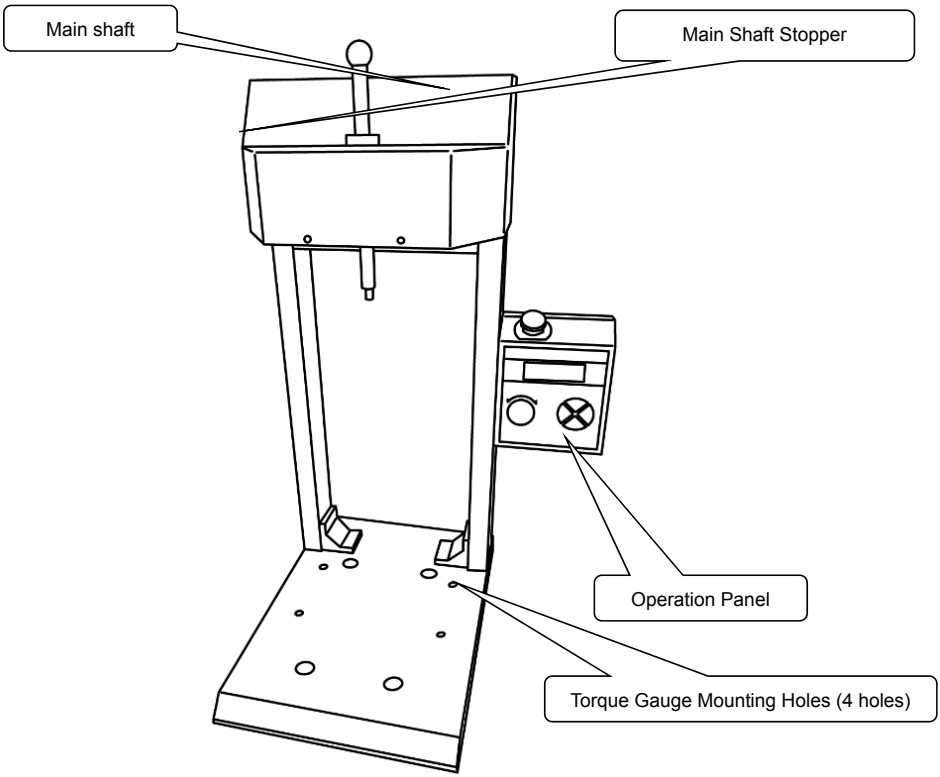
Caution on Accuracy of Torque Gauges

- We recommend constant inspection and calibration once a year to keep accuracy. Its interval should differ depending on frequency and conditions of use.
- Make sure to use under appropriate temperature for accurate measurement.
- Do not disassemble torque gauges.
- Electric supply should be same output when using this instrument and the torque gauge with AC adapter together.

A Table of Content

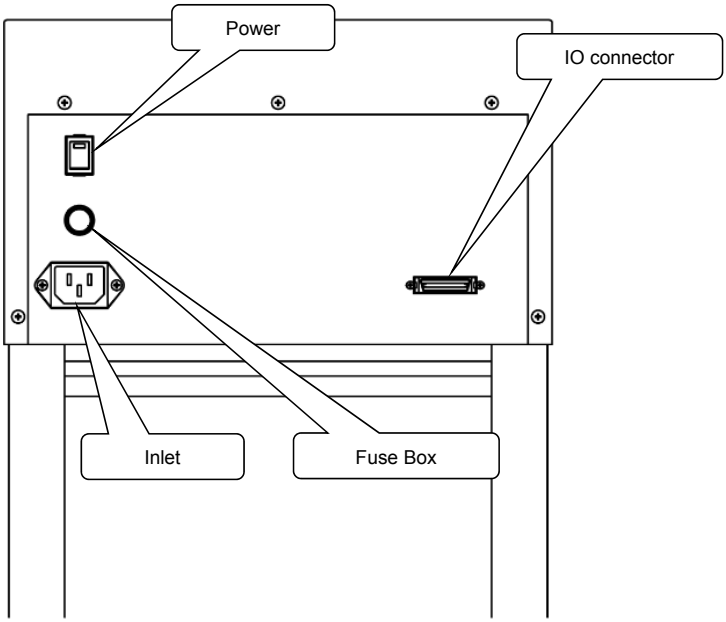
1. Each part name and function

1.1. Front



Main Shaft	Rotate a sample clamped with the optional attachment at the tip.
Main Shaft Stopper	Adjust the shaft height by the sample height.
Operation Panel	Operate the setting and the activities. Display the activity status and the settings.
Torque Gauge Mounting Holes	Mount the torque gauge.

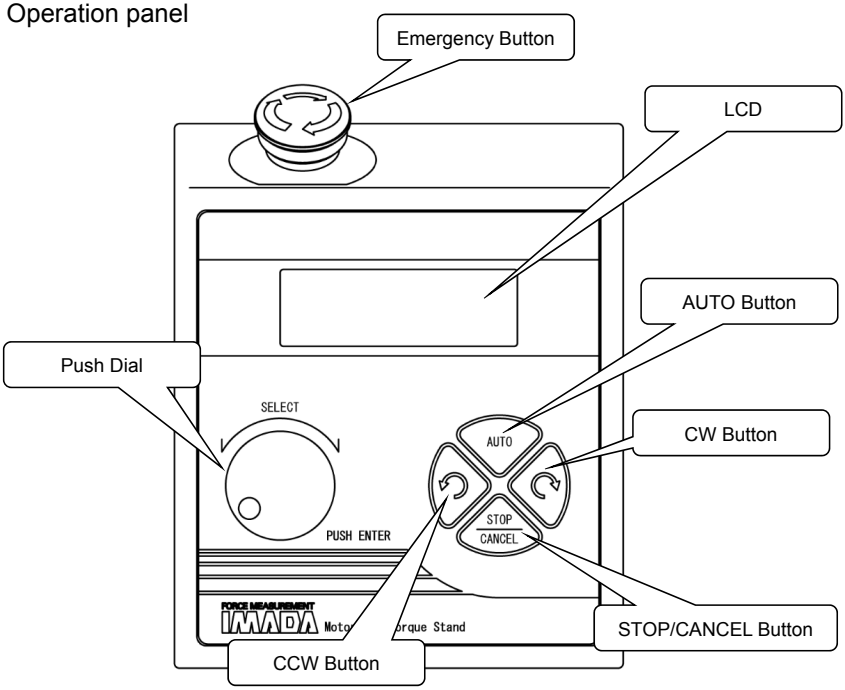
1.2. Back



Power	Turns power on/ off.
Inlet	Connects power cable.
Fuse Box	Fuse is inside.
IO connector	Control the measuring activities such as Automatic mode and Overload preventing function with captured torque value of the gauge by connecting the torque gauge with the included cable.

*Refer to the chapter 6 the IO connector for the signals.

1.3. Operation panel



Emergency button	Compulsorily stops the operation. Turn right to release.
Push Dial	At Manual mode, speed setting is available. At JOG mode, small traveling is available At Automatic mode and User setting mode, each selecting or changing of the setting value is available. The pushing operation determines the settings.
AUTO button	Switch the manual mode and the automatic mode.
STOP/CANCEL button	Stop the activity during the rotation by pressing. At the setting mode, cancel or back to the previous setting.
CW button	Rotate the main shaft for CW.
CCW button	Rotate the main shaft for CCW.
LCD	Conditions of settings and operations are displayed.

2. Accessories

The following accessories are included.

Power cable	1
Torque gauge connecting cable *1	1
Centering stick	1
Spare fuse *	1
Instruction Manual(This book)	1
Packing cardboard	1
L-wrench for M5 hexagon socket head bolt	1
L-wrench for M4 hexagon socket head bolt	1
M5 hexagon socket head bolt L20(For mounting torque gauge.） *2	4

*1 The cable differs between standard and optional product.

Standard type: CB-518

Optional type with displacement scale: CB-728

*2 The screws are temporarily mounted on the torque gauge mounting holes.

* The included fuse is different by the voltage.

3. The models and the specification

3.1. The models

Optional function	Available Sample height	Model
Standard type	Sample height up to 140mm	MTS-10N
	Sample height up to 240mm	MTS-10N-L
with Rotary encoder	Sample height up to 140mm	MTS-10N-RA
	Sample height up to 240mm	MTS-10N-L-RA

The available sample height is the height which is mounting the standard type attachment.

Besides, it is possible to specify the height by the customer samples except the above models.

Model:MTS-10N-ST+□□□（In □, there are the extension length (mm) for standard type）

Ex.)When the available sample height is required for 340 mm for 1.5 or 2 liter PET bottles.

Model:MTS-10N-ST+200, MTS-10N-RA-ST+200

3.2. Specification

Capacity	10N-m
Stroke	Refer to the dimension
Weight	Approx. 14kg
Speed Range	3~90°/sec
Dimensions（mm）	Refer to the dimension
Functions	Manual mode JOG mode Automatic mode（CONTINUOUS / ONE WAY）*1 Overload preventing function*1
	Speed adjustment
Optional Functions	with Rotary encoder–RA at the end of the model *2 Height changing option:-ST+□□□ (Extension length (mm) for standard type in □)

Voltage Levels	AC100 ~ 240V , 50/60Hz , max 3A *3
Temperature	0 degree Celsius ~40 degree Celsius
Humidity	Humidity less than 85% (NO condensation)

*1 It is necessary to connect the torque gauge with the included connecting cable.

*2 It is factory build option. Customers cannot attach.

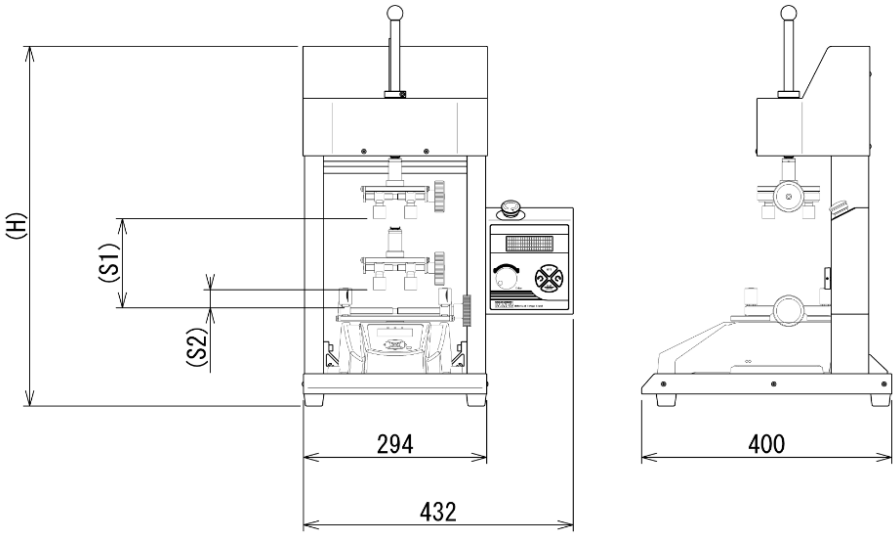
To save or check the angle, DTXA and Force Recorder Professional are required.

*3 Fuse needs to be changed when use under different voltage from one when purchased.

Please contact us or your local distributor if you are not sure for an appropriate fuse.

Voltage level	Fuse Rating	Dimension/ Characteristic
AC 100-120V	125V 1A	φ5 - 20mmGlass Tube/Time-delay type
AC 200-240V	250V 3.15A	φ5 - 20mm Glass Tube /Time-delay type

Dimension



Model	H	S1	S2
MTS-10N	575mm	140mm	30mm
MTS-10N-RA			
MTS-10N-L	675mm	240mm	130mm
MTS-10N-L-RA			
MTS-10N-ST+□□□	575+□□□mm	140+□□□mm	30+□□□mm
MTS-10N-RA-ST+□□□			

S1 and S2 strokes are based on at mounting the standard table on the torque gauge and the standard attachment (separately sold) on this product.

4. The setting and the torque gauge installing procedure

DANGER

- Use the included power cable properly. Otherwise electric shock, breakdown, or fire may occur.
- Connect the plug from AC adapter to an earth wire in order to prevent the break down and the leakage. Do not connect the earth wire with a tap, a gas pipe, an earth wire of telephone and a lightning conductor. It may cause inflammation and overcurrent.

CAUTION

- Place on level table.
- Place on solid table so that the table does not shake during operation.
- Low capacity force gauges and load cells are sensitive to be affected by shaking. Do not use roughly.
- Use the same power point when to use this test stand and equipment with power cable.

4.1. Power connect

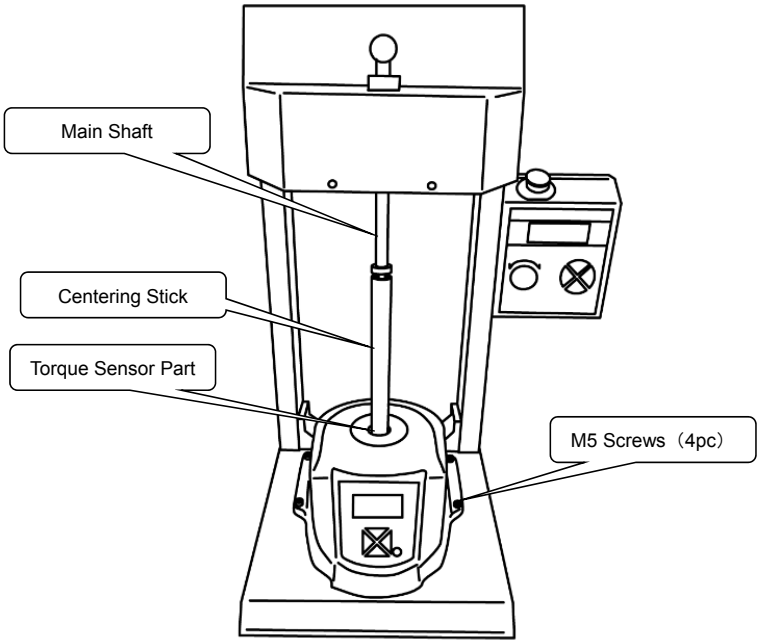
Connect to an output with the included power cord.

4.2. Connection with a torque gauge

You must connect this product and a torque gauge with the included torque gauge connecting cable. If the connection is not correct, the overload preventing function and Automatic mode do not activate.

The cable differs by the model.

4.3. Torque gauge installation

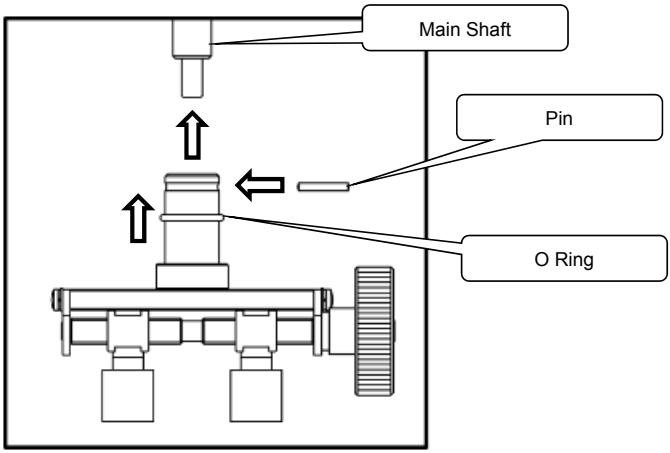


1. Turn the torque gauge over and remove the 4 piece of fixing M5 screws of the handles.
2. Temporarily, fix the torque gauge with the included 4 pieces of M5 screws.
3. Lift the main shaft up and insert the thin side of the centering stick into the torque sensor part of the gauge.
4. Down the main shaft and position the torque gauge at the place with no resistance. Fix it with the M5 screws properly.

Caution

- Remove the attachment of the torque gauges during the installation. Do not apply force on the torque sensor by the carrying which applies excessive force.
- Fix the gauge properly with no clattering caused by loosen screws.
- Carry out the centering stick insertion at the torque gauge temporary fixing the position can be adjusted. Besides, do not insert the centering stick compulsively.

4.4. Mounting the chuck attachment



Follow the below procedure to mount the suitable chuck attachment.

1. Fix the main shaft stopper at the center of the shaft.
2. The motor shaft which shape key way can be seen from the hole at the top. Match the key position and insert the main shaft from the top.
3. Move the O ring of the attachment and extract the pin.
4. Insert the attachment at the tip of main shaft and insert the pin extracted at Step 3.
5. Back the O ring to the first position.

Mount optional extension shaft if necessary. Refer to the height adjustment of chuck attachment for the detail.

The chuck attachments are separately sold. Please purchase the suitable one for your measurements.

Caution

- Hold the attachment properly to prevent from dropping by the weight at the removal.

5. Operation procedure

5.1. Power on/off

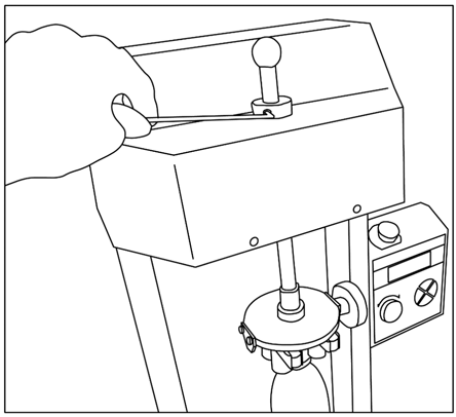
Turn on this product first, and then turn on the measurement instrument.

Turn off this product first, and then turn off the measurement instrument.

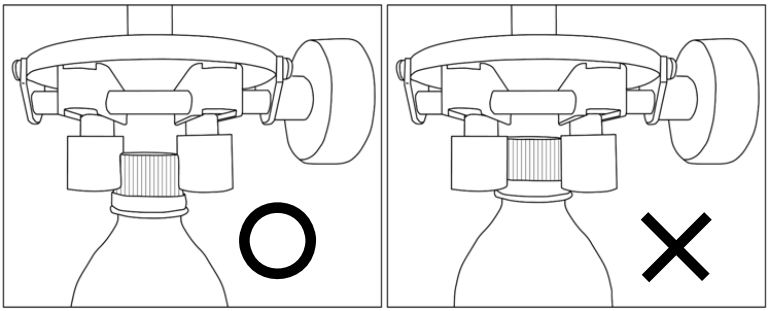
Do not repeat turning on and off in a short period of time. It may cause break down.

5.2. Height adjustment of the chuck attachment

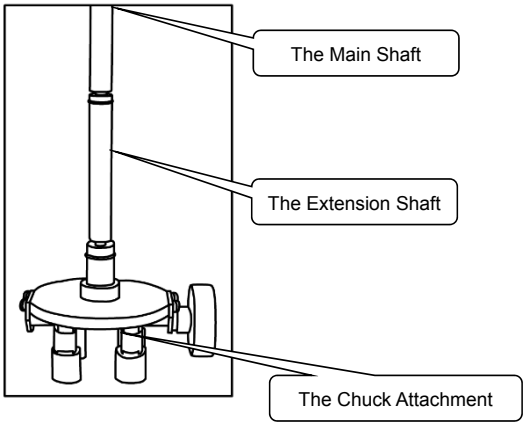
Hold the sample on the torque gauge table. Lift the main shaft up and loosen the main shaft stopper by loosening the screw of the stopper with the included L wrench. Screw the main shaft stopper at the position the attachment chucks the sample.



Pay attention to clamp the rotating parts only at testing cap torque such as for PET bottles.



Mount the optional extension shaft when the sample height is short.
The extension shaft installation is same as the chuck attachment installation. After inserting the pin, cover O ring at the first position.



Caution

- The main shaft will move down when the stopper screw is loosened due to the attachment weight.
- Tighten the stopper screw properly after the positioning decision. It may affect the measurement value if the screw is loosened as the main shaft moves down by the weight.

5.3. Sample fixation

The following is mentioned as the combination of this product standard chuck attachment (below “attachment”) and the torque gauge standard table (below “table”).

1. Mount pins on the table clamp bar along the groove. At this time, choose the holes which match the sample size.
2. Mount pins on the attachment clamp bar along the groove. At this time, choose the holes which match the sample size.
   The pins of the attachment are fixed with magnet. It may cause the pin dropping if the main shaft is lifted up and suddenly dropped.
3. Lift the main shaft up and clamp the sample on the table.
4. Clamp the upper part of the sample with the attachment.

Some samples such as PET bottle caps may be received bad influence from strong clamp as it could cause the breaking. Screw the M5 hexagon socket head bolt of the center on the handle with a torque wrench or a torque driver in order to keep the stable clamp.

Caution

- Carrying out the sample fixation, keep checking the displayed value of the torque gauge.
- The M5 cap bolt at the center of the handle is only used at the tightening. Use the handle at the loosening.
- Pay attention to the position of the attachment pins and the torque gauge pins when the sample is a board shape such as a circuit board. If the position is not properly, torque is applied before the measurement. In that case, adjust the position in JOG mode the attachment moves small. Please refer to Page 21 [5.6. Small rotation in JOG mode] for the JOG mode detail.

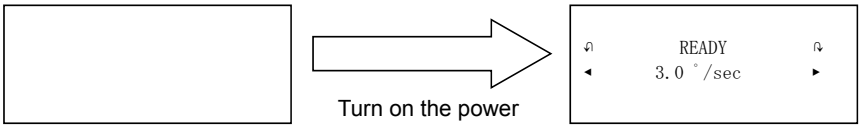
5.4. Mode selection

This product has below functions. Use each mode for each objective.

Mode	Outline	Detail
Manual mode	The main shaft rotates at the setting speed while pressing  or 	Page 20~21
JOG mode	The main shaft finely rotates for the push dial rounding direction.	Page 21
Automatic mode	Automatically repeat the rotation based on the measurement setting. The following 2 types of rotating are available at this mode. CONTINUOUS: Useful setting for durability tests. Reciprocating rotations. The main shaft starts the reverse rotation when the torque reaches at the setting torque. ONE WAY: Useful setting for opening torque tests. One way rotation. The measurement finishes after rotating the main shaft for one direction.	Page 22~25
Setting mode	Set the repeat rotating conditions in the automatic mode.	Page 29~30
User setting	Setting of this product. Change the user settings such as unit for your using.	Page31~32

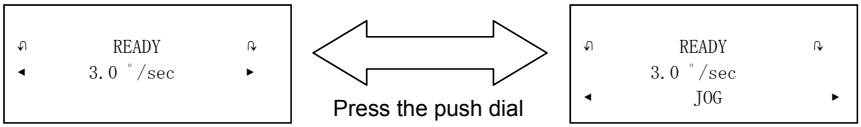
Follow the operations to move to each mode.

●Turn on the power. → Manual mode



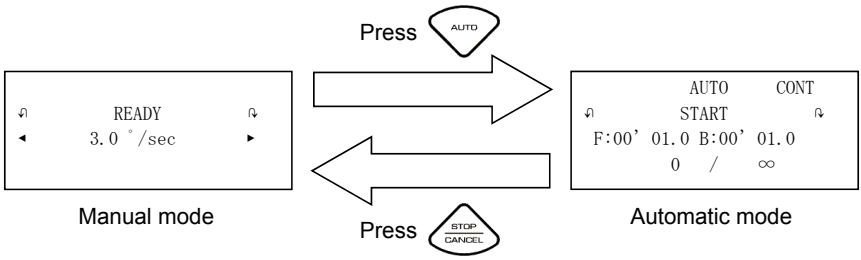
The power OFF　　Manual mode

●Manual mode⟷ JOG mode



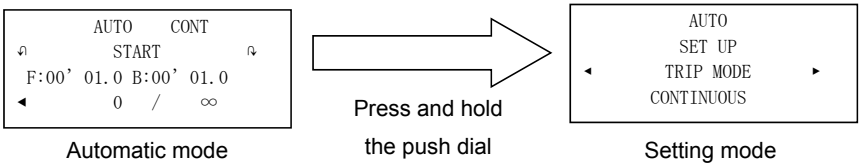
Manual mode　　JOG mode

●Manual mode⟷ Automatic mode



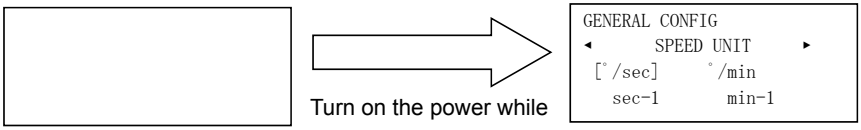
Manual mode　　Automatic mode

●Automatic mode→ Setting mode



Automatic mode　　Setting mode

●Turn the power → User setting



The power OFF　　User setting

5.5. Manual mode

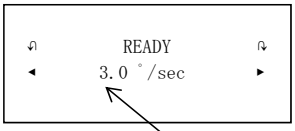
In this mode, the main shaft rotates at the setting speed while pressing  or  .

Procedure

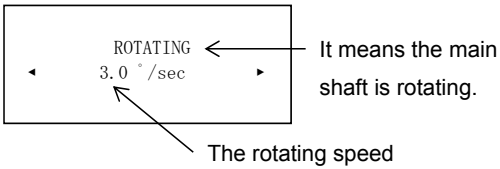
1. Set the rotating speed by turning the push dial.
2. By pressing  or  button, the main change rotates for the arrow direction on the button. The rotation continues until the button is released.

Display layout

Ready



Rotating



Speed setting steps

The step of 1 click of the push dial is depending on the displayed unit.
The unit setting steps in the each displayed unit are below.

Displayed unit: °/sec

Speed range	Speed setting steps
3 °/sec~10 °/sec	0.1 °/sec
10 °/sec~90 °/sec	0.5 °/sec

Displayed unit:°/min

Speed range	Speed setting steps
180 °/min~1000 °/min	5 °/min
1000 °/min~5400 °/min	50 °/min

Displayed unit: sec-1

Speed range	Speed setting steps
0.0085sec-1~0.0100sec-1	0.0001sec-1
0.0100sec-1~0.1000sec-1	0.0005sec-1
0.1000sec-1~0.2500sec-1	0.0050sec-1

Displayed unit: min-1

Speed range	Speed setting steps
0.50min-1~1.00min-1	0.01min-1
1.00min-1~10.00min-1	0.05min-1
10.00min-1~15.00min-1	0.50min-1

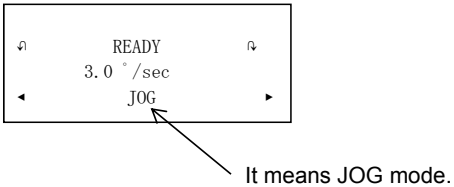
5.6. Small rotation in JOG mode

In this mode, the main shaft finely rotates for the direction by turning the push dial. It is useful for positioning of the chuck attachment at the sample setting.

Procedure

1. Press the push dial at Manual mode and change to JOG mode.
2. Turn the push dial and the main shaft finely rotates for the turning direction.

Display layout



Caution

Continuous turning of the push dial is not suitable for the measurement because the main shaft rotates discontinuously.

5.7. Automatic mode

2 types of rotating are available for the measurement at Automatic mode.

CONTINUOUS:

The main shaft rotates and the reverse rotation starts when the loading torque reaches at the setting torque. Reciprocate rotation.

It is useful for durability tests.

Refer to [5.7.1.CONTINUOUS mode] for the procedure.

ONE WAY:

The measurement finishes when the main shaft rotates for one direction and the loading torque reaches at the setting torque.

Also, the measurement finishes when the loading torque becomes smaller than the setting torque after the loading torque is beyond the setting torque. It is useful for opening torque tests.

Refer to [5.7.2. ONE WAY mode] for the procedure.

Automatic mode is required for the torque gauge and this product communication by the included cable connecting.

Error message will be appeared with no communication with the torque gauge.

Refer to the [7. Error] for the detail.

The measurement should be in Real time mode of the torque gauge in order to stop the rotation by the comparator signal from the torque gauge. The measurement does not carry out properly in Peak mode since the comparator signal is based on the peak value.

5.7.1. CONTINUOUS mode

In this mode, the main shaft rotates and the reverse rotation starts when the loading torque reaches at the setting torque. It is useful for durability tests.

<<Rotating Motion>>

The main shaft starts the rotation at FORWARD SPEED and pauses when the coparator signal from the torque gauge turns to –NG or +NG. Pausing in FORWARD TIMER time, the main shaft starts the reverse rotation at BACKWARD SPEED. The rotation pauses again the comparator signal +NG or –NG from the torque gauge. (If the first pause is in +NG, the next pause is in –NG. If the first pause is in –NG, the next pause is in +NG.) This flow is one cycle. Repeat the cycle until the counter setting.

The next cycle starts in BACKWARD TIMER time from the pause until reaching at the counter setting.

Condition Setting

1. Refer to the [5.8.Automatic mode]. Setting TRIP mode as [CONTINUOUS].
   Set the rotating speed, pausing time, counter if needed.
2. Set the torque gauge comparator Low value (-NG) and High value (+NG).
3. Set the torque gauge measurement mode in Real time mode.

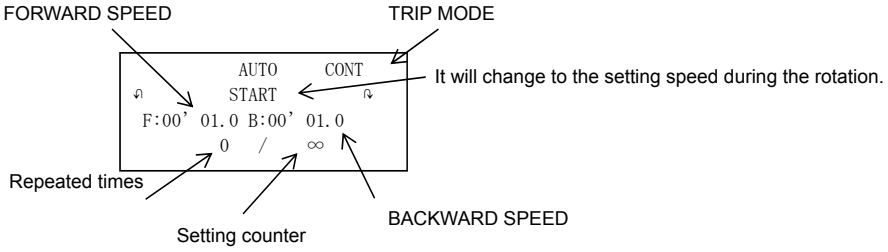
Refer to the torque gauge instruction manual for the comparator setting and switching to Real time mode.

Procedure

1. Press 

in Manual mode and move to Automatic mode.
2. Press  or  when the START is blinking on the second line. The main shaft starts to rotate for the arrow direction on the button and the measurement starts.

Display Layout



Measurement example of twisting board strength test

In durable test twisting a circuit board, set this product and the torque gauge below.

<<This product setting example>>

FORWARD SPEED:10 ° /sec

BACKWARD SPEED:20 ° /sec

FORWARD TIMER:00”02.0

BACKWARD TIMER:00”05.0

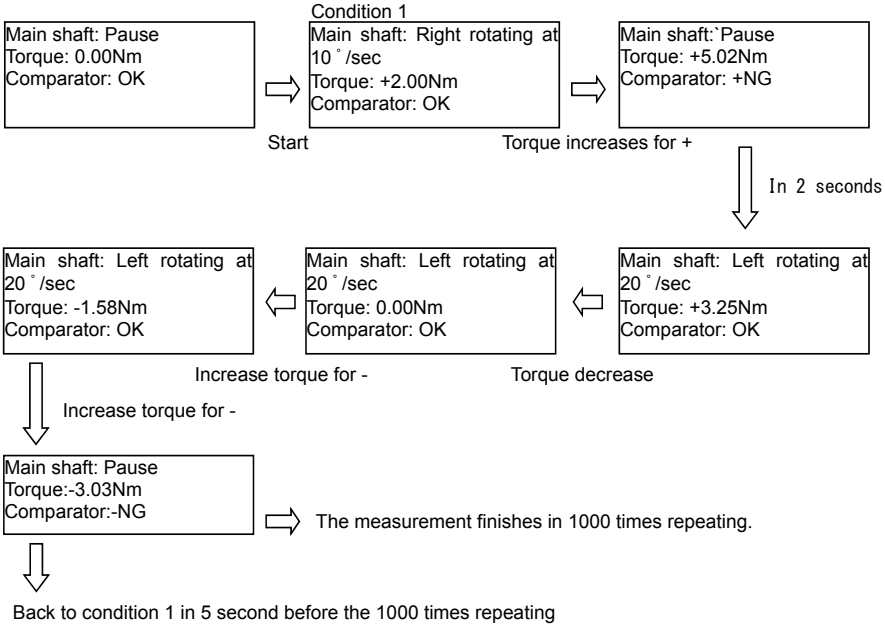
COUNTER:1000

<<Torque gauge setting example>>

Comparator High value: +5.00Nm

Comparator Low value: -3.00Nm

Pressing the  at this setting, the measurement carries out in following charts.



*The above charts are only for the description of measurement conditions. It is NOT displayed on LCD of this product.

5.7.2. ONE WAY mode

In this mode, the main shaft rotates for one direction and finishes the measurement when the loading torque reaches at the setting torque.
Also, the measurement finishes when the loading torque becomes smaller than the setting torque after the loading torque is beyond the setting torque. It is useful for opening torque tests.

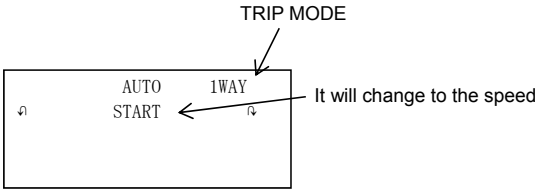
<<Rotating Motion>>
The main shaft rotates at FORWARD SPEED. When the comparator signal from the torque gauge turns from OK to – NG or + NG, the rotating finishes.
The rotation does not repeat even if the COUNTER setting is 2 or more.

Condition setting
1. Refer to [5.8.Automatic mode setting] and set TRIP MODE at [ONE WAY].
   Set the rotating speed if needed.
2. Set the torque gauge comparator High value and Low value.
3. Switch the torque gauge measuring mode to Real time mode.
   Refer to the torque gauge instruction manual for the setting of comparator and the switching to Real time mode.

Procedure
1. Press 

and the mode moves from Manual mode to Automatic mode.
2. Press  or  , when the START is blinking on the second line. The main shaft starts to rotate for the arrow direction on the button and the measurement starts.

Display layout



Measurement example of screw cap opening torque test

Set this product and the torque gauge below when the rotation finishes after measuring the peak torque in opening cap test of PET bottles or others.

Start the measurement at ONE WAY mode and the measurement automatically stops when the torque reaches at setting low value after the peak is captured.

<<This product setting example>>

FORWARD SPEED:10 ˚/sec

<<Torque gauge setting example>>

+/- Indicator: Reverse (The setting being positive when the torque is loaded for the opening direction)

Comparator High: 5.00Nm

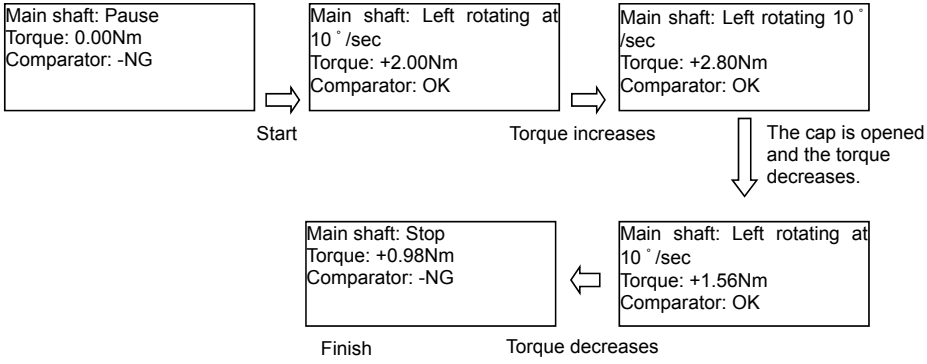
(It should be large torque than expectable Max. torque.)

Comparator Low: +1.00Nm

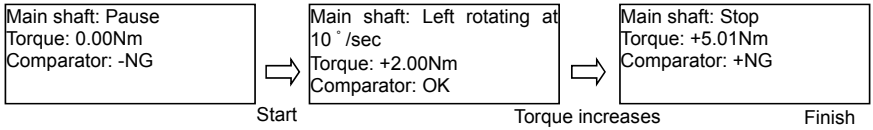
(Stop at this value after the cap opened and the measurement value decreases)

Pressing the  at this setting, the measurement carries out in following charts.

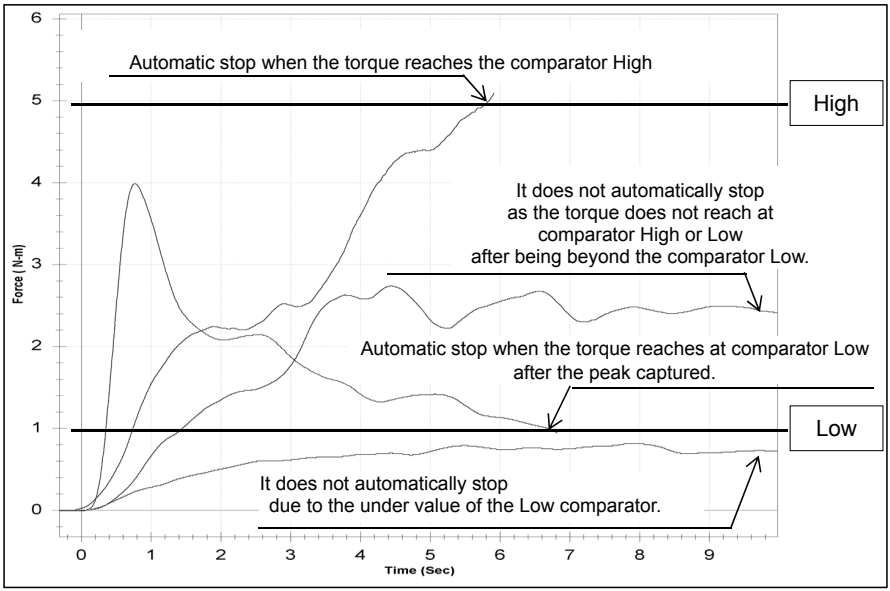
When the cap is opened at the smaller torque than Comparator High



When the cap is not opened at Comparator High

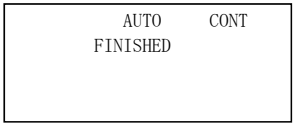


*The above charts are only for the description of measurement conditions. It is NOT displayed on LCD of this product.



5.7.3. Automatic rotation finish

The display changes to below display after Automatic mode finishes properly.



Press Push dial or 

and move to Manual mode in this condition.

Press 

and move to the ready in Automatic mode.

5.7.4. Automatic mode cancelling

In automatic rotating, the rotation stops by pressing 

. The mode is changed into Manual mode.

The counter remains the repeated times though the measurement is stopped in the middle.

The counter is maintained if the automatic measurement starts without Counter clear.

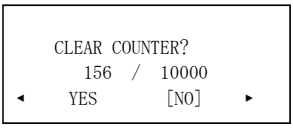
However, the count becomes “0”, the power turned off.

5.7.5. Counter clear

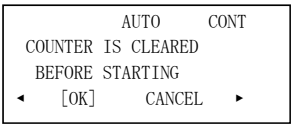
The counter does not become 0 automatically.

To clear the counter, change to Automatic mode and press push dial.

The below display is appeared. Turn the push dial to left and select [Yes]. Press the push dial.



Also, the below message is appeared before restarting Automatic mode when the present repeated times are beyond the setting counter number.



If you need to clear the counter and start the rotation, press the push dial at selecting OK.

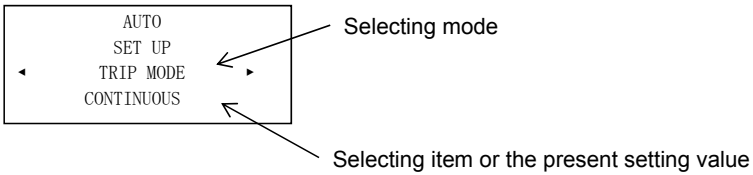
If you need to cancel the start, turn the push dial to right. Select [CANCEL] and press the dial.

5.8. Setting mode

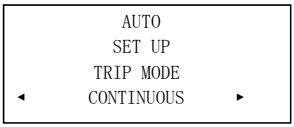
In this mode, set the repeating motion at Automatic mode.

Procedure

1. Press AUTO and the mode changes from Manual mode to Automatic mode.
2. To move to the setting mode, keep pressing the push dial before the rotating start (START is blinking)



3. Turn the push dial to left or right and select the items which you need to change. Press the dial after selecting.



4. Select and adjust the setting value by turning push dial to left and right. The values and the selecting items are different by which item is selected. Please refer to the setting item details.
   Also, the number becomes large when the dial turn quickly in the number adjusted items.
5. Decide the item setting by pressing the push dial after adjusting or selecting.
   Press STOP CANCEL before pressing the dial, the changed setting will be invalid. Back to selecting setting items.
6. "PRESS ENTER TO SAVE AND EXIT" is appeared by pressing STOP CANCEL when the setting item is selected.
   By pressing the push dial when "PRESS ENTER TO SAVE AND EXIT "is displayed, the mode is changed from Setting mode to Automatic mode.
   This setting is saved by the above operations. The setting is valid after shutting off and turning on the power again.

Details of the selecting items

Followings are selecting items in Setting mode

Setting item	Selecting item/ Adjusting value	Description
TRIP MODE	[CONTINUOUS] / [ONE WAY]	[CONTINUOUS] Reciprocating rotation. The main shaft reverse rotation starts when the torque reaches at setting torque. [ONE WAY] One way rotation. The main shaft rotates for one direction and the measurement finish when the loading torque reaches at the setting torque.
FORWARD SPEED	3.0 ˚/SEC~90.0 ˚/SEC	Set the proceeding rotation speed. The setting step and the setting range is same as Manual mode.
BACKWARD SPEED *	3.0 ˚/SEC~90.0 ˚/SEC	Set the returning rotation speed. The setting step and the setting range is same as Manual mode.
FORWARD TIMER *	00”00.0~99”59.9	The pausing time after proceeding rotation.
BACKWARD TIMER *	00”00.0~99”59.9	The pausing time after returning rotation.
COUNTER *	[∞] / 1~999999	Rotation repeating times. Set the motion continues until pressing  if choose [∞].
PRESS ENTER TO SAVE AND EXIT	—	Save the setting and move out from the setting mode by pressing the push dial.

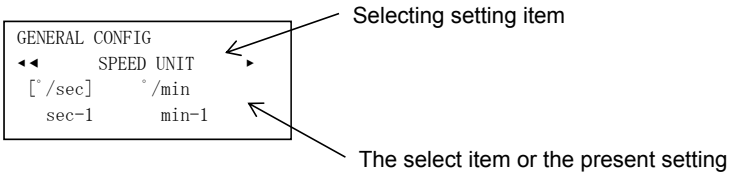
* BACKWARD SPEED, FORWARD TIMER, BACKWARD TIMER, and COUNTER are valid at only CONTINUOUS mode.

5.9. User setting

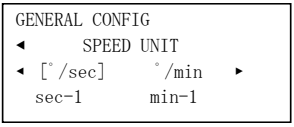
In this mode, the user can set the each items such as unit.

Procedure

1. Turn on the power while pressing the push dial. Move to User setting



2. Turn the push dial to left or right and select the items which you need to change. Press the dial after selecting.



3. Select and adjust the setting value by turning push dial to left and right. The values and the selecting items are different by which item is selected. Please refer to the setting item details
4. Decide the item setting by pressing the push dial after adjusting or selecting.

   Press 

   before pressing the dial, the changed setting will be invalid. Back to selecting items

5. The selecting item shifts to “PRESS ENTER TO SAVE AND EXIT “by pressing 

   when the setting item is selected.

   By pressing the push dial when “PRESS ENTER TO SAVE AND EXIT”is displayed, the mode is changed from Setting mode to Automatic mode.

   This setting is saved by the above operations. The setting is valid after shutting off and returning on the power again.

Details of setting items

Below setting items in User setting mode.

Setting items	Selecting item/ Adjusting value	Description
SPEED UNIT	[˚/sec] / [˚/min] / [sec-1] / [min-1]	Select the unit of the main shaft rotating speed in Manual mode and Automatic mode
DIRECTION	[NORMAL] / [REVERSE]	[NORMAL] When press  , the rotation is CW. When press  , the rotation is CCW. [REVERSE] When press  , the rotation is CCW. When press  the rotation is CW.
SOUND	[ON] / [OFF]	[ON] Sound the operation alarm and finishing buzzer. [OFF] No sound.
PRESS ENTER TO SAVE AND EXIT	—	Save the setting and move out from the user setting by pressing the push dial.

5.10. Angle measurement

Torque and the rotating angle can be measured and saved together on real time by combining the optional type of this product equipping an encoder and the torque gauge DTXA series. The scale setting of DTXA series is required for capturing rotating angle. Follow the below procedure for selecting the scale type.

The procedure of DTXA series scale setting

The initial setting at the shipment the scale setting is [OFF].

Please read the instruction manual of DTXA/DTXS series and select scale setting from initial setting menu. Select [Type B].

*The scale setting can be set from ZT-

Logger, the including software for DTXA, or Force Recorder, the separately sold graphing software.

CAUTION

- When the torque gauge overload is occurred, the motion is compulsorily stopped with alarm sound. Immediately, loosen the chuck attachment or the table attachment clamp and reduce the torque on the gauge.
- If the alarm is still sounding after removing the sample and reducing torque, the torque gauge may be broken down. Please contact us or your local distributor.
- Make sure to check the torque value during measurement and do not apply torque exceeding capacity. It may break down and decrease accuracy, if over capacity torque is applied in the any operation mode.
- If the torque gauge is in Peak mode, the Automatic mode does not work. It may cause the breaking of the sample or this product. Carry out the measurement in Real time mode.
- It may break down, if force is applied from direction besides measuring direction even within capacity.
- Do not use this product for purpose besides torque measurement.
  If used, it is out of warranty.
- Do not get wet this product during measurements.

6. IO connector

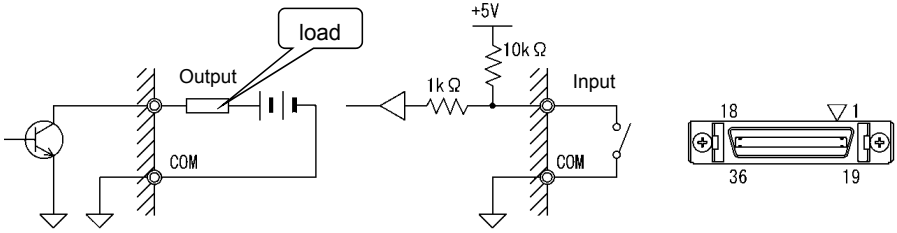
Use for connecting with the torque gauge. Connect the included cable.

	Pin No.	Signal	Description
Input	1~4	N/C	Not used
	5	-NG	Comparator input signal
	6	OK	
	7	+NG	
	8	OVL	Overload input signal
	9~10	COM	COM for input signal
Output	11~14	RESERVE	Not used
	15	Rec	Automatic recording output signal for the torque gauge.
	16~18	RESERVE	Not used
	19~20	COM	COM for output signal
	21~22	+5V	Rotary encoder output signal *Only for encoder option model
	23	N/C	
	24	A-	
	25	N/C	
	26	B-	
	27~28	N/C	
	29~30	GND	
	31~36	N/C	Not used

Input Pin: Short-circuit with COM to input

Output Pin: Transistor collector output. MAX 30mA/DC30V per a pin

Internal schematic depiction and the connecting example



Connector shape: Half pitch 36P female

7. Error

The error is appeared in the following situations.

Display	Error condition
EMERGENCY STOPPED	Emergency button is pressed, or it compulsorily stops by detecting over load signal. Sound alarm.
PLEASE CONNECT GAUGE TURN POWER ON	 was pressed with no connecting for the torque gauge. Or the communication with the torque gauge was disconnected.

8. Overload prevention

The following functions are valid at all time under the situation the gauge and this product is connecting with the included cable.

- Operation is compulsorily stopped by detecting over load signal which is output if torque exceeding capacity is applied.
- This function is valid at any mode as long as the torque gauge is turned on and connected with this product.

CAUTION

- This function does not guarantee perfect protection from the break down caused by over load.
- Operation cannot be resumed unless the factor of stop is resolved.
- To stop compulsorily, disconnect this product from the torque gauge and press emergency button. Turn the button to right to release.
- It is possible that the torque gauge after emergency stop by over load are broken down. It may look normal, but its accuracy may get worse. Please get a contact with your local dealer or us as soon as possible.

9. Calibration

We accept torque gauge calibration service (for a charge). To maintain the accuracy and carry out the trustful measurements, we recommend to calibrate regularly. Our recommendation is an annual calibration. Please ask your local distributor for the service fee and the term. And please note, the gauge setting and the stored data could be deleted at the calibration. Please record the data before the calibration.

10. Warranty

We warrant the products to be free from defects in workmanship and material under normal use and proper maintenance for one year from original purchase.

Service address:

HANS SCHMIDT & Co GmbH
Schichtstr. 16
D-84478 Waldkraiburg
Germany

Notes:

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