

# TWIST TESTER

**MICRO-CONTROLLER BASED ELECTRONIC TWIST TESTER, Model "TT-MCT"** has been designed specially to meet the growing demand of the textile industry for an accurate instrument to measure the TPM (Twist per Meter) or TPI (Twist per Inch) of the twisted yarn. It is a motor driven fully automatic instrument with auto stop facility for motor with built in sensor. The instrument has facility of both untwist or untwist/twist methods for measurement of TPM of twisted yarn. 16-Character LCD display unit gives TPM/TPI values with 'S' or 'Z' type of twist.

It has facility of storage of 20 sample readings with sample number or average value of 20 readings. The instrument has also facility to set the desired test length of the yarn with lead screw and nut mechanism driven by motor.

## SAFETY

Ensure that the instrument is properly grounded when power supply is connected. The twist tester employs a motor which can rotate at maximum speed of 1500 rpm. Even though the motor is relatively small in size, it is best to ensure that safe distance is maintained while in operation for the safety of the operator.

## POWER SUPPLY

The instrument operates on 230V AC 50 Hz supply.

## OPERATING CONTROLS

### 1. ON/OFF SWITCH

This switch controls the mains supply to the instrument. It is placed at the back of right side cover near the main cable entry point.

### 2. MAINS FUSE HOLDER

This is placed adjacent to 'ON/OFF' switch, as a safety device to protect the instrument from any extensive electrical damage in case of any fault.

### 3. LCD DISPLAY

A 16-character alphanumeric backlight LCD display is used for indication of parameters, operating modes, twist type S or Z, sample number, sample length and units (TPM or TPI etc.)

#### 4. KEYBOARD

The TT-MCT Keyboard has 16 soft touch keys. The function of each key is explained below.

S/Z Key:	Selecting type of twist (twist direction) of yarn
TPM/TPI Key:	Selecting display TPM or TPI count of twisted yarn
MODE Key:	Selecting different measuring modes, viz. M1, M2 or M3
TEST LENGTH Key:	Setting desired test length of the yarn under test
SET TWIST Key:	Setting expected TPM or TPI value in Mode M1
RESET Key:	Resetting the TPM/TPI count to zero
S.NO/AVG Key:	Selecting to store sample reading in memory or Avg. value
FOR Key:	Forward movement of motor, can be used to open remaining twists of the sample after reaching the set twist counts in Mode M1
REV Key:	Reverse movement of motor of yarn, can be used untwist the sample if number of twists has exceeded the in Mode M1
INC Key:	To scroll through sample 1 to 20 or with 'TEST LENGTH' key is activated, setting to desired test length of yarn in upward direction (Test length motor clockwise direction) or with 'SET TWIST' key is activated, setting of desired twist counts (normally 90 to 95% of expected TPM) in upward direction.
DEC Key:	To scroll of sample 20 to 1 or with 'TEST LENGTH' key is activated, setting to desired test length of yarn in downward direction (Test Length Motor anti-clockwise direction) or with 'SET TWIST' key is activated, setting of desired twist counts in downward direction.
ENTER Key:	To enter the test length and set twist values in Mode M1 or for entering the last sample test results in memory (Maximum 20 samples).
START Key:	Starting the test
CLEAR Key:	Clearing sample results from memory or average value depending on what is shown on display
PROG Key:	Entering into programming mode (Explained in programming section).
STOP Key:	Stopping the test

## OPERATING MANUAL

### 5. SENSOR (GREEN LED)

In M2 or M3 mode the GREEN light indicates proper sensor position before start of the test. In M1 mode it is to ensure correct test length of yarn under test.

### 6. SPEED KNOB

This knob is used for setting the desired motor speed.

### 7. STOP (RED LED)

The RED light indicates that the test has stopped manually or test over condition in Mode M1.

### 8. YARN CLAMPS

There are two clamps fixed at the two ends of the instrument. One clamp is fixed on the moving crosshead while the other on the motor shaft. The twisted yarn is to be held between these two clamps.

### 9. MEASURING SCALE

A graduated scale in inches or cm is fixed on the top of the instrument to ensure desired test length. It can also give elongation of yarn at untwisted position.

### 10. TENSIONING WEIGHT

Set of weights with pulley are provided to apply some tension to the yarn under test. Typically weight is calculated as denier of yarn \* 0.05.

### 11. STOPPER

In order to prevent the yarn from becoming weak a mechanical stopper is provided at the front of the instrument. This avoids elongating the yarn further at untwist position. Normally the stopper is set at approx. 50% of expected elongation.

## OPERATION PRODECURE

1. Put on the mains power to the instrument. While booting the following message is displayed:  
*Twist Tester V-1*
2. After boot is complete the machine enters the test mode and shows: *M1 S 01 0000 TPM*

Mode	Type of Twist	Sample Number or Average	Twist Count	Unit
M1, M2 or M3	S or Z	01 to 20 or AV	0000 to 9999 or 00.00 to 99.99	TPM or TPI

## OPERATING MANUAL

3. To set the desired test length, press the TEST LENGTH key. The display mode changes and it shows: *SET TEST LEN 500* indicating the current test length. This length can be set between 25 mm to 500 mm or 1" to 20" depending upon value displayed should be TPM or TPI with the help of INC or DEC keys.
4. To set the TPM count, press the SET TWIST key. Once again the display mode changes and it shows *SET TWIST 980*.  
Note: Set the value to 2% to 5% below the expected TPM count and press ENTER. This takes into account the motor inertia so that the motor stops at the expected TPM.
5. Clear all the values with AV value selected with CLEAR key.
6. Clamp the yarn in the clamp fixed on the moving crosshead.
7. Pull the other end of yarn through guide of other clamp on motor shaft. While clamping ensure that the clamp on moving crosshead is at starting '0' position, green sensor LED is 'ON', desired test length and twist count are selected and yarn is under correct tension of weight.
8. After ensuring all the above points, clamp the yarn at other end (motor shaft).
9. Select twist direction using the S/Z Key.
10. Initially keep speed adjustment knob at left-hand stop.
11. Select operation mode by pressing the MODE Key.

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### MODE M1: FIXED COUNT UNTWIST

- I. Start the test by pressing START key.
- II. The motor will start untwisting the yarn and LCD display will start counting.
- III. Gradually increase the speed of motor. Once the set TPM count is reached, bring the knob to left hand stop.
- IV. When set TPM Count is reached, the motor will stop automatically and STOP LED indication comes ON.
- V. At this stage, move chalk on untwisted yarn for separation of filaments in the yarn.
- VI. Insert the pin in untwisted yarn from left side of the instrument (moving crosshead side) and start moving the pin to the motor end and go on opening the yarn.
- VII. If the yarn is not fully untwisted (Set TPM count is less than expected) at auto stop position, then press FOR key for opening the remaining twists. Ensure that while operating FOR key, the SPEED control knob is at left hand stop (minimum position). Keep the FOR key pressed until the yarn is fully untwisted. Conversely, if the test is overrun (Set TPM count is more than expected) the yarn will start twisting in opposite direction. Now press the REV Key. This will reverse the motor direction and twists in opposite direction will open and counting will be also reversed.

## OPERATING MANUAL

### MODE M2: UNTWIST/TWIST

- I. Set the stopper at the left front side of the instrument at approx. 50% of expected elongation.
- II. Start the motor by pressing START key.
- III. The motor will start untwisting the yarn and LCD display will start counting.
- IV. Gradually increase the speed of motor and observe the movement of the clamp
- V. After untwisting completely, the yarn will start re-twisting and the clamp on moving crosshead comes back to start position. The built-in sensor senses this position and motor stops automatically.

### MODE M3: DOUBLE UNTWIST/TWIST METHOD

- I. Set the stopper at the left front side of the instrument at approx. 50% of expected elongation.
- II. Start the motor by pressing **START** key.
- III. The motor will start untwisting the yarn and LCD display will start counting. During untwisting, the yarn is elongated and clamp of moving crosshead moves towards left.
- IV. Gradually increase the speed of motor and observe the movement of clamp on moving crosshead.
- V. After untwisting completely, the yarn starts re-twisting and the clamp on moving crosshead moves towards right. Again slowly reduce the motor speed near '0' position. The sensor senses this '0' position and motor automatically reverse the direction and second untwist/twist cycle is starts.
- VI. Again gradually increase the motor speed and observe the movement of clamp on moving crosshead.
- VII. Reduce the motor speed to minimum near '0' position.
- VIII. During second untwist/twist cycle, the LCD display start counting in reverse direction (down count) to display actual twists in the yarn.
- IX. The motor stops automatically after finishing 2 untwist / twist cycles and direct TPM is displayed.

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12. After test of sample number 1 is over, press ENTER key to store the reading in the memory.

Repeat procedure for next samples maximum up to 20 samples.

13. Prepare the next sample and repeat if necessary.

## SPECIAL INSTRUCTIONS

The automatic operation in Mode M3 mentioned here requires untwisting / twisting operation twice. This reduces the errors created by frictions and other parameters, which cannot be exactly simulated.

Typically, the pulley itself provides sufficient weight and is suitable for most of the test applications. Thus additional weights and stopper are not required. However, additional weight and stopper can be used if desired.

The instrument is meant for testing a wide variety of yarns / threads. Results obtained are accurate and repeatable for most types. However, for certain types of yarns readings may vary per sample and in such cases average readings are required.

Handling of yarn before starting the test is extremely important to ensure accurate and repeatable results. For example yarn should not be allowed to untwist while mounting, it should be properly gripped, the setting of length and sensor are also critical.

Note: After completion of 20 sample readings, all readings are required to reset with the help of CLEAR key with average (AV) value selected on LCD display.

## MAINTENANCE

This instrument does not need any maintenance except regular cleaning and lubrication of sliding guides of moving crosshead.

## GUARANTEE

The TT-MCT carries a guarantee for period of 12 months for free repairs against any manufacturing defects. However this guarantee is void in case of physical damage or attempted repairs at customer end. The instrument is required to send to our works for free repairs under warranty.

## MODEL VARIATIONS

### TT-MCTF

The MCTF version of the twist tester is similar to the MCT except that the length is fixed at 250mm. All the other parameters such as mode of operation, display of units are exactly the same.

The TEST LENGTH Key for the MCTF shows a fixed value 250 and this cannot be changed. Also the PROG button does not provide any functionality.

## OPERATING MANUAL

### SPECIFICATIONS

Range	: Up to 9999 TPM or 99.99 TPI
Resolution	: 1 TPM or 0.01 TPI
Elongation Range	: 110mm or 4in with tolerance of 15mm or 0.6in
Motor Speed	: Adjustable up to 1500 RPM
Operation Modes	: M1: Fixed Twists M2: Twist and Untwist M3: Modified Twist and Untwist
Tension Weights	: 100 Grams adjustable in steps of 5 Grams
Supply	: 230 V AC, 50 Hz, 30 W
Size	: 1000 mm x 150 mm x 200 mm (approx.)

MODEL : TT-MCT

Yarn Test Length : 25 mm to 500 mm (metric unit) or 1" to 20" (imperial unit) adjustable

MODEL : TT-MCTF

Yarn Test Length : 250mm Fixed

### CONTACT INFORMATION

#### Office

D-218 ANSA Industrial Estate  
Saki Vihar Road, Andheri East  
Mumbai – 400 072  
Tel: +91 89990 65546  
Website: [www.sncmumbai.in](http://www.sncmumbai.in)

#### Works

M/S. Systems and Controls  
C-15 MIDC Malegaon – Sinnar  
Nashik – 422 103  
Tel: +91 70281 33547  
Email: [info@sncmumbai.in](mailto:info@sncmumbai.in)