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CAPTEST

DIGITAL TORQUE TESTER

Operator Manual and Technical Data

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FORCE & TORQUE TEST SOLUTIONS

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This manual

This reference manual covers the CAPTEST digital torque tester, its operation and technical specification.

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Part no. 431-434-02

Contents

The CAPTEST Digital Torque Tester

CAPTEST is used to measure and record the torque required for the opening and closing of screw-caps. CAPTEST stores up to 240 readings. The stored data can be sent to the display or to a data printer (e.g. EPSON P40) connected to the serial RS232 port. Statistical evaluation is accomplished by means of a Mitutoyo statistics processor (e.g. Mitutoyo DP-1 VR), which interfaces directly with CAPTEST.

The splash-proof, stainless steel housing and the robust construction of the clamping fixture guarantee continuous and reliable operation in laboratory and tough production environments.

The built-in rechargeable battery, in combination with the latest power-saving technology, enables extended operation, independent of a mains supply. In continuous operation, a minimum 72 hours operating time can be achieved. Automatic shut-off occurs if the device is not used for a period of about 2 minutes, enabling the device to operate for days without charging. When the battery charge is low, the display will show 'BAT'. The battery is prevented from being low-level discharged by a security function that switches the device off automatically.

When performing a measurement, the peak value of the applied torque is displayed.

General Operating Instructions

Before using

On delivery, please check your CAPTEST for damage and completeness. Should there be any defects, inform your CAPTEST distributor immediately.

- Screw the vertical grips into the clamping fixture, ensuring a centred and symmetrical arrangement.
- Charge the internal battery with the mains adapter provided: connect the charger to the CAPTEST before plugging it in.

The device can be operated with the mains adapter connected.

Battery management

CAPTEST is equipped with a modern power-saving technique to achieve a relatively long operating time. If you don't use the device for a period of 2 minutes, it will switch off automatically. To take new measurements, press the ON key; CAPTEST is immediately ready to use. The readings remain stored if the device is switched off manually or automatically. When the maximum operating time is reached, the symbol 'BAT' is displayed. Please charge your CAPTEST as soon as possible as described above. If you continue using the device without loading, it will switch off automatically shortly afterwards in order to prevent the battery from low-level discharge.

Interfaces

The interface plug is placed at the rear of the device. An RS232C or a DIGIMATIC cable can be connected. Be sure

that both the device to be connected and your CAPTEST are switched off before connecting.

RS-232 protocol: 9600 baud, 8 bit, 1 stop-bit, no parity, no handshake

Overload

CAPTEST is overload-protected by a mechanical end stop. This protection prevents the internal sensor from being damaged. The scale range, however, does not extend to this load range. If the scale range is exceeded, 'oL' (overload) is displayed.

Maintenance, cleaning, repair

CAPTEST is largely maintenance-free. The spindle drive of the clamping fixture has to be greased occasionally. Please clean the parts with a soft, moistened cloth and don't use any strong cleansing agents or solvents. Repairs will only be done by the manufacturer. If a repair is required, please return your CAPTEST to your distributor and describe any damage or faults you have identified.

Calibration

CAPTEST is calibrated carefully, so the precision of the measurement will be guaranteed for one year. After that time it is recommended to have the device checked annually by the manufacturer.

You can also have the device recalibrated and certified. If you do your own calibration, it is done in the following way:

- switch the device off
- press and hold the ZERO key
- press the ON key while holding the ZERO key

The device is now in the 'continuous' mode and the actual applied torque is displayed in the scientific unit N.m, together with the tilde '~'. Now you can apply a well-known torque and check the reading.

Safety issues

CAPTEST works with low-level voltages. In normal use there is no risk of electric shock. The splashproof housing normally prevents fluids from penetrating, but it should not be exposed to jets of water or immersed, or the electronics may be damaged. If you suspect any penetration of fluid, send the device to your CAPTEST distributor.

Important

Be careful if the device is connected to the mains supply. The mains adapter/charger is not splashproof. In case of a penetration of fluid into the adapter there is a danger of electric shock with risk to your personal safety.

Waste disposal

CAPTEST works with NiMh-battery. This battery must not be put into normal waste, but should be taken to battery recycling.

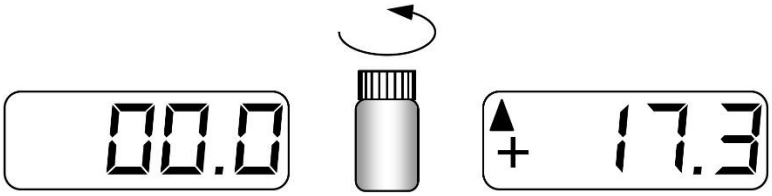
Using your CAPTEST

Instructions can also be found on the underside of the instrument.

Switch on

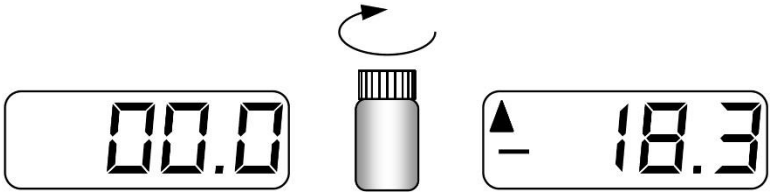
Device is ready for testing

Test: opening a closure



Peak value of applied anticlockwise torque

Test: closing a closure



Peak value of applied clockwise torque

Clear the current reading

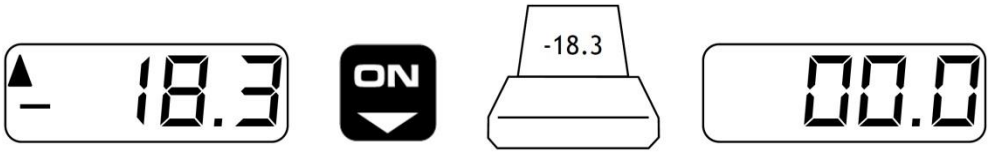
Device is ready for further measurement

Store the current reading

Pressing ON stores the reading and clears the display

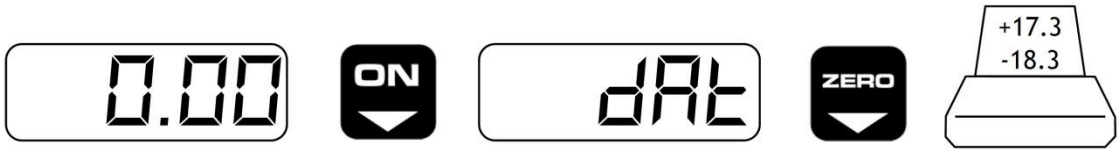
The reading is added to any data already stored.

Print the current reading



When printing the reading, the data is also stored. If no printer is connected, the reading is still added to any data already stored.

Print the stored data



All stored data is sent to the printer. Press the ON button to pause, or the ZERO key to stop printing.

Clear the memory

Memory cleared

Switch off

Blank display, device is off

If the tester is not operated for a period of 2 minutes, the tester automatically switches off.

Return to test mode

Operation is resumed

Press ON to cancel switching off.

Using a Mitutoyo Mini-Processor

The example used here is the Mitutoyo DP-1 VR, but other Mitutoyo mini-processors may be used.

The DP-1 VR mini-processor is an easy-to-use instrument for data analysis and statistical evaluation of CAPTEST data. The integral printer documents both the CAPTEST data and the results of analysis.

Before using the equipment, please read the DP-1 VR operating instructions. Some aspects of operation with CAPTEST will differ.

- The DP-1 VR [DATA] key is disabled. CAPTEST sends the data to the DP-1 VR: ON > ZERO.
- Time-controlled data acquisition by DP-1 VR is not possible.

Connection and use

Ensure that both the CAPTEST and DP-1 VR are switched off.

- Connect the CAPTEST to the DP-1 VR with the enclosed special Mitutoyo printer cable.
- First switch on the DP-1 VR [Power] and then the CAPTEST (ON key).
- To clear any stored DP-1 VR data, press the [CL] key.
- After you have taken a measurement, you can send CAPTEST data to DP-1 VR by pressing the ON key; data will be stored simultaneously in the CAPTEST and the DP-1 VR, so it is not necessary to transmit complete CAPTEST data to DP-1 VR at the end of a batch for the purpose of later analysis.

Note: If you do not want to print CAPTEST data each time it is sent, but only to have statistical analysis data at the end of a test batch, disable printing using the [Printer] key. CAPTEST data will still be stored.

Switching off

Always switch the CAPTEST off first, and then the DP-1 VR. This is important, because CAPTEST is equipped with an automatic interface detection.

Detach the interface connection only if both the CAPTEST and DP-1VR are switched off.

Setting tolerance limits

- Clear stored data: press the DP-1 VR [CL] key and clear the CAPTEST memory: ON > ON > ZERO.
- Press [TOL. LIMIT] on the DP-1 VR to begin setting values.
- Apply torque to the CAPTEST; to the upper or lower limit required (sequence does not matter). Transmit the value to the DP-1 VR: ON > ZERO.
- Repeat the last step to the second limit torque.
- Press the [TOL. LIMIT] key of the DP-1 VR. This will complete the setting and print the tolerance limits:

  LSL=lower limit; USL=upper limit, TOL=tolerance range.
- For each measurement transmitted to the DP-1 VR, red and green indicator lights will show if the result is below the lower limit, above the upper limit, or within limits.
- When you have completed a batch of measurements, make sure the printer is on and press the DP-1 VR [STAT] key to print the data values and histogram.

Technical Data

Range	5 N.m (44.2 lbf.in) clockwise and anticlockwise
Min peak	0.2 N.m (1.8 lbf.in)
Accuracy	better than 1%, at 20(±5)°C
Sampling rate	250 Hz in continuous mode
	8 or 60 Hz in peak mode
Data storage	240 readings, non-volatile memory
Clamping fixture	adjustable 15 mm to 130 mm, 3-bearing spindle
Interface	RS232C, Mitutoyo DIGIMATIC
Batteries	built-in NiMh battery, 4.8 V, 600 mAh
Mains adapter	Input 230 VAC, 50 Hz, 1.5 VA
	Output 8.2 VDC, 150 mA. Isolation: T40 E; IP20
DC-Input	5 mA (charge: max. 60 mA)
Charging time	8 h will provide 75% charge, delivering up to 72 hrs continuous operation
Housing	IP54-rated, stainless steel
Protection category	III (SELV) IEC 536/DIN VDE 0106
Environment	designed for indoor use
	max. altitude 2000 m
	temperature 5 to 40°C
	max. rel. humidity: 80% up to 31°C, by linear decrease to 50% at 40°C
Dimensions	width 180 mm, height 150 mm, depth 170 mm
Weight	2.3 kg

Configuring CAPTEST Settings

Settings for the CAPTEST are available from the configuration menu, and are not intended for the regular user to access. Please note the following:

- The settings you make are not visible from the display (e.g. there is no indication of units)
- There is no confirmation of the settings you choose: be methodical.
- There is no 'exit' from the configuration settings other than by pressing ENTER and accepting a setting.
- Settings are selected and made only one at a time.
- Settings are retained when the unit is switched off.

The settings menu

Settings are found and saved one at a time. To enter the settings, hold ZERO while pressing ON.

- Press the ON key until the display shows ***SEt***.
- Press ENTER: the display will show ***U1*** (the first settings item)
  - to set ***U1*** (use lbf.in as the units of measurement), press ENTER
  - or to find another setting in the list, press ON until it displays, and then press ENTER to set it.

Pressing ON returns you from the settings menu back to continuous mode measurement.

Settings

Units of measurement		
	U1	lbf.in
	U2	N.m
Data transmission frequency (continuous mode) (data acquisition frequency in peak value mode remains unaffected. at 250 Hz)		
	F1	8 Hz
	F2	60 Hz
Delay period for peak value recognition		
	t1	~ 2 sec
	t2	< 1 sec
Measurement threshold for peak value recognition		
	L1	0.14 N.m (1.2 lbf.in)
	L2	0.07 N.m (0.6 lbf.in)
Auto-off function		
	Au0	off
	Au1	on
Minus sign in the data output		
	S-	shows
	S	hidden

CE Declaration of Conformity

CE Declaration of Conformity

The manufacturer

KREIENSEN MESSTECHNIK
Erwinstr.79
D-79102 Freiburg
Germany

declares the conformity of the product

torque test equipment
C A P T E S T

to the following standards:

EN 61000-6-1-2-3-4:2007

in accordance to the directive 2006/95/EC (electromagnetic compatibility)

EN 61010-6-1

Safety requirements for electrical equipment for measurement
in accordance to the directive 73/23/EEC (low voltage directive)

Freiburg, 17.10.2007

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Mecmesin : a world leader in affordable force and torque testing solutions

Since 1977, Mecmesin has assisted thousands of companies achieve enhanced quality control in design and production. The Mecmesin brand represents excellence in accuracy, build, service, and value. In production centres and research labs worldwide, designers, engineers, operators, and quality managers endorse Mecmesin force and torque testing systems for their high performance across countless applications.

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