



TECHANGLE TECHNICAL PAGE

November 30, 2005

The **TECHANGLE™** wrench is an electronic torque and angle wrench. It is designed to provide

basic electronic features, including UNITS CONVERSION, (Nm, ft-lb and in-lb) TRACK, PEAK HOLD, and PRESET functions on a robust, yet ergonomically comfortable, wrench platform. The ANGLE mode utilizes piezo gyroscope technology that requires no mechanical reference. It is priced to compete with mechanical bending beam, dial, preset and adjustable click-type torque wrenches and angle gauges.



IMPORTANT SAFETY INSTRUCTIONS



WARNING Risk of flying particles.

Over-torquing can cause breakage. Force against flex stops on flex head can cause head breakage. An out of calibration angle wrench can cause part or tool breakage. Broken hand tools, sockets or accessories can cause injury. Excess force can cause crowfoot or flare nut wrench slippage.



☐ **Read this manual completely** before using the TECHANGLE™ wrench.

☐ To insure accuracy, work must not move in angle mode.

☐ For personal safety and to avoid wrench damage, follow good professional tool and fastener installation practices.

☐ Periodic recalibration is necessary to maintain accuracy.



☐ **Wear safety goggles, user and bystanders.**

☐ Be sure all components, including all adaptors, extensions, drivers and sockets are rated to match or exceed the torque being applied.

☐ Observe all equipment, system and manufacturer's warnings, cautions and procedures when using this wrench.



☐ Use the correct size socket for the fastener. .

☐ Do not use sockets showing wear or cracks.

☐ Replace fasteners with rounded corners.

☐ **To avoid damaging the wrench:** Never use the wrench with the power off. Always turn ON the wrench so the applied torque is being measured.

☐ Do not press ON/RESET while torque is applied or while the wrench is in motion.

☐ Never use this wrench to break fasteners loose.

☐ Do not use extensions, such as a pipe, on the handle of the wrench.

☐ Check that the wrench capacity matches or exceeds each application before proceeding.

☐ Verify calibration if dropped.

☐ Make sure the ratchet direction lever is fully engaged in the correct position.

☐ Verify the calibration of the wrench if you know or suspect its capacity has been exceeded.

☐ Do not force the head of flex head drives against stops.

☐ Always pull - do not push - on the wrench handle and adjust your stance to prevent a possible fall should something give.



WARNING Electrical Shock Hazard.

Electrical shock can cause injury. Plastic handle is not insulated.

☐ Do not use on live electrical circuits.





SAVE THESE INSTRUCTIONS

SPECIFICATIONS

Ratchet Head: square drive, 36 teeth, sealed flex

Display 4-digit LCD, torque units, CCW and battery condition flags

Sealed Key Pad

-  **POWER** - ON/OFF - auto self check - torque zero - angle reset
-  **UP** - increments torque and angle setting
-  **DOWN** - decrements torque and angle setting
-  **UNITS** mode select (Nm, ft-lb, in-lb, °)

Functions **Set** adjustable torque and angle - audible and tactile alert
 Track – torque or accumulated angular rotation with real time update
 Peak Hold - 10 sec. flashing at torque release

Accuracy (72°F)

ANGLE: $\pm 1\%$ of reading $\pm 1^\circ$ @ angular velocity $> 10^\circ/\text{sec} < 180^\circ/\text{sec}$

TORQUE:	CW	CCW	
(non-flexed	$\pm 2\%$	$\pm 3\%$	of reading, 20% to 100% of full scale
ratchet head)	$\pm 4\%$	$\pm 6\%$	of reading, 10% to 19% of full scale
	$\pm 8\%$	$\pm 10\%$	of reading, 5% to 9% of full scale

Preset Range

ANGLE: **5 to 360°** CW or CCW (Display Resolution 1°)

TORQUE: (Display Resolution as shown below)

Model	Square Drive	ft-lb	Nm	in-lb	overload (ft-lb)
ATECH2FR100	3/8 in	5.0-100.0	13.5-135.0	60-1200	125
ATECH3FR250	1/2 in	12.5-250.0	17.5-340.0	150-3000	312

Operating Temperature 5 to 42°C (40 to 110°F)

Storage Temperature -20 to 50°C (-1 to 122°F)

Measurement Drift ANGLE: -0.12 Angular Degrees per Degree C
TORQUE: +0.01% of reading per Degree C

Humidity - up to 90% non-condensing

Dimensions -	length	weight
ATECH2FR100	17 in.	2.2 lbs.
ATECH3FR250	26 in.	3.7 lbs.

Battery - three "AA" Alkaline cells, up to 40 hours continuous operation.

Auto Shut-off - after 2 minutes idle

CERTIFICATION

TECHANGLE™ wrenches are calibrated at the factory using angular displacement and torque measurement instruments that are traceable to the National Institute of Standards and Technology (N.I.S.T.). Torque parameters comply with ISO 6789-2003 and ASME B107-28-2005. Note: no U.S. or International Standards exist for angle wrenches.

INTRODUCTION

The Snap-on **TECHANGLE™ wrenches** digitally display and monitor fastener torque and angular rotation (turn).

Display Modes:

Torque—wrench functions as an adjustable torque wrench.

Angle—wrench functions as an adjustable angle wrench and simultaneously monitors torque to prevent fastener or wrench overload.

Settings – Adjustable torque and angle settings for fastener installation specifications. The preset values are programmable from 5% to 100% of full-scale torque and 5 to 360 degrees of rotation. The scrolling display rolls-over at both ends for convenient and quick setting.

Overload - If the wrench is used beyond 100% torque capacity, the audible tone will pulse rapidly to warn the user to stop.

Zero/Reset - Automatic self-check, torque zero and angle reset at power-on and any time the ON/RESET key is pushed. (This is not a calibration check).

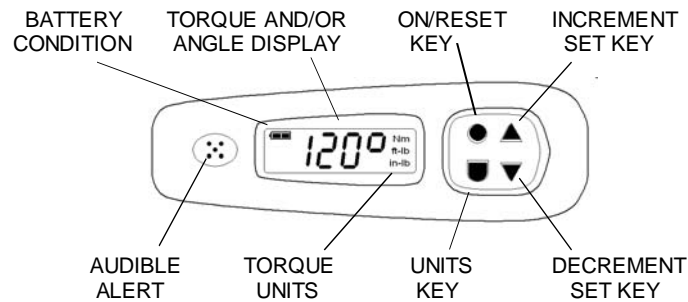
FUNCTION DETAILS

To **PRESET** the wrench, select the **UNIT** of measure “Nm, ft-lb, in-lb or degrees (°)” desired. Use the **UP** and **DOWN** keys to set the torque or angle required.

In the **torque display mode**, the display shows the torque PRESET value until 5% or more of full scale torque is applied. The display then switches to TRACK mode showing the applied torque in real time. When applied torque is within 2% of the preset value, the buzzer will sound for 1/2 second and the handle will vibrate continuously until torque is released. At torque release the display shows the PEAK value applied flashing for 10 seconds. If torque is re-applied during the 10-seconds the display will immediately switch to TRACK mode. If any key is pushed during the 10-seconds the PEAK value will be cleared. If wrench full-scale torque is exceeded the buzzer will pulse and the handle will vibrate until torque is released. Exceeding 125% of full scale the display will lockup showing “- - -” and the wrench must be reset by pushing the ON button.

In the **angle display mode**, the display shows the angle PRESET value. Angle measurement is held in reset until 5% of F.S. torque is applied. Rotation (turn) is accumulated in angular degrees. When torque is released, the accumulated torque and angle values will flash alternately for 10 seconds. The display will continue to accumulate if torque is reapplied within the 10 seconds. This allows time for reverse (ratchet) motion. When the accumulated angle equals the angle preset value, the buzzer will sound for one second and the handle will vibrate until torque is released. If full-scale torque is reached first, the buzzer will pulse and the handle will vibrate until torque is released. As above, after angle preset is reached, and torque is released, the total angle accumulation and the PEAK torque will be displayed alternating for 10 seconds or until any key is pushed. If angle preset is reached and torque is released, angle accumulation is reset to zero automatically. This allows moving on to the next fastener immediately.

OPERATOR INSTRUCTION



Operator Interface

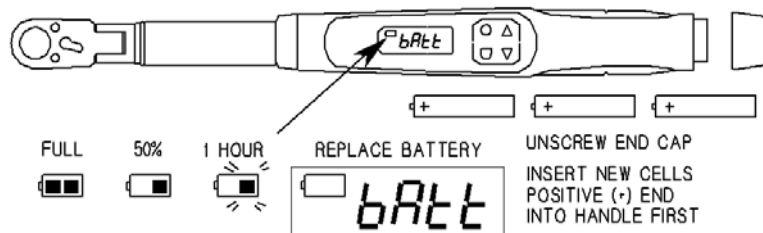
- 1 Turn the wrench on by momentarily pushing the ON/RESET key. The display will return to the mode of operation and preset values previously set up.
- 2 To change the mode of operation, TORQUE or ANGLE, scroll the selections by momentarily pushing the UNITS key. The preset values for each mode will be displayed.
- 3 Use the UP and DOWN keys to change the preset values. (Note: Torque is also measured in ANGLE mode).
- 4 Grasp the center of the handle, (do not pull on the endcap) and slowly apply torque to the fastener until the audible sounder and handle vibration alerts you to stop.
- 5 Release torque. Note the peak readings flashing on the display for 10 seconds or until the ON/RESET key is pushed to clear the display.

NOTES:

1. If the display shows "Err0" at power on, the wrench is damaged and must be returned for repair.
2. If the display shows "ErrA" in the angle mode, fastener rotation speed has exceeded the capacity of the wrench.
3. The wrench must be held still during angle mode reset. Motion is indicated by alternating outside center segments of the display "- -"
4. Remove battery when stored for extended periods.

BATTERY REPLACEMENT

Replace with three "AA" Alkaline cells only. (Available anywhere)



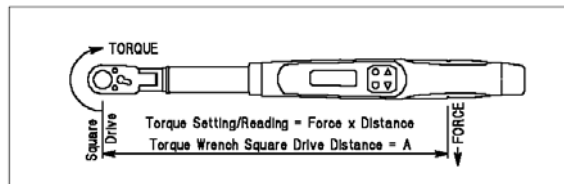
MAINTENANCE / SERVICE

Clean the wrench by wiping with a damp cloth. Do NOT use solvents, thinners or carburetor cleaners. Do NOT immerse in anything. Service, repair and calibration are to be done by Snap-on Service Centers only. Contact your Snap-on Tools representative. Ratchet head repair can be done by Snap-on Representative or user.

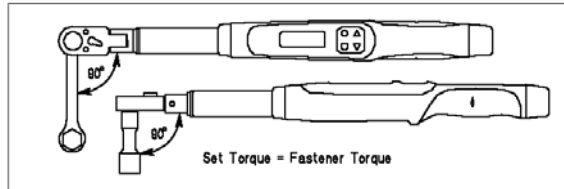
USE OF ADAPTORS, EXTENSIONS AND UNIVERSALS

Anytime an adaptor, extension or universal is used with a torque wrench in such a way that the fastener distance is different than the torque wrench square drive distance, an adjustment to the set torque is required to get proper fastener torque.

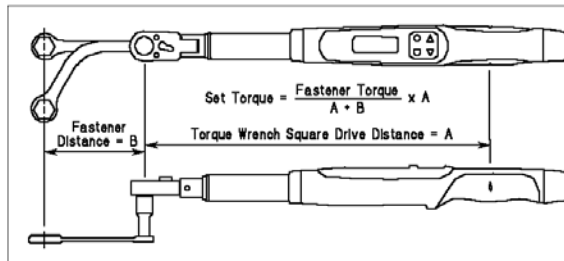
Fastener torque equals torque wrench square drive torque. Wrench setting is equal to desired fastener torque.



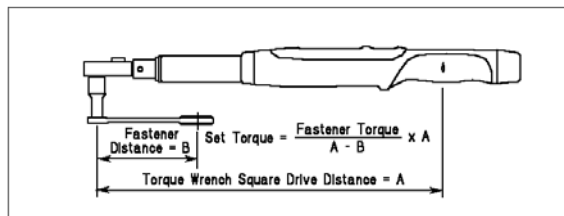
Fastener torque equals torque wrench square drive torque. Wrench setting is equal to desired fastener torque.



Fastener torque is greater than torque wrench square drive torque. Calculated setting will be lower than desired fastener torque.



Fastener torque is less than torque wrench square drive torque. Calculated setting will be higher than desired fastener torque.



When using wobble extension or a universal, do not exceed more than 15 degrees of offset from perpendicular drive. Do not use a long extension with the flex-drive at full flex.

