

KNC Model 3714 Portable Torque Calibrator



Product Description

The Model 3714 Portable Torque Calibrator by King Nutronics Corporation is a microprocessor-driven benchtop system designed to generate, control, measure, and display the rotational forces applied to torque measuring instruments within a range of 0.5 in-oz to 250 ft-lbs. Users can calibrate a variety of general purpose torque measuring instruments, such as wrenches, screwdrivers, T-handle drivers, and torque watches in the clockwise and counter-clockwise directions using the included adapters.

The Model 3714 Portable Torque Calibrator accommodates all dial, direct reading, beam type, and micrometer (click type) torque measuring instruments. The system incorporates a unique precision torque loading system consisting of a hand wheel coupled to a torque measuring transducer via a double-reduction worm gear.

Three operating modes are available for testing various torque measuring instruments. The **TRACK** mode displays instantaneous torque readings throughout the measurement range in real time in the upscale and downscale directions. The **MAX** mode displays ascending torque values in real-time until the applied torque is backed-off, at which point the maximum torque is displayed until it is cleared. A **FIRST PEAK** mode is also available for testing micrometer (click type) torque measuring instruments. In the **FIRST PEAK** mode, ascending torque values are displayed in real time until the click indicator releases. The first peak torque reading, representing the point at which the click indicator actuates, will then be displayed until it is cleared.

The worm gear mechanism eliminates the potential for errors and inaccuracies introduced by variations in the load applied by the operator when conventional torque calibrators are used. By precisely controlling the load applied to the unit under test, the Model 3714 Portable Torque Calibrator offers measurement accuracy of $\pm 0.1\%$ of reading from 10% to 100% of the transducer measurement range, and repeatability of $\pm 0.05\%$ of reading or ± 0.2 in-oz, whichever is greater. An electromagnetic brake prevents the hand wheel from turning when the calibration point is exceeded, protecting the unit under test from damage due to over-torquing. A reaction torque arm and restraining post prevent the handle of the unit under test from moving during the calibration process, while a removable Lexan shield protects the operator in the event of tool breakage.

A small console connected to the torque calibrator unit is used to control the system. Test points are programmed using a keypad and the target torque and measurement status are shown on the digital display. The console also incorporates an RS-232 serial interface, enabling test data to be logged using a PC compatible computer or other device. The torque calibrator, control console, and adapter kit are packed in a rugged polymer storage case. For remote operation in locations without AC power, a compact 5 VDC rechargeable battery pack (KNC P/N 3714-202-1) is available.

General Specifications

Characteristics	Specifications
Temperature range: Operating Storage Humidity (operating)	+15° to +35° C -40° to +75° C 5% to 95% RH, non-condensing
Input power: Voltage Current (max.) Fuse type (2 required)	115 to 220 VAC, 50 to 60 Hz 1.5 Amps 3 AG, 2 Amps
Display units	ft-lb, in-lb, in-oz, n-m, kdn-m, kg-m, and kg-cm
Dimensions, inches: Torque calibrator assembly Control console	28 (W) x 12 (D) x 16.75 (H) 16 (W) x 10.5 (D) x 4 (H)
Weight: Torque calibrator assembly Control console	80 lbs. 8 lbs.



Performance Specifications

Characteristics	Specifications
System range	0.5 in-oz to 250 ft-lbs
System repeatability	±0.05% of reading or ±0.2 in-oz, whichever is greater. Based on average of five readings.
System accuracy	±0.1% of reading from 10% to 100% of transducer range
Transducers: Quantity Range	3 0 to 5 ft-lbs, 0 to 50 ft-lbs, and 0 to 250 ft-lbs
Resolution: 0 to 10 ft-lbs 10 to 100 ft-lbs 100 to 250 ft-lbs	0.001 ft-lbs 0.01 ft-lbs 0.01 ft-lbs

Case Specifications

Characteristics	Specifications
Case type	IAW MIL-C-4150H, Type II, Style 1
Color	Gray blue, IAW FED-STD-595, chip no. 24148
Dimensions (inches): Model 3714 Torque Calibrator case assy. Recalibration Kit case assy. 1 Recalibration Kit case assy. 2	33.125 (L) x 21 (W) x 20.625 (H). Contains torque calibrator, control console, and adapter kit. 33.125 (L) x 21 (W) x 20.625 (H). Contains all items in Recalibration Kit except weights. 13.125 (L) x 13.125 (W) x 14.375 (H). Contains Class C slotted weights for Recalibration Kit.
Weight: Model 3714 Torque Calibrator case assy. Recalibration Kit case assy. 1 Recalibration Kit case assy. 2	43 lbs empty, 140 lbs full. Contains torque calibrator, control console, and adapter kit. 46 lbs empty, 184 lbs full. Contains all items in Recalibration Kit except weights. 11 lbs empty, 74 lbs full. Contains Class C slotted weights for Recalibration Kit.

Model 3714 Recalibration Kit

The Model 3714 Recalibration Kit (KNC P/N 3714-15-1), available separately, contains all of the items necessary for field maintenance and “dead weight” calibration of the instrument. The Recalibration Kit consists of a three-piece calibration arm, a set of Class C circular slotted calibration weights, a weight pan, and a pulley and cable linkage designed to eliminate the potential for cosine errors. A compact dot-matrix printer is also included in the kit for generating hard copies of calibration data. All of the items comprising the recalibration kit are packed in two rugged polymer storage cases.

True torque is dependent on the actual applied mass and the length of the calibration arm. The calibration arm furnished with the P/N 3714-15-1 kit is comprised of sections that can be assembled in various lengths, therefore, only 60.5 lbs of dead weight is required to calibrate the system throughout its full-scale range from 0.5 in-oz to 250 ft-lbs.

Recalibration of the Model 3714 Torque Calibrator is software-driven. The instrument software automatically calculates the true torque based on the length of the calibration arm and the mass value of the weights used, while compensating for local gravity effects and the ambient temperature. The true torque is then compared to the torque measured by the transducer. If the transducer is out of tolerance, it can be easily standardized using the built-in software.

Ordering Information

Part No.	Description
3714-1-1	Portable Torque Calibrator, Complete Kit. Includes 3714-3-1 calibrator and 3714-15-1 recalibration kit described below.
3714-3-1	Portable Torque Calibrator Only. Includes control console, interconnecting electrical cables, adapter/transducer kit, and storage case.
3714-15-1	Recalibration Kit. Includes Class C slotted weights, weight pan, three-piece calibration arm, pulley and cable linkage, compact dot-matrix printer, and two storage cases.
3714-202-1	5 VDC, 36 Amp Hour Rechargeable Battery Pack (Optional Accessory). With built-in AC charger and interconnecting cables in a protective wooden case. Case dimensions, inches: 7 (L) x 10 (W) x 10 (H). Weight: 21 lbs.

