AUDITOR™

AHCTS Series
Continuous Rotation
Torque Tool Test stands

Users Guide

AIMCO

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INTRODUCTION

DESCRIPTION

The Portable Torque Test Stands are designed specifically to test the torque output of a variety of continuous rotation torque tools. The AHCTS Stand features include a LCD graphics display, battery powered for remote testing, and movable reaction devices for a variety of tools. There are a variety of reaction devices available *contact us to ensure reaction devices are suitable for your specific tools*. The display has serial output for use with a serial printer or Windows PC (with any terminal emulator program – see serial settings in this manual – or special software available only from Auditor). Optional instruments are offered providing larger screens and data collection if required.

NOTE: The AHCTS series of test stands are available with a wide range of configurations that are driven by the specific users' needs.   You may notice many of the images contained in this manual may vary in reference to the actual unit that was configured.
However, Auditor branded instruments feature similar user interfaces and menu structure. When appropriate, an additional manual specific to the instrument configured on the stand may be included in the shipping documents.

SYSTEM SPECIFICATIONS

Dimensions of Stands	Small Stand Width: 8", Height: 15", Depth: 8", Weight 35 Lbs. Medium Stand Width: 12", Height: 15", Depth: 12", Weight 40 Lbs. HD Med Stand Width: 14", Height: 15", Depth: 19", Weight 45 Lbs. HD Large Stand Width: 18", Height: 15", Depth: 24", Weight: 50 Lbs.
Power Requirements	9V DC, 150 mA (120V mains adapter standard, 240v mains adapter available) or internal NiMH batteries.
Operating Temperature Range	0˚C to 50˚C
Data Communications	RS-232-C
Accuracy	1% of Indicated Reading with Auditor series transducers.
Range	10% to 100%
Lockout Combinations	Mode, Auto Clear, Mode & Auto Clear, Engineering Units, Mode & Engineering Units, Auto Clear & Engineering Units, Mode & Auto Clear & Engineering Units, None (Off)
Display	4 active digits
Units	Eight (8) available engineering units: Oz.in., Lb.in., Lb.ft., Nm, cNm, KgfCm, gfCm, Kgfm. Special units available, please inquire.
Filter	Selectable Hz filter: 125, 250, 500, 1000, 1500, & 2000
Full Scale Capacities/Models	500 Ft Lb, 1000 Ft Lb, 2500 Ft Lb, 5000 Ft Lb, 7500 Ft Lb
Configuration Styles	Base plate, casters, legs, legs & casters

OPERATION

DISPLAY OPERATION

Button Function:

1: Turns the display On
   Zeros the Transducer
   Clears the reading in Peak and 1st Peak Mode

2: Turns the display Off

3: Programmable 'Soft Buttons'. Functionality varies with the current
   menu set and is shown on the bottom two lines of the display. Arrow buttons scroll
   through torque modes and engineering units.

4: Accepts the reading into memory
   Scrolls back one level in the menu system
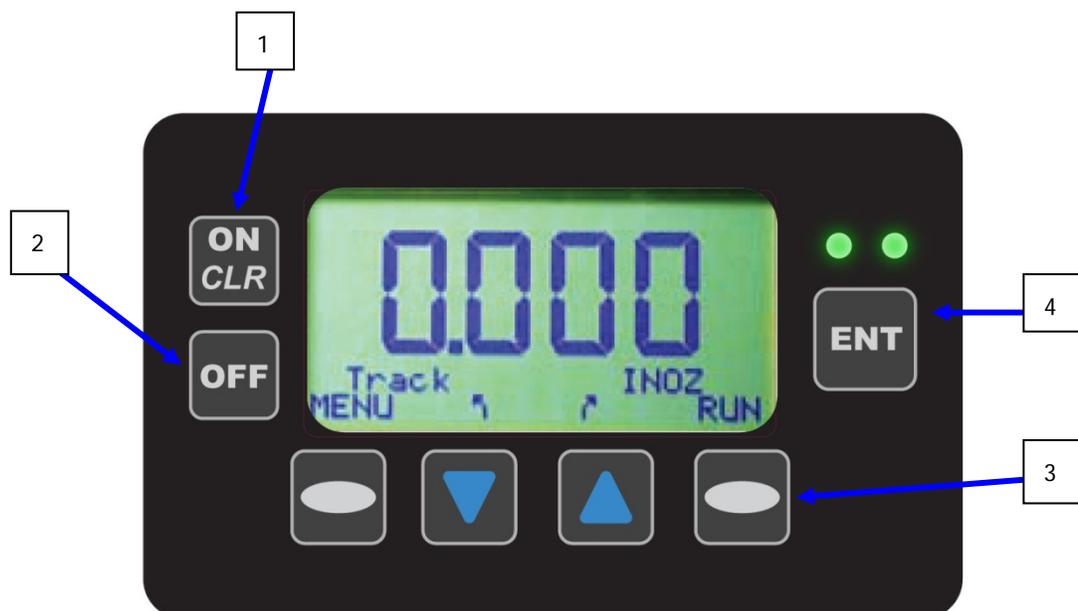
BACK PANEL INPUTS

The back of the stand display unit contains various interface connections.

Transducer Input (10-pin connector).

To install or remove the cable simply push in or pull out. Do this by gripping the outer metal case of the cable and NEVER from the cord itself. **THIS IS NOT A TWIST LOCK CABLE! IMPORTANT! REMOVE CABLE FOR SHIPPING & TRANSPORTING!!**

DC In

The interface for the AC Adapter supplied with the unit. Use this if you are working under Mains power. Use only the AC adapter provided with the unit. Use of another power source will void the warranty and may cause severe damage to the display.

RS-232

If you are downloading to a printer, data collector, computer, etc., this is the mini-plug interface for the RS-232 cable. Values are sent via RS-232 every time the unit auto-clears or the ENT/CLR button is pressed

CHARGING THE BATTERIES

1. The battery life is approximately 12 hours when fully charged. The Low-Battery indicator on the display will illuminate when the battery voltage is low. After this indication the user has approximately 15-30 minutes before the batteries will no longer power the unit.

2. The batteries charge when the system is plugged-in. In Fast Charge mode (i.e. the unit is plugged in and the power is **OFF),** charge time is 2- 4 hours depending on charge level. The green LED on the front panel will flash when the battery is charging and turned off. It is recommended the tester be plugged in when not in use. This will not harm the unit and will increase battery life.

Note: If the tester is stored for several months, ensure the battery is completely charged prior to storage.

RS-232

The display can be connected to a printer, computer or data collector via the RS232 interface. When a reading is accepted into memory, a peak is cleared, or data is transmitted via the print data menu(s), it is transmitted via the RS-232 port. To download the readings, go to the DATA MENU. Auditor has special software available to download the readings, or they can be viewed with a terminal emulator program such as HyperTerminal (included in all versions of Windows before Vista under Start>Programs>Accessories>Communications), or a free terminal program such as PuTTY.

RS232 Transfer Protocol

Protocol	Value
Cable	9 pin to mini-plug.
Baud	9600
Parity	None
Bits	8
S Bit	1
Flow	None

RS232 Datastream Format

mmmbsddddbuuuuucl, *where:*

m	Memory Location		
s	Sign (space or -)	**c**	Carriage Return
d	Data with Decimal Point	**l**	Line Feed
u	Units	**b**	Blank

RS232 Cable Pinouts (9 pin)

Pin #	Description	Pin #	Description
1	Unused	6	Unused
2	Transmit	7	Unused
3	Receive	8	Unused
4	Unused	9	Unused
5	Ground		

ICBL-USB Cable

PROGRAMMING & NAVIGATION

| ENTERS THE MENU SYSTEM	SCROLLS THROUGH TORQUE MODES
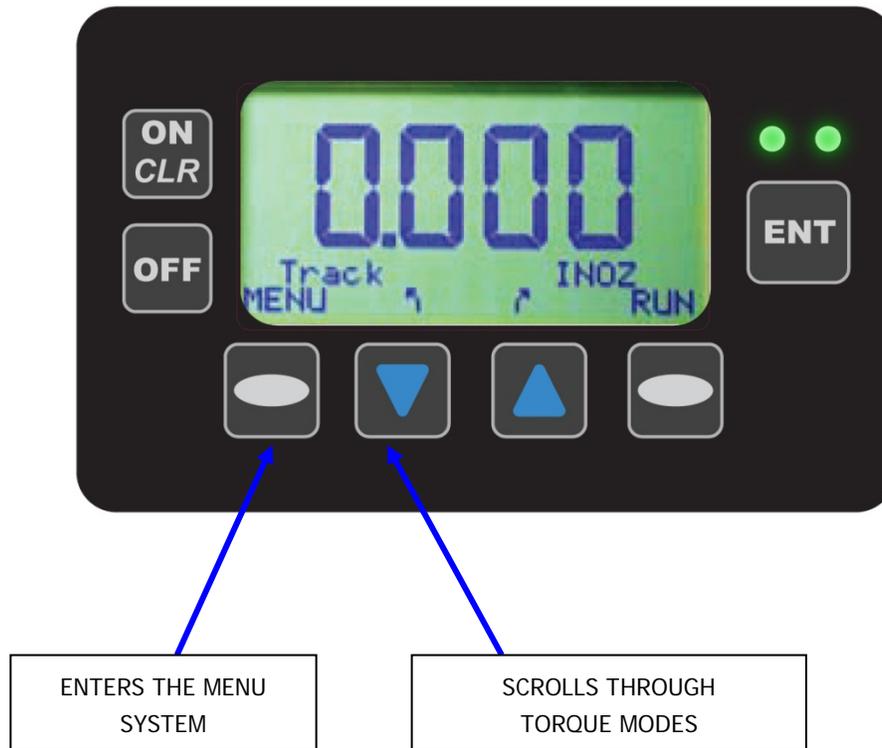
The Auditor product line has been designed to provide a consistent interface. the user interface menu is "driven", as opposed to 'hard coded' providing several advantages:

- Allows user to operate any of our products with the shortest learning curve possible.
- Offers greater functionality than previously possible.
- User can economically upgrade and/or customize the tester in the future.

The four buttons on the bottom row are programmable or "Soft Buttons". The functionality of the buttons will vary with the current selection. There are two ways to change settings, or otherwise gain access to the operation of the tester:

1. Live Programming: Where the "soft" buttons have text above them, pressing the button will scroll through the options. In the picture above, pressing the down arrow scrolls through the Torque Modes. These include Peak, 1st Peak and Track. The Up Arrow scrolls through the Engineering Units.
2. Menu Driven: There are two sets of menus in the display.
   a. Bottom right oval button scrolls through the Tester Operating Functions. For basic testers, this includes the RUN MODE and MEMORY (MEM) MODE. Toggling this button changes the functions of the other soft buttons appropriately.

b.   MENU (bottom left oval) takes you to the Main Menu system. (Shown below is a sample of one menu screen)

MENU LOCATION

MENU ACTION BUTTONS

MENU SCROLL BUTTONS

RETURNS TO PREVIOUS MENU
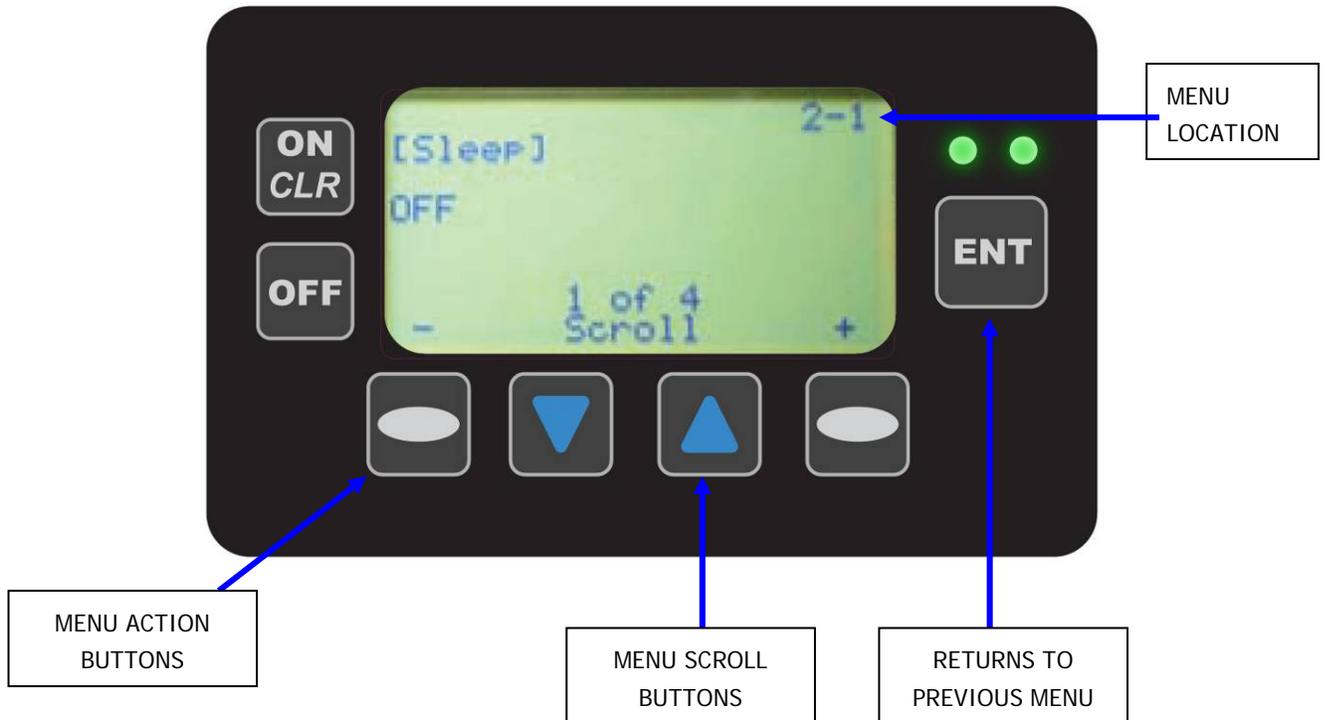
MENU TREE

Operation Overview: There are eight buttons on the display face: Off, On, four (4) programmable or 'soft' buttons Zero and Enter. The exact function of the soft buttons is defined by the bottom two rows of text and will vary depending on the current mode of operation. Pressing the ENT button takes you back to the previous screen, until you return to the Run Mode.

Button Operation:

Run Mode (Current mode displayed):

ON: Clears the peak reading if saved, otherwise zero's the display and erases the memory location..

ENT: Save current reading in memory if memory is on and clears the peak reading.

Memory Mode (MEM displayed instead of Run):

ON: Goes to Run Mode without erasing memory location.

ENT: Scrolls to next empty location.

Either Mode:

RUN -> MEM: (soft button) changes the mode of the arrow buttons.

Up and Down: (soft buttons) Units and Mode respectively for RUN; Memory location for MEM. Depends on the right programmable button.

MENU: Enter menus.

MENU Operation:

ENT: Previous menu.

Up and Down: Scrolls through the current menu.

Programmable Keys: Menu actions.   The text varies depending of the active menu selection.

MENU TREE

1 PEAK OPTIONS MENU
   SEL: Enters menu.
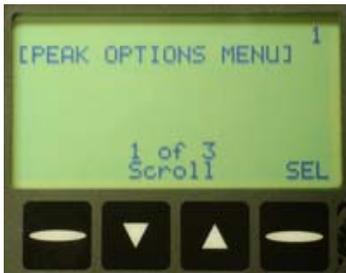
1-1 Auto clear

+, - Set time in seconds.

Auto-clear works in Peak and 1st Peak modes, freeing the operator from manually clearing the display after taking a reading. Auto-clear can be set from one to nine seconds, or turned completely off.

With AutoClr disabled, the reading will continue to display until the operator stores it by pressing the ENT button, or clears it by pressing the On button.

Pressing the + key will change "Off" to a value of "1", referring to the number of seconds the system will hold a reading on the screen before clearing. Press arrow key to scroll from "Off to "9". When the desired value is shown, press the enter button.

When unit is returned to operational mode, AC will show on the bottom of the display. Because AutoClr is now active, the reading will show for the specified number of seconds and then clear the display. At this point, all readings will clear and be stored automatically into memory.

   **Note:** AutoClr will not work in Track Mode.

1-2 Filter

   +, - Set filter value in Hz.

125, 250, 500, 1000, 1500 & 2000.
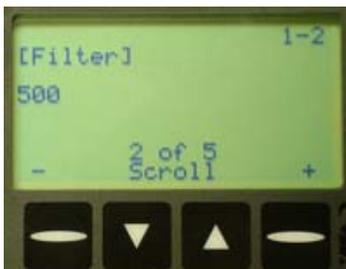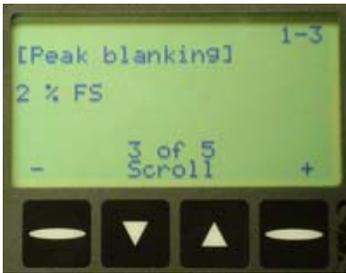
1-3 Peak Blanking

+, - Set blanking in percent of full scale.

Peak Blanking sets the minimum threshold at which torque is captured as a peak. Pressing the + and - buttons will toggle this from 2% to 50% of Full Scale. Pressing the ENT button will accept this value and return to Run Mode.
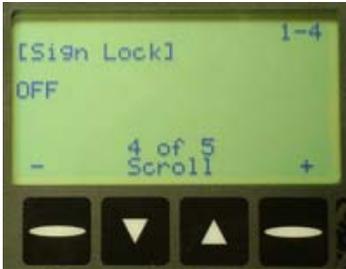
1-4 Sign Lock

+, - Toggle On or Off.

The Sign Lock feature allows the user to select the torque direction of the peak to be captured. With Sign Lock ON, the initial direction, or sign, is the default direction. Any peak in the non-selected direction will be measured, but not captured as a peak. To reset the sign, either cycle the power or zero the unit.

With Sign Lock OFF, the tester will capture both CW and CCW torque.

1-5 Edit Limits

High or Low edits that limit.

Limit editing:

Up and Down: Change the digit specified (5 is decimal point, OFF turns the limit off)

DIG: Changes which digit to edit.

ENT: Accepts changes.
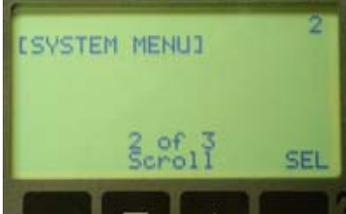
2 SYSTEM MENU

SEL: Enters menu.
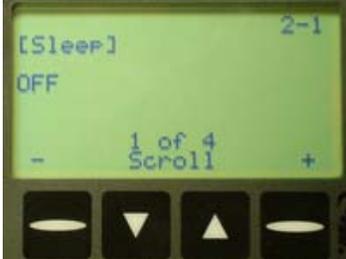
2-1 Sleep

+, -: Set time in minutes.

To conserve battery life, the display is equipped with a "sleep" mode which sets the limit to standby after a specified amount of inactive time Press the +/- keys to increase/decrease the number of minutes the unit will wait for input. The highest sleep setting is 20 minutes. Press ENT to accept the value and continue to the next function.
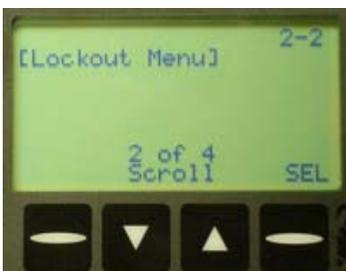
2-2 Lockout Menu

SEL: Enter menu.

2-2-1 Mode Lockout

+, -: Toggle on or off.

2-2-2 Units Lockout

+, -: Toggle on or off.

2-2-3 Scroll Lockout

+, -: Toggle on or off.
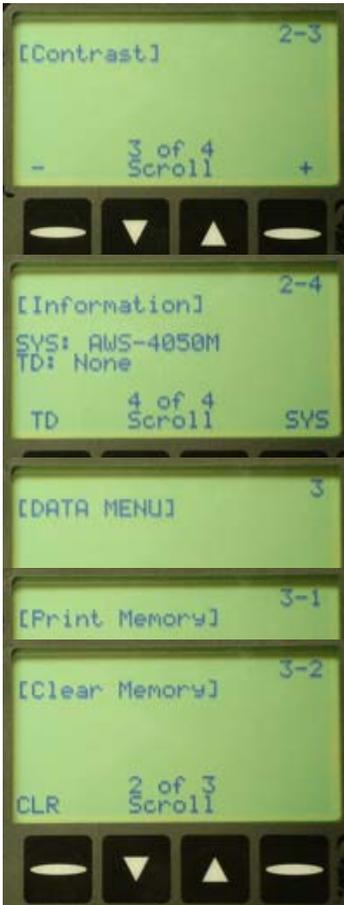
2-3 Contrast

+, -: Change the contrast of the display.

2-4 Information

SYS: Gives detailed information about the system.

TD: Gives detailed information about the transducer.

3 DATA MENU

SEL: Enters menu.

3-1 Print Memory

Send: Prints the currently saved readings.

3-2 Clear Memory

CLR: Followed by ENT clears the readings saved in memory.

3-3 Reset All

CLR: Followed by ENT clears all readings and all sets. Should be used approximately every 5000 readings.
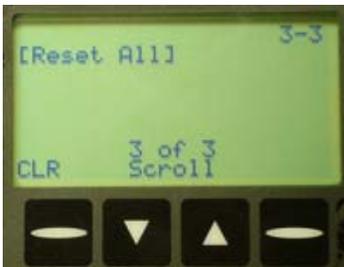
RUNDOWN FIXTURE MAINTENANCE

The test stands require very little maintenance; however, periodic lubrication of the rundown fixture is critical to the longevity of the tool and repeatability of tool testing. The rundown bolt and washers should be periodically removed and inspected, and if necessary, coated with a high pressure anti-seize lubricant.

We recommend McMaster Carr part number 1028K65 "Standard Nickel Antiseize Lubricant". After lubrication, replace the rundown washers as shown below. (some units have an additional washer installed. If there are 6 washers on your unit, install the last one to the right of the last washer shown below, facing the same way). You can configure your rundown to be "harder" or more "compliant" this may affect your torque result.
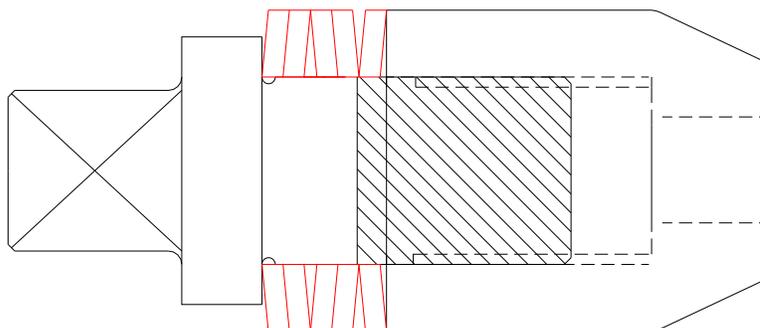
Reaction Points

IT IS THE RESPONSIBILITY OF THE USER TO UNDERSTAND PROPER REACTION GEOMETRY. INJURY TO THE OPERATOR AND/OR DAMAGE TO THE TOOL AND/OR TEST STAND WILL RESULT IF PROPER REACTION IS NOT PROVIDED.

DESCRIPTION OF FUNCTIONS

The following is a description of the standard features of the Auditor product line.

OPERATING MODES

Peak, 1st Peak or Track will show on the display. Press the Œ key to toggle them.

Peak
Recommended operating mode for stall tools.
Displays and retains the maximum torque exerted by the tool, as occurs when operating the wrench in the tightening direction. The Peak Mode is used for all power tools and dial wrenches.

1st Peak
Detects the "first peak" of torque exerted by the tool, capturing the initial torque as occurs when the torque wrench cams over. First Peak is used primarily for Click Torque Wrenches and cam over screwdrivers.

Track
Displays torque as it is being applied to the transducer. Track mode is used primarily for verifying calibration of the unit.

ENGINEERING UNITS

Shows the current engineering units. Press the ▲ key to cycle through the eight possible choices: Kgf m, KgfCm, gfCm, cNm, Nm, FT LB, IN LB, IN OZ.

FULL SCALE

Shows the Full-Scale value of the Torque Shaft. This is not an adjustable value.

LOW LIMIT

Use the Low Limit setting to visually flag the operator when a reading fails to reach a desired minimum value. A small down arrow will appear on the screen if a peak is captured below the limit setting.

The limit is adjusted by using the navigation buttons to set the first four digits to the desired value. The fifth digit is used to select the decimal point position. The Up and Down buttons under the "Soft" button **Change** will change the value from 0-9. Pressing the "soft" **DIG** will scroll through the digit positions. When the correct value is entered, pressing the **ENT** button will return you to the menu system.

When all the digits have been set, press the **MEM** key to accept the value and return to Program Function mode. Upon the next reading, "LO" will appear on the display if the captured value is less than the low limit

HIGH LIMIT

Use the high limit setting to visually flag the operator when a reading falls over a desired maximum value. High limits are set in the identical way as low limits. Please refer to the Low Limit section for details.

NOTE: The green LED on the front of the display will flash when a peak is captured that falls within the limit setting.

ADDITIONAL PRODUCT OPTIONS:

Auditor ATDA

Auditor ATDA-DC

Auditor ATDA-8000

AHCTS with Articulating Arm for above displays

At left is an image of the possible configurations of AHCTS and AHCTS-K test stands. Image illustrates various sizes, various reaction devices and illustration of rotary versus hydraulic test stands. Hydraulic test stands do not have bushing support collar or rundown fixtures while the rotary test stands do.

NEW TOOL AND ACCESSORY WARRANTY

Any new tool or accessory branded with the AIMCO, Uryu, AcraDyne or Eagle Industries name, and purchased from AIMCO, or through one of its authorized distributors or agents, is warranted to the original buyer against defects in materials and workmanship for a period of one (1) year* from date of delivery. Under the terms of this warranty, AIMCO will repair or replace any product or accessory warranted hereunder and returned freight prepaid proving to AIMCO's satisfaction to be defective as a result of workmanship or materials. In order to qualify for this warranty, written notice to AIMCO must be given immediately upon discovery of such defect, at which time AIMCO will issue an authorization to return the tool. The defective item must be promptly returned to an authorized AIMCO service center with all freight charges prepaid.

REPAIRED TOOL WARRANTY

Once a tool is beyond the new product warranty period as detailed above, AIMCO repairs are subject to the following warranty periods: pneumatic tools: 90 days*; electric tools and Acra-Feed: 90 days; battery tools: 30 days*; DC Electric tools: 90 days*

EXCLUSION FROM WARRANTY

This warranty is valid only on products purchased from AIMCO, or thru its authorized distributors or agents. AIMCO shall have no obligation pursuant to the AIMCO Warranty with respect to any tools or accessories which in AIMCO's sole judgment have been altered, damaged, misused, abused, badly worn, lost or improperly maintained. This Warranty is null and void if the customer, or any other person other than an authorized representative of AIMCO, has made any attempt to service or modify the tool or accessory prior to its return to AIMCO under this Warranty.

The warranty provision with respect to each such product may be amended by AIMCO from time to time in its sole discretion. The liability of AIMCO hereunder shall be limited to replacing or repairing, at its option, any products which are returned freight prepaid to AIMCO and which AIMCO determines to be defective as described above or, at AIMCO's option, refunding the purchase price of such products.

AIMCO reserves the right to make periodic changes in construction or tool design at any time. AIMCO specifically reserves the right to make these changes without incurring any obligation or incorporating such changes or updates in tools or parts previously distributed.

THE AIMCO WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND AIMCO EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY SETS FORTH THE SOLE AND EXCLUSIVE REMEDY IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE.

THIS WARRANTY IS THE ONLY WARRANTY MADE BY AIMCO WITH RESPECT TO THE GOODS DELIVERED HEREUNDER, AND MAY BE MODIFIED OR AMENDED ONLY BY A WRITTEN INSTRUMENT SIGNED BY A DULY AUTHORIZED OFFICER OF AIMCO.

LIMITATION OF LIABILITY

AIMCO'S LIABILITY PURSUANT TO WARRANTY OF THE PRODUCTS COVERED HEREUNDER IS LIMITED TO REFUND OF THE PURCHASE PRICE. IN NO EVENT SHALL AIMCO BE LIABLE FOR COSTS OF PROCUREMENT OF SUBSTITUTE GOODS BY THE BUYER. IN NO EVENT SHALL AIMCO BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES (INCLUDING WITHOUT LIMITATION, LOSS OF PROFIT) WHETHER OR NOT AIMCO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSS, HOWEVER CAUSED, WHETHER FOR BREACH OR REPUDIATION OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHERWISE. THIS EXCLUSION ALSO INCLUDES ANY LIABILITY WHICH MAY ARISE OUT OF THIRD PARTY CLAIMS AGAINST BUYER. THE ESSENTIAL PURPOSE OF THIS PROVISION IS TO LIMIT THE POTENTIAL LIABILITY OF AIMCO ARISING OUT OF THIS AGREEMENT AND/OR SALE.

Note: The AIMCO Warranty confers specific legal rights, however some states or jurisdictions may not allow certain exclusions or limitations within this warranty.

* All warranty periods addressed herein are determined using a standard shift, eight-hour work day.

Notes:

Notes:

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