SHOT CHEK

Model II

Current Pulse Monitor

U.S. Patent #4,502,004

Operation Manual

V2.0

Inspection Research division of
RG NDT International, Inc.
Oilfield Pipe Inspection Equipment & Supplies
165 Oates Rd, Houston, TX 77013 ~ (713) 675-5928

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Basic Operation

The ShotChek® ll equipment consists of a digital display unit, a current sensing probe, an interconnecting cable and a wall-mount charger.

1. Connect the current probe to the ShotChek® ll unit. Attach one end of the BNC connecting cable to the current probe output jack and the other end to the jack marked INPUT on the rear panel of the ShotChek® ll.

2. Move the POWER switch to the ON position. Both digital displays on the front of the unit should indicate “0.0” (the leftmost zero is automatically blanked whenever the readings are less than “10.0”). If the message “-LO-” appears on both displays, then the internal batteries must be recharged before further use. If “- - - -” appears on both displays, then the current probe either is not connected or is damaged, or the connecting cable is faulty (open-circuit).

3. Insert the current carrying conductor(s) through the center (ID) of the current probe. Since the ShotChek® ll will indicate the direction of current flow as well as the magnitude, it is not necessary to know the polarity of the current source and the current probe may be positioned arbitrarily with respect to direction.

4. Fire the shooting system (which may be either a capacitor discharge unit or battery-pack) and read the peak current (in kiloamps) on the left digital display. A minus sign means that the direction of the current flow was opposite to the direction indicated by the polarity arrow located on the nameplate of the current probe. The pulse duration (in milliseconds) will be indicated on the right digital display. Both readings will be held indefinitely or until the ShotChek® ll is reset.

5. Reset the ShotChek® II by pressing the RESET button. This will clear the displays and the unit in preparation for the next measurement. For hands-off operation, the AUTO MODE switch can be moved to the ON position, which will result in the ShotChek® ll performing an automatic reset 5 to 6 seconds after each measurement.

Operation Notes

1. The conductors carrying the current to be measured are passed once through the center (ID) of the current probe. No electrical connection to the current source is required.

2. Any number or type of conductors (cables, rods, bus bars, etc.) which will fit through the ID of the current probe may be used. In a system with multiple conductors connected in parallel, ALL CONDUCTORS MUST PASS THROUGH THE CURRENT PROBE TO MEASURE THE TOTAL CURRENT.

3. The current probe may be positioned anywhere along the current path since the current is the same at all points on the path (Kirchhoff's Current Law). In other words, the same current measurement will be obtained whether the current probe is located on the rod or the cables, near the current source or far away, etc.

4. The size and shape of the current conductor does not affect the accuracy of the measurement. The relative position of the current probe with respect to the conductor does not affect the accuracy of the measurement (Ampere's Circuital Law). In other words, the conductor does not have to be centered in the ID of the current probe, nor does the current probe have to be perpendicular to the flow of current.

5. Each ShotChek® unit and current probe is calibrated as a pair. Although it is possible for the display units and current probes to be physically interchanged, this is NOT RECOMMENDED because the specified accuracy cannot be assured if this is done. Each unit and probe are assigned a serial number in order to maintain the proper match. On the display unit this number is stamped on the bottom of the cabinet. On the current probe, the number is either stamped on the nameplate below the arrow indicating current direction, or directly into the probe.

6. Pulse width is defined as the time elapsed from the beginning of the pulse to the point at which the current has decayed to 50% of its peak value.

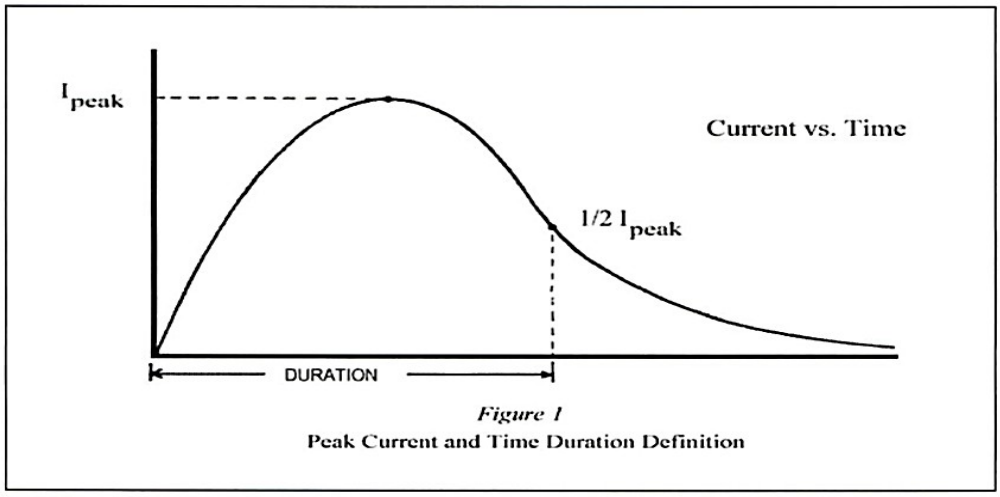

Figure 1
Peak Current and Time Duration Definition

Figure 1

Description of Rear Panel

Refer to *Figure 2* for the following discussion of the features of the rear panel of the ShotChek® unit.

Display Light

This push-button activates the backlight on the display. Extensive usage of the LCD backlight will reduce operating time.

Power

This switch turns the ShotChek® unit on or off. The unit automatically resets when the power is first applied and it is not necessary to manually reset it.

Charger

This jack is for connection of the wall-mount charger for the internal NiCad batteries which supply power for the operation of the ShotChek® unit. A low battery condition will be indicated by the appearance of the message “-LO-” on both displays. The wall-mount charger operates from 120 VAC and supplies 12 VDC at the 1/8” mini phone plug. Any other source which can supply 12 VDC @ I00 mA (min) can be used to charge the unit. The standard charge for a completely discharged unit is 14 hours. Neither benefit nor damage occurs from extended charging. A standard charge will provide at least 10 hours of continuous operation. Extensive usage of the LCD backlights will reduce operating time. Operation of the unit during charging will increase the amount of time required for a full charge.

Reset

This push-button switch clears the unit and zeroes the display after each measurement.

Auto Mode

This switch enables the automatic reset feature, which provides for an automatic reset to occur 5 to 6 seconds after a measurement is made. Also, the LCD backlights are activated during the 5 to 6 second waiting period. AUTO MODE allows “hands-off” operation of the ShotChek® ll unit even in low ambient light conditions. Leaving the AUTO MODE switch in the OFF position allows the unit to hold a reading indefinitely with no drift.

Input

This jack is for connection of the current probe. Any standard BNC to BNC cable may be used to connect the current probe to the ShotChek® unit. Using a different cable than the one used to calibrate the device may affect accuracy; for best results, use the same cable. **CAUTION: Never connect anything other than the ShotChek Current Probe to the input jack, otherwise the unit may be damaged and any warranty will be void.**

Figure 2 ~ REAR PANEL

Specifications

Peak Current

Range	00.00 to 99.99 kiloamps
Over-range	Display shows “99.9”
Resolution	00.10 kiloamps
Repeatability	within 00.10 kiloamp
Accuracy	13% of reading + 1 digit
Maximum dI/dt	20 x 10^6 amp/sec

Duration

Range	0 to 199.9 milliseconds
Over-range	Display shows “99.9”
Resolution	00.10 milliseconds
Repeatability	00.10 milliseconds
Accuracy	±3% of reading + 1 digit

Dimensions

Current probe	2.8” ID toroid
Display unit	8” x 8-1/2” x 3”

Display

Type	Dual Liquid Crystal Displays (LCD)
Backlighting	Electroluminescent (EL)
Polarity	Minus only on peak current

Other

Charger	12VDC @ 100mA (min)

RG NDT International, Inc. reserves the right to change specifications at any time without incurring any obligation to incorporate those changes into products previously sold.

Servicing & Calibration

To guarantee conformance to published specifications, servicing and/or calibration must be performed by RG NDT International, Inc. or its authorized agent. There are no user serviceable parts within the unit. Unauthorized opening of the cabinet or other disassembly of any part(s) of the unit will void the warranty.

As with all electronic instrumentation, periodic calibration should be performed. The recommended calibration period for the ShotChek® II unit is one (1) year.

If servicing or calibration is required, contact:

RG NDT International, Inc.
165 Oates Rd, Houston, TX 77013

Telephone: (713) 675-5928
Web: http://www.rgndt.com

Warranty

RG NDT International, Inc. warrants that its ShotChek® II unit will be free from defects in materials and workmanship under normal use and service for ninety (90) days from the date of delivery to the customer. RG NDT International, Inc. will replace or repair, at its option, any equipment or accessories which may be found to be defective under this warranty. This warranty does not cover any damage caused by negligence, abuse, or tampering with the product. Opening of the cabinet or other disassembly and/or modification of any part(s) of the unit will void this warranty.

To obtain service under this warranty, all products to be repaired must be returned to RG NDT International, Inc. or its authorized agent.

This express warranty is in lieu of all other warranties, expressed or implied. RG NDT International, Inc.'s liability shall be limited to replacement cost of its own product in question. In no event, and under no circumstances, shall RG NDT International, Inc. be liable for any indirect, incidental, or consequential loss or damage arising from the use or failure of its equipment or from breach of this warranty. No representation or other affirmation of fact, including but not limited to statements regarding suitability for use, or performance of the equipment, shall be or be deemed to be a warranty by RG NDT International, Inc. for any purpose, nor give rise to any liability or obligation of RG NDT International, Inc. No agent, distributor, salesman, wholesale or retail dealer has the authority to bind RG NDT International, Inc. to any other affirmation, representation, or warranty concerning these goods.

The terms of this warranty constitute the buyer's sole and exclusive remedy.