SHORT LOCATOR

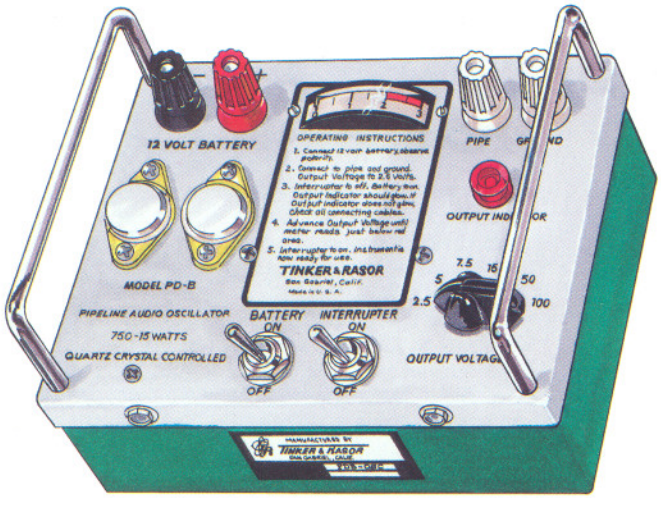
The Null Method...

FOR LOCATING ELECTRICAL SHORTS AND OPEN COUPLINGS ON UNDERGROUND PIPELINES WITH THE

ALL NEW MARK IV RECEIVER

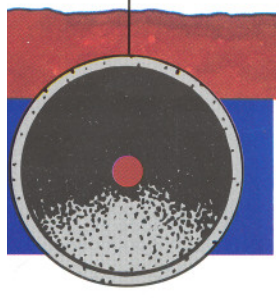
PD

The Model PD Detector and null Method have been well accepted by the industry. Acclaimed to be the fastest method known to accurately locate points of electrical contact and insulating joints on coated pipelines. This type survey may be conducted on coated pipelines regardless of their location. Unaffected by parallel lines, depths or cover, the survey can often be, in part, conducted from a moving vehicle over the pipe. In brief, the Null Method follows the flow of impressed audio frequency current in a coated pipe; determines where it leaves. The point of current discharge is determined by a sharp disturbance of the null itself rather than the signal level of the audio frequency. This method is quite practical, particularly as competent field personnel can interpret findings quickly and accurately.



An invaluable tool in the maintenance of cathodically protected piping systems for ...

- GAS
- PETROLEUM CHEMICALS
- AND WATER



HOLIDAY DETECTOR

PD

#1 Worldwide

TINKER & RASOR

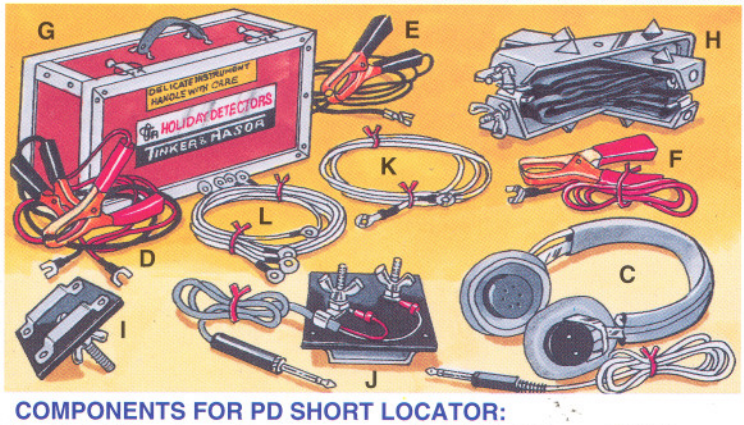
Pearson Type Detector

The Pearson-Type Detector is well known to industry, however, **Tinker & Rasor's Pearson-Type Detector, Model PD**, is an all transistor instrument. It's light weight, low battery drain and rugged construction are all features of this **New Design.**

The **PD Detector** can be used to locate discontinuities in the coating of buried pipelines, to locate electrical contacts on the lines and to effectively locate the lines themselves. All of these findings can take place without the necessity of uncovering the pipeline under test.

However, a Pearson-Type Detector can be used successfully only if a pipeline has been carefully backfilled and the soil is compact around it. There also must be some moisture content in the surrounding soil.

The cleats are worn by two inspectors walking in tandem. The cleats are terminated by cable connections to a receiver worn on the belt of one inspector. They enable him to accurately find holidays or large discontinuities in pipe coatings. The search coil can locate the pipe or shortings.



COMPONENTS FOR PD SHORT LOCATOR:

- **A.** Mark IV Receiver with batteries (1 spare)
- **B.** PD-B Oscillator
- **C.** Head set w/cushions
- **D.** Battery Cables (set) (Black-) (Red+)
- **E.** 30' Black Ground Cable)
- **F.** 6' Red Oscillator to Pipe Cable
- **G.** Carrying Case
  Instruction Manual (Not shown)

OPTIONAL ACCESSORIES FOR LOCATING HOLIDAYS:

- **H.** Shoe Cleats (set of 4)
- **I.** Terminal Board (single connect)
- **J.** Terminal Board (double connect)
- **K.** 30' Connecting Cable
- **L.** Cleat Cables (set of 4)

Shipping Weights: PD Short Locator 22 lbs. (49 kg)
PD Detector complete 28 lbs. (62 kg)

Dimensions: 18 1/4" x 12 1/4" x 9 1/4" (L–464 x W–312 x H–235 mm.)

Export Weight: Approximate 55 lbs. (122 kg)
Added cost for packing.

A.

RECEIVER

The New Mark IV Receiver employs a high gain, integrated circuit amplifier that is signal-to-noise optimized by three 750 cycle active filter elements. Modern circuit design insures maximum circuit stability even when operated at ambient temperature extremes. The filter attenuates a.c. and d.c. interference. The search coil is contained within the receiver and has low impedance of 2,000 ohms. Although earphones are furnished for operator's optional use, the loudspeaker offers advantages related to safety, convenience, and comfort. Built-in battery test and signal intensity meter of modern full-face design for ease of observation. Multi-directional depth level gauge for accurate (within 1 inch)depth determination.

B.

OSCILLATOR

The Oscillator provided with the set has been designed to use the latest developments in this type of instrumentation. A signal of 750 c.p.s. is generated by using a power transistor switching circuit. This arrangement eliminates troublesome vibrators, buzzers or other moving part elements. The Transistor Oscillator converts low voltage (twelve volts) d.c. to stable audio frequency a.c. directly and hence, by a highly efficient method, the input current to the Oscillator is only 1.7 amperes for a full output of fifteen watts, a conversion efficiency of better than 80%.

In order that a maximum of energy can be transferred from the Oscillator to the pipe, the output of the oscillator is provided with taps so that voltages of 2.5, 5, 7.5, 15, 50 and 100 volts are available to match the load. An interrupter is provided to make the signal more easily recognized.

FOR EASIER, FASTER, AND MORE ACCURATE ELECTRICAL SHORT LOCATING AND PIPE TRACING

ALL NEW The Probe

45/90

The **45/90 PROBE,** when used with the **TINKER & RASOR Model PD Short Locator,** allows for **greater accuracy and tracing distances** while locating electrical contacts and insulated joints on coated pipelines in corrosion control systems.

Use with all Model PD Receivers by simply plugging the probe jack into the "cleat" receptacle. Follow the same easy operating methods shown in the Model PD Instruction Manual for locating electrical shorts or pipe tracing.

The search coil is located in the tip of the probe head which allows **fast, accurate performance.** When the search coil is in a vertical position, a sharp "null" indicates the center of the pipe or cable.

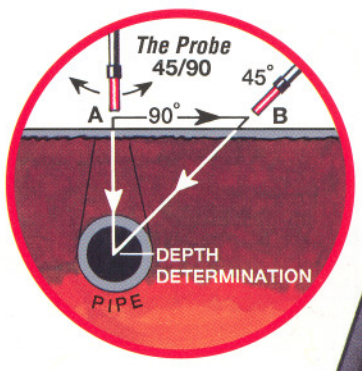
DEPTH of the pipe or cable can be accurately determined **WITHOUT** the usual **bending or kneeling.** First locate center of the pipe or line "A" by crossing the pipe in a sweeping motion. A "NULL" (no signal) will mark the center of the pipe. Mark this location "A", moving 90^0 from the pipe with bubble centered in 45^0 angle gauge and holding the probe tip close to the ground until another "NULL" – "B" is detected. This distance from "B" to "A" less $^1/_2$ of the outside diameter of the pipe will be the depth of the buried pipe.

FEATURES INCLUDE:

- Easy to operate
- Unaffected by surface cover
- Light Weight
- Rugged construction
- Water resistant

SPECIFICATIONS:

- Length: 34" (864. mm)
- Operating weight: 1 - $^1/_2$ lbs. (.680 kg)
- Shipping weight: 4 lbs. (1.814 kg)



BUMPER PROBE AND VEHICLE CLAMP FOR THE MODEL PD SHORT LOCATOR

BP-1
BP-1C

Time Saving–Money Saving

BUMPER PROBE & VEHICLE CLAMP*

TINKER & RASOR Model PD Short Locator, has gained wide acceptance for its usage in locating electrical contacts and insulated joints on buried coated pipelines.
The addition of the **NEW BUMPER PROBE and VEHICLE CLAMP** accessories serve to further enhance its operation, because the operator rides in the vehicle. The **Bumper Probe** is easily mounted on almost any field vehicle with the clamp made especially for this purpose. Twenty-five feet of cable is furnished to reach from the **Probe** to the **PD Receiver** positioned **in the vehicle** with the operator.

FEATURES:

- Rugged construction
- Water resistant
- Unaffected by surface cover
- Easy-to-install

OPTIONAL CHOICES*:

- BP-1* (Probe and Cable)
- BP-1C* (Probe, Cable and Vehicle Clamp)

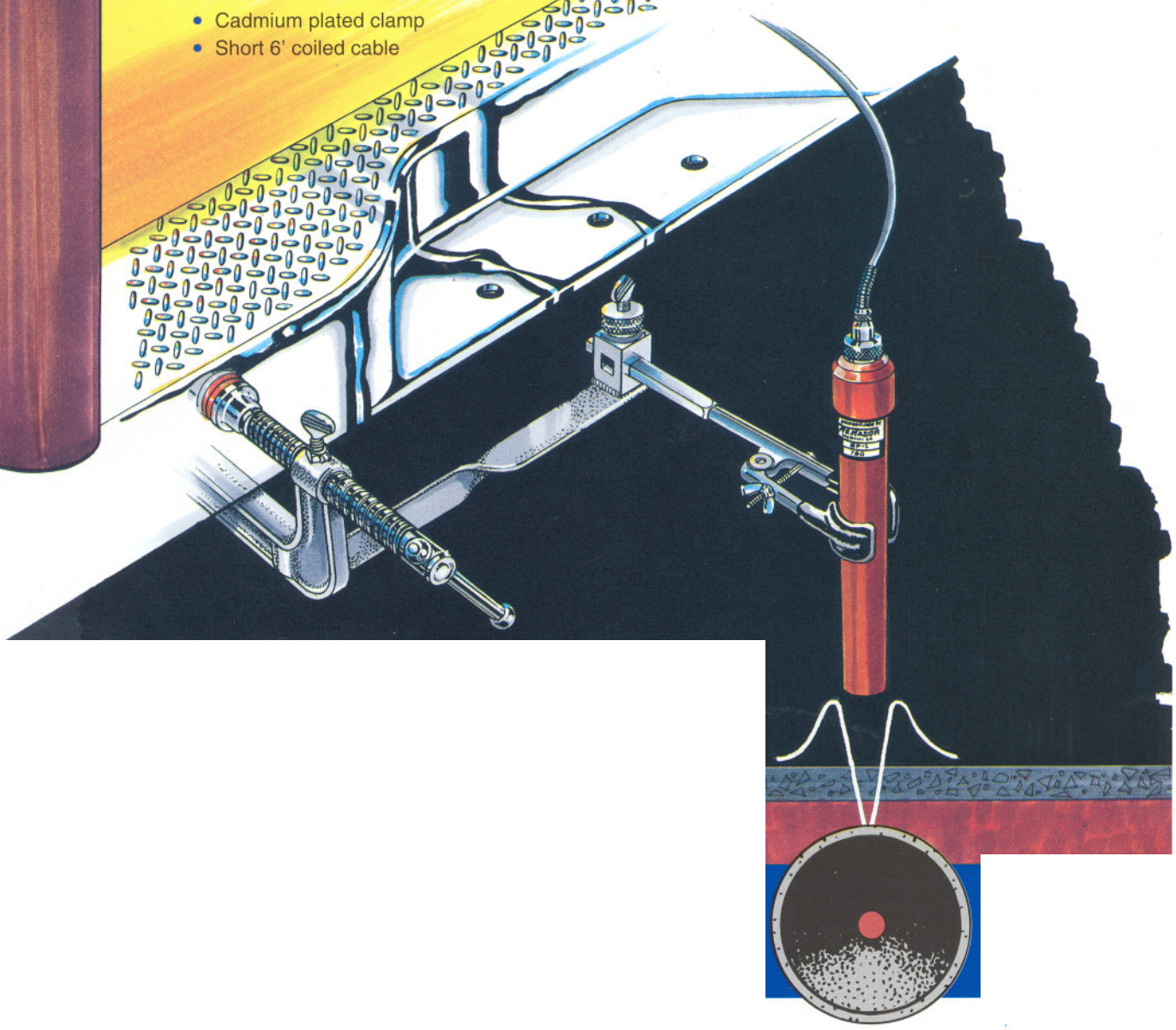
OPTIONAL ACCESSORIES:

- Cadmium plated clamp
- Short 6' coiled cable

SPECIFICATIONS:

Probe size: 1" dia. x 9 1/4" length (25.4 x 235. mm)
Shipping weight: Probe 2 lbs. (.907 kg)
Probe with clamp 4 lbs. (1.814 kg)

DELIVERY: Immediate Delivery, From Stock
F.O.B. San Gabriel, California
SERVICE: 24 hr. turn-around
TERMS: Net 30 Days, on approval of credit
WARRANTY: 90 days - parts and labor



TINKER&RASOR

CS-10

PORTABLE-10AMP CURRENT SUPPLY

For Cathodic Protection Testing. . .

The TINKER & RASOR portable current supply is an ideal D.C. current source for many Cathodic Protection Corrosion maintenance tests. Weighing only 10 pounds, the CS-10 comes complete with batteries as well as the accommodations for connecting to external power source. I.E. Vehicle battery.

Common usage is for determining current requirements for cathodic protection and impressing current on an underground structure for assisting in locating electrical contacts with foreign systems such as, foreign underground utilities.

The CS-10 comes complete with battery, 12 Volt lighter adapter and (2) sets of 6' cables. The instrument also contains one 9 Volt battery with a life expectancy of 2 years or more. Instrument case is manufactured by Pelican® and is considered indestructible and water resistant.

FEATURES INCLUDE:

- Adjustable D.C. Current Output from 0 to 10 Amps.
- External Power Input Capabilities
- Continuous or Interrupted Operation
- Interrupt Ranges:
  1 Second "OFF" – 4 Seconds "ON"
  2 Seconds "OFF" – 8 Seconds "ON"
  6 Seconds "OFF" – 14 Seconds "ON"
- (2) Meter Sensitivity Ranges – of 1 Amp. and 10 Amps.
- Meter Resolution - 1 Milliamp
- Liquid Crystal Display Meter
- (1) 12 Volt Sealed Lead Acid Battery
- (2) Sets of cables
- Indestructible and water resistant case
- Portable and weighing only 10 lbs.
- Easy to operate
- (1) Battery charger (Optional)

CORROSION

CS-10

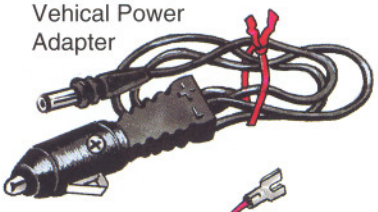
TINKER&RASOR

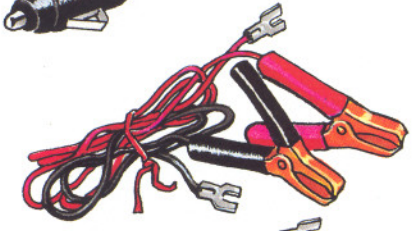
Cathodic Protection Testing

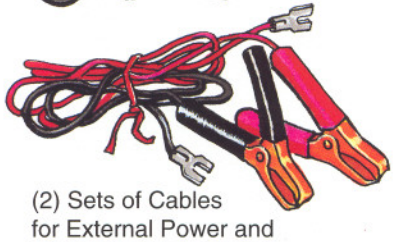
NEW! 10 AMP CURRENT SUPPLY

LIGHTWEIGHT, RELIABLE AND TOUGH

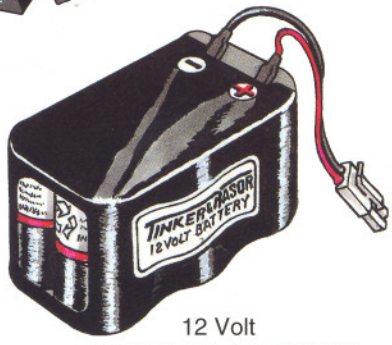
12 Volt Charger
Vehical Power
Adapter





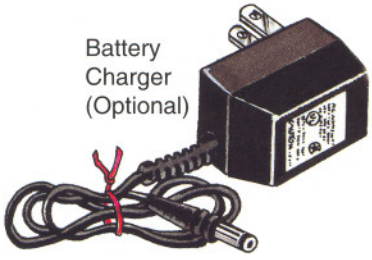


(2) Sets of Cables
for External Power and
External Output



12 Volt
Sealed Lead Acid Battery

Battery
Charger
(Optional)



SPECIFICATIONS:

- 2 Output Ranges of 1 Amp to 10 Amps
- Continuous Operation Mode and 3 Interrupt Ranges:
  - 1 Second "OFF" – 4 Seconds "ON"
  - 2 Seconds "OFF" – 8 Seconds "ON"
  - 6 Seconds "OFF" – 14 Seconds "ON"
- Fully adjustable current output of 0 to 10 Amps.
- Meter Sensitivity Ranges
  - (2) 1 Amp. and 10 Amps.
- Meter Resolution:
  - (1) Milliamp
- Common Usages:
  - Current Requirements
  - Short Identifications & Locations
  - Insulator Testing & Location
  - Casing Shorts

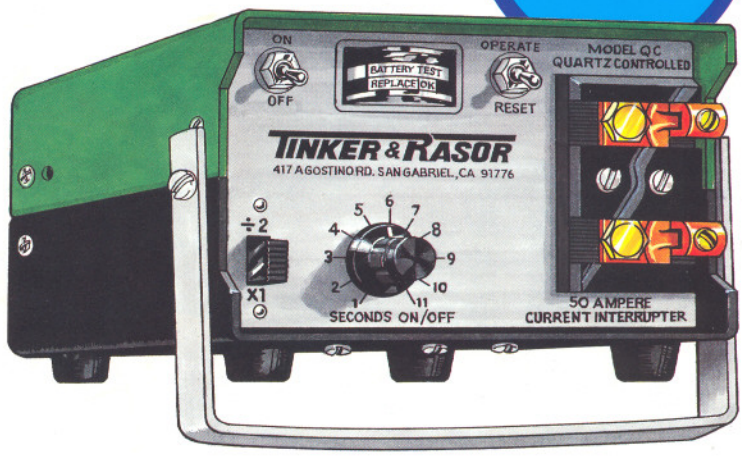
DIMENSIONS: 5-3/4" H x 12-1/4" W x 10" L
(146.05 x 311.15 x 254.0 mm)

WEIGHT: 9 lbs. (4.09 Kg)
Domestic Packaging 10 lbs. (4.54 Kg)

50 AMP CAPACITY

QUARTZ CONTROLLED CURRENT INTERRUPTER

"QC"



NEW!

THE CURRENT INTERRUPTER WITH TWO EXACT TIMING RANGES

TINKER & RASOR'S ALL NEW QUARTZ CONTROLLED CURRENT INTERRUPTER allows synchronization of two or more interrupters at separate Cathodic Protection Rectifier stations. The same **ACCURACY** can be expected as found in the high quality quartz wrist watches. Simply select the time intervals, flip the switch and **THE MODEL "QC" WILL CONTINUOUSLY CYCLE PRECISELY.**

Q C TIME SETTING TABLE

SETTINGS		1	2	3	4	5	6	7	8	9	10	11
X 1	SECONDS ON	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5
	SECONDS OFF	27.5	25	22.5	20	17.5	15	12.5	10	7.5	5	2.5
SETTINGS		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
÷ 2	SECONDS ON	1.25	2.5	3.75	5	6.25	7.5	8.75	10	11.25	12.5	13.75
	SECONDS OFF	13.75	12.5	11.25	10	8.75	7.5	6.25	5	3.75	2.5	1.25

Integrated circuitry assures long use under extreme field conditions. Instrument is housed in a rugged **HEAVY DUTY ALUMINUM CASE** designed for easy battery access and protective cover for panel controls.

SPECIFICATIONS:

EXACT TIMING–

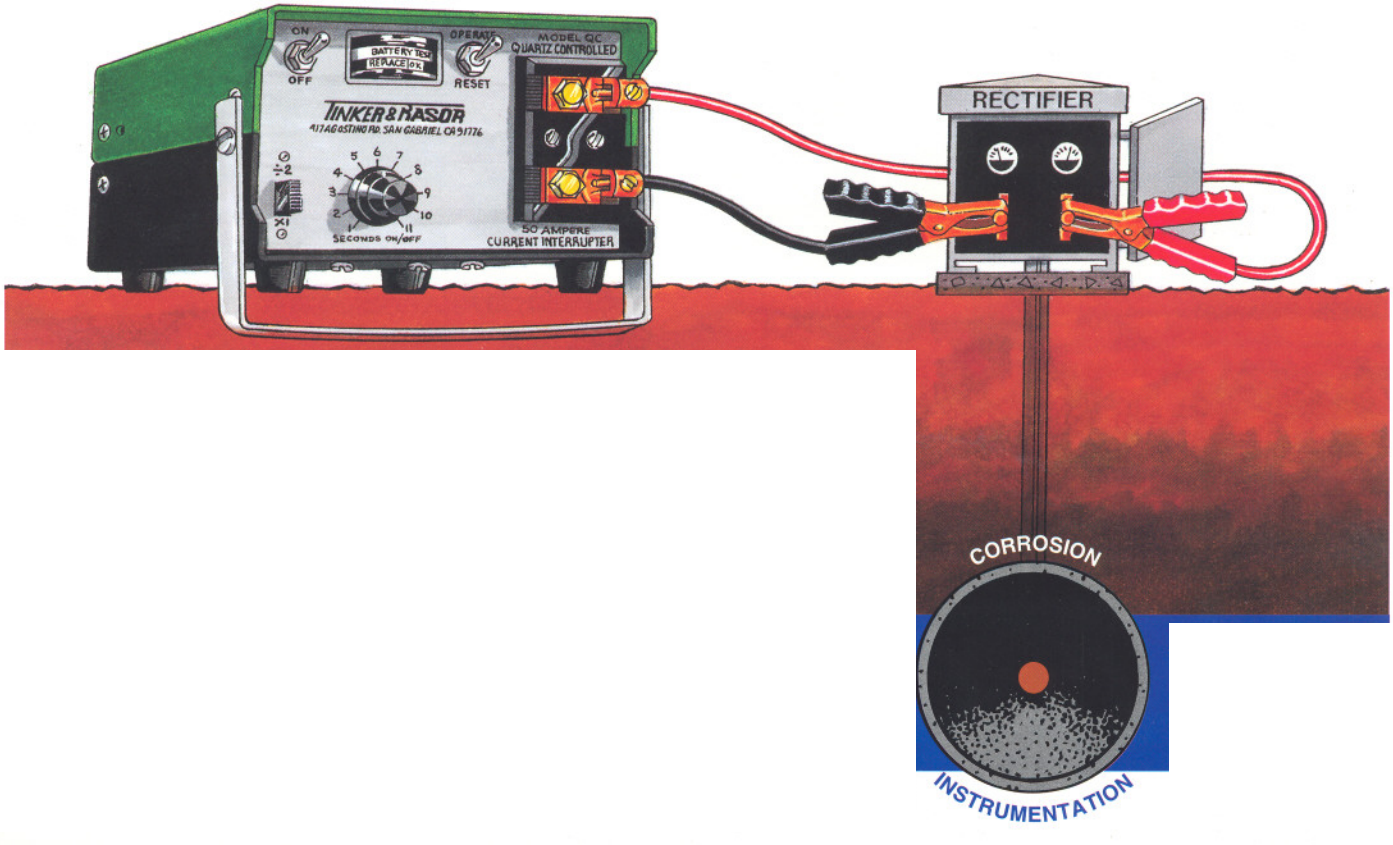
Ranges: 30 second cycle in 2.5 second increments
15 second cycle in 1.25 second increments

Ratings: DC..... 50 Amps – 28 Volts (Resistive Load)
AC..... 50 Amps – 120 Volts (Resistive Load)
AC..... 25 Amps – 240 Volts (Resistive Load)

Battery: One 12 Volt Lantern type

Dimensions: 5-3/4" x 3-3/4" x 10-1/2" (146 x 95.25 x 267 mm)

Weight: Operating weight less than 6lbs. (2.72 kg)
Domestic Packaging .....8lbs. (3.63 kg)



NEW! 50 AMP

CI-50 Cathodic Protection CURRENT INTERRUPTER

RUGGED, RELIABLE, PORTABLE

This **NEW TINKER & RASOR Rugged Ready to use CI-50 CURRENT INTERRUPTER** designed for hard field use is housed in a **Heavy Duty Aluminum Case.** The front panel allows access to the **Sturdy Terminal Lugs** for quick and easy clamping. This **CI-50** has the latest **Integrated Circuitry** construction for a long life expectancy in field environments.

The CI-50 Current Interrupter has a timing span range from 5 to 45 seconds in any combination through the continuous range function controls. With an operating weight of 6 pounds (approximately two pounds without a battery)

The CI-50 uses readily available 12 volt lantern battery.

SPECIFICATIONS:

Timing Range: Selectable from 5 to 45 seconds

Timing Selection: Any combination in the 5 to 45 second range.

Ratings: DC ..... 50 Amps - 28 Volts (Resistive Load)
AC ..... 50 Amps - 120 Volts (Resistive Load)
AC ..... 25 Amps - 240 Volts (Resistive Load)

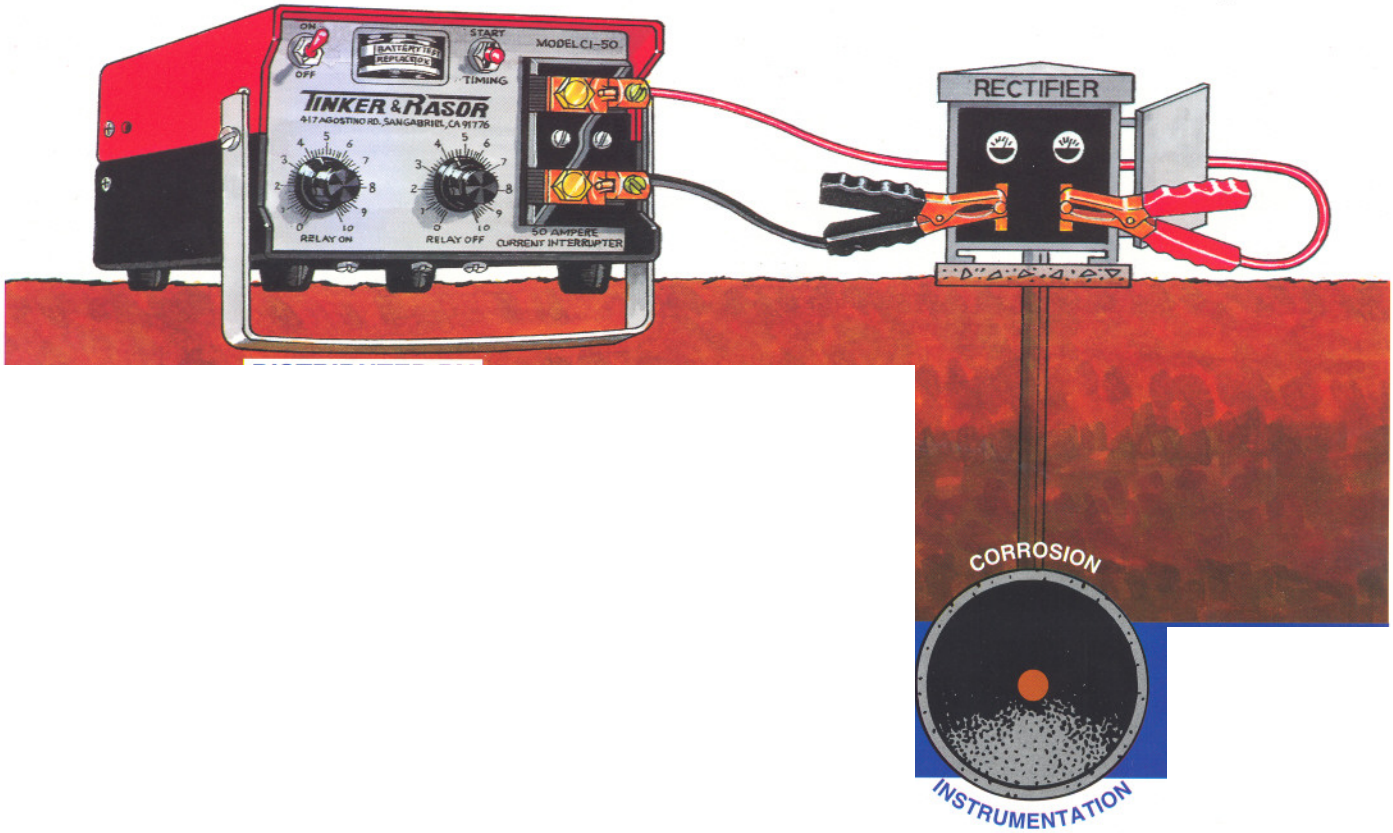
Battery: One 12 Volt Lantern type

Dimensions: 5-3/4" x 3-3/4" x 10-1/2" (146 x 95.25 x 267 mm)

Weight: Operating weight less than 6lbs. (2.72 kg)
Domestic Packaging .....8lbs. (3.63 kg)

FEATURES INCLUDE:

- Portable heavy-duty aluminum case
- Latest integrated circuitry
- A timing span range from 5 to 45 seconds
- Choice of any timing combinations with continuous range function controls
- Sturdy terminal lugs for quick and easy clamping
- Comes ready for field use
- Readily available 12 volt lantern battery

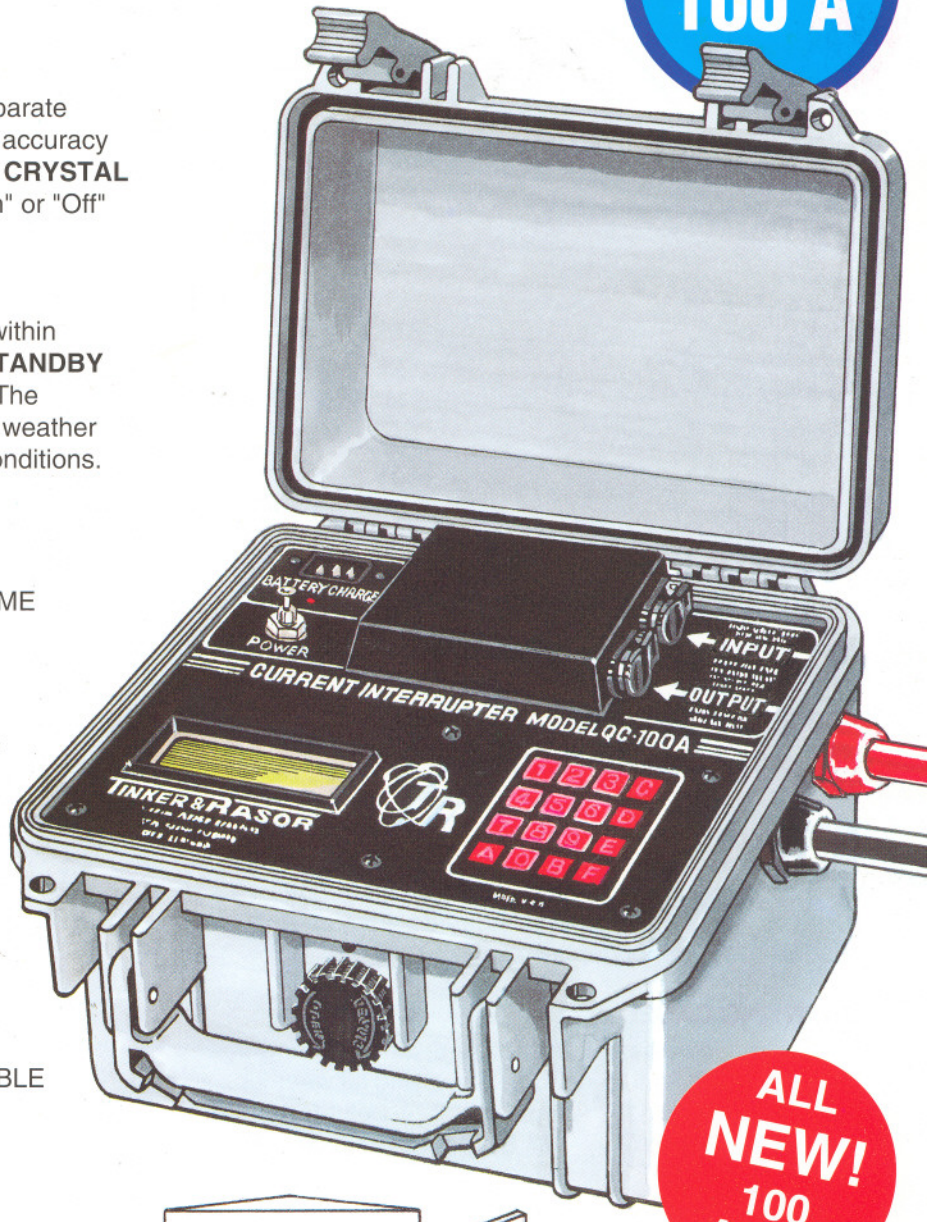


KEY PAD PROGRAMMABLE
CURRENT INTERRUPTER

QC 100 A

A totally **NEW SOLID STATE QUARTZ CONTROLLED CURRENT INTERRUPTER** with a mercury relay of 100 Amps. capacity to separate cathodic protection rectifier stations with extreme accuracy to within 1 ms. with a **THERMAL CONTROLLED CRYSTAL BASED SYSTEM** of 1 ppm. a timing span for "On" or "Off" in (0.5 to 9999.9 seconds).

It includes an **EASY-TO-READ-LCD** for simple programming. The cycle time from start to finish within 18 Hrs., will display (Hrs. Min. and Sec.) with a **STANDBY MEMORY MODE** to resume your last operation. The QC•100A comes in a heavy duty, high impact, all weather gray plastic case able to withstand severe field conditions.

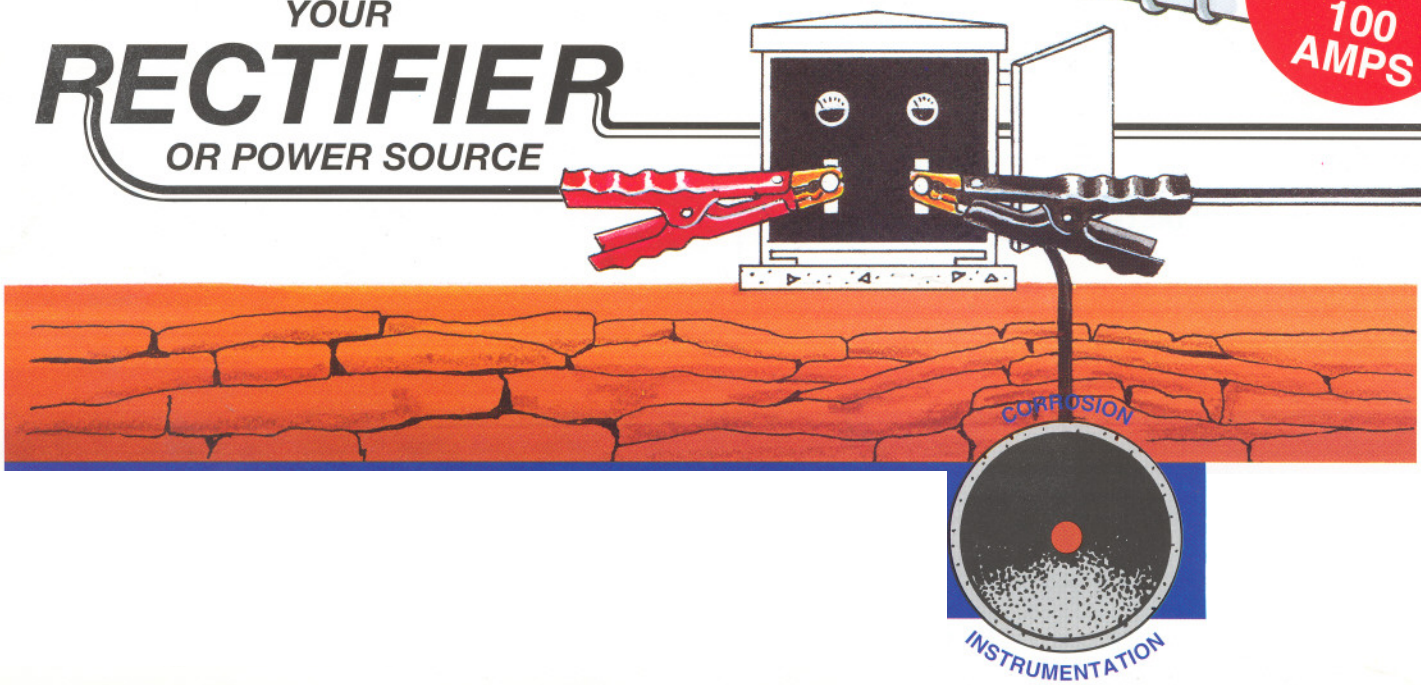


ALL NEW! 100 AMPS

FEATURES:

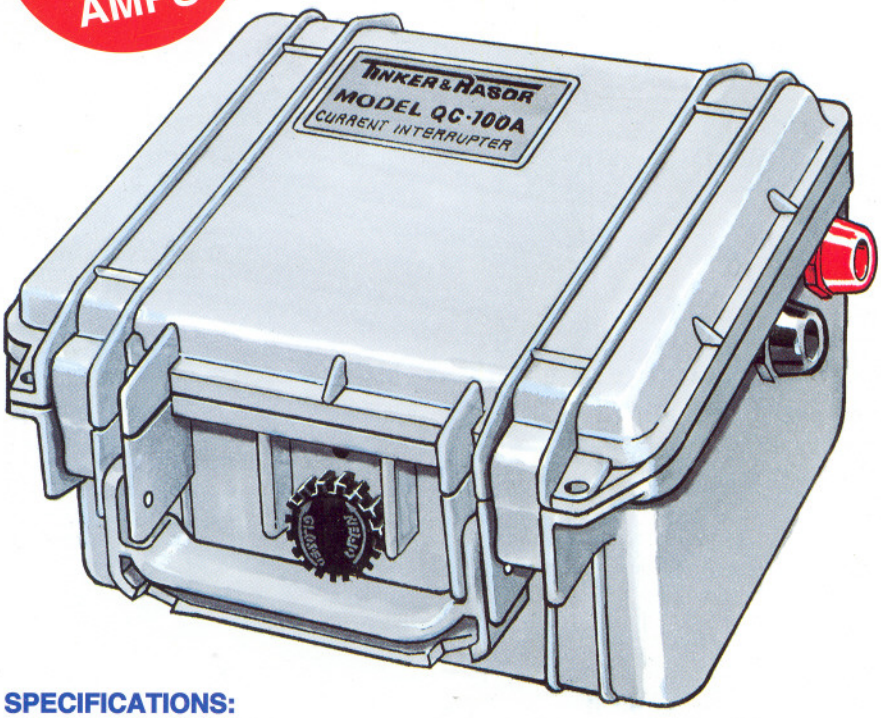
- SOLID STATE CONSTRUCTION
- PROGRAMMABLE KEY PAD AND RESET TIME CLOCK SETTINGS
- SYNCHRONIZED QUARTZ CONTROLLED TIMING
- EASY-TO-READ LIQUID CRYSTAL DISPLAY
- RECHARGEABLE 12V BATTERIES
- OUTPUT AND INPUT CABLE CONNECTIONS FOR INTER-CONNECTING ANY QUANTITY OF QC•100A INTERRUPTERS.
- 4 - CABLES INCLUDED WITH UNIT–
  (2) POWER CABLES
  (1) 110 VOLT AC CHARGER CABLE
  (1) 12 VOLT CAR BATTERY CHARGER CABLE

YOUR RECTIFIER OR POWER SOURCE



ALL NEW! 100 AMPS

KEY PAD PROGRAMMABLE CURRENT INTERRUPTER



SPECIFICATIONS:

OPERATING TEMPERATURES –
10^0 C to + 50^0 C (+14^0 F to 122^0 F)

BATTERY -Two rechargeable 12 volt lead acid 5 A/h batteries will operate the QC•100A approx. 120 hours.* An A/C charger is included, or can be charged from a standard car battery, thru the cigarette adapter.
*Battery life is dependent on cycle.

CARRYING CASE:

Tough, impact resistant, thick walled, plastic strong enough to withstand rugged field use and all weather conditions. **Width** 11" 27.9 cm. **Depth** 9 3/4" 24.8 cm. **Height** 7" 17.8 cm.

WEIGHT:

Operating weight.....16 lbs. (7.3 kg.)
Domestic shipping weight .....17 lbs. (7.7 kg.)
Export Shipping Weight .....25 lbs. (11.4 kg.)
(Added cost for export ocean crating and handling)

KEY PAD PROGRAMMABLE FUNCTION:

DISPLAY – Has a Microprocessor Based LCD Dot Matrix Display.

CYCLE RANGE – "On" or "Off"
0.5 to 9999.9 seconds

CYCLE TIME – From Start to End within 18 Hours shows (Hours, Minutes and Seconds).

RELAY AND START POSITION –
(Open or Closed)

RESET TIME CLOCK SETTINGS:

ACCURACY – Synchronized within 1 ms

TIMING – Has a thermal controlled crystal based system of 1 ppm.

RELAY – Mercury Displacement Relay

48 VDC	-100 Amps.	100 VAC	-100 Amps.
125 VDC	- 50 Amps.	250 VAC	- 60 Amps.
250 VDC	- 30 Amps.	480 VAC	- 60 Amps.

STANDBY MEMORY MODE: To resume last operation

OPTIONS:
2 - Input & Output Cables

750 c.p.s. HIGH POWER AUDIO FREQUENCY OSCILLATOR
Designed For Use With The MARK V RANGER LOCATOR

PD-5

ALL NEW!

TINKER & RASOR Model PD-5 is a new high power output **audio frequency oscillator** designed for long distance surveys of buried or submerged pipe or cable. Designed primarily for use with our **New Model Mark V Ranger** dual frequency pipe and cable locator/short locator. This powerful lightweight accessory, with optional 12 volt rechargeable battery pack, snaps securely inside the Transmitter section of the Ranger. The **PD-5** also features a built-in charger circuit for recharging the battery pack from a vehicle cigarette lighter plug without removing the battery. The **PD-5** can also be powered directly from a 12 volt automotive battery the same as our standard PDA and PDB model oscillators and is completely compatible with our Mark II, Mark III and Mark IV PD receivers.

A signal of 750 c.p.s. is generated by using a power transistor switching circuit. In order that a maximum of energy can be transferred from the pipe, the output of the oscillator is provided with taps so that **voltages of 2,3,4.25,6,9,12.5,17.5, 25, 50** and **100** volts are available to match the load. An interrupter signal is provided to make the signal more easily recognized.

FEATURES:

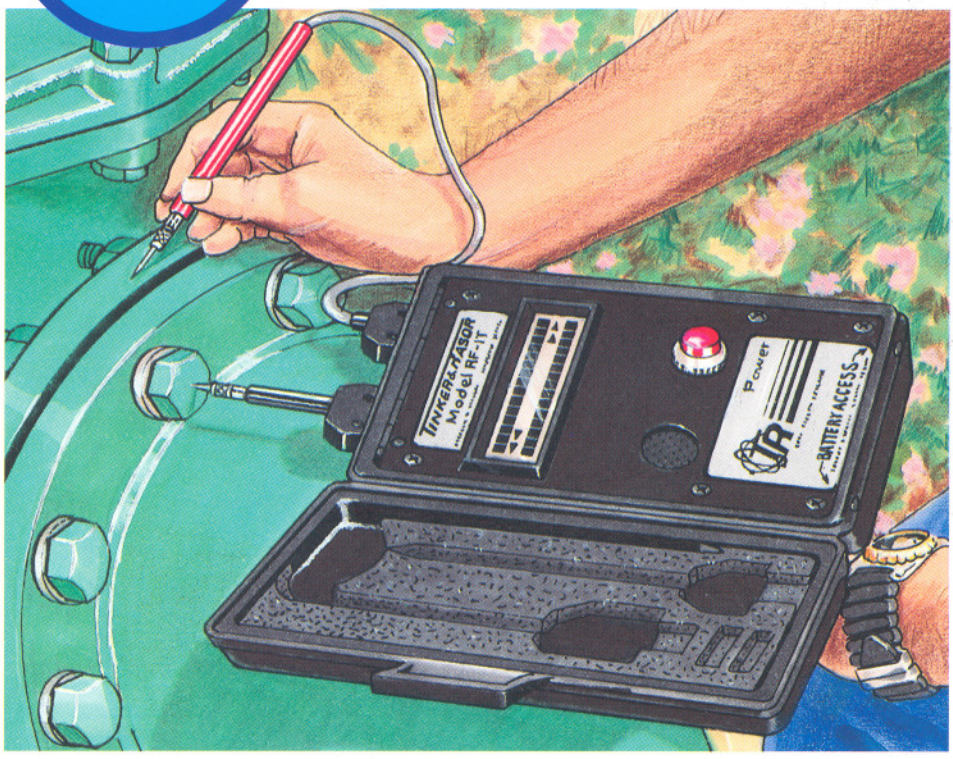
- 10 POSITION OUTPUT VOLTAGE SELECTOR
- COMPATIBLE WITH MARK II, MARK III AND MARK IV RECEIVERS
- PULSE "IDENTIFYING" SIGNAL
- BUILT-IN BATTERY CHARGING CIRCUIT
- LED ON-OFF INDICATORS
- OPTIONAL RECHARGEABLE BATTERY PACK

NEW & ADVANCED! Fast, Accurate, Easy To Use...

3 INSULATOR TESTERS

3-INSULATOR TESTERS

For Testing Insulators on Above Ground and Buried Pipelines



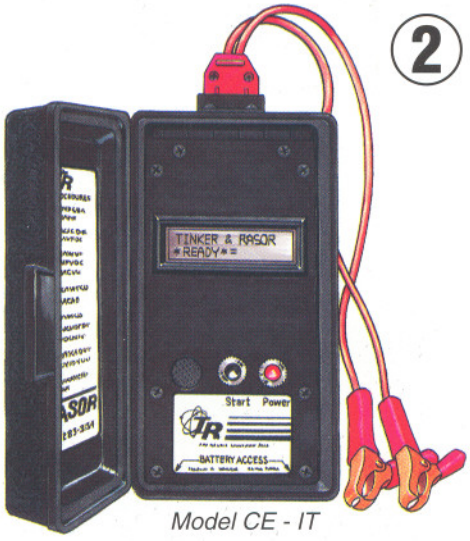
Model RF - IT

1

The Model RF-IT Insulator Tester is a highly sensitive device to test above ground pipeline insulators individually to determine their effectiveness. It comes ready to use! Featuring both audible and LCD read out, providing accurate test for high or low resistance shorts. It is compact, lightweight. The RF-IT offers automatic meter zeroing and requires no field adjustments. Self-contained with plug-in probes and spare needlepoints. It also has a 10 minute timed automatic "shut off" to extend battery life.

SPECIFICATIONS:

Battery:	(6) Alkaline "AA" Cells
Dimensions:	L-8" x W-4" x D-3" (203. x 102. x 76.mm)
Weight:	2lbs. (.907kg)
Shipping Weight:	3lbs. (1.4kg)



Model CE - IT

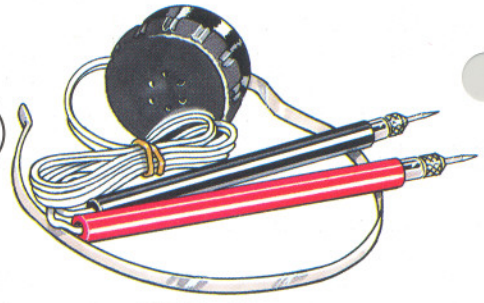
2

The Model CE-IT Insulator Tester is fully automatic, highly sensitive device to test buried pipeline insulators and isolation of pipelines in road crossing casings to determine their effectiveness. LCD readout in English, automatically adjusts to the voltage polarity present on underground pipeline systems in under 20 seconds. An audible signal is heard when the test cycle is completed. Equipped with power switch, the unit automatically shuts off in 10 minuter to conserve batteries. Comes complete with (6) "AA" batteries and needlepoint probes.

SPECIFICATIONS:

Battery:	(6) Alkaline "AA" Cells
Dimensions:	L-8" x W-4" x D-3" (203. x 102. x 76.mm)
Weight:	2lbs. (.907kg)
Shipping Weight:	3lbs. (1.4kg)

3



Model - IT

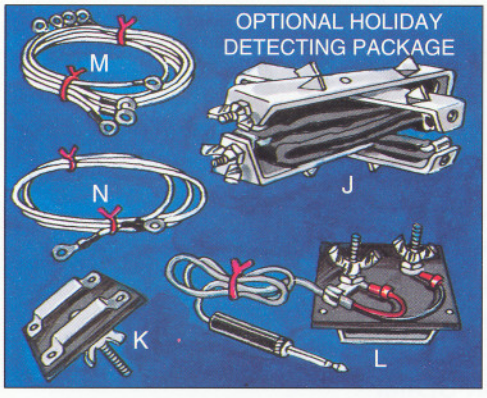
The Model-IT Insulator Tester consists of a magnetic transducer mounted in a single earphone headset with connecting needle point contact probes.

The Model-IT is a "GO or NO GO" type tester which operates from low voltage current present on all underground piping systems thus eliminating the necessity of any outside power sources or costly instrumentation and complex connections.

RADIO FREQUENCY PIPE AND CABLE LOCATOR
AUDIO FREQUENCY SHORT LOCATOR

NEW!

MARK V RANGER



DESCRIPTION

A RECEIVER WITH BATTERIES (6 – C CELLS)
B TRANSMITTER WITH BATTERIES (6 – C CELLS)
C GROUND PLATE, DIRECT CONNECT CABLE
D HEADPHONES, STEREO
E GROUND CABLE, 30'
F TERMINAL BOARD, PIPE AND GROUND
G CABLE, TRANSMITTER TO PIPE, 6'
H 45/90 ADAPTER
I CARRYING CASE
INSTRUCTION MANUAL (NOT SHOWN)

OPTIONAL HOLIDAY DETECTING PACKAGE

J SHOE CLEATS, (SET OF 4)
K TERMINAL BOARD, SINGLE
L TERMINAL BOARD, DOUBLE
M CLEAT CABLES, (SET OF 4)
N CONNECTING CABLE, 30'

FIRST DUAL FREQUENCY LOCATOR OFFERED

The **ALL NEW TINKER & RASOR MARK V RANGER** is a combination Radio Frequency Pipe and Cable Locator and Audio Frequency Short Locator. Unsurpassed in depth penetration, tracing distances and sensitivity. The **MARK V** was designed to expand the capabilities of the field technician by combining two instruments in one.

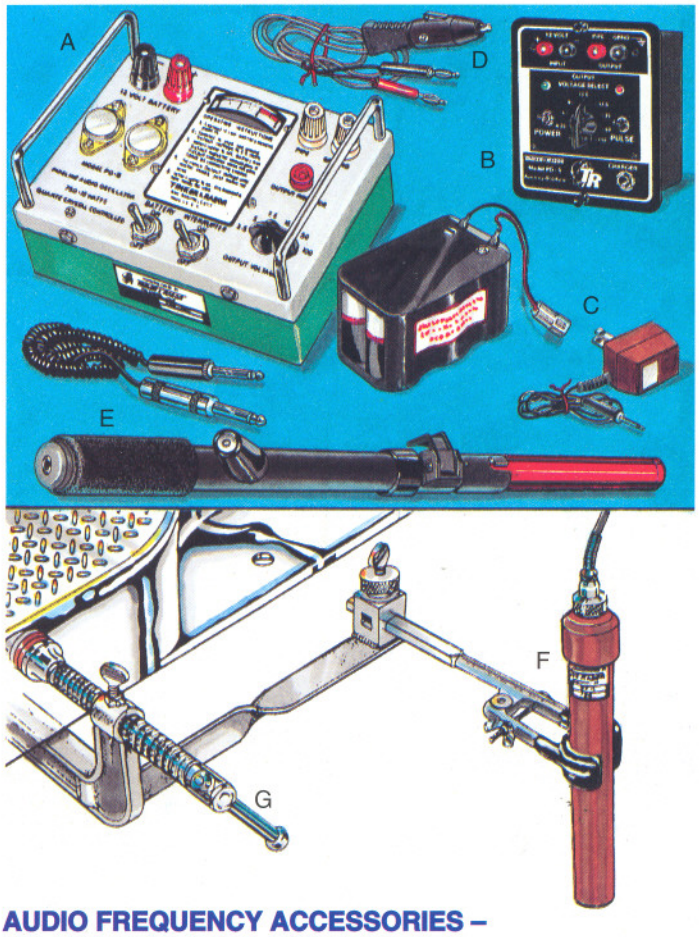
The **QUARTZ CRYSTAL CONTROLLED** signal provides outstanding single frequency output that eliminates high noise interference while being extremely sensitive even at the low range setting. Circuit boards are rigidly mounted to injection molded panels and treated to prevent corrosion and mildew without troublesome potting compounds. Built with the finest components and materials available, the **MARK V delivers the greatest reliability and performance ever offered.** Tough **ABS** thermoplastic panels, housing and compartmented carrying case assure years of trouble-free service in rugged field operations. As with all **TINKER & RASOR** products, the **MARK V** comes with batteries, ready for use, and is available from stock for immediate delivery.

QUARTZ CRYSTAL CONTROLLED

MARK V RANGER

AUTOMATIC IMPEDANCE MATCHING CIRCUIT ELIMINATES OUTPUT ADJUSTMENTS

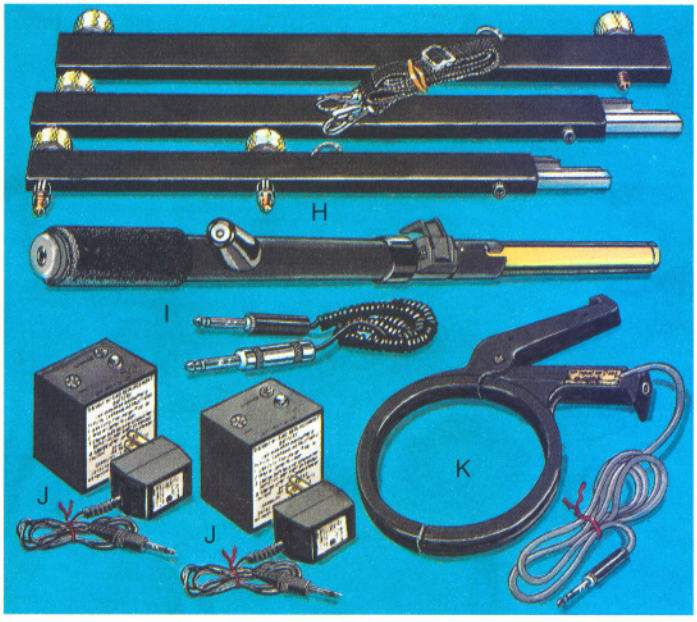
OPTIONAL ACCESSORIES:



AUDIO FREQUENCY ACCESSORIES –

- **A** PDB OSCILLATOR (STANDARD PD OSCILLATOR)
- **B** MODEL PD-5 HIGH POWER OSCILLATOR
- **C** 12 VOLT RECHARGEABLE LEAD-ACID BATTERY PACK WITH CHARGER. FOR MODEL PD-5
- **D** 12 VOLT PD-5 CIGARETTE LIGHTER ADAPTER
- **E** 45/90 PROBE WITH INPUT CABLE
- **F** BP-1 BUMPER PROBE
- **G** BUMPER PROBE VEHICLE CLAMP

OPTIONAL ACCESSORIES:



RADIO FREQUENCY ACCESSORIES –

- **H** 3 SECTION HANDLE WITH CARRYING STRAP
- **I** TS/8 PROBE WITH INPUT CABLE
- **J** 9 VOLT RECHARGEABLE NI-CAD BATTERY PACK (2 REQ'D) WITH CHARGERS
- **K** 501 INDUCTION CLAMP