

Concrete Ultrasonic Testing Equipment
Model: CUTE 102

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Outline:

CUTE 102 is a portable apparatus for Non-Destructive evaluation of concrete quality by Ultrasonic Pulse Velocity (UPV) measurement method. It is used to measure the transmission time of ultrasonic pulses in the test specimen, from which the velocity can be computed. A set of UPV readings can be used for further interpretations of structural concrete. The equipment is designed to comply with the recommendations of BS 1881 (Parts 210 & 203), ASTM C 597-71 (Reapproved 1979) and IS-13311 (Part I); 1992.

The Instrument generate pulse of ultrasonic frequency, which are coupled into the concrete specimen under test by the transmitting transducer. The receiving transducer is used to detect these pulses & to convert them back into electrical pulses. Suitable coupling media are used to minimize the losses due to acoustic mismatch at the transducer-specimen interfaces. A 10MHz Quartz time base ensures accurate measurement of pulse transit time (T) with a resolution of 0.1 microsecond. The path Length (L) can be measured with a tape & hence the Ultrasonic Pulse Velocity (UPV) in the specimen under test can be computed as, $V = L/T$

The CUTE 102 is a fully portable model with facility for using 12 V DC as well as 230 V AC supply. A liquid crystal display (LCD) provided on the front panel ensures good readability during outdoor use. The equipment is applicable for estimation of properties of concrete such as strength, uniformity, crack depths, etc.

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Specifications & Applications:-

Specifications:

- **Method of Measurement:** Ultrasonic Pulse Transmission time measurement with two probes (transducers) system.
- **Time Measurement Ranges:** 000.0 to 999.9 microseconds & 0000 to 9999 microseconds.
- **Time Base:** 10MHz Quartz.
- **Measurable Path Length:** Up to 5 meters in acceptable quantity of concrete, but it could vary according to the quantity of the concrete & material.
- **Frequency of Transducers:** 150 KHz (Nominal)
- **Display Type:** 4 digit 7 segment Liquid Crystal Display.
- **Operator Adjustments:**
 - a. ZERO reading set potentiometer.
 - b. Pulse Repetition Rate Select -3 PRR & 10 PRR.
- **Electric Power Source:** Internal 12 V DC Rechargeable Battery OR External 12 V DC supply OR 230 V AC, 50 Hz mains supply. (110 V AC supply can be provided instead of 230 V AC on request.)
- **Battery Indicator:** Battery status is indicated to the user.
- **Power Consumption:** 7 Watts.
- **Operating Temperature Range:** 0 to 50 °C.
- **Size:** W- 290mm x H-110mm x D-220mm

Applications:

As per recommendation of BS 1881 (Parts 201 & 203), ASTM C 597 – 71 (Reapproved 1979) and IS -13311 (Part I); 1992.

- Estimation of In-Situ strength of concrete as well as precast concrete products.
- Confirming the uniformity as well as quality of concrete to enable timely concrete actions before commencing serviceability of concrete. Thus versatile equipment for quality control & assurance.
- Estimation of depth of crack or investigation of internal defects of concrete.
- Estimation of defective layer of concrete sub-grades.
- Diagnosis of deterioration impact, attack of chemicals, alkali-aggregate reaction, etc.
- Estimation of damages due to fire, thermal shocks, and mechanical shocks.
- Estimation of endurance under freezing and thawing on concrete.

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