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CONTROLS S.R.L.
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Certificate No.
LRC 160150



CONTROLS S.R.L.
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Co-operation for
Accreditation

NEW EDITION

Non Destructive Test Equipment for Concrete

for

- Durability evaluation
- Strength evaluation
- Quality and homogeneity
- Crack measurement, length changes, deflection in structures



I.P.

NDT 06R01/E/B5



This is just a selection of Controls' vast range of products for testing construction materials.

Ask for our general or specific catalogues for Soil and Rock, Concrete, Cement, Aggregate, Asphalt and Steel testing.

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In line with its continual program of product research and development, CONTROLS reserves the right to alter specifications to equipment at any time.

Cover and rebar size measurement

Standards
BS 1881:204

58-E0060/A

**Microprocessor controlled
pulse induction cover meter**

- Accurate estimation of cover and bar sizing with direct reading of the values (mm) on the display
- Cover measurement: from 5 mm to a maximum of about 100 mm (the maximum depending upon bar diameter)
- Friendly user interface: large graphic display, modulated audio signal, integrated menu structured software
- Pulse induction technique
- Simple 4-button operation
- Permanent memory for more than 15,000 measurements
- Serial port for data download to PC (serial cable included)
- Battery operated
- Light and portable
- Complete with nylon carrying case and shoulder belt for site measurements

58-E0060/A



Accessory:
58-E0060/A1
Mini head for
detection of low
spaced rebars



Corrosion activity

Standards
BS 1881:201
ASTM C876
UNI 9535

58-E0065

Half-cell digital corrosion meter

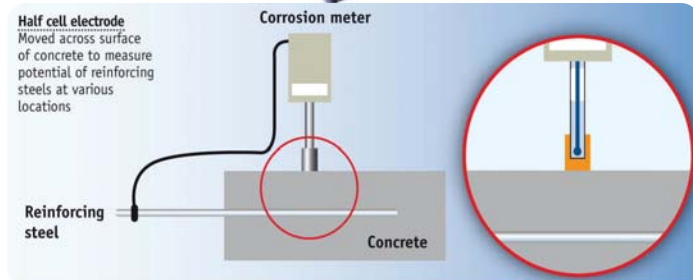
Operating principle

Corrosion of steel is an electrochemical process involving anodic (corroding) and cathodic (passive) areas of the metal. By measuring concrete – surface electrical potentials relative to a standard reference electrode on a predetermined grid, the presence and location of corrosion and its probable future performance may be assessed.

- Stable half-cell silver/silver chloride refillable probe
- Measurements automatically converted and displayed as copper/copper sulphate equivalent potentials
- LCD display
- Battery operated
- Light and portable



58-E0065



Carbonation depth

Standards
EN 13295

58-E0063

Carbonation test set

- Including 500 ml distilled water and phenolphthalein solution bottles and depth gauge
- To detect the loss of alkalinity associated with carbonation and related corrosion risk of rebars

Typical carbonation test result



58-E0063



Surface dampness measurement

58-E0033

Moisture meter

To measure the quantity of water in various solid material such as concrete, masonry, gypsum, brick and most woods using a high frequency capacitive sensor.

It is ideal for locating the source of dampness in walls and structures and to measure, directly and instantaneously, the moisture content within them.

Measurement:

$$\text{content by wet weight \%} = \frac{\text{weight of water}}{(\text{weight of water} + \text{weight of material})} \times 100\%$$

- Resolution: $\pm 0,1 \%$
- Sensing field volume: circa 80 cm³
- Operative temperature range: 0 to 70°C
- Powered by: battery 9 V
- Weight approx.: 250 g

58-E0033



Rebound index

58-Co181/N

Concrete test hammer

Standards
EN 12504:2
ASTM C805
BS 1881:202

58-Co184

Calibration anvil

To evaluate the strenght in various part of the structure

- Impact energy 2.207 joule
- Scale graduated in MPa



58-Co184



Rebound index

58-Co181/G

Digital concrete test hammer

Standards
EN 12504:2
ASTM C805
BS 1881:202

Main features of the digital model

- Introduction of a numerical code
- Setting of test parameters and factors (age, shape, correction factors)
- Selection of testing angle
- Selection of unit (MPa, p.s.i., kgf/cm²)
- Elaboration of test results (calculation of the mean value, standard deviation, concrete strength estimation)
- Large permanent memory: up to 5000 results
- RS 232 output to PC/Printer
- Rechargeable internal battery
- Light and easy to use



58-Co181/G

Test results shown on the display



Pull-off bond-strength tester for surface tensile strength of concrete and adhesive strength of applied coatings

58-Co215/T

Digital bond strength/pull-off tester. 16 kN capacity

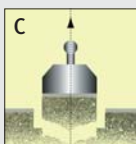
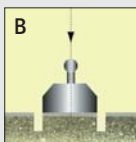
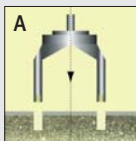
Portable equipment for use in any location.

- High accuracy of the load measurement by load cell and digital readout
- Graphic indication of applied load rate
- Serial port for PC connection
- Battery operated
- Position and height of the 3 supports adjustable
- Axial load with spherical seat
- Supplied with traceable calibration certificate
- Rigid carrying case included

Standards
EN 1015-12,
1348, 1542
EN 13963,
14496
BS 1881:207
ISO 4624
NF P18-858



Schematic drawings of pull-off test procedure



Accessories:

58-Co215/1 Drill bit with centring bit for the preparation of the test surface dia. 50 mm

58-Co215/2 Drill bit with centring bit for the preparation of the test surface dia. 20 mm

58-Co215/5 Aluminium test disc dia. 50 mm

58-Co215/8 Aluminium test disc dia. 20 mm

58-Co215/3 Stainless steel test disc dia. 50 mm (conforming to EN 1015-12 and EN 1542)

58-Co215/9 Epoxy resin with hardening compound. Pack of 1 kg

Taking 28 mm dia. core for compression tests

Standards
UNI 10776

58-Co299

Microcore apparatus. 230 V, 50 Hz, 1 ph

Microcore method

A proven technique for the non destructive evaluation of concrete and masonry strength is to take 28 mm dia. cores for compression tests particularly when used in conjunction with other non destructive testing apparatus such as the ultrasonic tester and the concrete hammer. The 28 mm dia. core sample, due to its small size does not affect the integrity of the structure thus permitting easy restoration of the cored surface.

58-Co299



The set includes:

- Electric drill
- Flanged guide assembly
- Two clamping pliers
- Two diamond bits 100 and 200 mm long
- Anchors and washers
- Carrying cases

Accessory:

83-D2020

Water reservoir 10 litres cap.

83-D2020



Combined ultrasonic and rebound test

58-E0049/B

Dual Tester for high power Ultrasonic and Rebound tests including electronic rebound hammer directly connected

58-E0049/A

Dual Tester for high power Ultrasonic and Rebound tests (with manual input of rebound hammer results)

Standard outfit

The 58-E0049/A version comprises the 54 kHz Transmitter and Receiving heads (one of the two probes is fitted with a sampling button in order to select readings to be recorded) with 3 m cable, calibration rod, 250 cc bottle of contact paste and carrying case. The 58-E0049/B comprises also the electronic rebound hammer.

Operating principle

The pulse velocity can be combined with the rebound hammer value for the concrete compressive strength evaluation based on the mathematical equation of the test report CUR 69 published by the Research Institute of the Dutch Concrete Association.

58-E0049/B Tester



The model 58-E0049/B combined tester is a compact apparatus including UPV meter and electronic rebound hammer. This provides significant practical and economic benefit by offering one system for both ultrasonic and rebound testing. The 58-E0049/A version provides a lower cost alternative which gives the same results but with manual input of rebound results measured using a standard concrete hammer 58-Co181/N.

Standards

EN 12504-2
EN 12504-4
ASTM C587
ASTM C805
BS 1881:202
BS 1881:203
etc.

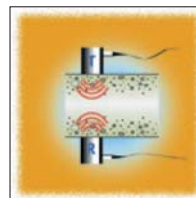
Main applications

- Combined ultrasonic and rebound hammer determination
- Non destructive evaluation of homogeneity of concrete and detection of cracks and voids
- Non destructive estimation of the mechanical properties of the concrete, strength and dynamic modulus of elasticity
- Light, portable and easy to use
- Probe with sampling button

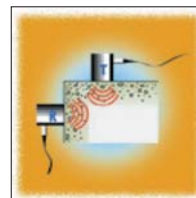
Main features

- **Frequency range:** from 24 kHz to 150 kHz depending upon the selected transducers
- **Transmitter output:** up to 1500 V
- **Pulse repetition rate:** from 1 to 10 pulses every second
- **Memory:** stores up to 1,200 results
- **Power supply:** internal rechargeable batteries
- **Connectable to oscilloscope**
- **RS 232 output**
- **Dimensions:** 210x300x300 mm approx.
- **Weight approx.:** net 3 kg approx.

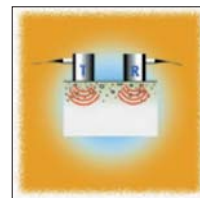
Direct Transmission



Semidirect Transmission



Indirect or Surface Transmission



Ultrasonic pulse propagation through concrete

58-E0048

Ultrasonic pulse velocity tester

Standards
EN 12504-4
ASTM C597
BS 1881:203
NF P18-418
UNE 83308
UNI 9524

To verify:

- Uniformity and homogeneity of concrete
- Presence of cracks or voids
- Changes in properties due to age of concrete
- Deterioration due to fire, frost or chemical attack
- Quick estimation of dynamic Modulus of elasticity
- Estimating time for formwork striking

Main features

- Frequency range: 24 to 150 kHz depending upon the selected transducers
- Transmitter output voltage: 800 V
- Pulse repetition rate: from 1 to 10 pulses every second
- Light and portable: 1.1 kg only
- Battery operated
- Easy to use
- RS 232 output
- Connectable to Oscilloscope
- Supplied complete with carrying case

The tester is supplied complete with:

Two 54 kHz transducers (transmitter and receiver) with 3 m cables
Calibration rod – Coupling agent (250 cc bottle) – Nylon carrying case

58-E0048



Crack width monitoring gauges

Crack spy for measuring the crack widths in different positions

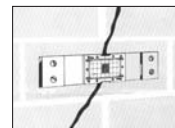
- Internal or external use
- Monitors the opening or closing of crack to an accuracy of 1 mm
- Capable of monitoring vertical as well as horizontal movements

58-Co219/A1

Standard crack width gauge for walls.

Pack of 5 pieces

Monitors horizontal and vertical movements across cracks



58-Co219/B1

Cracks width gauge for corners. Pack of 2 pieces

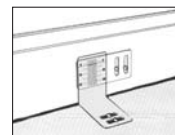
Monitors horizontal and vertical movements across cracks in corner



58-Co219/C1

Crack width gauges for floors

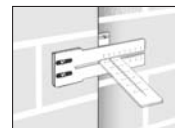
Monitors settlement of floors relative to a wall or column



58-Co219/D1

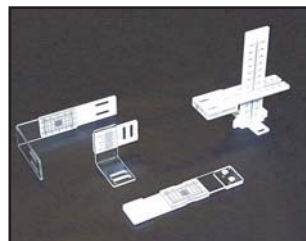
Crack width gauge for difference of level

Monitors movement across a crack when one surface moves out of plane to the other



58-Co219/SET

Complete set of crack spy with carrying case



58-Co219/A1, 58-Co219/C1,
58-Co219/B1, 58-Co219/D1



58-Co219/SET

Crack width measurement

58-Co218

Crack measurement microscope

A high quality microscope designed for measuring crack widths in concrete members, masonry walls and other structures.

General description and specifications

The apparatus operates by an adjustable lamp unit and the image is focused by turning a knob. The eyepiece scale can be turned to align with the direction of the crack or pitch under examination.

- Magnification: 40x
- Measuring range: 4 mm
- Subdivision: 0.02 mm
- Battery: 1.5 W
- Dimensions: 150x80x45 mm
- Weight approx.: net 550 g



Length change meters

Norme
BS 1881:206

This apparatus consists of:

- Dial indicator or digital dial gauge
- 100 mm to 300 mm base lengths depending on model
- Travel 5 mm
- Standard-Calibration bar
- No. 50 datum discs
- Adhesive compound for datum discs
- Carrying case

58-Co230/30

Length change meter

300 mm gauge length, 0.001 mm resolution

58-Co230/30D

Length change meter with digital dial gauge

300 mm gauge length, 0.001 mm resolution



58-Co230/30



58-Co230/30D



Deflection measurements

58-Co224

Deflectometer

Comprising: special dial gauge fitted on a metal basement; 20 m Invar coil; plastic case.

58-Co226

Swing-arm deflectometer with set of three 25x0.01 mm dial gauges

58-Co226/A

Swing-arm deflectometer with set of three 10x0.01 mm dial gauges

Comprising: swing-arm with clamp for total orientation in any position q.ty 3; Invar coil 20 m. Q.ty 3; dial gauges 25 or 10x0.01 mm q.ty 3; plumb weight q.ty 3; carrying case.

58-Co226



58-Co222



Flat jack method

Site evaluation of stress, elastic modulus and strength of brickwork and stone masonry.

Rectangular and semi-oval models. 50 bar capacity

58-Do567/C2

Rectangular flat jack 400x200x4,5 mm

58-Do567/C11

Set of 5 steel sheets 400x200 mm: 2 pieces 1.5 mm thick and 3 pieces 1 mm thick

58-Do567/C20

Rectangular flat jack 400x200x4,5 mm less valves

58-Do567/E2

Semi-oval flat jack 350x260x4,5 mm

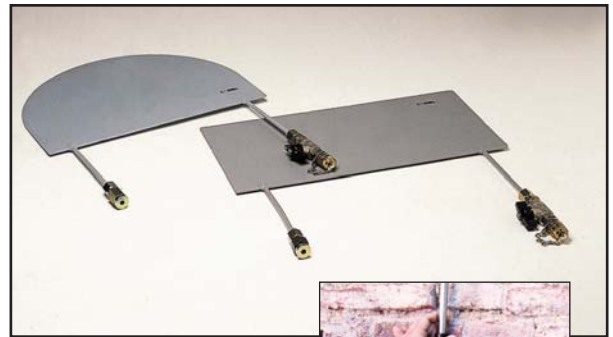
58-Do567/E11

Set of 5 steel sheets semi-oval 350x260 mm: 2 pieces 1.5 mm thick and 3 pieces 1 mm thick

58-Do567/E20

Semi-oval flat jack 350x260x4,5 mm less valves

58-Do567/E2 e 58-Do567/C2



Accessories for the test execution:

- Hydraulic hand pump
- Mechanical and electronic extensometers
- Datalog, data acquisition and processing system
- Pressure transducers
- Connecting flexible hose

Deflection measurement and recording

58-Co229/A

Complete digital system for testing structures in deflection

Consisting of:

- No. 3 tubular sensors with accessories and carrying case
- No. 1 Data acquisition and processing system
- No. 1 Printer 82-P0172

Each part can be also purchased separately.

Main features

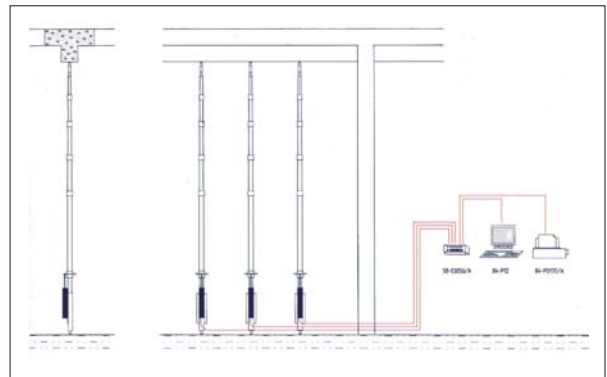
Telescopic tubular sensor

- Minimum height: 1100 mm
- Maximum extension: 3100 mm
- Sensor stroke: ± 50 mm
- Resolution: 0.01 mm
- Weight approx.: net 1.7 kg

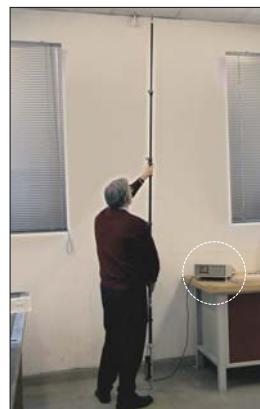
Datalogger

- Measuring channels: 8
- Wide data memory (18.000 readings each channel)
- Resolution 256 kB
- 32.000 divisions
- RS 232 serial output for PC
- 128 x 64 pixel back-lighted graphic display
- Programmable sampling rate (up to 3 Hz)
- Polynomial digital calibration
- Start/Stop function activated by external trigger

58-Co229/A



Schematic view of the deflection test set up



Fitting of a tubular sensor



Datalogger