

elcometer® 331 Mk2 Covermeter with Half Cell Option

Can be used in accordance with:

ACI 318
ASTM C876
BS 1881:201

BS 1881:204
BS 8110
CP 110

DGZfP:B2
DGZfP:B3
DIN 1045

EC 2
SIA 162
SIS 2006

TR60
UNI10174

Locating steel reinforcement bars and metal pipes is essential in the construction and maintenance of structures. Damage caused when a drill or a fastener makes contact with a pipe is costly. A drill making contact with rebar or tendon ducts, however, not only destroys the drill bit but also can lead to serious structural damage.

Before carrying out any maintenance work, it is vital to identify the location, orientation and depth of sub-surface metalwork. It is also useful to establish the condition of the metal work and assess the corrosion potential, so maintenance work can be scheduled accordingly.

Elcometer have three covermeters in their range, the Elcometer 331² Models BH, SH and TH incorporate the Half-Cell technology required to assess potential corrosion of rebar. Elcometer offer a comprehensive range of concrete inspection equipment to meet all of your requirements.

What is a Covermeter?



- A Covermeter is a gauge that measures the thickness of concrete Cover over steel reinforcement bars and metal pipes.
- The covermeter can tell you the depth of the concrete, the location and orientation of reinforcement bar (rebar) or metal pipe and can even determine the diameter of the rebar.
- A drill making contact with a rebar or tendon duct can not only destroy the drill bit, but can also cause serious structural damage.
- The Elcometer 331 covermeters are able to accurately determine where the metal is, even when there are complicated crossings of mesh support structures and then locate tendon ducts deep within the structure.
- This takes the guesswork out of rebar and pipe location

What is Half Cell?



- A Half Cell gauge measures the condition and potential corrosion of rebars and steel structures in concrete.
- When corrosion occurs the ferric oxide protective layer surrounding the concrete breaks down allowing an electrochemical reaction between the steel and the concrete.
- In the half cell test, the reference electrode is passed over the surface of the concrete and the potential voltage difference is recorded. The readings show where corrosion is likely to be or is currently present.

In Summary

- Periodic monitoring of the condition of the rebars and metal supporting structures in buildings, bridges etc. identifies signs and severity of corrosion - long before there are any physical indications of damage. Thus enabling more accurate forecast of projected lifetime.
- When the covermeter readings are combined with half cell readings, the user has a powerful surveying tool. This can be easily achieved using the Elcometer Covermaster* software



Features

This easy to use gauge not only quickly and accurately identifies the location, orientation, depth and diameter of rebar, but also the potential for corrosion.

Designed to meet IP65 this all-in-one rugged waterproof gauge can be used in the harshest of environments.

- **Fast and accurate:**
 - Locate and determine orientation of rebar quickly, easily & accurately.
- **Corrosion check:**
 - Check for potential corrosion of rebar using the same gauge.
- **Large memory:**
 - Holds up to 240,000 readings in linear or grid batches.
- **Large, easy to read backlit display:**
 - Graphical display clearly shows statistics, batches, graph plots and numerical readings
- **Interchangeable search heads and Half-Cell kits:**
 - Select from standard search head, narrow pitch search head, deep cover search head, borehole probe, Copper Half-Cell Kit and Silver Half-Cell Kit.
- **Powerful Covermaster® Software:**
 - Ultimate data management tool to store cover & Half-Cell readings and produce professional reports quickly and easily.
- **Intuitive menus in multiple languages:**
 - Allows use straight out of the box
- **International bar sizes:**
 - User selectable bar sizes include metric, US Bar Numbers, ASTM/Canadian and Japanese for use anywhere in the world.
- **Rechargeable battery supply:**
 - Battery packs can be charged inside or outside the gauge.

Following the Elcometer philosophy of flexibility, the Elcometer 331 Covermeters have a wide range of optional accessories to meet many specialist needs:

- **Identify subsequent layers of rebars & tendon ducts** – connected to our *Borehole Probe* the Elcometer 331 able to detect rebars or tendon ducts behind layer after layer of rebar up to 100cm deep.
- **Measure in a wide range of congested situations** – using the optional *Narrow Pitch Search Head*, the Elcometer 331 can measure close to corners, castellated concrete surfaces, and pre-cast concrete units. Reinforced cages in concrete pipes can also be investigated.
- **Extended Measurement Range** – using the *Deep Cover Search Head*, the Elcometer 331's measurement range can be extended to 180 mm of concrete cover

Technical Specifications

Bar Diameter Ranges	Metric:	5 - 50mm bar diameters in 21 values
	USA Bar Numbers:	#2 - #18 bar diameters in 16 values
	ASTM/Canadian:	10 - 55M bar diameters in 8 values
	Japanese:	6 - 57mm bar diameters in 17 values
Rechargeable Power Supply	7.4 lithium ion battery pack provides up to 32 hours of continuous use (20 hrs if backlight on). Rechargeable in 4 hours either inside or outside the gauge using external charger.	
Maximum Operating Temperature	50°C	
Unit Dimensions (including standard head & lead)	230 x 130 x 125mm	
Weight	1.54kg	



Technical Specifications & Features

	Model BH Covermeter & Half Cell	Model SH Covermeter & Half Cell	Model TH Covermeter & Half Cell
Rebar location	•	•	•
Rebar orientation	•	•	•
Depth of cover	•	•	•
Half Cell capability	•	•	•
Large cover thickness reading mm or inches	•	•	•
Large Half Cell reading mV	•	•	•
Large graphics display with backlight	•	•	•
Multiple language menu structure	•	•	•
Signal strength bar	•	•	•
Interchangeable heads with LED & keypad	•	•	•
User selectable bar range sizes & numbers	•	•	•
Measurement sound modes	•	•	•
Locate (tone increases as head approaches bar)	•	•	•
Under Cover (tone only sound for low cover)		•	•
Maxpip™ (tone only as head passes rebar centre)		•	•
Autosize mode bar diameter determination		•	•
Orthogonal mode bar diameter determination		•	•
RS232 Output - direct to printer or PC		•	•
EDTS+ Excel link software		•	•
Data logging with alpha numeric batch identification		10 linear batches of 1,000 readings each	240,000 readings in linear or grid batches*
Statistics		•	•
Minimum & maximum cover limits		•	•
Date & time			•
Rugged waterproof case (IP65)		•	•
Adjustable beep volume & earphone socket		•	•

* Linear batch mode: up to 200 batches of 1,000 readings Grid batch mode: up to 1,000 batches, maximum number of readings 240,000.

Packing Slips

Elcometer 331² Model BH:

- Concrete Covermeter with Half Cell
- Search head connecting cable
- Rechargeable battery pack and Battery charger
- Earphone
- Shoulder strap
- Plastic carrying case
- Operating instructions

Elcometer 331² Model SH and TH: As Above Plus:

- CD containing EDTS+ software
- CoverMaster® software
- Data transfer cable

Elcometer 331² Half Cell Probe Kit:

- Half-cell Probe
- 25m extension Cable on spool
- 1.7m red rebar cable with connecting clip
- 1.7m black half-cell connecting cable
- Plastic End Cap
- Operating instructions



Part Numbers

Model	Description	Part Number
Elcometer 331 ² Model BH	Elcometer 331 ² Model BH Covermeter with Half-Cell (Order search heads or Half-Cell probes separately)	W331BH--2
Elcometer 331 ² Model SH	Elcometer 331 ² Model SH Covermeter with Half-Cell (Order search heads or Half-Cell probes separately)	W331SH--2
Elcometer 331 ² Model TH	Elcometer 331 ² Model TH Covermeter with Half-Cell (Order search heads or Half-Cell probes separately)	W331TH--2
Search Heads and Borehole Probes	Elcometer 331 ² Standard Search Head	TW33119124-1A
	Elcometer 331 ² Narrow Pitch Search Head	TW33119124-2A
	Elcometer 331 ² Deep Cover Search Head	TW33119171A
	Elcometer 331 ² Borehole Probe 0 - 40cm	TW33119223-1A
	Elcometer 331 ² Borehole Probe 0 - 100cm	TW33119223-2A
Half Cell Probes	Elcometer 331 ² Half Cell Probe Kit Cu/CuSO ₄	TW331CUKIT
	Elcometer 331 ² Half Cell Probe Kit Ag/AgCl	TW331AGKIT
	Elcometer 331 ² Half Cell Probe Cu/CuSO ₄	TW33119668-1
	Elcometer 331 ² Half Cell Probe Ag/AgCl	TW33119668-2
Spares and Accessories	Elcometer 331 ² Extension Reel 100m	TW33119683
	Elcometer 331 ² Extension Reel 25m	TW33119678
	Elcometer 331 ² Rebar Cable with Clip 1.7m	TW33119677
	Elcometer 331 ² Half Cell Connecting Cable 1.7m	TW33116983
	Elcometer 331 Straight Cable 1.8m	TW33119201
	Elcometer 331 Curly Cable	TW33119199
	Elcometer 331 Replacement Battery Pack	TW33119038
	Elcometer 331 Extension Arm Kit	TW33119222
	Elcometer 331 Calibration Test Block	TW33119218
Elcometer 331 Replacement Earphones	T99912220	

Typical Applications

Construction :	At construction sites to locate rebars and metal pipes.
Maintenance :	During routine maintenance of structures such as bridges, to check on corrosion of supporting metal structures in concrete.
Building renovation :	To locate existing supporting metalwork and assess levels of corrosion.
Before drilling and coring :	Using a covermeter enables clear identification of "safe spots" for drilling and coring. This saves the cost of expensive drill bit replacement when metal supports are inadvertently hit.

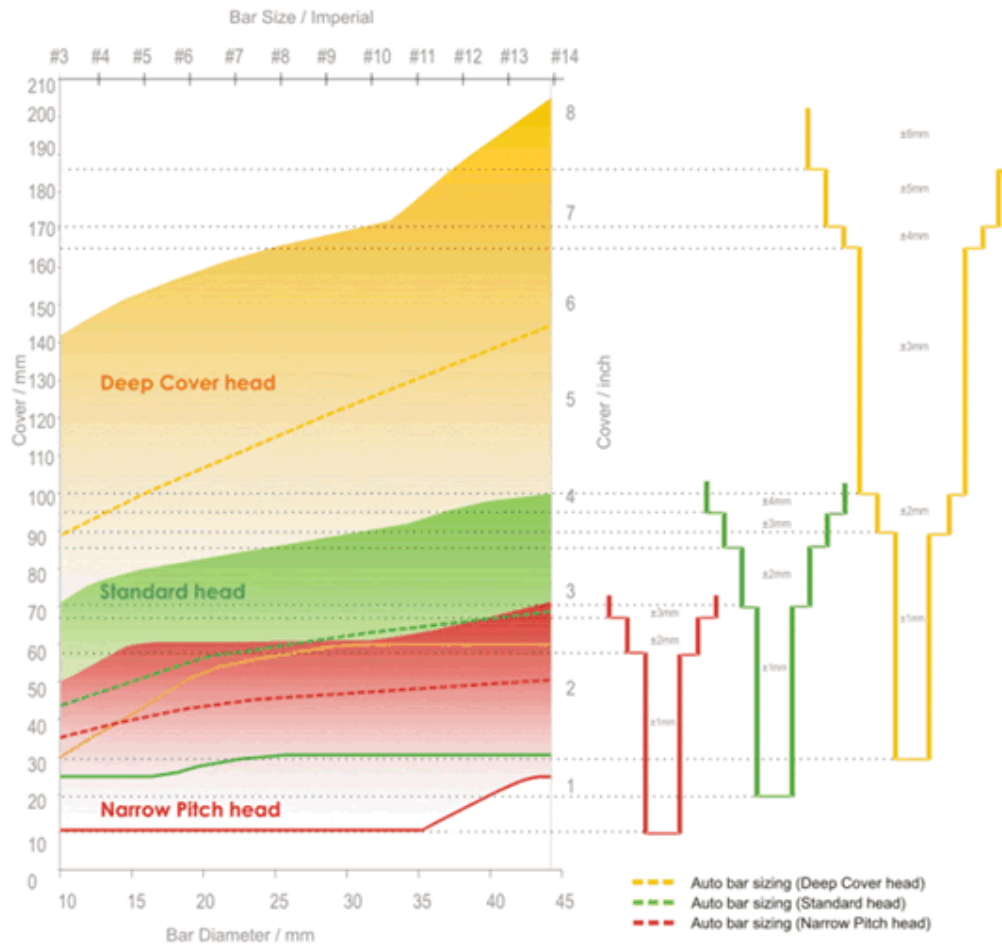
Measuring Ranges and Accuracy

Accuracy :	Up to 65 mm of Cover	+/-2mm		
	70 mm of Cover and Over	+/-3mm		
		Standard Search Head	Deep Search Head	Narrow Pitch Search Head
Cover :	40 mm Diameter Bar	15-95mm	35-180mm	8-80mm
	8 mm Diameter Bar	8-70mm	25-160mm	5-60mm
Resolution :		16mm at	10mm at	16mm at
	Cover	50mm	30mm	50mm
	Pitch	75mm	50mm	75mm
	Separation	60mm	40mm	60mm



Measuring Ranges and Accuracy

Elcometer 331² Measuring Ranges and Accuracy



Elcometer 331² Measurement Resolution

