



# Carlson Reinforced Concrete Meter



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## applications

Measurement of stress in reinforced concrete.

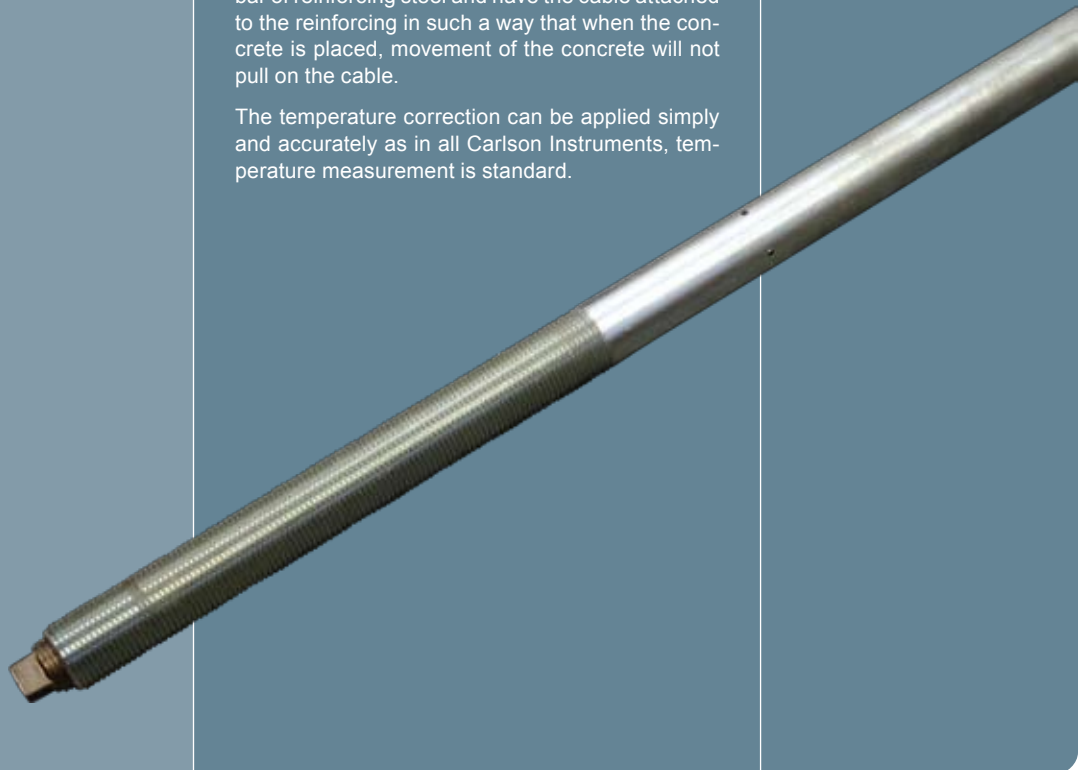
## features

- Robust construction
- Ease of installation
- Proven CARLSON design
- Integral temperature measurement
- Self temperature compensating

The Carlson Reinforced Concrete Meter is a rod-like device which simulates a bar of reinforcing steel. The rod is hollow to accommodate a miniature strain meter within, and it is this strain meter which measures the change in length from which the stress is derived. What makes the Reinforced Concrete Meter unique is that it measures the change in length of the steel rod regardless of the occurrence of fine cracking which is common to reinforced concrete. It measures the average strain over most of the rod's length, as all of the bond between the steel rod and the concrete occurs within a few inches of each end. To insure this happening the hollow steel rod is threaded externally near each end.

The fact that the Reinforced Concrete Meter measures average length change is important when there are external cracks, because the average length change determines the stress in the reinforcing. On the other hand, if conventional strain meters of limited length were used, they would indicate a different result depending upon whether a crack is within the gauge length or just beyond it. Whenever the Reinforced Concrete Meter indicates a strain greater than the strain capacity of the concrete, it may be concluded that the concrete is cracked. In such a case, it nevertheless indicates the true stress in the steel. In the case where the tensile strain is below the strain capacity of the concrete, the Reinforced Concrete Meter indicates both the tensile stress in the reinforcing and that in the concrete. Another advantage is ease of installation. Since the sensing element is surrounded by a heavy steel wall, the device is very rugged. The usual method of installation is to wire the meter to a bar of reinforcing steel and have the cable attached to the reinforcing in such a way that when the concrete is placed, movement of the concrete will not pull on the cable.

The temperature correction can be applied simply and accurately as in all Carlson Instruments, temperature measurement is standard.



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specifications + ordering info

# Carlson Reinforced Concrete Meter



## operating principle

Carlson Instruments are elastic wire strain meters containing two coils of highly elastic steel wire, one of which increases in length and electrical resistance when a strain occurs, while the other decreases. The ratio of the two resistances is independent of temperature (except for thermal expansion) and therefore the change in resistance ratio is a measure of strain. The total resistance is independent of strain since one coil increases the same amount as the other decreases due to a change in length of the meter. Therefore, the total resistance is a measure of temperature.

## cable specs

The cable most commonly used is heavy duty, neoprene rubber-covered, with either three or four conductors. Alternate cable types are available to suit site specific conditions and we invite your inquiries.

The Carlson MA-6B and later series readout instruments, while compatible with both three and four wire systems, require only three conductors to monitor both temperature and resistance. Earlier versions of Carlson readouts require four conductors to monitor both parameters. We recommend that the total design length of cable be attached at the factory in order to assure system integrity. Should the final design length not be known at the time of order, specify the total length of cable to be supplied in bulk, and that a 1 m. (40 in.) length of either three or four conductor be attached. As conductor diameter is determined by lead length, please specify the approximate total length, to insure that the most appropriate cable is supplied.

While field splicing is possible, the instructions in the Carlson field manual must be followed.

## specifications

DESCRIPTION	SPECIFICATION
Range (micro-strain)	±950
Resolution (micro-strain)	3.4
Resolution (stress in steel)	100 psi (690 kPa)
Resolution Temperature	0.1°F (.05°C)
Maximum Stress	±44,000 psi (300 MPa)
Weight	2.5 kg (5.5 lbs.)



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