



# Carlson Strain Meter



Standard Carlson Strain Meter

The Carlson Strain Meter is a device, which can be embedded in concrete to reveal the internal deformations. It responds to any change in dimension of the concrete, due to stress, creep, temperature change, moisture change or chemical growth. The main purpose of the strain meter, however, is to indirectly determine stress. Quick changes in stress are simply achieved by multiplying the measured strain by the modulus of elasticity. But for stress, which develops over a long period of time, account must be taken for changes in modulus of elasticity and of deformations due to creep and to all causes other than stress.

The standard strain meter may be embedded in concrete or attached to a surface with saddle mounts. The strain meter is furnished in three different lengths, from 8 cm to 51 cm (8 in. to 20 in.), but all with the identical sensing element. The end away from the cable has a tapped hole (1/4 - 28 UNF) to permit attachment to a spider for mass concrete embedment, or to incorporate an extender thereby increasing the length and sensitivity. The body is covered with PVC sleeving to break the bond with the concrete.

The miniature strain meter is for embedment in concrete applications where small size is essential. The miniature strain meter is furnished in three different lengths, from 10 cm to 20 cm (4 in. to 10 in.), but all with the identical sensing element. The end away from the cable has a tapped hole (6 - 32 UNF), which allows an extender to be added, thereby increasing the length and sensitivity. The body is covered with PVC sleeving to break the bond with the concrete.

The standard strain meters are intended for use in service structures, and the miniature strain meters are mainly for laboratory testing.



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## applications

Measures internal deformations in concrete.

## features

Responds to stress, creep, temperature, moisture change or chemical growth.

Indirectly determines stress.





# Carlson Strain 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.



Mini Carlson Strain Meter

## specifications

DESCRIPTION	STANDARD CONCRETE STRAIN METERS				MINI CONCRETE STRAIN METERS		
	A8	A10	A10S**	A20	M4	M8	M10
Range (micro-strain)*	2600	2100	2100	1050	3900	2000	1600
Resolution (micro-strain)	3.6	2.9	2.9	1.5	5.8	2.9	2.3
Resolution Temperature	0.1°F (.05°C)	0.1°F (.05°C)	0.1°F (.05°C)	0.1°F (.05°C)	0.1°F (.05°C)	0.1°F (.05°C)	0.1°F (.05°C)
Gauge Length	20.3 cm (8 in.)	25.4 cm (10 in.)	25.4 cm (10 in.)	50.8 cm (20 in.)	10.2 cm (4 in.)	20.4 cm (8 in.)	25.4 cm (10 in.)
Weight	.36 kg (.8 lbs.)	.59 kg (1.3 lbs.)	.59 kg (1.3 lbs.)	.82 kg (1.8 lbs.)	86 g (.19 lbs.)	145 g (.32 lbs.)	186 g (.41 lbs.)

\*Normally set at factory for 2/3 to 3/4 or range in compression. Within limits, other settings may be specified.  
 \*\*Saddle mount. Mounting diameter is 1-1/16 inches.

## ordering info

DESCRIPTION	STANDARD CONCRETE STRAIN METERS				MINI CONCRETE STRAIN METERS		
	A8	A10	A10S**	A20	M4	M8	M10
Part Number	CA020A	CA021A	contact RST for more info	CA022A	CA070A	CA071A	CA072A

