

VIBRATING WIRE STRAIN GAGE

MODEL EDS-21V Series



EDS-21V-E

EDS-21V-AW

INTRODUCTION

The vibrating wire strain gage is used to measure strain in steel, concrete or composite structure. It also provides data for structural load and stresses. The strain gage indirectly determines stress and its variation with time, quantitatively. Change in stress is determined by multiplying the measured strain by the modulus of elasticity.

The Encardio-rite EDS-21V series of vibrating wire strain gages are designed to measure large strains upto 5000 micro-strains. The model EDS-21V-E embedment strain gage is used to measure strains in concrete mass, while model EDS-21V-AW arc weldable strain gage can be fixed to steel structure or on concrete surface by suitable mounting blocks for monitoring strain.

FEATURES

- Accurate, robust and low cost
- Long term stability with high reliability
- Suitable for large strain measurement
- Completely waterproof
- Thermally aged wire to minimize long-term drift and changes in calibration
- Frequency signal can be transmitted over long distance
- Built-in thermistor for temperature measurements.

APPLICATION

- Monitoring of strain in dams and concrete structures during and after construction.
- Study of stress distribution in the underground cavities and tunnels.
- Stress distribution in concrete and masonry dams.
- Monitoring of stresses in pressure shafts.



OPERATING PRINCIPLE

The vibrating wire strain gage basically consists of two components – a basic gage and a sensor assembly.

The basic gage incorporates a high tensile strength wire made of a magnetic material stretched between two stainless steel cylindrical end blocks. The wire is sealed in a stainless steel tube by a set of double "O" rings fixed on each end block, ensuring to a great extent resistance to corrosive, humid, wet and other hostile environmental conditions.

The sensor houses a permanent magnet and a plucking coil assembly. The strain gage works on the principle that if a coil/magnet assembly plucks a fixed length stretched magnetic wire; its frequency of vibration is proportional to the tension in the wire. Any change in strain, directly affects the tension in the wire, resulting in a corresponding change in its frequency of vibration.

The strain is proportional to the square of the frequency that can be measured and displayed directly in micro strain by Encardio-rite's EDI-54V vibrating wire indicator. The data can also be automatically collected at desired frequency, stored and transmitted to remote server by a suitable datalogger.

EDS-21V-E EMBEDMENT STRAIN GAGE

Model EDS-21V-E vibrating wire strain gage is designed to measure strain in underground cavities, tunnels, buildings, concrete and masonry dams etc.

The embedment strain gage has stainless steel flanges at either ends and is suitable for embedment directly in concrete. Any deformation in the concrete mass causes the two end blocks to move relative to one another, thus changing the tension in the wire, resulting in a corresponding change in its frequency of vibration.

EDS-21V-AW ARC WELDABLE STRAIN GAGE

Model EDS-21V-AW is designed to measure strain in steel or on concrete surface of composite structure. It is suitable for surface mounting by welding on steel structures such as bridges, piles, wye sections, pressure shafts, tunnel linings and supports etc.

To mount the strain gage, two annular mounting blocks are accurately positioned and aligned with the help of a mounting jig and dummy gage and welded to the structure. The dummy gage is then finally replaced by the actual strain gage and clamped in position by a pair of set screws on each block.

Groutable reinforced bar annular mounting blocks are available for surface mounting the strain gage to a concrete structure.

An extra waterproofing is provided on the strain gage to prevent ingress of water, making it well suitable for locations subjected to dripping/running water or submerged in water.

Accessories for EDS-21V-AW

- Mounting blocks - weldable or groutable
- Installation kit consisting of mounting jig, dummy gage, Allen keys and grub screws (to be ordered separately)

SPECIFICATIONS

EDS-21V-AW & EDS-21V-E

Range	5000 μ strain
Sensitivity	2 μ strain
Active gage length	150 mm
Effective gage factor ¹	~ 4.051 x 10 ⁻³ μ strain/Hz ²
Thermistor type	YSI 44005 or equivalent (3,000 Ohm at 25°C)
Temperature limit	-20° to 80°C
Cable	4-core shielded 1 m long; specify
Size l x b x h (mm)	
Model EDS-21V-E	170 X 28.5 X 30
Model EDS-21V-AW	174 x 28.5 x 30

¹ For actual value, check test certificate