



IRAD Instrumented Rock Bolt Model 5660-RT-IRB Model

FEATURES

- **Least expensive, highly accurate method of measuring roof load**
- **Reduce roof bolt usage by testing for optimum bolt spacing and widening current spacing**
- **Robust, mine duty design—MSHA approved**
- **Fast and easy installation**
- **Extremely easy to read**
- **Can be hard-wired and automatically monitored to drive an alarm system to protect conveyers and other permanent underground installations**
- **Wireless local reading or remote hard-wire reading up to two kilometres away are available.**



APPLICATIONS

The IRAD Instrumented Bolt is a specially developed instrumented rock bolt that can be used in a wide variety of applications. The IRAD bolt eliminates the need for torque wrench measurement of strata loading that can destroy the integrity of the bolts' anchors. Together with a light-weight hand-held probe and an MSHA approved readout unit, the IRAD bolt forms a unique system for long or short-term monitoring of strata loads.

In coal or metal mines, the IRAD bolts can provide a warning to workers of impending overloading of the strata. Significant cost savings can result when the IRAD bolt is employed in a systematic study of strata load to prove that a wider bolting pattern can be safely utilized, thus reducing the total number of roof bolts purchased each year. The IRAD bolt can also help to reduce or eliminate damage to expensive equipment by providing a convenient means of permanently monitoring the load on strata.

In addition, the IRAD bolt can be

used to replace hollow core load cells to measure load transfer from the strata to the walls in tieback wall applications.

Description

The IRAD bolt is a standard, mechanically anchored, expansion shell type bolt that measures load (tension) on the bolt to a resolution of 10 pounds (4.5 kg) per digit change on the readout unit. The bolts are installed in the same manner as standard expansion shell type roof bolts and require no special handling.

The heart of the system is a miniature IRAD GAUGE vibrating wire strain gauge mounted in a hole along the central axis of the bolt. IRAD GAUGE vibrating wire strain gauges are well known for their ruggedness and long-term stability even in the harshest environments. Because the signal from a vibrating wire transducer is based on frequency, rather than resistance, contact resistance has no effect on readout. As a result, the load on an IRAD bolt can be read simply and con-

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veniently by touching the bolt head for 3 to 5 seconds with a hand-held probe. If the application is in a hazardous area, the bolts can be hard-wired for remote monitoring or automatic datalogging. In addition, these signals can be sent by wire more than two kilometres away without special readout equipment or signal amplification to protect permanently installed equipment like conveyers or power stations.

Installation

The IRAD bolt, which is either a mechanically anchored roof bolt or a rigid reinforcement bar, cement or resin grouted, is installed in the drift roof or tieback wall.

The installation procedure is not modified at all in the case of a bolt read with the hand-held probe since no fixed wire is attached to the bolt. In case of hard-wiring, special attention is required during the torquing or grouting procedure of the bolt.

Accessories

- Hand-held probe: 0.6 metres standard length. Other lengths available on request.
- MB-6T / MB-6TL vibrating wire readout unit (see separate data sheet).
- SENS-LOG data acquisition system (see separate data sheet).
- Anchors and washers (ask IRAD GAUGE representative for details)

- Spherical seating
- Centralizer bushing

Ordering Information

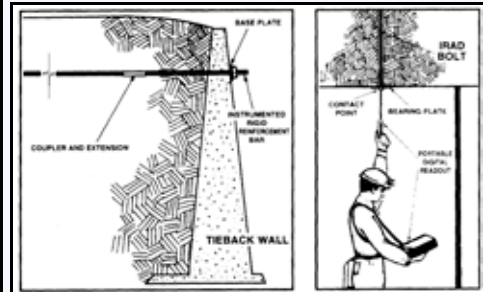
Please specify:

- Number of bolts
- Length of bolts
- Bolt diameter
- Length of hand-held probe or hard-wire reading
- MB-6T/MB-6TL readout unit.
- SENS-LOG data acquisition system
- Number of hard-wire connectors and cable length for remote or automated reading applications
- Other accessories

Specifications

ROOF BOLTS		
Nominal bolt size* Diameter: mm	15.875 mm	19.05 mm
Yield load-kilogram Grade 75 steel	4763 kg	7031 kg
Grade 55 steel	N / A	5216 kg
Nominal sensitivity- lb/linear unit on MB-6T readout	9	13
Temperature range	(-40°C to 66°C)	
Lengths**	1.2, 1.5, 1.8, 2.4, and 3 m	

* Other sizes supplied on special request
** Other lengths available on special request



TIEBACK WALL BOLTS		
Nominal Threadbar diameter	Nominal Sensitivity	Nominal Yield Load
cm	lb/linear unit	kg
1.905	13	6,364
2.223	18	9,091
2.540	25	12,273
2.865	33	15,909
3.226	43	20,909
3.581	53	25,909
4.300	79	38,636
5.733	144	70,455
Temperature Range	-40°C to 66°C	
Lengths	Instrumented section is approximately 1 metre long and is coupled to any bolt length required.	

Due to on-going design improvements and reviews, we reserve the right to amend product and specifications without prior notice.



FOR FURTHER INFORMATION

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