

Zensor[®] Rupture Disk Burst Sensor

The term Zensor[®] refers to the additional components ZOOK supplies attached onto a standard ZOOK Graphite Rupture Disk which enables the disk to electrically indicate a ruptured condition.

The Zensor design includes:

- **armored** Graphite Rupture Disk
- PTFE coated surfaces providing a non-conductive, non-stick, corrosive barrier
- highly corrosive resistant **Tantalum** Sensing element
- a **shielded** 6 foot long lead wire **sheathed** in PTFE
- a mounting bracket and hardware made of Stainless Steel
- PTFE lined vent surface for protection of the sensing element and vent side surface of the rupture
- completely assembled unit using standard non-asbestos material gaskets (other gasket materials are available upon request)

Zensor may be installed on the following type disks: Mono, Inverted, Two-way and Duplex.

Construction

An ARMORED type graphite rupture disk is required. ZOOK attaches a stainless steel bracket to the disk's steel OD. A 6 foot long shielded PTFE sheathed lead wire containing two wires is attached to the bracket. Inside the bracket, one sensing element is attached to the OD of the disk and is held in place by a stainless steel rivet. The second element leads out of the bracket and passes through the discharge side gaskets and attaches onto the membrane of graphite disk. The attachment of the tantalum sense element onto the membrane (the portion of the disk that breaks away from the rim when the disk ruptures) uses cement of the same composition as the disk. To protect the sensing element from chemical attack, a PTFE material liner is applied to the vent side surface. ALL disk surfaces are PTFE coated to provide a non-conductive, non-stick and corrosive resistant surfaces.

Reliability

The Zensor is an integral indication system – alternative designs utilize external type indicators, which are subject to corrosive attack and mechanical damage and may provide false indication.

The Zensor functions by allowing milliamp electrical current to pass through the disk material. Graphite is an excellent conductor of electricity.

If your application involves electrically conductive fluid media, a monitor that detects change in resistance (not just continuity) is recommended. The Zensor disk and ZM2 monitor system provides positive indication in electrically conductive fluid applications.

Classification

The Zensor is considered a simple apparatus and is intrinsically safe when powered within required limits. Refer to ZOOK Document ZQ4120.

Applications

- Positive indication for applications involving conductive fluids in direct contact with the rupture disk
- Protection of liquid processes
- Isolation of relief valves where the Zensor provides positive indication that the disk has ruptured, after the valve re-closes
- Inaccessible locations- where catwalks must be used to access the disk location or atop storage tanks. Anywhere that is difficult to read a telltale gauge mounted with a rupture disk
- Critical applications where emergency shutdown systems (pumps, actuated valves, etc.) could be initiated by the Zensor
- Immediate warning of atmospheric emission

The problem: Conductive fluid in contact with a metal type rupture disks

The Solution... Zensor and ZM2 monitor

- Alternate designs function on an open/closed circuit basis (continuity) which may not indicate properly in conductive fluid (liquid or highly saturated vapor) services.

The condition for a false or lack of burst indication may be due to the electrical conductivity of the process fluid. Upon opening of the indication device, a condition caused by the process fluid, the fluid may provide a conductive bridge across the indication device resulting in the monitor *not* indicating a ruptured condition.

- Users of metal type rupture disks are aware of the potential condition for pinhole leakage occurring through the metal materials used to manufacture metal disks. The user's concern is that a pinhole leak may develop leaving it difficult to maintain or allow for possible loss of the vapor space between the liquid process and the disk location. If the vapor space is lost, the process liquid may directly contact the rupture disk. If the disk is equipped with an external type indicator, the indicator may not function properly.

ZOOKs' solution to these problems is the graphite rupture disk with Zensor design indicator, which is designed integrally, combined with patented circuitry contained within the ZM2 monitor. The Monitor functions both a basis of continuity (like our competitors) **and** on the basis of **electrical resistance**. The resistance through the electrical loop will change when a ruptured condition occurs, the ZM2 monitor detects this change in resistance.

Zensor[®] is a trademark of ZOOK Enterprises



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