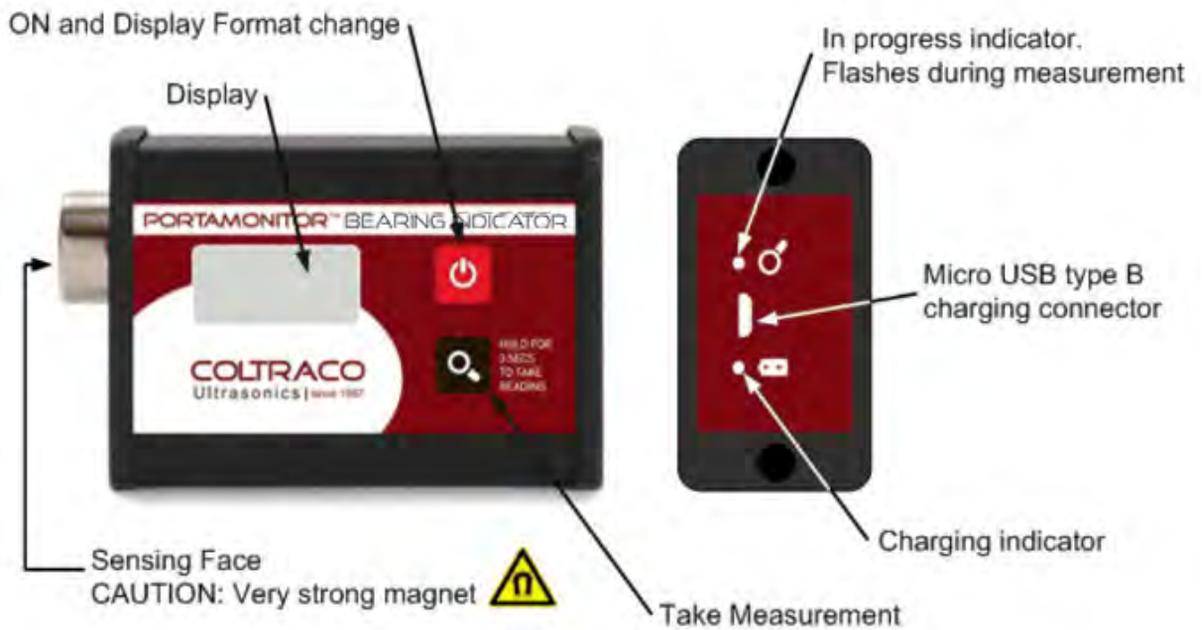




PORTAMONITOR®
USER MANUAL

I. Layout





2. Introduction and Intended Use

The BEARING INDICATOR is a state-of-the-art Condition Monitoring instrument with extreme sensitivity to detecting faults. The BEARING INDICATOR aids the detection of mechanically deteriorated bearings in operating machinery. It can also identify those having inadequate lubrication or lubricant contamination.

Utilising an established and unique approach to signal detection and processing, the BEARING INDICATOR monitors bearings in motors, pumps, fans, gearboxes and other rotating machinery applications.

BEARING INDICATOR readings provide insight into the planning of future repair actions and assist in identifying the need for improved lubrication.

3. Maintenance, Service & the Environment

3.1. Cleaning

The outer case does not require cleaning during normal use. If the case becomes soiled, wipe clean with a soft cloth or tissue. The sensing face should be kept clean and free of grit and debris. The sensing face can be degreased as necessary using a mild detergent. Do not use aggressive chemicals.

3.2. Service and Calibration

SDi recommends that the BEARING INDICATOR is serviced, checked and calibrated regularly through an authorized SDi service provider. The recommended recalibration period is 12 months.

The BEARING INDICATOR contains no user serviceable parts. Do not attempt to dismantle. Contact SDi for service and repair.

4. Safety Summary



The sensing face of the BEARING INDICATOR contains a very strong magnet and should never be positioned in the vicinity of sensitive electrical/electronic equipment (for example; pacemakers or other sensitive medical equipment) or magnetic storage media such as hard disk drives.



Do not carry out any instruction in this manual if it may cause risk of physical injury, damage to machinery, would be against site rules or could adversely affect products or processes.



Wear Personal Protective safety equipment appropriate to the area and potential hazards where measurements are to be made.



Never use the BEARING INDICATOR on or near exposed moving parts. Never override safety systems in order to gain access to operating machinery. Take care to avoid physical injuries when taking measurements.



To avoid the risk of personal injury, only use the BEARING INDICATOR on electrically grounded (earthed) machinery. Never use the BEARING INDICATOR on live electrical surfaces.



The BEARING INDICATOR could reach extremes of temperature when placed on HOT or COLD machines. Take precautions to avoid skin damage when handled.



The BEARING INDICATOR is NOT approved for use in HAZARDOUS ATMOSPHERES.

5. Distress and dB level

The BEARING INDICATOR outputs two key values to aid condition monitoring:

- | | |
|-----------------------|--|
| dB Level | Indicates an average of the measured signal level. |
| Distress [®] | Indicates the level of transient activity of the signal. |

6. Operation

6.1. Switching BEARING INDICATOR ON and OFF

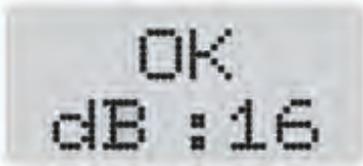
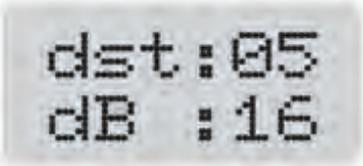
Press the  button to turn the unit on. The BEARING INDICATOR briefly displays its serial number and software version. The last measurement taken is then displayed.

The BEARING INDICATOR switches off automatically after 30 seconds of inactivity.

6.2. Distress® Display Format

To assist the effectiveness of general measurement taking, the display of the BEARING INDICATOR can show a qualitative output to aid the interpretation of results. The Distress® Quality mode is based on typical diagnostics for bearings.

To toggle between the modes, Press  for 3 seconds.

| Distress® Quality Mode | Distress® Numeric Mode |
|---|--|
| OK | Distress® (dst) <10 |
| Suspect | Distress® (dst) >10 <15 |
| Poor | Distress® (dst) >15 |
|  |  |

“Too low” is displayed when there is insufficient signal being detected to allow a Distress® reading to be taken.

7. Taking Measurements

7.1. Mounting location

 The sensing face needs to be acoustically coupled to a static part of a machine's external casing containing the bearing to be monitored. Positioning and orientation of the sensor is not critical although highest signal levels will be detected in the immediate vicinity of the bearing - avoid flimsy cowls, guards and nameplates. Make sure the surface is clean and free of grit and debris.

7.2. Fitting to the machine

 Use a pea sized amount of a suitable GREASE or GEL between the BEARING CATOR sensing face and the machine (1).

With the unit switched on, Press the  button for 3 seconds.

The display then shows 10 second countdown. Place the edge of the sensing face gently on the machine (2), then roll the BEARING INDICATOR into place (3). Twist the BEARING INDICATOR to spread the grease under the sensing face - this also allows the presence of debris to be felt (4).

Follow the GREASE or GEL supplier's instructions on its use, particularly with regard to skin irritant effects or contamination of the environment, nearby processes or product.



7.3. Displaying Readings

After the countdown, the BEARING INDICATOR takes measurements for a further 10 seconds; the Measurement in progress light will flash. Measured values of Distress® and dB are then displayed.

7.4. How to get the best from the BEARING INDICATOR



Do not move the BEARING INDICATOR during measurements and ensure nothing is touching the BEARING INDICATOR as this can affect the readings.



Distress® readings may appear artificially high if the BEARING INDICATOR case catches on anything or the sensing face moves on the machine surface during the measurement.



To avoid measurement errors, use the magnetic sensing face to attach the BEARING INDICATOR rather than hold the BEARING INDICATOR.



If a high reading is observed, it is recommended that a second measurement is taken to confirm the first result.



For consistency, repeatability and trending, measurements should be made at the same point(s) on any particular machine.

8. Charging

Recharge the BEARING INDICATOR using the USB cable supplied – the charging indicator lights up whilst charging is in progress. The USB port should have a standard 500mA output – some low powered hand-held devices may not supply enough power.



Recharging takes approx 4 hours from a standard USB port.

9. Typical Interpretation of Readings from Bearings

For progressive bearing deterioration due to pitting of race or rolling element surfaces in rotating machinery, the usual observation of readings is as follows:

| Wear Stages | | Distress [®] | | dB Level |
|-------------|---|---|-------------------------------|--|
| | | Numeric | Quality | |
| 1 | Good condition | <10 | "OK" | Lowest for machine. |
| 2 | (Not always seen) First signs of a possible problem. Occasional impacts from surface damage. | Repeated measurements only >10 occasionally | Either "Suspect" or "OK" | Typically Lowest for machine. |
| 3 | The problem becomes established. Copious impacts from surface damage. | Consistently >10 | Either "Suspect" or "Poor" | Slightly increased from normal. |
| 4 | Continuing to degrade. Sufficient damage to cause increased frictional activity. | Usually >10 (may be less in later stage) | Any: "OK" "Suspect" or "Poor" | Successive dB readings increase. |
| 5 | The approach to final failure. Severe frictional activity (note 1). | Usually drops to <10 | Either "Suspect" or "OK" | Increased to >20dB higher than normal. |



note 1: Bearings in the later stages of failure, especially when dB Levels have increased significantly, may show reduced values of Distress[®]. It is therefore recommended that historical trends are observed when interpreting results.



Not all fault conditions follow the above progression. For example high frictional activity from the outset would give a high dB and possibly a low Distress®, whereas a bearing spinning in its housing usually gives a high Distress® and an abnormally low dB. In addition, improving bearing lubrication – especially in the early stages, often gives a reduction in Distress® and may delay further deterioration.

10. Applicability

“Too Low” is displayed when there is insufficient signal being detected to allow a reading to be taken and it is below the sensitivity of the BEARING INDICATOR. Try to improve the coupling of the sensor face to the machine or select an alternative location.

The BEARING INDICATOR is not in general suitable for monitoring reciprocating machinery, hydraulic power packs, inverter driven or synchronous motors. Distress® is not recommended for use on machinery above 2,500 rpm.

Split bearing housings may produce high Distress® readings even when in good condition – trending values may identify deterioration.

11. Technical Specification

Sensor General

Sensing element: Resonant piezoelectric at ~ 100 kHz

Calibration: Factory set to within 1 dB of standard value

Signal Measurement

Distress® (dst) Description: Fault indicating parameter

Range: 0 to > 40 (typical)

Resolution: 1 unit

dB Level (dB) Description: Logarithmically scaled mean signal level

Range: up to 80 dB

Resolution: 1 dB

General Characteristics

Internal Battery Typically >1000 measurements between charges

“Low battery” message flashes on LCD display

Operating Temperature: 0 to +65 °C

Dimensions: 98 x 62 x 34mm (W x H x D) (inc. sensing face)

Weight: 250g



12. Disclaimer and General information

The BEARING INDICATOR assists in making service and maintenance decisions. It does this by detecting high frequency stress waves associated with energy loss mechanisms such as friction and impacts that are naturally produced by machinery in poor condition. The technology is known as Acoustic Emission or AE. The BEARING INDICATOR is not sensitive to low frequency activity such as that associated with vibration or audible sound.

This manual provides practical advice on the use of the BEARING INDICATOR and general guidelines for interpreting its readings. No such general guidelines, or indeed no such general purpose Condition Monitoring instrument, can be guaranteed to provide the information required in all cases. Therefore it is recommended that the BEARING INDICATOR complements existing methods and procedures for dealing with service, maintenance and repair of machinery.

Since SDi has no control over the machinery to which the BEARING INDICATOR will be applied, the care taken during its use, or the appropriateness of any actions taken, SDi cannot accept any responsibility or liability for any consequential loss howsoever arising from the use of the BEARING INDICATOR.

13. Warranty

The warranty (for the period specified at the time of purchase) is inclusive of all parts and labor costs subject to the exclusions listed. The decision to repair or replace defective product will be at the discretion of SDi. The warranty shall not apply to defects, damage or loss resulting from:

- Unauthorized modification or misuse
- Operation outside the environmental specification
- Fair wear and tear
- Accidental damage
- Cost of shipping back to SDi
- In no event will SDi be liable for any consequential or incidental damages including lost profits, savings or any claim by any party.

14. Support

If you have any technical or after-sales queries please contact Technical Support; service@sdifire.com (732)-751-9266