

Sealing Sensor Leads Against Oil Leakage

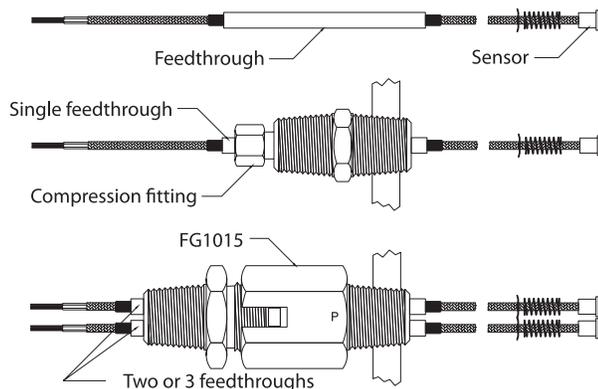
4 ways to keep oil in when bringing sensor wires out

Miniature temperature sensors embedded in bearing shoes provide a reliable indicator of bearing condition. Continuous temperature monitoring prevents catastrophic failure from oil film breakdown.

One challenge facing any sensor in this environment is bringing the leadwires out from the oily interior of gearboxes. Oil naturally tends to wick along wires or cables, seep through fittings, and collect in the connection head or instrument panel where the wires terminate. Forming an oil-tight seal against Teflon-insulated wires can be difficult.

In this Application Aid are several alternative solutions to the oil leakage problem.

Integral feedthroughs



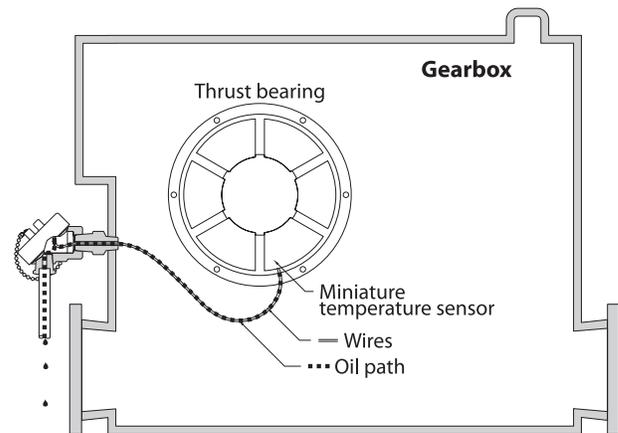
Disadvantages: Location on leads must be predetermined. Cannot be repaired.

Any bearing sensor may be supplied with a cylindrical feedthrough potted directly onto its leadwires. The feedthrough then passes through the machine bulkhead using a simple compression fitting (single or multiple openings).

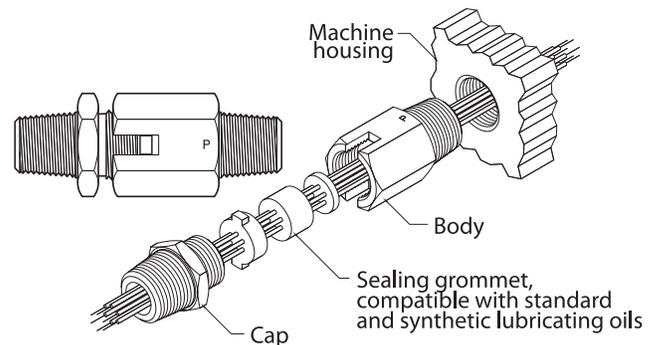
Because feedthroughs are epoxy-potted directly to bare leadwires, they provide an excellent barrier to oil.

Options for feedthroughs include:

- Diameters from 0.188" (4.8 mm) to 0.375" (9.5 mm)
- Variable length
- Two sensors potted in one tube (custom)



FG1015 and FG3015 multiport leadwire seals



Advantages: Easy to install. Accommodates up to 6 leads.

Disadvantages: Does not totally eliminate leaks.

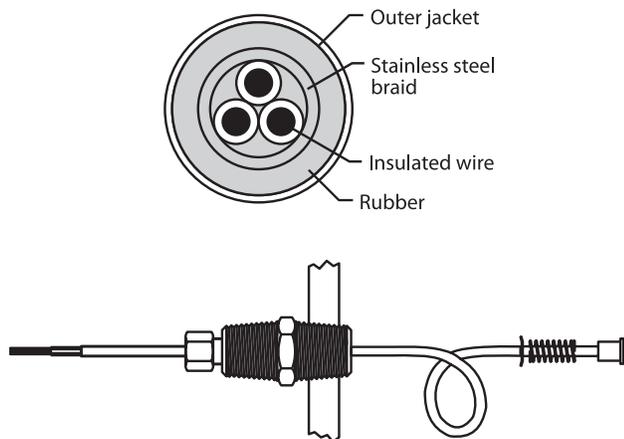
The FG1015 fitting is available with 2 or 3 holes for potted feedthroughs (at left). It may also come with 6 smaller holes to seal around individual insulated sensor wires, eliminating the need for a feedthrough. Plugs are provided for unused holes.

The FG1015 seals well to the outside of leads but a tiny amount of oil may flow inside leadwire, between the strands, and make its way past the FG1015. In most installations, this seepage is not objectionable.

The FG3015 features a split grommet for instances where access to leadwire ends is limited.

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Rubber-filled cable



Advantages: Good seal. Quick installation.

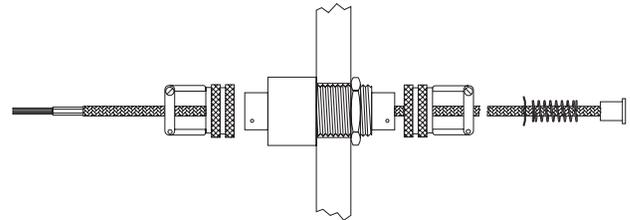
Disadvantages: Reduces cable flexibility. Expensive in long lengths.

On a custom basis, Minco can provide sensor cables with a rubber fill between the wires, the stainless steel braid, and the outer jacket. This fill can extend along the entire length of the cable, or a specified portion. The outside of the cable is sealed with compression fittings, similar to feedthroughs.

As with FG1015/FG3015 fitting, a minuscule amount of oil may escape inside the individual wires.

Contact Minco to obtain sensors with sealed cables.

Hermetic connectors (not available from Minco)



Advantages: Excellent seal.

Disadvantages: Expensive. Takes time to wire.

Various manufacturers offer connectors that mount in machine walls and pass conductors through via potted pins. They may have removable plugs at one or both ends of the fitting. Such connectors provide a reliable barrier to oil leakage and the additional benefit of quick disconnection. Typical cost is higher than with other methods.

Other methods

Potting dams: Fill the inside of a connection head or extension nipple with epoxy. Care must be taken to avoid gaps between individual wires.

“Gooseneck”: Wires pass through an inverted “U” formed in conduit, forming a barrier to oil leakage.

Epoxy coating: Form a cylinder of epoxy around the cable, allow to cure, and then seal to the epoxy plug with a grommet type fitting. Care must be taken to avoid gaps between individual wires.

Worldwide Headquarters

7300 Commerce Lane
Minneapolis, MN 55432 USA
Tel: 1.763.571.3121
Fax: 1.763.571.0927
sales@minco.com
www.minco.com

European Headquarters

Usine et Service
Commercial, Z.I.
09310 Aston, France
Tel: (33) 5 61 03 24 01
Fax: (33) 5 61 03 24 09

Asia Pacific Headquarters

20 Science Park Road
#02-31 Teletech Park
Singapore Science Park II
Singapore 117674
Tel: (65) 6511 3388
Fax: (65) 6511 3399

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