Application Note:
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Reliable Point Level Material Detection in Pressurized Coal Feeder Downspouts without Nuclear Devices

Key Words

- Point Level
- Microwave
- Pressurized Coal Feeder

Introduction

The downspout on a pressurized coal feeder can be a critical process area for a power plant. The column of coal is used to seal the boiler so it's imperative that the material level is maintained at all times. Because the chute is a small space with material always present, it is not desirable to place a monitoring device inside the chute. Often times nuclear devices are used to monitor this critical application because of their high reliability and non-intrusiveness. However, nuclear devices require certifications and extra procedures that some maintenance departments do not want to deal with.

Shown above is a Ramsey Microwave Point Level Detector installed on a pressurized coal downspout with a custom mounting bracket.

Microwave Point Level Detection

The Thermo Scientific Ramsey Microwave Point Level Detector provides highly reliable non-contact material detection in these applications. Like a nuclear point level device, the Ramsey™ detector uses a sender and receiver located outside of the chute to detect the presence of material. However, unlike a nuclear device, this level detector does not use any nuclear sources. The microwave energy levels used are completely safe and do not require any special safety precautions or posting signs.

Piloted tank flange and UHMW plug used as a process window.

How It Works

The sender transmits bursts of polarized microwave energy 200 times a second. Material in between the sender and receiver will absorb and scatter the signal, limiting how much of the microwave signal makes it to the receiver. The receiver measures the amount of microwave energy received to determine if material is present. The units have full sensitivity adjustment and enough power to send a signal through moderate amounts of non-metallic build up.

The microwaves used will penetrate non-conductive materials, making it possible to place the sender and receiver outside of the chute and have them look through windows installed in the chute. This keeps the sender and receiver outside of the process and easily accessible.

The sender and receiver shown above is used with a remotely located control module. Also available are units with integral controls.

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For More Information

Thermo Fisher Scientific
Process Instruments
501 90th Avenue NW
Minneapolis, MN 55433
+1 (763) 783-2500

Visit www.thermo.com/bulk-handling

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

Australia
+61 (0) 8 8208-8200
+61 (0) 8 8234-3772 fax

Canada
+1 (905) 888-8808
+1 (905) 888-8828 fax

Chile
+56 (0) 2-335-3388
+56 (0) 2-335-1590 fax

China
+86 (0) 21 6865 4588
+86 (0) 21 6445 1101 fax

Germany
+49 (0) 208-824930
+49 (0) 208-852310 fax

India
+91 (20) 6626 7000
+91 (20) 6626 7001 fax

Italy
+39 02 959514-1
+39 02 953200-15 fax

Netherlands
+31 (0) 76-579-5555
+31 (0) 76-571-4958 fax

Poland
+48 (0) 22 651 75 30
+48 (0) 22 651 75 35 fax

South Africa
+27 (0) 11-609-3101
+27 (0) 11-609-3110 fax

Spain
+34 91-484-5954
+34 91-661-5572 fax

United Kingdom
+44 (0) 1788-820300
+44 (0) 1788-820301 fax

United States
+1 (800) 227-8891
+1 (763) 783-2525 fax
+1 (763) 783-2500 direct

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