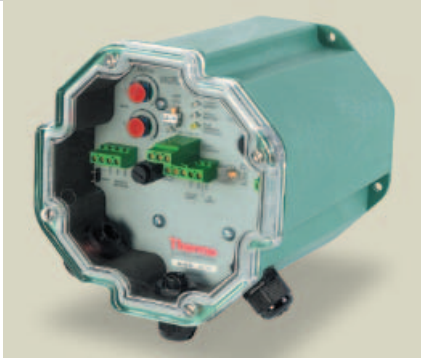


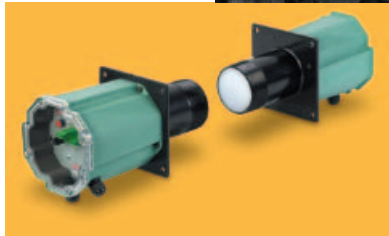
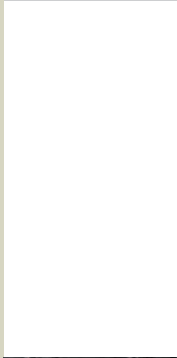
The Ramsey Microwave Plugged Chute Detector is a reliable instrument that can see through non-metallic wall build-up and detect the presence or absence of any material. By detecting the conditions in your chutes, it will alert you of any problems or disruptions in your process, allowing you to efficiently rectify the situation. This will save you time and money.

## Ramsey Microwave Plugged Chute Detector

Totally Non-Contacting Detection of Materials in Chutes



Ramsey Remote Microwave System (RMS) Amplifier/Control



Ramsey Integral Microwave System (IMS) Sender, Receiver and Amplifier/Control

The Ramsey Microwave Plugged Chute Detector from Thermo Electron Corporation is a totally non-contacting microwave plugged chute detector with a range from 10 cm (4 in) minimum to 150 m (492 ft) maximum. These reliable units can see through non-metallic wall build-up and detect the presence or absence of any material.

The switch can be used in pressurized coal down comers; electro-static precipitator hoppers; and in fly ash, clinker and coal transfer chutes. It provides high and low level point level detection.

High temperature applications are not a problem for the Ramsey Microwave Plugged Chute Detector. Each unit is protected from the process by a polyethylene, ceramic or tempered safety sight glass window. The switch is a safe and environment-friendly replacement for nucleonic switches and is not restricted by OSHA or FCC regulations.

### Theory of Operation

The Ramsey Remote Microwave System (RMS) is a microwave pulse sender-receiver

system comprised of three electrically isolated units: the sender, the receiver, and the amplifier. The sender-receiver units are mounted in-line and facing each other.

The Ramsey Integral Microwave System (IMS) is a microwave pulse sender-receiver system comprised of two electrically isolated units in an integral housing: the sender and the receiver/amplifier. The sender-receiver units are mounted in-line and facing each other.

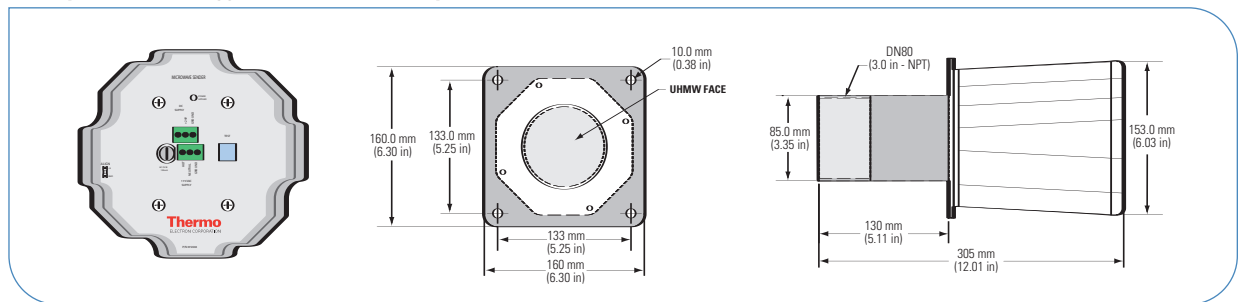
The sender emits a burst of microwave energy toward the receiver. Each burst occurs 200 times per second. When the line of sight is clear, the receiver will detect each of these bursts. If the line of sight is interrupted by sufficiently reflective or absorbent material, the receiver will not detect the microwave energy.

The receiver is designed to switch a relay when its detector changes. Settings for sensitivity and time delays allow the user to customize the control to their specific application.

## Ramsey Microwave Plugged Chute Detector

Specification	
<b>Input Voltage</b>	115 VAC nominal, 100-130 VAC acceptable, 50-60 Hz 240 VAC nominal, 200-270 VAC acceptable, 50-60 Hz AC supplies lined fuse: 100 mA, 250 VAC Both MRS & MRR units include terminals for 24 VDC supply power
<b>Power Consumption</b>	MRA <5 VA Remote Amplifier
<b>Power Density</b>	Rated from sender (MRS) to receiver (MRR) at approximately 20µW/cm <sup>2</sup> ; No interconnection wiring between sender and receiver; Complies with FCC Title Rules Part 15; Caution sign posting not required
<b>Transmitted Signal</b>	
Frequency	10.525 GHz, + 25MHz
Average Power Density	20 µW/cm <sup>2</sup> typical; Linearly Polarized Field; Beam angle (3 dB) approximately 30 degrees (conservative)
<b>Range</b>	
Maximum range—ideal conditions	150 m (492 ft)
Minimum range—ideal conditions	10 cm (4 in); Minimum ranges are dependent on application conductivity
<b>Mounting</b>	<ol style="list-style-type: none"> <li>DN80 (3 in - NPT) male thread or four 6 mm (0.250 in) blind bolt holes in flange                             <ol style="list-style-type: none"> <li>DN80 (3 in - NPT) weldments supplied for standard integral mounting</li> <li>Flange is used for remote mount in high vibration applications – isolation shock mounts are available</li> </ol> </li> <li>DN100 (4 in - NPT) weldments with PTFE (Teflon) and UHMW windows</li> <li>Ceramic window assemblies</li> <li>Firebrick window assemblies available on custom basis</li> <li>DN50 (2 in - NPT) sight glass window</li> <li>Waveguides – custom assemblies available</li> </ol>
<b>Adjustments</b>	
MRA	Test switch – momentary push-button. Single turn coarse and single turn fine adjustment potentiometers for set point. Relay time delays adjustable from 100 ms to 30 seconds via two independent on/signal make and off/signal break potentiometers with automatic reset.
<b>Fail-Safe</b>	
Switch selectable	Presence or absence of material
High level fail-safe position	Relay is activated when material is present
Low level fail-safe position	Relay is activated when no material is present
<b>Temperature</b>	MRS & MRR: -30°C to +65°C (-20°F to +150°F). For higher temperature applications, remote mounting with windows is necessary. Custom waveguide assemblies can also be provided.
UHMW Window	+80°C (+176°F)
Ceramic Window	+800°C (+1,470°F)
Firebrick Assemblies	Consult factory for manufacturer's specifications.
<b>Cabling Entry(ies)</b>	MRA, MRS, MRR: 9.525 mm (0.375 in) NPT
<b>Relay Contact Output</b>	MRA: SPDT - 10 amps @ 250 VAC resistive, 10 amps @ 125 VAC resistive
<b>Enclosure</b>	NEMA-4X; Meets Class 2, Div. 1, Groups E, F & G (DIP-Dust Ignition Proof) classification; FM approval pending
Windows	UHMW (ultra-high molecular weight) polyethylene standard, PTFE (Teflon) available
<b>Shipping Weights</b>	11.8 kg (26 lb) per pair

### Ramsey Microwave Plugged Chute Detector – Physical Dimensions



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