



## MODEL MD8100 HOT METAL DETECTOR



The self-contained Model MD8100 Hot Product Detector is available with either air coolant chamber venting as air purge or alternatively with a water coolant chamber and separate air purge.

- Self-Contained "ALL-IN-ONE" Design.
- 110 VAC or 24 VDC connection in one unit, 220 VAC optional on request
- Lens options: 2°, 4° or 1° x 25° F.O.V. Rectangular (1/2° optional on request)
- DIP switch selectable thresholds down to 300°C.
- Output #1: Relay with SPNO contact.
- Output #2: Selectable PNP or NPN Transistor.
- Adjustable response time from 2 to 200 msec.
- Supplementary analog output to assist in alignment.
- Remote Self-check facility.
- Robust IP66 aluminium housing with unique combined air purge & cooling facility. Optional water cooling with separate air purge available.
- Excellent steam penetration.

### General Description

The MD8100 self-contained "All-in-One" Hot Metal Detector sensor combines the features and benefits of various models into one unit. Thus the MD8100 provides one detector that can be standardized on throughout the mill, the only decision that has to be made prior to installation is what appropriate lens to use. The MD8100 is the economical choice. Now there is no need to stock a detector for each different trip level. Thus the costly inventory of ordinary detectors can be replaced with a single MD8100 detector.

The MD8100 Hot Metal Detector is a robust sensor activated by the infrared radiating from hot metal or product. Impervious to water or steam it is built to withstand the harshest environments.

All lenses incorporate filters removing the visible spectrum to minimize sensitivity to extraneous light. For general tracking, spot lenses are commonly used. Where high accuracy is required or the product deviates about the centre line (i.e. Rod Mill) a 1/2° x 25° lens should be utilized. This lens is also highly suited to Strip Mills.

Especially suitable where ambient temperatures are subject to wide deviations. In standard format, a large air cooled chamber vents via a deflector in front of the lens providing combined air purged facility. Alternatively, an optional sealed water coolant radiator & separate air purge facility may be provided.

To accommodate variation in product temperature and background radiation, six specific I.R. thresholds, from 300°C to 700°C, are selectable by an internal DIP switch in 50°C steps.

The MD8100 can operate from either 110VAC-50/60 Hz or 24VDC power input. Standard output includes a cradle relay with a 8A/250VAC SPNO volt free contact rating plus a switch selectable PNP or NPN transistor output. Alternatively, an optional reed relay with SPNO contact can be provided in place of the cradle relay.

The MD8100 includes a supplementary 0-6VDC non-linear analog output. This selectable facility allows the user to establish the amount of received I.R. energy relative to the pre-set trip level and thereby establish that the lens is clean and the MD8100 threshold is set correctly. This feature also allows the user to align the detector to a precise low energy target (i.e. a flashlight) that would normally be insufficient to switch the detector.

The MD8100 includes a remote self check. This facility remotely initiates an internal lamp in close proximity to the photodiode. When activated by a remote contact, the detector switches and its performance checked.

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## MODEL MD8100 HOT METAL DETECTOR

### Enclosure Specifications

**Housing:** Aluminum AL6, Oven baked blue paint  
**Housing Rating:** IEC IP66, DIN 89011  
**Weight w/o Cable:** 1.9 Kg  
**Connector:** IP65 Plug/Socket  
**Cable Length:** 2 M

### Air & Water Specifications

**Air Pressure:** 1 cu ft./min at 5 PSI for normal Conditions, non-instrument dry air and 0-15 PSI for severe conditions  
**Water Pressure:** 5 to 10 PSI  
**Water Volume:** Regulate between 0.2 - 0.3 liters/min.  
**Water Temp.:** For Ambient Temperature up to 80°C use ambient water below 20°C.  
 For Ambient Temperature up to 90°C use water chilled to 5°C.

### Part Number Specifications

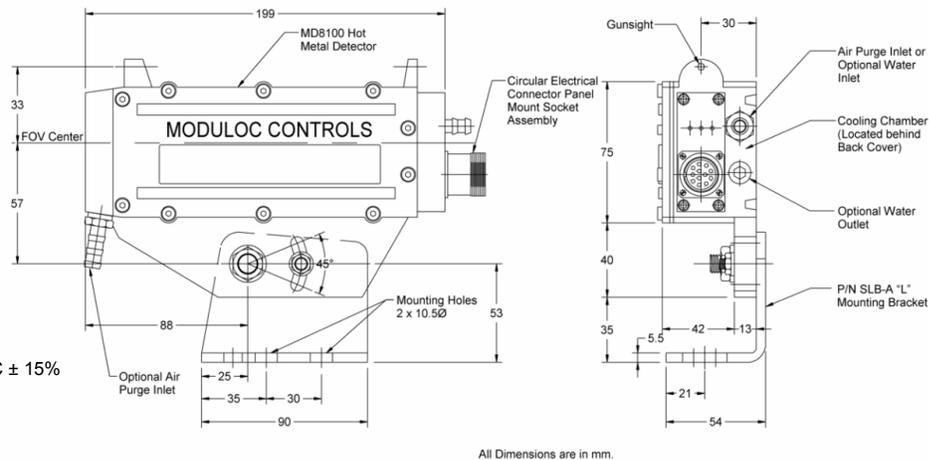
#### MD8100-98-14-RT0-CR2-A

**Supply Voltage:** -98 110 VAC ± 15% 50/60 Hz or 24 VDC ± 15%  
 -97 110 VAC ± 15% 50/60 Hz  
 -95 220 VAC ± 15% 50/60 Hz

**Lens:** -CR2 1° x 25° F.O.V. Rectangular Slit  
 -C2 2° F.O.V. Spot  
 -C4 4° F.O.V. Spot

**Cooling:** -A Air Cooled & Air Purged  
 -D Water Cooled & Air Purged

### Dimensions



### General Specifications

<b>Lens F.O.V.:</b>	<b>Standard:</b> -CR2 1° x 25° Rectangular Slit (1/2° optional on request) <b>Optional:</b> -C2 2° Spot, -C4 4° Spot	<b>Supply Voltage</b>	<b>Standard:</b> 110 VAC ± 15% 50/60 Hz or 24 VDC ± 15% <b>Optional:</b> 220 VAC ± 15% 50/60 Hz
<b>Sensing Element</b>	InGaAs Diode	<b>Power Consumption</b>	5 VA
<b>Power Indication:</b>	RED LED	<b>Operating Temperature</b>	-20°C to +60°C without air cooling
<b>Function Indication</b>	RED LED		-20°C to +70°C with air cooling
<b>Remote Self-Check</b>	Single wire to 0VDC internal line		+2°C to +80°C with (20°C ) water cooling
<b>I.R. Threshold settings</b>	Selector switch selectable in 50°C steps between 300°C to 700°C	<b>Output (#1)</b>	Relay Output SPNO 8A/250 VAC rating, with 20 msec response time
<b>Response Time:</b>	Factory Set at 10 msec (2 msec to 200 msec, dip switch selectable)	<b>Output (#2)</b>	Switch selectable NPN or PNP Outputs. N.O. 500 mA, 24 V 2A peak

### Alternative Temperature Diode Options

#### High Gain Diode

- Minimum temperature 170°C, maximum temperature 450°C

#### Silicon Diode

- Minimum temperature 675°C, maximum temperature 1100°C

### Smallest Detectable Product when utilizing a 1/2° x 25° Lens

The table to the right identifies the minimum % of vertical field of view required with hot steel at stated temperature for it to be repetitively detected.

Indicative Preset Thresholds		
Steel Temp.	Nominal 350°C Preset Trip	Nominal 450°C Preset Trip
400°C	10%	Not Detectable
450°C	5%	100%
500°C	1%	60%
600°C	1/2%	20%
800°C	Less than 1/2%	Less than 5%

### EU & USA Wire Diagram

Pin	EU	USA	Function/Rating
(1)	Pink	Pink	Self Check - Single wire to 0VDC internal line Pin (6)
(2)	Red	Red	+24 VDC
(3)	Brown	Black	110VAC Supply Line Hot (L1)
(4)	Blue	White	110VAC Supply Line Neutral (L2)
(5)	Violet	Violet	PNP/NPN Selectable Transistor Output – 500 mA Rating.
(6)	Black	Blue	0 VDC (For 24 VDC Supply)
(7)	Green	Green	Ground * CONNECT*
(8)	White	Brown	Relay Common 8A/250 VAC rating, with 20 msec response time
(9)	Orange or Grey/Pink according to cable	Orange or Grey/Pink according to cable	Relay Output SPNO 8A/250 VAC rating, with 20 msec response time
(10)	Light Blue or Red/Blue according to cable	Light Blue or Red/Blue according to cable	Set IR Trip Point - For Connection to Voltmeter (Dip-switch Isolated)
(11)	Yellow	Yellow	IR (+) Analog Output - For Connection to Voltmeter (Dip-switch Isolated)
(12)	Grey	Grey	IR (-) Common Line - For Connection to Voltmeter (Dip-switch Isolated)

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