MODULOC Control Systems

MD95100 REMOTE DIGITAL HOT METAL DETECTOR

"ALL-IN-ONE" Remote Design utilizing 400°C Optic Leads

- ***Fully Digital "All-in-One" Design***
- ***LED Bar Display of % IR Input Signal***
- ***Programmable 250°C to 1000°C Trip Level***
- ***Operates from 80-240 VAC or 24 VDC supply.***
- ***Remote Lenses Options: 1°, 2°, 4°, 7° F.O.V. spot or ½° x 25° F.O.V. precision slit rectangular.***
- ***High Temp lens ratings of 180°C, 400°C or 1000°C.***
- ***Programmable response time from 1 to 250 msec.***
- ***Control Relay and Fast Reed Relay Outputs.***
- ***Both NPN and PNP Transistor Outputs***
- ***Remote Self-Check facility.***
- ***Robust lens mounts are available including air purged, air cooled and water cooled.***

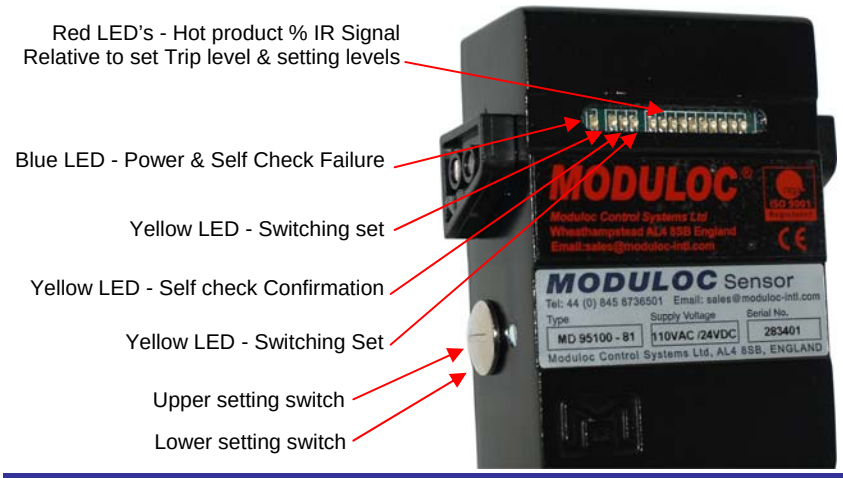
General Description

The MD95100 fully digital "All-in-One" Hot Metal Detector incorporates a bar display showing the IR input signal relative to the pre-set trip level as well as selected programmable thresholds and response times via simple external programming switch action. Operates via highly sensitive and stable InGaAs Photodiode, detection is assured via the heaviest water and steam.

The MD95100 utilizes a modular digital Controller in protective mounting Cradle, flexible armored optic leads and interchangeable Remote Lenses. As the controller can be used in conjunction with any lens option one standard controller can be used throughout the mill. Now there is no need to stock a detector for each requirement. Costly multiple inventory can be replaced with one detector.

A wide variety of remote lenses impervious to water & steam are built to withstand the harshest environments are available. Used in conjunction with flexible armored optic leads, these lenses provide a high level of optical accuracy by allowing the selection of the ideal lens arrangement for the installation. Robust lenses with temperature ratings of 180°C, 400°C and 1000°C can be mounted close to the hot product. Various robust lens mounts are available including air purged, air purged with air cooling and air purged with water cooling.

The remote lenses incorporate filters 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 center line (i.e. Rod Mill) a ½° x 25° precision slit rectangular lens should be utilized. This lens is also highly suited to Strip Mills. Also available is the 1000°C Shrouded Quartz Rod Lens, specifically engineered for mounting in the harsh and high ambient environment below the line or inside the mill stand.



LED Bar Display allows the user to clearly establish the amount of received IR both from the background metalwork and the bar being detected to thereby establish the correct trip level required.

One LED in this display also allows the user to align the Detector of a low energy source (torch), which normally would be insufficient to switch the Detector.

Adjustment of both the threshold and response time is also clearly defined by this bar display

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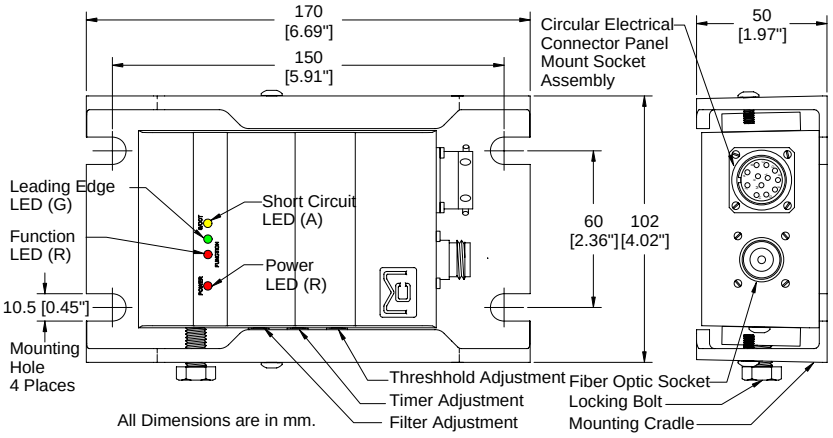
General Information

Remote Electronic Controller
Housing: Aluminum AL6, Oven baked black paint
Housing Rating: IEC IP66, DIN, 89011
Weight w/o Cable: 1.7 Kg
Connector: IP65 Plug/Socket
Cable Length: 1.5 M

Remote Lenses:
Precision Rectangular Slit: FOV: ½° x 5°, ½° x 15° & ½° x 25°; rated 160°C .
Stainless Rectangular Slit: FOV: 2° x 15°; rated 400°C .
Stainless Tubular Spot: FOV: 1°, 2°, 4° or 7°; rated 180°C or 400°C .
High Temperature Quartz Rod: FOV: 1°; rated 1000°C.

Fiber Optic Cables:
Flexible Armored Stainless Sheath available in lengths from 2 meters to 15 meters in 1 meter lengths; rated 400°C.

Dimensions



For dimensional information & specifications on remote lenses, lens mounts and optic cables please see Bulletin MC-MD9000L

General Specifications

Sensing Element	InGaAs Photodiode	Supply Voltage	80 –240 VAC 50/60HZ and 24 VDC ± 10%
Power Indication:	Blue LED	Power Consumption	5 VA
Function Indication	Outer Yellow LEDs	Operating Temperature	-20°C (-4°F) to +55°C (131°F)
% I. R. Signal	Red/Green/Red LEDs	Storage Temperature	-25°C to +75°C (-13°F to 167°F)
Remote Self-Check	Middle Yellow LED	Output (#1)	Cradle Relay Output, SPNO, 240 VAC, 8A with 20 msec response time.
Min/Max I.R. Threshold settings	Down to 250°C (482°F) and up to 1000°C (1832°F) via programming switch	Output (#2)	Reed Relay Output, SPNO, 240VAC, 0.5A 2 msec response time.
Response Time:	1 msec. min to 250 msec max., via programming switch	Output (#3) and (#4)	PNP and NPN Transistor Outputs, N.O., 500 mA, 45 VDC, 2A peak (requires 24VDC supply)

Smallest Detectable Product when utilizing a ½° x 25° Lens

The table below 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.	350°C Preset Trip	Nominal 450°C Preset Trip
400°C	10%	Not Detectable
450°C	5%	100%
500°C	1%	60%
500°C	1/2%	20%
800°C	Less than 1/2%	Less than 5%

North America & Asia Terminal Connections

Pin No.	Wire Color*	Function
1	Pink	Self-Check to + 24 VDC Supply
2	Red	+ 24VDC Supply
3	Black (Brown)	80-240 VAC Supply (L1)
4	White (Blue)	Supply Neutral (L2)
5	Violet	PNP Transistor Output (#3)
6	Blue (Black)	0VDC (For 24VDC Supply)
7	Green	Ground
8	Brown (White)	Cradle Relay Output (#1) N.O. Contact
9	Orange	Cradle Relay Output (#1) N.O. Contact
10	Light Blue	NPN Transistor Output (#4)
11	Yellow	Reed Relay Output (#2) N.O. Contact
12	Grey	Reed Relay Output (#2) N.O. Contact

* European connections are shown in parenthesis

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Your Local Sales Representative:

We reserve the right to alter specifications without prior notice. Specifications without tolerances are typical values.

Bulletin MC-MD95100-09-02
January 2009