MODULOC SENSOR ENTERPRISES

MSE

MSE-HMD85 DIGITAL HOT METAL DETECTOR

The MSE-HMD85 Digital Hot Metal Detector shown mounted on a supplied MSE-LH01 "L" Mounting Bracket.

- Fully Digital "All-in-One" Self-Contained Design
- Excellent steam penetration.
- LED Bar Display of % IR Input Signal
- Programmable 270°C to 1000ºC Trip Level
- Operates from 24 VDC supply.
- Optional operation from 80-240 VAC or 24 VDC Supply
- Rectangular Lens Options: 0.5ºx 25º, 0.5ºx 15º, 0.5ºx 5º FOV Spot Lens Option: 2º
- Programmable Response times from 1ms to 250ms
- Control Relay Output with SPNO contact
- NPN and PNP Transistor Outputs
- Optional Fast Reed Relay Output with SPNO contact
- Remote Self-Check Facility.
- Robust & Compact IP66 die-cast aluminum housing with air purge and water cooling, or combined air purge & air cooling facility.

General Description

The MSE-HMD85 is a fully digital "All-in-One" Self-Contained Hot Metal Detector uniquely incorporating a bar display showing the % IR input signal relative to the pre-set threshold as well as programmable thresholds and response times via simple program push switch action. This and the universal connection format means it provides the user with one universal Detector that can be used throughout the mill. The MSE-HMD85 is the economical choice. Now there is no need to stock various Detectors for each location. Costly multiple inventory can be replaced by one Detector.

The MSE-HMD85 Hot Metal Detector is a robust sensor activated by the infrared radiating from the hot product. Impervious to water or steam, it is built to withstand the harshest of environments. The product is detected via a highly stable InGaAs Photodiode to ensure detection regardless of heavy water and steam and incorporates filtering that removes the visible spectrum to minimize sensitivity to extraneous light. The precise 0.5ºx25º lens ensures accurate detection of strip and accommodates bar bounce. For general tracking or mounting the HMD at a long distance from the line an optional 2º spot lens is available.

This Detector is especially suitable where ambient temperatures are subject to large changes. In standard format, a large air cooled chamber vents via deflector in front of the lens to allow the use of non-instrument air and provides air purging. Alternatively, an optional sealed loop water coolant radiator accommodates tap pressure and a separate air purge inlet can be provided.

Additional Information

To accommodate variations in bar temperature and background IR, various precise thresholds are programmable via covered switches from 270°C to 1000°C to ensure reliable switching with reference to both the displayed background and product IR signal.

Furthermore, the response time is programmable from 1 ms to 250ms to accommodate black spots on the hot material.

The MSE-HMD85 incorporates a remote self-check facility emotely energized by closed contacts that illuminate an internal IR LED to switch the Detector and verify its' outputs operate correctly.

The MSE-HMD85 will operate with either a 88-240 VAC or 24 VDC power input. Standard outputs include a cradle relay, and both a NPN and PNP transistor outputs. An optional reed relay output is also available.

Rear Bar Display (Shown above)

The rear bar display allows the user to clearly establish the amount of received IR both from the background metalwork and the bar being detected and thereby establishing the correct trip level required. This display also allows the user to align the Detector from a low energy source such as an IR Bar or a flashlight, which normally would be insufficient to switch the detector. Adjustment of both the threshold and the response time is also clearly defined by this bar display.

Housing Specifications

Housing: Aluminum AL6, Oven baked blue paint
Housing Rating: IEC IP66, DIN 89011
Weight w/o Cable: 1.9 Kg
Connector: IP66 Plug/Socket
Cable Length: 2 m (standard) - Optional lengths of 5m, 10m and 15m are also available.

Air & Water Specifications

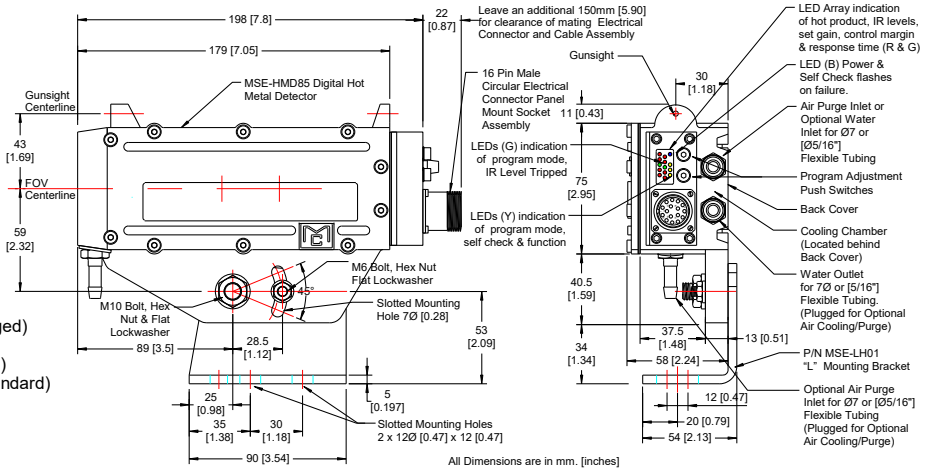
Air Pressure: 1 - 2 cu ft./min at 5 PSI for normal conditions, Non-instrument dry air and 10 - 15 PSI for severe conditions
Water Pressure: 0.3 - 1 bar. 3 bar maximum
Water Volume: Regulate between 1 - 2 liter/min.
Water Temp.: For Ambient Temperature up to +80°C use industrial quality water at chilled at 20°C minimum

Part Number Specifications

Example: MSE-HMD85-98-CR2-D
(80-240 VAC/24VDC, 0.5° x 25° Lens, Water Air Cooled & Air Purged)

Supply Voltage:	**-96**	24 VDC (standard)
	-98	80-240 VAC & 24 VDC (optional)
Lens:	**-CR2**	0.5° x 25° FOV Rectangular (standard)
	-CR1	0.5° x 15° FOV Rectangular
	-CR0	0.5° x 5° FOV Rectangular
	-C2	2° FOV Spot
Cooling:	**-A**	Air Cooled & Air Purged
	-D	Water Cooled & Air Purged
Output:	**-RR**	Fast Reed Relay, SPNO, 2ms response

Dimensions



All Dimensions are in mm. [inches]

General Specifications

Lens F.O.V.:	Standard: -CR2 0.5° x 25° Rectangular Optional[6]: -CR1 0.5° x 15°, -CR0 0.5° x 5° Rectangular Optional[6]: -C2 2° Spot	**Supply Voltage**	Standard:24 VDC ± 15% Optional[6]: 80-240VAC 50/60 Hz and 24 VDC[1] ± 15%
Sensing Element	InGaAs Photodiode	**Power Consumption**	5 VA
Power Indication	Blue LED, flashes in Self-Check Fault	**Operating Temperature**	-20°C (-4°F) to +50°C (122°F) without air or water cooling -20°C (-4°F) to +60°C (140°F) with air cooling[5] to +80°C (176°F) with water cooling chilled at 20°C[5] Higher temperature operation is possible using special cooling protection and heat shield.
Function Indication	Top & Bottom Yellow LED's,		
% I.R. Signal	Red/Green/Red Bar Display		
Remote Self-Check	Single wire to +24 VDC (Pin 2), Middle Yellow LED	**Output (#1)[7]**	Cradle Relay Output (SPNO) 250 VAC, 8A, 20 ms response.
Min/Max I.R. Threshold settings	Down to 270°C (518°F) and up to 1000°C (1832°F) via programming switch	**Optional Output (#2)[6]**	Optional[6]: Fast Reed Relay Output, SPNO, 240VAC, 0.5A 2 ms response time.
Response Time	1 ms to 250 ms, via Program Adjustment Push Switch	**Output (#3) and (#4)[7]**	PNP and NPN Outputs, N.O., 0.5A, 24 V, 2A peak, Reverse/ Thermal protected

Indicative Preset Thresholds

Steel Temp.	Nominal 350°C Preset Trip	Nominal 500°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%

Smallest Detectable Product when utilizing a 0.5° x 25° Lens
The above table identifies the minimum % of vertical field of view required with hot steel at stated temperature for it to be repetitively detected.

Notes:
1) = Connect to either VAC or VDC Input Power but not to both.
2) = Wire color could also be Orange instead of Grey/Pink.
3) = Wire color could also be Light Blue instead of Red/Blue.
4) = Used only when Reed Relay option is chosen.
5) = Vortex Air cooling is also an option.
6) = Optional Items must be specified at time of order placement.
7) = Standard Outputs include Cradle Relay, PNP & NPN Transistors.

Terminal Connections - Wire Colors - Function

Pin	Wire Color	Function
1	Pink	Self-check single wire to 24VDC (Pin 2)
2	Red	+ 24VDC[1] Supply (and used for NPN Transistor Output)
3	Black	80-240VAC[1] Supply Hot (L1) (Option)[6]
4	White	80-240VAC[1] Supply Neutral (L2) (Option)[6]
5	Violet	PNP Transistor Output, 24VDC, 0.5A, Output (#3)
6	Blue	0VDC (For 24VDC Supply & PNP Transistor Output)
7	Green	Ground
8	Brown	Relay Output, SPNO 250 VAC/7A, 20 ms response time, Output (#1)
9	Grey/Pink [2]	Relay Output, SPNO, 250 VAC/7A, 20 ms response time, Output (#1)
10	Red/Blue [3]	NPN Transistor Output, 24VDC, 0.5A, Output (#4)
11	Yellow [4]	Reed Relay, SPNO, 250 VAC/0.5A, 2 ms response time[4], Optional Output (#2)[6]
12	Grey[4]	Reed Relay, SPNO, 250 VAC/0.5A, 2 ms response time[4], Optional Output (#2)[6]

This MSE sensor is manufactured by Moduloc System Engineering Ltd. Yantai Shandong, China P.R. which was established 2007. The MSE-HMD85 is a direct replacement for the Model No. MD85100 previously manufactured by Moduloc Control Systems Ltd of the United Kingdom. This sensor can be also used as a direct replacement for the Model MD8100. Please contact MSE for additional questions on other replacement model numbers .

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

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Data Sheet MSE-HMD85-NA-25-09 September 2025