MODULOC SENSOR ENTERPRISES

MSE

MSE-PF100 Digital Scanning Hot Metal Detector

- **Detects Hot Product as low as 300°C**
- **1° x 15° FOV Scanning Angle**
- **Bar display of product pass line**
- **Operates by Signal Comparison**
- **Hot scale in Field of Vies is ignored**
- **Dirty Lens & Steam has no affect**
- **Fully digital - no motor driven rotating mirror**
- **Adjustable 1 - 250 ms response time**
- **Continuous & Remote Self-Test**
- **Relay and Opto-isolated Outputs**
- **NPN / PNP Transistor Output**
- **Robust IP66 aluminum housing with water coolant chamber and separate air purge facility**

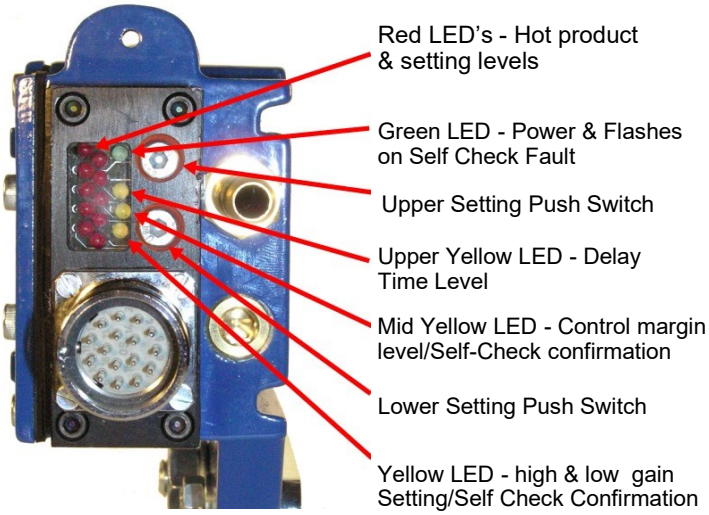
General Description

The MSE-PF100 Digital Scanning Hot Metal Detector utilizes fast microprocessor technology to ensure precise reliable detection in the most difficult area of detection such as experienced on furnace exits, run-out table and cooling beds.

Whereas old style Hot Metal Detectors purely detect the hot product above pre-set thresholds, the MSE-PF100 operates by microprocessor comparison of the background and hot product Infrared signal. Neither static hot scale or steam in the field of view causes false triggering or loss of detection. Furthermore, lens contamination will not raise its trip level.

While static analog Hot Metal Detectors utilize single photodiode detection and Rotary Scanners incorporate rotating mirrors, the MSE-PF100 utilizes a digitally scanned InGaAs Photodiode Array. This new technology removes the maintenance associated with motor diriven Rotary Scanners yet provides the high reliability and accuracy associated with Scanners.

Microprocessor technology provides exceptionally fast and accurate detection of Rod or Strip leading/trailing edge where wide variations of IR signal are present. Response times are digitally adjusted by locking timers. To assist in alignment, product path is duplicated by an 10 LED Array Bar Display which is also used to indicate adjustments to precise values.



Rear Bar Display (Shown on the left)

The rear bar display consists of 10 LEDs and is a visual indication of the hot product in the Scanners Field of View.

The rear bar display is also used to pre-set levels when in Adjustment Mode.

A Green LED Is provided for an indication that power is on and flashes if the automatic or manual self-check feature fails.

Three yellow LEDs are provided as an indication that the Scanner is in self - test mode. The top and bottom Yellow LED's mimic outputs while the Scanner is in Operating mode. These LEDs are also to aid in programming Operating Parameters while in Adjustment Mode. .

Typical Applications

In the Hot Mill: Detection of hot bar, rail, rod, billets, slabs, or strip.

Other: Detection of castings mold overflow, hot glass, hot zinc, hot copper, hot aluminum, hot metal.

Housing Specifications

Housing: Aluminum AL6, Oven baked blue powder coat
Housing Rating: IEC IP66, DIN 89011
Weight w/o Cable: 1.9 Kg (4.2lb)
Connector: IP65 Plug/Socket
Cable Length: 2m (6.6ft) (standard) - Optional 5m (16.4ft), 10m (32.8ft) , 15m (49.2ft)

Air & Water Specifications

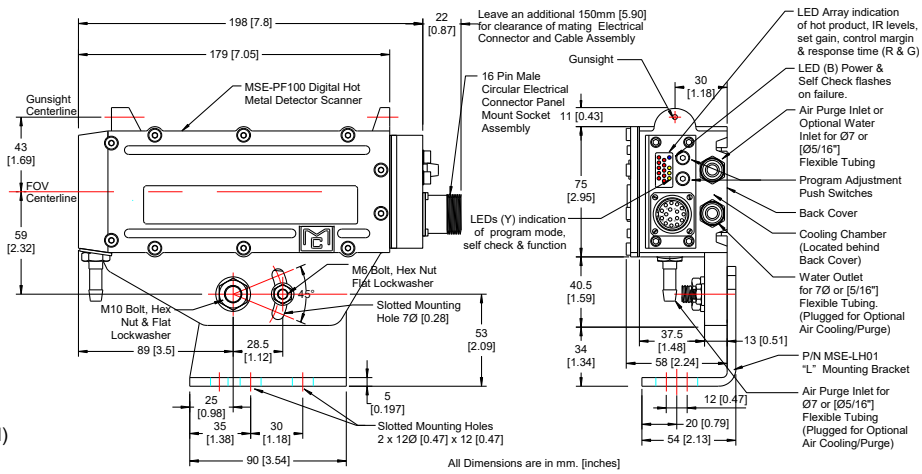
Air Pressure: 1 - 2 cu ft./min at 5 PSI for normal conditions,
Non-instrument dry air and 10 - 15 PSI for severe conditions
Water Pressure: 1 - 2 bar
Water Volume: Regulate between 0.5 - 1 liter/min.
Water Temperature: For Ambient Temperature up to

Part Number Specifications

Example: MSE-PF100-96-D
(1° x 15° Scanning Angle, 24VDC, Water Air Cooled & Air Purged)

Supply Voltage:	**-96**	24 VDC
	-98	80-240VAC & 24VDC (optional[3]))
Cooling:	**-D**	Water Cooled & Air Purged (standard)
	-A	Air Cooled & Air Purged (optional[3]))

Dimensions



All Dimensions are in mm. [inches]

General Specifications

Typical Detection:	10mm (0.39 in) Rod at 350°C (660°F) from 2 m (78 in) and 50mm (1.97 in) Bar at 350°C (660°F) from 4 m (156 in).	**Supply Voltage**	Standard: 24 VDC ± 15% Optional[3]: 80-240VAC 50/60 Hz and 24 VDC[1] ± 15%
Sensing Element	InGaAs Photodiode Array	**Power Consumption**	5 Watts
Array Scan Time	2 ms	**Operating Temperature**	-20°C (-4°F) to +50°C (122°F) without cooling -20°C (-4°F) to +60°C (140°F) with air cooling[2] to +80°C (176°F) with water cooling chilled at ≤ 20°C[2] Higher temperature operation is possible using special cooling protection and heat shield.
Power Indication	Green LED, flashes in Self-Check Fault		
Product Presence	Top & Bottom Yellow LED's		
Product Position	10 Red LED Bar Display	**Remote Self-Test**	Remote Self Check Facility
Scanning Angle (FOV)	Standard: 1° x 15°	**Output (#1)**	Cradle Relay Output (NO) 240 VAC, 10A, 20W, 4 ms response
Product Temperature	Minimum: 300°C (480°F)	**Output (#2)**	Opto-isolated NPN Output 300 V, 150 mA, 200mW, 2 ms response, Not reversed protected
Response Time	1- 250 ms digitally adjustable locking timers	**Output (#3)**	NPN & PNP Outputs 500 mA, 24 V, Reverse and thermal protected

Background IR Signal Charts

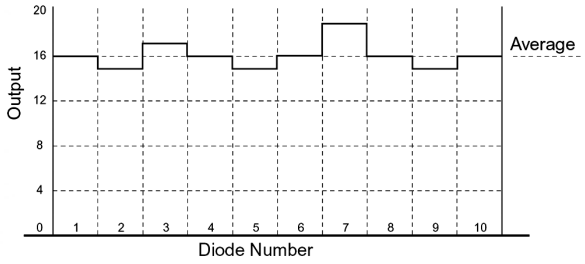
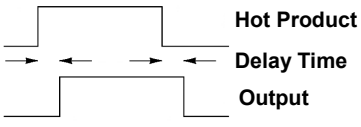


Chart illustrating signal from typical hot background

The hot product is detected by reference to an appropriate site-adjusted control margin (stored in Non-Volatile memory) that ensures sufficient gap between background IR signal and the IR radiating from the product.



Delay Timer Function

Outputs delayed from the detection of leading and trailing edge by 10 digitally adjustable preset delay times from 1 to 250 ms. Set delay time indicated by relative high/low Red LED indication.

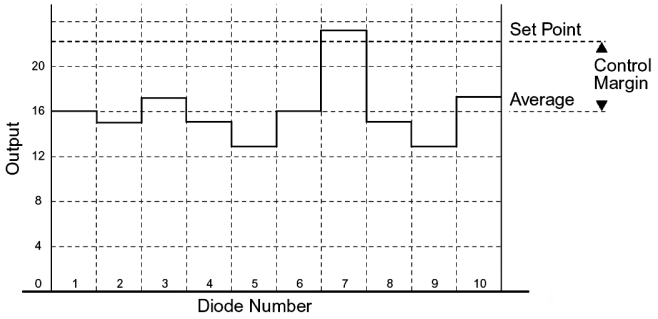


Chart illustrating signal from passing hot product

This chart illustrates the control margin. Where the background IR is uniform then the control margin can be set to a lower figure. Any hot product passing needs to give a signal that exceeds the set point.

Notes:
1) = Connect to either VAC or VDC Input Power but not to both.
2) = Vortex Air cooling is also an option.
3) = Optional Items must be specified at time of order placement.

This MSE sensor is manufactured by Moduloc System Engineering Ltd. Yantai Shandong, China P.R. which was established 2007.
The MSE-PF100 is a direct replacement for the Pathfinder Model No. PF1015 previously manufactured by Moduloc Control Systems Ltd of the United Kingdom. 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.

Your Local Sales Contact:

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