NTM-LW Pyrometer Specification

The NTM-LW is compact long-wave radiometer, capable of measuring temperature of liquid layers on a wafer (single wafer wet process), glass panels (flat screen, touch screen, solar panels, etc.), low-resistivity silicon (<1 Ohm-cm) and other opaque objects.

Probe setup and data logging is possible using the supplied user-friendly control and data-logging software, or using RS232/RS485/USB 2.0 communications protocol implemented by the customer. Data can also be output via two analog output channels.

Unique Features

Background Subtraction

The general purpose input/output channel of the NTM-LW can be used to transfer measurements from one NTM-LW to other probes within a given chamber. This feature can be used, for example, to subtract background radiation from the measurement, by having one probe view directly the background radiation source (for example, a chamber wall which is slowly heating up), and pass the measured background radiation level to other NTM-LW probes in the same chamber. The probes receiving the background signal level can then correct their readings by subtracting the background signal level from their measurements.

Tool-to-tool Matching

Calibration routines in the control and data-logging software allow the operator to match the probe reading to a given reference source. Alternately, customer-specific calibration routines can be implemented to allow calibration of the probe based on process data results. These calibration features can improve process uniformity across the wafer and process matching between tools

Specifications:

Temperature range	0 to 800°C (standard, other ranges per application requirements)
Repeatability	1°C or 1% of °C reading, whichever is larger Condition: Ambient 18-28°C, target emissivity 1
Temperature noise	0.05°C + abs(T-50°C)/5000 one standard deviation, target emissivity = 1, update rate 2Hz.
Response time (63%)	0.005 seconds at 960Hz update rate setting
Measurement rate	1 to 960Hz, user configurable using supplied PC-based control & data-logging software
Analog outputs	2 analog output channels, each configurable to any one of: 4-20mA, 0-20mA, 0-5V, 0-10V
Analog input	One channel, user configurable to any one of: 0-20mA, 4-20mA, 0-5V, 0-10V
Digital output	One optocoupler isolated output
Digital input	One optocoupler 24V isolated
General purpose input/output channel	5V level input, non-isolated open collector.
Communication	One of RS232 or USB 2.0 (user selectable via software). Supplied with PC-based control & data-logging program, as well as general communication command protocol. (RS485 ready)
Power supply	18-32 VDC, 5Watt
Dimensions	Sensor head: 14mm diameter x 45mm long. M12x1 threading on front 8mm of sensing head. Controller: 95mm x 160mm x 36mm Standard head-to-controller cable length = 2m. Other lengths per customer specification.

Spot size: Hardware configurable (at factory) per application requirements:
Example viewing spot size as function of distance from probe: