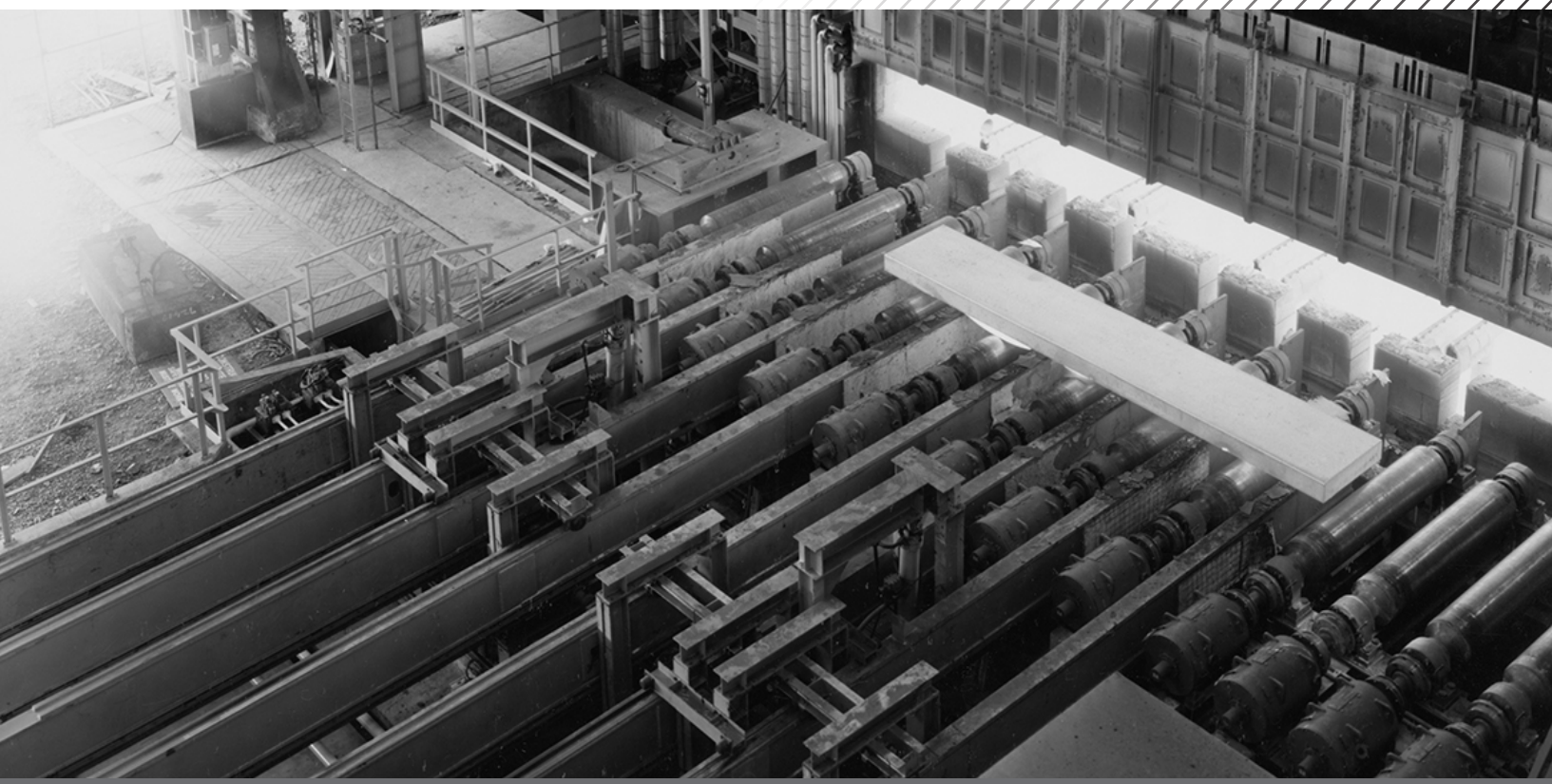
LAND®

AMETEK®

APPLICATION NOTE



SPOT+ M390
High temperature measurement in reheat and industrial furnaces

See degrees differently.

REHEAT FURNACE MEASUREMENT

The SPOT+ M390 , provides a continuous true temperature of the reheat furnace load and with it the possibility of big savings in operating costs.

The Measurement

The M390, operating at a wavelength of 3.9 µm, measures the apparent temperature of the furnace load. The output from this pyrometer contains a component which is due to radiation from the hot background being reflected from the load. Either the furnace control thermocouple or a second M390 measures the furnace background temperature and is wired via a 4-20 mA input into the SPOT+ M390, where on-board background correction is available, which means metal temperatures can be corrected for both emissivity and background radiation in real-time and based on actual insulation temperatures.

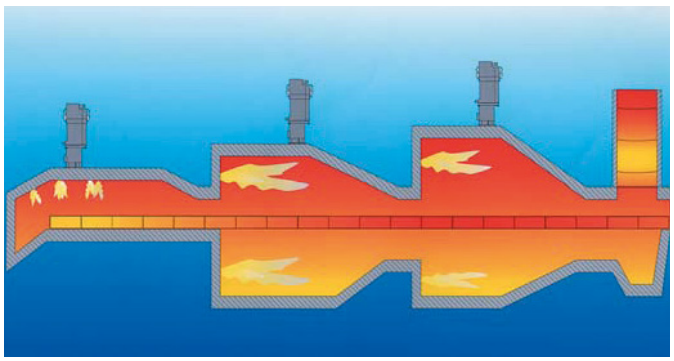
Advantages over the widely implemented Furnace Thermometer System (FTS)

The older FTS thermometer has been replaced by the SPOT+ M390. The FTS required the installation of a separate signal processor that is not required with the SPOT+ due to the advanced on-board capabilities.

The SPOT+ family works with AMETEK Land's optional SPOTPro software, which can display, record and trend corrected data from the instrument. Communicatons with temperature controllers, SCADA and DCS can also be easily configured. A visual camera, used for alignment and to determine lens condition, can be displayed on IMAGEPro, our advanced Image Processing tool.

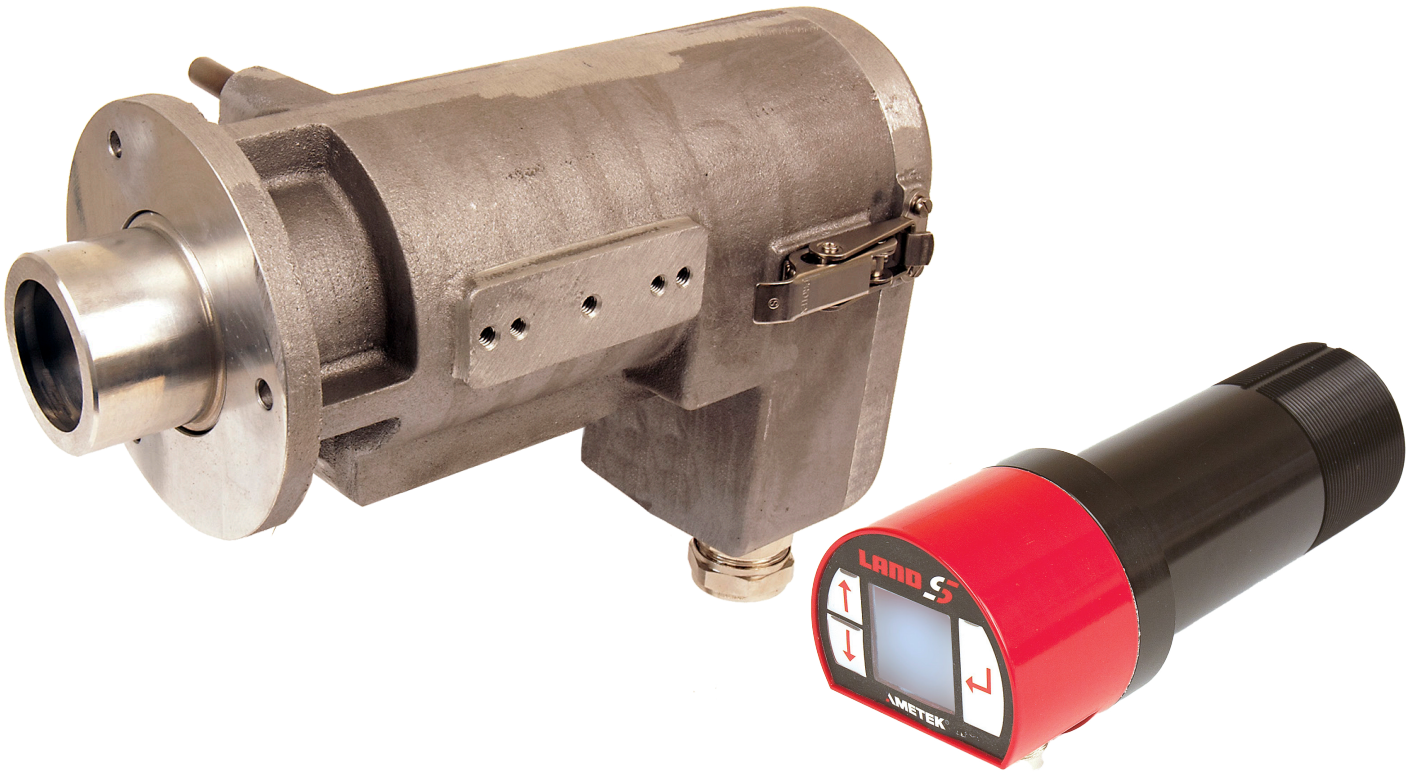
The Application

High system measurement accuracy (typically better than ± 20 °C/ ± 36 °F at 1000 °C/1830 °F) is required in gas-fired steel reheat furnaces in the first heating zone. Similarily, high accuracy measurements can be achieved in many furnaces fired on light or heavy oil.
The SPOT+ M390 uses a 3.9 µm wavelength detector, developed for its ability to penetrate yellow or orange flames typical in reheat furnace atmospheres. Other wavelengths may provide the temperature of the products of combustion instead of the metal temperature.

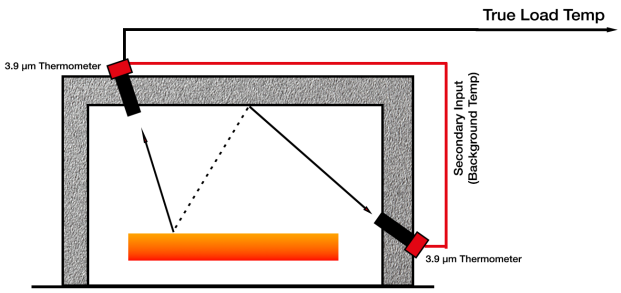


Potential locations for the Spot+ M390 on a reheat furnace

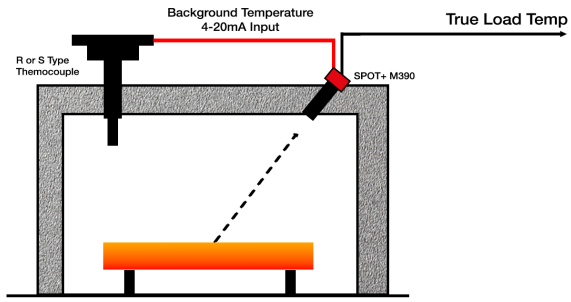
SPOT+ M390 DESIGN



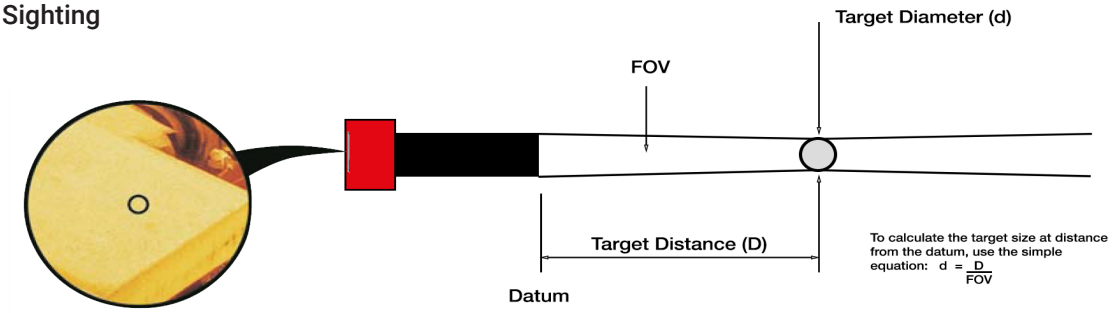
2 Pyrometer Schematic



1 Pyrometer and 1 Thermocouple Schematic



Sighting



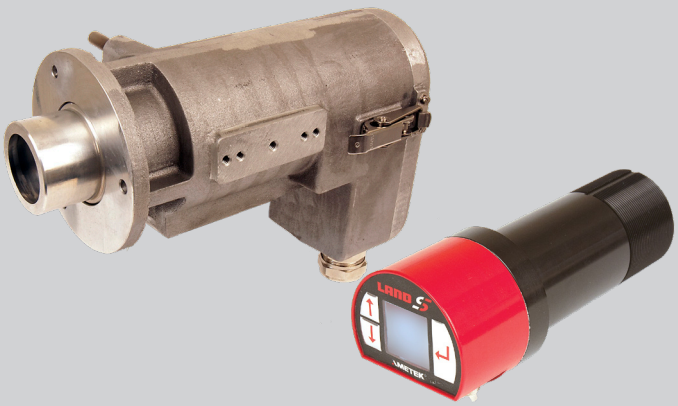
Display showing target area

SPOT+ M390
High temperature measurement in reheat and industrial furnaces

AMECARE®
PERFORMANCE SERVICES

Our global service centres provide after-sales services to ensure you get the best performance from your system. This includes technical support, certification, calibration, commissioning, repairs, servicing, preventative maintenance and training. Our highly trained technicians/engineers can also attend your site to cover planned maintenance schedules and repair emergency breakdowns.

SPOT+ M390



The AMETEK Land SPOT+ M390 Pyrometer is a compact, high-accuracy infrared sensor for precise, non-contact temperature measurement. Designed for industrial applications, it offers a wide temperature range, fast response, and reliable real-time data, ensuring optimal performance and process control in environments like metal and glass manufacturing.

LAND® AMETEK

SPOT+

Smart High-precision pyrometers

The SPOT+ range of smart infrared pyrometers offers advanced industrial connectivity and visible light process video. The technologies utilised in SPOT+ make non-contact temperature measurement accurate, flexible and easy to use.

Combining EtherNet/IP, REST API, web server, Modbus TCP/IP, image streaming, analogue and alarm outputs within one device, SPOT+ makes all these conveniently available to the operator.

Pyrometer readings and configuration settings are available on the rear display and remotely via webserver or through SPOTPro software. The standard body models use a focus assist flashing green patented* LED and provide visible light process video to confirm measurement SPOT+ size and location. The M/R100 and M/R160 models offer a fiber-optic variant which uses a red LED for alignment.

Flexible design with adapters provide simplified installation and easy replacement of older pyrometers. SPOT+ is designed to be interchangeable with any existing fixed spot pyrometers.

SPOT+ is designed to be interchangeable with any existing fixed spot pyrometers.

MONOCHROMATIC PYROMETERS
M100, M160, M210, M3-5 and M390 Standard Body
The M-Series pyrometers have a measurement range of 50 to 2500 °C / 122 to 4532 °F. Proven, reliable electronics and a precision optical system combine to give a pyrometer which delivers accurate, repeatable temperature measurement.

Fiber-optic VariantS
M100, M160, R100 and R160
The M and R Series fiber-optic versions generally measure at the same temperature range and wavelength. The use of flexible fiber-optics allows the optic head to be mounted in a hostile environment and the detector and electronics enclosure to be located in a less hostile environment, several metres away. The use of the fiber-optic variant permits measuring of targets that are inaccessible, in areas with electromagnetic interference or in high ambient temperature environments where water cooling may not be possible.

See degrees differently.

LAND® AMETEK

CONTACT US
WEB: www.ametek-land.com
EMAIL: land.enquiry@ametek.com

We are fully committed to Quality Assurance. See all our accreditations at **AMETEK-LAND.COM/QUALITY**

MARCOMS_DOC-0242 SPOT+ M390 High-Temperature Measurement in Reheat and Industrial Furnaces Rev 5 EN