

# MWIR- BORESCOPE-640

THERMAL IMAGING SOLUTIONS



① 300-1800 °C / 572-3272 °F

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PROCESS & ANALYTICAL INSTRUMENTS



QUALITY CUSTOMER SOLUTIONS

# MWIR-BORESCOPE-640

THERMAL IMAGING SOLUTIONS

## AMETEK LAND HAS BEEN MANUFACTURING PRECISION MEASURING EQUIPMENT SINCE 1947.

We are specialists in non-contact temperature measurement and combustion monitoring with applications across diverse industries such as steel and glass making, power generation and cement manufacture.

As part of AMETEK Process & Analytical Instruments Division since 2006, our customers benefit from the worldwide AMETEK sales and service team.

**Building on more than twenty years of thermal imaging experience, AMETEK Land continues to expand its range of temperature measurement solutions with the addition of the MWIR-Borescope-640.**

Dirty fuels and application-specific furnace atmospheres require a thermal imaging solution with advanced spectral filtering and a high thermal and spatial resolution to deliver clear live images of the furnace, boiler, and stock.

The MWIR-B-640 enables a continuous and clear view, even through heavy smoke and hot furnace atmospheres, which is not possible with visual furnace camera systems.

With a clear view through smoke and furnace gases, the MWIR-B-640 allows highly accurate and fully radiometric temperature measurement image data to be taken, stored, and trended over the lifetime of the furnace/boiler.

The advanced IMAGEPro thermal imaging and data processing software supports long term data trending, to enable the early detection of leaks and temperature variations and achieve process optimisation. Operators have a clear view of the critical furnace/boiler areas with more than 300,000 accurate point temperatures,

measuring in the range of 300-1200 °C (572-2192 °F) and 500-1800 °C (932-3272 °F). Providing advanced digital communications via the IMAGEPro software, the performance of the furnace can be monitored to easily identify hot and cold areas and any uneven heating can be visualised with corrections viewed in real-time.

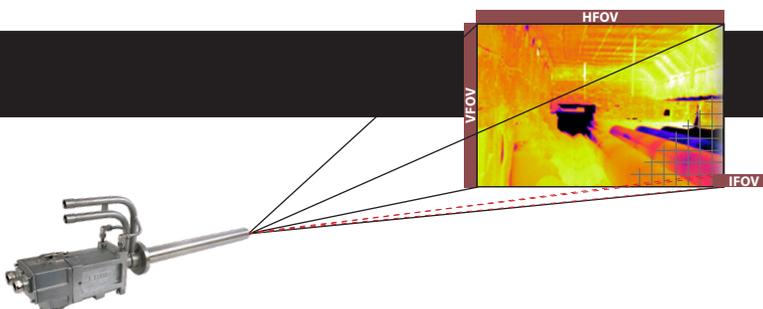
The high-resolution image, combined with the wide-angle field of view (90°), allows multiple areas to be imaged and measured simultaneously. With the wide-angle view into the furnace, image data can be viewed in real-time from the safety of the control room.

The MWIR-B-640 uses proven thermal imaging technology to accurately and continuously profile the temperature of the furnace and the stock, resulting in improved data accuracy through automation and reduced risk to personnel by minimizing the need for an operator to be in the hazardous furnace/boiler area.

With only a small opening in the wall, the MWIR-B-640 can accurately profile the temperature of the entire furnace without affecting the furnace atmosphere, the stock temperature, or energy consumption.

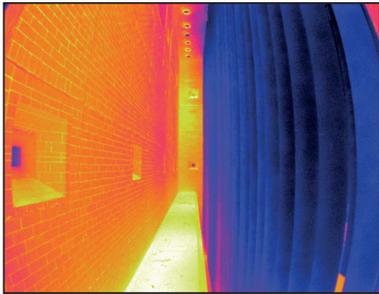
The MWIR-B-640 is an invaluable tool in prolonging furnace and boiler lifetime, optimising production throughput, reducing energy consumption, and improving stock temperatures.

### FIELD VIEW OF OPTICS ▼

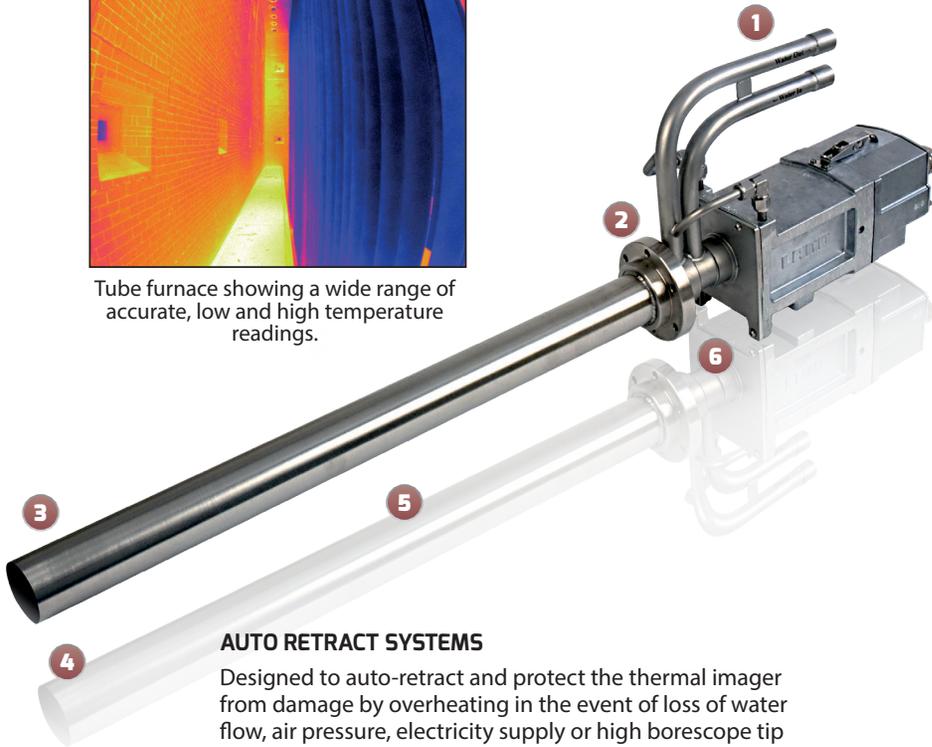


Distance	1 m			5 m			10 m			15 m			20 m		
	Width	Height	IFOV	Width	Height	IFOV	Width	Height	IFOV	Width	Height	IFOV	Width	Height	IFOV
<b>90° x 67.5°</b>	2.0 m	1.3 m	3.1 mm	10.0 m	6.6 m	15.6 mm	20.0 m	13.3 m	31.3 mm	30.0 m	20.0 m	46.9 mm	40.0 m	26.7 m	62.5 mm

# SPECIFICATION & DESIGN



Tube furnace showing a wide range of accurate, low and high temperature readings.



## 1: HIGH-PERFORMANCE WATER COOLING SYSTEM

Low water flow requirements even in the highest temperature furnaces, results in low running costs

## 2: RANGE OF MOUNTING OPTIONS

Common mounting options available to ensure simple installation

## 3: THERMOCOUPLE AT MWIR-B-640 TIP

Giving the operator an alarm for removing the instrument, preventing damage if maximum temperatures are exceeded

## 4: VIEWING ANGLE

90° angle provides a thermal view of multiple areas. 640 x 480 resolution gives 307,200 data points

## 5: PROBE LENGTHS

Range of the probe lengths suitable for every installation

## 6: INTEGRATED AIR PURGE

The air purge maintains a dust-free optical system while consuming minimal instrument air

## AUTO RETRACT SYSTEMS

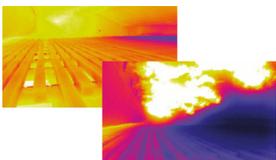
Designed to auto-retract and protect the thermal imager from damage by overheating in the event of loss of water flow, air pressure, electricity supply or high borescope tip temperature alarm.



## TYPICAL APPLICATIONS

HPI Reformer Furnaces	Reheat Furnaces
Heat Treatment Furnaces	Waste Boilers
Incinerators	Coal Boilers
Biomass Boilers	Annealing Furnaces
Cement (Kiln) Furnaces	Petrochemical Processes

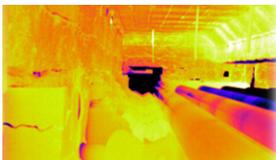
## SYSTEM BENEFITS



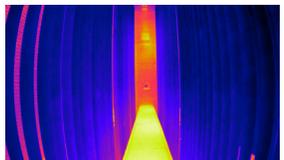
**ADVANCED SPECTRAL FILTERING** enables an extensive and clear view even through dusty and smoky furnace atmospheres.



**24/7 OPERATION AND REMOTE PROCESS MONITORING** reduces the risk to personnel by removing the need for an operator to be in the area on a regular basis.



**FULLY-RADIOMETRIC AND HIGHLY ACCURATE** temperature measurement at > 300,000 pixels.



**PATENTED BACKGROUND COMPENSATION** corrects the effect of background reflection online and continuously enables correct stock temperature readings.

## FEATURES & BENEFITS

**ADVANCED SPECTRAL FILTERING** - enabling a clear view through dusty/smoky and hot furnace atmospheres, working in the mid Infrared range

**HIGH-TEMPERATURE MEASUREMENT ACCURACY** - enables optimum furnace and boiler control through enhanced furnace thermal imaging

**ADVANCED IMAGE PROCESSING SOFTWARE** - control, monitor, analyse and capture data from the thermal imaging camera with IMAGEViewer and IMAGEPro

**REAL-TIME THERMAL DATA COMBINED WITH HIGH-RESOLUTION, LOW NOISE VISUAL IMAGE** - allows true real-time furnace optimisation and the opportunity to improve energy efficiency without degrading furnace/boiler lifetime

**SAFE 24 HOUR, 7 DAY MONITORING** - guarantees accurate, reliable data from a safe remote position without risk to the operators

# MWIR-BORESCOPE-640

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## SPECIFICATIONS

### CAMERA UNIT

Measurement Range:	300-1200 °C / 572-2192 °F 500-1800 °C / 932-3272 °F
Pixel Resolution:	640x480
Spectral Response:	3.9 µm
Frame Rate:	60 fps / <9 fps* (*export licence free)
Detector:	FPA - Microbolometer
Optic (HFOV x VFOV):	90° x 67.5°
Optic (IFOV):	2.4 mrad (90 °)
Focus Range:	1 m to infinity
Probe Diameter:	Ø 61 mm / Ø 2.4"
Probe Lengths:	305, 609 or 914 mm (12", 24" or 36")
Mountings:	Choice of 3" ANSI 150 RF Flange & Gasket or PN16 DN80 Flange & Gasket with a 12" standpipe
Protection Window:	Sapphire
Accuracy:	1 % of reading (C)
Repeatability:	1 K
Dimensions:	254 x 560 x 717 mm (or 1021 mm or 1326 mm) 10" x 22" x 32" (or 56")
Power Rating:	24 V DC
Weight:	< 25 kg (for 609 mm / 24" version)
Ambient Temperature:	-20 to 60 °C (-4 to 140 °F) 0 - 95 % humidity (non-condensing)
Cooling/Purging Options:	Water cooling / Air purging
Environmental Rating:	IP65

### CAMERA SUPPLY

Connections:	Digital data over 1 GBit Ethernet (M12, 8 pin) Power (8 pin)
Alarm Functions:	Tip temperature, internal camera temperature, image max. temperature
Signal-LED:	Power, Ethernet, Tip-Temperature (green/yellow/red)
Service:	Water, instrument air and power input

### POWER SUPPLY UNIT (PSU)

Components & Connections:	Power supply, Ethernet communications (switch) Fibre optic data connection (option)
IP Rating:	IP65 / NEMA 4
Size:	380 x 380 x 211 mm / 15" x 15" x 8.3"
Weight:	15 kg (33.07 lbs)
UL Approval:	Listed to UL508A & CSA-C22.2 No. File Number E499440

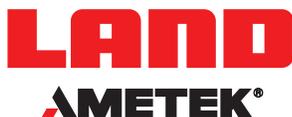
### IMAGE PROCESSING

Software:	IMAGEViewer & IMAGEPro Advanced Image Processing and Controlling Software
Workstation:	PC-Workstation (option)
Interfacing:	Open Data Interface, Modbus TCP, Moxa I/O unit

### STANDARD ACCESSORIES

Accessories (optional):	Power supply, cables, water-cooled/purged mounting and tube, software, workstation, auto-retraction system
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[www.ametek-land.com](http://www.ametek-land.com)



[land.enquiry@ametek.com](mailto:land.enquiry@ametek.com)

