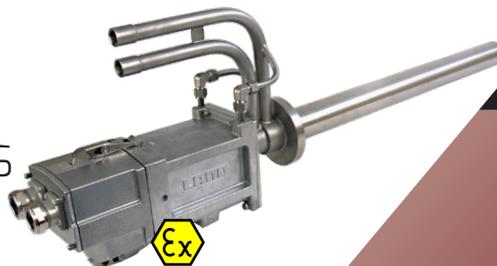


NIR-BORESCOPE-640-EX

(FORMERLY NIR-BORESCOPE-3XR)

THERMAL IMAGING SOLUTIONS
FOR REFORMER AND CRACKER TUBE FURNACES

ATEX, IECEx and CSA HAZARDOUS AREA CERTIFIED



① 600 to 1800 °C / 1112 to 3272 °F



LAND
AMETEK[®]
PROCESS & ANALYTICAL INSTRUMENTS



QUALITY CUSTOMER SOLUTIONS

NIR-BORESCOPE-640-EX

THERMAL IMAGING SOLUTIONS
FOR REFORMER AND CRACKER TUBE FURNACES

AMETEK LAND HAS BEEN MANUFACTURING PRECISION MEASURING EQUIPMENT SINCE 1947.

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

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

The NIR-BoreScope-640-EX is a short wavelength radiometric infrared borescope imaging camera for steam reformer and cracker tube continuous temperature measurement and furnace optimisation and monitoring. ATEX and IECEx approved to Ex nA IIC T4 Gc for use in Zone 2 gas atmospheres, and CSA Certified for US and Canada to Class I, Division 2, Groups A, B, C, D T4, the NIR-B-640-EX provides a high resolution thermal image with real time continuous high accuracy temperature measurements of both the tube wall and refractory wall surface. The camera measures temperatures in the single range 600 to 1800 °C (1112 to 3272 °F) and utilises the latest wide dynamic range imaging technology. This is ideal for applications with a high differential temperature in the field of view such as tube and furnace walls.

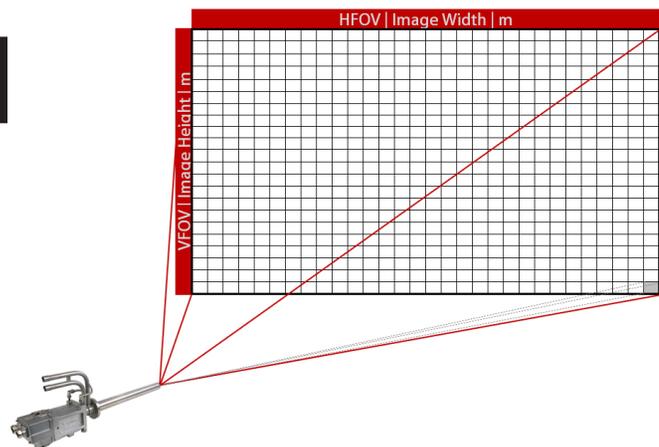
With the NIR-B-640-EX it is possible to use the proven technology of the NIR thermal imager to accurately and continuously profile the temperature of the reformer, improving data accuracy through automation and at the same time reducing the risk to personnel by removing the need for an operator to be in the hazardous area on a regular basis. The NIR-B-640-EX uses the shortest wavelength to minimise errors associated with varying emissivity, allowing highly accurate temperature measurement point data to be

taken, stored and trended over the lifetime of the reformer or cracker. The image and data processing software supports long term data trending, allowing process optimisation to be achieved, combined with potentially avoiding catastrophic failure.

The high resolution image combined with the wide angle field of view (90° x 67.5°, 44° x 33°) allows multiple reformer or cracker tubes in the lane to be imaged and measured simultaneously. With advanced digital communications the image and data can be viewed real-time in the control room in the safe area. The image also allows the user to monitor and optimise the performance of the furnace; easily identifying hot and cold areas and any uneven heating and gas mix can be visualised with corrections viewed in real-time. During start-up phases any burners that are not operating correctly can be clearly identified and the effect of any impinging flames can be seen.

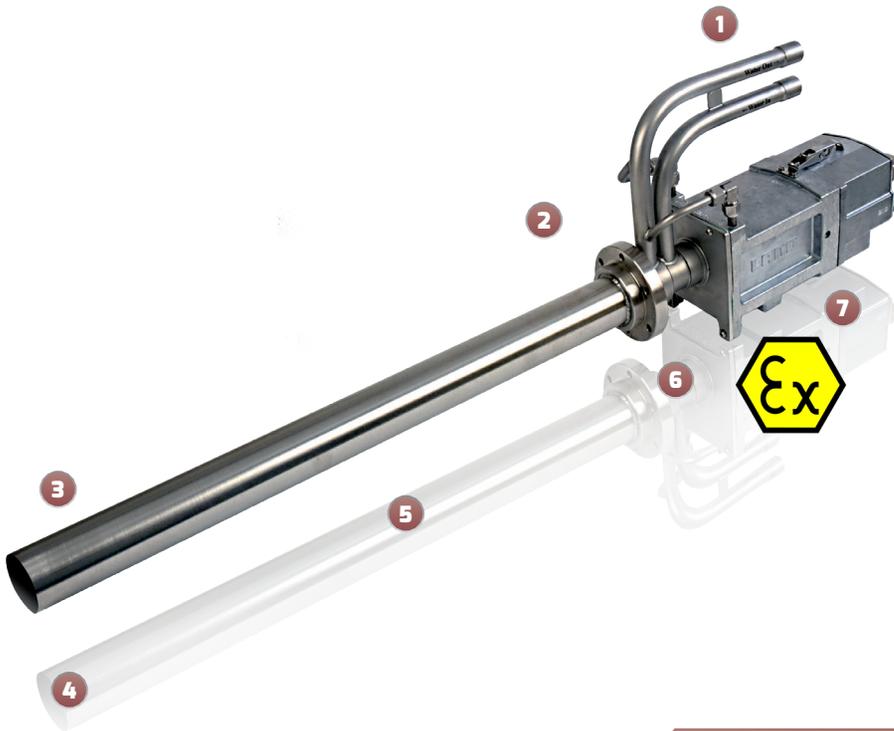
The NIR-B-640-EX is an invaluable tool in prolonging reformer tube life time, optimising production throughput and reducing energy consumption.

FIELD OF VIEW LENS OPTION



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
90° x 67.5°	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
44° x 33°	0.8 m	0.6 m	1.3 mm	4.0 m	2.9 m	6.3 mm	8.0 m	5.9 m	12.5 mm	12.1 m	8.8 m	18.9 mm	16.1 m	11.8 m	25.2 mm

SPECIFICATION & DESIGN



1: HIGH PERFORMANCE WATER COOLING SYSTEM

The low water flow requirements for the cooling systems, even in the highest temperature furnaces equal low running costs

2: RANGE OF MOUNTING OPTIONS

The most common mounting options available to ensure simple installation

3: THERMOCOUPLE AT NIR-B-640-EX TIP

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

4: VIEWING ANGLES

The 90° x 67.5° and 44° x 33° angles provide a thermal view of multiple tubes. 640 x 480 resolution gives 307,200 data points

5: PROBE LENGTHS

Range of probe lengths create the best fit for reformer installations

6: INTEGRATED AIR PURGE

The air purge design maintains a clean lens in harsh process environments while consuming minimal instrument air

7: HAZARDOUS AREA CERTIFICATION

ATEX and IECEx approved to Ex nA IIC T4 Gc for use in Zone 2 gas atmospheres, and CSA Certified for US and Canada to Class I, Division 2, Groups A, B, C, D T4

TYPICAL APPLICATIONS

Hydrogen Reformer

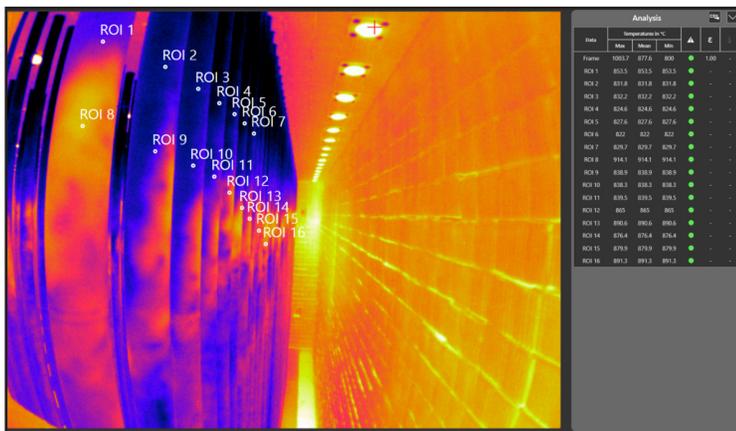
Ammonia Production

Ethylene Cracking Furnaces

Methanol Production

Syngas Production

VIEW OF REFORMER TUBES



FEATURES & BENEFITS

High temperature measurement accuracy - enables optimum process control through enhanced thermal imaging

Real-time thermal data - combined with high resolution visual image - allows true real-time furnace optimisation and the opportunity to improve energy efficiency without degrading reformer lifetime

Short wavelength sensor - low sensitivity to emissivity changes

Dedicated software - data points, areas of interest, automated alarms and long term data trending and system inter-connectivity (DCS, OPC)

24 Hour, 7 Day Monitoring - Shutterless operation guarantees accurate, reliable data with no blind time

Export License Free - rapid, hassle-free shipping

NIR-BORESCOPE-640-EX

THERMAL IMAGING SOLUTIONS
FOR REFORMER AND CRACKER TUBE FURNACES

SPECIFICATIONS

Measurement Range:	600 to 1800 °C / 1112 to 3272 °F
Spectral Response:	1 µm
Frame Rate:	7.5 fps (100M Ethernet)
Image Pixels:	640 x 480
Accuracy:	1.0 % Celsius
Sealing:	IP 65 (when connections mated/fitted with caps); Pollution Degree 2
Repeatability:	1 °C
Data Out:	Digital data over 100M Ethernet
Software:	IMAGEViewer & IMAGEPro Advanced Image Processing and Controlling Software
Standard Accessories:	Field Connection Box (ExHazLoc), Control Room Unit (ExHazLoc, associated apparatus), Junction Box (ExHazLoc), software, water cooled/purged mounting and tube
Field of View (Horizontal):	90° x 67.5°, 44° x 33°
Focus Range:	1000 mm to infinity
Probe Length:	305, 609 or 914 mm (12", 24" or 36")
Probe Diameter:	60.5 mm (2.38 in.) max.
Mountings:	Choice of 3" ANSI 150 RF Flange & Gasket or PN16 DN80 Flange & Gasket with a 12" standpipe
Dimensions:	254 x 560 x 717 mm (or 1021 mm or 1326 mm); 10" x 22" x 32" (or 44" or 56")
Power Rating:	21.6 - 26.4 V dc, 0.6 A; Over-voltage Category II
Weight:	< 25 kg (for 609 mm / 24" version)
Hazardous Area Certification: <i>EX Borescopes</i>	 EX NIR-b WG1: Ex nA IIC T4 Gc Tamb=-20 °C to +55 °C (ATEX certificate: CML 15ATEX4086X / IECEx certificate: IECEx CML 15.0042X) EX NIR-b WG2: Class I, Division 2, Groups A, B, C, D; T4 Tamb=-20 °C to +60 °C (CSA certificate for US and Canada: 70080206)
Field Connection Boxes	EX FCB 31: Ex nA nC [op is Ga] IIC T4 Gc Tamb=-25 to 54 °C, ATEX only, single channel (ATEX certificate: CML 15ATEX4085X) EX FCB 32: Class I, Division 2, Groups A, B, C, D; T4 Tamb=-25 to 50 °C, CSA only, single channel (CSA certificate for US and Canada: 70052791)  EX FCB 42: Ex nA nC IIC T3 Gc Tamb=-25 to 54 °C, ATEX and IECEx, four channels (ATEX certificate: CML 16ATEX4310X/ IECEx certificate: IECEx CML 17.0021X) EX CRU 1: [Ex op is IIC T4 Ga] Tamb=-25 to 54 °C Associated apparatus to the EX FCB 42 ONLY (ATEX certificate: CML 17ATEX4037X/ IECEx certificate: IECEx CML 17.0022X) EX FCB 41: Class I, Division 2, Groups A, B, C, D; T4 Tamb=-25 to 50 °C, CSA only, four channels (CSA certificate for US and Canada: 70052791) EX CRU 2: Tamb=-25 to 50 °C Associated apparatus to the EX FCB 41 ONLY (CSA certificate for US and Canada: 70157657)

DISCOVER HOW OUR BROAD RANGE
OF NON-CONTACT TEMPERATURE
MEASUREMENT AND COMBUSTION
& EMISSIONS PRODUCTS OFFER A
SOLUTION FOR YOUR PROCESS

WWW.AMETEK-LAND.COM

LAND
AMETEK®

CONTACT US



www.ametek-land.com



land.enquiry@ametek.com



Certificate No. CC-2041
APPLIES IN INDIA



APPLIES IN THE UK



APPLIES IN THE US



REGISTERED
MANAGEMENT SYSTEM