NEWS RELEASE

February 24, 2016
Nippon Avionics Co., Ltd.
http://www.avio.co.jp/english/

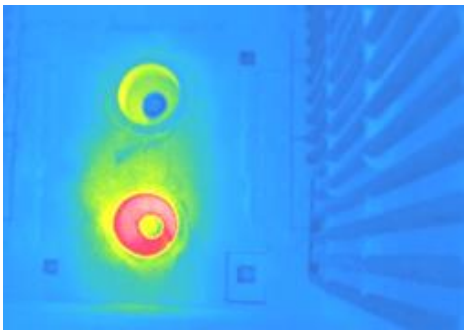
Sharply Imaging Passing Through Flame

Inside of Coal and Oil Refinery Furnaces

Avio Developed Light Weight and Compact Thermal Imaging Camera for Measuring Passing Through Flame

Demonstrating the power in ascertaining state of adhered clinker and diagnosing deterioration of internal facility of furnace

External appearance of the product



Thermal image passing through flame in a combustion furnace

Nippon Avionics Co., Ltd. (Head office: Tokyo, Japan. President Katsuhiko Akitsu, hereafter called Avio) launched the portable infrared thermal imaging camera (hereafter called Infrared Camera) Model InfReC R300BP-TF for capturing a thermal image passing through a flame on February 24, 2016. This new product can capture thermal images of wall surfaces and pipes inside of a combustion furnace, by utilizing the outstanding sensitivity of (Japanese-made) Uncooled Infrared Detector.

Normally around 3.8μm wavelength band is used for transmitting through carbon dioxide gas (CO^2) generated by a flame and a combustion, when capturing a thermal image passing through a flame by an infrared camera. However the wavelength of infrared camera equipped with “uncooled infrared detector” is 8 to 14μm which cannot pass through a flame. So normally infrared camera equipped with special “cooled

infrared detector" is used in order to detect infrared ray around 3.8μm wavelength band but the cooled infrared detector camera is expensive and heavy weight over 3kg, and needs the maintenance cost and its time-consuming that prevent to be popular in the market.

As the latest development, Avio have succeeded in improving optical system of the portable infrared camera (weight only 1.5kg) equipped with (Japanese-made) uncooled infrared detector which provides the sensitivity at around 3.8um wavelength band passing through flame. Utilizing this Infrared Camera makes it possible to image temperature distributions sharply in burning materials and conditions in combustion furnaces passing through a flame. Through development of this Infrared Camera, Avio is aiming to contribute to society in new fields, such as prevention of accidents due to adhered "clinker-mass" (i.e., ashes and dregs adhered to furnace walls) and diagnosis of equipment mounted inside combustion furnaces.

■ Model and Release

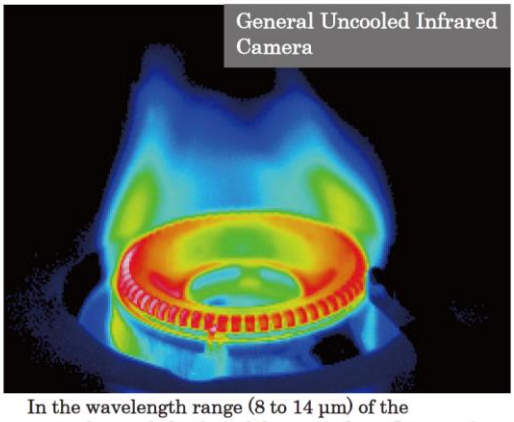
Model	Sales release
R300BP-TF	Beginning of March 2016

■ Main features of the new model

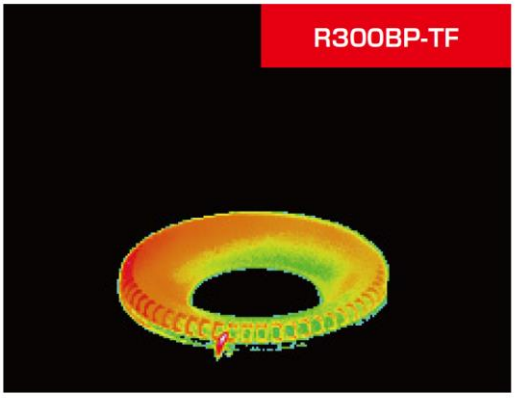
1) Maintenance-free operation thanks to a new (Japanese-made) uncooled infrared detector

Measurement passing through a flame is made possible by utilizing an (Japanese-made) uncooled infrared detector with outstanding sensitivity.[*1] As a result, the new model features a significantly reduced price and maintenance-free operation comparing with conventional cooled infrared camera. Since replacing a cooling mechanism is unecessary, the infrared camera can be used without worrying about its lifetime, and maintenance cost is lowered accordingly.

The flame is eliminated by the infrared detector with a passing-flame filter with outstanding sensitivity at 3.8 μm wavelength band.



In the wavelength range (8 to 14 μm) of the general uncooled infrared detector, the influence of the flame is clearly present.



By stretching the sensitivity of the (Japanese-made) uncooled detector to the short-wavelength region, it is possible to eliminate the flame influence by using a 3.8-μm passing-through-flame filter.

2) Making a quick measurement in extremely harsh environments possible by a infrared camera with outstanding mobility and operability in the field

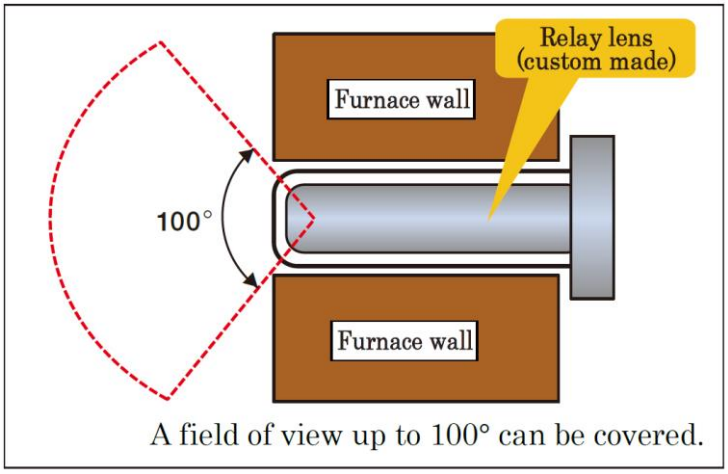
- Lightweight and compact body (battery operated) weighing only 1.5kg (including a battery pack excluding a protection shield)
- Thermal movie images can be recorded on SD card at max. speed 10 Hz and can be analyzed by software later. In this manner, required data can be recorded in a short time.
- A rotational LCD monitor enables images to be captured at various angles.
- "Full-auto function" allows temperature scale and focus to be adjusted simultaneously.

3) Folding protection shield included as standard

Imaging is possible while assuring the safety of the operator from intensive radiant heat.

4) Combination with a relay lens inserted in the furnace is available.

A wide field of view (up to 100°) is available through a furnace wall by combination with a relay lens of custom made.



A field of view up to 100° can be covered.

Measuring temperature might be affected by the temperature of the target object and the type of combustion gas. Actual measurement by a demo model is thus recommended.

Inquiries:

For Further Information, Please Contact ;
Nippon Avionics Co., Ltd.
International Sales Group, Sales & Marketing Department,
Thermal Imaging Division.
Phone: Tokyo, Japan +81-3-5436-1614
E-mail:product-irc-e@ml.avio.co.jp

<Specifications>

Functions			Specifications
Basic Performance	Infrared Detector		Uncooled Focal Plane Array (Microbolometer)
	Spectral Range		3.7 to 3.9μm
	Measuring Range		400°C to 1500°C
	Sensitivity (NETD)		4°C at 400°C (with S/N improvement)
	Accuracy		±44°C
	Frame Rate		60 Hz
	Detector Pixels		320 (H) x 240 (V) pixels
	Recording Pixels		Standard mode : 320 (H) x 240 (V) Super Resolution(SR mode)mode: 640 (H) x 480 (V) *1
	Field of View		22° (H) x 17° (V) (with standard lens)
	Spatial Resolution		Standard mode : 1.2 mrad Super Resolution (SR mode) mode: 0.8 mrad equivalent *2
	Focal Distance		50cm to infinity (with standard lens)
	Focus		Auto / Manual
Image Display	Auto Functions		Auto Scale, Auto Focus, Full Auto
	Color Pallet		7 pallets (Rainbow, Brightness, Hot White, Hot Black, etc.)
	Gradation		256 / 32 / 16 / 8 grade
	Visible Camera		CMOS camera 3.1M pixels
	Visible/Thermal Fusion		Side-by-Side, Fusion (transparency changeable), Picture-in-Picture (transparency changeable)
	Display Functions		1 to 4 times continuous zoom (with display positioning scroll), Grid Overlay, 9 images multi-display (replay mode)
	Image Quality Improvement	Averaging	Off / Σ4 / Σ8 / Σ16 (with ghost rejection)
		Edge Enhancement	Provided
Measuring Functions	Point Temperature		10 Movable Points, Temperature Tracking: MAX/MIN x 1 each, Delta T
	Temperature Display in Assigned Region		MAX, MIN and AVG in Box (for up to 5 Boxes)
	Line Profile		Horizontal, Vertical, Horizontal & Vertical
	Alarm function		Alarm Display, Alarm Sound, Color Alarm (ISO), Alarm Recording, Alarm Signal Output
	Temperature Correction Function		Emissivity, Environment / Background, NUC

		Emissivity	Multi-Point Correction, Emissivity Reverse Calculation
Storage & Output	Storage Device		SD card, Conform to SDHC
	Data Storage		Still Image: JPEG with temperature data (14 bit) recorded with Visible image
		Super Resolution(SR)	Provided
		Quick Panorama	Horizontal Equivalent to 70° / Vertical Equivalent to 52°
		External Trigger Recording	Provided
		Interval Recording	3 sec to 60 min interval, with Visible image recorded
		Movie Recording	Max 10 fps in SD Card
		Voice Recording	30 sec recording, replay per a Thermal image
		Text Annotation	Annotate up to 128 characters per a Thermal image, Characters imported from SD Card
	Interface	USB 2.0	Mass-Storage, Image transfer (Thermal image Max 60 Hz, Visible image Max 7.5 Hz)
		Video Output	NTSC / PAL Switchable
		Alarm Output	Contact Signal. No Voltage
		External Trigger Input	Pulse Signal
Others	Graphical User Interface's Supported Language		English, French, Spanish, German, Italian, Portuguese, Russian, Finnish, Danish, Norwegian, Swedish, Dutch, Chinese (Traditional, Simplified), Korean and Japanese.
	Display		3.5" LCD Monitor (with tilt and brightness adjustment), Color View Finder (with tilt adjustment)
	Auxiliary		Laser Pointer (Red, class 2, conform to PSC regulation), LED Light, Remote Controller
	Environment Resistance	Operating temperature / Humidity	0°C to 40°C, 90%RH (non-condensing)
		Storage temperature / Humidity	-40°C to 70°C, 90%RH (non-condensing)
		Vibration / Shock	29.4m/sec² (3G), 294m/sec² (30G)
		EMC	Conform to CE regulations (Class A)
		Dust & splash proof	Protection class IP54 equivalent
	Battery Operation		2 hours (Typ), Rechargeable Li-Ion battery, (4 hours with

		optional “Portable Power (TVB-C501)”) *3
	AC Power	100V - 220V AC, 50 / 60 Hz
	Dimensions	Approx. H121 mm x W105 mm × D195 mm (excluding projection)
	Weight	Approx. 1.5kg (including Battery Pack)
	Standard Software	InfReC Analyzer NS9500 Professional

*1 Still image Only

*2 This increased resolution results from detecting characteristic within all frames acquired by the SR process and removing such effects as those caused by hand vibration.

*3 2 extra batteries (optional parts) are required for 4 hours operation.