

PRACTICAL ADVANTAGES:

- Fully radiometric IR camera made in the EU
- Real-time measurement and real-time image display guarantee clear, high-quality thermal images
- Precise temperature measurement over the whole image
- High thermal sensitivity
- High geometric resolution
- Digital camera for real images
- Ergonomic and robust (IP 54)
- Maintenance-free operation due to uncooled microbolometer technology
- Moveable LCD colour display
- Image recording with a refresh rate of up to 50/60 Hz
- DuoVision function for picture-in-picture display
- Integrated laser pointer
- Large memory
- A variety of measuring functions
- Data transmission via USB
- Easy handling
- Intelligent power management
- Highly-sophisticated analysis software included in the scope of delivery

IR cameras from the IC series

The compact MultiMeasure infrared cameras in the Trotec IC Series deliver a convincing performance with precise thermographic measurements in real-time, an expansive temperature range and a variety of functions – combined with an amazingly low price which offers unbeatable value for money.



The construction basis of the IC Series is one of the most widely sold camera platforms in the world. Benefit during your daily measuring operations from a series of instruments which leaves nothing to be desired.

Whether it's fully radiometric temperature measurements with real-time image repetition frequencies, a high geometric resolution of up to 1.3 mrad, a large display with as many as 110,592 temperature measuring points, an integrated

digital camera for combined real images, picture-in-picture display with the patented DuoVision function, maintenance-free operation due to microbolometer technology, dynamic four-point measuring, automatic temperature tracking and much, much, more – a selection of eight different cameras from three user-specific model series provides you with exactly the IC infrared camera you need for your own individual application.



Do you need thermal imaging cameras with a works test certificate or with a calibration certificate for specific measuring points?

Then use the Trotec calibration service!



We can guarantee you the shortest reaction times in any service case with our own calibration and service centre in Germany.

Sounds interesting? More information on +49 2452 962-400.

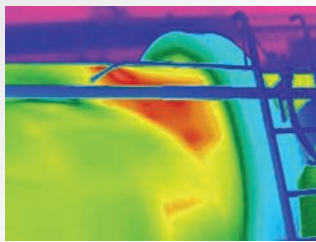


The IC090 Ex is also suitable for operation in areas where there is a high risk of explosion! (on request)

IC – Intelligent and Clever...

IC cameras have everything that you would expect from a professional thermal imaging camera whilst at the same time being surprisingly inexpensive to buy. Clever electronics and functions, intelligent power management and mobility concept:

High precision even at high temperatures...



A geometric resolution of up to 1.3 mrad, the high thermal sensitivity and an image repetition frequency of 50/60 Hz enable precise thermograms to be made in real-time in every possible measuring situation – in a measuring range between -20 °C and +1,500 °C depending on the type of model.

We don't do things by halves: Always in the picture thanks to real-time display...

REAL TIME The IC thermal imaging camera's highly developed sensor system constantly determines even the smallest temperature changes.

As many as 110,592 autarkic temperature measuring points measure the current values close to 60 times a second and transfer this information to an LCD display. The high image repetition frequency guarantees that not a single

image – i.e. valuable thermographic information - is left out and that the infrared image is displayed in real-time.

Without real-time, half is missing...

Only a high image refresh rate of 50/60 Hz guarantees working without fatigue and exact measurements, even in the case of moving objects.

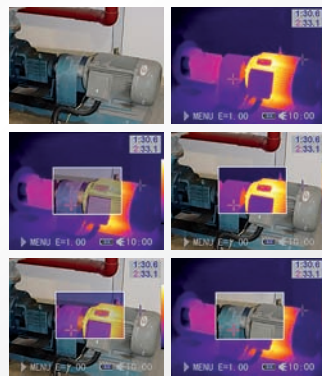
You won't miss a thing – with DuoVision...

DUO VISION The IC cameras in the V and LV Series are equipped with an additional digital camera for real images and an integrated photo lamp to light up dark areas.

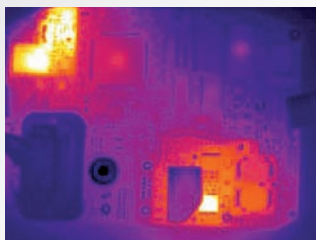
The patented DuoVision-technology does not only enable infrared or real images to be displayed individually, it can also supply an individually selectable four-stage combined overlapping depiction of both images. This means that any damage or defects can be detected at a single glance.

Regardless which of the display options you use, both the real image and the infrared image information is stored

separately so that the measuring data can be fully retrieved when needed.



The IC gets to the point...



The integrated laser pointer makes it easy to locate problem areas quickly and the integrated hot spot/cold spot detection saves you having to search for the hottest or coldest point in the image.

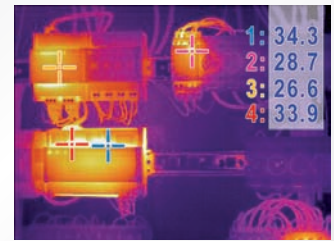
Due to the short minimum focusing distance of just 10 cm, even close-up objects can be examined with pinpoint accuracy.

A clear target in view,...

...or two, or three, or four?

The powerful camera technology allows differential measurements at up to four movable temperature measurement points, of which three can be individually configured.

In addition, temperature limits that you set yourself via an alarm or isotherm function can be displayed by a special



colour or by an alarm signal – ideal for **dew point detection** on surfaces!

The IC shows everything as clear as daylight...



A high-quality germanium lens guarantees perfect thermographic images, which are shown in real-time on the brilliant LCD display.

The tilting monitor element can be ergonomically adjusted to suit the observer in every recording situation.

Thanks to the folding mechanism, the monitor element can be folded down fully after measurements are completed, thus protecting the LCD display and the operating keypad against dirt.

Rough shell, clever core...

All interfaces are located centrally and well protected in the base of the sturdy IP54 housing, which is also suitable for use under the harshest environmental conditions.

Thanks to the intelligent power management, the cameras are ready for use quickly at all times – the advanced camera circuitry places numerous measurement functions at the user's disposal just a few seconds after switching on.



Quality is standard...

The software included in the package is not just a simple data transfer or display tool – with each IC camera you get a professional, full-value analysis and documentation program with numerous functions for evaluation, organisation and documentation of your measurement results.



DUO VISION The software's DuoVision function also offers the option to overlap infrared and real images in varying degrees of intensity.



These DuoVision images can also be stored and they are then not only easier to evaluate but also provide a more professional means of documentation.

Trotec

Telemetry

Planning and survey

Temperature

Velocity

Moisture

Multi-function

Tracing an detection

Optical inspection systems

Leak detection

← IR-cameras from the IC series – further information...

Thermography for all...

The objective of developing the IC camera series was to reply to the strongly increasing demand for thermographic measurement methods in many areas of application with a series that allows the use of high-quality cameras even on a tight budget.

Thanks to their full range of features, all IC cameras not only provide for transparency quickly and effectively when used for thermographic measuring tasks; the pricing structure is also refreshingly transparent, enabling you to select the optimum model for your needs, quickly and simply.

Benefits in practice come as standard – this is something all the IC models offer:

Functions and features:	Your benefit in practice:	IC 060	IC 080	IC 120	IC 080 V	IC 120 V	IC 080 LV	IC 120 LV
A high image repetition frequency of 50/60 Hz	The high image repetition frequency guarantees a non-top image representation of the infrared images. Not a single image - which equates into valuable thermographic information - is left out when the images are depicted in real-time.	■	■	■	■	■	■	■
Fully radiometric infrared images	Precise temperature measurements over the entire image, no interpolation interference. The sensor has an autarkic measuring point for each individual pixel which delivers exact temperature values exclusively for this individual pixel. The absolute temperature can be read pixel by pixel.	■	■	■	■	■	■	■
High thermal sensitivity	Reliable diagnoses even with the smallest of temperature differences. Even the smallest of temperature differences become visible. High sensitivity reduces thermal noise in the infrared image. The smaller the value, the better the quality of the image.	■	■	■	■	■	■	■
Uncooled microbolometer sensors	No moving sensor parts, extremely resilient, crisp, clear and detailed images. Compact size, low weight, low power consumption, completely maintenance-free.	■	■	■	■	■	■	■
Moveable LCD display	Optimal ergonomic view at all times and from every angle. Folds together to protect the monitor and the key pad against dirt and damage.	■	■	■	■	■	■	■
Automatic temperature tracking (Hot-/Cold-Spot)	Cold and hot spots on the measured object are measured in real-time and displayed automatically.	■	■	■	■	■	■	■
Temperature alarm	Acoustic and optical alarm help you to detect critical areas quickly and more easily. Ideal for dew point detection on surfaces.	■	■	■	■	■	■	■
Protection class IP 54	Robust housing, dust and splashproof – ideal for rough operations in industry and all kinds of weather in case of outdoor measuring.	■	■	■	■	■	■	■
Integrated laserpointer	Facilitates quick localisation of problematic areas and visual targeting in poorly illuminated areas.	■	■	■	■	■	■	■
USB interface	Quick and easy connection to all PCs, quick data transfer.	■	■	■	■	■	■	■
Intelligent power management	High rechargeable battery performance, longer non-stop measuring operations.	■	■	■	■	■	■	■
A variety of measuring and analysis functions	Quick, reliable and accurate results due to dynamic four-point measuring, automatic temperature tracking, difference measurements, isotherm and alarm function.	■	■	■	■	■	■	■
Professional analysis software	No additional costs for expensive software: Full analysis and documentation program with numerous functions for assessment, organisation and documentation already included in the scope of delivery.	■	■	■	■	■	■	■

The standard model range in the IC Series

The standard model range is already packed with a bundle of extras that comes as standard. The IC060, IC080 and IC120 provide all you would expect of a professional compact infrared camera.

There are three individual measuring ranges and the ideal measuring device for each individual application.



V for even more variety...

The V models in the IC Series take an even more in depth look at your measuring objects. In contrast to the IC080V and IC120V standard models, they are equipped with a real image camera, a photo lamp, DuoVision display options and an optional Bluetooth connection for wireless voice comments via headset.



Not all users always need all the features and functions or the most expensive temperature range they can get. That's why the IC Series offers the optimal camera for each individual type of user.

The higher the model number, the bigger the temperature range: Additional model designations stand for further features and a higher degree of precision – it's as simple as that.

Exactly the right equipment for each individual requirement – model-specific differences:

Functions and features:	Your benefit in practice:	IC 060	IC 080	IC 120	IC 080 V	IC 120 V	IC 080 LV	IC 120 LV
Image sensor with 160 x 120 measuring points	19,200 autarkic temperature measuring points measure even the smallest of temperature differences in real-time. Optimal resolution for a whole host of applications.	■	■	■	■	■		
Image sensor with 384 x 288 measuring points	Highest precision in measuring due to 110,592 autarkic temperature measuring points . You can be twice as far from the target with this detector than with a 160 x 120 detector and still carry out measurements with the same accuracy.						■	■
High geometric resolution of 2.2 mrad	Defines the solid angle measurement for the smallest detectable measuring point. The smaller the value, the more accurate the measuring results. The measuring point of each thermal pixel principally has a diameter of 2.2mm when measured from a distance of 1m from the object.	■	■	■	■	■		
Very high geometric resolution of 1.3 mrad	Defines the solid angle measurement for the smallest detectable measuring point. The smaller the value, the more accurate the measuring results. The measuring point of each thermal pixel principally has a diameter of 1.3mm when measured from a distance of 1m from the object.						■	■
Integrated digital camera	Quicker and easier object inspection due to simultaneous display and recording of infrared and real images.				■	■	■	■
Integrated photo lamp	Better photo results due to improved illumination of darker target regions when performing real image recording.				■	■	■	■
DuoVision picture-in-picture display	Real-time display of overlapping infrared and real images with four separate display options. Easier orientation and localisation during measuring.				■	■	■	■
Bluetooth (optional)	Wireless connectability for an optional headset.				■	■	■	■
Voice recording (optional)	Add on-scene comments and valuable additional information to your recorded images.				■	■	■	■
mini-SD interchangeable memory card slot	Quick and easy memory management; room for thousands of images on the mini-SD card included in scope of delivery. Practically endless memory capacity by simply changing cards.				■	■	■	■
Integrated flash memory	No cards needed, large memory for approx. 1,000 thermal images.	■	■	■				
DuoVision software function	The software not only stores both the infrared and the real image but allows an overlapping depiction of both images in varying degrees of intensity for better assessment and more professional documentation.				■	■	■	■
IR video recordings in real-time (optional)	Thermographic real-time video recordings and evaluations on the PC connected to your infrared camera.				■	■	■	■

LV measures highly accurately...

The LV model range in the IC Series expands the benefits of the V models and provides a 384 x 288 infrared sensor with 110,592 temperature measuring points.

In addition, the IC080LV and the IC120LV distinguish themselves with an extremely high geometric resolution of 1.3 mrad. The highest precision and the highest accuracy for the highest of demands!

For all those who like just that little bit more...

More flexibility? More mobility?

The standard scope of accessories leaves nothing to be desired. But should you want just that little bit more, then we have an extensive range of accessories designed to suit your needs:

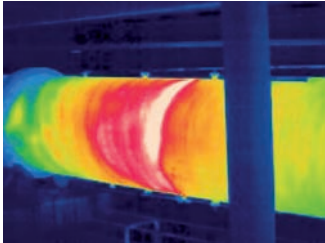
Tele lenses, wide-angle lenses – a total of eight different interchangeable lenses are optionally available. And besides that a car charger cable, further software packages and even more!

← IR-cameras from the IC series – further information...

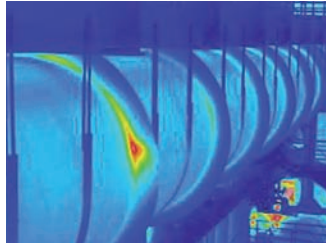
Possible applications...

The IC thermal imaging cameras are very easy to operate and are suitable for numerous areas of application, for example:

Production checking and plant maintenance in industry



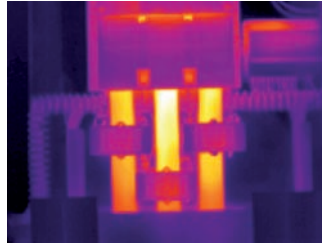
Use the thermal imaging cameras for monitoring and maintenance tasks in industrial plants; for example, for checking combustion processes or monitoring temperature-controlled processes.



The inspection of thermal insulation on machines and plants is also a typical area of use of the IC cameras, as is preventative maintenance.

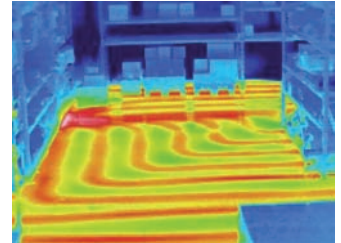
For example, "hot spots" in drive systems can point to the start of bearing damage.

Electrothermography



Whether control cabinets, electric motors or other current conducting systems - with IC cameras you can detect dilapidated components or damaged connections at an early stage and rectify faults, preventing costly interruptions in production and reducing the risks of fire.

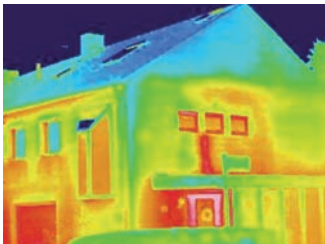
Leak detection



The infrared cameras from the IC series enable fast, precise localisation of an actual leak, usually invisible to the human eye, in inaccessible or concealed piping, for example in under-floor heating.

The costs and damage incurred by repair work can thus be minimised.

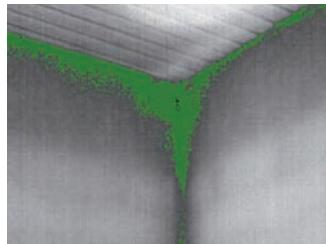
Building thermography



Whether the building shell or the entire structure – the examination for missing thermal insulation and the detection of physical building defects or concealed structural elements are all possible by means of thermographic measurements with IC cameras, even during the construction phase.

As a result, warranty claims can be asserted at an early stage and energy costs saved.

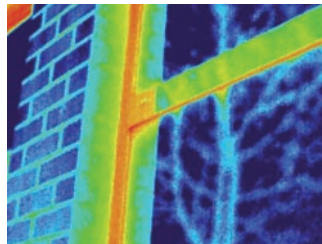
In the run-up to modernisations, thermographic measurements also represent a reliable basis for the planning of conversion work for the elimination of energy losses.



It is similarly possible to take stock of the interior climate with IC thermal imaging cameras.

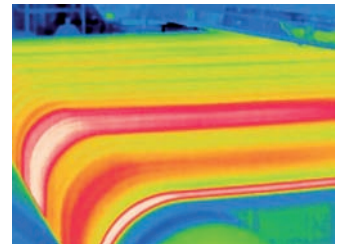
This is a quick, simple way to localise dew-point-endangered places in the building where mould, which may be toxic or cause allergies, could grow if structural counter-measures are not taken.

Energy consultation



The IC cameras are extremely well suited to the detection and documentation of energy losses through exterior windows, exterior doors, roller shutter boxes, radiator niches, the roof structure and the entire building shell, for example due to missing or faulty insulation, and are the optimum measuring tools for comprehensive diagnostic and maintenance use in connection with energy consultation.

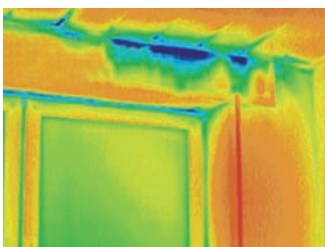
Many further areas of use



Due to the indisputable advantages of this method, thermographic measurements have been established in many areas of application for some time now.

The cameras in the innovative IC Series offer unbeatable value for money and make thermal imagery attractive for a whole variety of crafts and trades and application scenarios for which the use of contact-free and non-destructive thermography was too expensive and for a whole host of different users for whom such an acquisition was up to now quite simply unaffordable.

Do you have any questions on the possibilities of using the IC series for your personal application case? Just call us, we will be pleased to advise you!



Technical data		IC090 EX	IC060	IC080	IC120	IC080 V	IC120 V	IC080 LV	IC120 LV	
Article no.		3.110.003.016	3.110.003.008	3.110.003.010	3.110.003.018	3.110.003.011	3.110.003.019	3.110.003.012	3.110.003.020	
Measurement	Temperature range	-20 °C to +250 °C	-20 °C to +250 °C	-20 °C to +600 °C	-20 °C to +1,500 °C	-20 °C to +600 °C	-20 °C to +1,500 °C	-20 °C to +600 °C	-20 °C to +1,500 °C	
	Accuracy	±2 °C or 2 % of the measured value								
Image output radiometric	Detector type	Focal Plane Array (FPA), uncooled microbolometer								
	Detector resolution	160 x 120 pixels						384 x 288 pixels		
	Spectral range	7.5 to 14 µm					8 to 14 µm	7.5 to 14 µm		
	Field Of View (FOV)	38° x 28.5°					20° x 15°	24° x 21°		
	Geometric resolution	4.4 mrad					2.2 mrad	1.3 mrad		
	Thermal sensitivity	0.1 °C at 30 °C						0.08 °C at 30 °C		
	Image refresh rate					50/60 Hz				
	Focus	manuell								
	Min. focussing distance	0.10 m								
	Image performance visual	Digital photo camera	–				Colour depiction 680 x 480 Pixel, integrated photo lamp			
Video norm		–				PAL/NTSC				
Image representation	Image display	2.5" LCD, pseudo colours, 6 colour palettes								
	Image display options	IR image				IR image, real image, 4 DuoVision options for the combined display of IR and real image				
Measuring functions	Measuring point	Up to four moveable measuring points (3x manual and 1x automatic)								
	Isotherm	Yes (between the upper and lower limit values)								
	Emission factor	Variably adjustable from 0.01 to 1.0								
	Measurement correction	Automatic on the basis of user-defined specifications for environmental temperature, distance, relative humidity								
Image storage	Storage medium	Integrated flash memory card for approx. 1,000 images				Interchangeable memory card slot for mini-SD card				
	Data format radiometric	14-bit radiometric IR format								
	Data format visual	–				CCD				
	Video recording	–				Comments can be stored with each IR image (optional Bluetooth expansion kit and Bluetooth headset necessary)				
System status indicator	Status display	LCD display	–							
Laser	Type	Semiconductor AlGaInP Diode Laser, 1 mw/635 nm red								
	Classification	Class 2								
Power supply	Battery type	Rechargeable standard lithium-ion battery, replaceable								
	Operating time	≈ 2.5 h								
	Mains operation	8 - 11V DC								
	Energy saving mode	user-defined								
Ambient conditions	Operating temperature	0 °C to +40 °C								
	Storage temperature	-40 °C to +70 °C								
	Humidity	10 % to 95 % r.H. (non-condensing)								
	Protection class	IP 54 IEC 529								
	Shockproof to	25G IEC 68-2-29								
Physical parameters	Dimensions	211 x 80 x 195 mm				230 x 80 x 195 mm				
	Weight	700 g				740 g				
	Stand mounting	1/4-inch - 20								
Interfaces	PC	USB 1.1				USB 2.0				
	Video output	Composite Video								
Package contents	Standard lens	38° x 28.5°	20° x 15°				24° x 21°			
	Standard equipment	Camera with standard lens, LCD display and laser, battery charger 110/230 Volt (IC090 Ex-protected) with charging status indicator, Li-ion battery (IC090 two Ex-protected special rechargeable batteries), video cable, USB cable for downloading images to your PC, operating instructions, carry case, software package, temperature test certificate, mini-SD interchangeable memory card (only V and LV models)								
	Optional interchangeable lenses	–	38°, 28°, 14°, 12°, 9°, 6.4°, 4.8°, 3.5°-Linse				48°, 12°- lens			
	Optional accessories	on request	Tripod mount bracket, power supply, 12V adapter for cigarette lighter, additional battery, leather holster, Bluetooth expansion kit and Bluetooth headset (only V and LV models), software upgrade for thermographic video recordings and evaluations in real-time (only V and LV models), further software packages on request							