



Committing to the future

Industrial thermography with the thermal imagers from Testo



testo 875



testo 876



testo 881



testo 882



testo 885

Simply see more without contact

Testo thermal imagers quickly and reliably detect anomalies, weak spots and damage in industrial maintenance, production monitoring, and in Research and Development. Materials and components are tested completely without damage thanks to an image creation process. Problem zones are identified without contact before a malfunction or a fire risk occurs. Whereas with other methods, cable or pipeline systems must be dismantled, with a Testo thermal imager, a single glance is enough.

Testo thermal imagers for industrial thermography:

- prevent damage and save money
- stand out thanks to high resolution images
- ensure fast and comprehensive analysis
- have intuitive operation
- guarantee a large image section thanks to the light wide-angle lens

For daily use in industrial surroundings

Thanks to excellent detector and lens quality, as well as intelligent system solutions, no detail is missed: this applies to large-scale panorama images just as well as to small details of the measurement object. In addition to the intuitive menu, the PC software IRSofT in particular also guarantees fast and professional analysis of the image data.

Even the smallest temperature differences can be identified with the outstanding temperature resolution of the Testo thermal imagers. Industrial thermography with Testo thermal imagers saves time, energy and money – for more security, less damage and more efficiency.



Ideal ergonomics



Intuitive operation



What is thermography?

All objects which are warmer than minus 273 degrees centigrade (absolute zero), emit infrared heat radiation. Infrared radiation cannot be seen by the human eye. Thermal imagers, however,

can convert this infrared radiation into electrical signals, and present them as a thermal image. The heat radiation is thus made visible for the human eye.

Optimum image quality and innovative technology

Testo offers the right thermal imager for every industrial application. With high-quality Germanium optics and the best detector quality, the Testo thermal imagers guarantee optimum image quality. Thanks to the patent-pending SuperResolution technology, every thermal image has four times the resolution – with four times more pixels. This means: even more details and even more security in measurement.



Optimum image resolution, high-value system components and quality “made in Germany”: simply better thermography with Testo and the experience of more than 50 years’ measurement technology!

High-performance, intuitive and safe

The intuitive operation and the user-friendly handling offer security and flexibility in every situation. The high-performance PC software IRSoft offers extensive functions for the professional analysis of your thermal images: It allows sophisticated image analysis, provides templates for convenient report creation and with TwinPix, offers image overlay of the real and the thermal images. The information from these two images can thus be presented together in one image on a PC.



Testo thermal imagers in industrial thermography

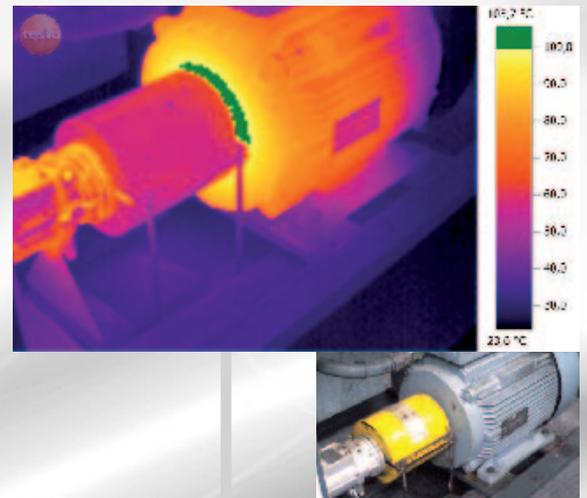
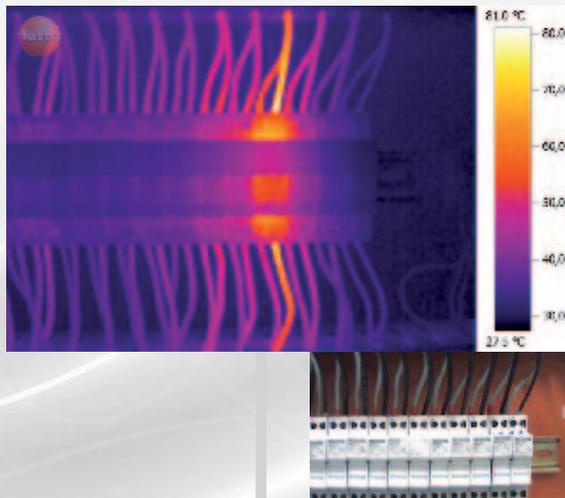
Thermography has proven its worth as a tool for preventive maintenance, in order to monitor mechanical and electrical systems or production processes. In the field of research and development, Testo thermal imagers are also used to examine microelectronic components.

1. Regular checks in electrical maintenance

Testo thermal imagers allow an evaluation of the heat status of low, medium and high voltage systems. Thermal images lead to early recognition of defective components, so that the required targeted preventive steps can be taken. This minimizes the dangerous risk of fire and avoids costly production downtimes.

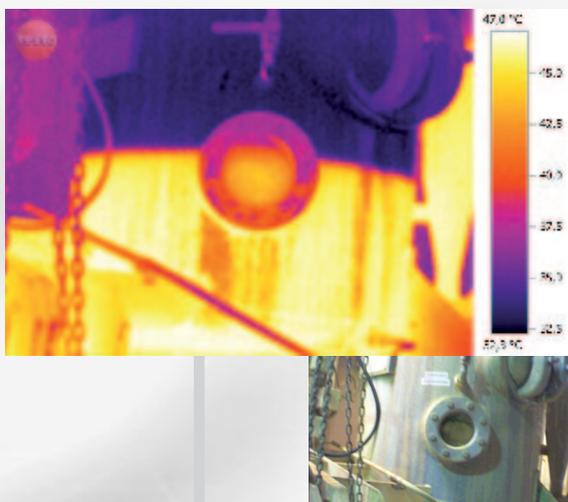
2. Support in preventive mechanical maintenance

A reliable early recognition of threatening damage to process-relevant system components is necessary in order to guarantee the security and reliability of the machines. A high level of heat emissions, especially from mechanical components, may indicate an elevated level of stress. This is caused, for example, by friction due to faulty adjustment, component tolerances or a lack of lubricant. With their high temperature resolution, Testo thermal imagers provide an exact diagnosis. Critical heating conditions can be directly detected with the alarm or isotherm function, and countermeasures can be introduced.



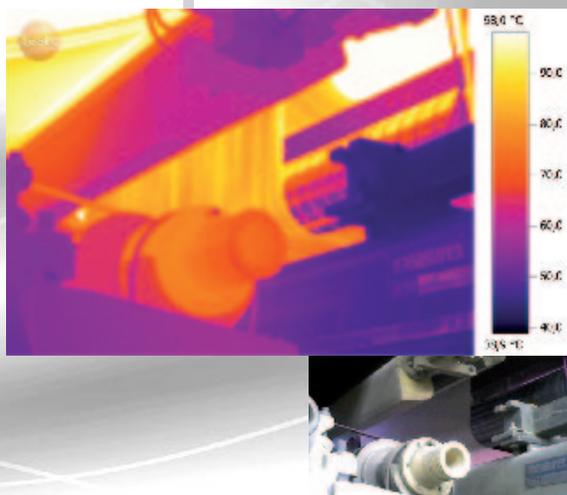
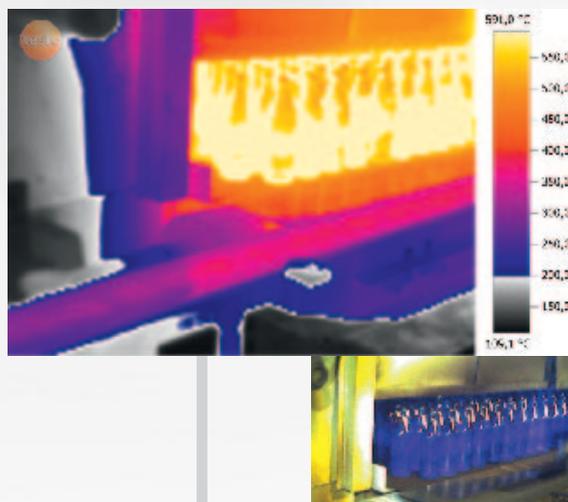
3. Fast and easy monitoring of filling levels

Level control in sealed fluid tanks has proved to be a useful method for avoiding machine damage and therefore production losses. If, for example, the fluid in coolant tanks falls to a dangerously low level, machines are no longer cooled correctly. They run hot and may fail. Often, an automatic level control regulates the level of the refrigerant and issues an alarm when the filling level is too low. However, the automatic control can also fail. In this case, a regular look through a thermal imager will also help.



4. Safe high temperature measurement

In applications with high scene temperatures the Testo thermal imagers are adaptable to the requirements. With the high temperature option, the measuring range can be flexibly extended to up to 1200 °C. The high-contrast representation in the display takes place using the high-temperature colour palette Iron HT or the special histogram compensation.



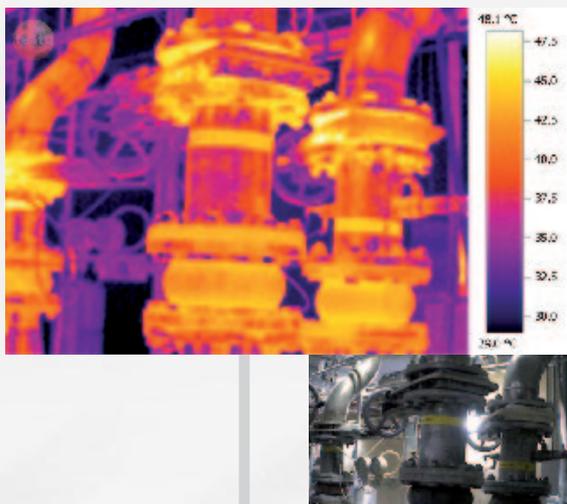
5. More reliability in quality assurance and production monitoring

The thermal imagers from Testo ensure precise situation analysis, thus supporting process monitoring and product quality assurance. In addition to foreign bodies in production processes, anomalies in the heat distribution of components are also recognized at a glance, quickly and without contact.

Testo thermal imagers in industrial thermography

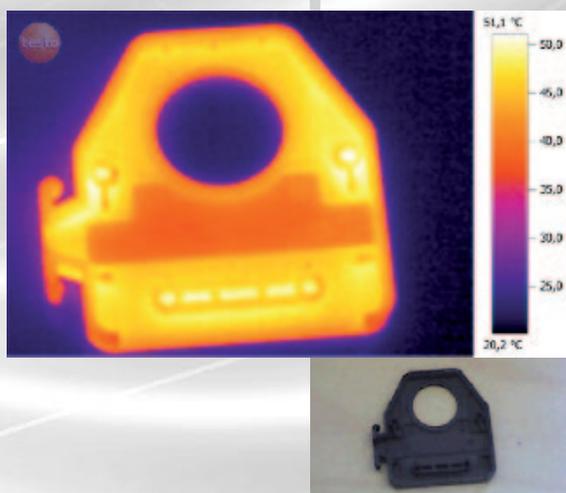
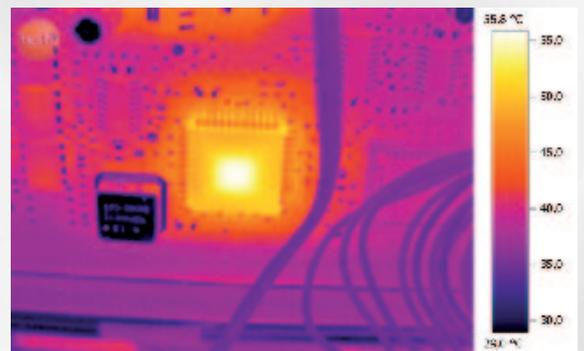
6. Power production guarantee

Energy is an important commodity which must always be available in sufficient quantity. For this reason, power stations and utility companies ensure that no interruptions occur, from energy production to distribution. Testo thermal imagers support the preventive maintenance of electrical and mechanical components. Developing damage is identified early.



7. Precise visualization of critical temperatures on circuit boards.

In the field of research and development, thermal imagers are also used to for the targeted analysis of heat distribution, e.g. on circuit boards. Electronic components on circuit boards are becoming smaller and smaller, the demands on heat withdrawal are increasing. Only high-quality thermal imagers with the finest geometrical resolution are up to this task. For optimization purposes, the analysis of the warming and cooling behaviour over time can be useful, and can be carried out using the video measurement with Testo thermal imagers.

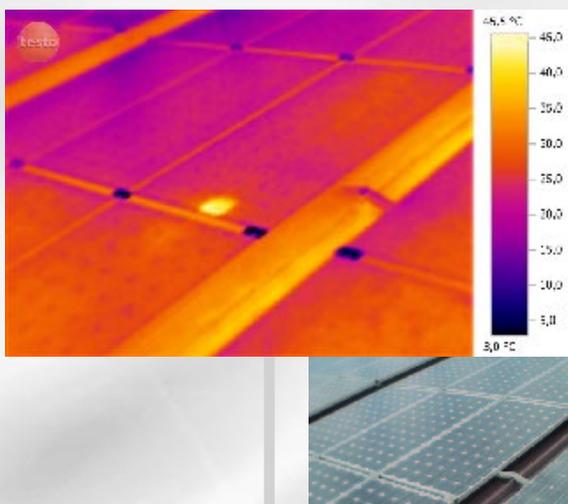


8. Quality control in the production of diecast plastic components

In the development and production of diecast plastic components, the Testo thermal imagers are used for the targeted monitoring of the cooling process. If the diecast components cool very irregularly, differing material densities occur within the diecast components – leading to reduced stability and bad fitting. The cooling process can be monitored and documented using a Testo thermal imager. This allows problematic areas to already be recognized during development, and directly remedied.

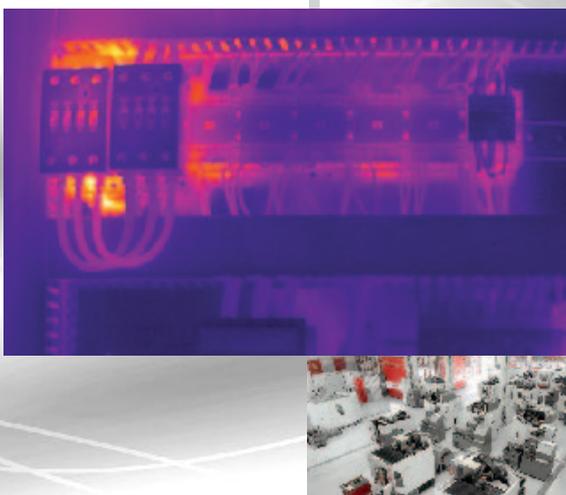
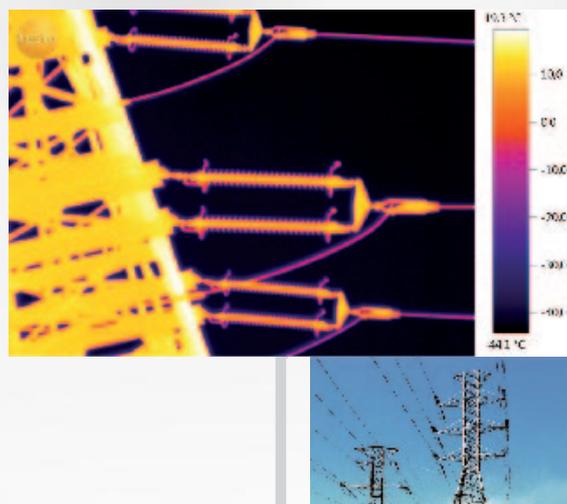
9. Monitoring and checking solar energy systems

There are two main reasons for examining solar energy systems: Safety and performance monitoring. Solar energy systems reach top performance in full sunshine. Large and small photovoltaic systems can be monitored without contact, from a distance, and especially efficiently using Testo thermal imagers. Malfunctions are identified, the smooth running of all components guaranteed, and thus the highest level of economic viability achieved. Thanks to the possibility of entering the important measurement parameter, sun irradiation intensity, additional security is gained: the value entered is stored together with the thermal image and is available later for image analysis purposes.



10. Analysis of energy distribution systems

Because of the far-reaching consequences, downtimes in energy distribution systems should be avoided at all costs. In particular, defective connections in high-tension masts can be critical here. These transfer points, which can sometimes be a long way away, can only be clearly recognized with a sufficiently large detector or telephoto lens. Because this is the only way to obtain the detail needed to evaluate the thermal image without error.



11. Inspection management in large production systems

The regular inspection of machines and switchboxes in large production systems is time-consuming, but indispensable. During such inspection tours, similar measurement objects often have to be monitored, resulting in many thermal images of the same type. Previously, in order to be able to allocate the measurements clearly to the different measurement sites, complex lists needed to be kept, or a voice comment added to each individual thermal image. With Testo SiteRecognition technology, measurement sites are automatically recognized and the resulting thermal images correctly archived. This allows periodical inspection tours to be conducted efficiently.

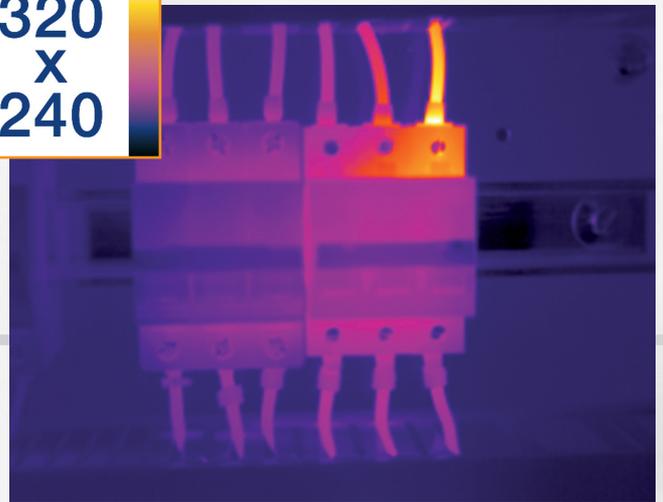
Innovative technology – easy to use

Testo thermal imagers offer optimum image quality and intelligent system components. In order to be able to conduct thermography applications with the highest possible level of security and efficiency, the engineers at Testo have not only developed innovative technologies, but have also adapted them to each other ideally in the thermal imagers. This means that each Testo thermal imager is an intuitively operable, highly developed thermography system.

Excellent image quality

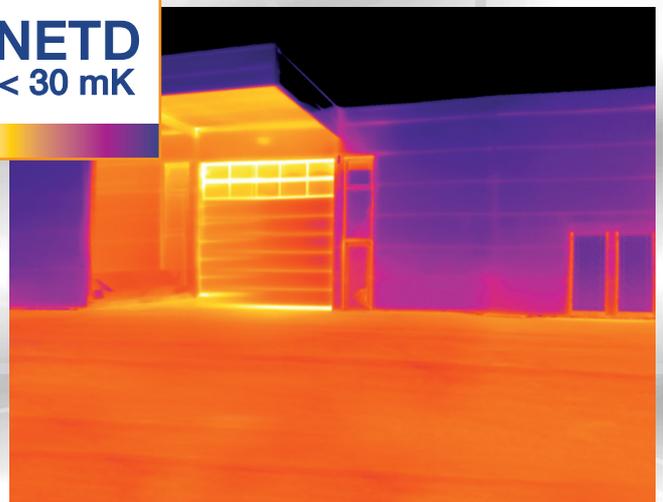
The heart of a thermal imager is the detector. Testo places great value on the highest possible quality. Detectors of 160 x 120 pixels to 320 x 240 pixels are at work in Testo thermal imagers. In combination with the high-quality Germanium optics, this guarantees optimum image resolution in any situation. In addition to this, using the new Testo SuperResolution technology, very high-resolution images with up to 640 x 480 pixels can be recorded.

**320
X
240**



For the measurement of finest temperature differences, the best possible thermal sensitivity (NETD) is also indispensable. Testo thermal imagers offer an excellent NETD of up to < 30 mK. In combination with a high image resolution, this allows the finest temperature differences in the smallest structures to be made visible.

**NETD
< 30 mK**



Ideal ergonomics

In order to be able to use the thermal imager safely and efficiently in industrial applications, Testo offers sophisticated ergonomics. In addition to the proven and practical pistol design, there are also Testo thermal imagers in camcorder design. These have a fold-out, rotatable display, allowing images to be recorded above the user's head. The ergonomic rotatable handle additionally allows secure handling in difficult-to-access places (such as at floor level).



Intuitive operation

The intuitive operability of the Testo thermal imagers was always in focus in the product development. The different camera types (pistol design or camcorder design) can be used very easily and safely in any situation. With the newly developed hybrid operation, graphic input directly on a touchscreen can be selected in addition to the proven joystick operation.

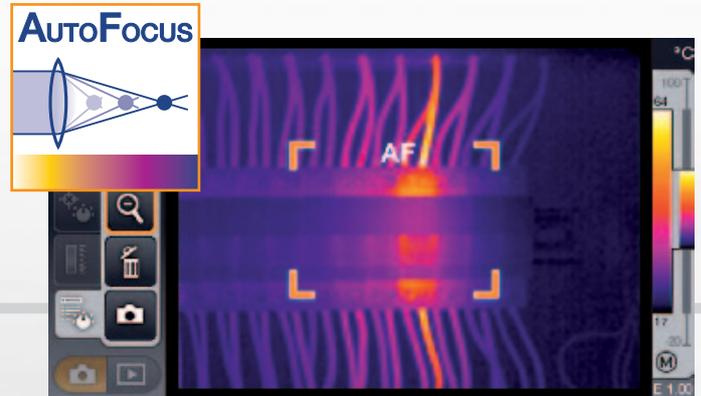
In order to always have a hand free (e.g. for safety reasons), all Testo thermal imagers offer the possibility of one-hand operation, with which all functions of the camera can be reliably called up.



Innovative technology – easy to use

The right focus

The prerequisite for any thermographic measurement is a properly focussed measurement object. With Testo thermal imagers, the measurement object can be focussed according to your individual preference. Whether manually, with the motor focus or with auto focus – the user has the choice.



Versatile exchangeable lenses

Testo thermal imagers can, thanks to the possibility of using several lenses, be flexibly adapted to different measurement requirements. As standard, a light wide-angle lens is provided, allowing fast work. If the application requires the resolution of small structures, or if images from a greater distance are necessary, telephoto lenses are available.



Integrated digital camera

Testo thermal imagers have an integrated digital camera, with which a parallel real image of the measurement object can be recorded. This means that for every thermal image, the corresponding real image is also available. The power LED's guarantee optimum illumination of dark areas when recording real images.



Special lens protection glass

In order to save the valuable Germanium lenses from damage, the Testo thermal imagers offer a special glass for the optimum safeguarding from scratching or dust.



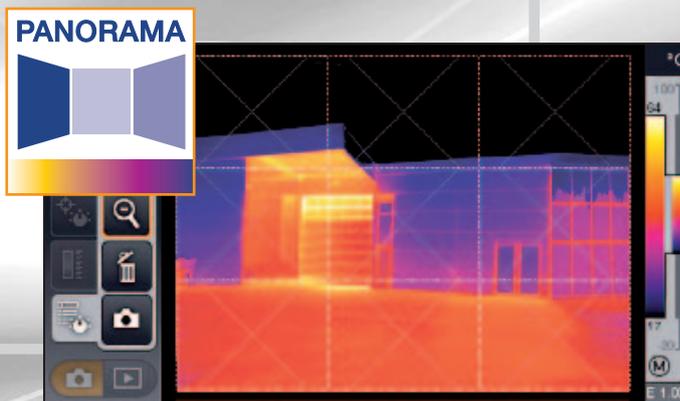
Efficient SiteRecognition technology

The Testo SiteRecognition technology saves time and nerves. The measurement site recognition with measurement site management carries out the recognition, storage and management work for the thermal images after a measurement series. Periodical inspection tours can be conducted efficiently and all thermal images then precisely analyzed on a PC. The various measurement sites are simply identified with markers on the measurement object, and the imager does the rest.



Practical panorama image assistant

Conducting thermography on very large objects is a great challenge to the user. He is always faced with the conflict between attention to detail and the most complete object coverage as possible. In order not to have to administer, view and compare several images, but to be able to analyze and document the entire object at a glance, there is now the Testo panorama image assistant. It simply stitches several individual images together to one total view. This creates a total image with a high level of attention to detail.



Innovative technology – easy to use

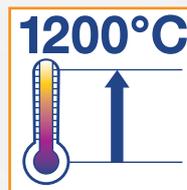
Parallax-free laser marker

In order to keep the overview in complicated measurement situations, the laser marker is shown in the display of the Testo thermal imagers. This orientation point exactly mirrors the measurement spot which is targeted by the laser on the measurement object. The temperature at the exact spot at which the laser is pointing is displayed.



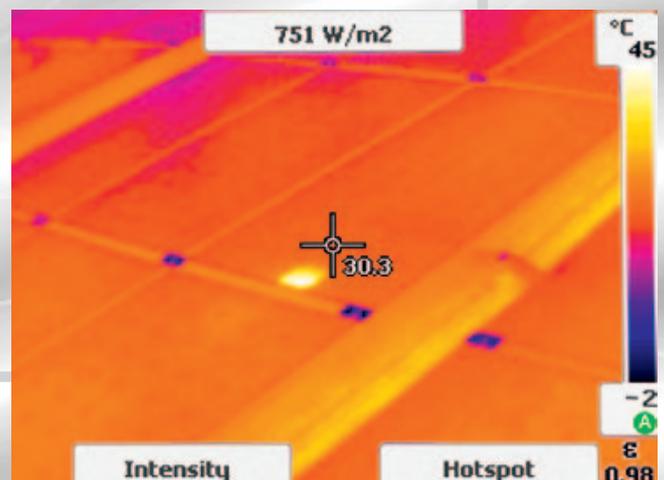
Variable high temperature measurement

In some industrial applications, very high temperatures need to be measured. In Testo thermal imagers, the temperature measuring range can be flexibly extended to up to 1200°C. This means that the right measuring range is available for every application. The high-contrast representation takes place using the high-temperature colour palette Iron HT or the special histogram compensation.



Safe solar mode

The irradiation intensity of the sun plays an important part in the monitoring of photovoltaic systems. If this is too low, a meaningful thermographic measurement is not possible. In the Testo thermal imagers' solar mode, the sun irradiation value can be simply entered into the camera. This value is not lost, it is stored with each thermal imager and is available for analysis in the PC software.



SuperResolution technology

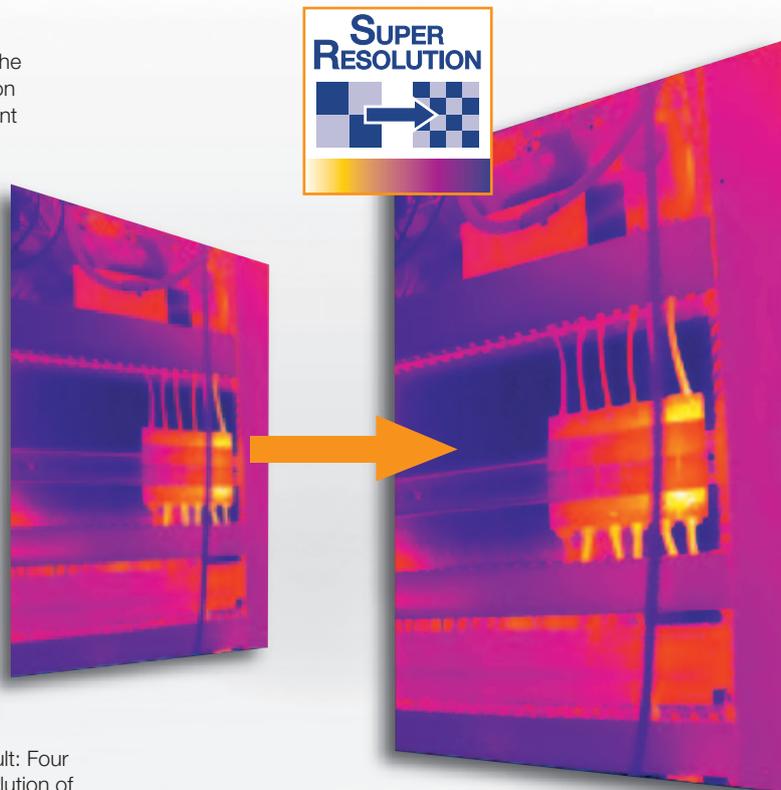
High-resolution thermal images

Optimum thermography is basically quite easy: The better the image resolution and the more pixels, the better the attention to detail and the clearer the presentation of the measurement object. And just when one cannot approach the measurement object closely, or when one needs to identify the finest structures, a high-resolution image quality is essential. Because the more you can see in the thermal image, the better is the analysis.

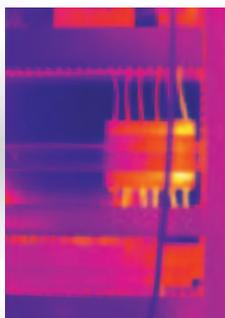
Simply see more with one upgrade.

With the SuperResolution technology, the image quality of the Testo thermal imagers is improved by one class, i.e. by four times more pixels, and a geometric resolution which is higher by a factor of 1.6. For example, 160 x 120 pixels are turned into 320 x 240 pixels at once, or 320 x 240 pixels become 640 x 480 pixels. And all by a simple software upgrade in the testo 875, testo 876, testo 881, testo 882 or testo 885.

The patent-pending innovation from Testo uses the natural movement of the hand, and records several images very quickly one after the other. These are then calculated into one image using an algorithm. The result: Four times more pixels and a considerably better geometric resolution of the thermal image. These more meaningful thermal images can be easily called up in the PC software, and analyzed.



Thermal image 1

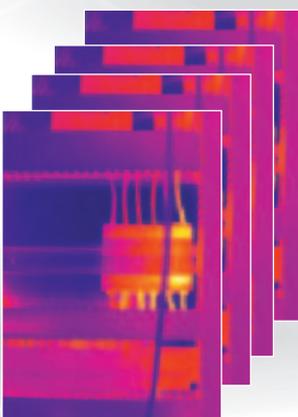


Resolution quality
160 x 120 pixels

Image



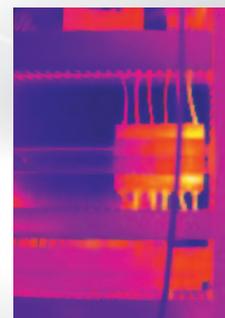
Thermal images 1-4



SR
algorithm



SR thermal image 1



Resolution quality
320 x 240 pixels

PC software IRSoft

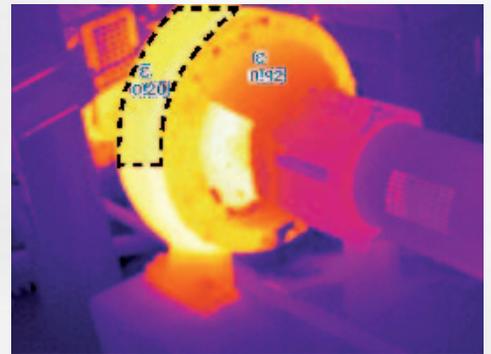
IRSoft – the high-performance PC software for professional thermography analysis from Testo. The IRSoft allows comprehensive analysis of thermal images on a PC. It stands out thanks to its clear structure and high user-friendliness. All analysis functions are explained using easily comprehensible symbols. So-called tool tips additionally provide explanations of each function by mouseover. This assistance simplifies image processing and allows intuitive operation. A fully functional version of the PC software IRSoft is included with all Testo thermal imagers.

With the IRSoft from Testo:

- you analyze thermal images precisely
- you create professional thermography reports quickly and easily
- you can analyze and compare several images simultaneously

IRSoft – Precise analysis of thermal images

Infrared images can be conveniently processed and analyzed on a PC using the IRSoft. Extensive functions are available for professional image analysis. For example, the different emissivities of the various materials for image areas can be corrected afterwards, right up to individual pixels. The histogram function shows the temperature distribution of an image area. Up to five profile lines can be used to analyse temperature curves. In order to visualize critical temperatures in an image, limit value violations as well as pixels in specific temperature range can be emphasized. In addition to this, unlimited measurement points can be set, hot/cold spots determined, and comments on the analysis made.

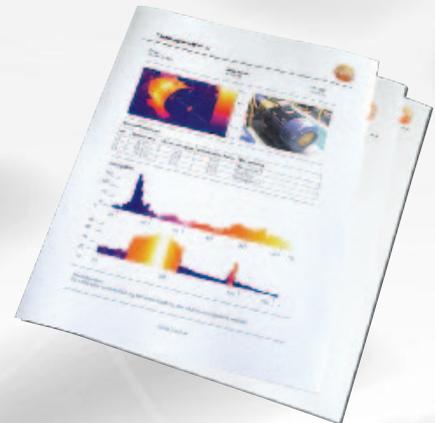


Change of emissivity by area for exact temperature analysis.

Easy creation of professional thermography reports

Infrared and real images are displayed in the screen already during analysis, and automatically taken over into the report. This makes easy and professional documentation of the measurement results possible.

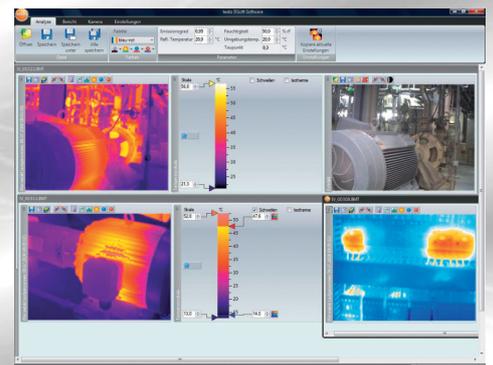
The report assistant guides step by step to a complete and clear report. Different templates are available not only for short and quick reports, but also for more comprehensive documentation. The templates contain all relevant information on measurement site, measurement task and examination results. In addition to this, the report designer can be used to create user-defined templates for individual reports.



Multi-page reports for complete documentation

IRSoft – all important information at a glance

Several infrared images can be opened and analyzed parallel to each other. All analyses in the images are visible at a glance and comparable to each other. Alterations to settings can be carried out either for the whole infrared image or for individual image sections. It is additionally possible to transfer current image corrections to all opened infrared images with a mouse click.



Simultaneous evaluation and comparison of several images

TwinPix – thermal and real images in one image

The thermal imagers from Testo with integrated digital camera automatically store a thermal and a real image simultaneously. With the professional image overlay TwinPix, these two images can be superimposed over each other in the PC software IRSoft. The information from the thermal image and the real image are then displayed together in one image.



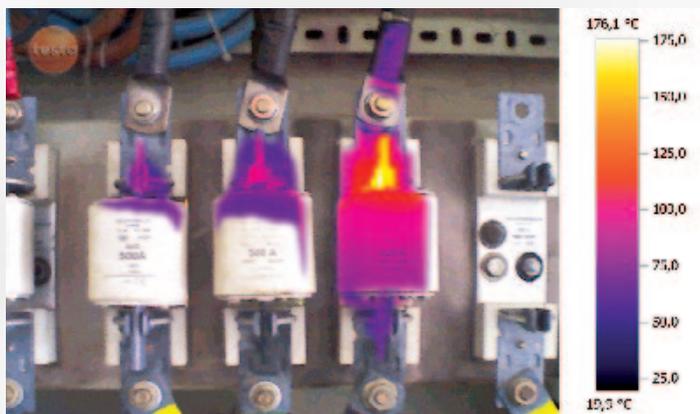
Straight to the perfect result with Testo TwinPix

By setting marking points which correspond in the thermal and the real image, the images are overlaid exactly. Even scenes with measurement objects at different distances can be blended without a problem, and shown simultaneously in one image.

Show what's important, with the professional image overlay from Testo

During the analysis, the image overlay helps orientation in the image and in the exact localization of the damaged area.

Setting the transparency level regulates the intensity of the infrared or the real image component in the overlay. Critical temperature ranges can be marked by inserting infrared limit values and the infrared range. Even in the real image, problem areas can be directly emphasized, and the temperature status of the measurement object displayed plastically. The overlaid image is taken over into the report for documentation purposes.



See temperature differences even in the real image, with TwinPix



Function of the PC software: Image overlay TwinPix

The thermal imagers from Testo

testo 875

- Detector size 160 x 120 pixels
- SuperResolution technology (to 320 x 240 pixels)
- Thermal sensitivity < 80 mK
- Exchangeable lenses
- Integrated digital camera
- Lens protection glass
- Solar mode
- Auto Hot/Cold Spot Recognition



testo 876

- Detector size 160 x 120 pixels
- SuperResolution technology (to 320 x 240 pixels)
- Flexible fold-out, rotatable display
- Thermal sensitivity < 80 mK
- Exchangeable lenses
- Integrated digital camera
- Lens protection glass
- Voice recording using headset
- Min-/Max on area calculation
- Solar mode



testo 881

- Detector size 160 x 120 pixels
- SuperResolution technology (to 320 x 240 pixels)
- Thermal sensitivity < 50 mK
- Exchangeable lenses
- Integrated digital camera with power LEDs
- Lens protection glass
- Voice recording using headset
- Min-/Max on area calculation
- Solar mode
- Measuring range up to 550°C



testo 882

- Detector size 320 x 240 pixels
- SuperResolution technology (to 640 x 480 pixels)
- Thermal sensitivity < 60 mK
- Large field of view thanks to 32° lens
- Integrated digital camera with power LEDs
- Lens protection glass
- Voice recording using headset
- Min-/Max on area calculation
- Solar mode
- Measuring range up to 550°C



testo 885

- Detector size 320 x 240 pixels
- SuperResolution technology (to 640 x 480 pixels)
- Flexibility thanks to rotatable handle and fold-out, rotatable display
- Thermal sensitivity < 30 mK
- Large field of view thanks to 30° lens
- Exchangeable lenses
- Integrated digital camera with power LEDs
- Auto focus
- Panorama image assistant
- SiteRecognition technology
- Parallax-free laser marker
- Lens protection glass
- Voice recording using headset
- Area measurement (Min/Max & Average)
- Solar mode
- Measuring range up to 1200°C



Overview of Testo thermal imagers

Features	testo 875-1		testo 875-2		testo 876		testo 881-1		testo 881-2		testo 882		NEW testo 885-1		NEW testo 885-2	
	Detector size (in pixels)					160 x 120								320 x 240		
SuperResolution technology					(to 320 x 240)								(to 640 x 480)			
Thermal sensitivity (NETD)					< 80 mK				< 50 mK				< 60 mK		< 30 mK	
Temperature measuring range					-20 °C to +280 °C								-20 °C to +350 °C			
Image refresh rate					9 Hz								33 Hz*			
Standard lens					32°								30° x 20°			
Exchangeable telephoto lens	-		(9° x 7°)				-		(9° x 7°)		-		-		11° x 9°	
Focussing	manual				manual / motor		manual		manual / motor				manual / auto			
Rotatable display	-		-		✓		-		-		-		✓		✓	
Rotatable handle	-		-		-		-		-		-		✓		✓	
Touchscreen	-		-		-		-		-		-		✓		✓	
High temperature measurement	-		-		-		-		(up to 550 C°)		(up to 550 C°)		-		(up to 1,200 C°)	
Auto Hot/Cold Spot Recognition	✓		✓		✓		✓		✓		✓		✓		✓	
Min-/Max on area calculation	-		-		✓		-		✓		✓		✓		✓	
Isotherm function	-		-		✓		-		✓		✓		✓		✓	
Alarm value function	-		-		-		-		-		-		✓		✓	
Display of surface moisture distribution via manual input	-		✓		✓		-		✓		✓		-		✓	
Humidity measurement with radio humidity probe**	-		-		-		-		(✓)		(✓)		-		(✓)	
Solar mode	✓		✓		✓		✓		✓		✓		✓		✓	
Voice recording	-		-		✓		-		✓		✓		-		✓	
Integrated digital camera	-		✓		✓		✓		✓		✓		✓		✓	
Integrated power LEDs	-		-		-		-		✓		✓		✓		✓	
Panorama image assistant	-		-		-		-		-		-		✓		✓	
SiteRecognition technology	-		-		-		-		-		-		-		✓	
Video measurement with up to 3 measurement points (via USB)	-		-		-		-		-		-		✓		✓	
Laser***	-		-		-				Laser pointer				Laser marker			

(✓) Optional ✓ Standard - not available

* inside the EU, outside 9 Hz

** depending on country permit

Your practical benefit

The detector size indicates the number of temperature measurement points (pixels) with which the thermal imager is equipped. The more pixels, the more detailed and clearer the measurement objects are presented.

SuperResolution technology improves the image quality by one class, i.e. the resolution of the thermal image is four times higher.

The thermal sensitivity (NETD) displays the smallest temperature difference which can be resolved by the thermal imager. The lower this value is, the smaller the temperature differences which can be measured.

The temperature measuring range of your thermal imager informs up to which temperature your thermal imager is able to record and measure the heat radiation of objects.

The display refresh rate informs as to how frequently the thermal imager is refreshed per second.

The standard lens (light wide-angle lens) records a large image section, and thus allows a fast overview of the temperature distribution of the measurement object.

The exchangeable telephoto lens assists in the measurement of the smallest details and visualizes them even at greater distances in the thermal image.

The focussing allows the focus of the thermal image to be adjusted exactly. This can be done manually, with motor support, or automatically.

Using the rotatable display, thermography can be conducted safely from many additional positions (e.g. overhead). Undesired reflections on the display are avoided.

The rotatable handle allows secure handling of the thermal imager in difficult-to-access places (such as at floor level).

In addition to joystick control, the thermal imager can be operated via the touchscreen.

With the high temperature option, the measuring range can be flexibly extended. Thanks to a high temperature filter, the measurement of temperatures up to 550 °C / 1,200 °C is possible.

The coldest and the hottest spot on the measurement object are automatically indicated in the thermal image in the imager display. Critical heat conditions are identified at a glance.

The minimum and maximum temperatures of an image section are displayed directly on site. Critical heat conditions in this image section are identified at a glance.

The optical colour alarm shows all image points whose temperature values are within a defined range, marked in colour in the thermal image.

The optical colour alarm shows all image points whose temperature values are above or below a defined limit value, marked in colour in the thermal image.

The value of the relative surface moisture is displayed for each measurement point. This is calculated from the externally measured ambient temperature and humidity as well as the measured surface temperature.

The value of the relative surface moisture is displayed for each measurement point. This is calculated from the ambient temperature and humidity automatically transferred in real time by wireless probe, as well as the measured surface temperature.

In solar mode, the value of the sun irradiation can be entered into the thermal imager. This value is stored with each thermal image and is then available for analysis in the evaluation software.

Localized weak spots can be easily commented using voice recording. Additional information is thus documented directly on site.

Parallel to the thermal image, a real image of each measurement object is also stored. A faster and easier object inspection can be carried out due to the simultaneous display of thermal and real images.

The power LED's guarantee optimum illumination of dark areas when recording real images.

For large measurement objects, the panorama image assistant allows the analysis and documentation of a total image stitched together from many individual images. There is no need to administer, view and compare several images.

The SiteRecognition technology takes care of the recognition, storage and administration of the thermal images for periodic inspection tours with similar measurement objects.

With the video measurement, thermographic video recordings can be directly transferred to a PC. Up to 3 measurement points are available for each individual image, and can be analyzed.

Using the laser pointer, a laser spot can be displayed on the measurement object, for orientation purposes. With the laser marker, this laser point is also shown parallax-free in the display of the thermal imager.



testo 875



testo 876



testo 881



testo 882



testo 885

