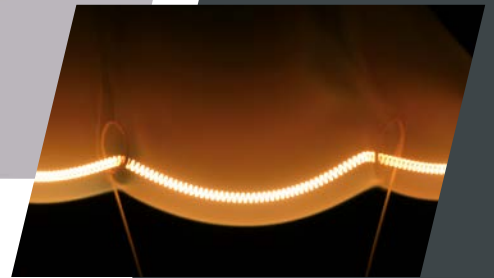




by **KELLER**  
infrared  
temperature  
solutions **ITS**



## APPLICATION Measurement of small objects

Temperature measurement of very small objects, such as various types of filaments, with panorama pyrometers®



5 years warranty

**QUALITY**  
made in Germany



## Description of the application

The coil temperature of filament lamps and X-ray tubes and the strip temperature of cathode ray tubes or mass spectrographs is a process-relevant measure to check radiation characteristics, to study aging effects or to control heating systems.

## Intensity comparison pyrometer

Due to the small size of objects, accurate temperature measurements in the past could only be made with intensity comparison pyrometers. By looking through the lens at the target object, the user compares and harmonises the colour (intensity) of a calibrated reference marker with the object colour.

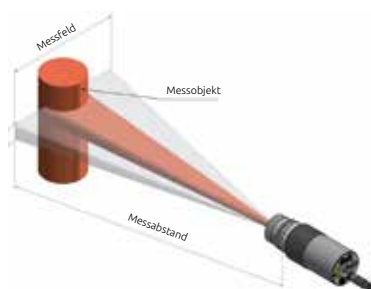
This instrument uses a very short wavelength and it is then less sensitive to the change of emissivity. The modification of the radiation characteristics of the object (color, roughness) have less influence. The measure is therefore more accurate. In addition, the measurement does not directly depend on the size of the target object and can even be made from a long distance. The disadvantage of this measurement method is the manual and time-consuming adjustment procedure. An automatic control of heating systems is impossible.

## Electronic pyrometers

The optical systems of modern electrical pyrometers must have excellent imaging qualities and a very high spatial resolution to measure the temperature at very small objects. Required are objective lenses with broadband-corrected multi-lens systems to ensure the exact correspondence of the measurement area of the infrared measurement with the field of vision of the sighting device.

An electronic pyrometer automatically measures the temperature of coiled filaments. It evaluates and uses the reading as a correcting variable for controlling heating systems. The readings can be continuously recorded and analysed afterwards for metrological studies, e.g. to determine aging effects or the radiation characteristics of different coil geometries.

## Solution



The two-colour pyrometer CellaTemp PA 43 was developed to solve this measurement task. This device is a so-called panorama pyrometer® with a rectangular measurement area. Thanks to the two-colour measurement principle the target object

may even be smaller than the measurement area. A hot wire may move freely within the measurement area.

Compared to a device with a circular measurement area, panorama pyrometers® are much easier to adjust to smaller target objects and they provide a reliable measurement.



The CellaTemp 43 is offered with 5 different lenses. Used together with the optionally available supplementary lenses, you may choose among more than 40 different optical variations for target objects starting from 0.1 mm.

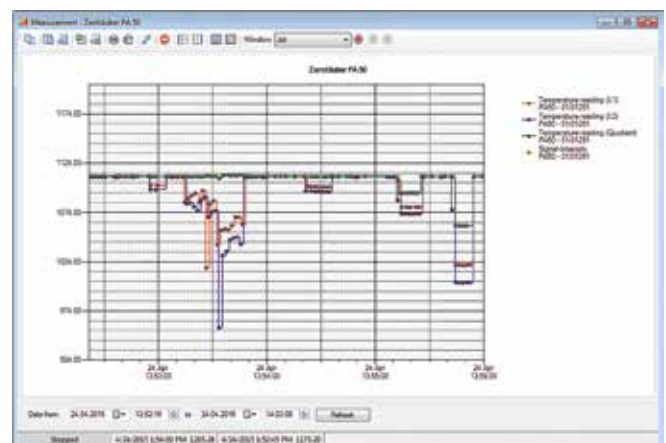
The measurement area calculator on our website [www.keller.de/its](http://www.keller.de/its) makes it easy for you to select the suitable objective lens and the supplementary lens to determine the optimal solution for your application.

If you want use the pyrometer to measure tungsten, a special calibration curve is available to take into account the specific radiation characteristics of tungsten in relation to the measurement temperature.



For optical adjustment, you have the option to choose between through-the-lens sighting, a laser or a colour camera. The target marker in the viewfinder or on the monitor defines the exact size and position of the measurement area.

Via a digital interface, the measurement readings can be transferred from the pyrometer directly to a personal computer where they can be recorded with the CellaView software.



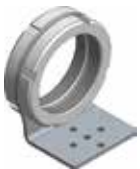
When using the device together with a video camera, visual changes on the surface of the target object can additionally be recorded and analysed.

## Measuring system

Model PA 43...			Technical data			
Sighting aids			Measuring range	Objective lens	Focal range	Measurement area*
Through-the-lens sighting	Video camera	Laser spot light				
AF 20	AF 20/C	AF 20/L	600 - 1400 °C 1112 - 2552 °F	PZ 20.08	0.30 m - ∞	≥ 2.00 mm
AF 1	AF 1/C	AF 1/L	650 - 1700 °C 1202 - 3092 °F	PZ 20.01	0.40 m - ∞	≥ 1.74 mm
AF 2	AF 2/C	AF 2/L		PZ 20.03	0.20 m - 0.40 m	0.93 - 1.86 mm
AF 3	AF 3/C	AF 3/L		PZ 20.06	1.20 m - ∞	≥ 3.20 mm
AF 10	AF 10/C	AF 10/L		PZ 20.05	0.20 m - ∞	≥ 3.64 mm
AF 13	AF 13/C	AF 13/L		PZ 20.08	0.30 m - ∞	≥ 2.00 mm
AF 21	AF 21/C	AF 21/L		PA 20.06	0.60 m - ∞	≥ 1.20 mm
AF 4	AF 4/C	AF 4/L		750 - 2400 °C 1382 - 4532 °F	PZ 20.01	0.40 m - ∞
AF 5	AF 5/C	AF 5/L	PZ 20.03		0.20 m - 0.40 m	0.61 - 1.21 mm
AF 6	AF 6/C	AF 6/L	PZ 20.06		1.20 m - ∞	≥ 2.07 mm
AF 11	AF 11/C	AF 11/L	PZ 20.05		0.20 m - ∞	≥ 2.35 mm
AF 14	AF 14/C	AF 14/L	PZ 20.08		0.30 m - ∞	≥ 1.30 mm
AF 17	AF 17/C	AF 17/L	PA 40.01		86 mm - 115 mm	0.23 - 0.30 mm
AF 22	AF 22/C	AF 22/L	PA 20.06		0.60 m - ∞	≥ 0.82 mm
AF 7	AF 7/C	AF 7/L	850 - 3000 °C 1562 - 5432 °F	PZ 20.01	0.40 m - ∞	≥ 1.14 mm
AF 8	AF 8/C	AF 8/L		PZ 20.03	0.20 m - 0.40 m	0.61 - 1.21 mm
AF 9	AF 9/C	AF 9/L		PZ 20.06	1.20 m - ∞	≥ 2.07 mm
AF 12	AF 12/C	AF 12/L		PZ 20.05	0.20 m - ∞	≥ 2.35 mm
AF 15	AF 15/C	AF 15/L		PZ 20.08	0.30 m - ∞	≥ 1.30 mm
AF 18	AF 18/C	AF 18/L		PA 40.01	86 mm - 115 mm	0.23 - 0.30 mm
AF 23	AF 23/C	AF 23/L		PA 20.06	0.60 m - ∞	≥ 0.82 mm

\* Use supplementary lenses for smaller measurement areas.

## Accessories



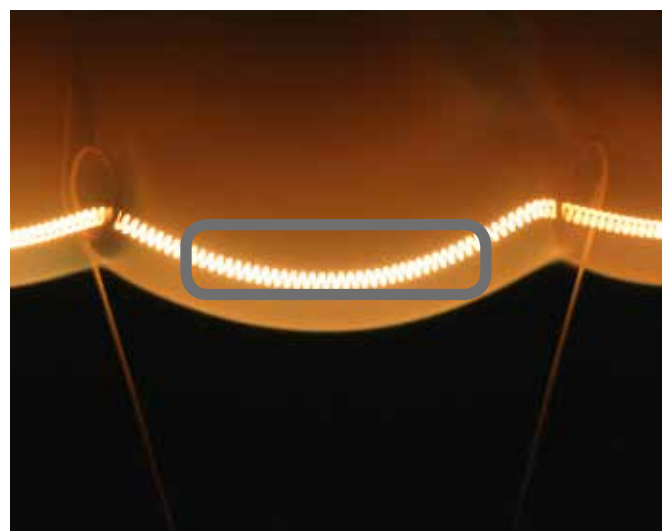
Mounting bracket  
with 2 shaft nuts  
PA 11/U

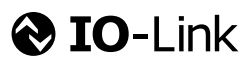


Mounting angle  
PA 11/K



Supplementary  
lenses  
PZ 20/O-50  
PZ 20/O-63  
PZ 20/O-75  
PZ 20/O-120





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