

# Pyrometer Series CellaTemp® PZ



Whether a pyrometer with through-the-lens-sighting or with fibre-optic cable, a spectral or a two-colour pyrometer: For each application the correct pyrometer of the PZ series.



**KELLER H.C.W.**  
MEASURING · CONTROL · SYSTEMS

## Type Survey

| Type  | Description                                 | Measuring ranges     |
|-------|---|----------------------|
| PZ 10 | Low temperature                             | 0 °C to +1000 °C     |
| PZ 15 | Glass surfaces                              | +1000 °C to +2500 °C |
| PZ 20 | Universal pyrometer                         | +250 °C to +2500 °C  |
| PZ 25 | Measurements of metals                      | +180 °C to +1200 °C  |
| PZ 27 | Measurement at Nd-Yag- and diode lasers     | +250 °C to +2500 °C  |
| PZ 30 | High temperature                            | +600 °C to +2500 °C  |
| PZ 40 | Two-colour pyrometer                        | +700 °C to +3000 °C  |
| PZ 50 | Two-colour pyrometer                        | +500 °C to +1400 °C  |
| PZ 21 | Fibre optic pyrometer                       | +350 °C to +2000 °C  |
| PZ 41 | Two-colour pyrometer with fibre optic cable | +900 °C to +3000 °C  |

# Convince Yourself of the Features of the Pyrometer Series CellaTemp® PZ

## General

- For temperatures from  $\pm 0$  °C to +3000 °C
- With through-the-lens-sighting or fibre optic
- Available as spectral pyrometer or two-colour pyrometer

## Optics

- Through-the-lens sighting with target marking in the real size
- Very large field of view
- Focus-cash optics for the optimal adjustment of the measuring distance
- Interchangeable optics; the pyrometer can be equipped with different optics
- Smallest target diameter 0,3 mm
- Polarization filter for the protection of the eyes in case of bright objects
- Protection cap for the ocular

## Electronic

- Digital construction
- High accuracy due to the use of micro controllers
- Very short response time
- Very large measuring ranges
- No chopper sensors; no rotating wheels inside
- Wear and tear free, no maintenance
- High EMV noise immunity; so meets the requirements of the law according noise immunity EN50081-2, EN50082-2



CellaTemp® PZ with PROFIBUS-connection.

## Interfaces

- Analogue output 0 (4) up to 20 mA linearized
- Digital interface (point to point connection)
  - RS 232 (standard)
  - RS 422 (optionally) for transmission distances up to several 100 m
- Field bus interface (optional)
  - DIN-measuring bus (according to DIN 66348)
  - PROFIBUS DP (according to EN 50170)
- Parallel operation analogue output and digital point to point connection is possible
- Parameter setting and communication software are in the pyrometer integrated; operation via the digital interface without any special software by means of a terminal program (constituent of Windows®) possible
- On-line parameter setting for the adaption to changing measuring conditions
- Optional operation via digital interface by the measuring and visualization software CellaMevis® with graphical user surface
- For two-colour pyrometers parallel transfer of the two-colour temperature as well as of both spectral temperatures

## Mechanical construction

- Robust aluminium housing
- Electrical connection via plug
- Protection type IP 65
- Ex-housing available
- Large program of accessories for high protection of the pyrometer even under very rough environmental conditions

## Parameter setting

- Free adjustable measuring range within the standard range
- Adjustable emissivity/emissivity ratio
- Parameter setting via switches on the backside of the pyrometer or via interface

## Functions

- Min./max. storage
- Double max. storage
- Smoothing function
- Automatic temperature control of the instrument with alarm signal
- Reasonableness check of the ratio temperature

## Spectral pyrometers/two-colour pyrometers

The pyrometers of the PZ series are offered both as spectral pyrometers and as two-colour pyrometers. Spectral pyrometers detect the heat radiation at a given wavelength. Quotient- or two-colour pyrometers measure the infrared radiation of two different wavelengths. The ratio of these two intensities is proportional to the temperature.

A two-colour pyrometer therefore provides a steady measuring signal in case of homogeneous weakening of the signal, e. g. caused by vapour or dust in the sighting path, steamy or dirty optics or changing surface structures of the target.

# CellaTemp® PZ

## Examples of Applications



**Measurement at the pouring stream**

The system CellaCast®, based on a two-colour pyrometer with a pouring stream display, enters automatically the temperature per casting.



**Crystal growth system**

The pyrometers of the series CellaTemp® PZ meet the high requirements of the extremely precise and long-term-stable temperature measurement for the production of semiconductor and glass crystals.



**Combustion plants, coking plants**

Because of the extreme measuring conditions two-colour pyrometers are used in combustion plants or coking plants.



**Induction hardening Automatic laser welder**

Quick and safe detection of the temperature even of very small targets in places with limited space.



**Blast furnace groove, forging, hardening and tempering**

The temperature has a considerable influence on the manufacturing, treatment and subsequent treatment process in many areas of the metal industry.



**Rolling mill Galvanizing plant**

A quick and exact detection of the temperature is the precondition for a steady quality during the rolling of billets and ingots and for the coating of metal strips.



**Glass industry**

Temperature measurement in the glass feeder, at glass drops, at glass moulds or in the cooling stretch.



**Rotary kiln**

Measurement of the clinker temperature at the kiln inlet and outlet, checking of the shell temperature in case of damages of the refractories.



**Annealing kiln**

A wear and tear free measuring system for the direct and quick detection of the object temperature guarantees an optimum kiln control.

# Through-the-Lens Sighting Units

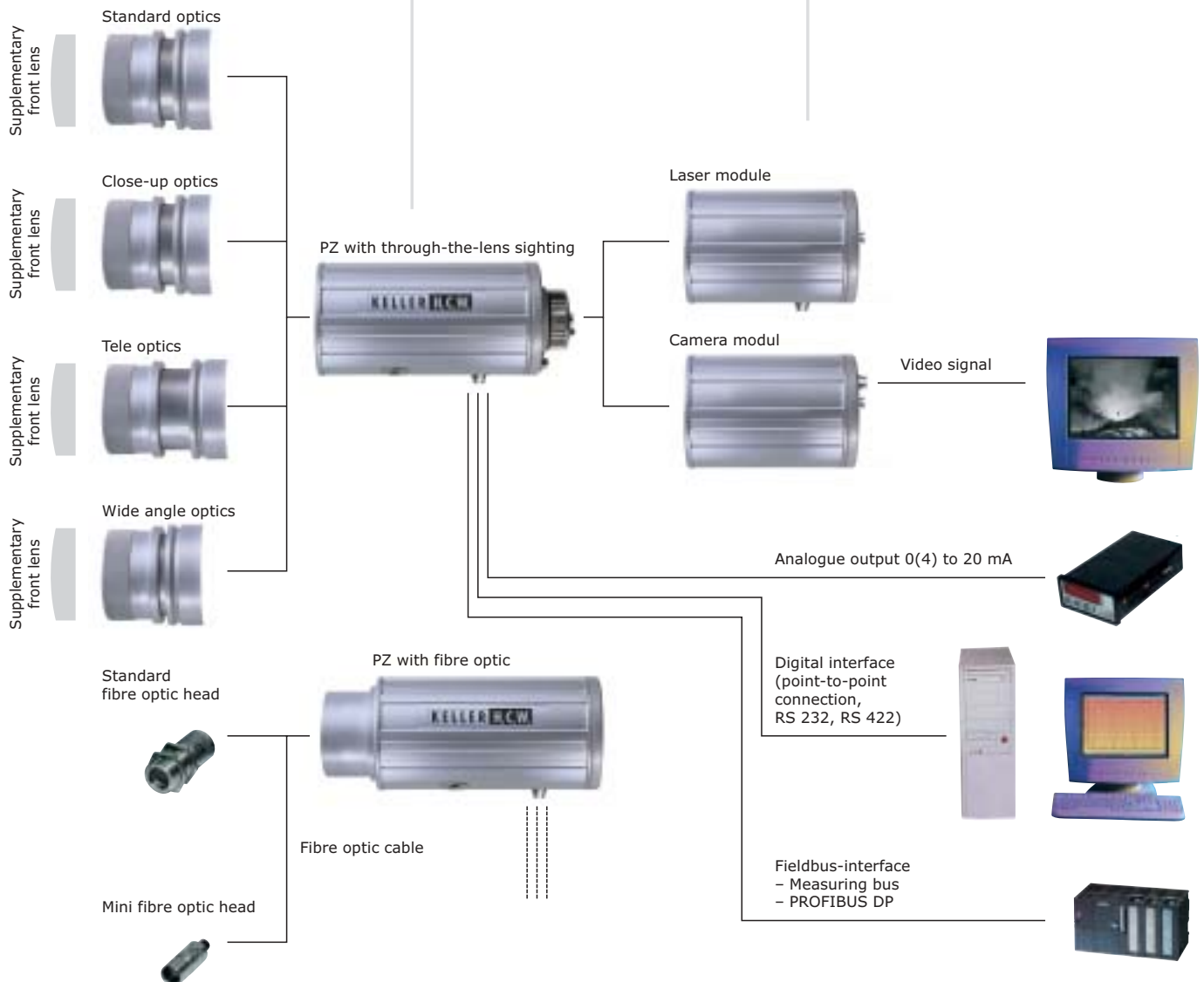
## Features

- Through-the-lens sighting with target marker and large lens coverage
- Interchangeable optical systems with focal adjustment
- Optical systems interchangeable without recalibration

The antiparallax through-the-lens sighting with target marker and very large lens coverage makes it easy to align the pyrometer to the target. The pyrometer is adjusted to the necessary measuring distance by means of its focusable optical system.

Various interchangeable optical systems (e.g. close-up lens, standard

lens, tele lens, wide angle lens) can be screwed (standard camera thread) to all basic units without having to recalibrate the instrument afterwards. Additional lenses can at choice be screwed to the instruments and provide even more than 40 combinations to make exact measurements of smallest and even largest targets with one basic unit.



## Versions with Fibre Optic

### Features

- Optics and electronics connected by fibre-optic cables
- Fibre optic cable reciprocally removable via screw connection
- Focussable fibre optic measuring head for the adjustment of the measuring distance

- Applicable for ambient temperatures of up to +250 °C without cooling
- Fibre optic pyrometers are also available as spectral and two-colour pyrometers
- Small optical heads of Ø 30 x 75 mm or Ø 12 x 50 mm
- Integrated pilot signal for the display of the true size of the measuring target



CellaTemp® PZ with fibre optic

## Version for Laser Treatment Processes

The CellaTemp® PZ 27 was developed for heating up and treatment processes, where lasers are used for the heating up. Due to the special measuring wavelength the measuring signal is not

influenced by the high radiation energy of the laser. The CellaTemp® PZ 27 device is applicable for CO<sub>2</sub>-NdYAG and diode lasers.



CellaTemp® PZ 27

## Version CellaCast® for Pouring Stream Measurement

The measuring system CellaCast® records the temperature at continuous and intermittent pouring stream processes. It consists of a two-colour pyrometer and a digital display including a special pouring stream

program. Per casting a measured value is determined automatically, displayed and transferred optionally to the central data collection system. Disturbances by steam, dust, flame formation or dripping down pouring stream are

eliminated by the reasonableness check within the pyrometer and the pouring stream program of the display.



Pouring stream display



Temperature measurement of the pouring stream

# Technical Data of Pyrometer Series CellaTemp® PZ Versions with Through-the-Lens Sighting

| Versions                             | Spectral Pyrometers                                     |                    |                     |                    |
|--------------------------------------|---|--------------------|---------------------|--------------------|
| Types                                | PZ 20 AF...   |                    | PZ 30 AF...         |                    |
| Range<br>(variably adjustable)       | +250 °C...+2000 °C                                      | +350 °C...+2500 °C | +500 °C...+2500 °C  | +800 °C...+3000 °C |
| Type of optic<br>(focal range)       | Distance ratio of the focussable interchangeable optics |                    |                     |                    |
| Standard optic<br>(0.4 m...∞)        | AF1: 150:1  | AF5: 150:1         | AF1: 175:1          | AF5: 175:1         |
| Close optic<br>(0.2 m...0.4 m)       | AF2: 140:1  | AF6: 140:1         | AF2: 140:1          | AF6: 140:1         |
| Tele optic<br>(1.2 m...∞)            | AF3: 200:1  | AF7: 200:1         | AF3: 240:1          | AF7: 240:1         |
| Wide angle optic<br>(0.2 m...∞)      | AF4: 32:1   | AF8: 32:1          | AF4: 35:1           | AF8: 35:1          |
| Sensor                               | InGaAs-photodiode                                       |                    | Si-photodiode       |                    |
| Spectral range                       | 1.1–1.7 μm  |                    | 0.78–1.06 μm        |                    |
| Uncertainty<br>(at ε=1 and Tu=23 °C) | 0.75 % of reading                                       |                    | 0.75 % of reading   |                    |
| Repeatability                        | 1 K   |                    | 1 K                 |                    |
| Response time t <sub>9g</sub>        | ≤2 ms for T>750 °C                                      |                    | ≤2 ms for T>1000 °C |                    |
| Resolution                           | ≤1 K  |                    | ≤1 K                |                    |
| Dimensions                           | 65 mm x 200 mm  |                    |                     |                    |

# Technical Data of Pyrometer Series CellaTemp® PZ Versions with Through-the-Lens Sighting

| Versions   | Two-Colour Pyrometers                                    |  |   |  |
|--|--|--|---|--|
| Types  | PZ 40 AF...  |  |   | PZ 50 AF...                            |
| Range<br>(variably adjustable)                   | +700 °C ...+1600 °C<br>from +650 °C for $\epsilon > 0.5$ | +900 °C ...+2400 °C<br>from +800 °C for $\epsilon > 0.5$ | +1000 °C ...+3000 °C<br>from +900 °C for $\epsilon > 0.5$ | +500 °C ...+1400 °C                    |
| Type of optic<br>(focal range)                   | Distance ratio of the focussable interchangeable optics  |  |   |  |
| Standard optic<br>(0.4 m ... $\infty$ )          | AF1: 80:1  | AF4: 150:1   | AF7: 150:1  | AF1: 80:1                              |
| Close optic<br>(0.2 m ... 0.4 m)                 | AF2: 75:1  | AF5: 140:1   | AF8: 140:1  | AF2: 75:1                              |
| Tele optic<br>(1.2 m ... $\infty$ )              | AF3: 120:1   | AF6: 240:1   | AF9: 240:1  | AF3: 120:1                             |
| Wide angle optic<br>(0.2 m ... $\infty$ )        | AF10: 17:1   | AF11: 35:1   | AF12: 35:1  | AF4: 15:1                              |
| Sensor   | Si-double-photodiode                                     |  |   | Si-InGaAs-<br>doublediode              |
| Spectral range                                   | 0.95 $\mu\text{m}$ /1.05 $\mu\text{m}$                   |  |   | 0.95 $\mu\text{m}$ /1.55 $\mu\text{m}$ |
| Uncertainty<br>(at $\epsilon=1$ and $T_u=23$ °C) | 1 % of reading   |  |   | 1 % of<br>reading                      |
| Repeatability                                    | 2 K  |  |   | 2 K                                    |
| Response time $t_{9g}$                           | $\leq 10$ ms for $T > 750$ °C                            | $\leq 10$ ms for $T > 950$ °C                            | $\leq 10$ ms for $T > 1050$ °C                            | $\leq 16$ ms for $T > 600$ °C          |
| Resolution                                       | $\leq 1.5$ K   |  |   | $\leq 1.5$ K                           |
| Dimensions                                       | 65 mm x 200 mm   |  |   |  |

# Technical Data of Pyrometer Series CellaTemp® PZ Versions with Through-the-Lens Sighting

| Versions                             | Low Temp.   | Special Versions                  |                                   |                                   |
|--------------------------------------|---|-----------------------------------|-----------------------------------|-----------------------------------|
| Types                                | PZ 10 AF...   | PZ 15 AF...<br>glass surfaces     | PZ 25 AF...<br>metal measurements | PZ 27 AF...<br>laser applications |
| Range<br>(variably adjustable)       | ±0 °C...+1000 °C  | +1000 °C...+2500 °C               | +180 °C...+1200 °C                | +250 °C...+2500 °C                |
| Type of optic<br>(focal range)       | Distance ratio of the focussable interchangeable optics |                                   |                                   |                                   |
| Standard optic<br>(0.4 m...∞)        | AF1: 40:1<br>F=0.3 m...∞                                | AF1: 55:1<br>F=0.6 m...∞          | AF1: 80:1<br>F=0.3 m...∞          | AF1: 150:1                        |
| Close optic<br>(0.2 m...0.4 m)       | AF2: 38:1<br>F=0.15...0.3 m                             |                                   |                                   | AF2: 140:1                        |
| Tele optic<br>(1.2 m...∞)            |   |                                   |                                   | AF3: 200:1                        |
| Wide angle optic<br>(0.2 m...∞)      |   |                                   |                                   | AF4: 32:1                         |
| Sensor                               | Thermopile  | Thermopile                        | InGaAs-photodiode                 | ext. InGaAs                       |
| Spectral range                       | 8–14 μm   | 4.46–4.82 μm                      | 1.1–1.7 μm                        | 1.8–2.2 μm                        |
| Uncertainty<br>(at ε=1 and Tu=23 °C) | 1 % of reading,<br>min. 2K                              | 1 % of reading<br>but a least 2 K | 2 K or 0,75 %<br>of reading       | 0.75 % of<br>reading              |
| Repeatability                        | 1 K   | 1 K                               | 1 K                               | 1 K                               |
| Response time t <sub>9g</sub>        | t <sub>90</sub> ≤ 100 ms                                | t <sub>90</sub> ≤ 100 ms          | ≤ 500 ms                          | ≤ 2 ms for T > 750 °C             |
| Resolution                           | ≤ 0.5 K   | ≤ 1 K                             | ≤ 1 K                             | ≤ 1 K                             |
| Dimensions                           | 65 mm x 200 mm  |                                   |                                   |                                   |

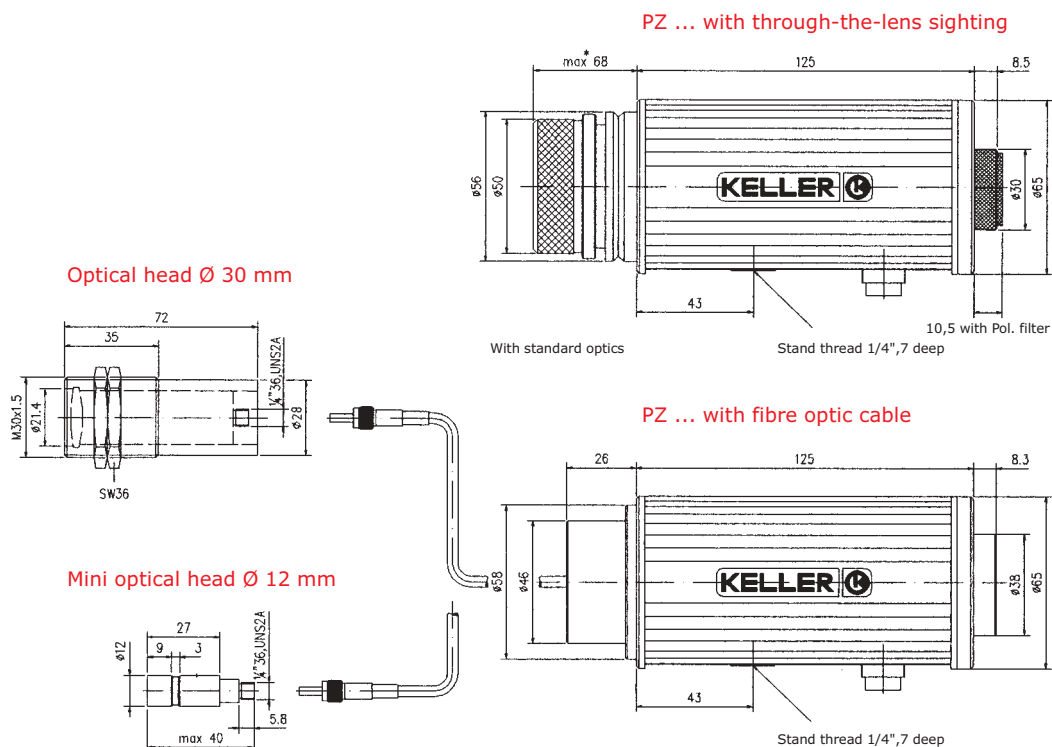
# Common Technical Data Pyrometer Series PZ

|   |  |
|---|--|
| Analogue output                                 | 0 (4) . . . 20 mA linear   |
| Load  | Max. 500 ohms  |
| Digital interface                               | <p>■ Point to point connection<br/>RS 232 or RS 422 with integrated software guide for communication for parameter setting and measured value output</p> <p>■ Fieldbus interface<br/>DIN measuring bus (according DIN 66348 part 2), PROFIBUS DP (according EN 50170) up to 12 M Bit/sec</p> |
| Emissivity/<br>emissivity<br>ratio              | Spectral: 0.10 . . . 0.99 in steps 0.01; two-colour: 0.872 . . . 1.127 in steps 0.001  |
| Smoothing function                              | 0 . . . 10 sec.  |
| Storage   | Min. and max. storage; double-max.-storage with adjustable hold time   |
| Linearization                                   | Digital with micro controller; > 2000 correction points  |
| Temperature coefficient<br>(deviation to 23 °C) | 0.25 K/K (for T < +500 °C)<br>0.05 %/K (for T ≥ +500 °C)   |
| Noise immunity                                  | According EN 50081-2; EN 50082-2   |
| Power supply                                    | 22 . . . 27 VDC / < 60 mA (160 mA with aiming spot)  |
| Storage temperature                             | -20 . . . +70 °C   |
| Ambient<br>temperature                          | Electronic: 0 . . . +60 °C<br>Optical head: 0 . . . +250 °C, fibre optic cable: 0 . . . +85 °C, optionally to +250 °C  |
| Housing material                                | Aluminium  |
| Connection                                      | With plug  |
| Weight  | Approx. 0,5 kg   |
| Protection type                                 | IP 65  |
| Optional accessories                            | <p>Calibration certificate according to ISO 9001;<br/>Calibration certificate according to DKD;<br/>Large variety of accessories (protection, digital displays etc.)<br/>PC measuring and visualization software CellaMevis®</p>   |

# Technical Data of Pyrometer Series CellaTemp® PZ Versions with Fibre Optic Cable

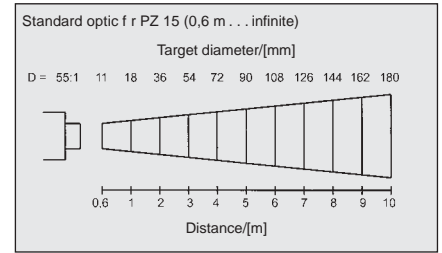
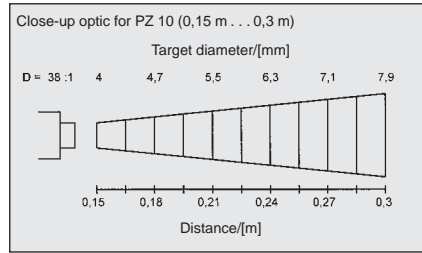
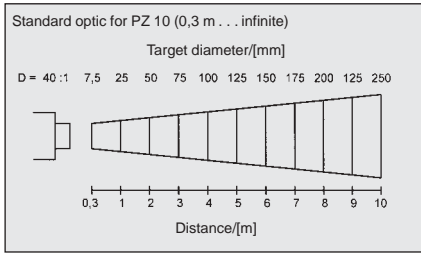
| All versions alternatively with:<br>– Kevlar coating (<85 °C)<br>– Metal coating (<250 °C)<br>Standard length 2 m and 5 m | One-colour pyrometer   |                     | Two-colour pyrometer                         |   |
|---|--|---------------------|--|---|
|   | PZ 21 AF...  | PZ 31 AF...         | PZ 41 AF...                                  |   |
| Range<br>(variably adjustable)  | +350 °C...+2000 °C   | +800 °C...+2500 °C  | +900 °C...+2400 °C<br>from +800 °C for ε>0,5 | +1000 °C...+3000 °C<br>from +900 °C for ε>0,5 |
| Type of optical head<br>(focal range)   | Distance ratios of the focussable fibre optic heads                |                     |  |   |
| Standard optic (0.15 m...∞)   | AF1: 80:1  | AF1: 80:1           | AF1: 80:1                                    | AF4: 80:1                                     |
| Close-up optic (70...100 mm)  | AF90: 50:1   | AF90: 50:1          | AF90: 50:1                                   | AF91: 50:1                                    |
| Tele optic (0.4 m...∞)  | AF2: 120:1   | AF2: 120:1          | AF2: 120:1                                   | AF3: 120:1                                    |
| Mini head/Standard optic<br>(0.12 m...∞)  | AF11: 50:1   | AF11: 50:1          | AF11: 50:1                                   | AF13: 50:1                                    |
| Mini head/Close optic<br>(33...45 mm)   | AF12: 50:1   | AF12: 50:1          | AF12: 50:1                                   | AF14: 50:1                                    |
| Sensor  | InGaAs-photodiode  | Si-photodiode       | Si-double-photodiode                         |   |
| Spectral sensitivity  | 1.1–1.7 μm   | 0.78–1.06 μm        | 0.95 μm/1.05 μm                              |   |
| Uncertainty<br>(at ε=1 and Tu=23 °C)  | 1 % of reading   |                     | 1,5 % of reading                             |   |
| Repeatability   | 2 K  | 2 K                 | 3 K  |   |
| Response time t <sub>98</sub>   | ≤2 ms for T>1000 °C  | ≤2 ms for T>1200 °C | ≤20 ms for T>950 °C                          | ≤20 ms for T>1050 °C                          |
| Resolution  | ≤1 K   | ≤1 K                | ≤2 K   |   |
| Dimensions  | Electronic: 65 x 160 mm; optical head Ø 30 x 75 mm or Ø 12 x 35 mm |                     |  |   |

## Dimensions of the PZ Pyrometers

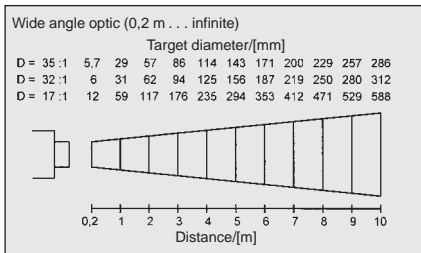
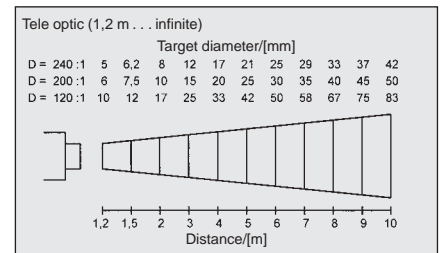
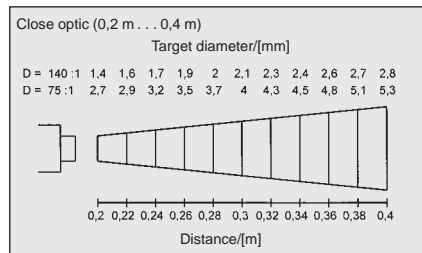
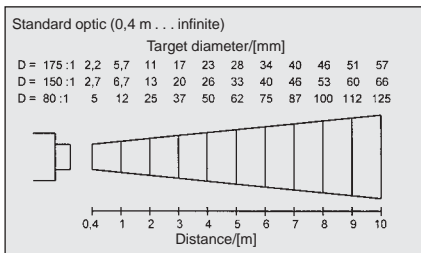


# Target Diagrams of Interchangeable Optics and Fibre Optic Heads of the Series PZ

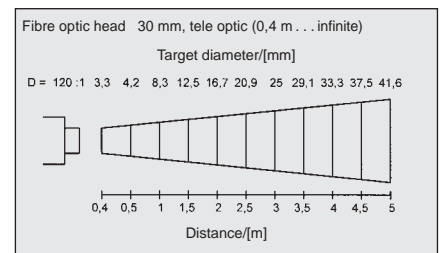
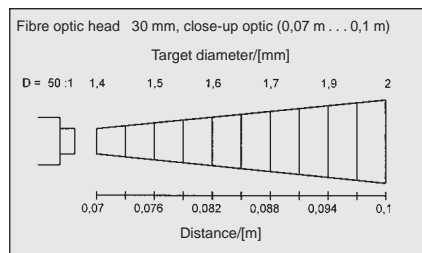
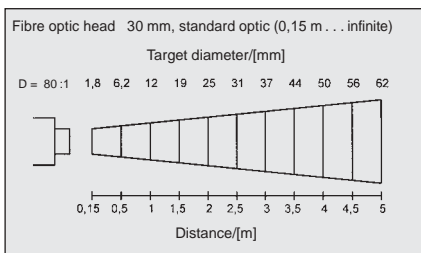
## Interchangeable optics for PZ 10, PZ 15



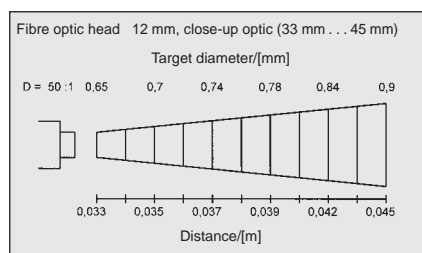
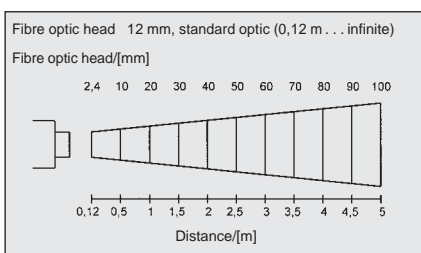
## Interchangeable optics for PZ 20, PZ 30, PZ 40, PZ 50, PZ 25, PZ 27



## Optical heads Ø 30 mm for PZ 21, PZ 31, PZ 41



## Mini optical head Ø12 mm for PZ 21, PZ 31, PZ 41



# CellaCap® Video Monitoring System

## Features

- Self-sufficient video system to adapt to all pyrometers of the PZ series with through-the-lens sighting
- Permanent control possibility of the point of measurement and the correct orientation of the pyrometer towards the object from the control room
- Presentation of the measuring environment and the exact measuring spot of the pyrometer
- Remote monitoring of the process or of the combustion chamber
- Aiming support for difficult accessible measuring points or small objects
- Remote adjusting of the pyrometer from the control room by means of a swivelling drive
- Very small design (Ø 65 x 235 mm incl. pyrometer)
- Very high sensitivity (from 0.4 lux)
- Easy integration into available video and/or computer systems
- Robust and industrial proof design
- Video signal transferable up to 100 m without additional booster

## Functional description

The video monitoring system "CellaCap®" is used for the external check of the measuring point and the adjustment of the pyrometer from the control room.

Basis of the modular system is a CCD video camera. The camera module is screwed backside onto the pyrometer and looks through the aiming optic of the pyrometer. The path of the rays for measuring and sighting are on the same optical axis so that the measuring environment as well as the exact measuring spot of the pyrometer become visible in the video picture on the monitor as a ring-shaped marker.

The system allows a permanent control of the measuring point as well as a permanent alignment of the pyrometer in order to avoid disturbances directly. The swivelling slope drive allows to adjust the pyrometer from the control room. It is a considerable relief for difficult accessible measuring points.

The camera module can be installed to all pyrometers of the PZ series with

through-the-lens sighting. Even already installed pyrometers can be retrofitted very simply.

The camera is equipped with an automatic gain control (AGC) so that it adapts itself automatically to the brightness of its environment. The aperture can be adjusted manually in order to optimise the image qualities.

The modular camera system can be linked up to the pyrometer as an autonomous video unit or as a complete measuring and visualization system, which is operating in connection with a PC.

## Technical specifications of the camera module CellaCap®

### Display:

black/white

### Number of pixels:

512 (level) x 582 (upright)

### Resolution:

380 lines

### Sensitivity:

0.4 lux

### Lens:

1:1.4 / 16 mm

### Video output:

1 Vpp, 75 Ohm

### Ambient temperature:

-10 to +50 °C

### Power supply:

24 VDC, 150 mA

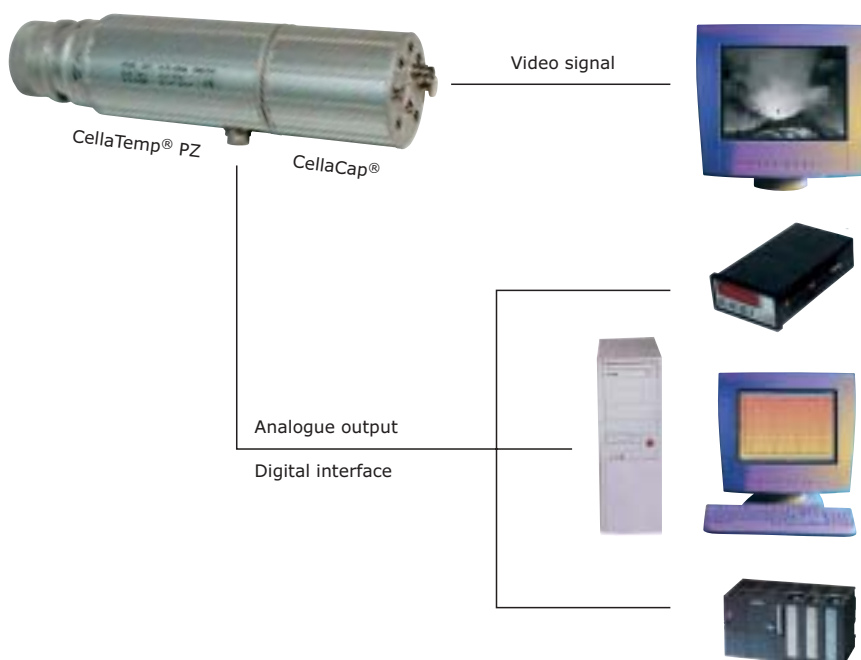
### Dimensions:

65 x 89 mm (with connection socket)

### Length of the cable for the video signal:

100 m (without booster)

CellaCap® and CellaMevis® are registered trademarks of KELLER HCW GmbH, Ibbenbüren, Germany. Microsoft®, Windows® and Excel® are registered trademarks of Microsoft Corporation, Redmond, WA, USA.



**Installation, commissioning and remote adjustment accessories**



1. Weatherproof protective camera housing TVG-400 with built-in heating and rugged anodized ALU housing  
type of protection: IP 65  
dimensions: inside  
140 x 100 x 300 mm  
outside  
145 x 150 x 420 mm



2. Operating module for remote adjustment PT 124



3. Video communication unit DU-502E for lengths up to 1.2 km  
power supply: 230 VAC



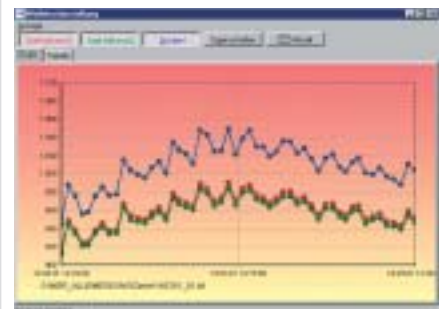
4. Swivelling slope drive VPT-40/24 V in massive, weatherproof & industrial proof version  
power supply: 24 V AC, 285 mA  
torque: 16.5 Nm, 33.0 Nm  
rotation speed:  
6 deg/sec, 3 °/sec  
angle of rotation:  
360° level, ± 90 ° upright  
limit switches internally adjustable  
operating temperature: - 20 to + 70 °C  
type of protection: IP 66

## Software CellaMevis®

The measuring and visualization software CellaMevis® running under Windows® serves the pyrometer series of CellaTemp® PZ for the real time display, analysis and filing of measured temperature values. The software reads in the detailed measuring values formatted in the ASCII-Code via RS 232-interface. The temperatures can be directly displayed on-line as a course of the curve or as a table.

**Features:**

- Graphical user interface for Windows®
- Real time graphics of the measured values as a temperature/time elapsed diagram
- Minimum and maximum values analysis
- Logging and recording of the measured values for later analysis
- Detailed graphical display by zoom function
- Simultaneous display of the one-colour and two-colour temperatures of two-colour pyrometers
- Trend display of the internal temperature of the pyrometer
- Manual or automatic file storage



Temperature/time diagram

# Pyrometer Series CellaTemp® PZ Program of Accessories

For the pyrometers of the PZ series we provide a wide range of protecting accessories to allow operation even under rough industrial conditions. The accessories protect the pyrometer against mechanical forces, keep the lens clean and cool the system. Mounting components complete the range.

- (1) Pyrometer**  
of series PZ with through-the-lens sighting.
  - (2) Fibre optic cable**  
with optical head Ø 30 mm (alternatively Ø 12 mm; without picture). The fibre optic cable is temperature resistant up to +85 °C (alternatively with metal sheathing up to +250 °C).
  - (3) Cooling jacket PZ 20/B**  
The cooling jacket PZ 20/B can be operated with air or water. The jacket covers the pyrometer and allows ambient temperatures up to +200 °C. Further this jacket protects the pyrometer against mechanical forces.
- Cooling jacket PZ 20/M**  
(without picture): Like PZ 20/B, but with removeable cap on the backside of the jacket (for a complete covering of the pyrometer).

- (4) Ex-proof housing PZ 20/Y**  
Ex-proof housing for a pyrometer according class EEx-d IIC T6.
- (5) Mounting ring PZ 20/E**  
Adapter from the pyrometer to the following accessories when not using a cooling jacket.
- (6) Quartz screen hinge PZ 20/I**  
The screen avoids a soiling of the optic of the pyrometer. For a casual cleaning of the screen the hinge can be opened.

- (7) Axial air nozzle PZ 20/A**  
The air nozzle is powered with compressed air. The airflow creates an air cushion which avoids the soiling of the optic or of the quartz-screen.
- (8) Distance tube PZ 20/C**  
This tube improves the flushing effect of the air nozzle by increasing the air cushion. That avoids the intrusion of dust and soil.
- (9) Aperture PZ 20/T**  
The aperture finishes the set. The small hole leads to a higher speed of the flushing air increasing the effect.
- (10) Flange PZ 20/F**  
This flange can be mounted on the outside wall of the furnace for a face side mounting of a complete set of accessories.
- (11) Clamp PZ 20/L**  
Clamp with 70 mm diameter for mounting the set of accessories.
- (12) Adapter PZ 20/W**  
Adapter from clamp PZ 20/L to mounting socket PB 08/K.

- (13) Mounting socket PB 08/K**  
Robust socket to mount the set of accessories. With this socket the accessories can be adjusted in vertical and horizontal direction.
  - (14) Clamp PZ 20/N**  
As PZ 20/L, but with 65 mm diameter for the direct mounting of the pyrometer.
  - (15) Mounting angle PZ 20/U**  
For a simple mounting of a pyrometer along with a clamp PZ 20/L or PZ 20/N.
  - (16) Interchangeable optics**  
The pyrometers of the PZ series can be equipped with several interchangeable optics for different applications.
- Digital display DA 230**  
(without picture) Programmable, universal digital display with 24 V DC power supply for the pyrometer. The display provides a lot of helpful functions for the evaluation of the temperature readings.
- Further accessories**  
(without picture)  
Scan attachment PZ 20/X  
Mirror attachment 90° PZ 50/W  
Laser module PZ 10/L



# Examples of Sets of Accessories

**The sets of accessories can be composed according to the requirements of the applications. The modular components allow a free composition of the elements.**

The set PZ 20-008 X4 on the right side provides a complete protection of the pyrometer.

The cooling jacket PZ 20/M protects the instrument against high ambient temperatures and against mechanical forces.

The optic is protected against soiling and other disturbing influences.

Quartz screen PZ 20/I, axial air nozzle PZ 20/A, distance tube PZ 20/C and aperture PZ 20/T create an air cushion which avoids a soiling of the optic.

The mounting socket PB 08/K provides a robust mounting with the possibility of adjusting the pyrometer.



Combination PZ 20-007 X3



CellaTemp® PZ with attached swivelling mirror and laser module

Combination PZ 20-008 X4

The set of accessories PZ 20-007 X3 which is mounted via flange offers a complete protection of the instrument.

The adjustment of the pyrometer can be controlled with the optical aiming sight through the complete set of accessories.

The adjustment is done with the ball flange PB 08/I.

With this set the pyrometer can be mounted on the outside wall of a kiln or furnace.



Assembly example with video camera consisting of cooling device, swivelling slope device, quartz disk hinge, axial play nozzle, protective pipe and dust screen.

This combination ensures even under rough industrial conditions a safe and reliable temperature measurement by keeping a free field of view for the pyrometer.

The air nozzle PZ 20/A creates an air cushion in the distance tube PZ 20/C. The air flow keeps soil and dust and vapour away from the protecting quartz screen PZ 20/I. The quartz screen hinge PZ 20/I can be opened for casual cleaning.

The optic of the pyrometer is completely protected by the hinge PZ 20/I.

# Survey of the Delivery Programme

## Non-contact temperature measuring instruments

### Portix

Portable pyrometer with data storage and interface. Also available as combination device with probe connector -30 °C to +1999 °C.



### Optix

Portable Pyrometer with through-the-lens sighting and focussable interchangeable optics from +250 °C to +2500 °C.



### Intensity Comparison Pyrometer Mikro

For high-precision temperature control of small and very small objects in a continuous range from +700 °C to +3500 °C.



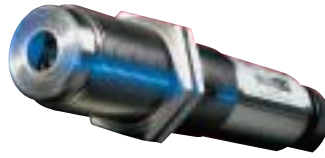
### CellaTemp® PM

Digital miniature pyrometer for temperature measurements from 0 °C to +400 °C.



### CellaTemp® PS

Digital mini Pyrometer situated in a high grade steel housing Ø 30 x 190 mm for ranges of application from -30 °C to +3000 °C.



### CellaTemp® PS 36

Digital Pyrometer with mini fibre optic head Ø 12 mm. +700 °C to +2500 °C.



### CellaTemp® PZ

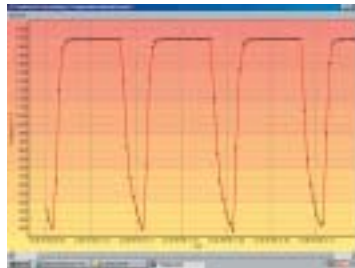
With through-the-lens sighting or fibre optic available as spectral pyrometer or two-colour pyrometer for temperature measurements from 0° C to +3000 °C.



## Visualization software

### CellaMevis®

CellaMevis® is an industrial software running under Windows® for the real-time display, analysis and filing of temperature readings.



## Temperature data logger

### CellaLog®

Mainly independent temperature logger -40 °C to +85 °C.



## Humidity and temperature measuring instruments

### Cellahum® GB

Combined humidity and temperature measuring instrument from 0 to 100 % r. h. or -30 °C to +170 °C for gases as channel or cable version.



## System and automation technology

- System solutions for the recording, visualization and filing of measuring values.
- Process control, automation and visualization solutions for weighing, mixing and dosing systems.



**KELLER H.C.W.**

KELLER HCW GmbH – a member of the CERIC Group

49470 Ibbenbüren-Laggenbeck (Germany) · P. O. B. 2064 · Tel. +49 54 51/85-0 · Fax +49 54 51/85-310 · info@keller-hcw.de · www.keller-hcw.de