

# CellaCast PT 183

Handheld pyrometer for non-wearing temperature measurement of molten metal



- Non-contact, non-wearing temperature measurement of molten metal from a safe distance
- Range: 650 – 1700 °C
- Rectangular measurement area ensures reliable temperature data even when pour stream position varies
- 3 focusable lenses for distances starting at 0.3 m
- Special filter captures IR radiation from surfaces free of slag and oxides
- ATD automatically identifies the target and detects its temperature
- Dual wavelength technique provides accurate data despite dust or steam in the sight path
- Parallax-free imaging with diopter compensation
- Traffic light status indicator in the viewfinder shows when distance to target is ideal



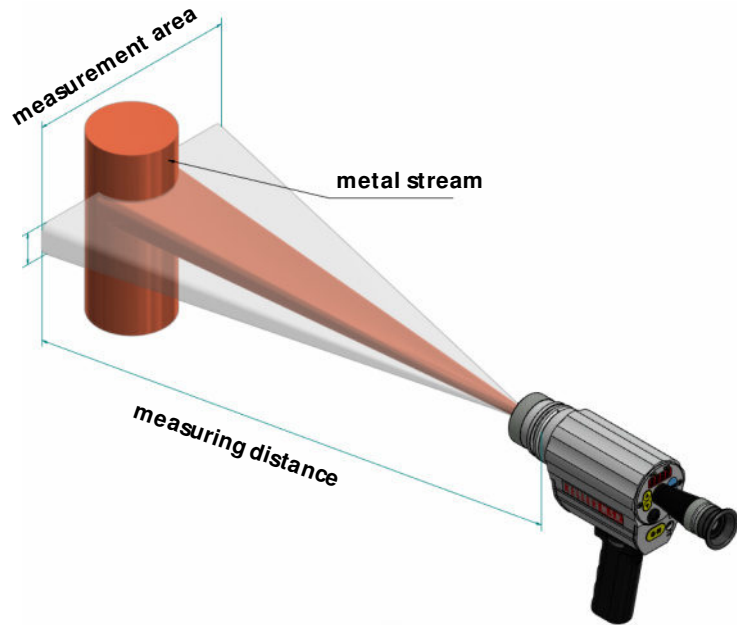
## Applications

The CellaCast PT 183 was specially designed for mobile temperature detection of molten metal.

This handheld pyrometer can capture a metal stream poured from a foundry ladle or discharged from a bottom-pour ladle. The challenge of this temperature measurement application: the position of the pour stream varies with the tilt angle or pouring nozzle of the ladle.

The CellaCast PT 183 features a rectangular measurement area. As long as the moving target remains some-where within this rectangular area, The CellaCast PT 183 captures the pour and produces an accurate temperature reading.

The CellaCast PT 183 is also ideal for temperature detection of molten metal as it is transferred from the melting furnace to the pouring ladle.



Unique feature of the CellaCast PT 183: rectangular measuring area

## How it works

The CellaCast PT 183 is based on a non-contact, optical measuring technique. The infrared energy radiating from an object's surface is detected and processed to produce a temperature reading. The pyrometer's optics capture the temperature within a defined measuring area. Depending on the selected lens and size of the target, the pyrometer can be used from a distance of up to several meters.

The CellaCast PT 183 is a two-colour pyrometer. This means that it simultaneously detects the IR energy emitted from the target at two different wavebands. The pyrometer produces a temperature reading based on the ratio of these two intensities.

This method makes it possible to measure the temperature of objects which are smaller than the pyrometer's measuring area.

As a two-colour or ratio pyrometer, the CellaCast PT 183 is far less sensitive to sight path obstructions such as steam, dust or smoke than pyrometers which detect temperature at a single wave-length.

Special signal conditioning combined with high-resolution analogue-to-digital conversion enables a wide measuring span. The temperature resolution remains uniformly high across the entire measuring range.

## Measuring molten metal

Liquid metal presents a unique challenge due to the composition of its surface which is particularly susceptible to slag and oxides which have a significant effect on the radiation properties of the material. To obtain accurate temperature data, it is essential that the pyrometer only detects and processes the IR energy emitted from the bare metal surface.

The CellaCast PT 183 is equipped with a special algorithm which filters out the signal obtained from the metal surface which is free of slag and oxides.

Only a pyrometer can detect temperature at the moment in the casting process which is most crucial to product quality: just as the mould is being filled. A temperature reading is produced for each cast workpiece, providing continuous verification of compliance with temperature requirements.

Immersion probes can only detect molten metal temperature at the furnace or ladle. This method cannot capture the molten metal stream as it pours into the mold. Another disadvantage: data accuracy is subject to the precision with which the foundry operator performs the measurement. Temperature readings will vary, depending on immersion depth and position of the probe.

The CellaCast PT 183 requires virtually no maintenance and does not contain parts subject to wear. Foundries eliminate the need for expendable thermocouple tips and thus reduce their operating costs.

## Temperature detection

The CellaCast PT 183 features ATD (automatic temperature detection), a function which automatically identifies the intended target.

The PT 183 starts measuring as soon as you point it at the target. After several seconds an audible alarm indicates the end of the measurement. The pyrometer shows the correct temperature reading at the display panel and, if desired, transmits the data to a PC.

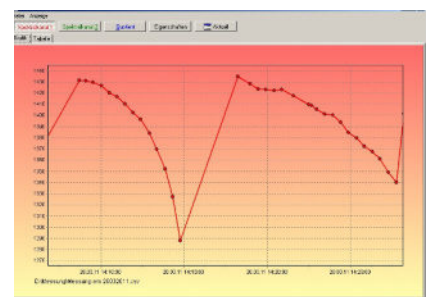
## Data communication

The USB interface enables remote configuration and data transmission to a PC.

The CellaMevis software, which is supplied with the pyrometer, provides online graphical display and enables data analysis and archiving.

For prolonged temperature data logging, use the AC adapter to plug into the mains supply.

Temperature data can be exported to Excel worksheets in .csv format to facilitate in-depth data analysis.



## Optics

The CellaCast PT 183 is supplied with one of 3 available lenses. The target size and distance you require will determine which lens is most suitable for your application.

The lens system is optimized for the visible and infrared range. Due to its superior imaging properties, the high-precision lens provides consistently high optical resolution across the entire focusing range.

The lens is infinitely adjustable to the exact required distance between pyrometer and target.

The glass lens features an antireflective coating. It is robust, easy to clean and suitable for harsh industrial environments.



## Through-the-lens sighting



The wide field of view makes it easy to focus on the target object. The ocular features a widened interpupillary distance to accommodate users who wear glasses or a helmet.

A built-in diopter compensation dial enables users to adjust the strength of the viewfinder in accordance with their eyesight.

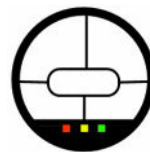
To protect the user's eye, the built-in polarizing filter can be adjusted to the brightness of the target.

## Shipment comes with

- CellaCast PT 183 pyrometer
- Battery charger / mains adapter
- USB-cable VK 11/D (1.8 m)
- CellaMevis software
- Hard shell carrying case
- Instruction manual
- Calibration certificate
- Quartz protective glass 70146

## Signal strength indicator

A traffic light status indicator is integrated in the viewfinder. It lets the user know if the amount of IR energy detected is sufficient for a reliable temperature measurement.



If the signal is too weak due to sight path obstructions such as dust, steam or smoke, or because the distance to the target is too great, the pyrometer stops measuring and the red LED lights up.

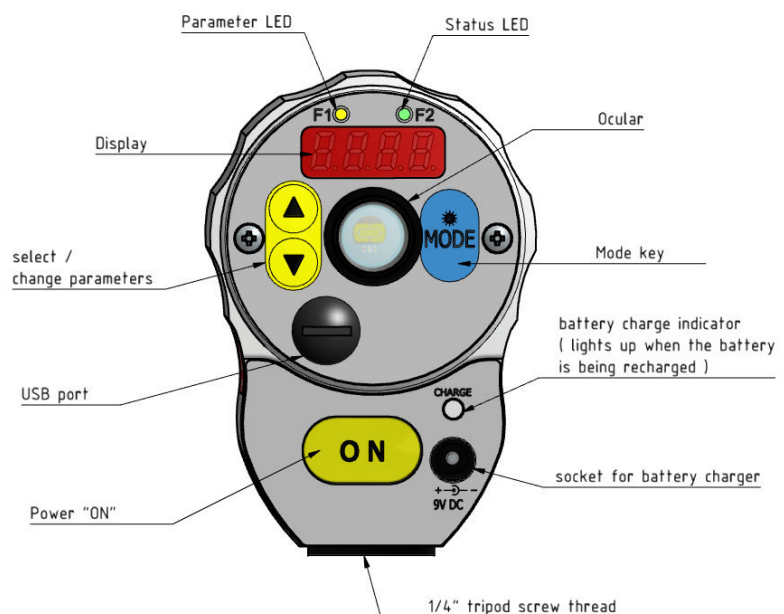
## Control keys

Parameters can be adjusted during running operations using the rear keypad. The large control keys are easy to access and operate.

The brightly lit 8 mm digits on the LED display are visible from a great distance.

Two status LEDs can be custom configured to indicate operating conditions.

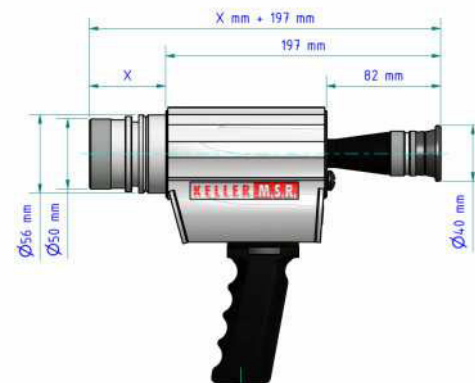
The pyrometer can be preconfigured with user-defined emissivity settings. These preselected emissivity values let you instantly adjust the device to the measuring task on hand by selecting the dedicated emissivity setting for your specific target material.



## Range of models

Model	Lens	Focus-range	Distance ratio	FOV
PT 183 AF 1	PZ 20.01	0.4 m ... ∞	D <sub>V</sub> = 230 : 1 D <sub>H</sub> = 45 : 1	7.1°
PT 183 AF 3	PZ 20.06	1.2 m ... ∞	D <sub>V</sub> = 375 : 1 D <sub>H</sub> = 75 : 1	4.5°
PT 183 AF 13	PZ 20.08	0.3 m ... ∞	D <sub>V</sub> = 150 : 1 D <sub>H</sub> = 30 : 1	10.8°

## Dimensions



## Technical data

### Temperature range

650 - 1700 °C

### Sensor

Double photodiode

### Spectral sensitivity

0.95 / 1.05 μm

### Data communication

USB interface

### LED display

4-digit (digit height 8 mm)

### Response time t<sub>98</sub>

≤ 10 ms (T > 750 °C)

### Measurement uncertainty

1.5 % of temp. reading, at least 4K  
(at ε = 1 and T<sub>a</sub> 23 °C)

### Repeatability

3 K

### Temperature coefficient

≤ 0.05 %/K  
(referenced to 23 °C)

### Resolution

Display: 1 K

USB: 0.1 K

### Power supply

Rechargeable battery pack

Mains adapter

### Battery life

Up to 12 hours of use  
(based on continuous operation  
at T<sub>a</sub> = 23 °C)

### Permissible humidity

95 % r.H. max.  
(non-condensing)

### Ambient operating temperature

0 - 50 °C

### Storage temperature

-20 - +50 °C

### Housing

Aluminium

### Protection rating

IP 40 according to DIN 40050

### Weight

Approx. 1.1 kg

### Sighting

Through-the-lens sighting, parallax-free imaging, target spot indicator, diopter compensation, polarizing filter

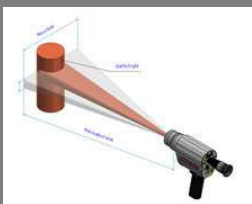
### ATD function

for automatically identifies the target and detects its temperature

## Shipment includes

- Pyrometer CellaCast PT 183
- Transport and protective case
- Power supply unit
- Quartz protective glass 70146
- USB cable VK 11/D
- Software CellaMevis
- Instruction manual
- Calibration certificate ISO 9001

## Width of measuring area

Model		Measuring distance [m]												
		0.3	0.4	1	1.2	2	3	4	5	6	7	8	9	10
PT 183 AF 1	Width of measuring area [mm]		9	22	27	44	67	89	111	133	156	178	200	222
PT 183 AF 3					13	27	40	53	67	80	93	107	120	147
PT 183 AF 13		10	13	33	40	66	100	133	166	200	233	266	300	330