

IMPAC IN 5/5

Compact pyrometer for temperature measurement of glass and quartz glass surfaces. Temperature ranges between 100 to 2500°C (212 to 4532°F).



The Impac® IN 5/5 infrared thermometers are specially designed for non-contact temperature measurements of glass surfaces and quartz surfaces. This instrument is a digital pyrometer in two-wire technique. This technique combines the high accuracy of the digital signal processing with the simple connection and operating with two wires. The solid and robust design of the instruments guarantees high operational safety even in rough industrial environments. For optimal match of the instrument to the application (size of the measuring object, distance), different optics are available.

PRODUCT HIGHLIGHTS

- Pyrometers in two wire form with analog output 4 to 20 mA
- High accuracy due to digital linearization of the output
- Small spot sizes, min. 2.5 mm
- Adjustable exposure time
- Compact housing

TYPICAL APPLICATIONS

- Float glass
- Hollow glass
- Glass drop
- Glass hardening
- Glass bending
- Bulb production
- Heat treatment

AT A GLANCE

Temperature Ranges

- 100 to 600°C (MB 6)
- 200 to 800°C (MB 8)
- 100 to 1300°C (MB 13)
- 400 to 2500°C (MB 25)

Spectral Range

5.14 μm

Measurement Uncertainty

- <1300°C: 0.6% oR or 2°C
- 1300 to 1800°C: 0.8% oR
- >1800°C: 1% oR

Repeatability

0.3% oR or 0.6°C

Optics

- 3 fixed optics:
100 mm, 300 mm, 800 mm

Output

4 to 20 mA

TECHNICAL DATA

Measurement Specifications		
Temperature Ranges	100 to 600°C (212 to 1112°F) (MB 6)	
	200 to 800°C (392 to 1472°F) (MB 8)	
	100 to 1300°C (212 to 2372°F) (MB 13)	
	400 to 2500°C (752 to 4532°F) (MB 25)	
	(Additional MB on request)	
IR Detector	Thermopile	
Data Handling	Digital	
Spectral Range	5.14 μm	
Emissivity ε	0.2 to 1.0 adjustable	
Measurement Uncertainty T _{amb} (ε = 1, t ₉₀ = 1 s)	T < 1300°C	0.6% of reading in °C or 2°C (T _{amb} = 15 to 30°C) ¹
		1% of reading in °C or 1.5°C (T _{amb} = 0 to 15°C or 30 to 63°C) ¹
	T = 1300 to 1800°C	0.8% of reading in °C (T _{amb} = 15 to 30°C)
		1.2% of reading in °C (T _{amb} = 0 to 15°C or 30 to 63°C)
T = 1800 to 2500°C	1% of reading in °C (T _{amb} = 15 to 30°C)	
	1.4% of reading in °C (T _{amb} = 0 to 15°C or 30 to 63°C)	
Repeatability (ε = 1, t ₉₀ = 1 s)	0.3% of reading in °C or 0.6°C ¹	
Noise Equivalent Temperature Difference (NETD) (ε = 1, t _{amb} = 23°C)	@ t ₉₀ = 80 ms: 0.7°C (@ 110°C measuring temperature)	
	@ t ₉₀ = 1 s: 0.4°C (@ 110°C measuring temperature)	
Optics	Zinc-Sulfide (ZnS) lens	

Electrical	
Power Supply	24 VDC (10 to 30 V)
Power Consumption	Max 20 mA
Load	Max 700 Ω @ 24 V (max 100 Ω @ 12 V)

Environmental Specifications	
Protection Class	IP 65 (DIN 40050)
Ambient Temperature	0 to 70°C (32 to 158°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	Non-condensing conditions
Weight	Approx 410 g (~14.47 ounces)
Housing	Stainless steel
CE Label	According to EU directives about electromagnetic immunity

Interface and Communication	
Parameters	Adjustable on the pyrometer: Emissivity, Exposure time
Analog Output	4 to 20 mA (linear)
Exposure Time t ₉₀	0.08 s; adjustable in the pyrometer: 0.5 s, 1 s, 2 s, 5 s

¹ Whichever value is greater. The instrument must be at a constant ambient temperature for a minimum of 15 minutes (and has to be connected to the power supply)

² MB is a shortcut used for temperature range (in German: Messbereich).

The determination of the technical data of this pyrometer is carried out in accordance with VDI/VDE IEC TS 62942-2, the calibration / adjustment in accordance with VDI/VDE 3511, Part 4.4.

OPTICS

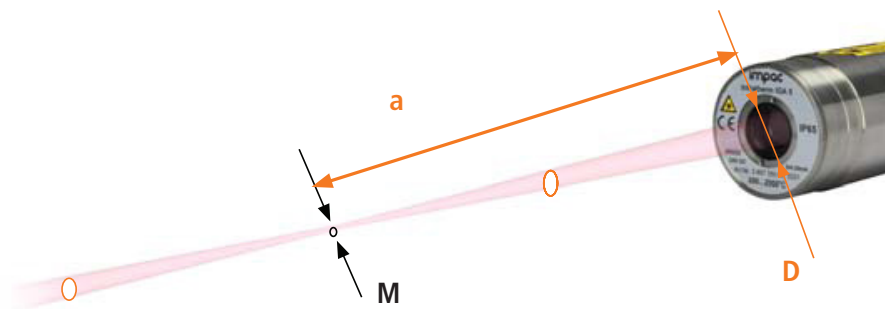
The pyrometers are equipped ex works with one of the specified optics. Each optic is focused at a certain distance (main measuring distance). At these distances, each lens achieves its smallest spot size. Normally the spot size will increase at any other distance (shorter or longer).

For each optic, some example values for measuring distance (measured from the front of the lens) and spot size are listed in the table. Keep this in mind when considering the mounting position of the pyrometer as well as the size of the measuring object (the measuring object must be at least as big as the spot size).

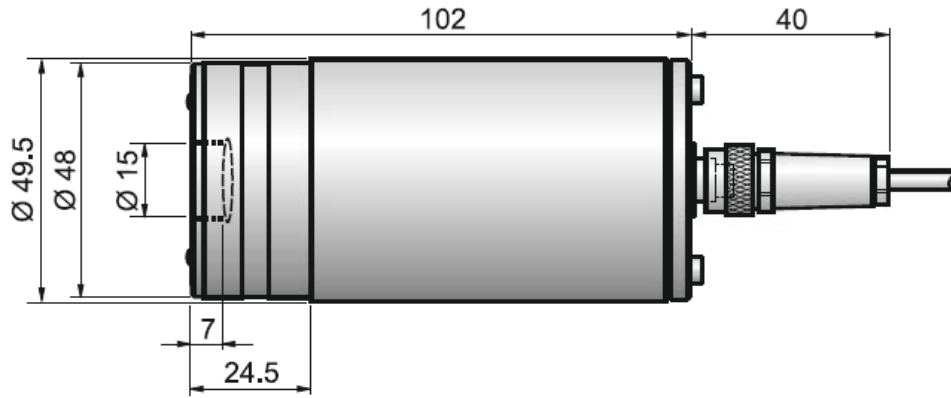
When measuring the temperature of very large and hot surfaces (for example by the float glass production), additional radiation is received by the pyrometer's detector due to unavoidable effects (diffraction, multiple reflection). These effects increase the temperature output. To get correct temperature values in this case, the pyrometer must be prepared ex works. The effect will be compensated by "float glass calibration."

Optics for IN 5/5			
	Measuring Distance a [mm]	Spot Size M_{90} [mm]	
		MB 6, MB 8, and MB 13	MB 25
Optics 100	100	2.5	2.5
	200	18	13
	300	35	24
Optics 300	300	6	6
	600	22	17
	1000	45	32
Optics 1200	1200	24	24
	2500	50	43
	4000	80	65
Aperture D [mm]		15	10

The determination of the main spot size "M" in the main measuring distance "a" occurs at 90% measuring signal.



DIMENSIONS



Dimensions in mm

INSTRUMENT SETTINGS

The emissivity and the exposure time can be set directly in the instrument. After removing the cover on the back side of the pyrometer, the corresponding adjustments are available.



REFERENCE NUMBERS

IN 5/5		
Optics	Temperature Range ¹	Without Laser Targeting Light
When ordering please select one optics (optics a = 100, 300, or 1200)	100 to 600°C	3 869 110
	200 to 800°C	3 869 120
	100 to 1300°C	3 869 130
	400 to 2500°C	3 869 140

¹ Other temperature ranges on request.

Scope of Delivery

Instrument with selected optic, works certificate, operation manual, PC measurement and evaluation software InfraWin

Ordering Notes

A connection cable is not included in scope of delivery and must be ordered separately. The float glass calibration has to be ordered in addition to the instrument with the reference number 3 891 050.

ACCESSORIES

PN	Description
3 820 210	Connection cable for IN 5 and IN 5/5, 2 m
3 820 560	Connection cable for IN 5 and IN 5/5, 5 m
3 820 570	Connection cable for IN 5 and IN 5/5, 10 m
3 820 580	Connection cable for IN 5 and IN 5/5, 15 m
3 820 590	Connection cable for IN 5 and IN 5/5, 30 m
3 852 290	Power supply NG DC 100 to 240 VAC ⇒ 24 VDC, 1 A
3 852 540	Power supply NG 0D 85 to 265 VAC ⇒ 24 VDC, 600 mA
3 890 650	DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 230 VAC
3 891 220	DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 115 VAC
3 890 520	DA 6000: LED digital display, digital and analog input, 2 limit switches, maximum value storage, analog output, RS232
3 890 530	DA 6000: like the DA 6000-N, but with analog input and 2 limit switches for the RS485 interface.
3 826 510	PI 6000: PID programmable controller, extremely fast, for digital Impac pyrometers
3 834 210	Adjustable mounting support (Series 5 and 6)
3 835 160	Air purge unit, aluminium
3 835 440	Air purge unit, stainless steel
3 837 230	Water cooling jacket (heavy duty) with integrated air purge unit (with metric mounting threads)
5 837 230	Water cooling jacket (heavy duty) with integrated air purge unit (UNC mounting threads)
3 837 340	Water cooling jacket (heavy duty) with protection window
3 837 370	Water cooling jacket (light duty) with integrated air purge unit (with metric mounting threads)
5 837 370	Water cooling jacket (light duty) with integrated air purge unit (UNC mounting threads)
3 837 390	Water cooling jacket (light duty) with protection window
3 846 100	Mounting tube
3 846 120	Flange tube
3 837 540	Cooling plate for series 5 and 6, with air purge
3 846 620	Vacuum flange KF16 with protection window
3 846 650	Spare protection window, Ø 25 x 3 with Viton-O-ring

INFRAWIN 5 OVERVIEW

InfraWin is easy-to-use measurement and evaluation software for remote configuration of stationary, digital Impac brand pyrometers.

This software allows the user to remotely adjust and control settings for one or two pyrometers from a single computer. InfraWin also allows the user to simultaneously monitor and control temperatures.

- Display temperature data as color bars and online graphics
- Capture downstream evaluations as tables, graphics or text files
- Calculate the spot size for different measuring distances
- Features UPP standard (Universal Pyrometer Protocol)

Pyrometer Settings

An Impac digital pyrometer connected to a PC will be automatically detected by the software. All available parameters are adjustable, including emissivity, response time, maximum value storage, output signal and sub range.

Further special functions are adjustable for example controllers or TV parameters on instruments available with these functions. Changes are transmitted directly to the pyrometer.



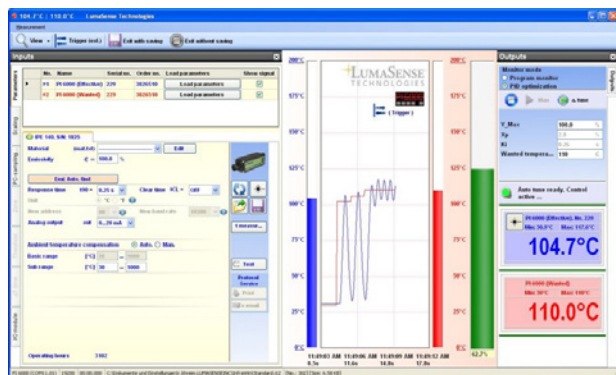
Measurement with Color Bar

In this window a temperature value for the upper or lower limit can be adjusted numerically or with the mouse.

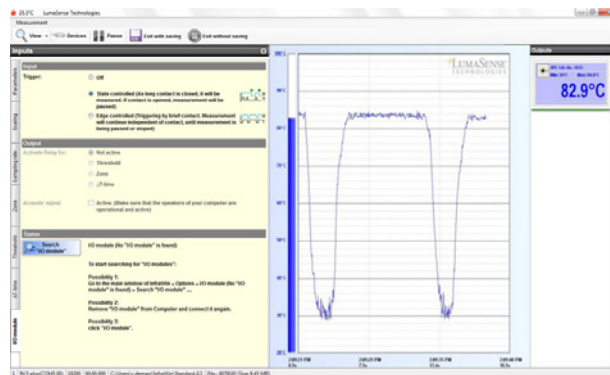
The acquired minimum and maximum value is indicated as well as the inner temperature of the pyrometer. The emissivity is changeable during the measurement at any time.

Infrared Calculator

After input of the aperture and the focused spot size per datasheet, the calculation of spot sizes at non-focused distances is possible.



Measurement with Internal Temperature of radiation temperature and internal instrument temperature. Parameters can be changed during the measurement.



I/O Module allows users to trigger measurement externally and gives a potential free output contact.



ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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