IMPAC IS 5 AND IGA 5

Stationary, digital pyrometers for non-contact temperature measurement between 250 and 3000°C (482 and 5432°F).

The Impac® IS 5 and IGA 5 are digital, compact, and fast infrared measuring instruments for non-contact temperature measurement on metals, ceramics, or graphite. For optimal match of the instrument to the application two optics with extremely small spot sizes are available.

PRODUCT HIGHLIGHTS

- Temperature ranges between 250 and 3000°C (482 and 5432°F)
- Very small spot sizes, minimum 0.5 mm
- Different sightings available: laser targeting light or through lens view finder
- Analog output adjustable 0 to 20 mA or 4 to 20 mA
- Built-in maximum value storage
- Digital interface
- Bus capable with RS485 interface
- Small dimensions

TYPICAL APPLICATIONS

- Induction heating
- Casting
- Annealing
- Welding
- Forging
- Sintering
- Melting
- Rolling
- Hardening

AT A GLANCE

Temperature Ranges

IS 5
650 to 1800°C (MB 18)
600 to 2000°C (MB 20)
800 to 2500°C (MB 25)
1000 to 3000°C (MB 30)

IGA 5
350 to 1800°C (MB 18)
250 to 2000°C (MB 20)
400 to 2500°C (MB 25)
500 to 3000°C (MB 30)

Spectral Range

IS 5
0.8 to 1.1 µm

IGA 5
1.45 to 1.8 µm

Repeatability

0.2% oR in °C + 1°C

Optics

2 fixed optics

OVERVIEW

The most important parameters such as emissivity, exposure time and analog output can be set directly in the instrument.

Additionally, the pyrometer can be connected to a PC via serial interface, enabling adjustments of further parameters with the delivered software InfraWin. This can be used for temperature indication, data logging and further analyzing of complete temperature processes.

The response time of only 2 ms facilitates the measurement of fast heating processes or short temperature peaks.

For a precise alignment of the pyrometers to the measuring object, the instruments are optionally equipped with a laser targeting light or a view finder.

TECHNICAL DATA

Measurement Specifications		
Temperature Ranges	IS 5	650 to 1800°C (MB 18)
		600 to 2000°C (MB 20)
		800 to 2500°C (MB 25)
		1000 to 3000°C (MB 30)
	IGA 5	350 to 1800°C (MB 18)
		250 to 2000°C (MB 20)
		400 to 2500°C (MB 25)
		500 to 3000°C (MB 30)
IR Detector	IS 5: Silicon photo diode (Si)	
	IGA 5: Indium-Gallium-Arsenic photo diode (InGaAs)	
Sub Range	User adjustable (minimum span is 51°C)	
Spectral Range	IS 5: 0.8 to 1.1 µm	
	IGA 5: 1.45 to 1.8 µm	
Resolution	0.1°C @ the interface	
	At the analog output: < 0.1% of the adjusted temperature range but min 0.1°C	
Emissivity ε	0.2 to 1.0 adjustable in the instrument or with the software InfraWin in steps of 0.01	
Response Time t_{90}	≤ 2 ms, adjustable to 0.01 s, 0.05 s, 0.25 s, 1 s, 3 s, 10 s	
Measurement Uncertainty (T_{amb} ε =1, t_{90} = 1 s)	< 350°C: 0.5% of reading in °C + 1°C	
	350 to 1500°C: 0.3% of reading in °C + 1°C	
	< 350°C: 0.5% of reading in °C + 1°C	
Repeatability (T_{amb} = 25°C, ε =1, t_{90} = 1 s)	0.2% of reading in °C + 1°C	
Sighting	Laser targeting (max. power level < 1 mW, λ = 630 to 680 nm, CDRH class II) or through lens view finder	

1 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.

TECHNICAL DATA (CONTINUED)

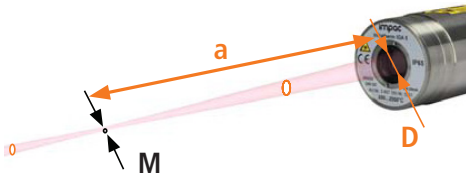
Electrical Specifications	
Power Supply	24 VDC ±25%, stabilized, ripple must be less than 50 mV
Power Consumption	≤ 3 W (including active laser targeting light)
Isolation	Power supply, digital output and analog output are galvanically isolated against each other

Environmental Specifications	
Protection Class	IP 65 IEC 60529 (value in mated condition)
Ambient Temperature	0 to 70°C (32 to 158°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Weight	550 g (1.21 lb)
Housing	Stainless steel
CE Label	According to EU directives about electromagnetical immunity

Interface and Communication Specifications	
Analog Output	0 to 20 mA or 4 to 20 mA, switchable, linear in temperature, load independent DC
Digital Interface	Optional RS232 or RS485 (addressable), half duplex, baud rate 1.2 up to 38.4 kBd
Maximum/Minimum Value Storage	Single or double storage, clear modes: time (off, 0.01 s, 0.05 s, 0.25 s, 1 s, 5 s, 25 s), external clear contact, via interface or automatic "hot object mode“, hold-function for freezing the current temperature reading (not at pyrometers with PID-controller)
Parameters	Adjustable on the converter’s rear side: Emissivity, response time, analog output 0 ... 20 mA or 4 ... 20 mA, online / offline mode for settings via PC or pyrometer
	Additionally via interface adjustable and readable: Temperature sub range, settings for maximum value storage, address, baud rate
	Readable via interface only: Measured value, internal temperature of the unit

OPTICS

Two different optics are available. The optics are adjusted ex works to one of the distances "a" mentioned in the tables below, to achieve the smallest possible spot size in the corresponding measuring distance (measured from the front of the housing). The required measuring distance has to be specified when ordering, other distances within the optics range are possible on request.



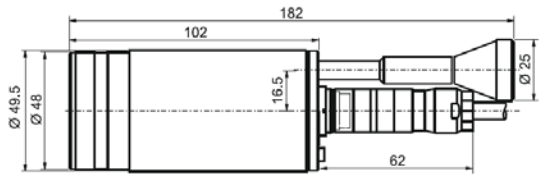
Optics F (For Long Distances 220 to ∞)

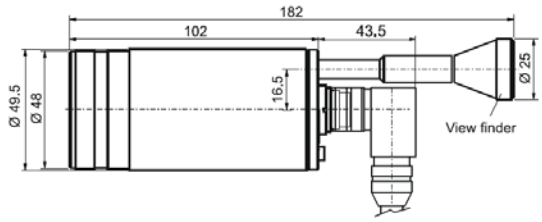
Meas. Distance a [mm]	IS 5		IGA 5	
	MB 18 MB 20	MB 25 MB 30	MB 20	MB 18, 25, and 30
	Spot size M_{90} [mm]			
220	2	1	2	1
300	2.7	1.4	2.7	1.4
500	4.8	2.4	4.8	2.4
800	8	4	8	4
1300	13	6.6	13	6.6
2000	22	12	22	12
4000	50	28	50	28
Aperture D [mm]	5	5 (MB 25) 3 (MB 30)	8	8 (MB 18, 25) 5 (MB 30)

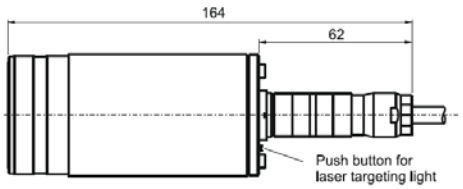
Optics N (For Short Distances 90 to 250 mm)

Meas. Distance a [mm]	IS 5		IGA 5	
	MB 18 MB 20	MB 25 MB 30	MB 20	MB 18, 25, and 30
	Spot size M_{90} [mm]			
90	1	0.5	1.1	0.7
100	1.1	0.6	1.3	0.8
150	1.8	0.9	2	1.1
200	2.6	1.4	2.6	1.4
250	3.1	1.6	3.6	1.8
Aperture D [mm]	5	5 (MB 25) 3 (MB 30)	8	8 (MB 18, 25) 5 (MB 30)

DIMENSIONS







Dimensions in mm

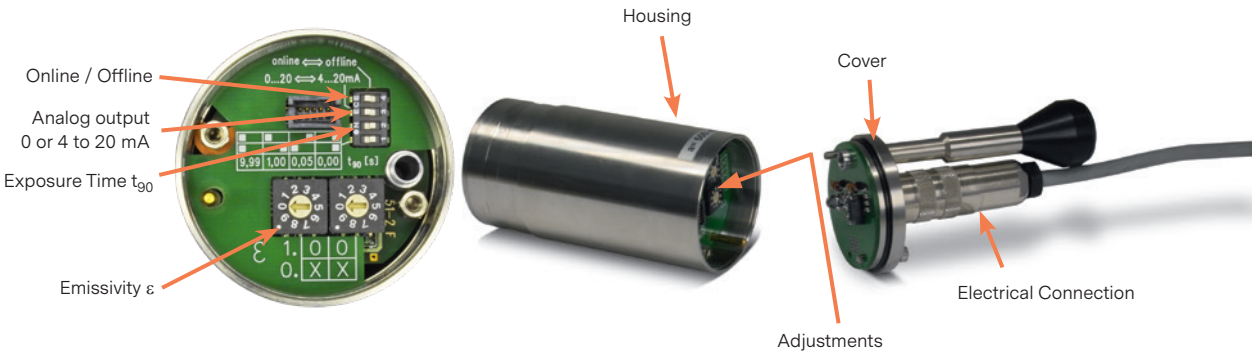
INSTRUMENT SETTINGS

Offline Mode

The most important parameters such as emissivity, exposure time and analog output can be set directly in the instrument. After removing the cover on the back side of the pyrometer, the corresponding adjustments are accessible.

Online Mode

Switch to online mode to enable the communication via serial interface and software InfraWin (in scope of delivery) on a PC. This allows additional setting options as well as the graphical temperature display combined with subsequent analysis of the measurement values.



REFERENCE NUMBERS

Model	Temperature Range	MB	With Laser Targeting Light		With Thru Lens View Finder	
			RS232	RS485	RS232	RS485
IS 5	650 to 1800°C	MB 18	3 857 100	3 857 110	3 857 120	3 857 130
	600 to 2000°C	MB 20	3 857 150	3 857 160	3 857 170	3 857 180
	800 to 2500°C	MB 25	3 857 200	3 857 210	3 857 220	3 857 230
	1000 to 3000°C	MB 30	3 857 250	3 857 260	3 857 270	3 857 280
IGA 5	350 to 1800°C	MB 18	3 857 400	3 857 410	3 857 420	3 857 430
	250 to 2000°C	MB 20	3 857 350	3 857 360	3 857 370	3 857 380
	400 to 2500°C	MB 25	3 857 450	3 857 460	3 857 470	3 857 480
	500 to 3000°C	MB 30	3 857 920	3 857 930	3 857 940	3 857 950

Scope of Delivery

Converter, works certificate, and software InfraWin.

Ordering Note

When ordering please select optics N or F as well as the required measuring distance. A connection cable or is not included in scope of delivery and has to be ordered separately.

ACCESSORIES

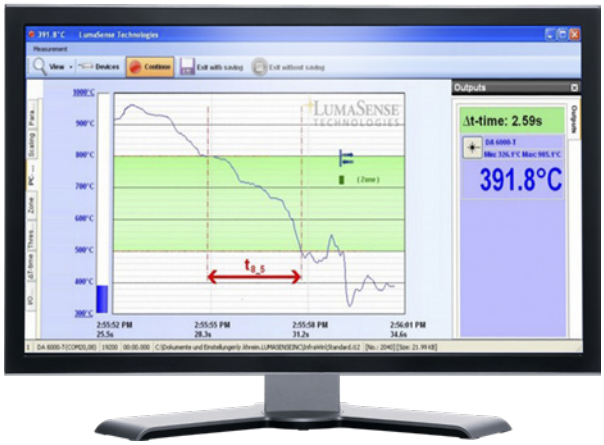
PN	Description
3 820 330	Connection cable, 5 m, straight connector
3 820 500	Connection cable, 10 m, straight connector
3 820 510	Connection cable, 15 m, straight connector
3 820 810	Connection cable, 20 m, straight connector
3 820 820	Connection cable, 25 m, straight connector
3 820 520	Connection cable, 30 m, straight connector
3 820 740	Connection cable 5 m (straight connector, temperature resistant up to 200°C)
3 821 050	Connection cable, 5 m, 90° connector
3 821 060	Connection cable, 10 m, 90° connector
3 821 330	Connection cable, 12 m, 90° connector
3 821 280	Connection cable, 20 m, 90° connector
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
3 852 550	Power supply NG 2D, as NG 0D with 2 limit switches
3 891 220	DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 115 VAC
3 890 650	DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 230 VAC
3 890 560	DA 6000-N: LED digital display with digital input RS232 and possibility for pyrometer parameter settings
3 890 570	DA 6000-N digital display, to allow adjustment of pyrometer through RS485 interface
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.
3 826 500	HT 6000: portable battery driven indicator and instrument for pyrometer parameter settings; RS232 / RS485
3 826 510	PI 6000: PID programmable controller, extremely fast, for digital Impac pyrometers
3 843 500	SCA 5, Scanner for Series 5 with CaF_2 window; 24 VAC/DC
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)
3 837 370	Water cooling jacket (light duty) with integrated air purge unit (with metric mounting threads)
3 837 540	Cooling plate for series 5 and 6, with air purge
3 846 590	Vacuum flange KF16 with protection window

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.

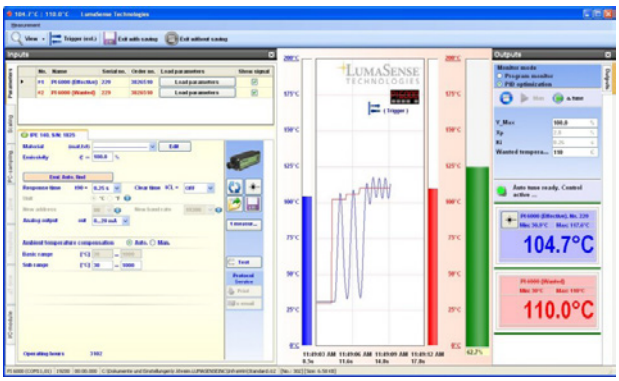
Further special functions are adjustable for example controllers or TV parameters on instruments available with these functions. Changes are transmitted directly to the pyrometer.

Measurement with Color Bar

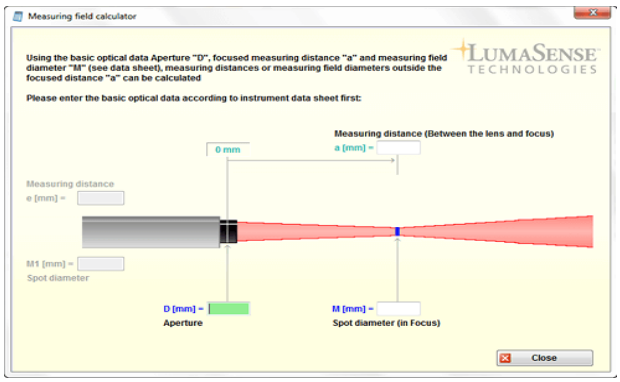
In this window a temperature value for the upper or lower limit can be adjusted numerically or with the mouse.
The acquired minimum and maximum value is indicated as well as the inner temperature of the pyrometer. The emissivity is changeable during the measurement at any time.

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.



The Spot Size Calculator calculates the data for the non-focused regions.

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.

PRECISION | POWER | PERFORMANCE

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ENG-ISIGA5-235-02 10.19