LUMASENSE™ TECHNOLOGIES

IMPAC Infrared Thermometers

Compact, Short Wavelength Digital Infrared Thermometer for Non-Contact Temperature Measurement of Metallic Surfaces, Graphite or Ceramics between 300 and 1800 °C

CE

IMPAC IS 320 • IMPAC IGA 320

- Small housing dimensions for easy installation in confined spaces
- RS485 interface for connection to a PC in long transmission networks
- Analog output adjustable to 0 or 4 to 20 mA for connection to standard analyzing instruments
- Internal digital signal processing for high accuracy and long temperature ranges
- High quality optics for measurement of small objects
- Built-in LED targeting light for easy alignment to the measuring object

The IMPAC IS 320 and IGA 320 are short wavelength infrared measuring instruments with internal digital signal processing capabilities. IS 320 and IGA 320 pyrometers are used for measurements of metallic surfaces, graphite and ceramics, and much more.

The compact housing dimensions of both instruments allow easy integration of the pyrometers into compact production machines, and the solid and robust designs guarantee reliability even in the harshest industrial environments.

The instruments are equipped with a choice of optics for small spot sizes.

An LED targeting light enables precise alignment on the measurement object. It is automatically active and can be used during measurement.

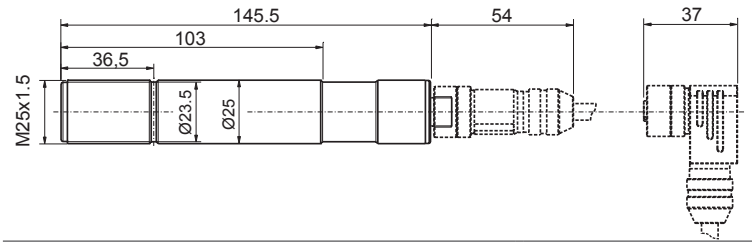
In addition to the analog output, the pyrometers are equipped with digital RS485 interfaces, which enable secure data transmission to a PC or a PLC over long distances.

The included InfraWin software enables graphical display and storage of measurement values, as well as easy set-up of all instrument parameters.

Typical Applications:

- Preheating
- Annealing
- Tempering
- Welding
- Forging
- Hardening
- Sintering
- Melting
- Soldering
- Brazing
- Rolling

Technical Data

	IMPAC IS 320	IMPAC IGA 320
Temperature Ranges:	550 - 1400 °C (MB14); 600 - 1600 °C (MB16); 650 - 1800 °C (MB18)	300 - 1300 °C (MB 13); 350 -1650 °C (MB 16.5); 400 - 1800 °C (MB 18)
Sub Range:	Any range adjustable within the temperature range, minimum span 51 °C	
Spectral Range:	0.8 - 1.1 µm	1.45 - 1.8 µm
IR Detector:	Silizium-Fotodiode (Si)	Indium Gallium Arsenide photo diode (InGaAs)
Power Supply:	24 V DC (10 to 30 V DC), ripple must be less than 0.5 V	
Power Consumption:	Max. 1 W	
Analog Output:	0 to 20 mA or 4 to 20 mA (linear), switchable	
Load:	0 to 500 Ω	
Switch Contact:	Opto relays; max. 50 V DC, 0.2 A; Pmax = 300 mW	
Hysteresis:	2 ... 20 °C, adjustable	
Digital Interface:	RS485 addressable (half duplex), baud rate 1200 up to 38400 Bd	
Resolution:	0.1 °C on interface; < 0.025% of the adjusted temperature sub range at the analog output	
Isolation:	Power supply, analog output and digital interface are galvanically isolated from each other	
Parameters:	Adjustable via interface: Emissivity ε, transmittance t, exposure time t_{90}, max./min. value storage, analog output, sub temperature range, ambient temperature compensation, pyrometer address, switch contact, hysteresis, baud rate, wait time t_w	
Emissivity ε:	10.0 to 100.0% adjustable via interface in steps of 0.1%	
Transmittance t:	10.0 to 100.0% adjustable via interface in steps of 0.1%	
Exposure Time t_{90}:	2 ms (with dynamical adaptation at low signal levels); adjustable to 0.01 s; 0.05 s; 0.25 s; 1 s; 3 s; 10 s	
Maximum/Minimum Value Storage:	Built-in single or double storage. Clearing with adjusted time t_{clear} (off; 0.01 s; 0.05 s; 0.25 s; 1 s; 5 s; 25 s), via interface or automatically with the next measuring object	
Uncertainty:	Up to 1500 °C: 0.3% of reading in °C + 1 °C; Above 1500 °C: 0.5% of reading in °C	
Repeatability:	0.2% of reading in °C + 1°C (ε = 1, t90 = 1 s, Tamb. = 23 °C)	
Protection Class:	IP65 (IEC 60529)	
Mounting Position:	any	
Ambient Temperature:	0 to 70 °C	
Storage Temperature:	-20 to 70 °C	
Rel. Humidity:	None condensing conditions	
Weight:	0.3 kg	
Housing:	Stainless steel	
Dimensions:		
	All dimensions in mm	
Connector:	8 pin connector	
Sighting:	Built-in LED targeting light	
CE Label:	According to EU directives about electromagnetic immunity	

Equipment Features

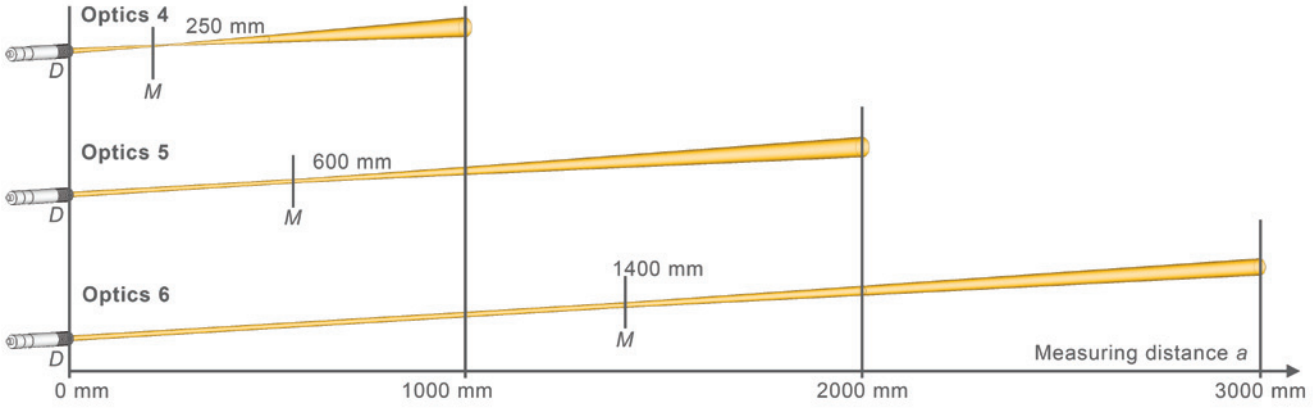
Optics

Depending on the selected type the pyrometers are equipped ex works with different optics which are focusing on different distances, i.e. in this distances they achieve the smallest spot size in relation to the measuring distance. At any other distances (shorter or longer) the spot size will decrease or increase. Please note that the measuring object must be at least as big as the spot size.

The following table shows the size of the spots (M in mm) at a given measuring distance a [mm]; the drawings show an impression of the proportions. Values between the stated data can be calculated by interpolation. The aperture D indicates the diameter of the optics (at measuring distance 0), this value is used to calculate measuring distances in intermediate distances, e.g. with the spot size calculator in the InfraWin software.

Type	Optics	Temperature Range	a : M *)	a [mm]	M [mm]	a1 [mm]	M1 [mm]	a2 [mm]	M2 [mm]	D [mm]
IS 320	4	550 ... 1400 °C (MB 14)	83 : 1	250	3	500	15	1000	39	9
		600 ... 1600 °C (MB 16)	125 : 1		2	500	13	1000	35	
		650 ... 1800 °C (MB 18)	192 : 1		1.3	500	12	1000	33	
	5	550 ... 1400 °C (MB 14)	92 : 1	600	6.5	1000	17	2000	43	
		600 ... 1600 °C (MB 16)	133 : 1		4.5	1000	14	2000	36	
		650 ... 1800 °C (MB 18)	188 : 1		3.2	1000	11.3	2000	32	
	6	550 ... 1400 °C (MB 14)	93 : 1	1400	15	2000	26	3000	43	
		600 ... 1600 °C (MB 16)	156 : 1		9	2000	17	3000	30	
		650 ... 1800 °C (MB 18)	200 : 1		7	2000	14	3000	26	
IGA 320	4	300 ... 1300 °C (MB 13)	125 : 1	250	2	500	13	1000	35	9
		400 ... 1800 °C (MB 18)	208 : 1		1.2	500	11.4	1000	32	
	5	300 ... 1300 °C (MB 13)	133 : 1	600	4.5	1000	13.5	2000	36	
		350 ... 1650 °C (MB 16.5)	188 : 1		3.2	1000	11.4	2000	32	
		400 ... 1800 °C (MB 18)	231 : 1		2.6	1000	10.3	2000	30	
	6	300 ... 1300 °C (MB 13)	156 : 1	1400	9	2000	16.8	3000	30	
		400 ... 1800 °C (MB 18)	233 : 1		6	2000	12.4	3000	24	

*) a : M: distance ratio (90% intensity), M: spot size, a: measuring distance, D: aperture (effective lens diameter)



Settings and Operation via the RS485 Interface

With connection to the power supply the instruments are ready for use immediately. Following the signal processing either can be done via the analog ouput (e.g. for connection of a digital display) or via the digital RS485 interface (for connection of a PC or to a PLC). The included InfraWin software enables easy instrument settings and multiple graphical temperature illustration views.

With RS485, long transmission distances can be realized and several pyrometers can be connected in a bus system.

InfraWin software enables:

- Easy instrument settings
- Display of temperature curves
- Graphic or tabular analysis, e.g. for printing out or exporting
- Quick spot size calculation

Reference Numbers

Type	Optics	Temperature Range		
		550 - 1400 °C (MB 14)	600 - 1600 °C (MB 16)	650 - 1800 °C (MB 18)
IMPAC IS 320	4	3 903 200	3 903 400	3 903 230
	5	3 903 210	3 903 410	3 903 240
	6	3 903 220	3 903 420	3 903 250

Type	Optics	Temperature Range		
		300 - 1300 °C (MB 13)	450 - 1650 °C (MB 16.5)	400 - 1800 °C (MB 18)
IMPAC IGA 320	4	3 903 300	-	3 903 330
	5	3 903 310	3 903 370	3 903 340
	6	3 903 320	-	3 903 350

Scope of delivery: Instrument with selectable optics, inspection sheet, and manual

Ordering note: A connection cable is not included in scope of delivery and must be ordered separately

Accessories

3 920 030	Connection cable, 2 m (straight connector)
3 920 040	Connection cable, 5 m (straight connector)
3 920 050	Connection cable, 10 m (straight connector)
3 920 060	Connection cable, 15 m (straight connector)
3 920 070	Connection cable, 20 m (straight connector)
3 920 080	Connection cable, 25 m (straight connector)
3 920 090	Connection cable, 30 m (straight connector)
3 920 130	Connection cable, 2 m (90° connector)
3 920 140	Connection cable, 5 m (90° connector)
3 920 150	Connection cable, 10 m (90° connector)
3 920 160	Connection cable, 15 m (90° connector)
3 920 170	Connection cable, 20 m (90° connector)
3 920 180	Connection cable, 25 m (90° connector)
3 920 190	Connection cable, 30 m (90° connector)
3 920 100	Adapter cable (0.2 m) 8 pin onto 12-pin IMPAC standard connector
3 852 290	Power supply NG DC, 100 ... 240 V AC, 50 ... 60 Hz to 24 V DC, 1 A
3 852 550	Power supply NG 2D, 85 ... 265 V AC, 48 ... 62 Hz to 24 V DC, 600 mA, with 2 limit switches
3 852 600	USB nano: Converter RS485 to USB
3 852 610	USB LabKit, adapter RS485 to USB with targeting light push-button and analog output clamp, pyrometer cable, power supply 100...240 V AC
3 890 640	DA 4000-N, LED-display, 2-wire power supply (specify 230 or 115 V AC)
3 890 650	DA 4000, LED-display, 2-wire power supply, 2 limit switches (relay contacts) (specify 230 or 115 V AC)
3 890 530	DA 6000, LED-display, RS485, max. value storage, analog output
3 826 510	PI 6000: PID programmable controller, extremely fast, for digital IMPAC pyrometers
3 826 520	PI 6000-N: PID programmable controller, extremely fast, for pyrometers with analog output
3 890 150	DA 6000-T, digital display for measurement of the cooling-off time from 800 °C to 500 °C (for welding processes), RS232 interface
3 852 580	RS232 to USB converter (matched to DA 6000-T)
3 834 230	Adjustable mounting support, stainless steel
3 846 170	Mounting tube (L 600 x Ø 70 mm)
3 835 180	Air purge unit, stainless steel
3 835 240	90° mirror (with air purge)
3 843 460	SCA 300, scanning attachment with quartz glass window; 24 V AC/DC
3 835 290	Air purge for scanner

Accessory Overview

Mechanical Overview

Mounting Tube

Scanning Attachment SCA 300

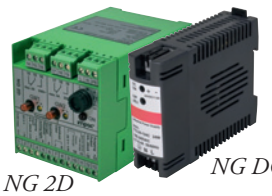
Air Purge

Air Purge for Scanning Attachment

90° Mirror (with Air Purge)

Electrical Overview

LED Digital Display DA 6000



NG 2D *NG DC*

Power Supplies

USB-LabKit

Converter RS485 to USB

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