LUMASENSE®
TECHNOLOGIES

IMPAC Infrared Temperature Sensors

Stationary, digital pyrometer for non-contact temperature measurement in ranges between 50 and 1800 °C

IGA 6/23 Advanced

$C\epsilon$

• Wide temperature ranges for flexible process adaptation

• Highest accuracy and repeatability in its class

• Fully digital core for sub-ranging and adopted analog output

• Reponse time of 0.5 ms for very fast and highly dynamic processes

• High-end optics with manual focus capability

• 4 digit LED display

• Robust, stainless steel sensor for harsh environments (IP65/NEMA4)

The IGA 6/23 Advanced is a digital, compact, and fast infrared measuring instrument for non-contact temperature measurement on metals, ceramics, or graphite.

For optimal match to the application, the instrument is equipped with a high-end optics with manual focus.

The fast response time of only 0.5 ms facilitates the measurement of fast and dynamic processes or short temperature peaks.

The integrated 4 digit LED display indicates the current measuring temperature or the currently set measuring distance.

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.

The pyrometers can be connected to a PC through an RS485 to USB connection, enabling you to make parameter adjustments using the InfraWin software. The software can be used for temperature indication, data logging, and further analyzing of complete temperature processes.

Typical applications:

• Induction processes (e.g. Hardening, Welding, Brazing, Soldering etc.)

• Preheating

• Tempering

• Heating and cooling processes

• Melting

• Annealing

• Rolling

• Forging

• Sintering

Technical Data

Measurement Specifications

Temperature Ranges:	50 to 1000 °C (MB 10) 75 to 1300 °C (MB 13) 150 to 1800 °C (MB 18)
Sub Range:	Any range adjustable within the temperature range, minimum span 50 °C
Spectral Range:	2 to 2.6 µm (main wavelength 2.3 µm)
Resolution:	0.1 °C or 0.2 °F at interface; < 0.0015% of adjusted temperature range at analog output, 16 bit; 1 °C or 1 °F on display
Emissivity ε:	0.050 to 1.000 in steps of 1/1000
Transmittance τ:	0.050 to 1.000 in steps of 1/1000
Exposure Time t_{90}:	0.5 ms; (with dynamic adaption at low signal levels) adjustable to: 1 ms; 3 ms; 5 ms; 10 ms; 50 ms; 250 ms; 1 s; 3 s; 10 s
Measurement Uncertainty: (ε = 1, t_{90} = 1 s, $T_{Amb.}$ = 25 °C)	< 1500 °C: 0.3% of reading in °C + 2 °C > 1500 °C: 0.6% of reading in °C
Repeatability: (ε = 1, t_{90} = 1 s, $T_{Amb.}$ = 25 °C)	0.15% of reading in °C + 1 °C

Optical Specifications

Sighting:	Built-in laser aiming light (max. power level < 1 mW, λ = 630 to 680 nm, CDRH class II) or through-lens sighting
Optics:	Manually focusable from rear cover measuring distance a = 210 to 5000 mm
Distance Ratio:	MB 10: approx. 50:1 MB 13: approx. 100:1 MB 18: approx. 350:1

Environmental Specifications

Protection Class:	IP 65 IEC 60529 (value in mated condition)
Operating Position:	any
Ambient Temperature:	0 to 70 °C at housing
Storage Temperature	-20 to 80 °C
Relative Humidity:	Non condensating conditions
Weight:	0.6 kg
Housing:	Stainless steel
CE Label:	According to EU directives about electromagnetic immunity

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

Note: The calibration / adjustment of this pyrometer is carried out in accordance with VDI/VDE 3511, Part 4.4. See http://info.lumasenseinc.com/calibration for more information.

Interface

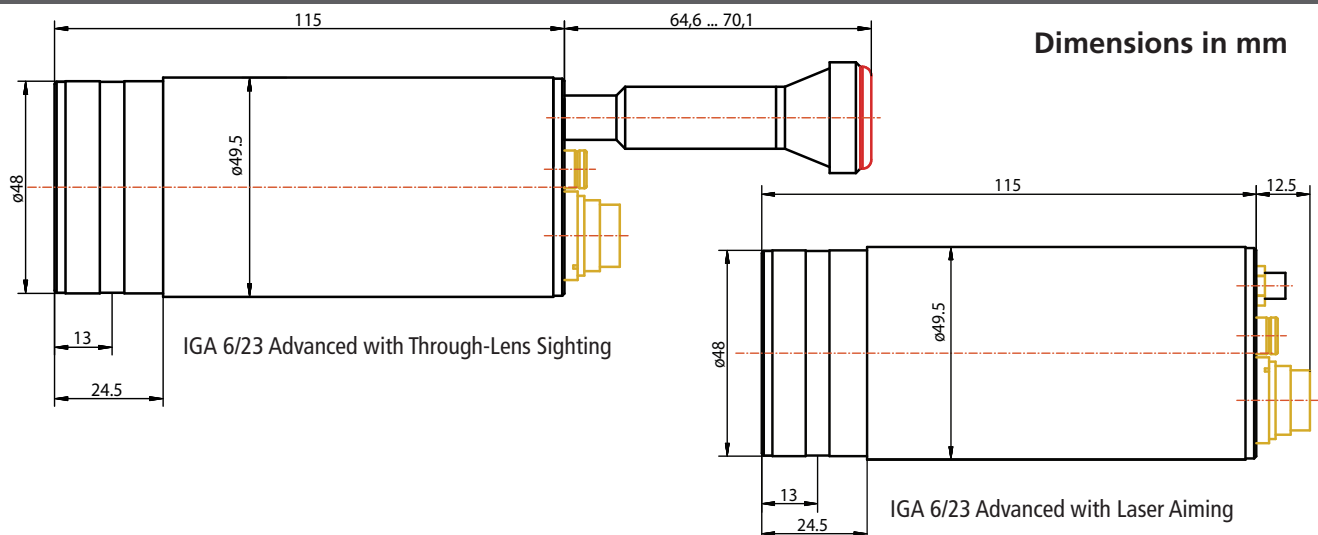|	
Connection:	12-pin connector
Display (in rear cover):	LED, 4 digit matrix, 5 mm high temperature signal or measuring distance
Parameters:	Adjustable via interface: emissivity, sub range, ambient temperature compensation, settings for maximum value storage, address, baud rate, transmittance, response time t_{90}, 0 to 20 mA or 4 to 20 mA analog output range, °C / °F Readable via interface: measured value, internal temperature of the unit, measuring distance

Communication

Analog Output:	Adjustable 0 to 20 mA or 4 to 20 mA, linear (via digital interface)
Digital Interface:	RS485 addressable (half-duplex) Baud rate: 1200 Bd to 115.2 kBd or RS232
Maximum Value Storage:	Built-in single or double storage. Clearing with adjusted time t_{clear} (off; 10 ms; 50 ms; 250 ms; 1 s; 5 s; 25 s), via interface, automatically with the next measuring object, hold-function

Electrical

Power Supply:	24 V DC ± 25%, ripple must be less than 50 mV
Power Consumption:	Max. 3 W (incl. laser)
Load (analog output):	0 to 500 Ω
Isolation:	Power supply, analog output, and digital interface are galvanically isolated from each other

Product Schematic

Dimensions in mm

115 | 64,6 ... 70,1

ø48 | ø49.5

13
24.5

IGA 6/23 Advanced with Through-Lens Sighting

115 | 12.5

ø48 | ø49.5

13
24.5

IGA 6/23 Advanced with Laser Aiming

Sighting

IGA 6/23 Advanced with Through-Lens Sighting

IGA 6/23 Advanced with Laser Aiming

CAUTION
LASER RADIATION
DO NOT STARE INTO BEAM
WAVELENGTH: 630-680nm
<1mW MAXIMUM
CLASS II LASER PRODUCT

Optics

The optics can be manually adjusted at all distances between 210 mm and 5000 mm.

The table below shows examples of distances and the corresponding spot diameters:
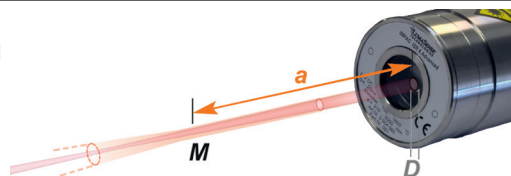
IGA 6/23 Advanced

distance *a* [mm]	Spot diameter M [mm] MB 10	Spot diameter M [mm] MB 13	Spot diameter M [mm] MB 18
210	4.2	2.1	0.6
300	6	3	0.9
500	10	5	1.5
800	16	8	2.3
1300	26	13	3.7
2000	40	20	5.8
5000	100	50	15

Effective aperture D for all temperature ranges:
13 mm (focused to longest distance) to 15 mm (focused to shortest distance)

Reference Numbers

Type	Temperature Range	With Through-Lens Sighting		With Laser Aiming	
		RS485	RS232	RS485	RS232
IGA 6/23 Advanced	50 to 1000 °C (MB 10)	3 914 220	3 914 340	3 914 210	3 914 330
	75 to 1300 °C (MB 13)	3 914 260	3 914 380	3 914 250	3 914 370
	150 to 1800 °C (MB 18)	3 914 300	3 914 420	3 914 290	3 914 410

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Scope of delivery: Pyrometer with PC software InfraWin for adjustment and evaluation, Works Certificate, and Manual.

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

Accessories

3 820 320 Special connection cable with plug and key for pilot light, 5 m

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*

3 820 340 Connection cable, 5 m, 90° connector*

3 820 530 Connection cable, 10 m, 90° connector*

3 820 540 Connection cable, 15 m, 90° connector*

3 820 830 Connection cable, 20 m, 90° connector*

3 820 840 Connection cable, 25 m, 90° connector*

3 820 550 Connection cable, 30 m, 90° connector*

3 852 290 Power supply NG DC for DIN rail mounting; 100 to 240 V AC => 24 V DC, 1 A

3 852 550 Power supply NG 2D for DIN rail mounting; 85 to 265 V AC => 24 V DC, 600 mA with 2 settable limit switches

3 826 750 USB to RS485 adapter cable, HS-Version, 1.8 m long

3 852 440 Protocol transducer RS485/RS232 (switch.) <-> Profibus-DP for 1 device

3 852 460 Protocol transducer RS485 <-> Profibus DP for 32 devices

3 852 620 Protocol converter UPP RS485 or RS232 <-> ProfiNet, for 1 pyrometer

3 852 630 Protocol converter UPP RS485 <-> ProfiNet, for max. 32 pyrometers

3 891 220 DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 115 V AC

3 890 650 DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 230 V AC

3 890 570 DA 6000-N digital display, to allow adjustment of Pyrometer through RS485 interface

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

3 890 630 LD24-UTP; large digital indicator, 57 mm height of digits

3 843 490 SCA 5, External Scanner Series 5 & 6 with fused silica window, 24 V AC/DC

3 846 260 Instrument's support (Series 5 & 6)

3 834 210 Adjustable mounting support (Series 5 & 6)

3 846 290 Instrument's support (Series 5 & 6) with fused silica window

3 835 590 90° mirror for Series 5, quartz glass window

3 843 250 ROT 5 scanning mirror attachment up to 70°

3 835 160 Air purge unit, aluminium

3 837 230 Water cooling jacket (heavy duty) with integrated air purge unit

3 837 280 Water cooling jacket (heavy duty) with fused silica window

3 837 500 Water cooling jacket (light duty, with air purge unit (only for instruments with laser targeting)

3 837 510 Water cooling jacket (light duty), with fused silica window (only for instruments with laser targeting)

3 837 540 Cooling plate for series 5 and 6, with air purge

3 846 590 Vacuum flange KF16 with quartz glass window

*All connection cables include a short adapter cable with a 9-pin SUB-D connector. This connector may be used in combination with the RS485 to USB adapter.