Pyrometer with fiber optics for non-contact measurements on metals, ceramics, graphite etc. with temperature ranges between 250 and 3500 °C

IS 50-LO plus • IGA 50-LO plus

- Very short response time below 1 ms
- Extremely small spot sizes, min. 0.45 mm
- Built-in LC display
- Laser targeting light
- Parameter adjustments via integrated key pad or interface
- Interface RS232 / RS485 switchable
- Test current output

The pyrometers **IS 50-LO plus** and **IGA 50-LO plus** are digital, highly accurate infrared measuring instruments with fiber optics for non-contact temperature measurement on metals, ceramics, graphite etc. between 250 and 3500 °C.

The **IS 50/055-LO plus** and **IS 50/067-LO plus** are special versions with extremely short wavelengths where e.g. molten metal has a very high emissivity.

The instrument type **IS 50-Si-LO plus** is optimized for measurements on silicon wafers, e. g. in vacuum chambers.

The **IS 50-Al-LO plus** is specially designed for measurements on aluminum parts and profiles.

The instruments are equipped with a fibre and an exchangeable optical head. The fiber and optical head are unaffected by electromagnetical interferences (e. g. induction) and can be used in high ambient temperatures up to 250 °C.

Two different types of optical heads for different measuring distances and very small spot sizes are available. A laser targeting light enables the exact alignment onto the measuring object.

The very short response time of below 1 ms facilitates the measurement of fastest heating processes.

The pyrometers are equipped with a display which shows in measuring mode the current temperature. Additionally, all parameters can be read if they are changed via the integrated keys at the instrument.

The temperature can be displayed and stored via serial interface and the software InfraWin. Parametrizing can also be done via interface or PC software InfraWin.

Typical Applications:

- metal moulds
- pressing tools
- bearings, bearing housings
- preheating
- annealing
- tempering
- sintering
- soldering
- rolling
- brazing
- normalizing

Technical Data

Measurement Specifications		
Temperature Range:	IS 50-LO plus	550...1400 °C (MB 14) 600...1600 °C (MB 16) 650...1800 °C (MB 18) 750...2500 °C (MB 25) 900...3300 °C (MB 33) 550...1800 °C (MB 18L)
	IS 50/055-LO plus	1000...2300 °C (MB 23)
	IS 50/067-LO plus	1100...3500 °C (MB 35)
	IS 50-AI-LO plus	400...1000 °C (MB 10)
	IS 50-Si-LO plus	400...1300 °C (MB 13) 500...1600 °C (MB 16)
	IGA 50-LO plus	300...1300 °C (MB 13) 350...1800 °C (MB 18) 450...2500 °C (MB 25) 250...1350 °C (MB 13,5L) 300...2000 °C (MB 20L) 350...2500 °C (MB 25L)
Subrange:	any range adjustable within the temperature range, minimum span 51 °C	
Spectral Ranges:	IS 50-LO plus	0.7 ... 1.1 µm
	IS 50/055-LO plus	0.55 µm
	IS 50/067-LO plus	0.676 µm
	IS 50-Si-LO plus & IS 50-AI-LO plus	narrow band in the near infrared
	IGA 50-LO plus	1.45 ... 1.8 µm
Signal Processing:	fotoelectric current, digitized immediately	
Meas. uncertainty: (at ε=1, T_{90}=1 s, T_{amb}:=23 °C)	below 1500 °C: 0.3% of measured value in °C + 1 °C above 1500 °C: 0.5% of measured value in °C	
Resolution:	Interface and display: 0.1°C, analog output: < 0.1 % of the adjusted temperature range	
Repeatability: (at ε=1, T_{90}=1 s, T_{amb}:=23 °C)	0.1% of reading in °C + 1 °C	
Emissivity ε:	20 ... 100% adjustable inside the instrument or via interface in steps of 0.1%	
Exposure Time t_{90}:	< 1 ms; adjustable to 0.01 s; 0.05 s; 0.25 s; 1 s; 3 s; 10 s	
Sighting:	Laser targeting (max. power level < 1 mW, λ = 630-680 nm, CDRH class II)	

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.

Maximum Value Storage:	Single or double storage; cleared by: preselected time interval or external deletion contact or via digital interface or automatically with the next measuring object	
Communication / Interface		
Analog Ouput:	linear 0 ... 20 mA or 4 ... 20 mA, DC, switchable; load max. 500 Ohm	
Serial Interface:	Switchable: RS232 or RS485 (addressable), half duplex, baud rate 1.2 up to 115 kBd	
Display:	Illuminated LC display for temperature indication or parameter settings	
Switch contact:	Max. 0.15 A (to recognize a hot object in the measuring beam)	
Test Current Output:	Fixed 10 mA (for 0 to 20 mA analog output) or fixed 12 mA (for 4 to 20 mA analog output) for inspection of wiring and connected instruments	
Parameters:	Adjustable at the instrument or via serial interface: emissivity ε, exposure time t_{90}, analog output, address, baud rate, waiting time, °C / °F, setting of the maximum value storage, temperature sub range	
Electrical		
Power Supply:	24 V AC or DC (12 - 30 V AC or DC) (AC: 48 - 62 Hz)	
Power Consumption:	max. 2 W	
Isolation:	Power supply, digital interface, analog output are galvanically isolated against each other	
Environmental		
Ambient Temperature:	IS 50-LO plus & IGA 50-LO plus	0 ... 60 °C on the converter, up to 250 °C on side of fiber/ optical head
	IS 50-Si-LO plus & IS 50-AI-LO plus	20 ... 30 °C on the converter, up to 250 °C on side of fiber / optical head
Storage Temp. :	-20 ... 70 °C	
Rel. Humidity:	Non condensing conditions	
Protection Class:	IP54	
Weight:	Converter: 600 g; optical head II: 140 g; fiber (2.5 m): 250 g	
CE-Label:	according to EU directives about electromagnetic immunity	

Fiber

The transmission between optical head and converter is done via 0.2 mm (red fiber mark) mono fiber with a stainless steel protection hose (exceptions: IS 50-Si-LO plus, MB 13: 0.4 mm mono fiber (blue mark) and IS 50-AI-LO plus: 0.6 mm mono fiber (green mark)).

The optical head contains only the lens, the sensor and the electronics are located in the converter. Fiber and optical head can be used in ambient temperatures up to 250 °C without additional cooling (fiber at converter side max. 125 °C).

Minimum bending radius (in mm):

	Red	Blue	Green
for short time (max. 250 °C):	50	100	150
permanent (max. 250 °C):	120	300	500
wound up (max. 50 °C):	120	300	500

Optics

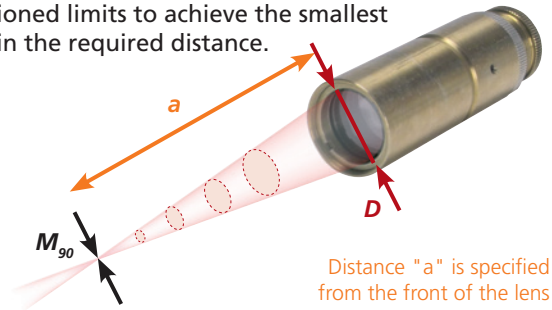
Depending on the application the instrument will be delivered with a small or a large optical head. The selection of the optical head depends not only on its size but also on the required spot size (size of the measuring object) and the measuring distance.

Optical head I:
With the very small dimensions the optical head I is suited for use in confined spaces. The optics is adjusted to one of the measuring distances mentioned in the table. The mentioned spot size will be achieved in exactly this distance (other distances on request).

Optical head II:
The optics II is bigger, but smaller spot sizes can be achieved. Two designs are available, fixed adjusted or focusable:

Similar to optics I the fixed adjusted type is adjusted to one of the measuring distances mentioned in the table (other distances on request).

The focusable type is available for 6 different distance ranges. Each measuring distance can be adjusted within the mentioned limits to achieve the smallest spot size in the required distance.



Distance "a" is specified from the front of the lens

Optical Head I	Measuring distance a [mm]	Spot size M_{90} [mm]			Aperture D [mm]
		IS 50-LO plus IS 50/055-LO plus IS 50/067-LO plus IS 50-Si-LO plus, MB 16 IGA 50-LO plus	IS 50-Si-LO plus MB 13	IS 50-Al-LO plus	
Optical head I: 	Adjusted to: 120	1.2	2.2	3.3	7
	Adjusted to: 260	2.6	5	7.5	7
	Adjusted to: 700	7.2	14	21	7
Optical head II: **(fixed adjusted)** 	Adjusted to: 87	0.45	0.75	1.1	17
	Adjusted to: 200	0.8	1.5	2.3	17
	Adjusted to: 600	2.7	5.3	8.0	15
	Adjusted to: 4500	22	42	63	15
Optical head II: **(focusable)** 	Range: 88 ... 110	0.45 ... 0.6	0.8 ... 1.1	1.2 ... 1.7	17
	Range: 95 ... 129	0.5 ... 0.75	0.9 ... 1.3	1.4 ... 2.0	16
	Range: 105 ... 161	0.6 ... 1	1.1 ... 1.7	1.7 ... 2.6	15
	Range: 200 ... 346	0.8 ... 1.5	1.5 ... 2.8	2.3 ... 4.2	17
	Range: 247 ... 606	1.1 ... 2.7	2.0 ... 5.2	3.0 ... 7.8	16
	Range: 340 ... 4500	1.5 ... 22	2.8 ... 42	4.2 ... 63	15

Features

Reference numbers

IS 50-LO plus		
3 882 500	550 ... 1400 °C	(MB 14)
3 882 520	600 ... 1600 °C	(MB 16)
3 882 540	650 ... 1800 °C	(MB 18)
3 882 560	750 ... 2500 °C	(MB 25)
3 882 580	900 ... 3300 °C	(MB 33)
3 882 600	550 ... 1800 °C	(MB 18L)

IS 50/055-LO plus		
3 882 680	1000 ... 2300 °C	(MB 23)

IS 50/067-LO plus		
3 882 690	1100 ... 3500 °C	(MB 35)

IS 50-Si-LO plus		
3 882 660	400 ... 1300 °C	(MB 13)
3 882 640	500 ... 1600 °C	(MB 16)

IS 50-Al-LO plus		
3 882 840	400 ... 1000 °C	(MB 10)

IGA 50-LO plus		
3 882 700	300 ... 1300 °C	(MB 13)
3 882 720	350 ... 1800 °C	(MB 18)
3 882 740	450 ... 2500 °C	(MB 25)
3 882 760	350 ... 1350 °C	(MB 13.5L)
3 882 780	300 ... 2000 °C	(MB 20L)
3 882 800	350 ... 2500 °C	(MB 25L)

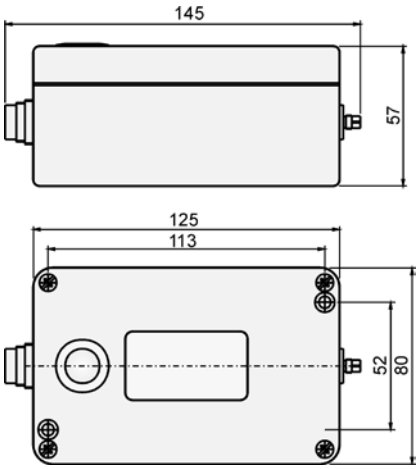
Scope of delivery: Converter, mono fiber 2.5 m, one selectable optical head (please specify when ordering), works certificate, InfraWin operating and analizing software, user manual.
Ordering note: A connection cable is not included in scope of delivery.

Accessories

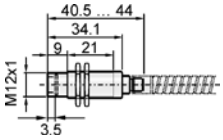
3 820 330 Connection cable, length 5 m, straight connector
3 820 500 Connection cable, length 10 m, straight connector
3 820 510 Connection cable, length 15 m, straight connector
3 820 810 Connection cable, length 20 m, straight connector
3 820 820 Connection cable, length 25 m, straight connector
3 820 520 Connection cable, length 30 m, straight connector
3 834 390 Ball and socket mounting for optical head I or II
3 834 230 Adjustable mounting support for optical head II
3 835 170 Air purge for optical head I
3 835 180 Air purge for optical head II
3 835 240 90° mirror for optical head II
3 852 290 Power supply NG DC for DIN rail mounting; 100 to 240 V AC ⇒ 24 V DC, 1 A
3 890 640 LED digital display DA 4000-N
3 890 650 LED digital display DA 4000: with 2 limit switches
3 890 560 LED digital display DA 6000-N: with possibility for pyrometer parameter settings for digital IMPAC pyrometers; RS232 interface
3 890 520 LED digital display DA 6000; DA 6000-N additional with 2 limit switches and analog input and output
3 826 500 HT 6000, portable battery driven indicator and instrument for pyrometer parameter setting

Dimensions

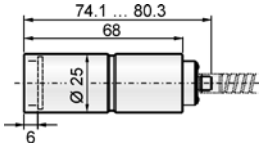
Converter:



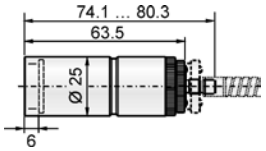
Optical head type I:



Optical head type II: (fixed adjusted)



Optical head type II: (focusable)



All dimensions in mm

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