

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 pyrometers with fiber optics for non-contact temperature measurement on metals, ceramics, graphite etc. between 250° and 2500°C.

The **IS 50/67-LO plus** is a special version with an extremely short wavelength where 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-AI-LO plus** is specially designed for measurements on aluminum parts and profiles.

The instrument is equipped with a fibre and an exchangeable optical head. The fiber and optical head are unaffected by electromagnetic 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 pyrometer is 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.

Via serial interface and the provided software *InfraWin* the temperature can be displayed and stored on a PC, parametrizing can also be done.

Typical field of application:

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

Technical Data

Temperature ranges:	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 50/67-LO plus: 1100 - 3500°C (MB 35) IS 50-AI-LO plus: 400 - 1000°C (MB 10)	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) IS 50-Si-LO plus: 400 - 1300°C (MB 13) 500 - 1600°C (MB 16)
Subrange:	Any range adjustable within the temperature range, minimum span 51°C	
Spectral range:	IS 50-LO plus: 0.7 - 1.1 µm; IS 50-Si-LO plus; IS 50-AI-LO plus: narrow band in the near infrared IS 50/67-LO plus: 0.676 µm IGA 50-LO plus: 1.45 - 1.8 µm	
IR detector:	IS 50-LO plus; IS 50/67-LO plus; IS 50-Si-LO plus; IS 50-AI-LO plus: Silicon photo diode (Si) IGA 50-LO plus: Indium Gallium Arsenide photo diode (InGaAs)	
Signal processing:	Photo current, digitized immediately	
Power supply:	24 V AC or DC (12 - 30 V AC or DC) (AC: 48 - 62 Hz)	
Power consumption:	Max. 2 W	
Analog output:	0 - 20 mA or 4 - 20 mA (linear), switchable; load: 0 - 500 Ω	
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	
Serial interface:	Switchable: RS232 or RS485 (addressable), half duplex, baud rate 1.2 up to 115 kBd	
Resolution:	Interface and display: 0.1°C, analog output: < 0.1 % of the adjusted temperature range	
Isolation:	Power supply, digital interface, analog output are galvanically isolated against each other	
Display:	Illuminated LC display for temperature indication or parameter settings	
Parameters:	Adjustable at the instrument or via serial interface: emissivity; exposure time; analog output; address; baud rate; waiting time; °C or °F; setting of the maximum value storage; temperature sub range	
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	
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	
Switch contact:	Max. 0.15 A (to recognize a hot object in the measuring beam)	
Meas. uncertainty: (ε = 1, t ₉₀ = 1 s, T _{amb.} = 23°C)	Up to 1500°C: 0.3% of reading in °C + 1°C Above 1500°C: 0.5% of reading in °C	
Repeatability:	0.1% of reading in °C + 1°C (ε = 1, t ₉₀ = 1 s, T _{amb.} = 23°C)	
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 temperature:	-20 to 70°C	
Rel. humidity:	Non condensing conditions	
Sighting:	Laser targeting (max. power level < 1 mW, λ = 630-680 nm, CDRH class II)	
Protection class:	IP65 (DIN 40050)	
Weight:	Converter: 600 g; optical head II: 140 g; fibre (2.5 m): 250 g	
CE-label:	According to EU directives about electromagnetic immunity	



Features

Advantages of the digital signal processing: The signal processing of series 50 pyrometers is fully digital, i. e. the detector signal are digitized immediately and digitally processed. With this technique an extremely high accuracy and repeatability is achieved.

Accuracy: The high accuracy is achieved by the digital linearisation of the sensor output as well as the digital compensation for the ambient temperature.

Temperature range: Due to the digital technique any temperature sub range within the full temperature range can be set. The analog measuring output corresponds automatically to the selected sub range. This setting of a sub range does not effect the high accuracy and repeatability.

Output: The analog measuring outputs 0 - 20 mA or 4 - 20 mA are selectable as well as the serial digital interfaces RS232 or RS485. Additionally the interface allows the controlling of the pyrometer via PC.

Bus control: The serial interface RS485 facilitates the integration of the pyrometer into existing field bus systems.

Calibration: If necessary a calibration of the pyrometers can be done with help of a PC and a calibration source without opening the housing.



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:

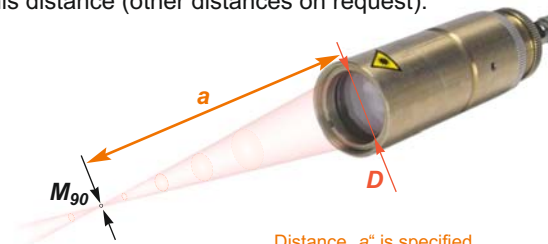
With the very small dimensions the optical head I is suited for use in confined spaces. The optics is adjusted to one of the measuring distances mentioned in the table. The mentioned spot size will be achieved in exactly this distance (other distances on request).

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	Measuring distance a [mm]	Spot size M_{90} [mm]	Aperture D [mm]
Optical head I: 	Adjusted to: 120	1.2	7
	Adjusted to: 260	2.6	7
	Adjusted to: 700	7.2	7
Optical head II: (fixed adjusted) 	Adjusted to: 87	0.45	17
	Adjusted to: 200	0.8	17
	Adjusted to: 600	2.7	15
	Adjusted to: 4500	22	15
Optical head II: (focusable) 	Range: 88 to 110	0.45 to 0.6	17
	Range: 95 to 129	0.5 to 0.75	16
	Range: 105 to 161	0.6 to 1	15
	Range: 200 to 346	0.8 to 1,5	17
	Range: 247 to 606	1.1 to 2.7	16
	Range: 340 to 4500	1.5 to 22	15

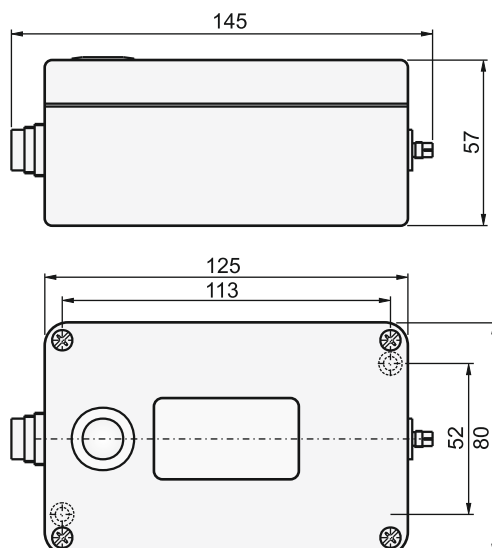
Fiber

The transmission between optical head and converter is done via 0.2 mm mono fiber with a stainless steel protection hose. 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 (fibre at converter side max. 125°C).

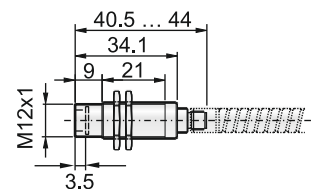
Minimum bending radius: for short time (max. 250°C): 50 mm
 permanent (max. 250°C): 120 mm
 wound up (max. 50°C): 120 mm

Dimensions

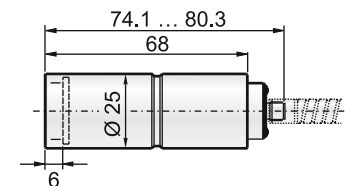
Converter:



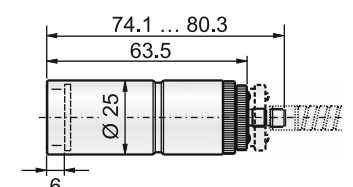
Optical head type I:



Optical head type II: (fixed adjusted)



Optical head type II: (focusable)



All dimensions in mm

Reference Numbers

IS 50-LO plus:	
3 882 500	550 to 1400°C (MB 14)
3 882 520	600 to 1600°C (MB 16)
3 882 540	650 to 1800°C (MB 18)
3 882 560	750 to 2500°C (MB 25)
3 882 580	900 to 3300°C (MB 33)
3 882 600	550 to 1800°C (MB 18L)
IS 50/67-LO plus:	
3 882 690	1100 to 3500°C (MB 35)
IS 50-Si-LO plus:	
3 882 640	500 to 1600°C (MB 16)
3 882 660	400 to 1300°C (MB 13)
IS 50-Al-LO plus:	
3 882 840	400 to 1000°C (MB 10)

IGA 50-LO plus:	
3 882 700	300 to 1300°C (MB 13)
3 882 720	350 to 1800°C (MB 18)
3 882 740	450 to 2500°C (MB 25)
3 882 760	250 to 1350°C (MB 13,5L)
3 882 780	300 to 2000°C (MB 20L)
3 882 800	350 to 2500°C (MB 25L)

Scope of delivery:

Converter, mono fibre 2.5 m, one selectable optical head (please specify when ordering), works certificate, *InfraWin* operating and analyzing software, user manual.

Note: A connection cable is not included in scope of delivery.

Accessories:

3 820 330	Connection cable, length 5 m, straight connector	3 834 230	Adjustable mounting support for optical head II
3 820 500	Connection cable, length 10 m, straight connector	3 835 170	Air purge for optical head I
3 820 510	Connection cable, length 15 m, straight connector	3 835 180	Air purge for optical head II
3 820 810	Connection cable, length 20 m, straight connector	3 835 240	90° mirror for optical head II
3 820 820	Connection cable, length 25 m, straight connector	3 852 290	Power supply NG DC for DIN rail mounting; 100 ... 240 V AC ⇒ 24 V DC, 1 A
3 820 520	Connection cable, length 30 m, straight connector	3 890 640	LED digital display DA 4000-N
3 836 400	Fiber, 5 m	3 890 650	LED digital display DA 4000: with 2 limit switches
3 836 410	Fiber, 7.5 m	3 890 560	LED digital display DA 6000-N: with possibility for pyrometer parameter settings for digital IMPAC pyrometers; RS232 interface
3 836 420	Fiber, 10 m	3 890 520	LED digital display DA 6000; DA 6000-N additional with 2 limit switches and analog input and output
3 836 430	Fiber, 15 m	3 826 500	HT 6000, portable battery driven indicator and instrument for pyrometer parameter setting
3 836 440	Fiber, 30 m		
3 834 370	Mounting angle for optical head I (fixed)		
3 834 380	Mounting angle for optical head I (adjustable)		
3 834 390	Ball and socket mounting for optical head I or II		

Overview Accessories

Mounting:



Air purge units:



Digital displays:



Power supply:



Note: all mechanical accessories are made of stainless steel.

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Digital 2-color pyrometer with fiber optic for non-contact temperature measurement on metals, ceramics, graphite etc. between 700 and 3000°C

ISR 50-LO



- Short exposure time
- Very small spot sizes
- Built-in lens contamination control system
- HeavyDuty fiber connector for rough application conditions
- Built-in LC display
- All settings adjustable at the instrument or via interface
- Digital interface RS232 / RS485 (switchable)
- Test current output for diagnostics



The ISR 50-LO is a digital, highly accurate 2-color pyrometer with fiber optic for non-contact temperature measurements in temperature ranges between 700 and 3000°C.

The pyrometer measures in the 2-color principle (ratio principle) in which two adjacent wavelengths are used to calculate the temperature. This technique offers the following advantages compared with the standard one-color pyrometers:

- The temperature measurement is independent of the emissivity of the object in wide ranges.
- The measuring object can be smaller than the spot size.
- Measurements are unaffected by dust and other contaminants in the field of view or by dirty viewing windows.

Additionally the pyrometer can be switched to 1-color mode and used like a conventional pyrometer.

The instrument is equipped with an optical fiber, which can be used in very high ambient temperatures up to 250°C without cooling and it is unaffected by electromagnetic interferences.

The built-in display shows the current temperature or all instrument settings. Via the built-in keys all parameters can be changed if necessary.

Via serial interface and the provided software InfraWin the temperature can be displayed and stored on a PC, parametrizing can also be done.

Typical Applications:

- Induction heating
- Annealing
- Welding
- Forging
- Sintering
- Melting
- Rolling mill
- Rotary kilns
- Pouring stream
- Research and development
- Laser application

Technical Data

Measurement Specifications		Parameters:	Adjustable or readable at the instrument or via interface:
Temperature ranges:	700 - 1800°C (MB 18) 800 - 2500°C (MB 25) 1000 - 3000°C (MB 30)		Measuring temperature, operation mode (ratio/mono), emissivity slope or emissivity, exposure time, clear times for maximum value storage, hold function, analog output 0 - 20 or 4 - 20 mA, temperature sub range, switch-off level, contamination limit, RS485 address, baud rate, RS485 wait time, temperature display in °C or °F, error status, maximum internal temperature
Sub range:	Any range adjustable within the temperature range, minimum span 51°C		
Spectral ranges:	Channel 1: 0.9 µm Channel 2: 1.05 µm		
IR detector:	Silicon photo diode (Si/Si)		
Fiber:	MB 18: HD multi fiber 0.6 mm (green fiber mark) MB 25 and MB 30: HD mono fiber 0.2 mm (red fiber mark)		
Uncertainty: ($\varepsilon = 1$, $t_{90} = 1$ s, $T_{amb.} = 23^{\circ}\text{C}$)	Up to 1500°C: 0.5% of measured value in °C + 2°C Above 1500°C: 1% of measured value in °C		
Repeatability: ($\varepsilon = 1$, $t_{90} = 1$ s, $T_{amb.} = 23^{\circ}\text{C}$)	0.2% of measured value in °C + 2°C		
Resolution:	0.1°C on interface and display < 0.1% of temperature range at the analog output		
Exposure time t_{90} :	10 ms; adjustable to 0.01 s; 0.05 s; 0.25 s; 1 s; 3 s; 10 s		
Emissivity slope K:	0.8 - 1.2 adjustable in steps of 0.001		
Emissivity ε :	5 - 100% adjustable in steps of 0.1%		
Switch-off level:	2% - 50%, adjustable		
Maximum value storage:	Built-in single or double storage. Clearing with adjusted t_{clear} (off; 0.01 s; 0.05 s; 0.25 s; 1 s; 5 s; 25 s), extern, via interface or automatically with the next measuring object		
Internal LC display:	LC display for temperature indication or parameter settings		
Digital interface:	RS232 or RS485 addressable (half duplex), switchable; baud rate 1200 up to 115200 Bd		
Physical Characteristics		Dimensions:	See drawing on the right side
		Weight:	Converter: approx. 600 g Optical head: approx. 140 g Fiber (2.5 m): approx. 630 g
Environmental Specifications		Ambient temperature:	0 to 50°C on the converter; 0 to 250°C on side of the optical head
		Storage temperature:	-20 to 60°C
		Relative humidity:	Non condensing conditions
		Protection class:	IP65 (DIN 40050)
Electrical		Power supply:	24 V DC (18 - 36 V DC), ripple < 500 mV
		Power consumption:	Max. 1 W
		Analog Output:	0 - 20 mA or 4 - 20 mA (linear), switchable; test current 10 mA or 12 mA by pressing test key
		Load:	0 - 500 Ω
		Isolation:	Power supply, analog output and digital interface are galvanically isolated from each other
		Switch contact: Opto relay (AC/DC):	Switch contact for dirty window alarm max. switch current: 0,5 A; max. switch supply 60 V AC/DC
		CE label:	According to EU directives about electromagnetic immunity

Signal Processing

Advantages of the digital signal processing: The signal processing of series 50 pyrometers is fully digital, i. e. the detector signal is digitized immediately and digitally processed. With this technique an extremely high accuracy and repeatability is achieved.

Accuracy:	The high accuracy is achieved by the digital linearisation of the sensor output as well as the digital compensation for the ambient temperature.
Temperature range:	Due to the digital technique any temperature sub range within the full temperature range can be set. The analog measuring output corresponds automatically to the selected sub range. This setting of a sub range does not effect the high accuracy and repeatability.
Output:	The analog measuring outputs 0 ... 20 mA or 4 ... 20 mA are selectable as well as the serial digital interfaces RS232 or RS485. Additionally the interface allows the controlling of the pyrometer via PC.
Bus control:	The serial interface RS485 facilitates the integration of the pyrometer into existing field bus systems.
Calibration:	If necessary a calibration of the pyrometers can be done with help of a PC and a calibration source without opening the housing.

HD Optical Head

The instrument is delivered with a HD optical head II that is specially designed for the connection of a HD fiber. The optics has to be adjusted ex-works to the required measuring distance (possible range 340 to 4500 mm, measured from the front of the lens). Only in this distance the specified spot sizes will be achieved.



Measuring distance a [mm]	Spot size M_{90} [mm]		Aperture D [mm]
	0.6 mm fiber 700 ... 1800°C (MB 18)	0.2 mm fiber 800 ... 2500°C (MB 25); 1000 ... 3000°C (MB 30)	
340 mm	5.1	1.7	17
600 mm	9	3	17
1000 mm	15	5	17
4500 mm	66	22	17

HD Fiber

The transmission between optical head and converter is done via a heavy duty fiber with a stainless steel protection hose. Depending on the temperature range the fiber is designed in different thicknesses and built as mono fiber or multi fiber.

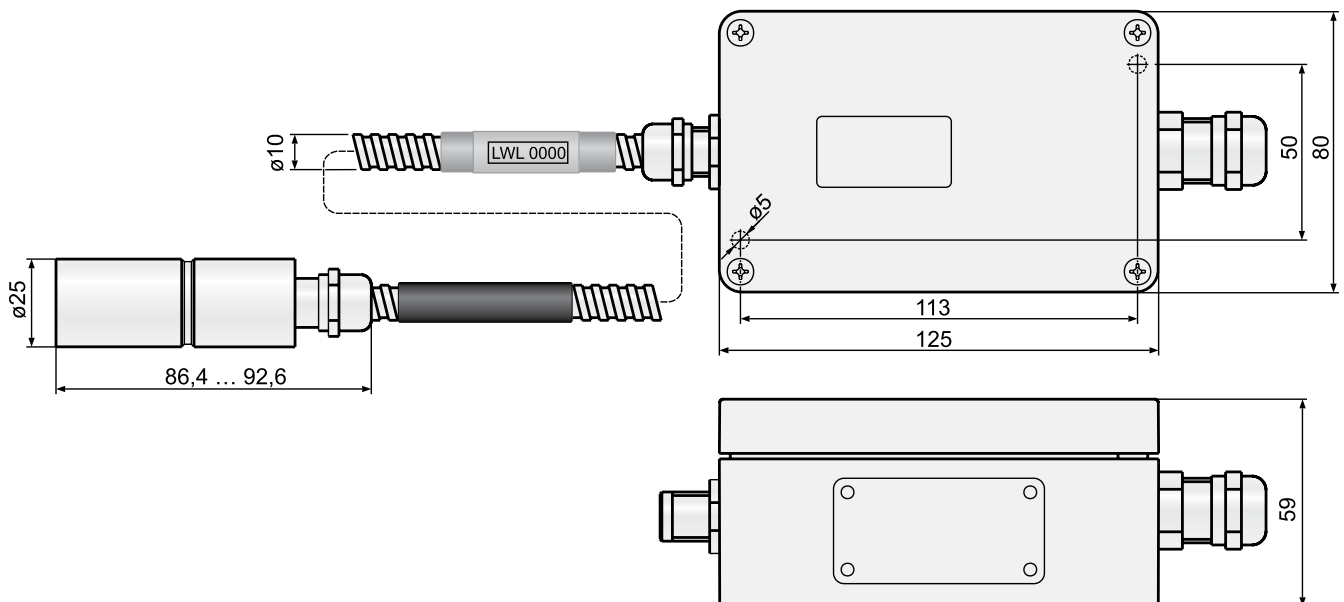
MB 18: HD multi fiber 0.6 mm (green fiber mark)

MB 25 and MB 30: HD mono fiber 0.2 mm (red fiber mark)

As the optical head contains only the lens system and the sensor and the electronics are located in the converter box, fiber and optical head can withstand ambient temperatures up to 250°C without cooling (fiber at converter side max. 125°C).

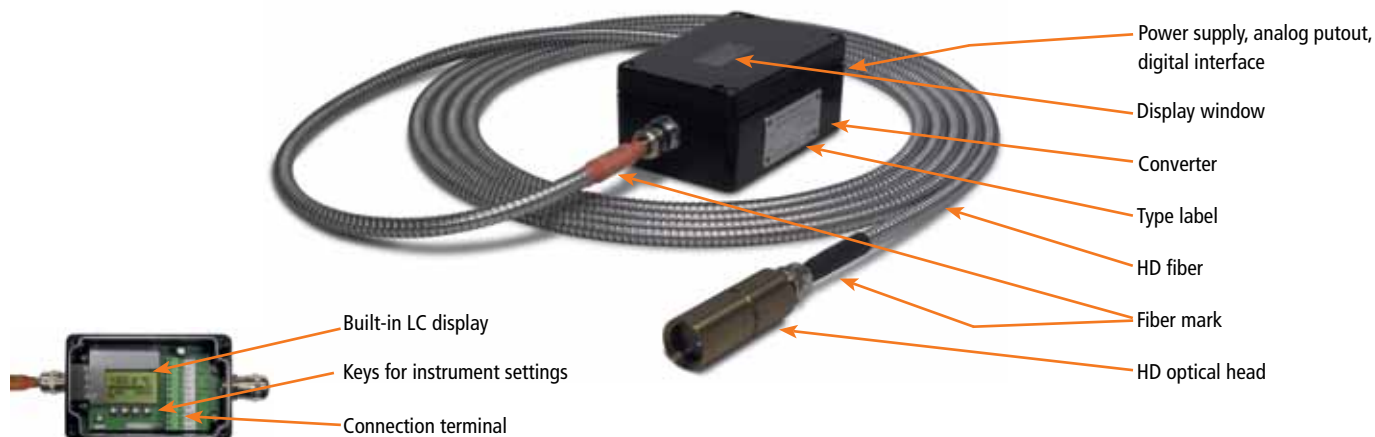
Minimum bending radius:			0.6 mm fiber	0.2 mm fiber
	for short time (max. 250°C):		30 mm	50 mm
permanent (max. 250°C):		50 mm	120 mm	
wound up (max. 50°C):		50 mm	120 mm	

Dimensions



All dimensions in mm

Features



Power supply, analog putout, digital interface

Display window

Converter

Type label

HD fiber

Fiber mark

HD optical head

Built-in LC display

Keys for instrument settings

Connection terminal

Reference numbers

Instruments:

Ref. number	Temperature range		
3 882 900	ISR 50-LO	MB 18	700 - 1800°C
3 882 910	ISR 50-LO	MB 25	800 - 2500°C
3 882 920	ISR 50-LO	MB 30	1000 - 3000°C

Scope of delivery:

Pyrometer ISR 50-LO consisting of converter, HD fiber, length: 2.5 m (other length 5 m, 6 m, 10 m or 15 m possible for extra charge) and optical head; works certificate, PC software „InfraWin“, user manual. A connection cable is not included in scope of delivery!

Notes:

When ordering the following data are necessary:

- the measuring distance the optical head has to be adjusted
- the length of the fiber in case of another length as the standard length of 2.5 m

Accessories:

3 821 440	Connection cable 5 m, 11 wires, with additional digital cable (1 m)
3 821 450	Connection cable 5 m, 4 wires (supply and analog output only)
on request	Fiber extension to total length of 5 m
on request	Fiber extension to total length of 6 m
on request	Fiber extension to total length of 10 m
on request	Fiber extension to total length of 15 m

3 834 390	Ball and socket mounting for optical head
3 834 230	Adjustable mounting support for optical head
3 835 180	Air purge for optical head
3 835 240	90° mirror for optical head
3 852 290	Power supply NG DC for DIN rail mounting; 100 - 240 V AC ⇒ 24 V DC, 1 A
3 852 540	Power supply NG 0D for DIN rail mounting; 85 - 265 V AC ⇒ 24 V DC, 600 mA
3 852 550	power supply NG 2D, as NG 0D: additionally with 2 limit switches
3 890 640	LED digital display DA 4000-N
3 890 650	LED digital display DA 4000: as DA 4000-N additionally with 2 limit switches
3 890 560	LED digital display DA 6000-N: with possibility for pyrometer parameter settings for digital
3 890 570	LED digital display DA 6000-N with RS485
3 890 520	LED digital display DA 6000; as DA 6000-N additional with 2 limit switches and analog input and output
3 890 530	LED digital display DA 6000 with RS485
3 890 630	ILD24-UTP, LED large display height of digits 57 mm
3 826 500	HT 6000, portable battery driven indicator and instrument for pyrometer parameter setting

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ISR50LO-Datasheet-EN - Rev. 12/13/2011

**Digital infrared thermometer with fibre optic
designed for the glass industry**

IS 50-LO/GL



- Adjustable temperature ranges between 600 and 1800°C
- High accuracy
- Ambience up to 250°C without cooling
- Robust design
- Simple parametrizing
- Integrated air purge
- Quick release for optical head
- Two wire technique



The pyrometer **IS 50-LO/GL** is specially designed for the glass industry. It is used for the temperature measurement of glass in tank, working end, forehearth and feeder. Additional applications are the measurement of brickworks in regenerator and tank.

Using a robust fiber optic cable (length up to 30 m) enables the use

of the instrument in an ambient temperature up to 250°C without cooling.

The IS 50-LO/GL 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 emissivity is exactly adjustable at the device, additionally any sub range and the response time via service interface. The instrument is equipped with a test function to check the correct connection.

Technical Data

Temperature range:	600 ... 1800°C
Sub range:	any range adjustable within the measuring range, minimum range 51°C
IR-detector:	Silicon photo diode
Spectral range:	0.8 ... 1.1 µm
Data handling:	Digital
Uncertainty:	< 1500°C: ± 0.3% of meas. value in °C + 1°C > 1500°C: ± 0.5% of meas. value in °C + 1°C
Repeatability:	0.1% of measured value in °C + 1°C
Resolution:	1°C
Emissivity ε:	0.05 ... 1.00; adjustable
Response time t ₉₀ :	250 ms, adjustable up to 10 s; ex works adjusted to 1 s
Test port:	4 ... 20 mA, temperature linear
Max. load:	700 Ohm at 24 V power supply
Temperature dependency:	0.2°C per °C variation from 23°C
Power supply:	24 V DC ± 25%, ripple max. 50 mV
Power consumption:	0.6 W
Interface:	Service interface RS232
Parameter settings:	Emissivity, test signal 12 mA
Additional parameters via interface:	Measuring range, response time
Protection:	IP65 with mounted cable
Ambient temperature:	0 ... 70°C at the housing
Storage temperature:	-20 ... 70°C
Rel. humidity:	Non condensing conditions
Converter housing:	Alu die-casting, 125 mm x 80 mm x 57 mm (L x W x H, without plug)
Optical head:	Stainless steel, 112 mm x 22 mm
Fiber optic:	Multi fiber with flexible stainless steel protection
Weight:	600 g
CE-label:	According EU rules for electromagnetic immunity



Typical Applications

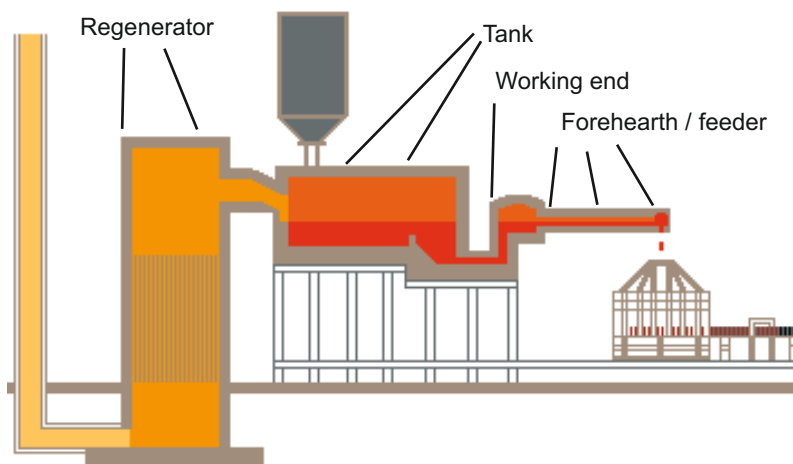
Glass temperature measurement

- in forehearth
- in feeder
- in tank

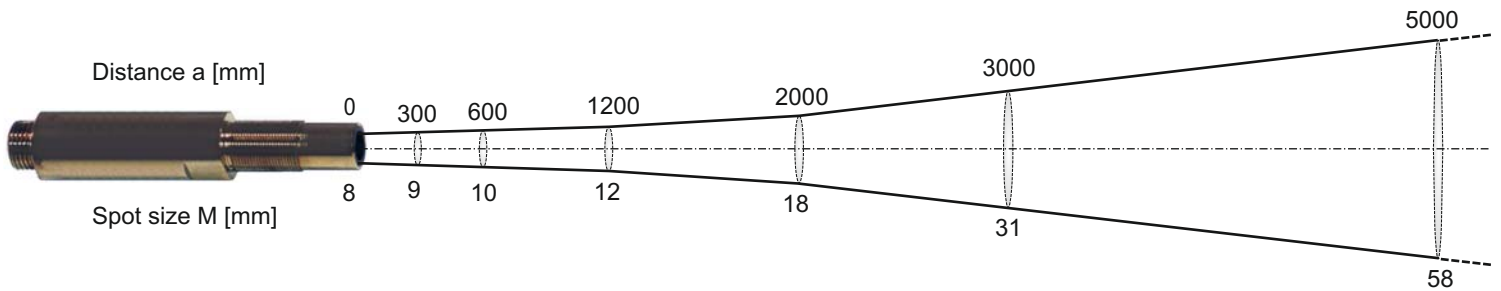
Temperature measurement of brickworks

- tank side walls
- tank roof
- in regenerator

The different sighting tubes enable to adapt the pyrometers optimally to the different applications. For an easy installation of the pyrometers it is possible to separate the optical head and converter from the fiber optic.



Measuring Distance and Spot Sizes



Reference Numbers

Pyrometer:

3 857 900 IS 50-LO/GL, 600 ... 1800°C, with fibre optic 5 m and optical head

Scope of delivery:

Converter, optical head, fiber 5 m
(a connection cable is not included in scope of delivery.)

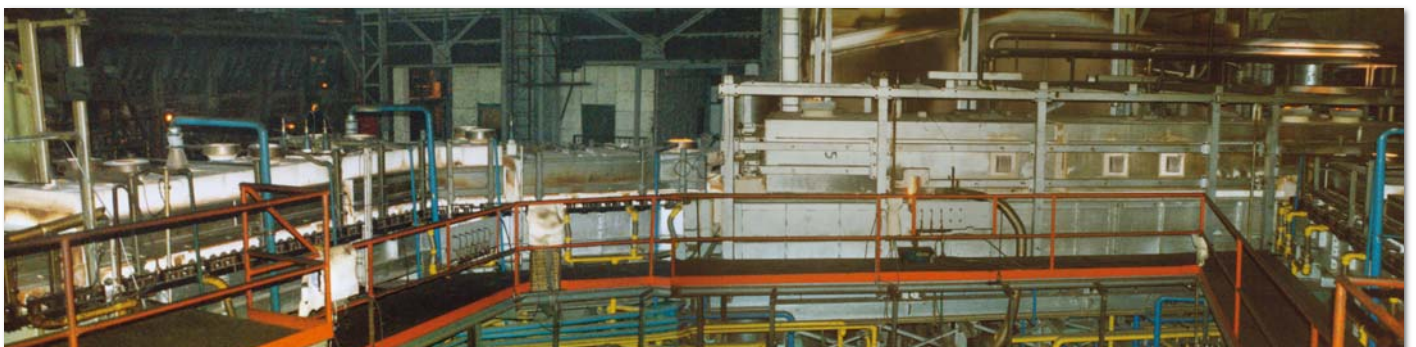
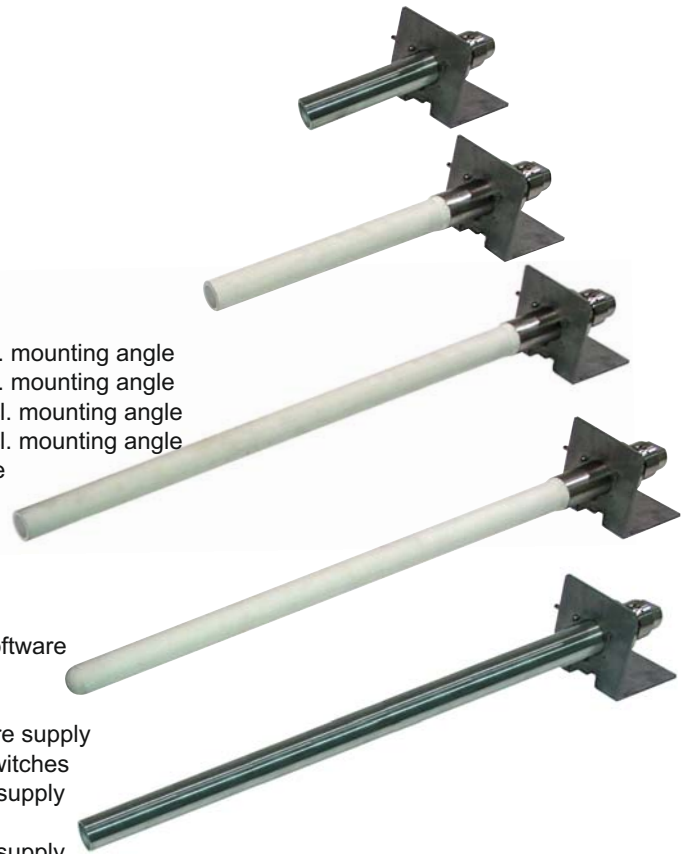
Accessories:

3 820 650 Connection cable, length 5 m
3 820 660 Connection cable, length 10 m
3 820 670 Connection cable, length 15 m
3 820 680 Connection cable, length 30 m

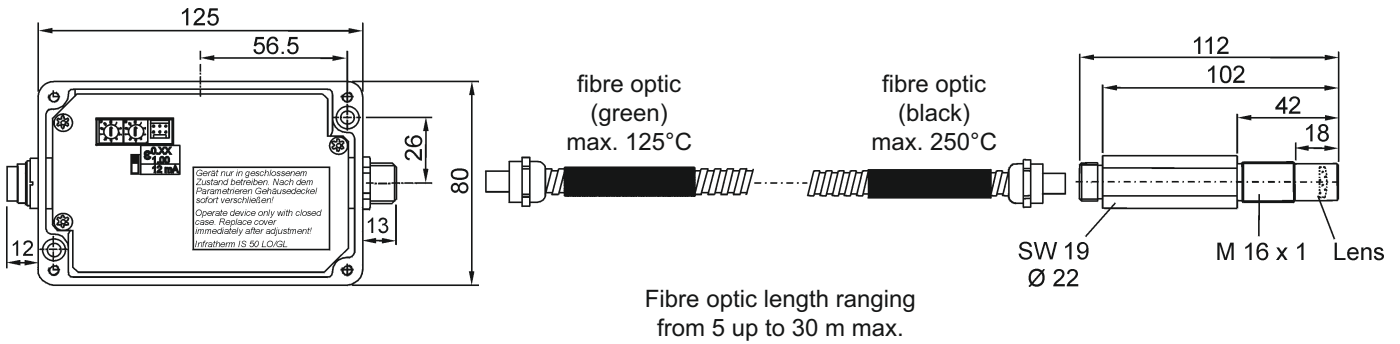
On request: Other length of fiber optic: 10 m, 15 m and 30 m

3 835 300 Air purge unit with inconel tube, 140 mm, open, incl. mounting angle
3 835 380 Air purge unit with inconel tube, 600 mm, open, incl. mounting angle
3 835 310 Air purge unit with ceramic tube, 300 mm, open, incl. mounting angle
3 835 370 Air purge unit with ceramic tube, 600 mm, open, incl. mounting angle
3 835 390 Ceramic tube, 600 mm, closed, incl. mounting angle
3 835 400 Air purge unit incl. mounting angle

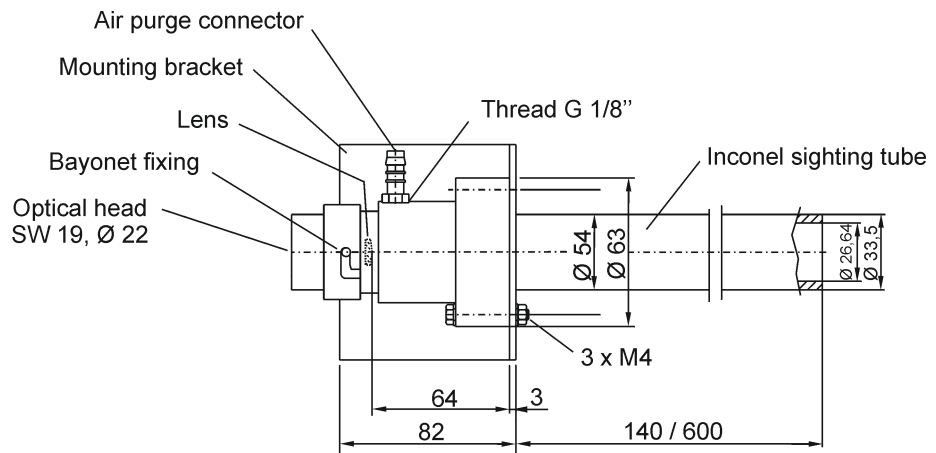
3 836 900 Spare ceramic tube, 300 mm, open
3 836 700 Spare ceramic tube, 600 mm, open
3 836 710 Spare ceramic tube, 600 mm, closed
3 820 370 RS232 adapter cable for HT 6000 or PC incl. PC software
3 820 980 RS232 adapter cable HT 6000
3 890 600 Din-rail power supply
3 890 640 DA 4000-N: LED digital display with integrated 2 wire supply
3 890 650 DA 4000: like DA 4000-N, additionally with 2 limit switches
3 890 520 DA 6000: LED digital display with integrated 2 wire supply and serial interface RS232
3 890 530 DA 6000: LED digital display with integrated 2 wire supply and serial interface RS485
3 826 500 HT 6000: Battery driven, portable parametrizing unit
3 863 010 Converter IW 5-C (4 ... 20 mA in 0 ... 20 mA)



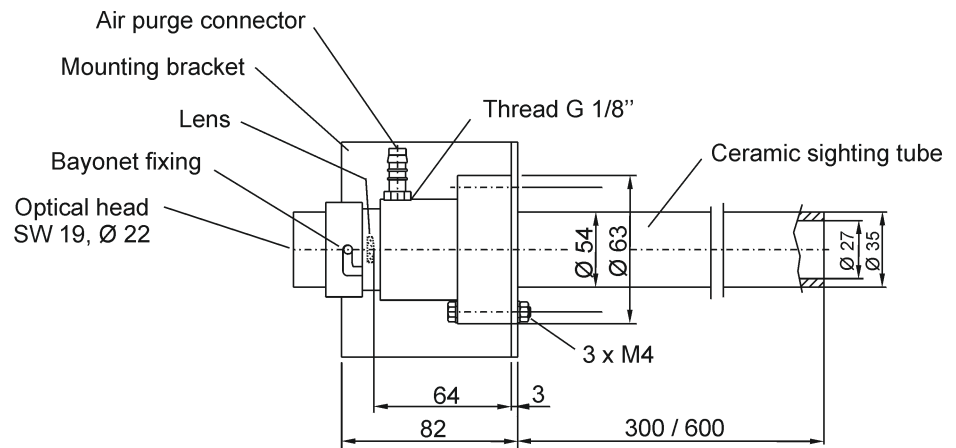
Dimensions



Air purge with inconel tubes:



Air purge with ceramic tubes:



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