Non-contact thermometry best done
with *INFRATHERM* pyrometers

ISQ 5-LO

Highly accurate, digital, fast

Stationary, digital 2-color pyrometer with fibre optics for non-contact temperature measurement between 700°C and 2500°C

- Temperature ranges between 700 and 2500°C
- High accuracy
- Wide temperature ranges
- Very small spot sizes, min 0.45 mm
- Laser targeting light
- Analog output 0 ... 20 mA or 4 ... 20 mA
- Digital interface RS232 or RS485
- Built-in maximum value storage
- Bus control (RS485)
- Fibre optic and optical head withstand up to 250°C
- Rugged mono fibre optic (max. length up to 30 m)

The pyrometer **ISQ 5-LO** is a digital, accurate 2-color pyrometer with fibre optic for non-contact temperature measurement.
The pyrometer measures in the 2-color principle (ratio principle) in which two adjacent wavelength 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, it is unaffected by dust and other contaminants in the field of view, it is unaffected by dirty viewing windows, the measuring object can be smaller than the spot size.
Additionally the pyrometer can be switched to 1-color mode and used like a conventional pyrometer.
The instrument is equipped with an optical fibre (length up to 30 m), which can be used in very high ambient temperatures up to 250°C without cooling and it is unaffected by electromagnetical interferences.
Two different optical heads for different measuring distances and very small spot sizes are available.
The response time of only 10 ms facilitates the measurement of fast heating processes.
The most important parameters can be set directly in the instrument, all instrument's parameters can be adjusted with the portable parametrizing device HT 6000 or with the digial indicator DA 6000-N. The parametrizing can also be done with the PC and the standard operating software *InfraWin*. Additionally the software offers online temperature display and data storage.

Typical applications:

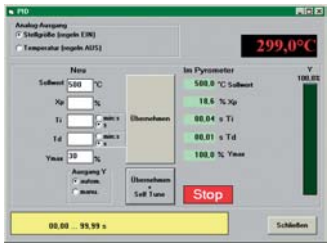
- Induction heating
- Welding
- Casting
- Forging
- Annealing
- Sintering
- Rolling mill
- Rotary kilns
- Pouring stream

Technical data

Temperature ranges:	MB 18: 700 ... 1800°C MB 25: 800 ... 2500°C
Sub range:	any range adjustable within the temperature range, minimum span 51°C
Spectral ranges:	channel 1: 0.7 ... 1.15 µm; channel 2: 0.97 ... 1.15 µm
Accuracy: (25°C, ε = 1, t_{90} = 1 s)	< 1500°C: 0.5% of reading in °C + 2°C > 1500°C: 1.0% of reading in °C
Repeatability:	0.2% of reading in °C + 2°C
Temperature dependence:	± 0.25°C per °C deviation of ambient temperature from 25°C
Resolution:	0.1°C; analog output: 4096 steps
Response time:	< 10 ms, adjustable up to 10 s
Emissivity slope:	(ε1 / ε2): 0.800 ... 1.250
Emissivity:	0.05 ... 1.00 (mono channel mode)
Switch off limit:	adjustable via interface: 2% ... 50%
Analog output:	0 ... 20 mA or 4 ... 20 mA, switchable, linear in temperature, load independent DC
Power supply:	24 V DC ± 25%, stabilised, ripple < 250 mV
Max load:	≤ 3 VA (incl. active laser targeting light)
Sighting system:	laser targeting light
Interface:	RS232 or RS485 adressable, half duplex, baud rate up to 38.4 kBd
Parameters:	adjustable on the converter's rear side: emissivity slope, response time, laser targeting light, 0 ... 20 mA or 4 ... 20 mA analog output, online/offline additionally via interface adjustable and readable: 2-color / 1-color temperature signal, emissivity slope, emissivity, parametrising the analog output, temperature sub range, maximum value storage, clear time and external clear of the maximum value storage, address, baud rate, switch off limit via interface readable only: measured value, internal temperature of the unit
Maximum value storage:	single or double storage, clear modes: time, external clear contact, via interface or automatic „hot object mode“
Isolation:	power supply and digital and analog output are galvanically isolated
Protection system:	IP65 (according to DIN 40050)
Operating temperature:	0 ... 70°C at the converter housing
Storage temperature:	-20 ... 70°C
Weight:	550 g
Housing:	stainless steel, 102 x 49,5 (L x D), for details see drawing on next page
CE-label:	according to EU directives about electromagnetic immunity

Option: ISQ 5-LO-C, special version with integrated PID-controller

The pyrometer *Infratherm* ISQ 5-LO can be delivered with an built-in PID controller called ISQ 5-LO-C. This instrument enable automatic controlling and monitoring of processes. The controller compares the actual (measured) temperature with the target value temperature and sends out a control signal. This signal can be used directly to control machines (e. g. induction heating machines). It is a very fast controller which updates the signal with the pyrometer's response time (< 10 ms). The controller can be activated and deactivated and its parameters can be adjusted via interface and PC or portable parametrizing device HT 6000 or digital display DA 6000-N. Please ask for additional data sheets.



Details

Optical head

Depending on the application the instrument will be delivered with a small (type **I**) or a big (type **II**) optical head. The optics are adjusted to one of the measuring distances mentioned in the table. The distance is measured from the front of the window to the target surface. The mentioned spot size will be achieved in exactly this distance (other distances on request).

Optical head	Measuring distance a [mm]	Spot size 700 ... 1800°C M [mm]	Spot size 800 ... 2500°C M [mm]	Aperture D [mm]
Type I 	120	2.2	1.2	7
	260	5	2.6	7
	700	14	7.2	7
Type II 	87	0.75	0.45	17
	200	1.5	0.8	17
	600	5.3	2.7	15
	4500	42	22	15

Fibre optic

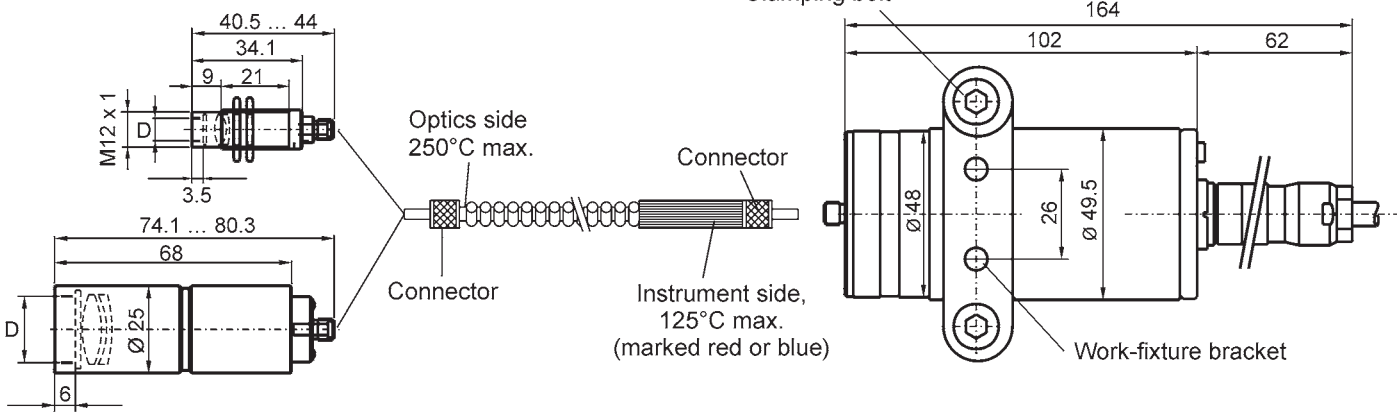
The radiation, coming in through the optical head, is transported via the lens system into the mono glass fibre with flexible stainless steel protection tube where it is transmitted along to the converter. As the optical head contains only the lens system and the sensor and the electronics are located in the converter box, fibre and optical head can withstand ambient temperatures up to 250°C without cooling. Depending on the measuring range 2 different fibres are used. They are marked red or blue.

Monofibre in stainless steel, flexible protection tube with standardised FSMA-plugs.

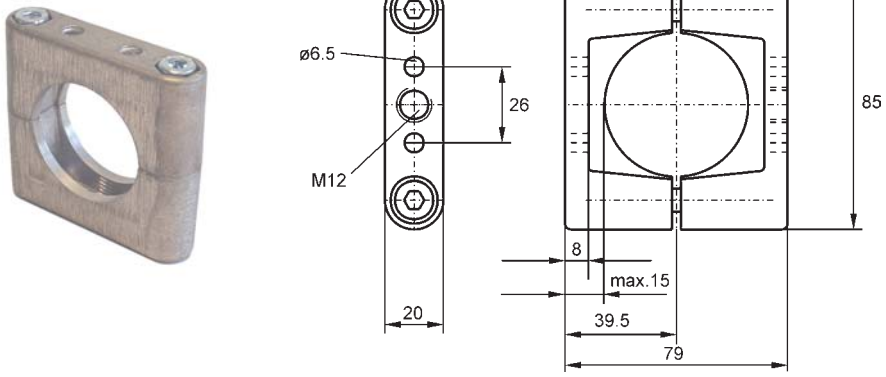
Length:	2.5 m in scope of delivery; 5 m, 7.5 m, 10 m, 15 m, 30 m on request
Color mark at the fibre:	blue: MB 18
	red: MB 25
Ambient temperature:	max. 250°C (instrument's side with color mark max 125°C)
Minimum bending radius:	blue: 100 mm for short time, 300 mm permanently
	red: 50 mm for short time, 120 mm permanently

Dimensions

Optical head type I



Optical head type II



Reference numbers

Type	Temp. range	Interface	
		RS232	RS485
ISQ 5-LO	MB 18: 700 ... 1800°C	3 853 940	3 853 950
	MB 25: 800 ... 2500°C	3 853 960	3 853 970

Type	Temp. range	Interface	
		RS232	RS485
ISQ 5-LO-C	MB 18: 700 ... 1800°C	3 853 680	3 853 690
	MB 25: 800 ... 2500°C	3 853 780	3 853 790

Scope of delivery: Converter, optical head I or II, optical fibre 2.5 m, mounting bracket, works certificate, PC software *InfraWin*.
A connection cable is not included in scope of delivery, it has to be ordered separately!

Ordering details: To process your order as fast as possible, please give us the following data:

- Instrument with reference number (e.g. ISQ 5-LO, 3 853 940)
- Optical head's design (I or II) and the desired measuring distance (e.g. optical head I, a = 120 mm)
- Length of optical fibre (except standard length 2.5 m)
- Connecting cable (e.g. 5 m length 3 820 330)

IMPAC 24 months warranty

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
3 820 740	connection cable, length 5 m, straight connector, temperature resistant up to 200°C
3 834 370	Mounting support for optical head I (fixed)
3 834 380	Mounting support for optical head I (adjustable)
3 834 050	Ball and socket mounting with clamp for optical head I or II
3 834 230	Adjustable mounting support for optical head II
3 835 170	Air purge unit, stainless steel, for optical head I
3 835 180	Air purge unit, stainless steel, for optical head II
3 852 540	Power supply NG 0D for carrier rail mounting (85 ... 265 V AC ⇒ 24 V DC, 600 mA)
3 852 550	Power supply NG 2D, with 2 limit switches (85 ... 265 V AC ⇒ 24 V DC, 600 mA)
3 852 180	Power supply NG DC (85 ... 265 V AC ⇒ 24 V DC, 600 mA)
3 890 640	LED digital display DA 4000-N
3 890 650	LED-display DA 4000 with 2 limit switches
3 890 560	LED digital display DA 6000-N: with possibility for pyrometer parameter settings for digital INFRATHERM pyrometers; RS232 interface
3 890 570	LED digital display DA 6000-N; RS485-interface
3 890 660	Front cover (IP65) for LED-displays
3 826 500	HT 6000, portable parametrizing device
3 826 430	Optics monitoring box

Overview accessories

Digital indicator


Portable parametrizing device HT 6000


Air purge unit for optical head II


Adjustable mounting support for optical head II


Power supply NG 0D


Power supply NG 2D


Power supply NG DC


Air purge unit for optical head I


Fixed and adjustable mounting support for optical head I

IMPAC Infrared GmbH
Temperature Measurement

Krifteler Strasse 32
D-60326 Frankfurt/Main

Phone: +49(0)69-9 73 73-190
Fax: +49(0)69-9 73 73-167

E-Mail: info@impacinfrared.com
Internet: www.impacinfrared.com

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