

# MI-S 5-LO; MI-GA 5-LO

The highly accurate, completely digital infrared pyrometer with fiber optic

Stationary digital pyrometers with fiber optic for non-contact temperature measurement between 300°C and 2500°C

- highest accuracy
- wide ranges
- analog and digital output
- integrated maximum value storage
- bus control (RS485)
- fiber optic and optical head withstand up to 250°C
- rugged mono fiber optic (max. length up to 30 m)



**MI-S5-LO** and **MI-GA5-LO** are fully digital pyrometers with fiber optic for non-contact temperature measurement. They are specially designed for applications under rough conditions, such as high ambient temperatures or electromagnetic interferences. As the fiber and optical head do not contain electronic parts, they may be used in areas with high ambient temperatures (up to 250°C) without cooling

or in areas where electromagnetic interferences can influence a correct measurement. The pyrometer can be adapted perfectly to an application by selection of one of the different optical heads. These optical heads achieve smallest spot sizes. With the very short response time of less than 2 ms the pyrometer can even measure fastest heating processes.

#### Typical applications:

- induction heating
- welding
- casting
- forging
- annealing
- sintering
- rolling mill
- rotary kilns
- pouring stream

## Technical data

IR-Detector:	Si or InGaAs-photoelement (ident letter S or GA)
Spectral response:	0.8 ... 1.1 $\mu\text{m}$ (S); 1.45 ... 1.8 $\mu\text{m}$ (GA)
Analog output:	0/4 ... 20 mA, switchable, linear in temperature, load independent DC
Max load:	500 $\Omega$
Accuracy:	< 1500°C: 0.3% of measured value / °C $\pm$ 1°C > 1500°C: 0.5% of measured value / °C
Resolution:	< 1°C
Repeatability:	0.1% of measured value / °C $\pm$ 1°C
Temp. dependence:	0.2°C per °C deviation from 23°C
Response time $t_{90}$ :	$\leq$ 2 ms, adjustable up to 10 s
Emissivity:	0.2 ... 1.00, adjustable
Power supply:	24 V DC $\pm$ 25%, ripple max. 50 mV
Power consumption:	max. 2.5 W (with active targeting)
Interface:	RS232 or RS485 addressable, half-duplex, baud rate up to 19.2 kBd,
Sighting system:	laser targeting, Laser (650 nm), Laser power level <1 mW, CDRH Class II
Parameters adjustable at the instrument:	emissivity, response time, offline/online, output 4 ... 20 mA or 0 ... 20 mA, laser
Additional parameters adjustable via interface:	measuring subrange, clear time or external clearing of maximum value storage, address, baud rate; measured value and internal temperature only display.
Maximum value storage:	single or double storage: clearing by time, external contact, automatically, via interface
Enclosure rating:	IP65
Connection:	12-pin plug
Ambient temperature:	0 ... +70°C at the housing
Storage temperature:	-20 ... +70°C
Housing:	stainless steel, 102 mm x 49.5 mm (L x D without plug)
Weight:	0.55 kg
CE-label:	according to EU directives about electromagnetic immunity



## Basic measuring ranges / Reference numbers:

MI-S5-LO	Ref.No.:	MI-GA 5-LO	Ref.No.:
MB 20: 600 ... 2000°C	5 857 750	MB 13: 300 ... 1300°C	5 857 600
MB 25: 800 ... 2500°C	5 857 550	MB 18: 350 ... 1800°C	5 857 650
		MB 25: 400 ... 2500°C	5 857 700

Any shorter ranges within the limits of the basic measurement range can be specified when ordering or are programmable with a PC by the user.

**Options:** **RS485 instead of RS232:** add + 010 to the reference number of MI-S 5 or MI-GA 5 (Example: 5 857 610 instead of 5 857 600)

**Scope of delivery:** Converter, optical head I or II, optical fiber 2.5 m, mounting unit for converter, PC software. **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:

- Measuring range (e.g. MB 13 or 300 ... 1300°C) or reference number (e.g. MI-GA5-LO, 5 857 600)
- Optical head's design (I or II) and the desired measuring distance or the reference number (e.g. optical head I, a = 120 mm, or ref.no. 5 873 320 )
- Interface (e.g. RS232)
- Length of optical fiber (if it is not the standard length of 2.5 m)
- Connecting cable (e.g. 5 m length 5 820 330)

## Optics:

Spot size M [mm] in the measuring distance a:

Optical head	a [mm]	M [mm]	D [mm]	Ref.No.
Type I (small measuring head)	120	1.2	7	5 873 320
	260	2.6	7	5 873 340
	700	7.2	7	5 873 350
Type II (large measuring head)	87	0.45	17	5 873 420
	200	0.8	17	5 873 440
	600	2.7	15	5 873 460
	4500	22.0	15	5 873 470

Optical head withstand up to 250°C ambient temperature.

## Fiber optic:

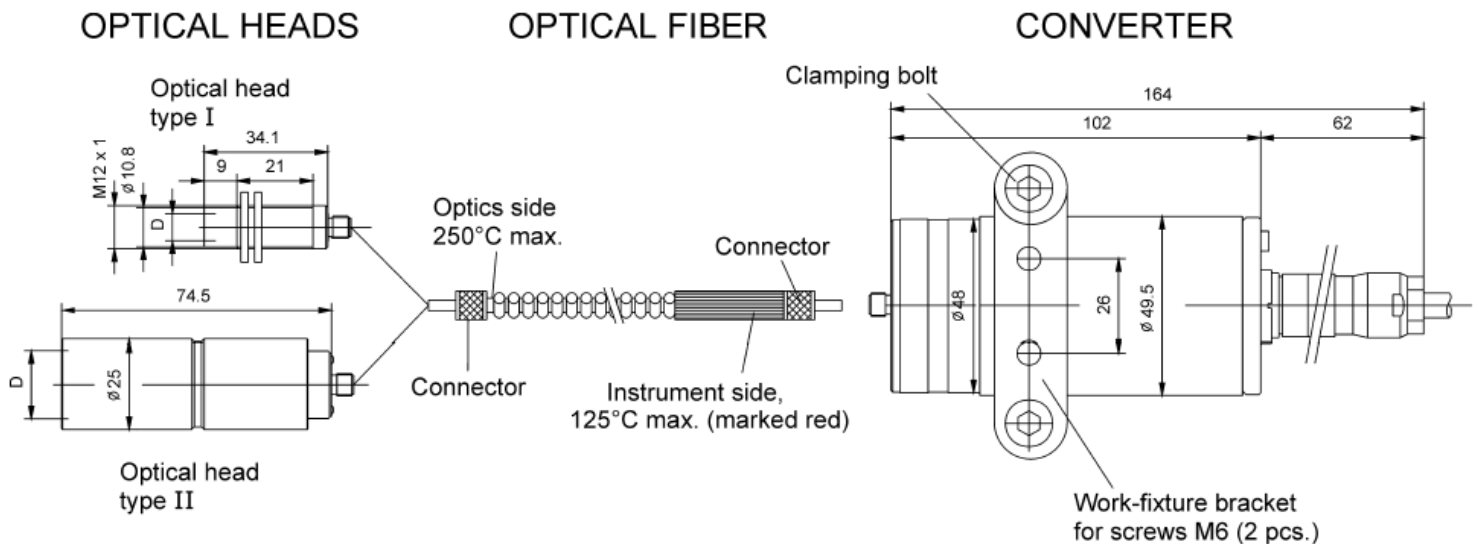
Monofiber optic in stainless steel, flexible protection tube with standardised FSMA-plugs.

Length: 2.5 m, scope of delivery  
lengths up to 15 m in steps of 2.5 m on request

Max ambient temperature  
on optics side: max. 250°C  
on instrument's side: max. 125°C

Minimum bending radius: 50 mm for short time, 120 mm permanently

## Dimensions:



## Option: special versions with integrated PID-controller: MI-S 5-LO-C and MI-GA 5-LO-C

The MI-S 5-LO and MI-GA 5-LO can be delivered with an integrated PID controller called MI-S 5-LO-C and MIGA 5-LO-C. These instruments enable automatic controlling and monitoring of processes. The controller compares the actual (measured) temperature with the target value temperature and sends out the difference as 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 (< 2 ms). The controller can be activated and deactivated and its parameters can be adjusted via interface and PC or portable parametrizing device MI-HT 6000 or digital display MI-DA 6000-N. Please ask for additional datasheets.

## Accessories:

3 820 330	Connecting cable, 12 pin straight connector, length 5 m
18712-1	power supply 24VDC 0.42 Amp (90 ... 250 V AC / 24 V DC, 420 mA)
17219-1	LED digital display
17219-1	LED digital display with 2 limit switches
5 890 560	LED-display MI-DA 6000-N RS232-interface
5 890 570	LED-display MI-DA 6000-N RS485-interface
3 890 660	Front cover (IP65) for MI-DA-displays
5 826 500	MI-HT 6000, portable parametrizing device
3 835 170	Air purge unit, stainless steel, for optical head I
3 835 180	Air purge unit, stainless steel, for optical head II
3 834 050	Ball and socket mounting with clamp for optical head I or II
3 834 230	Adjustable mounting support for optical head II



Air purge unit  
for optical head I



Air purge unit  
for optical head II



Adjustable  
mounting sup-  
port for optical  
head II



Ball and socket  
mounting for  
both optical  
heads



Digital indicator



17219-1



Portable parametrizing  
device MI-HT 6000

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