

# IMPAC HIGHSPEED 740 SERIES

High-speed pyrometers for non-contact temperature measurement of metallic surfaces, graphite, or ceramics.



The Impac® IGA 740 and IGA 740-LO pyrometers are stationary instruments specifically designed with an extremely fast response time of only 6  $\mu$ s, making them suitable for monitoring fast moving objects or fast temperature changes. The pyrometers are also available as temperature measuring stations IMGA 740 and IMGA 740-LO.

## PRODUCT HIGHLIGHTS

- Extremely fast response time of only 6  $\mu$ s
- High quality optics for detection of small measuring objects
- Built-in LED targeting light for easy alignment to the measuring object; IGA 740 also available with view finder
- Laser protection filter (optional) to shield the laser wavelength for laser applications

## TYPICAL APPLICATIONS

- Laser applications (laser cutting, laser welding, soldering, etc.)
- Material development / material testing
- Combustion engines
- Airbag testing
- Wafer control
- Air purge assembly
- Turbines
- Plasma measurements
- Explosion processes

## AT A GLANCE

### Temperature Ranges

IGA 740  
160 to 2500°C (320 to 4532°F)

IGA 740-LO  
200 to 2500°C (392 to 4532°F)

IMGA 740  
160 to 3500°C (320 to 6332°F)

IMGA 740-LO  
200 to 3500°C (392 to 6332°F)

### Spectral Ranges

1.58 to 1.8  $\mu$ m  
1.58 to 2.2  $\mu$ m  
2.0 to 2.2  $\mu$ m

### Measurement Uncertainty

0.75% of reading

### Repeatability

< 0.3% of reading

### Optics

IGA 740: Focusable or macro lens  
IGA 740-LO: Fiber optical heads

### OVERVIEW

The Impac IGA 740 and IGA 740-LO pyrometers are stationary instruments for non-contact temperature measurement of metallic surfaces, graphite, ceramics, etc. With the extremely fast response time of only 6  $\mu$ s, they are suitable for use in high speed applications.

Two types are available: the compact instrument IGA 740 with integrated optics and the IGA 740-LO with fiber and optical head.

The IGA 740 is available with either focusable or macro optics. With the focusable optics, a measuring distance between 450 and 3000 mm can be adjusted to achieve the smallest spot sizes. The macro optics provides, at a fixed distance, a spot size of only 0.7 mm or 1 mm, depending on the temperature range.

The IGA 740-LO uses an optical fiber and an optical head for transmitting the radiation. The fiber and optical head are unaffected by electromagnetic interferences (e.g. induction) and can be used in very high ambient temperatures up to 260°C without cooling.

For easy alignment to the measuring object, the instruments are equipped with an LED targeting light that shows the size of the spot. Alternatively, the IGA 740 can be delivered with a view finder.

### TECHNICAL DATA

Measurement Specifications		
Temperature Range	IGA 740	160 to 1000°C (320 to 1832°F) (MB 10)
		300 to 1400°C (572 to 2552°F) (MB 14)
		300 to 2300°C (320 to 4172°F) (MB 23)
		500 to 2500°C (932 to 4532°F) (MB 25)
		350 to 3500°C (662 to 6332°F) (IMGA 740 only)
	IGA 740-LO	200 to 1000°C (392 to 1832°F) (MB 10)
		300 to 1400°C (572 to 1832°F) (MB 14)
		300 to 2300°C (572 to 4172°F) (MB 23)
		500 to 2500°C (932 to 4532°F) (MB 25)
		400 to 3000°C (752 to 5432°F) (IMGA 740-LO only)
		350 to 3500°C (662 to 6332°F) (IMGA 740-LO only)
Spectral Ranges	1.58 to 1.8 $\mu$ m (MB 14 + 25)	
	1.58 to 2.2 $\mu$ m (MB 10)	
	2.0 to 2.2 $\mu$ m (MB 23)	
Measurement Uncertainty ( $T_{amb.} = 25^{\circ}\text{C}$ , $\epsilon = 1$ , $T_{95} = 1\text{s}$ )	0.75% of reading	
Repeatability ( $T_{amb.} = 25^{\circ}\text{C}$ , $\epsilon = 1$ , $T_{95} = 1\text{s}$ )	< 0.3% of reading	
Response Time $t_{95}$	9 $\mu$ s via current output, 6 $\mu$ s via voltage output	
Emissivity $\epsilon$	0.1 to 1, continuously adjustable	

<sup>1</sup> MB is a shortcut used for temperature range (in German: Messbereich).

The determination of the technical data of this pyrometer is carried out in accordance with VDI/VDE IEC TS 62942-2, the calibration / adjustment in accordance with VDI/VDE 3511, Part 4.4.

TECHNICAL DATA (CONTINUED)

Optical Specifications	
Sighting	IGA 740: LED targeting light or view finder
	IGA 740-LO: LED targeting light
Detector	Ge photo diode (MB 14 + 25)
	InGaAs photo diode (MB 10 + 23)

Electrical Specifications	
Power Supply	24 VDC or AC, max. current consumption 0.2 A
Output	0 or 4 to 20 mA (specify when ordering), temperature linear, max load 500 Ω
	0 to 10 V linear voltage output (via BNC connector)

Environmental Specifications	
Protection Class	IP54 (according to DIN 40 050)
Ambient Temperature	IGA 740: 0 to 40°C (32 to 104°F)
	IGA 740-LO: 0 to 40°C (32 to 104°F) (instrument), max 260°C (500°F) (fiber/optical head)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	Non-condensing conditions
CE Label	According to EU directives about electromagnetic immunity
Weight	IGA 740: ~1.2 kg
	IGA 740-LO: ~0.9 kg (instrument), ~250 g (fiber), ~150 g (optical head)
Dimensions (L x W x H)	IGA 740: 235 x 70 x 70 mm (9.25 x 2.76 x 2.76")
	IGA 740-LO: 200 x 70 x 70 mm (7.88 x 2.76 x 2.76")

MEASURING STATIONS

The IGA 740 and IGA 740-LO pyrometers are also available as temperature measuring stations. In addition to the pyrometer, the IMGA 740 and IMGA 740-LO packages include a bench unit, digital display, USB interface, power supply, connecting cable, software, 1.5 m optical fiber (only for IMGA 740-LO).

IMGA 740 and IMGA 740-LO			
Temperature Range	IMGA 740	IMGA 740-LO	Interface
160 to 1000°C (320 to 1832°F)	47402-01990	-	USB
200 to 1000°C (392 to 1832°F)	-	47402-11990	USB
300 to 1400°C (572 to 2552°F)	47401-01990	47401-11990	USB
300 to 2300°C (320 to 4172°F)	47402-02990	47402-12990	USB
500 to 2500°C (932 to 4532°F)	47401-02990	47401-12990	USB
400 to 3000°C (752 to 5432°F)	-	47400-19990	USB
350 to 3500°C (662 to 6332°F)	47400-09990	47400-18990	USB

## OPTICS

Depending on the application, the instrument is available with different optics. The selection mainly depends on the required spot size (size of the measuring object) and the measuring distance.

For the Focusable Optics, as well as the Fiber Optical Heads, the measuring distances are measured from the leading edge of the optics.

For the Macro Optics, they are measured from the pyrometer's front edge.

Optical fiber and optics are not included in the scope of delivery of the IGA 740-LO and must be ordered separately.

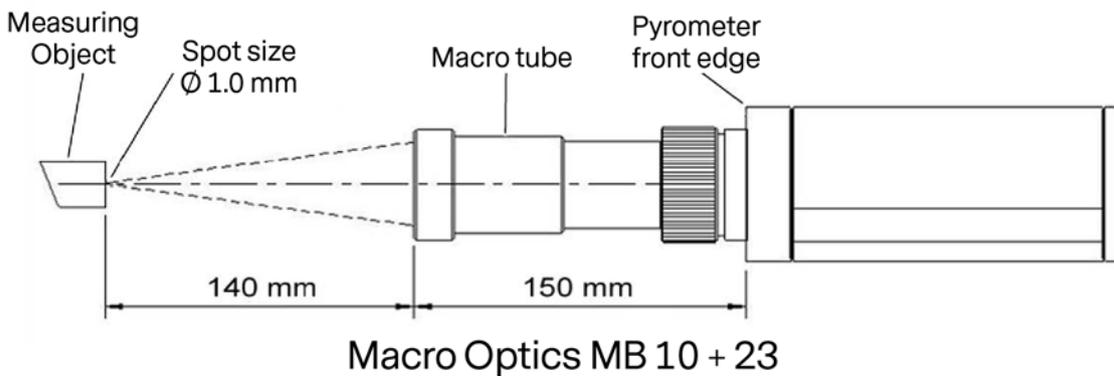
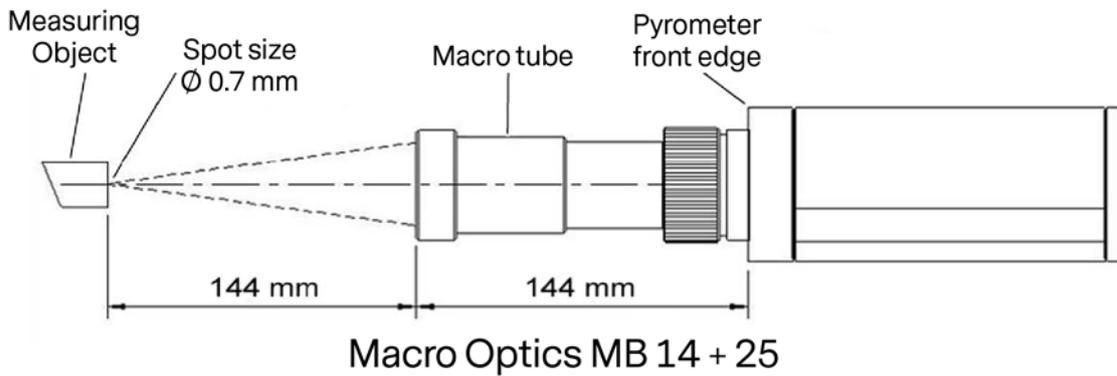
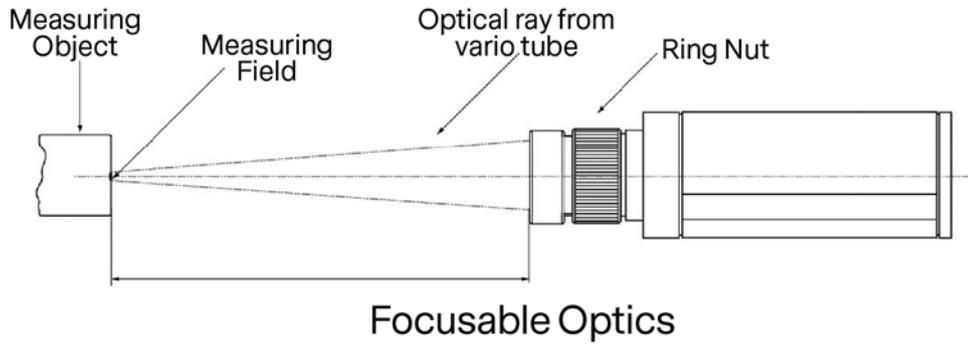


IGA 740 - Focusable Optics											
Measuring distance [mm]	450	600	800	1000	1200	1400	1600	1800	2000	2500	3000
Spot size Ø [mm]	2.5	4.0	6.0	8.0	10.5	11.5	13.0	14.0	15.0	20.0	28.0

IGA 740 - Macro Optics		
Range	MB 14 + 25	MB 10 + 23
Measuring distance [mm]	288	290
Spot size Ø [mm]	0.7	1

IGA 740-LO - Fiber Optical Heads						
	Type	Measuring Distance [mm]	Spot Size Ø [mm]	Optical Fiber	Temperature Range	Aperture
Standard	LVO 25	80 to 300	1.6 to 4.3	blue	all	13
	LVO 35	250 to 1000	3.5 to 11	blue	all	21
Special	LVO 25-S1	115 to 300	0.4 to 1.5	red	> 400°C	10
	LVO 25-S2	200 to 240	0.85 to 1.1	red	> 350°C	12
	LVO 25-S3	78	0.3	red	> 400°C	10
	LVO 25-S4	60	0.5	red	all	11
	LVO 25-S5	70 to 200	1 to 2.6	blue	all	12
	LVO 25-S6	250 to 500	3.5 to 6.3	blue	all	16
	LVO 25-S9	74 to 284	1 to 3.8	red	all	10
LVA 25	110 to 800	0.7 to 3	red	all	13	

OPTIC SCHEMATICS



REFERENCE NUMBERS

IGA 740					
	Temperature Range	Focusable optics		Macro optics	
		0 to 20 mA	4 to 20 mA	0 to 20 mA	4 to 20 mA
LED Targeting Light	160 to 1000°C	47402-01010	47402-01020	47402-01110	47402-01120
	300 to 1400°C	47401-01010	47401-01020	47401-01110	47401-01120
	300 to 2300°C	47402-02010	47402-02020	47402-02110	47402-02120
	500 to 2500°C	47401-02010	47401-02020	47401-02110	47401-02120
View Finder	160 to 1000°C	47402-01210	47402-01220	47402-01310	47402-01320
	300 to 1400°C	47401-01210	47401-01220	47401-01310	47401-01320
	300 to 2300°C	47402-02210	47402-02220	47402-02310	47402-02320
	500 to 2500°C	47401-02210	47401-02220	47401-02310	47401-02320

IGA 740-LO			
	Temperature Range	0 to 20 mA	4 to 20 mA
LED Targeting Light	200 to 1000°C	47402-11200	47402-11400
	300 to 1400°C	47401-11200	47401-11400
	300 to 2300°C	47402-12200	47402-12400
	500 to 2500°C	47401-12200	47401-12400

**Scope of Delivery**

Pyrometer with retaining pin, inspection sheet, and operation manual.

**Ordering Note**

A connection cable (as well as optical fiber and optical head for IGA 740-LO) is not included in scope of delivery and must be ordered separately.

## ACCESSORIES

PN	Description
30007-50040	Connection cable, 4 m, 5-pin straight plug
30007-50075	Connection cable, 7.5 m, 5-pin straight plug
30007-50100	Connection cable, 10 m, 5-pin straight plug
30007-50150	Connection cable, 15 m, 5-pin straight plug
30007-50200	Connection cable, 20 m, 5-pin straight plug
30007-91040	BNC cable for 0 to 10 V output, 4 m
30007-91075	BNC cable for 0 to 10 V output, 7.5 m
30007-91100	BNC cable for 0 to 10 V output, 10 m
30007-91150	BNC cable for 0 to 10 V output, 15 m
30007-91200	BNC cable for 0 to 10 V output, 20 m
3 852 190	Power supply NG AC; 230 V AC $\Rightarrow$ 24 V DC, 750 mA
3 852 540	Power supply NG 0D, 85 to 265 V AC $\Rightarrow$ 24 V DC, 600 mA
3 852 550	Power supply NG 2D, 85 to 265 V AC $\Rightarrow$ 24 V DC, 600 mA, with 2 limit switches
30002-30020	Scanner SC1 with screwed flange
30002-10010	Ball and socket mounting for Series 740, screw mounting with retaining pin M12
30002-10020	Ball and socket mounting for Series 740, clamp mounting with retaining pin M12
30006-32150	Mounting support for LVO 25, with retaining pin $\varnothing$ 10 mm
30006-32160	Mounting support for LVO 35, with retaining pin $\varnothing$ 10 mm
30006-32120	Ball and socket mounting for LVO 25
30006-32130	Ball and socket mounting for LVO 35
30006-32020	90° mirror for LVO 25
30006-32220	Air purge unit for LVO 25
30006-32230	Air purge unit for LVO 35
30006-33122	Laser protection filter for integration in LVO 25 & LVA 25, 920 to 1100 nm
30006-33132	Laser protection filter for integration in LVO 35, 920 to 1100 nm
30006-33132	Laser protection filter for integration in LVO 35, 920 to 1100 nm



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## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

PRECISION | POWER | PERFORMANCE

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