IMPAC IS 12-TSP AND IGA 12-TSP

Fully digital, extremely precise transfer standard pyrometer (TSP) for accuracy inspection of calibration sources.

The Impac® IS 12-TSP and IGA 12-TSP are extremely precise and long-term stable transfer standard pyrometers which are specifically designed for checking calibration sources. The pyrometers are available in several temperature ranges between 200 and 3000°C (392 and 5432°F), as well as in various spectral ranges. This means they can be used with calibration sources with which pyrometers with Silicon or Indium Gallium Arsenide detectors can be checked. The detectors in the transfer standard pyrometer are thermostatically controlled to achieve this high precision. This means that the measurement is, to a large extent, independent of surrounding temperature variations and allows a resolution of 0.01°C to be achieved.

PRODUCT HIGHLIGHTS

- Temperature ranges between 200 and 3000°C (392 and 5432°F)
- Resolution of only 0.01°C
- Built-in 5-digit LED display
- Digital interface
- Focusable optics

AT A GLANCE

Temperature Ranges

IS 12-TSP
530 to 1900°C (986 to 3452°F)
600 to 2520°C (1112 to 4568°F)
600 to 3000°C (1112 to 5432°F)
850 to 2520°C (1562 to 4568°F)

IGA 12-TSP
200 to 1020°C (392 to 1868°F)
250 to 1400°C (482 to 2552°F)
300 to 1700°C (572 to 3092°F)

Measurement Uncertainty

< 1500°C: 0.15% oR + 1°C
1500 to 2700°C: 0.25% oR
> 2700°C: 0.35% oR

Optics

3 focusable optics:
275 to 520 mm
385 to 1125 mm
540 to 9000 mm

Sighting

Through-lens sighting and laser targeting

OVERVIEW

Calibration sources are subject to heavy wear due to the extremely high temperatures which they have to produce. This can lead to the fact that, over time, the temperature display at the controller no longer corresponds to the radiation temperature in the spectral range being investigated. If high precision measurements are required on the calibration source over long periods of time, we recommend that regular checks are carried out.

Use of a transfer standard pyrometer ensures that temperature values as stipulated by national institutes can be transferred to your own calibration sources to guarantee traceability to the ITS90 international temperature scale. In order to guarantee an adherence to high technical specifications, the transfer standard pyrometer should be checked regularly by Advanced Energy. This is, however, only necessary every two years thanks to the pyrometer's solid construction.

TECHNICAL DATA

Measurement Specifications		
Temperature Ranges	IS 12-TSP	530 to 1900°C (986 to 3452°F)
		600 to 2520°C (1112 to 4568°F)
		850 to 2520°C (1112 to 4568°F)
		600 to 3000°C (1562 to 5432°F)
	IGA 12-TSP	200 to 1020°C (392 to 1868°F)
		250 to 1400°C (482 to 2552°F)
		300 to 1700°C (572 to 3092°F)
Sub Range	Any range adjustable within the temperature range, minimum span 51°C	
Spectral Range	IS 12-TSP	0.94 µm @ temperature ranges ranges 530 to 1900°C and 600 to 2520°C /3000°C
		0.65 µm @ temperature ranges range 850 to 2520°C
	IGA 12-TSP	1.57 µm
Resolution	Up to 1000°C: 0.01°C on interface and display;	
	Above 1000°C: 0.1°C on display, 0.01°C on digital interface < 0.025% of temperature range at the analog output	
Emissivity ε	0.100 to 1.000 in 1/1000 steps	
Measurement Uncertaint ($\varepsilon = 1, t_{90} = 1$ s, $T_{amb} = 23°C$)	Below 1500°C: 0.15% of measured value in °C + 1°C	
	Above 1500°C: 0.25% of measured value in °C	
	Above 2700°C: 0.35% of measured value in °C	
Repeatability ($\varepsilon = 1, t_{90} = 1$ s, $T_{amb} = 23°C$)	1°C	

Electrical Specifications	
Power Supply	24 VDC (15 to 40 VDC), or 24 VAC (12 to 30 VAC), 48 to 62 Hz
Power Consumption	Max 14 W
Isolation	Power supply, digital interface, analog output are galvanically isolated against each other and housing

1 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.

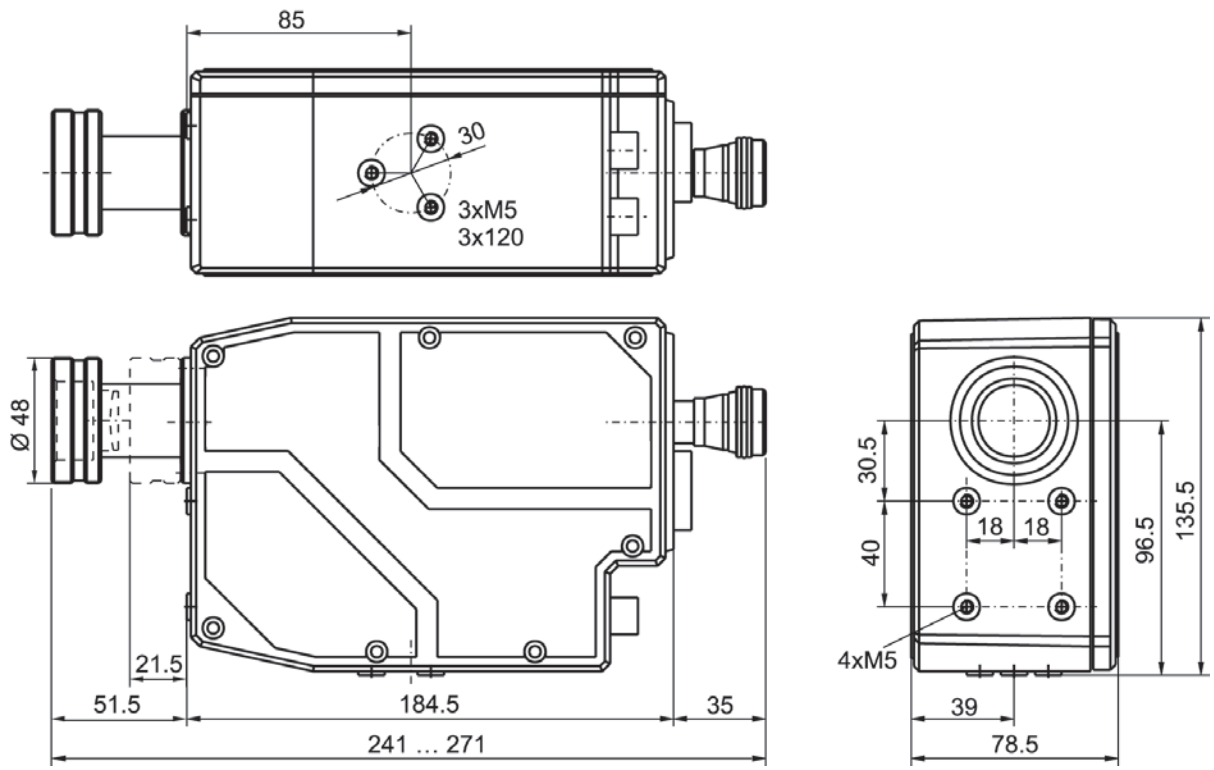
TECHNICAL DATA (CONTINUED)

Environmental Specifications	
Ambient Temperature	0 to 60°C (32 to 140°F) at the housing
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	Non-condensing conditions
Weight	2.2 kg (~2.20 lbs)
Protection System	IP65 (according to DIN 40 050)
CE Label	According to EU directives about electromagnetic immunity

Interface Specifications	
Display	Built-in 5 digit LED display, additional function LEDs
Control Panel	4 keys, operate with tip of ball-point pen
Sighting	Built-in parallax free thru-lens view finder; additionally laser targeting light (max power level < 1 mW, λ = 630 to 680 nm, CDRH class II) (at IS 12-TSP with temperature range 850 to 2520°C, only with view finder)
Control Panel	4 keys, switch for interface, key for test current
Parameters	Adjustable at the instrument or via serial interface: Emissivity ε, exposure time t_{90}, clear time for maximum value storage t_{Clear}, temperature sub range, analog output 0 to 20 or 4 to 20 mA, switch points for limit switches, temperature display in °C / °F, interface RS232 or RS485, address, baud rate, test current output
	Additionally adjustable (only via interface): keyboard lock, recalibration (with special software)

Communication Specifications	
Analog Output	Linear 0 to 20 mA or 4 to 20 mA, DC, switchable; load max 500 Ohm
Test Current Output	Fixed 10 mA
Serial Interface	Switchable at the pyrometer: RS232 or RS485 (addressable), half duplex; baud rate 2.4 up to 115 kBd
Limit Switches	2 relay outputs (change-over contacts), switch power max 30 W (Imax: 1 A, Umax: 60 VDC)
Exposure Time t_{90}	< 1 ms (with dynamical adaptation at low signal levels), factory setting 1 s, adjustable up to 10 s
Maximum Value Storage	Built-in single or double storage. Clearing with adjusted time t_{clear}, extern, via interface or automatically with the next measuring object

DIMENSIONS

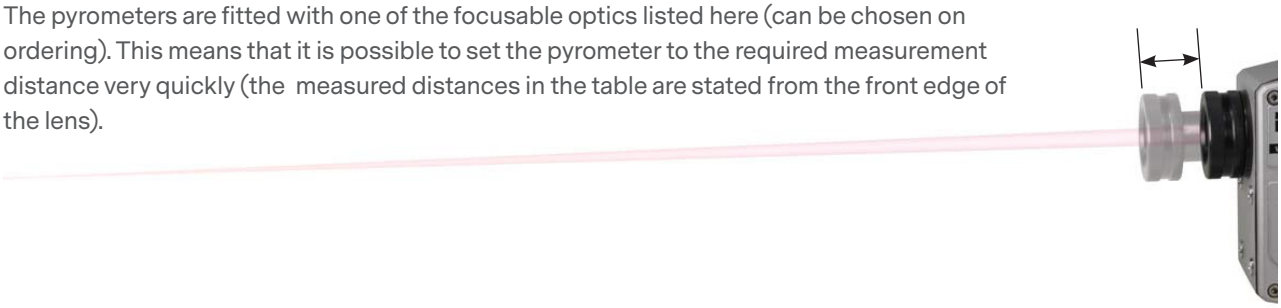


All dimensions in mm

FEATURES

OPTICS

The pyrometers are fitted with one of the focusable optics listed here (can be chosen on ordering). This means that it is possible to set the pyrometer to the required measurement distance very quickly (the measured distances in the table are stated from the front edge of the lens).



Optics for IS 12-TSP and IGA 12-TSP

Optics	Measuring Distance a [mm]	Spot Size M_{90} [mm]				Objective Length [mm]
		IS 12-TSP All Temp. Ranges	IGA 12-TSP 200 to 1020°C	IGA 12-TSP 250 to 1400°C	IGA 12-TSP 300 to 1700°C	
Optics 1	a = 275 mm	0.7	2	1.1	0.9	30
	a = 400 mm	1.1	3	1.6	1.3	9
	a = 520 mm	1.5	4.2	2.2	1.8	0
Optics 2	a = 385 mm	1	2.7	1.5	1.2	30
	a = 700 mm	1.9	5.2	3	2.4	8.5
	a = 1125 mm	3.4	8.5	4.9	3.9	0
Optics 3	a = 540 mm	1.4	3.5	2	1.6	30
	a = 3000 mm	8.5	23	13	10	3
	a = 9000 mm	26	72	38	30	0
Aperture D[1]		13.5 to 17				

1 Depending on the objective length.

REFERENCE NUMBERS

IS 12-TSP and IGA 12-TSP				
PN	Type	Spectral Range	Temperature Range	Sighting
3 840 700	IS 12-TSP	940 nm	530 to 1900°C	View finder, laser targeting light
3 840 710	IS 12-TSP	940 nm	600 to 2520°C	View finder, laser targeting light
3 840 720	IS 12-TSP	940 nm	600 to 3000°C	View finder, laser targeting light
3 840 760	IS 12-TSP	650 nm	850 to 2520°C	View finder
3 840 810	IGA 12-TSP	1570 nm	200 to 1020°C	View finder, laser targeting light
3 840 820	IGA 12-TSP	1570 nm	250 to 1400°C	View finder, laser targeting light
3 840 830	IGA 12-TSP	1570 nm	300 to 1700°C	View finder, laser targeting light

Scope of Delivery

Instrument with one optics, case, power supply (service unit) NG 0S (100 to 240 VAC, 50 to 60 Hz ⇒ 24 VDC, 1 A) with 5 m connection cable to the pyrometer, PC analysing software InfraWin, work certificate according to ITS 90 (IS 12-TSP, 600 to 3000°C: work certificate up to 2500°C), user manual.

Ordering Note

When ordering, please select one optics (included in scope of delivery).

ACCESSORIES

PN	Description
3 820 340	Connection cable, 5 m, 90° connector
3 820 530	Connection cable, 10 m, 90° connector
3 820 540	Connection cable, 15 m, 90° connector
3 820 830	Connection cable, 20 m, 90° connector
3 820 840	Connection cable, 25 m, 90° connector
3 820 550	Connection cable, 30 m, 90° connector
3 821 120	Additional cable for limit contacts, 5 m
3 834 200	Ball and socket mounting
3 826 630	Adjustment base
3 837 200	Cooling plate

Ball and socket mounting

Adjustment base

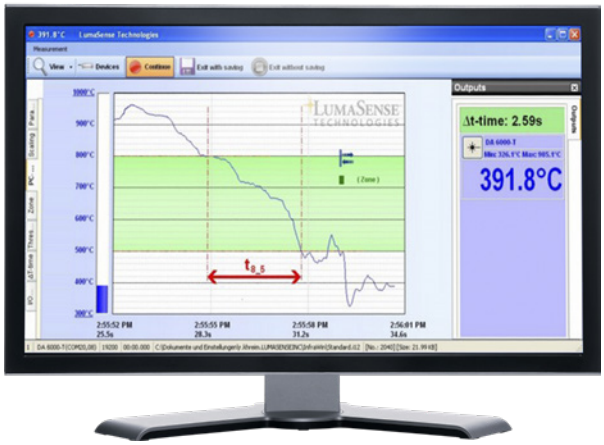
Cooling plate

INFRAWIN 5 OVERVIEW

InfraWin is easy-to-use measurement and evaluation software for remote configuration of stationary, digital Impac brand pyrometers.

This software allows the user to remotely adjust and control settings for one or two pyrometers from a single computer. InfraWin also allows the user to simultaneously monitor and control temperatures.

- Display temperature data as color bars and online graphics
- Capture downstream evaluations as tables, graphics or text files
- Calculate the spot size for different measuring distances
- Features UPP standard (Universal Pyrometer Protocol)



Pyrometer Settings

An Impac digital pyrometer connected to a PC will be automatically detected by the software. All available parameters are adjustable, including emissivity, response time, maximum value storage, output signal and sub range.

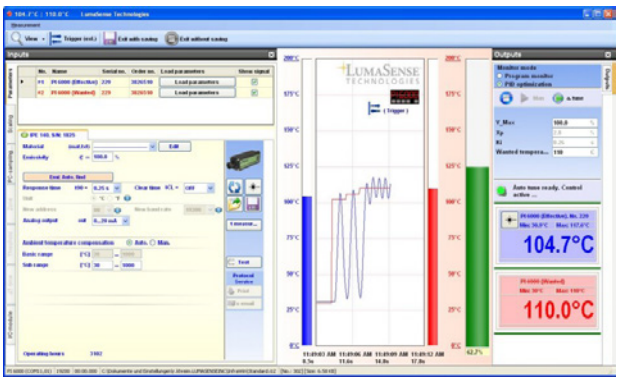
Further special functions are adjustable for example controllers or TV parameters on instruments available with these functions. Changes are transmitted directly to the pyrometer.

Measurement with Color Bar

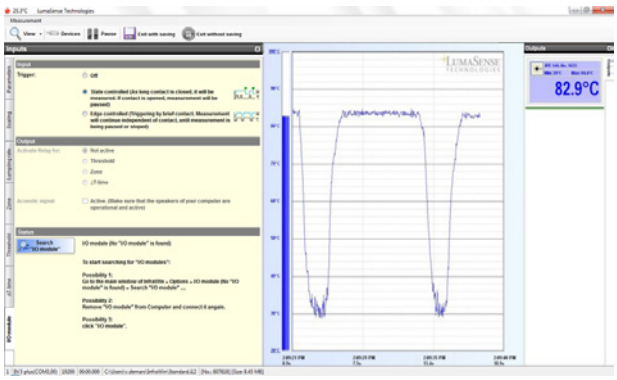
In this window a temperature value for the upper or lower limit can be adjusted numerically or with the mouse.
The acquired minimum and maximum value is indicated as well as the inner temperature of the pyrometer. The emissivity is changeable during the measurement at any time.

Infrared Calculator

After input of the aperture and the focused spot size per datasheet, the calculation of spot sizes at non-focused distances is possible.



Measurement with Internal Temperature of radiation temperature and internal instrument temperature. Parameters can be changed during the measurement.



I/O Module allows users to trigger measurement externally and gives a potential free output contact.

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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