

**Fully digital, extremely precise Transfer Standard Pyrometer
for exact inspection of calibration sources**

IS 12-TSP • IGA 12-TSP



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



IS 12-TSP and **IGA 12-TSP** are extremely precise and long-term stable transfer standard pyrometers which can be used for the checking of calibration sources.

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.

The IS 12-TSP or IGA 12-TSP transfer standard pyrometers have been specially designed for this purpose. They are available in several temperature ranges between 200 and 3000°C and in various spectral ranges, which means that they can be used with calibration sources with which pyrometers with Silicon or Indium Gallium Arsenide detectors can be checked.

The detectors in the TS 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.

Use of a TS 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 TS pyrometer should be checked regularly by IMPAC. This is, however, only necessary every 2 years thanks to the pyrometer's solid construction.

Technical Data

	IS 12-TS	IGA 12-TSP
Temperature ranges:	600 - 2520°C 850 - 2520°C 600 - 3000°C	200 - 1020°C 250 - 1400°C
Spectral range:	0.94 μm (at temperature range 600 to 2520°C / 3000°C) 0.65 μm (at temperature range 850 to 2520°C)	1.57 μm
Accuracy: ($\epsilon=1$, $t_{90}=1$ s, $T_{amb.}=23^{\circ}\text{C}$)	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 : ($\epsilon=1$, $t_{90}=1$ s, $T_{amb.}=23^{\circ}\text{C}$)	1°C	
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	
Subrange:	Any range adjustable within the temperature range, minimum span 51°C	
Signal processing:	Fotoelectric current, digitized immediately	
Power supply:	24 V DC (15 - 40 V DC) or 24 V AC (12 - 30 V AC), 48 to 62 Hz	
Power consumption:	Max. 14 W	
Analog output:	Linear 0 - 20 mA or 4 - 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	
Display:	Built-in 5 digit LED display, additional function LED's	
Isolation:	Power supply, digital interface, analog output are galvanically isolated against each other and housing	
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 - 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)	
Emissivity ϵ :	0.100 to 1.000 in $\frac{1}{1000}$ steps	
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	
Limit switches:	2 relay outputs (change-over contacts), switch power max. 30 W (I_{max} : 1 A, U_{max} : 60 V DC)	
Sighting:	Built-in parallax free thru-lens view finder; additionally laser targeting light (max. power level < 1 mW, $\lambda = 630 - 680$ nm, CDRH class II) (at IS 12-TSP with temperature range 850 - 2520°C only with view finder)	
Control panel:	4 keys, operate with tip of ball-point pen	
Protection class:	IP65 (DIN 40 050)	
Ambient temperature:	0 - 60°C at the housing	
Storage temperature:	-20 - 70°C	
Humidity:	No condensating conditions	
Weight:	2.2 kg	
CE-label:	According to EU directives about electromagnetic immunity	

Instrument's Equipment



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).



	Measuring distance <i>a</i> [mm]	Focusable optics IS 12-TSP	Focusable optics IGA 12-TSP		Objective length [mm]
		Spot size <i>M</i> ₉₀ [mm]	Spot size <i>M</i> ₉₀ [mm]		
		All temperature ranges	200 to 1020°C	250 to 1400°C	
Optics 1	<i>a</i> = 275 mm	0.7	2	1.1	30
	<i>a</i> = 400 mm	1.1	3	1.6	9
	<i>a</i> = 520 mm	1.5	4.2	2.2	0
Optics 2	<i>a</i> = 385 mm	1	2.7	1.5	30
	<i>a</i> = 700 mm	1.9	5.2	3	8.5
	<i>a</i> = 1125 mm	3.4	8.5	4.9	0
Optics 3	<i>a</i> = 540 mm	1.4	3.5	2	30
	<i>a</i> = 3000 mm	8.5	23	13	3
	<i>a</i> = 9000 mm	26	72	38	0
Aperture <i>D</i> *):		13.5 - 17	13.5 - 17		

*) depending on the objective length

Reference Numbers

Ref. number	Type	Spectral range	Temp. range	Sighting
3 840 710	IS 12-TSP	940 nm	600 - 2520°C	View finder, laser targeting light
3 840 720	IS 12-TSP	940 nm	600 - 3000°C	View finder, laser targeting light
3 840 760	IS 12-TSP	650 nm	850 - 2520°C	View finder
3 840 810	IGA 12-TSP	1570 nm	200 - 1020°C	View finder, laser targeting light
3 840 820	IGA 12-TSP	1570 nm	250 - 1400°C	View finder, laser targeting light

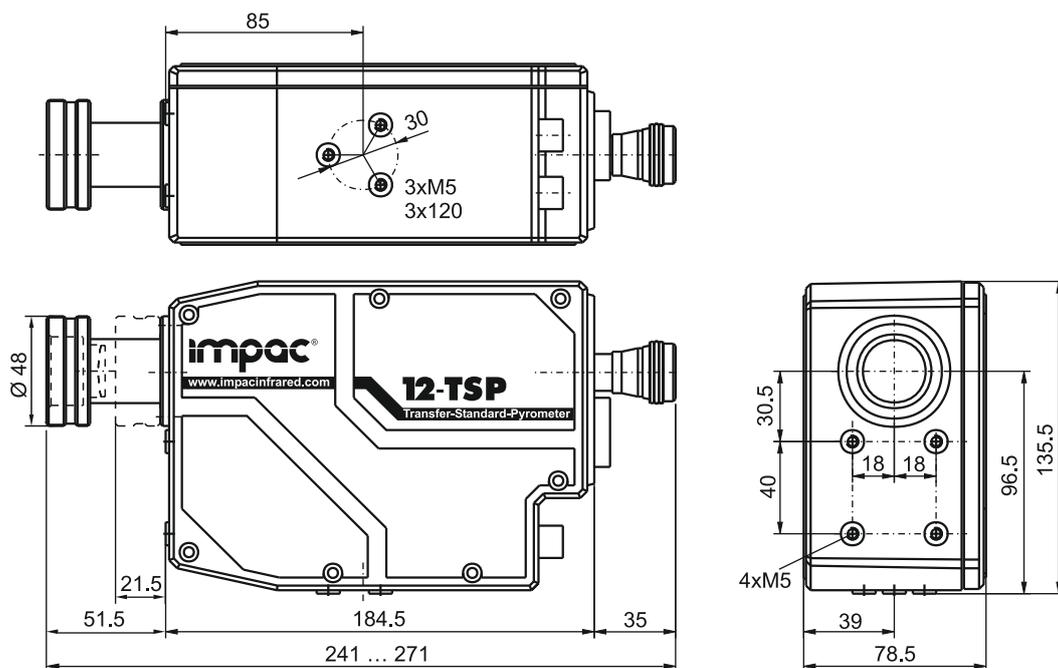
Ordering note: When ordering please select one optics (included in scope of delivery).

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

Application Scheme



Dimensions



All dimensions in mm

Accessories



Ball and socket mounting



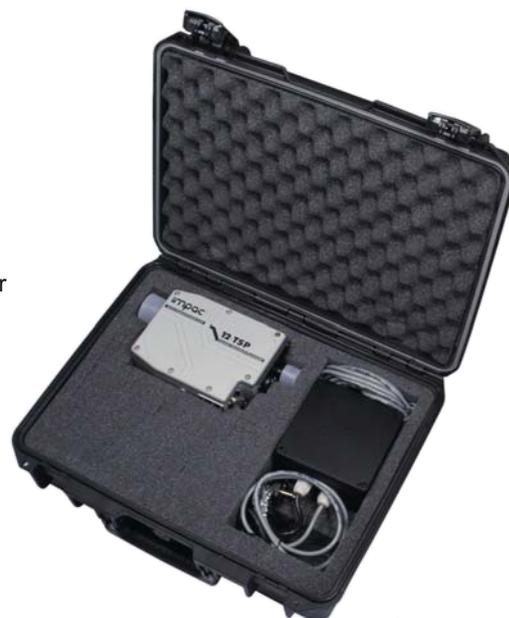
Adjustment base



Photo tripod adapter



Cooling plate



Delivery in plastic case

Accessories:

- | | |
|-----------|---|
| 3 834 200 | Ball and socket mounting |
| 3 826 630 | Adjustment base |
| 3 837 200 | Cooling plate |
| 3 820 340 | Connection cable, 5 m length, angled connector |
| 3 820 530 | Connection cable, 10 m length, angled connector |
| 3 820 540 | Connection cable, 15 m length, angled connector |
| 3 820 830 | Connection cable, 20 m length, angled connector |
| 3 820 840 | Connection cable, 25 m length, angled connector |
| 3 820 550 | Connection cable, 30 m length, angled connector |
| 3 821 120 | Additional cable for limit switches, 5 m |
| 3 834 060 | Photo tripod adapter (3/8") |

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