

- Measure
- Monitor
- Control

# PRODUCT OVERVIEW

## IMPAC Pyrometers



-50°C








3500°C



### Infrared Thermometers for Non-Contact Temperature Measurement

- Portables
- Fixed Pyrometers
- Fibre Optic Pyrometers
- Temperature Switches









Measuring material	Generally non-metallic surfaces				
Properties	Portables		Small, low-priced		
<b>IMPAC pyrometers</b>					
<b>Instrument</b>	<b>Series 14</b> <b>Series 15</b>	<b>IS 8-K plus</b>	<b>IN 3000</b>	<b>IN 510, IN 510-N</b> <b>IN 530, IN 530-N</b>	<b>IN 300</b> <b>IN 310</b>
<b>Benefits</b>	General applications  Laser targeting light, maximum value storage Laser targeting light, Min./ Max./ Avg., data storage, close-up lens for spot sizes up to 2.2 mm	Special version of IS 8 plus, designed for measurement of nozzle brick temperatures in coke ovens	Small, good value, simple sensor, different linear measuring outputs are available	Digital pyrometers with separate miniature sensor head. Sensor head / cable usable in ambient temperatures without cooling: up to 85°C up to 180°C (short-time 210°C)	Good value, small 2-wire pyrometer with fixed focus and adjustable emissivity, easy installation
<b>Temperature ranges</b> (between... and...)	-32...600°C -32...900°C	700...1600°C	0...500°C	-40...700°C	-20...500°C
<b>Spectral range</b>	8...14 µm	0.6...1.1 µm	8...14 µm	8...14 µm	8...14 µm
<b>Field of view</b> (Minimum spot size Ø in mm)	10 : 1 15 : 1 30 : 1 50 : 1 (min 2.2)	min 300 : 1 (min 0.8)	5 : 1	2 : 1 or 10 : 1	15 : 1 30 : 1
<b>Exposure time t<sub>90</sub><sup>1)</sup></b>	300 ms 150 ms	100 ms	300 ms	180 ms	300 ms
<b>Output</b>	– USB	RS232	10 mV/°C, thermocouple type J or type K	adjustable up to 30 s 0/4...20 mA, 0...5 V, thermoc. J / K, RS232/RS485 (switchable)	4...20 mA







Measuring material	Metallic surfaces, ceramics, graphite				
Properties	Portables		Small, low-priced		
<b>IMPAC pyrometers</b>					
<b>Instrument</b>	<b>IGA 15 plus</b>	<b>IS 8 plus</b> <b>IGA 8 plus</b>	<b>IS 8-GS plus</b>	<b>IS 300</b> <b>IGA 300</b>	<b>IS 200</b> <b>IGA 200</b>
<b>Benefits</b>	Measurement of metals, ceramics, graphite, etc. Laser targeting light, Min./ Max./ Avg., data storage, close-up lens for spot sizes up to 1.25 mm	Very fast portable for temperature measurements on metals and ceramics. Very small spot sizes, maximum value storage, temperature indicator inside the view finder	Special version of IS 8 plus, designed for measuring of temperatures on molten metals in the pouring stream.	Good value, small, fast, medium / high temperature 2 wire pyrometers with fixed focus, adjustable emissivity and LED targeting light	Fast digital medium/high temperature digital pyrometers in 2 wire design with analog output and service interface (for programming emissivity, response time and temperature range), LED targeting light.
<b>Temperature ranges</b> (between... and...)	250...1800°C	600...2500°C 300...1300°C	1000...2000°C	650...2500°C 300...1500°C	650...2500°C 300...1800°C
<b>Spectral range</b>	1.45...1.8 µm	0.6...1.1 µm 1.45...1.8 µm	0.55 µm	0.8...1.1 µm 1.45...1.8 µm	0.8...1.1 µm 1.45...1.8 µm
<b>Field of view</b> (Minimum spot size Ø in mm)	200 : 1 (min 1.25)	min 300 : 1 (min 0.8)	min 300 : 1 (min 0.8)	3 fixed optics min 75 : 1 (min 1.6)	3 fixed optics min 200 : 1 (min 5) min 100 : 1 (min 6)
<b>Exposure time t<sub>90</sub><sup>1)</sup></b>	20 ms	1 ms	500 ms	10 ms	20 ms adjustable up to 10 s
<b>Output</b>	USB	RS232	RS232	4...20 mA	4...20 mA

Note: Coloured data in the table are only valid for the respective type of pyrometer, the black data for all types of the same column.


## Generally non-metallic surfaces


Small, low-priced	Compact class			Comfort class	Different
					
<b>IN 200</b>	<b>IN 5</b>	<b>IN 5 plus</b>	<b>IN 5-H plus</b> <b>IN 5-L plus</b>	<b>IPE 140/34</b> <b>IPE 140/45</b>	<b>TS 300</b> <b>TGA 300</b>
Digital pyrometer with analog output (2 wire design) and service interface (for programming emissivity, response time and temperature range).	Digital pyrometer with analog output (2 wire design). Different measuring ranges and optics.	Digital pyrometer with analog output, digital interface, max. / min. value storage, adjustable measuring range, different optics, laser targeting light	High speed version of IN 5 plus with shorter response times Special version of IN 5 plus with very small spot sizes	Special version of IPE 140: for measuring of thin PE and PP foils with a minimum material thickness of only 10 µm. For measurement of combustion flames and hot gases containing CO <sub>2</sub> .	Infrared temperature switch. Recognizes without contact hot objects located in its measuring beam to trigger a switch process.
-32...900°C	-32...900°C	-32...900°C	-32...900°C	50...500°C 400...2000°C	700...1500°C 400...1400°C
8...14 µm	8...14 µm	8...14 µm	8...14 µm	3.43 µm CO <sub>2</sub> hot band	0.85...1.1 µm 0.8...1.8 µm
3 fixed optics 40 : 1 (min 2.5)	3 fixed optics 50 : 1 (min 2)	3 fixed optics 50 : 1 (min 2)	3 fixed optics 50 : 1 (min 2) 3 fixed optics 100 : 1 (min 1)	3 focusable optics min 50 : 1 (min 2.1) 3 focusable optics min 200 : 1 (min 0.7)	2 fixed optics 55:1 (min 4) 85:1 (min 7)
120 ms adjustable up to 10 s 4...20 mA	80 ms adjustable up to 5 s 4...20 mA	80 ms adjustable up to 30 s 0/4...20 mA, RS232 or RS485	10 ms, 180 ms adjustable up to 30 s 0/4...20 mA, RS232 or RS485 4...20 mA	1.5 ms <sup>2)</sup> adjustable up to 10 s 0/4...20 mA, RS232 or RS485 (switchable)	1 ms  switch output 20 V, max. 30 mA

## Metallic surfaces, ceramics, graphite

Small, low-priced	Compact class		Compact class with fibre		
					
<b>IN 200/4</b>	<b>IN 5/4</b> <b>IN 5/4 plus</b>	<b>IS 5</b> <b>IGA 5</b>	<b>IS 5-LO</b> <b>IGA 5-LO</b>	<b>IS 50-LO plus</b> <b>IGA 50-LO plus</b>	<b>IS 50/67-LO plus</b>
Special version for measurement of objects in flame heated furnaces, sees through clean combustion flames and hot gases	Special versions of IN 5 and IN 5 plus. For measurement of objects in flame heated furnaces, sees through clean combustion flames and hot gases.	Very fast digital pyrometers with analog output and digital interface. Maximum value storage, adjustable measuring range, laser targeting light or view finder or integrated TV camera.	Very fast digital fibre optic pyrometer with analog output and digital interface. Maximum value storage, adjustable measuring range, laser targeting light. Two optical heads available, very small spot sizes.	Very fast, digital fibre optic pyrometers. Two optical heads available, very small spot sizes. Display, buttons for instrument settings. Analog output, digital interface, maximum value storage.	Special version of IS 150-LO plus with extremely short wavelength for measurements of metals with high emissivity.
300...1000°C	300...2500°C	650...3000°C 250...3000°C	650...3000°C 300...3000°C	550...3300°C 180...2500°C	1100...3500°C
3.9 µm	3.9 µm	0.8...1.1 µm 1.45...1.8 µm	0.8...1.1 µm 1.45...1.8 µm	0.8...1.1 µm 1.45...1.8 µm	0.676 µm
3 fixed optics 33 : 1 (min 3)	3 fixed optics 50 : 1 (min 2)	optics N min 160 : 1 (min 0.5) optics F min 200 : 1 (min 1)	optical head I min 100 : 1 (min 1.2) optical head II min 200 : 1 (min 0.45)	optical head I min 100 : 1 (min 1.2) optical head II min 200 : 1 (min 0.45)	optical head I min 100 : 1 (min 1.2) optical head II min 200 : 1 (min 0.45)
120 ms adjustable up to 10 s 4...20 mA	80 ms adjustable up to 30 s 4...20 mA 0/4...20 mA, RS232 or RS485	≤ 2 ms adjustable up to 10 s 0/4...20 mA, RS232 or RS485, PID- controller (option)	≤ 2 ms adjustable up to 10 s 0/4...20 mA, RS232 or RS485 PID controller (option)	< 1 ms adjustable up to 10 s 0/4...20 mA, RS232 or RS485 (switchable)	< 1 ms adjustable up to 10 s 0/4...20 mA, RS232 or RS485 (switchable)







<sup>1)</sup> According to IEC/TS 62492-1

Measuring material	Metallic surfaces, ceramics, graphite				
Properties	Ratio pyrometers				Comfort class
<b>IMPAC pyrometers</b>					
<b>Instrument</b>	<b>ISQ 5</b>	<b>ISQ 5-LO</b>	<b>ISR 50-LO</b>	<b>ISR 12-LO</b> <b>IGAR 12-LO</b>	<b>IPE 140/39</b>
<b>Benefits</b>	Digital, fast pyrometer in 2-colour design (switchable to mono mode) with analog output and digital interface, maximum value storage, adjustable measuring range, laser targeting light or view finder or integrated TV camera.	Digital, fast fibre optic ratio pyrometer in 2-colour design (switchable to mono mode) with analog output and digital interface. Max. value storage, adjustable measuring range, laser targeting light. Two optical heads available, very small spot sizes.	Fast digital, fibre optic ratio pyrometer (switchable to 1-color design). Analog output, digital interface, maximum value storage, laser targeting light. Two optical heads available. Very small spot sizes	Fully digital, very fast pyrometer in 2-colour design (switchable to mono mode), with long fibre optic cable lengths up to 30 m, display and laser targeting light, very small spot sizes, analog output and digital interface, maximum value storage.	Special versions of IPE 140: For measurement of objects in flame heated furnaces, sees through clean combustion flames and hot gases.
<b>Temperature ranges</b> (between... and...)	600...3000°C	700...2500°C	700...3000°C	600...3300°C 300...2200°C	20...1450°C
<b>Spectral range</b>	channel 1: 0.9 µm channel 2: 1.05 µm	channel 1: 0.9 µm channel 2: 1.05 µm	channel 1: 0.9 µm channel 2: 1.05 µm	0.8...1.1 µm 1.28...1.7 µm	3.9 µm
<b>Field of view</b> (Minimum spot size ∅ in mm)	min 200 : 1 (min 1.5)	min 100 : 1 (min 1.2) optical head I min 200 : 1 (min 0.45)	min 100 : 1 (min 1.2) optical head I min 200 : 1 (min 0.45)	optical head I min 100 : 1 (min 1.2) optical head II (focusable) min 200 : 1 (min 0.45)	3 focusable optics min 200 : 1 (min 0.7)
<b>Exposure time t<sub>90</sub><sup>1)</sup></b>	< 10 ms adjustable up to 10 s	≤ 10 ms adjustable up to 10 s	< 10 ms adjustable up to 10 s	2 ms <sup>2)</sup>	1.5 ms <sup>2)</sup> adjustable up to 10 s
<b>Output</b>	0/4...20 mA, RS232 or RS485	0/4...20 mA, RS232 or RS485 PID controller (option)	0/4...20 mA, RS232 or RS485 (switchable)	0/4...20 mA, RS232 or RS485 (switchable)	0/4...20 mA, RS232 or RS485 (switchable)







Measuring material	Metall. surf., ceramics, graphite		Glass surfaces		
Properties	Comfort class		Portables	Small, low-priced	
<b>IMPAC pyrometers</b>					
<b>Instrument</b>	<b>IP 140</b> <b>IPE 140</b>	<b>IP 140-LO</b>	<b>IN 15/5</b> <b>IN 15/5 plus</b>	<b>IN 300/5</b>	<b>IN 200/5</b>
<b>Benefits</b>	Fully digital, very fast pyrometer for measurements of low temperatures on metals. View finder or laser targeting light, very small spot sizes, focusable optics. Display, setting keys, max. value storage. Analog output, digital interface.	Fully digital, very fast pyrometer for measurements of low temperatures on metals. Fibre, two optics available, laser targeting light, very small spot sizes LC-display, instrument settings, analog output, digital interface RS232/RS485, max. value storage	Special version of series 15 for measurements of glass surfaces. Spectral range 5.14 µm	Glass surface measurement version of IN 300, 2 wire design, spectral range 5.14 µm	Glass surface measurement version of IN 200, 2 wire design and service interface. Programmable measuring range, spectral range 5.14 µm
<b>Temperature ranges</b> (between... and...)	50...1300°C 5...1200°C	100...750°C	150...1800°C	300...1300°C	100...1200°C
<b>Spectral range</b>	2...2.8 µm 3...5 µm	2...2.6 µm	5.14 µm	5.14 µm	5.14 µm
<b>Field of view</b> (Minimum spot size ∅ in mm)	3 focusable optics min 400 : 1 (min 0.25)	optical head I min 35 : 1 (min 3.4) optical head II min 80 : 1 (min 1.1)	50 : 1	2 fixed optics 40 : 1 (min 2.5)	3 fixed optics 40 : 1 (min 2.5)
<b>Exposure time t<sub>90</sub><sup>1)</sup></b>	1.5 ms <sup>2)</sup> adjustable up to 10 s	1.5 ms <sup>2)</sup> adjustable up to 10 s	150 ms	100 ms	120 ms adjustable up to 10 s
<b>Output</b>	0/4...20 mA, RS232 or RS485 (switchable)	0/4...20 mA, RS232 or RS485 (switchable)	USB	4...20 mA	4...20 mA

Note: Coloured data in the table are only valid for the respective type of pyrometer, the black data for all types of the same column.

## Metallic surfaces, ceramics, graphite

Comfort class		Robust industry design			Precision class	
						
<b>IS 140</b> <b>IGA 140</b>	<b>IS 140/67</b>	<b>IS 12, IS 12-S</b> <b>IGA 12, IGA 12-S</b>	<b>IS 12-AI</b> <b>IS 12-AI/S</b>	<b>IS 12-Si</b>	<b>IS 12-TSP</b> <b>IGA 12-TSP</b>	
Fully digital, very fast pyrometers. View finder or laser targeting light or color TV camera. Very small spot sizes, focusable optics. Display, buttons for instrument settings. Analog output, digital interface, maximum value storage.	Special version of IS 140 with extremely short wavelength for measurements of metals with high emissivity.	Fully digital, highly accurate, very fast pyrometer. Build in digital display, view finder and optional targeting light, very small spot sizes, variable or fixed optics, analog output, digital interface, maximum value storage. Option: built-in scanner (-S).	Special version of IS 12, designed for measuring of aluminium. <i>With built-in scanner, scanning angle adjustable between 0...4°, scanning frequency between 0...10 Hz.</i>	Special version of IS 12, designed for measuring of silicon wafers.	Transfer-Standard-Pyrometer specially designed for the exact verification of the temperature of a blackbody calibration source. Resolution 0.01°C, extremely high accuracy and long term stability. Traceable works certificate with 5 measuring points.	
550...3300°C 250...2500°C	1100...3500°C	550...3500°C 300...1800°C	350...900°C	350...1800°C	600...2520°C 200...1020°C	
0.7...1.1 µm 1.45...1.8 µm	0.676 µm	0.7...1.1 µm 1.45...1.8 µm	special	special	2 types: 0.94 µm / 0.65 µm; 1.570 µm	
3 focusable optics min 300 : 1 (min 0.35)	3 focusable optics min 300 : 1 (min 0.35)	6 fixed optics min 900 : 1 (min 0.1) 3 focusable optics min 800 : 1 (min 0.4)	5 fixed optics min 60 : 1 (min 2.2)	6 fixed optics min 370 : 1 (min 0.7)	3 focusable optics min 400 : 1 (min 0.7)	
< 1 ms adjustable up to 10 s	< 1 ms adjustable up to 10 s	1 ms adjustable up to 10 s	< 1.5 ms adjustable up to 10 s	10 ms adjustable up to 10 s	1 ms adjustable up to 10 s	
0/4...20 mA, RS232/485 (switch.), Profibus-DP (opt.); PID contr. (opt.)	0/4...20 mA, RS232 or RS485 (switchable), Profibus-DP (option)	0/4...20 mA, RS232 or RS485 (switchable)	0/4...20 mA, RS232 or RS485 (switchable)	0/4...20 mA, RS232 or RS485 (switchable)	0/4...20 mA, RS232 or RS485 (switchable)	

## Glass surfaces

Compact class		Compact class with fibre			Comfort class
					
<b>IN 5/5</b>	<b>IN 5/5 plus</b>	<b>IN 5/5-H plus</b> <b>IN 5/5-L plus</b>	<b>IS 5-LO/GL</b>	<b>IS 50-LO/GL</b>	<b>IN 140/5</b> <b>IN 140/5-H, IN 140/5-L</b>
Glass surface measurement version of IN 5, spectral range 5.14 µm, in 2 wire design	Glass surface measurement version of IN 5 plus, spectral range 5.14 µm. Optional with laser targeting light	Fast speed version of IN 5/5 plus with shorter response times for glass surface measurement. Special version of IN 5/5 plus with very small spot sizes, for glass surface measurement. spectral range 5.14 µm	Fibre optic pyrometers for measurement of molten glass for forehearth, feeder and gobs. Adjustable measuring ranges. Analog output, digital interface, maximum value storage, laser targeting light	Fibre optic pyrometers for measurement of molten glass for forehearth, feeder and gobs. Adjustable measuring ranges. 2 wire design, analog output, (service interface).	Pyrometer for glass surface measurement, spectral range 5.14 µm. Laser targeting light or thru-lens view finder or color TV camera. Focusable optics with small spot sizes <i>-H: high speed version</i> <i>-L: better field of view</i>
100...2500°C	100...2500°C	200...2500°C	650...2500°C	600...1800°C	250...2500°C
5.14 µm	5.14 µm	5.14 µm	0.8...1.1 µm	0.8...1.1 µm	5.14 µm
3 fixed optics 50 : 1 (min 2.5)	3 fixed optics 50 : 1 (min 2.5)	3 fixed optics 50 : 1 (min 2.5) 3 fixed optics 100 : 1 (min 1.1)	optical head 240 : 1 (min 5)	optical head 100 : 1 (min 12)	3 focusable optics min 150 : 1 (min 1); 3 focus. optics min 150 : 1 (min 1) focus. opt. 180 : 1 (min 0.9)
80 ms adjustable up to 5 s	80 ms adjustable up to 30 s	10 ms, 80 ms adjustable up to 30 s	≤ 2 ms adjustable up to 10 s	250 ms adjustable up to 10 s	< 40 ms; 10 ms; < 40 ms adjustable up to 10 s
4...20 mA	0/4...20 mA, RS232 or RS485	0/4...20 mA, RS232 or RS485	0/4...20 mA, RS232 or RS485	4...20 mA	0/4...20 mA, RS232 or RS485 (switchable)

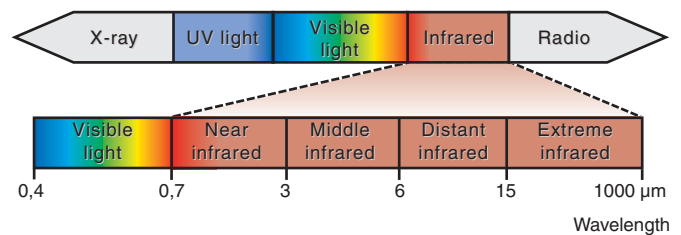
<sup>1)</sup> According to IEC/TS 62492-1

<sup>2)</sup> With dynamical adaption at low signal levels

## Infrared Temperature Measurement

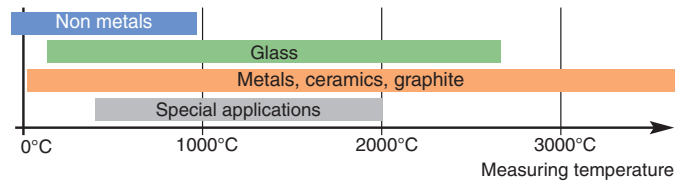
The non-contact temperature measurement (pyrometry) is an optical measurement based on the property of all materials to send out electromagnetic radiation (infrared radiation). The infrared thermometer (pyrometer) uses this radiation to determine the temperature. The pyrometer aims with the optics at a certain spot of the object and determines the temperature of this spot. Today typically spectral responses of pyrometers are in the near, middle and distant infrared.

Electromagnetic Spectrum



## Selection of the Correct IMPAC Pyrometer

To choose the correct pyrometer for a certain application different properties of the measuring object have to be taken into consideration, such as temperature, material and size. For a fast material allocation every pyrometer is assigned with a color mark.



## Temperature Range

IMPAC pyrometers measure temperatures from -50 to 3500°C. The instruments are available in different temperature ranges. The ranges stated in the technical specifications do not show one single temperature range but give an overview over all available measurable temperatures.

## Spectral Range

The material of the measured object demands the correct selection of the optimum spectral range of the pyrometer for a certain application. Therefore the correct spectral range is one of the most important features.

Typical spectral ranges are:

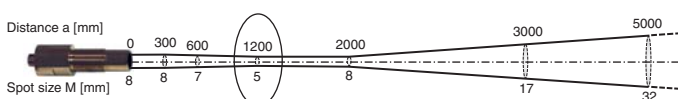
- 0,676 µm: Measurement of molten metals (min. 1100°C)
- 0.8...1.1 µm: Measurement of molten glass, metals, ceramics (min. 600°C)
- 1.45...1.8 µm: Measurement of metals, ceramics (min. 250°C)
- 2.0...2.8 µm: Measurement of metals (min. 50°C)
- 3...5 µm: Measurement of metals, ceramics (min. 5°C)
- 3.43 µm: Measurement of PE and PP foils (min. 50°C)
- 3.9 µm: Measurement in flame heated furnaces (min. 75°C)
- 5.14 µm: Measurement of glass surfaces (min. 100°C)
- 8...14 µm: Measurement of non-metal surfaces and coated metals (min. -40°C)

## Field of View

The dimensions of the measured object determine the required spot size of the pyrometer. At least the spot size has to be as big as the measured object to achieve a correct temperature measurement. The spot sizes are dependent on the type of pyrometer and measuring distance, they can be calculated using the distance ratio or field of view (FOV).

FOV = measuring distance / spot size  
 (e.g. 240 : 1 means:  
 in a distance of 1200 mm the spot size is 5 mm).

Example:



## Response Time

The response time is the time interval between the instant of an abrupt change in the value of the measuring temperature and the instant from which the measured value of the pyrometer remains within specified limits.

## Output

Different pyrometers provide different outputs. Analog outputs and digital interfaces are available. Some pyrometers have various switchable outputs, the output at the IN 3000 has to be selected when ordering.

- Analog output 0...20 mA or 4...20 mA or 10 mV/°C or 0...5 V or thermo couple type J or K
- Digital interface RS232 or RS485
- Profibus-DP
- (switch output for IR switch: 20 V, max. 30 mA)

## Controller

For control processes some pyrometers are equipped with an integrated PID controller. For digital pyrometers without controller output a very fast programmable PID controller is available (PI 6000), especially optimized for pyrometers.

## Design

IMPAC pyrometers are designed for the use in industry under rough conditions. The housings of the fixed pyrometers are made of stainless steel or die cast aluminum with the protection class of IP65. The housings of the portables are made of robust plastics. Available are:

- Compact pyrometers with integrated lens
- Fibre optic pyrometers (LO)
- Portables

## Sighting

For easy alignment of the pyrometers to the measuring object, different sighting systems are available:

- Aiming (LED or laser)
- View finder
- TV camera



## Service

IMPAC's products and solutions are designed to feature accurate and repeatable measuring results. Thus they can provide support for the realization of your business targets. As one of the leading companies in the field of infrared temperature measurement IMPAC assures that you can always rely on professional service performances – before, during and after purchasing an IMPAC product. Qualified employees plus the latest technical equipment guarantee the highest possible quality standards, which are reflected in the following service performances:

- ◆ Individual consultancy
- ◆ On-site service
- ◆ Instrument repairs
- ◆ Adjustment and calibration
- ◆ On-site adjustment and calibration service
- ◆ Issue of inspection sheets and works certificates

### Individual Consultancy

IMPAC pyrometers are available in many different designs and specifications for almost any application. For this reason questions regarding the correct use, the settings or the installation of the instruments may occur and many of these questions can only be answered in an individual dialogue. Accordingly, our experienced personnel from the relative specialist departments are at your disposal to answer your questions.

### On-site Service

The successful assembly of one or more pyrometers into an existing system often requires a careful inspection of the conditions on the spot. Sometimes this cannot be managed by oneself or with telephone support only, especially if particular accessories are needed. In these cases you can rely on our "field application engineers", who will support you in these areas.

### Repairs

IMPAC produces high quality temperature measuring instruments, which operate efficiently, even under the toughest of conditions. Nevertheless a repair of an instrument may become necessary. Our in-house repair department provides a fast turn round of your repair order so that your instruments will be available to you again as quickly as possible.

### Adjustment and Calibration Service

IMPAC pyrometers work accurately and within their technical specifications for many years. But a periodical inspection or

ISO-certification of the instruments is recommended, if for example, the system control of a production process is directly dependent on the pyrometers accuracy.

For this purpose IMPAC offers an adjustment and calibration service. Using a wide range of "calibration sources" which generate well-defined temperatures, the pyrometers are checked in terms of deviations (calibrated) and re-adjusted, if necessary. The inspection results are documented in written form. DKD-certificates can also be requested, if needed.

The accuracy of the calibration sources is guaranteed due to the use of highly accurate reference pyrometers. These pyrometers are checked and certified by the PTB (Physical, Technical Federal Agency (Germany)) or by other calibration laboratories (e.g. DKD (German Calibration Service)) accredited by the PTB.

### On-site Adjustment and Calibration Service

Within Germany and France IMPAC offers an on-site adjustment and calibration service for a wide range of pyrometer types. This service is addressed to customers who do not want to return their instruments, since they are needed back in the application process as fast as possible. The pyrometers are inspected on-site using mobile calibration sources specifically adapted to the particular pyrometer type. The instruments can immediately be adjusted. Moreover inspection sheets or certificates can be issued if needed.



The on-site adjustment and calibration service feature inspections of IN- instruments with a spectral range of 8...14  $\mu\text{m}$  up to 900°C and adjustments up to 500°C. For IS- and IGA- instruments inspections up to 1800°C and adjustments up to 1300°C are provided.

### Inspection Sheets and Works Certificates

The scope of delivery of IMPAC pyrometers always includes an inspection sheet. This document confirms the operational reliability as well as measuring accuracy stated in the technical specifications. Inspection sheets can also be issued after a successful inspection of an IMPAC pyrometer at any time.

An additional works certificate is enclosed to series 12 and 140 instruments. Here the deviation of the measuring accuracy at specified temperatures will be checked and documented. If required for certain process temperatures predefined inspection temperatures can be declared.

### Service Prices

All IMPAC services with costs such as an inspection and adjustment or repairs have fixed prices, independent of the pyrometer type. Transparency of the incurred costs can be provided at any time.



