

Small, stationary infrared thermometer using 2-wire technique for non-contact temperature measurement of metallic surfaces, graphite or ceramics between 300°C and 2500°C

IS 300 • IS 310

IGA 300 • IGA 310



- Very small housing dimensions for easy installation, suited for use in confined spaces
- 2-wire technique for current supply and temperature measurement at the same time
- Internal digital signal processing for high accuracy
- High quality optics for detection of small measuring objects
- Built-in LED targeting light for easy alignment to the measuring object



The **IS 300**, **IS 310**, **IGA 300** and **IGA 310** are stationary pyrometers for non-contact temperature measurement of metallic surfaces, graphite, ceramics, etc.

The very small housing dimensions enable the integration of the pyrometer in compact production machines, the 2-wire technique ensuring very easy electrical connection, the solid and robust design of the instrument guarantees reliability even in rough industrial environments.

The types 300 and 310 differ in the optical data and slightly different housings. Additionally the type 310 is equipped with a connector for electrical installation, this offers the option to use connection cables up to 30 m. The type 300 has a fixed installed 2 m cable.

For optimal match 3 different focusable optics with small spot sizes are available.

Typical applications:

- preheating
- annealing
- tempering
- welding
- forging
- hardening
- sintering
- melting
- soldering
- brazing
- rolling
- tempering

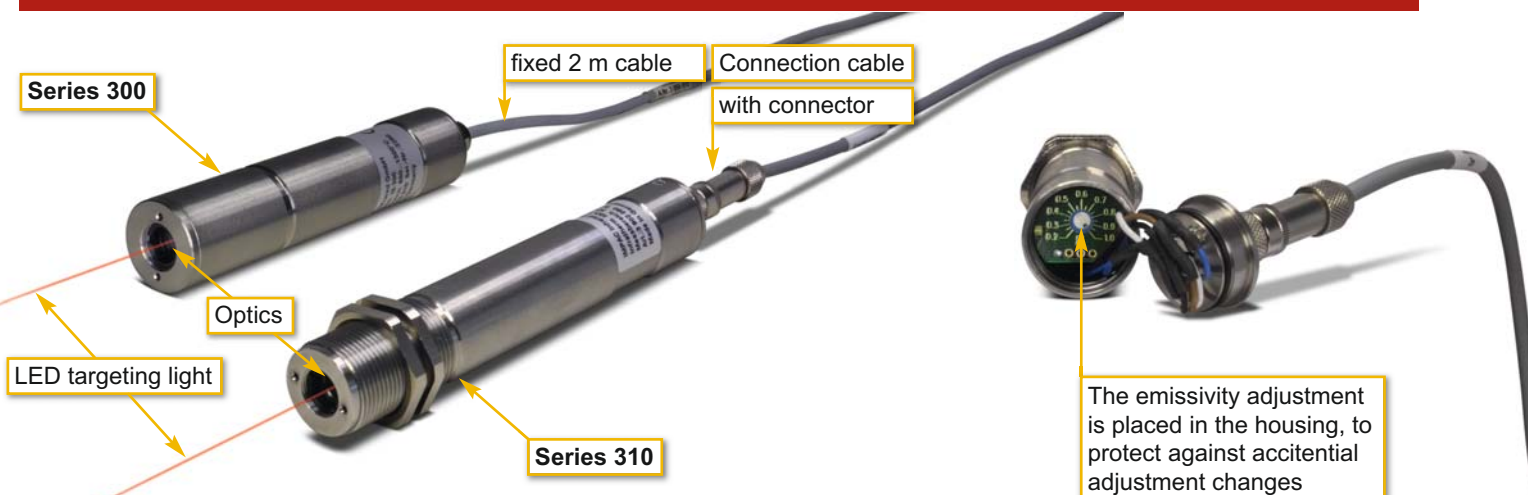
Technical data

| | IS 300 | IS 310 | IGA 300 | IGA 310 |
|--------------------------|--|--|---|---|
| Temperature range: | 650 to 1300°C (MB 13) 650 to 1800°C (MB 18) 800 to 2300°C (MB 23) 1100 to 2500°C (MB 25) | 650 to 1800°C (MB 18) 800 to 2300°C (MB 23) 1100 to 2500°C (MB 25) | 300 to 800°C (MB 8) 400 to 1200°C (MB 12) 300 to 1300°C (MB 13L) 500 to 1500°C (MB 15) | 300 to 1300°C (MB 13L) 500 to 1500°C (MB 15) |
| Spectral range: | 0.8 to 1.1 μm | | 1.45 to 1.8 μm | |
| Detector: | Si photo diode | | InGaAs photo diode | |
| Output: | 4 to 20 mA, load independent current, linear temperature output | | | |
| Max load: | 500 Ω at 24 V power supply, max. 200 Ω at 18 V, max. 800 Ω at 30 V | | | |
| Emissivity ϵ : | 0.2 to 1; adjustable | | | |
| Response time t_{90} : | 10 ms | | | |
| Accuracy: | Up to 1500°C: 0.8% of measured value + 1°C ($\epsilon=1, T_{\text{amb.}}=23^\circ\text{C}$) Above 1500°C: 1% of measured value + 1°C | | | |
| Repeatability: | 0.3% of measured value ($\epsilon=1, T_{\text{amb.}}=23^\circ\text{C}$) | | | |
| Power supply: | 24 V DC \pm 25% stabilised, ripple < 50 mV 5 to 30 V DC for LED targeting light ($I \leq 30$ mA) | | | |
| Sighting: | LED targeting light | | | |
| Ambient temp.: | 0 to 70°C | | | |
| Storage temp.: | -20 to 70°C | | | |
| Relative humidity: | No condensing conditions | | | |
| Housing: | Stainless steel | | | |

| Dimensions: | | |
|-------------|--|--|
| | | |
| | <p>*) Aperture D depending on instrument type, see right page</p> <p>All dimensions in mm</p> | |

| | |
|--------------------|---|
| Protection class: | IP65 (DIN 40 050) |
| Mounting position: | Any |
| Weight : | 275 g |
| Connection cable: | IS 300; IGA 300: 2 m length IS 310; IGA 310: 2 m - 30 m length, connection via connector |
| CE label: | According to EU directives about electromagnetic immunity |

Details

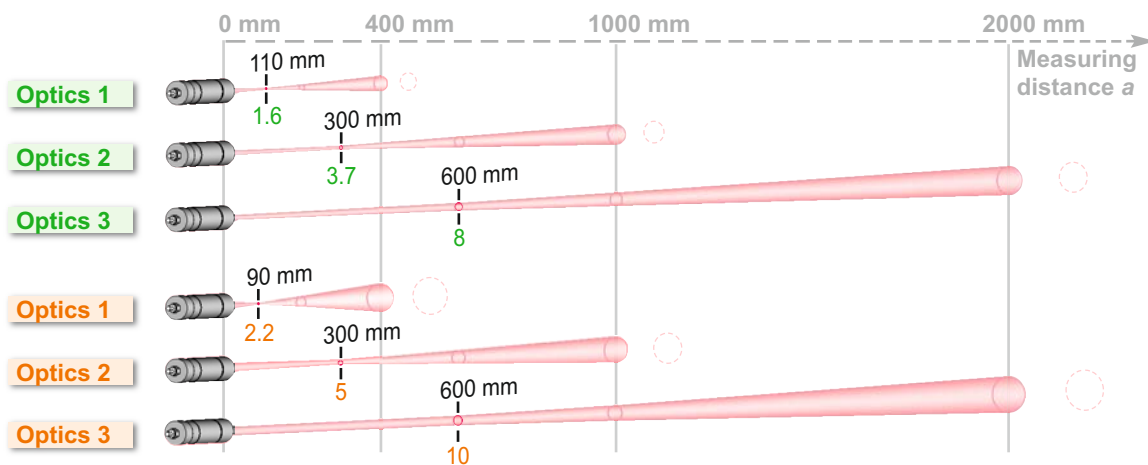


Optics

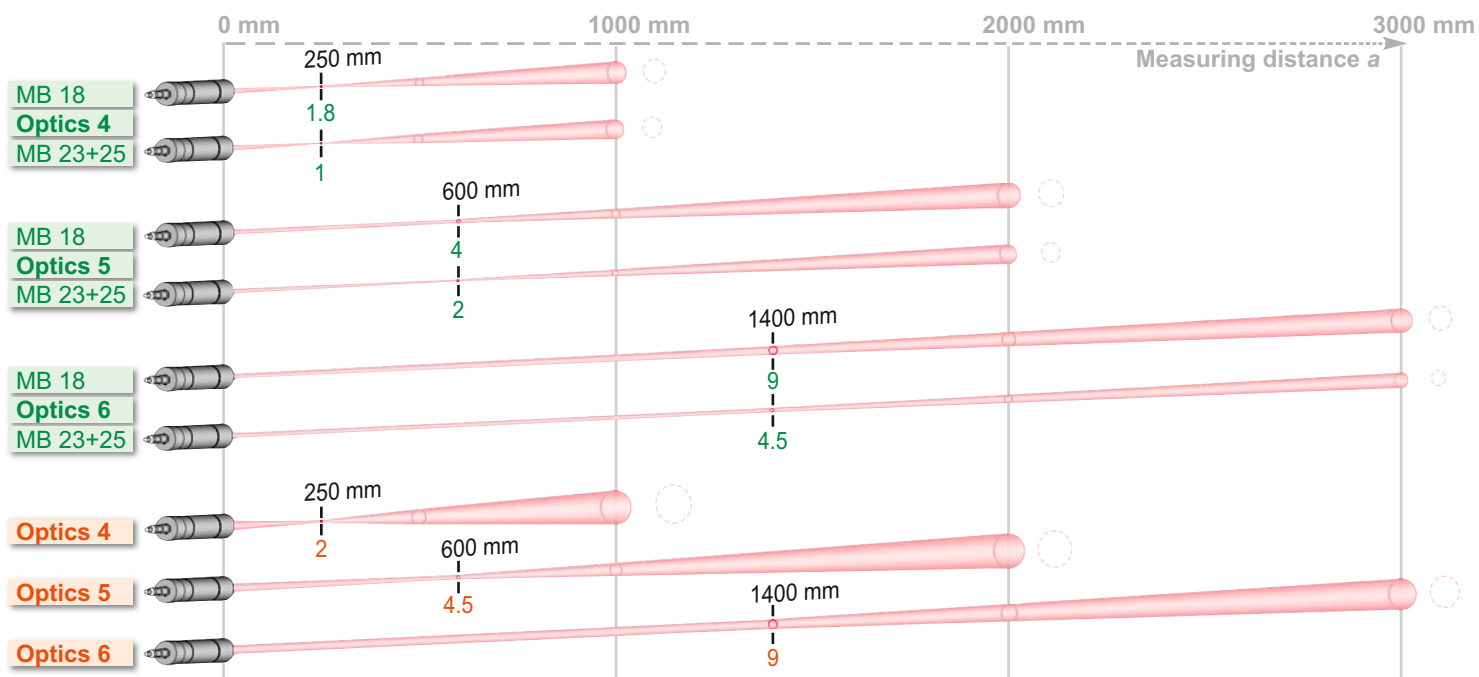
The pyrometers are equipped ex works with one of the following optics. These optics are fixed to a certain distance, i.e. at these distances each optic achieves its smallest spot size in relation to the measuring distance. The spot size will change in any other distance (shorter or longer). Please note that the measuring object must be at least as big as the spot size.

The following table shows the size of the spots (spot size M in mm) at a given measuring distance a . Values between the stated data can be calculated by interpolation. The spot size for measuring distance 0 is equivalent to the aperture diameter D of the optics, this value is used e.g. to calculate measuring distances in intermediate distances.

| Type | $a : M$ *) | Optics | a [mm] | M [mm] | a_1 [mm] | M_1 [mm] | a_2 [mm] | M_2 [mm] | D [mm] |
|---------|------------|--------|----------|----------|------------|------------|------------|------------|----------|
| IS 300 | 65 : 1 | 1 | 110 | 1.6 | 200 | 6 | 400 | 16 | 5 |
| | 80 : 1 | 2 | 300 | 3.7 | 600 | 11 | 1000 | 21 | |
| | 75 : 1 | 3 | 600 | 8 | 1000 | 14 | 2000 | 30 | |
| IGA 300 | 40 : 1 | 1 | 90 | 2.2 | 200 | 11 | 400 | 30 | 9 |
| | 60 : 1 | 2 | 300 | 5 | 600 | 15 | 1000 | 28 | |
| | 60 : 1 | 3 | 600 | 10 | 1000 | 16 | 2000 | 38 | |



| Type | | $a : M$ *) | Optics | a [mm] | M [mm] | a_1 [mm] | M_1 [mm] | a_2 [mm] | M_2 [mm] | D [mm] |
|---------|----------------|------------|--------|----------|----------|------------|------------|------------|------------|----------|
| IS 310 | (MB 18) | 140 : 1 | 4 | 250 | 1.8 | 600 | 11.6 | 1000 | 23 | 5.2 |
| | (MB 23+25) | 250 : 1 | | | 1 | | 9.7 | | 20 | |
| | (MB 18) | 150 : 1 | 5 | 600 | 4 | 1000 | 10.1 | 26 | | |
| | (MB 23+25) | 300 : 1 | | | 2 | | 6.8 | 20 | | |
| | (MB 18) | 155 : 1 | 6 | 1400 | 9 | 2000 | 15.1 | 25 | | |
| | (MB 23+25) | 310 : 1 | | | 4.5 | | 8.7 | 16 | | |
| IGA 310 | MB 13L + MB 15 | 125 : 1 | 4 | 250 | 2 | 600 | 17.4 | 1000 | 35 | 9 |
| | | 135 : 1 | 5 | 600 | 4.5 | 1000 | 13.5 | 2000 | 36 | |
| | | 155 : 1 | 6 | 1400 | 9 | 2000 | 16.8 | 3000 | 30 | |



*) $a : M$; distance ratio (90% intensity), M : spot size, a : measuring distance, D : aperture (effective lens diameter)

Reference numbers

| Type | Optics | Temperature range | | | |
|--------|-----------------------------------|--------------------------|--------------------------|--------------------------|---------------------------|
| | | 650 to 1300°C (MB 13) | 650 to 1800°C (MB 18) | 800 to 2300°C (MB 23) | 1100 to 2500°C (MB 25) |
| IS 300 | 1, 2 or 3 (specify when ordering) | 3 856 610 | 3 856 620 | 3 856 630 | 3 856 650 |
| IS 310 | 4 (focus: 250 mm) | - | 3 902 210 | 3 902 250 | 3 902 310 |
| | 5 (focus: 600 mm) | - | 3 902 220 | 3 902 260 | 3 902 320 |
| | 6 (focus: 1400 mm) | - | 3 902 230 | 3 902 270 | 3 902 330 |

| Type | Optics | Temperature range | | | |
|---------|-----------------------------------|------------------------|--------------------------|---------------------------|--------------------------|
| | | 300 to 800°C (MB 8) | 400 to 1200°C (MB 12) | 300 to 1300°C (MB 13L) | 500 to 1500°C (MB 15) |
| IGA 300 | 1, 2 or 3 (specify when ordering) | 3 856 500 | 3 856 510 | 3 856 530 | 3 856 540 |
| IGA 310 | 4 (focus: 250 mm) | - | - | 3 902 050 | 3 902 110 |
| | 5 (focus: 600 mm) | - | - | 3 902 060 | 3 902 120 |
| | 6 (focus: 1400 mm) | - | - | 3 902 070 | 3 902 130 |

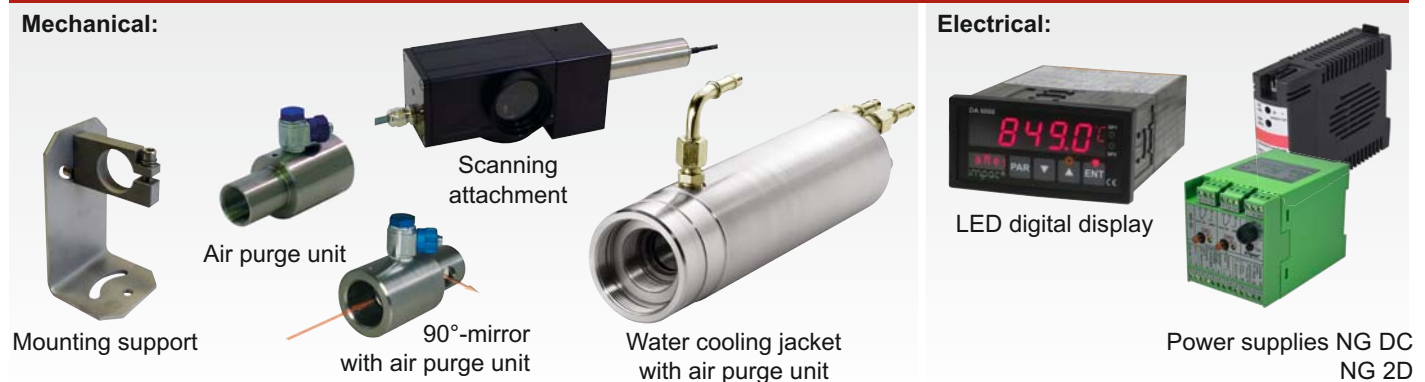
Scope of delivery: Instrument, works certificate, user manual.

Ordering note: A connection cable for the series 310 is not included in scope of delivery and has to be ordered separately.

Accessory

| | | | |
|-----------|--|-----------|--|
| 3 821 610 | Connection cable IS / IGA 310, 2 m | 3 890 610 | Galvanic separator for measuring output (carrier rail mounting housing) |
| 3 821 620 | Connection cable IS / IGA 310, 5 m | 3 863 010 | Converter (4 - 20 mA to 0 - 20 mA) |
| 3 821 630 | Connection cable IS / IGA 310, 10 m | 3 834 230 | Adjustable mounting support, stainless steel |
| 3 821 640 | Connection cable IS / IGA 310, 15 m | 3 846 170 | Mounting tube |
| 3 821 650 | Connection cable IS / IGA 310, 20 m | 3 835 180 | Air purge unit, stainless steel |
| 3 821 660 | Connection cable IS / IGA 310, 25 m | 3 835 240 | 90°-mirror |
| 3 821 670 | Connection cable IS / IGA 310, 30 m | 3 837 160 | Water cooling jacket series 300, stainless steel, with integrated air purge unit |
| 3 852 290 | Power supply NG DC, 100 to 240 V AC, 50 to 60 Hz ⇒ 24 V DC, 1 A | 3 834 210 | Adjustable mounting support for water cooling jacket |
| 3 852 550 | Power supply NG 2D, 85 to 265 V AC, 48 to 62 Hz ⇒ 24 V DC, 600 mA, with 2 limit contacts | 3 890 150 | DA 6000-T, digital display, RS232, measures the time to cool from 800°C to 500°C (for welding processes) |
| 3 890 640 | DA 4000-N: LED-display, 2-wire power supply | 3 843 460 | SCA 300, scanning attachment with quartz glass window; 24 V AC/DC |
| 3 890 650 | DA 4000: like DA 4000-N with 2 limit contacts | 3 835 290 | Air purge unit for scanning attachment |
| 3 890 520 | DA 6000, LED display, RS232, 2-wire power supply, maximum value storage, analog output | | |
| 3 890 530 | DA 6000 with RS485 | | |

Accessory overview



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