

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.

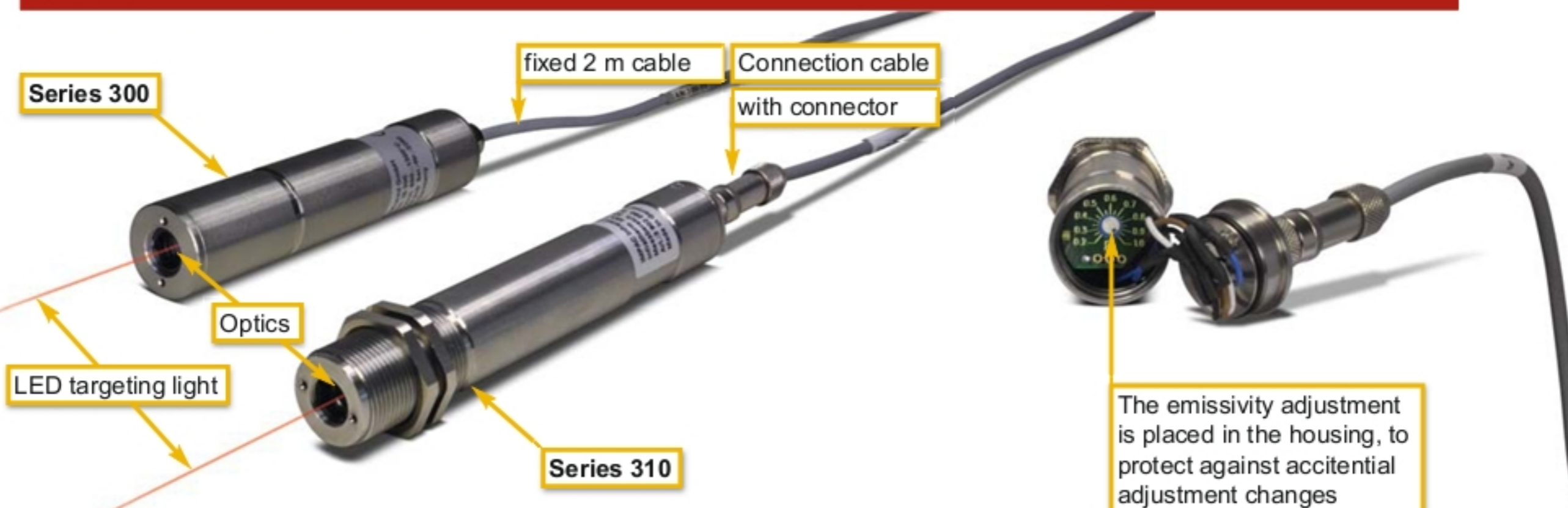
**Typical applications:**

- 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 <sub>90</sub> :	10 ms			
Accuracy: (ε = 1, T <sub>amb.</sub> = 23°C)	Up to 1500°C: 0.8% of measured value + 1°C Above 1500°C: 1% of measured value + 1°C			
Repeatability:	0.3% of measured value (ε = 1, T <sub>amb.</sub> = 23°C)			
Power supply:	24 V DC ± 25% stabilised, ripple < 50 mV 5 to 30 V DC for LED targeting light (I ≤ 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>IS 300 / IGA 300:</p> <p>IS 310 / IGA 310:</p> <p>*) Aperture <i>D</i> 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

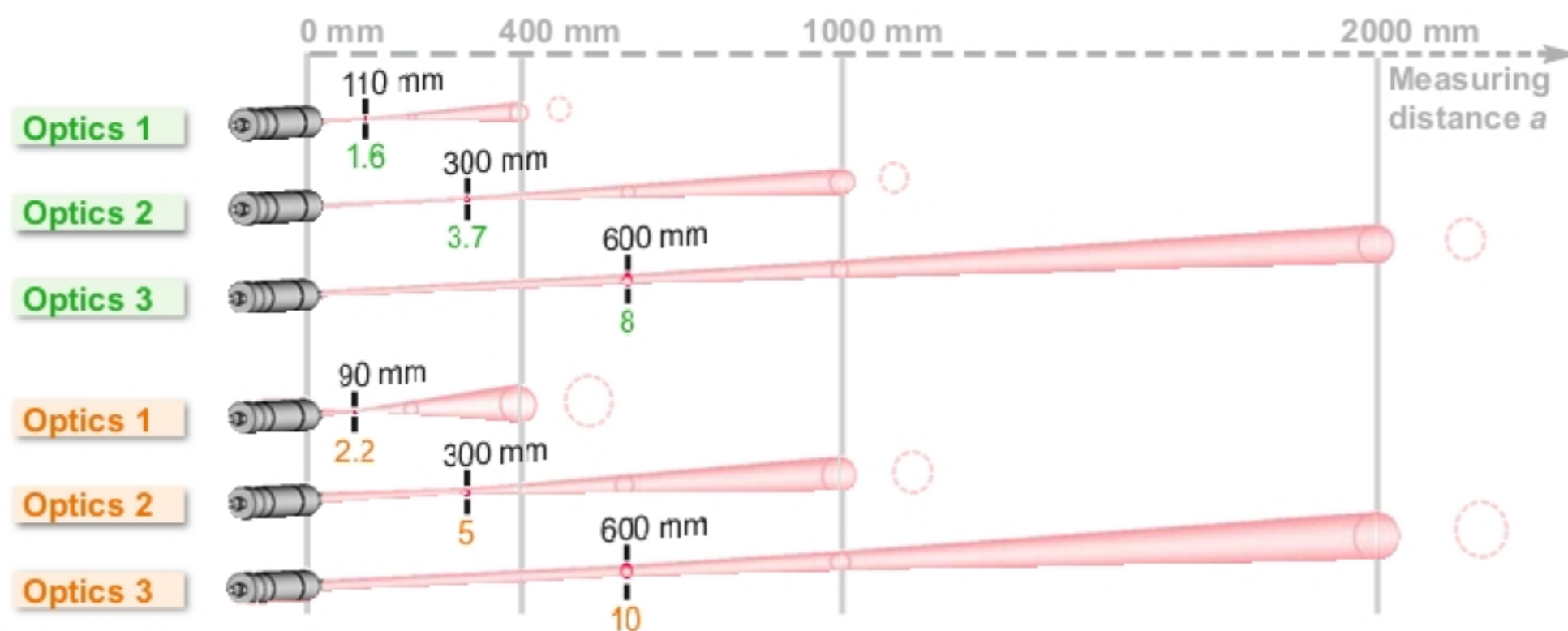


# Optics

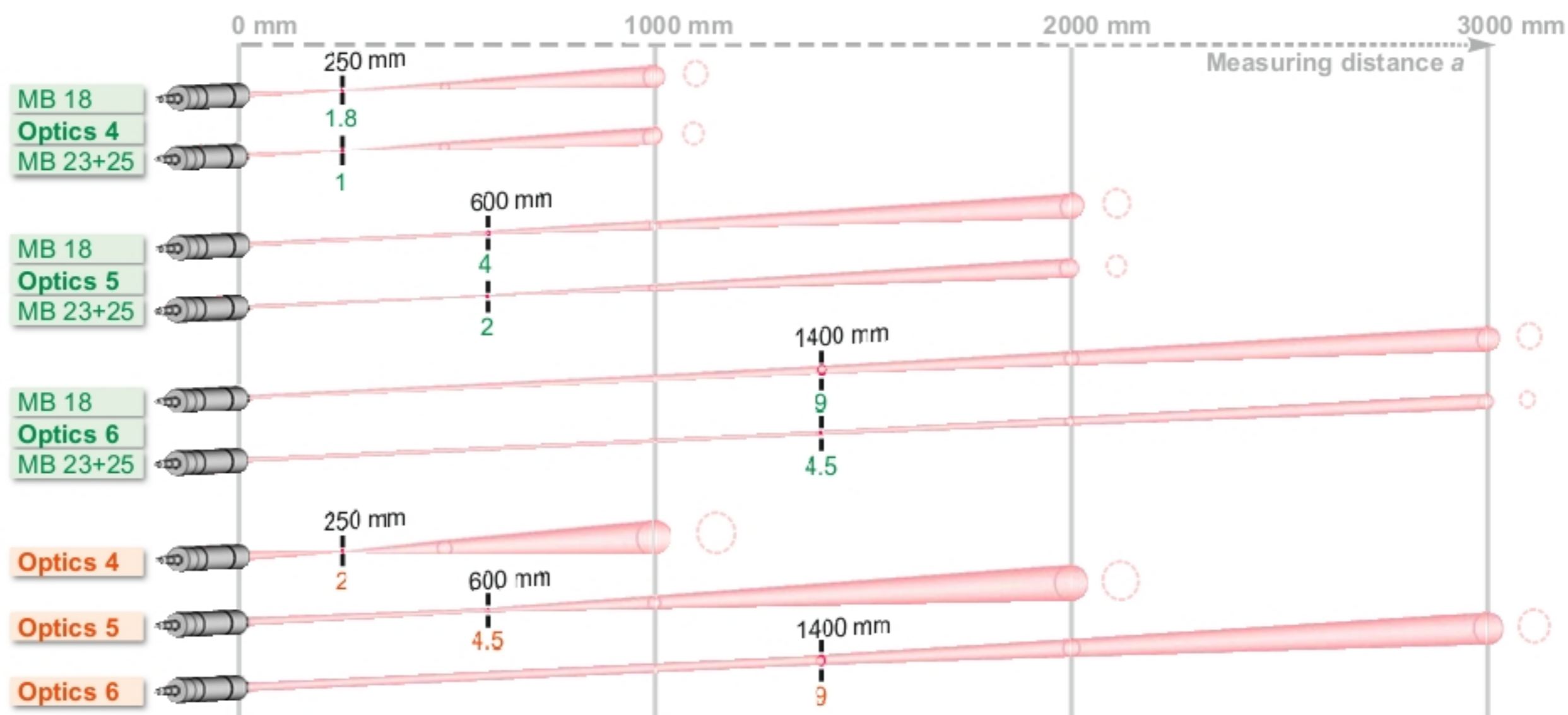
The pyrometers are equipped ex works with one of the following optics. These optics are fixed to a certain distance, i.e. at these distances each optic achieves its smallest spot size in relation to the measuring distance. The spot size will change in any other distance (shorter or longer). Please note 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)	4	250	1.8	600	11.6	1000	23	5.2
	(MB 23+25)			1		9.7		20	
	(MB 18)	5	600	4	1000	10.1	2000	26	
	(MB 23+25)			2		6.8		20	
	(MB 18)	6	1400	9	2000	15.1	3000	25	
	(MB 23+25)			4.5		8.7		16	
IGA 310	MB 13L + MB 15	4	250	2	600	17.4	1000	35	9
		5	600	4.5	1000	13.5	2000	36	
		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

### Mechanical:



### Electrical:

