

# METIS H309 / H316 / H318

**1-Color High-Speed Pyrometers** 



## 1-color high-speed pyrometers for very fast non-contact temperature measurement

#### Shortwave spectral ranges

- for measurements on metals, shiny materials, ceramics, graphite and many more
- for measurements and laser power control in plastic welding.

#### Versatile model types due to modular design

- Focusable optics: integrated or as optical fiber version
- Sighting method: laser targeting light, through-lens sighting or color camera
- Integrated PID controller

from $120 - 520^{\circ}C$ (248°F)
to 700 – 2500°C (4532°F)

**Temperature ranges** 

Response time / Exposure time										
< 40 μs < 20 μs										
Smallest possible spot size										

0.4 mm

#### 50,000 Measurements per Second

1-color high-speed pyrometers of the H3 series perform 50,000 measurements per second and are thus capable, e.g. to perform laser power control almost in real time and react to complex workpiece geometries.

Infrared radiation

H3 are high-precision and extremely fast measuring devices that combine mod-

ern pyrometer technology with the advantag-

es of digital signal processing. The digital microcontroller signal processing ensures 100% reproducibility of displayed readings

by computational integration of emissivity settings or continuous ambient temperature compensation.

### **Technical Data**

Measured object

Model	H309	)	H3	16	H318							
Temperature ranges	550 – 1200°C	750 – 1800°C	250 – 800°C	500 – 1600°C	120 – 520°C							
· · · · · · · · · · · · · · · · · · ·	600 – 1400°C	$00 - 1400^{\circ}$ C 750 - 2000^{\circ}C 300 - 900^{\circ}C 600 - 1800^{\circ}C 180 -										
	650 – 1600°C		350 – 1100°C	700 – 2500°C								
	400 – 1200°C											
Temp. sub ranges	Any temperature su	b-range adjust	able within the terr	nperature range (r	ninimum span 50°C)							
Spectral range	0.7–1.1	μm	1.45–1	.8 µm	1.65–2.1 µm							
Detector	Silico	n n	InGa	aAs	InGaAs							
Response time t <sub>an</sub>	< 40 µs, adjustable	up to 10 s										
Exposure time	< 20 µs											
Uncertainty	0.5% of measured value in °C + 1K											
$(\epsilon = 1, t_{90} = 1 \text{ s}, T_A = 23^{\circ}\text{C})$												
Repeatability	0.2% of measured value in °C + 1K											
$(\epsilon = 1, t_{00} = 1 \text{ s}, T_{\Delta} = 23^{\circ}\text{C})$												
2 analog outputs	0 or 4–20 mA, max. load: 500 $\Omega$ , resolution 0.0015% of the (adjusted) temperature (sub) range (16 Bit).											
	Output 1: output of the measured temperature, output 2 adjustable: measured temperature, device tem-											
	perature, control ou	perature, control output (devices with PID controller). Outputs can be set within or outside the tempera-										
	ture range.		,									
Serial interface	RS485 (4.8–921.6 kBd), Resolution 0.1°C/°F											
Inputs / outputs	12-pin connector: 3 configurable connectors (digital input, output or one analog input)											
	17-pin connector: 4 digital inputs, 2 digital outputs, 1 analog input.											
	<ul> <li>Digital inputs (via</li> </ul>	supply voltage	): laser targeting l	ight on/off, clearin	g of peak picker, PID controller							
	start, load a set c	f parameters, t	rigger input for sta	rt / stop of measu	red value recording.							
	Digital outputs (1)	2-pin devices: I	nax. 50 mA, 17-pi	n devices: max. 1	00 mA): limit switch, exceeding							
	the beginning of	emperature rai	nge, device measi	uring readiness. de	evice over-temperature, signal							
	<ul> <li>strength too low. Devices with PID controller: controller active, control process within limits or finished.</li> <li>Analog input (12-pin: 0–20 mA, 17-pin: 0–10 V): analog adjustment of emissivity slope, emissivity or setpoint (devices with PID controller).</li> </ul>											
Display (only 12-pin	Dot Matrix, greenve	llow, 128 x 32 L	ots (5.6 mm high)	for temperature of	or parameter settings							
devices)	resolution 0.1°C / °F	=	(e.e		, parameter eetmige,							
Device parameters	Temperature sub range response time (<1 ms $-10s$ ) emissivity (0.050 $-1.200$ ) transmittance (5 $-100\%$ )											
	spot size fill factor (5–100%) neak nicker (clear settings: automatic, time clear, externally) device											
	address (00–97), baud rate (4.8–921.6 kBd), analog outputs (0 or 4–20 mA), temperature unit (°C/°F)											
	device menu language (only 12-pin devices: English/German)											
Power requirement	24 V DC (18–30 V I	C) max 12 V	A: protected again	st reverse polarity	1							
Isolation	Voltage supply analog outputs and serial interface are galvanically isolated from each other											
Sightings	<ul> <li>Through-lens sighting (can be darkened at high measuring temperatures)</li> </ul>											
(optional)	■ Laser targeting light (red: $\lambda$ =650 nm, green: $\lambda$ =515 nm, P< 1 mW laser class 2 acc. to IEC 60825-1)											
(optional)	■ Color CCD camera (field of view: ca. 3.6% x 2.7% of measuring distance:											
	output signal: EBAS ca 1 V 75.0 CCIR NTSC / PAL switchable: Resolution: NTSC: 720 x 480											
	pixels: PAL: 720 x 576 pixels: frame rate: NTSC: 60 Hz PAL: 50 Hz)											
Ambient temperature	$(120 \times 170 \times 170$											
	Storage: $_{20}$ to $85^{\circ}$ C ( $_{24}$ to $185^{\circ}$ E)											
Relative humidity	Non condensing conditions											
Housing/protection class	Aluminum / IPG5 with connector											
Weight	650 a											
CE label	According to EU directives											

#### **Ordering Specifications**

Model: Specify each model in 12- or 17-pin, with temperature range, sighting method (red or green for laser targeting light) as well as optics type. For fiber-optic devices additional the optical fiber length between 2.5 and 30 m (in 2.5 m increments).
 Scope of delivery: Device (optical fiber devices optionally with optics OL12 or OL25, special optics OQ30 for an additional charge. Optical fiber: 2.5 m; surcharge for each additional 2.5 m), works certificate, operating manual, *SensorTools* software. Connection cables are not included and have to be ordered separately.



Output signals

Microcontrolle

#### **Optics / Device Versions / Features**



## **Optics Data**

The focus distance is the measuring distance in which the spot size is smallest.

It can be continuously adjusted in the specified range for all optics. Measurements outside the focus distance are also possible, but the spot size diameter is usually larger.

															υį	
Optics:	Fiber optics						Integrated optics									
Designa-	OL	.12-	OL25-			00	30-	OM09-					OV09-			
tion:	E	3	G	60	H0		9	0 A0		.0	B0		C0		D1 / D2 *)	
Models		H309:		H309:		H309:		H309:		H309:		H309:		H309:		H309:
and full		all		all		all		all		all		all		all		all
scale	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:	H316:
tempera-	≤1100	≥1200	≤1100	≥1200	≤1100	≥1200	≤1100	≥1200	≤1100	≥1200	≤1100	≥1200	≤1100	≥1200	≤1100	≥1200
ture value	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:	H318:
(FSC):	520	800	520	800	520	800	520	800	520	800	520	800	520	800	520	800
Focus	Messfeld-Ø M [mm]															
distance										(						
a [mm]							/ 🕐					L <u>è</u> .				
75			0.6	0.45												
100	1.5	0.9	0.9	0.6												
130	2.2	1.25	1.3	1					0.6	0.4						
160	2.9	1.56	1.75	1.2					0.8	0.5						
170	3.1	1.67	1.78	1.3	1.6	1			0.87	0.53						
180	3.34	1.8	1.8	1.4	1.67	1.05			0.95	0.55						
190	3.6	1.9			1.74	1.1			1	0.6	0.8	0.5				
200	3.8	2			1.8	1.15			1.1	0.65	0.85	0.54				
300	5.5	3.14			2.9	1.83					1.4	0.9				
340	6.2	3.6			3.34	2.1	1.3	0.8			1.7	1	1.3	0.8	1.8	0.9
420	8.4	4.54			4.22	2.75	1.8	1.05			2	1.3	1.8	1.05	2.3	1.08
500	10	5.5			5	3.2	2.3	1.3					2.3	1.3	2.5	1.2
600	10.9	6			6	4.1	2.8	1.62					2.8	1.62	3	1.5
700					7.5	4.8	3.3	2					3.3	2	3.8	1.9
1000					11	7	4.5	2.9					4.5	2.9	5.6	2.8
2000					23	15	10.5	6.1					10.5	6.1	10	4.7
3000					34	22	14.3	9.6					14.3	9.6	15	8
4000					45	29	18	13					18	13	19	11
4500					52	34										
Aperture D:	7 mm 13 mm						16 m	m (FSC	≤ 1400°0	C): 8 mm	(FSC >	1400°C)	1			

Fiber Ø: 0.4 mm 0.2 mm 0.4 mm 0.2 mm 0.4 mm 0.2 mm 0.4 mm 0.2 mm The values in the tables are exemplary, intermediate values can be interpolated.

16 mm (FSC ≤ 1400°C); 8 mm (FSC > 1400°C)

a [mm]

METIS H3

D [mm]

M [mm]

## SensorTools Software (included in delivery)

Communication and evaluation software for all pyrometers, controllers, digital displays and calibration sources.

- Measured value display, graphically and numerically, device temperature
- Measured value recording incl. parameters
- View and compare up to 4 measurement data files simultaneously in the SensorTools Viewer
- Make all device settings
- Special recording settings: externally start / stop, retroactive or extended recording via signal input
- Print or save pyrometer settings, or transfer settings to other devices or export to csv files
- Switch on / off laser targeting light, adjust camera settings or motorized focus (depending on features)







Sensortherm reserves the right to make changes in scope of technical progress or further developments. Sensortherm-Datasheet\_Metis\_H309\_H316\_H318 (July 25, 2024)

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