

FIDELIS Series Pyrometers



PROCESS SENSORS
CORPORATION
a KPM brand

SMALL, ROBUST RADIATION PYROMETER SERIES

OVERVIEW

The Process Sensors FIDELIS Series 1-color non-contact temperature measuring pyrometers combine modern technology with the advantages of digital signal processing and stainless steel housing.

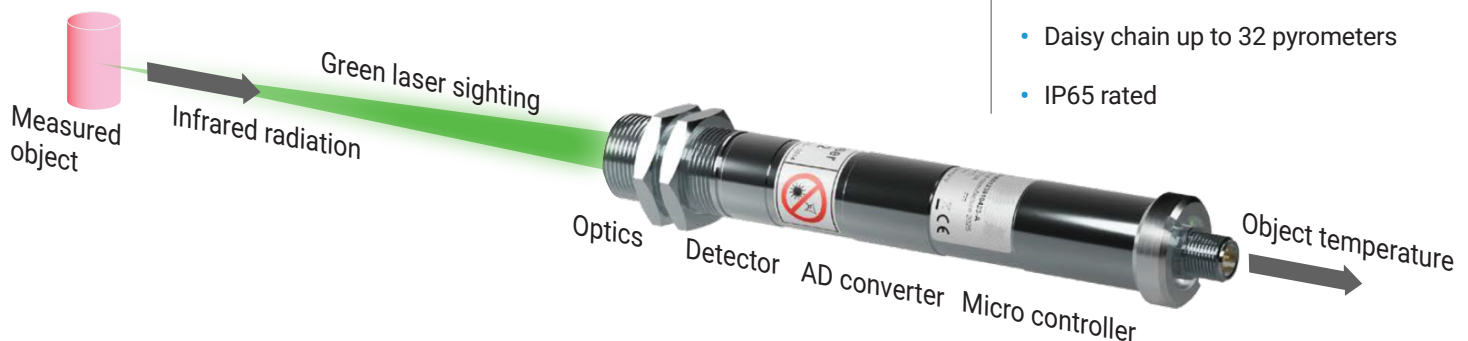
The digital micro controller signal processing ensures 100% reproducibility of the displayed measured values through mathematical integration of set measurement parameters and continuous ambient temperature compensation. This technology allows for quick readjustment at any time should measurement deviations arise over the years.

FIDELIS Series Pyrometers are designed for ambient temperatures between 7°C to 70°C (45°F to 158°F).

APPLICATIONS / INDUSTRIES

- Induction heating
- Steel/metals
- Semiconductor wafers
- Kilns / cement & lime
- Vacuum furnaces
- Welding / brazing
- Ceramics
- Additive manufacturing
- Composites
- Sintering
- Molten glass
- Research & development

HOW IT WORKS



FIDELIS SERIES FEATURES

- High accuracy: 0.3% of reading in °C + 1°C
- Wide temperature ranges from 50°C to 1800°C (122°F to 3272°F)
- Shortwave spectral responses minimize temperature errors due to changes in emissivity
- Green laser aiming light is clearly visible on red-hot surfaces
- 0 or 4-20 mA (switchable) & RS485
- Small spot sizes (down to 1 mm)
- Fast response time (<1.5 ms)
- On-board limit switch
- Peak picker circuitry
- Digital in/outputs
- Daisy chain up to 32 pyrometers
- IP65 rated



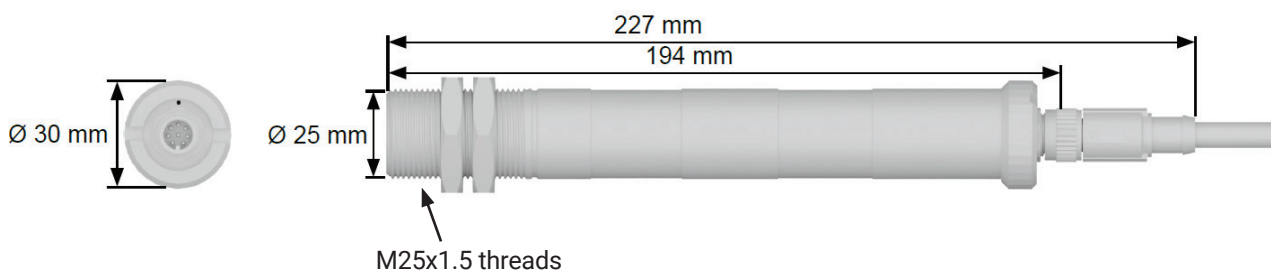
FIDELIS Series Pyrometers



TECHNICAL DATA

Model	F309	F318	F323
Temperature Range	550°C to 1400°C (1022°F to 2552°F) / 650°C to 1800°C (1202°F to 3272°F)	100°C to 700°C (212°F to 1292°F) / 150°C to 900°C (302°F to 1652°F)	50°C to 600°C (122°F to 1112°F)
Temperature Sub Ranges	Any temperature sub-range within the temperature range (minimum span 50°C (122°F))		
Spectral Range	0.7–1.1 µm	1.65–2.1 µm	2.0–2.6 µm
Detector	Silicon	InGaAs	InGaAs
Response Time (t ₉₀)	< 1.5 ms (with dynamical adaptation at low signal levels), adjustable up to 10 s		
Accuracy (ε = 1, t ₉₀ = 1 s, T _A = 23°C)	Full-scale value ≤ 1400°C: 0.3% of reading in °C + 1 K Full-scale value > 1400°C: 0.5% of reading in °C + 1 K		70-100°C: 3° > 100°C: 0.5% of reading in °C+1 K (min. 2°C)
Repeatability (ε = 1, t ₉₀ = 1 s, T _A = 23°C)	0.1% of reading in °C + 1 K	0.2% of reading in °C + 1 K (min. 1.6°C)	
Analog Output	0 or 4–20 mA, max. load: 500 Ω, resolution 0.0015% of the (adjusted) temperature (sub) range (16 Bit). Output can be set within the temperature range.		
Serial Interface	RS485 (4.8–921.6 kBd). Resolution 0.1°C / °F		
Inputs/Outputs	2 digital input/outputs, each configurable as input or output: - Digital input (via supply voltage): Laser targeting light on/off, clearing of peak picker, load a set of parameters. - Digital output (max. 50 mA): Limit switch, beginning of temperature range exceeding, device measuring readiness, device over-temperature.		
Device Parameters	Temperature sub range, response time (<1.5 ms–10s), emissivity (0.050–1.200), transmittance (5–100%), peak picker (clear settings: automatic, time clear or externally via digital input), device address (00–97), baud rate (4.8–921.6 kBd), analog output (0 or 4–20 mA), temperature unit (°C / °F).		
Power Requirement	24 V DC (18–30 V DC), max. Protected against reverse polarity		
Isolation	No galvanic separation		
Sighting	Laser targeting light, green: λ=515 nm, P< 1 mW, laser class 2 according to IEC 60825-1		
Ambient Temperature	7°C to 70°C (45°F to 158°F)		
Storage	-20°C to 85°C (-4°F to 185°F)		
Relative Humidity	Non-condensing conditions		
Housing/Protection Class	Stainless steel / IP65 (with female connector)		
Weight	Approx. 500 g (1.1 lbs)		
CE-Symbol	According to EU regulations (EN 50 011)		

DIMENSIONS

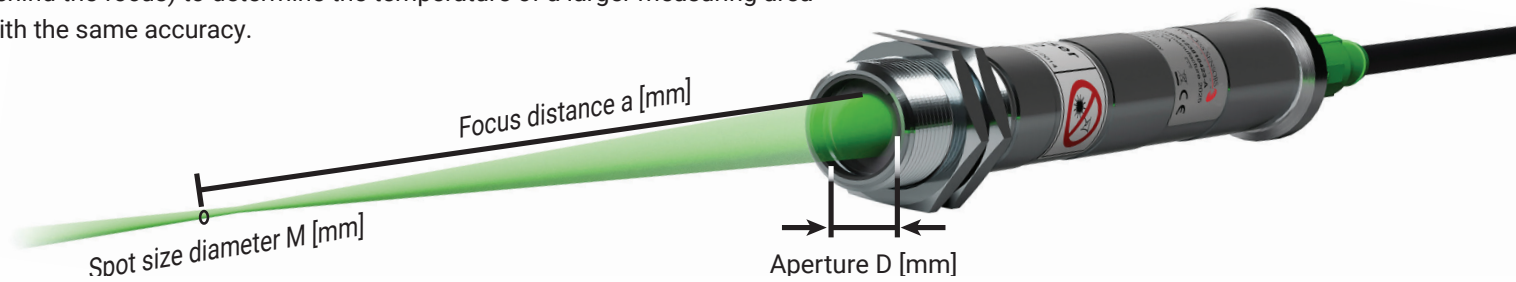


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OPTICS DATA

The spot size diameter is smallest at the optics focus distance. However, you can also deliberately measure in the de-focused area (in front of or behind the focus) to determine the temperature of a larger measuring area with the same accuracy.



Lens Type	OF09-A0	OF09-B0	OF09-C0	OF09-D0
Models & temperature ranges	F309 All temp. ranges	F318 100°C to 700°C (212°F to 1292°F)	F318 150°C to 900°C (302°F to 1652°F)	F323 50°C to 600°C (122°F to 1112°F)
Fixed distance a [mm]	Spot size diameter M [mm]			
200	1	1.7	1	3.2
500	2.4	4.8	2.6	9.1
1000	5	10	5.5	19
3000	15.6	30.5	16.8	58.5
Aperture D:	13 mm			

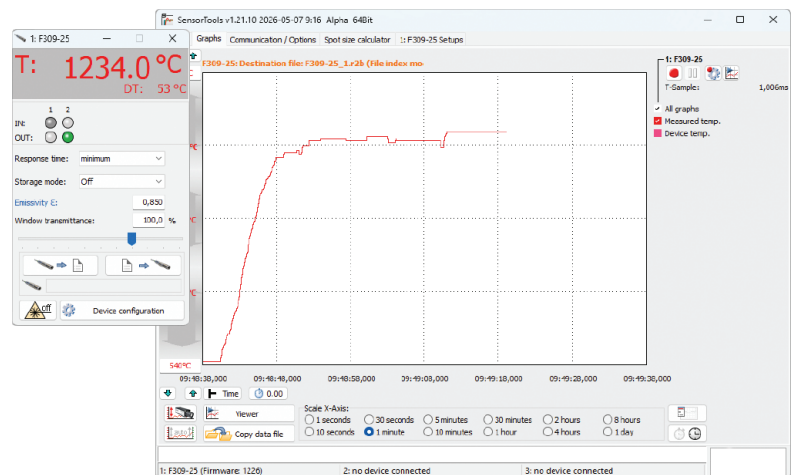
M refers to 90% of the acquired thermal radiation.

Model number example: F318-0150-0900 Optic C.

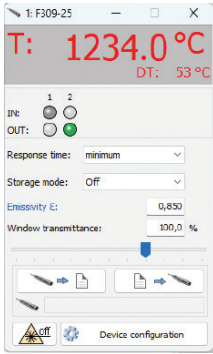
SENSORTOOLS SOFTWARE (INCLUDED)

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 16 measurement data files simultaneously in the SensorTools Viewer
- Make all device settings
- Switch on / off laser targeting light
- 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



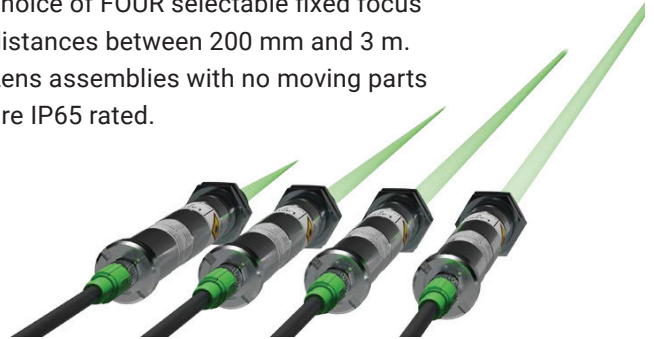
DEVICE CONFIGURATION



Measurement parameters and device settings can be adjusted via PC software with connection to RS485 interface converter and USB cable.

INTEGRATED OPTICS

The focus distance is preset with a choice of FOUR selectable fixed focus distances between 200 mm and 3 m. Lens assemblies with no moving parts are IP65 rated.



ACCESSORIES



*Pyrometer cable
(available in 5 and 10 m)
straight connector = P/N FK431005
right angle connector = P/N FK43101
adapter cable from 12-pin to 8-pin = P/N FA1001*



*Adjustable mounting bracket
P/N PSC-3310A21010*



DIN rail power supply P/N PSC-950-004



LED Digital Display Model IF00



*Water cooling jacket
P/N K960-13*



*RS485 to USB interface
converter (1.7 m)
P/N DK5485*



*90° deflection mirror
P/N UM25-13*

*Scanning mirror
adapter
P/N SC10-13*



*Air purge
P/N BL14-13*



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