

PYROSPOT DGF 11N

Pyrometer with fibre cable for industrial application

Overview

Digital pyrometers with RS-485 interface



Features

- For temperature measurements between 250 °C and 2500 °C
- Short response times from 2 ms
- Vario and fixed optics with measuring field diameter from 0.7 mm
- RS-485 interface
- Display and keyboard
- Applicable up to 250 °C ambient temperature

Description and applications

The digital pyrometers PYROSPOT DGF 11N are specifically designed for industrial purpose. The devices are suitable for temperature measurement from 250 °C on many different surfaces for example metals, ceramics or graphite.

The solid body with fibre optics cable allows usage even under rough environmental conditions. The bright temperature display is visible even over long distance.

With a fast response time of only 2 ms (t_{95}) these pyrometers are also suitable for fast measuring processes. The vario or fixed optics for fibre optical head realizes spot sizes from 0.7 mm diameter. A special vacuum lead through or variants with quartz or sapphire glass are also available.

The integrated laser aiming light enables to focus the measuring object exactly. The temperature linear standard output signal of 0/4 to 20 mA allows easy implementation in existing measurement and control systems.

The device is equipped with a galvanically isolated RS-485 interface, which allows parameterizing and software evaluation even in bus systems.

All parameters are adjustable via push-buttons and display directly on the device. Also by using the convenient parameterising and evaluation software PYROSOFT Spot the parameters can be easily adjusted to the application.

Typical application areas:

- Steel industry
- Kiln engineering
- Hardening
- Welding
- Metal industry



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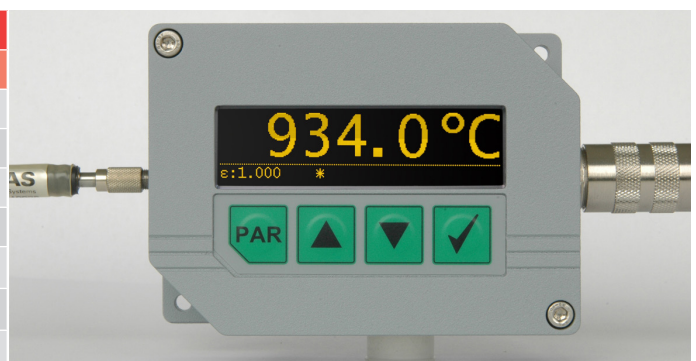
Technical data

Type	DGF 11N			
Temperature ranges	250 °C to 1500 °C	350 °C to 2000 °C	250 °C to 2000 °C	400 °C to 2500 °C
Order number	5111010205	5111010206	5111010208	5111010207
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C			
Spectral range	1.5 µm to 1.8 µm			
Optics (see table)	several optical heads (vario optics FOH I-100, FOH II-65, FOH II-250, FOH A-150, FOH A-225, fixed optics FOH F)			
Distance ratio	see table			
Measurement uncertainty ¹	0.5 % of meas. value in °C + 1 K			
Reproducibility ¹	0.1 % of meas. value in °C + 0.5 K			
NETD ^{1,2}	0.1 K			
Transmittance	50 % to 100 %			
Ambient radiation	adjustable within temperature range			
Response time (t ₉₅)	2 ms ³ , adjustable up to 100 s			
Emissivity	0.050 bis 1.000			
Storage	minimum-/maximum value storage			
Output	0/4 to 20 mA, adjustable via software, temperature linear, max. burden: 500 Ω (galvanically isolated)			
Interface	RS-485 (galvanically isolated), half duplex, max. 115 kBd, Modbus RTU			
Aiming	laser aiming light, 630 nm to 680 nm, class II, < 1mW			
Switching output/threshold	1 opto relay, R _{load} min. 48 Ω/adjustable within temperature range			
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro			
Parameters ⁴	ratio correction, emissivity, transmissivity, response time, temperature unit °C or °F, storage, settings, sub temperature range of output, switching thresholds of switching output			
User controls	display and keys for parameter settings			
Power supply	24 V DC ± 25 %, residual ripple 500 mW			
Power consumption	max. 1.5 W (without load on switching output)			
Operating temperature	0 °C to 70 °C (electronics), 0 °C bis 250 °C (optical head) 0 °C to 250 °C (fibre cable), 0 °C to 150 °C (fibre cable with 90° curve)			
Storage temperature	-20 °C to 70 °C			
Weight	approx. 600 g (without fibre cable and optical head)			
Dimensions	approx. 110 mm × 80 mm × 40 mm (without connectors)			
Housing	alu housing with plug connector, display and keyboard			
Safety class	IP 65 (DIN 40 050)			
CE symbol	according to EU regulations (EN 50 011)			
Scope of delivery	PYROSPOT DGF 11N, user manual, inspection sheet, PYROSOFT Spot for Windows® (without connecting cable, fibre cable and optics, please order separately)			

¹ T_{ambient} = 23 °C, ε = 1, t₉₅ = 1 s ² Noise equivalent temperature difference. ³ With dynamic adaption at low signal level. ⁴ Adjustable via software and interface or directly at the device.

Fibre cables, stainless steel Ø 200 µm - Order numbers

Temperature range	length	straight	90° curve
DGF 11N	1.5 m	3310A42001	3310A42011
	2.0 m	3310A42002	3310A42012
	2.5 m	3310A42003	3310A42013
	5.0 m	3310A42004	3310A42014
	7.5 m	3310A42005	3310A42015
	10.0 m	3310A42006	3310A42016
	15.0 m	3310A42007	3310A42017



Other lengths on request! Variants with vacuum lead through or special quartz and sapphire glass available.

PYROSPOT DGF 11N

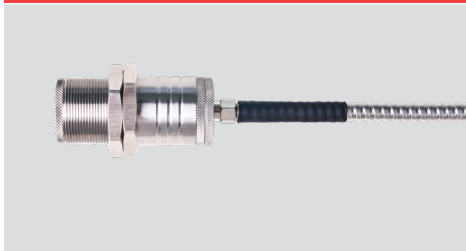
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Optical heads FOH I, FOH II, FOH A and FOH F

Vario optics type	FOH II-65	FOH II-250	FOH I-100	FOH A-150	FOH A-225
Measuring distance a [mm]	65 ... 300	250 ... 2500	100 ... 1000	150 ... 230	225 ... 2500
Measuring temperature range	Target size M [mm]				
DGF 11N (250 °C to 1500 °C)	0.7 ... 2.5	1.7 ... 17.0	0.9 ... 9.0	1.1 ... 1.7	1.7 ... 17.0
DGF 11N (350 °C to 2000 °C)	0.7 ... 2.5	1.7 ... 17.0	0.9 ... 9.0	1.1 ... 1.7	1.7 ... 17.0
DGF 11N (250 °C to 2000 °C)	0.7 ... 2.5	1.7 ... 17.0	0.9 ... 9.0	1.1 ... 1.7	1.7 ... 17.0
DGF 11N (400 °C bis 2500 °C)	0.7 ... 2.5	1.7 ... 17.0	0.9 ... 9.0	1.1 ... 1.7	1.7 ... 17.0
Aperture D [mm]	9.0	9.0	6.0	9.0	9.0
Part number	3310A50020	3310A50025	3310A50010	3310A52020	3310A52025

Fixed optics type FOH	F-65	F-100	F-200	F-300	F-400	F-600	F-800	F-1000	F-1500
Measuring distance a [mm]	65	100	200	300	400	600	800	1000	1500
Temperature range	Measuring field diameter M [mm]								
DGF 11N (250 °C to 1500 °C)	0.7	1.0	1.8	2.1	2.7	4.4	5.5	6.8	10.0
DGF 11N (350 °C to 2000 °C)	0.7	1.0	1.8	2.1	2.7	4.4	5.5	6.8	10.0
DGF 11N (250 °C to 2000 °C)	0.7	1.0	1.8	2.1	2.7	4.4	5.5	6.8	10.0
DGF 11N (400 °C bis 2500 °C)	0.7	1.0	1.8	2.1	2.7	4.4	5.5	6.8	10.0
Aperture D [mm]	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Order number	3310A51006	3310A51010	3310A51020	3310A51030	3310A51040	3310A51060	3310A51080	3310A51100	3310A51150

Fibre cable (200 µm)



Optical heads FOH F, FOH II, FOH I



Fibre cable 90° curve



Optical head FOH A, 90° angled



Software PYROSOFT Spot

For evaluation and processing of measured data obtained DIAS provides two software variants for its pyrometer **PYROSPOT**. These are the free Windows software **PYROSOFT Spot** and the pay version **PYROSOFT Spot Pro**. The Pro version allows the measurement, visualization and measurement recording of several simultaneously connected pyrometers, whereas this is possible with the free version only for one connected pyrometer.



Further functions are for example:

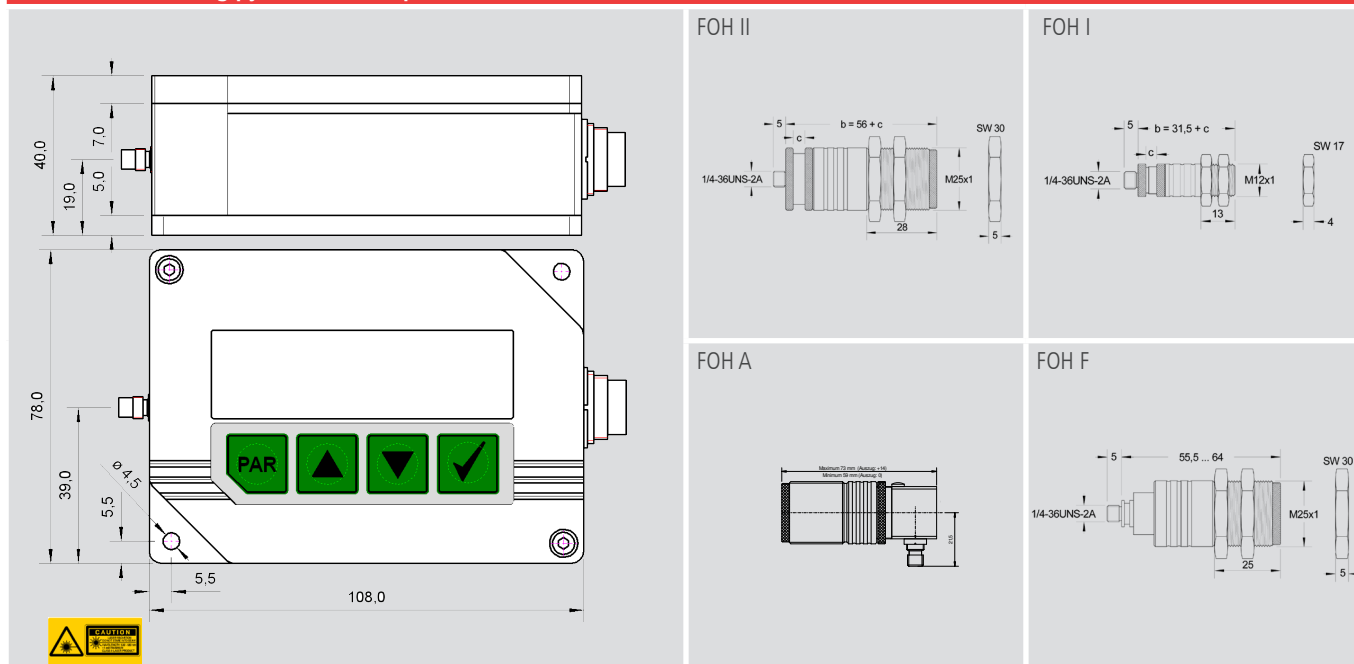
- Measurement data logging with real-time display, parameterization of DIAS pyrometers
- Trigger functions^{*)} and auto save^{*)}
- Extensive statistical analysis of measurement data
- Measurement cursor, print functions, automatic emissivity determination
- Export of measured data as text file and automatic creation of Microsoft Excel® spreadsheets
- Integrated report function with customized templates for Microsoft Word®
- Integrated calculator for easy calculation of optics parameters

^{*)}only for PYROSOFT Spot Pro

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Dimensional drawing pyrometer and optical heads FOH I, FOH II, FOH A and FOH F



Electrical accessories¹ – Order numbers

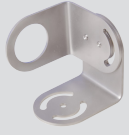
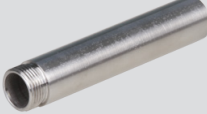
Connecting cable 12 pin	straight plug	angulated plug
Length 2 m	3310A11111	3310A11131
Length 5 m	3310A11112	3310A11132
Length 10 m	3310A11113	3310A11133
Length 15 m	3310A11114	3310A11134
Interface module RS-485 to USB	3310A14020	
Interface module RS-485 to Profibus DP	3310A14021	
Power supply PSU 15 (24 V DC, 1 A)	3310A12010	

¹ Selected accessories, other is available

Mechanical and optical accessories¹

Mounting angle fixed for optical head FOH I	3310A21014
Mounting angle fixed for optical head FOH II	3310A21522
Mounting angle adjustable for optical head FOH II	3310A21523
Air purge unit for FOH II	3310A22520
Sighting tube 100 mm	3310A22530
Sighting tube 300 mm	3310A22535
Mirror for FOH II, stainless steel, 90°	3310A31020

Selected accessories - pictures

Mounting angle, adjustable, for FOH II	Mounting angle, adjustable, for FOH II	Air purge unit for FOH II
Order number:: 3310A21523	Order number:: 3310A21520	Order number:: 3310A22520
		
Mirror 90° for FOH II	Power supply	Sighting tube (100 mm)
Order number:: 3310A31020	Order number:: 3310A12010	Order number: 3310A22530
		



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