

PYROSPOT DGRF 11N

Ratio pyrometers with fibre cable for industrial application

Overview

Digital ratio pyrometers with RS-485 interface



Features

- For temperature measurements between 300 °C and 2300 °C
- Short response times from 5 ms
- Vario optics with measurement field diameters from 0.7 mm
- RS-485 interface
- Display and keyboard
- Applicable up to 250 °C ambient temperature

Description and applications

The digital ratio pyrometers PYROSPOT DGRF 11N are specifically designed for industrial temperature measurement from 300 °C. They utilize the 2-colour system which has the advantage of measurement widely independent from the emissivity.

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 5 ms (t_{95}) these pyrometers are also suitable for fast measurement processes. The vario optics for fibre optical head realizes spot sizes from 0.7 mm diameter.

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 parameterizing and evaluation software PYROSOFT Spot the parameters can be easily adjusted to the application.

Typical application areas:

- Monitoring of the cooling down temperatures in the heat treatment of metals
- Stress relief annealing
- Recrystallization annealing
- Tempering

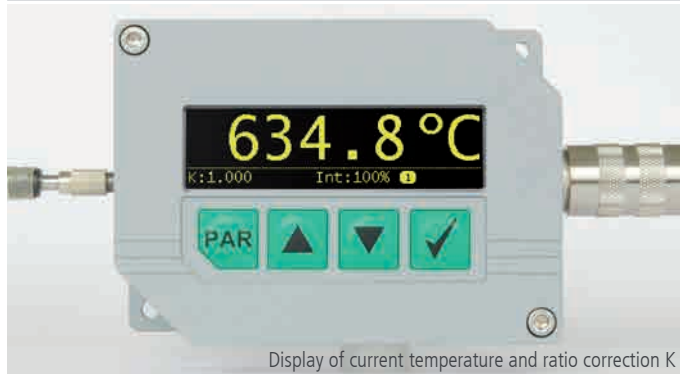


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Technical data				
Type (Order number)	DGRF 11N (5113010202)	DGRF 11N (5113010203)	DGRF 11N (5113010204)	DGRF 11N (5113010205)
Temperature range	300 °C to 1100 °C	350 °C to 1300 °C	400 °C to 1600 °C	500 °C to 2300 °C
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C			
Spectral range	1.5 µm to 1.9 µm			
Optics	vario optics ROH I-100, ROH II-65, ROH II-250			
Distance ratio	see table			
Measurement uncertainty ¹	0.5 % of measured value in °C + 1 K			
Reproducibility ¹	0.2 % of measured value + 0.5 K			
Transmittance	50 % to 100 %			
NETD ^{1,2}	0.1 K			
Response time (t ₉₅)	5 ms ³ , adjustable up to 100 s			
Ratio correction K	0.800 to 1.200			
Emissivity	0.050 to 1.000 (1-channel mode)			
Storage	minimum and maximum value storage			
Output	0/4 to 20 mA, switchable, temperaturlinear, max. burden: 500 Ω (galvanically isolated)			
Interface	RS-485 (galvanically isolated), half duplex, max. baudrate 115 kBd, Modbus RTU			
Aiming	laser aiming light, 630 nm to 680 nm, class II, < 1 mW			
Switching output/thresholds	1 solid state 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 keyboard for parameter setting			
Power supply	24 V DC ± 25 %, residual ripple 500 mV			
Power consumption	max. 1.5 W (without load on switching output)			
Operating temperature	0 °C to 45 °C (electronics), 0 °C to 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	appr. 600 g (without fibre cable and optical head)			
Dimensions	appr. 110 mm × 80 mm × 40 mm			
Housing	alu housing with plug connector, display and keyboard			
Safety class	IP 65 (DIN 40 050)			
CE symbol	according to EU regulations (EN 55 011)			
Scope of delivery	PYROSPOT DGRF 11N, manual, inspection sheet, PYROSOFT Spot for Windows® (without connection cable, fibre cable and optical head, please order separately)			

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



Display of current temperature and ratio correction K



Optical head ROH II (left side) and optical head ROH I (right side)

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Optics

ROH I-100 (Part number 3310A50011), Aperture D = 6,0 mm

Measurement distance a [mm]	0	100	165	225	300	500	700	1000
Measuring temperature range	Target size M [mm]							
300 °C to 1100 °C	6.0	1.8	2.9	4.0	5.5	9.0	13	18
350 °C to 1300 °C	6.0	1.8	2.9	4.0	5.5	9.0	13	18
400 °C to 1600 °C	6.0	0.9	1.4	2.0	2.7	4.5	6.5	9.0
500 °C to 2300 °C	6.0	0.9	1.4	2.0	2.7	4.5	6.5	9.0

ROH II-65 (Part number 3310A50021), Aperture D = 9,0 mm

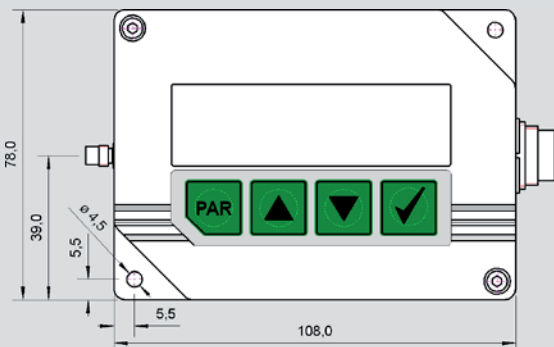
Measurement distance a [mm]	0	65	85	110	150	200	240	300
Measuring temperature range	Target size M [mm]							
300 °C to 1100 °C	9.0	1.3	1.7	2.1	2.8	3.6	4.2	5.0
350 °C to 1300 °C	9.0	1.3	1.7	2.1	2.8	3.6	4.2	5.0
400 °C to 1600 °C	9.0	0.7	0.9	1.1	1.4	1.8	2.1	2.5
500 °C to 2300 °C	9.0	0.7	0.9	1.1	1.4	1.8	2.1	2.5

ROH II-250 (Part number 3310A50026), Aperture D = 9,0 mm

Measurement distance a [mm]	0	250	400	600	800	1000	2000	2500
Measuring temperature range	Target size M [mm]							
300 °C to 1100 °C	9.0	3.0	5.0	7.2	9.2	12	24	31
350 °C to 1300 °C	9.0	3.0	5.0	7.2	9.2	12	24	31
400 °C to 1600 °C	9.0	1.7	2.7	4.4	5.5	6.8	13	17
500 °C to 2300 °C	9.0	1.7	2.7	4.4	5.5	6.8	13	17

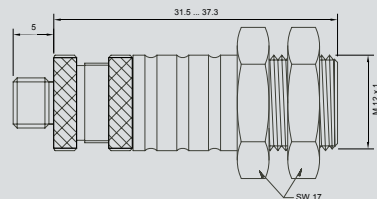
Maßzeichnungen

Maßzeichnung Pyrometer

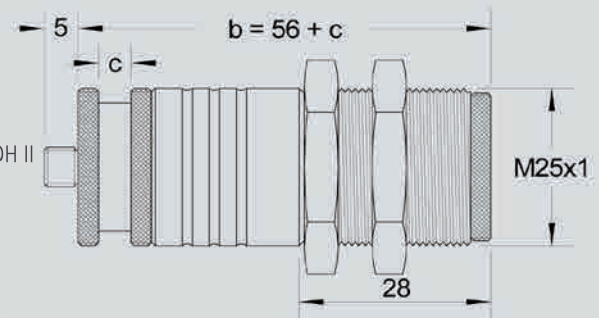


Maßzeichnungen Optikköpfe

ROH I

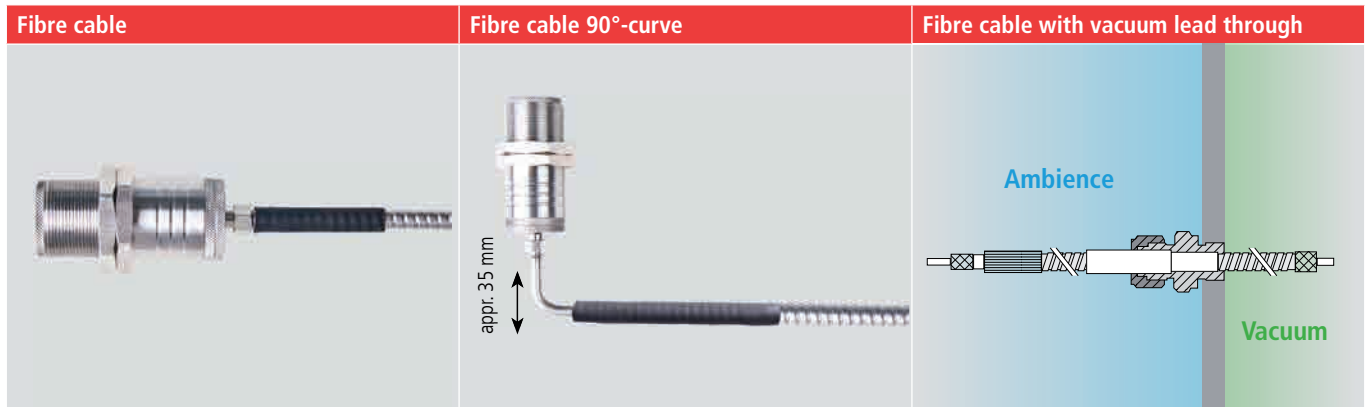


ROH II



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Fibre cables, stainless steel Ø 200 µm - Order numbers				Fibre cables, stainless steel Ø 400 µm - Order numbers			
Temperature range	length	straight	90° curve	Temperature range	length	straight	90° curve
DGRF 11N 400 °C to 1600 °C 500 °C to 2300 °C	1.5 m	3310A42001	3310A42011	DGRF 11N 300 °C to 1100 °C 350 °C to 1300 °C	1.5 m	3310A44001	3310A44011
	2.0 m	3310A42002	3310A42012		2.0 m	3310A44002	3310A44012
	2.5 m	3310A42003	3310A42013		2.5 m	3310A44003	3310A44013
	5.0 m	3310A42004	3310A42014		5.0 m	3310A44004	3310A44014
	7.5 m	3310A42005	3310A42015		7.5 m	3310A44005	3310A44015
	10.0 m	3310A42006	3310A42016		10.0 m	3310A44006	3310A44016
	15.0 m	3310A42007	3310A42017		15.5 m	3310A44007	3310A44017
Other lenghts on request! Variants with vacuum lead through or special quartz and sapphire glass available.							

Electrical accessories ¹ - Order numbers			Mechanical and optical accessories ¹	
Connecting cable 12 pin	straight plug	angulated plug		
Length 2 m	3310A11111	3310A11131	Mounting angle fixed for optical head ROH I	3310A21014
Length 5 m	3310A11112	3310A11132	Mounting angle fixed for optical head ROH II	3310A21522
Length 10 m	3310A11113	3310A11133	Mounting angle adjustable for optical head ROH II	3310A21523
Length 15 m	3310A11114	3310A11134	Air purge unit for ROH II	3310A22520
Interface module RS-485 to USB	3310A14020		Sighting tube 100 mm	3310A22530
Interface module RS-485 to Profibus DP	3310A14021		Sighting tube 300 mm	3310A22535
Power supply PSU 15 (24 V DC, 1 A)	3310A12010		Mirror for ROH II, stainless steel, 90°	3310A31020

¹ Selected accessories.

Selected accessories - pictures

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



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