PYROSPOT DGR 10N/DGR 10NV
Pyrometers for industry and research

DIAS Infrared Systems

Digital ratio pyrometers with RS-485 interface

Features

- For temperature measurements between 300 °C and 1100 °C
- Display and keyboard for parameterization
- Widely independent from emissivity
- Aiming: aiming light, through-lens sighting or camera module
- Short response times from 5 ms
- Temperature linear output 0/4 to 20 mA

Description and applications

The digital pyrometers PYROSPOT DGR 10N/DGR 10NV are specifically designed for industry and research applications. They utilize the 2-colour system which has the advantage of measurement widely independent from the emissivity.

The solid construction in form of a compact housing with a protection window for optics allows usage even under rough environmental conditions. With a short response time of only 5 ms (t95) these pyrometers are also suitable for fast measuring processes. The vario optics with quartz glass protection window realise measuring field diameters from 2.5 mm.

The integrated LED or laser aiming light or, the alternative through-lens sighting, enables an exact focus on the measurement object. With the optional color video module (PYROSPOT DGR 10NV) the alignment of the pyrometers to the target can be monitored visually and the entire process can be recorded and documented.

The temperature linear standard output signal of 0/4 to 20 mA allows easy implementation in existing measurement and controll systems. The device is equipped with a galvanically isolated RS-485 interface which allows parameterising and software evaluation even in bus systems.

The ratio correction K and the emissivity (in single channel mode) is also adjustable via push-buttons and display directly on the device. All parameters can be easily adjusted to the application by using the convenient software PYROSOFT Spot.

Typical pyrometer application areas:

- Tempering of cast iron
- Tempering
- Hardening
- Stress relief annealing
- Soft annlealing
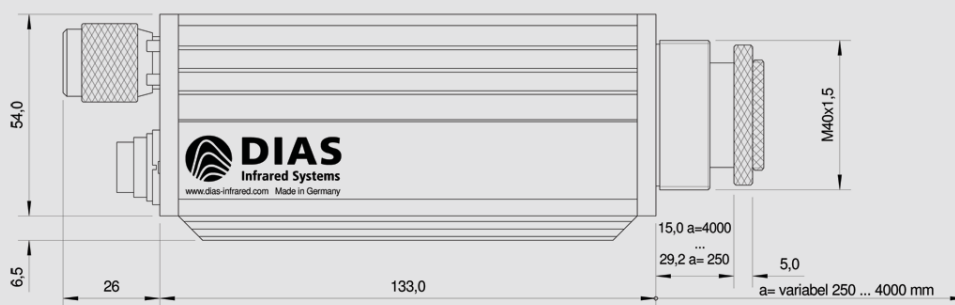
PYROSPOT DGR 10N/DGR 10NV
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Technical data	
Type	**DGR 10N/DGR 10NV**
Temperature range	300 °C to 1100 °C
Sub temperature range	adjustable within temperature range, minimum span 50 °C
Spectral range	1.5 µm to 1.7 µm
Optics	vario optics with quartz glass protection window, measuring field diameters from 2.5 mm
Distance ratio	approx. 100 : 1
Measurement uncertainty [1]	0.5 % of measured value
Reproducibility [1]	0.2 % of measured value
Transmissivity	50 % to 100 %
Ambient radiation	adjustable within temperature range
NETD [2]	0.1 K [1]
Response time (t95)	5 ms, adjustable up to 100 s
Ratio correction K	0.800 to 1.200, adjustable at the device or via interface
Emissivity	0.050 to 1.000, adjustable at the device (single channel mode) or via interface
Storage	minimum and maximum value storage, adjustable via RS-485 interface
Output	0/4 to 20 mA, switchable via software, temperature linear, max. burden 500 Ω (galvanically isolated)
Interface	RS-485 (galvanically isolated), half duplex, baudrate up to 115 kBd, data protocol Modbus RTU
Switching output/threshold	1 Opto relay, R_{Load} min. 48 Ω/adjustable within temperature range
Aiming	LED aiming light, laser aiming light (630 to 680 nm, class II, < 1 mW), through-lens sighting or camera module (DGR 10NV)
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro
Parameters	ratio correction, emissivity, transmissivity, ambient radiation, response time, temperature unit °C or °F, storage settings, sub temperature range of measurement output, switching thresholds of switching output (adjustable via software and interface)
User controls	ratio correction or emissivity control push-buttons (resolution 0.001), aiming light push-button, display
Power supply	24 V DC ± 25 %
Power consumption	max. 1.5 W (without load at switching output)
Operating temperature	0 °C to 60 °C
Storage temperature	−20 °C to 70 °C
Weight	approx. 520 g
Dimensions	54 × 54 mm, length 170 mm
Housing	compact housing with plug connector, display, push-buttons and optics protection window
Safety class	IP 65 (DIN 40 050)
CE symbol	according to EU regulations (EN 50 011)
Scope of delivery	PYROSPOT DGR 10N/DGR 10NV, mounting screw nut, inspection sheet, manual, PYROSOFT Spot for Windows® (**without** connection cable, please order separately)

[1] $T_{Ambient}$ = 23 °C, ε = 1, t95 = 1 s. [2] Noise equivalent temperature difference.

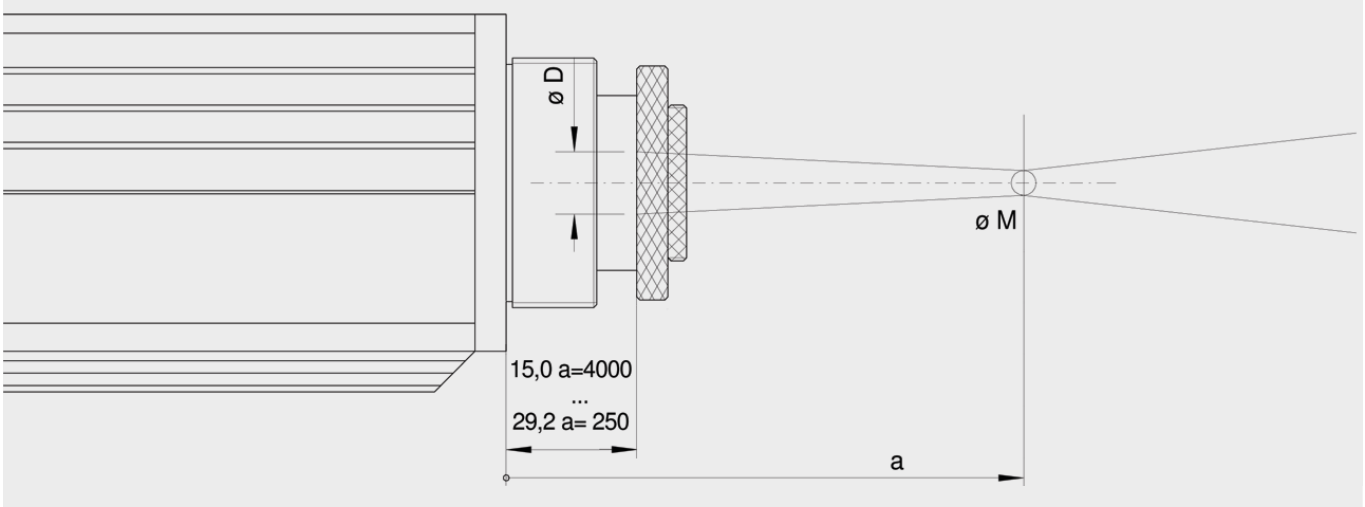| Dimensional drawing pyrometer (with through-lens sighting) |
|---|

54,0

6,5

26

133,0

M40x1,5

15,0 a=4000
...
29,2 a= 250

5,0

a= variabel 250 ... 4000 mm

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Vario optics

Measuring distance a [mm]	250	300	350	500	800	4000	Aperture diameter ∅ D [mm]		Part number	
Optics pullout [mm]	29.2	25.5	23.5	20.3	18.0	15.0	at		LED	Laser
Temperature range	Measuring field diameter M [mm]						a = 250 mm	a = 4000 mm	Through-lens sighting	Video module
300 °C to 1100 °C	2.5	3.0	3.5	5.0	8.0	40.0	8.0	6.5	5103001202	5103011202
									5103021202	5103031202

Dimensional drawing vario optics

15,0 a=4000
...
29,2 a= 250

ø D

ø M

a

Technical data video camera (DGR 10NV)

Video signal	Composite video signal approx. 1Vss at 75 Ω (galvanically isolated, video signal can be deactivated via software)
Color norm	PAL (B), 50 Hz (optional color norm NTSC (M), 60 Hz)
Resolution	1/3 inch video chip 628 × 586 pixels (NTSC option: 510 × 496 pixels)
Exposure control	automatic
Visible field	approx. 8 % × 6 % of adjusted measurement distance (NTSC option: 6.5 % × 5 %)
Date/time	Real-time clock with minimum 3 days power reserve, adjustable via software
Durable image displays	Target mark in measurement spot size , measurement temperature, emissivity
Optional image displays	Via software: serial number, device name or user-defined text (16 characters), date, time, temperature unit °C/°F, 12/24 hours display

Pyrometer with TFT monitor

The video image can be displayed via the additionally available TFT monitor.

Detailed view of video image

PYROSPOT № 1120146   24.Nov 2015
DGR 10NV   17:03:46
DIAS

Int

Ratio: 707.4C   K: 1.009

PYROSPOT DGR 10N/DGR 10NV
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Electrical, mechanical and optical accessories[1]		Order number	
Connection cable, 12 pin, angulate plug	length 2 m	3310A11131	
	length 5 m	3310A11132	
	length 10 m	3310A11133	
	length 15 m	3310A11134	
	length 20 m	3310A11135	
	length 25 m	3310A11136	
	length 30 m	3310A11137	
Video connection cable	length 2 m	3310A16521	
	length 5 m	3310A16522	
	length 10 m	3310A16523	
	length 15 m	3310A16524	
	length 20 m	3310A16525	
	length 25 m	3310A16526	
	length 30 m	3310A16527	
Interface module	RS-485 to USB	3310A14020	
Power supply PSU 15	24 V DC, 0.6 A	3310A12010	
Mounting angle	adjustable	3310A21020	
Air purge adaptor	stainless steel, purge air 0.1 to 0,5 bar, oil-free	3310A22020	
Window slide	without window	3310A21210	
Vacuum flange	KF 16	3310A24015	
	with quartz window	3310A34021	
	with sapphire window (scratch-proof)	3310A34051	
Cooling jacket	including air purge unit	3310A23031	
DHP 1040	handheld programming device for parameterizing	3310A17010	
TFT monitor / TFT-monitor industrial	3.5" with 2 m cable[2]	3310A16110	3310A16120
Adapter	Video/USB	3310A14030	

[1] More accessories available. [2] Cable lengths 5 m and 10 m also available.

Detailed view: display

The digital display shows current temperature value and emissivity setting.

Current temperature

Ratio correction setting

814.0°c
K:1.000

Detailed view: back side

The emissivity can be adjusted by using the two keys on the back side of the device. The value settings will be stored automatically.

Through-lens sighting or aiming light push-button

Push-buttons for ratio correction/ emissivity adjustment

Plug connector and interface