PYROSPOT DGR 55N/DGR 55NV

Ratio pyrometer for industrial application

DIAS Infrared Systems

Overview

Digital pyrometers with RS-485 interface

Special features

- For temperature measurements between 300 °C and 2300 °C
- Temperature linear output 0/4 to 20 mA, switchable
- Display, keys and RS-485 interface
- Different fixed optics
- Laser aiming light, integrated color video camera or through-lens sighting
- Very short response time 5 ms

Description and application

The digital DIAS PYROSPOT DGR 55N ratio pyrometers are specially designed for industrial use. They are suitable for temperature measurements from 300 °C on a variety of surfaces, such as metals, graphite or ceramics. The DGR 55N measures the infrared radiation in two neighboring wavelength ranges and determines the temperature value.

With different fixed optics, target sizes starting from 0.8 mm are available. Ratio correction can be set directly at the device using buttons and display. All other parameters are adjusted via interface and software, for example PYROSOFT Spot.

Even in harsh environments, the compact and robust IP 65 stainless steel housing of the pyrometer can withstand. With a minimum response time of only 5 ms (t_{95}), the devices also realize fast measuring tasks.

Thanks to the temperature linear standard output signal of 0/4 to 20 mA, the pyrometers can be easily integrated into existing measurement and control systems. The pyrometer has a galvanically isolated RS-485 interface. The device is thus bus capable and uses the Modbus RTU protocol.

The integrated red laser aiming light helps to precisely align the pyrometer with the target.

If the objects are very hot, it is recommended to use an integrated color video camera instead of the laser as a aiming variant (PYROSPOT DGR 55NV). Thus, a glare-free alignment is easily possible. The integrated video camera also facilitates installation in difficult local conditions, where the pyrometer is difficult to reach or the measurement object is not visible. Optionally, a through-lens sighting is available.

Typical application areas:

- Steel and metal industry
- Furnace industry
- Soldering applications
- Ceramic industry

Image source: Shutterstock.de/pan demin

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Technical data								
Type	**DGR 55N/DGR 55NV**							
Temperature range	300 °C to 1100 °C		350 °C to 1300 °C		400 °C to 1600 °C		500 °C to 2300 °C	
Optics	different fixed optics (type 250, 650 ,2000, 4000)							
Part number	Through-lens sighting		Through-lens sighting		Through-lens sighting		Through-lens sighting	
	Laser	Video	Laser	Video	Laser	Video	Laser	Video
250	5553072202		5553072203		5553072204		5553072205	
	5553062202	5553082202	5553062203	5553082203	5553062204	5553082204	5553062205	5553082205
650	5553073202		5553073203		5553073204		5553073205	
	5553063202	5553083202	5553063203	5553083203	5553063204	5553083204	5553063205	5553083205
2000	5553076202		5553076203		5553076204		5553076205	
	5553066202	5553086202	5553066203	5553086203	5553066204	5553086204	5553066205	5553086205
4000	5553077202		5553077203		5553077204		5553077205	
	5553067202	5553087202	5553067203	5553087203	5553067204	5553087204	5553067205	5553087205
Sub temperature range of analog output	adjustable within measuring temperature range, minimum span 50 °C							
Spectral range	1.5 µm to 1.9 µm							
Ratio correction K	0.800 to 1.200							
Emissivity ε	0.050 to 1.000 (1-channel mode)							
Response time (t_{95})	5 ms [3], adjustable up to 100 s							
Measurement uncertainty[1]	0.5 % of measured value in °C +1 K							
Reproducibility[1]	0.2 % of measured value in °C + 0.5 K							
NETD[2]	0.1 K[1]							
Transmittance	50 % to 100 %							
Analog output	0/4 mA to 20 mA, temperature linear, maximum burden 500 Ω (galvanically isolated)							
Interface	RS-485 (galvanically isolated), half duplex, max. 115 kBd, Modbus RTU protocol							
Aiming	DGR 55N: laser aiming light (630 … 680 nm, class II, < 1 mW) or through-lens sighting[4] DGR 55NV: video camera, composite video, galvanically isolated (PAL (B), 50 Hz or optional NTSC (M), 60 Hz)							
Switching output/ Switching threshold	1 opto relay, R_{Burden} min. 48 Ω (galvanically isolated)/adjustable within measuring temperature range							
Operating and display elements	Two push-buttons for „Parameter menu", „Enter", „Up" and „Down", OLED with standard display of temperature and ratio correction, pilot light button (option)							
Parameters	– adjustable via interface and software: ratio correction, emissivity, transmittance, response time, memory settings, sub temperature range of measuring output, switching threshold of switching output – adjustable additionaly on the device with push-buttons and display: ratio correction							
Power supply	24 V DC ± 25 %, residual ripple 500 mV							
Power consumption	max. 1.5 W (without burden on switching output)							
Operating temperature	0 °C to 70 °C [5]							
Storage temperature	–20 °C to 70 °C							
Weight	approx. 600 g							
Housing	stainless steel housing with plug connector, length approx. 105 mm (without through-lens sighting), diameter 50 mm							
IP code	IP65 according to DIN EN 60529 und DIN 40050							
Test regulations	EN 55 011:1998, limit class A							
CE symbol	according to EU regulations							
Scope of delivery	PYROSPOT DGR 55N/DGR 55NV, user manual, inspection sheet, software PYROSOFT Spot, without connection cable (please order seperately)							

[1] Specifications for black body radiator, $T_{ambience}$ = 23 °C, t_{95} = 1 s. [2] Noise equivalent temperature difference. [3] With dynamic adaption at low signal level. [4] Operating temperature up to 50 °C due to the risk of burns. [5] DGR 55NV: 0 °C to 45 °C.

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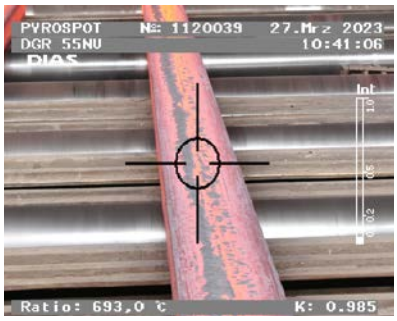
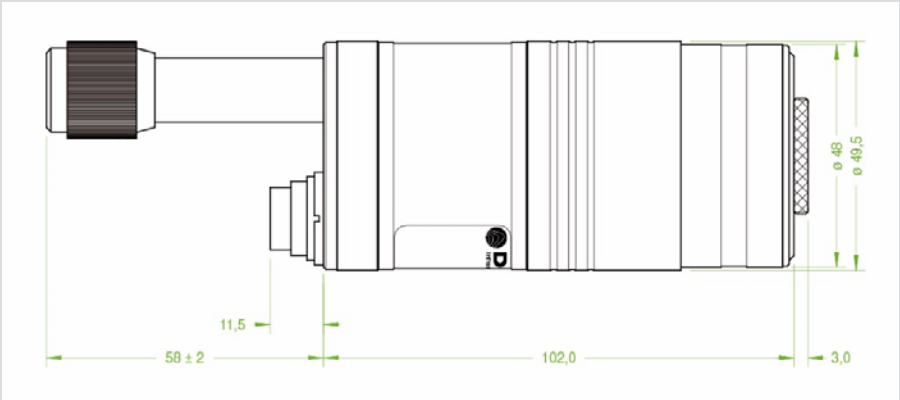
Fixed optics						
Measurement distance a [mm]		a = 250	a = 650	a = 2000	a = 4000	
Temperature range	Distance ratio	Target size M [mm]				Aperture ∅ [mm]
300 °C to 1100 °C	100 : 1	2.5	6.5	20	40	6.0
350 °C to 1300 °C	130 : 1	1.9	4.9	15	30	6.0
400 °C to 1600 °C	200 : 1	1.3	3.5	10	20	6.0
500 °C to 2300 °C	300 : 1	0.8	2.2	6.7	13	6.0

Technical data DGR 55NV with video camera	
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, K factor
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
The video image can be displayed via the additionally available TFT monitor.	



Dimensional drawing: Pyrometer with through-lens sighting



Pyrometer with different aiming variants

Through-lens sighting | Video camera | Laser aiming light

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Electriacal, mechanical and optical accessories[1]			Part number	
Connection cable, straight plug, 12 pin	Connection cable, angulated plug, 12 pin	Length 2 m Length 5 m Length 10 m Length 15 m Length 20 m Length 30 m	3310A11111 3310A11112 3310A11113 3310A11114 3310A11115 3310A11117	3310A11131 3310A11132 3310A11133 3310A11134 3310A11135 3310A11137
Video connection cable		Length 2 m Length 5 m Length 10 m Length 15 m Length 20 m Length 25 m Length 30 m	3310A16521 3310A16522 3310A16523 3310A16524 3310A16525 3310A16526 3310A16527	
Mounting angle		adjustable	3310A21050	
Cooling jacket		including air purge unit, without mounting angle	3310A23050	
Ball flange		M40 × 1,5	3310A24020	
Air purge unit		stainless steel	3310A22050	
Power supply PSU 15		24 V DC, 0.6 A	3310A12010	
Threaded ring		with protection window quartz glass with protection window sapphire glass	3310A34022 3310A34052	
TFT monitor	TFT monitor industrial	3.5" with 2 m cable[2]	3310A16110	3310A16120
Adapter		Video/USB	3310A14030	
Handheld programming device DHP 1040		mobile handheld device for pyrometer parameterization	3310A17010	

[1] More accessories on request. [2] Cable length 5 m or 10 m available, too.

Selected accessories – Images

Mounting angle, adjustable

Part number: 3310A21050

Cooling jacket

Part number: 3310A23050

Air purge unit

Part number: 3310A22050

TFT monitor industrial

Part number: 3310A16120

Ball flange

Part number: 3310A24020

Handheld programming device DHP 1040

Part number: 3310A17010

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