PYROSPOT DSR 55N/DSR 55NV

Pyrometer for industrial application

DIAS
Infrared Systems

Overview

Digital pyrometers with RS-485 interface
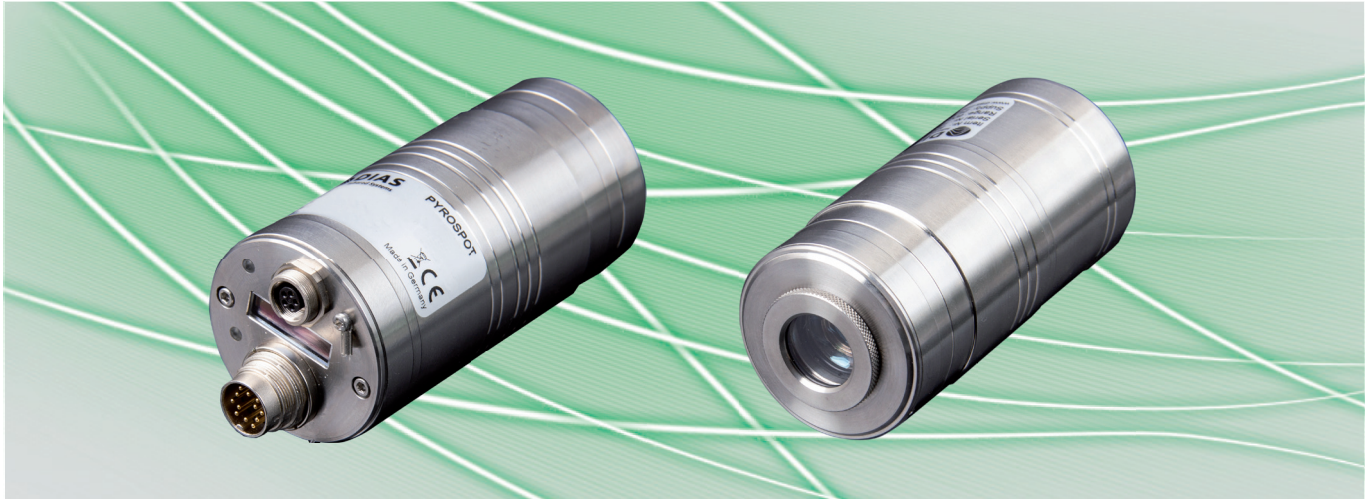
Special features

- For temperature measurements between 500 °C and 3000 °C
- Temperature linear output 0/4 to 20 mA, switchable
- Display, keys and integrated RS-485 interface

- Vario optics with motor focus
- Laser aiming light, integrated color video camera or through-lens sighting
- Very short response time 5 ms

Description and application

The digital DIAS PYROSPOT DSR 55N pyrometers are specially designed for industrial use. They are suitable for temperature measurements from 500 °C on a variety of surfaces, such as metals, graphite or ceramics. The DSR 55N measures the infrared radiation in two neighboring wavelengths and determines the temperature value.

A special feature of this pyrometer is the vario optics with motor focus. For example, if the devices are installed in hard-to-reach places, the user can conveniently change or adjust the focus via interface and software. Alternatively, motor focus and the parameter ratio correction can be set directly on 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. The vario optics focus motorized and precise already small measuring fields from 1.0 mm diameter.

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 connection to local networks can be supported by an Ethernet interface box.

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 DSR 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
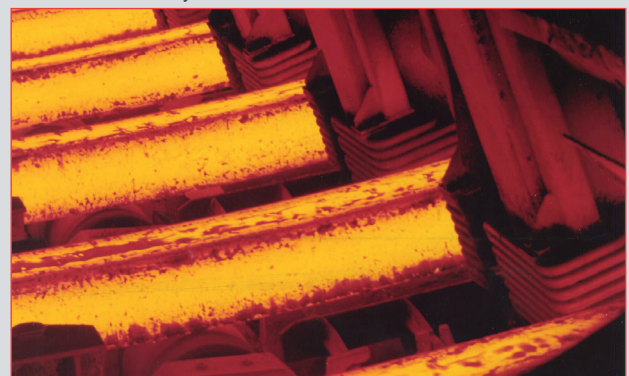- Soldering applications
- Ceramic industry

Image source: Stahl-Zentrum

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Technical data

Type	DSR 55N/DSR 55NV				
Measuring temperature range	500 °C to 1200 °C	600 °C to 1400 °C	700 °C to 1800 °C	800 °C to 2500 °C	900 °C to 3000 °C
Distance ratio	40 : 1	80 : 1	160 : 1	240 : 1	240 : 1
Optics	vario optics with motor focus				
Aiming (Part no.) — Laser	5552011201	5552011202	5552011203	5552011204	5552011205
Aiming (Part no.) — Color camera	5552031201	5552031202	5552031203	5552031204	5552031205
Aiming (Part no.) — Through-lens sighting	5552021201	5552021202	5552021203	5552021204	5552021205
Analog output	0/4 mA to 20 mA, temperature linear, maximum burden 500 Ω (galvanically isolated)				
Sub temperature range of analog output	adjustable within measuring temperature range, minimum span 50 °C				
Spectral range	0.7 µm to 1.1 µm				
Ratio correction K	0.800 to 1.200				
Emissivity ε	0.050 to 1.000				
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 %				
Ambient radiation	adjustable within measuring temperature range				
Interface	RS-485 (galvanically isolated), half duplex, max. 115 kBd, Modbus RTU protocol				
Aiming	DSR 55N: laser aiming light (630 … 680 nm, class II, < 1 mW) or through-lens sighting DSR 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, transmittane, ambient radiation, response time, memory settings, sub temperature range of measuring output, switching threshold of switching output, motor focus – adjustable additionaly on the device with push-buttons and display: emissivity, motor focus				
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				
Storage temperature	−20 °C to 70 °C				
Weight	approx. 750 g				
Housing	stainless steel housing with plug connector, length approx. 105 mm, diameter 50 mm				
IP code	IP65 nach 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 DSR 55N/DSR 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.

Vario optics with motor focus (adjustable in 8 steps)

Measurement distance a [mm]		240	360	540	800	1200	1800	2500	4000
Measuring temperature range	Aperture diameter D [mm]	Target size M [mm]							
500 °C to 1200 °C	8.0	6.0	9.0	14	20	30	45	63	100
600 °C to 1400 °C	6.0	3.0	4.5	6.8	10	15	23	32	50
700 °C to 1800 °C	6.0	1.5	2.3	3.4	5.0	7.5	11	16	25
800 °C to 2500 °C	6.0	1.0	1.5	2.3	3.4	5.0	7.5	11	17
900 °C to 3000 °C	6.0	1.0	1.5	2.3	3.4	5.0	7.5	11	17

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Technical data DSR 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, 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 industrial

Detailed view of video image

Pyrometer with different aiming variants

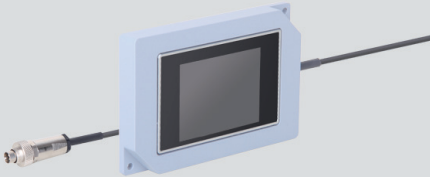

Laser aiming light

Through-lens sighting

Video camera

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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 25 m Length 30 m	3310A11111 3310A11112 3310A11113 3310A11114 3310A11115 3310A11116 3310A11117	3310A11131 3310A11132 3310A11133 3310A11134 3310A11135 3310A11136 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	
Ethernet interface box DCU[IoP]		for integration into local networks and parameterization	3310A13500	

[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

Ethernet Interface-Box DCU[IoP]
Part number: 3310A13500

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