

PYROSPOT DSR 56N/DSR 56NV

Ratio pyrometer for industrial application

Overview

Digital ratio pyrometer with RS-485 interface



Special features

- For temperature measurements between 550 °C and 3000 °C
- Temperature linear output 0/4 to 20 mA, switchable
- Display, keys and integrated RS-485 interface
- Laser aiming light or integrated color video camera
- Optional through-lens sighting
- Very short response time 5 ms

Description and application

The digital DIAS ratio pyrometer PYROSPOT DS 56N is specifically designed for industrial purposes. This device is suitable for non-contact temperature measurement from 500 °C on different surfaces like metal, graphite or ceramics. The DSR 56N measures infrared radiation in two adjacent wavelengths and determines therefrom the temperature value.

The solid and compact stainless steel housing allows usage even under rough environmental conditions. Measuring spot sizes from 0.8 mm can be easily realized. With a minimal response time of only 5 ms (t_{95}) the devices are usable for fast measuring tasks.

The temperature linear standard output signal of 0/4 to 20 mA allows an easy implementation in existing measurement and control systems.

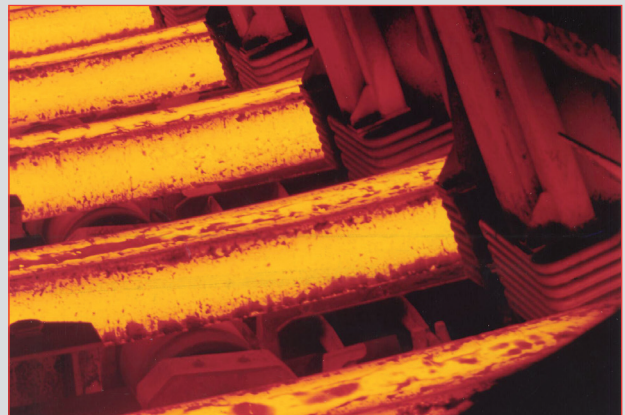
Use the integrated red laser aiming light for the exact aiming of the pyrometer to the measurement object. The optional integrated video camera module (DSR 56NV) provides an anti-glare aiming of the pyrometer even when the measurement object is very hot. It substantially facilitates the adjustment under difficult local conditions where the pyrometer is not easy to reach or the measurement object cannot be seen directly. A through-lens sighting is also optionally available.

The PYROSPOT DSR 56N possesses a RS-485 interface. The devices are bus-compatible in this way and use the Modbus RTU protocol.

Connect the pyrometer to a PC to adjust the parameters emissivity, sub temperature range, data storage settings and response time to the application by using the comfortable parameterizing and evaluation software PYROSOFT Spot.

Typical application areas:

- Steel and metal industry
- Furnace industry
- Hardening
- Welding



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Technical data

Type	DSR 56N/DSR 56NV									
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	50 : 1		100 : 1		200 : 1		300 : 1		300 : 1	
Optics ¹	several fixed optics (type 250, 650, 2000, 4000)									
Part numbers	Laser	Color camera	Laser	Color camera	Laser	Color camera	Laser	Color camera	Laser	Color camera
	Through-lens sighting		Through-lens sighting		Through-lens sighting		Through-lens sighting		Through-lens sighting	
250	5562062201	5562082201	5562062202	5562082202	5562062203	5562082203	5562062204	5562082204	5562062205	5562082205
	5562072201		5562073201		5562072203		5562072204		5562072205	
650	5562063201	5562083201	5562063202	5562083202	5562063203	5562083203	5562063204	5562083204	5562063205	5562083205
	5562073201		5562073201		5562073203		5562073204		5562073205	
2000	5562066201	5562086201	5562066202	5562086202	5562066203	5562086203	5562066204	5562086204	5562066205	5562086205
	5562076201		5562076201		5562076203		5562076204		5562076205	
4000	5562067201	5562087201	5562067202	5562087202	5562067203	5562087203	5562067204	5562087204	5562067205	5562087205
	5562077201		5562077201		5562077203		5562077204		5562077205	
Sub temperature range of analog output	adjustable within 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 ² , adjustable up to 100 s									
Measurement uncertainty ³	0.5 % of measured value in °C +1 K									
Reproducibility ³	0.2 % of measured value in °C + 0.5 K									
NETD ^{3,4}	0.1 K									
Transmittance	50 % to 100 %									
Ambient radiation	adjustable within temperature range									
Output	0/4 mA to 20 mA, temperatur linear, burden max. 500 Ω (galvanically isolated)									
Interface	RS-485 (galvanically isolated), half duplex, max. 115 kBd, data protocol Modbus RTU									
Aiming	DS 56N: laser aiming light, 630 ... 680 nm, class II, < 1 mW, optional optical through-lens sighting ⁵ DS 56NV: video camera, composite video signal PAL (B), 50Hz (galvanically isolated) or NTSC (M), 60 Hz									
Switching output/threshold	1 opto relay, R _{load} min. 48 Ω (galvanically isolated)/adjustable within temperature range									
Parameters	adjustable via interface and software or at the device: ratio correction, emissivity, transmissivity, ambient radiation, response time, data storage settings, sub range of measurement output, switching thresholds of switching output									
Power supply	24 V DC ± 25 %, residual ripple 500 mV									
Power consumption	max. 1.5 W (without load at switching output)									
Operating temperature	0 °C to 70 °C									
Storage temperature	–20 °C to 70 °C									
Weight	approx. 750 g									
Housing	stainless steel round housing with plug connector, length: approx. 140 mm (without through-lens sighting), Ø 50 mm									
Safety class	IP65 according to DIN EN 60529 and DIN 40050									
Test regulations	EN 55 011:1998, limit class A									
CE symbol	according to EU regulations									
Scope of delivery	PYROSPOT DSR 56N/DSR 56NV, manual, inspection sheet, software PYROSOFT Spot, without connection cable (please order separately)									

¹ Other fixed optics on request. ² With dynamic adaption at low signal level. ³ Specifications for black body radiator, T_{ambient} = 23 °C, t₉₅ = 1 s. ⁴ Noise equivalent temperature difference. ⁵ Operating temperature up to 50 °C to avoid injury.

Fixed optics

Measurement distance a [mm]	Aperture D [mm]	a = 250	a = 650	a = 2000	a = 4000
Temperature range		Measuring field diameter M [mm]			
500 °C to 1200 °C	8.0	5.0	13.0	40.0	80.0
600 °C to 1400 °C	6.0	2.5	6.5	20.0	40.0
700 °C to 1800 °C	6.0	1.3	3.5	10.0	20.0
800 °C to 2500 °C	6.0	0.8	2.2	6.7	13.3
900 °C to 3000 °C	6.0	0.8	2.2	6.7	13.3

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Technical data DSR 56NV 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 $\times$ 586 pixels (NTSC option: 510 $\times$ 496 pixels)
Exposure control	automatic
Visible field	approx. 8 % $\times$ 6 % of adjusted measurement distance (NTSC option: 6.5 % $\times$ 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 $^{\circ}\text{C}/^{\circ}\text{F}$, 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



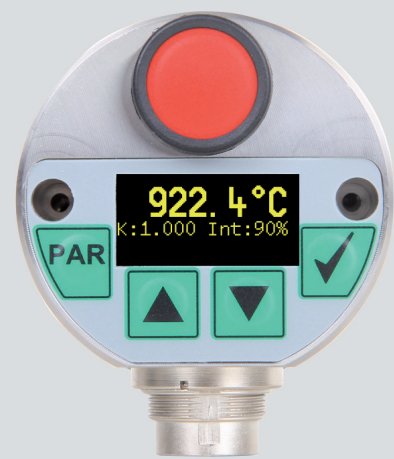
Pyrometer with different aiming variants



through-lens sighting



color video camera



laser aiming light



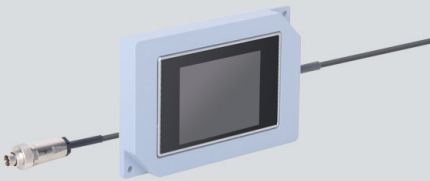
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Electrical, mechanical and optical accessories ¹			Part number	
Connection cable, straight plug, 12 pin	length 2 m		3310A11111	
	length 5 m		3310A11112	
	length 10 m		3310A11113	
	length 15 m		3310A11114	
	length 20 m		3310A11115	
	length 25 m		3310A11116	
	length 30 m		3310A11117	
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	
Mounting angle	adjustable		3310A21050	
Cooling jacket	including air purge unit, without mounting angle		3310A23056	
Ball flange	thread M40 × 1.5		3310A24020	
Air purge unit	stainless steel		3310A22050	
Power supply PSU 15	24 V DC, 0.6 A		3310A12010	
Ring nut	with quartz glass window		3310A34022	
	with sapphire glass window		3310A34052	
TFT monitor	TFT monitor industrial	3.5" with 2 m connection cable ²	3310A16110	3310A16120
Adaptor	video/USB		3310A14030	
DHP 1040	handheld programming device		3310A17010	

¹ More accessories on request. ² Cable lengths 5 m and 10 m also available.

Selected accessories

Mounting angle, adjustable	Cooling jacket	Air purge unit
Part number: 3310A21050 	Part number: 3310A23056 	Part number: 3310A22050 
TFT monitor (industrial)	Ball flange	Power supply PSU 15
Part number: 3310A16120 	Part number: 3310A24020 	Part number: 3310A12010 



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