PYROSPOT DSR 10N/DSR 10NV

Pyrometers for industry and research

DIAS Infrared Systems

Digital ratio pyrometers with RS-485 interface

Features

- For temperature measurements between 500 °C and 3000 °C
- Display and keys for parameterization and representation
- 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 DSR 10N/DSR 10NV are spefically 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 (t_{95}) these pyrometers are also suitable for fast measuring processes. The vario optics with quartz glass protection window realise measuring field diameters from 0.8 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 DSR 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.

All parameters are adjustable via push-buttons and display directly on the device or by using the convenient software PYROSOFT Spot.

Typical pyrometer application areas:

- Steel industry
- Kiln engineering
- Hardening
- Welding
- Metal industry
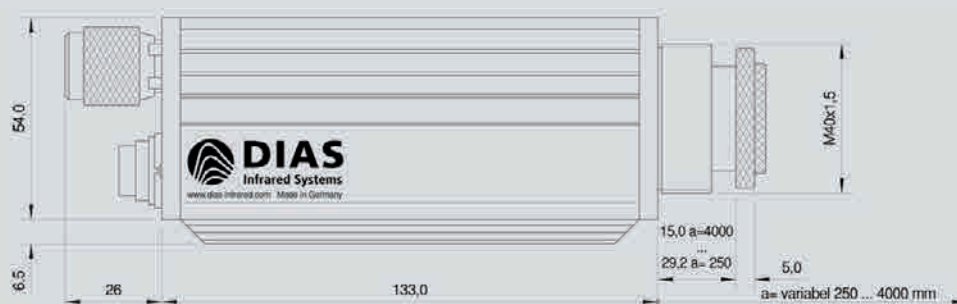
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Technical data

Type	DSR 10N/DSR 10NV	DSR 10N/DSR 10NV	DSR 10N/DSR 10NV	DSR 10N/DSR 10NV	DSR 10N/DSR 10NV
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	approx. 50 : 1	approx. 100 : 1	approx. 200 : 1	approx. 300 : 1	approx. 300 : 1
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C				
Spectral range	0.7 µm to 1.1 µm				
Optics	vario optics with quartz glass protection window, measuring field diameters from 0.8 mm				
Measurement uncertainty [1]	0.5 % of measured value in °C + 1 K				
Reproducibility [1]	0.2 % of measured value in °C + 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, adjustable at the device or via interface				
Emissivity	0.050 to 1.000, adjustable at the device 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 solid state 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 (DSR 10NV)				
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro				
Parameters [4]	ratio correction, emissivity, transmittance, ambient radiation, response time, temperature unit °C or °F, storage settings, sub temperature range of measurement output, switching thresholds of switching output, key lock				
User controls	Keys for „Parameter Menu", „Enter", „Up" and „Down", 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 70 °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 55 011)				
Scope of delivery	PYROSPOT DSR 10N/DSR 10NV, mounting screw nut, inspection sheet, manual, PYROSOFT Spot for Windows® (without connection cable, please order separately)				

[1] $T_{Ambient}$ = 23 °C, ε = 1, t_{95} = 1 s. [2] Noise equivalent temperature difference. [3] With dynamic adaption at low signal level. [4] Adjustable via software and interface or directly at thr device.

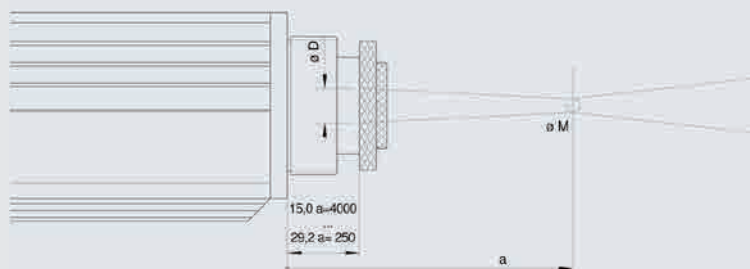## Dimensional drawing pyrometer (with through-lens sighting)

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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
500 °C to 1200 °C	5.0	6.0	7.0	10.0	16.0	80.0	8.0	6.5	5102001201	5102011201
									5102021201	5102031201
600 °C to 1400 °C	2.5	3.0	3.5	5.0	8.0	40.0	8.0	6.5	5102001202	5102011202
									5102021202	5102031202
700 °C to 1800 °C	1.2	1.5	1.7	2.5	4.0	20.0	8.0	6.5	5102001203	5102011203
									5102021203	5102031203
800 °C to 2500 °C	0.8	1.0	1.2	1.7	2.7	13.3	8.0	6.5	5102001204	5102011204
									5102021204	5102031204
900 °C to 3000 °C	0.8	1.0	1.2	1.7	2.7	13.3	8.0	6.5	5102001205	5102011205
									5102021205	5102031205

Dimensional drawing vario optics

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

Technical data video camera (DSR 10NV)

Video signal	Composite video signal approx. 1Vss at 75 Ω (galvanically isolated, video signal can be deactivated via software)
Video norm	PAL (B), 50 Hz (optional video norm NTSC (M), 60 Hz)
Resolution	1/3 inch video chip 628 × 586 pixels (NTSC option: 510 × 496 pixels)
Exposure control	Automatic or manual via software or device
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; ratio pyrometers: ratio mode: meas. temperature, K factor, intensity bar 1-channel mode: measurement temperature, emissivity
Optional displays	Via software: serial number, device name or user-defined text (16 characters), date, time, temperature unit °C/°F, 12/24 hours display
White balance	Automatic or manual via software or device

Detailed view: Display

Depending on the selected operation mode, the main display is different. When in ratio mode, the device shows in additionto the emissivity the ratio correction (K) and the intensity.

Current measured temperature

K factor set (ratio correction)

intensity
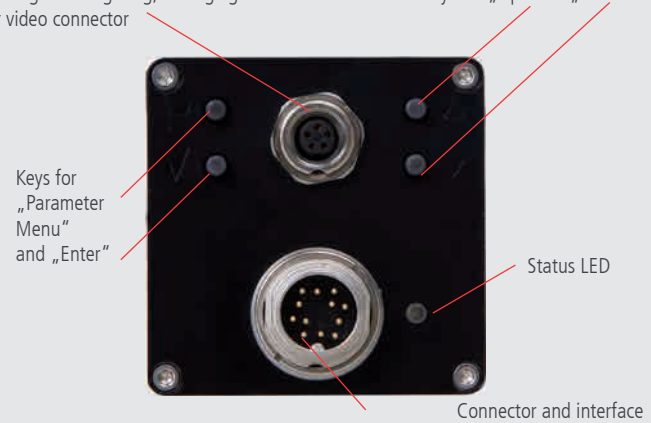
emissivity set

status switching output

Detailed view: Rear side

The parameters can be adjusted with the keys at the rear side of the device. The set value is taken over directly.

Through-lens sighting, aiming light or video connector

Keys for „Up" and „Down"

Keys for „Parameter Menu" and „Enter"

Status LED

Connector and interface

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Electrical, mechanical and optical accessories (more accessories on request)		Part number	
Connection cable, 12 pin, angled plug	Length 2 m Length 5 m Length 10 m Length 15 m Length 20 m Length 25 m Length 30 m	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	
Interface adapter	RS-485 to USB	3310A14020	
Power supply PSU 15	24 V DC, 0.6 A	3310A12010	
Mounting angle	Adjustable	3310A21020	
Air purge unit	Stainless steel, purge air 0.1 to 0.5 bar, oil-free	3310A22020	
Window slide	without window	3310A21210	
Vacuum flange	KF 16 with quartz glass with sapphire glass (scratch-proof)	3310A24015 3310A34021 3310A34051	
Cooling jacket	including air purge unit	3310A23031	
Mounting angle	for cooling jacket	3310A23036	
ATEX housing		3310A23100	
Handheld programming device DHP 1040	mobile device for pyrometer parameterization	3310A17010	
TFT display	TFT display industrial	3.5" with 2 m cable	3310A16110	3310A16120
Adapter	Video/USB	3310A14030	

Selected accessories – images

Mounting angle, adjustable
Part number: 3310A21020

Ball and socket mounting
Part number: 3310A21025

Cooling jacket
Part number: 3310A23031

Cooling plate
Part number: 3310A23020

Air purge unit
Part number: 3310A22020

ATEX housing
Part number: 3310A23100

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