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

DIAS Infrared Systems

Overview

Digital pyrometers with RS-485 interface

Features

- For temperature measurements between 550 °C and 3000 °C
- Keyboard and display for emissivity and temperature
- Temperature linear output 0/4 to 20 mA
- Aiming: aiming light, through-lens sighting or camera module
- Short response times from 2 ms
- Vario optics

Description and applications

The digital pyrometers PYROSPOT DS 10N/DS 10NV are specifically designed for industry and research applications. The devices are suitable for temperature measurement from 550 °C on many different surfaces for example metals, ceramics or graphite.

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 2 ms (t95) these pyrometers are also suitable for fast measuring processes. The vario optics with quartz glass protection window realise measuring field diameters from 1.2 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 DS 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 emissivity 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 parameterizing and evaluation software PYROSOFT Spot.

Typical pyrometer application areas:

Steel industry, metal industry, kiln engineering, hardening, welding

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Technical data

Type	DS 10N/DS 10NV	DS 10N/DS 10NV	DS 10N/DS 10NV	DS 10N/DS 10NV
Temperature range	550 °C to 1500 °C	600 °C to 1800 °C	800 °C to 2500 °C	900 °C to 3000 °C
Sub temperature range	adjustable within temperature range, minimum span 50 °C			
Spectral range	0.8 µm to 1.1 µm			
Optics	vario optics with quartz glass protection window, measuring field diameters from 1.2 mm			
Distance ratio	approx. 200 : 1			
Measurement uncertainty [1]	0.5 % of measured value			
Reproducibility [1]	0.1 % of measured value			
Transmissivity	50 % to 100 %			
Ambient radiation	adjustable within temperature range			
NETD [2]	0.1 K [1]			
Response time (t95)	2 ms, adjustable up to 100 s			
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 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 (DS 10NV)			
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro			
Parameters	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	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 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 50 011)			
Scope of delivery	PYROSPOT DS 10N/DS 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.

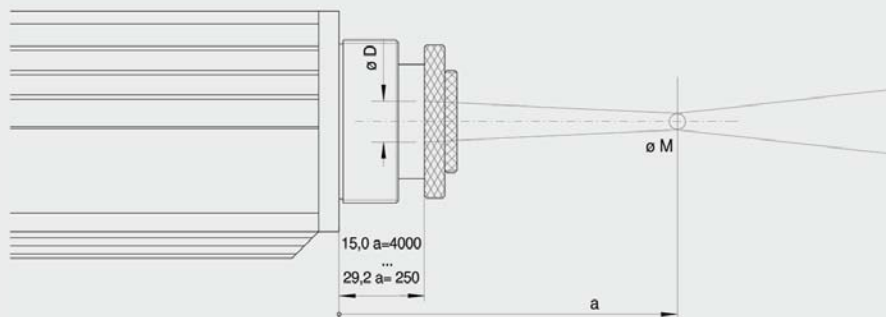### Dimensional drawing pyrometer (with through-lens sighting)

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Vario optics

Measuring distance a [mm]	250	300	350	500	800	4000	Aperture diameter ∅ D [mm]		Order number	
Optics pullout [mm]	29.2	25.5	23.5	20.3	18.0	15.0	at		LED aiming light	Laser aiming light
Temperature range	Measuring field diameter M [mm]						a = 250 mm	a = 4000 mm	Throug-lens sighting	Camera module
550 °C to 1500 °C	1.2	1.5	1.7	2.5	4.0	20.0	13.0	10.5	5100001201	5100011201
									5100021201	5100031201
600 °C to 1800 °C	1.2	1.5	1.7	2.5	4.0	20.0	8.0	6.5	5100001202	5100011202
									5100021202	5100031202
800 °C to 2500 °C	1.2	1.5	1.7	2.5	4.0	20.0	10.0	8.5	5100001203	5100011203
									5100021203	5100031203
900 °C to 3000 °C	1.2	1.5	1.7	2.5	4.0	20.0	5.5	4.3	5100001204	5100011204
									5100021204	5100031204

Dimensional drawing vario optics

Technical data video camera (DS 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

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Electrical, mechanical and optical accessories[1]			Order number	
Connection cable, 12 pin, angulate 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 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 with quartz window with sapphire window (scratch-proof)		3310A24015 3310A34021 3310A34051	
Mounting angle	for cooling jacket		3310A23036	
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

Emissivity setting

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 emissivity adjustment

Plug connector and interface

Technische Änderungen vorbehalten. Technical details are subject to change. 06.03.14