

Pyrometers for combustors

Overview

Digital special pyrometers with RS-485 interface



Features

- For temperature measurements between 600 °C and 2500 °C
- Display and keys for parameterization
- Measuring distance adjustment up to 4 m

- Aiming: aiming light, through-lens sighting or camer module
- Short response times from 5 ms
- Temperature linear output 0/4 to 20 mA

Description and applications

The digital pyrometers PYROSPOT DSR 10NF/DSR 10NFV are specifically designed for industry applications. The devices can be particularly used for measuring the temperature of lighting flames with variable soot parts.

The solid compact housing and the standard protection window for the optics enables the use under rough environmental conditions. These pyrometers are suitable for the exact measurement of fast process with the very short response time (t_{95}) of only 5 ms. The vario optic has a protective glass made of quartz glass and enables the adjustment of the measurement distance up to 4 m.

For an easy and accurate alignment the instrument is equipped with a LED or laser aiming light or trough-lens-sighting. With the optional color video module (PYROSPOT DSR 10NFV) the alignment of the pyrometers to the target can be monitored visually and the entire process can be recorded and documented.

The switchable standard linear temperature output of 0/4 to 20 mA enables a simple integration into existing measurement and controll systems.



The DSR 10NF/DSR 10NFV are equipped with galvanically isolated RS-485 interface which allows parameterizing and software evaluation even in bus systems. The black body temperature with emissivity calculation, the colour temperature and the optical thickness are readable.

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

Typical pyrometer application areas:

- Measurement of lighting flames
- Carbon dust and oil combustion system
- Waste bunkers
- Combustors



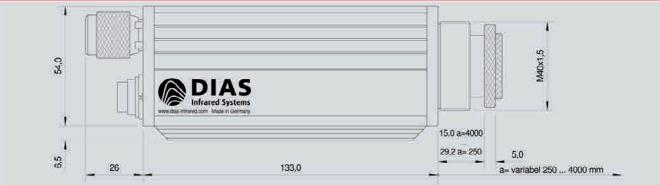


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Technical data						
Туре	DSR 10NF/DSR 10NFV	DSR 10NF/DSR 10NFV	DSR 10NF/DSR 10NFV			
Temperature range	600 °C to 1400 °C	700 °C to 1800 °C	800 °C to 2500 °C			
Distance ratio	100:1	200:1	300:1			
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C					
Spectral range	0.7 μm to 1.1 μm					
Optics	vario optics with quartz glass protection window					
Measurement uncertainty 1	0.5 % of measured value in °C + 1 K					
Transmittance	50 % to 100 %					
Ambient radiation	adjustable within temperature range					
Reproducibility ¹	0.2 % of measured value in °C + 0.5 K					
NETD 1,2	0.1 K					
Response time (t ₉₅)	5 ms ³ , adjustable up to 100 s					
Soot factor n	0.5 to 2.5, adjustable via interface or at the device					
Storage	minimum and maximum value storage, adjustable via RS-485 interface or at the device					
Output	0/4 to 20 mA, switchable via software, t	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/treshold	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, camera module (DSR 10NFV)					
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro					
Parameters ⁴	soot factor, 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	ca. 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 10NF/DSR 10NFV, mounting screw nut, inspection sheet, manual, PYROSOFT Spot for Windows® (without connection cable, please order separately)					
$^{1}T = 23 ^{\circ}C c = 1 t = 1 c^{2} \text{Nic}$	oise equivalent temperature difference. 3 With dynamic	adaption at low signal level 4 Adjustable via interface	and software or directly at the device			

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

Dimensional drawing (with through-lens sighting)

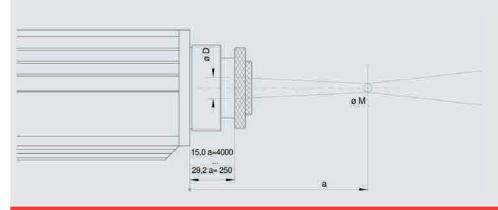




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Vario optics										
Measuring distance a [mm]	250	300	350	500	800	4000	Aperture diameter ∅ D [mm] Order number			
Optics pullout [mm]	29.2	25.5	23.5	20.3	18.0	15.0	at		LED aiming light	Laser aiming light
Device	Measu	Measuring field diameter M [mm] $a = 250 \text{ mm}$ $a = 4000 \text{ mg}$				a = 4000 mm	Through-lens sighting	Color module		
600 °C to 1400 °C	2.5	3.0	3.5	5.0	8.0	40.0 8.0 6.5	6.5	5102001242	5102011242	
									5102021242	5102031242
700 °C to 1800 °C	1.2	1.5	1.7	2.5	4.0	20.0	8.0 6.5	5102001243	5102011243	
							5102021243	5102031243		
800 °C to 2500 °C	0.8	0.8 1.0	1.2 1.7	2.7	13.3	8.0	6.5	5102001244	5102011244	
								5102021244	5102031244	

Dimensional drawing vario optics





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 \times 586 pixels (NTSC option: 510 \times 496 pixels)
Exposure control	Automatic or manual via software or device
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; 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 addition to the emissivity the ratio correction (K) and the intensity.

Current measured temperature



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.





Pyrometers for combustors

Electrical, mechanical and optical acces	ssories (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





Ball and socket mounting



Cooling jacket





Cooling plate

Part number: 3310A23020



Air purge unit

Part number: 3310A22020



ATEX housing

Part number: 3310A23100





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