PYROSPOT DSR 10NF/DSR 10NFV
Pyrometers for combustors

DIAS
Infrared Systems

Overview

Digital special pyrometers with RS-485 interface

Features

- For temperature measurements between 600 °C and 2500 °C
- Display and keyboard for soot factor adjustment
- 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 (t95) 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.

The soot factor n 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 software PYROSOFT Spot

Typical pyrometer application areas:

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

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PYROSPOT DSR 10NF/DSR 10NFV
Pyrometers for combustors

Technical data

Type	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
Sub temperature range	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		
Distance ratio	100 : 1	200 : 1	
Measurement uncertainty [1]	0.5 % of measured value		
Transmissivity	50 % to 100 %		
Ambient radiation	adjustable within temperature range		
Reproducibility [1]	0.2 % of measured value		
NETD [2]	0.1 K [1]		
Response time (t95)	5 ms, 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		
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/treshold	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, camera module (DSR 10NFV)		
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro		
Parameters	soot factor, 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	soot factor control push-buttons, aiming light push-buttons, 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 50 011)		
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] $T_{Ambient}$ = 23 °C, ε = 1, t95 = 1 s. [2] Noise equivalent temperature difference.
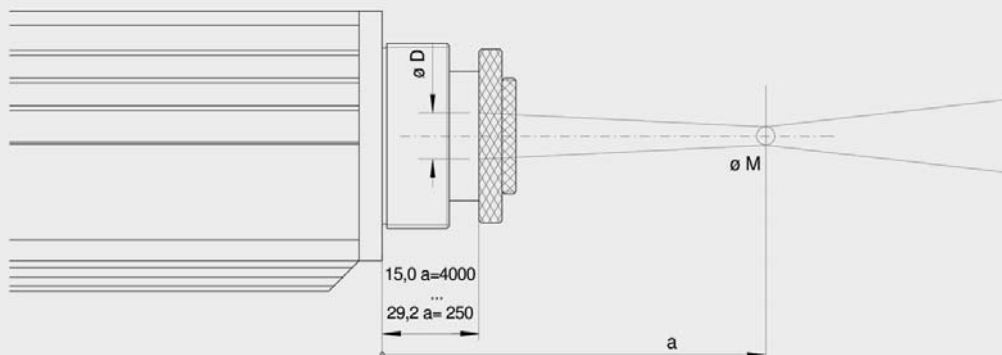
Dimensional drawing (with through-lens sighting)

PYROSPOT DSR 10NF/DSR 10NFV
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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	Measuring field diameter M [mm]						a = 250 mm	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	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	1.2	1.5	1.7	2.5	4.0	20.0	8.0	6.5	5102001244	5102011244
									5102021244	5102031244

Dimensional drawing vario optics

Technical data video camera (DSR 10NFV)

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 soot factor setting.

Current temperature

soot factor n

814.0°c
n:1.250

Detailed view: back side

The soot factor 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 soot factor adjustment

Plug connector and interface

Technische Änderungen vorbehalten. Technical details are subject to change. 27.06.16

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