PYROSPOT DSR 54NF/DSR 54NFV

Pyrometers for combustors

DIAS
Infrared Systems

Overview

Digital special pyrometers with RS-485 interface

Special features

- For temperature measurements between 700 °C and 2500 °C
- Temperature linear output 0/4 to 20mA
- Integrated RS-485 interface

- Integrated laser aiming light or video camera
- Robust stainless steel housing
- Very short response times from 5 ms

Description and application

The digital special pyrometer PYROSPOT DSR 54NF is specifically designed for industrial purposes. The devices can be particularly used for measuring the temperature of luminous flames with variable soot parts. It measures the infrared radiation just like a ratio pyrometer in two adjacent wavelengths but additionally corrects the typical measurement error that occurs at measurements on luminous flames.

The solid and compact stainless steel housing allows usage even under rough environmental conditions. Measuring spot sizes from 3.5 mm for the PYROSPOT DSR 54N can be easily realized. With a minimal response time of only 5 ms (t95) 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 optional integrated red laser aiming light for the exact aiming of the pyrometer to the measurement object .The optional integrated video camera module (DSR 54NFV) 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.

The PYROSPOT DSR 54NF possesses a RS-485 interface. The devices are bus-compatible in this way and use the Modbus RTU protocol.

You can connect the pyrometer via an optionally available interface adaptor RS-485 to USB with a PC. Connect the pyrometer to a PC to adjust the parameters sooth factor, ratio correction, 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:

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

Bildnachweis: Stahl-Zentrum, SMS Group

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Technical data

Type	DSR 54NF/DSR 54NFV			
Temperature range[1]	700 °C to 1800 °C		800 °C to 2500 °C	
Distance ratio	200 : 1		200 : 1	
Optics	several fixed optics (type 650, 2000, 4000)			
Part number	Laser	Video	Laser	Video
650	5542063243	5542083243	5542063244	5542083244
2000	5542066243	5542086243	5542066244	5542086244
4000	5542067243	5542087243	5542067244	5542087244
Sub temperature range	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			
Soot factor n	0.50 to 2.50			
Response time (t95)	5 ms (min.), adjustable up to 100 s			
Measurement uncertainty[2]	0.5 % of measured value in °C			
Reproducibility[2]	0.1 % of measured value in °C			
NETD[3]	0.1 K^2			
Transmissivity	50 % to 100 %			
Ambient radiation	adjustable within temperature range			
Output	0/4 mA to 20 mA, temperature linear, burden max. 500 Ω (galvanically isolated)			
Interface	RS-485 (galvanically isolated), half duplex, max. 115 kBd, Modbus RTU			
Aiming	DSR 54NF: Laser aiming light, 630 … 680 nm, class II, < 1 mW DSR 54NFV: Video camera, composite video signal PAL (B), 50Hz (galvanically isolated), optional NTSC (M), 60 Hz			
Switching output/threshold	1 Opto-Relais, R_{Last} min. 48 Ω (galvanisch getrennt)/beliebig einstellbar innerhalb des Grundmessbereichs			
Parameters[3]	soot factor, ratio correction, emissivity, transmissivity, 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. 600 g			
Housing	stainless steel round housing with plug connector, length: approx. 105 mm, ⌀ 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 54NF/DSR 54NFV, manual, inspection sheet, software PYROSOFT Spot, without connection cable (please order separately)			

[1] Other temperatures ranges on request. [2] Specifications for black body radiator, $T_{ambient}$ = 23 °C, t95 = 1 s. [3] Noise equivalent temperature difference. [4] Adjustable via interface and software or at the device.

Fixed optics

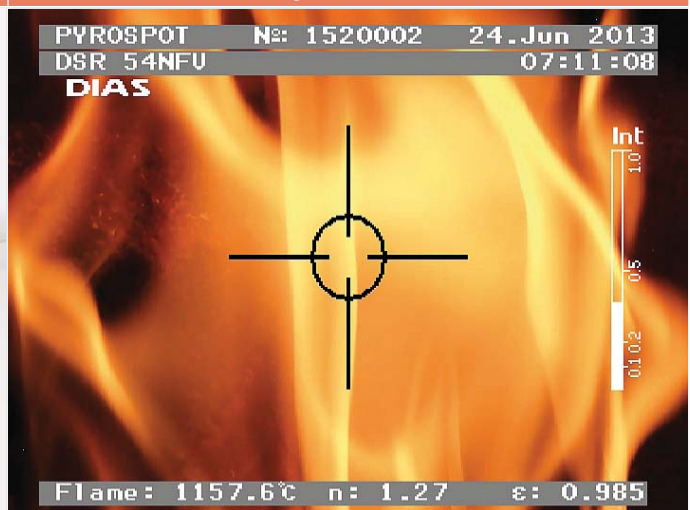| Measuring distance a [mm]	Aperture D [mm]	a = 650	a = 2000	a = 4000
Temperature range		Measuring field diameter M [mm]		
700 °C to 1800 °C	6.0	3.5	10.0	20.0
800 °C to 2500 °C	6.0	3.5	10.0	20.0

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![DIAS Infrared Systems]

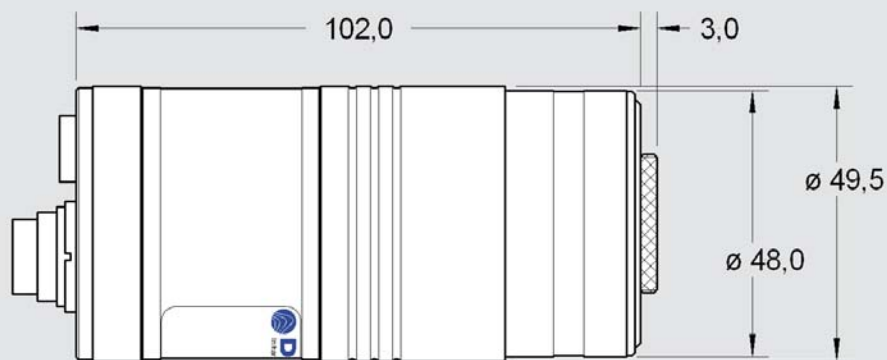| Technical data Video-Kamera (DSR 54NFV)	
Video signal	Composite video signal approx. 1Vss at 75 Ω (galvanically isolated, video signal can be deactivated via software)
Color norm	PAL (B), 50 Hz (optional color norm NTSC (M), 60 Hz)
Resolution	1/3 inch video chip 628 × 586 pixels (NTSC option: 510 × 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

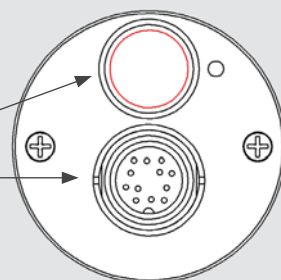**Detailed view of video image**

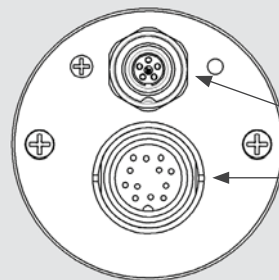**Dimensional drawing pyrometer**

Option laser aiming light:

laser button

12 pin device connection

Option video camera:

5 pin video circular plug

12 pin device connection

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Electrical, mechanical and optical accessories[1]		Part number
Connection cable, straight plug, 12 pin	length 2 m length 5 m length 10 m length 15 m length 20 m length 25 m length 30 m	3310A11111 3310A11112 3310A11113 3310A11114 3310A11115 3310A11116 3310A11117
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
Mounting angle	adjustable	3310A21050
Cooling jacket	including air purge unit, without mounting angle	3310A23050
Ball flange	thread M40 × 1.5	3310A24020
Air purge unit		3310A22050
Power supply PSU 15	24 V DC, 0.6 A	3310A12010
Ring nut	with quartz glass window with sapphire glass window	3310A34022 3310A34052
TFT display	3.5" with 2 m connection cable	3310A16110
Adaptor	video/USB	3310A14030
DHP 1040	handheld programming device	3310A17010

[1] More accessories on request.

Selected accessories

Mounting angle, adjustable
Part number: 3310A21050

Cooling jacket
Part number: 3310A23050

Air purge unit
Part number: 3310A22050

Ball flange
Part number: 3310A24020

Screwed coupling for ball flange
Part number: 3310A24021

Handheld programming device DHP 1040
Part number: 3310A17010

Technische Änderungen vorbehalten. Technical details are subject to change. 06.11.13

www.dias-infrared.com