

# Digital Pyrometers **PYROSPOT**

Non-contact Temperature Measurement

**-40 °C to 3000 °C**



# PYROSPOT Series

## Digital pyrometers for non-contact temperature measurement

Our digital pyrometers **PYROSPOT** are **radiation thermometers** for a non-contact measurement of temperature between **-40 °C to 3000 °C**. They are characterized by robust housings, excellent accuracy and high reliability. The pyrometers are specifically suitable for the use in industrial environments.

With an extensive range of accessories pyrometers can be customized individually to the application and integrated into system solutions. For the parameterization of the pyrometer settings and interpretation of the measured data the Windows® software **PYROSOFT Spot** is available.

We offer you an **extremely wide pyrometer range** with an **excellent cost-performance ratio**. So you can find the suitable product for your application.

To minimize physically caused temperature measurement errors resulting from emissivity inaccuracies, one should measure at a short wavelength. There are typical spectral ranges, recommended temperature ranges and applications presented in this overview:

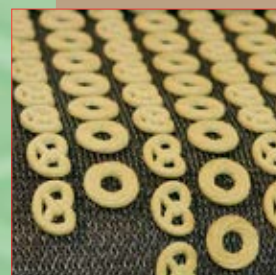
Materials	Temperature range	Spectral range	Device type
Non-metals	-40 °C to 1000 °C	8 µm to 14 µm	„L”
Ultrathin glass	300 °C to 1200 °C	about 7.7 µm	„U”
Glass surfaces	50 °C to 2500 °C	4.8 µm to 5.2 µm	„G”
CO <sub>2</sub> measurements	500 °C to 2000 °C	about 4.5 µm	„C”
Measurement through flames	100 °C to 2500 °C	about 3.9 µm	„F”
Metals, ceramic, graphite	20 °C to 1000 °C	3.0 µm to 5.0 µm	„M”
Metals, ceramic, graphite	50 °C to 2200 °C	2.0 µm to 2.8 µm	„N”
Metals, ceramic, graphite	200 °C to 2500 °C	1.5 µm to 1.8 µm	„N”
Metals, glass melts	500 °C to 3000 °C	0.8 µm to 1.1 µm	„N”

Our **ratio pyrometers** contained within most PYROSPOT series are suitable for measurements on objects with changing or unknown emissivity. Pyrometers with **fiber optics** are specifically suitable for measurements in hot environmental conditions or measurement points that are not easy to reach.

All pyrometers have a **0/4 to 20 mA temperature linear output**. **Galvanically isolated digital interaces** are available via **USB** or **RS-485** on most units. The RS-485 interface uses the data protocol **Modbus RTU**. In this way, the pyrometers so equipped can be easily and directly integrated into existing bus systems and process controls. Integration into local networks is possible with the **Ethernet interface box DCU<sup>OP</sup>**.

### What does the device name mean?

<b>PYROSPOT</b>	<b>D</b>	--	-	-	--	-	--
<b>DIAS</b>							
<b>Detector</b>							
S, G, A, GE, GA – Semiconductor photodiodes							
P, PE – Semiconductor photoresistors							
T – Thermopile, Y – pyroelectric detector							
<b>R – Ratio pyrometers</b>							
<b>F – Fiber optics</b>							
<b>Device series</b> 4, 10, 11, 25, 30, 34, 40, 42, 44, 48, 54, 56, 80							
<b>Spectral range</b>							
N, M, F, C, G, U, L (please refer overview)							
<b>Additional designation:</b> F – Flames, G – Glass, T – Tungsten, V – Video camera							





# PYROSPOT Series 5x

High-precision, very fast pyrometers for operations in industry

## Series 56 – Powerful pyrometers with display and parameterization keys



- Different fixed optics with very small measurement field diameters from 0.7 mm
- Very fast response times  $t_{95}$  from 2 ms
- Laser aiming light, color video camera or through-lens sighting
- Stainless steel housing IP65

Device type	Spectral range	Temperature range	Distance ratio	$t_{95}$	Interface	Aiming/targeting aid
DS 56N	0.8 $\mu\text{m}$ to 1.1 $\mu\text{m}$	550 °C to 3000 °C	200 : 1 to 300 : 1	2 ms	RS-485	Laser, video, through-lens sighting
DG 56N	1.5 $\mu\text{m}$ to 1.8 $\mu\text{m}$	200 °C to 2500 °C	200 : 1 to 300 : 1	2 ms	RS-485	Laser, video, through-lens sighting
DGE 56N	2.0 $\mu\text{m}$ to 2.6 $\mu\text{m}$	75 °C to 2200 °C	80 : 1 to 200 : 1	2 ms	RS-485	Laser or through-lens sighting
DT 56G	about 5,0 $\mu\text{m}$	100 °C to 2500 °C	75 : 1 to 100 : 1	10 ms <sup>1)</sup>	RS-485	Double laser
DT 56L	8 $\mu\text{m}$ to 14 $\mu\text{m}$	-40 °C to 1000 °C	75 : 1 to 100 : 1	10 ms <sup>1)</sup>	RS-485	Double laser
Ratio pyrometer						
DSR 56N	0.7 $\mu\text{m}$ to 1.1 $\mu\text{m}$	500 °C to 3000 °C	50 : 1 to 300 : 1	5 ms	RS-485	Laser, video, through-lens sighting

## Series 54 – Powerful pyrometers with very good cost-performance ratio



- Parameterization via RS-485 interface
- Laser aiming light, color video camera or through-lens sighting
- Special pyrometers for measurements in combustion chambers
- Compact and robust stainless steel housing with protection class IP65

Device type	Spectral range	Temperature range	Distance ratio	$t_{95}$	Interface	Aiming/targeting aid
DS 54N	0.8 $\mu\text{m}$ to 1.1 $\mu\text{m}$	550 °C to 3000 °C	200 : 1 to 300 : 1	2 ms	RS-485	Laser, video, through-lens sighting
DG 54N	1.5 $\mu\text{m}$ to 1.8 $\mu\text{m}$	200 °C to 2500 °C	200 : 1 to 300 : 1	2 ms	RS-485	Laser, video, through-lens sighting
DT 54G	about 5.0 $\mu\text{m}$	100 °C to 2500 °C	75 : 1 to 100 : 1	10 ms <sup>1)</sup>	RS-485	Double laser
DT 54U	about 7.7 $\mu\text{m}$	300 °C to 1200 °C	65 : 1	50 ms	RS-485	Double laser
DT 54L	8 $\mu\text{m}$ to 14 $\mu\text{m}$	-40 °C to 1000 °C	75 : 1 to 100 : 1	10 ms <sup>1)</sup>	RS-485	Double laser
Ratio pyrometer						
DSR 54N	0.7 $\mu\text{m}$ to 1.1 $\mu\text{m}$	500 °C to 3000 °C	50 : 1 to 300 : 1	5 ms	RS-485	Laser, video, through-lens sighting
Special pyrometer for combustion chambers						
DSR 54NF	0.7 $\mu\text{m}$ to 1.1 $\mu\text{m}$	700 °C to 3000 °C	200 : 1	5 ms	RS-485	Laser, color video camera

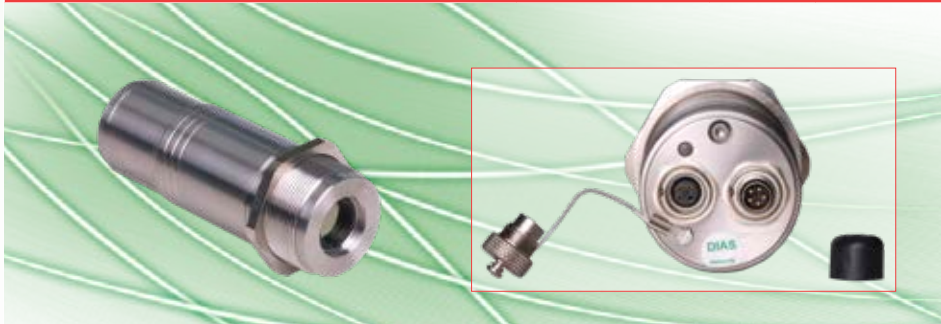


Series 5x with accessories

# PYROSPOT Series 4x

Universal, compact and robust pyrometers for industrial application

## Series 40 – All-around applicable 2-wire pyrometers with USB interface



- Different fixed and vario optics with very small measurement field diameters from 0.7 mm
- Integrated LED or laser aiming light
- Pyrometer with fiber optics available
- Stainless steel housing IP65

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DS 40N	0.8 μm to 1.1 μm	600 °C to 2500 °C	100 : 1 to 200 : 1	10 ms	USB	LED or laser aiming light
DG 40N	1.5 μm to 1.8 μm	250 °C to 2000 °C	100 : 1 to 200 : 1	10 ms	USB	LED or laser aiming light
DT 40F	about 3.9 μm	300 °C to 2500 °C	50 : 1	60 ms	USB	LED aiming light or laser aiming light adapter
DT 40C	about 4.5 μm	500 °C to 1800 °C	50 : 1	60 ms	USB	none
DT 40G	about 5.0 μm	100 °C to 2500 °C	50 : 1	60 ms	USB	LED aiming light or laser aiming light adapter
DT 40U	about 7.7 μm	300 °C to 1100 °C	50 : 1	60 ms	USB	none
DT 40L	8 μm to 14 μm	-40 °C to 1000 °C	50 : 1	60 ms	USB	LED aiming light or laser aiming light adapter

### Fiber optics pyrometer

DSF 40N	0.8 μm to 1.1 μm	600 °C to 2500 °C	50 : 1 to 150 : 1	10 ms	USB	LED or laser aiming light
DGF 40N	1.5 μm to 1.8 μm	250 °C to 2000 °C	50 : 1 to 150 : 1	10 ms	USB	LED or laser aiming light

## Series 42 – Good value series with emissivity adjustment for first-time user



- Different fixed optics available
- 2-wire device in stainless steel housing (IP65)
- Extensive accessories, e.g. cooling jacket, air purge unit

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DS 42N	0.8 μm to 1.1 μm	600 °C to 2500 °C	100 : 1 to 200 : 1	10 ms	none	Laser aiming light
DG 42N	1.5 μm to 1.8 μm	250 °C to 1800 °C	100 : 1 to 200 : 1	10 ms	none	Laser aiming light
DT 42G	about 5.0 μm	100 °C to 2500 °C	50 : 1	100 ms	none	Laser aiming light adapter
DT 42L	8 μm to 14 μm	-40 °C to 1000 °C	50 : 1	100 ms	none	Laser aiming light adapter





# PYROSPOT Series 4x

Universal, compact and robust pyrometers for industrial application

## Series 44 – Bus-compatible pyrometers with RS-485 interface



- Different fixed and vario optics with very small target sizes from 0.7 mm
- Special ratio pyrometers and devices with fiber optics
- Robust stainless steel housing IP65

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DS 44N	0.8 μm to 1.1 μm	600 °C to 2500 °C	100 : 1 to 200 : 1	5 ms	RS-485	LED or laser aiming light
DG 44N	1.5 μm to 1.8 μm	250 °C to 2000 °C	100 : 1 to 200 : 1	5 ms	RS-485	LED or laser aiming light
DGE 44N	2.0 μm to 2.6 μm	75 °C to 1200 °C	80 : 1 to 200 : 1	5 ms	RS-485	Laser aiming light
DA 44M	3.0 μm to 5.0 μm	20 °C to 1000 °C	50 : 1	5 ms	RS-485	LED aiming light or laser aiming light adapter
DA 44MF	3.5 μm to 4.0 μm	50 °C to 1000 °C	50 : 1	5 ms	RS-485	LED aiming light or laser aiming light adapter
DA 44F	about 3.9 μm	100 °C to 2500 °C	50 : 1	5 ms	RS-485	LED aiming light or laser aiming light adapter
DA 44G	about 5.0 μm	50 °C to 2500 °C	50 : 1	5 ms	RS-485	LED aiming light or laser aiming light adapter
DT 44L	8 μm to 14 μm	-40 °C to 1000 °C	50 : 1	10 ms <sup>1)</sup>	RS-485	LED aiming light or laser aiming light adapter

### Ratio pyrometers

DSR 44N	0.7 μm to 1.1 μm	600 °C to 2500 °C	50 : 1 to 200 : 1	5 ms	RS-485	Laser aiming light
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### Fiber optics pyrometer

DSF 44N	0.8 μm to 1.1 μm	600 °C to 2500 °C	50 : 1 bis 150 : 1	5 ms	RS-485	LED or laser aiming light
DGF 44N	1.5 μm to 1.8 μm	250 °C to 2000 °C	50 : 1 bis 150 : 1	5 ms	RS-485	LED or laser aiming light

### Ratio pyrometers with fiber optics

DSRF 44N	0.7 μm to 1.1 μm	700 °C to 1800 °C	40 : 1	5 ms	RS-485	Laser aiming light
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## Series 4 – Pyrometers with small remote sensor head and separate electronics



- Large OLED display and programmable keys
- Parameterization directly at the device
- Best cost-performance ratio for OEM application
- Protection class IP65

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DS 4N	0.8 μm to 1.1 μm	600 °C to 2500 °C	32 : 1 to 64 : 1	10 ms	RS-485	none
DG 4N	1.5 μm to 1.8 μm	250 °C to 1800 °C	32 : 1 to 64 : 1	10 ms	RS-485	none
DT 4G	about 5.0 μm	200 °C to 1800 °C	20 : 1	100 ms	RS-485	none
DT 4L	8 μm to 14 μm	-40 °C to 1000 °C	20 : 1	100 ms	RS-485	none

## Series 48 – Fast temperature switch with potential-free output



- Very short switch times of only 1 ms
- Different fixed optics
- Protection class IP65
- Option: Hot metal detector

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DG 48N	1.5 μm to 1.8 μm	200 °C to 1800 °C	45 : 1 to 200 : 1	1 ms	none	LED aiming light

# PYROSPOT Series 1x

High-precision pyrometers for industry and research

## Series 10 – Fast pyrometers with display, keys for parameterization and vario optics



- Different vario optics with very small measurement field diameters from 0.7 mm
- Integrated display for measured values and parameters
- Push buttons for parameterization
- Various aiming/targeting aids

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DS 10N	0.8 μm to 1.1 μm	550 °C to 3000 °C	200 : 1 to 300 : 1	2 ms	RS-485	Each pyrometer is equipped with an integrated LED or laser aiming light, a through-lens sighting or a color video camera
DGA 10N	about 0.88 μm	400 °C to 2500 °C	50 : 1 to 200 : 1	2 ms	RS-485	
DG 10NT	about 1.25 μm	500 °C to 2500 °C	200 : 1	2 ms	RS-485	
DG 10N	1.5 μm to 1.8 μm	200 °C to 2500 °C	200 : 1 to 300 : 1	2 ms	RS-485	
DGE 10N	2.0 μm to 2.6 μm	100 °C to 1200 °C	100 : 1 to 200 : 1	2 ms	RS-485	
DP 10N	2.0 μm to 2.8 μm	50 °C to 1200 °C	100 : 1 to 200 : 1	1.5 ms	RS-485	
DPE 10M	3.0 μm to 5.0 μm	20 °C to 1000 °C	75 : 1 to 150 : 1	1.5 ms	RS-485	
DPE 10MF	3.5 μm to 4.0 μm	50 °C to 2500 °C	75 : 1 to 200 : 1	1.5 ms	RS-485	
DPE 10C	about 4.5 μm	500 °C to 2000 °C	100 : 1	1.5 ms	RS-485	Through-lens sighting
DA 10G	about 5.0 μm	75 °C to 2500 °C	100 : 1 to 130 : 1	1 ms	RS-485	LED or laser aiming light, through-lens sighting or color video camera
DY 10L	8 μm to 14 μm	0 °C to 1000 °C	80 : 1 to 100 : 1	30 ms	RS-485	sighting or color video camera

### Ratio pyrometer

DSR 10N	0.7 μm to 1.1 μm	500 °C to 3000 °C	50 : 1 to 300 : 1	5 ms	RS-485	LED or laser aiming light, through-lens sighting or color video camera
DSR 10NF	0.7 μm to 1.1 μm	600 °C to 2500 °C	100 : 1 to 300 : 1	5 ms	RS-485	
DGR 10N	1.5 μm to 1.9 μm	300 °C to 2300 °C	100 : 1 to 300 : 1	5 ms	RS-485	

### Transfer radiation thermometer set for calibration

DS 10N cal	0.8 μm to 1.1 μm	600 °C to 2500 °C	200 : 1	1 s	RS-485	Through-lens sighting
DG 10N cal	1.5 μm to 1.8 μm	300 °C to 1800 °C	200 : 1	1 s	RS-485	Through-lens sighting
DY 10F cal	about 3.9 μm	200 °C to 1500 °C	70 : 1	1 s	RS-485	Through-lens sighting
DY 10G cal	about 5.0 μm	100 °C to 1400 °C	70 : 1	1 s	RS-485	Laser aiming light
DY 10L cal	8 μm to 14 μm	0 ° to 1000 °C	70 : 1	1 s	RS-485	Laser aiming light

## Series 11 – Robust and fast fiber optics pyrometers with display and control keys



- Vario and fixed optics available
- ambient conditions up to 250 °C
- Large OLED display and keys for parameterization
- Protection class IP65

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DSF 11N	0.8 μm to 1.1 μm	600 °C to 3000 °C	100 : 1 to 150 : 1	2 ms	RS-485	Laser aiming light
DGAF 11N	about 0.88 μm	350 °C to 2500 °C	15 : 1 to 150 : 1	2 ms	RS-485	Laser aiming light
DGF 11N	1.5 μm to 1.8 μm	250 °C to 2500 °C	100 : 1 to 150 : 1	2 ms	RS-485	Laser aiming light
DGEF 11N	1.5 μm to 2.2 μm	100 °C to 800 °C	20 : 1 to 30 : 1	2 ms	RS-485	Laser aiming light
DGEF 11N	2.0 μm to 2.6 μm	150 °C to 1200 °C	50 : 1 to 75 : 1	2 ms	RS-485	Laser aiming light
Ratio pyrometer						
DSRF 11N	0.7 μm to 1.1 μm	600 °C to 3000 °C	50 : 1 to 150 : 1	5 ms	RS-485	Laser aiming light
DGRF 11N	1.5 μm to 1.9 μm	300 °C to 2300 °C	50 : 1 to 150 : 1	5 ms	RS-485	Laser aiming light



# PYROSPOT Series 2x and 3x

Fixed pyrometers for application in industry

## Series 25 – Compact pyrometers with attractive price-performance ratio



- 2-wire pyrometer with parameterization interface
- Stainless steel round housing (IP65)

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DT 25L	8 μm to 14 μm	-20 °C to 700 °C	40 : 1	200 ms	Parameter interface	optional laser aiming light adapter

## Series 30/34 – Extremely temperature resistant pyrometers with excellent price-performance ratio



- Pyrometer with fiber optic cable for glass industry with fixed optics, mono fiber cable and air purge unit with quick lock

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DSF 30NG	0.8 μm to 1.1 μm	600 °C to 1800 °C	200 : 1	10 ms	USB	None
DSF 34NG	0.8 μm to 1.1 μm	600 °C to 1800 °C	200 : 1	10 ms	RS-485	None

# PYROSPOT Series 8x

Portable pyrometers for the use in heavy industry

## Series 80 – Fast portable pyrometers with TFT color display



- High accuracy
- Easily focusable precision optics
- 2.5" TFT display with measurement field mark and measured value display
- Robust housing

Device type	Spectral range	Temperature range	Distance ratio	t <sub>95</sub>	Interface	Aiming/targeting aid
DS 80NV	0.8 μm to 1.1 μm	550 °C to 2500 °C	200 : 1	5 ms	USB	TFT color display, laser
DG 80NV	1.5 μm to 1.8 μm	200 °C to 2000 °C	200 : 1	5 ms	USB	TFT color display, laser
Ratio pyrometer						
DSR 80NV	0.7 μm to 1.1 μm	500 °C to 2500 °C	50 : 1 to 200 : 1	5 ms	USB	TFT color display, laser

# PYROTHERM Black body calibration sources

Infrared calibration sources



**PYROTHERM CS 120**  
Temperature range:  
-15 °C to 120 °C



**PYROTHERM CS 400**  
Temperature range:  
50 °C to 400 °C



**PYROTHERM CS 500**  
Temperature range:  
50 °C to 500 °C



**PYROTHERM CS 1200/1500**  
Temperature range:  
300 °C to 1200/1500 °C



**PYROTHERM CS F35 to F150**  
Fixed temperatures:  
35 °C to 150 °C

## A wide range of accessories is available for all PYROSPOT series

Accessories	Series 4	Series 10	Series 11	Series 25	Series 30/34	Series 40	Series 42	Series 44	Series 48	Series 54/56
Mounting angle, fixed	✓		✓	✓	✓	✓	✓	✓	✓	
Mounting angle, adjustable		✓	✓	✓		✓	✓	✓	✓	✓
Ball and socket mounting		✓				✓	✓	✓	✓	
Air purge unit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sighting tube		✓	✓	✓	✓	✓	✓	✓	✓	✓
Cooling plate		✓								
Cooling jacket with air purge unit		✓				✓	✓	✓	✓	✓
ATEX housing		✓						✓		
Mirror 90°	✓	✓	✓			✓	✓	✓	✓	✓
Vacuum flange/Vacuum lead-through		✓	✓			✓	✓	✓	✓	✓
Window slide		✓				✓	✓	✓	✓	✓
Protection window		✓	✓			✓	✓	✓	✓	✓
Ring nut with protection glass		✓	✓			✓	✓	✓	✓	✓
Connection cable		✓	✓	✓	✓	✓	✓	✓	✓	✓
Interface module RS-485 to USB	✓	✓	✓		✓ <sup>1)</sup>			✓		✓
Interface module RS-485 to Profibus DP	✓	✓	✓		✓ <sup>1)</sup>			✓		✓
Ethernet interface box DCU <sup>10P</sup>		✓	✓		✓ <sup>1)</sup>			✓		✓
Interface module video to USB		✓								✓
Power supply 24 V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Digital display	✓	✓	✓	✓	✓	✓	✓	✓		✓
Display and control unit		✓	✓	✓	✓	✓	✓	✓		✓
Handheld programming device DHP 1040		✓	✓	✓	✓	✓		✓		✓
TFT display 3.5"		✓								✓

More accessories available on request. <sup>1)</sup> Only available for series 34.



Detailed view video image

### Software PYROSOFT Spot

For evaluation and processing of measured data obtained, DIAS provides two variants of its pyrometer software. These are the free Windows software **PYROSOFT Spot**, and the pay version **PYROSOFT Spot Pro**. The Pro version allows the measurement, visualization and measurement recording of several simultaneously connected pyrometers, whereas this is possible with the free version only for one connected pyrometer.

Further functions are:

- Trigger functions<sup>1)</sup>
- Extensive statistical analysis of measurement data<sup>1)</sup>
- Export of measured data as text file and automatic creation of Excel spreadsheets
- Video functions for pyrometers with integrated camera module
- Integrated calculator for easy calculation of optics parameter
- Display and parameterizing of optional digital display and control unit DCU200 and digital displays<sup>1)</sup>
- Automatic emissivity determination
- Report generation from template document

The video image can be viewed via a TFT display which is available additionally.

<sup>1)</sup> only available for PYROSOFT Spot Pro



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