# PYROSPOT DGA 10N/DGA 10NV

## Special pyrometer for industry and research

DIAS Infrared Systems

## Overview

### Digital pyrometers for temperature measurement on silicium and for LASER application


## Features

- For temperature measurement between 400 °C and 2500 °C
- Special spectral range for measurement on silicium
- Keys and display for parameterization and display of temperature
- Vario optics with aiming light, through-lens sighting or color video module
- Short response time from 2 ms
- Temperature linear output 0/4 to 20 mA

## Description and application

The digital pyrometers PYROSPOT DGA 10N are developed for temperature measurements from 400 °C on silicium and for LASER application in industry and research. Due to a special narrow-band spectral range the silicium, that is otherwise permaeble for infrared radiation, can be measured exactly in a wide temperature range with almost constant emissivity.

Also for application on metal surfaces that are machined with LASER the PYROSPOT DGA 10N is the best choice. The wavelength of many LASER is outside of the spectral range of the pyrometer so that the temperature measurement is not influenced by the LASER. The additional use of mostly extensive LASER blocking filter lapses in this way.

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 ($t_{95}$) 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.

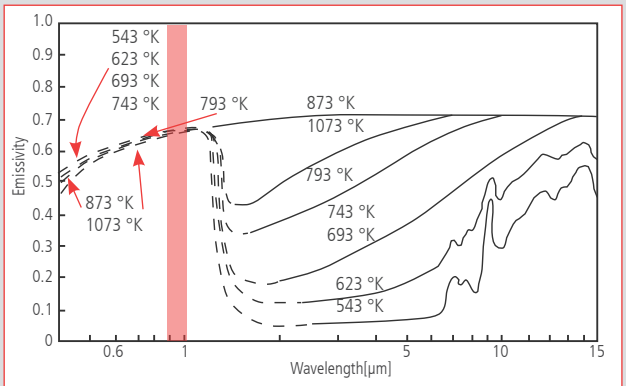
The integrated LED or laser aiming light or the alternative through-lens sighting, enables an exact focus on the measurement object. With the optional color video module (PYROSPOT DGA 10NV) the alignment of the pyrometers to the target can be monitored visually and the entire process can be recorded 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 application areas are:

- Silicium and solar industry
- Steel and metal industry
- LASER application




Emission of silicium as function of temperature and wavelength
Quelle: Sato, T., Jap., Appl. Phys. 6, March, 1967, p. 339-347

# PYROSPOT DGA 10N/DGA 10NV

## Special pyrometer for industry and research

| Technical data | | | |
|---|---|---|---|
| **Type** | **DGA 10N/DGA 10NV** | **DGA 10N/DGA 10NV** | **DGA 10N/DGA10NV** |
| Temperature range | 400 °C to 1400 °C | 450 °C to 1800 °C | 600 °C to 2500 °C |
| Sub temperature range of analog output | adjustable within temperature range, minimum span 50 °C | | |
| Spectral range | about 0.88 µm | | |
| Optics | vario optics with quartz glass protection window, measuring field diameters from 1.2 mm | | |
| Distance ratio | please refer table | | |
| Measurement uncertainty[1] | 0.5 % of measured value in °C + 1 K | | |
| Reproducibility[1] | 0.1 % of measured value in °C + 0.5 K | | |
| Transmittance | 50 % to 100 % | | |
| Ambient radiation | adjustable within temperature range | | |
| NETD[1,2] | 0.1 K | | |
| Response time ($t_{95}$) | 2 ms [3], 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 (DA 10NV) | | |
| Software | PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro | | |
| Parameters[4] | emissivity, transmittance, ambient radiation, response time, temperature unit °C or °F, storage settings, sub temperature range of measurement output, switching thresholds of switching output | | |
| 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 | 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 DGA 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, $t_{95}$ = 1 s. [2] Noise equivalent temperature difference. [3] With dynamic adaption at low signal level. [4] Adjustable via software and interface or directly at the device.

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

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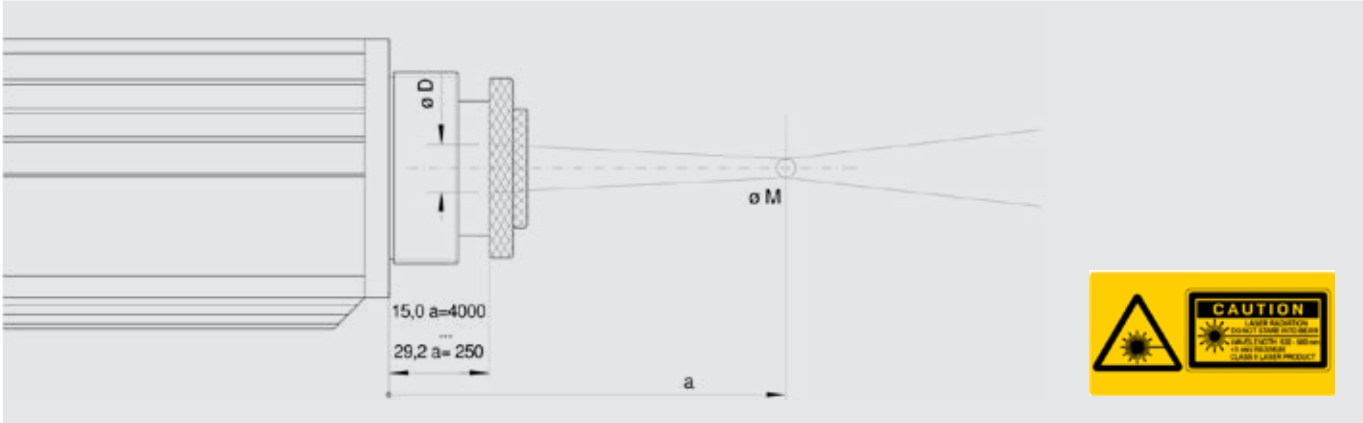
### Vario optics

| 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 |
| 400 °C to 1400 °C | 5.0 | 6.0 | 7.0 | 10.0 | 16.0 | 80.0 | 13.0 | 10.5 | 5107001203 | 5107011203 |
| | | | | | | | | | 5107021203 | 5107031203 |
| 450 °C to 1800 °C | 1.9 | 2.3 | 2.6 | 4.3 | 6.0 | 30.0 | 13.0 | 10.5 | 5107001204 | 5107011204 |
| | | | | | | | | | 5107021204 | 5107031204 |
| 600 °C to 2500 °C | 0.9 | 1.1 | 1.2 | 1.8 | 2.8 | 14.0 | 8.0 | 6.5 | 5107001205 | 5107011205 |
| | | | | | | | | | 5107021205 | 5107031205 |

### Dimensional drawing vario optics




### Technical data video camera (DGA 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:<br>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

# PYROSPOT DGA 10N/DGA 10NV

## Special pyrometer for industry and research

| Electrical, mechanical and optical accessories[1] | | Order number |
|---|---|---|
| Connection cable, 12 pin, angulate plug | length 2 m<br>length 5 m<br>length 10 m<br>length 15 m<br>length 20 m<br>length 25 m<br>length 30 m | 3310A11131<br>3310A11132<br>3310A11133<br>3310A11134<br>3310A11135<br>3310A11136<br>3310A11137 |
| 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<br>with quartz window<br>with sapphire window (scratch-proof) | 3310A24015<br>3310A34021<br>3310A34051 |
| Mounting angle | for cooling jacket | 3310A23036 |
| DHP 1040 | handheld programming device for parameterizing | 3310A17010 |

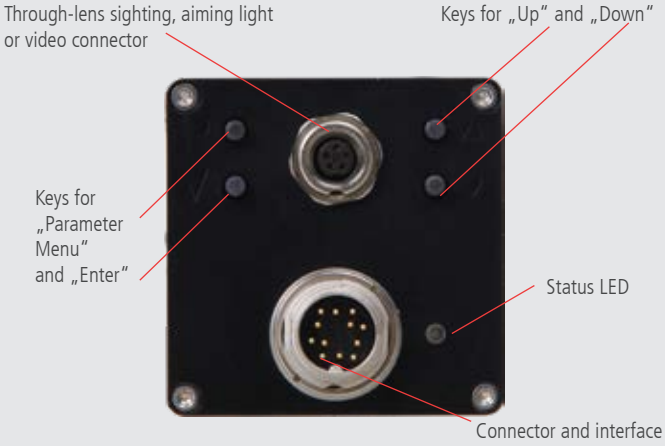
[1] More accessories available. [2] Cable lengths 5 m and 10 m also available.

### Detailed view: Display

The digital display shows the current measured value and the emissivity set as well as further information.


### 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.




### Selected accessories – images

| Mounting angle, adjustable | Ball and socket mounting | Cooling jacket |
|---|---|---|
| Part number: 3310A21020 | Part number: 3310A21025 | Part number: 3310A23031 |
|  |  |  |

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Phone: +49 351 896 74-0
Fax: +49 351 896 74-99
Email: info@dias-infrared.de
Internet: www.dias-infrared.com

DIAS Infrared GmbH
Pforzheimer Straße 21
01189 Dresden
Germany