

PYROSPOT DGA 10N/DGA 10NV

Special pyrometer for industry and research

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 permeable 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.

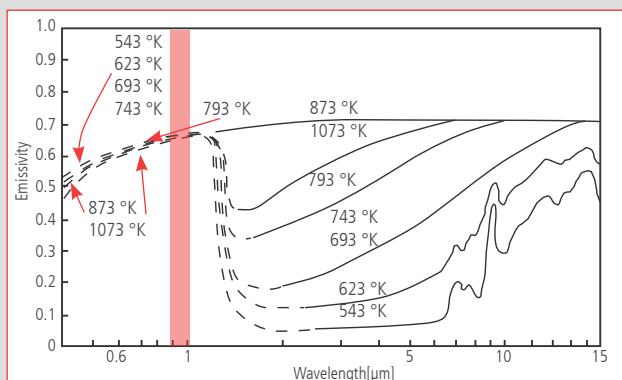
The integrated LED or laser aiming light or the alternative through-lens sighting, enables an exact focus on the measurement object. With the optional color video module (PYROSPOT DGA 10NV) the alignment of the pyrometers to the target can be monitored visually and the entire process can be recorded and documented. The temperature linear standard output signal of 0/4 to 20 mA allows easy implementation in existing measurement and control 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

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Technical data

Type	DGA 10N/DGA 10NV	DGA 10N/DGA 10NV	DGA 10N/DGA 10NV
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 \pm 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 \times 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 $T_{\text{ambient}} = 23 \text{ }^\circ\text{C}$, $\epsilon = 1$, $t_{95} = 1 \text{ s}$. ²Noise equivalent temperature difference. ³With dynamic adaption at low signal level. ⁴Adjustable via software and interface or directly at the device.

Dimensional drawing pyrometer (with through-lens sighting)



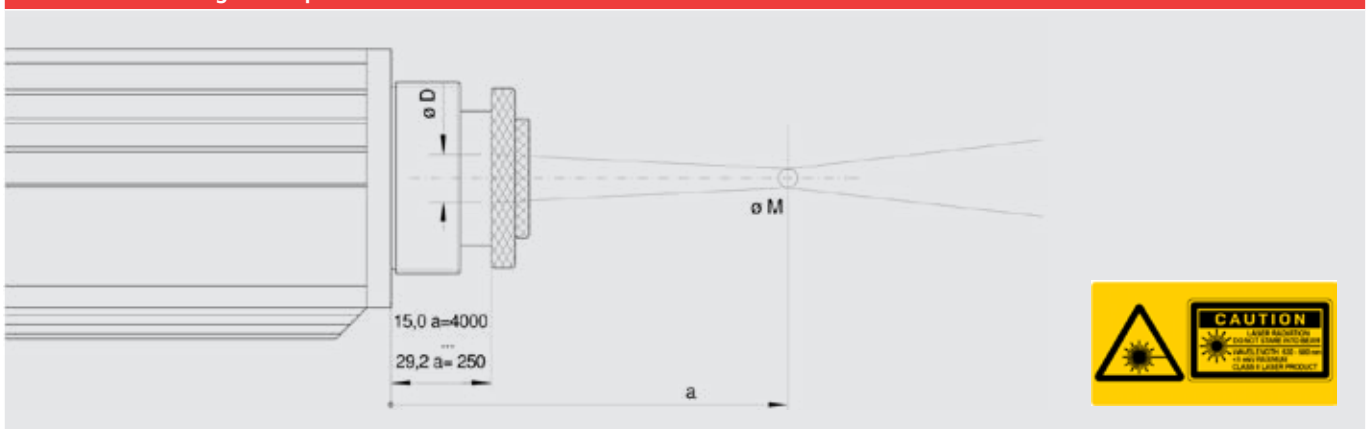
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Vario optics

Measuring distance a [mm]	250	300	350	500	800	4000	Aperture diameter \varnothing 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	Through-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
450 °C to 1800 °C	1.9	2.3	2.6	4.3	6.0	30.0	13.0	10.5	5107021203	5107031203
600 °C to 2500 °C	0.9	1.1	1.2	1.8	2.8	14.0	8.0	6.5	5107001204	5107011204
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Dimensional drawing vario optics



Technical data video camera (DGA 10NV)

Video signal	Composite video signal approx. 1V _{ss} 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 \times 586 pixels (NTSC option: 510 \times 496 pixels)
Exposure control	automatic
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, 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


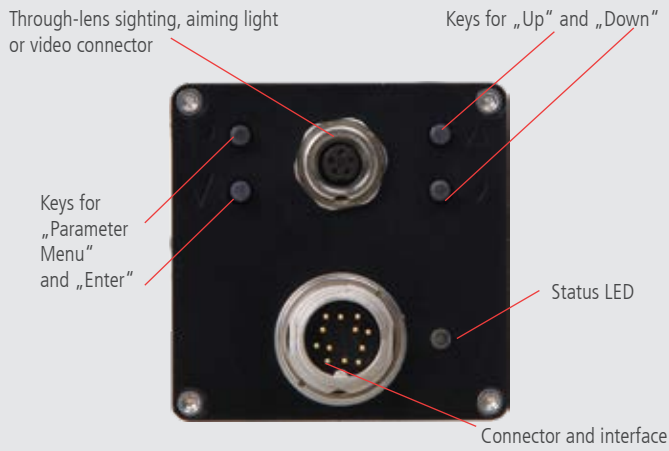


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Electrical, mechanical and optical accessories ¹		Order number
Connection cable, 12 pin, angulate plug	length 2 m	3310A11131
	length 5 m	3310A11132
	length 10 m	3310A11133
	length 15 m	3310A11134
	length 20 m	3310A11135
	length 25 m	3310A11136
	length 30 m	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	3310A24015
	with quartz window	3310A34021
	with sapphire window (scratch-proof)	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	Detailed view: Rear side
<p>The digital display shows the current measured value and the emissivity set as well as further information.</p> 	<p>The parameters can be adjusted with the keys at the rear side of the device. The set value is taken over directly.</p> <p>Through-lens sighting, aiming light or video connector</p> 

Selected accessories – images		
Mounting angle, adjustable	Ball and socket mounting	Cooling jacket
Part number: 3310A21020 	Part number: 3310A21025 	Part number: 3310A23031 

Technische Änderungen vorbehalten. Technical details are subject to change. 20.05.20



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