

PYROSPOT DA 44MF

Pyrometers for industrial application

Overview

Digital pyrometer with RS-485 interface



Features

- For temperature measurements between 50 °C and 1000 °C
- Temperature linear output 0/4 to 20 mA
- RS-485 interface
- Short response times from 5 ms
- Several fixed optics available
- Stainless steel housing

Description and applications

The digital pyrometers PYROSPOT DA 44MF are specifically designed for industrial applications. The devices are suitable for temperature measurement from 50 °C to 1000 °C within the midwave infrared (MWIR) between 3.5 µm and 4.0 µm.

The solid body in stainless steel housing allows usage even under rough environmental conditions. With a fast response time of only 5 ms (t_{95}) these pyrometers are also suitable for fast measuring processes. Several fixed optic types realise measuring field diameters from 1.6 mm.

The temperature linear standard output signal of 0/4 to 20 mA allows easy implementation in existing measurement and control systems.

The devices are equipped with a galvanically isolated RS-485 interface, which allows parameterizing and software evaluation even in bus systems. The connection to local area networks can be supported by an Ethernet interface box.

The optional integrated LED aiming light allows exact alignment to the measuring object. The LED size is identical to measuring spot size and visible even at high temperatures.

Via an optional interface module (RS-485 to USB) parameters like emissivity, sub range, response time and storage can be easily adjusted by using the convenient parameterizing and evaluation software PYROSOFT Spot. The parameters can also be adjusted via RS-485 interface with the optional available handheld programming device DHP 1040 or the Ethernet Interface-Box DCU^{loP}.

Typical application areas:

- Semiconductor industry
- Metal industry
- Measurement through combustion gases
- Furnace industry



Image source: Shutterstock.de/MS Mikel

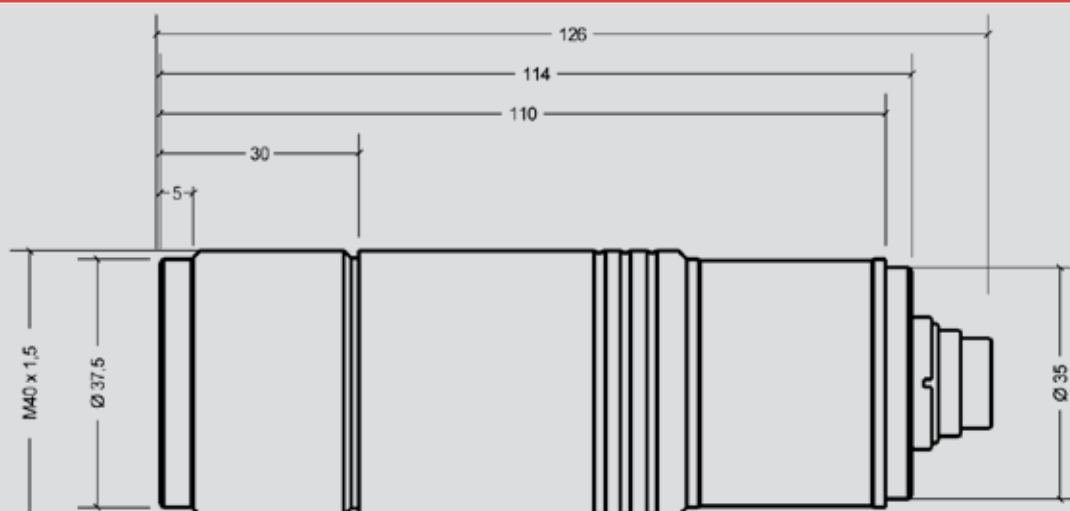
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Technical data	
Type	DA 44MF
Measuring temperature range	50 °C to 1000 °C
Sub temperature range	adjustable via RS-485 interface within temperature range, minimum span 50 °C
Spectral range	3.5 µm to 4.0 µm
Optics	several fixed optics (type 100, 300 and 800), aperture diameter D = 15 mm
Distance ratio	approx. 50 : 1
Measurement uncertainty ¹	0.6 % of meas. value in °C or 1 K ²
Reproducibility ¹	0.3 % of meas. value in °C or 0.5 K ²
NETD ³	0.1 K ⁴
Response time (t ₉₅)	5 ms, adjustable via RS-485 interface
Emissivity ε	0.050 to 1.000, adjustable via RS-485 interface
Storage	minimum and maximum value storage, adjustable via RS-485 interface
Output	0/4 to 20 mA, temperature linear, max. burden: 700 Ω at 24 V
Interface	RS-485 (galvanically isolated), half duplex, max. baudrate 115 kBd, data protocol Modbus RTU
Aiming	none, optional: integrated LED aiming light or laser aiming light adaptor
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro
Parameters	emissivity, response time, storage, sub range, adjustable via RS-485 interface and software
Power supply	24 V DC ± 25 %, residual ripple 500 mV
Power consumption	max. 1.5 W (without aiming light)
Operating temperature	0 °C to 70 °C
Storage temperature	–20 °C to 70 °C
Weight	appr. 450 g
Dimensions	thread M40 × 1.5, length 126 mm
Housing	stainless steel with plug connector
Protection class	IP 65 (according to DIN EN 60529 and DIN 40050)
CE symbol	according to EU regulations
Scope of delivery	PYROSPOT DA 44MF, manual, inspection sheet, mounting screw nuts, PYROSOFT Spot for Windows® (without connecting cable, please order separately)

¹ For black body radiator, T_{ambient} = 23 °C, t₉₅ = 1 s. ² Whichever is higher value. ³ Noise equivalent temperature difference. ⁴ T_{ambient} = 23 °C, ε = 1, t₉₅ = 100 ms, T_{object} = 200 °C.

Dimensional drawing



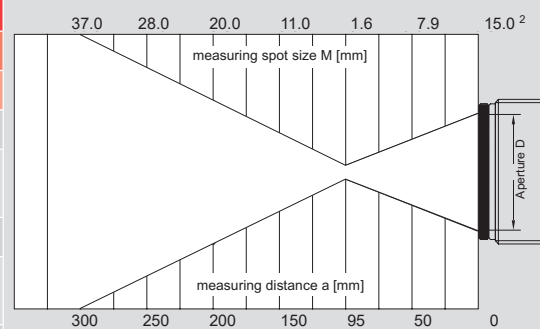
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Pyrometers for industrial application

Optics types 100, 300 and 800

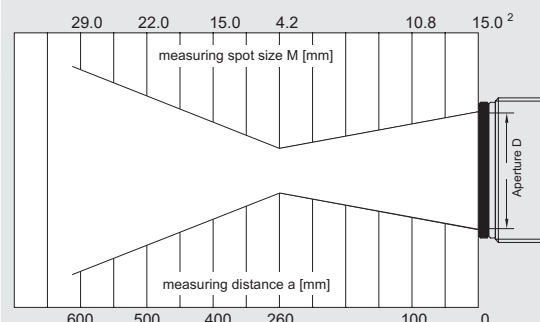
Optics 100 (sharp point at a = 95 mm measuring distance)

Measuring distance a [mm]	0	50	95	150	200	250	300
Measuring temperature range	Target size M [mm]						
DA 44MF (50 °C to 1000 °C) without LED aiming light	15.0	7.9	1.6	11.0	20.0	28.0	37.0
DA 44MF (50 °C to 1000 °C) with LED aiming light ¹	13.0	7.2	2.0	12.0	19.0	27.0	35.0



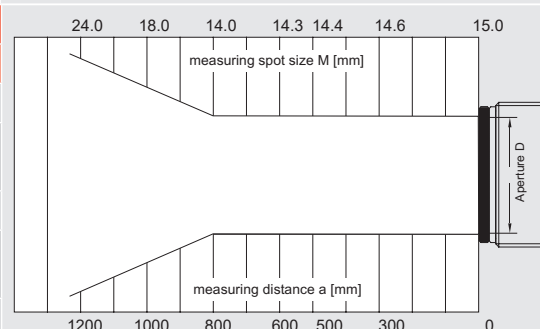
Optics 300 (sharp point at a = 250/260 mm measuring distance)

Measuring distance a [mm]	0	100	250	260	400	500	600
Measuring temperature range	Target size M [mm]						
DA 44MF (50 °C to 1000 °C) without LED aiming light	15.0	10.8	4.6	4.2	15.0	22.0	29.0
DA 44MF (50 °C to 1000 °C) with LED aiming light	15.0	11.0	4.8	5.6	18.0	26.0	33.0



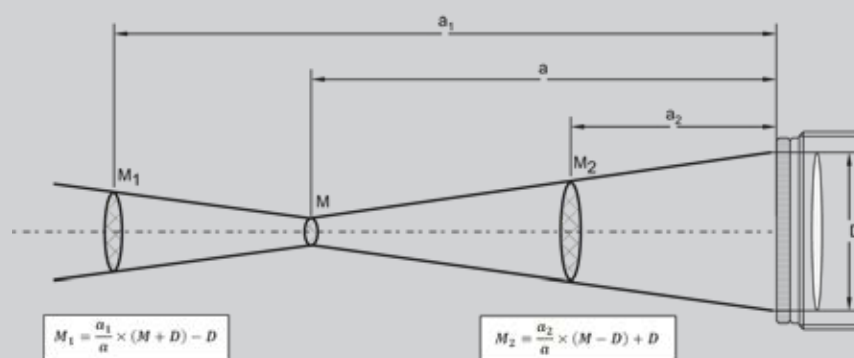
Optics 800 (sharp point at a = 800 mm measuring distance)

Measuring distance a [mm]	0	300	500	600	800	1000	1200
Measuring temperature range	Target size M [mm]						
DA 44MF (50 °C to 1000 °C) without LED aiming light	15.0	14.6	14.4	14.3	14.0	18.0	24.0
DA 44MF (50 °C to 1000 °C) with LED aiming light ¹	15.0	14.6	14.4	14.3	14.0	18.0	24.0



¹ With attachment lens tubus. Aperture D = 13 mm, length 24 mm, Ø 19 mm. ² Target size without LED aiming light.

Calculation of measuring field diameter



Part numbers

Device	Optics	100	300	800
DA 44MF (50 °C to 1000 °C)		4449341201, 4449351201 (LED)	4449342201, 4449352201 (LED)	4449343201, 4449353201 (LED)
(LED = with LED aiming light)				

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Electrical, mechanical and optical accessories ¹			Order number	
Connecting cable, straight plug, 12-pin	Connecting cable, with pilot light button, angulated plug, 12-pin	length 2 m	3310A11111	3310A11151
		length 5 m	3310A11112	3310A11152
		length 10 m	3310A11113	3310A11153
		length 15 m	3310A11114	3310A11154
		length 20 m	3310A11115	3310A11155
		length 25 m	3310A11116	3310A11156
		length 30 m	3310A11117	3310A11157
Interface module		RS-485 to USB	3310A14020	
Power supply PSU 15		24 V DC, 0.6 A	3310A12010	
Mounting angle		fixed,	3310A21010	
		adjustable	3310A21011	
Ball and socket mounting			3310A21012	
Air purge unit		stainless steel, purge air 0.1 to 0.5 bar, oil-free	3310A22010	
Cooling jacket		stainless steel, with integrated air purge unit	3310A23010	
Vacuum flange		KF 16 (without window)	3310A24010	
		with zinc selenide window	3310A24010 + 3310A34041	
Laser aiming light adaptor		adapter (only for devices without integrated LED aiming light)	3310A33010	
ATEX explosion protection housing			3310A23100	
DHP 1040		portable handheld device for pyrometer programming	3310A17010	
Ethernet Interface-Box DCU ^{loP}		For the connection in local networks and parameterizing	3310A13500	
¹ More accessories available.				

Selected accessories - images

Mounting angle, adjustable	Cooling jacket	Air purge unit for series 40/42/44
Order number: 3310A21011 	Order number: 3310A23010 	Order number: 3310A22010 
Ethernet Interface-Box DCU ^{loP}	DHP 1040	ATEX explosion protection housing
Order number: 3310A13500 	Order number: 3310A17010 	Order number: 3310A23100 