PYROSPOT DA 44F

Pyrometers for measurement through flames

DIAS Infrared Systems

Overview

Digital pyrometer with RS-485 interface
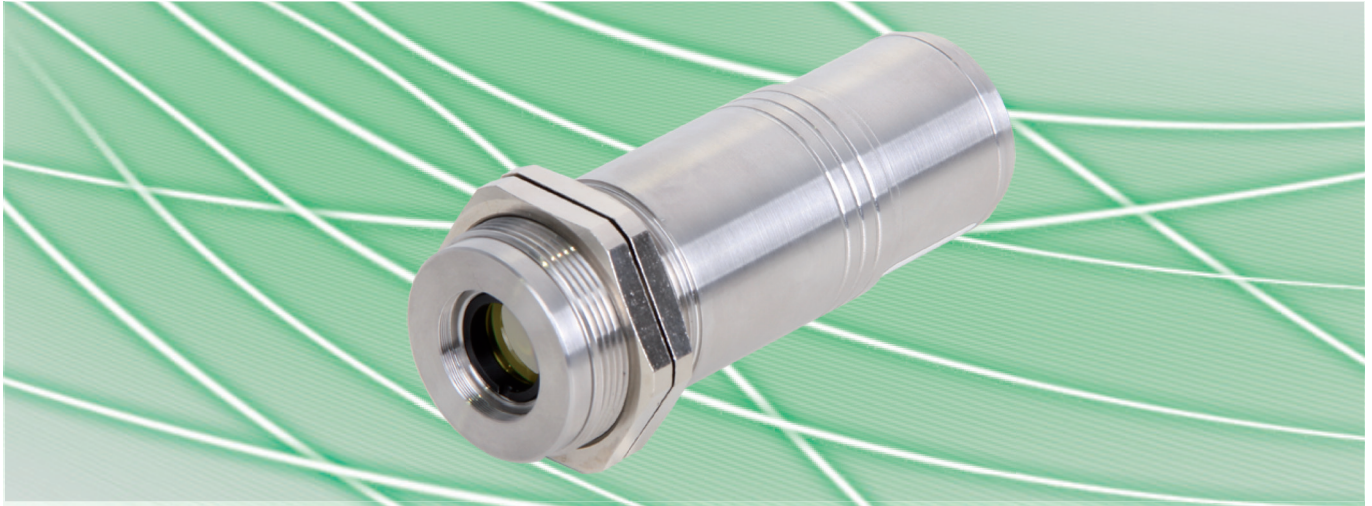
Features

- For temperature measurements between 100 °C and 2500 °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 44F are specifically designed for industrial applications. The devices are suitable for temperature measurement from 100 °C to 2500 °C through flames and combustion gases.

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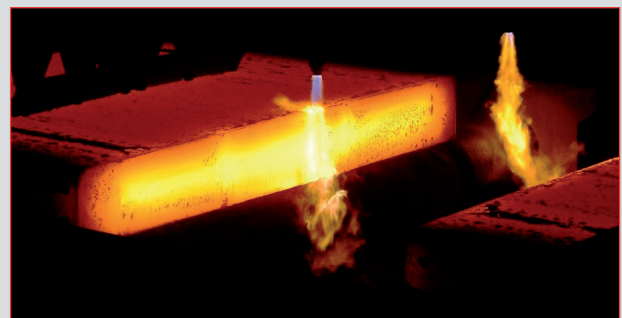
The devices are equipped with a galvanically isolated RS-485 interface, which allows parameterizing and software evaluation even in bus systems. The connection to local area networks can be supported by an Ethernet interface box.

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^IoP.

Typical application areas:

- Measurement through flames
- Furnace industry
- Measurement through combustion gases
- Glass industry
- Metal industry

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Technical data

Type	DA 44F	DA 44F
Measuring temperature range	100 °C to 1400 °C	500 °C to 2500 °C
Sub temperature range	adjustable via RS-485 interface within temperature range, minimum span 50 °C	
Spectral range	around 3.9 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]	5 ms, adjustable via RS-485 interface	
Emissivity	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 44F, 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, t_{95} = 1 s. [2] Whichever is higher value. [3] Noise equivalent temperature difference. [4] $T_{ambient}$ = 23 °C, ε = 1, t_{95} = 100 ms, $T_{Object (100 °C to 1400 °C)}$ = 300 °C, $T_{Object (500 °C to 2500 °C)}$ = 700 °C. [5] With dynamic adaption at low signal level.

Dimensional drawing
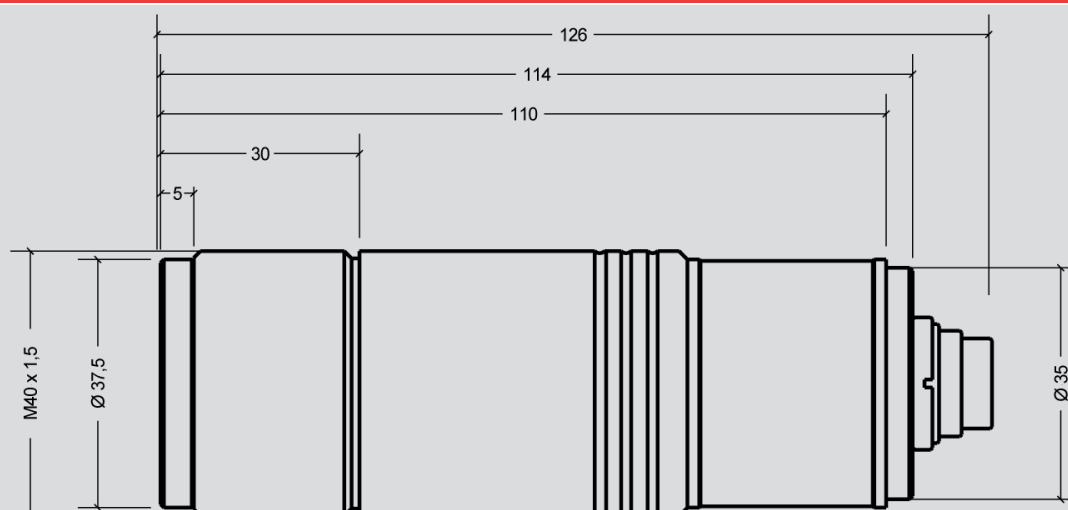
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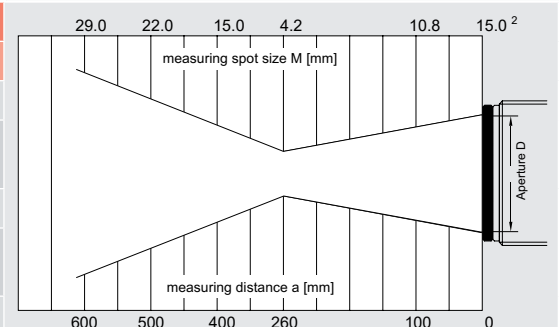
Optics 100, 300 and 800

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

Measuring distance a [mm]	0	50	**95**	150	200	250	300
Temperature range	Measuring field diameter M [mm]						
DA 44F (100 °C to 2500 °C) without LED aiming light	15.0	7.9	**1.6**	11.0	20.0	28.0	37.0
DA 44F (100 °C to 2500 °C) with LED aiming light [1]	13.0	7.2	**2.0**	12.0	19.0	27.0	35.0
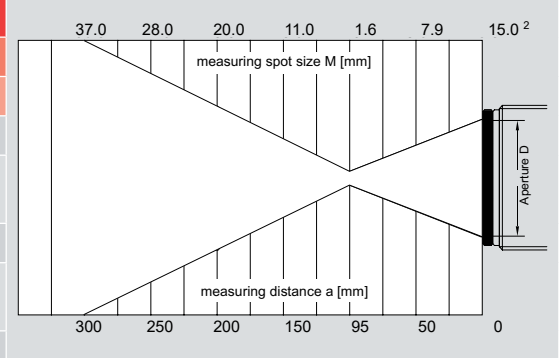
Optics 300 (sharp point at a = 250/260 mm measuring distance, marked bold)

Measuring distance a [mm]	0	100	**250**	**260**	400	500	600
Temperature range	Measuring field diameter M [mm]						
DA 44F (100 °C to 2500 °C) without LED aiming light	15.0	10.8	4.6	**4.2**	15.0	22.0	29.0
DA 44F (100 °C to 2500 °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, marked bold)

Measuring distance a [mm]	0	300	500	600	**800**	1000	1200
Temperature range	Measuring field diameter M [mm]						
DA 44F (100 °C to 2500 °C) without LED aiming light	15.0	14.6	14.4	14.3	**14.0**	18.0	24.0
DA 44F (100 °C to 2500 °C) with LED aiming light	15.0	14.6	14.4	14.3	**14.0**	18.0	24.0
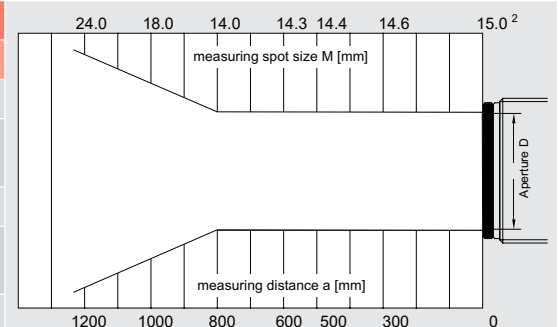
[1] With attachment lens tubus. Aperture D = 13 mm. [2] Measuring field diameter without LED aiming light.

Calculation of measuring field diameter

$$M_1 = \frac{a_1}{a} \times (M + D) - D$$

$$M_2 = \frac{a_2}{a} \times (M - D) + D$$
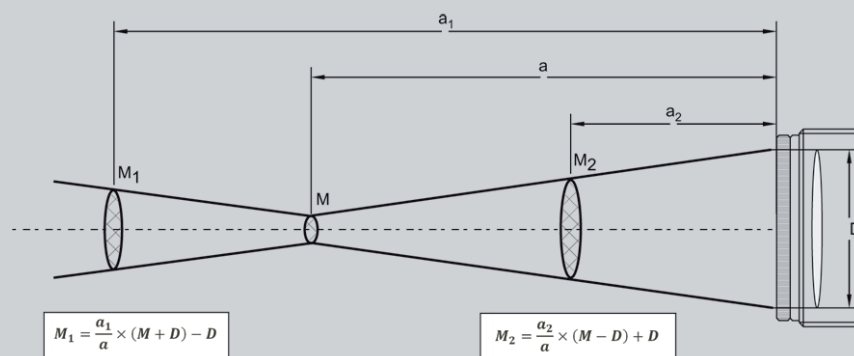
Order numbers

Device \ Optics	100	300	800
DA 44F (100 °C to 1400 °C)	4449441201, 4449451201 (LED)	4449442201, 4449452201 (LED)	4449443201, 4449453201 (LED)
DA 44F (500 °C to 2500 °C)	4449441203, 4449451203 (LED)	4449442203, 4449452203 (LED)	4449443203, 4449453203 (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 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	3310A11151 3310A11152 3310A11153 3310A11154 3310A11155 3310A11156 3310A11157
Interface module	RS-485 to USB		3310A14020	
Power supply PSU 15	24 V DC, 0.6 A		3310A12010	
Mounting angle	fixed, adjustable		3310A21010 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) with zinc selenide window		3310A24010 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[IoP]	For the connection in local networks and parameterizing		3310A13500	
[1] More accessories available.				

Selected accessories - images

Mounting angle, adjustable

Order number: 3310A21011

Cooling jacket

Order number: 3310A23010

Air purge unit for series 40/42/44

Order number: 3310A22010

Ethernet Interface-Box DCU[IoP]

Order number: 3310A13500

DHP 1040

Order number: 3310A17010

ATEX explosion protection housing

Order number: 3310A23100

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