# PYROSPOT DA 44F

## Pyrometers for measurement through flames

### 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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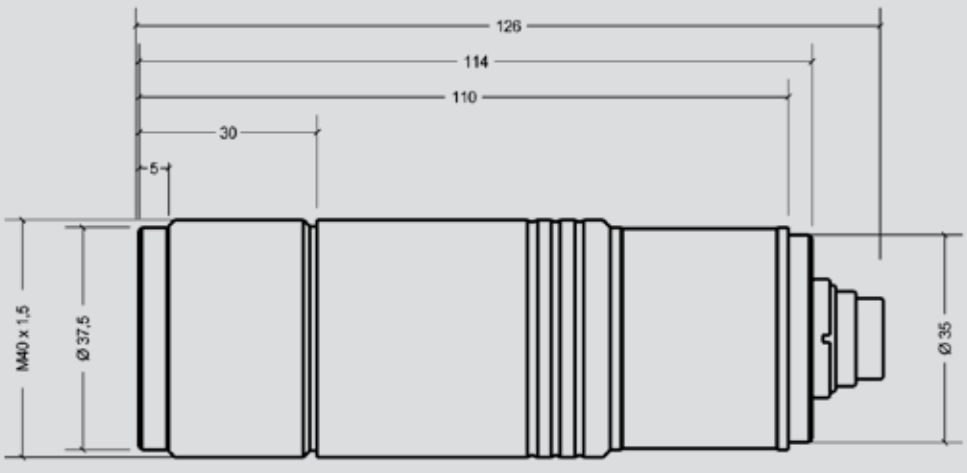
# PYROSPOT DA 44F

## Pyrometers for measurement through flames

| 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 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 [5] 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] Measuring temperature ranges 150 °C to 1400 °C and 500 °C to 2500 °C.

## Dimensional drawing



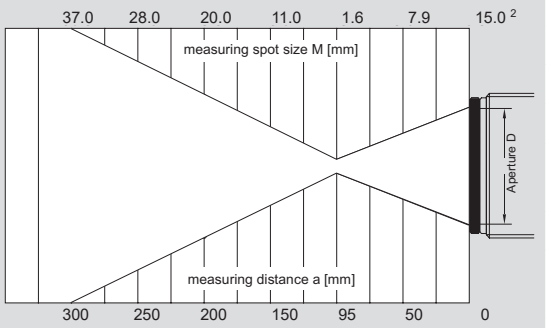
# PYROSPOT DA 44F

## Pyrometers for measurement through flames

### Optics 100, 300 and 800

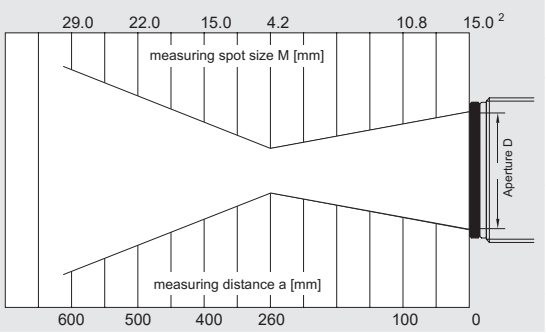
#### Optics 100 (sharp point at a = 95 mm measuring distance, marked bold)

| 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 (150 °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)

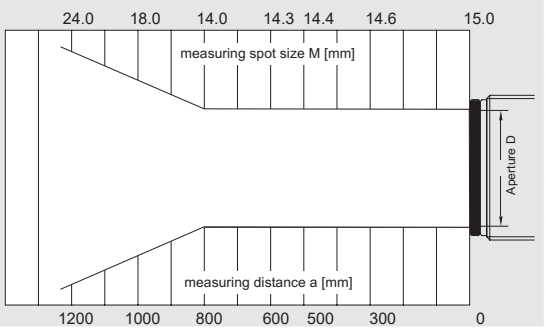
| Measuring distance a [mm] | 0 | 100 | **250** | **260** | 400 | 500 | 600 |
|---|---|---|---|---|---|---|---|
| Temperature range | Measuring field diameter M [mm] | | | | | | |
| DA 44F (100 °C to 2500 °C) without LED aiming light | 15.0 | 10.8 | 4.6 | **4.2** | 15.0 | 22.0 | 29.0 |
| DA 44F (150 °C to 2500 °C) with LED aiming light | 15.0 | 11.0 | **4.8** | 5.6 | 18.0 | 26.0 | 33.0 |



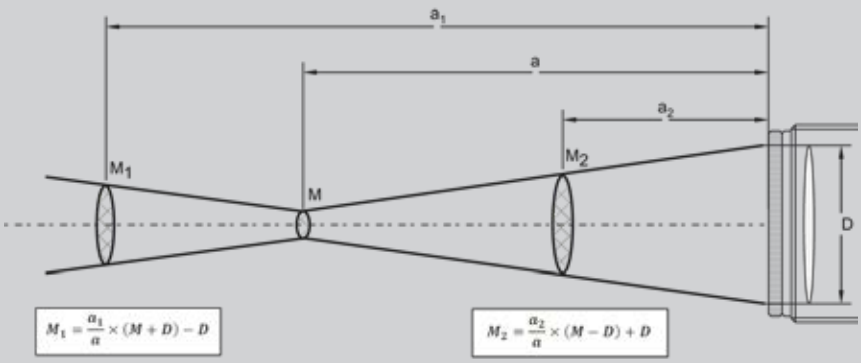

#### Optics 800 (sharp point at a = 800 mm measuring distance, marked bold)

| 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 (150 °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, length 24 mm, ∅ 19 mm. [2] Target size without LED aiming light.




### Calculation of measuring field diameter




### Order numbers

| Device / Optics | 100 | 300 | 800 |
|---|---|---|---|
| DA 44F (100 °C to 1400 °C) | 4449441201 | 4449442201 | 4449443201 |
| DA 44F (150 °C to 2500 °C) | 4449451201 (LED) | 4449452201 (LED) | 4449453201 (LED) |
| DA 44F (500 °C to 2500 °C) | 4449441203, 4449451203 (LED) | 4449442203, 4449452203 (LED) | 4449443203, 4449453203 (LED) |
| (LED = with LED aiming light) | | | |

# PYROSPOT DA 44F

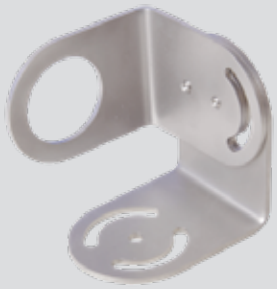
## Pyrometers for measurement through flames

| 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<br>length 5 m<br>length 10 m<br>length 15 m<br>length 20 m<br>length 25 m<br>length 30 m | 3310A11111<br>3310A11112<br>3310A11113<br>3310A11114<br>3310A11115<br>3310A11116<br>3310A11117 | 3310A11151<br>3310A11152<br>3310A11153<br>3310A11154<br>3310A11155<br>3310A11156<br>3310A11157 |
| Interface module | | RS-485 to USB | 3310A14020 | |
| Power supply PSU 15 | | 24 V DC, 0.6 A | 3310A12010 | |
| Mounting angle | | fixed,<br>adjustable | 3310A21010<br>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)<br>with zinc selenide window | 3310A24010<br>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

Technische Änderungen vorbehalten. Technical details are subject to change. 02.07.20

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