

PYROSPOT DA 47F

Ethernet pyrometer for measurement through flames

Overview

Digital pyrometer with Ethernet interface and web server



Features

- For temperature measurements between 100 °C and 2500 °C
- Temperature linear output 0/4 to 20 mA
- Ethernet interface 100 Mbit/s
- Integrated web server
- Short response times from 5 ms
- Different fixed optics available
- Optionally integrated LED aiming light or laser aiming light adapter
- Robust stainless steel housing

Description and application

The digital pyrometers PYROSPOT DA 47F are specially designed for industrial applications. They are suitable for temperature measurements from 100 °C to 2500 °C especially when measuring through flames and combustion gases.

The solid construction in a compact IP65 stainless steel housing ensures use even under harsh environmental conditions.

With a response time of only 5 ms (t_{95}), these pyrometers are also suitable for fast measurements. Different optics variants realize measuring fields from 1.6 mm diameter.

The optional integrated LED pilot light allows the exact alignment of the pyrometer to the measuring object. Even at high temperatures, the pilot light can be seen very clearly.

The devices are equipped with an Ethernet interface, which allows data transfer to local networks. Via an integrated web server or the Modbus-TCP protocol, the parameters can be optimally adapted to the application.

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

Also for parameterization and measured value recording the comprehensive parameterization and evaluation software PYROSOFT Spot can be used.

Typical applications of the pyrometers are:

- Measurement through flames
- Kiln engineering
- Measurement through combustion gases
- Glass industry
- Metal industry

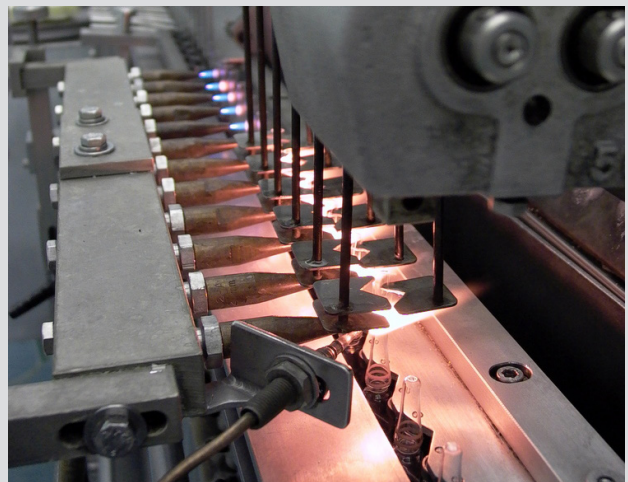


Image source: Shutterstock.de/lreal Melendez Jr.

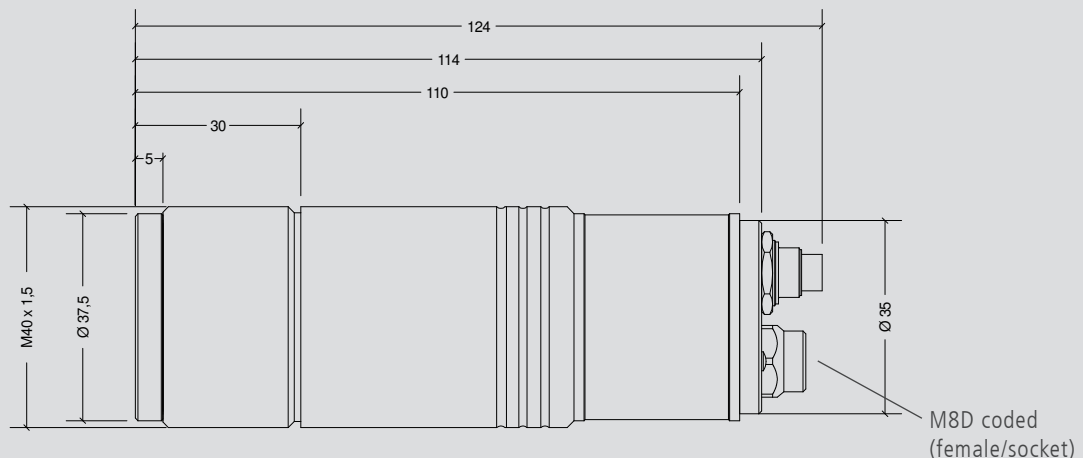
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Technical data				
Type	DA 47F		DA 47F	
Measuring temperature range	100 °C to 1400 °C	500 °C to 2500 °C	150 °C to 1400 °C	500 °C to 2500 °C
Sub temperature range	adjustable within temperature range, minimum span 50 °C			
Spectral range	around 3.9 µm			
Optics	different fixed optics (type 100, 300 and 800), aperture diameter D = 15 mm			
Distance ratio	approx. 50 : 1			
Measurement uncertainty ¹	0.6 % of measured value in °C or 1 K ²			
Reproducibility ¹	0.3 % of measured value in °C or 0.5 K ²			
NETD ³	0.1 K ⁴			
Response time (t ₉₅)	5 ms (min.), adjustable up to 100 s			
Emissivity ε	0.050 to 1.000			
Data storage	minimum/maximum value storage			
Output	0/4 to 20 mA, temperature linear, max. burden: 700 Ω at 24 V			
Interface	Ethernet 100 Mbit/s, Webserver, Datenprotokoll Modbus-TCP			
Aiming	optional: laser aiming light adapter		integrated LED aiming light	
Software	PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro			
Parameters	adjustable via web server or Modbus-TCP: emissivity, response time, data storage, sub range, transmittance, ambient compensation, analog output, pilot light, additionally via Modbus-TCP: network configuration			
Power supply	24 V DC ± 25 %, residual ripple 500 mV			
Power consumption	max. 1.5 W (without pilot light)			
Operating temperature	0 °C to 70 °C			
Storage temperature	–20 °C to 70 °C			
Weight	approx. 450 g			
Dimensions	thread M40 × 1.5, length 124 mm			
Housing	stainless steel housing with plug connectors, link LED			
Protection class	IP 65 (according to DIN EN 60529 and DIN 40050)			
CE symbol	according to EU regulations			
Scope of delivery	PYROSPOT DA 47F, user manual, mounting screw nuts, inspection sheet, PYROSOFT Spot for Windows® (without connection cable, please order separately)			

¹ Specifications 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} (100 °C to 1400 °C) = 300 °C, T_{Object} (500 °C to 2500 °C) = 700 °C.

Dimensions



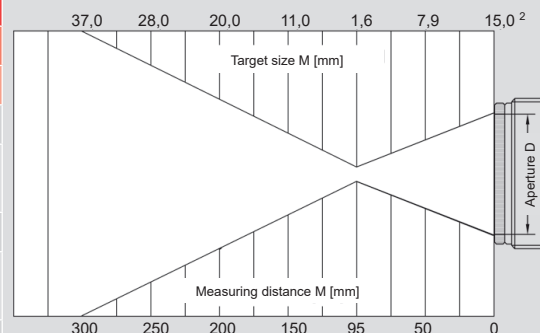
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Optics types 100, 300 and 800

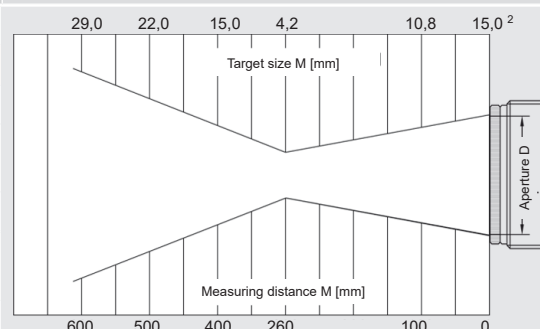
Optics 100 (focus point at a = 95 mm measurement distance)

Measurement distance a [mm]	0	50	95	150	200	250	300
Measurement range	Target size M [mm]						
DA 47F (100 °C to 2500 °C) without LED pilot light	15.0	7.9	1.6	11.0	20.0	28.0	37.0
DA 47F (150 °C to 2500 °C) with LED pilot light ¹	13.0	7.2	2.0	12.0	19.0	27.0	35.0



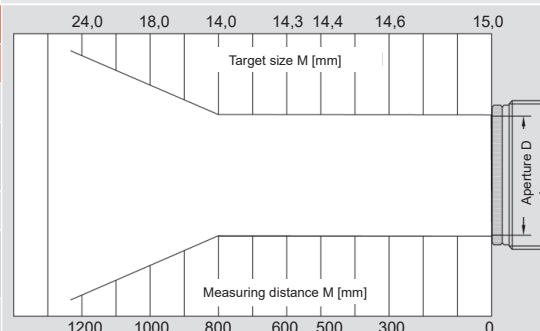
Optics 300 (focus point at a = 250/260 mm measurement distance)

Measurement distance a [mm]	0	100	250	260	400	500	600
Measurement range	Target size M [mm]						
DA 47F (100 °C to 2500 °C) without LED pilot light	15.0	10.8	4.6	4.2	15.0	22.0	29.0
DA 47F (150 °C to 2500 °C) with LED pilot light	15.0	11.0	4.8	5.6	18.0	26.0	33.0



Optics 800 (focus point at a = 800 mm measurement distance)

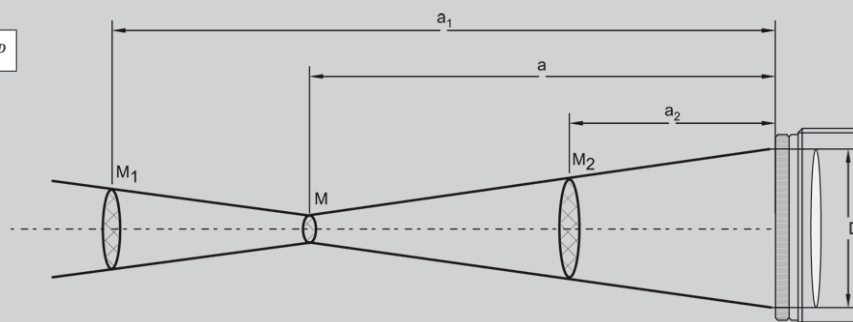
Measurement distance a [mm]	0	300	500	600	800	1000	1200
Measurement range	Target size M [mm]						
DA 47F (100 °C to 2500 °C) without LED pilot light	15.0	14.6	14.4	14.3	14.0	18.0	24.0
DA 47F (150 °C to 2500 °C) with LED pilot light	15.0	14.6	14.4	14.3	14.0	18.0	24.0



¹ With attachment tube, aperture D = 13 mm, length 24 mm, 19 mm ² Target size without LED pilot light.

Calculation of the target size

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



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

Part number

Device	Optics	100	300	800
DA 47F (100 °C to 1400 °C)		4479441401	4479442401	4479443401
DA 47F (150 °C to 1400 °C)		4479451401 (LED)	4479452401 (LED)	4479453401 (LED)
DA 47F (500 °C to 2500 °C)		4479441403, 4479451403 (LED)	4479442403, 4479452403 (LED)	4479443403, 4479453403 (LED)
(LED = with LED pilot light)				

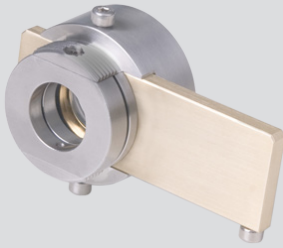
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Electrical, mechanical and optical accessories ¹		Part number
Connection cable (5 pin)	length 5 m length 10 m length 15 m	3310A11512 3310A11513 3310A11514
Ethernet cable RJ45 (4 pin)	length 5 m length 10 m length 15 m	3310A11412 3310A11413 3310A11414
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
Sighting tube for air purge unit	length 100 mm length 300 mm	3310A22030 3310A22035
Mirror	90°, including air purge	3310A24110
Cooling jacket	stainless steel with integrated air purge unit	3310A23010
Vacuum flange	KF 16 (without window) with sapphire window	3310A24010 3310A24010 + 3310A34051
Protection window	sapphire window with threaded ring	3310A34052
Ball flange	with sleeve	3310A24020 + 3310A24021
Laser pilot light adapter	screw-on attachment (only for version without integrated LED pilot light)	3310A33010

¹ More accessories on request.

Selected accessories – images

Mounting angle, adjustable	Cooling jacket	Air purge unit
Part number: 3310A21011 	Part number: 3310A23010 	Part number: 3310A22010 
Window slide	Laser pilot light adapter	Power supply PSU 15
Part number: 3310A21210 (ohne Scheibe) 	Part number: 3310A33010 	Part number: 3310A12010 

Technische Änderungen vorbehalten. Technical details are subject to change. 04.04.22



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