

ASTAL390 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 AST AL390 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 AST NET. 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:

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



AST AL390 44F

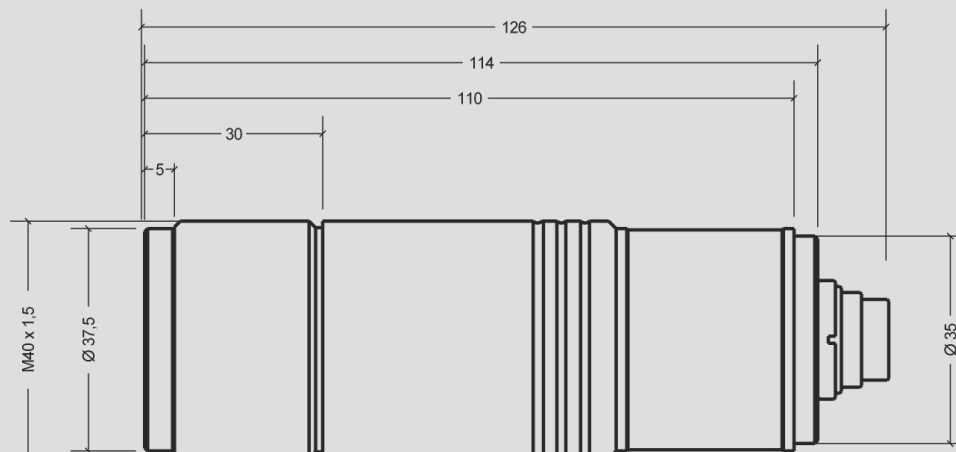
Pyrometers for measurement through flames

Technical data

Type	AL390 44F	AL390 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	AST NET for Windows®, optional: AST NET	
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	AL390 44F, manual, inspection sheet, mounting screw nuts, AST NET 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} (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



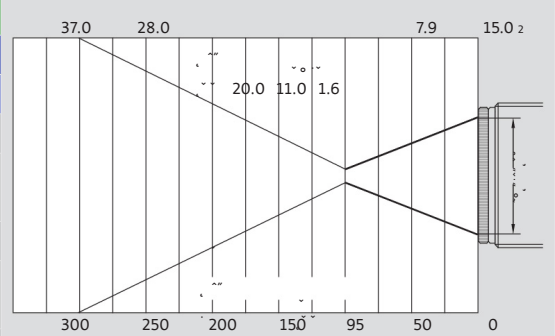
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Pyrometers for measurement through flames

Optics 100, 300 and 800

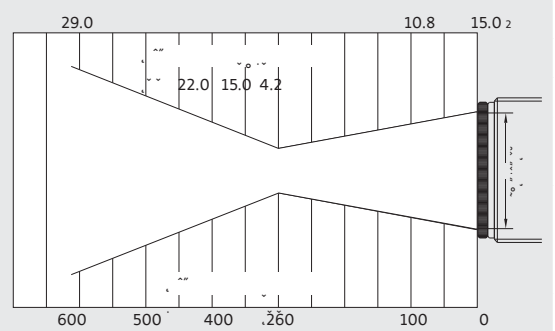
Optics 100 (sharp point at a = 95 mm measuring distance, marked bold)

Measuring distance a [mm]	0	50	95	150	200	250	300
Temperature range	Measuring field diameter M [mm]						
AL390 44F (100 °C to 2500 °C) without LED aiming light	15.0	7.9	1.6	11.0	20.0	28.0	37.0
AL390 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



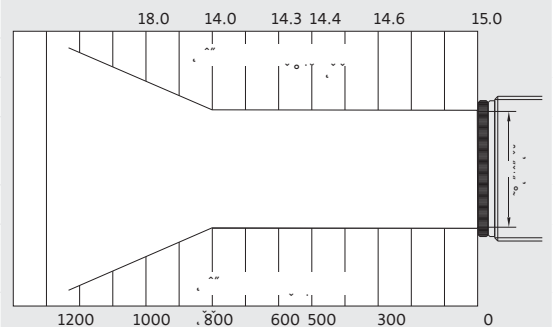
Optics 300 (sharp point at a = 250/260 mm measuring distance, marked bold)

Measuring distance a [mm]	0	100	250	260	400	500	600
Temperature range	Measuring field diameter M [mm]						
AL390 44F (100 °C to 2500 °C) without LED aiming light	15.0	10.8	4.6	4.2	15.0	22.0	29.0
AL390 44F (150 °C to 2500 °C) with LED aiming light	15.0	11.0	4.8	5.6	18.0	26.0	33.0



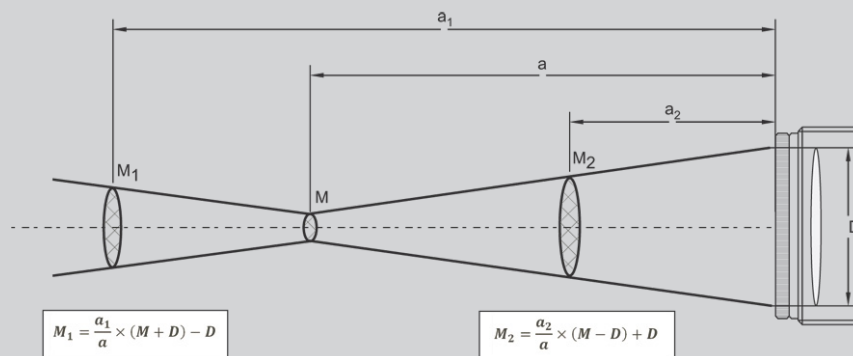
Optics 800 (sharp point at a = 800 mm measuring distance, marked bold)

Measuring distance a [mm]	0	300	500	600	800	1000	1200
Temperature range	Measuring field diameter M [mm]						
AL390 44F (100 °C to 2500 °C) without LED aiming light	15.0	14.6	14.4	14.3	14.0	18.0	24.0
AL390 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, Ø 19 mm. ² Target size without LED aiming light.

Calculation of measuring field diameter



Order numbers

Device	Optics 100	300	800
AL390 44F (100 °C to 1400 °C)	4449441201	4449442201	4449443201
AL390 44F (150 °C to 2500 °C)	4449451201 (LED)	4449452201 (LED)	4449453201 (LED)
AL390 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:			Order number	
Connecting cable, straight plug, 12-pin	Connecting cable, with pilot light button, angled 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, 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 _{IO} P	For the connection in local networks and parameterizing	3310A13500		

† 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 _{IO} P	DHP 1040	ATEX explosion protection housing
Order number: 3310A13500 	Order number: 3310A17010 	Order number: 3310A23100 

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



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