

AST T3-814 44

Pyrometers for industrial application

Overview

Digital pyrometer with RS-485 interface



Features

- For temperature measurements between $-40\text{ }^{\circ}\text{C}$ and $1000\text{ }^{\circ}\text{C}$
- Temperature linear output 0/4 bis 20 mA
- RS-485 interface
- Short response time from 10 ms
- Several fixed optics available
- Robust stainless steel housing

Description and applications

The digital pyrometers AST T3-814 44 are specifically designed for industrial purpose. The devices are suitable for temperature measurement from $-40\text{ }^{\circ}\text{C}$ to $1000\text{ }^{\circ}\text{C}$ on many different nonmetallic or coated metallic surfaces.

The solid body in stainless steel housing allows usage even under rough environmental conditions.

With a fast response time from 10 ms (t_{90}) these pyrometers are also suitable for fast measuring processes. Several fixed optic types realise measuring field diameters from 1.7 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 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 NET1. The parameters can also be adjusted via RS-485 interface with the optional available handheld programming device DHP 1040.

Typical application areas:

- Glass and ceramic industry
- Paper and packaging industry
- Furnace applications
- Chemical industry
- Food industry



Picture credits: „The furnace for automatic heating of cookies“ by sspopov, 2013. Used with licence from shutterstock.de

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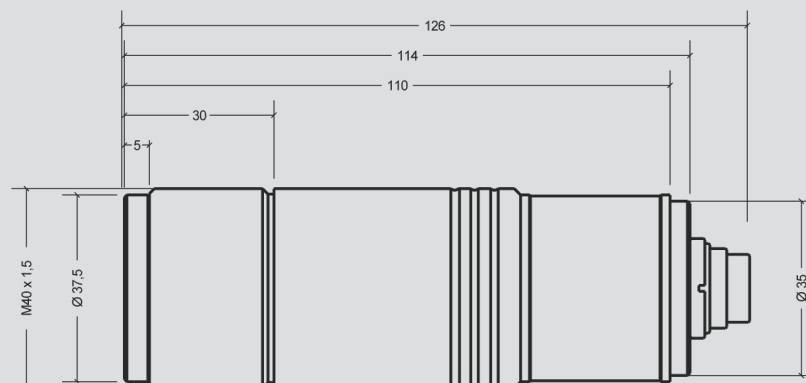
Pyrometers for industrial application

Technical data

Type	T3-814 44				T3-814 44L		
Temperature range	-40 °C to 1000 °C				0 °C to 1000 °C		
Fixed optics	100	300	800	2000	100	300	800
Order number	4448241201	4448242201	4448243201	4448246201	4448251202	4448252202	4448253202
Sub temperature range	adjustable within temperature range, minimum span 50 °C						
Spectral range	8 μm to 14 μm						
Distance ratio	approx. 50 : 1						
Optics	several fixed optics (type 100, 300, 800 and 2000), aperture diameter D = 15 mm						
Measurement uncertainty ₁	0.6 % of meas. value in °C or 1 K _{2,5}						
Reproducibility ₁	0.3 % of meas. value in °C or 0.5 K _{2,5}						
NETD ₃	0,1 K ₄						
Response time (t ₉₀)	10 ms (min.) ₆ , adjustable via RS-485 interface						
Emissivity	0.200 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, adjustable via software, temperature linear, max. burden: 700 Ω						
Interface	RS-485 (galvanically isolated), half duplex, max. baudrate 115 kBd, data protocol Modbus RTU						
Aiming	none or optional laser aiming light adaptor				integrated LED aiming light		
Software	AST NET1 for Windows®,						
Parameters	emissivity, response time, storage, sub range, adjustable via RS-485 interface						
Power supply	24 V DC ± 25 %, residual ripple 500 mV						
Power consumption	max. 1.5 W						
Operating temperature	0 °C to 70 °C						
Storage temperature	-20 °C to 70 °C						
Weight	appr. 450 g						
Dimensions	thread M40 × 1.5, length 125 mm						
Housing	stainless steel with plug connector						
Safety class	IP 65 (according to DIN EN 60529 and DIN 40050)						
CE symbol	according to EU regulations						
Scope of delivery	AST T3-814 44, manual, inspection sheet, mounting screw nuts, AST NET1 for Windows® (without connecting cable, please order separately)						

1 For black body radiator, T_u = 23 °C, t₉₅ = 1 s 2 Whichever is higher value. 3 Noise equivalent temperature difference. 4 T_u = 23 °C, ε = 1, t₉₅ = 200 ms, T_{Object} = 100 °C. 5 For devices with integrated LED aiming light and T_{Object} > 100 °C. 6 DT 44L with LED t₉₅ = 150 ms

Dimensional drawing

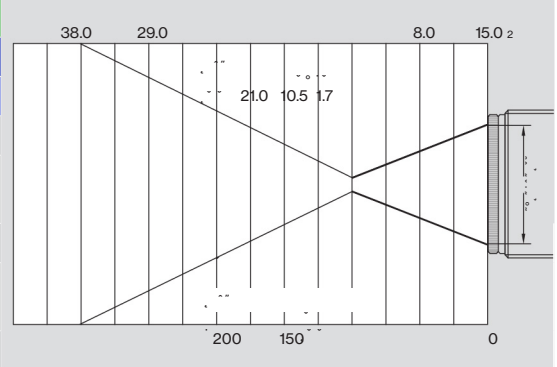


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Optics 100, 300, 800 and 2000

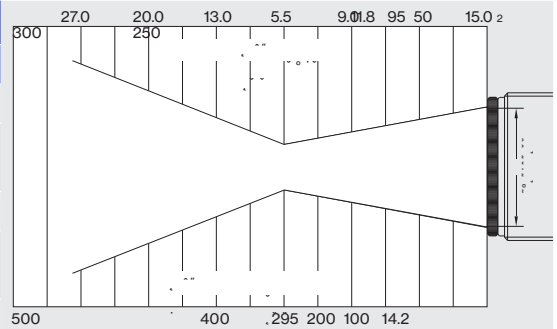
Optics 100 (sharp point at a = 95/100 mm measuring distance, marked bold)

Measuring distance a [mm]	0	50	95	100	200	250	300
Measuring range	Measuring field diameter M [mm]						
T3-814 44L (-40°C to 1000 °C) without LED aiming light	15	8.0	1.7	2.0	21	29	38
T3-814 44 (0°C to 1000 °C) with LED aiming light 1	13	7.8	3.0	2.5	18	26	34



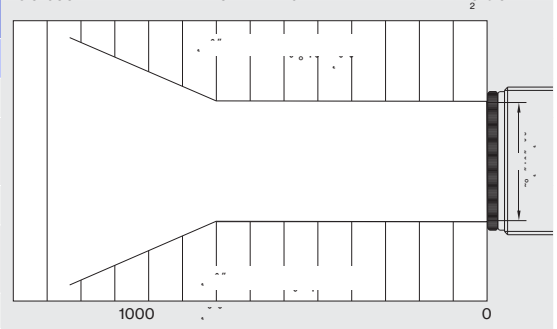
Optics 300 (sharp point at a = 270/295 mm measuring distance, marked bold)

Measuring distance a [mm]	0	100	270	295	400	500	600
Measuring range	Measuring field diameter M [mm]						
T3-814 44L (-40°C to 1000 °C) without LED aiming light	15	11.8	6.3	5.5	13	20	27
T3-814 44 (0°C to 1000 °C) with LED aiming light 1	13	11.6	5.7	7.6	16	24	31



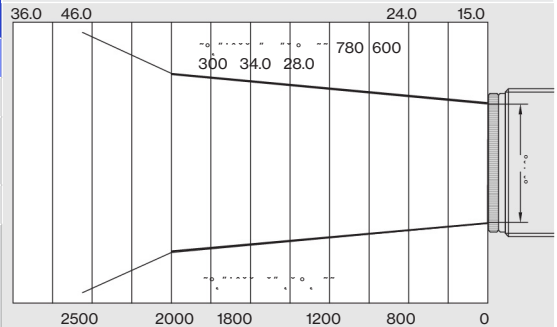
Optics 800 (sharp point at a = 750/780 mm measuring distance, marked bold)

Measuring distance a [mm]	0	300	500	600	750	780	1000
Measuring range	Measuring field diameter M [mm]						
T3-814 44L (-40°C to 1000 °C) without LED aiming light	15	14.6	14.4	14.2	14.0	14.0	19.0
T3-814 44 (0°C to 1000 °C) with LED aiming light 1	15	14.6	14.4	14.2	14.0	15.2	19.0



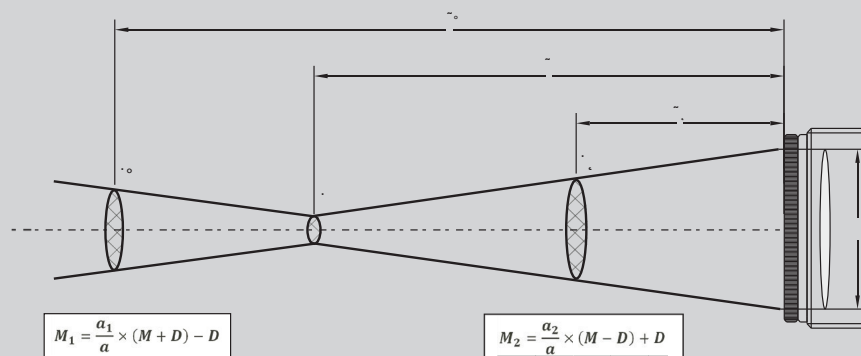
Optics 2000 (sharp point at a = 2000 mm measuring distance, marked bold)

Measuring distance a [mm]	0	800	1200	1800	2000	2500	3000
Measuring range	Measuring field diameter M [mm]						
T3-814 44L (-40°C bis 1000 °C) without LED aiming light	15	24	28	34	36	46	57



1 With attachment lens tubus. Aperture $\varnothing D = 13$ mm, length 24 mm, diameter 19 mm.
2 Measuring field diameter without LED aiming light.

Calculation of measuring field diameter



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Electrical, mechanical and optical accessories:			Order number	
Connecting cable, straight plug, 12-pin	Connecting cable, angulate 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			3310A23110	
DHP 1040		portable handheld device for pyrometer programming	3310A17010	
1 More accessories available.				

Selected accessories - images

Mounting angle, adjustable	Window slide (without window)	Air purge unit for series 40/42/44
Order number: 3310A21011 	Order number: 3310A21210 	Order number: 3310A22010 
Cooling jacket	DHP 1040	ATEX explosion protection housing
Order number: 3310A23010 	Order number: 3310A17010 	Order number: 3310A23110 

Technical details are subject to change. 15.06.20



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