

AST T3-450C 44

Ratio pyrometer for industrial application

Overview

Digital pyrometer with RS-485 interface



Features

- For temperature measurements between 600 °C and 2500 °C
- Temperature linear output 0/4 to 20 mA
- Integrated RS-485 interface
- Very short response times from 5 ms
- Robust stainless steel housing
- Several fixed optics with FOV up to 200 : 1

Description and applications

The digital ratio pyrometers AST T3-450C 44 are specifically designed for industrial purpose. The devices are suitable for high temperature measurement from 600 °C on many different metallic surfaces. The infrared radiation is measured in two adjacent wavelength ranges and the temperature values is detected hence. Thereby, the temperature measurement is widely independent from the emissivity.

The solid body in stainless steel housing with protection window for optics 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 1.5 mm.

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

The pyrometer are equipped with a galvanically isolated RS-485 interface which allows parameterizing and software evaluation even in bus systems.

The integrated laser aiming light enables to focus the measuring object exactly. The size of the aiming light is identical to the measuring field.

Via optional interface module (RS-485 to USB) parameters like emissivity sub range, response time and storage can be easily adjusted by using the comfortable 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.

Typical application areas:

- Steel and metal industry
- Furnace construction
- Hardening
- Welding



Image credit: „Hot steel in the steel mill workshop production line“ Copyright by pan demin, used with licence from Shutterstock.de

AST T3-450C 44

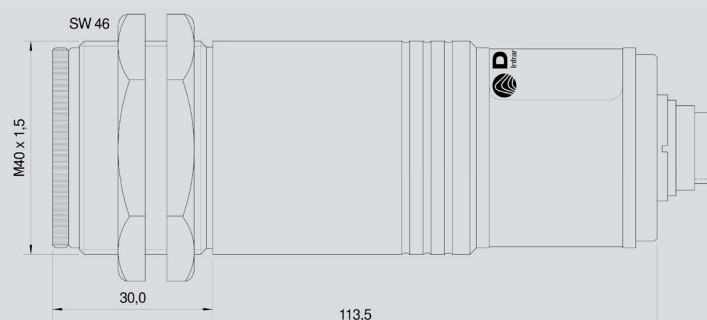
Ratio pyrometer for industrial application

Technical data

Typ	T3-450C 44		
Temperature range	600 °C to 1400 °C	700 °C to 1800 °C	800 °C to 2500 °C
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C		
Spectral range	0.7 µm to 1.1 µm		
Optics	several fixed optics (type 290, 650 and 1500) with quartz glass protection window		
Part number	Laser	Laser	Laser
Optics 290	4442062202	4442062203	4442062204
Optics 650	4442062302	4442063203	4442063204
Optics 1500	4442067202	4442067203	4442067204
Distance ratio	approx. 50 : 1	approx. 100 : 1	approx. 200 : 1
Measurement uncertainty ¹	0.5 % of measured value in °C + 1 K		
Reproducibility ¹	0.2 % of measured value in °C + 0.5 K		
NETD ^{1,2}	0.1 K		
Response time (t ₉₅)	5 ms, adjustable up to 100 s, adjustable via RS-485 interface		
Emissivity	0.05 to 1.00, adjustable via RS-485 interface		
Ratio correction	0.800 to 1.200		
Storage	minimum and maximum value storage, adjustable via RS-485 interface		
Output	0/4 to 20 mA, switchable via Software, temperature linear, max. burden: 500 Ω		
Interface	RS-485 (galvanically isolated), half duplex, baudrate 115 kBd, data protocol Modbus RTU		
Aiming	integrated laser aiming light		
Software	AST NET1 for Windows®		
Parameters	ratio correction, emissivity, response time, storage, sub temperature range (adjustable via RS-485 interface and software)		
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. 455 g		
Dimensions	thread M40 × 1.5, length 125 mm		
Housing	stainless steel housing with plug connector		
Safety class	IP 65 (according to DIN EN 40050)		
CE symbol	according to EU regulations		
Scope of delivery	PAST T3-450C 44, manual, mounting screw nuts, inspection sheet, AST NET for Windows® (without connecting cable, please order separately)		

¹ Specifications for black body radiator, T = 23 °C, ε = 1, t₉₅ = 1 s. ² Noise equivalent temperature difference. _{ambient}

Dimensional drawing



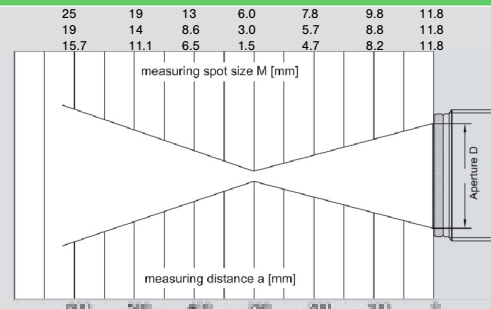
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Optics type 290, 650 and 1500

Optics 290 (sharp point at a = 290 mm measurement distance, aperture ϕ D = 11.8 mm)

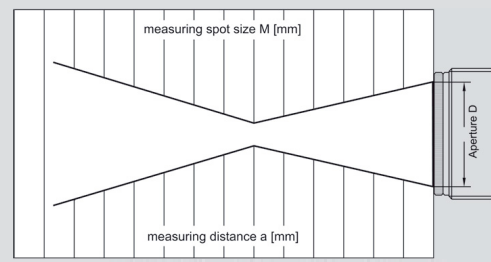
Measurement distance a [mm]	2900	100	200	300	400	500	600
Temperature range	Measurement field diameter M [mm]						
600 °C to 1400 °C	11.8	9.8	7.8	6.0	13	19	25
700 °C to 1800 °C	11.8	8.8	5.7	3.0	8.6	14	19
800 °C to 2500 °C	11.8 8.2		4.7	1.5	6.5	11.1 15.7	



Optics 650 (sharp point at a = 650 mm measurement distance, aperture ϕ D = 10.8 mm)

Measurement distance a [mm]	0	200	400	650	800	1000	1500
Temperature range	Measurement field diameter M [mm]						
600 °C to 1400 °C	10.8	11.5	12.2	13	18.5	26	44
700 °C to 1800 °C	10.8	9.2	8.2	6.5	10.5	16	29
800 °C to 2500 °C	10.8	8.6	6.3	3.5	6.8		11.2 22

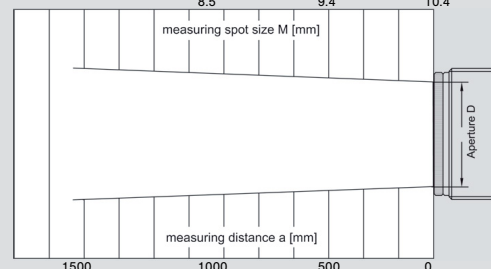
44 26 18.5 13 12.2 11.5 10.8 29 16 10.5 6.5 8.2 9.2 10.8
22 11.2 6.8 3.5 6.3 8.6 10.8



Optics 1500 (sharp point at a = 1500 mm measurement distance, aperture ϕ D = 10.4 mm)

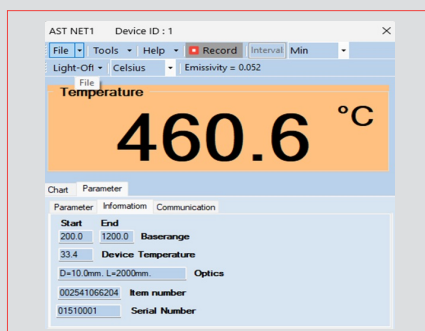
Measurement distance a [mm]	0	500	750	1000	1250	1500	2000
Temperature range	Measurement field diameter M [mm]						
600 °C to 1400 °C	10.4	17	20	24	27	30	43
700 °C to 1800 °C	10.4	11.9	12.7		13.5	14.2	15
800 °C to 2500 °C	10.4	9.4	8.9	8.5	8.0	7.5	13.5

30 24 17 10.4
15 13.5 11.9 10.4
7.5 8.5 9.4 10.4



AST NET1

For evaluation and processing of measured data obtained AST provides a window case software it allows the measurement, visualization and measurement recording of several simultaneously connected pyrometers.



Further functions are for example:

- Measurement data logging with real-time display, parameterization of AST pyrometers
- Trigger functions and auto save
- Extensive statistical analysis of measurement data
- Measurement cursor, print functions, automatic emissivity determination
- Export of measured data as text file and automatic creation of Microsoft Excel® spreadsheets
- Integrated report function with customized templates for Microsoft Word®
- Integrated calculator for easy calculation of optics parameters

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Electrical, mechanical and optical accessories:			Order number	
Connecting cable, straight plug, 12-pin	Connecting cable, angulate plug, with aiming light button, 12-pin	length 2 m length 5 m length 10 m length 15 m length 20 m length 25 m length 30 m	3310A1111 3310A1112 3310A1113 3310A1114 3310A1115 3310A1116 3310A1117	3310A11151 3310A11152 3310A11153 3310A11154 3310A11155 3310A11156 3310A11157
Interface module		RS-485 to USB	3310A14020	
Power supply		24 V DC, 0.6 A	3310A12010	
Mounting angle		fixed adjustable	3310A21010 3310A21011	
Air purge unit		stainless steel, purge air 0.1 to 0.5 bar, oil free	3310A22010	
Water cooling jacket		stainless steel with integrated air purge unit	3310A23010	
Vacuum flange KF16		with quartz window or with sapphire window	3310A24010 and 3310A34021 3310A24010 and 3310A34051	
Mirror		90°, with integrated air purge unit	3310A24110	
ATEX explosion protection housing			3310A23100	
DHP 1040		mobile handheld programming device	3310A17010	

† More accessories available.

Selected accessories – pictures

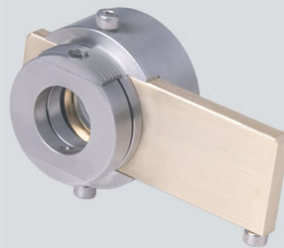
Mounting angle, adjustable

Order number: 3310A21011



Window slide

Order number: 3310A21210



Air purge unit

Order number: 3310A22010



Water cooling jacket

Order number: 3310A23010



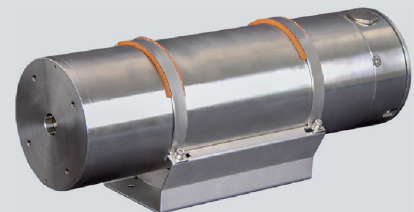
Handheld programming device DHP 1040

Order number: 3310A17010



ATEX explosion protection housing

Order number: 3310A23100



Technical details are subject to change. 08.01.19



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