

# AST A450C+ PL/TL/V 56

## Ratio pyrometer for industrial application

### Overview

Digital ratio pyrometer with RS-485 interface



### Special features

- For temperature measurements between 550 °C and 3000 °C
- Temperature linear output 0/4 to 20 mA, switchable
- Display, keys and integrated RS-485 interface
- Laser aiming light or integrated color video camera
- Optional through-lens sighting
- Very short response time 5 ms

### Description and application

The digital AST ratio pyrometer AST A450C+ is specifically designed for industrial purposes. This device is suitable for non-contact temperature measurement from 500 °C on different surfaces like metal, graphite or ceramics. The AST A450C+ PL/TL/V measures infrared radiation in two adjacent wavelengths and determines therefrom the temperature value.

The solid and compact stainless steel housing allows usage even under rough environmental conditions. Measuring spot sizes from 0.8 mm can be easily realized. With a minimal response time of only 5 ms ( $t_{95}$ ) the devices are usable for fast measuring tasks.

The temperature linear standard output signal of 0/4 to 20 mA allows an easy implementation in existing measurement and control systems. The AST A450C+ PL/TL/V possesses a RS-485 interface. The devices are bus-compatible in this way and use the Modbus RTU protocol.

Use the integrated red laser aiming light for the exact aiming of the pyrometer to the measurement object. The optional integrated video camera module (AST A450C+V) provides an anti-glare aiming of the pyrometer even when the measurement object is very hot. It substantially facilitates the adjustment under difficult local conditions where the pyrometer is not easy to reach or the measurement object cannot be seen directly. A through-lens sighting is also optionally available.

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Connect the pyrometer to a PC to adjust the parameters emissivity, sub temperature range, data storage settings and response time to the application by using the comfortable parameterizing and evaluation software AST NET1. Typical application areas:

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



Bildnachweis: Stahl-Zentrum

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Technical data										
Type	AST A450C +PL/TL/V 56									
Temperature range	500 °C to 1200 °C 600 °C to 1400 °C			700 °C to 1800 °C		800 °C to 2500 °C		900 °C to 3000 °C		
Distance ratio	50 : 1		100 : 1		200 : 1		300 : 1		300 : 1	
Optics <sup>1</sup>	several fixed optics (type 250, 650, 2000, 4000)									
Part numbers	Laser	Color camera	Laser	Color camera	Laser	Color camera	Laser	Color camera	Laser	Color camera
	Through-lens sighting		Through-lens sighting		Through-lens sighting		Through-lens sighting		Through-lens sighting	
250	5562062201	5562082201	5562062202	5562082202	5562062203	5562082203	5562062204	5562082204	5562062205	5562082205
650	5562063201	5562083201	5562063202	5562083202	5562063203	5562083203	5562063204	5562083204	5562063205	5562083205
2000	5562066201	5562086201	5562066202	5562086202	5562066203	5562086203	5562066204	5562086204	5562066205	5562086205
4000	5562067201	5562087201	5562067202	5562087202	5562067203	5562087203	5562067204	5562087204	5562067205	5562087205
Sub temperature range of analog output	adjustable within temperature range, minimum span 50 °C									
Spectral range	0.7 µm to 1.1 µm									
Ratio correction K	0.800 to 1.200									
Emissivity ε	0.050 to 1.000									
Response time (t <sub>95</sub> )	5 ms <sup>2</sup> , adjustable up to 100 s									
Measurement uncertainty <sup>3</sup>	0.5 % of measured value in °C +1 K									
Reproducibility <sup>3</sup>	0.2 % of measured value in °C + 0.5 K									
NETD <sup>3,4</sup>	0.1 K									
Transmittance	50 % to 100 %									
Output	0/4 mA to 20 mA, temperatur linear, burden max. 500 Ω (galvanically isolated)									
Interface	RS-485 (galvanically isolated), half duplex, max. 115 kbd, data protocol Modbus RTU									
Aiming	AST 450C+PL: laser aiming light, 630 ... 680 nm, class II, < 1 mW, AST 450C+TL optional optical through-lens sightings AST 450C+ V: video camera, composite video signal PAL (B), 50Hz (galvanically isolated) or NTSC (M), 60 Hz									
Switching output/threshold	1 opto relay, RLoad min. 48 Ω (galvanically isolated)/adjustable within temperature range									
Parameters	device: ratio correction, emissivity, transmissivity, response time, data storage settings, sub range of measurement output, switching thresholds of switching output									
Power supply	24 V DC ± 25 %, residual ripple 500 mV									
Power consumption	max. 1.5 W (without load at switching output)									
Operating temperature	0 °C to 70 °C									
Storage temperature	-20 °C to 70 °C									
Weight	approx. 750 g									
Housing	stainless steel round housing with plug connector, length: approx. 140 mm (without through-lens sighting), Ø 50 mm									
Safety class	IP65 according to DIN EN 60529 and DIN 40050									
Test regulations	EN 55 011:1998, limit class A									
CE symbol	according to EU regulations									
Scope of delivery	AST 450C+ PL\TL\V 56 manual, inspection sheet, software AST NET1without connection cable (please order separately)									

<sup>1</sup> Other fixed optics on request. <sup>2</sup> With dynamic adaption at low signal level. <sup>3</sup> Specifications for black body radiator, T<sub>ambient</sub> = 23 °C, t<sub>95</sub> = 1 s. <sup>4</sup> Noise equivalent temperature difference. <sup>5</sup> Operating temperature up to 50 °C to avoid injury.

Fixed optics					
Measurement distance a [mm]	Aperture D [mm]	a = 250	a = 650	a = 2000	a = 4000
Temperature range		Measuring field diameter M [mm]			
500 °C to 1200 °C	8.0	5.0	13.0	40.0	80.0
600 °C to 1400 °C	6.0	2.5	6.5	20.0	40.0
700 °C to 1800 °C	6.0	1.3	3.5	10.0	20.0
800 °C to 2500 °C	6.0	0.8	2.2	6.7	13.3
900 °C to 3000 °C	6.0	0.8	2.2	6.7	13.3

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### Technical data AST450C+ Vwith video camera

Video signal	Composite video signal approx. 1V <sub>pp</sub> at 75 Ω (galvanically isolated, video signal can be deactivated via software)
Color norm	PAL (B), 50 Hz (optional color norm NTSC (M), 60 Hz)
Resolution	1/3 inch video chip 628 × 586 pixels (NTSC option: 510 × 496 pixels)
Exposure control	automatic
Visible field	approx. 8 % × 6 % of adjusted measurement distance (NTSC option: 6.5 % × 5 %)
Date/time	Real-time clock with minimum 3 days power reserve, adjustable via software
Durable image displays	Target mark in measurement spot size, measurement temperature, emissivity
Optional image displays	Via software: serial number, device name or user-defined text (16 characters), date, time, temperature unit °C/°F, 12/24 hours display

### Pyrometer with TFT monitor



The video image can be displayed via the additionally available TFT monitor.

### Detailed view of video image



### Pyrometer with different aiming variants



through-lens sighting



color video camera



laser aiming light




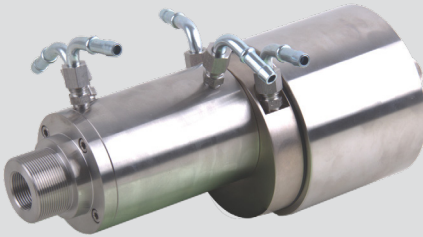

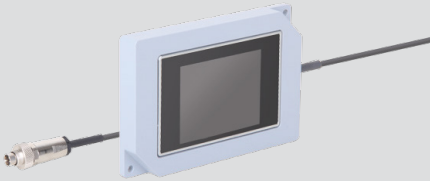


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Electrical, mechanical and optical accessories:		Part number		
Connection cable, straight plug, 12 pin	length 2 m	3310A11111		
	length 5 m	3310A11112		
	length 10 m	3310A11113		
	length 15 m	3310A11114		
	length 20 m	3310A11115		
	length 25 m	3310A11116		
	length 30 m	3310A11117		
Video connection cable	length 2 m	3310A16521		
	length 5 m	3310A16522		
	length 10 m	3310A16523		
	length 15 m	3310A16524		
	length 20 m	3310A16525		
	length 25 m	3310A16526		
	length 30 m	3310A16527		
Mounting angle	adjustable	3310A21050		
Cooling jacket	including air purge unit, without mounting angle	3310A23056		
Ball flange	thread M40 × 1.5	3310A24020		
Air purge unit	stainless steel	3310A22050		
Power supply PSU 15	24 V DC, 0.6 A	3310A12010		
Ring nut	with quartz glass window with sapphire glass window	3310A34022 3310A34052		
TFT monitor	TFT monitor industrial	3.5" with 2 m connection cable:	3310A16110	3310A16120
Adaptor	video/USB	3310A14030		
DHP 1040	handheld programming device	3310A17010		

1 More accessories on request. 2 Cable lengths 5 m and 10 m also available.

#### Selected accessories

Mounting angle, adjustable	Cooling jacket	Air purge unit
Part number: 3310A21050 	Part number: 3310A23056 	Part number: 3310A22050 
TFT monitor (industrial)	Ball flange	Power supply PSU 15
Part number: 3310A16120 	Part number: 3310A24020 	Part number: 3310A12010 

Technische Änderungen vorbehalten. Technical details are subject to change. 06.09.22



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