

AST AL514 44 Pyrometer for application in glass industry

Overview

Digital pyrometer with RS-485 interface



Features

- For temperature measurements between 50 °C and 2500 °C
- Temperature linear output 0/4 to 20 mA
- RS-485 interface
- Short response time from 5 ms
- Several fixed optics available
- Robust stainless steel housing

Description and applications

The digital pyrometers AST AL514 44 are specifically designed for application in glass industry. The devices are suitable for temperature measurement from 50 °C to 2500 °C on glass surfaces, float glass and liquid glass especially in glass industry.

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 recesses. 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:

- Glass industry
- Float glass
- Glass bottle production
- Liquid glass
- Glass forms



AST AL514 44

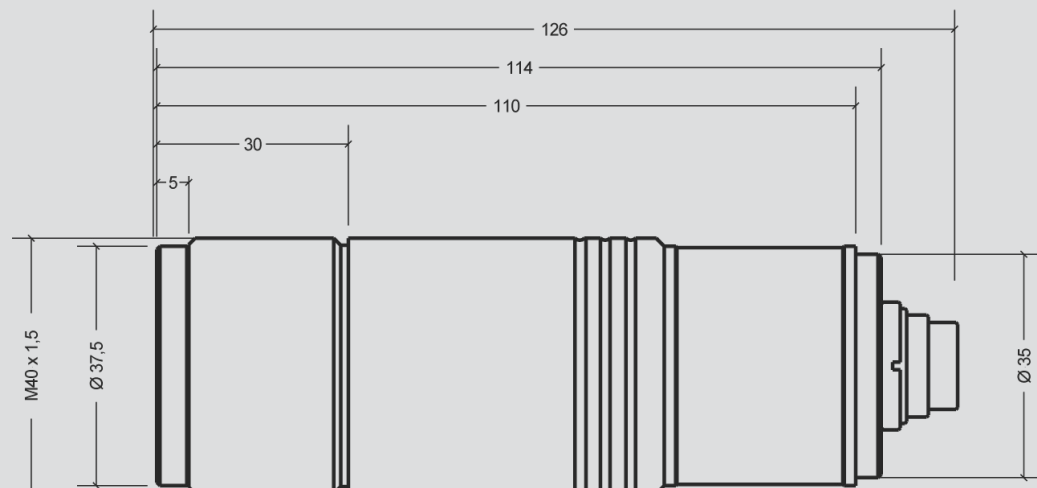
Pyrometer for application in glass industry

Technical data

Type	AL514 44	AL514 44	AL514 44
Measuring temperature range	50 °C to 1300 °C	100 °C to 1800 °C	500 °C to 2500 °C
Sub temperature range	adjustable via RS-485 interface within temperature range, minimum span 50 °C		
Spectral range	around 5.0 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 ₁	0.1 K ₄		
Response time (t ₉₅)	5 ms (min.), 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		
Interface	RS-485 (galvanically isolated), half duplex, max. baudrate 115 kBd, data protocol Modbus RTU		
Aiming	none, optional: integrated LED aiming light or laser aiming light adaptor		
Software	AST NET1		
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	approx. 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	AST AL514 44, manual, inspection sheet, mounting screw nuts, AST NET for Windows® (without connecting cable, please order separately)		

¹ For black body radiation at 23 °C to 200 °C, T = 300 °C, never is higher value. ² Noise equivalent temperature difference (NETD) at 500 °C to 2500 °C

Dimensional drawing



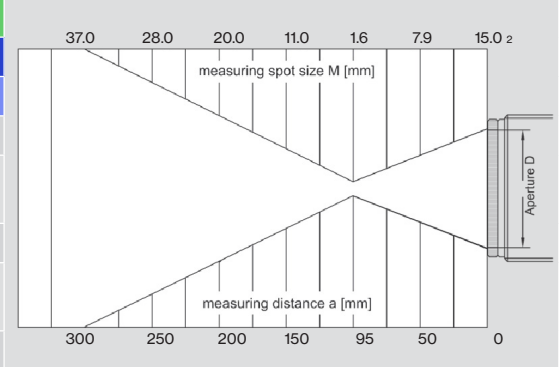
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Pyrometer for application in glass industry

Optics 100, 300 and 800

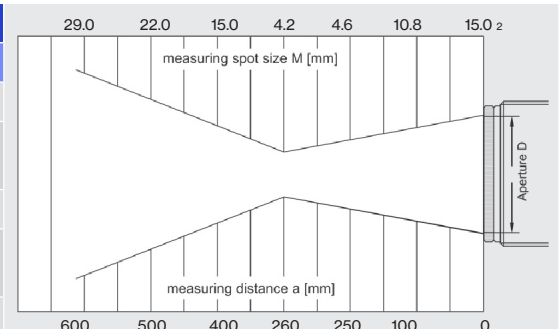
Optics 100 (sharp point at a = 95 mm measuring distance, marked bold)

Measuring distance a [mm]	0	50	95	150	200	250	300
Temperature range	Measuring field diameter M [mm]						
AL514 44(50 °C to 2500 °C) without LED aiming light	15.0	7.9	1.6	11.0	20.0	28.0	37.0
AL514 44(50 °C to 2500 °C) with LED aiming light ¹	13.0	7.1	1.7	11.0	18.0	26.0	34.0



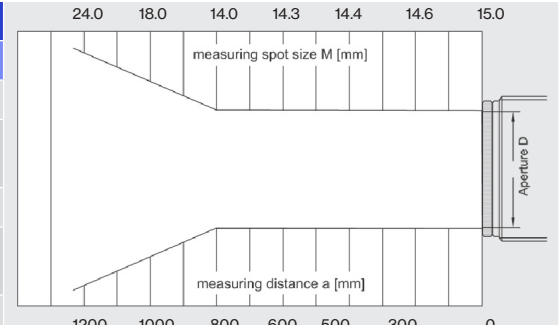
Optics 300 (sharp point at a = 250/260 mm measuring distance, marked bold)

Measuring distance a [mm]	250	260	100	400	500	600	
Temperature range	Measuring field diameter M [mm]						
AL514 44(50 °C to 2500 °C) without LED aiming light	15.0	10.8	4.6	4.2	15.0	22.0	29.0
AL514 44(50 °C to 2500 °C) with LED aiming light	15.0	11.0	4.5	5.3	17.0	25.0	32.0



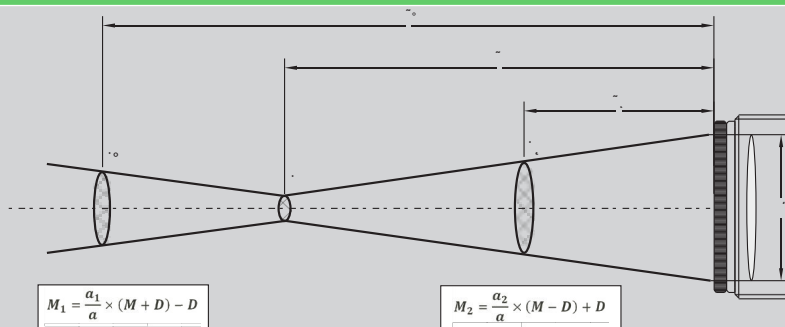
Optics 800 (sharp point at a = 800 mm measuring distance, marked bold)

Measuring distance a [mm]	0	300	500	600	800	1000	1200
Temperature range	Measuring field diameter M [mm]						
AL514 44(50 °C to 2500 °C) without LED aiming light	15.0	14.6	14.4	14.3	14.0	18.0	24.0
AL514 44(50 °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
AL514 44(50 °C to 1300 °C)		4449541201, 4449551201 (LED)	4449542201, 4449552201 (LED)	4449543201, 4449553201 (LED)
AL51444 (100 °C to 1800 °C)		4449541202, 4449551202 (LED)	4449542202, 4449552202 (LED)	4449543202, 4449553202 (LED)
AL514 44(500 °C to 2500 °C)		4449541203, 4449551203 (LED)	4449542203, 4449552203 (LED)	4449543203, 4449553203 (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, angulated plug, 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 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	
DHP 1040		portable handheld device for pyrometer programming	3310A17010	
Ethernet Interface-Box DCU _{ioP}		For the connection in local networks and parameterizing	3310A13500	
† 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	Ethernet Interface-Box DCU _{ioP}	Digital display DD 200/210
Order number: 3310A23010 	Order number: 3310A13500 	Order number: 3310A13020/3310A13025 

Technical details are subject to change. 24.06.20



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