

PSC-A10C

Temperature Measurement of Flame and Hot Combustion CO₂ Gases

Overview

Digital pyrometer with 0 / 4 - 20 mA output and Modbus RS485 RTU



Features

- Temperature measurement from 200 °C to 2000 °C
- Through-lens sighting with adjustable focus optics
- RS-485 Modbus RTU Communication
- Rugged protective cooling jacket with air purge
- On-board temperature display
- Built-in Relay

Description and application

The Process Sensors IR model PSC-A10C pyrometer measures temperature within the CO₂ Gas absorption band. By utilizing the optimal wavelength, non-contact infrared sensors can measure Hot CO₂ gases and flame temperature.

Power generation requires fuel combustion to generate steam in a turbine's boiler to produce electricity. High-accuracy temperature measurements of flue gas (FGET) is essential in optimizing the combustion process and increasing the longevity of the boiler or reducing furnace refractory downtime.

The infrared radiation emitted from the gas stream is collimated onto the detector via the IR sensor's lens. The acquired temperature reading is averaged from the pyrometer's cone of vision which penetrates up to 8 to 14 feet into the boiler/furnace. This is typically based on an 8 - 12% CO₂ gas concentration.

The PSC-A10C pyrometer has integrated through-the-lens sighting, allowing the operator to view through the pyrometer and see into the boiler or furnace. It is equipped with a galvanically isolated RS-485 interface which provides data acquisition in bus systems. The linear output signal of 0/4 to 20 mA allows easy implementation into pre-existing measurement and control systems.

All parameters can be adjusted with the parameterization and evaluation software PSCSpot.

Typical application areas:

- Kilns and Furnaces
- Garbage incinerators / Hazardous Waste Boilers
- Power Generation Boilers
- Biomass Boilers
- Recovery Boilers
- Fluidized Bed Boilers



PSC-A10C

Pyrometer for Flame / CO₂ Gas Temperature Measurement

Technical data		
Type	PSC-A10C	
Temperature range	200 °C to 1800 °C	500 °C to 2000 °C
Sub temperature range	adjustable within temperature range, min. span 50 °C	
Spectral range	4.6 µm	
Optics	variable focus optics	
Distance ratio	approx. 100 : 1	
Measurement uncertainty ¹	3 % (200 to 500°C) or 1% (500 - 1800°C) of measured value	0.5 % of measured value + 1 K
Repeatability ¹	0.2 % of measured value + 1 K	
NETD ²	0.1 K ³	
Response time (t ₉₅)	1 ms, adjustable up to 100 seconds	
Emissivity	0.100 to 1.000	
Data storage	minimum/maximum value storage	
Output	0/4 to 20 mA, switchable via software and directly at the device, temperature linear, max. burden 700 Ω	
Interface	RS-485 interface (galvanically isolated), half duplex, baud rate up to 115 kBd, data protocol Modbus RTU	
Aiming	through-lens sighting	
User controls	keys, display	
Software	PSCSpot for Windows®, optional: PSCSpot Pro	
Parameters	emissivity, response time, data storage, sub temperature range, adjustable via software and interface or directly at the device	
Switching output, switching threshold	one opto relays, R _{last} min. 48 Ω, switching threshold adjustable within measuring temperature range	
Power supply	24 V DC ± 25 %	
Power consumption	max. 1.5 W	
Operating temperature	0 °C to 70 °C	
Storage temperature	-20 °C to 70 °C	
Weight	approx. 520 g	
Dimensions	54 × 54 mm, length 170 mm	
Housing	compact housing with plug connector, display and keys	
Safety class	IP65 (according to DIN 40 050)	
CE symbol	according to EU regulations (EN 50 011)	
Scope of delivery	PSC-A10C pyrometer with inspection sheet, operation manual, PSCSpot for Windows® (no connection cable, please order separately)	

¹ T_{ambience} = 23 °C, ε = 1, t₉₅ = 1 s. ² Noise equivalent temperature difference. ³ T_U = 23 °C, ε = 1, t₉₅ = 100 ms, T_{Object} = 700 °C.

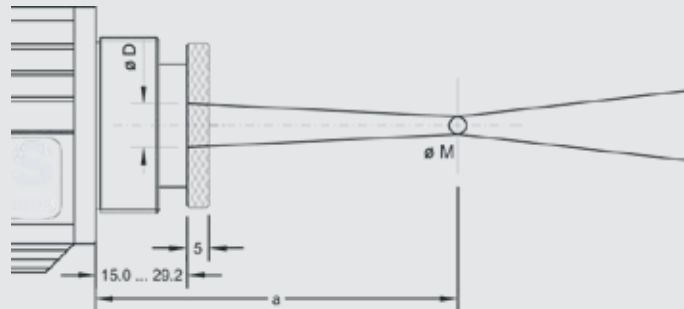
Variable focus optics		
Measurement distance a [mm]	Measuring field diameter M [mm]	Aperture D [mm]
400 to 4500	4 to 60	11.6

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Pyrometer for Flame / CO₂ Gas Temperature Measurement

Measuring field

Variable focus optics



Detailed view: Display

The digital display shows the current measured value and the emissivity set as well as further information.

Current measured temperature

Emissivity set

Key lock

Status switching output



Detailed view: Rear side

The parameters can be adjusted with the keys at the rear side of the device. The set value is taken over directly.

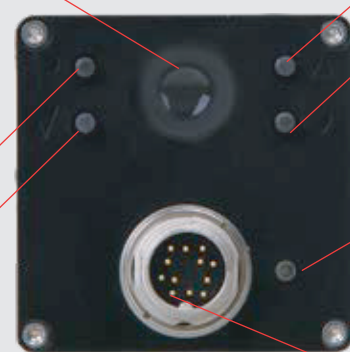
Through-lens sighting

Keys for "Up" and "Down"

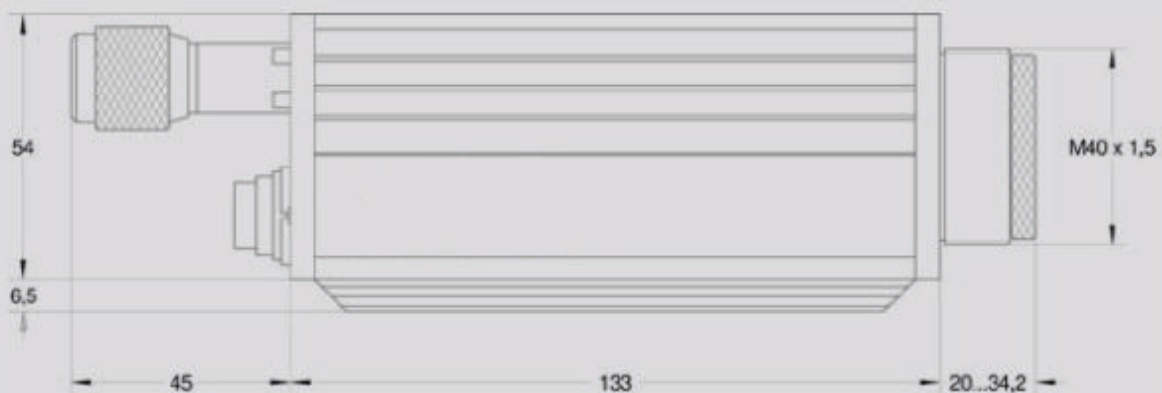
Keys for "Parameter Menu" and "Enter"

Status LED

Connector and interface



Dimensional drawing - PSC-A10C



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Pyrometer for Flame / CO₂ Gas Temperature Measurement

Electrical, mechanical and optical accessories ¹		Part number
pyrometer cable, 12 pin, right angle connector	length 2 m	PSC-3310A11131
	length 5 m	PSC-3310A11132
	length 10 m	PSC-3310A11133
	length 15 m	PSC-3310A11134
	length 20 m	PSC-3310A11135
	length 25 m	PSC-3310A11136
	length 30 m	PSC-3310A11137
Interface adapter	RS-485 to USB	PSC-3310A14020
USB connection cable	11.8 m, for PSCSpot software to PC connection	PSC-3310A14010
Power supply	24 V DC, 1.5 A	PSC-950-004
Mounting bracket	adjustable	PSC-3310A21020
Air purge	stainless steel, purge air 0.1 to 0.5 bar, oil-free	PSC-3310A22020
Mounting base for pyrometer	only for pyrometer, not jackets	PSC-3310A21025
Vortec Cooler	requires 70 to 90 PSI, maintenance free cooling via air	PSC-950-232A
Removable sealed window assembly	sapphire window included	PSC-950-133A-S
Mounting flange	flange for threaded sight tubes)	PSC-950-046
Water cooling jacket	protects sensor in hot / dirty environments, aluminium	PSC-KG10-00

¹ More accessories on request

Selected accessories

Water Cooling jacket	Removable Sapphire sealed window assembly	Threaded sight tube with window flange
Part number: PSC-KG10-00 	Part number: PSC-950-133A-S	Part number: PSC-950-145
Right angle 12-pin Pyrometer cables	Mounting base for PSC-A10C Pyrometer	Mounting Flange for Furnace / Boiler
Part number: PSC-3310A1113X 	Part number: PSC-3310A21025	Part number: PSC-950-046