

# PSC-GRF11N

## Ratio pyrometers with fiber cable for industrial applications

### Overview

#### Digital 2-color pyrometers with 0/4-20mA and RS-485 interface



### Features

- Temperature ranges from 300°C to 2300°C
- Fast speed of response - 5 ms
- Variable focus optics from 0 to 98 inches
- Laser Aiming
- Small spot sizes starting from 0.7mm
- RS-485 Modbus RTU interface
- Display and keyboard for pyrometer settings
- Ambient temperature up to 250°C
- Immune to Electromagnetic Interference
- Accepts remote input from PLC

### Description and applications

The digital ratio pyrometers PSC-GRF11N series are specifically designed for industrial temperature measurement starting from 300°C. The 2-color model is capable of a wide range of measurement, independent of emissivity.

The cast aluminum housing with fiber optics cable allows usage in harsh environmental conditions. The bright temperature display is visible over a long distance.

With a fast response time of 5 ms ( $t_{95}$ ) these pyrometers are suitable for quick measurement processes. The variable focus fiber optical lens provides spot sizes from 0.7 mm in diameter.

The integrated laser provides precision aiming to the measured object. The linear temperature output signal of 0/4 to 20 mA makes it easy to incorporate the pyrometer in existing measurement and control systems.

The device is equipped with a galvanically isolated RS-485 interface, which allows parameterizing & software evaluation even in bus systems.

All parameters are adjustable via push-buttons and displayed directly on the electronics box. By using the convenient parameterizing & evaluation software PSCSpot, settings can easily be adjusted from a PC.

Applications include:

- Induction heating
- Semiconductor processes
- Heat treating
- Composites and Ceramics
- Kiln engineering
- Vacuum Furnace/Reactors
- Steels and Metals

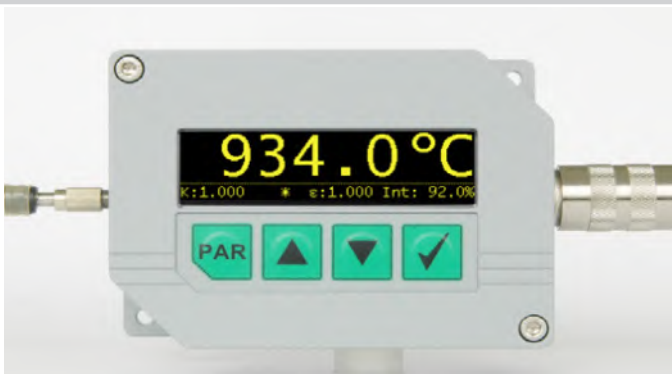


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Technical data				
Type	PSC-GRF11N			
Temperature range	300 to 1100°C	350 to 1300°C	400 to 1600°C	500 to 2300°C
Sub temperature range	adjustable within temperature range, minimum span 50°C			
Spectral range	Channel 1: 1.45 to 1.7 µm // Channel 2: 1.65 to 1.9 µm			
Optics	variable focus optics ROH I-100, ROH II-65, ROH II-250			
Distance ratio	see table			
Measurement uncertainty <sup>1</sup>	0.5 % of measured value in °C + 1°C			
Reproducibility <sup>1</sup>	0.2 % of measured value + 0.5°C			
Transmittance	50 % to 100 %			
NETD <sup>1,2</sup>	0.1 K			
Response time (t <sub>95</sub> )	5 ms <sup>3</sup> , adjustable up to 100 s			
Ratio correction K	0.800 to 1.200			
Emissivity	0.050 to 1.000 (1-channel mode)			
Storage	minimum and maximum value storage			
Output	0/4 to 20 mA, switchable, temperaturlinear, max. burden: 500 Ω (galvanically isolated)			
Interface	RS-485 (galvanically isolated), half duplex, max. baudrate 115 kBd, Modbus RTU			
Aiming	laser aiming light, 630 nm to 680 nm, class II, < 1 mW			
Switching output/thresholds	1 opto relay, R <sub>load</sub> min. 48 Ω/adjustable within temperature range			
Software	PSC-Spot for Windows®			
Parameters <sup>4</sup>	ratio correction, emissivity, transmissivity, response time, temperature unit °C or °F, storage, settings, sub temperature range of output, switching thresholds of switching output			
User controls	display and keyboard for parameter setting			
Power supply	24 V DC ± 25 %, residual ripple 500 mV			
Power consumption	max. 1.5 W (without load on switching output)			
Operating temperature	0 °C to 70 °C (electronics), 0 °C to 250 °C (optical head) 0 °C to 250 °C (fiber cable), 0 °C to 150 °C (fiber cable with 90° curve)			
Storage temperature	-20 °C to 70 °C			
Weight	appr. 600 g (without fiber cable and optical head)			
Dimensions	appr. 110 mm × 80 mm × 40 mm			
Housing	alu housing with plug connector, display and keyboard			
Safety class	IP 65 (DIN 40 050)			
CE symbol	according to EU regulations (EN 55 011)			
Scope of delivery	PSC-GRF11N, manual, inspection sheet, PSC-Spot for Windows® (no connection cable, fiber cable and optical head, please order separately)			

<sup>1</sup> T<sub>ambient</sub> = 23 °C, ε = 1, t<sub>95</sub> = 1 s. <sup>2</sup> Noise equivalent temperature difference. <sup>3</sup> With dynamic adaption at low signal level. <sup>4</sup> Adjustable via interface and software or directly at the device.



Display of current temperature and ratio correction K



Optical head ROH II (left side) and optical head ROH I (right side)

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### Lens Optics

#### ROH I-100 (Aperture D = 6.0 mm)

Measurement distance a [mm]	0	100	165	225	300	500	700	1000
Temperature range	Target size M [mm]							
300 °C to 1100 °C	6.0	1.8	2.9	4.0	5.5	9.0	13	18
350 °C to 1300 °C	6.0	1.8	2.9	4.0	5.5	9.0	13	18
400 °C to 1600 °C	6.0	0.9	1.4	2.0	2.7	4.5	6.5	9.0
500 °C to 2300 °C	6.0	0.9	1.4	2.0	2.7	4.5	6.5	9.0

#### ROH II-65 (Aperture D = 9.0 mm)

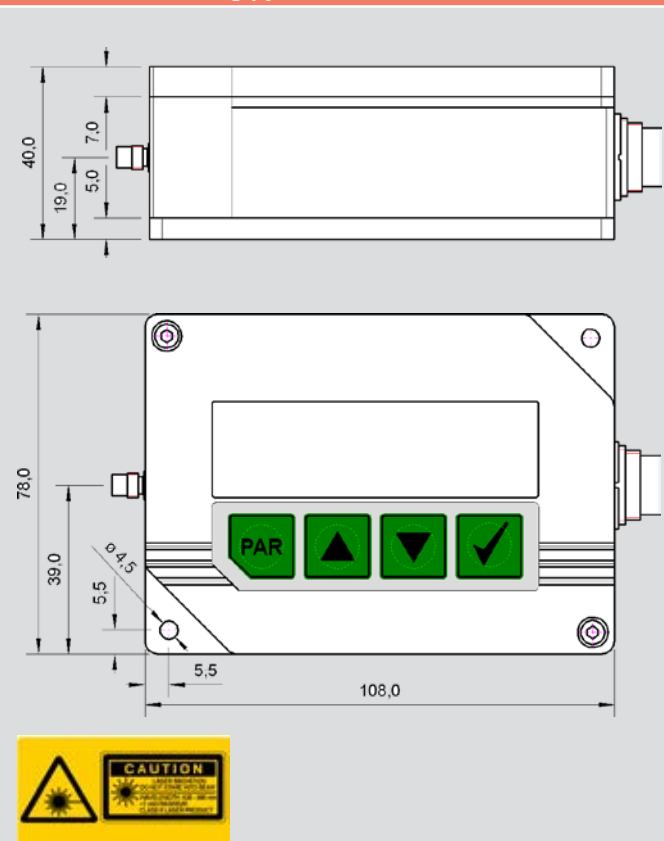
Measurement distance a [mm]	0	65	85	110	150	200	240	300
Temperature range	Target size M [mm]							
300 °C to 1100 °C	9.0	1.3	1.7	2.1	2.8	3.6	4.2	5.0
350 °C to 1300 °C	9.0	1.3	1.7	2.1	2.8	3.6	4.2	5.0
400 °C to 1600 °C	9.0	0.7	0.9	1.1	1.4	1.8	2.1	2.5
500 °C to 2300 °C	9.0	0.7	0.9	1.1	1.4	1.8	2.1	2.5

#### ROH II-250 (Aperture D = 9.0 mm)

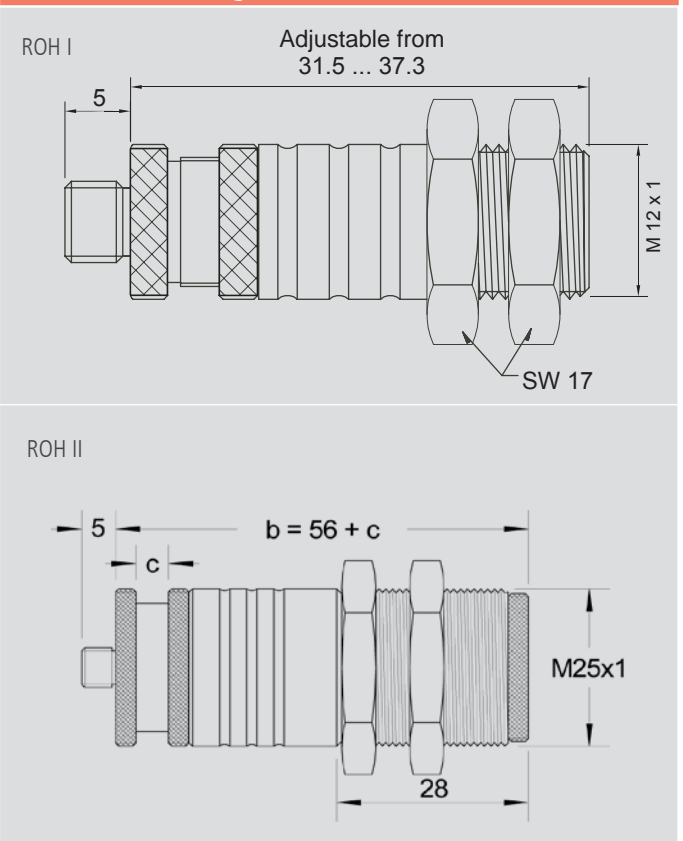
Measurement distance a [mm]	0	250	400	600	800	1000	2000	2500
Temperature range	Target size M [mm]							
300 °C to 1100 °C	9.0	3.0	5.0	7.2	9.2	12	24	31
350 °C to 1300 °C	9.0	3.0	5.0	7.2	9.2	12	24	31
400 °C to 1600 °C	9.0	1.7	2.7	4.4	5.5	6.8	13	17
500 °C to 2300 °C	9.0	1.7	2.7	4.4	5.5	6.8	13	17

### Dimensional drawings in (mm)

#### Dimensional drawing pyrometer

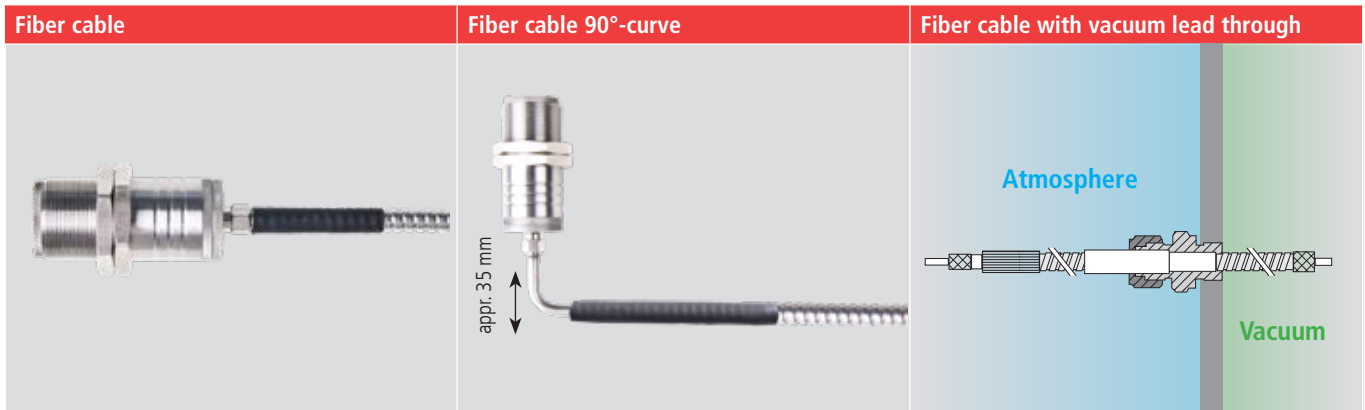


#### Dimensional drawings of focusable lenses ROH



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Fiber optic cables, stainless steel $\varnothing$ 200 $\mu$ m core - Order numbers				Fiber optic cables, stainless steel $\varnothing$ 400 $\mu$ m core - Order numbers			
Temperature range	length	straight	90° curve	Temperature range	length	straight	90° curve
PSC-GRF11N 400 °C to 1600 °C 500 °C to 2300 °C	1.5 m	PSC-3310A42001	PSC-3310A42011	PSC-GRF11N 300 °C to 1100 °C 350 °C to 1300 °C	1.5 m	PSC-3310A44001	PSC-3310A44011
	2.0 m	PSC-3310A42002	PSC-3310A42012		2.0 m	PSC-3310A44002	PSC-3310A44012
	2.5 m	PSC-3310A42003	PSC-3310A42013		2.5 m	PSC-3310A44003	PSC-3310A44013
	5.0 m	PSC-3310A42004	PSC-3310A42014		5.0 m	PSC-3310A44004	PSC-3310A44014
	7.5 m	PSC-3310A42005	PSC-3310A42015		7.5 m	PSC-3310A44005	PSC-3310A44015
	10.0 m	PSC-3310A42006	PSC-3310A42016		10.0 m	PSC-3310A44006	PSC-3310A44016
	15.0 m	PSC-3310A42007	PSC-3310A42017		15.5 m	PSC-3310A44007	PSC-3310A44017

Other lengths on request! Variants with vacuum lead through/special quartz and sapphire glass available.

Electrical accessories <sup>1</sup> - Order numbers			Mechanical and optical accessories <sup>1</sup>	
Connecting cable 12 pin	straight plug	Right angle plug		
Length 2 m	PSC-3310A11111	PSC-3310A11131	Mounting angle fixed for optical head ROH I	PSC-3310A21510
Length 5 m	PSC-3310A11112	PSC-3310A11132	Mounting angle fixed for optical head ROH II	PSC-3310A21522
Length 10 m	PSC-3310A11113	PSC-3310A11133	Mounting angle adjustable for optical head ROH II	PSC-3310A21520
Length 15 m	PSC-3310A11114	PSC-3310A11134	Air purge unit for ROH II	PSC-3310A22520
Interface module RS-485 to USB	PSC-3310A14020		Sighting tube 100 mm	PSC-3310A22530
Interface module RS-485 to ProfiBus DP	PSC-3310A14021		Sighting tube 300 mm	PSC-3310A22535
Power supply PSU 15 (24 V DC, 1 A)	PSC-3310A12010		Mirror for ROH II, stainless steel, 90°	PSC-3310A31020

<sup>1</sup> Selected accessories.

### Selected accessories - pictures

Mounting bracket, fixed	Mounting bracket, adjustable, for ROH II	Air purge for ROH II
Order number:: PSC-3310A21522 	Order number:: PSC-3310A21520 	Order number:: PSC-3310A22520 
Mirror 90° for ROH II	Power supply	Sighting tube (100 mm)
Order number:: PSC-3310A31020 	Order number:: PSC-950-0004 	Order number: PSC-3310A22030 

### PROCESS SENSORS CORPORATION

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