

Long-wave Infrared Temperature Sensor

ABSD-01A

User Manual



1. Introduction

Infrared temperature sensors calculate the surface temperature of objects by measuring the infrared radiation emitted by the target, without physical contact. Non-contact measurement is the core advantage of infrared thermometers, enabling users to conveniently measure hard-to-reach or moving targets.

The ABSD-01A Series is an integrated infrared temperature sensor, with the sensor, optical system, and electronic circuitry housed in a stainless steel enclosure. It features easy installation via standard threads on the metal housing for quick connection to mounting points. Optional accessories (e.g., air purges, mounting brackets, adjustable mounting brackets, and protective air purge sleeves) are available to meet various application requirements.

2. Specifications

2.1. Basic Parameters

IP Rating	IP65 (NEMA-4)
Ambient Temperature	0 ~ 60°C
Storage Temperature	-20 ~ 80°C
Relative Humidity	10 – 95% (non-condensing)
Material	Stainless Steel
Cable Length	1.5 m (standard), other custom lengths available

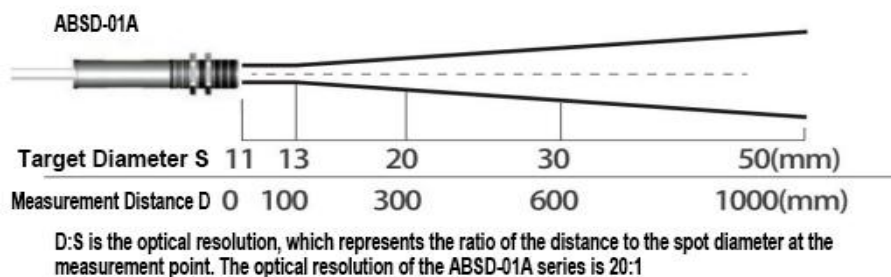
2.2. Electrical Parameters

Power Supply	24 VDC
Maximum Current	30 mA
Output Signals	4-20 mA, 0-5 V, 0-10 V, RS485, RS232

2.3. Measuring Parameters

Spectral Range	8~14 μm
Temperature Range	Selectable ranges from -20°C to 1200°C
Optical Resolution	20:1
Response Time	150 ms (95%)
Temperature Accuracy	$\pm 1\%$ of reading or $\pm 1.5^\circ\text{C}$, whichever is greater
Repeatability	$\pm 0.5\%$ of reading or $\pm 1^\circ\text{C}$, whichever is greater
Dimensions	113 mm \times Φ 18 mm or 71 mm \times Φ 18 mm (Length \times Diameter)
Emissivity	Fixed at 0.95 (other values available upon customization)

2.4. Optical Path Diagram



3. Working Principle & Notes

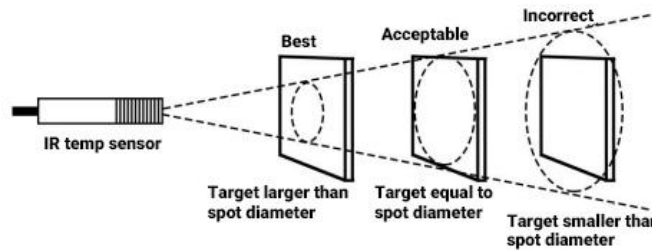
a. Principle of Infrared Temperature Measurement

All objects emit infrared energy, and its intensity varies with the object's temperature. Infrared thermometers

typically detect infrared radiation within the 0.8 μm – 18 μm wavelength range. An infrared temperature sensor is an optoelectronic device that receives infrared radiation and converts it into an electrical signal. After amplification, linearization, and signal processing by electronic circuits, the temperature value is displayed or output.

b. Maximum Distance and Size of Measured Point

The size of the target and the optical characteristics of the infrared thermometer determine the maximum distance between the target and the sensor probe. To avoid measurement errors, the target should fully fill the field of view of the probe. Therefore, the measured spot should always be smaller than the target, or at least the same size as the target.



c. Ambient Temperature

The ABSD-01A Series infrared temperature sensors can operate within an ambient temperature range of 0 – 60° C. Otherwise, a cooling protective sleeve must be selected.

d. Lens Cleaning

The instrument lens must be kept clean to avoid measurement errors or even lens damage caused by contaminants such as dust or smoke. If dust adheres to the lens, wipe it with lens cleaning tissue dampened with anhydrous ethanol.

e. Electromagnetic Interference

To prevent electromagnetic interference, ensure the following measures: Keep the infrared temperature sensor away from electromagnetic field sources (e.g., motors, high-power cables) during installation. Use a metal conduit if necessary.

4. Installation

a. Mechanical Installation

The ABSD-01A Series features a metal housing with M18 × 1 thread, allowing direct installation or mounting via brackets. An adjustable mounting bracket enables easier adjustment of the sensor probe. Ensure the optical path is unobstructed when aligning the target with the probe.

b. Electrical Installation & Wiring

Wire Color		Function
Red		12 - 24V DC Power +
Black		12 - 24V DC Power -
4-20mA Output	Blue	Signal +
	Orange	Signal -
0-5V / 0-10V Output	White	Signal +
	Blue	Signal -
Shielded Wire		Ground
RS485 Output	See RS485 protocol manual for wiring definition	
RS232 Output		

4.1. Wiring Method

Signal Type	Wiring System	Line Color	Wiring Definition
4 - 20mA	Two-wire	Red	24VDC +
		Blue	Current +
	Three-wire	Red	24VDC +
		Black + Orange	24VDC -
		Blue	Current +
	Four-wire	Red	24VDC +
		Black	24VDC -
		Blue	Current +
Orange		Current -	
0 - 5V / 0 - 10V	Three-wire	Red	24VDC +
		Black + Blue	24VDC -
		White	Voltage +
	Four-wire	Red	24VDC +
		Black	24VDC -
		White	Voltage +
		Blue	Voltage -
RS485	Four-wire	Red	24VDC +
		Black	24VDC -
		Green	RS485 A
		White	RS485 B

4.2. Outline Dimensions & Options

