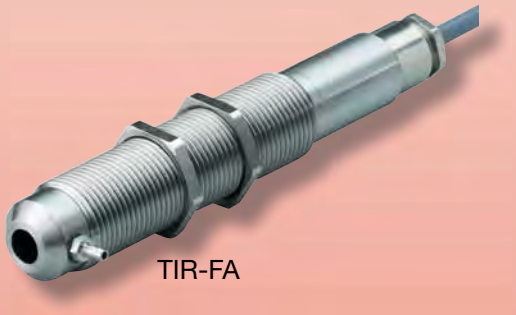
Infrared Thermometers

Stationary

measuring • monitoring • analyzing

TIR-S / TIR-F

TIR-SN



TIR-FA

TIR-FS/TIR-FG

- Measuring Ranges From:
  -20...300 °C to 1100... 2500 °C
  (-4...572 °F to 2012...4532 °F)
- Accuracy:
  0.8% of Reading +1 °C ... 1.5% of Temperature Range
- Output: 4-20 mA, Thermoelectric Voltage Type J, K 10 mV/°C
- Adjustable Emissivity
- Non-contact Temperature Measurement
- Easy to Operate

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Description

The TIR-FA is a stationary infrared sensor for non-contact temperature measurement of non-metallic surfaces and painted, coated, or anodized metals. The small housing enables installation in compact production machines and the solid and rugged design guarantees reliability even in rough industrial environments. With the built-in air purge, the lens can be protected from dust and moisture contamination. These features allow it to be adapted to various measuring tasks. It is an analog measuring device that provides 3 different outputs.

Special Features

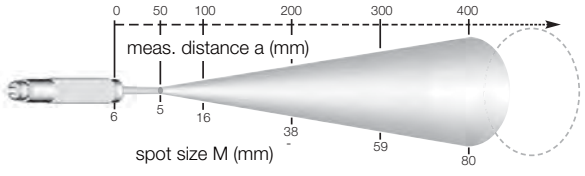
- Built-in Air Purge Unit to Keep the Lens Clean in Dusty Environments
- Easy Installation and Connection
- Stainless Steel Housing with PG 11 Thread for Easy Mounting
- Very Small Housing Dimensions, Suited for Use in Confined Spaces
- Up to 70 °C (158 °F) Operating Temperature without Cooling

Typical Applications

- Plastics
- Textile
- Asphalt
- Rubber
- Paint
- Glass
- Wood
- Varnish
- Ceramic
- Paper
- Liquids
- Food
- Painted Metals
- Coated Metals
- Anodized Metals

Optics

The optics are fixed to a distance of 50 mm. At this distance, it achieves the smallest spot size in relation to the measuring distance. The spot size will be enlarged in any other distance (shorter or longer). Please note that the measuring object must be at least as big as the spot size.

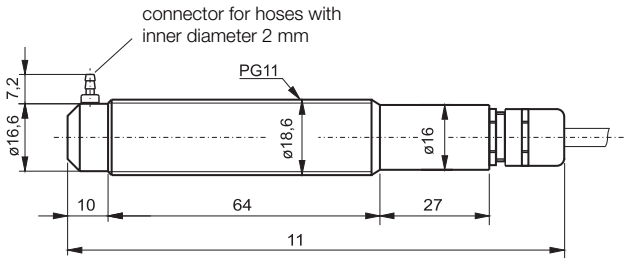


Technical Details

Power Supply:	18…30 VDC
Output:	10 mV/°C or thermocouple model J or K
Load:	Min. 50 kΩ
Emissivity ε:	95% (fixed)
Exposure Time t_{90}:	300 ms
Uncertainty:	1.5% of temperature range or 2.5 °C*
Repeatability:	1% of reading or 1°C*
Noise (NETD, σ =1):	<0.2 °C
Ambient Temp.:	0...70 °C (32...158 °F)
Storage Temp.:	-20...70 °C (-4...158 °F)
Relative Humidity:	No condensing conditions
Housing:	Stainless steel
Weight:	150 g (0.33 lb.)
Mounting Position:	Any
Connection Cable:	1 m (3.3 feet)
Air Purge Unit:	For connecting hose with 2 mm inner diameter
Protection:	IP65 (DIN 40 050)
CE Label:	According to EU directives about electromagnetic immunity

* The larger value is valid

Dimensions (mm)



Order Details (Example: TIR-FA V12)

Measuring Range	Output		
	10 mV/°C	Model J	Model K
0...120 °C (32...248 °F)	**TIR-FA V12**	**TIR-FA J12**	**TIR-FA K12**
0...300 °C (32...572 °F)	**TIR-FA V30**	**TIR-FA J30**	**TIR-FA K30**
100...500 °C (212...932 °F)	**TIR-FA V50**	**TIR-FA J50**	**TIR-FA K50**

Description

The TIR-SN is a stationary pyrometer for non-contact temperature measurement of non-metallic surfaces and painted, coated, or anodized metals. The very small housing enables integration into compact production machines. The 2-wire technique enables very easy electrical connection. The solid and rugged design guarantees high operational safety even in rough industrial environments.

Special Features

- Very Small Housing Dimensions for Easy Installation, Suitable for Use in Confined Spaces
- 2-wire Technique for Current Supply and Temperature Measurement at the Same Time
- Stainless Steel Housing
- Easy Electrical and Mechanical Installation
- Suitable for the Food Industry
- Ambient Temperature up to 70 °C (158 °F) without Cooling

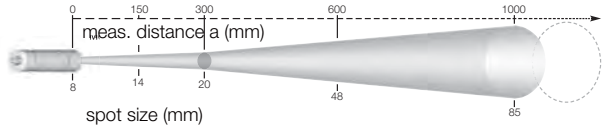
Typical Applications

- Plastics
- Rubber
- Paper
- Ceramics
- Food
- Fluids
- Painted Parts
- Asphalt
- Wood
- Glass
- Coated Metals

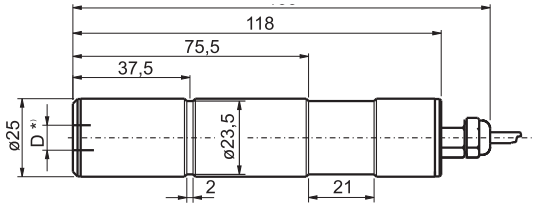
Technical Details

Spectral Range:	8...14 µm
Optics:	Ge lens
Output:	4 ... 20 mA, load independent current, temperature linear
Max Load:	500 Ω bei 24 V power supply
Emissivity ε:	0.4 ...1; adjustable
Response Time t_{90}:	300 ms
Uncertainty:	1,5% of measuring range / °C (ε = 1, TU = 23 °C)
Repeatability:	1% of measuring range
Temp. Dependence:	0... 60 °C: 0.03% of measuring range per °C (23 °C)
Distance Ratio:	15 : 1
Power Supply:	24 V_{DC} ± 25% stabilized, ripple <50 mV
Ambient Temp.:	0...70 °C (32...158 °F)
Storage Temp.:	-20...70 °C (-4...158 °F)
Housing:	Stainless steel
Protection:	IP 65 (DIN 40 050)
Weight:	215 g (0.48 lb.)
Connection Cable:	2 m (6.6 feet) length, fixed
CE Label:	According to EU directives about electromagnetic immunity

Optics



Dimensions (mm)



Order Details (Example: TIR-SN 410G)

Model	Measuring Range	Optics	Infrared Detector	Applications
TIR-SN410..	0... 100 °C (32...212 °F)	**..G** = Optic 300 mm (1:15) (Standard)	Thermopile Spectral Range: 8-14 µm	Plastics, Rubber, Paper, Ceramics, Food, Liquids, Painted Parts, Asphalt, Wood, Glass, Coated Metals, ***No Bright Metal***
TIR-SN420..	0 ...200 °C (32...392 °F)			
TIR-SN430..	-20 ... 300 °C (-4...572 °F)			
TIR-SN450..	0 ... 500 °C (32...932 °F)			

Description

The TIR-FS and TIR-FG are stationary pyrometers for non-contact temperature measurement of metallic surfaces, graphite, ceramics, etc. The very small housing dimensions enable integration into compact production machines. The 2-wire technique ensures very easy electrical connection. The solid and rugged design guarantees reliability, even in rough industrial environments. They are equipped with a connector for electrical installation and this offers the option to use connection cables up to 30 m. For optimal match, 3 different focusable optics with small spot sizes are available.

Special Features

- Very Small Housing Dimensions for Easy Installation, Suited for Use in Confined Spaces
- 2-wire Technique for Current Supply and Temperature Measurement at the Same Time
- Internal Digital Signal Processing for High Accuracy
- High Quality Optics for Detection of Small Measuring Objects
- Built-in LED Targeting Light for Easy Alignment to the Measuring Object

Typical Applications

- Preheating
- Annealing
- Tempering
- Welding
- Forging
- Hardening
- Sintering
- Melting
- Soldering
- Brazing
- Rolling

Technical Details

Spectral Ranges:	TIR-FS	0.8...1.1 µm
	TIR-FG	1.45...1.8 µm
Detector:	TIR-FS	Si photo diode
	TIR-FG	InGaAs photo diode
Output:	4...20 mA, load independent current, linear temperature output	
Max Load:	500 Ω bei 24 V power supply, max. 200 Ω at18 V max. 800 Ω at 30 V	
Emissivity ε:	0.2...1; adjustable	
Response Time t_{90}:	10 ms	
Meas. Uncertainty:	Up to 1500 °C: 0.8% of reading +1°C above 1500 °C: 1% of reading +1°C (ε=1, $T_{umg.}$ =23 °C)	
Repeatability:	0.3% of reading (ε=1, $T_{umg.}$=23 °C)	
Power Supply:	24 V_{DC} ±25% stabilized, ripple <50 mV 5...30 V_{DC} for LED targeting light (I ≤30 mA)	
Sighting:	LED targeting light	
Ambient Temp.:	0...70 °C (32...158 °F)	
Storage Temp.:	-20...70 °C (-4...158 °F)	
Relative Humidity:	No condensing conditions	
Housing:	Stainless steel	
Protection:	IP65 (DIN 40050)	
Mounting Position:	Any	
Weight:	275 g (0.61 lb.)	
Connection Cable:	2 m - 30 m (6.6 - 98.4 feet) length, connection via connector	
CE Label:	According to EU directives about electromagnetic immunity	

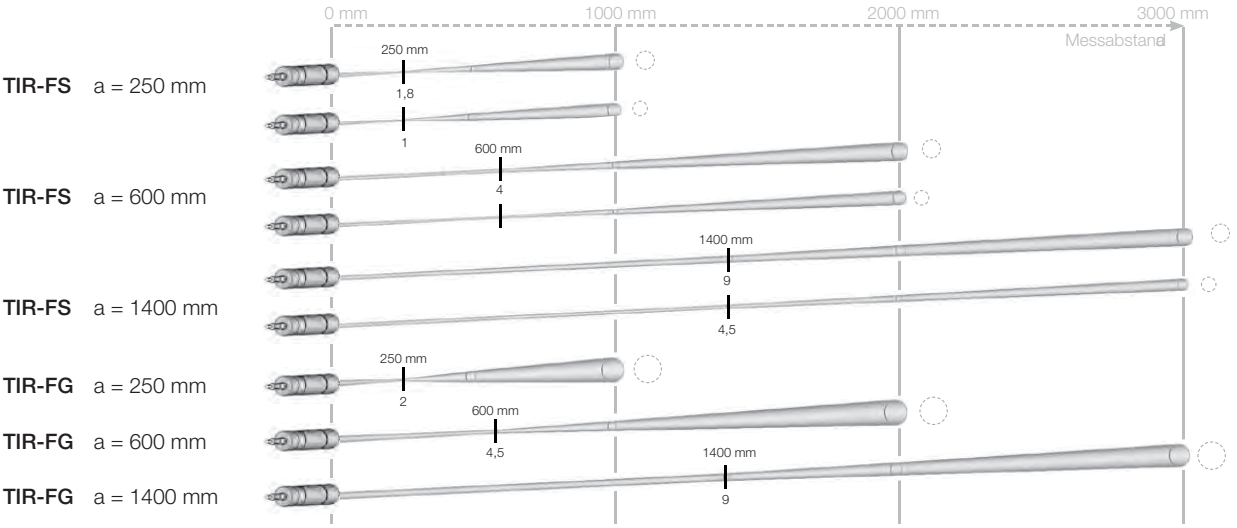
Optics

The pyrometers are equipped with one of the following optics. These optics are fixed to a certain distance, where at these distances each optic achieves its smallest spot size in relation to the measuring distance. The spot size will change in any other distance (shorter or longer). Please note that the measuring object must be at least as big as the spot size.

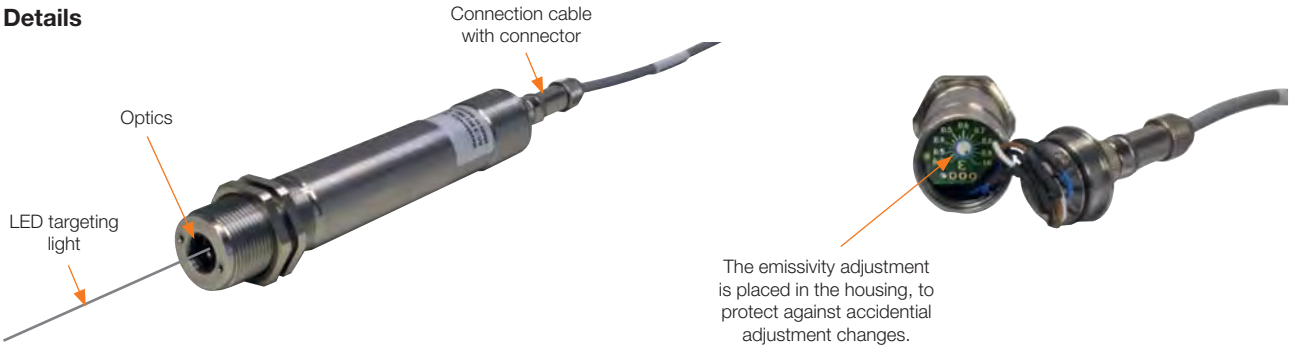
The following table shows the size of the spots (spot size M in mm) at a given measuring distance a. Values between the stated data can be calculated by interpolation. The spot size for measuring distance 0 is equivalent to the aperture diameter D of the optics, this value is used e.g. to calculate measuring distances in intermediate distances.

Model	a: M*	a (mm)	M (mm)	a_1 (mm)	M_1 (mm)	a_2 (mm)	M_2 (mm)	D (mm)
TIR-FS	140 : 1	250	1.8	600	11.6	1000	23	5.2
	250 : 1		1		9.7		20	
	150 : 1	600	4	1000	10.1	2000	26	
	300 : 1		2		6.8		20	
	155 : 1	1400	9	2000	15.1	3000	25	
	310 : 1		4.5		8.7		16	
TIR-FG	125 : 1	250	2	600	17.4	1000	35	9
	135 : 1	600	4.5	1000	13.5	2000	36	
	155 : 1	1400	9	2000	16.8	3000	30	

* a: M; distance ratio (90% intensity), M: spot size, a: measuring distance, D: aperture (effective lens diameter)



Details



Order Details (Example: TIR-FG4T5 H)

Model	Measuring Range	Optics	Infrared Detector	Applications
TIR-FG4T3..	300...1300°C (572...2372 °F)	**..H** = Optic 250 mm **..E** = Optic 600 mm **..K** = Optic 1400 mm	InGaAs-photodiode Spectral Range: 1.45...1.8 µm	Preheating, Annealing, Tempering, Welding, Forging, Hardening, Sintering, Melting, Soldering, Brazing, Rolling
TIR-FG4T5..	500...1500°C (932...2732 °F)			
TIR-FS4T8..	650...1800°C (1202...3272 °F)		Si-photodiode Spectral Range: 0.8...1.1 µm	
TIR-FS4Z3..	800...2300°C (1472...4172 °F)			
TIR-FS4Z5..	1100...2500°C (2012...4532 °F)			

Accessories for Stationary Infrared Measuring Instruments

TIR-ZS100	Adjustable Mounting for Rough Environments. Material: Stainless Steel
TIR-ZS200	Installation and Alignment Support
TIR-ZS300	Installation Tube
TIR-ZS400	Stainless Steel Vent Nozzle to Prevent Dust Depositing on Optics
TIR-ZS500	Bracket for Flange System
TIR-ZS600	Tube Support with Vent Nozzle and Flange
TIR-ZS700	Bracket with Silica Glass Pane for Flange System
TIR-ZS800	Ceramic Tube 600 mm Closed for Flange System, Max. 1600 °C (2912 °F)
TIR-ZS900	Cooling Housing with Integrated Vent Nozzle for Cooling the Infrared Thermometer and Preventing Dust Deposits on Optics. For Connection to Cooling Water Circuit and Compressed Air. Material: Stainless Steel
TIR-ZF610	Connection Cable TIR-FG/TIR-FS, 2 m (6.6 feet)
TIR-ZF620	Connection Cable TIR-FG/TIR-FS, 5 m (16.4 feet)
TIR-ZF630	Connection Cable TIR-FG/TIR-FS, 10 m (32.8 feet)
TIR-ZF640	Connection Cable TIR-FG/TIR-FS, 15 m (49.2 feet)
TIR-ZF650	Connection Cable TIR-FG/TIR-FS, 20 m (65.6 feet)
TIR-ZF660	Connection Cable TIR-FG/TIR-FS, 25 m (82 feet)
TIR-ZF670	Connection Cable TIR-FG/TIR-FS, 30 m (98.4 feet)

Dimensions (mm)