IR*tec* **Rayomatic 100**

eurotron
"Excellence in Measurements"

Fiber Optic Two-Color Temperature Transmitter

INFRARED THERMOMETERS

Monocromatic or 2-color Operations

2-wire, 4-20 mA Transmitter

Temperature Range from 600 to 2700°C

High Optical Resolution

Replaceable Fiber Optic without Recalibration

Smart Microcontroller Technology

Bi-directional RS232 simulltaneous

Windows™ Software for Remote Setup and Datalogging

Integrated Averaging, Peak-Picker and Track&Hold

Programmable Alarm Output with Dual Setpoint

CE

All descriptions are related to a fully optioned instrument. See last page for the different configurations.

General

The Fiber Optic **IRtec Rayomatic 100** ratio thermometer provides maximum performance in high temperature applications, such as metal production, foundries, annealing, glass making, forging, induction heating, kilns, and refractory.

The rugged design steel coated fiber optic cable allows both confined space and high ambient temperature installations.

The instrument use the "2-color" principle, in which the temperature measurement is made simultaneously by two independent detectors with different, but adjacent, narrow band infrared filters. By ratioing the output of these two detectors, the temperature measurement becames independent of a number of factors that during the measurement usually degrade the accuracy of one conventional instrument.

Exceeds the monochromatic application limits

Usually you can use a standard monocromatic thermometer when the hot object being measured fill the target area and no obstruction can interfere with the cone of vision. Same time the application does not allow the Infrared thermometer to work well. For example when the object is smaller than the nominal target; when emissivity changes for gray targets; when dust, vapour, particles are in the field of view; when you measure behind a dirty lens or window.

A ratio thermometer can usually solve these problems. If the energy reduction is lower than 95%, the ratio thermometer can measure better than a monocromatic thermometer.

E-Slope

A two-color thermometer consists of two single-color "brightness" thermometers in the same package. The signals from the two detectors are then processed as a ratio. The calibration curve is based on the ratio of the two signals, which will be very accurate, as long as the partial obstruction or attenuation affects each of the wavelengths by an equal amount. In addition, some applications require adjustments for

"non-gray" behavior of the measured material. A good example is the measurement of molten metals where the emissivity of the material varies with wavelength. Even when a two-color thermometer is used to measure the temperature of some molten metals, the resulting temperature reading may be incorrect because the pre-programmed ratio or "slope" of the two signals is incorrect. To compensate for this type of error, the **IRtec Rayomatic 100** have a user-adjustable "E-slope" feature that allows the user to set the correct emissivity slope for the material being measured. The E-slope control modifies the ratio of the two signals to correct for the unequal spectral emissivities of the target. When measuring a material or alloy type for the first time, the E-slope value is determined by adjusting the E-slope control so that the instrument reading matches the temperature reading from an accurate contact type device. The E-slope value is then known and used for that particular material. Once the E-slope is set, the problems of smoke, steam, dust, and so forth are handled by the instrument.

Innovative design

Eurotron gets over another challenge with the ratio fiber optic **IRtec Rayomatic 100**:

true 2-wire connection (the thermometer is powered by the signal current loop);
no stabilization time at power-on;
bi-directional digital communication superimposed over the 2-wire signal current loop;
flexible, steel coated, fiber optic and small measuring head for high ambient temperature (200°C) and confined space applications.

Report of Calibration

IR*tec* Rayomatic is delivered, with a traceable EA or NIST Report of Calibration stating the nominal, the actual values and the deviation errors.

Bell202/RS232 serial adapter

IRtec Rayomatic temperature transmitters have an integrated Bell202 communication module. This protocol allows to superimpose the digital serial communication over the process 2-wire current loop.

The Eurotron Bell202 to RS232 adapter and software, allows you to set, to program and to test the transmitter using a standard Personal Computer. The adapter allows you 3 different operations:

24Vdc current loop power supply
Bell202/RS232 protocol converter
Bell202/RS232 protocol converter + 24Vdc current loop power supply

Setup & LogMan Software

The IRtec Rayomatic thermometers use the Eurotron "smart" technologies. The instruments have both analogue (4-20 mA) and digital outputs.

The optional RS232 adapter and the Setup Windows™ software allow you the remote thermometer settings. Remote settings includes: E-slope, Emissivity, Response time, and Temperature span. Also advanced internal functions can be programmed as Peak, Valley, Peak-Picker, Average, Track&Hold, Alarms, etc.

The **LogMan** data logger software is developed by Eurotron to graph the temperature versus time and to log data to disk in Excel™ format.
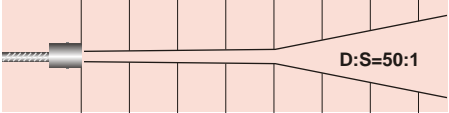
Optics

Target size calculated @ 95% of energy

Distance	0	250	500	1000	1500	mm
Target	11	13	16	20	36	mm

D:S=50:1

Distance	0	10	20	39	59	in.
Target	0.4	0.5	0.6	0.8	1.4	in.

Distance	0	250	650	1000	1500	mm
Target	11	11	10	20	36	mm

D:S=65:1
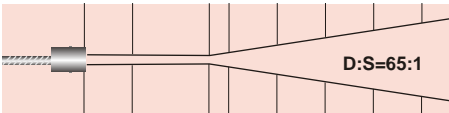
Distance	0	10	20	39	59	in.
Target	0.4	0.4	0.6	0.8	1.4	in.

Distance	0	350	500	1000	1500	mm
Target	11	5	12	20	36	mm

D:S=70:1
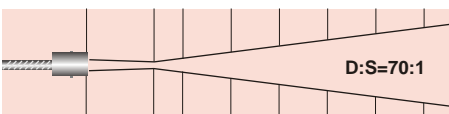
Distance	0	14	20	39	59	in.
Target	0.4	0.2	0.5	0.8	1.4	in.

Distance	0	150	500	1000	1500	mm
Target	11	2	32	76	119	mm

D:S=75:1
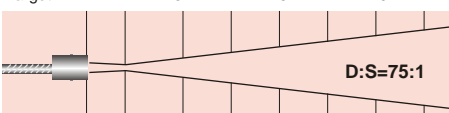
Distance	0	6	20	39	59	in.
Target	0.4	0.1	1.3	3.0	4.7	in.

Distance	0	100	500	1000	1500	mm
Target	11	1	49	109	169	mm

D:S=100:1
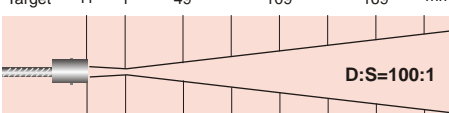
Distance	0	3.9	20	39	59	in.
Target	0.4	0.04	1.9	4.3	6.7	in.

EE290074 Electronic Mounting Support

Specifications

Accuracy: @ 23°C ±5°C and ε=1.0
2-color: ±0.75% FS (with 95% attenuation)
monocromatic: ±0.5% FS
Repeatability:
2-color: ±0.25% FS
monocromatic: ±0.25% FS
Response time: 38ms (t95)
Emissivity (monocromatic)**:**
adjustable by PC from 0.30 to 1.00 in 0.01 increments
E-Slope (2-color)**:**
adjustable by PC from 0.800 to 1.200 in 0.001 increments
Temperature drift:
<±0.05 % rdg./°C for the band exceeding +18 to +28°C
Digital communication:
Built-in Bell202 superimposed over the 2-wire current loop
RS232 with optional adapter
Signal Processing:
Average, Peak, Valley, Peak-Picker, Valley-Picker, Track&Hold, Alarms
Output signal:
4/20 mA 2-wire current loop
max load 700 Ω
Environmental rating:
IP65 (NEMA-4)
Power supply: from 12 to 32 Vdc
Storage temperature:
from -30 to +70 °C
Operating temperature:
optical head: 200 °C max
fiber optic: 200 °C max
electronic module: from -20 to +60 °C
Dimensions:
electronic module ø 45 mm x 175 mm - M44x1.5
fiber optic ø 8 mm
optical head ø 16 mm x 52 mm (Fast-Lock)
Weight:
electronic module 500g

Fast Lock Optical Head

Electronics Housing

Ordering Code

Table A   Range
1	600 to 1600°C *(1100 to 2900°F)*
2	800 to 2000°C *(1470 to 3630°F)*
3	1000 to 2200°C *(1830 to 4000°F)*
4	1500 to 2700°C *(2700 to 4900°F)*

Table B   Signal output
2	4-20mA linear

Table C   Fiber Optic Length
1	1 m
2	3,5 m
3	6 m
4	8 m
9	special length

Table D   Target - Distance (D:S ratio)
1	20mm OD @ 1000mm (50:1)
2	10mm OD @ 650mm (65:1)
3	5mm OD @ 350mm (70:1)
4	2mm OD @ 150mm (75:1)
5	1mm OD @ 100mm (100:1)

Table E   Electrical connection
1	2m - 6 wire standard shielded cable
4	2m - 6 wire High temperature (200°C) shielded cable
9	special length shielded cable

Table F   Calibration Certificate
1	Eurotron Traceable Certificate

Fast Lock to ½"BSPM Head Adapter
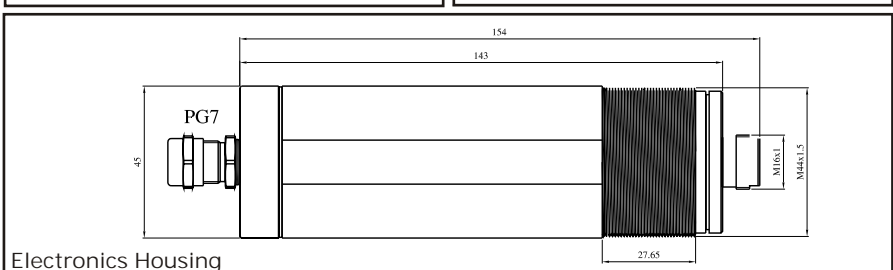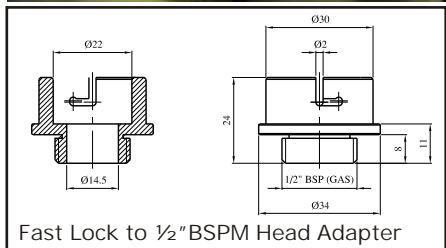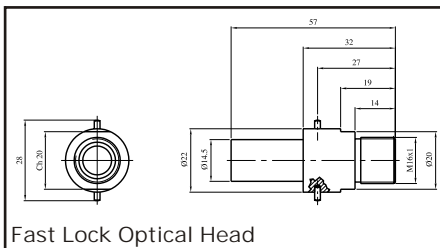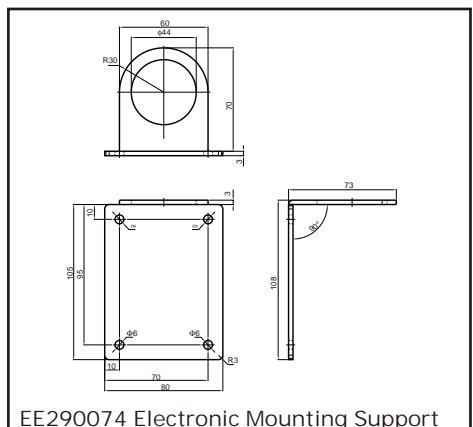
IR*tec* **Rayomatic 100**
Fiber Optic Ratio Thermometer

INFRARED THERMOMETERS

Accessories

ELECTRONIC MODULE	FIBER OPTIC	OPTICAL HEAD	AIR PURGE	FLANGE	SIGHTING TUBE

Diagram contents:

ELECTRONIC MODULE
IRtec Rayomatic 100
EE 290074

FIBER OPTIC
FIBER OPTIC
EE360xxx : L=1 m
EE360114 : L=3.5 m
EE360115 : L=6 m
EE360116 : L=8 m

OPTICAL HEAD
OPTICAL HEAD
EE298095 OPTICAL HEAD F1000
EE298101 OPTICAL HEAD F650
EE298102 OPTICAL HEAD F350
EE298103 OPTICAL HEAD F150
EE298104 OPTICAL HEAD F100

AIR PURGE
EE290046 AIR PURGE
EE290060 COMPACT AIR PURGE

FLANGE
EE 280113 — 3/4" BSPP AISI 304 — 1" 1/2 BSPP
EE 280223 — 3/4" BSPP AISI316 — 1" 1/2 BSPP
EE 280292 — 1" 1/4 BSPP AISI304 — 1" 1/2 BSPP
EE 280115 — FORO PASSANTE THROUGH HOLE AISI 304
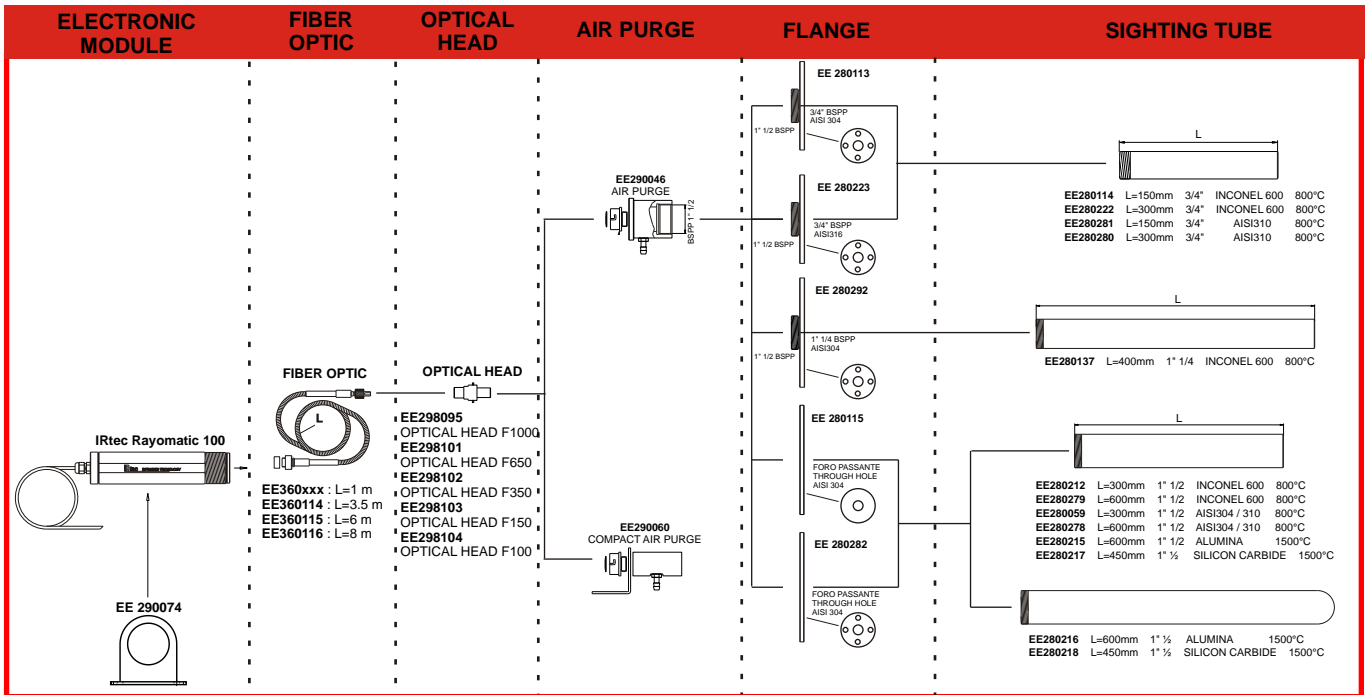EE 280282 — FORO PASSANTE THROUGH HOLE AISI 304

SIGHTING TUBE

Code	L	Size	Material	Temp
EE280114	L=150mm	3/4"	INCONEL 600	800°C
EE280222	L=300mm	3/4"	INCONEL 600	800°C
EE280281	L=150mm	3/4"	AISI310	800°C
EE280280	L=300mm	3/4"	AISI310	800°C
EE280137	L=400mm	1" 1/4	INCONEL 600	800°C
EE280212	L=300mm	1" 1/2	INCONEL 600	800°C
EE280279	L=600mm	1" 1/2	INCONEL 600	800°C
EE280059	L=300mm	1" 1/2	AISI304 / 310	800°C
EE280278	L=600mm	1" 1/2	AISI304 / 310	800°C
EE280215	L=600mm	1" 1/2	ALUMINA	1500°C
EE280217	L=450mm	1" ½	SILICON CARBIDE	1500°C
EE280216	L=600mm	1" ½	ALUMINA	1500°C
EE280218	L=450mm	1" ½	SILICON CARBIDE	1500°C

DigiMax II - Standard Indicator 1/8 DIN

48x96 mm, 4 digits, 15mm wide, green LEDs
Programmable universal input (Tc, RTD, mV, 4-20 mA)
18Vdc for transmitter P.S.
Up to 4 alarms with relays
4/20 mA analog output
RS485 serial interface

DigiMax VR18 - Videographic Recorder

Programmable universal input (Tc, RTD, mV, 4-20 mA)
18Vdc board for transmitter P.S.
Up to 18 analogue inputs
Ethernet, RS232, RS485 serial interface

DigiMax III - Compact Indicator 1/32 DIN

48x24 mm, 4 digits, 10mm wide, green LEDs
Programmable universal input (Tc, RTD, mV, 4-20mA)
18Vdc for transmitter P.S.
Alarm with relay
4/20 mA analog output
RS485 serial interface
PID output

Accessories

BB530200	BELL202/RS232 adapter cable for PC
BB260195	Rayomatic 100 **Setup** software
BB260196	Rayomatic 100 **LogMan** software
4820	Single 24Vdc rail mounting power supply
4822	Dual 24Vdc rail mounting power supply

Specifications may change without notice.

ISO 9001 GASTEC

eurotron
"Excellence in Measurements"

Distributed by: