HUKX

Sensor
Technology

Brochure

Pyrgeometer with heater and 4–20 mA transmitter

IR02-TR

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Pyrgeometer with heater
and 4–20 mA transmitter

IR02-TR is a pyrgeometer suitable for longwave irradiance measurement in meteorological applications. The instrument can be heated, which improves measurement accuracy by mitigating dew and frost deposition on its window. IR02 houses a 4–20 mA transmitter for easy read-out by commonly used data loggers.

IR02-TR measures the longwave or far-infrared radiation (FIR) received by a plane surface, in W/m^2, from a field of view angle of approximately 150 °. Longwave radiation is the portion of atmospheric radiation that is not emitted by the sun.

While the actual field of view angle is not the ideal 180 °, the reduction makes it possible to offer IR02 at an attractive price level with only a minor loss in accuracy. IR02 has a window with a cut-on at 4.5×10^{-6} m, making it suitable for both day and night observations.

Figure 1 IR02-TR pyrgeometer with heater and 4–20 mA transmitter.

- basic pyrgeometer
- with heating
- 4-20 mA output

Operation

Using IR02-TR is easy. It connects directly to commonly used data logging systems. The irradiance in W/m² is calculated by using the transmitter's output and temperature reading. The final result is calculated by taking into account the irradiance radiated by the sensor itself (Stefan-Boltzmann law). In IR02-TR's standard configuration, the 4 to 20 mA output corresponds to a transmitted range of -300 to +100 W/m², which can be adjusted at the factory upon request.

Suggested use

– general meteorological observations
– climatological networks
– agricultural warning networks (frost)

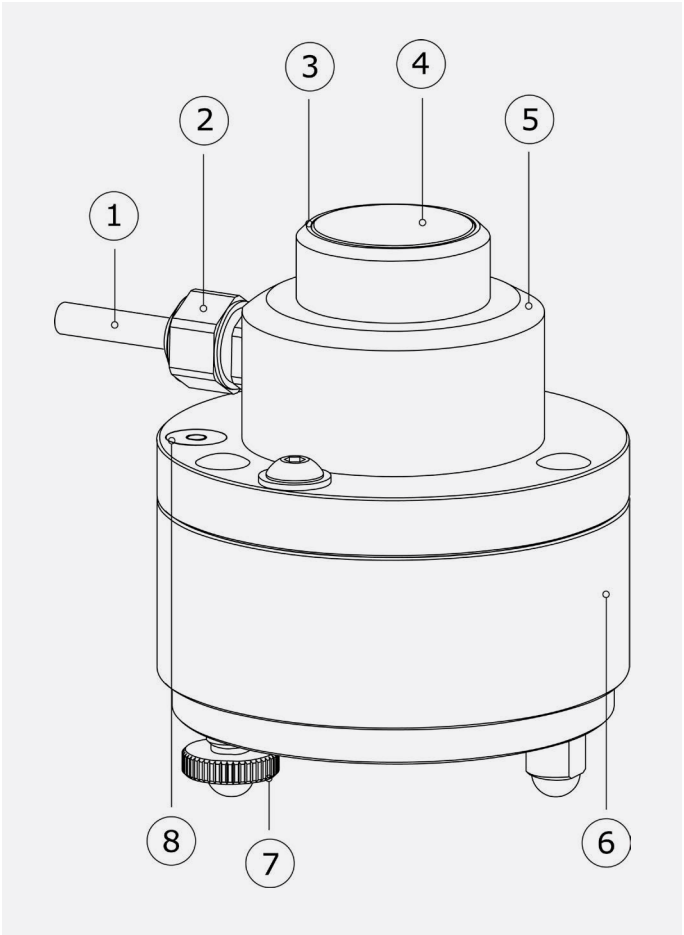

Figure 2 Overview of IR02-TR:

1. cable
2. cable gland
3. window with solar blind filter
4. sensor (below window)
5. sensor body
6. transmitter housing
7. leveling feet
8. bubble level

Figure 3 IR02-TR with heater and 4–20 mA transmitter.

IR02-TR design

IR02-TR employs a thermal sensor with black coating, a flat silicon window with a solar-blind filter, and an anodized aluminum body. Its built-in on-board heater prevents condensation on the pyrgeometer window, which can otherwise cause significant measurement errors.

Standards

Calibration of pyrgeometers used for downward longwave radiation is traceable to the World Infrared Standard Group (WISG). This calibration accounts for the spectral properties of downward longwave radiation

Options

– longer cable, in multiples of 5 m
– adapted transmitted range
– IR02 version without a transmitter

See also

– alternative instrument: research-grade pyrgeometer model IR20 for higher accuracy longwave radiation measurements
– Pyrgeometers are often used in combination with pyranometers for solar radiation (shortwave) measurement. View our complete product range of solar sensors.

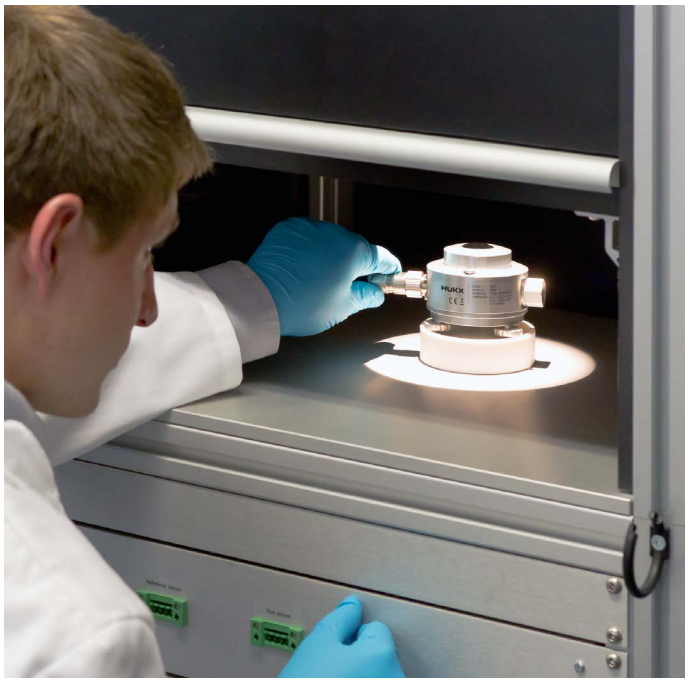

Figure 4 Pyrgeometer during conformity assessment.

IR02-TR specifications

General specifications

measurand	longwave radiation
optional measurand	sky temperature
optional measurand	surface temperature
output	4 to 20 mA
principle	2-wire current loop
spectral range IR02-TR	4.5 to 40 x 10^{-6} m
field of view angle	150 °
response time (95 %)	18 s
rated operating temperature range	-40 to +80 °C
transmitted range	-300 to 1000 W/m^2
temperature dependence	< ± 3 % (-10 to +40 °C)
calibration traceability	to WISG
optional traceability	to blackbody (ITS-90)
heater	12 VDC, 1.5 W
temperature sensor	Pt100
standard cable length	5 m

About Hukx

Hukx is the leading innovator in solar radiation and heat flux sensor technology. We are proud to set the standard in high-accuracy measurement, and to be working at the heart of the energy transition.

Customers worldwide rely on our bestselling pyranometers and heat flux sensors. From sensor design and selection to supply and recalibration, we support you across the entire lifecycle.

Hukx is headquartered in the Netherlands, with locally owned representative sales offices in the USA, Brazil, India, China, Southeast Asia, and Japan.

Let us help you select the best sensor for your application.
Get in touch with our experts today via: info@hukx.com

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