

2031 Panelmeter for IR-sensors

- Thermocouple K IR-sensors
- Pt100 and process inputs also available
- Linearisation in the range -45..650°C
- Emissivity adjustable in the range 0,05..1,0
- Galvanically isolated output 0/4..20 mA, 0..10 V
- 2-4 alarm relays
- Serial output RS-485 and RS-232
- Wide power supply range 85..240 VAC or 12..32 VDC/ 24 VAC
- Front panel protection IP65



The panelmeter 2031 is designed for thermocouple-type infrared sensors. The low-cost thermocouple-type IR-sensors are linearised for two ranges -45..+350 °C and -30..+650 °C. The emissivity value is easy to adjust in the range 0,1 .. 1,0 via front panel keys. Adjustment of the emissivity value is important, as the surface material of the target determines how much IR-radiation the object emits and the correction is done with the emissivity value. Emissivities vary a lot according to the targets to be measured, for instance for painted surfaces, concrete and water the value is typically 0,8..0,9, whereas for metallic surfaces the variation is wide, 0,05..0,9, depending on how polished and shiny the metal is.

High emissivity values provide a more accurate measurement than low emissivity values (e.g. shiny metals). In practice the emissivity value is determined by measuring the temperature of the object with a reference indicator using e.g. Pt100 or thermocouple, and adjusting the emissivity value until the the panelmeter displays the correct temperature. The panelmeter itself includes a Pt100 input which can be used in the reference measurement, if necessary, and the IR-sensor can be connected afterwards. In the selection of the sensor type, the

size of the measurement spot and the distance of the sensor from the target also have to be taken into account.

There are several optional cards available for the panelmeter: alarms, a galvanically isolated output and serial output RS-485 or RS-232. Optional cards can easily be added on afterwards as well.

The panelmeter series 2000 is very flexible and easy to modify by changing input cards for different kinds of sensors, such as temperature sensors, pulse sensors, serial inputs etc. The modification does not require any calibration. The optional cards are the same for all the instruments in this product family. Each panelmeter type has its own datasheet.

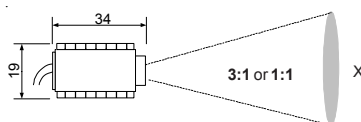
The display can be damped by a digital filter. Separate passwords may be set for access to the alarms and configuration menu. Min. and max. values are indicated by the front panel signal lights. Brightness of the display may be adjusted. Front panel rating is IP65. There are two power supply alternatives: one for line voltage 85..240 VAC and the other 12..32 VDC or 24 VAC.

Typical thermopile infrared sensors

IRT/c.01-K-140F (3:1)
IRT/c.03-K-140F (1:1)



Low-cost ABS-sensor



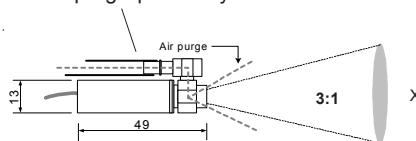
Model IRT/c.01-K-140F

Dimensions	32,5 mm x ø20 mm
Case material	ABS-plastic, cable PVC
Field of view	1:1 (60°) tai 3:1(17°)
Min. measurement spot	8 mm
Temperature range	-45..290°C
Ambient temperature	-18..70°C
Response time 95%	0,1 seconds on average

IRT/c.3X-K-140F



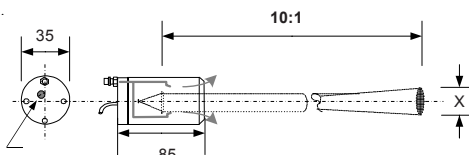
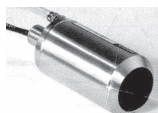
Air purge possibility



Model IRT/c.3X-K-140F

Dimensions	45 mm x ø 13 mm
Case material	stainless steel, cable 1 m
Field of view	3:1 (17°)
Min. measurement spot	6 mm
Temperature range	-45..650°C
Ambient temperature	-18..120°C; >70°C with air purge

IRT/c.10A-HiE



Model IRT/c.10A-HiE or IRT/c.10A-LoE

Dimensions	85 mm x ø35 mm
Field of view	10:1 (~6°)
Min. measurement spot	20 mm from a distance of 200 mm (10:1)
Temperature range	other than metals (Hi E) 45..1370°C; metals, ε < 0,4 (Lo E) 260..1370°C
Ambient temperature	-18..+200°C >100°C with air purge
Connection cable	Teflon insulated (max. 200°C), length 1m

Technical specifications:

IR-sensor inputs:

Sensor type	Thermocouple
Linearised temp. range	-45..+650 °C (K-140F, K-440F)
Accuracy	0,2 % FS
Cold junction compensation	0,05 °C /°C
Line resistance effect	<10kΩ, no effect
Emissivity	0,05..1,0

The specifications do not include the inaccuracy caused by the sensor.

Sensor selection:

Thermocouple **- K-140F, linearised temperature range -30..+340°C for targets where the ambient temperature is low <60°C.
 Thermocouple **-K-440F, linearised temperature range -40..+650°C for targets where the ambient temperature is high 70..125°C
 **= the sensor type is selected on the basis of the mechanical structure

Other thermopile sensor types:

Thermocouple-sensors K, separate datasheets
 Adjustable sensors a separate datasheet on sensors
 These sensor types have narrower temperature ranges, the details of which can be found in the separate datasheets.

PT100 or process inputs:

RTD-sensors and process inputs are also available in the menu.
 One sensor input type can be selected at a time.

RTD-sensors:

Measurement range	Pt100 3- and 4-wire, (Pt1000, Ni100)
Measuring current	-200..+700°C (Pt100)
Accuracy	0,3 mA
Linearity error	0,05 % FS
Input resistance	< 0,07°C (-200..700°C)
	<10 kΩ, no effect

Process inputs:

Display scaling	0/4..20 mA, 0.5/10 V, -10..+10 V
Input resistance	on the whole range (-99999..999999)
Accuracy	current input 50 Ω and voltage input >1MΩ
Linearity	0,02 % FS
Supply for transmitter	0,007 % FS
	24 VDC, max. 150 mA

Options:

Output:

0/4..20 mA, max. load 700 Ω
 or 0..10V, linearity 0,02 %
 scaleable on the whole display range

Alarms:

2 to 4 alarms, relays max. 240 V, 2 A
 hysteresis selectable 0..100%,
 automatic or manual reset, reversible function
 RS-232 and RS-485

Serial output:

serial output only for measurement reading;
 address and baudrate selectable

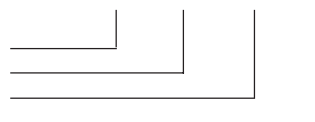
General:

Display	6-digit, bright red (or green)LED, height 14,5 mm, brightness selectable
Input filter	digital, freely adjustable
AD-converter	16 bits (1/64 000), uni-or bipolar
Temperature effect	0,0004 %/°C with voltage inputs
Operating temperature	-10..+60 °C
Front panel signal lights	alarms 1-4, min. and max. level removable, wire 2,5 mm ²
Terminals	85..240 VAC or 12..32 VDC/ 24VAC
Power supply	IP65 with a rubber gasket
Front panel protection	96 x 48 x 110 mm (without the terminals)
Dimensions	240 g
Weight	

How to order:

2031-OUT-REL2-24VDC

Input card
 Output card
 Relay card
 Power supply
 12..32 VDC, 24VAC



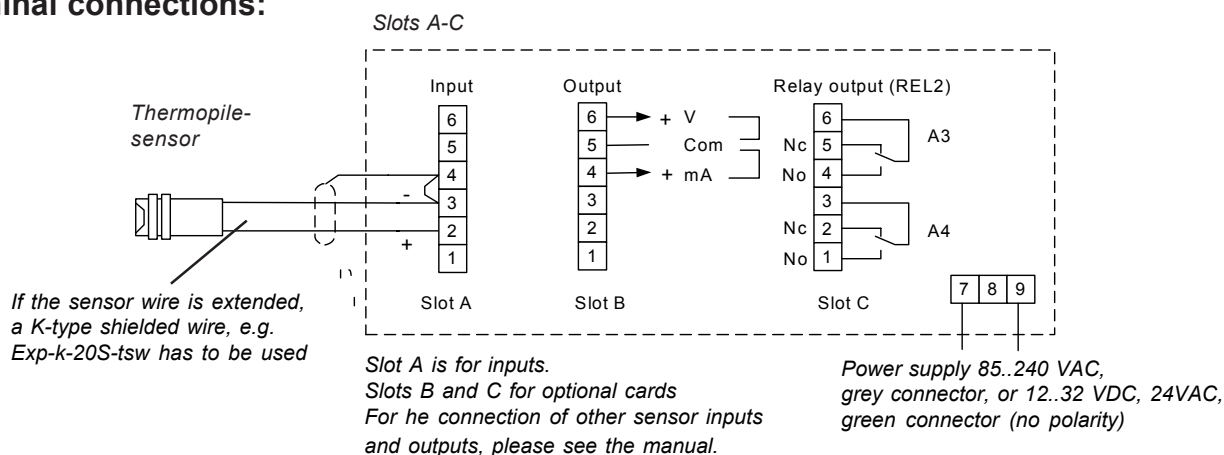
Optional cards (2 options possible at a time):

Output card	2000-OUT
Relay card, 2 alarms	2000-REL2
Serial output card RS-232/485	2000-RS

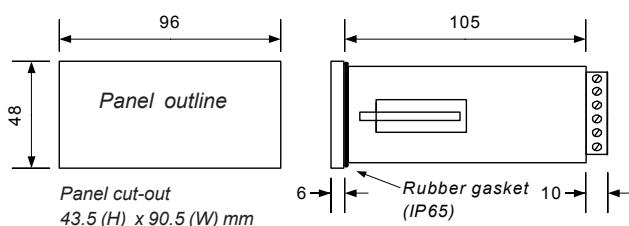
(When ordering a panelmeter, the "2000" of the cards is left out.)

The panelmeter is also available with a green LED display: please specify 2031GR in the order code.

Terminal connections:



Dimensions:



Structure of the panelmeter series 2000

Changing cards is fast and simple without any tools

