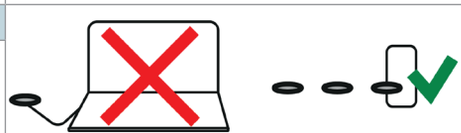
Universal hat rail transmitter RTD/TC IPAQ-R330

Article number: 809700 2901

The IPAQ R330 for resistance sensors and thermocouples is a head transmitter for installa tion in resistance thermometers with connection heads in DIN B or larger. The sophisticate product design leaves sufficient space for mounting. It is optimally designed for use in pla and machine construction and is characterized by high accuracy, reliability, long-term stal lity and its robust product design. The transmitter is extremely insensitive to external influe ces such as vibration and EMC interference. Installation and commissioning are particular user-friendly. For example, parameterization can be carried out wirelessly, conveniently ar easily via the cell phone app using NFC technology. The monitoring functions such as sen break monitoring, sensor short-circuit and measuring range monitoring can also be activa via this.

Special features	
Inputs and outputs	**Parametrization**
Input: various resistance sensors and thermocouples Output: 4 to 20mA, temperature linear output signal	Configuration - wireless via NFC technology Free app for Iphone, Android & Huawei Parameterization templates for fast mass configuration
Accuracy and Long-term stability	
Accuracy: depending on temperature sensor / thermocouple Long-term stability Maximum ±0.02 °C or ±0.02 % of span per year	
Design	**Alarm function**
Robust - vibration and shock resistant design Suitable for hat rails according to DIN EN50022 Compact housing design Facilitated mounting	configurable via app Sensor break monitoring Sensor short circuit Measuring range monitoring

Input Universal hat rail transmitter RTD/TC IPAQ-R330				
Resistance sensors				
Measuring element	**Norm**	**Maximum configurable measuring range**	**Min. Span**	**Accuracy**
Pt100	IEC 60751 | a=0,00385 JIS C 1604 | a=0,003916	-200 °C to +850 °C | -328 °F to +1562 °F	10 °C | 50 °F	±0,08 °C| ±0,08 % [2]
Pt X (10<X<1000)	IEC 60751 | a=0,00385	Corresp. to max. 4000 Ω	10 °C | 50 °F	±0,1 °C| ±0,1 % [2]
NI100	DIN 43760	-60 °C to +250 °C | -76 °F to +482 °F	10 °C | 50 °F	±0,1 °C| ±0,1 % [2]
NI120	Edison Curve No. 7	-60 °C to +250 °C | -76 °F to +482 °F	10 °C | 50 °F	±0,1 °C| ±0,1 % [2]
Ni1000 [1]	DIN 43760		10 °C | 50 °F	±0,1 °C| ±0,1 % [2]
Cu10	Edison Copper Windings No.15	-50 °C to +200 °C | -58 °F to +392 °F	83 °C | 181,4 °F	±1,5 °C| ±0,2 % [2]
Temperature influence ±0.01 % of span per °C | [1] Ni1000 ±0.02 % at 2-wire > 2000 Ω of span per °C | [2] of span				
Connectinon type		2-, 3- and 4-Wire		
Sensor current		≤ 300 µA		
Max. wire loop resistance		2-Wire: Compensation for 0 to 40 Ω loop resistance 3-, 4-wire: 50 Ω | wire		
Resistivity		Adjustable in the APP		

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Input Thermocouple					
Measuring element	**Material / Raw Material**	**Norm**	**Maximum configurable measuring range**	**Min. Span**	**Accuracy**
Type B	Pt30Rh-Pt6Rh	IEC 60584	-400 °C to +1800 °C | -688 °F to +3272 °F	+700 °C | +1292 °F	±1 °C| ±0,1 % [1)]
Type C	W5-Re	ASTM E 988	0 °C to +2315 °C | +32 °F to +4199 °F	+200 °C | +392 °F	±1 °C| ±0,1 % [1)]
Type D	W3-Re	ASTM E 988	0 °C to +2315 °C | +32 °F to +4199 °F	+200 °C | +392 °F	±1 °C| ±0,1 % [1)]
Type E	NiCr-CuNi	IEC 60584	-200 °C to +1000 °C | -328 °F to +1832 °F	+50 °C | +122 °F	±0,5 °C| ±0,1 % [1)]
Type J	Fe-CuNi	IEC 60584	-200 °C to +1000 °C | -328 °F to +1832 °F	+50 °C | +122 °F	±0,5 °C| ±0,1 % [1)]
Type K	NiCr-Ni	IEC 60584	-200 °C to +1350 °C | -328 °F to +2462 °F	+50 °C | +122 °F	±0,5 °C| ±0,1 % [1)]
Type N	NiCrSi-NiSi	IEC 60584	-100 °C to +1300 °C | -148 °F to +2372 °F	+100 °C | +212 °F	±0,5 °C| ±0,1 % [1)]
Type N	NiCrSi-NiSi	IEC 60584	-250 °C to -100 °C | -418 °F to +148 °F	±1 °C | ±1 °F	±0,5 °C| ±0,1 % [1)]
Type R	Pt13Rh-Pt	IEC 60584	-50 °C to +1750 °C | -58 °F to +3182 °F	+100 °C | +212 °F	±1 °C| ±0,1 % [1)]
Type S	Pt10Rh-Pt	IEC 60584	-50 °C to +1750 °C | -58 °F to +3182 °F	+300 °C | +572 °F	±1 °C| ±0,1 % [1)]
Type T	Cu-CuNi	IEC 60584	-200 °C to +400 °C | -328 °F to +752 °F	+50 °C | +122 °F	±0,5 °C| ±0,1 % [1)]
Temperature influence ±0.01 % of span per °C | [1)] of span (cold junction compensation error is not included)					
Input impedance	>10 MΩ				
Max. wire loop resistance	500 Ω (incl. thermocouple)				
Cold Junction Compensation	Internal or external				

Additional inputs			
Resistance | Potentiometer		**Voltage input**	
Resistance range (Ω)	0 to 10000	Voltage range (mV)	-10 to +1000
Potentiometer range (Ω)	100 to 10000		
Minimum span (Ω)	10	Minimum span (mV)	2
Customized linearization	Due to 50 points	Customized linearization	Due to 50 points
Sensor current (µA)	<300	Input impedance	> 10
Max. wire resistance (Ω)	20 | wire	wire loop resistance	500

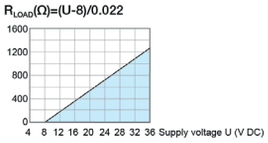
General information about the input	
Zero adjustment	Within measuring range
Max. offset adjustment	50% of selected max value

Output	
Output type	analog, temperature linear for RTD & TC
Output signal (mA)	4 to 20; 20 to 4
Parametrization / Scaling	Configurable via NFC
Resolution	0,4
Measurment accuracy	1
Load	750 Ω at 24 VDC
Connection type	2-wire

Output load diagram

Standard version

$R_{LOAD}(\Omega)=(U-8)/0.022$



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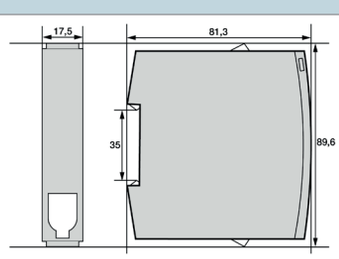
Time response	
Closing time / Update time (Inor)	~150 - 300
Heating period	The specified accuracy is reached after max. 4 minutes
Signal attenuation / Ajustable output filtering (Inor)	0,15 to 75 adjustable via App
Measuring cycle	< 1
Sensor monitoring & sensor error	
Sensor break / Short circuit	Upscale (≥21.0 mA) or Downscale (≤3.6 mA)
Sensor failure effects (Inor)	according to NAMUR NE43

Accuracy and stability	
Typical accuracy	
RTD and Thermocouples	See table below
Resistance accuracy (digital) [1]	0-1000 Ω: Max. ±40 mΩ or ±0,040 % of span | 1000-10000 Ω: ±0,05 % or max. 1 Ω of span
Resistance accuracy (analog) [1]	±0.06 % of span
Voltage accuracy (digital) [1]	±5 µV or ±0.02 % of span
Voltage accuracy (analog) [1]	±0.06 % of span
Temperature influence ±0.01 % of span per °C | [1] Total accuracy = Sum of digital and analog accuracy, calculated as an RMS (Root Mean Square) value	
Temperature influence	
RTD and Thermocouples	see table below
Resistance	±0,01 % < 4000 Ω [2] < ±0,02 % of span per °C
Voltage	±0,01 % of span per °C
Temperature influence ±0.01 % of span per °C | [2] 2000 Ω at 2-wire	
Cold junction compensation	
Cold Junction Compensation	±0,5 °C within ambient temperature -40 °C to +85 °C
Temperature influence	±0,01 °C per °C
Influence of the sensor cable	
RTD and resistance (2-wire)	Adjustable wire resistance compensation
RTD and resistance (3-wire)	Negligible, with equal wire resistance
RTD and resistance (4-wire)	Negligible
Thermocouples and Voltage	Negligible
Further data	
Supply voltage influence	Within specified limits <±0,005 % of span per V
Long-term drift	Max of ±0,02 °C or ±0,02 % of span per year

Type		
Dimensions	See drawing	
Material | Flammability	PC/ABS + PA, V0/HB, RoHS compliant	
Mounting	DIN B-head or larger, DIN rail (with mounting kit)	
Connection	Single wires, max. 1,5 mm², AWG 16	
Weight	35	
General data		
Isolation	1500 VAC, 1 min	
Supply Voltage (VDC)	8 to 36, polarity protected	All dimensions in mm

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Ambient conditions				
Ambient Temperatur	Storage	-40 °C to +85 °C | -40 °F to +185 °F	Operating	-40 °C to +85 °C | -40 °F to +185 °F
Humidity	0 to 98 (non-condensing)			
Protection	Housing IP65		Anschlussklemmen IP00	
Vibration	according to IEC 60068-2-6, Test Fc, 10bis2000 Hz, 10 g			
Shock	according to IEC-60068-2-27, test Ea			
Environmental influences	according to IEC 60068-2-31:2008, Test Ec			
EMC				
Standard	Directive: 2014/30/EU | Harmonized standards: EN 61326-1, EN 61326-2-3 | NAMUR NE 21			
Immunity performance	EN61326-1 and -2-3: Criteria A | NE 21: <0,5% of span			

Factory configuration (if not ordered otherwise)			
Input	Pt100, 3-wire, 0 °C to 100 °C	Output (mA)	4 to 20
Sensor control	Upscale (≥21.0 mA)		

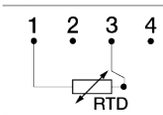
Delivery

Transmitter, Instruction manual, individually packed in PE bag

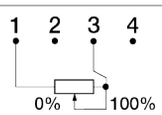
Matching accessories		
Picture	Designation	Order no.
	DIN rail power supply	On request
	Table power supply	On request
	Connection head mounting set	On request
	DIN rail adapter and screws (10 pcs.)	On request

Commissioning

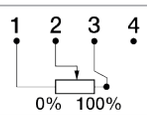
Input



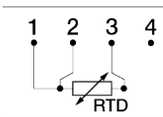
RTD - 2-wire



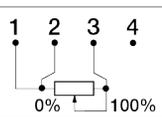
Resistor - 2-wire



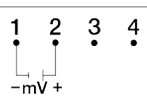
Potentiometer - 3-wire



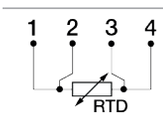
RTD - 3-wire



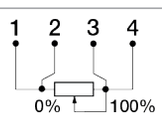
Resistor - 3-wire



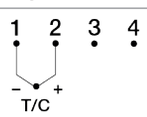
Voltage - mV



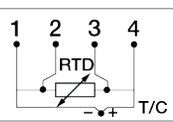
RTD - 4-wire



Resistor - 3-wire

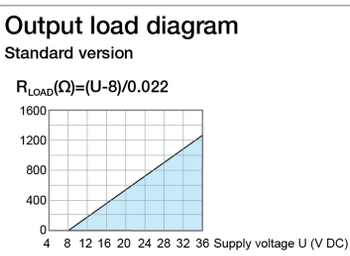


Thermocouple

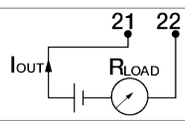


RTD & Thermocouple (RTD also forremote CJC)

Output



Supply voltage V DC



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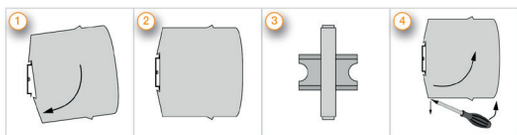
Mounting

You can easily mount the APAQ R330 hat rail transmitter on 35mm hat rails according to DIN EN50022. The mounting is easy because you can fix the transmitter on the rail without any tools.
Mounting material for the installation of the transmitter is available as accessory.
Important: To prevent measuring errors, the connecting screws for fastening the connecting cable must be tightened firmly.



Mounting and dismounting of the transmitter
(1) Fix the upper part of the transmitter on the rail
(2) Then press the lower part of the transmitter onto the rail. The electrical connection is made according to the wiring diagram
(4) To remove the transmitter, use a screwdriver and bend the latch downwards

Configuration | Parametrization

Massenparametrierung & Einstellungs-Templates

Before making a configuration of APAQ C130TC you need to do following:
Make sure that you have a mobile device with NFC communication activated.
Download the app INOR Connect to your mobile device.

Required versions:
iOS: iOS 13 or later and Iphone 7 or later Android: Android 4.4 or later

Configuration procedure
Launch the app by clicking on the App icon or holding your mobile device against the transmitter on the part of the device where NFC is located (only possible with Android). Click on “Read Configuration” and hold your mobile device against the transmitter as explained in the first section.
In the app you can edit the following:
Sensor type and number of wire circuits
Measuring range
Upscale or Downscale
sensor control
TAG-number
Password settings
In the configuration window you can enter and change the parameters. The selected configuration is transferred to the transmitter by clicking the "Send to transmitter" button. After the transfer is completed, the transmitter uses the new parameters.

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