



APAQ-H

Multirange 2-wire In-head Temperature Transmitters

Actual size

APAQ-H is a family of multirange 2-wire temperature transmitters for in-head mounting in DIN B or larger connection heads.

Designed for highest reliability and cost-efficiently manufactured, APAQ-H represents a family of transmitters that combine attractive pricing with high quality and excellent industrial performance.



Main features

Multirange design

- APAQ-HRF for Pt100 input with selectable measurement ranges.
- APAQ-HCF for T/C J, L, T, K and N inputs with continuous range adjustment.

Accurate measurements

- Temperature linear 4-20 mA output for Pt100 input.

Easy mounting and access

- Flat design gives easy access to terminals and adjustments.
- Large center hole lets the lead wires or an insert tube pass easily.

Safety

- Genuine sensor break detection with selectable action, upscale or downscale.
- Excellent EMC performance.

High load capacity

- Only 6.5 V voltage drop over the transmitter allows for high loads.

Competitive pricing

5 year limited warranty

Description

APAQ-H is a family of analog, 2-wire, in-head transmitters with selectable ranges for Pt100 and selectable types and ranges for thermocouple input.

The "Low Profile" housing, with its protected electronics, is extremely durable and facilitates easy connections and adjustments.

APAQ-HRF is adjustable for different Pt100 ranges in both °C and °F and provides a temperature linear output.

APAQ-HCF covers 5 different thermocouple types, is continuously adjustable and provides a voltage linear output.

Adjustments are made with solder pads and potentiometers.

Intrinsically safe versions, APAQ-HRFX (Pt100) and APAQ-HCFX (T/C) are available with ATEX and FM approval.

Specifications

Input	APAQ-HRF/HRFX	APAQ-HCF/HCFX
Pt100 ($\alpha = 0.00385$), 3-wire connection	Adjustable to specific ranges within: -50 to +550 °C / -60 to +1120 °F	
Thermocouples		Selectable, type J, L, T, K and N with ranges within -5 to +55 mV
Sensor current	~1.1 mA	
Input impedance		>5 MΩ
Max. sensor wire resistance	15 Ω/wire	500 Ω (total loop)
Monitoring		
Sensor break detection, selectable	Upscale ~25 mA, downscale ~3 mA	Upscale ~25 mA, downscale ~3 mA
Adjustments		
Zero	-50 to +50 °C / -60 to +120 °F	±10 % of span
Span, selectable	50 to 500 °C / 100 to 1000 °F	10 to 50 mV
Span, fine adjustment	±10 % (± 5% for 600/800/1000°F)	±10 %
Output		
Current	4 - 20 mA	4 - 20 mA
Linearity	Temperature linear	Voltage linear
Current limitation	~ 25 mA	~ 25 mA
Permissible load	APAQ-HRF/HCF	700 Ω @ 24 VDC, 25 mA
	APAQ-HRFX/HCFX	620 Ω @ 24 VDC, 25 mA
Temperature		
Ambient, storage	-40 to +100 °C / -40 to +212°F	-40 to +100 °C / -40 to +212°F
Ambient, operating	APAQ-HRF/HCF	-40 to +85 °C / -40 to +185 °F
	APAQ-HRFX/HCFX	See "Intrinsic Safety specifications"
General data		
Response time 10-90%	≤ 0.2 s	≤ 0.2 s
Humidity (non-condensing)	0 to 95 %RH	0 to 95 %RH
Intrinsic safety	APAQ-HRFX/HCFX	ATEX: II 1G EEx ia IIB T4, T5, T6 FM: Class I, Div.1, Group A-D
		ATEX: II 1G EEx ia IIB T4, T5, T6 FM: Class I, Div.1, Group A-D
Power supply , polarity protected		
Supply voltage	APAQ-HRF/HCF	6.5 to 32 VDC
	APAQ-HRFX/HCFX	8.5 to 30 VDC ¹⁾
Permissible ripple	4 Vp-p @ 50/60 Hz	4 Vp-p @ 50/60 Hz
Accuracy		
Linearity	±0.1 % of span	±0.1 % of span
Calibration	±0.1 % of span	±0.1 % of span
Cold Junction Compensation (CJC)		±1.0 °C / ±1.8 °F
Temperature influence	±0.6 % of span/25 °C, ±0.7 % of span/50 °F	±0.6 % of span/25 °C, ±0.7 % of span/50 °F
Temperature influence CJC		±1.25 °C/25 °C, ±2.5 °F/50 °F ³⁾
Sensor wire influence	±0.005 °C/Ω / ±0.009 °F/Ω ²⁾	0.4 μV/Ω
RFI influence, 0.15-1000MHz, 10 V or V/m	±0.2 % of span(typical)	±0.2 % of span(typical)
Supply voltage influence	±0.02 % of span/V	±0.02 % of span/V
Supply ripple influence, 50/60 Hz, 4 Vp-p	±0.05 % of span	±0.05 % of span
Long term stability	±0.1 % of span/year	±0.1 % of span/year
Housing		
Material / Flammability(UL)	Zinc alloy + ABS / V0	Zinc alloy + ABS / V0
Mounting	DIN B-head or larger	DIN B-head or larger
Connection, single/stranded wires	≤2.5 mm ² , AWG 14	≤2.5 mm ² , AWG 14
Weight	40 g	40 g
Protection, housing with cover/terminals	IP 20 / IP 10	IP 20 / IP 10

¹⁾ Preliminary data for FM approval

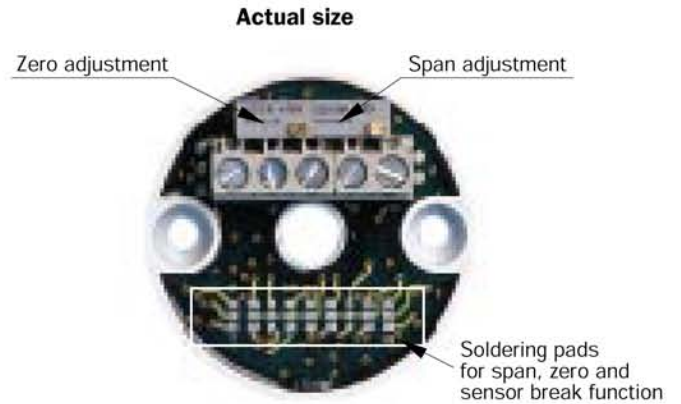
²⁾ Per wire, with equal resistance

³⁾ ±2.5 °C/25 °C, ±5.0 °F/50 °F for type T

The User Instructions must be read prior to adjustment and/or installation.

Range adjustments APAQ-HRF, APAQ-HRFX

Zero adjustment	-50 to +50 °C	-60 to +120 °F
Span selection	50 °C	100 °F
	100 °C	200 °F
	150 °C	300 °F
	200 °C	400 °F
	300 °C	600 °F
	400 °C	800 °F
	500 °C	1000 °F



Range adjustments APAQ-HCF, APAQ-HCFX

Zero adjustment	Adjustable ±10 % of span					
Span selection	mV	T/C J *	T/C L *	T/C T *	T/C K *	T/C N *
	10 to 50	186 - 870°C	183 - 855°C	213 - >400°C	246 - 1232°C	319 - >1300°C
	(no gap)	335 - 1566°F	329 - 1540°F	383 - >720°F	443 - 2218°F	574 - >2340°F

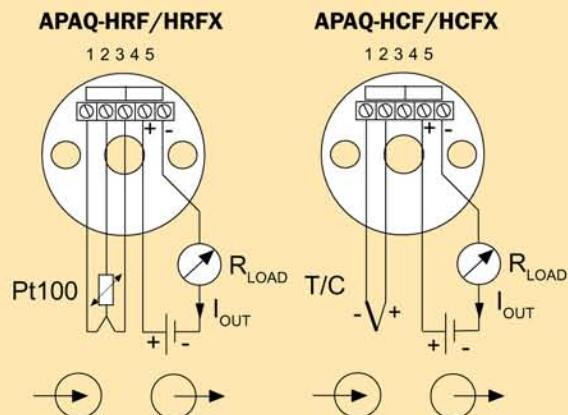
*The temperature spans correspond to the mV spans with zero adjustment = 0 % of span

Intrinsic Safety specifications

Specifications APAQ-HRFX APAQ-HCFX

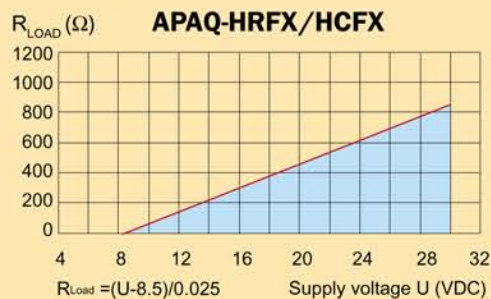
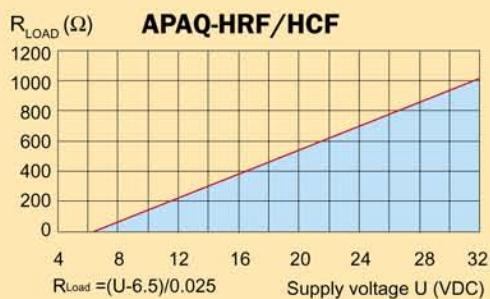
Approval	Demko / ATEX	Factory Mutual (FM)
Classification	II1G EEx ia IIB T4, T5, T6 T4/+85°C, T5/+55°C, T6/+40°C	IS for use in Class I, Div. 1, Group A-D, T4/+80°C
Certificate No.	DEMKO 03 ATEX 135011X	J.I. 6D9A3.AX, dwg 3-7892
Output/Supply		
Max voltage to transmitter	U _i = 30 Vdc	V _{max} = 30 Vdc
Max current to transmitter	I _i = 100 mA	I _{max} = 100 mA
Max power to transmitter	P _i = 700 mW	P _{max} = 700 mW
Internal inductance	L _i = 0 mH	L _i = 0 mH
Internal capacitance	C _i = 0 nF	C _i = 0 nF
Input (Sensor)		
Max voltage from transmitter	U _o = 30 Vdc	V _{oc} = V _T = 30 Vdc
Max current from transmitter	I _o = 100 mA	I _{sc} = I _T = 95.8 mA
Max power from transmitter	P _o = 700 mW	P _o = P _T = Not specified
Max inductance (input loop)	L _o = 5 mH	L _a = 4.0 mH (@GP IIA/B)
Max capacitance (input loop)	C _o = 66 nF	C _a = 0.12 μF (@ GP IIA/B)

Connections



Output load diagrams

Permissible R_{LOAD} at 25 mA output



Ordering table

Low Profile types (normally stocked)

Standard transmitter for Pt100

Type	Part No.
APAQ-HRF	70APHRF001

Intrinsically Safe transmitters for Pt100

Type	Part No.
APAQ-HRFX (ATEX)	70APHRFX01
APAQ-HRFX (FM)	70APHRFX11

Standard transmitter for T/C

Type	Part No.
APAQ-HCF	70APHCF001

Intrinsically Safe transmitters for T/C

Type	Part No.
APAQ-HCFX (ATEX)	70APHCFX01
APAQ-HCFX (FM)	70APHCFX11

Accessories

Item	Part No.
Surface mounting box	70ADA00008
Rail mounting box	70ADA00009
Head mounting kit (Low Profile)	70ADA00011
Rail mounting kit	70ADA00013