



APAQ-HCF



Cost-optimized Adjustable 2-wire Transmitter for Thermocouple Input



APAQ-HCF is an analog, multirange 2-wire temperature transmitter for in-head mounting in DIN B or larger connection heads.

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

Designed for highest reliability and cost-efficiently manufactured, APAQ-HCF combines attractive pricing with high quality and industrial performance.

The Intrinsically Safe version, APAQ-HCFX, is available with ATEX and FM approval.

Multirange design

- Adjustable for thermocouple type J, L, T, K and N inputs with continuous range settings.
- Adjustments are made with solder pads and potentiometers.

Adjustments APAQ-HCF /-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

Cold Junction Compensation

- Automatic compensation for the terminal temperature.

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 upscale or downscale action.
- Excellent EMC performance.

High load capacity

- Only 6.5 V voltage drop over the transmitter allows for high loads in the 4-20 mA output loop.

Industrial design

- The "Low Profile" housing, with its protected electronics, is extremely durable.

Cost-optimized

- High volumes combined with cost-effective design and production contributes to a very attractive pricing.

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Specifications : APAQ-HCF/-HCFX

Input

Thermocouples	Selectable, type J, L, T, K and N with ranges within -5 to +55 mV
Input impedance	>5 M Ω
Max. sensor wire resistance	500 Ω (total loop)

Monitoring

Sensor break detection, selectable	Upscale ~25 mA, downscale ~3 mA
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Adjustments

Zero	± 10 % of span
Span, selectable	10 to 50 mV
Span, fine adjustment	± 10 %

Output

Current	4 - 20 mA
Linearity	Voltage linear
Current limitation	~ 25 mA
Permissible load	APAQ-HCF 700 Ω @ 24 VDC, 25 mA
	APAQ-HCFX 620 Ω @ 24 VDC, 25 mA

Temperature

Ambient, storage	-40 to +100 $^{\circ}\text{C}$ / -40 to +212 $^{\circ}\text{F}$
Ambient, operating	APAQ-HCF -40 to +85 $^{\circ}\text{C}$ / -40 to +185 $^{\circ}\text{F}$
	APAQ-HCFX ATEX:T4 /+85 $^{\circ}\text{C}$, T5 /+55 $^{\circ}\text{C}$, T6 /+40 $^{\circ}\text{C}$; FM: T4/+80 $^{\circ}\text{C}$

General data

Response time 10-90%	≤ 0.2 s
Humidity (non-condensing)	0 to 95 %RH
Intrinsic safety	APAQ-HCFX ATEX: II 1 G Ex ia IIB T4, T5, T6 FM: Class I, Div.1, Group A-D

Power supply, polarity protected

Supply voltage	APAQ-HCF 6.5 to 32 VDC
	APAQ-HCFX 8.5 to 30 VDC
Permissible ripple	4 Vp-p @ 50/60 Hz

Accuracy

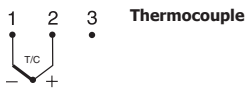
Linearity (mA output to mV input)	± 0.1 % of mV span
Calibration	± 0.1 % of span
Cold Junction Compensation (CJC)	± 1.0 $^{\circ}\text{C}$ / ± 1.8 $^{\circ}\text{F}$
Temperature influence	± 0.6 % of span/25 $^{\circ}\text{C}$, ± 0.7 % of span/50 $^{\circ}\text{F}$
Temperature influence CJC	± 1.25 $^{\circ}\text{C}/25$ $^{\circ}\text{C}$, ± 2.5 $^{\circ}\text{F}/50$ $^{\circ}\text{F}$ ¹⁾
Sensor wire influence	0.4 $\mu\text{V}/\Omega$
RFI influence, 0.15-1000MHz, 10 V or V/m	± 0.2 % of span (typical)
Supply voltage influence	± 0.02 % of span/V
Supply ripple influence, 50/60 Hz, 4 Vp-p	± 0.05 % of span
Long term stability	± 0.1 % of span/year

Housing

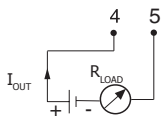
Material / Flammability(UL)	Zinc alloy + ABS / V0
Mounting	DIN B-head or larger
Connection, single/stranded wires	≤ 2.5 mm ² , AWG 14
Weight	40 g
Protection, housing with cover/terminals	IP 20 / IP 10

¹⁾ ± 2.5 $^{\circ}\text{C}/25$ $^{\circ}\text{C}$, ± 5.0 $^{\circ}\text{F}/50$ $^{\circ}\text{F}$ for type T

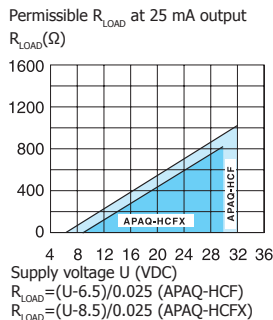
Input connections



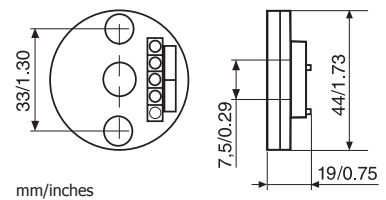
Output connections



Output load diagram



Dimensions



Ordering information

APAQ-HCF	70APHCF001
APAQ-HCFX (ATEX)	70APHCFX01
APAQ-HCFX (FM)	70APHCFX11
Head mounting kit	70ADA00011
Rail mounting kit	70ADA00013
Configuration	70CAL00001