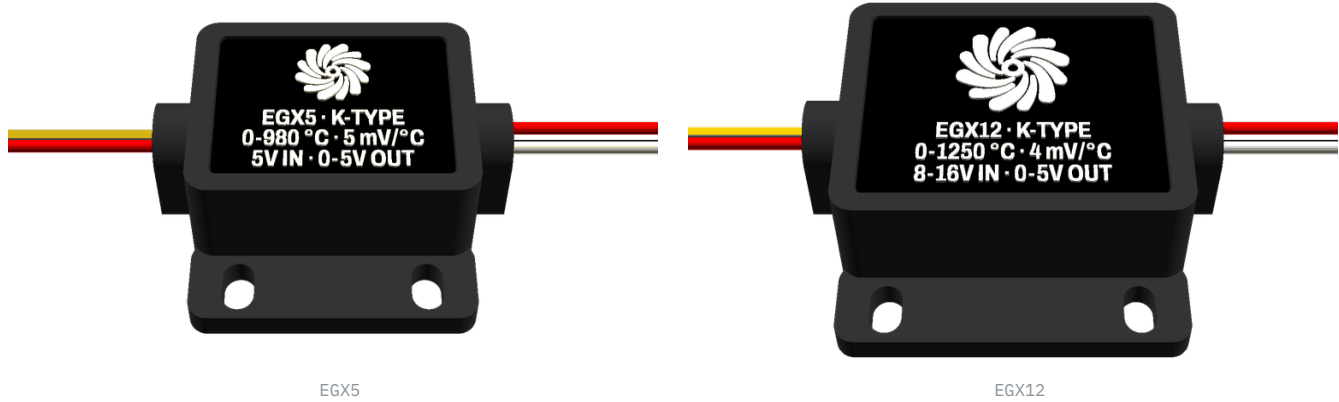


A potted thermocouple amplifier. The output side is the **same three wires as any pressure sensor** — supply, ground, signal — so it wires into a spare analog input and calibrates with two points. Sold as a **kit** with a tested ungrounded probe, bung and fitting, or as the module on its own.



Specifications

EGX5 · EGX12

Parameter	EGX5	EGX12
MEASUREMENT		
Sensor	Type K thermocouple, ungrounded	Type K thermocouple, ungrounded
Range	0 – 980 °C	0 – 1250 °C
Scaling	5 mV/°C	4 mV/°C
Zero	0.000 V = 0 °C	0.000 V = 0 °C
Full scale	4.900 V at 980 °C	5.000 V at 1250 °C
At a 10-bit input	≈ 0.98 °C per count	≈ 1.22 °C per count
Kit probe	Stainless, 5 mm, 0 – 1200 °C	Stainless, 5 mm, 0 – 1200 °C — the kit's ceiling, not the module's
Pro probe	Inconel, 3/16" sealed, ungrounded tip, 1300 °C, ±1.1 °C SLE, response <i>TBC</i>	Inconel, 1/8" sealed, ungrounded tip, 1300 °C, ±1.1 °C SLE, 550 ms — <i>reaches the full 1250 °C</i>
Pre-turbo option	+\$20 — Inconel, 1/4", sealed, ungrounded tip, response <i>TBC</i>	+\$20 — Inconel, 1/4" swaged to 1/8", sealed, ungrounded tip, 500 ms
OUTPUT		
Type	0 – 5 V analog, single ended	0 – 5 V analog, single ended
Source impedance	≈ 100 Ω	≤ 150 Ω
Drives	10 kΩ analog input	10 kΩ input, or a thermistor input with a 2.49 kΩ pull-up to 5 V
Ceiling under fault	Supply rail	≈ 5.3 V — buffered off a regulated rail, cannot reach the supply
Open probe	Drives high	Drives to 5 V as a fault
SUPPLY		

Parameter	EGX5	EGX12
Voltage	5 V — the ECU's sensor rail	8 – 16 V switched, 12 V nominal
Current	≤ 2 mA	≤ 5 mA
Reverse polarity	<i>Not protected</i>	Protected indefinitely
Jump start	<i>Not applicable at 5 V</i>	24 V for 5 minutes
Load dump	<i>Not applicable at 5 V</i>	Transient to 40 V
Input protection	<i>None — bare amplifier input</i>	Series limits, RC filter and clamp diodes on both legs
AMPLIFIER		
Part	AD8495, MSOP-8	AD8495ARMZ, MSOP-8
Initial accuracy	± 3 °C at 25 °C	± 3 °C at 25 °C
Ambient rejection	0.05 °C per °C	0.05 °C per °C
Gain error	0.3 %	0.3 %
Scaling network	—	0.1 % thin film, ratio-matched — +0.5 °C at full scale
Cold-junction window	0 – 50 °C trimmed	0 – 50 °C trimmed
ENVIRONMENT		
Component rating	–40 to +105 °C	–40 to +105 °C
Recommended ambient	Under 50 °C — see rule 2	Under 50 °C — see rule 2
Ingress	No lid, no gasket, no gland	No lid, no gasket, no gland
MECHANICAL		
Enclosure	36.3 × 27.5 × 15.6 mm, printed ASA	44 × 34 × 16.1 mm, printed ASA
Board	20.3 × 16.5 mm	28 × 23 mm, 2-layer, own design
Module mounting	Two zip-tie flanges	Two zip-tie flanges
Probe mount	Weld-in bung included — 1/8"–27 NPT, 304 stainless	Weld-in bung included — 1/8"–27 NPT, 304 stainless
No-weld option	+\$24.95 — M18 × 1.5 male to 1/8" NPT female adapter, not stocked, so it adds a few days to dispatch. Uses a spare O2 port, and raises the probe: check stack height and insertion depth first.	+\$24.95 — M18 × 1.5 male to 1/8" NPT female adapter, not stocked, so it adds a few days to dispatch. Uses a spare O2 port, and raises the probe: check stack height and insertion depth first.
Thermocouple leads	150 mm, 22 AWG TXL, yellow / red, tinned	150 mm, 22 AWG TXL, yellow / red, tinned
Output leads	300 mm, 22 AWG TXL, red / black / white, tinned	300 mm, 22 AWG TXL, red / black / white, tinned

Wiring

THERMOCOUPLE IN, 0–5 V OUT

Thermocouple in on one side, sensor pigtail out on the other. **On a kit** the thermocouple pigtail ends in a mini-K socket and the supplied probe plugs straight in. **On the module alone** it is bare yellow and red leads — splice them right at the module, not down the run.

Output pigtail — 30 cm, 22 AWG TXL, tinned

Wire	Goes to
● Red	EGX5 — 5 V sensor supply EGX12 — switched 12 V
● Black	Sensor ground. Use the ECU's sensor ground, not chassis.
○ White	Any spare 0–5 V analog input.

Thermocouple pigtail — 15 cm

Wire	Goes to
● Yellow	Probe + — yellow on a Type K lead
● Red	Probe – — red on a Type K lead

Calibration

TWO-POINT CALIBRATION

Calibration points

Model	Low	High
EGX5	0.000 V = 0 °C	4.900 V = 980 °C
EGX12	0.000 V = 0 °C	5.000 V = 1250 °C

Bench check before you fit it

Probe in	EGX5	EGX12
Ice water, 0 °C	0.00 V	0.00 V
Boiling water, 100 °C	0.50 V	0.40 V

Three things that cause every support ticket

READ BEFORE FITTING

1. Use an ungrounded probe

A grounded or exposed-junction probe ties the manifold's ground to the amplifier input. Every bump in the manifold-to-module ground offset then lands on the reading. **The kit's probe is ungrounded and tested before it ships** — this rule is for anyone fitting their own. Check the listing says **ungrounded** or **isolated junction**, then verify it: ohmmeter from either thermocouple lead to the metal sheath should read **open**. A few ohms means grounded — send it back.

2. Mount it cool, not on the exhaust side

Cabin side of the firewall, or an inner fender. The probe lead is the hot part — the module wants to stay under about 60 °C. Cold-junction compensation is referenced to the module's own temperature, so a hot module reads high, and the enclosure is ASA.

3. Extend with K-type wire only, never copper

A copper run between the probe and the module spans a temperature gradient and reads wrong with no other symptom. The module's own 15 cm pigtail is copper and that is fine — **because the splice sits at the module**. If you need more reach, use Type K extension wire from the probe end.

In the box

KIT

The module, the probe, and the bung it threads into. Splices and ties are whatever you already run.

- **The module** — potted, mini-K socket on the thermocouple pigtail
- **Ungrounded Type K probe, 1/8 NPT, mini-K plug fitted** — tested before it ships, and replaceable without touching the module.
Kit: stainless, 5 mm. **Pro:** Inconel, ± 1.1 °C special limits of error, sealed ungrounded tip, made in USA
- **Weld-in bung** — 1/8"-27 NPT, 304 stainless. The probe's own compression fitting threads into it.

Warranty

12 MONTHS

12 months, replace, no questions asked. If it stops reading, tell us what it was fitted to and a new one goes out. We would rather know that it failed than argue about why.

The module is sealed against vibration, moisture and heat cycling. That does not protect against a grounded probe — see rule one.