

CO-POCKET 2027

User Manual

Portable carbon monoxide monitor for aircraft • Firmware FW79 • Manual Revision I • October 2026

Part # RI-2025-10-COPOCKET-27



Figure 1: CO-Pocket-2027 Carbon Monoxide Alarm

Quick start

- 1. Power on in clean air.** Move the slide switch up; this will turn it on, while outdoors or in a fresh-air cabin. The red light comes on for about 1.5 seconds. If the optional external alarm is fitted it beeps twice; the instrument itself is silent.
- 2. Wait out the full warm-up.** The screen counts down 180 seconds. There is no CO reading and no alarm until it finishes. Do not press a button to skip it unless that's what you really want to do — that locks in the zero from whatever air the sensor has seen so far, without waiting for a normal 3 minute countdown.
- 3. Confirm it is monitoring.** CO number, NORMAL in green, SENSOR OK, green battery symbol, no fault message.
- 4. Mount it where you can see it.** Display and red light in your scan; sensor opening open to cabin air, away from heater outlets. We recommend Velcro (sorry, not supplied) for bottom or back mounting to a flat panel; keep the sensor opening and USB port uncovered.
- 5. Watch the color.** Green is NORMAL. Anything else means act — see section 1.

Color	Status	What to do
Green	NORMAL (0–10 ppm)	Continue normal operation.
Yellow	CAUTION (11–34 ppm)	Cabin heat off; increase fresh air. Find the source.
Red + flashing light	ALERT (35–49 ppm)	Cabin heat off, maximum fresh air. Consider oxygen. Prepare to land.
Red + alarm sounds	ALARM / DANGER (50+ ppm)	Treat as an emergency. Land as promptly as possible, but only when landing conditions are safe.

A rising reading or any symptoms — headache, dizziness, nausea, confusion — means act now, whatever the number.

A DARK SCREEN IS NOT OFF

The screen fades to black after 30 seconds. Monitoring continues, and the screen wakes itself for any CO warning or fault — except if the microprocessor can't read the digital value from the CO sensor. This causes a COM FAILURE (a cyan, frozen reading). Glance at it periodically; the pulsing green light only means powered on. Only the power switch turns the unit off, and off means no monitoring; no breathing green LED; no screen.

To silence the alarm: press either button once. Silence lasts 120 seconds; the red light and CO number keep working. Do not press again — a second LEFT press changes brightness, and from full bright it drops to the dimmest level.

1 Safety

WARNING

A CO alarm, a rising reading you cannot explain, or symptoms of CO exposure are reasons to act now. Do not wait for a higher number, and do not silence the alarm and continue unchanged.

Carbon monoxide

Carbon monoxide (CO) is colorless and odorless. Symptoms of poisoning include headache, dizziness, weakness, nausea, chest pain, and confusion. Severe exposure causes unconsciousness and death. Symptoms worsen at altitude and appear sooner than they would on the ground. You cannot smell CO, and the absence of symptoms does not mean the air is safe.

If CO is suspected in flight

Fly the aircraft first and follow its emergency procedures. The FAA recommends:

- Turn the cabin heat fully off.
- Increase cabin fresh-air ventilation to the maximum. Open windows if the flight profile and the aircraft operating manual permit.
- If available, and provided it does not create a safety or fire hazard, use supplemental oxygen.
- Land as promptly as possible.
- Tell air traffic control of your concern and ask for vectors to the nearest airport.
- Once on the ground, seek medical attention. Before continuing the flight, have the aircraft inspected by a certified mechanic.

If CO is suspected on the ground

Move everyone to fresh air immediately. Call 911 (or your local emergency number). Do not stay in the area to read the graph or operate the instrument.

What CO-Pocket does and does not do

- It shows the CO concentration at its sensor opening. It does not measure CO in your blood or calculate how long you can safely stay.
- NORMAL means the reading is at or below 10 ppm. It is not a guarantee that the air is safe.
- The warning thresholds are fixed instrument settings, not medical limits, and do not adjust for altitude.
- It is a supplemental awareness device. It does not replace aircraft maintenance, an emergency checklist, or any equipment required for your installation.
- It is not a smoke alarm, oxygen monitor, or general gas detector.
- Silencing the alarm or switching the unit off does not remove CO from the cabin.

2 Controls and screen

Left and right are as you face the display.

Control	Function
Power switch	Turns the instrument on or off. Off stops all monitoring and alarms and clears the session history. Down is off and Up is on.
LEFT button	Steps through eight brightness levels. If the alarm is sounding and not yet silenced, the first press silences it instead.
RIGHT button	Starts the screen fade (monitoring continues). While a warning is keeping the screen awake, RIGHT cannot fade it; during an unsilenced alarm, RIGHT silences the alarm like LEFT.
Either button, screen dark	Wakes the screen. The waking press does nothing else; release, wait for the screen, and press again for the next action.
Either button, alarm sounding	Silences the external alarm for 120 seconds.
Either button, during warm-up	Starts a 10-second hold, then sets the session zero from the air seen so far. Not recommended.

With the screen lit, buttons act on release. A dark screen wakes on press. There are no hold functions, hidden menus, or user calibration.

The normal screen

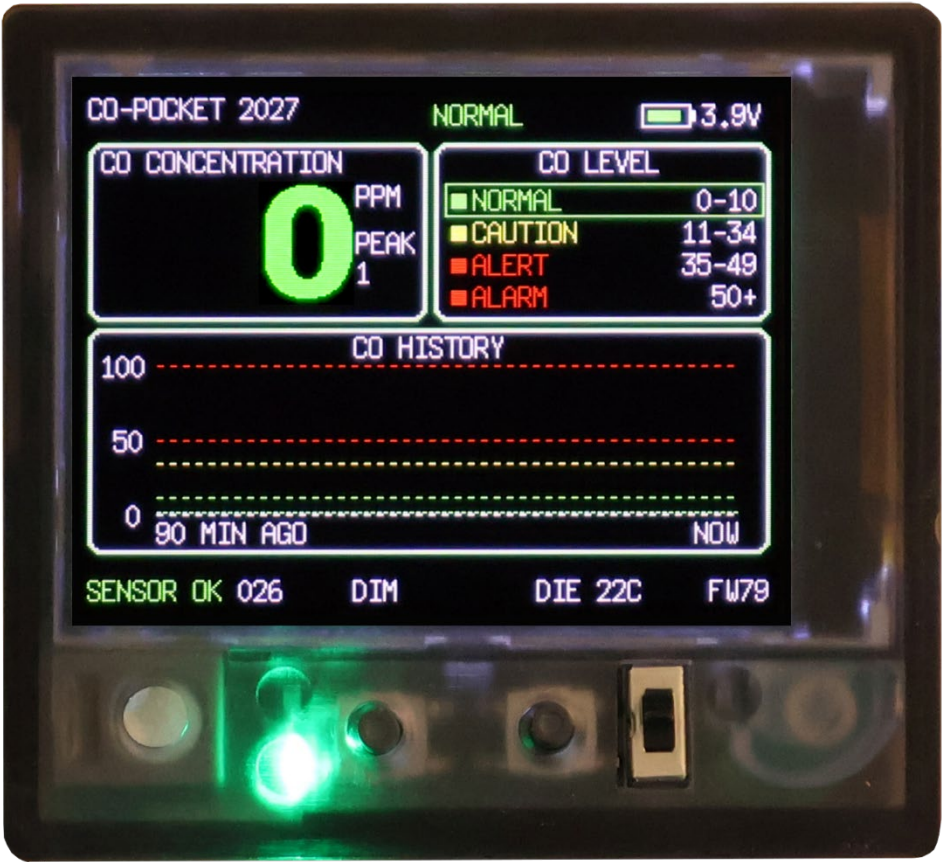


Figure 2: Normal Screen for CO-Pocket-2027

Screen item	Meaning
CO CONCENTRATION / PPM	Current CO reading in parts per million, updated every second. Shows up to 999. This is the number to use.
Status word	NORMAL, CAUTION, ALERT, ALARM, or DANGER, in the same color as the reading.
PEAK	Highest reading since power-on. Stays high after the current reading falls.
CO HISTORY	Bar graph of the last 90 minutes. Each bar is the highest reading in one minute; NOW is the live reading at the right. Scale 0–100 ppm. Dotted lines mark the CAUTION, ALERT, and ALARM thresholds.
Battery symbol and voltage	Green, yellow, or red symbol plus the measured battery voltage. See section 6.

Screen item	Meaning
DIE 22 C	Internal temperature of the instrument, whole degrees Celsius. DIE is a label, not a warning. It is not a cabin thermometer! CO temperature compensation is applied automatically. DIE --C is a fault (section 7). (Our example shows 22 C – your value will vary).
SENSOR OK nnn	Sensor communication is good. The small white number is the sensor's raw output before zero, gain, and temperature correction. It is not a ppm value and can be nonzero when the CO reading is 0. Ignore it in flight; it is for service.
DIM (bottom line)	Brightness reminder: press LEFT to step through the brightness levels. LOW BATTERY or TEMP FAULT replaces it when they apply.
FW79	Firmware version. Your firmware version may be higher than this!

Reading the history graph

- The graph starts filling when warm-up ends. Older minutes move left; the 90 MIN AGO label is the scale, not a claim that 90 minutes have been recorded.
- A bar shows the minute's highest reading, so a brief spike stays visible after the live number returns to normal.
- Readings of 100 ppm and above fill the graph to the top; read the number or PEAK for the value.
- Bar colors follow the thresholds exactly. The status word holds on a little as CO falls (section 3), so on the way down a bar can be yellow while the status still says ALERT.
- A blank minute is missing data, not zero.
- A cyan number or cyan NOW bar means COM FAILURE — the reading is frozen, not live. See section 9.
- History and PEAK survive screen sleep but not power-off. Photograph the screen before switching off if you need a record.

3 CO levels, lights, and alarm

Thresholds apply to the displayed reading as it rises. They are instrument settings, not medical exposure limits.

Reading	Status	Indication
0–10 ppm	NORMAL	Green. Green status light pulses slowly. Screen may sleep.
11–34 ppm	CAUTION	Yellow. Screen stays awake. No change to the lights — the green light keeps pulsing.
35–49 ppm	ALERT	Red. Red light flashes about five times per second.
50–99 ppm	ALARM	Red. Red light flashes. External alarm sounds (three chirps, repeating) if fitted.
100+ ppm	DANGER	As ALARM. Entering DANGER cancels any silence in effect; the alarm sounds again.

The on-screen legend groups 50 ppm and above as ALARM 50+; the status word shows DANGER from 100 ppm.

As CO falls: warnings clear in steps

A warning clears when the reading falls more than 3 ppm below the level that set it, so the display does not flicker at a boundary. Normally each step clears to the next band down, not straight to NORMAL (a fast fall can pass through more than one step at once):

Status	Set at	Clears at	Clears to
DANGER	100 ppm	96 ppm	ALARM — horn continues
ALARM	50 ppm	46 ppm	ALERT — horn stops, red light continues
ALERT	35 ppm	31 ppm	CAUTION — red light stops, screen stays awake
CAUTION	11 ppm	7 ppm	NORMAL — screen may sleep

The horn stopping is not the warning clearing. On the way down from an alarm, the horn stops at 46 ppm, the red light keeps flashing until 31 ppm, and the screen stays awake until 7 ppm.

Status lights

The green light pulses whenever the instrument is on and not flashing red. It pulses during CAUTION, during COM FAILURE, and during CAL FAULT; it pulses faster as the battery runs down. It means powered on — not that the sensor is talking, and not NORMAL. The red light (on the front panel) flashes at ALERT and above; the red charging light, in another area of the device, is steady and never blinks. At power-on the red light is held on steadily for about 1.5 seconds as a lamp test.

External alarm (optional)

CO-Pocket has no internal aural annunciator. Without the optional external alarm, power-on is silent and a 50 ppm alarm is silent: the screen and the red light are the only in-flight warnings, and the red light does not start until 35 ppm. With the alarm fitted, it beeps twice at power-on; a CO alarm is repeating groups of three chirps. Check at power-on that you can hear it where it is mounted — do not assume it will carry over engine noise or through a headset. The external annunciator produces a 110 dB alarm.

Silencing the alarm

- With the screen awake, press and release either button once. The alarm stops for 120 seconds; the CO number, red light, PEAK, and history continue.
- The alarm resumes when the 120 seconds end if CO is still in an alarm band, or sooner if CO rises into DANGER.
- If the reading drops out of the alarm band, the silence ends. If it later rises into an alarm band again, the alarm sounds at once without waiting for the previous 120 seconds to expire.
- Pressing again during a silence does not restart the timer. A second LEFT press changes brightness — and from full bright, the first step is to the dimmest level. Do not press twice "to be sure."

4 Power-on and warm-up

What you see

At power-on the screen shows dashes for CO and PEAK, a SENSOR WARM-UP countdown from 180 seconds, battery status, and DIE temperature. SENSOR OK and the raw sensor number appear as soon as the sensor responds — that confirms communication, not that warm-up is complete. The red light is held on and the external alarm beeps twice as a lamp and sounder test.

WARM-UP IS NOT MONITORING

During the countdown the calibrated CO reading and the CO alarms are not active — for the full three minutes, even if the cabin already contains CO. The small raw number is diagnostic only. Complete warm-up in clean air before relying on the instrument.

ANY BUTTON: SKIP shortens the remaining warm-up to a 10-second hold. CO and PEAK show -- and alarms stay off during the hold; then the session zero is set from whatever the sensor has seen so far. Pressing again, or pressing with 10 seconds or less left, changes nothing. A skip after twenty seconds in a dirty cabin can bias every reading until power-off.

Why clean air matters

When warm-up ends, the instrument takes the air around it as its zero. It will absorb up to 20 ppm of indicated CO into that zero; more than that is not zeroed away. If you power on in a cabin that already contains CO, readings for the rest of the session may be low by that amount.

During the session the zero can only move down (as cleaner air persists); it never moves up to follow rising CO. It never changes the factory calibration.

DO NOT RESTART TO CLEAR A READING

If the unit shows CO, treat it as CO. Restarting in a suspect cabin can hide low-level CO in the new zero.

What power-off resets

Switching off clears the history, PEAK, session zero, alarm silence, and brightness setting. Factory calibration is kept. The next power-on begins a new warm-up. Screen sleep does not reset anything.

5 Display, brightness, and sleep

Brightness

With the screen lit, press LEFT to step through eight levels. The unit powers on at the brightest level; from the brightest level the next press wraps to the dimmest, and each further press steps brighter. At 3.60 V battery and below, the two brightest levels are not available. There is no ambient-light sensor — set a level that suits the cockpit and check again when lighting changes.

Sleep

In NORMAL status with no warnings, the screen fades to black after 30 seconds without a button press. RIGHT starts the fade immediately. Monitoring, history, and PEAK continue while dark. This saves power. Co-Pocket continues to monitor the air, even when the screen is dark.

Screen state	What is happening	To wake
Dark, under 10 minutes	Backlight off; screen contents retained. Green LED is slowly pulsing – this means only that the unit is powered on.	Press either button; the screen returns at once.
Dark, over 10 minutes	Display controller also asleep. Monitoring continues. This saves even more power; the green LED is slowly pulsing, but the screen wakeup takes a couple of seconds.	Press either button; the screen redraws after a short pause. An automatic wake for a warning has the same pause.

The waking press only wakes the screen. Release it, wait for the screen, then press again for brightness or fade; presses within about half a second of the wake are ignored.

When the screen stays awake

The screen will not sleep, and wakes itself if dark, for: warm-up, any status other than NORMAL, LOW BATTERY, TEMP FAULT, or CAL FAULT. RIGHT cannot put the screen to sleep in these conditions.

COM FAILURE does not wake the screen. Check the live screen periodically; do not rely on the green light. (COM FAILURE means the instrument is receiving no valid data from the sensor.)

6 Battery and power

Check the battery symbol and the voltage together before every flight. The symbol shows color only; there is no percentage or remaining-time display.

Battery voltage	Symbol	Action
3.70 V and above	Green	Normal.
3.50 V to 3.69 V	Yellow	Charge before the next flight. At 3.60 V and below the two brightest backlight levels are disabled.
Below 3.50 V	Red	Charge now. Do not rely on the readings.

LOW BATTERY appears at 3.50 V and below. The screen stays awake, and if the status would otherwise be NORMAL it flashes UNRELIABLE instead. The warning clears only when the voltage recovers to 3.55 V, so LOW BATTERY can remain on screen while the symbol is already yellow.

LOW BATTERY MEANS THE READING IS NOT TRUSTWORTHY

The instrument can still show numbers after LOW BATTERY appears, but the sensor supply is no longer adequate. Charge before relying on it.

The displayed voltage is rounded to one decimal: an indicated 3.7 V can be as low as 3.65 V (yellow symbol), and an indicated 3.5 V can be on either side of the LOW BATTERY threshold. Go by the symbol and the message, not the tenths digit.

A low battery never downgrades a CAUTION, ALERT, ALARM, or DANGER status. TEMP FAULT takes the message line ahead of LOW BATTERY, so also look at the symbol.

Charging

The battery is recharged using the USB-C port and included cable. It can take up to 6 hours to fully charge. By charging slowly; we preserve battery life. The unit can be operated while charging. The battery is not user replaceable.

When charging, the case will glow red close to the USB port. When fully charged, this changes to a very faint red glow, which may be indiscernible. This charging light is separate from the CO red light: the CO red light is on the front panel and blinks; the red charging light is in another area of the device and does not blink.

7 Temperature

Every unit is individually calibrated at the factory: zero in clean air, span against 100 ppm CO, and a temperature-correction table measured in a chamber from room temperature to 42 °C. The instrument applies that correction automatically from the internal temperature measurement. No user calibration exists or is needed.

- Below room temperature the correction is held at its room-temperature value; above 42 °C it is held at its 42 °C value. Accuracy outside the characterized range is not specified.
- DIE shows whole degrees, truncated: 21.9 °C displays as 21 C. The displayed number is a separate factory-calibrated indication; the CO correction uses the measurement directly.
- There is no over-temperature warning. Keep the unit out of direct sun and off hot surfaces, and let it settle after a large temperature change.
- Never dismiss a CO reading as "just temperature."
- If the unit gets too hot (over 42C) it may provide unreliable results.

TEMP FAULT / DIE --C means the internal temperature reading is not usable. The last valid correction is held. **CAL FAULT / FACTORY SERVICE REQUIRED** means no valid factory calibration was found and the unit will not monitor. Both require service.

8 Care, checks, and service

Protect the sensor

- Keep the sensor opening clear. No caps, filters, foam, tape, or sealant.
- Wipe the exterior with a soft dry cloth. Absolutely keep liquids out of the openings.
- Keep cleaners, alcohol, solvents, aerosols, fuel, and adhesives away from the unit — they can poison or confuse the sensor.
- Mount securely so it cannot interfere with controls, instruments, or exits.

Power-on check vs. response test

The power-on sequence tests the display, red light, and external alarm. It does not test the sensor with CO.

Test only after warm-up has finished; there is no CO reading or alarm during warm-up. The correct way to test the unit is to place it into a inverted glass chamber with a single extinguished match moved up and into the inverted chamber. This will elicit a rapid response. Remove the CO-Pocket immediately after a response is indicated. Even a few seconds of heavy smoke can permanently damage CO-Pocket. If the sensor is poisoned with excessive smoke, it may recover if left in clean air (preferably in a shady outdoor area) for one or two days. Do not leave exposed to direct sunlight.

Alternatively, test with a CO “bump” gas canister. When placed in air with 100PPM CO, CO-Pocket will begin to respond within 5 seconds.

After an unexpected reading

Deal with the possible exposure first (section 1). Once safe, note the CO reading, PEAK, the history graph (a photo is ideal), DIE temperature, battery voltage, the raw number after SENSOR OK, and what was going on — engine, cabin heat, ventilation, chemicals nearby. A reading that falls in fresh air was still a reading; have the aircraft checked.

Stop relying on the unit and contact Radiant if it alarms repeatedly in verified clean air, shows a fault, has been contaminated, or fails a response check. Instruments do break; aging sensors do drift.

Service

Contact Radiant Instruments with the serial number, firmware version, a description of the problem, and a photo of any fault screen.

Warranty and service life: 3 years. The sensor manufacturer rates the sensor for a 5-year service life, but the sensor ages on the shelf and in shipping before you receive the unit, so we warrant it for 3 years and recommend replacing the CO-Pocket when the warranty expires. To return a unit, email info@radiantinstruments.com with the information above. We strive to answer emails in one business day. Radiant Instruments does not offer telephone support; email is the way to reach us.

9 Troubleshooting

For an active CO warning, use section 1 first. A fault never means CO is absent.

What you see	Meaning and action
Dark screen, green light pulsing	Screen sleep — or COM FAILURE, which does not wake the screen. Press either button and read the screen.
Screen will not sleep	A warning is keeping it awake: non-NORMAL status, LOW BATTERY, TEMP FAULT, CAL FAULT, or warm-up.
Red light but no sound	Red light starts at 35 ppm; sound at 50 ppm. Check that the external alarm is connected and not silenced.
Alarm returns after silencing	Normal: silence lasts 120 seconds, or ends sooner if CO rises into DANGER or leaves and re-enters the alarm band. Fix the exposure, not the alarm.
Horn stopped, red light still flashing	Normal. ALARM clears at 46 ppm; ALERT and the red light continue until 31 ppm. The warning has not cleared.
CO number cyan; COM FAILURE --- in place of SENSOR OK nnn	COM FAILURE: no sensor data for about six seconds. The CO number is frozen at its last value — a cyan 0 is not a measured zero. Alarms stay as they were. Blank graph minutes are missing data. Monitoring resumes without a new warm-up when data returns. If it persists or recurs, service.
CAL FAULT / FACTORY SERVICE REQUIRED	No valid factory calibration. The unit will not monitor. Service.
TEMP FAULT / DIE --C	Temperature sensor fault; last correction held. Accuracy not assured. Service if it persists.
LOW BATTERY / UNRELIABLE	Charge the battery. Readings are not dependable until it clears (3.55 V).
Screen went dark during an alarm	A second button press after silencing stepped the brightness to its dimmest level. Press LEFT to step brighter.
Live number low, PEAK or graph high	Normal. PEAK and the graph keep the session maxima. Photograph before switching off.
DIE reads 21 C in a 22 °C room	Normal. Whole-degree truncation, and DIE is internal temperature, not air temperature. The temperature calibration is not perfect.
Garbled or unreadable display	Do not rely on it. In clean air, power-cycle (this restarts warm-up and clears history). If it recurs, service.
CO shown in apparently clean air	Assume it is real until proven otherwise. Then check placement, battery, warm-up, and faults. Do not restart repeatedly to force a zero.

10 Specifications

CO reading	Whole ppm, 0–999; updated once per second
Status thresholds	CAUTION 11 · ALERT 35 · ALARM 50 · DANGER 100 ppm; each clears 4 ppm below its threshold
Warm-up	180 seconds; no CO reading or alarm during warm-up
Startup zero	Absorbs up to 20 ppm indicated at end of warm-up; adjusts downward only
History	90 minutes, one-minute maxima, 0–100 ppm scale; cleared at power-off
Alarm output	Optional external alarm; no internal aural annunciator; 120-second silence
Display	Eight brightness levels; fade after 30 s idle; deep sleep after 10 minutes dark
Battery indication	Green ≥ 3.70 V · Yellow 3.50–3.69 V · Red < 3.50 V. Backlight cap at ≤ 3.60 V. LOW BATTERY at ≤ 3.50 V, clears at 3.55 V
Calibration	Factory: clean-air zero, 100 ppm span, six-point temperature table to 42 °C. No user calibration
Sensor range / accuracy	Range is 0 to 999. Accuracy is not guaranteed.
Operating temperature	-5C to 42C
Battery / run time / charging	500mah / 24 hours / 6 hours / may be used while charging
Size / weight	0.6 x 2.4 x 2.6" / 1.87 oz (53 grams)
Regulatory	None. We recommend use only in aircraft. Not a residential CO alarm; not certified to UL 2034 or any other standard. Do not use it to monitor CO in a home or other building.

About this manual

Revision I, October 2026, for firmware FW79. Revision D incorporated program-manager and independent review of Revision C: battery thresholds corrected, warning clearance table added, warm-up skip and raw-reading behavior clarified, FAA wording aligned with OK-24-1154. Revision E: a button press during warm-up now starts a 10-second hold instead of ending warm-up at once; the lamp-test time, the COM FAILURE display, the DIM hint, and the warning-clearing wording were corrected against the firmware. FW78 added the raw sensor readout. CO calculation and alarm behavior are unchanged from FW77.

CO safety guidance in section 1 follows FAA publication OK-24-1154 "Carbon Monoxide: A Deadly Menace" (September 2024), the CDC, and the U.S. CPSC. These organizations do not endorse this product.

11. Disclaimers

Products from Radiant Technology are not designed to be used in applications where their failure would endanger safe flight or human life in any way. They are intended solely for use in VFR conditions. They are not certified to meet any Technical Standard Order and are not produced under a Parts Manufacturing Authority (TSO / PMA). As a result, if permanently installed in the aircraft, they are suitable only for use in experimental and ultralight aircraft, and in Light Sport Aircraft, if meeting the requirements of the respective manufacturer. Specifically not for use as a primary display instrument in certified aircraft. An AOA indicator is an aid to stall awareness, not a replacement for it; always fly the aircraft within its published limitations.

12. Warranty

Your new Radiant Technology instrument carries a three-year warranty from the invoice date. Please contact us at support@radiantinstruments.com should your product need warranty service. There is an additional charge for international warranty service.

13. Return / Refund Information

Must be returned in new, uninstalled, resalable condition within 60 days after receipt. Ship to Radiant Technology, PO Box 20690, Wichita KS 67208.