

# RESPA Advisor

Cab Monitoring Systems



# SEE THE UNSEEN

threats on industrial jobsites

CO<sub>2</sub> Levels • Cab Pressurization • Filter Life



RESPA Advisor®  
Pressure Monitor



RESPA Advisor®+  
Pressure + CO<sub>2</sub> Monitor

Meets ISO 23875 requirements

# RESPA Advisor+

## ISO 23875 Compliant

- Meets ISO 23875 performance requirement for real-time operator cab monitoring, including stringent CO<sub>2</sub> sensor specifications

## High-Quality CO<sub>2</sub> Monitor

- Includes a nondispersive infrared sensor (NDIR) providing real-time CO<sub>2</sub> readings to alert operators when air quality conditions are unsafe

## Real-Time Pressure Monitoring

- Reports cab pressurization levels in real-time to support a controlled-air-quality cab environment

## Tracks Filter Life

- Ensures filters are replaced timely to help maintain optimal air quality

## NEW Pressure and CO<sub>2</sub> Monitor



RESPA ADVISOR+ Sy-Klone RESPA Advisor+ CO2 and Pressure Monitor App



# RESPA Advisor+ Cab Monitoring System

RESPA Advisor+ cab monitoring system provides visibility into the operator cab environment. With the RESPA Advisor+ cab monitoring system, see the unseen threats on an industrial job site, including unsafe levels of CO<sub>2</sub>, loss of cab pressurization which could lead to harmful respirable particulates entering the cab, and loss of filter life caused by changing filters prematurely.

## Cab Pressurization

Monitor reports cab pressurization levels in near real-time to provide machine operators indicator of cab environment

## High Quality CO<sub>2</sub> Monitor

Not all CO<sub>2</sub> sensors are created equally. Sy-Klone sourced a high-quality sensor with precision accuracy to provide near real-time CO<sub>2</sub> data to alert operators when unsafe air quality conditions exist

## Filter Life Tracking

Take the guess work out of filter life, with manual filter tracking to ensure optimal filter life and performance *Coming soon*

## Ready for Jobsites Around the World

- Metric and Imperial units of measurement
- Symbol-based interface for ease of use for all users regardless of native language

## Designed for Cab Environment

- Small size and dark color scheme blends into operator cab environment
- Matte surface texture eliminates glare and visual safety concern



## Audible and Visual Alarms

Built-in alarm alerts the operator when pressurization or CO<sub>2</sub> levels go outside of the allowable threshold

## Interactive, LCD Display

Full color, interactive LCD screen is easy to use and quick to learn, making it easy to integrate into the jobsite

## Access Data for Better Insights into the Operator Cab Environment

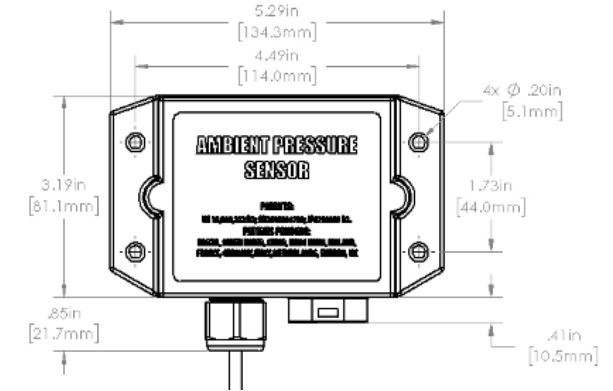
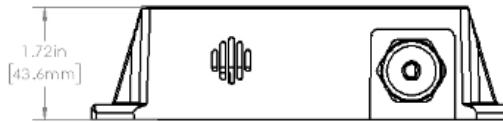
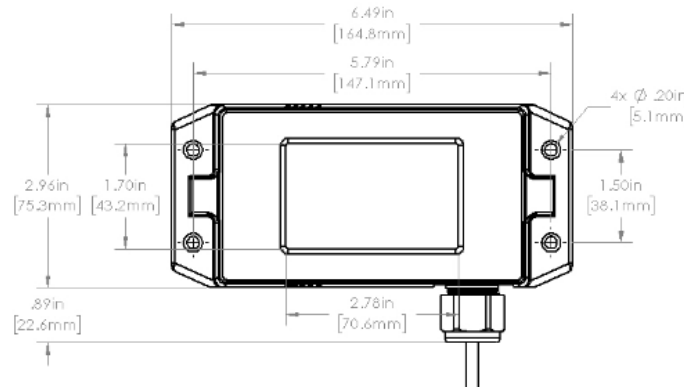
- Data logging with download capability via Bluetooth
- Admin access for
- Smartphone App to access data

# RESPA Advisor+ Technical Specifications

## RESPA Advisor+ Specifications

- **Voltage:** 12-24 VDC (Undervoltage protection @ 10 VDC; Overvoltage protection @ 30 VDC)
- **Current Consumption:** Main Module: Less than 30 mA /Ambient Pressure Sensor (APS): Less than 0.6mA
- **Inside/Outside Operating Temperature Rating:** -10°C to 60°C (Main Module Inside CAB)/-40°C to 80°C (APS outside CAB)
- **Storage Temperature Rating:** -55°C to 125°C
- **Operating Pressure Range:** 0 to 400 Pa (0 to 1.61 Inches-H<sub>2</sub>O)
- **Operating CO<sub>2</sub> Range:** 0 to 5000 PPM
- **Display Resolution:** 1 Pascal (0.01 Inches-H<sub>2</sub>O)
- **Main Module Dimensions:** 164.84 x 75.31 x 43.56 mm (6.489 x 2.965 x 1.715 inches)
- **Mounting Plate Dimensions:** 165 x 76 x 6.35 mm (6.5 x 3.0 x 0.25 inches)
- **Main Module Weight:** 426 g (15 oz.)
- **Ambient Pressure Sensor (APS) Weight:** 72 g (13.1 oz)
- **Mounting Bolt Size:** 4mm Hex Bolt
- **Connector:** Deutsch part number DT04-2P-E005, Qty 1
  - W2P Secondary lock, qty 1; 0460-202-16141 Contact pins, Qty 2
- **Communication frequency:** The main monitor and ambient pressure sensor communicate using a standard Bluetooth frequency of 2.4 GHZ

## Main Module and APS Dimensions



# RESPA Advisor+

## ISO 23875-compliant CO<sub>2</sub> and Pressure Cab Monitor



### Technology

## Meet safety goals with in-cabin monitoring and filtration innovations

SAFE TO WORK EXAMINES THE LANDSCAPE OF NEW PRODUCTS AND IDENTIFIES THREE AIR-QUALITY TRENDS THAT HAVE EMERGED TO HELP MINE SITES PROTECT MACHINE OPERATORS.

**M**eeting exposure reduction targets is a primary health and safety initiative, as well as an overall industry goal, for mining companies. Exposure to respirable dust may cause short-term health issues, increased incidences of long-term chronic lower lung disease, and even death.

Reducing occupational exposure has the ability to improve worker health, increase company productivity and reduce employer healthcare costs.

Environmental health and safety officers are partnering with maintenance, repair and operations teams to update new machine tenders, as well as retrofit existing fleets of heavy-equipment cabins, with engineering controls that comply with standards designed to reduce exposure to respirable particulates.

New clean air innovations are providing additional engineering control options that isolate workers from hazards and are more effective than administrative controls, which focus on changing the way people work and/or personal protective equipment (PPE).

In addition, a new standard – ISO 23875 cabin air quality standard – provides practical steps for mine sites to improve engineering controls and operational integration of machine cabs, in support of reducing occupational



The RESPA PURE is an in-cabin filtration system that does not require adaptation or plumbing.

exposure and improving worker health. ISO 23875 seeks to “address the fundamental design requirements that will allow for operator enclosures to perform at a level that provides sustained air quality, reducing concentrations of respirable particulate matter and carbon dioxide that are harmful to human health.”

Safe to Work examines the landscape of new products and identifies three air-quality trends that have emerged to help sites protect machine operators. The trends include cabin pressurisation impact on exposure reduction, the hidden dangers of CO<sub>2</sub> and the importance of recirculation on maintaining air quality in cabins.

#### CABIN PRESSURISATION REDUCES EXPOSURE

New machines and existing fleets of equipment need a properly sealed cabin that can maintain pressurisation.

A properly sealed cabin is the first step to maintaining good air quality, as loss of cabin pressure can allow harmful respirable particulate to enter the cabin.

Monitoring cabin pressure can be achieved through in-cabin monitoring devices. The in-cabin monitor provides machine operators real-time visibility into pressurisation levels, which can be a good indicator of both cabin air quality and filter life.

**THE HIDDEN DANGERS OF CO<sub>2</sub>**  
Operator fatigue is a major contributor to near misses and accidents on industrial job sites. Unsafe levels of CO<sub>2</sub> in confined spaces, such as a machine cabin, are a contributor to operator fatigue and may lead to drowsiness and loss of concentration or mental acuity.

Implementing safety controls to alert machine operators to unsafe conditions is important to maintaining a safe working environment. Safety controls should include both audible and visual alarms to notify operators when conditions are outside defined limits.

New generations of in-cabin monitors alert a machine operator when CO<sub>2</sub> levels increase beyond safe limits.

When selecting an in-cabin monitor for CO<sub>2</sub> monitoring, it is important to choose a device that includes a high-quality CO<sub>2</sub> sensor to ensure accuracy, real-time visibility to air-quality conditions and compliance with industry standards, such as ISO 23875.

The latest standout in-cabin monitor for heavy machinery and fixed plant cabins is his company’s RESPA Advisor+. The RESPA Advisor+ is the only ISO 23875-compliant in-cabin pressure and CO<sub>2</sub> monitor on the market.

Sy-Klone International sales and marketing vice president Austin Browne recommends that “every cabin air-quality system include a monitor to ensure machine operators have visibility to the condition of the air quality inside of their cabin.”

“Monitors provide fact-based datapoints for machine operators, health and hygiene officers, and maintenance leaders to better manage cabin air quality systems, resulting in improved operator air quality, reduced occupational exposure, compliance with industry standards, and more consistently meeting defined maintenance intervals,” Browne says.

“We are proud to partner with mine operators on achieving ISO



The RESPA Advisor+ is the only ISO 23875-compliant in-cabin pressure and CO<sub>2</sub> monitor on the market.

#### REFRESHING AIR INSIDE THE CABIN

Maintaining good air quality inside a machine cabin is one of the most effective, as well as cost-effective, methods for addressing exposure levels on a job site.

Many recirculation filters are not efficient enough to adequately recover air quality back to healthy levels following temporary spikes in respirable particulate caused when dust enters the cabin, such as when an operator opens the cabin door. Ensuring a cabin air-quality system can meet a specified time (decay rate) required to recover the cabin air quality below a defined particulate limit, is an important part of exposure reduction efforts and achieving compliance under ISO 23875.

To properly address these spikes and achieve ISO 23875 compliance, a recirculation system with a high-efficiency filter, such as a ISO 15 E or HEPA ISO 35 H, is required.

A traditional challenge in installing an aftermarket recirculation system is space constraints or having to plumb the system into the air conditioning system. New entrants into the market have reduced the size of recirculation system offerings, making it feasible to integrate

high-efficiency filtration into a wider variety of cabins.

A new, innovative solution is the Sy-Klone RESPA PURE, an in-cabin filtration system that does not require adaptation or plumbing into a machine’s air conditioning system.

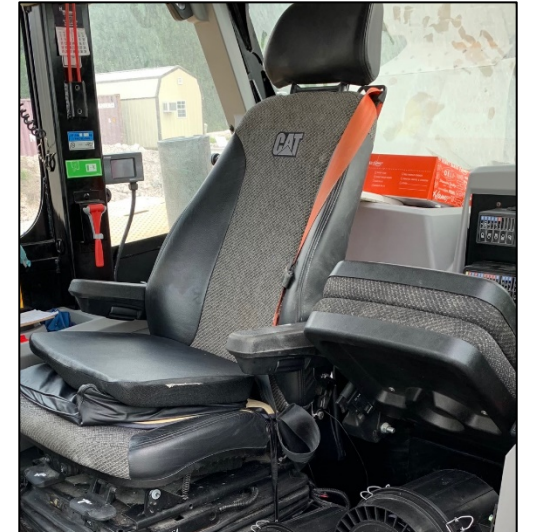
Sy-Klone is leading the market in providing a full suite of products needed for ISO 23875 compliance across a range of applications, supporting early adopters of the standard.

“The RESPA PURE is a stand-alone, compact air purifier that complements existing OEM recirculation systems. The purifier runs independently from the air conditioning system, making it easy to install and service,” Browne says.

The RESPA PURE features a HEPA ISO 35 H filter, which enables machine owners to meet the decay rate requirement as specified in ISO 23875. The PURE has two installation configurations, including an in-cabin option, as well as a flange-mounted version accessible from the exterior of the machine.

#### INNOVATIONS ADVANCE ENGINEERING CONTROLS

Clean air innovations and new standards are making mine sites a safer place to work. New products and engineering controls, such as the RESPA Advisor+ and RESPA PURE, are helping mine sites meet safety goals as well as exposure reduction targets. [E](#)



# RESPA Advisor

## Real-Time Pressure Monitoring

- Reports cab pressurization levels in real-time to support a controlled-air-quality cab environment
- Cab pressure digital read-out

## LED and Audio Alarms

- Visual alarm alerts the operator when cabin pressure drops below the preset level
- Audio alarm can be turned on / off and volume can be adjusted

## New Color and Design

- Modernized design includes updated, dark color scheme blends into operator cab environment

## Filter Life and Operator Cab Environment Insights

- Real-time visibility into pressurization levels can be good indicators of both cab air quality and filter life

## Updated Pressure Monitor



# RESPA Advisor Pressure Monitor

The RESPA Advisor Pressure Monitor provides visibility to the air quality in the operator cab. Loss of cab pressure can allow harmful respirable particulate to enter the cab.

## Cab Pressure Numeric Display

The monitor reports cab pressurization levels in real-time to provide the machine operator an indicator of cab environment.

## LED Alarm

The lighted indicator illuminates whenever the cab pressure drops below the preset minimum threshold for more than ten seconds. This feature cannot be disabled. The ten second delay allows for normal door opening and closing without setting off the alarm. The light will remain on until pressure is restored.

## Low Pressure Signal Alarm

This feature is internal in all units. It can be activated or deactivated during setup, and the volume level can also be adjusted to suit the environment. If the feature is activated, the alarm will sound whenever the cab pressure drops below the preset minimum pressure level for more than ten seconds. It automatically self-resets when the cab pressure returns to normal or when a off/on power cycle is completed.



## Silence Alarm Button

Sometimes it is necessary to open a window or door for more than ten seconds, which will set off the alarm. The alarm signal can be silenced by pushing the button. The alarm mode is self-resetting when the cab pressure normalizes or with an off/on power cycle. The alarm is again armed and will sound after a ten second pressure drop.

## Quick Connect Fitting

The included air line, which provides ambient air pressure from outside the cab, attaches here.

## Electrical Wiring

Connects to any convenient DC voltage connection between 9 VDC and 36 VDC, so the same unit can be installed on a 12-volt or 24-volt system.

## Customizable Settings

Pressure units in Pascal or inches of H<sub>2</sub>O, selectable during setup, along with volume level and alarm behavior.

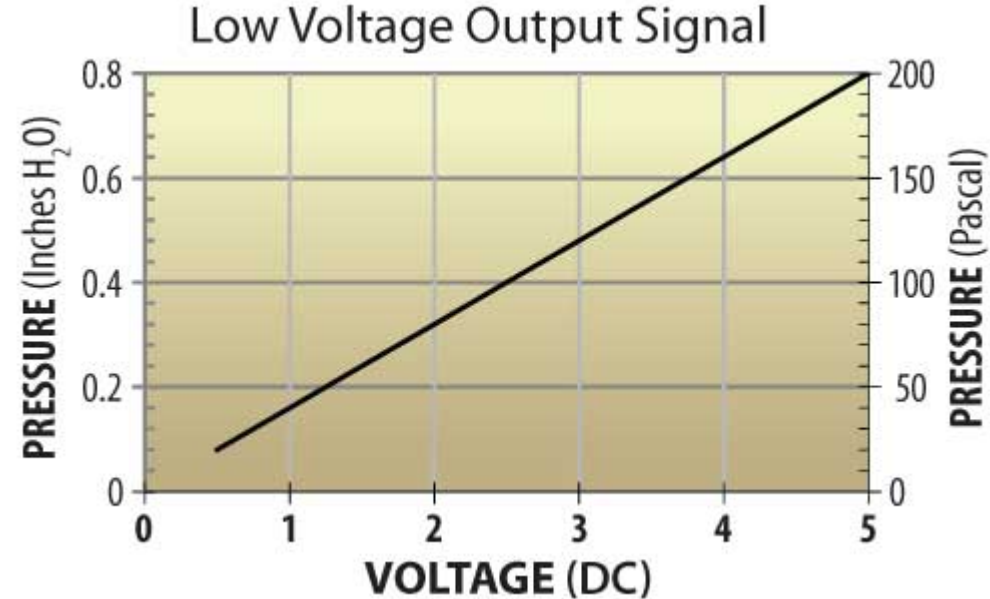
## Low Voltage Pressure Signal Port:

The unit includes a 0 to 5 volt output signal that can stream real-time pressure information to an on-board computer. The 1/8-inch mono-plug signal port puts out a low power voltage signal that varies with the pressure reading.



# RESPA Advisor Technical Specifications

- **Operating Pressure Range:** 0 to 0.8 Inches H<sub>2</sub>O (0 to 200 Pa)
- **Display Resolution:** 0.01 Inches H<sub>2</sub>O (1 Pa)
- **DC Input Voltage (self-resetting fuse):** Minimum: 9V, Maximum: 36V
- **Current Consumption:** Less than 30 mA
- **Operating Temperature Range:** -40 F to 140 F (-40 C to 60 C)
- **Enclosure Dimensions:** 3.50 x 2.52 x 1.39 inches (88.9 x 64 x 35.2 mm)
- **Mounting Plate Dimensions:** 4.52 x 2.52 x 0.11 inches (114.8 x 64 x 2.8 mm)
- **Weight:** 0.2 oz. (175 g)
- **Air Tube:** 3/16 inches OD; 6 foot length (1.8 m)
- **Default Settings (as shipped from Sy-Klone):**
  - **Sound:** On
  - **Volume:** Full volume
  - **Digital display units:** Inches of H<sub>2</sub>O
  - **Alarm threshold:** 0.08 inches H<sub>2</sub>O (20 Pa)
- **Low Voltage Pressure Output Signal:**
  - 0V @ 0 Inches H<sub>2</sub>O (0 Pa)
  - 5V @ 0.8 Inches H<sub>2</sub>O (200 Pa)
  - 20 mA



This low voltage output signal chart can be used to calibrate real-time pressure data when sent to a computer or telemetric system.