kaiterra

Sensedge Duct Air Quality Monitor

(Wireless, Battery-Powered Model)

Specially engineered for HVAC environments, the Sensedge Duct is designed to monitor up to ten air quality and environmental parameters within supply or return air ducts.

Featuring a robust duct-mount installation and a dual-probe air sampling design, it delivers accurate, reliable, real-time measurements of the air being distributed through your HVAC system.

WORKS WITH WELL

RESET STANDARD — HEALTHY BUILDINGS

Product Features

Dual-probe precision
Custom dual-probe air sampling design with a pressure-stabilized sensing chamber ensures accurate, representative readings across varying airflow rates in real time.

True environmental sensing
External temperature and humidity sensor positioned directly in the airstream captures real conditions with fast response.

Flexible wireless setup
Battery-powered with up to 8 years of battery life - no cabling required. Utilizes Sub-GHz wireless communication to a gateway with cellular and Ethernet connectivity. BMS integration available.

Modular & upgradeable
Replaceable sensor modules allow quick swaps for long-term accuracy and easy maintenance. Optional filter efficiency attachment unlocks extra diagnostics and filter performance metrics.

Sensedge Duct (Wireless Model) is Available in 4 SKUs

	DU-300A	DU-301A	DU-300W	DU-301W
	Sensedge Duct (Wireless)	Sensedge Duct with Filter Efficiency (Wireless)	Sensedge Duct for WELL (Wireless)	Sensedge Duct for WELL with Filter Efficiency (Wireless)
CO_2	✅	✅	✅	✅
Temperature	✅	✅	✅	✅
Relative Humidity	✅	✅	✅	✅
Particulate Matter (PM_1, $PM_{2.5}$, PM_{10})	✅	✅	✅	✅
TVOC	✅	✅	✅	✅
CO			✅	✅
O_3			✅	✅
NO_2			✅	✅
Filter efficiency attachment (dual-pressure and airspeed sensor)		✅		✅

Sensor Specification

Particulate Matter Sensor
(Available in all SKUs)

Sensor technology
Laser particle sensor (Light scattering)
Mass concentration size range
$PM_{2.5}$: 0.3 to 2.5 μm
PM_{10}: 0.3 to 10.0 μm
Mass concentration range
0 to 1,000 μg/m³
Mass concentration accuracy for $PM_{2.5}$
0 to 30 μg/m³: ±3 μg/m³
30 to 1000 μg/m³: ±10 % m.v.
Mass concentration accuracy for PM_{10}
0 to 30 μg/m³: ±3 μg/m³
30 to 1000 μg/m³: ±15 % m.v.
Sensor output resolution
1 μg/m³
Calibration
Calibrated against standardized aerosol mix
WELL specification requirements
Adjustable particle density (K-factor) to
accommodate project/region-specific
particulate profile.
Complies with WELL Performance Verification
Guidebook **to be used in WELL certification.**

TVOC Sensor
(Available in all SKUs)

Sensor technology
Multi-pixel metal oxide sensor (MOx)
Target gas profile
Complex mixture of 22 VOCs[1] as defined by
Molhave et al.
Measurement range
0 - 1,382 ppb
0 - 5,482 ug/m³
Accuracy
±15 % ±4 ppb
±15 % ±18 ug/m³
Sensor output resolution
1ug/m³
Calibration
Ethanol in clean air
Sampling process
Passive
WELL specification requirements
Calibration gas: ethanol
Target gas profile (ppb=μg/m³ conversion
factor under STP): 22 VOC mixed per Molhav et
al. (1 ppb = 4.57 μg/m³)
Complies with WELL Performance Verification
Guidebook to **be used in WELL certification.**

Relative Humidity Sensor
(Available in all SKUs)

Sensor technology
Digital sensor
Measurement range
0 - 100 %RH
Accuracy
±2 % RH
Sensor output resolution
0.1 % RH

CO₂ Sensor
(Available in all SKUs)

Sensor technology
Non-dispersive infrared (NDIR)
Measurement range
400 to 5,000 ppm[2]
Up to 10,000 ppm extended range[3]
Accuracy
± 40 ppm ± 3%[4] (Comply with ANSI/ASHRAE
Standard 62.1-2022)
Sensor output resolution
1 ppm
Target gas
CO_2

Temperature Sensor
(Available in all SKUs)

Sensor technology
Digital sensor
Measurement range
-20 - 100 °C
Accuracy
±0.2 °C
Sensor output resolution
0.1 °C

O$_3$ Sensor

(Available in DU-300W/301W)

Sensor technology
Electrochemical
Measurement range
0 to 2,000 ppb
Accuracy
0 to 100 ppb: ±10 ppb
›100 ppb: ±10 %
Typical response time
(T90): ‹ 120s
Sensor output resolution
1 ppb
Recommended lifetime
3 years
Interference gas
CL2
Target gas
O$_3$

CO Sensor

(Available in DU-300W/301W)

Sensor technology
Electrochemical
Measurement range
0 to 100 ppm
Accuracy
0 to 20 ppm: ±1 ppm
›20 ppm: ±5%
Typical response time
(T90): ‹ 60s
Sensor output resolution
0.1ppm
Recommended lifetime
3-5 years
Interference gas
Not listed
Target gas
CO

NO$_2$ Sensor

(Available in DU-300W/301W)

Sensor technology
Electrochemical
Measurement range
0 to 2,000 ppb
Accuracy
0 to 100 ppb: ±10 ppb
›100 ppb: ±10 %
Typical response time
(T90): ‹ 120s
Sensor output resolution
1 ppb
Recommended lifetime
3 years
Interference gas
CL2
Target gas
NO2

Filter Efficiency Add-on

(Available in DU-301A/301W)

Sensor technology
Differential pressure (Thermal mass flow)
Filter pressure drop (2 channels)
Range: ±500Pa
Accuracy：3%
Resolution：0.1Pa
Duct air flow (1 channel)
Range: 1.5 - 20m/s
Accuracy：±10%
Resolution：0.1m/s

Device Specification

Power
Battery: 6 x Li/SOCl2 AA size
USB-C: 5V 0.5A (Cable not included)
PoE: Via PoE to USB-C converter (Cable not included)

Battery Life
Up to 8 years of battery life[6] using Adaptive Sampling™ and 3.5 years using a high frequency fixed sampling rate[7] [8]

Connectivity
Frequency range (MHz):
Sub-Ghz wireless communication
IN865/EU868/US915/AU915/KR920/AS923
These frequency bands cover over 200 countries, contact Kaiterra for details on compliance in your location.
Gateway supports cellular[9] and ethernet

Integration
BACnet/IP via Gateway

Installation
Duct mount with screws (on supply and/or return air ducts)

Data Logging & Storage
Data Storage:
Cloud storage
Local data storage: 0.5 days
Data sampling:
Adaptive Sampling™ to automatically adjust sampling frequency to maximize battery life. Selected sensors support a configurable sampling rate from 1 minute to 24 hours.

Modules & Calibration
Compatible modules:
KM-300: Particulate Matter sensor module
KM-308: CO, O_3, NO_2 sensor module
Calibration: Swappable sensor modules

Operating conditions
Operating temperature: -20 to 50 °C
Operating humidity: 5 to 95 %RH, non-condensing

Size & Weight
Without filter efficiency feature:
Length:375 mm (14.76 in)
Height: 300 mm (11.8 in)
Width: 300 mm (11.8 in)
Weight:1488 g (3.28 lbs)
With filter efficiency feature:
Length: 375 mm (14.76 in)
Height: 300 mm (11.8 in)
Width: 300 mm (11.8 in)
Weight: 2388 g (5.26 lbs)

1. n-Hexane, n-Nonane, n-Decane, n-Undecane ,1-Octane, 1-Decene, Cyclohexane, m-Xylene, Ethylbenzene, 1,2,4-Trimethylbenzene, n-Propylbenzene, a-Pinene, n-Pentanal, n-Hexanal, Iso-propanol, n-Butanol, 2-Butanone, 3-Methyl-3-butanone, 4-Methyl-2-pentanone, n-Butylacetate, Ethoxyethylacetate, 1, 2-Dichloroethane
2. Extended exposure to concentrations below 400 ppm may result in incorrect operation of ABC algorithm and should be avoided.
3. Sensor provides readings in the extended range but the accuracy may be lower than that specified in the table.
4. The accuracy specification covers environments ranging from 0-50°C and 0-80% RH, and complies with indoor air quality standards ANSI/ASHRAE Standard 62.1-2022 at 25°C.
5. Sensor specifications are under controlled laboratory conditions. Field measurements may use localized ambient air quality and historical infiltration rates to enhance the accuracy and baseline readings of NO_2 concentrations. This method is effective under typical indoor conditions but may not suit environments with persistently high indoor NO_2 levels.
6. Using Adaptive Sampling™ in a building with 15 devices, located in a typical North American city with mechanical ventilation and strong wireless signal strength to the gateway.
7. During operating hours (9-5, Mon-Fri): one sample per minute for all sensors except particulate matter, and one sample every 10 minutes for particulate matter. Outside of operating hours: one sample every five minutes for all sensors except particulate matter sensor, and one sample every 60 minutes for particulate matter.
8. Actual battery life may vary based on usage, environmental conditions, and other factors. Model SE-300W has a battery life expectancy of 3.5 years. Model SE-300L has a battery life expectancy of 8.5 years.
9. Cellular is supported in select countries and regions.

Get in touch with us! | www.kaiterra.com   info@kaiterra.com