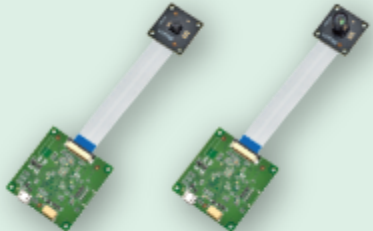# Omron Solutions
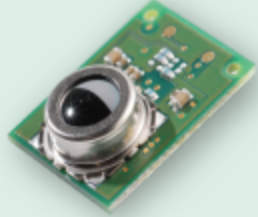# for Healthcare

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Omron Sensor Overview

Human Sensing

Embedded-type Human Vision Components

Face detection
Face recognition (Mr.Alex)
Expression estimation (happiness)
Age estimation (age 25)
Gender estimation (male)

Face Direction estimation (Right 30°)
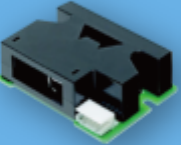Gaze estimation
Body detection
Hand detection
Blink estimation

MEMS Thermal Sensor

Position of people
Number of people (2)

Condition Sensing

Air Quality Sensor
Dust

MEMS Flow Sensor
Airflow

Seismic Sensor
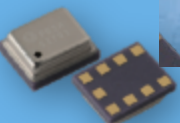Earthquake

MEMS Thermal Sensor
Temperature

Light Convergent Reflective Sensor
Object presence/absence

MEMS Barometric Pressure Sensor
Absolute pressure

Photomicrosensor
Object presence/absence

Environment Sensor
Temperature
Humidity
Absolute pressure
Light
Noise
UVI

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Omron Rules for Medical applications

Conditions to work on Medical applications:

- All projects have to be confirmed through Business Theme Sheet
- Class is based on EU categorization.
- Class III is prohibited to sell
- Class IIB –we can sell only products developed for medical

	Class I	Class IIA	Class IIB	Class III	Remark
Products developed for general use	Y	Y	N	N	
Products developed for Medical use	Y	Y	Y	N	Ex: EE-SX4320 in next page

Contact Omron representative for confirming each project.

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Photomicrosensor for medical use

- **OMRON developed SMD type PMS for medical devices.**
- **Possible to be installed in up to class Ⅱb medical devices.**
- **Improved the quality control system and the production process in order to guarantee the medical quality.**

Slot Width	2mm		3mm		4mm		5mm	
Output	P-Tr	P-IC	P-Tr	P-IC	P-Tr	P-IC	P-Tr	P-IC
Standard type	SX1320 SX1321 (2ch)	SX4320	SX1330	No	SX1340	SX3340 SX4340	SX1350	SX3350 SX4350
Medical type	No	Available SX4320-M1	No	No	No	No	No	No

- Only one type is available at this moment.
- The specification is same as standard one (EE-SX4320)
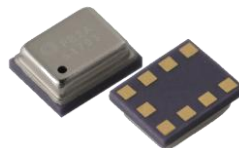
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Sensors by Application - Healthcare

Insulin pump
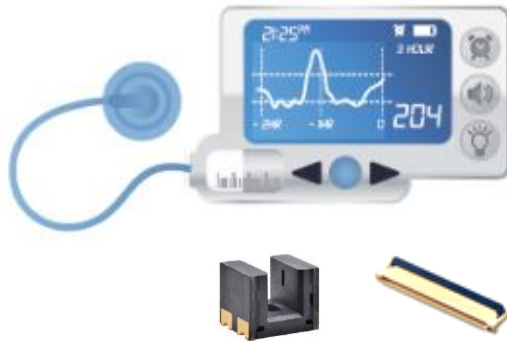
Oxygen concentrator

Smart inhalers

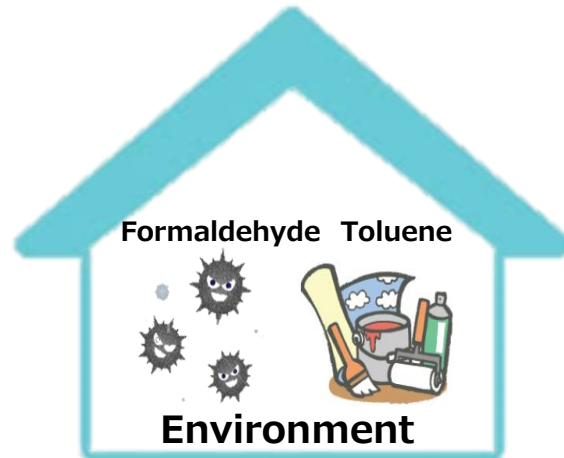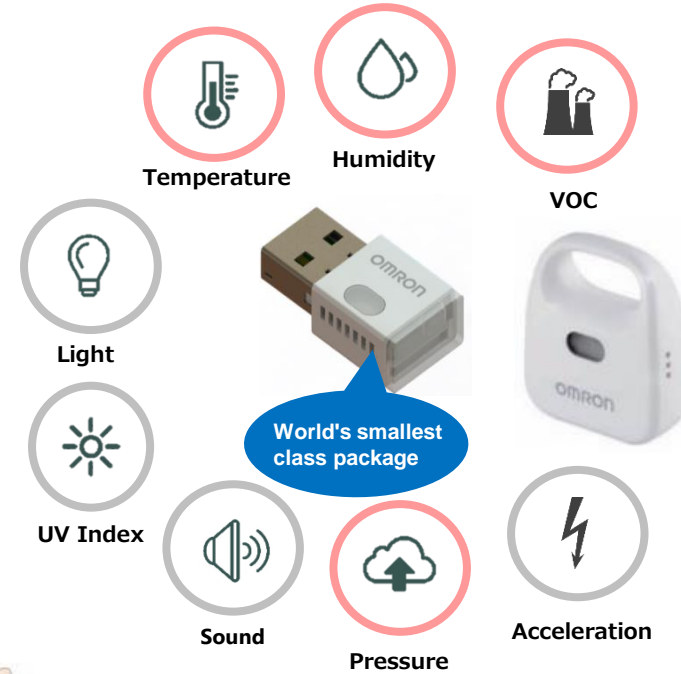**Smart bed / Warming blankets**

Clean room flow detection

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2JCIE projects for respiratory

Monitor the environment condition which causes respiratory disease for better control of symptom

Item	Specification
Sensors	Temperature, Humidity, Light, Pressure, Noise, Acceleration, VOC(Volatile Organic Compounds)
Power Supply	USB Supply
Interface	Bluetooth *1 , USB2.0
Dimensions	Approx. 14.9mm × 29.1mm × 7.0 mm
Weight	Approx. 10g

Temperature   Humidity   VOC

Light

World's smallest class package

UV Index   Sound   Pressure   Acceleration

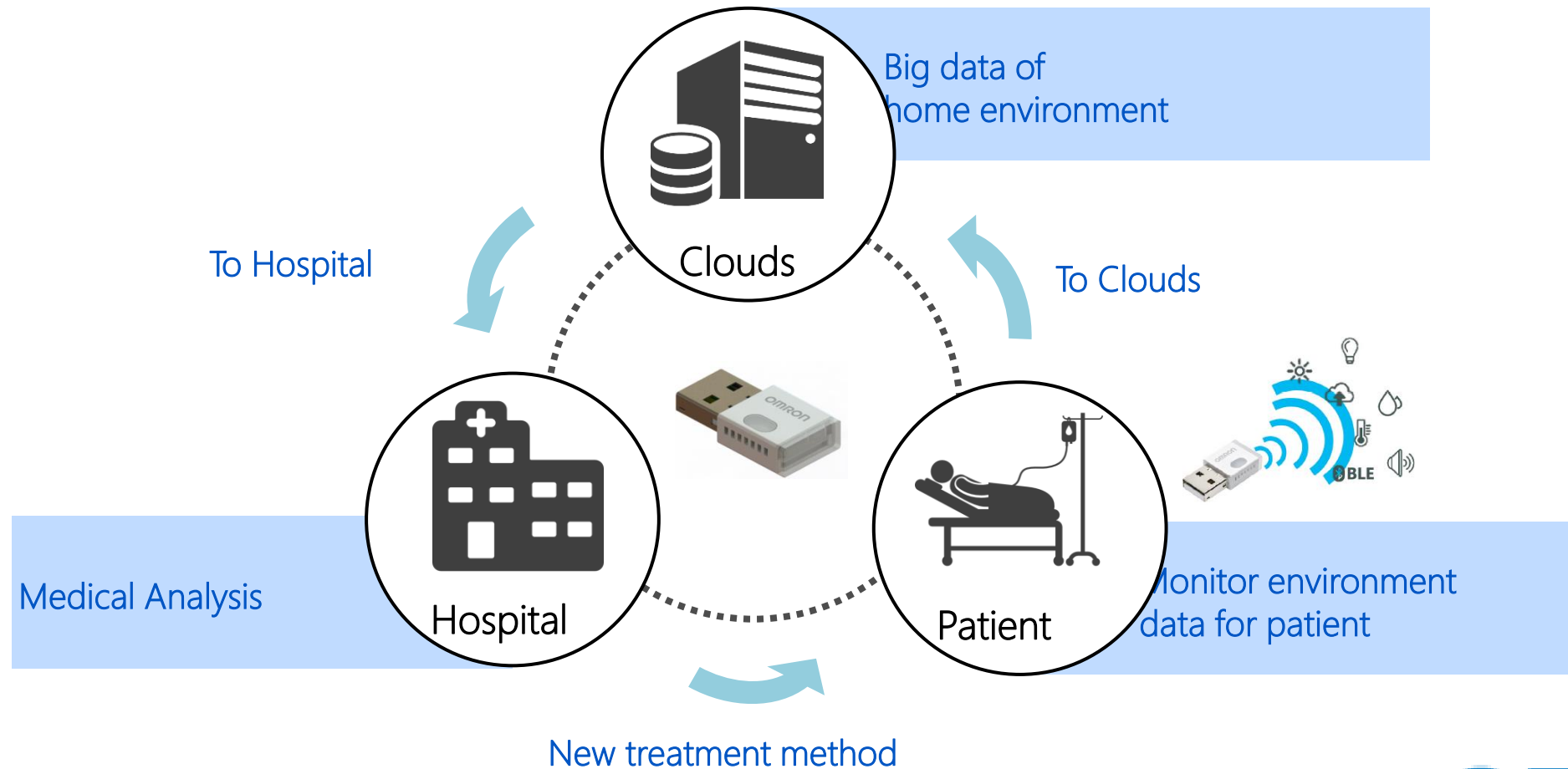Formaldehyde Toluene

Environment

BLE

User

Visualize the environment condition

Analyze environmental conditions to predict asthma attach
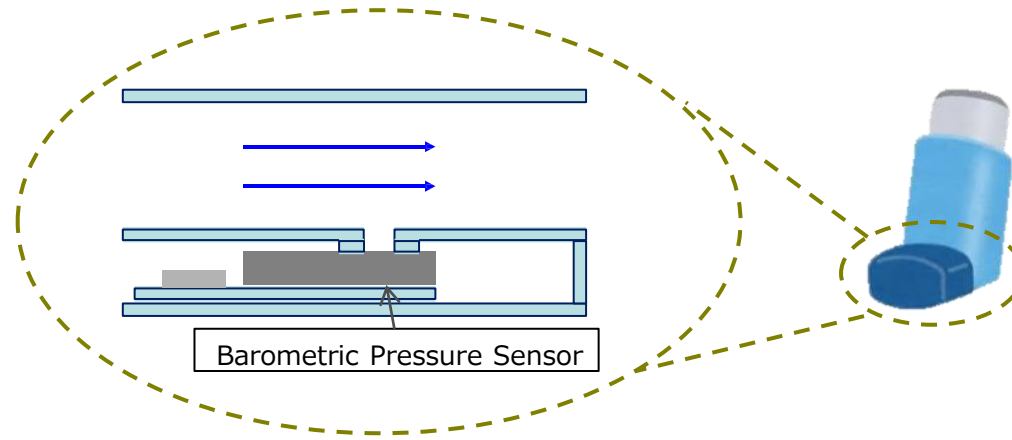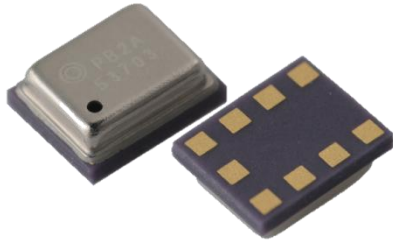
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2JCIE projects for respiratory

- **Monitor the environment data for patient**
- **Develop new treatment methods from big data analysis**

2SMPB projects for respiratory
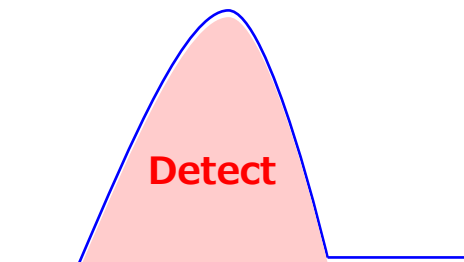
Smart inhalers – breath detection

Barometric Pressure Sensor 2SMPB-02E

Barometric Pressure Sensor

Schematic Diagram

Detect Inhalation	Detect Sync of Spray & Inhalation	Detect Inhalation Pressure
Avoid miscount caused by unintended push by detecting inhalation	Efficient drug delivery by detecting synchronization of spray and inhalation	Support patient to inhale properly by detecting inhale pressure

Detect

Waveform of delivers

OK area

Waveform of Delivers

Reach Depth

Inhale Pressure
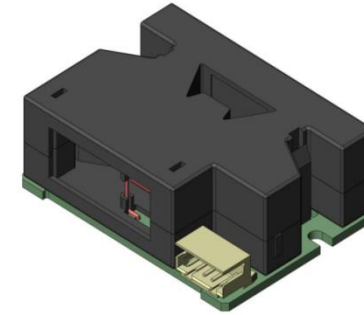
OMRON
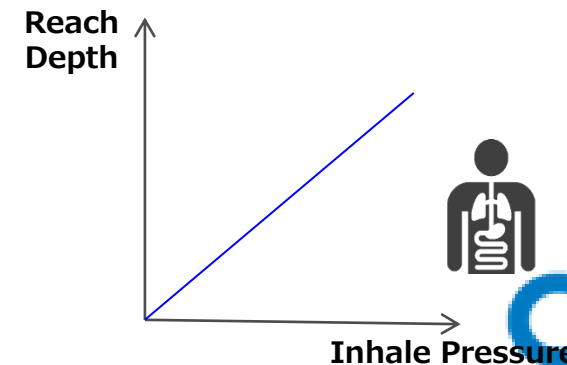
Air Quality Sensor for respiratory

Air Quality Sensor B5W-LD0101

High Sensitivity

1. Detection of PM2.5 or less possible using LED (minimum 0.5um)

2. Unique flow path which allows particulates to flow through the sensor effectively
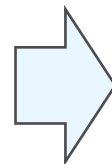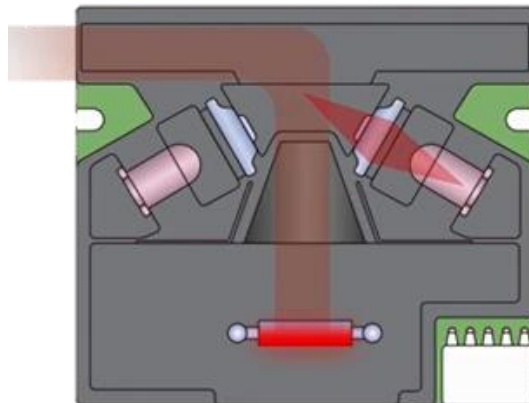
Compact

Realize compact package by optimal optical design: 52.3(W) × 39.3(H) × 17.6(D) mm

Light Source: LED
Detective Device: PIC

Technical Outline

Generate ascending current by heater

Detect Particulates

Lead particulates, detect scattered light by particulates and output signal
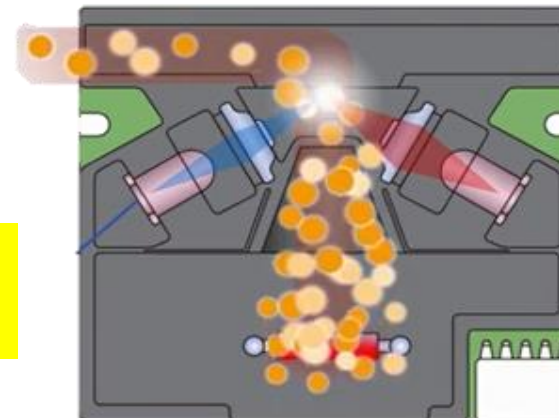
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Oxygen Therapy

Four Solutions

#1 Oxygen Flow Sensing

Schematic of Oxygen concentrator

Compressor
Sieve bed
Sieve bed
PSA part
Air
Concentrating unit

Oxygen tank

Regulator

Cannula tube

Supply unit
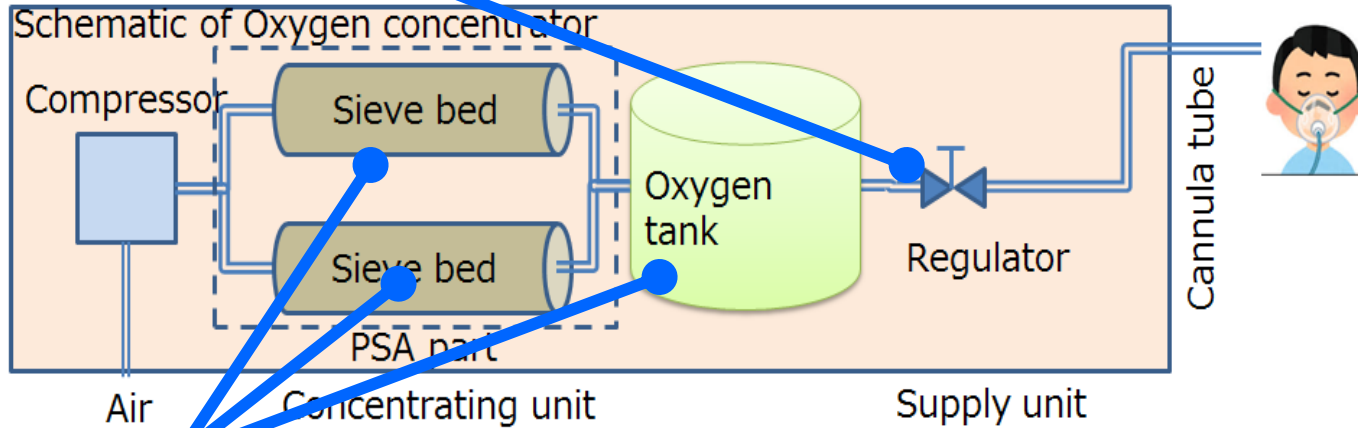
#2 Sieve Bed or other pressure sensing

#3 Altitude Correction

#4 Environment Sensing

79%
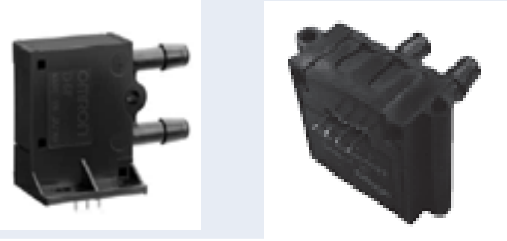
~ 21883425

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#1. Oxygen Flow Sensing

Sensors to detect flow rate

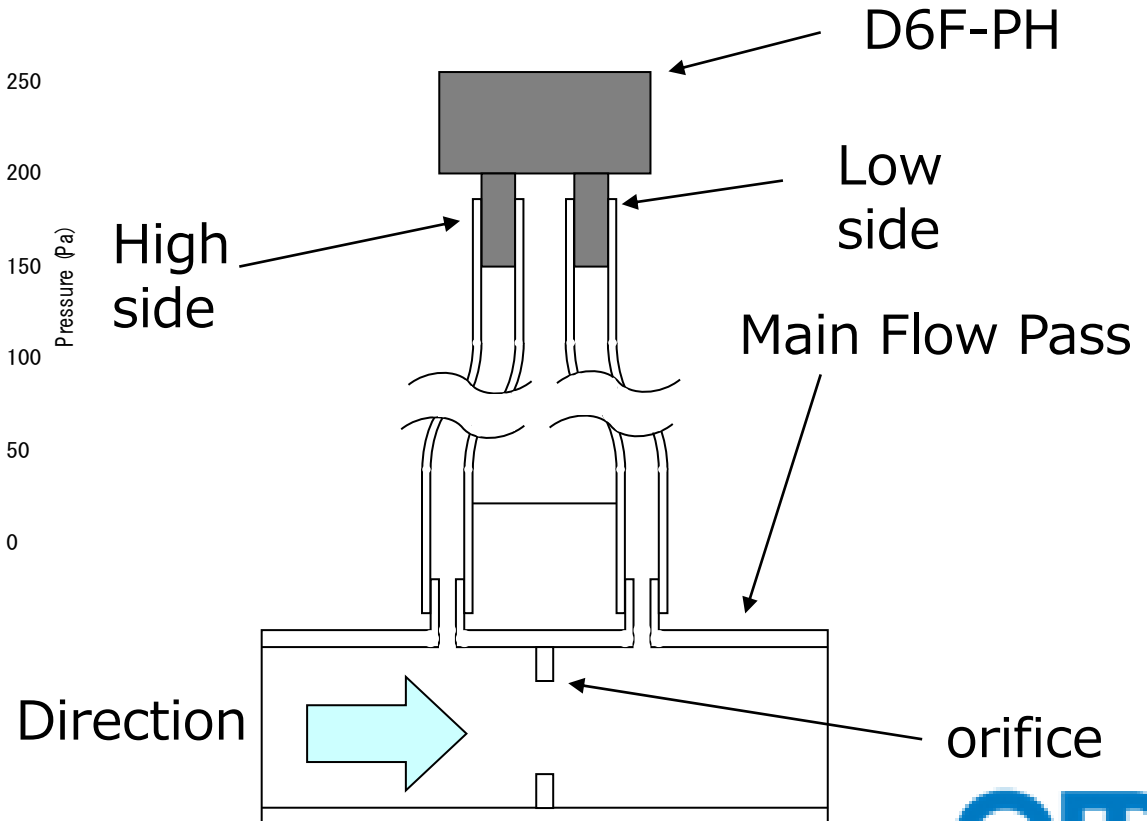| Omron products	D6F-PH / D6F-P
Type	Differential pressure sensor
Object	Flow type Differential pressure
Piping	Bypass
Appearance	
Key Points	1.High sensitivity at low flow range

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Differential Pressure Type – Model: D6F-PH

Thermal flow type has high sensitivity at low flow rate / pressure condition compare with diaphragm type differential pressure sensor.
Final linearized output is same but accuracy should be effected raw output.
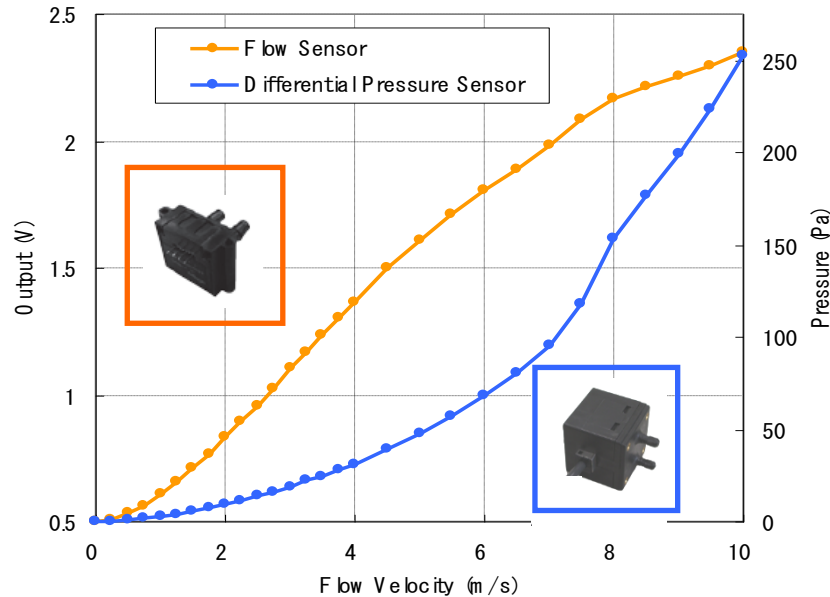
Differential pressure sensor D6F-PH

D6F-PH

Low side

High side

Main Flow Pass

Raw output of sensor

Direction

orifice

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Gauge Pressure Sensor

feature	
Points	-Gauge pressure type 　+37kPa,±50kPa -Analog output -SMD -Bottom insert

#3. Altitude sensing

Absolute Pressure Sensor

Feature
- Small size & Thin package
- High Accuracy
- Digital output through I2C/SPI
- Low current consumption by auto sleep mode

Item	Specification (type : 2SMPB-02E)			Unit	Comment
	Min	Typ	Max.		
PKG size	2.0 x 2.5 x 0.85			mm	
Supply voltage	1.5	2.2	3.6	V	
Current consumption	-	640	800	uA	Sleeping mode; 1.1uA
Usage voltage	-40	-	85	℃	
Accuracy	-	±50	-	Pa	
Interface	I2C / SPI			-	

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1.Dust sensor

Able to detect PM2.5& PM10

1. Concept **OMRON**

High sensitivity & Smaller size Air Quality Sensor

Product Image
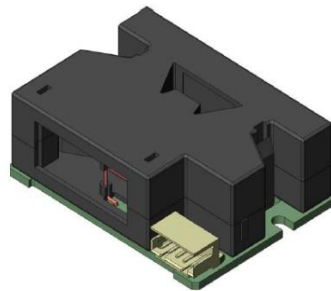
Features

*Light source : LED
*detective device : PIC

1. High sensitivity
   -1. Detection of the 0.5um particle is possible using LED.
   -2. The original duct structure that can breathe in the air stably and effectively.

2. Smaller size
   Small size by having slimmed an optical design.

2-1. Features [High Sensitivity] **OMRON**

The sensor can detect particle of 0.5um dia. by high sensitivity.

⇒It realizes this by Omron's original high sensitive PIC and optical design technology.

- LED +optical LENS design
- High sensitive PIC development
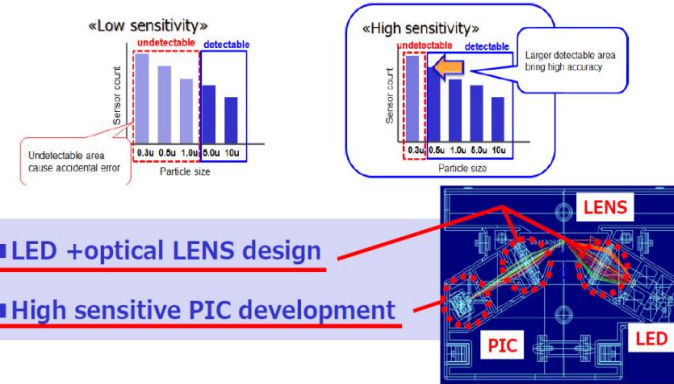
2-2. Features [High suction performance] **OMRON**

High suction performance design by thermic fluid simulation

⇒ The pulse count increases by high suction performance because it can suck more particle into the sensor.
High pulse count make stable the particle count per period.

- heater and thermic fluid design with simulation

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#4 Environment sensing
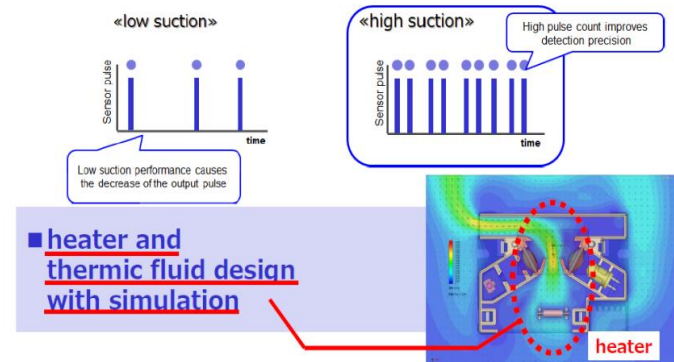
2. Environment sensor

Feature

・Low current consumption
・Function
    Bluetooth low energy
    6 sensors
    Beacon alert
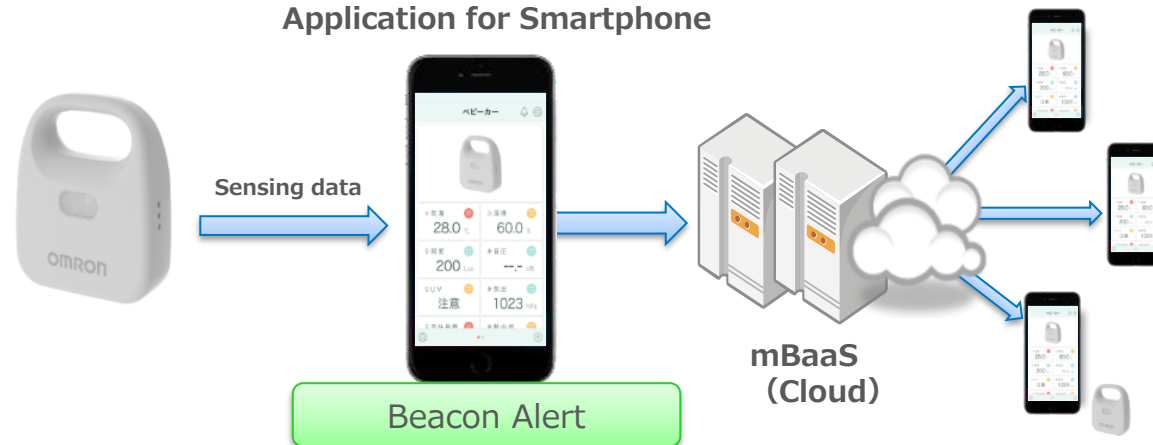
・Temperature
・Humidity
・Pressure
・Light
・UV
・Sound

46×39×15mm

FC **CE**

Bluetooth®

Remote monitor through the sever

Basic system　　　**Application for Smartphone**

Sensing data

Beacon Alert

mBaaS
(Cloud)

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Application for Smart Bed

Sleep Monitoring Sensor

Move & Temperature Detection
MEMS IR Sensor
D6T

Room Condition Sensor

Temp. Humidity, VOC & Light Sensing
Environment Sensor
2JCIE
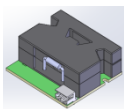
Particle Sensing
Air Quality Sensor
B5W

Bed Position Sensor

Position Detection
Photomicro Sensor
EE-SX

Position Detection
Micro Switches
SS/V/D3V

Tilt Sensing
Tilt Sensor
D7E

Bed Control

Motor control
Power Relays
G5NB/G5Q G8ND

Operation

Tactile Sensor
B3F/B3FS/B3W

Touch Sensor
W7EB

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Room & Bed Condition Sensor

Uniqueness by OMRON

1. **Turn-key solution which can monitor both room and inside of bed**
2. **OMRON's unique algorithm to change from raw data to data with meaning**
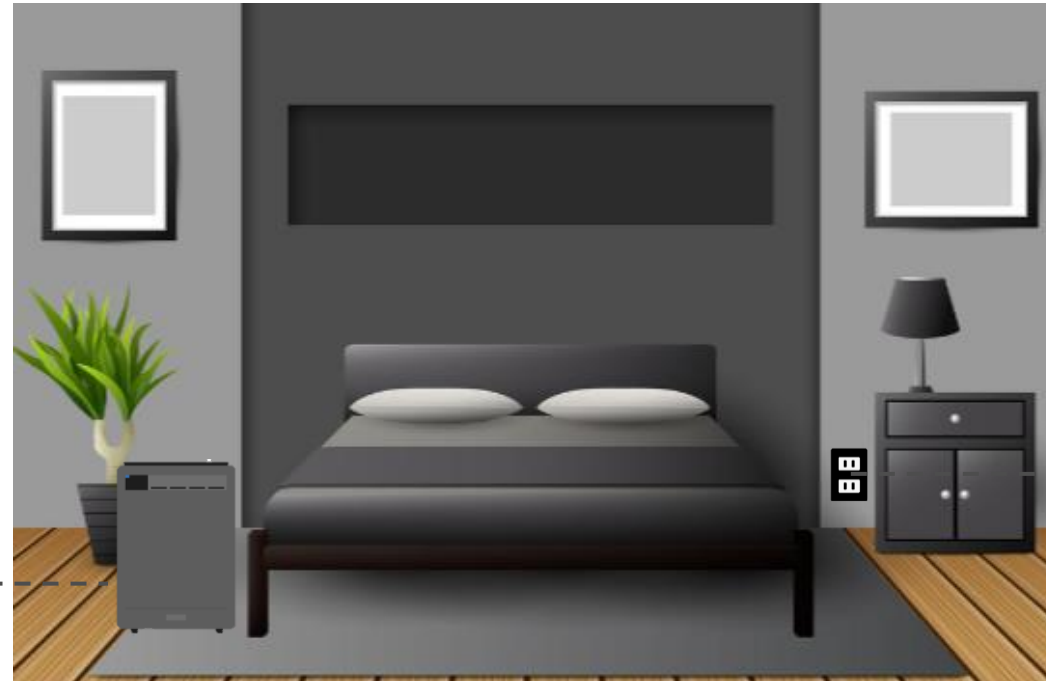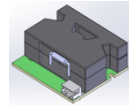
3 Air Quality Sensor

PM2.5

Pollen

4 Environment Sensor

Temperature | Humidity | Light | Barometric Pressure | Noise | Acceleration | VOC

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2JCIE Environment Sensor

Sense a variety of environment information by small package of sensor for comfortable life

Detection Function

Temperature

Humidity

Light

Barometric Pressure

Noise

Acceleration

VOC

World's smallest class package

Monitoring Method (e.g.)

Cloud collaboration accessible on smartphones

- The amount of data captured on smartphones can be stored in the cloud.
- Environmental data can be checked from smartphones in remote locations.

Data → Smartphone Application → Cloud

Contribute for a good night sleep

- **Heatstroke prevention**
- **For a good night sleep**
  - -Temperature,Humidity,Light,Noise,VOC and CO_2

Source https://www.components.omron.com/solutions/mems-sensors/environment-sensor

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