

## MEMS Air Velocity Sensor

### D6F-W

**Compact, intelligent sensors featuring MEMS precision technology for repeatable airflow detection.**

- Precision uni-directional air velocity detection.
- Integral passive Dust Segregation System (DSS).
- Compact size: 39 (L) x 20 (W) x 9 (H) mm
- User friendly - no adjustment necessary.



RoHS Compliant

## Application Examples

- Cassette (ceiling / suspended), multi-modular air conditioners.
- Duct connected heating and air conditioning systems.
- Alternative for single point Pitot tube.
- Alternative for thermal dispersion measurement.
- Air & water cooled chillers, indoor packaged AC systems.
- Window / split, multi-split residential AC coolers.
- Air purifiers, dehumidifiers.
- Fan assisted space heaters.
- Air cooled, high power indoor lighting.
- Mission critical PC, Workstation ventilation.
- 19" rack / tray mounted PSU watchdog ventilation systems.

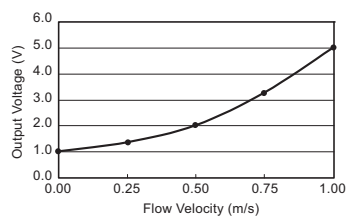
## Ordering Information

Model	Case	Applicable Gas	Flow Range
D6F-W01A1	PPS	Air (See note.)	0-1 m/sec
D6F-W04A1	PPS	Air (See note.)	0-4 m/sec
D6F-W10A1	PPS	Air (See note.)	0-10 m/sec
D6F-W CABLE (Optional)			

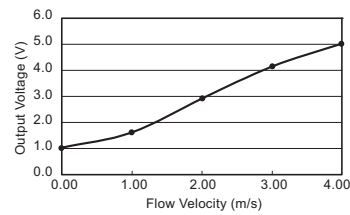
**Note:** Dry gas must not contain large particles, eg dust, oil, mist.

# Output Voltage Characteristics

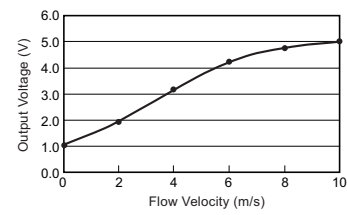
**D6F-W01A1**



**D6F-W04A1**



**D6F-W10A1**



**D6F-W01A1**

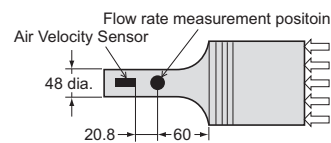
Flow Velocity (m/s)	0.00	0.25	0.50	0.75	1.00
Output Voltage (VDC)	1.00±0.2	1.35±0.2	2.01±0.2	3.27±0.2	5.00±0.2

**D6F-W04A1**

Flow Velocity (m/s)	0	1	2	3	4
Output Voltage (VDC)	1.00±0.2	1.58±0.2	2.88±0.2	4.11±0.2	5.00±0.2

**Note:** Air velocity. D6F-W is optimally adjusted for air velocity detection, derived from mass air-flow measurement according to our in-house test method using a wind tunnel phi 48 mm as shown in Fig. 1.

**Fig. 1.**



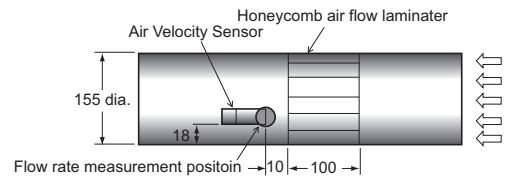
Measurement condition: Power supply voltage 12±0.1 VDC, ambient temperature 25±5 °C. and ambient humidity 35 to 75 % RH.

**D6F-W10A1**

Flow Velocity (m/s)	0	2	4	6	8	10
Output Voltage (VDC)	1.00±0.24	1.94±0.24	3.23±0.24	4.25±0.24	4.73±0.24	5.00±0.24

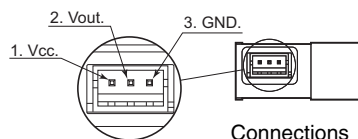
**Note:** Air velocity. D6F-W is optimally adjusted for air velocity detection, derived from mass air-flow measurement according to our in-house test method using a wind tunnel phi 155 mm as shown in Fig. 2.

**Fig. 2.**



Measurement condition: Power supply voltage 12±0.1 VDC, ambient temperature 25±5 °C. and ambient humidity 35 to 75 % RH.

## Connections



Enlarged view

Connections

- Pin No. 1: Vcc
- Pin No. 2: Vout
- Pin No. 3: GND

Connector S3B-ZR-SM2-TF  
(Made by JST Mfg. Co.,Ltd.)

The connector linked to this product should use the following JST Mfg.Co.,Ltd.

- Contact and an electrical wire
- 1) Contact:SZH-002T-P0.5  
Wire: AWG#28 to #26 or
- 2) Contact:SZH-003T-P0.5  
Wire: AWG#32 to #28
- Housing: ZHR-3

# Characteristics / Performance

## ■ Coil Ratings

Models	D6F-W01A1	D6F-W04A1	D6F-W10A1
Flow Range (See note 1.)	0 to 1 m/s	0 to 4 m/s	0 to 10 m/s
Applicable Gas (See note 2.)	Air		
Electrical Connection	Connector (3 wire)		
Power Supply	10.8 to 26.4 VDC		
Current Consumption	Max. 15 mA (no load, Vcc = 12 to 24VDC)		
Output Voltage (VDC)	1 to 5 VDC		
Accuracy	± 5% F.S. max. of detected characteristics at 25 °C		
Repeatability (See note 3.)	± 0.4% F.S.		
Output Voltage (Max.)	5.7 VDC (Lead resistance 10kΩ)		
Output Voltage (Min.)	0 VDC (Lead resistance 10kΩ)		
Rated Power Supply Voltage	26.4 VDC		
Rated Output Voltage	6 VDC		
Case	PPS		
Degree of Protection	IP40		
Operating Temperature	-10 to 60 °C (with no icing or condensation)		
Operating Humidity	35 to 85% RH (with no icing or condensation)		
Storage Temperature	-40 to 80 °C (with no icing or condensation)		
Storage Humidity	35 to 85% RH (with no icing or condensation)		
Temperature Characteristics	± 5% F.S. max. of detected characteristics at 25 °C (within -10 to 60 °C)		
Insulation Resistance	20 MΩ (500 VDC between lead terminal and the case)		
Dielectric Strength	500 VAC, 50/60 Hz for 1 minute. (Leakage current typ. Max. 1 mA) between lead terminals and case.		
Weight	6.3 g		

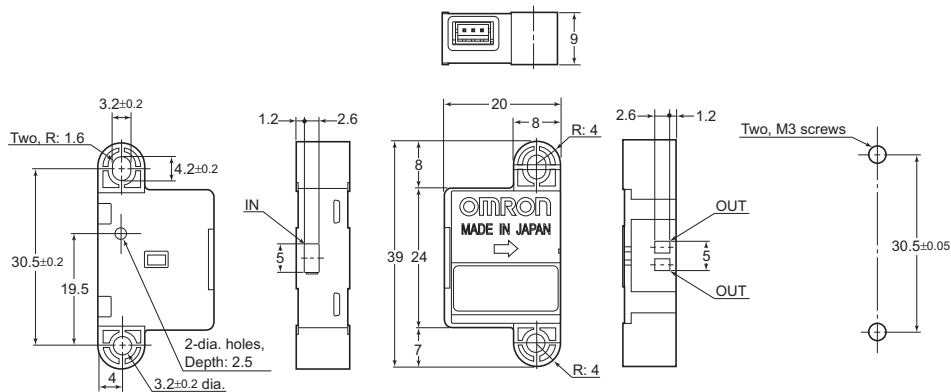
- Note: 1. Flow Velocity at 0 °C, 101.3kPa.  
 2. Dry gas. (must not contain large particles, eh dust, oil, mist)  
 3. Reference (typical)

## Dimensions

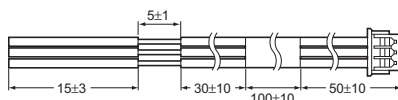
(Unit: mm)

Note: All units are in millimeters unless otherwise indicated.

### D6F-W01A1 D6F-W04A1 D6F-W10A1

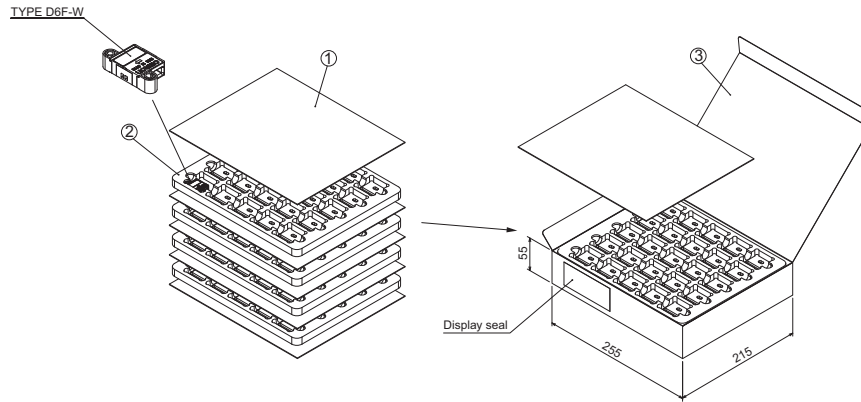


## ■ CABLE (Optional) D6F-W CABLE



GND - blue  
 Vout - black  
 Vcc - brown

# Packaging



No.	Item	Material
1	Sock liner	CCNB
2	Tray (25pcs)	Polyethylene
3	Box	CCNB

# Safety Precautions

## ■ Caution

The D6F is built for use with general-purpose devices. In particular, when using the D6F for applications with the safety requirements described below, take steps to ensure system and device safety through measures such as fail-safe designs, redundant designs, and regular inspections.

- Safety devices for ensuring safety for persons
- Transportation equipment control (such as applications to stop operation)
- Aviation and space equipment
- Nuclear power equipment

Do not use the D6F for applications in which D6F operation would directly affect human life.

## ■ Precautions for Correct Use

### Fluids, Piping, and Sensor Installation

1. Do not use combustible gas (such as hydrogen) or corrosive gas (such as chlorine, sulfur, acid, or alkali) other than the specified applicable fluids. Doing so may cause product failure.
2. The specified performance may not be obtained if the D6F is used for fluids other than the specified applicable fluids.
3. After removing the Sensor from the package, do not allow foreign particles to enter the piping. Foreign particles in the piping may cause product failure.
4. It is recommended that the pipes be mounted horizontally. If they are not mounted horizontally, an error of  $\pm 1\%$  FS or higher may result.
5. Install the Sensor on a flat surface. Incorrect installation may cause malfunctions or may make it impossible to obtain correct measurements.
6. Turn OFF the power supply to the system before installing the Sensor. If the Sensor is installed while the power supply is ON, electric shock or incorrect operation may occur.
7. Always check operation after installing the Sensor.
8. Do not drop the Sensor or disassemble the cover.
9. Depending on the environment and the mounting position, foreign objects, such as dust or dirt, may enter into the Sensor and partially or completely block the flow path. If this occurs, the Sensor may not be able to sufficiently perform as described above. Make sure that you understand how to use the Sensor and test it in advance with the actual equipment with which it is to be used.
10. Mount the Sensor using M3 panhead screws, and tighten the screws to a torque of 0.59 N•m maximum.

### Operating Environment

Do not use the Sensor in the following locations:

- Locations subject to direct radiant heat from heating equipment
- Locations subject to water or oil
- Locations subject to direct sunlight
- Locations subject to sudden temperature changes
- Locations where there is a possibility of icing or condensation
- Locations subject to strong vibration or shock

## Countermeasures Against Noise

Noise may make it impossible to obtain correct measurements. Consider the following countermeasures.

- Install the Sensor as far as possible from devices that generate surges or strong high frequencies (such as high-frequency welders and machines).
- Attach surge absorbers or noise filters to noise-generating devices that are near the Sensor (in particular, equipment with inductance, such as motors, transformers, solenoids, and magnetic coils). (It also helps to separate pipes and ducts, and to use shielded cables.)

## Power Supply

- Use the applicable connectors. Directly soldering the connection terminals will cause product failure.
- Check the terminal names and polarity and wire the power supply correctly. Incorrect wiring will cause failure of internal components.
- When using a commercially available switching regulator, ground the FG (frame ground) and G (ground) terminals.

## ■ RoHS Directive

The RoHS mark is displayed on the packing of products for which the six substances banned by the RoHS Directive have been abolished (both in processing and in the electronic components mounted to the PCBs).

**Note:** RoHS marking may be deleted if it is later determined that parts that were previously treated as RoHS compliant are not compliant due to circumstances at the supplier of the parts.

## RoHS Compliance Standards

The following standards are used to determine RoHS compliance for the six banned substances.

- Lead: 1,000 ppm max.
- Hexavalent chromium: 1,000 ppm max.
- Mercury: 1,000 ppm max.
- PBB: 1,000 ppm max.
- Cadmium: 100 ppm max.
- PBDE: 1,000 ppm max.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. A184-E1-02 **In the interest of product improvement, specifications are subject to change without notice.**

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