



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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D6F-PH

MEMS Differential pressure Sensor

A Compact, High-accuracy Differential Pressure Sensor with Superior Resistance to Environments.

  Digital

- High accuracy of $\pm 3\%$ RD
- Linearized and temperature compensated
- Digital output (I2C communication)
- High flow impedance to reduce the influence of bypass configuration



RoHS Compliant



Refer to the *Common Precautions for the D6F Series* on page 40.

Ordering Information

Applicable fluid (See note 1.)	Measurement range (See note 3.)	Model
Air (See note 2.)	0 to 250 Pa (0 to 1 in. H ₂ O)	D6F-PH0025AD1
	-50 to +50 Pa (± 0.2 in. H ₂ O)	D6F-PH0505AD3
	-500 to +500 Pa (± 2 in. H ₂ O)	D6F-PH5050AD3

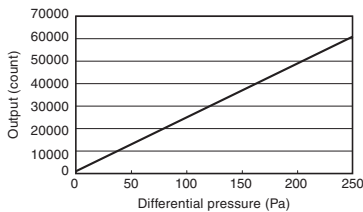
Note: 1. The Sensor be calibrated for different gas types. Consult your Omron representative.

Note: 2. Dry gas must not contain large particles, e.g., dust, oil, or mist.

Note: 3. At standard atmospheric pressure (1013.25 hPa)

Output Characteristics

D6F-PH0025AD1



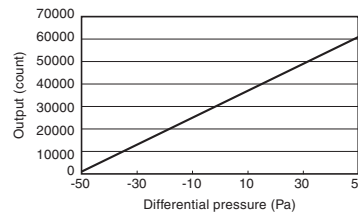
Differential pressure (Pa)	0	50	100	150	200	250
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	37024 (90A0)	49024 (BF80)	61024 (EE60)

Measurement conditions: Power supply voltage of 3.3 ± 0.1 VDC, ambient temperature of $25 \pm 5^\circ\text{C}$, and ambient humidity of 35% to 75%.

Differential pressure conversion formula: $Dp = (Op - 1024) / 60000 \times 250$

Dp = Differential pressure, Op = Output

D6F-PH0505AD3



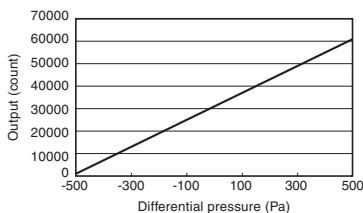
Differential pressure (Pa)	-50	-30	-10	0	10	30	50
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	31024 (7930)	37024 (90A0)	49024 (BF80)	61024 (EE60)

Measurement conditions: Power supply voltage of 3.3 ± 0.1 VDC, ambient temperature of $25 \pm 5^\circ\text{C}$, and ambient humidity of 35% to 75%.

Differential pressure conversion formula: $Dp = (Op - 1024) / 60000 \times 100 - 50$

Dp = Differential pressure, Op = Output

D6F-PH5050AD3



Differential pressure (Pa)	-500	-300	-100	0	100	300	500
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	31024 (7930)	37024 (90A0)	49024 (BF80)	61024 (EE60)

Measurement conditions: Power supply voltage of 3.3 ± 0.1 VDC, ambient temperature of $25 \pm 5^\circ\text{C}$, and ambient humidity of 35% to 75%.

Differential pressure conversion formula: $Dp = (Op - 1024) / 60000 \times 1000 - 500$

Dp = Differential pressure, Op = Output

Note. Change of gas density affects the sensor output.

Change of atmospheric pressure is compensated by the following formula.

$Dpeff = Dp \times (Pstd / Pamb)$

$Dpeff$: Effective differential pressure

Dp : Differential pressure of the sensor output

$Pstd$: Standard atmospheric pressure (1013.25 hPa)

$Pamb$: Actual ambient atmospheric pressure (hPa)

Characteristics/Performance

Model	D6F-PH0025AD1	D6F-PH0505AD3	D6F-PH5050AD3
Differential pressure range (See note 1)	0 to 250 Pa	±50 Pa	±500 Pa
Calibration Gas (See note 2.)	Air		
Port Type	Bamboo joint, Maximum outside diameter: 4.9 mm, minimum outside diameter: 4.0 mm		
Power Supply	2.3 to 3.6 VDC		
Current Consumption	6 mA max. with no load and Vcc of 3.3 VDC, GND = 0 VDC, 25°C		
Resolution	12 bit		
Zero point tolerance (See note 4.)	±0.2 Pa		
Span tolerance (See note 4.)	±3% RD		
Span shift due to temperature variation	< 0.5% RD per 10°C		
Response time	33 ms typical at 12 bit resolution (50 ms max.) The processing time is 6 ms typical at 12 bit resolution.		
Gas flow through sensor (See note 3.)	63 mL/min	23 mL/min	100 mL/min
Interface	I2C		
Case material	PPS		
Degree of Protection	IEC IP40 (Excluding tubing sections.)		
Withstand Pressure	10 kPa		
Operating temperature (See note 5.)	-20 to +80°C		
Operating humidity (See note 5.)	35 to 85 %RH		
Storage temperature (See note 5.)	-40 to +80°C		
Storage humidity (See note 5.)	35 to 85 %RH		
Insulation Resistance	Between Sensor outer cover and lead terminals: 20 MΩ min. (at 500 VDC)		
Dielectric Strength	Between Sensor outer cover and lead terminals: 500 VAC, 50/60 Hz min. for 1 min (leakage current: 1 mA max.)		
Weight	5.2 g		

Note: 1. At standard atmospheric pressure (1013.25 hPa)

Note: 2. Dry gas must not contain large particles, e.g., dust, oil, or mist.

Note: 3. Type D6F-PH is based on thermal flow principle. Air flow is needed to measure the differential pressure.

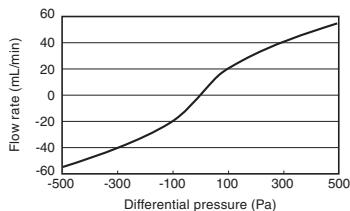
Typical characteristic of air flow by differential pressure is below.

Note: 4. The zero point tolerance and span tolerance are independent uncertainties and add according to the principles of error propagation.

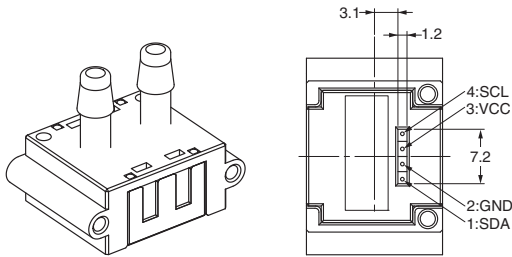
Note: 5. With no condensation or icing.

Note: 6. Please call us about functions, such as fault detection, temperature check, Vdd check, threshold value setup.

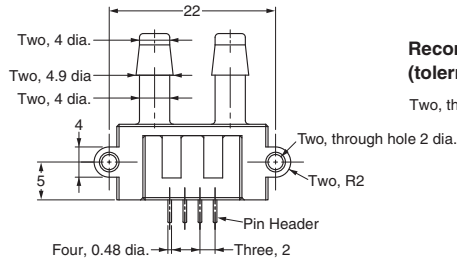
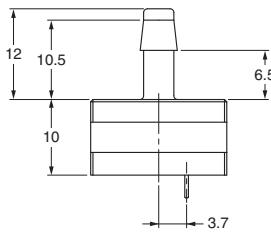
Relation between pressure and flow rate



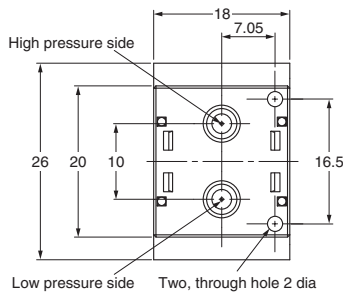
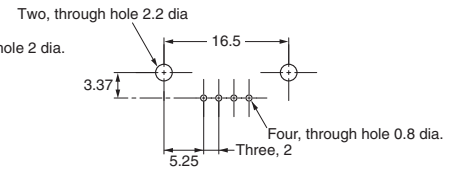
Connections/Dimensions (Unit: mm)



Mounting Direction
Install the Sensor so that the joints are facing upward.



Recommendation size for pin header installation (tolerances: ± 0.1)



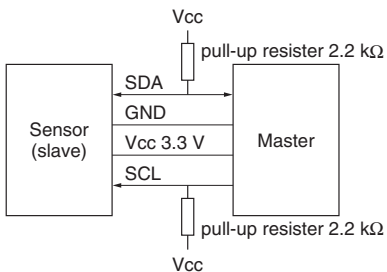
Tubes

Install tubes made of materials such as rubber or urethane so that they will not come out.
For urethane tubes, tubes with an outer diameter of 6 mm and an inner diameter of 4 mm are recommended.

Soldering Conditions

Use a soldering iron for 5 s at 350°C with a pressure of 100 gf max.

Electrical connection



Communication

Serial Interface	I2C
Master/Slave	Slave / Address: HEX : 0x6C BIN : 110_1100 (7bit)
Speed mode	Fast Mode 400kHz
Signal	
SCL	Serial Clock
SDA	Data Signal