GC30
Digital Differential Pressure Gauge

For gas measurement
(Featuring silicone diaphragm)

Overview

Compactly designed 30-mm-square enclosure with display, outputs and switch functions is suitable for limited space installation. It features miniaturized silicone capacitive sensor with high pressure resistance enables for highly sensitive and reliable pressure measurements.

RoHS

CE

Features

- **Wide differential pressure range from 50Pa to ±5kPa**
- **Switch functions (NPN or PNP open collector)**
- **1 to 5VDC analog output (Standard)**
- **Loop check, Pressure indication & analog output scaling, Filter, Key lock, Peak and bottom hold display and Zero point adjustment**
- **10mm large LED (3 1/2 digit)**

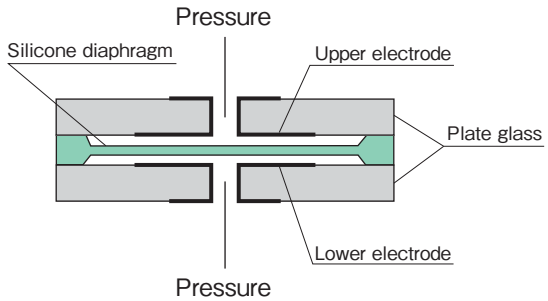
Features of sensor

Silicon Capacitive (SC) Sensor

Miniaturized sensing part designed with silicon diaphragm having less moving parts contributes for excellent vibration proof and shock resistance.

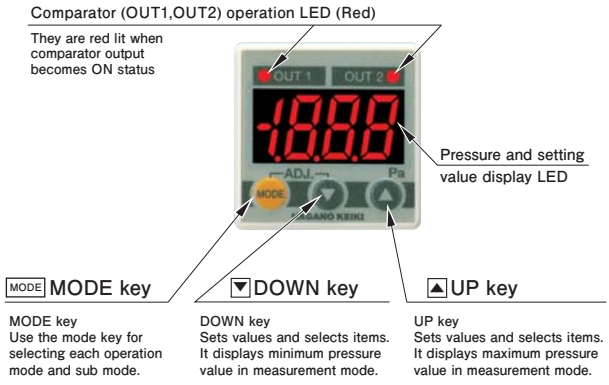
Actual size

SC Sensor
Sensor chip



Functions

- Two open collectors (NPN or PNP type) provide highly accurate ON/OFF comparator operation. Specify NPN or PNP when ordering.
- Standard specifications include a wide variety of features over display scaling, filter, peak and bottom hold display, loop check and analog output (1 to 5 VDC). Square root extraction function is optionally available.
- Applications include differential and flow measurements and controls.



Specifications

Item		Description
Media		Gas (Dry air and nitrogen gas) No water or dusts should be contained.
Installation environment		Install in location where no gases or liquids may exist that have the poetntial to become flamable or ignitable under normal operating condition
Mounting		Surface mounting
Process connection		M5 female screw
Wetted parts		Silicon, glass, silicone and PC/ABS
Differential pressure range		0 to 50Pa → 0 to 5kPa, ±50Pa → ±5kPa Refer to pressure range table
Max. allowable pressure		50kPa
Accuracy		Differential pressure display accuracy: ±(1.0%F.S.+1digit) at 23℃ (1kPa and over), ±(1.5%F.S.+1digit) at 23℃ (200 to 500Pa), ±(2.0%F.S.+1digit) at 23℃ (100Pa and under) Analog output accuracy and square root accuracy: Refer to the accuracy table
Temperature coefficient		±0.1%F.S./℃ (Zero, Span) (1kPa, ±1kPa and over) ±0.15%F.S./℃ (Zero, Span) (500Pa, ±500Pa and under)
Display		3 1/2 digit, 10mm LED
Display update rate		200ms
Units of display		Differential pressure (GC30-□□1) in Pa, kPa Square root extraction (GC30-□□2) in Pa, kPa, root
Power source		12 to 24 V DC, ripple (p-p) not exceeding 10%
Consumption current		30mA and less
Output signal	Comparator output	NPN open collector x 2 contacts (Output capacity 30 VDC 80 mADC maximum) or PNP open collector x 2 contacts (Output capacity 80 mADC maximum) Response time: 5 ms and under Deadband: Variable in hysteresis mode 1%F.S. fixed by window comparator mode Operating status indicator: Red LED will light up when comparator is on
	Analog output	Voltage output: 1 to 5 V DC w/load resistance of 10kΩ and over Analog output resolution: Approx. 30 mV DC Response speed within 50ms
Functions	Square root extraction (Option)	Wind velocity and air volume display (± bidirectional range can not be made)
	Scaling	Display, analog output
	Loop check	Comparator outputs, analog output
	Filter	No filter, 25ms, 250ms, 2.5s, 5s, 10s (Time constant) Setting value has an effect on both comparator and analog output.
	Error indication	Over pressure, Comparator overloaded, Outside of effective range for the zero adjustment
	Hold	Display of peak and bottom values
	Others	Zero adjustment, Key lock
Circuit protection		Reverse power connection, Comparator overcurrent protection
Operating temperature		-10 to 50℃ (Non-Freezing)
Operating humidity		35 to 85%RH (Non-Condensing)
Storage temperature		-20 to 60℃ (Non-Freezing)
Allowable leak rate		1.7×10^{-4}Pa・m^3/s ＊1
Case construction		Indoor use (IP40 in accordance with IEC Standard)
Case materials		PC/ABS (UL94V-0)
Cable		Length: 2m, Cross-section area of conductor: 0.18mm^2
Weight		Approx. 75 g, including 2m cable
CE Compliance ＊2		Applicable Directive: 2004/108/EC Applicable Standards: EN61326-1:2006; EN61326-2-3:2006 (EMI Class A / EMS Table 2)
RoHS Compliance		EU RoHS Directive applicable

＊1 This product is NOT suitable for use with leakage test requiring strict measurement of leakage amounts.
＊2 Ensure wiring connections not to be affected by oversupply of electric power due to lightening.
Not allowed for the use as "Safety accessories".

Differential pressure / display ability

Differential pressure ranges		Maximum display of values by unit *1		Differential pressure display (GC30-□□1)	Square root extraction *2 (GC30-□□2)
		Pa	kPa		
0 to 50Pa	±50Pa	50.0 (±50.0)	—	Scaling value can be arbitrarily displayed within the -1999 to 1999 range	Value can be arbitrarily set within the 0 to 1999 range
0 to 100Pa	±100Pa	100.0 (±100)	—		
0 to 200Pa	±200Pa	200 (±200)	—		
0 to 500Pa	±500Pa	500 (±500)	—		
0 to 1kPa	±1kPa	—	1.000 (±1.00)		
0 to 2kPa	±2kPa	—	2.00 (±2.00)		
0 to 5kPa	±5kPa	—	5.00 (±5.00)		

※ Negative mark (-) is displayed when the pressure measured at high pressure port (H) is lower than the pressure measured at low pressure port (L).
*1 ( ): when differential pressure range is ± bidirectional.
*2 Not available for ± bidirectional, 2kPa and 5kPa pressure ranges

Accuracy / Temperature coefficient

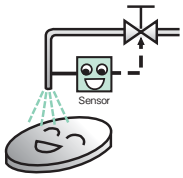
Differential pressure ranges		Accuracy			Temperature coefficient
		Differential pressure	Analog output	Square root extraction *3	
0 to 50Pa	±50Pa	±(2.0%F.S.+1digit) at 23℃	±1.5%F.S. Against indicated value	±0.5%F.S. Within the differential pressure range of 5 to 100%F.S.	±0.15%F.S./℃ Zero and Span
0 to 100Pa	±100Pa				
0 to 200Pa	±200Pa	±(1.5%F.S.+1digit) at 23℃			
0 to 500Pa	±500Pa				
0 to 1kPa	±1kPa	±(1.0%F.S.+1digit) at 23℃			±0.1%F.S./℃ Zero and Span
0 to 2kPa	±2kPa				
0 to 5kPa	±5kPa				

*3 Not available for ± bidirectional ranges, 2kPa and 5kPa

Applications

Differential pressure

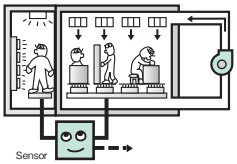
N_2 pressure monitoring and control



Purge and exhaust pressure monitoring to control yield rate of wafer production

Differential pressure

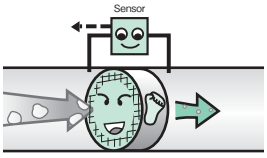
Clean room pressure monitoring



Monitoring inside and outside pressure of clean room to control supply pressure to maintain pressure inside of clean room stable,

Differential pressure

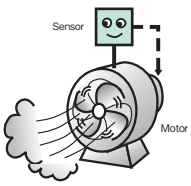
Filter clogging detection



Filter clogging monitoring to validate appropriate timing for replacing filter inside air conditioning system.

Flow

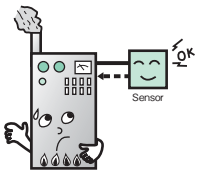
Exhaust fan speed control



Exhaust fan speed control to determine and maintain appropriate flow rate in the exhaust duct.

Flow

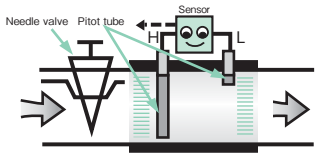
Firing pressure measurement



Measurement of combustion pressure can help for maintaining ideal level of air supply rate to improve combustion efficiency.

Flow

Gas flow rate measurement in conjunction with pitot tube.



Use as purge meter, control over intake/exhaust detections etc.

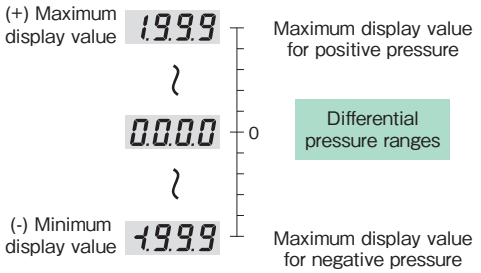
■Caution
The product can't be used for corrosive, flammable gas and fluids measurements.

Seven Primarily Functions

1 Flexible rangeability with accurate pressure value indication and analog output scaling.

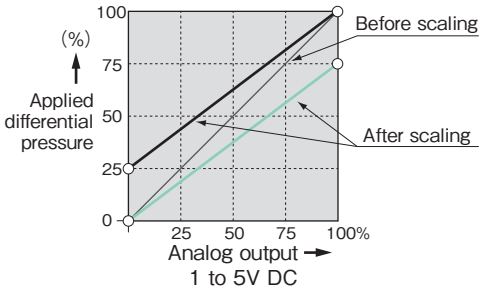
●Indication scaling function

Pressure value can be displayed arbitrarily within the maximum 3 1/2 digits (1999) display ability.

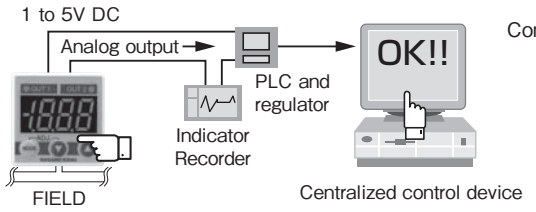


●Analog output scaling function

Analog output scaling value can be arbitrarily displayed based on minimum and maximum pressures within the rated differential pressure range and maximum display ability.

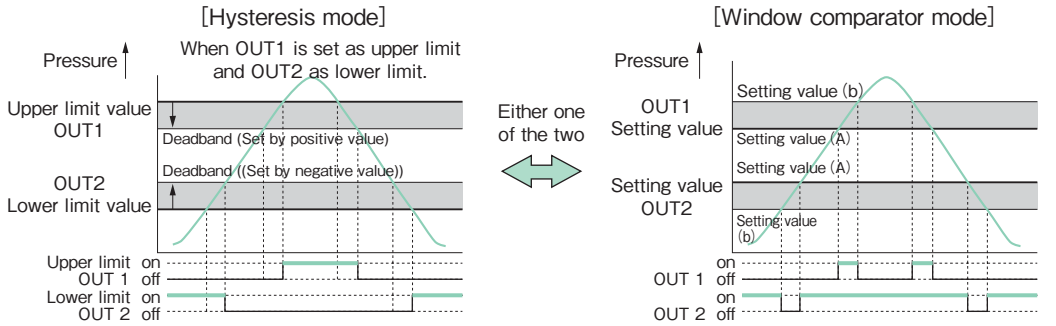


2 Loop check function allows user to check display indication, analog and comparator output manually by using up or down key without actually applying pressure to the unit suitable for checking proper wiring and other simulations.



Comparator operation can also be tested.

3 Selectable comparator switch operation



The upper limit (deadband set by positive value) and lower limit (deadband set by negative value) on OUT1 and OUT2 can be determined at any point.

The upper limit (A≦b) and lower limit (A>b) on OUT1 and OUT2 can be determined at any point.

ON/OFF delay time can also be set toward setting value.

4 Digital filter function is used when pressure fluctuations can result in erratic pressure indication (Select from: OFF, 25ms, 250ms, 2.5s, 5s, 10s).

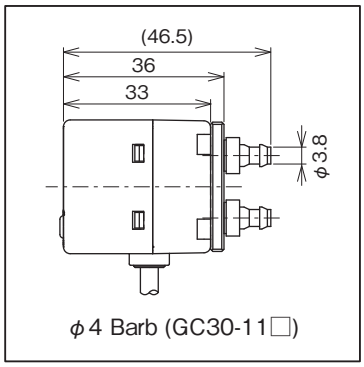
5 Zero adjustment is easily available just pressing「ADJ」key greater than 3 seconds with both sides of pressure port open to atmosphere.

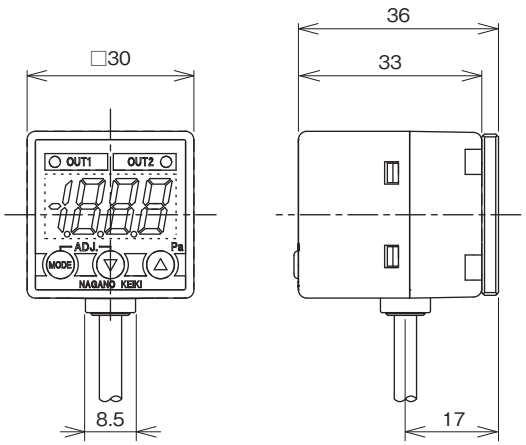
6 The unit keeps the maximum and minimum pressure in the internal memory. They are displayed while holding the up or down keys respectively.

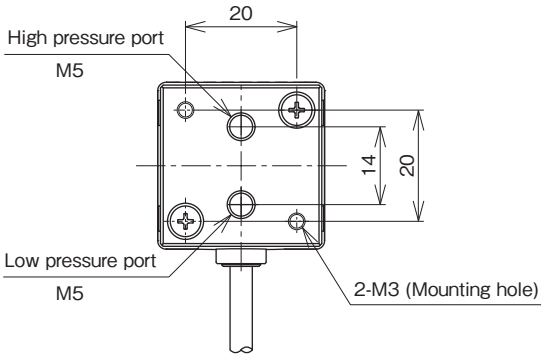
7 Other features include key lock function to prevent inadvertent operation, error message indication when pressure is applied beyond rated pressure range or applied pressure is outside of allowable range during zero point adjustment.

Dimensions

Unit: mm







M5 Female screw (GC30-10□)

Cable color

- Brown・・・Power source (+)
- Blue・・・・Power source (−)
- Black ・・・Open collector output (OUT1)
- White ・・・Open collector output (OUT2)
- Orange・・・Analog output

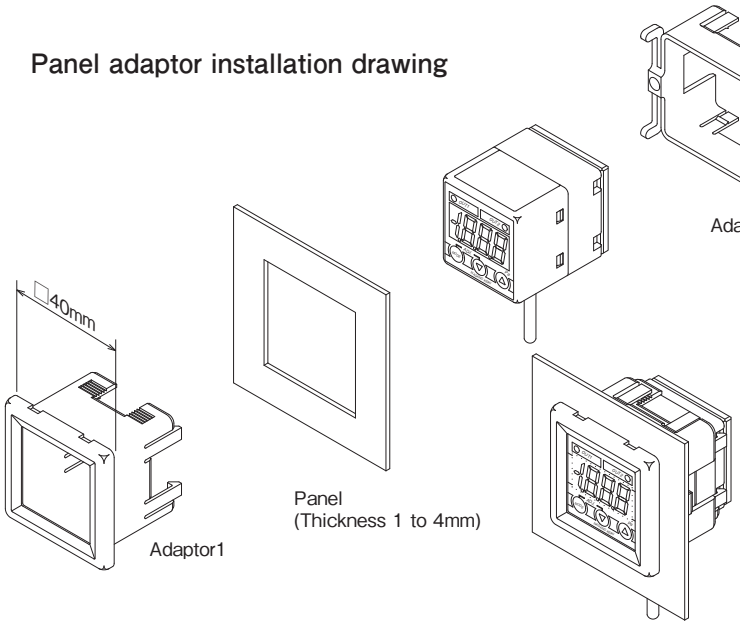
Cable【Outline】

Conductor
- ・Composition: 0.18sq (7Compositions/0.18mm)
- ・Standard outer diameter of coating

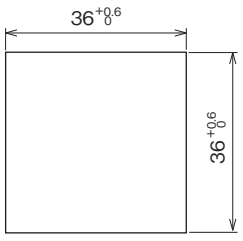
Sheath
- ・Outside diameter: 4±0.15mm

Atachment **Option**

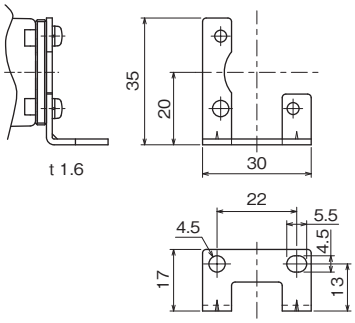
Panel adaptor installation drawing



Panel cutout dimension



L type clump



Model number configuration

Please specify the model, each requiring specification and differential pressure range to order.

Model

G C 3 0	—	1			—			N		8		×	×	×	×	×	
Digital Differential Pressure Gauge		①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Model number	Product specifications	Additional specifications (Optional)

① Mounting	1	Surface mounting
② Process connection	0	M5 Female screw (Standard)
	1	Barb fittings for tubing with ϕ4 inner diameter vinyl tube)
③ Display	1	Differential pressure display
	2	Square root extraction (± bidirectional range, 2kPa and 5kPa are not available.)

Please specify differential pressure range and unit of measure along with corresponding ordering code. →

④ Differential pressure range*
⑤ Accuracy

④	⑤	④Differential pressure range	⑤Accuracy
M	9	0 to 50Pa	± (2.0%F.S.+1digit) at 23℃
N	9	0 to 100Pa	
P	8	0 to 200Pa	± (1.5%F.S.+1digit) at 23℃
Q	8	0 to 500Pa	
R	7	0 to 1kPa	± (1.0%F.S.+1digit) at 23℃
S	7	0 to 2kPa	
T	7	0 to 5kPa	
B	9	±50Pa	± (2.0%F.S.+1digit) at 23℃
C	9	±100Pa	
D	8	±200Pa	± (1.5%F.S.+1digit) at 23℃
E	8	±500Pa	
F	7	±1kPa	± (1.0%F.S.+1digit) at 23℃
G	7	±2kPa	
H	7	±5kPa	

These pressure ranges are only available for manufacturing with the GC30-1□1.

⑥ Power source	N	12 to 24V DC ±10%
⑦ Comparator output	1	PNP Open collector × 2 output (80mA maximum)
	3	NPN Open collector × 2 output (30V DC, 80mA maximum)
⑧ Analog output	8	1 to 5V DC
⑨ Accessory	0	Not required
	A	Panel adapter
	B	L type mounting bracket
⑮ Documents	0	Not required
	1	Required (Documents available upon request) Datasheet (Drawing / Specifications) Instruction manual Inspection procedure Calibration test report (One-part one sheet) Inspection / Traceability certificate Attending inspection

* Negative sign (-) is displayed when the pressure measured at high pressure port (H) is lower than the pressure measured at low pressure port (L).

*Specify code "X" to refer N/A

■Warning
The product can't be used for corrosive, flammable gas and fluids measurements.