Compact design (Small □30mm size)

GC31
Digital Pressure Gauge

Fluids and gases measurement
(Featuring stainless diaphragm)

Overview

Small digital pressure gauge, incorporating high reliable proven Chemical Vapor-Deposited Semiconductor Strain Gauge (SS sensor), features 10mm LED indication, switch actuation and analog output in 30 x 30mm compact enclosure. Application includes hydraulic, air and water pressure monitor and control.

Features

- Pressure range:
  Covering ±100kPa through 0 to 50MPa
- Switch function (NPN or PNP)
- 1 to 5V DC Analog output (Standard)
- 6 internal time constant filters
  (OFF, 25ms·250ms, 2.5·5·10s)
- Loop check, Indication & analog output scaling, Filter, Key lock, Peak and bottom hold display and zero point adjustment
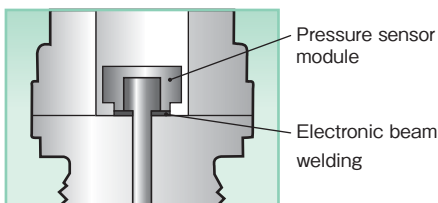- 10mm large LED (3 1/2 digit)

RoHS

Features of sensor

Chemical Vapor-Deposited Semiconductor Strain Gauge (SS sensor)

Proven Chemical Vapor-Deposited Semiconductor Strain Gauge (SS sensor) achieves integral construction that semiconductor strain gauge, sensing part and fitting are all integrated without using any adhesive or corrosive materials to contributes to high durability and stability.

SS Sensor

Pressure sensor module

Electronic beam welding

Fully welded type

Integral safety construction body and fittings are fully welded

Function

- 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 indication scaling, filter, peak and bottom hold display, loop check and analog output (1 to 5V DC).

Comparator (OUT1,OUT2) operation LED (Red)
They are red lit when comparator output becomes ON status

LED display for pressure and setting value indication

MODE MODE key	▼DOWN key	▲UP key
Use the mode key for selecting each operation mode and sub mode.	Sets values and selects items. It displays minimum pressure value in measurement mode.	Sets values and selects items. It displays max. pressure value in measurement mode.

GC31
Digital Pressure Gauge

Specifications

Item		Description
Media		Air, water, hydraulic fluids (Non-corrosive gases and fluids)
Installation environment		Install in location where no gases or liquids may exist that have the potential to become flammable or ignitable under normal operating condition
Mounting		Vertical mounting or horizontal mounting
Connection		R1/8 (With M5 female)※1, R1/4, G1/4B
Wetted parts		Diaphragm: SUS630 (17-4PH), Fitting: SUS304
Pressure range		±100kPa → -0.1 to 2MPa 0 to 500kPa → 0 to 50MPa
Maximum allowable pressure		200% of rated pressure range (150% for 35 MPa, 50 MPa)
Accuracy	Indication accuracy	±(1.0% F.S.+1digit) at 23℃
	Temperature coefficient	±0.1%F.S./℃ (zero, span)
Display		3 1/2 digit, 10mm LED
Display update rate		200ms
Units		MPa, kPa
Power source		12 to 24V DC ±10%　Ripple (P-P) 10% or less
Consumption current		30mA or less
Output signal	Comparator output	Two-output type NPN open collector 　Output capacity 30V DC 80mA DC max. or Two-output type PNP open collector 　Output capacity 80mA DC max. Response time: 5ms or less Dead band: Variable in the hysteresis mode 　　　　　1%F.S. fixed in the window comparator mode On/Off pilot lamp Red LED remains lit when comparator is on.
	Analog output	Voltage output: 1 to 5V DC Load resistance 10kΩ min. Analog output accuracy: Indication + 1.5%F.S. or less Response time: 50ms max., Output resolution: Approx. 30mV DC
Function	Scaling	Display and analog output
	Loop check	Comparator and analog outputs
	Filter	No filter, 25ms, 250ms, 2.5s, 5s, 10s (Time constant) The set value is reflected in both comparator and analog outputs.
	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
Protection circuits		Reverse power connection, Comparator overcurrent protection.
Operating temperature		-10 to 50℃ (Non-Freezing and Condensing)
Operating humidity		35 to 85%RH (Non-Condensing)
Storage temperature		-20 to 60℃ (Non-Freezing and Condensing)
Enclosure		Indoor use (IP40 IEC Standard)
Case materials		Front case: PC/ABS (UL-94, V0) Rear case: ADC12
Cable		Length: 2m　Cross-sectional area of conductor: 0.18mm^2
Weight		Approx. 100 g, (including 2m cable)
EMC applicable standards※2		Applicable Standards: EN61326/1997, A1/1998, A2/2001
RoHS Compliance		EU RoHS Directive applicable

※1 R1/8 connection is available for range up to 1 Mpa.
※2 Ensure wirings and connections to eliminate risk of oversupply of electric power due to lightening etc. Not allowed for the use as "Safety accessories.

Pressure range and maximum display value

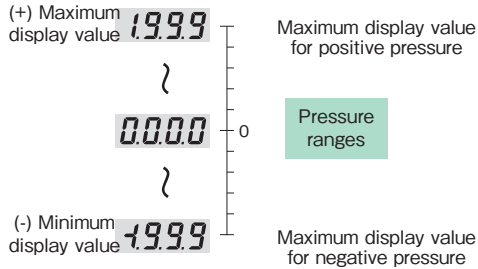| Pressure range	Maximum display value	Pressure range	Maximum display value
-100 to 100kPa	100kPa	0 to 5.0MPa	5.00MPa
0 to 500kPa, -100 to 500kPa	500kPa	0 to 10MPa	10.00MPa
0 to 1.0, -0.1 to 1.0MPa	1.000MPa	0 to 20MPa	20.0MPa
0 to 2.0, -0.1 to 2.0MPa	2.00MPa	0 to 35MPa	35.0MPa
0 to 3.5MPa	3.50MPa	0 to 50MPa	50.0MPa

※Negative sign (-) is displayed when the vacuum pressure is measured.

Seven Primarily Functions

1 Flexible rangeability with accurate pressure value indication and analog output scaling.
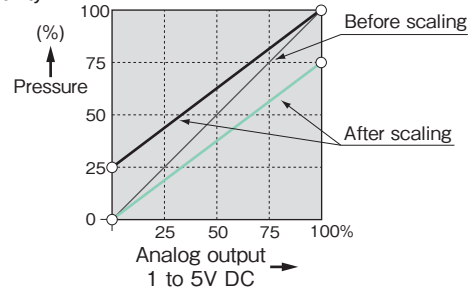
● **Indication scaling function**
Pressure value can be displayed arbitrarily within the maximum 3 1/2 digits (1999) display ability.

(+) Maximum display value **1.9.9.9** — Maximum display value for positive pressure

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0.0.0.0 — 0

Pressure ranges

~

(-) Minimum display value **-1.9.9.9** — Maximum display value for negative pressure
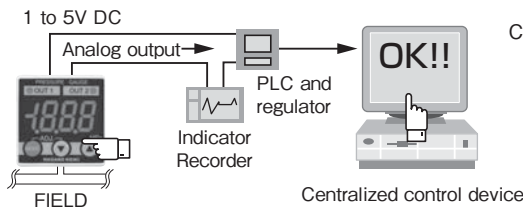
● **Analog output scaling function**
Analog output scaling value can be arbitrarily displayed based on minimum and maximum pressures within the rated differential pressure range and maximum display ability.
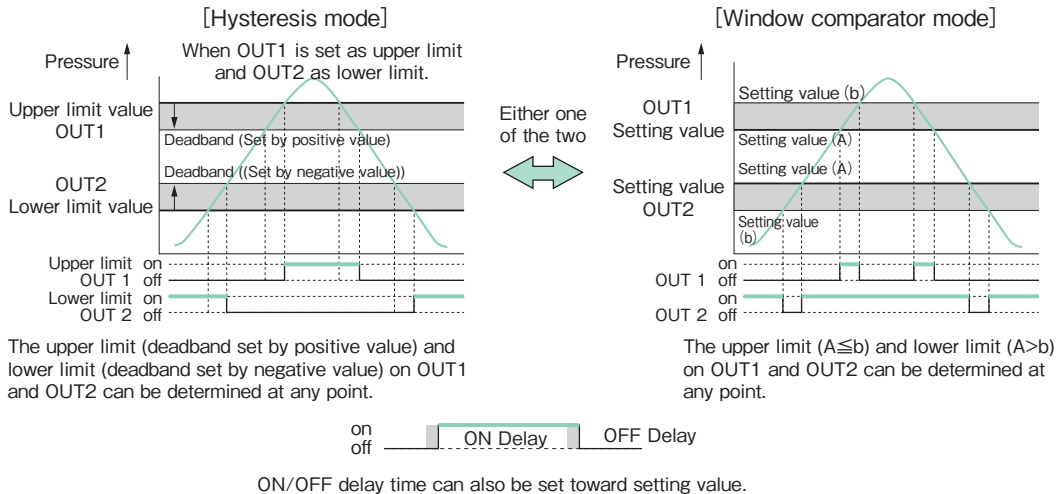
(%) Pressure — 100, 75, 50, 25, 0
Before scaling
After scaling
25 50 75 100%
Analog output 1 to 5V DC

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.

1 to 5V DC
Analog output →
PLC and regulator
Indicator Recorder
FIELD
OK!!
Centralized control device

Comparator operation can also be tested.

3 Selectable comparator switch operation

[Hysteresis mode]
Pressure ↑
When OUT1 is set as upper limit and OUT2 as lower limit.
Upper limit value OUT1
Deadband (Set by positive value)
Deadband ((Set by negative value))
OUT2 Lower limit value
Upper limit OUT 1 on / off
Lower limit OUT 2 on / off

Either one of the two

[Window comparator mode]
Pressure ↑
OUT1 Setting value
Setting value (b)
Setting value (A)
Setting value (A)
Setting value OUT2
Setting value (b)
OUT 1 on / off
OUT 2 on / off

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
ON Delay   OFF Delay

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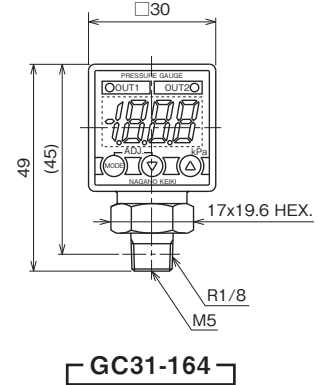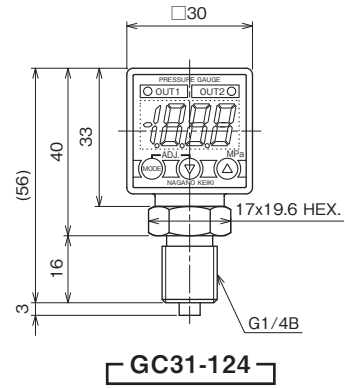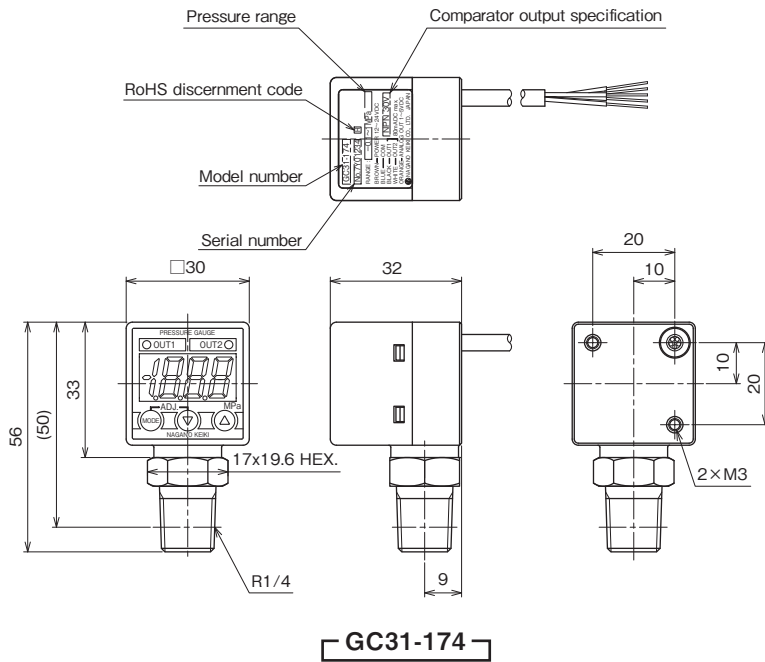
5 Zero adjustment is easily available just pressing 「ADJ」 key greater than 3 seconds with both sides of pressure port open to atmosphere.

6 The unit keeps the maximum and minimum pressure in the internal memory. They are displayed while holding the up or down keys respectively.
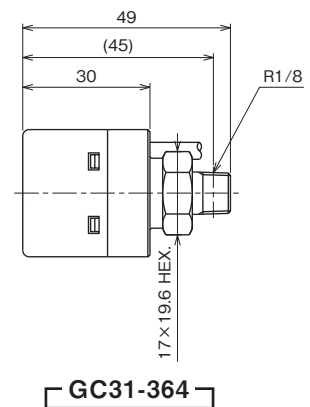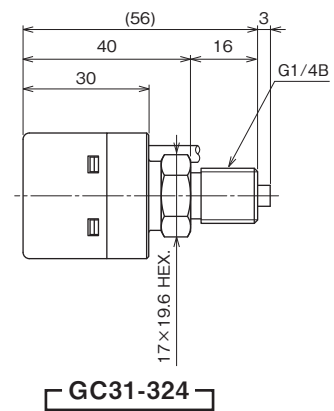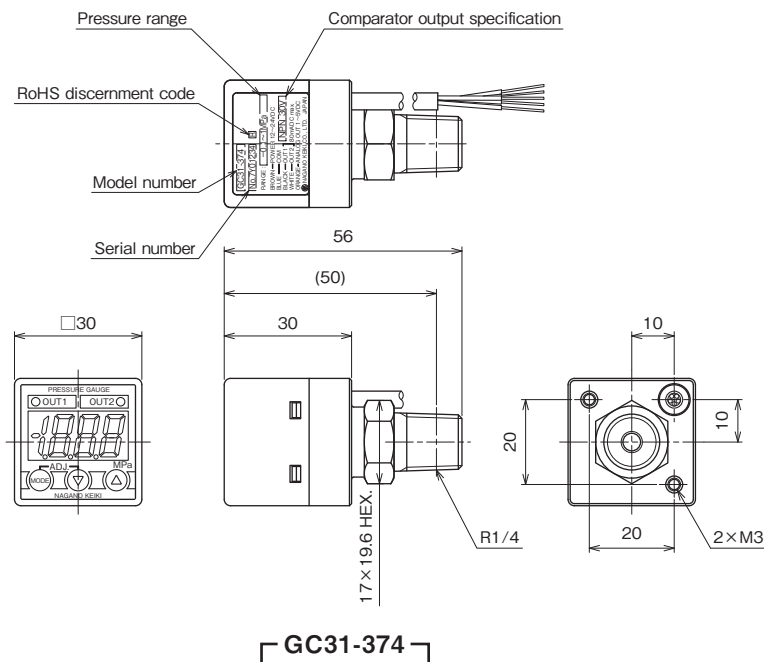
7 Other features include key lock function to prevent inadvertent operation, error message indication when pressure is applied beyond rated pressure range or applied pressure is outside of allowable range during zero point adjustment.
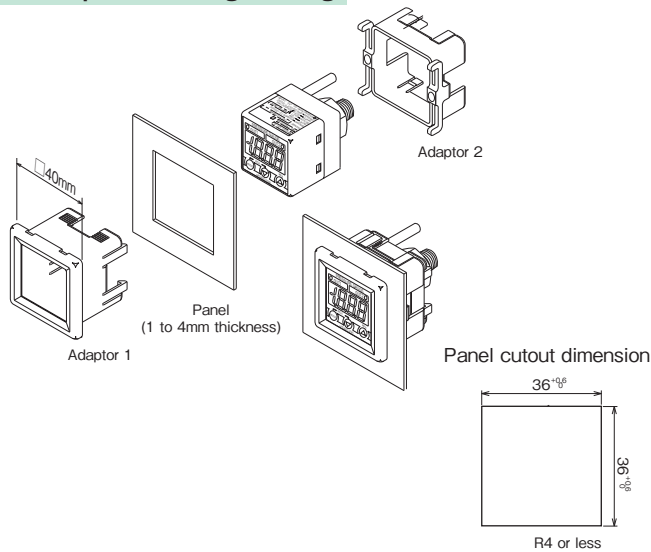
Dimensions

Unit: mm

Vertical mounting

Pressure range

Comparator output specification

RoHS discernment code

Model number

Serial number

☐30
32
20
10
33
56
(50)
17x19.6 HEX.
20
10
9
R1/4
2×M3

┌ **GC31-174** ┐

☐30
(56)
40
33
16
3
17x19.6 HEX.
G1/4B

┌ **GC31-124** ┐

☐30
49
(45)
17x19.6 HEX.
R1/8
M5

┌ **GC31-164** ┐

Horizontal mounting

Pressure range

Comparator output specification

RoHS discernment code

Model number

Serial number

☐30
56
(50)
30
17×19.6 HEX.
10
20
10
20
R1/4
2×M3

┌ **GC31-374** ┐

(56)
40
30
16
3
G1/4B
17×19.6 HEX.

┌ **GC31-324** ┐

49
(45)
30
R1/8
17×19.6 HEX.

┌ **GC31-364** ┐

Wiring

Brown·····Power source (＋)

Blue·······Power source (－)

Black·····Open collector output (OUT1)

White·····Open collector output (OUT2)

Orange···Analog output

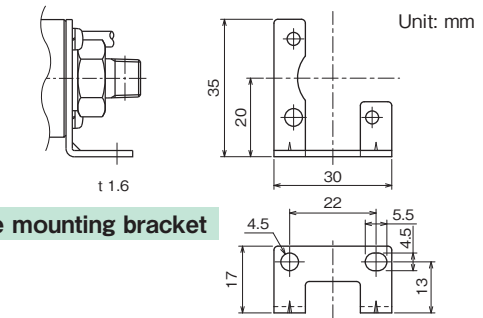**Cable Specification【Specifications】**

Conductor

・Construction: 0.18sq (7quantity/0.18mm)

・Diameter including cable jacket: 0.86mm
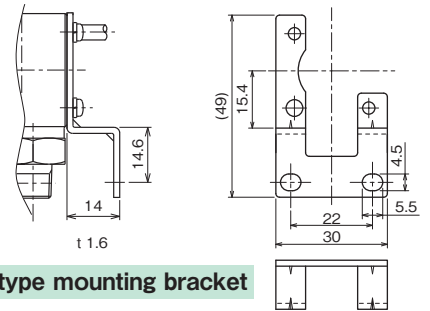
Sheath

・Outer diameter: 4±0.15mm

Option

Panel adaptor mounting drawing

Adaptor 2

□40mm

Panel
(1 to 4mm thickness)

Adaptor 1

Panel cutout dimension

36 +0.6/0

36 +0.6/0

R4 or less

Unit: mm

t 1.6

L type mounting bracket

35
20
30
22
4.5
5.5
4.5
17
13

Hook type mounting bracket

14.6
14
t 1.6
(49)
15.4
22
30
4.5
5.5

Model number configuration

Please specify the model number, each specs and the range for ordering.

Model																
G	C	3	1	—			4	—	7	N	8			×	×	×	×

Digital 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	Vertical mounting
	3	Horizontal mounting

② Connection		Thread	Maximum working pressure range
	2	G1/4B	50MPa
	6	R1/8 (With M5 female)	1MPa
	7	R1/4	50MPa

③ Wetted parts	4	Diaphragm: SUS630 (17-4PH) Fitting: SUS304

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

*Ensure the measuring fluids and gases are compatible with wetted parts.
*Ensure indoor wirings and connections to eliminate risk of oversupply of electric power due to lightening etc.

④ Pressure range	A	-100 to 100 kPa		K	0 to 3.5 MPa	R1/8 not available
	B	-100 to 500 kPa		L	0 to 5 MPa	
	C	-0.1 to 1 MPa		M	0 to 10 MPa	
	D	-0.1 to 2 MPa	R1/8 not available	N	0 to 20 MPa	
	G	0 to 500 kPa		P	0 to 35 MPa	
	H	0 to 1 MPa		Q	0 to 50 MPa	
	J	0 to 2 MPa	R1/8 not available			

⑤ Indication accuracy	7	±(1.0%F.S.+1digit) at 23℃

⑥ Power source	N	12 to 24V DC

⑦ Comparator output	1	PNP open collector × 2 outputs (80mA max.)
	3	NPN open collector × 2 outputs (30V DC, 80mA max.)

⑧ Analog output	8	1 to 5V DC (Standard)

⑨ Treatment	0	Not required
	1	Use no oil
	2	Use no water
	3	Use no oil & water

⑩ Accessory	0	Not required
	A	Panel adaptor (horizontal mounting only)
	B	L type mounting bracket
	C	Hook type mounting bracket

Treatment against wetted parts

■Use no oil
Oil used in manufacturing the gauges had been flushed out & no oil residue remained inside its wetted parts.

■Use no water
Water used in manufacturing the gauges had been flushed out & no water residue remained inside its wetted parts.

■Use no oil & water
Oil/Water used in manufacturing the gauges had been flushed out & no oil/water residue remained inside its wetted parts.

⑮Documents

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 Strength calculation sheet Attending inspection

*Specify code "X" to refer N/A