

GC50

Multifunctional Digital Differential Pressure Gauge

Fluids and gases
(featuring SUS316L diaphragm)

Overview

This product is a multifunctional digital differential pressure gauge with liquid-filled highly sensitive silicon capacitance sensor for detecting micro differential pressure featuring sensor module consisted of stainless diaphragm (SUS316L) for wetted parts. This can be used for variety of pressure media (Gases and fluids).

Features

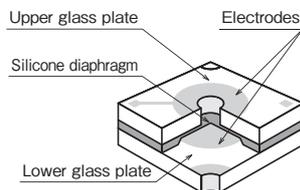
- Small, lightweight and compact
- Available in multifunctional models (Current output, alarm output)
- Optional Level and flow measurements
Square-root extraction, integral display



Features of sensor

Silicon Capacitive (SC) Sensor

The mounted silicon capacitance sensor consists of a micro diaphragm and electrodes formed by micro machining. The diaphragm is protected from excessive pressure by upper and lower glass plates and sealed in liquid by means of diaphragm SUS316L, realizing a highly reliable structure even though its micro pressure range.



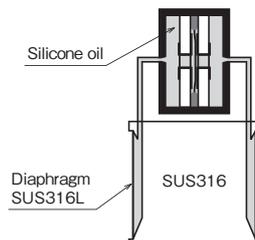
Actual size



SC Sensor
Sensor chip



Back view



The size of the flange and sensor at the pressure inlet has been reduced in volume, allowing the position of the pressure inlet to be changed vertically. A specialized joint can be selected for each individual connecting application.

View of lower inlet connection (With 25.4mm conversion joint)



(GC50-302)

Features of functions

The following types can be selected depending on applications.

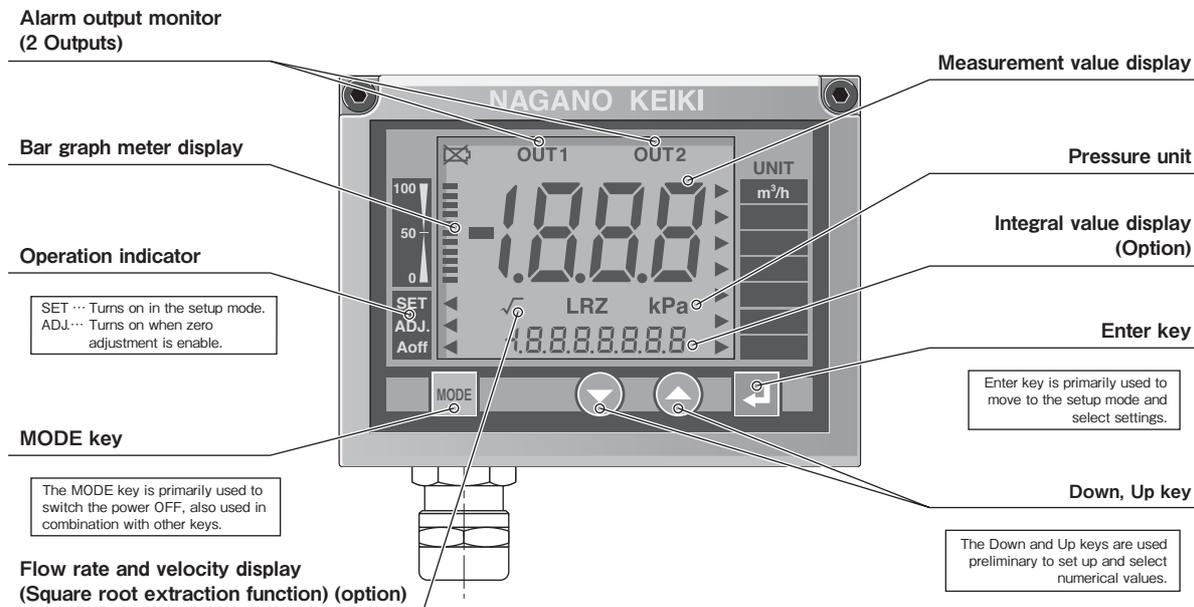
①	Current output (2 Wires) Operates on an external 24VDC power supply with 2-wire 4 to 20 mADC analog output.	<ul style="list-style-type: none"> •The analog output scaling function allows analog output corresponding to desired display values. •The loop check function enables wiring check without applying differential pressure. •The zero-adjustment function allows one-touch display, zero-point adjustment of output, as well as offset adjustment. 	
②	With alarm output (3 Wires) Operates on an external 24VDC power supply allowing two independent alarm outputs to be mounted. Analog output (4 to 20mADC)	<ul style="list-style-type: none"> •With the alarm output in the hysteresis mode, the upper and lower limits and the dead-band can be set up independently for each of the two outputs. •Alarm output operation display with variable analog output (4 to 20mADC). •The loop check function enables wiring check without applying differential pressure. 	

Specification

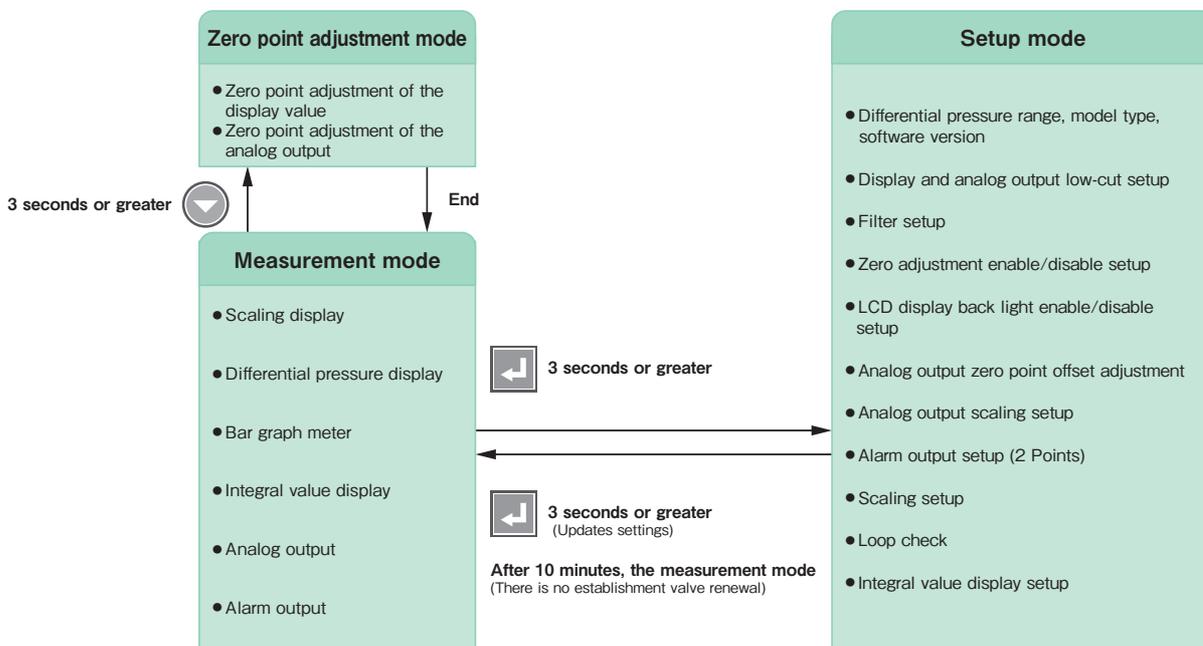
Item	Description	
Media	Gases and fluids (Not corrosive to the wetted material)	
Differential pressure range	1, 2, 5, 10, 20, 50, 100kPa ±1, ±2, ±5, ±10, ±20, ±50kPa	
Allowable maximum pressure	Allowable maximum pressure: Double withstand pressure 2MPa Negative pressure side -90kPa Single withstand pressure 700kPa (5kPa or higher, ±2kPa or higher) Single withstand pressure 200kPa (2kPa or lower, ±1kPa)	
Accuracy		
Indication accuracy	±(1.0%F.S.+1 digit) at 23°C	
Square root operation accuracy	±0.1%F.S. (Within 5 to 100% F.S. differential pressure range)	
Temperature coefficient	±0.1%F.S./°C (For zero point and span)	
Effect of basic pressure	±2.0%F.S./MPa Differential pressure range: 1kPa ±1.0%F.S./MPa Differential pressure range: 2kPa, ±1kPa ±0.5%F.S./MPa Differential pressure range: 5kPa or higher, ±2kPa or higher	
Effect of mounting angle	±(0.1%F.S.+1 digit) at 23°C (At zero point) (At 90°in front behind the element vertical reference line) ±150Pa max. at 23°C (At zero point) (90°to the right and left)	
Display		
Measurement value display	3 1/2 Digit LCD (Digit size: 18mm) Maximum display range: -1999 to 1999	
Integral value display	7 1/2 Digit LCD (Digit size: 5mm) Maximum display range: 0 to 19999999	
Model type	Current output (2 wire system)	Alarm output + Current output (3 wire system)
Power supply	24V DC±10% Insulation resistance: 100MΩ or higher/50V DC (Between case and terminal tied) Withstand voltage: 500V AC 50/60Hz 1 minute	
Alarm output	Not required	NPN open collector output 2 Output capacity: 30V DC 80mA max.
Current output	4 to 20mA DC Load resistance: 600Ω or less Output accuracy: ±0.5%F.S. at 23°C (Toward the indication) Temperature coefficient: ±0.03%F.S./°C (Zero, Span) Response time: 2 ms or lower (With 0 times filter setting)	
Material		
Wetted parts	Diaphragm: SUS316L Body: SUS316 O-ring: Fluorine-contained rubber Drain seal: Alumina ceramic	
Filled liquid	Silicone oil	
Case material, paint	Aluminum die cast, Melamine resin paint	
Conversion joint (Option)	25.4mm Conversion joint (Rc1/4, With equalizing valve): SCS14 Tube conversion joint with valve (Tube diameter 6mm): SUS316 54mm Conversion joint: SCS14	
Mounting method	Dedicated joint with wall mounting bracket	
Operating fluid temperature	-10 to 70°C (Non-freezing)	
Operating temperature and humidity	-10 to 50°C, 10 to 85%RH (Non-freezing and condensing)	
Vibration resistance	10 to 150Hz, multi-amplitude 0.7mm (60Hz and under) Acceleration: 50m/s ² (60Hz and over) Vibrating direction: x, y, z (2.5 Hours for each)	
Shock resistance	Impact acceleration: 100m/s ² Impact direction: x, y, z (3 Times into forward and backward directions for each)	
Ingress protection	IP65 (Excluding open-air port)	
Weight	Main display body only: Approx. 520g	

Features of display

This product allows digital display of flow and flow velocity measurement value in combination with flow rate or flow velocity detector with selectable square-root extraction and integrated display function. Scaling function is available for the arbitrarily rangeability within the specification.



Function of each mode

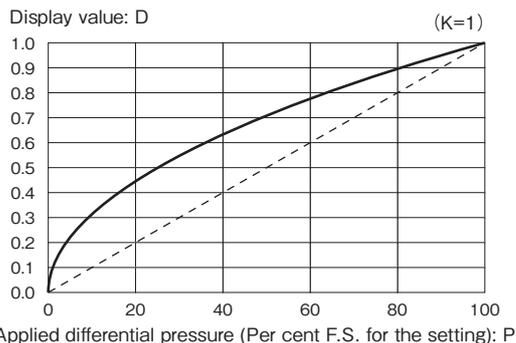


- ① **Large size LCD** The bar graph meter makes setup check, maintenance, and inspection easy.
- ② **Back light** The display can be read even in a dark place (3 wire system only).
- ③ **Filter function** Digital filter function is used when pressure fluctuations can result in erratic pressure indication. (Select from: 0, 2, 4, 8, 16, 32s weighted average).
- ④ **Zero point adjustment function** Zero point adjustment of display is possible with a one-touch operation.
- ⑤ **Square root operation function (Option)** Switch to select flow rate, flow velocity display, differential pressure display.
- ⑥ **Square root operation function (Option)** 7 1/2 display. Selection of the integral coefficient is possible.

Sample application 1 Flow rate and velocity measurement

Flow rate can be calculated through the use of scaling and square root extraction function, just setting differential pressure generated when the maximum desired flow rate occurs.

The flow rate and flow velocity display (D) is proportional to the applied differential pressure (P) square root of as shown below.



The graph above can be represented by the following formula:
 Flow rate / flow velocity display value: D
 Operation coefficient: K
 Applied differential pressure: P(%)

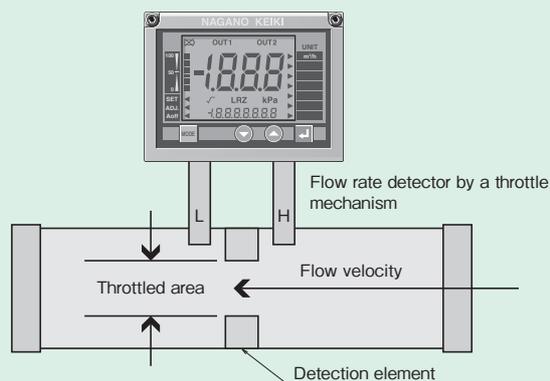
$$D = K \times \sqrt{\frac{P \%}{100\%}}$$

EXAMPLE

If the maximum flow rate is 120L/min at the detector element, and the differential pressure is 8kPa. (When a 10kPa range differential pressure sensor is purchased for the measurement, and the maximum flow rate is set to 120L/min by the scaling function.)

$$120 \div 134 \times \sqrt{(80\%/100\%)}$$

($\Delta P=8/10=80\%$, $K=120/\sqrt{(80\%/100\%)=134}$)

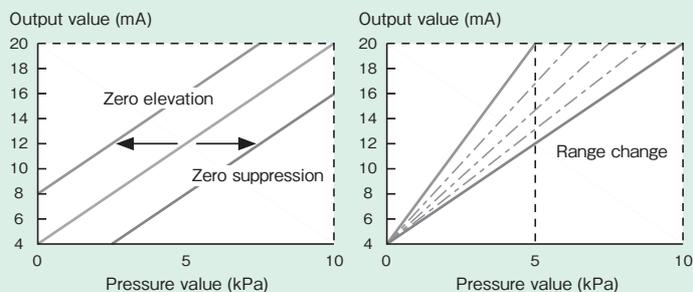


Sample application 2 Tank (sealed) level measurement

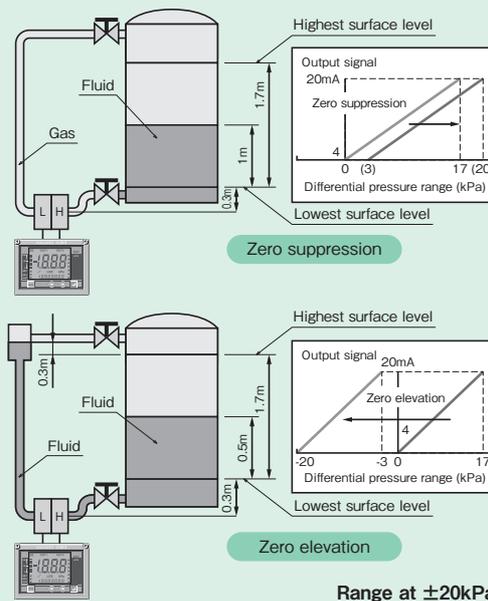
EXAMPLE

Zero point transition graph

When measuring a surface level of a tank, such as the one on the right, the zero point output varies according to the gauge mount position. However, the same gauge is capable in adjusting to its zero point shift by a fine-tuning on the user side.



A range between the minimum span and the maximum span can be programmed in accordance with the user requirements.



*Recommended for filter blockage of exhaust gas duct, head pressure correction of an open tank, and other industrial applications as shown below.

Building air conditioning process	Water cooling and heating system	Factory energy-saving process	Air conditioning fan pump	Environmental plant instrumentation	Cogeneration monitoring and control
	Air volume inverter control		Exhaust blower control		Blast furnace and incinerator
	Duct damper control		Dust chamber inverter control		New energy collateral facilities

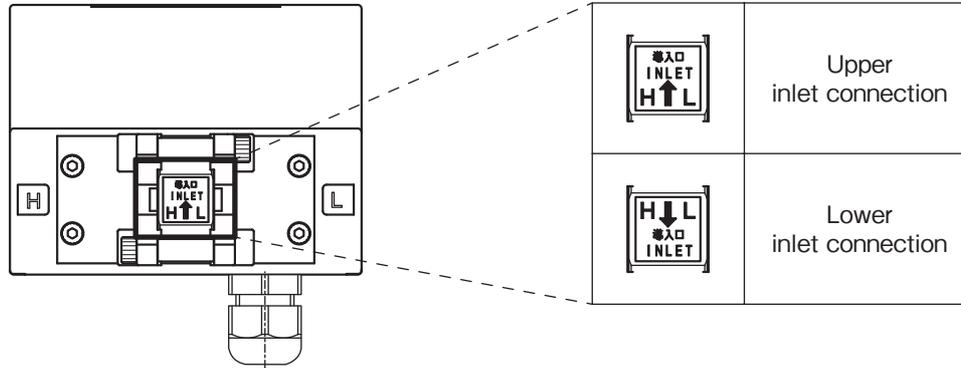
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Pressure Connection

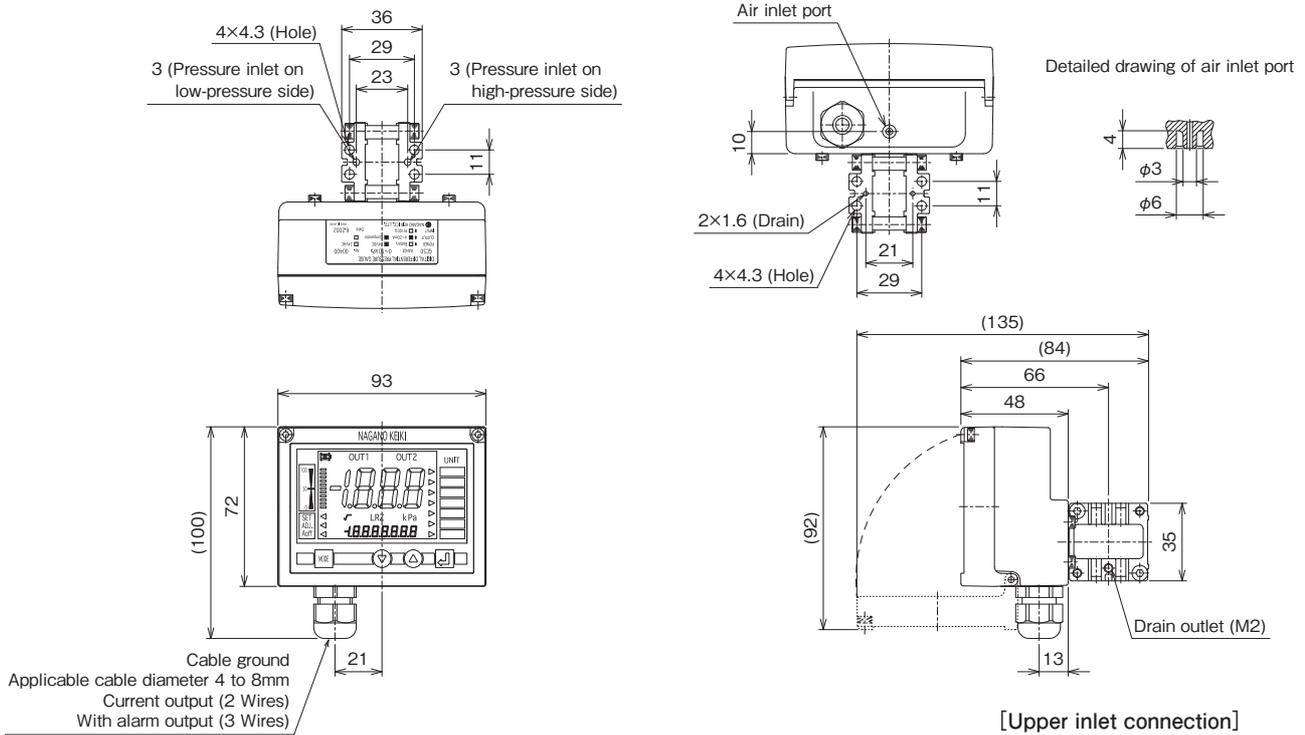
When connecting the conversion joint, pay attention to the orientation of the inlet connection.

Back view



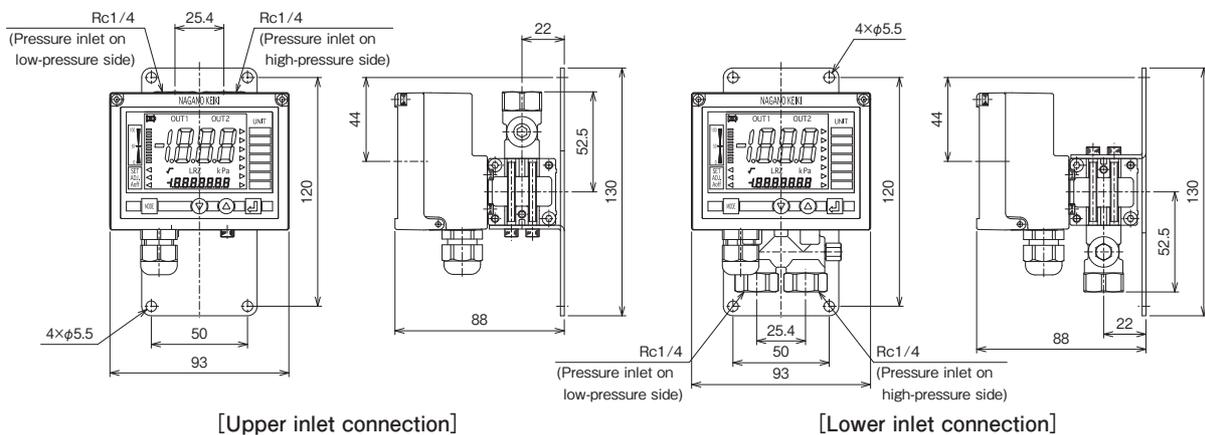
Dimensions

Unit: mm



Installation drawings

Unit: mm

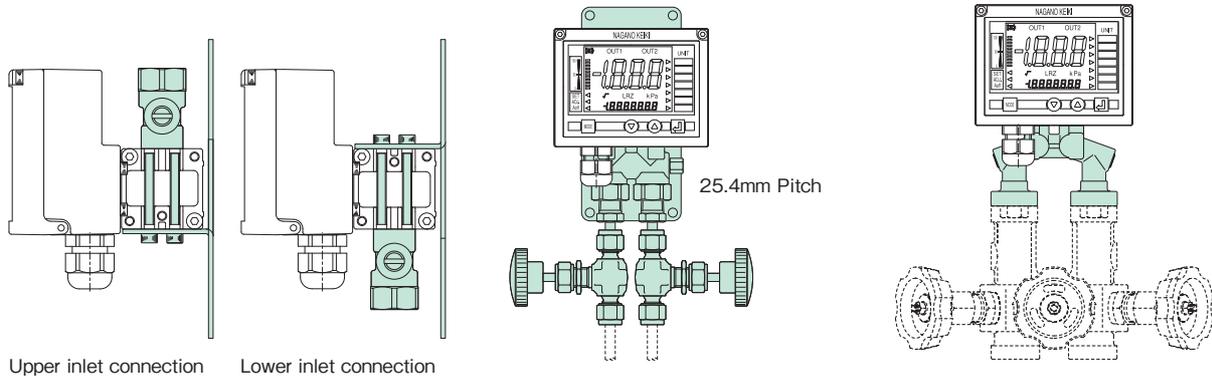


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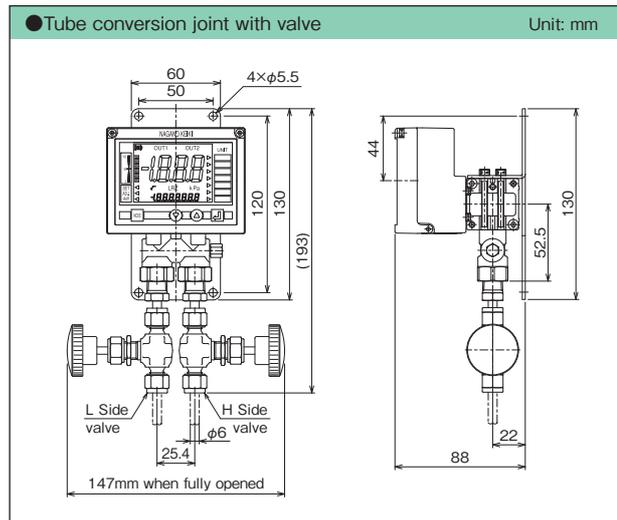
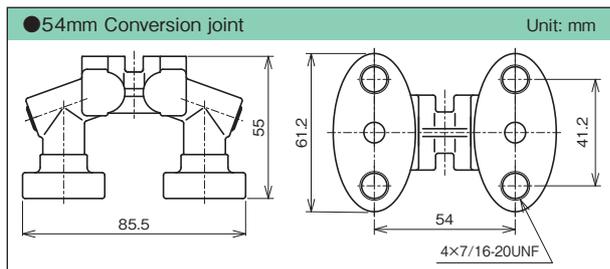
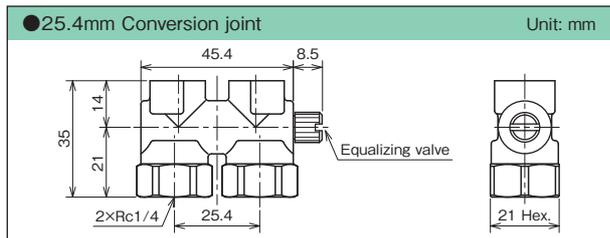
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Options

- 25.4mm Conversion joint
- Tube conversion joint with valve
- 54mm Conversion joint

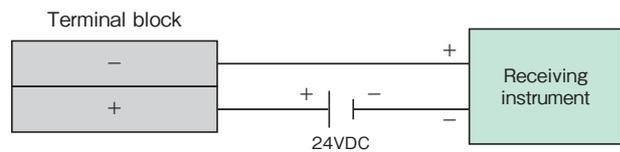


OUTLINE DRAWING FOR OPTION

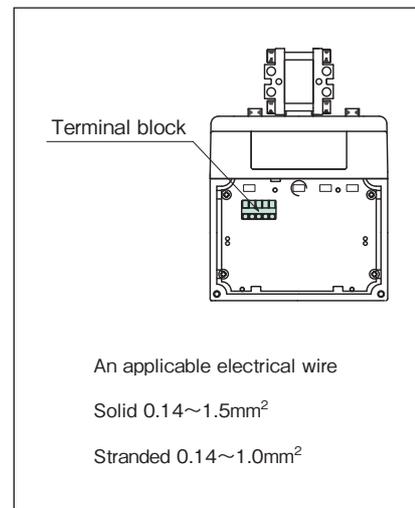
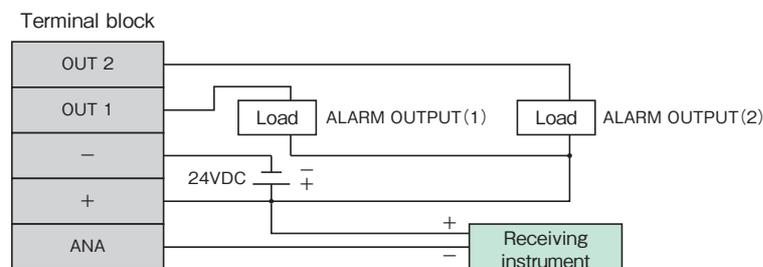


Wiring

CURRENT OUTPUT TYPE (2 Wires)



ALARM OUTPUT TYPE (3 Wires)



※ Analog output corresponds to the value of scaling display.

