

Connections

● **Wiring**

The cable's wiring colors are as displayed in the table below. After confirming the connections, turn on the power. In addition, wait at least 5 minutes after turning the power on and when in a stable state perform a zero point adjustment and measurement.

	Standard (no analog output)	Analog output (with 1 to 5V DC)
Brown	Power (+)	Power (+)
Blue	Power (-)	Power (-)
Black	Open collector output 1	Open collector output 1
White	Open collector output 2	Open collector output 2
Orange	—	Analog output (+)

The analog output (-) and power (-) are common.

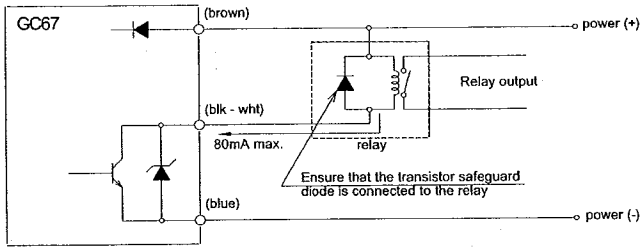
● **Output Circuits**

The open collector output is the comparator output, and the 1~5 V DC output is the analog output.

The open collector is the output transistor's collector which is discharged by the user and can be used for a variety of purposes. In the following diagrams 1~3 display the 3 main uses. The output transistor's rating is 30 V DC, 80 mA - ensure that this rating is not exceeded.

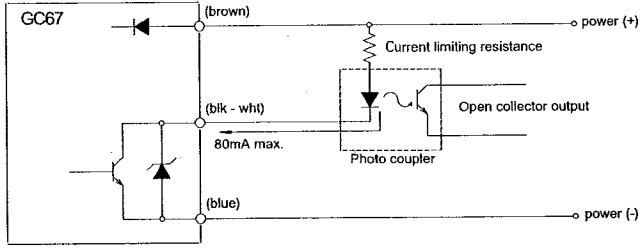
Also, an example of the analog output 1~5 V DC output is shown in diagram 4 below.

1 - Open collector uses (relay connection)

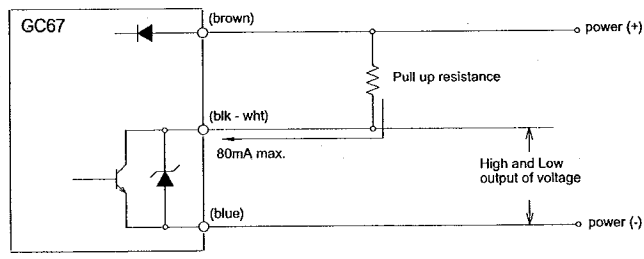


Caution) The relay's operation coil rated current and voltage must be within the transistor's rating.

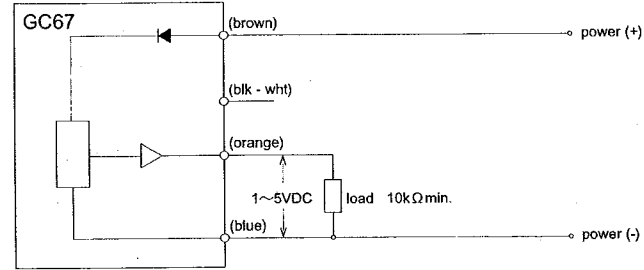
2 - Open collector uses (photo coupler connection)



3 - Open collector uses (Voltage output)



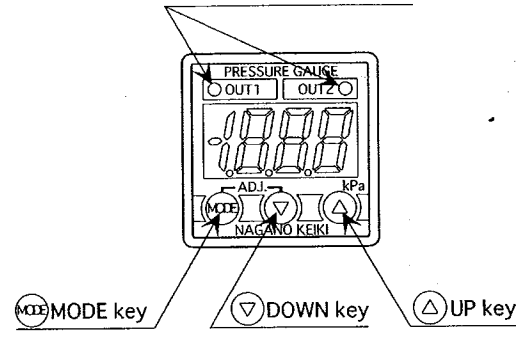
4 - Analog output wiring example



How to switch between modes

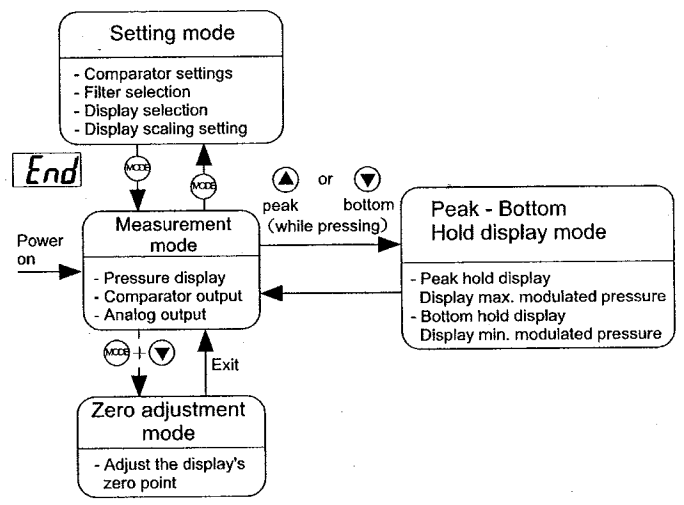
● **Panel names and functions**

Comparator operations display LED (OUT1, OUT2)



As a sharp hole will open in the panel, do not touch the keys.

● **Functions of each mode**

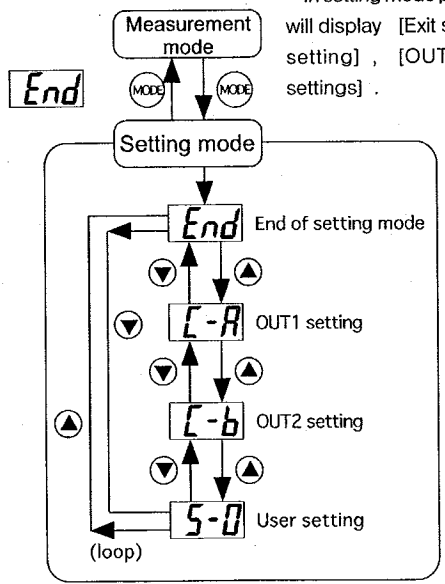


Function settings mode

● **Setting steps**

In measurement mode pressing the **MODE** key and releasing changes to setting mode.

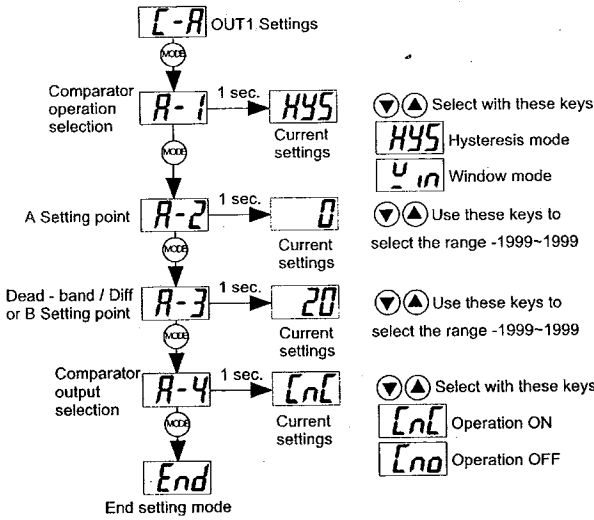
In setting mode pressing the **DOWN**/**UP** keys will display [Exit setting mode], [OUT1 setting], [OUT2 setting] or [User settings].



Comparator operation settings

OUT1 and OUT2 are both internal in the comparator, and both hysteresis and window modes can be selected and set independently.

When the comparator's output conditions have been reached the outputs will turn ON and the comparator operation display LEDs OUT1 and OUT2 will light up.



[C-b] OUT2 settings are the same

OUT1 settings

Using the ∇/\blacktriangle keys set [OUT1].

Using the MCSE key select [Comparator operation selection].

After [R-1] 1 sec. the current setting is displayed. Press the ∇/\blacktriangle keys to switch between hysteresis and window mode.

Next use the MCSE key to select [A Setting point]. After [R-2] is displayed for 1 sec. the current setting is displayed. The numerical values entered here are the [Comparator operation selection] hysteresis and window mode's [A Setting point].

Using the MCSE key select [Dead - band / Diff or B Setting point]. After [R-3] is displayed for 1 sec. the current setting is displayed. The numerical values entered here are the [Comparator operation selection] hysteresis and window mode's [B Setting point] or [Dead - band Diff]. Using the MCSE key select [Comparator output selection]. After [R-4] is displayed for 1 sec. the current setting is displayed. Press the ∇/\blacktriangle keys to switch operations ON or OFF.

OUT2 settings

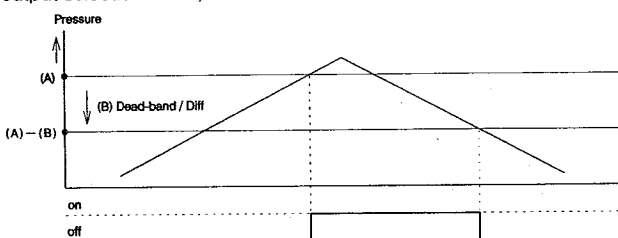
Using the ∇/\blacktriangle keys set [OUT2].

In the same manner as [OUT1 settings] the settings [Comparator operation selection], [A Setting point], [B Setting point] and [Dead - band Diff] are selected.

Comparator Operations

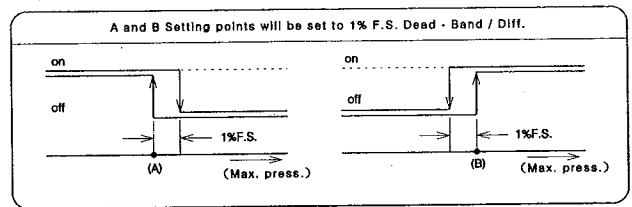
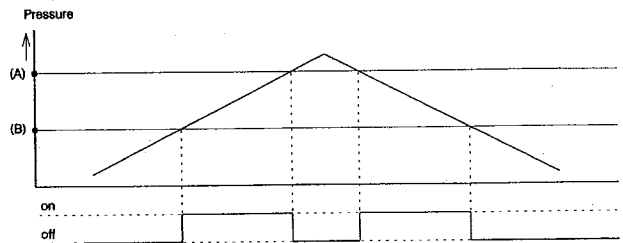
Hysteresis mode operations

The diagram below shows the comparator operation with A setting point's value as (A) and the Dead - band Diff as (B). (The comparator output selection is ON).



Window mode operation

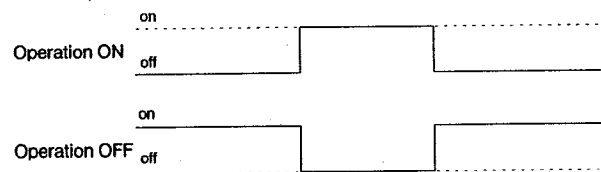
The following diagram shows the comparator operation where A Setting point is (A) and B Setting point is (B). (Comparator output is selected as ON).



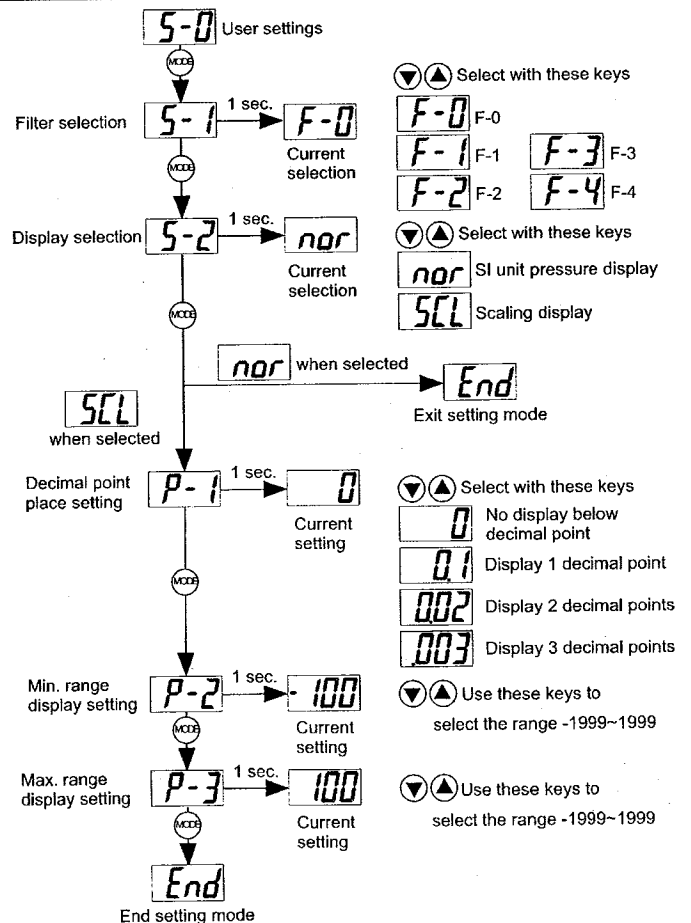
Comparator output selection

Set the comparator output logic. Hysteresis mode and window mode can also be selected.

The diagram below shows the ON and OFF operation output. The comparator operation LEDs also change.



User settings



Using the $\blacktriangledown/\blacktriangle$ keys set [User settings].
 Using the MOD key select [Filter selection]. After **5-1** is displayed for 1 sec. the current setting is displayed. Press the $\blacktriangledown/\blacktriangle$ keys to select the filter setting value. The GC67 has 4 types of filters with time constants built in. Use when there is intense pressure fluctuation. The selected filter's time constant influences the comparator output.

F-0	Without filter
F-1	Time constant 10ms
F-2	Time constant 50ms
F-3	Time constant 200ms
F-4	Time constant 600ms

Next use the MOD key to select [Display selection]. After **5-2** is displayed for 1 sec. the current setting is displayed. Press the $\blacktriangledown/\blacktriangle$ keys to choose between SI unit display (kPa or MPa) or scaling.

When **SCL** is selected, the modulated pressure LED display value will be arbitrarily scaled. This function is for scaling the LED display of the pressure range Min. and Max. values and does not influence the modulated pressure output and analog output.

When **SCL** is selected, press the MOD key to select [Decimal point place selection]. After **P-1** is displayed for 1 sec. the current setting is displayed.

Press the $\blacktriangledown/\blacktriangle$ keys to select the decimal point place.

Next, press the MOD key to select [Min. range display setting].

After **P-2** is displayed for 1 sec. the current setting is displayed. Use these keys $\blacktriangledown/\blacktriangle$ to select the range -1999 ~ 1999.

Next, press the MOD key to select [Max. range display setting].

After **P-3** is displayed for 1 sec. the current setting is displayed. Use these keys $\blacktriangledown/\blacktriangle$ to select the range -1999 ~ 1999.

The pressure range Min/Max display value is a calculated coefficient in the internal memory. From this point on when **SCL** is selected this coefficient is used to scale the LED display.

Ex) For the pressure range 0 ~ 1MPa (0 ~ 100%F.S.), the gauge display 0.000 ~ 1.000MPa is changed to 0.00 ~ 10.20 (0 ~ 100%F.S.).

Decimal point place (from the least significant digit) :	3	→	2
Pressure range min. display value :	0	→	0
Pressure range max. display value :	1000	→	1020

Other functions

● Key operation basic points

[OUT1 settings] and [OUT2 settings] values are entered using the $\blacktriangledown/\blacktriangle$ keys. The \blacktriangle key is used to increase the value and the \blacktriangledown key is used to decrease the value. If the $\blacktriangledown/\blacktriangle$ keys are held for more than 1 sec. the value repeats at a rate of 20/sec, increasing or decreasing.

The user settings values are changed with the $\blacktriangledown/\blacktriangle$ keys. The \blacktriangledown key decreases the value and the \blacktriangle key increases the value.

In the setting mode, filter selection, decimal point setting, comparator operation/output are all set using the $\blacktriangledown/\blacktriangle$ keys.

● Zero point adjustment

In measurement mode air release the pressure coupler and with the MOD key pressed down, press the \blacktriangledown key. After releasing the keys the display value can be set to zero.

When a zero adjustment has made correctly, **Rdu** is displayed.

When the pressure is modulated outside the pressure range of -5 ~ 5% F.S. the error **E-0** will display for 1 sec. and a zero adjustment will not be performed.

● Peak/bottom hold

Max. and min. modulations in the pressure coupler are stored in the internal memory as peak values and bottom values. Peak values and bottom values are displayed while pressing the \blacktriangle and \blacktriangledown keys.

Peak and bottom values can be reset by turning off the power or as follows :

Peak value reset : While pressing the \blacktriangle key, press the \blacktriangledown key.

Bottom value reset : While pressing the \blacktriangledown key, press the \blacktriangle key.

● Key lock

To avoid mistakenly overwriting existing settings there is a key lock setting.

Once key lock is set, modes other than peak/bottom hold mode cannot be set. The key lock state remains even after resetting the power and can only be turned off using the unlock procedure.

In measurement mode, while pressing the MOD key down press the \blacktriangle key and **LoL** will display for 1 sec. indicating key lock mode.

Release is also activated in the same manner, while pressing the MOD key down press the \blacktriangle key and **unL** will display for 1 sec. indicating unlocked mode.

● Error display

During measurement mode if an error occurs the error message will alternate with the pressure display, or only the error will display.

Error display	Content	What to do
FFF	Occurs when the pressure range modulates over 110% or the display passes 1999.	Return to proper rating.
-FFF	Occurs when the pressure range modulates below -10% or the display goes below -1999.	Return to proper rating.
E-1	Comparator 1 has overloaded. (Caution 1)	Set the load current to below 80mA. To recover, reset the power.
E-2	Comparator 2 has overloaded. (Caution 1)	
E-12	Comparator 1 and 2 have both overloaded. (Caution 1)	
E-3	Needs to be examined by our service personnel.	Please contact our closest dealer or office.
E-4		

(Caution 1 : When an electrical overload is detected in comparator 1 or 2, output is shut off for 1 sec. and after processing the overload the non overloaded comparator will come back on.

Noise measures

- Power line

If noise occurs in the power line the pressure display can change and malfunctions can occur. Take care that the DC power line does not get tangled and also use a power source with a high noise reduction level.


- Output line

The open collector output and analog output (option) are combined in the same internal output line. Ensure that the cable does not get tangled by keeping it as short as possible.

- Induction noise

Induction from outside can cause malfunctions. In this case the source of the noise must be eliminated, the direction changed, magnetic shield or static electricity shield must be installed.

Storage

 Caution	Do not store in the following places as damage can result.
	<ul style="list-style-type: none"> ● Any place that water can reach. ● Any place where there can be a negative influence of atmosphere, temperature, humidity, poor ventilation, sunlight, dust, salty or sulphuric air. ● Any places where there is vibration or shock (including during transportation) . ● Any place where chemicals are stored or where there are releases of gas. ● In direct sunlight or inside a hot vehicle.

Maintenance

The gauge do not require adjustment but according to amount of use and conditions it is possible that there will be deterioration over time and an inspection every 6 months is recommended.

Also, please perform all zero point adjustments at the same time.

The case is made from plastic, refrain from touching with a soldering iron etc. As chemicals can damage the case, take proper precautions to ensure that none come in contact with it.