

COPAL ELECTRONICS

HANDY MANOMETER

PG-100B Series

Instruction Manual
Ver.1.2

Thank you for purchasing NIDEC COPAL ELECTRONICS CORP. product.

In order to use the product correctly and most appropriately, please completely read this manual before use and keep it for future reference.

For inquiries regarding the product, please contact:

COPAL ELECTRONICS

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Important Information and Warnings



This caution mark indicates a chance of physical damages to the user and/or the product if it is used improperly and/or incorrectly. The damage can be substantial.



- The product is not explosion-proof. Do not use the product in designated areas where explosion-proof specification is required.
- The product is not drip-proof /dust-proof.
- The product is designed for measurement of intended articles and does not feature control functions that ensure security, such as prevention of accidents.

Operating Precautions

(1) The applicable media are gases/liquids compatible with SUS316L.

Materials of the pressure port are SUS316L while those of the attachment are SUS316 and SUS 304. So please be careful about compatibility with applicable media.

Use of corrosive fluids may cause injury and/or malfunction of products.

In addition, the product is not explosive-proof. Never use flammable fluid as media.

(2) Maintain the measuring pressure within the pressure range as stated in specifications.

Pressures exceeding the maximum pressure rating may cause product failure.

(3) Be careful not to let any liquid inside the main product.

Liquid leak on the pressure port may cause product failure. So please be careful to remove fluids completely before detaching relevant fitting and/or tube from the pressure port.

(4) Be careful not to mix foreign materials in the pressure port.

Mixing a foreign material in the port may cause product failure or air leakage. If there is a possibility of mixing foreign materials into the port, use the product with a filter.

(5) Be aware of possibilities of accidents related to the strap.

Swinging the product intentionally in the air by holding the strap may result in unexpected accidents, injury or product damage. Be sure to use the product with its main body gripped firmly.

(6) Be careful not to give external shocks to the products.

External shocks such as hitting and dropping may cause product failure.

(7) Installation of attachments

When installing an attachment to the pressure port, the tightening torque should be set at around 1 N·m. Make sure to use "insert ring" (attachment) when you pour liquid into a tube connected with "one-touch fitting" (attachment).

(8) Attention for analog output function using.

No voltage or signal should be applied to the CAL terminal by the faulty wiring. Failure to heed this warning may result in product malfunction or damage to the main body.

Moreover, do not lose the battery cover when the analog output function is used.

(9) Caution for handling of protect cover

The protect cover is made of silicon rubber. Never use fluids as media which are not compatible with the silicon rubber. The main purpose of the protect cover is to prevent liquid leak into the main body when the attachment and tube are detached from the product. It doesn't serve as drip-proof, so please wipe off in case any liquid leak takes place.

Maintenance Precautions

(1) Periodic maintenance check should be carried out.

Make sure the product operates normally before using. Unexpected event may cause product failure and affect its basic function..

(2) Do not disassemble or modify the product.

Unauthorized disassembly or modification may result in a malfunction. The product warranty does not cover failures caused by disassembly and/or modification of the product.

(3) The batteries used are AAA manganese dry cells or AAA alkaline dry cells.

Use of batteries other than as stated above may cause product failure.

(4) Insert the batteries to contact the correct positive and negative terminals.

Insertion of the battery in the wrong direction may induce rupture or electrolyte leakage of the battery, resulting in product failure. When the product is intended not to be used for a long period of time, remove the battery from it in order to prevent electrolyte leakage.

(5) Stains on the product should be wiped off with a soft, dry cloth.

Stains on the product should be wiped off with a cloth immersed in a neutral detergent diluted with water and squeezed well; dry with a soft cloth. At this time, be careful not to allow the neutral detergent solution to enter the pressure port and/or main body. Infiltration of the neutral detergent may cause product failure.

(6) Caution for storage of protect cover

Please store the protect cover in a cool and dark place if it is to be stored. Ultraviolet rays exposure may make the quality of the cover deteriorate. Please replace the protect cover with new one in case color of it changes or the visibility of the display deteriorates.

Bundled Items

· Attachments ※		
One-touch fitting : SSC6-M5		1 piece
Insert ring : WR0640		1 piece
· Strap		1 piece
· Operating instructions (This manual)		1 sheet
· AAA dry cell (The service life of the batteries that come with the product is not guaranteed.)		2 cells
· Protect cover (with product)		1 piece

※Refer to a maker's homepage for the details of an attachment. NIHON PISCO CO.,Ltd. : <http://www.pisco.co.jp/>

Model Number Designation

PG-100 B-103R -M X1 T

(1) (2) (3) (4) (5) (6)

- (1) Model number : PG-100
- (2) Available media : B (Gases/Liquids compatible with SUS316L)
- (3) Pressure range : 102R, 103R, and 102A.
- (4) Indication unit : Blank (kPa)
M (MPa)
H (mmHg)*
W (With unit switching function)**
- (5) Inspection report : Blank (Not attached)
X1 (Inspection report attached)
X2 (Inspection report and calibration certificate attached)
- (6) Certificate : Blank (Not attached)
T (Traceability certificate attached)

* ... For particular application. The application is necessary for buying this model.

** ... Foreign sales. The application is necessary for buying this model.

Specifications

Model	PG-100B		
Pressure range	102R	103R	102A
Type	Gauge		Absolute
Rated pressure	-100~100kPa (-750~750mmHg)	-100~1000kPa (mmHg undisplayable)	0~100kPa abs. (mmHg undisplayable)
Max. pressure	200kPa	1500kPa	200kPa abs.
Indication system	3-1/2-digit LCD		
Resolution	1digit		
Indication unit	kPa, MPa, mmHg, in.Hg, mmAq, psi, bar*		
Function	Zero adjustment, Hold, Offset, Auto power off, Unit switching		
Indication accuracy (at 25°C)	±0.5%F.S.±2digits		
Indication accuracy (at 25±25°C)	±1.0%F.S.±2digits	±2.0%F.S.±2digits	
Available media	Gases/Liquids compatible with SUS316L		
Operating temp.	0°C to 50°C (No freezing)		
Operating humidity	15 to 85% RH or below (No condensing)		
Driving power	3 VDC, AAA dry cell x 2		
Pressure port	M5 female screw (P=0.8)		
IP protection	IP40 (IEC standards) **		
Outer dimensions	55 (W) × 16.9 (D) × 110 (H)		
Weight	Approx. 100g		
Battery service life	Approx. 1,000 hours		
Analog output (at 25°C)			
Power supply	5±0.5V DC, 5mA maximum, External supply		
Output voltage	±1.000V		
Output accuracy	±10mV (Indicated value standard)		

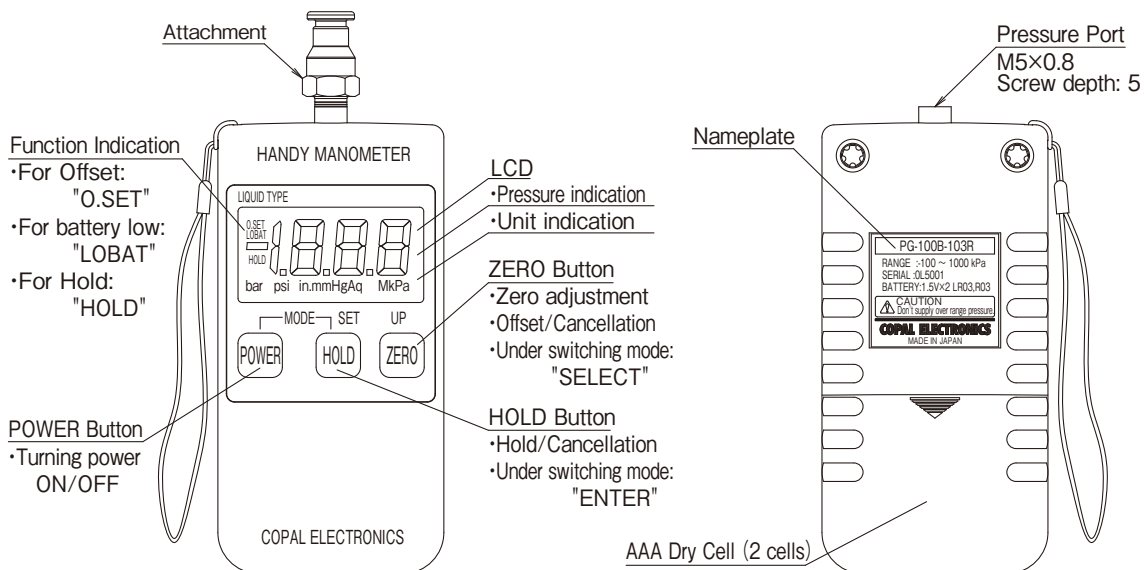
*Only W type can switch all display unit.

** Out-of-specification when the analog output function is used.

Pressure range	Unit switching function (Only for -W model)						
	kPa	MPa	mmHg	in.Hg	mmAq	psi	bar
102R	○	○	○	○	—	○	○
103R	○	○	—	○	—	○	○
102A	○	○	○	○	—	○	○

"—" means undisplayable.

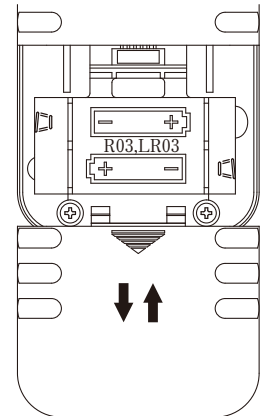
Name of Each Part



Operation Method/Functional Explanation

[Insertion of Batteries]

Slide the battery cover on the back of the product body downward to open the cover. Insert the batteries in the direction as illustrated, check that the batteries are correctly and firmly in place, and slide the battery cover again to close.



[Operation Method]

(1) Turning the power ON

With the power turned off, press the **POWER** button under open air atmospheric pressure, and check that the minimum digit for the pressure indication is within 0 ± 10 digits. (For the pressure range "102A", 100 (kPa abs.) will be displayed when the power button is turned on under atmospheric pressure.)

(2) Zero adjustment

After turning on the power, if a difference is detected between the zero values in open air atmospheric pressure, press the **ZERO** button for three seconds or longer and performs the zero adjustment. (The zero adjustment function is invalid in 102A range, because it is based on an absolute vacuum.)

(3) Measurement

When pressure is applied, the measured value is displayed on the LCD.

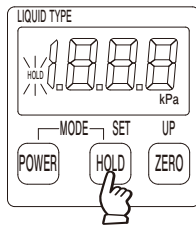
(4) Turning the power OFF

With the power turned on, press the **POWER** button to turn off the power. When the auto power off function is activated, the power is turned off according to the preset time.

[Functional Explanation]

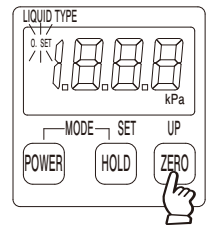
(1) Hold

When pressure is applied, the measured value is displayed. Press the **HOLD** button to retain the pressure value displayed at that time. At this time, the "HOLD" mark is displayed on the LCD. Press the button again to cancel the hold.



(2) Offset

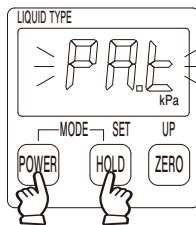
When the pressure exceeds $\pm 1\%FS$, press the **ZERO** button for three seconds or longer to enable subsequent indication of variations with the zero value set to 0. At this time, "0.SET" is displayed on the LCD. Press the **ZERO** button for three seconds or longer again to return the indication to the previous display. (The offset function is invalid in 102A range, because it is based on an absolute vacuum.)



(3) Switching of auto power off function

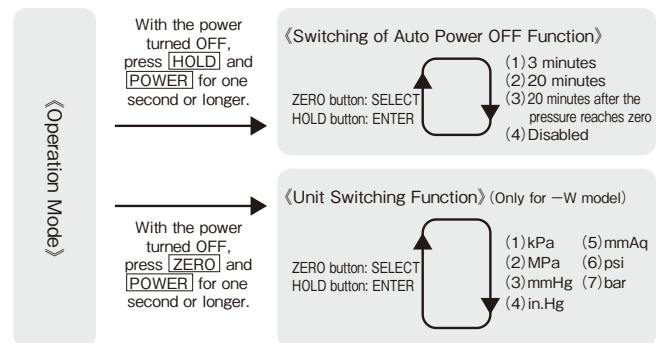
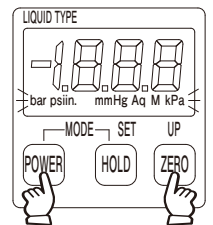
With the power turned off, press the **POWER** button for one second or longer while pressing the **HOLD** button to set the mode to the switching mode of the auto power off function. Choose the mode from four modes including ["P3": 3 min.], ["P20": 20 min.], ["PAT": 20 min. after the pressure reaches zero], and ["PoF": Disabled].

Press the **ZERO** button to select the mode and press the **HOLD** button to enter the mode. While the switching mode is activated, if any button operation is not made for 20 seconds, the mode shifts to the measurement mode at the preset value displayed at that time. In the initial state, ["P3": 3 min.] is set.



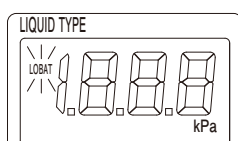
(4) Unit switching function (Only for -W model)

With the power turned off, press the **POWER** button for one second or longer while pressing the **HOLD** button to set the mode to the unit switching mode. While the unit indication is blinking, press the **ZERO** button to select the mode and press the **HOLD** button to enter the mode.



(5) Battery replacement timing

When the battery voltage is low, "LOBAT" is displayed on the LCD. Replace the batteries. The batteries are two AAA dry cells. The used batteries should be discarded according to the instructions of the respective local governments. After replacing the batteries, be sure to perform the zero adjustment. (See Operation Method(2). But excluding 102A range.)



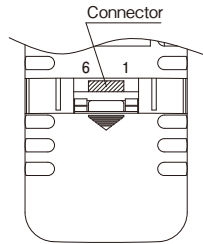
(6) Excessive pressure error

When pressure exceeding 130% of the rated pressure is applied, the indication will start to blink. Check the source pressure, and use the product within the range of the rated pressures.

Analog Function

Open the battery cover on the back of the main body and insert the pre-wired connector according to the table shown below. After applying external power, press the **POWER** button to turn on the power. Be sure to use the product with the batteries removed. The mode will not switch to the analog output mode unless the batteries are removed.

Connector No.	Description
1	External power input (5V)
2	Analog output terminal ($\pm 1V$)
3	GND
4	CAL
5	CAL
6	CAL



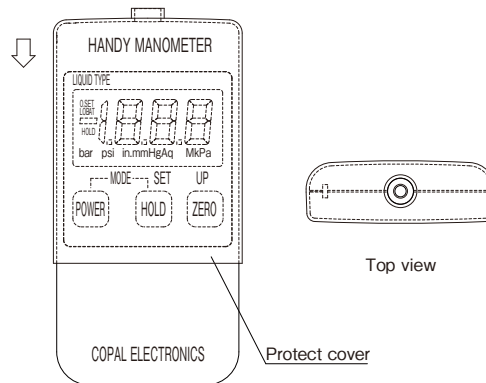
Manufacturer	Housing	Contact	Wire gauge
JST Mfg. Co., Ltd.	ZHR-6	SZH-002T-P0.5	AWG28~26
		SZH-003T-P0.5	AWG32~28

Analog voltage as indicated will be output to the analog output terminal.
 Pressure range, rated pressure and output voltage are shown to the table below.
 No voltage or signal should be applied to the CAL terminal since it is for adjustment use only.
 Failure to heed this warning may result in product malfunction or damage to the main body.

Pressure range	Rated pressure [kPa]	Output voltage [V]	
102R	-100.0~100.0	-1.000~1.000	
103R	-100~1000	-0.100~1.000	
102A	0.0~100.0 ※	0.000~1.000	※Unit : kPa abs.

Attachment of protect cover

Please attach the protect cover to the main body from top side (the side of pressure port) to the end completely. Be careful about the front side of the cover. Strap can't be attached with the protect cover on the main body.



Periodical Calibration

If you would like to calibration request, please contact the sales office where you purchased.

Warranty

The warranty period for the product shall be one year. A failure due to causes attributed to design or manufacturing defects during the period one year from the date of delivery shall be repaired or replaced free of charge. However, the term "warranty" herein referred to shall imply the warranty for the product unit only, and damages from failure of the product shall be excluded. The following shall be excluded from the warranty:

- (1) Failure or damage caused by improper use and careless operation in violation of the Operating Instructions.
- (2) Failure or damage caused by inappropriate modification, adjustment, or repair.
- (3) Failure or damage caused by acts of God, fire, or other unavoidable accidents.
- (4) Replacement of accessories (cables, etc.) and supplies that come with the product.

[Note]

Copying or reprinting the entire or part of the Operating Instructions shall be prohibited except where exceptions to copyright laws apply. Furthermore, descriptions stated in the Operating Instructions are subject to change without prior notice.

