Before Use

Sensor Monitor

PSE3##A Series

Thank you for purchasing an SMC PSE3##A Series Digital Display Setting Equipment.
Please read this manual carefully before operating the product and make sure you understand its capabilities and limitations. Please keep this manual handy for future reference.

To obtain the operation manual about this product,
please refer to the SMC website
(URL http://www.smcworld.com) or contact SMC directly.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage.
These instructions indicate the level of potential hazard with the labels of "Caution", "Warning" or "Danger". They are all important notes for safety and must be followed in addition to International standards (ISO/IEC) and other safety regulations.

⚠ **Caution:**	CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning:**	WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger:**	DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Operator

- The operation manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment. Only those persons are allowed to perform assembly, operation and maintenance.
- Read and understand the operation manual carefully before assembling, operating or providing maintenance to the product.

■Safety Instructions

⚠ Warning

■**Do not disassemble, modify (including changing the printed circuit board) or repair.**
An injury or failure can result.

■**Do not operate the product outside of the specifications.**
Do not use for flammable or harmful fluids.
Fire, malfunction, or damage to the product can result.
Verify the specifications before use.

■**Do not operate in an atmosphere containing flammable or explosive gases.**
Fire or an explosion can result.
This product is not designed to be explosion proof.

■**Do not use the product in a place where static electricity is a problem.**
Otherwise it can cause failure or malfunction of the system.

■**If using the product in an interlocking circuit:**
•Provide a double interlocking system, for example a mechanical system
•Check the product regularly for proper operation
Otherwise malfunction can result, causing an accident.

■**The following instructions must be followed during maintenance:**
•Turn off the power supply
•Stop the air supply, exhaust the residual pressure and verify that the air is released before performing maintenance work
Otherwise an injury can result.

⚠ Caution

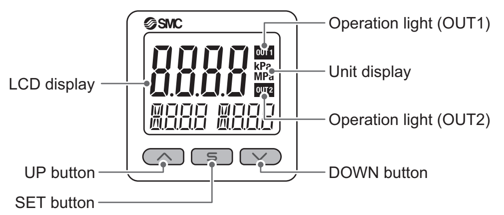
■**Do not touch the terminals and connectors while the power is on.**
Otherwise electric shock, malfunction or damage to the product can result.

■**After maintenance is complete, perform appropriate functional inspections and leak tests.**
Stop operation if the equipment does not function properly or there is a leakage of fluid.
When leakage occurs from parts other than the piping, the product might be faulty.
Disconnect the power supply and stop the fluid supply.
Do not apply fluid under leaking conditions.
Safety cannot be assured in the case of unexpected malfunction.

■NOTE

•The direct current power supply to be used should be UL approved as follows: Circuit (of Class 2) which is of maximum 30 Vrms (42.4 V peak), with UL1310 Class 2 power supply unit or UL1585 Class 2 transformer.
•The product is a UL approved product only if it has a cULus mark on the body.

Summary of Product parts



Name	Description
Operation light	Displays the switch operating condition.
LCD display	Displays the current status of pressure, setting mode, selected display units and error code. 4 types of display can be selected for the main display: Single colour of constant red or green; or switching from red to green or green to red corresponding to the output. The indication for the sub display is orange.
UP button	Increases mode and ON/OFF set values.
DOWN button	Decreases mode and ON/OFF set values.
SET button	Press this button to change mode and to confirm settings.
Unit display	Indicates the units currently selected. (Only for display units of kPa and MPa)

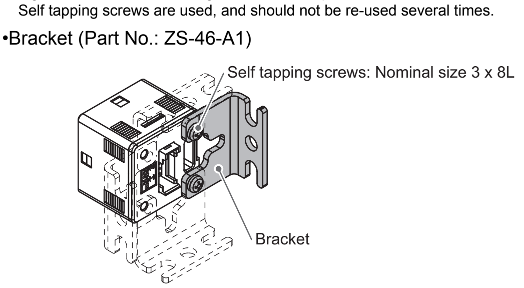
Mounting and Installation

■Installation

○Mounting with bracket

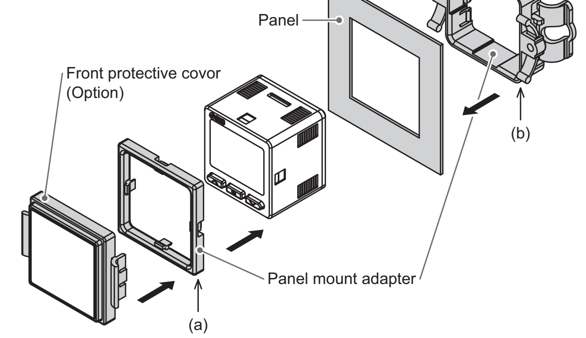
- Mount the bracket to the body with mounting screws (Self tapping screws: Nominal size 3 x 8L (2 pcs.)), then set the body to the specified position.
  *: Tighten the bracket mounting screws to a torque of 0.5±0.05 Nm.
  Self tapping screws are used, and should not be re-used several times.

•Bracket (Part No.: ZS-46-A1)



○Mounting with panel mount adapter

- Mount part (a) to the front of the body and fix it. Then insert the body with (a) into the panel until (a) comes into contact with the panel front surface. Next, mount part (b) to the body from the rear and insert it until (b) comes into contact with the panel for fixing.
  •Panel mount adapter (Part No.: ZS-46-B)
  Panel mount adapter + Front protective cover (Part No.: ZS-46-D)



*: The panel mount adapter can be rotated through 90 degrees for mounting.

Refer to the product catalogue or SMC website (URL http://www.smcworld.com) for more information about panel cut-out and mounting hole dimensions.

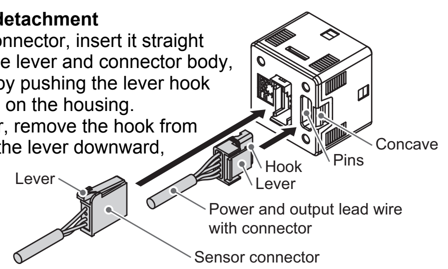
■Wiring

○Wiring connections

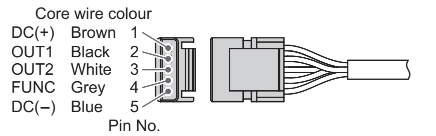
- Connections should be made with the power supply turned off.
- Use a separate route for the product wiring and any power or high voltage wiring.
  Otherwise, malfunction may result due to noise.
- If a commercially available switching power supply is used, be sure to ground the frame ground (FG) terminal. If the switching power supply is connected for use, switching noise will be superimposed and it will not be able to meet the product specifications. In that case, insert a noise filter such as a line noise filter/ferrite between the switching power supplies or change the switching power supply to the series power supply.

○How to use connector
Connector attachment/detachment

- When connecting the connector, insert it straight onto the pins, holding the lever and connector body, and lock the connector by pushing the lever hook into the concave groove on the housing.
- To detach the connector, remove the hook from the groove by pressing the lever downward, and pull the connector straight out.

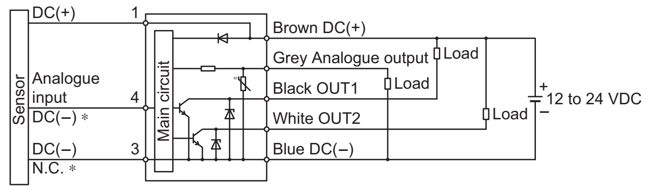


Connector pin numbers

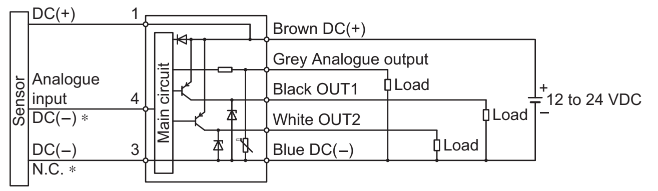


○Internal circuit and wiring examples

•NPN open collector 2 output + Analogue output
Max. 30 V, 80 mA
Residual voltage: 1 V or less



•PNP open collector 2 output + Analogue output
Max. 80 mA
Residual voltage: 1.5 V or less



*: 2-wire type

Refer to the product catalogue or SMC website (URL http://www.smcworld.com) for more information about other internal circuit and wiring examples.

Outline of Settings

Power is supplied

↓

The product code is displayed for approximately 3 sec. after supplying power. After that, measurement mode is displayed.
*: Within approximately 0.2 second after power-on, the switch starts.

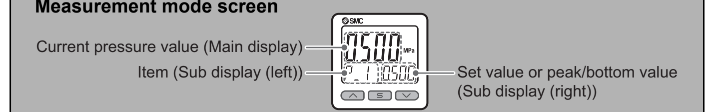
↓

[Initial Setting]
Set the pressure range, display unit and switch output NPN/PNP specifications.

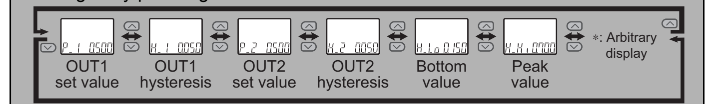
↓

[Measurement mode]
Detects the pressure after power is supplied, and indicates the display and switch operating status. This is the basic mode; other modes should be selected for set-point changes and other function settings.

Measurement mode screen



Sub display
In measurement mode, the display of the sub display can be temporarily changed by pressing the UP or DOWN buttons.



*: One arbitrary display mode can be added to the sub display by setting the [F10] sub display setting.
If the sub display is switched during the arbitrary display setting, the display will be returned to the arbitrary display 30 seconds later. (The default setting does not include arbitrary display.)

Press the SET button once.	Press the SET button between 1 and 3 sec.	Press the SET button between 3 and 5 sec.	
[3 step setting mode] Set either of set value or hysteresis.	**[Simple setting mode]** Select the set value, hysteresis and delay time.	**[Function selection mode]** Change the function settings.	**[Other Settings]** •Zero-clear function •Key-lock function

*: The outputs will continue to operate during setting.
*: If a button operation is not performed for a certain time during the setting, the display will flash.
(This is to prevent the setting from remaining incomplete if, for instance, an operator were to leave during setting.)
*: 3 step setting mode, simple setting mode and function selection mode settings are reflected each other.

Initial setting

Set the pressure range, display unit and NPN/PNP output specifications.

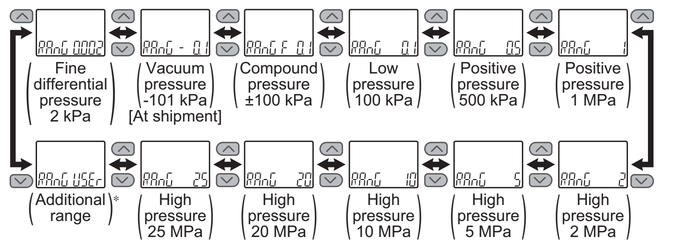
Measurement mode

↓ Press the SET button between 3 and 5 seconds.

[F 0] Display the switching function of the pressure range, display unit and switch output specifications.

Press the SET button. ↓ Move on to pressure range setting.

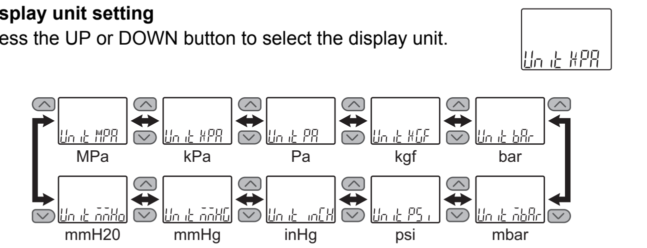
Pressure range setting
Press the UP or DOWN button to select pressure range.



*: For the pressure range setting, refer to the operation manual, available from the SMC website (URL http://www.smcworld.com) for selecting the additional range.

Press the SET button to set. ↓ When selecting the buttons other than [USEr], move on to the display unit setting with SET button.

Display unit setting
Press the UP or DOWN button to select the display unit.

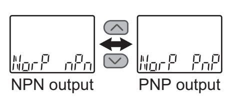


*: The unit that can be displayed is different depending on the pressure range.
(kPa/MPa/Pa can still be selected if the product does not have the units selection function.)
Refer to the operation manual, available from the SMC website
(URL http://www.smcworld.com) for more detailed information.

Press the SET button to set. ↓ Move on to the switch output NPN/PNP specification switching setting.

Switching setting of switch output NPN/PNP specifications
The switch output of this product can be switched to NPN or PNP output in accordance with the user device construction.

Press the UP or DOWN button to select switch output specification.



Press the SET button to set. ↓ Return to function selection mode.

[F 0] Setting of the switching function of the pressure range, display unit and switch output specifications is completed.

↓ Press the SET button for 2 second or longer.

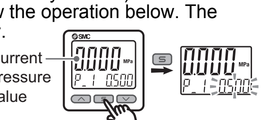
Measurement mode
(Initial setting is completed)

↓

Perform the setting with the 3 step setting mode, simple setting mode and function selection mode.

3 Step Setting Mode

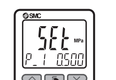
[3 step setting mode (hysteresis mode)]
In the 3 step setting mode, the set value (P_1 or n_1) and hysteresis (H_1) can be changed. Set the items on the sub display (set value or hysteresis) with UP or DOWN button. When changing the set value, follow the operation below. The hysteresis setting can be changed in the same way.



(1) Press the SET button once when the item to be changed is displayed on the sub display. The set value on the sub display (right) will start flashing.
(2) Press the UP or DOWN button to change the set value.
The set value can be increased with UP button and can be reduced with DOWN button. When UP and DOWN buttons are pressed and held simultaneously for 1 second or longer, the set value is displayed as [- - -], and the set value will be the same as the current pressure value automatically (snap shot function).
Afterwards, it is possible to adjust the value by pressing UP or DOWN button.
(3) Press the SET button to complete the setting.

The pressure switch turns on within a set pressure range (from P1L to P1H) during window comparator mode.
Set P1L, the lower limit of the switch operation, and P1H, the upper limit of the switch operation and WH1 (hysteresis) following the instructions given above.
(When reversed output is selected, the sub display (left) shows [n1L] and [n1H].)
*: Set OUT2 in the same way. (P_2, H_2 etc.)
*: Setting of the normal/reverse output switching and hysteresis/window comparator mode switching are performed with the function selection mode [F 1] OUT1 setting and [F 2] OUT2 setting.

Simple Setting Mode



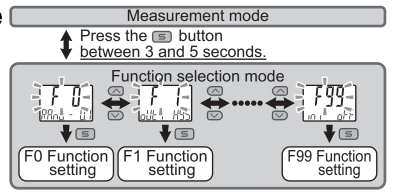
(1) Press and hold the SET button between 1 and 3 seconds in measurement mode. [SEt] is displayed on the main display.
When the button is released while in the [SEt] display, the current pressure value is displayed on the main display, [P_1] or [n_1] is displayed on the sub display (left), and the set value is displayed on the sub display (right) (Flashing).
(2) Change the set value with UP or DOWN button, and press the SET button to set the value. Then, the setting moves to hysteresis setting.
(The snap shot function can be used.)
(3) Change the set value with UP or DOWN, button, and press the SET button to set the value. Then, the setting moves to the delay time of the switch output.
(The snap shot function can be used.)
(4) Press the UP or DOWN button, the delay time of the switch output can be selected.
Delay time setting can prevent the output from chattering.
(5) Press the SET button for 2 seconds or longer to complete the setting.
*: If the button is pressed for less than 2 seconds, the setting will moves to the OUT2 setting.

In the window comparator mode, set P1L, the lower limit of the switch operation, and P1H, the upper limit of the switch operation, WH1 (hysteresis) and dt1 (delay time) following the instructions given above.
(When reversed output is selected, the sub display (left) shows [n1L] and [n1H].)
*: Set OUT2 in the same way.

Function Selection Mode

■Function selection mode

In measurement mode, press the SET button between 3 and 5 seconds, to display [F 0]. Select to display the function to be changed [F□□]. Press and hold the SET button for 2 seconds or longer in function selection mode to return to measurement mode.



*: Some products do not have all the functions. If no function is available or selected due to configuration of other functions, [- - -] is displayed on the sub display (right).

■Default setting

The default setting is as follows.
If no problem is caused by this setting, keep these settings.

- Switching function of [F 0] Pressure range, display unit and switch output specifications

Item	Default setting
Connected sensor range	-101 kPa
Display units	kPa
Switch output specifications	NPN/PNP *

*: Depends on part number.

- [F 1] Setting of OUT1

Item	Default setting
Output mode	Hysteresis mode
Reversed output	Normal output
Pressure setting	-50.5 kPa
Hysteresis	5.1 kPa
Delay time	1.5 ms or less
Display colour	Output ON: Green/Output OFF: Red (Linked to OUT1)

- [F 2] Setting of OUT2
  Same setting as [F 1] OUT1.

- Other parameter settings

Item	Default setting	Item	Default setting
[F 3] Digital filter setting	0 ms	[F80] Power saving mode	OFF
[F 4] Auto-preset function	Not used	[F81] Security code	OFF
[F 5] FUNC terminal setting *	Analogue output: 1 to 5 V/4 to 20 mA	[F82] Input of line name	AAAA
		[F90] Setting of all functions	OFF
[F 6] Fine adjustment of display value	0%	[F96] Input signal check	No configurable items
		[F97] Selection of copy check	No configurable items
[F10] Sub display setting	std (Standard)	[F98] Output check	N/A (normal output)
[F11] Display resolution setting	1000-split	[F99] Reset to default settings	OFF

*: This function is available for models with analogue output.

If you use the product by changing the setting, refer to the SMC website (URL http://www.smcworld.com) for more detailed information, or contact SMC.

Other Settings

○Peak/bottom value indication
The max. (min.) pressure when the power is supplied is detected and updated. The value can be displayed on the sub display by pressing UP or DOWN button in measurement mode.

○Snap shot function
The current pressure value can be stored to the switch output ON/OFF set point. When the set value and hysteresis are set, press the UP and DOWN buttons for 1 second or longer simultaneously. Then, the set value of the sub display (right) shows [- - -], and the values corresponding to the current pressure values are automatically displayed.

○Zero-clear function
In measurement mode, when the UP and DOWN buttons are pressed for 1 second or longer simultaneously, the main display shows [- - -], and the reset to zero.
The display returns to measurement mode automatically.

○Key-lock function

To set each of these functions, refer to the SMC website
(URL http://www.smcworld.com) for more detailed information, or contact SMC.

Maintenance

How to reset the product after a power cut or forcible de-energizing
The setting of the product will be retained as it was before a power cut or de-energizing. The output condition is also basically recovered to that before a power cut or de-energizing, but may change depending on the operating environment. Therefore, check the safety of the whole installation before operating the product. If the installation is using accurate control, wait until the product has warmed up (approximately 10 to 15 minutes).

Troubleshooting

■Error indication function

This function is to display error location and content when a problem or error has occurred.

Error	Error displayed	Description	Measures
Over current error	Er 1 / oC1 Er 2 / oC2	The switch output load current is 80 mA or more.	Turn the power off and remove the cause of the over current. Then supply the power again.
Residual pressure error	Er 3 / ZEro	During zero clear operation, pressure greater than ±7%F.S. (±3.5%F.S.for compound pressure) is present. Note that the mode is returned to measurement mode automatically 1 second later. The zero clear range varies by ±1%F.S. due to variation between individual products.	Release the applied pressure to atmospheric pressure, and retry the zero clear operation.
Pressurizing error	HHH	Pressure exceeding the upper limit of the set pressure range is applied.	Reset applied pressure to a level within the set pressure range. Check the sensor connection and wiring.
	LLL	Pressure exceeding the lower limit of the set pressure range is applied. Sensor is not connected or wired incorrectly.	
Copy error	Er 13 / SLAu	Fail to operate copy function.	Press the UP and DOWN buttons 1 second or longer to recover from error. Try copy function after checking wiring, product model etc.
System error	Er 0 Er 4 Er 6 Er 7 Er 8 Er 9	Displayed if an internal data error has occurred.	Turn the power off and on again. If the failure cannot be solved, contact SMC.

If the error cannot be reset after the above measures are taken, or errors other than above are displayed, please contact SMC.
Refer to the SMC website (URL http://www.smcworld.com) for more information about troubleshooting.

Specifications/Outline with Dimensions (in mm)

Refer to the product catalogue or SMC website (URL http://www.smcworld.com) for more information about the product specifications and outline dimensions.

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