ORIGINAL INSTRUCTIONS

Instruction Manual
PSE Sensor Set up Tool
PSE-ST-# series

The intended use of the Sensor Set up Tool is to enable the successful set up of a variety of pressure sensors manufactured by SMC.

1 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) *1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. Part 1: General requirements.
ISO 10218-1: Robotics - Safety requirements - Part 1: Industrial robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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

⚠ Warning

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.
- This product is class A equipment intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted or radiated disturbances.
- Refer to the operation manual on the SMC website (URL: https://www.smcworld.com) for more Safety instructions.

2 Specifications

2.1 General specifications

Product No.		PSE-ST series						
Applicable pressure sensor		PSE 541 -L	PSE 543 -L	PSE 573 -L2 PSE 574 -L2	PSE 540 -L PSE 570 -L2	PSE 575 -L2	PSE 576 -L2	PSE 577 -L2
Pressure	Rated pressure range	0 to -101 kPa	-100 to 100 kPa	0 to 500 kPa	0 to 1 MPa	0 to 2 MPa	0 to 5 MPa	0 to 10 MPa
	Display/set pressure range	10 to -105 kPa	-105 to 105 kPa	-50 to 525 kPa	-0.105 to 1.05 MPa	-0.105 to 2.1 MPa	-0.105 to 5.25 MPa	-0.105 to 10.5 MPa
Power supply	Voltage	5 VDC						
	Current consumption	2 A maximum						
	Protection	Over voltage protection						
	Connector	USB Type-C						
Sensor input	Number of inputs	1						
	Connection method	Connector						
	Protection	Polarity protection, Over voltage protection						
Display	Display type	LCD						
	Number of displays	3-screen display (Main display, sub display x 2)						
	Display colour	1) Main display: Red / Green 2) Sub display: Orange						
	Number of digits	Main display: 4 digits (7-segments) Sub display: 4 digits (upper 1 digit 11-segments, 7-segments for others)						
Environment	Enclosure	IP40						
	Withstand voltage	1000 VAC for 1 minute between terminals and housing						
	Insulation resistance	50 MΩ or more between terminals and housing (with 500 VDC megger)						
	Ambient temperature range	Operation: 0 to 45 °C, Storage: -10 to 60 °C (no condensation or freezing)						
	Ambient humidity range	Operation, Storage: 35 to 85% RH (No condensation)						
Standard		CE / UKCA / WEEE						
Weight	Body	50 g (without connector)						

∗1: Use this product by connecting it to a mobile battery with a 5 VDC, 2 A minimum output.
Do not connect to any power source other than a mobile battery.
If the product does not operate, there is a risk that the power supply may be faulty. Check the specifications of the mobile battery.
If the mobile battery is used at a temperature higher than the specifications, it may cause a malfunction, fire or burns.
Follow the instructions and precautions for use for the mobile battery.

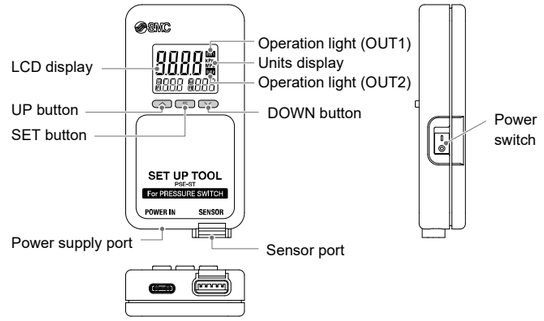
∗2: If this product is connected to a mobile battery that has a function that automatically turns off the power supply according to the current consumption of the mobile battery, this product may not operate correctly. It is recommended to use a mobile battery that can be switched on and off.

∗3: Any products with tiny scratches, smears, or variations in the display colour or brightness, which does not affect the performance of the product, are verified as conforming products.

⚠ Warning

- Special products (-X) might have specifications which are different to those shown in the specifications section. Contact SMC for specific drawings.

3 Summary of Product parts



Part	Description
Operation light	Displays the switch operating conditions.
LCD display	Displays the current status of pressure, setting mode, selected display units and error codes. The main display is normally a solid green colour, but when there is an error, it will turn red. The sub display colour is orange.
UP button	Increases the mode and ON/OFF set values.
DOWN button	Decreases the mode and ON/OFF set values.
SET button	Press this button to change the mode and to confirm the settings.
Units display	Indicates the units currently selected.
Power supply port	Port for connecting a mobile battery power supply using a USB Type-C connector. The mobile battery and cable are to be prepared by the user.
Sensor port	Port for connecting the pressure sensor to be set up via the conversion connector cable.
Power switch	Switch to turn the product ON/OFF.

4 Installation

4.1 Operation

- Use only with the specified pressure sensors.
Other products may not operate correctly.
- Turn on the power switch after connecting the pressure sensor.
- Do not short circuit the pressure sensor.
If the output of the pressure sensor is short-circuited, an error will be displayed, but there is a possibility that an overcurrent will flow and the product will be damaged.
- Do not press the setting buttons with a sharp pointed object.
- To reduce the measurement error in the environment where the pressure sensor is used, warm up the product for 10 to 15 minutes.
The pressure sensor display will drift approximately ±1% immediately after and within 10 minutes of the power supply being turned on.
However, if the product is not operated for 10 minutes, the power supply to the sensor will be turned off due to power saving mode.
Therefore, set the power save mode to OFF or use button operations to prevent the power save mode from operating.
- Perform settings suitable for the operating conditions.
Incorrect setting can cause operation failure.
- Do not touch the LCD during operation.
The display can vary due to static electricity.
- If the pressure sensor output specification is a switch output, note that changing the set value will result in operation that differs from the set value indicated on the nameplate of the pressure sensor.
- Do not pull the lead wire forcefully. Do not lift or carry the product by pulling on the lead wire. (Tensile strength: 35 N maximum for products with a conversion connector).
- This product cannot store data.
Be aware that any data you are working on will be lost if the power supply is turned off.

4 Installation (continued)

4.2 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water, water or steam are present.
- Do not use the product in an environment where it is constantly exposed to water or oil splashes.
- Do not use in an area where surges are generated.
Equipment which generates a large amount of surge (solenoid type lifter, high frequency induction furnace, motor, etc.) close to the product, may cause deterioration or damage of the internal circuit of the product.
Avoid sources of surge generation and crossed wires.
- Check the specifications of the mobile battery used as a power source.
If the mobile battery is used at a temperature higher than the specifications, it may cause a malfunction, fire or burns.
Follow the instructions and precautions for use for the mobile battery.
- Do not use the product under excessive vibration or impact.
- Prevent foreign matter such as remnants of wires from entering the product.
- Do not use the product in an environment exposed to temperature cycles.
Heat cycles other than ordinary changes in temperature can adversely affect the product.
- Do not expose the product to direct sunlight. Use a suitable protective cover.
- Keep the product within the specified ambient temperature range.
- Do not operate the product near to a heat source, or in a location exposed to radiant heat.

5 Wiring

5.1 Wiring

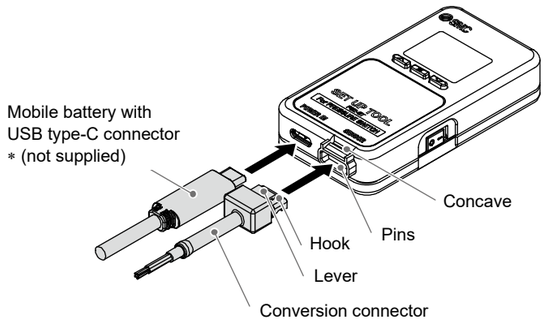
⚠ Caution

- Do not perform wiring while the power is on.
- Confirm proper insulation of wiring.
- Use a separate route for the product wiring and any power or high voltage wiring.
- Avoid repeatedly bending or stretching the lead wire or placing a heavy load on them.
If the lead wire can move, fix it near the body of the product.
The recommended bend radius of the lead wire is 6 times the outside diameter of the sheath, or 33 times the outside diameter of the insulation material, whichever is larger.
Replace any damaged lead wire with a new one.
- Wire the product correctly.
Incorrect wiring can damage the product.
- Turn on the power switch after connecting the mobile battery to the product.
Otherwise damage to the internal parts can result, causing malfunction.
- Confirm proper insulation of wiring.
Poor insulation (interference from another circuit, poor insulation between terminals, etc.) can lead to excess voltage or current being applied to the product, causing damage.
- Keep wiring as short as possible to prevent interference from electromagnetic noise and surge voltages.

5.2 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 down, and pull the connector straight out.

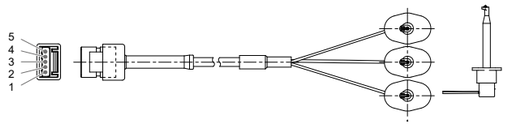
5 Wiring (continued)



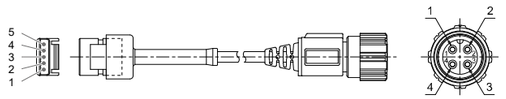
∗: The mobile battery and cable must be provided by the user.

5.3 Connector Pin layout

- Discrete wires type (Part No. D-LH03C)

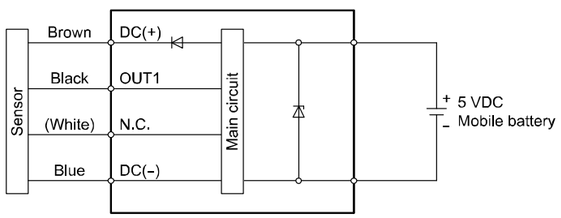


- M12 4-pin connector type (Part No. D-LH03B)

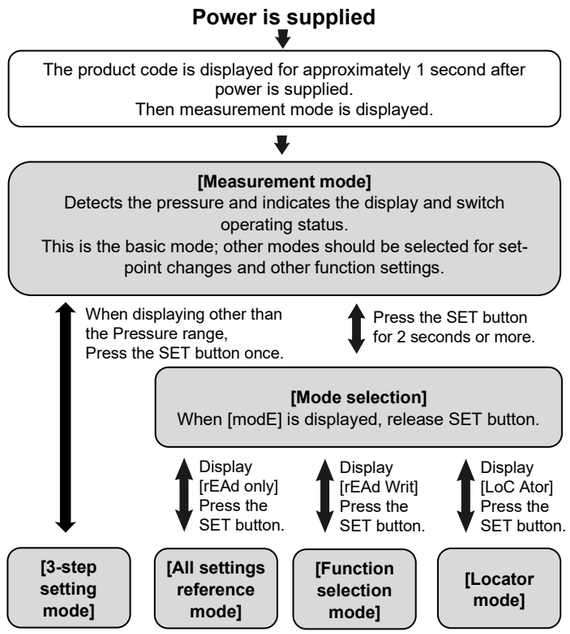


Wiring				Description
Connector pin number	Wire colour	Connector colour (D-LH03C)	M12 Connector Pin number (D-LH03B)	
1	Blue	Blue	3	DC(-)
2	-	-	-	N.C.
3	-	-	-	N.C.
4	Black	Black	4	OUT1
5	Brown	Red	1	DC(+)

5.4 Internal circuit and Wiring



6 Outline of Settings



∗: The outputs will continue to operate during setting.
∗: If a button operation is not performed for a certain time during 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 on each other.
∗: If the SET button is pressed for 2 seconds or longer in any mode, the product will move to measurement mode.

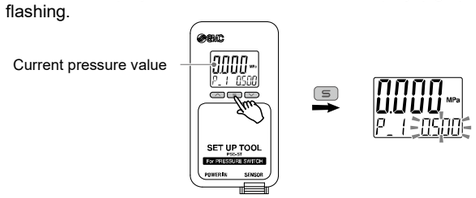
7 3-step Setting mode

In 3-step setting mode, the set values can be input in just 3 steps.
Use this mode if the product is to be used straight away, after changing only the set values (The current pressure value is displayed on the main display).

7.1 Operation

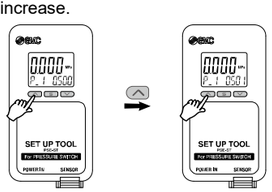
In 3-step setting mode, the set value (P_1 or n_1, P_2 or n_2) and hysteresis (H_1, H_2) can be changed. Set the items on the sub display (set value or hysteresis) using the UP or DOWN button. When changing the set value, follow the operation below. The hysteresis setting can be changed in the same way.

(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.

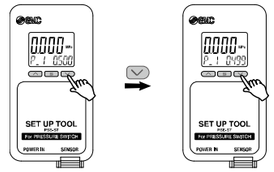


(2) Press the UP or DOWN button to change the set value.
The UP button is to increase and the DOWN button is to decrease.

- Press the UP button once to increase by one digit, or press and hold to continuously increase.



- Press the DOWN button once to decrease by one digit, or press and hold to continuously decrease.



(3) Press the SET button to complete the setting.

- Press and hold the UP and DOWN buttons simultaneously for 1 second or longer, the set value is displayed [- - -], and the set value will be set to the same as the current pressure value automatically (snap shot function). Then it is possible to adjust the value by pressing the UP or DOWN button.
- In window comparator mode the product will turn on within a set pressure range (OUT1: from P1L to P1H, OUT2: from P2L to P2H). Set P1L/P2L, the lower limit of the switch operation, and P1H/P2H, the upper limit of the switch operation and WH1/WH2 (hysteresis) following the instructions given in the operation manual.
  (When reversed output is selected, the sub display (left) will display [n1L]/[n2L] and [n1H]/[n2H]).

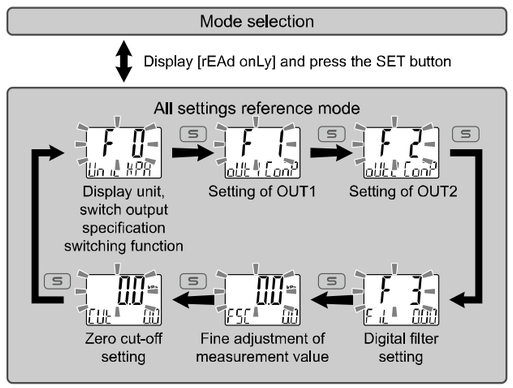
∗: Setting of the normal/reversed output selection and hysteresis/window comparator mode selection are performed in function selection mode [F 1] Setting of OUT1 and [F 2] Setting of OUT2.

8 All Settings Reference mode

- In mode selection, when [rEAd onLy] is displayed, press the SET button to display [F 0].
  [F**] indicates the mode for displaying the parameters set for each function. The settings cannot be changed.

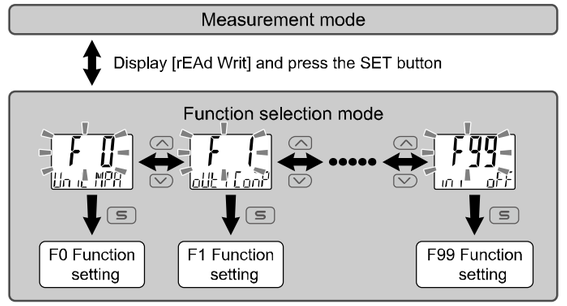
- The following parameters can be confirmed.
  [F 0]: Display units, switch output switching function.
  [F 1]: Setting of OUT1.
  [F 2]: Setting of OUT2.
  [F 3]: Digital filter setting.
  [F 6]: Fine adjustment of measurement value.
  [F14]: Zero cut-off setting.

∗: In [F 6] [F14], the [F**] is not displayed, but [F 6]: adjusted pressure value, and [F14]: zero-cut pressure value are displayed.
  - Press and hold the SET button for 2 seconds or longer in all setting reference modes to return to measurement mode.



9 Function Selection mode

In mode selection, when [rEAd Writ] is displayed, press the SET button 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.



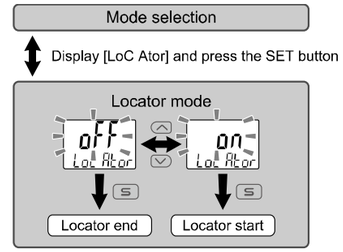
∗: Depending on the pressure sensor connected, not all functions are available. If a function is not available or selected due to configuration of other functions, [- - -] is displayed on the sub display (right).

9.1 Default function settings

As this product is used to display and change the settings of the connected pressure sensor, there are no default settings for this product.

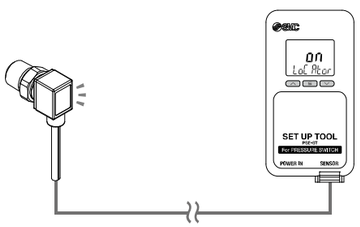
10 Locator mode

Locator mode is the mode for checking the connected pressure sensor and for setting the start and end of the locator function.
Press and hold the SET button for 2 seconds or longer in locator mode to return to measurement mode.



- Locator function

The locator function can be used to make the operation indicator light of the connected pressure sensor to flash (for 10 minutes). This allows a visual check of which pressure sensor is connected to the product, even after the pressure sensor has been connected to the equipment.
If the connected pressure sensor is changed while the locator function is turned on, the operation light on the newly connected pressure sensor will flash.
With the locator function turned on, press the SET button for 2 seconds or longer to return to measurement mode, and the setting values can be changed while the locator function is still on.
To disable the locator function turn the product off and on again.



11 Other Settings

- **Snap shot function**
- **Zero-clear function**

Refer to the operation manual on the SMC website (URL: https://www.smcworld.com) for setting these functions.

12 Troubleshooting

12.1 Error indication

Error	Error display	Description	Countermeasures
Over current error (output)	Er 1 oC1	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.
	Er61 Hi wOUt	There is an over current in the pressure sensor.	Check the connection and wiring of the pressure sensor.
Device connection error	Er62	The connection between this product and the pressure sensor has failed, or a sensor other than the correct pressure sensor is connected.	Check that the correct pressure sensor is connected. Check the sensor connections and wiring.
Device system error	Er63 dEv	There is a system error in the process data of the pressure sensor.	Clear the system error using the process data of the pressure sensor.
Non SI units error	Er64 Unit	The units of the connected pressure sensor are other than kPa or MPa.	Use a pressure sensor with units of kPa or MPa.
Mobile battery voltage error	Current display value	The mobile battery voltage is less than 4.5 VDC or more than 5.5 VDC.	Use a mobile battery with a power supply voltage of 4.75 to 5.25 V DC.
Residual pressure error	Er 3 rEro	During a zero clear operation, pressure greater than ±7% F.S. (±3.5% F.S. for compound pressure) was present. Note that the mode returns 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.
Pressurize error	HHH	Pressure above the upper limit of the set pressure range is applied.	Reset the applied pressure to a level within the set pressure range. Check the pressure sensor connection and wiring.
	LLL	Pressure below the lower limit of the set pressure range is applied. A sensor is not connected or is wired incorrectly.	
Copy error	--- CoPy Err	Failure to operate copy function.	Check the wiring and sensor and connect the pressure sensor again.

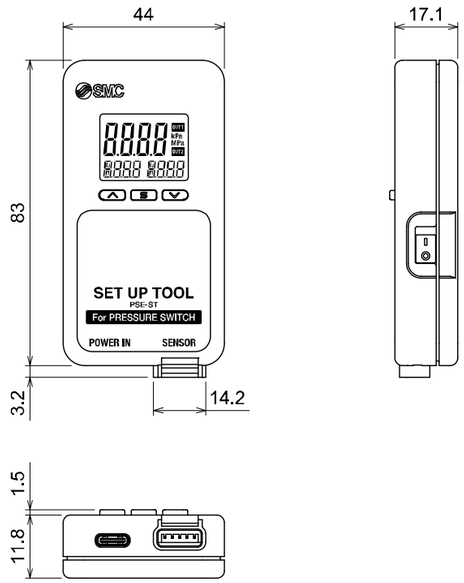
If the error cannot be reset after the above countermeasures are taken, or errors other than the above are displayed, please contact SMC.

Refer to the operation manual on the SMC website (URL: https://www.smcworld.com) for more detailed Troubleshooting information.

13 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: https://www.smcworld.com) for the How to order information.

14 Outline Dimensions (mm)



15 Maintenance

15.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

- Remove the mobile battery power supply before maintenance. There is a risk of unexpected malfunction.
- Perform regular maintenance and inspections.
- Do not use solvents such as benzene, thinner etc. to clean the product. They could damage the surface of the body and erase the markings on the body. Use a soft cloth to remove stains. For heavy stains, use a cloth soaked with diluted neutral detergent and fully squeezed, then wipe up the stains again with a dry cloth.

16 Limitations of Use

Limited warranty and Disclaimer/Compliance Requirements
Refer to Handling Precautions for SMC Products.

17 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

18 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL : https://www.smcworld.com (Global) https://www.smc.eu (Europe)
SMC Corporation, 1-5-5, Kyobashi, Chuo-ku, Tokyo 104-0031, JAPAN

Template DKP50047-F-085O