ZISE##-TFM113GB-A

Installation & Maintenance Manual
Digital Pressure Switch
Series ZSE10/ZSE10F/ISE10

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), Japan Industrial Standards (JIS) and other safety regulations.
To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

⚠ **Caution**	Operator error could result in injury or equipment damage.
⚠ **Warning**	Operator error could result in serious injury or loss of life.
⚠ **Danger**	In extreme conditions, there is a possibility of serious injury or loss of life.

⚠ 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.**

  Otherwise an injury can be caused.

Safety Instructions (Continued)

⚠ 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.

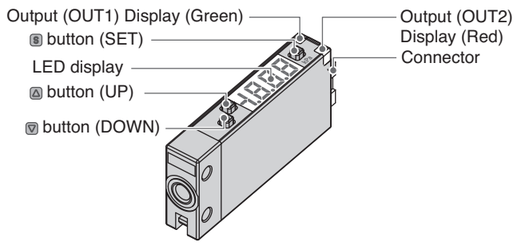
NOTE

- 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) or less, with UL1310 Class 2 power supply unit or UL1585 Class 2 transformer.
- The Pressure switch is a UL approved product only if it has a UL mark on the body.

Model Indication and How to Order

Refer to the operation manual,and catalogue for this product.

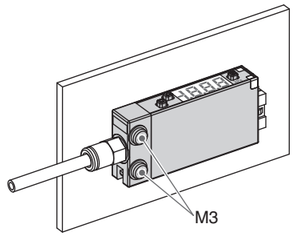
Names and Functions of Individual Parts



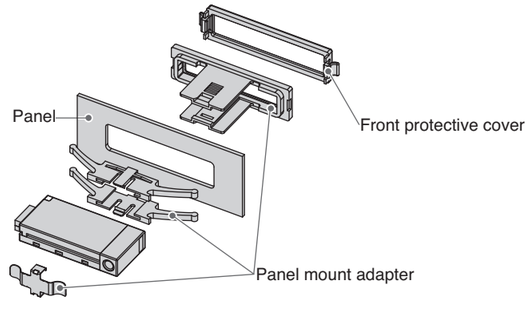
Output (OUT1) Display (Green): Lights ON when the switch output (OUT1) is turned ON.
Output (OUT2) Display (Red): Lights ON when the switch output (OUT2) is turned ON.
LED display: Displays the current status of pressure, setting mode and error code.
button (UP): Selects the mode or increases the ON/OFF set value. Press this button to change to the peak display mode.
button (DOWN): Selects the mode or decreases the ON/OFF set value. Press this button to change to the bottom display mode.
button (SET): Press this button to change to either mode and to set a value.

Installation

Installation
Mounting
*: The tightening torque of piping port must be 1 Nm for M5 and 7 to 9 Nm for R1/8 and NPT1/8.
- Mount with the set screws M3 size (2 pcs.) for direct installation.
  The tightening torque of the mounting screw must be 0.5 to 0.7 Nm.

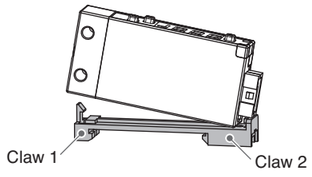


Mounting with panel mount adapter
- Panel mount adapter + Front protective cover (Model: ZS-39-D)



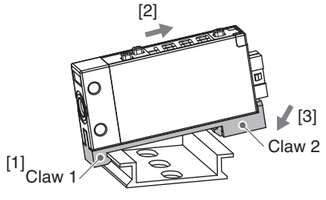
Removal and mounting of DIN rail
- It is necessary to prepare a DIN rail adapter for mounting on the DIN rail (Model: ZS-39-R)
- Take care not to bend the claws of the DIN rail adapter when mounting.

<Mounting of DIN rail adapter>



Engage the pressure switch with claw 2 of the DIN rail adapter ,than press down horizontally on to claw 1 until it clicks.

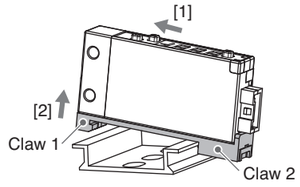
<Mounting on DIN rail>



Engage claw 1 of the adapter on to the DIN rail as indicated [1], apply force in direction [2] indicated, then press downward horizontally [3] until claw 2 clicks on to the DIN rail.

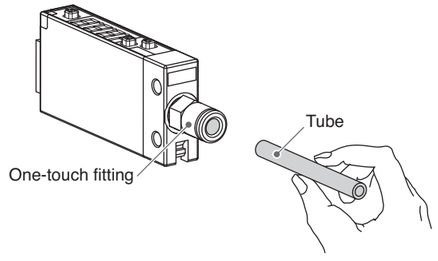
Installation (Continued)

<Removal of DIN rail>



Move in the direction [1], and remove claw 1 as indicated with [2].

Piping
Connection using One-touch fitting
1. Cut the tube perpendicularly.
2. Hold the tube and insert it into the One-touch fitting slowly until it bottoms out.



- Allow sufficient tube length to prevent twist, tensile and moment load from being applied to the fitting and tube.
- When using a tube manufactured by a company other than SMC, check its outside diameter accuracy satisfies the following conditions.
  1) Nylon tube: ±0.1 mm maximum
  2) Soft nylon tube: ±0.1 mm maximum
  3) Polyurethane tube: +0.15 mm/-0.2 mm maximum

Internal Circuit and wiring

Wiring

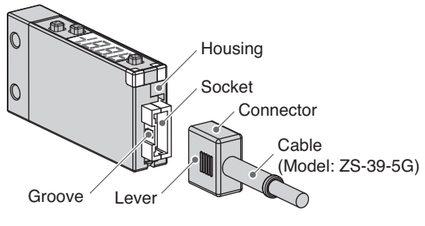
Connection

- Make connection after turning the power off.
- Use a separate route for wiring to the Pressure switch. Malfunction stemming from noise may occur if the wire is installed in the same route as that of power or high-voltage cable.
- Be sure to ground terminal FG when using a commercially available switch-mode power supply. When the switch-mode power supply is connected to the Pressure switch, switching noise will be superimposed and product specification can no longer be met. This can be prevented by inserting a noise filter, such as a line noise filter and ferrite core, between the switch-mode power supply and the Pressure switch, or by using a series power supply instead of the switch-mode power supply.

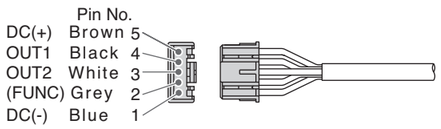
Connector

Connecting/Disconnecting

- When mounting the connector, insert it straight into the socket, holding the lever and connector body, and fit the hook of the lever into the groove in the housing to lock.
- When removing the connector, press down the lever to release the hook from the groove and pull the connector straight out.



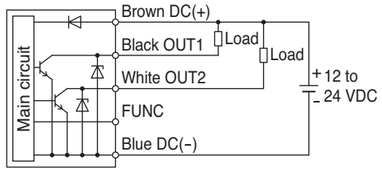
Pin No. of the Connector



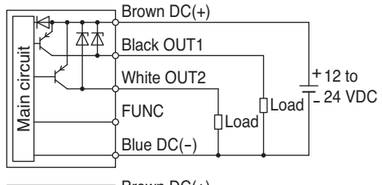
Internal Circuit and wiring(Continued)

Internal circuit and wiring example

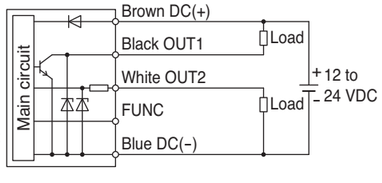
-A
NPN open collector
2 outputs
Max. 28 V, 80 mA
Residual voltage 2 V or less



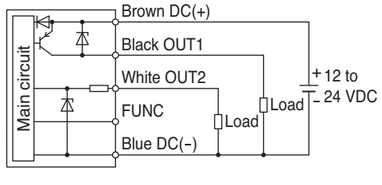
-B
PNP open collector
2 outputs
Max. 80 mA
Residual voltage 2 V or less



-C
NPN open collector
1 output
Max. 28 V, 80 mA
Residual voltage 2 V or less
Analogue voltage output
Output impedance approx. 1 kΩ



-E
PNP open collector
1 output
Max. 80 mA
Residual voltage 2 V or less
Analogue voltage output
Output impedance approx. 1 kΩ



Setting

Pressure Setting

Set ON point and OFF point of the Pressure switch.

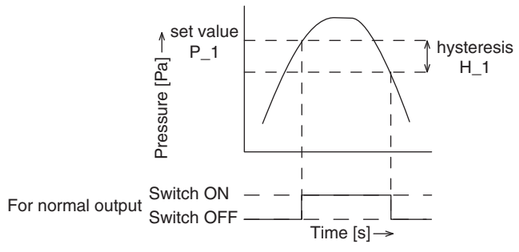
Operation

When the pressure exceeds a set value, the Pressure switch will be turned on.

When the pressure falls below the set value by the amount of hysteresis or more, the Pressure switch will be turned off.

The default setting of the output set value is the central value between the atmospheric pressure and the upper limit of the rated pressure range.

If the operation shown below does not cause any problem, keep this operation setting.



Setting (Continued)

<How to operate>

•Hysteresis mode

1, Press the [S] button once in measurement mode.



2, [P_1] or [n_1] and the set value are displayed in turn.

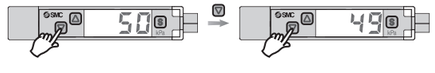


3, Press the [▲] or [▼] button to change the set value.
The [▲] button is for increase and the [▼] button is for decrease.

- Press the [▲] button once to increase by one figure, and press it continuously to keep increasing the set figure.



- Press the [▼] button once to decrease by one figure, and press it continuously to keep decreasing the set figure.



4, Press the [S] button to finish the setting.
If 2 outputs specification is selected, [P_2] is displayed.
Set OUT2 in the same way as OUT1.

•Window comparator mode

The Pressure switch turns on within a set pressure range (from P1L to P1H) during window comparator mode. Set P1L (switch lower limit) and P1H (switch upper limit) using the setting procedure above.

Zero clear of indication
Indication is reset to zero when [▲] and [▼] buttons are pressed simultaneously for 1 second.
For the first operation, perform zero clear without pressure supply.

Setting (Continued)

Default setting

At the time of shipment, the following settings are provided.
If the setting is acceptable, keep it for use.
To change setting, enter function selection mode.

•[F 0] Unit conversion function

Unit specification	Pressure range	Default setting
Nil or M	ISE10	MPa
	ZSE10(F)	kPa
P	ISE10	PSI
	ZSE10(F)	

•[F 1] Setting of OUT1

Item	Explanation	Default setting
Output mode	Selects hysteresis mode, window comparator mode or OFF mode.	Hysteresis mode
Reversed output	Selects reversed output.	Normal output
Pressure setting	Sets ON point or OFF point of the switch output.	ISE10: 0.500 MPa ZSE10: -50.5 kPa ZSE10F: 50.0 kPa
Hysteresis	Chattering can be prevented by setting hysteresis.	ISE10: 0.050 MPa ZSE10: 5.1 kPa ZSE10F: 5.0 kPa

•[F 2] Setting of OUT2

Same setting as [F 1] OUT1.

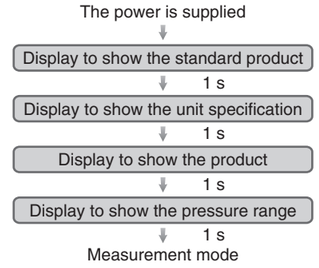
To set [F 2] setting of OUT2 in detail, refer to the operation manual.

Item	Default setting
[F 3] Setting of response time	2.5 ms
[F 4] Setting of auto-preset	Manual
[F 6] Setting of fine adjustment of display value	0%
[F11] Setting of display resolution	1000-split
[F80] Setting of power saving mode	OFF
[F81] Setting of security code	OFF
[F90] Setting of all functions	OFF
[F97] Selection of copy function	OFF
[F98] Check of output	Normal
[F99] Reset to the default setting	OFF

To set each function in detail, refer to the operation manual.

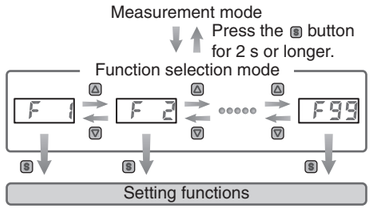
Measurement mode

The measurement mode is the condition where the pressure is detected and indicated, and the switch function is operating.
This is the basic mode, and other modes should be selected for setting change and other function setting changes.



Setting (Continued)

Function selection mode
In measurement mode, press the S button for 2 seconds or longer to display [F 0]. Select to display the function setting to be changed, [F□□]. Press the S button for 2 seconds or longer in function selection mode to return to measurement mode.



*: Some functions are not available depending on part number. All functions are displayed with [F□□] and followed with function description. If a function is not available for specified type, the function is displayed as [---].
To set each function in detail, refer to the operation manual.

Other Functions

•Peak/Bottom hold value indication
•Zero clear
•Key lock

To set each function in detail, refer to the operation manual.

Maintenance

How to reset the product for 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 system before operating the product.
If the system is using accurate control, wait until the pressure switch has warmed up (approximately 10 to 15 minutes)

Error Indication Function

This function is to display error location and content when a problem or an error occurs.

Error Name	Error Display	Error Type	Troubleshooting Method
Over current Error	Er 1 Er2	A load current of switch output is 80 mA or more.	Turn the power off and remove the output factor for the over current. Then turn the power on.
Zero-clear Error	Er3	During zero clear operation, pressure over ±7%F.S. (±3.5%F.S.for compound pressure) is applied. After 1 s, the mode will reset to the measurement mode. ±1%F.S. of the zero clear range varies with individual product differences.	Perform zero clear operation again after restoring the applied pressure to an atmospheric pressure condition.

Error Indication Function (Continued)

Error Name	Error Display	Error type	Troubleshooting Method
Pressurizing Error	HHH	Pressure has exceeded the upper limit of the set pressure range.	Reset applied pressure to a level within the set pressure range.
	LLL	Pressure has exceeded the lower limit of the set pressure range.	
System Error	Er0 Er4 Er6 Er7 Er8 Er9	Displayed in the case of an internal data error.	Turn the power off and turn it on again. If resetting fails, an investigation by SMC CORPORATION will be required.

If the error can not be reset after the above measures are taken, then please contact SMC.

Troubleshooting

Refer to the operation manual for this product.

Specification

Refer to the operation manual and catalogue for this product.

Outline with Dimensions (in mm)

Refer to the operation manual and catalogue for this product.

Contacts

AUSTRIA	(43) 2262 62280-0	LATVIA	(371) 781 77 00
BELGIUM	(32) 3 355 1464	LITHUANIA	(370) 5 264 8126
BULGARIA	(359) 2 974 4492	NETHERLANDS	(31) 20 531 8888
CZECH REP.	(420) 541 424 611	NORWAY	(47) 67 12 90 20
DENMARK	(45) 7025 2900	POLAND	(48) 22 211 9600
ESTONIA	(372) 651 0370	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	ROMANIA	(40) 21 320 5111
FRANCE	(33) 1 6476 1000	SLOVAKIA	(421) 2 444 56725
GERMANY	(49) 6103 4020	SLOVENIA	(386) 73 885 412
GREECE	(30) 210 271 7265	SPAIN	(34) 945 184 100
HUNGARY	(36) 23 511 390	SWEDEN	(46) 8 603 1200
IRELAND	(353) 1 403 9000	SWITZERLAND	(41) 52 396 3131
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