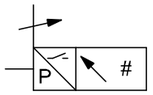
ORIGINAL INSTRUCTIONS

Instruction Manual
Compact Pressure Switch
ZSE1 / ISE1(L) / ZSE2 / ISE2(L)



The intended use of the compact pressure switch is to measure, monitor and display pressure and provide an output signal.

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 or catalogue on the SMC website (URL: https://www.smcworld.com) for more safety instructions.

2 Specifications

2.1 General specifications

Model No.		ZSE1 ZSE2	ISE1L ISE2L	ISE1 ISE2
		Vacuum pressure	Low pressure	High pressure
Setting pressure range		0 to -101 kPa	0 to 100 kPa	0 to 1 MPa
Withstand pressure		500 kPa		1.5 MPa
Applicable fluids		Air, non-corrosive gases, non-combustible gases		
Power supply voltage		12 to 24 VDC with ±10% voltage ripple or less		
Current consumption	Z/ISE1(L)	1 output: 17 mA or less (@ output ON) 2 output: 25 mA or less (@ output ON)		
	Z/ISE2(L)	17 mA or less at 24 VDC		
Response time		5 ms or less		
Repeatability		±1% F.S. or less		
Environment	Enclosure	IP40		
	Temperature range	Operation: 0 to 60°C Storage: -10 to 60°C (no freeing)		
	Humidity range	Operation, Storage: 35 to 85% RH ((no condensation)		
	Vibration proof	10 to 500 Hz, 2 hours each in X,Y,Z direction respectively		
	Impact proof	980 m/s 3 times each in X,Y,Z direction		
Temp. characteristics		±3% F.S. or less (at 25°C)		
Withstand voltage		1000 VAC, 1 minute (between lead block and case)		
Insulation resistance		50 MΩ or more at 500 VDC (between lead block and case)		
Port sizes	Z/ISE1(L)	01; R(PT)1/8, M5x0.8 T1:NPTF1/8, M5x0.8 00: elector mounting type (for ZM unit)		
	Z/ISE2(L)	01; R1/8, M5x0.8 T1:NPTF1/8, M5x0.8 0X: with suction filter (for ZX unit) 0R: base mount type (for ZR unit)		
Weight		40 g (including 0.6 m lead)		

2.2 Output specifications – ZSE1(L)

Model	-14	-15	-16	-17	-18	-19	-55
Switch output	NPN open collector, 30V, 80 mA or less						PNP open collector 80 mA or less
Hysteresis	1 to 10% of setting range (variable)		3% F.S. or less (fixed)		1 to 10% of setting range (variable)		N/A
Analogue output	N/A				1 to 5 V ±5% F.S. impedance 1kΩ approx.		N/A
Setting point	1 point		2 points		1 point		
Indicator light	LED @ON (Red)		LED @ON OUT1: Red OUT2: Green		LED @ON (Red)		
Trimmer adjustment	3 turns	200°	3 turns	200°	3 turns	200°	

2.3 Output specifications – ZSE2(L)

Model	-15	-55
Switch output	NPN open collector 30V, 80 mA or less	PNP open collector 80 mA or less
Residual voltage	1 V or less (load current 80 mA)	
Number of outputs	1	
Hysteresis	3% F.S. or less (fixed)	
Indicator light	LED is ON when output is ON (Red)	
Trimmer adjustment	200°	

3 Installation

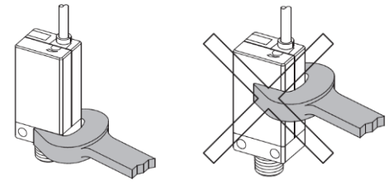
3.1 Installation

Warning

Do not install the product unless the safety instructions have been read and understood.

3.2 Mounting

- When mounting the pressure switch a spanner should be applied to the metal attachment part only.
  Do not apply the spanner to the plastic part, is this will cause damage.



- The switch tightening torque is 7 to 9 N•m.
  If the tightening torque is exceeded the switch may be damaged.
  If the correct tightening torque is not applied the switch may become loose.
- After installation, repair or maintenance, apply air and power and test for leakage before operation.

3.3 Piping

Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

3.4 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.

3.5 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

4 Wiring

4.1 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 a series power supply.

4 Wiring (continued)

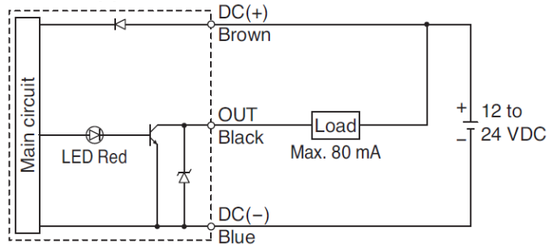
4.2 Connector attaching / detaching

- When assembling the connector, push it straight onto the pins until the lever locks into the housing.
- To remove the connector, push the lever down to unlock the hook from the groove, and withdraw the connector straight out.

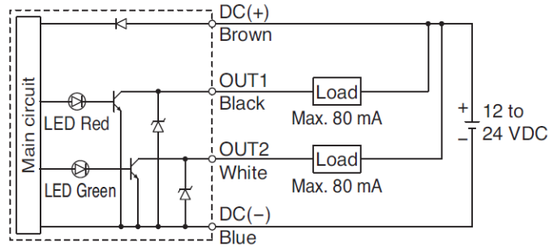
4.3 Wiring diagram

When the lead wire with connector provided by SMC is used, the wire colours (Brown, Black, Blue) will apply as shown in the diagrams.

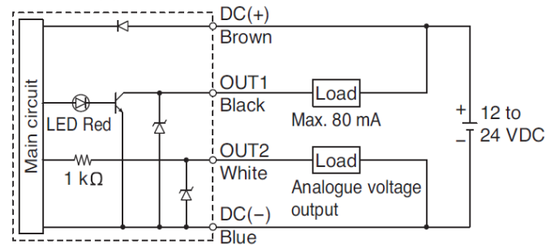
ZSE1 / ISE1(L) -#-14 / -15
ZSE2 / ISE2(L) -#-15



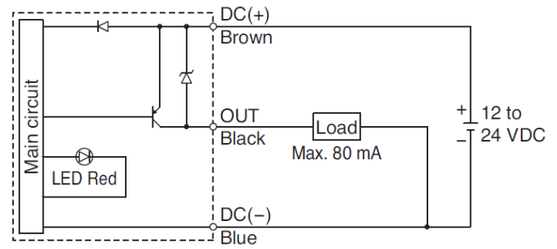
ZSE1 / ISE1(L) -#-16 / -17



ZSE1 / ISE1(L) -#-18 / -19



ZSE1 / ISE1(L) -#-55
ZSE2 / ISE2(L) -#-55

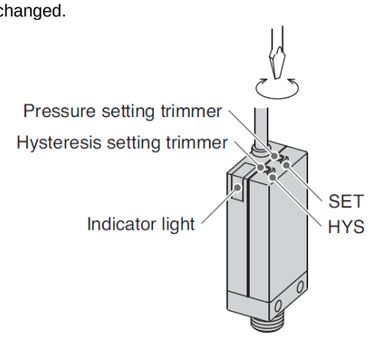


5 Setting

- Adjust the pressure setting trimmer to set the ON pressure.
- Rotate the trimmer clockwise to increase the set pressure (or vacuum pressure).
- To adjust use a small flat blade screwdriver suitable for trimmers.
- Rotate gently to adjust and do not exceed the trimmer adjustment range.

5.1 ZSE1 / ISE1(L) -#-14 / -15 / -18 / -19 / -55 setting

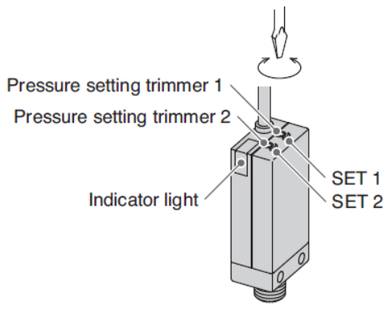
Switches with variable hysteresis can be adjusted using the hysteresis setting trimmer HYS in the range 1 to 10% of the setting pressure range. Re-adjust the ON pressure setting when the hysteresis setting trimmer has been changed.



5.2 ZSE1 / ISE1(L) -#-16 / -17 setting (with 2 outputs)

Output OUT 1 can be set using pressure setting trimmer 1 (SET 1). The corresponding wire is black with Red LED.

Output OUT 2 can be set using pressure setting trimmer 2 (SET 2). The corresponding wire is white with Green LED.

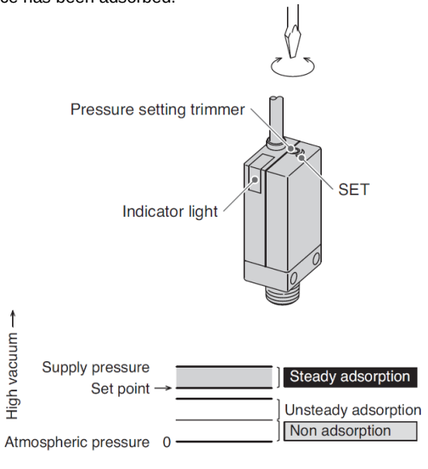


5.3 ZSE2 / ISE2(L) -#-15 / -55 setting

Adjust the pressure setting trimmer to set the minimum possible set pressure to confirm the correct workpiece adsorption.

If the set pressure is too low the switch will turn ON when the adsorption is not complete.

If the set pressure is too high the switch will not turn ON even when the workpiece has been adsorbed.



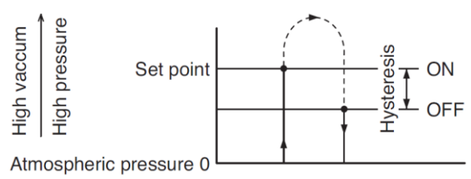
5 Setting (continued)

Caution

- Observe the following precautions when setting the set pressure:
- Use a small flat blade screwdriver suitable for trimmers.
- Do not use a large screwdriver as this may damage the trimmer groove.
- Gently turn the trimmer and do not exceed the trimmer adjustment range.

5.4 Hysteresis

Hysteresis is the pressure difference between the ON and OFF pressure of the output signal. The set pressure is the pressure selected to switch from OFF to ON.



6 How to Order

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

7 Outline Dimensions

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

8 Maintenance

8.1 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.

9 Limitations of Use

9.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

Caution

- **SMC products are not intended for use as instruments for legal metrology.**
  Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.
  Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

10 Product disposal

This product shall 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.

11 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

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