Installation and Maintenance Manual Series ZSE4B/ISE4 B Digital Pressure Switch (For vacuum)/(For positive pressure)

For future reference, please keep this manual in a safe place

manual should be read in conjunction with the current switch catalogue

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger" To ensure safety, be sure to observe ISO4414 (Note1), JIS B 8370 (Note2) and other safety practices. Note 1: ISO 4414: Pneumatic fluid power – Recommendations for the

application of equipment to transmission and control systems. Note 2: JIS B 8370: Pneumatic system axiom.

- 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 possible result of serious injury or loss of life.

Specifications

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment Compressed air can be dangerous if an operator is unfamiliar

- with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.
- remove component until safety is confirmed. 1) Inspection and maintenance of machinerv/equipment should
- control positions. 2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and
- exhaust all residual compressed air in the system. 3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Bleed air into the system gradually to create back-pressure,
- i.e. incorporate a soft-start valve). 4. Contact SMC if the product is to be used in any of the
- following conditions:
 - tions, or if product is used outdoors.
- navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
- An application which has the possibility of having negative 3) safety analysis

\triangle caution

Ensure that the air supply system is filtered to 5 micron.

where the component is subjected to water or oil droplets.

Analog output has no overcurrent detection function.

please consult SMC.

If it is intended to energise these switches for an extended period

The reset function is not available when the switch is in the SET mode.

Model Item Output method Output specifications NPN open collector 30V, 80mA, residual voltage: 1V or less ZSE4B- T NPN output Analog output ZSE4B- 11 -20 Vacuum $1 \sim 5V (\pm 5\%$ F.S.), load impedance: $1k\Omega$ PNP output ZSE4B- 11-6 PNP open collector 80mA ISE4I B- 11 - 21 Positive pressure NPN output NPN open collector 30V, 80mA, residual voltage: 1V or less $1 \sim 5V (\pm 5\%$ F.S.), load impedance: 1k Ω ISE4LB- 11 -26 100kPa Analog output PNP output (1.02 kgf/cm²) type PNP open collector 80mA ISE4LB- 11-65 ISE4B- 1-25 NPN output NPN open collector 30V, 80mA, residual voltage: 1V or less Positive pressure ISE4B- 1-26 1MPa 1~5V (\pm 5%F.S.), load impedance: 1k Ω Analog output ISE4B- 11-65 (10.2 kgf/cm²) type PNP output PNP open collector 80mA

Lead wire: The standard lead wire length is 0.6m, Grommet. "L" is added for 3m long lead wire. (Example ZSE4B-01-25L 01 stands for R(PT)1/8 and T1 for NPTF1/8. Both types have M5x0.8 female threads inside. Port size:

Standard specifications

ltem		Vacuum			Positive pressure					
		vacuum		100kPa (1.02 kgf/cm ²) type			1MPa (10.2 kgf/cm ²) type			
Model		ZSE4B	ZSE4B	ZSE4B	ISE4LB	ISE4LB	ISE4LB	ISE4B	ISE4B	ISE4B
		25	26	65	25	26	65	25	26	65
Pressure display range		10~-101kPa -		-10~100kPa -		-0.1~1MPa				
		(75~-760mm Hg)		(-0.1~1.02 kgf/cm ²)		(-1~10.2 kgf/cm ²)				
Max. operating pressure		200kPa (2.04 kgf/cm ²)		200kPa (2.04 kgf/cm ²)			1MPa (10.2 kgf/cm ²)			
Min. display unit		mm Hg:5		kgf/cm ² : 0.01			kgf/cm ² :0.1			
		kPa: 1	PSI: 0.1		kPa: 1	PSI: 0.1		MPa: 0.01	PSI: 1	
			bar: 0.01			bar: 0.01			bar: 0.1	
		ON: Turn		ON: Turn	ON: Turn		ON: Turn	ON: Turn		ON: Turn
Display light		on light	-	on light	on light	-	on light	on light	-	on light
1 5 5		(Green)		(Green)	(Green)		(Green)	(Green)		(Green)
Response frequency		200Hz		200Hz	200Hz		200Hz	200Hz		200Hz
		(5ms)	ms) -	(5ms)	(5ms)	-	(5ms)	(5ms)	-	(5ms)
	Hysteresis	Adjustable		Adjustable	Adjustable		Adjustable	Adjustable		Adjustable
Note 1)	mode	(3 digit or more)	-	(3 digit or more)	(3 digit or more)	-	(3 digit or more)	(3 digit or more)	-	(3 digit or more)
Hysteresis	Window	Eivod		Eivod	Eivod		Eivod	Eivad		Eivod
	comparator	(D. J. J.)	-	(D. I. II)	(D II II)	-	() I' I'	() I' I'	-	
	mode	(3 digit)		(3 digit)	(3 aigit)		(3 aigit)	(3 aigit)		(3 digit)

Installation

Ensure all air and power supplies are isolated before commencing installation.

DO NOT INSTALL THESE SWITCHES IN EXPLOSIVE ATMOSPHERES. This switch is an open type therefore DO NOT use these switches

- 3. Do not service machinery/equipment or attempt to
 - only be performed after confirmation of safe locked-out
- 1) Conditions and environments beyond the given specifica-
- 2) Installations in conjunction with atomic energy, railway, air
- effects on people, property, or animals, requiring special



Fluid	Air, non-corrosive gas				
Temp. characteristics	±3% F.S. max.				
Repetition accuracy	±1% F.S. max.				
Power supply	12~24VDC (Ripple 10% max.)				
Consumption current	45mA max.				
Back light	Yellow-green				
Emergency display	Display=Red / display the error code on LCD				
Pressure display	3 v_2 Digit LCD (10mm-size numerals)				
Self diagnosis function	(Note 2) Excess current), Excess pressure, Data error, Pressure during 0-clear				
Operating temp. range	0~50°C				
Noise resistance	1000Vp-p pulse width 1µs standing 1ns				
Voltage resistance	Between whole wires and case 1000VAC 50/60Hz for 1min.				
Insulation resistance	Between whole wires and case $2M\Omega$ (500VDC by megameter)				
Vibration resistance	10~500Hz width=1.5mm or acceleration 10G (chose the smaller vibration) to X, Y, Z direction (2 hours)				
Shock resistance	100G to X,Y,Z direction (3 times for each direction)				
Weight	45g (incl. 0.6m-long lead wire)				
Port size	01:B (PT) 1/8.M5x0.8 T1:NPTF1/8.M5x0.8				

Note 1: • Hysteresis mode

When the values of P1 and P2 are the same or when P1>P2 within 3 digits, the hysteresis will be automatically 3 digits for the set value of P1

Window comparator mode

The hysteresis is 3 digits, so separate P1 from P2 by 7 digits or more and set them. *1 digit is the minimum pressure display unit (See the table above).

Analog output has no overcurrent detection function.

Note 2.





Fig 2

Fig 1

Switch output modes (Fig 3)

A variety of switch output modes Applicable to a hysteresis mode, window comparator mode, and reversed output of respective modes.

ON ON OFF OFF P2 P1 Hysteresis mode (standard) ON ON OFF OFF SMC PRESSURE SWITCH With back light 100

DOWN key

LED (red)

SET key

cause malfunction

Displays unit LED (green): Displays switch operation conditions. LED (red): Blinks on and off when an error occurs. Switches to the setting mode. SET key: When the button is pressed for 1 second or more, the mode changes to the output mode. UP key: Increases ON/OFF setting value. DOWN key: Decreases ON/OFF setting value. Used for unit change and output mode change. RESET key: Press the UP and DOWN buttons simultaneously, and the RESET function is available. Clears anomaly. Displays "0".

SET Q

Displays present pressure. Displays ON/OFF setting. Displays error code.

Fig 4

Mode Display and reset function

Peak mode

Press the UP button during pressure display, and the peak pressure (the highest degree of vacuum) is displayed. In that case, "H" appears on the LCD. For resetting, press the UP button again.

Ø Bottom mode

Press the DOWN button during pressure display, and the bottom pressure (the lowest degree of vacuum) is displayed. In that case, "L' appears on the LCD. For resetting, press the DOWN button again.

Reset function

- The resetting operation causes the following:
- 1) When the reset button is pressed during normal operation.
- · Peak display clear, bottom display clear, or zero clear.

Fig 3

2) When the reset button is pressed after an error has occurred While data that were set in the setting mode is retained, the condition will become the same as that when power is turned ON. (The system is reset.)

· When a data error occurs, the system enters the setting mode. when power is turned ON. (The system is reset.)

Note: The reset function is unavailable in the setting mode.

Peak/bottom hold function

peak pressure (upper limit) or bottom pressure (lower limit) will be held and displayed. This function is available during pressure setting.



Fig 4

Complete self-diagnosis function

An error is displayed when pressure is applied during overcurrent, excessive pressure, data error, or 0-clear, in order to prevent possible trouble

Exact detection of atmospheric pressure

The atmospheric pressure that returns after vacuum break pressure is applied, can be exactly detected.



This switch cannot be used for corrosive gasses

Do not wire this unit together with other units as 'noise' may

Fig 6

n2 n1 Hysteresis mode (reversed)



After data setting, the condition will become the same as that

Press the \blacktriangle or \checkmark button while pressure is being displayed, and the





Error codes

	-	
Display	Contents	Disposition
E JC	Set data is changed by	Push the RESET key to
	some influence.	set all the data again.
§ [F]	Current exceeding 80mA is flowing through the Output 1 load.	Turn off the power supply and exchange the load, which connected to Output 1. (white wire)
Note	Output 1 (white wire), being unloaded, may have contacted when the output was turned ON or be contacting the power supply, etc.	Confirm that the Output 1 (white wire) is not contacting the power supply, etc and execute RESET operation.
§ PE	1.5-fold max. operating pressure and 0.5MPa pressure are applied for more than 2 seconds on one for positive pressure and one for vacuum pressure respectively.	Set the pressure less than the rated pressure.
Ę HP	Pressure of ±0.07MPa and ±7kPa min. compared with the atmospheric pressure are applied on one for 1MPa and ones for vacuum pressure and 100kPa at the time of "0" clear.	Release the RESET key to restore atmospheric pressure.

Note: The above does not apply to analog output types.

Precautions to be observed when handling the switch: Do not handle the switch using the wire as this will cause damage to the internal wiring.

When attaching switch to piping ensure that a 12mm spanner is used for this purpose.

Never apply a wrench to the resin body of the unit (see Fig 5).

When you enquire about the product, please contact the following

			-
SMC Corpora	tion:		
ENGLAND	Phone 01908-563888	TURKEY	Phone 212-2211512
ITALY	Phone 02-92711	GERMANY	Phone 6103-402-0
HOLLAND	Phone 020-5318888	FRANCE	Phone 01-64-76-10-00
SWITZERLAND	Phone 052-34-0022	SWEDEN	Phone 08-603 07 00
SPAIN	Phone 945-184100	AUSTRIA	Phone 02262-62-280
	Phone 902-255255	IRELAND	Phone 01-4501822
GREECE	Phone 01-3426076	DENMARK	Phone 8738-0800
FINLAND	Phone 09-68 10 21	NORWAY	Phone 67-12 90 20
BELGIUM	Phone 03-3551464	POLAND	Phone 48-22-6131847