Choice of display units

Display units can be easily selected and changed, making these switches globally acceptable.

- **Vacuum**: kPa ⇔ mmHg ⇔ PSI ⇔ bar
- **Positive press. (High)**: MPa ⇔ kgf/cm² ⇔ PSI ⇔ bar
- **Positive press. (Low)**: kPa ⇔ kgf/cm² ⇔ PSI ⇔ bar

Variety of switch output modes

- **Hysteresis mode**: P2 \(\rightarrow\) P1 (Standard) \(\rightarrow\) n2 \(\rightarrow\) n1 (Reversed)
- **Window comparator mode**: P1 \(\rightarrow\) P2 (Standard) \(\rightarrow\) n1 \(\rightarrow\) n2 (Reversed)

Exact detection of atmospheric pressure

(For vacuum)

Atmospheric pressure can be immediately detected after vacuum release pressure is applied.

Self-diagnostic function

- Over-voltage
- Over-pressure
- Data error

- LCD indicator of error code
- LED (Green)
- LED (Red)

Calibration data

The calibration data is stored in an EEPROM. The EEPROM is rated to keep its memory for 100,000 hours (approx. 11 years) without having power supplied.

Panel mounting available.

A special adaptor permits panel mounting.

Dust/Splash proof cover (Optional)

Refer to the p.3.2-21 to 3.2-24.
With Backlight Digital Pressure Switch  ZSE4B/ISE4B

How to Order

Setting pressure range

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>-0.1 to 1MPa</td>
</tr>
<tr>
<td>L</td>
<td>-10 to 100kPa</td>
</tr>
</tbody>
</table>

Lead wire length (Grommet)

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>0.6m</td>
</tr>
<tr>
<td>L</td>
<td>3m</td>
</tr>
</tbody>
</table>

Output specifications

- 25: NPN Open collector/1 output (Sinking)
- 26: Analog output (1 to 5V)
- 65: PNP Open collector/1 output (Sourcing)

Positive pressure

<table>
<thead>
<tr>
<th>Style</th>
<th>ISE4</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>B</td>
</tr>
</tbody>
</table>

Vacuum

<table>
<thead>
<tr>
<th>Style</th>
<th>ZSE4</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

Port size

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Rc(Pt) 1/8</td>
</tr>
<tr>
<td>T1</td>
<td>NPTF 1/8</td>
</tr>
</tbody>
</table>

Note: Standard: M5 X 0.8 (Female)

Style

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>D'</td>
<td>Dust/Splash proof</td>
</tr>
</tbody>
</table>

Caution

Be sure to read before handling. Refer to p.0-26 and 0-27 for Safety Instructions and common precautions on the products mentioned in this catalog and refer to p.3.0-7 to 3.0-9 for precautions on every series.

Panel mount adaptor No.

- Panel adaptor A + Panel adaptor B: ZS-22-A
- Panel adaptor A: ZS-22-01
- Panel adaptor B: ZS-22-02

Bracket No.

- With two M4 mounting threads: ZS-32-B
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Vacuum</th>
<th>Positive pressure: 100kPa</th>
<th>Positive pressure: 1MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE4B</td>
<td>–101kPa</td>
<td>–10 to 100kPa</td>
<td>–0.1 to 1MPa</td>
</tr>
<tr>
<td>ISE4LB</td>
<td>–100kPa</td>
<td>–10 to 100kPa</td>
<td>–0.1 to 1MPa</td>
</tr>
</tbody>
</table>

#### Model Details
- **ZSE4B/ISE4B** Series
- **Model**: ZSE4B/ISE4B
- **Series**: 2/23/99 2:38 PM  Page 11

#### Operating pressure range
- **ZSE4B**: 10 to –101kPa
- **ISE4LB**: –10 to 100kPa
- **ISE4B**: –0.1 to 1MPa

#### Max. pressure
- **ZSE4B**: 200kPa
- **ISE4B**: 1MPa

#### Min. display unit
- **kPa**: 1
- **MPa**: –0.01
- **mmHg**: 5
- **kg/cm²**: –0.01
- **PSI**: 0.1
- **bar**: 0.01

#### Indicator light
- **ON**: When Green LED turns on
- **Frequency response**: 200Hz (5ms)
- **Hysteresis**
  - **Hydrostatic mode**: Adjustable (3 digits or more)
  - **Window comparator mode**: Fixed (3 digits)

#### Fluid
- **Temperature characteristics**: -10% F.S. or less
- **Repeatability**: ±20% F.S.
- **Supply voltage**: 12 to 24V DC (±10% or less)

#### Output Specification
- **Output**: NPN Open collector 30V, 80mA or less
- **PNP open collector**: 80mA or less

#### Current consumption
- **NPN**: 45mA or less
- **PNP**: 45mA or less

#### Backlight
- **Yellow-green**

#### Error display
- **Red light blinks**: Displays the error code on LCD
- **Yellow-green**

#### Pressure display
- **3 1/2 digits LCD (10mm-size numerals)**

#### Self-diagnostic function
- **Over current**, **Over pressure**, **Data error**, **Pressure during zero out**

#### Operating temperature range
- **0 to 50°C** (No condensation)

#### Voltage resistance
- **Between external terminals and housing**: 1000V AC, 1000/50/60Hz for 1 min.
- **Standing**: 1nS

#### Insulation resistance
- **Between external terminals and housing**: 2MΩ (500V DC by megameter)

#### Vibration resistance
- **Between external terminals and housing**: 10 to 500Hz, Pulse width 1.5mm or acceleration 98 m/s² (smaller vibrations) to X, Y, Z direction (2 hrs)
- **Shock resistance**: 980 m/s² to X, Y, Z direction (3 times for each direction)

#### Weight
- **Standard**: 45g (including 0.6m-long lead wire), Dust/Splash proof: 110g

#### Port size
- **Standard**: R(PT) 1/8, M5 X 0.8
- **T1**: NPTF 1/8, M5 X 0.8

#### Protective construction
- **Standard**: IP40, Dust/Splash proof: IP66

### Description

- **RESET key**: Press the UP and DOWN buttons simultaneously to reset the switch. Clears abnormalities. Displays "0".
- **UP key**: Increases ON/OFF set point. Switches to the peak holding.
- **LED (Green)**: Displays switch operation condition.
- **LCD**: Displays present pressure. Displays ON/OFF setting value. Displays error code. Displays unit.
- **DOWN key**: Decreases ON/OFF set point. Used for peak mode low change, unit change and output mode change.
- **LED (Red)**: Blinks on and off when an error occurs.
- **SET key**: Switches the mode. Used for unit change and output mode change by pressing the button for at least 1 second.

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.

Note 2: Window comparator mode: The hysteresis is 3 digits, so separate P1 from P2 by 7 digits or more and set them.

Note 3: 1 digit is the minimum display unit. (See the table above.)

Note 4: Refer to p.3.2-21 to 3.2-24 for the details about the dust/splash proof specifications.
### Calibration Procedures

**Procedures**

1. **Initial setup**
   - Select "Display units" and "Output mode".
2. **Calibration**
   - Calibrate set point for switch output.
3. **Normal operation**
   - Measured pressure displayed, switch operation occurs.

#### Initial setup

1. **Initial setup mode**
   - Press the "SET" button for at least 1 second. "1.3" is displayed and the display blinks.
   - "1.3" is a program version of a micro computer.

2. **Selection of "Display units"**
   - Select "Display unit" by pressing the "button.
3. **Selection of "Output mode"**
   - Select "Output mode" by pressing the "button.
   - By pressing the "SET" button, the calibration is completed.

#### Table 1: Output mode

<table>
<thead>
<tr>
<th>Output mode</th>
<th>P</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>NO</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

- **Pressure/Vacuum up**
- **H (Fixed hysteresis)=3 digits**
- **Hysteresis mode**
- **Window comparator mode**

#### Calibration procedures

1. **Set point input mode**
   - Press the "SET" button.
2. **Input set point value (1)**
   - ▲ button: Increase set point value
   - ▼ button: Decrease set point value
3. **Input set point value (2)**
   - ▲ button: Increase set point value
   - ▼ button: Decrease set point value

By pressing the "SET" button, the calibration is completed.
### ZSE4B/ISE4B

#### Other Functions

**Peak Mode High**

To display the high peak pressure (highest degree of vacuum), press the UP button during normal operation. The LCD displays "H". To return back to normal operation press the UP button again.

**Peak Mode Low**

To display the low peak pressure (lowest degree of vacuum), press the DOWN button during normal operation. The LCD displays "L". To return back normal operation, press the DOWN button again.

**Reset Function**

Simultaneously pressing the UP and DOWN button will reset the switch.

1. Reset will cause the following during normal operation:
   - Peak high is cleared.
   - Peak low is cleared.
   - Zero is reset.
2. Reset will cause the following when error has occurred:
   - Switch will assume normal operation (all calibration data has retained).
   - In case of data error, reset the setup mode and then switch will assume normal operation.

Note: In the setup mode, the reset function does not work.

#### Internal Circuit and Wiring

Lead wire colors inside [ ] are those prior to conformity with IEC standards.

- **-25 HPN Open Collector**
  - Max. 30V, 80mA
  - Residual voltage: 1V or less

- **-26 Analog Output**
  - 1 to 5V (±5% F.S.)
  - Load impedance: 1kΩ

- **-65 PHP Open Collector**
  - Max. 80mA

#### Error Codes

<table>
<thead>
<tr>
<th>Display</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>ε : dE</td>
<td>Calibration was changed by accident, reason unknown.</td>
<td>Push the Up and Down buttons to reset all the data.</td>
</tr>
<tr>
<td>ε : CEⅠ (1)</td>
<td>Output 1 output current is exceeding 80mA.</td>
<td>Turn off the power and verify the load connected output 1.</td>
</tr>
<tr>
<td>ε : CEⅡ</td>
<td>Output 1 (Back wire) could be shorted out.</td>
<td>Verify that the output is not shorted out and then reset the switch.</td>
</tr>
<tr>
<td>ε : PE</td>
<td>Max. operating pressure has been exceed for more than 2 seconds.</td>
<td>Reduce the supply pressure to below the max. pressure rating and then reset the switch.</td>
</tr>
<tr>
<td>ε : HP</td>
<td>When zeroing out the gauge, pressure differences ±0.07MPa for ISE4B and ±0.7kPa for ZSE4B have occurred.</td>
<td>Apply atmospheric pressure and then reset the switch.</td>
</tr>
</tbody>
</table>

Note 1) Does not apply to Analog output.

---

3.2-13
With Backlight Digital Pressure Switch **ZSE4B/ISe4B**

**Dimensions**

**Standard**

**With bracket**

**Panel mounting**

**Cutout dimensions for panel mounting**

- **Thickness of panel:** 1 to 3.2mm