High accuracy ±0.05%

With Silicon Resonant Sensor

Pneumatic Pressure Standard
MC100

- High accuracy ±(0.05% of full scale)
- Excellent stability provided by silicon resonant sensor
- Temperature coefficient: ±0.002% of full scale / °C (span)
- Divided output function with as many as 20 steps
- Auto-step output function
- Sweep output function
- Offset monitor function to present deviation from final value
High speed, high accuracy, and long-term stability provided by silicon resonant sensor and needle valve

The MC100 Series of Pneumatic Pressure Standard provides high accuracy and excellent reliability using a proprietary silicon resonant sensor developed by Yokogawa. Various pressure instruments such as pressure sensors, industrial transmitters, and pressure switches, as well as sphygmomanometers and other medical devices face severe price competition and demands for improved accuracy. The MC100 Series answers these demands and helps manufacturers improve production speed and reduce production costs. Furthermore, the high accuracy of the MC100 Series makes it well-suited for calibration and maintenance of pressure instrumentation.

### Names of parts and functions
- **Front panel**
  - Output monitor
  - Offset monitor
  - Set pressure/interval display
  - Divider - output display
  - Manual - output
  - Auto step key
  - Divider output display
  - Offset monitor
- **Rear panel**
  - Output connector
  - Monitor - output terminal
  - Power switch
  - Zero calibration key
  - Repeatability key
  - Hold key

### High performance and reliability
- **High accuracy** ±(0.05% of full scale)
- **Low temperature coefficient**
  - Zero point: ±0.003% of full scale/C
  - Span: ±0.002% of full scale/C
- **Excellent stability**

### Useful functions
- **Divided output function with as many as 20 steps**
- **Auto-step output function**
- **Sweep output function**
- **Offset monitor function to present deviation from final value**

### Calibration system
- **Primary standards**
  - High precision
  - Standard pressures
  - Calibration standards instruments
- **Working standards**
  - Digital manometers
  - Product: Pneumatic Pressure Standard

### Silicon resonant sensor
- **A vibrator, formed using semiconductor process technology on a silicon wafer, is driven by a permanent magnet.**
- **When pressure is applied to the silicon diaphragm, the vibrator is distorted, causing the resonant frequency to change.**

### Specifications
- **Supplied output range:** 0 to 25 kPa gauge (767401)
  - 0 to 200 kPa gauge (767402)
- **Minimum set resolution:** 0.001 kPa (767401)
  - 0.01 kPa (767402)
- **Supplied output:** 50 ±10 kPa (767401)
  - 200 ±20 kPa (767402)
- **Max. allowable input:** 100 kPa gauge (767401)
  - 800 kPa gauge (767402)
- **Accuracy:**
  - Including calibration accuracy: ±0.05% of full scale (at 23°C ±3°C)
  - Not including calibration accuracy: ±0.045% of full scale (at 23°C ±3°C)
- **Output noise:** ±0.02% of full scale
- **Effect of mounting orientation:**
  - Forward/backward inclination of 90°: ±0.1% of full scale (767401)
  - ±0.01% of full scale (767402)
  - Sideways inclination of 30°: ±0.3% of full scale (767401)
  - ±0.02% of full scale (767402)
- **Temperature coefficient:**
  - ±0.002% of full scale/C
  - ±0.001% of full scale/C
- **Pressure display unit:**
  - Select from the following when ordering (KPa only; kPa, kgf/cm², mmHg, mmH₂O (selectable)); KPa, mH₂O, kH₂O, psi (selectable)
- **Output settings:** 4.5-digit settings
- **Alarm:** LED turns on for low or excessively high supply pressure.
- **Supply pressure source:**
  - Dry air only. Temperature: between 5°C and 40°C, and the amount of temperature change must be small.
  - A pressure-reducing valve with a filter must be used to input a stable supply pressure.
- **Air pressure control method:** Servo valve with needle valve structure
- **Pressure sensor:** Silicon resonant sensor
- **I/O connections:** Rs=1/4 or 1/4 NPT (backside attachment in both cases; select when ordering)
- **Output response time**
  - (Time for value reached: 0.1% of full scale once change starts)
  - Approximately 5 seconds
- **Condition:** Any 20% or 25% divided output (one step), with no load.
- **Monitor output:**
  - 0 to 10 mV full scale or 0 to 2 V full scale (selectable)
- **Calibration interval:** 6 months
- **Air consumption rate:** Approximately 30 liters per minute (with supply pressure in specified range)

### Features
- **High sensitivity and resolution and superior long-term stability**
- The vibrators are in a vacuum. This reduces the dispersion of vibration energy. Combined with the superior flexibility of monocryystal silicon, this makes it possible to obtain a high Q value.
- **Extremely low temperature dependence**
  - Two vibrators are used, and pressure is derived from the difference between the two unique oscillation counts. With this operating structure, it is possible to cancel out external environment influences such as ambient temperature.
  - In addition, the oscillators are in a vacuum, so they are not affected by ambient temperature or humidity.

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**Manuel (divider ratio output):**
- Outputs a pressure equal to the specified value: \( n/ (m_0 \to m_n \to m_1 \to 20) \)

**Auto-step output:**
- Divider output is automatically generated in steps. Interval time: 1 to 600 seconds in 5-second intervals
- Repeated: One to infinity (stopping stepwise through is also permitted)

**Sweep output:**
- The generated pressure is increased or decreased linearly over the interval time from 0% to 100% of the set pressure.
- Interval time: 15 to 600 seconds in 5-second intervals
- Repeated: One to infinity (stopping stepwise through is also permitted)

**Output monitor:**
- Displays 0 to 100% of setting on 10-set LED bar graph. A buzzer sound is output when the output value reaches the setting (100%) during auto-step or sweep output.

**Offset monitor:**
- Displays the deviation from the final value.

**Communication:**
- Select one of the following:
  - GPIB interface: Electrical and mechanical specifications: Conform to IEEE Standard 488-1978
  - Serial (RS-232) interface: Transmission method: Start stop synchronization

**Transfer rates:**
- 1200, 2400, 4800, 9600 bits per second

**Warmup time:**
- Approximately 5 minutes

**Operating temperature and humidity ranges:**
- 0°C to 40°C and 20 to 90%RH (no condensation)

**Maximum operating altitude:**
- 2000 meters

**Storage temperature range:**
- 20°C to 60°C

**AC power ratings:**
- 100-120, 200-240 V AC, 50/60 Hz

**Power fluctuation tolerance range:**
- 90-132 V AC; 180-264 V AC

**Frequency fluctuation tolerance range:**
- 47-63 Hz

**Power consumption:**
- 40 VA Max. (100-200V) / 50 VA Max. (200-240V)

**Insulation resistance:**
- Minimum 100 MΩ at 500 V DC (across AC power and casing)

**Withstand voltage:**
- 1500 V AC, 50/60 Hz, for one minute (across AC power and casing)

**External dimensions and weight:**
- Approximately 132 x 213 x 400 mm

**Accessories:**
- Input adapter connectors (For 4 of 50 µV max. B1019PR), Two rubber pads for use, one power cord, Pneu (AT1130), One instruction manual

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*1: Ambient temperature: ±20°C. Pressure range: 0.1% of full scale.
*2: The default pressure unit is kPa.
*3: Monitor output: The output value can be monitored based on the voltage output.
Model and suffix codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Description</th>
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<tbody>
<tr>
<td>767401</td>
<td>—</td>
<td>Pneumatic pressure Standard (25 kPa range model)</td>
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<tr>
<td>767402</td>
<td>—</td>
<td>Pneumatic pressure Standard (200 kPa range model)</td>
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<tr>
<td>Pressure unit</td>
<td>—</td>
<td>kPa</td>
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<tr>
<td>—</td>
<td>—U1</td>
<td>kPa</td>
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<td>—</td>
<td>—U2</td>
<td>kPa, kgf/cm², mmH₂O, mmHg</td>
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<td>—</td>
<td>—U3</td>
<td>kPa, inH₂O, inHg, psi</td>
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<tr>
<td>Communication function</td>
<td>—C1</td>
<td>GP-IB interface</td>
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<tr>
<td>—</td>
<td>—C2</td>
<td>RS-232 interface</td>
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<td>I/O connection unit</td>
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<td>Rc 1/4</td>
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<td>Power cord</td>
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<td>UL/CSA female screw</td>
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<td>—</td>
<td>—R</td>
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<td>—Q</td>
<td>BS standard</td>
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Accessories (sold separately)

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<th>Product</th>
<th>Model</th>
<th>Suffix code</th>
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<tbody>
<tr>
<td>Connector assembly kit</td>
<td>B9310RR</td>
<td>—</td>
<td>For 4x4 46 vinyl pipe</td>
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<tr>
<td>Quick connector assembly</td>
<td>B9310ZH</td>
<td>—</td>
<td>For 4x4 46 vinyl pipe</td>
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<td>Adapter connector</td>
<td>G9612BG</td>
<td>— JIS</td>
<td>JIS, R1/4-Rc1/8</td>
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<td>Adapter connector</td>
<td>G9612BJ</td>
<td>— ANSI</td>
<td>ANSI, R1/4-1/8 female screw</td>
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<tr>
<td>Adapter connector</td>
<td>G9612BW</td>
<td>— ANSI</td>
<td>ANSI, R1/4-1/8 female screw</td>
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Input adapter connectors (separately sold accessories)

<table>
<thead>
<tr>
<th>Connector assembly for Rc</th>
<th>Simple connector assembly</th>
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<tr>
<td>B9310RR</td>
<td>B93102H</td>
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<tr>
<td>G9612BG</td>
<td>G9612BJ</td>
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<td>G9612BW</td>
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Contracted separately when required

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<tr>
<td>Test certificate</td>
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<td>Instruction manual</td>
<td>DOC IM</td>
<td>One additional</td>
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<td>Drawings</td>
<td>3984 03</td>
<td>Up to 5</td>
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</table>

NOTICE

- Before operating the product, read the instruction manual thoroughly for proper and safe operation.
- If this product is for use with a system requiring safeguards that directly involve personnel safety, please contact the Yokogawa sales offices.

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