

Highly accurate
With Silicon Resonant Sensor
 $\pm 0.05\%$

Pneumatic Pressure Standard
MC100



- High accuracy $\pm(0.05\%$ of full scale) ● Excellent stability provided by silicon resonant sensor
- Temperature coefficient: $\pm 0.002\%$ 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

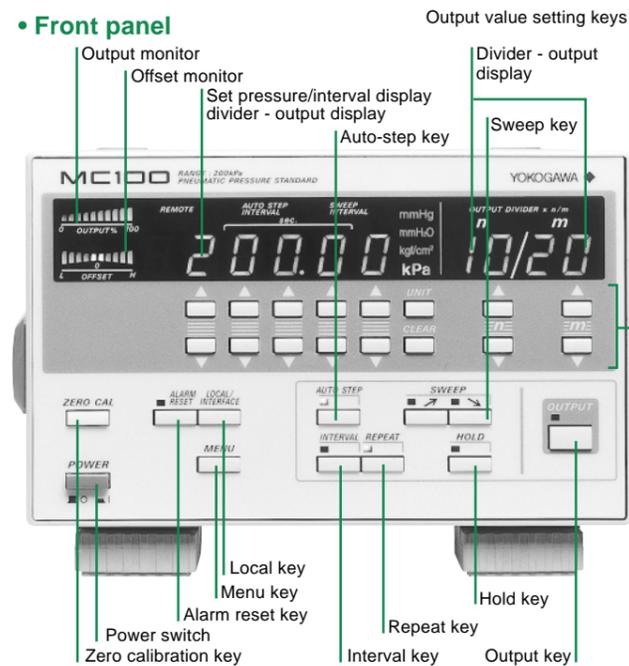
High speed • high accuracy and long-term stability provided by silicon resonant sensor and needle valve

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

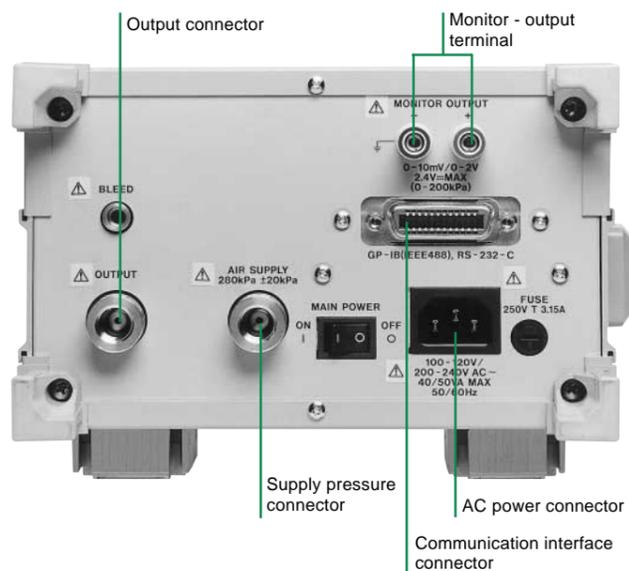
demands for improved accuracy. The MC100 Series answers these demands and helps manufacturers improve production speed and reduce production costs. Furthermore, the high accuracy of the MC100 Series makes it well-suited for calibration and maintenance of pressure instrumentation.

Names of parts and functions

• Front panel



• Rear panel



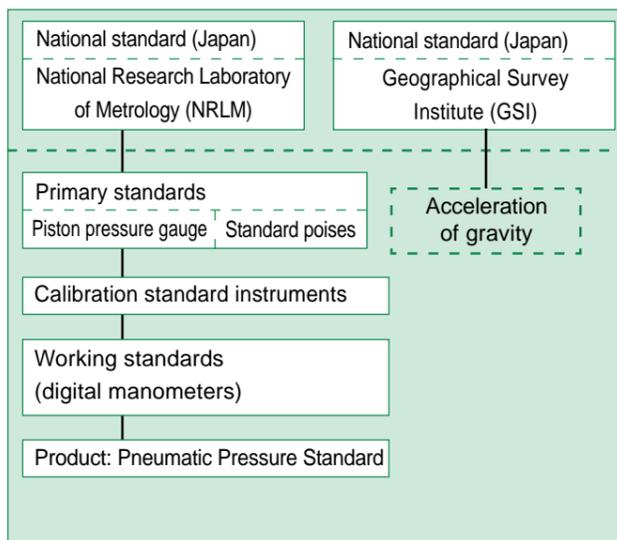
High performance and reliability

- High accuracy $\pm(0.05\%$ of full scale)
- Low temperature coefficient
 - Zero point: $\pm 0.003\%$ of full scale/ $^{\circ}\text{C}$
 - Span: $\pm 0.002\%$ of full scale/ $^{\circ}\text{C}$
- Excellent stability

Useful functions

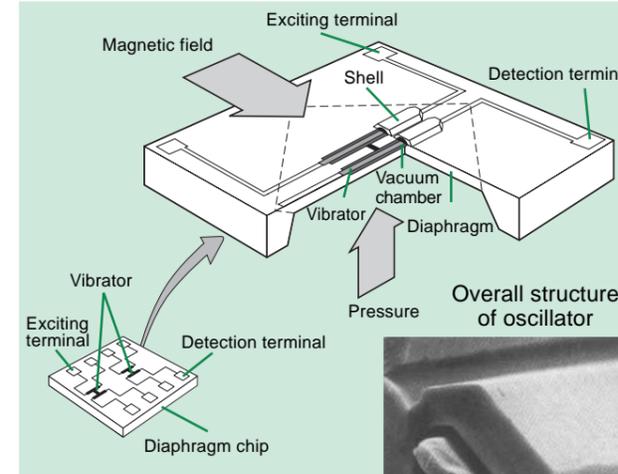
- Divided output function with as many as 20 steps
- Auto-step output function
- Sweep output function
- Offset monitor function to present deviation from final value

Calibration system



Silicon resonant sensor

(winner of the Okochi Memorial Prize, Keidanren Chairman's Prize)



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 \pm 10kPa (767401)
280 \pm 20kPa (767402)
- Max. allowable input** : 100 kPa gauge (767401)
500 kPa gauge (767402)
- Accuracy*1** :
Including calibration accuracy : $\pm 0.05\%$ of full scale (at 23 $^{\circ}\text{C}$ $\pm 3^{\circ}\text{C}$)
Not including calibration accuracy : $\pm 0.045\%$ of full scale (at 23 $^{\circ}\text{C}$ $\pm 3^{\circ}\text{C}$)
- Output noise** : $\pm 0.02\%$ of full scale
- Effect of mounting orientation** :
Forward/backward incline of 90 $^{\circ}$: $\pm 0.1\%$ of full scale (767401)
 $\pm 0.01\%$ of full scale (767402)
Sideways incline of 30 $^{\circ}$: $\pm 2.5\%$ of full scale (767401)
 $\pm 0.2\%$ of full scale (767402)
- Temperature coefficient** :
Zero point : $\pm 0.003\%$ of full scale/ $^{\circ}\text{C}$
Span : $\pm 0.002\%$ of full scale/ $^{\circ}\text{C}$
- Pressure display unit** *2 (Select from the following when ordering)
kPa only; kPa, kgf/cm², mmHg, mmH₂O (selectable);
kPa, inH₂O, inHg, 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 must be between 5 $^{\circ}\text{C}$ and 40 $^{\circ}\text{C}$, 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** : Rc1/4 or 1/4 NPT (backside attachment in both cases; select when ordering)
- Output response time** (Time for value to read $\pm 0.1\%$ of full scale once change starts) : Approximately 5 seconds
Conditions : Any 20% - or 25% - divided output (one step), with no load.
- Monitor output** *3 : 0 to 10 mV/full scale or 0 to 2 V/full scale (selectable)
- Calibration interval** *3 : Six 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 monocrystal 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.

Manual (divider ratio) output : Outputs a pressure equal to the specified value $\times n/m$ ($n=0$ to m , $m=1$ to 20)

Auto-step output : Divider output is automatically generated in steps.
Interval time : 10 to 600 seconds in 5-second intervals

Repetitions : One to infinity (stopping partway 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
Repetitions : One to infinity (stopping partway through is also permitted)

Output monitor : Displays 0 to 100% of setting on 10-segment 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:

GP-IB interface : Electrical and mechanical specifications: Conform to IEEE Standard 488-1978
Functional specifications : SH1, AH1, T5, L4, SR1, RL1, PPO, DC1, DT1, CO

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 :

5 to 40 $^{\circ}\text{C}$ and 20 to 80% RH (no condensation)

Maximum operating altitude : 2000 meters

Storage temperature range : -20 to 60 $^{\circ}\text{C}$

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 M Ω 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 \times 213 \times 400 mm

(protrusions not included), approximately 9.5 kg

Accessories : Input adapter connectors (For $\phi 4 \times \phi 6$ PVC tube, B9310RR), Two rubber

pads for rear feet, one power cord, Fuse (A1113EF), one instruction manual

*1: Ambient temperature 23 \pm 3 $^{\circ}\text{C}$. Pressure source using pressure reducing valve with a filter.

*2: The default pressure unit is kPa.

*3: Monitor output: The output status can be monitored based on the voltage output.

Model and suffix codes

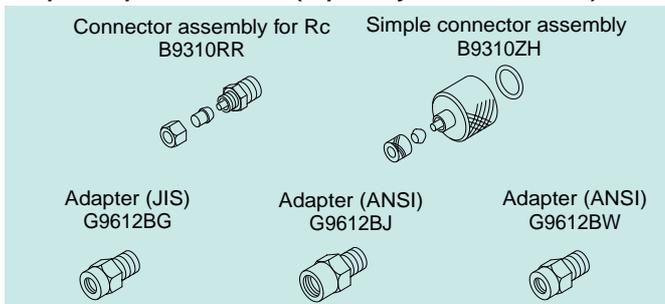
Main unit

Model	Suffix code	Description
767401	—	Pneumatic pressure Standard (25 kPa range model)
767402	—	Pneumatic pressure Standard (200 kPa range model)
Pressure unit	-U1	kPa
	-U2	kPa, kgf/cm ² , mmH ₂ O, mmHg
	-U3	kPa, inH ₂ O, inHg, psi
Communication function	-C1	GP-IB interface
	-C2	RS-232 interface
I/O connection unit	-P1	Rc 1/4
	-P2	1/4 NPT female screw
Power cord	-D	UL/CSA standard
	-F	VDE standard
	-R	SAA standard
	-Q	BS standard

Accessories (sold separately)

Product	Model	Suffix code	Description
Connector assembly kit	B9310RR	—	For $\phi 4 \times \phi 6$ vinyl pipe
Quick connector assembly	B9310ZH	—	For $\phi 4 \times \phi 6$ vinyl pipe
Adapter connector	G9612BG	—	JIS, R1/4-Rc1/8
Adapter connector	G9612BJ	—	ANSI, R1/4-1/4 NPT female screw
Adapter connector	G9612BW	—	ANSI, R1/4-1/8 NPT female screw

Input adapter connectors (separately sold accessories)



Contracted separately when required

Item	Code number	Count
Test certificate	DOC TC	—
Instruction manual	DOC IM	One additional
Drawings	3984 03	Up to 5

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.

YOKOGAWA

YOKOGAWA ELECTRIC CORPORATION

Measurement Sales Dept.

9-32, Nakacho 2-chome, Musashino-shi,
Tokyo 180-8750, JAPAN

Phone: 81-422-52-6614, Fax: 81-422-52-6624

YOKOGAWA CORPORATION OF AMERICA

2 Dart Road, Newnan, Georgia 30265, U.S.A.

Phone: 1-770-253-7000, Fax: 1-770-251-2088

YOKOGAWA EUROPE B.V.

Vanadiumweg 11, 3812 PX Amersfoort, THE NETHERLANDS

Phone: 31-33-4622142, Fax: 31-33-4641616

YOKOGAWA ENGINEERING ASIA PTE. LTD.

5 Bedok South Road, Singapore 469270

Phone: 65-2419933, Fax: 65-2412606

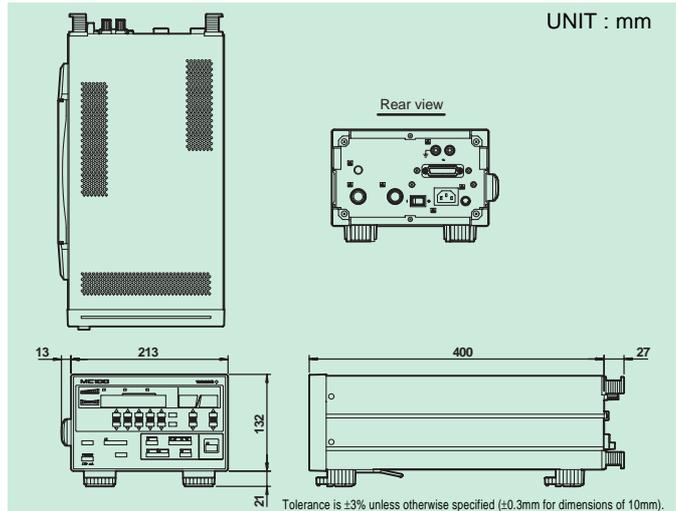
YOKOGAWA ELECTRIC CORPORATION

Test & Measurement Business Division

155 Takamuro-cho, Kofu-shi, Yamanashi-ken, 400-8558 Japan

Phone: 81-552-43-0310, Fax: 81-552-43-0396

External dimensions



Related products

Mini Manometer MT10

- Highly reliable (uses silicon-resonant sensor)
- Compact
- Accurate
±0.04% of reading + 0.03% of full scale (130 kPa model)
- Three ranges: 130 kPa, 700 kPa, 3000 kPa
- Simple to operate
- Data hold function
- RS-232C interface



Compact CAL CA100

- High accuracy (DC voltage generation: ±0.02% of setting)
- DC voltage/current, thermocouple/RTD output, frequency generation and resistance generation functions
- Independent generation/measurement functions
- Compact size
- 24 VDC power supply function handy for maintenance of transmitters, etc.
- Sink & source function for current supply and absorption



Digital Manometer MT100 series

- High accuracy: ±0.02% of rdg
- Full lineup available for measuring minute pressures (1 kPa) to very high pressures (3000 kPa)
- Can be powered by a 12 VDC power supply.
- GP-IB/RS-232-C interface
- The following two digital manometers are available: MT120 which has the DMM function (5 V/20 mA DC) and 24 V DC power supply; MT110 which has only pressure measurement functions.



Represented by :

MM-07E