



# High Accuracy and Long Term Stability

## MT300 Digital Manometer

Precision Making

Bulletin MT300-01EN



Yokogawa has been designing and providing precision measuring instruments with the highest quality for over 100 years.

While continuing to meet the needs of a broad customer base, we have accumulated and improved our measurement technologies over time. For over 40 years, we have pioneered the techniques of pressure measurements, that are even today, used by many governments and standards organizations as the de-facto standard. The new MT300 delivers high quality and reliable pressure measurements for today's advanced pressure measurement needs.

#### The MT300 provides:




**Technology** – Proprietary, silicon based resonant sensor technology, delivers high measurement accuracy of 0.01% and long term stability of accuracy up to 12 months.

**Operability** – With high speed, high resolution, and synchronous measurements, the MT300 meets the needs of a wide range of industries, other than just pressure measurements.

**Confidence** – Yokogawa's high standards of quality and performance, gives engineers a high level of confidence in their measurements.

## Rich lineup

Choose from a variety of model based on your application needs.

		
Gauge pressure model	Absolute pressure model	Differential pressure model
6 ranges	3 ranges	4 ranges
10 kPa 200 kPa 1000 kPa 3500 kPa 16 MPa <b>NEW</b> 70 MPa <b>NEW</b> *1	130 kPa 700 kPa <b>NEW</b> 3500 kPa <b>NEW</b>	1 kPa 10 kPa 130 kPa 700 kPa

\*1 Shield gauge pressure model

## High accuracy and long term stability

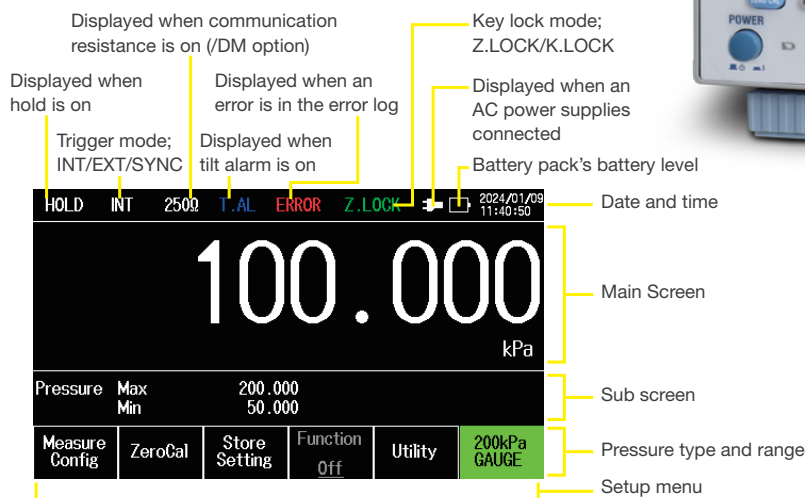
**Relative accuracy of pressure measurement: 0.01%**

**Accuracy guarantee period: 12 months**

Yokogawa's proprietary silicon based resonant sensor technology achieves a high measurement accuracy of 0.01% as relative accuracy. In addition, with long term stability performance backed by measurement data accumulated over many years, we guarantee the measurement accuracy of 12 months.

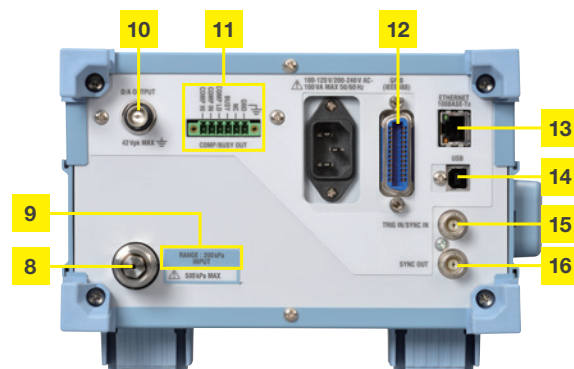
## An informative color display

The use of a color dot matrix LCD, allows measurement data and analysis to be displayed with high resolution and high visibility.



Differential pressure model

## Front panel/rear panel



- 14 USB port
- 15 External trigger/synchronized signal input terminal
- 16 Synchronized signal output terminal

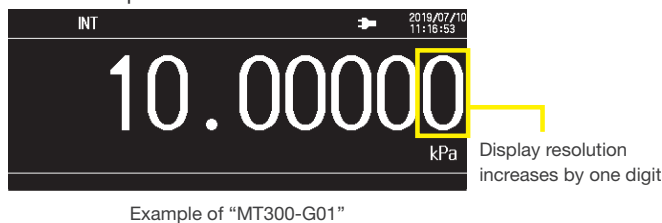
\*<sup>1</sup> Located on both front and rear panels; however, simultaneous input to connections on both sides are prohibited. There are two input ports on both sides when differential models are selected. In the case of -G08 (70 MPa range), input connector is located on only rear panel.

# With various functions, we can meet the needs of a wide range of industries

## High precision measurements

### High resolution display (When /R1 is selected.)

By using a high resolution display, pressure measurements can be more accurately displayed and visualized. In addition, the increased resolution, especially in calibration environments, reduces the uncertainty of the entire calibration process.



### High speed measurement (When /F1 is selected.)

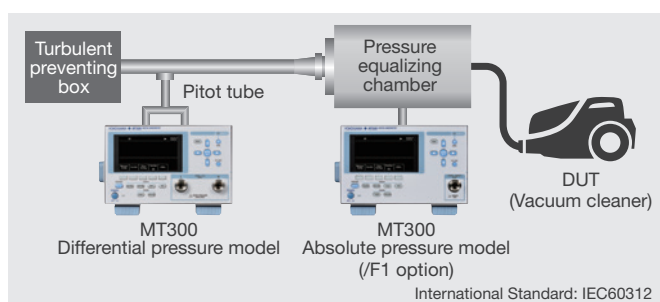
Rapid pressure changes and transient responses requires high speed and reliable measurements. Depending on the application, you can choose your measurement speeds from three different modes, normal, medium or high speed.

### Synchronous measurement

Using the synchronization features, you can collect data and display measurements from multiple units. Measurements can be captured and correlated at high speed with high accuracy and confidence.

#### Application:

In the performance testing of vacuum cleaners, the suction-force is calculated from the amount of suction-air in the pressure equalizing container and the degree of vacuum. The amount of intake-air can be obtained by measuring the differential pressure via a pitot tube, and the degree of vacuum can be obtained by measuring the absolute pressure. With the /F1 option, the dynamic characteristics can be captured at high speed, with accurate results, by synchronously measuring these two values from two MT300s.



Suction Power Test of Vacuum Cleaner

## Support for efficient works

### Leak test

The Leak-test feature can be used to measure pressure change or leak rate within the measurement period. It can be used to check the tightness or integrity of a pressure measurement system.

Start	100.000	@01:00:00	Delta	0.020	Time
Stop	99.980	@01:02:00	Rate	0.010/min	00:02:00
FncMode	Time		Start	Stop	
LeakTest					

Start: Pressure value and time when started

Stop: Pressure value and time when stopped

Time: Measurement time

Delta: Difference of pressure value between started and stopped

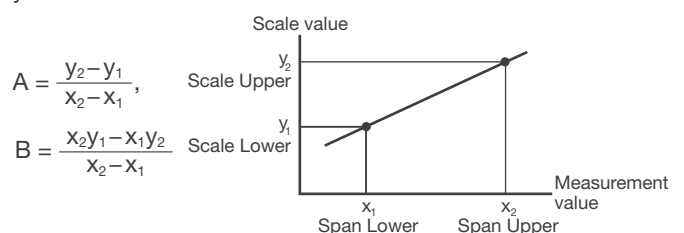
Rate: Difference of pressure value per minute

Leak rate =  $\frac{(\text{Started value}) - (\text{stopped value})}{\text{Leak test period (minute)}}$

### Scaling

The scaling function can be used to assign customer specific coefficients to the measured values. Depending on the application, you can display your own conversion value. Scaling coefficient A and offset B are determined according to the following equation. Set the scale values for the upper and lower span limits.

$$y = Ax + B$$



\*If you change the unit, set scaling coefficient A and offset B again.

### Statistical processing

You can apply statistical processing to the data acquired. Find and display the maximum value, minimum value, average value, and standard deviation for the measured data. When error data is detected, the number of error data within the measurement range can be recorded and displayed.

Max	100.020	AVG	99.998	ERR	0
Min	99.980	$\sigma$	0.014	NUM	400
FncMode			Start	Stop	
Statistics					

Max: Maximum value

AVG: Average value

ERR: Number of error data

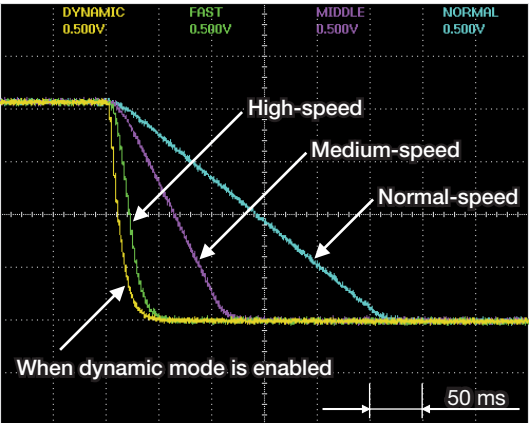
Min: Minimum value

$\sigma$ : Standard deviation

Support for linkage with external devices

D/A output (When /DA is selected)

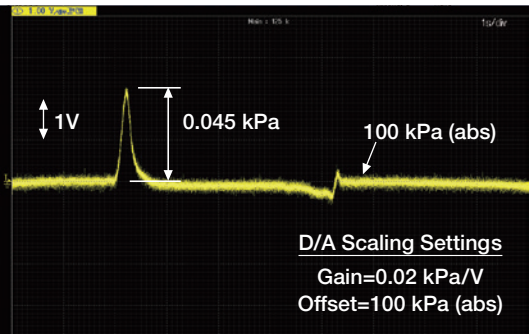
The Digital-to-Analog (D/A) option, makes it easy to output measured pressure values to an external terminal going to a measurement system or a recorder. The output update interval can be set to 250  $\mu$ s in combination with the /F1 option (in medium-speed/high-speed modes).



Example of the waveform differences in measurement modes

D/A Scaling (When /DA is selected)

Any range within the pressure measurement ranges is output in full scale of the D/A output range. Minute changes in pressure can be captured with high resolution.



Measurement of minute changes in atmospheric pressure

Support for field device calibration and maintenance works

- Outputting 24 VDC for the supply of transmitter
  - Measuring transmitter output (1 to 5 V or 4 to 20 mA selective)
  - Built-in communication resistance enables ON/OFF switching.
- Above functions can be available when /DM is selected.
- It is possible to bring it out without AC power by Li-ion battery operation.
- Running time: Approx. 6 hours with all functions turned on  
Charge time: Approx. 6 hours

Above function can be available when /EB is selected or add them as accessory after ordered.

Tilt alarm and Tilt Correction (Absolute pressure model)

Tilt alarm

This function determines the orientation state of the absolute pressure model body and displays a warning.

Tilt correction

This function corrects for the offset (amount of influence) of measured pressure values when the body of an absolute pressure model is used in a vertical orientation.

Indication

- Blue value:** The instrument is installed in the appropriate orientation and that tilt correction is on.
- Red value:** The combination of the installation orientation and the tilt correction on/off state is inappropriate.

		Vertical Orientation	Horizontal Orientation
Tilt Alarm ON	Tilt Corr ON		
	Tilt Corr OFF		

Example of tilt alarm and tilt correction



# High performance and reliability

Yokogawa's proprietary and self-developed silicon based resonant sensor enables high accuracy, high resolution, and high stability pressure measurement system.

Yokogawa's proprietary silicon resonant sensor has excellent characteristics that satisfy the conditions required for "accuracy measurement", such as stability, reproducibility, sensitivity, and temperature characteristics.

## High sensitivity and resolution and superior long term stability

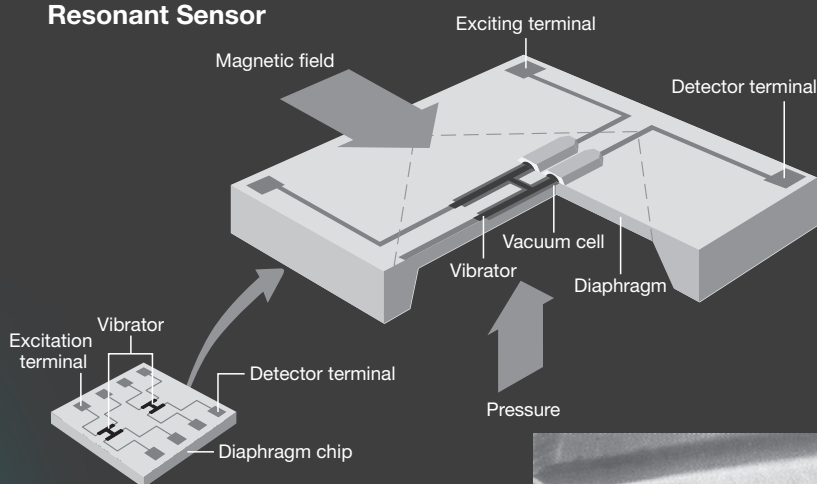
The vibrators are in a vacuum. This reduces the dispersion of vibration energy. Combined with the superior flexibility of silicon single crystal, this makes it possible to obtain a high Quality factor.

## Extremely low temperature dependency

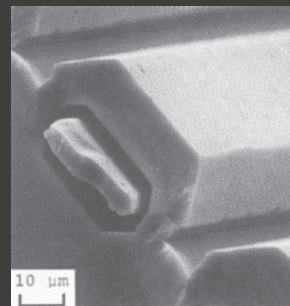
Two vibrators are used, and pressure is derived from the difference between the two unique oscillation counts. With this operating structure, it is possible to cancel out external environment influences such as ambient temperature. In addition, the vibrators are in a vacuum, so they are not affected by humidity.

## Silicon Resonant Sensor

### Structural View of 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.



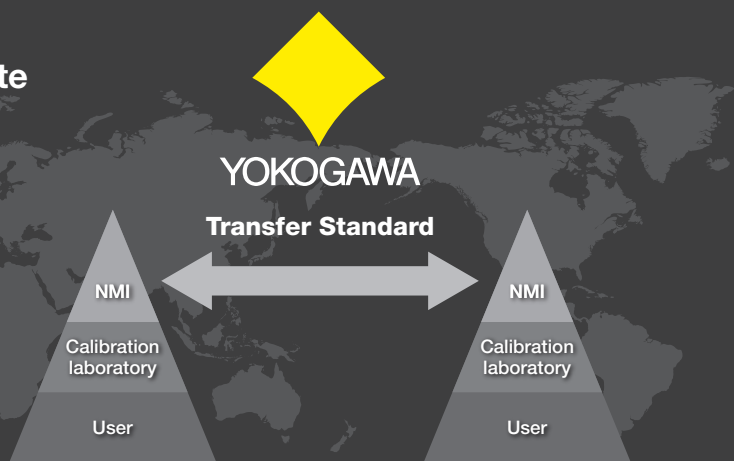
## Initiatives for National Metrology Institute

### International Comparison

The Yokogawa's pressure sensor and the MT series are adopted as a Transfer Standard for many CC-level and the regional-level (for example APMP) international comparisons of pressure standards based on the enhanced performance of digital pressure gauges and the evaluation result of long term stability.

\* Transfer Standard:

A standard used as a transfer equipment to compare standards.

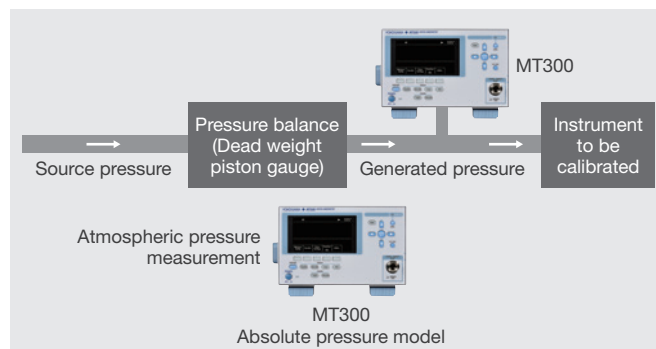


# Applications

## High precision and resolution providing stable measurements

### Pressure calibration using Pressure Balance

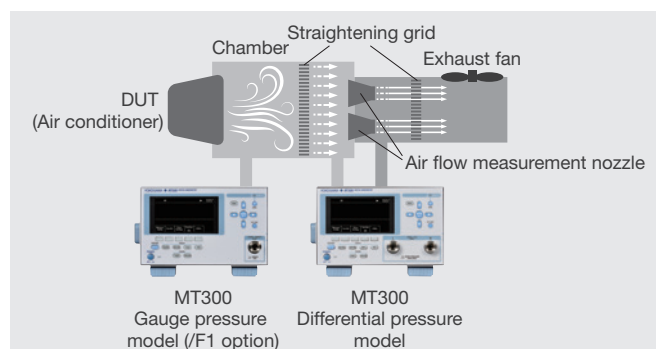
When pressure balance is used in calibration, connecting a manometer is necessary to confirm that the calibration values are generated correctly. Also, measurement of atmospheric pressure is necessary to confirm the effects of atmospheric pressure to the calibration results. The MT300 is best suited for this type of application, where high accuracy, long stability and high resolution is needed.



## High speed measurements for rapidly changing pressures

### Evaluation of Air Conditioner

The cooling and heating performance of air conditioners is calculated by testing the differential pressure before and after an air flow measurement nozzle and the air temperature/humidity. The test has to be performed in an equilibrium state and it is necessary to measure the internal and external pressures. The MT300 with /F1 option allows measurement of rapidly changing pressures.



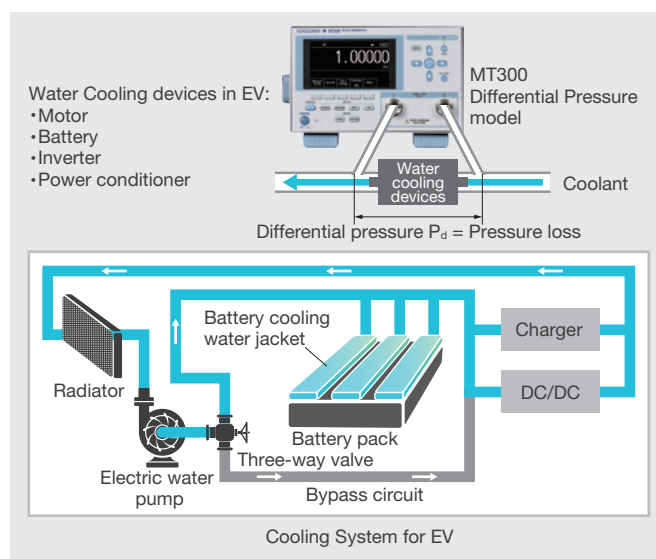
## Measuring pressure loss with one unit

### Measurement of Coolant Flow Pressure Loss in Water Cooling Systems for EV

There are many devices require temperature control in Electric Vehicles (EVs) such as motors, batteries, and power control units. Since each of these devices generates different amounts of heat and has a different optimum temperature, a single vehicle is usually equipped with multiple cooling systems. As EV performance improves, the importance of cooling systems also increase.

In the design and development of water cooling systems, it is essential to measure the pressure loss in the flow path where coolant flows.

The MT300 multiple differential pressure models features optimal range and resolution, enabling high accuracy measurements for a variety of applications with one unit.



For more examples of applications, visit our website.



# Specifications

## Pressure-measurement Specifications

### Gauge-pressure models

Model Code					-G01	-G03	-G05	-G06	-G07	-G08 <sup>9</sup>
Range					10 kPa	200 kPa	1000 kPa	3500 kPa	16MPa	70MPa
Guaranteed Accuracy Range		Positive pressure			0 ka to 10 kPa	0 kPa to 200 kPa	0 kPa to 1000 kPa	0 kPa to 3500 kPa	0 kPa to 16000 kPa	0 kPa to 70000 kPa
		Negative pressure <sup>14</sup>			-10 kPa to 0 kPa	-90 kPa to 0 kPa	-90 kPa to 0 kPa	-90 kPa to 0 kPa	—	—
Readout range					-12 kPa to 12 kPa	to 240 kPa	to 1200 kPa	to 4200 kPa	to 19200 kPa	to 77000 kPa
Display resolution		-----			0.0001 kPa	0.001 kPa	0.01 kPa	0.01 kPa	0.1 kPa	0.1 kPa
		When /R1 is selected			0.00001 kPa	0.0001 kPa	0.001 kPa	0.001 kPa	0.01 kPa	—
Allowable input					2.7 kPa (abs) to 50 kPa (gauge)	2.7 kPa (abs) to 500 kPa (gauge)	2.7 kPa (abs) to 3000 kPa (gauge)	2.7 kPa (abs) to 4500 kPa (gauge)	2.7 kPa (abs) to 21 MPa (gauge)	2.7 kPa (abs) to 98 MPa (gauge)
Accuracy  12 months after calibration Tested at 23±3°C, after zero calibration	Measurement mode	Normal-speed <sup>6, 7</sup>	Positive pressure	Relative accuracy <sup>1</sup>	±0.01% of full scale	25 kPa to 200 kPa: ±(0.008% of reading + 0.002 kPa) 0 kPa to 25 kPa: ±0.004 kPa	The smaller of ±(0.01% of reading + 0.03 kPa) or ±0.01% of full scale	The smaller of ±(0.01% of reading + 0.09 kPa) or ±0.01% of full scale	The smaller of ±(0.008% of reading + 1.4 kPa) or ±0.01% of full scale	The smaller of ±(0.008% of reading + 5.0 kPa) or ±0.01% of full scale <sup>10</sup>
				Absolute accuracy	±(0.015% of reading + 0.0015 kPa)	25 kPa to 200 kPa: ±(0.02% of reading) 0 kPa to 25 kPa: ±0.005 kPa	100 kPa to 1000 kPa: ±(0.02% of reading + 0.03 kPa) 0 kPa to 100 kPa: ±0.05 kPa	±(0.02% of reading + 0.10 kPa)	±(0.02% of reading + 1.5 kPa)	±(0.02% of reading + 6.0 kPa) <sup>10</sup>
			Negative pressure	Relative accuracy <sup>1</sup>	±(0.1% of reading + 0.0050 kPa)	±(0.2% of reading + 0.040 kPa)	±(0.2% of reading + 0.04 kPa)	±(0.2% of reading + 0.04 kPa)	—	
				Absolute accuracy	±(0.2% of reading + 0.0100 kPa)	±(0.2% of reading + 0.080 kPa)	±(0.2% of reading + 0.08 kPa)	±(0.2% of reading + 0.08 kPa)	—	
		Medium-speed <sup>3</sup>			±0.0020 kPa	±0.026 kPa	±0.14 kPa	±0.60 kPa	—	
		High-speed <sup>3</sup>			±0.0060 kPa	±0.065 kPa	±0.35 kPa	±1.50 kPa	—	
		Readout update interval <sup>4</sup>	Measurement mode	Normal-speed			250 ms			
Medium-speed <sup>3</sup>				100 ms				—		
High-speed <sup>3</sup>				100 ms				—		
Response time <sup>5</sup>	Measurement mode	Normal-speed			2.5 s or less					
		Medium-speed <sup>3</sup>			200 ms or less				—	
		High-speed <sup>3</sup>			100 ms or less	50 ms or less	70 ms or less	150 ms or less	—	
Influence of temperature		Positive pressure			±(0.001% of reading + 0.00015 kPa/°C	±(0.001% of reading + 0.0013 kPa/°C	±(0.001% of reading + 0.007 kPa/°C	±(0.001% of reading + 0.03 kPa/°C	±(0.001% of reading + 0.16 kPa/°C	±(0.001% of reading + 0.7 kPa/°C
		Negative pressure			±(0.001% of reading + 0.00015 kPa/°C	±(0.001% of reading + 0.0008 kPa/°C	±(0.001% of reading + 0.0008 kPa/°C	±(0.001% of reading + 0.0008 kPa/°C	—	—
Influence of positional setup (Zero point drift)		90° tilt, forward or backward			±0.01 kPa	±0.013 kPa	±0.07 kPa	±0.3 kPa	±1 kPa or less	±1 kPa or less
		30° tilt, right or left			±0.25 kPa	±0.26 kPa	±0.35 kPa	±0.3 kPa	±1 kPa or less	±1 kPa or less
Weight (main unit)					Approx. 7.0 kg	Approx. 6.2 kg	Approx. 6.2 kg	Approx. 6.2 kg	Approx. 6.2 kg	Approx. 5.0 kg
Internal volume					Approx. 12 cm <sup>3</sup>					Approx. 6 cm <sup>3</sup>

### Absolute-pressure Model

Model code				-A03	-A05	-A06
Range				130 kPa (abs)	700 kPa (abs)	3500 kPa (abs)
Guaranteed Accuracy Range				0 kPa (abs) to 130 kPa (abs)	0 kPa (abs) to 700 kPa (abs)	0 kPa (abs) to 3500 kPa (abs)
Readout range				to 156 kPa	to 840 kPa	to 4200 kPa
Display resolution	-----			0.001 kPa	0.01 kPa	0.01 kPa
	When /R1 is selected			0.0001 kPa	0.001 kPa	0.001 kPa
Allowable input				1 Pa (abs) to 500 kPa (abs)	1 Pa (abs) to 3000 kPa (abs)	1 Pa (abs) to 4500 kPa (abs)
Accuracy <sup>2</sup>	Measurement mode	Normal-speed <sup>6, 7</sup>	Relative accuracy <sup>1</sup>	The smaller of ±(0.01% of reading + 0.005 kPa) or ±0.01% of full scale	The smaller of ±(0.008% of reading + 0.04 kPa) or ±0.01% of full scale	The smaller of ±(0.01% of reading + 0.14 kPa) or ±0.01% of full scale
12 months after calibration Tested at 23±3°C, after zero calibration			Absolute accuracy	±(0.03% of reading + 0.006 kPa)	±(0.03% of reading + 0.07 kPa)	±(0.03% of reading + 0.35 kPa)
		Medium-speed <sup>3</sup>	±0.026 kPa	±0.14 kPa	±0.70 kPa	
		High-speed <sup>3</sup>	±0.065 kPa	±0.35 kPa	±1.75 kPa	
Readout update interval <sup>4</sup>	Measurement mode	Normal-speed	250 ms			
		Medium-speed <sup>3</sup>	100 ms			
		High-speed <sup>3</sup>	100 ms			
Response time <sup>5</sup>	Measurement mode	Normal-speed	2.5 s or less			
		Medium-speed <sup>3</sup>	200 ms or less			
		High-speed <sup>3</sup>	50 ms or less	70 ms or less	150 ms or less	
Influence of temperature			±(0.001% of reading + 0.0013 kPa)/°C		±(0.001% of reading + 0.007 kPa)/°C	±(0.001% of reading + 0.03 kPa)/°C
Influence of positional setup (Zero point drift)		90° tilt, forward or backward		±0.65 kPa		
		30° tilt, right or left		±0.26 kPa		
		When using the stand		±0.10 kPa		
Weight (main unit)				Approx. 6.0 kg		
Internal volume				Approx. 12 cm <sup>3</sup>		



Differential-pressure models

Model code		-D00	-D01	-D03	-D05
Range		1 kPa	10 kPa	130 kPa	700 kPa
Guaranteed Accuracy Range (High pressure ≥ Low pressure)		0 kPa to 1 kPa	0 kPa to 10 kPa	0 kPa to 130 kPa	0 kPa to 700 kPa
Readout range		−1.2 kPa to 1.2 kPa	−12 kPa to 12 kPa	−156 kPa to 156 kPa	−156 kPa to 840 kPa
Display resolution		0.00001 kPa	0.0001 kPa	0.001 kPa	0.01 kPa
	When /R1 is selected	—	0.00001 kPa	0.0001 kPa	0.001 kPa
Allowable input		1 Pa (abs) to 50 kPa (gauge)	2.7 kPa (abs) to 50 kPa (gauge)	2.7 kPa (abs) to 500 kPa (gauge)	2.7 kPa (abs) to 1000 kPa (gauge)
Accuracy <sup>*5,*7</sup>  12 months after calibration Tested at 23±3°C, after zero calibration	Relative accuracy <sup>*1</sup>	±(0.01% of reading + 0.00025 kPa)	±0.01% of full scale	The smaller of ±(0.01% of reading + 0.005 kPa) or ±0.01% of full scale	The smaller of ±(0.01% of reading + 0.03 kPa) or ±0.01% of full scale
	Absolute accuracy	±(0.02% of reading + 0.00030 kPa)	±(0.015% of reading + 0.0025 kPa)	25 to 130 kPa: ±(0.02% of reading + 0.013 kPa) 0 to 25 kPa: ±0.018 kPa	100 to 700 kPa: ±(0.02% of reading + 0.10 kPa) 0 to 100 kPa: ±0.12 kPa
Readout update interval <sup>*4</sup>		250 ms			
Response time <sup>*5</sup>		5 s or less	2.5 s or less	2.5 s or less	2.5 s or less
Influence of static pressure (zero point drift)		±0.00015 kPa / 50 kPa (gauge)	±0.0005 kPa / 50 kPa (gauge)	±0.008 kPa / 500 kPa (gauge)	±0.04 kPa / 1000 kPa (gauge)
Influence of temperature		±(0.001% of reading + 0.00005 kPa)/°C	±(0.001% of reading + 0.00015 kPa)/°C	±(0.001% of reading + 0.0013 kPa)/°C	±(0.001% of reading + 0.007 kPa)/°C
Influence of positional setup (Zero point drift)	90° tilt, forward or backward	±0.005 kPa	±0.010 kPa	±0.013 kPa	±0.07 kPa
	30° tilt, right or left <sup>*8</sup>	±0.05 kPa	±0.25 kPa	±0.26 kPa	±0.35 kPa
Weight (main unit)		Approx. 7.2 kg	Approx. 7.2 kg	Approx. 7.2 kg	Approx. 7.2 kg
Internal volume		Approx. 12 cm <sup>3</sup> for both H and L sides			

Common specifications (Gauge-pressure model, Absolute-pressure model and Differential-pressure model)

Material of measurement section	Diaphragm: Hastelloy C276; flange of measurement chamber: stainless steel (JIS SUS316), Internal piping: stainless steel (JIS SUS316); input connector: stainless steel (JIS SUS316); O-ring: fluororubber or neoprene rubber, metal gasket: stainless steel (JIS SUS316L) <sup>*11</sup>
Leak rate	10 <sup>-6</sup> Pa·m <sup>3</sup> /s or less
Applicable fluids	Gases and liquid (non-flammable, non-explosive, non-toxic and non-corrosive fluids) Substances and mixtures defined in Directive 2014/68/EC Article 13(1)a are excluded.
Fluid temperature	5 to 50°C (10 to 35°C when -D00 is selected)
Liquid viscosity	5×10 <sup>-6</sup> m <sup>2</sup> /s or less
Pressure sensor	Silicon resonant sensor
Pressure sensing element	Diaphragm
Readout unit	Pa, hPa, kPa, MPa, mbar, bar, atm only, or add mmHg, inHg, gf/cm <sup>2</sup> , kgf/cm <sup>2</sup> , Torr, psi, mmH <sub>2</sub> O@4°C, mmH <sub>2</sub> O@20°C, ftH <sub>2</sub> O@4°C, ftH <sub>2</sub> O@20°C, inH <sub>2</sub> O@4°C, inH <sub>2</sub> O@20°C
Input connection	Rc1/4" female-thread, 1/4"NPT female-thread, VCO <sup>*12</sup> 1/4" male-thread or 1/2" NPT female-thread (specify when ordering), located on both front and rear panels; however, simultaneous input to connections on both sides is prohibited). <sup>*13</sup>

\*1: Relative value for the measure toward the working standard of YOKOGAWA.

\*2: Long term stability of zero point is excluded.

\*3: When /F1 is selected, the measurement mode can be selected from normal-speed, medium-speed and high-speed.  
Add each value to the accuracy in normal-speed measurement mode.

\*4: The interval of outputting data via communication is the same as the readout update interval.

\*5: Conditions of response time measurement

- The response time is defined as the interval from the start of change to the time the readout settles to within ±1% of its final value.
- The manometer under test is made open to the atmospheric pressure when it is at its full scale value, where the input section is under no load.  
In the case of -A03, the manometer under test is made open to the atmospheric pressure at a scale value of 0.  
In the case of -G07 and -G08, the manometer under test is made open to the atmospheric pressure at a scale value of 3500 kPa.
- Measurement is performed using the D/A conversion output.
- Measurement integration time is 1500 ms or more. (The time is 4000 ms when -D00 is selected.)

\*6: Measurement integration time is 1500 ms or more. (The time is 4000 ms when -D00 is selected.)

\*7: Add the following value to each measurement accuracy when the measurement integration time is 250 ms. (2500 ms or less when -D00 is selected)

-G01: ±0.0007 kPa	-A03: ±0.006 kPa	-D00: ±0.00070 kPa
-G03: ±0.006 kPa	-A05: ±0.04 kPa	-D01: ±0.0007 kPa
-G05: ±0.04 kPa	-A06: ±0.06 kPa	-D03: ±0.006 kPa
-G06: ±0.06 kPa		-D05: ±0.04 kPa
-G07: ±0.6 kPa		
-G08: ±3.0 kPa		

\*8: 5° tilt, right or left when -D00 is selected.

\*9: -G08 is shield gauge pressure model.

\*10: Stability of zero point is excluded.

\*11: It is used only -G07.

\*12: The equivalent connection is attached when -P3 is selected.

\*13: In the case of -G08, input connector is located on only rear panel.

\*14: Negative pressure inspection point for -G03, -G05, and -G06 is -80 kPa only.

## Other specifications

Comparator Output	
Display area	In the main LCD display
Output signal	HI/IN/LO
Target value	Pressure measurement value
Judgement interval	Every triggered

External Trigger	
Trigger mode	Internal trigger, external trigger and synchronous trigger
Trigger source	Internal trigger: Readout update interval (interval:100 ms or 250 ms) External trigger: Trigger key, external input (TRIG IN/SYNC IN), or communication commands Synchronous trigger: External input (TRIG IN/ SYNC IN)
Trigger I/O range	−0.3 V to 5.5 V
Trigger input level	High; 2.5 V or more, LOW 0.8 V or less
Trigger edge	Trailing edge
Trigger output level	High; 3.5 V or more, LOW 0.45 V or less
Terminals	Input (TRIG IN/ SYNC IN): BNC Output (SYNC OUT): BNC

Synchronous measurement	
Unit for Synchronization	4 units maximum with daisy chain
Precision of Synchronization	Trigger delay between master unit and slave units: 2.5 ms maximum

Data memory	
Data store mode	Auto store or manual store
Auto store interval	Medium-speed or High-speed measurement mode: 0.1 s/0.5 s/1 s/2 s/5 s/10 s/30 s/60 s/2 min/5 min Normal-speed measurement mode: 0.25 s/0.5 s/1 s/2 s/5 s/10 s/30 s/60 s/2 min/5 min
Store data	Store date, pressure measurement value, DMM measurement value (when /DM is selected) and each parameter
Maximum number of data entries per file	10000 data
Total number of data entries	30000 data
Maximum number of files	200 files

Offset function	
Zero offset for Gauge and differential range model	Zero calibration
Zero offset for Absolute range model	Absolute zero calibration and absolute zero calibration including data offset

Tilt correction function (Absolute-pressure model)	
Tilt alarm	Judges the orientation state of the instrument and sends alarm notifications
Tilt correction	Corrects the offset of measured pressure values (correction and reference value settings)

Relative value display	
The criterion by measurement value, the criterion by setting value	

Arithmetic function	
%ERROR, scaling and leak test	

Statistical processing function	
Maximum value, minimum value, average and standard deviation	

General Specifications	
Display	Display unit 4.3 inch TFT color liquid crystal display (480 x 272 dots) * There may be some pixels on the LCD that never light or are always lit (total number defective pixels 5 or less). Digits of pressure value 6 digits max. (7 digits max. when /R1 is selected) Digits of DMM value 5 digits (when /DM is selected)
Warm up time	More than 5 minutes
Operating temperature/humidity ranges	5 to 40°C, 20 to 80% RH (no condensation allowed) 10 to 35°C, 20 to 80% RH (no condensation allowed) when -D00 is selected
Altitude of operation	2000 m or less
Storage temperature	−20°C to 60°C (no condensation)
Power Supply	AC or Li-ion battery (739883) with battery pack cover (269918)

AC power rating	AC power rating 100 to 120 VAC/200 to 240 VAC, at 50/60 Hz	
	Allowable supply voltage range 90 to 132 VAC/180 to 264 VAC	
	Allowable supply frequency range 47 to 63 Hz	
Battery pack (739883)	Battery type	Li-ion
	Driving time	Approx. 6 hours with all functions turned on
	Recharge time	Approx. 6 hours
	Mounting	Battery pack and battery pack cover mounted on top of the instrument
Power consumption	When in pressure measurement mode: 25 VA maximum for 100 V power line; 40 VA maximum for 200 V power line When in recharge mode: 80 VA maximum for 100 V power line; 100 VA maximum for 200 V power line	
External Dimensions (not including the protrusions)	Main unit: Approx. 213 mm (W) × 132 mm (H) × 350 mm (D) Battery pack + battery pack cover: Approx. 87 mm (W) × 31 mm (H) × 304 mm (D)	
Weight	Main unit: Refer to "Weight (main unit)" in the pressure measurement sections Battery pack + battery pack cover: Approx. 720 g	

Interfaces	
USB-PC	Connection Terminal
	Connector USB type B connector × 1
	Electromechanical specifications
	USB 2.0 compliant
Supported transfer standards	High Speed (480 Mbps), Full Speed (12 Mbps)
	Supported class
	USB-FUNCTION interface
	USBTMC-USB488 (USB Test and Measurement Class Ver. 1.0)
Virtual serial com port	CDC (Communication Device Class)
	Storage
	USB Mass Storage Class Ver. 1.1
Ethernet	Connector
	RJ-45 connector × 1
	Electromechanical specifications
	IEEE 802.3 compliant
Transmission methods	Ethernet (100BASE-TX/10BASE-T)
	Transmission speed
	100 Mbps max.
	Protocol
TCP/IP	Supported services
	DHCP/VXI-11
GP-IB	Electromechanical specifications
	Conforms to IEEE std. 488-1978 (JIS C 1901-1987)
	Functional specifications
	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
Protocol	Conforms to IEEE std. 488.2-1992
	Address
	0 to 30

/DM (option)	
DCV/DCA measurement	
Measurement range	DCV: DC 5 V DCA: DC 20 mA
Guaranteed Accuracy Range	DCV: 0 to ±5.25 V DCA: 0 to ±21 mA
Readout range	DCV: 0 to ±6 V DCA: 0 to ±24 mA
Display resolution	DCV: 0.0001 V DCA: 0.001 mA
Accuracy 12 months after calibration	Tested at 23±3°C DCV: ±(0.015% reading + 0.5 mV) DCA: ±(0.015% reading + 3 µA)
Measurement interval	Approx. 300 ms when average OFF
Response time	Approx. 500 ms when average OFF
Maximum allowable input	DCV: ±30 V DCA: ±100 mA
Input impedance	DCV: Approx. 1 MΩ DCA: Approx. 10 Ω
Temperature effect	±(0.01% of reading + 2 digits)/10°C
CMRR	100 dB or more (50/60 Hz, Rs=1 kΩ)
NMRR	60 dB or more (50/60 Hz)
Terminals	Plug-in terminal [4 mm diameter banana jack (female type)]

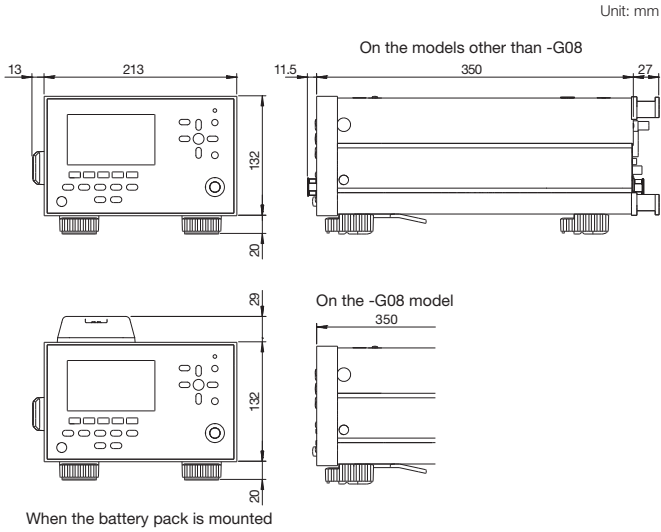
24 V DC output	
Output voltage, output current	24 V±1 VDC, 24 mA when communication resistor OFF 24 V±6 VDC, 20 mA when communication resistor ON
Maximum output current	30 mA (current limit approx. 40 mA)
Load capacitance	0.1 µF or less
Communication resistance	250 Ω ON/OFF
Terminals	Plug-in terminal [4 mm diameter banana jack (female type)]

The maximum allowable potential difference between any measuring terminal and the grounding terminal is 42 Vpeak.

/DA (option)	
D/A conversion	
Output voltage	DC 2 V range, DC 5 V range switchable
D/A scaling	Outputs any range within the measurement ranges in full scale of the output range (set in the 2-point mode or direct input mode)
Guaranteed Accuracy Range	DC 2 V range: 0 to ±2 V DC 5 V range: 0 to ±5 V
Output resolution	16 bits
Output range	Approx. ±120% of the range
Output accuracy 12 months after calibration	Tested at 23±3°C When dynamic mode OFF, Add ±0.05% of full scale to the pressure accuracy When dynamic mode ON, <sup>1</sup> When D/A scaling OFF, ±0.5% of full scale ±0.7% of full scale(when -G01 is selected) When D/A scaling ON, Add ±0.5% of full scale to the pressure accuracy Add ±0.7% of full scale to the pressure accuracy (when -G01 is selected)
Readout update interval	When dynamic mode OFF, Approx. 0.25 ms when medium-speed mode or high-speed mode is selected. Approx. 2 ms when normal-speed mode is selected When dynamic mode ON, <sup>1</sup> Approx. 0.25 ms
Response time <sup>2</sup>	When dynamic mode OFF, Same as the response time specified in the pressure measurement specifications section. When dynamic mode ON, <sup>1</sup> Same as the response time specified for the high-speed measurement mode.
Output resistance	0.1 Ω or less
Temperature effect	±(0.005% of full scale)/°C
Load resistance	10 kΩ or more
Load capacitance	0.1 µF or less
Terminal	BNC
Comparator Output	
Output signal	HI/IN/LO, BUSY
Output range	-0.3 V to 5.5 V
Output level	HIGH: 3.5 V or more, LOW: 0.45 V or less
Terminal	Removable terminal plug (standard Accessory on model with the /DA option)

\*1: When /F1 is selected, the measurement mode can be selected from normal-speed, medium-speed and high-speed.  
\*2: The response time is defined as the interval from the start of change to the time the readout settles to within ±1% of its final value.  
The maximum allowable potential difference between D/A conversion terminals and the grounding terminal is 42 Vpeak.  
The GND of comparator output is earth ground.

Dimensions



Model and Suffix code

Model	Suffix code	Descriptions	
MT300		Digital Manometer	
Pressure type and range	-G01	10 kPa range	Gauge pressure model
	-G03	200 kPa range	Gauge pressure model
	-G05	1000 kPa range	Gauge pressure model
	-G06	3500 kPa range	Gauge pressure model
	-G07	16 MPa range	Gauge pressure model
	-G08 <sup>*1</sup>	70 MPa range	Gauge pressure model
	-A03	130 kPa range	Absolute pressure model
	-A05	700 kPa range	Absolute pressure model
	-A06	3500 kPa range	Absolute pressure model
	-D00	1 kPa range	Differential pressure model
	-D01	10 kPa range	Differential pressure model
	-D03	130 kPa range	Differential pressure model
Pressure unit	-D05	700 kPa range	Differential pressure model
	-U1	Pa, hPa, kPa, MPa, mbar, bar, atm	
Input connection	-U2	Pa, hPa, kPa, MPa, mbar, bar, atm, mmHg, inHg, gf/cm <sup>2</sup> , kgf/cm <sup>2</sup> , Torr, psi, mmH <sub>2</sub> O@4°C, mmH <sub>2</sub> O@20°C, ftH <sub>2</sub> O@4°C, ftH <sub>2</sub> O@20°C, inH <sub>2</sub> O@4°C, inH <sub>2</sub> O@20°C	
	-P1	Rc 1/4" female-thread	
	-P2	1/4" NPT female-thread	
	-P3	VCO 1/4" male-thread	
	-P4 <sup>*2</sup>	1/2" NPT female-thread	
Power cord	-D	UL/CSA Standard and PSE compliant	
	-F	VDE/Korean Standard	
	-Q	British Standard	
	-R	Australian Standard	
	-H	Chinese Standard	
	-N	Brazilian Standard	
	-T	Taiwanese Standard	
	-B	Indian Standard	
	-U	IEC Plug Type B	
Option	/F1 <sup>*3</sup>	Measurement mode switching function (Normal, Medium or High)	
	/DM <sup>*4</sup>	DCV/DCA measurement, 24 VDC Output	
	/DA	DA conversion output	
	/R1 <sup>*5</sup>	One additional display resolution digit	
	/EB	Battery pack + battery pack cover	

<sup>\*1</sup>: -G08 is shield gauge pressure model.  
<sup>\*2</sup>: When -G08 is selected, only -P4 can be selected for -G08.  
<sup>\*3</sup>: Not selectable for -G07, -G08, or the differential pressure model.  
<sup>\*4</sup>: Selectable on the gauge pressure model and absolute pressure model.  
<sup>\*5</sup>: Not selectable for -G08 or -D00.

NOTICE

- Before operating the product, read the user's manual thoroughly for proper and safe operation.

■ Any company's names and product names mentioned in this document are trade names, trademarks or registered trademarks of their respective companies.

Yokogawa's approach to preserving the global environment

- Yokogawa's electrical products are developed and produced in facilities that have received ISO14001 approval.
- In order to protect the global environment, Yokogawa's electrical products are designed in accordance with Yokogawa's Environmentally Friendly Product Design Guidelines and Product Design Assessment Criteria.

This is a Class A instrument based on Emission standards EN61326-1 and EN55011, and is designed for an industrial environment.  
Operation of this equipment in a residential area may cause radio interference, in which case users will be responsible for any interference which they cause.



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Accessories


Model	Name	Description	
269918	Battery pack cover <sup>*1</sup>	Battery cover for MT300	
739883	Battery pack <sup>*1, *2</sup>	Li-ion battery	
99045	Conversion adapter	Binding Post (Red Black with one sheet plate)	
99046	Conversion adapter	Binding Post (Red, Red with one sheet plate)	
366921	Conversion adapter	BNC (Plug) - Binding Post (Red Black)	
91080	Adapting connector	R 1/4" male thread to 1/8" NPT female thread (for -P1)	
91081	Adapting connector	R 1/4" male thread to 1/4" NPT female thread (for -P1)	
91082	Adapting connector	1/4" NPT male thread to 1/8" NPT female thread (for -P2)	
91083	Adapting connector	1/2" NPT male thread to 1/8" NPT female thread (for -P4)	
91086	Adapting connector	1/2" NPT male thread to 1/4" NPT female thread (for -P4)	
91087	Adapting connector	1/2" NPT male thread to Rc 1/4" female thread (for -P4)	
B9984BW	Connector assembly kit	For use with 4 mm diameter × 6 mm diameter PVC tubing (for -P2)	
B9984BY	Connector assembly kit	For use with 4 mm diameter × 6 mm diameter PVC tubing (for -P1)	
701963	Carrying case	Soft Carrying case	

<sup>\*1</sup>: Included in the /EB option.  
<sup>\*2</sup>: Operation of the battery pack (739883) requires the battery pack cover (269918).

Related Products


MC100 Pneumatic Pressure Standard

- Basic accuracy: 0.05% of full scale
- Output ranges: 0 to 200 kPa/0 to 25 kPa
- Divider output, auto-step output, and sweep output.
- Supply pressure
  - 0 to 200 kPa range model: 280 kPa ±20 kPa
  - 0 to 25 kPa range model: 50 kPa ±10 kPa



CA700 Pressure Calibrator

- Basic accuracy: 0.01% reading
- Widest range: 200 kPa gauge/1000 kPa gauge/3500 kPa gauge
- Both gases and liquids measurable.
- DC mA signals can be measured by supplying power to the transmitter from a 24 V DC power supply.



PM100 External Pressure Sensor for CA700

- Basic accuracy: 0.01% of reading
- The highest resolution in class 0.0001 MPa
- Multi range:
  - 16 MPa model: Three ranges of 7 MPa/10 MPa/ 16 MPa are built into one unit.
  - 70 MPa model: Three ranges of 25 MPa/50 MPa/ 70 MPa are built into one unit.

