

Pressure Calibrator
CA700



Pressure Calibrator

CA700

New Standard for Field Calibration

Bulletin CA700-EN

www.yokogawa.com/ymi

High Accuracy

New Standard for Field Calibration

Long Stability



High Resolution

CA7000

High Accuracy

■ High Accuracy

- Achieves basic accuracy

■ Rangeability

- Achieves 0.001 kPa

■ User Support

- Strong support
 - Calibration embedded software
 - "As Found" calibration

■ Field Usability

- IP54 dustproof and waterproof environment

■ Accessibility

- Three high-contrast ranges

The CA700 is a highly accurate and highly functional pressure

High Performance and Functionality in a Compact Body

■ High Accuracy and Long Stability

The highest accuracy in the portable class achieved with a silicon resonant sensor

The CA700 employs a silicon resonant pressure sensor with which Yokogawa has achieved the highest accuracy in the portable class of a 0.01 % of reading for pressure measurement and 0.015% of reading for current and voltage measurement. This calibrator is ideal for input and output testing of differential pressure and pressure transmitters in that it correctly measures the input and output accuracy and calculates the error rate.

■ Rangeability

Has the highest resolution and the widest range in its class

The CA700 has achieved a resolution of 0.001 kPa (200,000 kPa range) which is 10-fold higher than that of general field calibrators. The excellent sensing characteristics of a silicon resonant sensor make it possible to achieve a very wide range and enable one CA700 calibrator to replace multiple field calibrators.

■ User Support

Strong support

Calibration procedures are embedded, calibration and can be performed by following the field work. Measurements can be saved to a USB cable. In the event of a failure, the device can be replaced.



■ Field Use

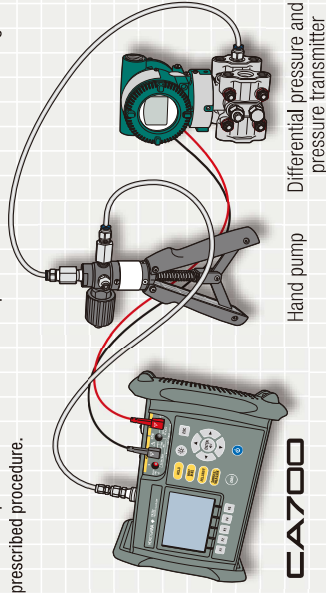
IP54 waterproof
this calibrator

Calibration of pressure transmitters where the environment has a robust calibration standard. The device is dustproof and can be attached to a field calibrator.

Supports Various Applications

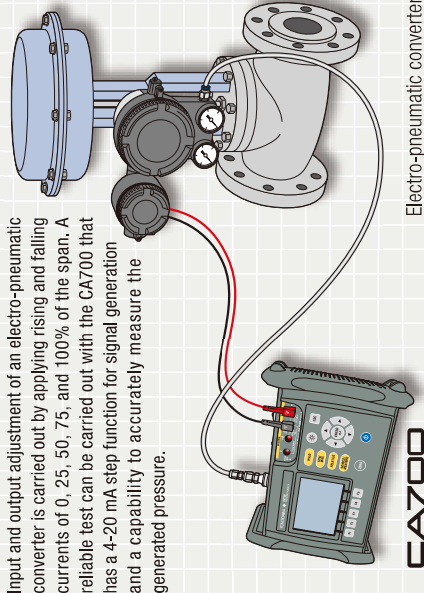
■ Field Calibration of Differential Pressure and Pressure Transmitters

Calibration of pressure transmitters is required to accurately measure the input and output values and to calculate the error rate. The CA700 ensures reliable calibration with its function to accurately measure the input and output values of pressure and current. Additionally its embedded calibration procedures enable users to perform certain calibration following the prescribed procedure.



■ Check and I/O Adjustment of an Electro-pneumatic Converter

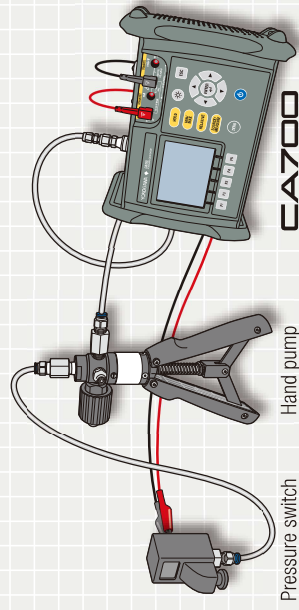
Input and output adjustment of an electro-pneumatic converter is carried out by applying rising and falling currents of 0, 25, 50, 75, and 100% of the span. A reliable test can be carried out with the CA700 that has a 4-20 mA step function for signal generation and a capability to accurately measure the generated pressure.



■ Two-wire Transmitter Loop Check

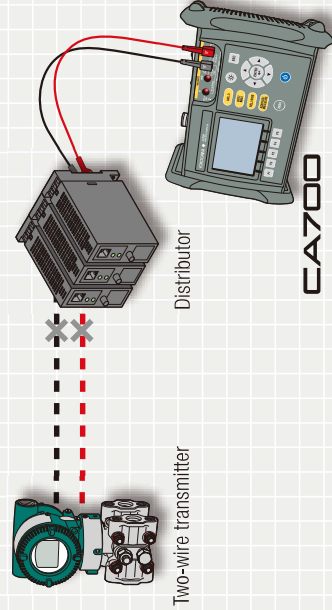
■ Pressure Switch Test

A pressure switch test measures the pressure at the time when the contact opens and closes and the resistance at the time when the dead band contact closes. A test procedure is embedded to enable users to carry out a test following the prescribed procedure.



■ 20 mA SIMULATE (Two-wire Transmitter Simulator)

The CA700 can also be used as a transmitter simulator to carry out a loop test. It can absorb (SINK) the set current from an external voltage generating device (e.g., a distributor system or PLC) of instrumentation equipment. 4-20mA current can be sourced with an accuracy of 0.015% of the reading.



■ Input Command Check and Adjustment of Recorders and Controllers

Three High-Pressure



■ Basic Specifications (Measurement Unit) 23°C±3°C

Pressure Measurement

Model	CA700-E-01	CA700-E-02	CA700-E-03
Pressure type	Gauge		
Measurement range	Positive pressure: 0 to 200 kPa Negative pressure: -80 to 0 kPa	Positive pressure: 0 to 1000 kPa Negative pressure: -80 to 0 kPa	Positive pressure: 0 to 3500 kPa Negative pressure: -80 to 0 kPa
Measurement display range	To 240.000 kPa	To 1200.00 kPa	To 4200.00 kPa
Resolution	0.001 kPa	0.01 kPa	0.01 kPa
Measurement accuracy *1 *2 (6 months after calibration) (tested after zero calibration)	Positive pressure 20 to 200 kPa: ±(0.01% of reading + 0.003 kPa) 0 to 20 kPa: ±0.005 kPa Negative pressure: ±(0.2% of reading + 0.080 kPa)	Positive pressure: ±(0.01% of reading + 0.04 kPa) Negative pressure: ±(0.2% of reading + 0.08 kPa)	Positive pressure: ±(0.01% of reading + 0.15 kPa) Negative pressure: ±(0.2% of reading + 0.08 kPa)
Measurement accuracy *1 *2 (1 year after calibration) (tested after zero calibration)	Positive pressure 20 to 200 kPa: ±(0.01% of reading + 0.010 kPa) 0 to 20 kPa: ±0.012 kPa Negative pressure: ±(0.2% of reading + 0.090 kPa)	Positive pressure: ±(0.01% of reading + 0.08 kPa) Negative pressure: ±(0.2% of reading + 0.09 kPa)	Positive pressure: ±(0.01% of reading + 0.30 kPa) Negative pressure: ±(0.2% of reading + 0.09 kPa)
Response time *3	2.5 s or less		
Allowable input	2.7 kPa abs to 500 kPa gauge	2.7 kPa abs to 3000 kPa gauge	2.7 kPa abs to 4500 kPa gauge
Internal volume	Approx. 6 cm ³		
Temperature coefficient *4	±(0.001% of reading + 0.001% of full scale)/°C or less		
Influence of positional setup	Zero-point drift ±0.3 kPa or less		
Measurement fluid	Gas and liquid (non-corrosive, non-flammable, non-explosive, and non-toxic fluids)		
Measurement fluid temperature *5	-10 to 50°C		
Pressure sensor	Silicon resonant sensor		
Pressure sensor element	Diaphragm		
Pressure display units	kPa and other units (Pa, hPa, MPa, mbar, bar, atm, mmHg, inHg, gf/cm ² , kgf/cm ² , mmH ₂ O@4°C, mmH ₂ O@20°C, ftH ₂ O@4°C, ftH ₂ O@20°C, Torr, psi)		
Input port	Rc 1/4 or 1/4 NPT female thread (selectable)		
Measurement unit material	Diaphragm: Hastelloy C276 and input port: SUS316		

DC Current Measurement

Range	Resolution	Measurement range	Measurement accuracy (1 year)	Remark
20 mA	1 µA	0 to ±20.000 mA	0.015% of reading + 3 µA	Input resistance: 10 Ω or less.
100 mA	10 µA	0 to ±100.00 mA	0.015% of reading + 30 µA	The maximum display is 1.2-fold of range.

DC Voltage Measurement

Range	Resolution	Measurement range	Measurement accuracy (1 year)	Remark
5 V	0.1 mV	0 to ±5.0000 V	0.015% of reading + 0.5 mV	Input resistance: approx. 1 MΩ.
50 V	1 mV	0 to ±50.000V	0.015% of reading + 5 mV	The maximum display is 1.1-fold of range.

24 V Loop Power Supply

Supply voltage		Remark
24 V ± 1 V		Load current 24 mA when communication resistance OFF
24 V ± 6 V		Load current 20 mA when communication resistance ON

■ Basic Specifications (Generation Unit) 23°C±3°C

■ General Specifications

Display	Dot matrix
Backlight	LED
Display refresh rate	Approx. 3
Warm-up time	Approx. 5
Power supply	Six alkaline
Battery life	Approx. 3
Auto power-off	Approx. 6
Insulation resistance	100 MΩ
Withstand voltage	500 VAC
Protection grade	IP54 dust
Dimensions	Approx. 2
Weight	Approx. 2
Compliance standards	Safety: EN
	EMC: EN61326
Operating temperature / humidity ranges	-10 to 50°C
Storage temperature / humidity ranges	-20 to 60°C
Interfaces	Select an
External sensor	A dedicat
Accessories*	A set of 1 thread x 1

* The type of the included conversion connector varies depending on the model.

■ Number of Data Records

Device operation status		Number of data records
Measurement / Source	Save	1000
	Logging	1000
Leak test		
Transmitter calibration (Number of calibration points: 5)	As Found	1000
	As Left	1000
Pressure switch calibration	As Found	1000
	As Left	1000

* The maximum number of files is 250.

* The total data capacity is approx. 3.5 MB

■ Hand Pump Specifications

Product name	Model	Pressure
Hand Pump (Low Pressure)	91051	-8
Hand Pump (Pneumatic)	91056	-8
Hand Pump (Hydraulic)	91061	C

Model and Suffix Code

CA700

Product name	Model	Suffix code
Pressure Calibrator	CA700	General use type
		-E
		All countries except Japan
		-01
		Gauge pressure: 200kPa
		-02
		Gauge pressure: 1000kPa
		-03
		Gauge pressure: 3500kPa
		-U1
		Metric units*
		-U2
		Metric units and non-metric units
		-P1
		Rc 1/4" female thread
		-P2
		1/4" NPT female thread

*1: Only kPa, Pa, hPa, MPa, mbar, bar, atm are available.

Separately Sold Accessories *2

Product name	Model	Specification
Carrying Case	93050	Bag for the calibrator, accessories, and peripheral devices
Grabber Clip	98025	A set of separate red and black clips (for 2 m long wires)
Cleaning Unit	91040	For input connection port -P1 (R 1/4" male thread)
Cleaning Unit	91041	For input connection port -P2 (1/4" NPT male thread)

*2: These accessories are not included in the CA700 calibrator package.



Carrying Case
93050



Grabber Clip
98025



Cleaning Unit
91040/91041

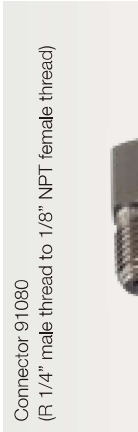
CA700 Accessories *3

Product name	Model	Specification
Connector *4	91080	R 1/4" male thread to 1/8" NPT female thread conversion connector (for -P1)
Connector *4	91081	R 1/4" male thread to 1/4" NPT female thread conversion connector (for -P1)
Connector *5	91082	1/4" NPT male thread to 1/8" NPT female thread conversion connector (for -P2)
Lead Wires for Source / Measurement	98064	Red and black alligator clip lead wires, 1.7 m long
Accessory Bag	B9108XA	For lead wires and connector

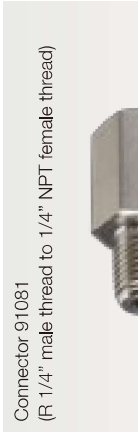
*3: Included in the CA700 calibrator package at the time of purchase.

*4: Included in the package when suffix code -P1 is selected.

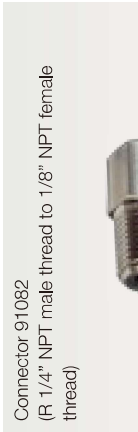
*5: Included in the package when suffix code -P2 is selected.



Connector 91080
(R 1/4" male thread to 1/8" NPT female thread)



Connector 91081
(R 1/4" male thread to 1/4" NPT female thread)



Connector 91082
(R 1/4" NPT male thread to 1/8" NPT female thread)

Model and Suffix Code

Pressure Hand Pump Kits *6

Product name	Model
Hand Pump Kit (Low Pressure)	91050
Hand Pump Kit (Pneumatic)	91055
Hand Pump Kit (Hydraulic)	91060

*6: These accessories are not included in the CA700 calibrator package.



Hand Pump Kit (Low Pressure)
91050

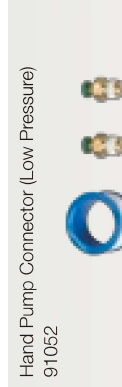
Hand Pump Kit Accessories *7

Product name	Model
Hand Pump (Low Pressure)	91051
Hand Pump (Pneumatic)	91052
Hand Pump (Hydraulic)	91053
Hand Pump Connector (Low Pressure)	91054
Hand Pump Connector (Pneumatic)	91055
Hand Pump Connector (Hydraulic)	91056
Hand Pump Case (Low Pressure)	91057
Hand Pump Case (Pneumatic/Hydraulic)	91058

*7: These accessories are included in the hand pump kit package.



Hand Pump (Low Pressure)
91051



Hand Pump Connector (Low Pressure)
91052

■ Related Products

PC-based field device management tool

- Multi-vendor, multi-protocol support BRAIN, FOUNDATION™ Fieldbus H1, HART®, PROFIBUS and ISA100.11a
- Automatic device data acquisition upon connection to a device or a segment (Segment Viewer)
- Easy acquisition and diagnosis of device status (Device Viewer)
- Categorization, sorting and filtering (History)
- Multi-parameter set-up (Parameter Manager)



FieldMate™

Versatile Device Management Wizard

Handheld Terminal for BRAIN Communication

- Online monitoring and communication.
- Easy setup and alteration procedures in English prompting interactive sequences.
- Diagnostics/security with error messages. (Self-check function, Security code protection of setpoints, Low battery voltage alarm and Automatic power-off)
- Printer prints out tag numbers and other parameters on the spot.



**BRAIN Terminal
BT200**

Highly Accurate All-In-One Calibrator

- Dual display of source and measurement with an accuracy of 0.02%
- Multiple sources and measurements of DCV, DCmA, Ω, TC, RTD, Hz, and PULSE
- 24 V loop power supply and output signal measurement at the same time
- Current sink function to simulate a transmitter
- A variety of sweep functions selectable (Step, Linear, Program, and Sweep)
- Three power supply options available (AA batteries, AC adapter [sold separately], and NiMH batteries [sold separately])



**Handy Calibrator
CA150**

Best-Selling Field Calibrator Model with High Performance and Low Price

- Small, light, and high performance at a low price
- Source and measurement of DCV, DCmA, Ω, TC, RTD, Hz, and PULSE
- DMM-like operation with a rotary switch
- Source and measurement (counting) of dry contact pulses



**Handy Calibrator
CA71**

Clamp-on Measurement of 4-20 mA Instrumentation Signals

- Process signal measurement with no need to disconnect a loop
- Accuracy 0.2% + 5 dgt and resolution 0.01 mA
- Simultaneous display of percentage (%) of the measured value and span
- LED backlight ideal for measuring in dark places
- Thick signal wire with a diameter of up to 6 mm can be clamped easily.



**Clamp-on Process Meter
CL420**

Safety DMM Equipped with a Loop Power Supply and 4-20 mA Output

- 24 V loop power supply and measures output signal at the same time
- Resistor (250Ω) for HART and BRAIN communication embedded and selectable.
- Transmitter simulation (current sink) function
- Step, Auto-step, and Linear sweep functions are selectable
- 6,000-count DMM function
- EN61010-1 CATIV600V and CATIII1000V safety design



**Process Multimeter
CA450**

⚠ NOTICE

- Before using the product, read the instruction manual carefully to ensure proper and safe operation.

Yokogawa Meters & Instruments Corporation

World Wide Web site at
<http://www.yokogawa.com/yml>

vigilantplant.®

The clear path to operational excellence

SEE
CLEARLY

KNOW
IN ADVANCE

ACT
WITH AGILITY

VigilantPlant is Yokogawa's automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

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