User's Manual

CA700 Pressure Calibrator Getting Started Guide

YOKOGAWA
Yokogawa Test & Measurement Corporation

IM CA700-02EN
7th Edition

Product Registration

Thank you for purchasing YOKOGAWA products.

YOKOGAWA provides registered users with a variety of information and services. Please allow us to serve you best by completing the product registration form accessible from our website.

http://tmi.yokogawa.com/

Thank you for purchasing the CA700 pressure calibrator. This getting started guide primarily explains the handling precautions and basic operations of the CA700. To ensure correct use, please read this manual thoroughly before beginning operation.
After reading this manual, keep it in a safe place. The following manuals, including this one, are provided as manuals for the CA700. Please read all manuals.

Manual Title	Manual No.	Description
CA700 Pressure Calibrator User's Manual	IM CA700-01EN	The manual explains all the CA700 features. It is included in the accompanying CD.
CA700 Pressure Calibrator Getting Started Guide	IM CA700-02EN	This guide. Provided as a printed manual. This guide explains the handling precautions, basic operations, and specifications of the CA700.
CA700 Pressure Calibrator	IM CA700-92Z1	Document for China

The "-EN" in the manual number is the language code.

Contact information of Yokogawa offices worldwide is provided on the following sheet.

Document Description	Description
PIM 113-01Z2	List of worldwide contacts

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functionality. The figures given in this manual may differ from those that actually appear on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
- Copying or reproducing all or any part of the contents of this manual without the permission of YOKOGAWA is strictly prohibited.

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- Adobe, Acrobat, and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated.
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- In this manual, the TM and ® symbols do not accompany their respective®registered trademark or trademark names.
- Other company and product names are registered trademarks or trademarks of their respective holders.

7th Edition: October 2019 (YMI)

Revisions

- 1st Edition: August 2013
- 2nd Edition: September 2015
- 3rd Edition: June 2017
- 4th Edition: October 2017
- 5th Edition: June 2018
- 6th Edition: October 2018
- 7th Edition: October 2019

Checking the Contents of the Package

Unpack the box and check the contents before operating the instrument. If the wrong items have been delivered, if items are missing, or if there is a problem with the appearance of the items, contact your nearest YOKOGAWA dealer.

CA700

Check that the product that you received is what you ordered by referring to the model name and suffix code given on the name plate on the rear panel.

MODEL	Suffix Code	Specifications
CA700		Pressure calibrator
	-E	For all countries except Japan
Gauge pressure	-01	200 kPa guage model
	-02	1000 kPa guage model
	-03	3500 kPa guage model
Pressure unit	-U1	SI units
	-U2	SI units and non-SI units
Input connection	-P1	Rc1/4 female threads
	-P2	1/4NPT female threads

No. (Instrument number)

When contacting the dealer from which you purchased the instrument, please give them the instrument number.

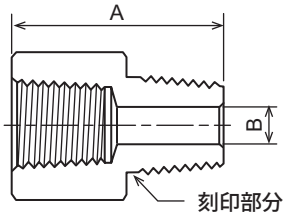
Standard Accessories

The instrument is shipped with the following accessories. Make sure that all accessories are present and undamaged.

Item	Model/Part No.	Quantity	Specifications and Notes
Signal cable	98064	1	Red/Black pair
Shoulder strap	B8070CY	1	—
Connector	91080	1	For -P1(Rc1/4)
	91081	1	For -P1(Rc1/4)
	91082	1	For -P2(1/4NPT female threads)
Dry cells	A1070EB	6	Alkaline “AA” (LR6) 1.5 V
Accessory case	B9108XA	1	—
Ferrite core	A1193MN	2	
Cap	L4060CL	1	For the pressure input port (comes attached to the CA700)
CD-ROM (User’s Manuals)	L3060TD	1	Contains PDFs of the user’s manuals and USB driver
User’s manual	IM CA700-02EN	1	This guide.
	IM CA700-92Z1	1	Document for China
	PIM 113-01Z2	1	List of worldwide contacts

Standard accessories are not covered by warranty of this instrument.

External Dimensions of Conversion Connectors



Connector	A(mm)	B(mm)	Note
91080	26.9	7.1	Engraved as “NPT”
91081	36.1	7.1	Engraved as “NPT”
91082	26.9	7.1	

CD-ROM (User's Manuals)

The CD-ROM contains PDF files of the following manuals. To view these user's manuals, you need Adobe Reader 5.0 or later.

English

File Name	Manual Title	Manual No.
CA700 User's Manual.pdf	CA700 Pressure Calibrator User's Manual	IM CA700-01EN
CA700 Getting Started Guide.pdf	CA700 Pressure Calibrator Getting Started Guide	IM CA700-02EN

WARNING

Never play this CD-ROM, which contains the user's manuals, in an audio CD player. Doing so may cause loss of hearing or speaker damage due to the large sounds that may be produced.

French

AVERTISSEMENT

Ce CD contient les manuels d'utilisation. Ne jamais insérer ce CD dans un lecteur de CD audio. Cela pourrait entraîner une perte d'audition ou l'endommagement des enceintes en raison du volume potentiellement élevé des sons produits.

Optional Accessories (Sold separately)

The following optional accessories are available for purchase separately. For information about ordering accessories, contact your nearest YOKOGAWA dealer.

Item	Model/ Part No.	Min. Q'ty	Specifications	Manual No.
Carrying case	93050	1	CA700, accessory case	-
Grabber clip	98025[1]	1	Red/Black pair, separate type (2.0 m)	-
Grabber clip	98026	1	Red/Black pair, separate type (2.0 m)	-
Cleaning unit	91040	1	Pressure input port Rc1/8 female thread, 2 locations (for -P1 and -P2)	-
Cleaning unit	91041	1	Pressure input port 1/8NPT female thread, 2 locations (for -P1 and -P2)	-
Connector	91080	1	R1/4 male to NPT 1/8 female	-
Connector	91081	1	R1/4 male to NPT 1/4 female	-
Connector	91082	1	NPT 1/4 male to NPT 1/8 female	-
Low pressure pump kit	91050	1	A set containing 91051, case (93052), and connector set (91052)	-
Low pressure pump	91051	1	-83 Pa to 700 kPa	-
Connector set (low pressure pump)	91052	1	Connector set for 91051	-
Pneumatic pressure pump kit	91055	1	A set containing 91056, case (93053), and connector set (91057)	-
Pneumatic pressure pump	91056	1	-83 Pa to 4000 kPa	-
Connector set (pneumatic pressure pump)	91057	1	Connector set for 91056	-
Hydraulic pressure pump kit	91060	1	A set containing 91061, case (93053), and connector set (91062)	-
Hydraulic pressure pump	91061	1	-0 Pa to 70 MPa	-
Connector set (hydraulic pressure pump)	91062	1	Connector set for 91061	-
Case (for 91051)	93052	1	For storing 91051 and 91052	-
Case (for 91056 and 91061)	93053	1	For storing 91056 and 91057, or 91061 and 91062	-
External pressure sensor[2]	PM100	1	-05: 16 MPa range shield gauge model -06: 70 MPa range shield gauge model	PM100-01EN

Optional accessories(sold separately) are not covered by warranty of this instrument.

1: Obsolete product

2: PM100-*-05: available in 1.10 or later firmware versions of the CA700.
PM100-*-06: available in 1.20 or later firmware versions of the CA700.
You can download the latest firmware version from our website.

Conventions Used in This Manual

Unit

k: Denotes 1000. Example: 100 kS/s (sample rate)

K: Denotes 1024. Example: 720 KB (file size)

Displayed Characters

Bold characters in procedural explanations are used to indicate panel keys and soft keys that are used in the procedure and menu items that appear on the screen.

Notes

The notes and cautions in this manual are categorized using the following symbols.

mproper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the user's manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION Calls attention to actions or conditions that could cause light injury to the user or cause damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

Note Calls attention to information that is important for the proper operation of the instrument.

French

Une manipulation ou une utilisation incorrectes risquent de blesser l'utilisateur ou d'endommager l'instrument. Ce symbole apparaît sur l'instrument pour indiquer à l'utilisateur qu'il doit se reporter au manuel de l'utilisateur afin d'y lire les instructions spécifiques correspondantes. Ce même symbole apparaît à la section correspondante du manuel de l'utilisateur pour signaler lesdites instructions. Dans le manuel de l'utilisateur, ce symbole est accompagné des termes AVERTISSEMENT et ATTENTION.

AVERTISSEMENT Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures graves (voire mortelles), et sur les précautions de sécurité pouvant prévenir de tels accidents.

ATTENTION Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures légères ou d'endommager l'instrument ou les données de l'utilisateur, et sur les précautions de sécurité susceptibles de prévenir de tels accidents.

Safety Precautions

This product is designed to be used by a person with specialized knowledge.
The general safety precautions described herein must be observed during all phases of operation.
If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. YOKOGAWA assumes no liability for the customer's failure to comply with these requirements.
This manual is an essential part of the product; keep it in a safe place for future reference. Yokogawa Electric Corporation assumes no liability for the customer's failure to comply with these requirements.

The following symbols are used on this instrument.


Handle with care. Refer to the user's manual or service manual. This symbol appears on dangerous locations on the instrument which require special instructions for proper handling or use. The same symbol appears in the corresponding place in the manual to identify those instructions.


Ground (earth) or functional ground terminal (do not use this terminal as a protective ground terminal)


Alternating current


Direct current


Power switch

French


À manipuler délicatement. Toujours se reporter aux manuels d'utilisation et d'entretien. Ce symbole a été apposé aux endroits dangereux de l'instrument pour lesquels des consignes spéciales d'utilisation ou de manipulation ont été émises. Le même symbole apparaît à l'endroit correspondant du manuel pour identifier les consignes qui s'y rapportent.


Borne de terre ou borne de terre fonctionnelle (ne pas utiliser cette borne comme prise de terre.)


Courant alternatif

Courant direct


l'interrupteur d'alimentation

Failure to comply with the precautions below could lead to injury or death or damage to the instrument.

WARNING

Use the Instrument Only for Its Intended Purpose

This instrument is equipped with DC current and DC voltage measurement and generation features as well as a pressure measurement feature. It is a calibrator for pressure devices. Use the instrument only for measuring and generating DC current and DC voltage, measuring pressure, and calibrating pressure devices.

Check the Physical Appearance

Do not use the instrument if there is a problem with its physical appearance.

Do Not Operate in an Explosive Atmosphere

This instrument is not explosion-proof.
Do not operate the instrument in the presence of flammable gases or vapors. Doing so is extremely dangerous.

Do Not Remove Covers or Disassemble or Alter the Instrument

Removing covers and disassembling or altering the instrument are strictly prohibited.
Some sections inside the instrument have high voltages that are extremely dangerous. For internal inspection and adjustment, contact your nearest YOKOGAWA dealer.

Measuring High Pressure Fluid

- Use piping and pressure connectors that can withstand the pressure to be measured.
- Make sure that there are no leaks from the piping, connectors, and joints and that the joints are not loose. If the fluid under measurement leaks or if a joint comes loose, the pressure can endanger the user or the surrounding instruments. Note that higher the pressure, greater the danger.
- Depending on the amount or type of gas, if you are handling gas that is 1 MPa or higher, safety laws related to high pressure gas may require supervision.
- Do not measure flammable, explosive, poisonous, or corrosive liquids.

Such an act can endanger the user.

Observer the Pressure Limit

Do not apply pressure exceeding the allowable input range. Doing so may cause damage to the instrument.

Measurement Category

The measurement category of this instrument is Other (O). Do not use it to measure the main power supply or locations that fall under Measurement Categories II, III, and IV.

Install or Use the Instrument in Appropriate Locations

- The instrument complies with protection level IP54. Do not install the instrument in locations whose level exceeds this protection level.
- Install the instrument so that you can immediately remove the batteries if an abnormal or dangerous condition occurs.

CAUTION

- Do not use the instrument to measure gas or liquids that can corrode the piping material, high temperature liquids (50°C or higher) or gas-liquid mixtures.
  If you are measuring gas, make sure the gas is dry and clean. Do not measure air with high moisture or high oil content.

- For safety and sanitary reasons, do not use the instrument to measure liquids for drinking.
- This instrument has been designed to withstand physical shock, but to maintain high accuracy, handle the instrument with care (protect the instrument from physical shock).
- Do not use the instrument where the ambient temperature drastically fluctuates. Such environment can cause measurement errors.
- Using the instrument where there is wind or air flow may degrade the measurement accuracy.

Operating Environment Limitations

This product is a Class A (for industrial environments) product. Operation of this product in a residential area may cause radio interference in which case the user will be required to correct the interference.

French

AVERTISSEMENT

Utiliser l'instrument aux seules fins pour lesquelles il est prévu

Cet instrument est équipé de fonctions de génération et de mesure de tension c.c. et de courant c.c., ainsi que d'une fonction de mesure de pression. Il s'agit d'un calibreur pour dispositifs de pression.

Utiliser cet instrument uniquement pour mesurer et générer un courant c.c. et une tension c.c., mesurer la pression et calibrer des dispositifs de pression.

Inspecter l'apparence physique

Ne pas utiliser l'instrument si son intégrité physique semble être compromise.

Ne pas utiliser dans un environnement explosif

Cet instrument n'est pas antidéflagrant.

Ne pas utiliser l'instrument en présence de gaz ou de vapeurs inflammables. Cela pourrait être extrêmement dangereux.

Ne pas retirer le capot, ni démonter ou modifier l'instrument

Seul le personnel YOKOGAWA qualifié est habilité à retirer le capot et à démonter ou modifier l'instrument. Certains composants à l'intérieur de l'instrument sont à haute tension et par conséquent, représentent un danger.

Mesure du fluide haute pression

- Utiliser une tuyauterie et des connecteurs pression pouvant résister à la pression à mesurer.
- S'assurer de l'absence de fuites au niveau de la tuyauterie, des connecteurs et des joints, et vérifier que les joints ne sont pas desserrés. En cas de fuite du fluide mesuré ou de desserrage d'un joint, la pression risque de mettre en danger l'utilisateur ou les instruments environnants. Il est à noter que plus la pression est élevée, plus le danger est important.
- En cas de manipulation de gaz à 1MPa ou plus, la législation relative à la sécurité des gaz haute pression peut rendre une surveillance obligatoire, en fonction de la quantité ou du type de gaz.
- Ne pas mesurer des liquides inflammables, toxiques ou corrosifs.

Une telle action peut s'avérer dangereuse pour l'utilisateur.

Respecter la limite de pression

Ne pas appliquer de pression supérieure à la plage d'entrée autorisée. Le cas échéant, un endommagement de l'équipement risquerait de se produire.

Catégorie de mesure

<DLM4000>La catégorie de mesure des terminaux d'entrée de signal du DLM4000 est Autre (O). Ne pas l'utiliser pour mesurer l'alimentation électrique, ni pour les catégories de mesure II, III et IV.

Installer et/ou utiliser l'instrument aux emplacements appropriés

- L'instrument est conforme au niveau de protection IP54. Ne pas installer l'instrument à un emplacement de niveau supérieur à ce niveau de protection.
- Installer l'instrument de façon à pouvoir en retirer immédiatement les batteries en cas d'apparition d'une condition anormale ou dangereuse.

ATTENTION

- Ne pas utiliser l'instrument pour mesurer des gaz ou des liquides susceptibles de corroder le matériau de la tuyauterie, des liquides haute température (50 °C ou plus) ni des mélanges gaz-liquides.
  En cas de mesure de gaz, s'assurer que le gaz est propre et sec. Ne pas mesurer de l'air très humide ni de l'air à haute teneur en huile.
- Pour des raisons sécuritaires et sanitaires, ne pas utiliser l'instrument pour mesurer des liquides destinés à être ingérés.
- Cet instrument a été conçu de façon à résister à des chocs physiques. Cependant, pour maintenir son haut niveau de précision, manipuler l'instrument avec précaution (protéger l'instrument contre les chocs physiques).
- Ne pas utiliser l'instrument dans un lieu exposé à de fortes fluctuations de la température ambiante. Un tel environnement peut provoquer des erreurs de mesure.
- L'utilisation de l'instrument dans un lieu exposé au vent ou aux courants d'air risque d'affecter la précision de la mesure.

Limitations relatives à l'environnement opérationnel

Ce produit est un produit de classe A (pour environnements industriels). L'utilisation de ce produit dans un zone résidentielle peut entraîner une interférence radio que l'utilisateur sera tenu de rectifier.

Sales in Each Country or Region

Waste Electrical and Electronic Equipment

Waste Electrical and Electronic Equipment (WEEE)

(This directive is valid only in the EU.)

This product complies with the WEEE Directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive, this product is classified as a "Monitoring and control instruments" product.

Do not dispose in domestic household waste. When disposing products in the EU, contact your local Yokogawa Europe B. V. office.

New EU Battery Directive

New EU Battery Directive

(This directive is valid only in the EU.)

Batteries are included in this product. This marking indicates they shall be sorted out and collected as ordained in the EU battery directive

Battery type: Alkaline dry cell, size "AA" (LR6) 1.5V

When you remove batteries from this product and dispose them, discard them in accordance with domestic law concerning disposal.

Take the proper action to dispose batteries in accordance with the established collection system in the EU.

How to remove batteries safely

See section 2.3, "Inserting Batteries and Turning the Power On and Off."

Battery type: Primary lithium battery for memory back up

You cannot replace batteries by yourself. If you are in the EU, contact your local Yokogawa Europe B. V. office.

Pressure Equipment Directive

The CA700 is categorized as Sound Engineering Practice(SEP) under the Pressure Equipment Directive(PED).

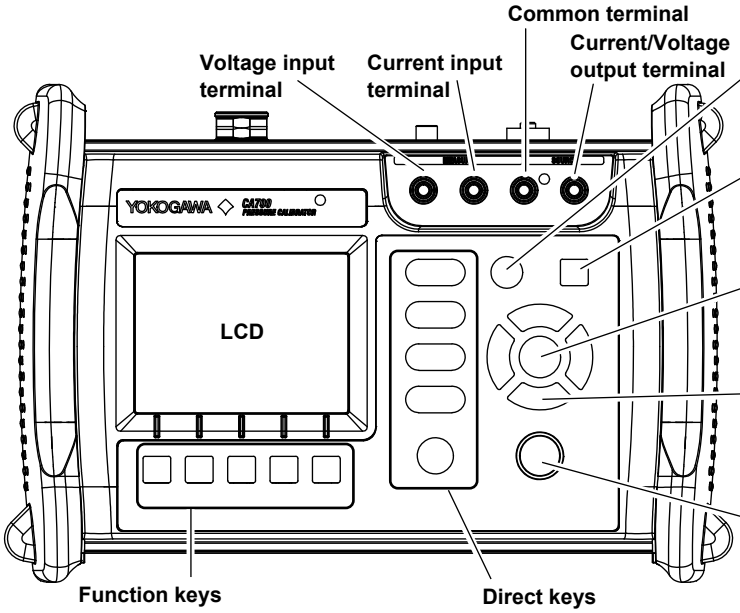
Authorized Representative in the EEA

Yokogawa Europe B. V. is the authorized representative of Yokogawa Test & Measurement Corporation in the EEA for this product. To contact Yokogawa Europe B. V., see the separate list of worldwide contacts, PIM 113-01Z2.

Contents

1.1 Front Panel, Top Panel, and Rear Panel

Front Panel



Backlight key
Turns on and off the LCD backlight

ESC key
Press to return to the previous menu or to cancel the current operation.

ENTER key
Press to confirm procedures and settings.

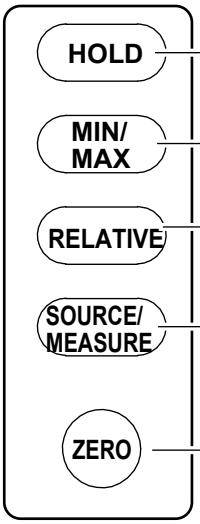
Arrow keys
Press to change values, move between digits, and move the cursor.

Power on/off key
Press to turn the CA700 on and off.

Function keys
Press to select the menu items that are shown at the bottom of the display.

Direct keys

Direct Keys



HOLD Key
Press to hold the measured value in the display. When you press HOLD, all keys are disabled except for the HOLD key, the Power ON/OFF key, and the Save and Logging Start function key.

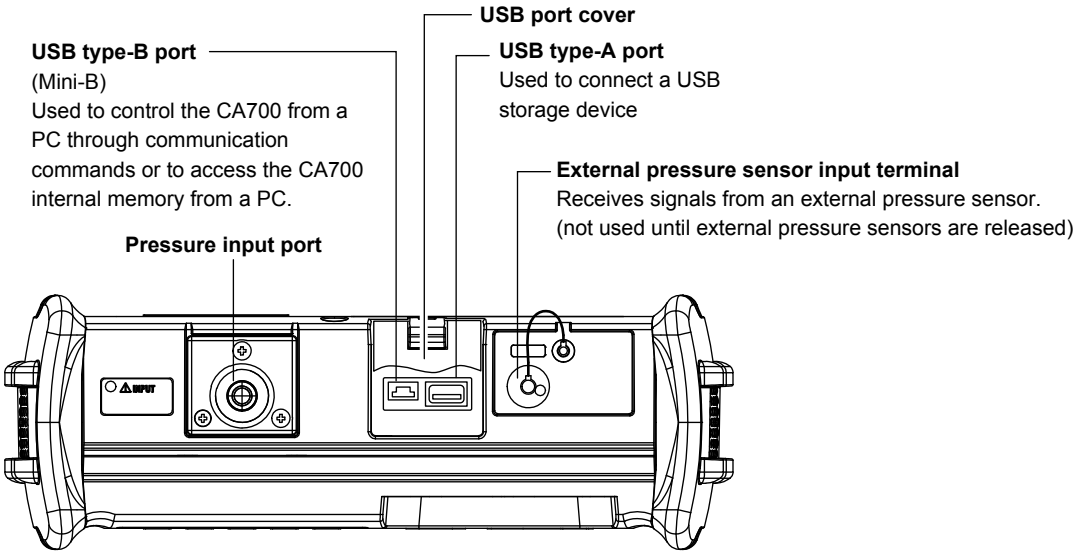
MIN/MAX key
Press to hold the maximum and minimum values in the display or to clear them.

RELATIVE key
Press to display the difference between the measured value and the preset reference value. When the difference is displayed, “REL” appears in the display.

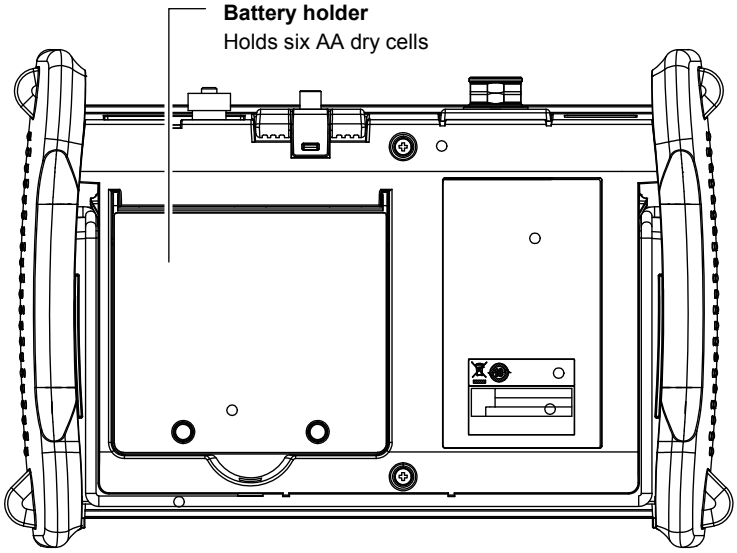
SOURCE/MEASURE key
Press to switch between source and measure.

ZERO key
Press to perform zero point calibration for pressure measurement.

Top Panel



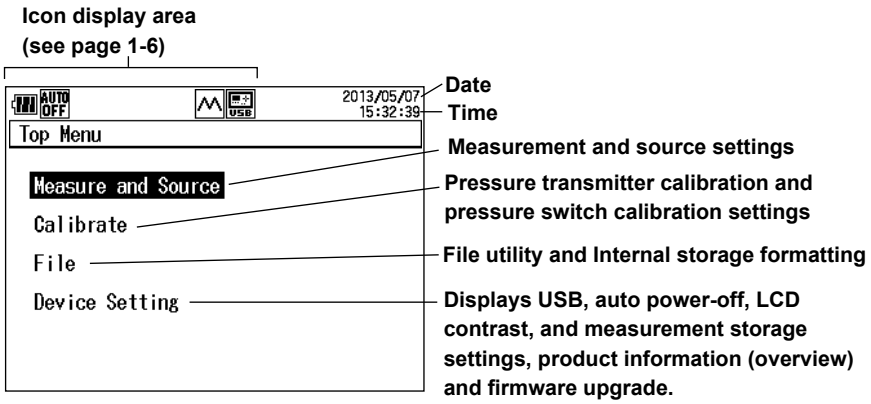
Rear Panel



1.2 Display

Top Menu

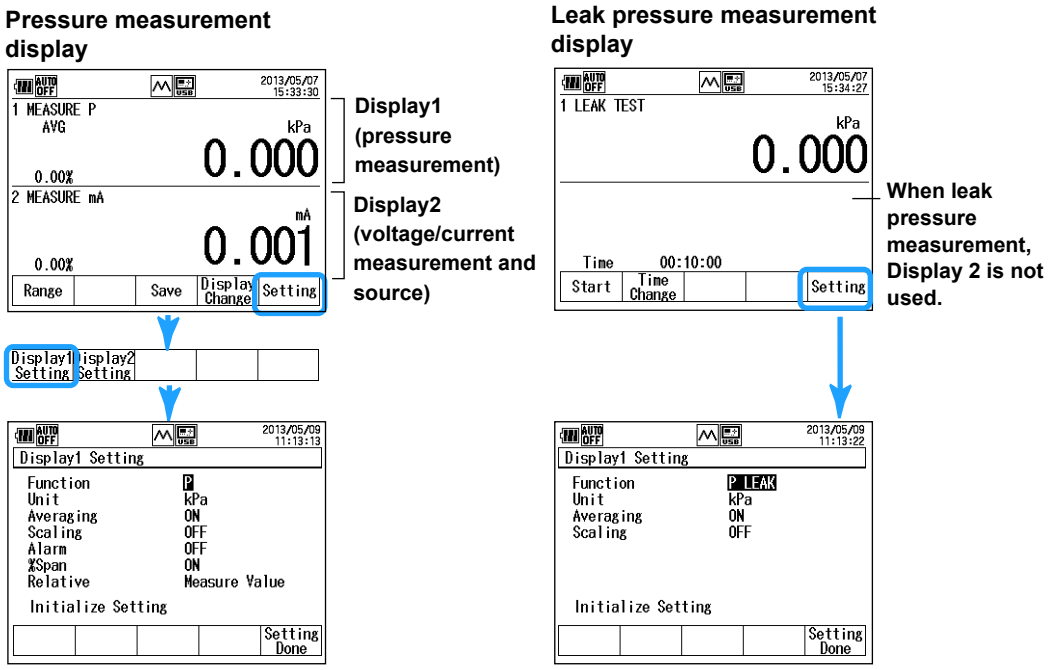
When you turn the power on, the top menu appears.



Selecting **Measure and Source** from the top menu shows a pressure, voltage, and current measurement and voltage and current source displays. The top half of the display shows the pressure measurement display (Display1), and the bottom half displays the current and voltage measurement/ source display (Display2).

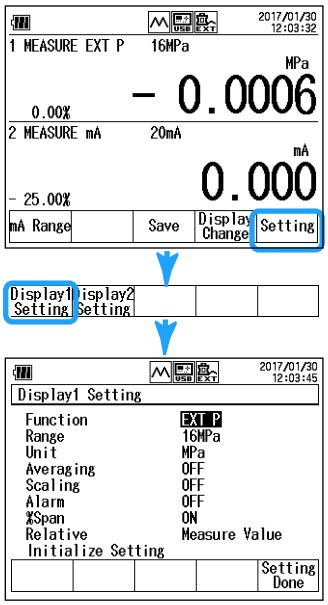
Configuring the Pressure Measurement

When the External Pressure Sensor Is not Used

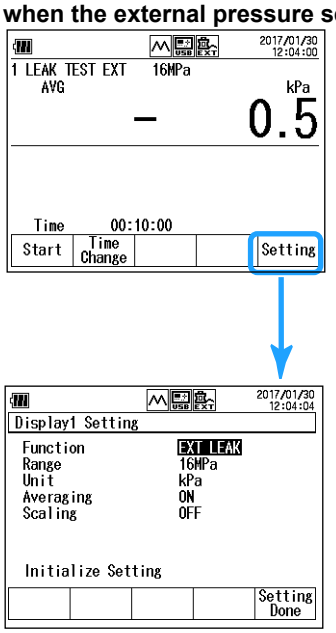


When the External Pressure Sensor Is Used

Pressure measurement display when the external pressure sensor is used



Leak pressure measurement display when the external pressure sensor is used

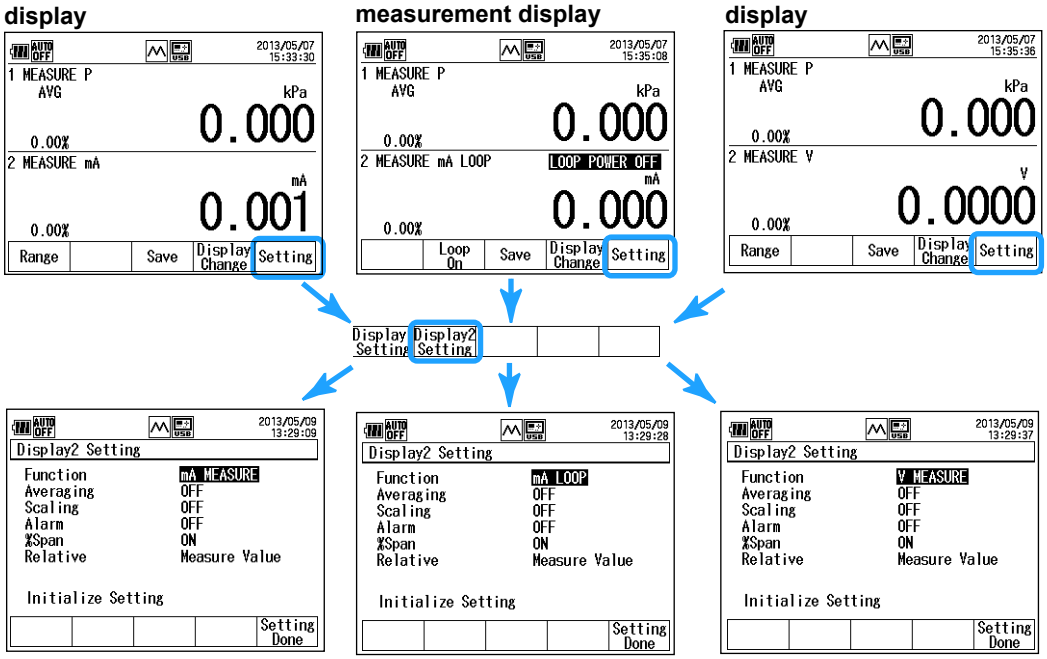


Configuring the Current/Voltage Measurement

Current (mA) measurement display

Loop current (mA LOOP) measurement display

Voltage (V) measurement display

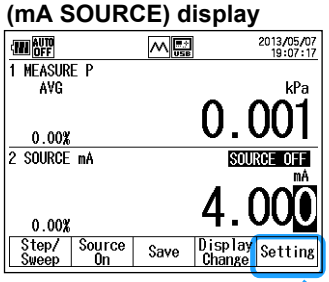


Note

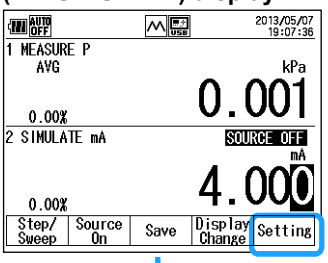
Selecting Scaling, Alarm, %Span, or Relative and then pressing ENTER shows the corresponding setup menu.

Configuring the Current/Voltage Source

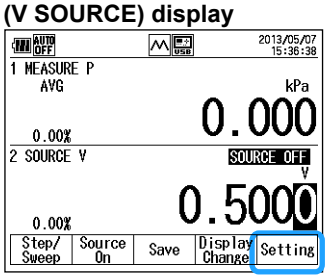
Current source (mA SOURCE) display

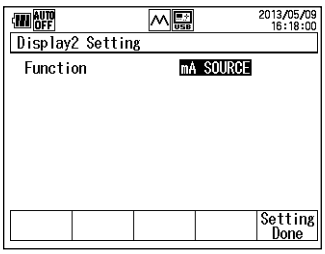


Current simulation (mA SIMULATE) display

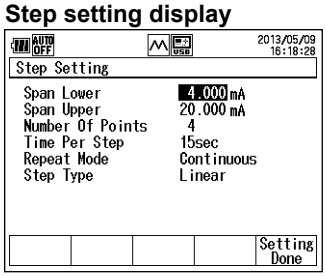


Voltage source (V SOURCE) display





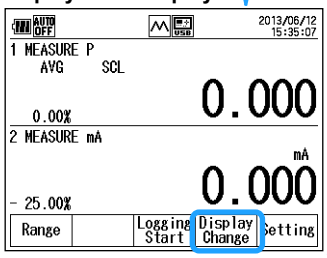
Step setting display



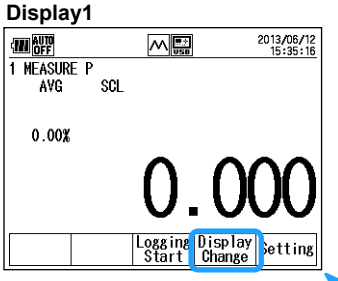
Switching between Display1 and Display2

In the pressure measurement, voltage/current measurement, or voltage/current source display, pressing Display Change (F4) switches the display from showing Display1 and Display2 to showing only Display1 or Display2.

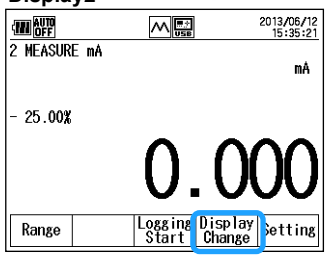
Display1 and Display2



Display1



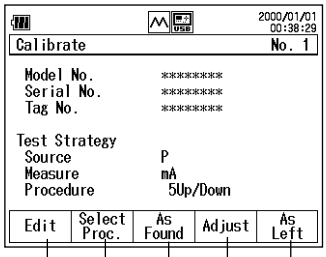
Display2



When only Display1 or Display2 is showing, pressing Setting (F5) will show the corresponding setup display.

Pressure Transmitter/Pressure Switch Calibration Display

Selecting **Calibrate** from the top menu shows the pressure transmitter and pressure switch calibration display.



Edit the calibration target information.

Select the calibration procedure.

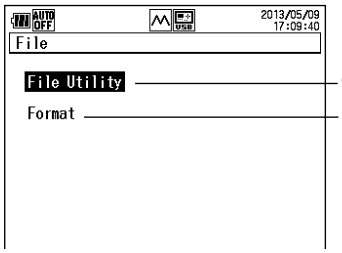
Saves data after calibration

Adjustment

Saves data before calibration

File Display

Selecting **File** from the top menu shows the file display.

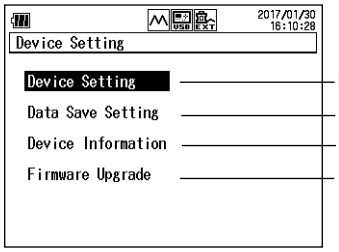


Copy and delete files.

Format the Internal storage

Basic Setting Display

Selecting **Device Setting** from the top menu shows the file display.



Basic settings (auto power-off, display contrast, USB, etc.)

Data saving options (interval, number of data points, etc.)

Product information (overview)

Firmware Upgrade (internal pressure sensor, external pressure sensor)

Icon

The icon display area shows the following icons (marks) depending on the CA700 settings.

Remaining battery power

Appears when the auto-off feature is ON

Appears while holding

Appears when the internal resistor (250 Ω) is on

Sweep mode

Appears in step sweep mode

Appears in linear sweep mode

USB feature

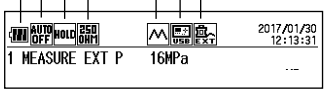
Appears when USB communication is set to Function and USB Function is set to Comm. (communication with the PC)

Appears when USB Connection is set to Function and USB Function is set to Mass Storage (USB storage for the PC)

Appears when USB Connection is set to Host (USB storage device connected to the CA700)

External pressure sensor

Appears when the external pressure sensor is connected



2.1 Handling Precautions

Safety Precautions

If you are using this instrument for the first time, make sure to read “Safety Precautions” on pages vii and viii.

Do Not Remove the Case

Do not remove the case from the instrument. Some parts of the instrument use high voltages and are extremely dangerous. For internal inspection and adjustment, contact your nearest YOKOGAWA dealer.

Unplug If Abnormal Behavior Occurs

If you notice smoke or unusual odors coming from the instrument, immediately turn off the power and remove the batteries. Then, contact your nearest YOKOGAWA dealer.

Operating Environment and Conditions

This instrument complies with the EMC standard under specific operating environment and operating conditions. If the installation, wiring, and so on are not appropriate, the compliance conditions of the EMC standard may not be met. In such cases, the user will be required to take appropriate measures.

General Handling Precautions

Do Not Place Objects on Top of the Instrument

Never place objects such as other instruments or objects that contain water on top of the instrument. Doing so may damage the instrument.

Do Not Subject the Inputs to Mechanical Shock

Applying shock to the input connectors, probes, etc., can cause electrical noise to enter the instrument through the signal lines.

Do Not Damage the LCD

Because the LCD is very vulnerable and can be easily scratched, do not allow any sharp objects near it. Also, the LCD should not be exposed to vibrations or shocks.

Remove the Batteries during Extended Non-Use

Remove the batteries.

When Carrying the Instrument

First, turn off the item under measurement. Then, turn off the CA700. Remove all lead cables. Use the carrying case to carry the instrument.

When Cleaning the Instrument

When cleaning the case or the operation panel, gently wipe the outer surface using a damp, well-wrung, soft, clean cloth. The instrument can malfunction if water enters inside the instrument.
Do not use volatile chemicals such as benzene or thinner for cleaning, as they may lead to discoloration or deformation.

Other Precautions

- Keep electrically charged objects away from the input terminals. They may damage the internal circuitry.
- Do not cover the case or operation panel with a volatile material or leave rubber or vinyl products in contact with the case or operation panel for a long time.
- The operation panel is made of thermoplastics resin. Keep soldering iron and other heating elements away from the operation panel.
- For precautions related to the handling of batteries, see section 2.3, “Installing Batteries and Turning the Power On and Off.”
- Do not use the instrument with the battery holder open.

Storage Precautions

Storage Location

Avoid the following kinds of places for storing the instrument:

- Where the temperature falls outside the storage temperature and humidity ranges
- In direct sunlight or near heat sources
- In an environment with excessive amounts of soot, steam, dust, or corrosive gas
- In an environment that is subject to large levels of mechanical vibration
- On an unstable surface
- Where an excessive amount of soot, dust, salt, or iron is present

Other Precautions

When storing the instrument, attach the supplied cap to the pressure input port.

2.2 Installing the Instrument

WARNING

Install the instrument so that you can immediately turn off the power if an abnormal or dangerous condition occurs.
Do not use the instrument to measure locations that fall under Measurement Categories II, III, and IV.

CAUTION

- IThe instrument complies with protection level IP54 when protection caps are used. Do not install the instrument in an environment whose level exceeds this protection level. Water or dust can enter inside the instrument and cause a malfunction.
- This instrument is equipped with voltage and current source and measurement features. Do not use the instrument when it is wet. Doing so may damage the instrument.

French

AVERTISSEMENT

- Installer l'instrument de façon à pouvoir le mettre immédiatement hors tension en cas d'apparition d'une condition anormale ou dangereuse.
- Ne pas utiliser l'instrument pour mesurer des emplacements appartenant aux catégories de mesure II, III, et IV.

ATTENTION

- L'instrument est conforme au niveau de protection IP54 lorsque des capuchons de protection sont utilisés. Ne pas installer l'instrument à un emplacement dont le niveau est supérieur à ce niveau de protection. De l'eau ou de la poussière risque de pénétrer à l'intérieur de l'instrument et de provoquer un dysfonctionnement.
- Cet instrument est doté de fonctions de mesure et de source de courant et de tension. Ne pas utiliser l'équipement lorsqu'il est mouillé. Le cas échéant, un endommagement de l'équipement risquerait de se produire.

Installation Conditions

Install the instrument in a place that meets the following conditions.

Flat, Even Surface

To measure pressure using the pressure sensor in the instrument, install the instrument on a stable surface that is level in all directions. Pressure may not be measured correctly when the instrument is placed in an unstable or inclined place.

Operating Altitude and Ambient Temperature and Humidity

Use the instrument in the following environment.

Ambient temperature	10°C to 50°C
Ambient humidity	20% RH to 80% RH; no condensation
Operating altitude	2000 m or less

Note

- To ensure high measurement accuracy, operate the instrument within the following ranges: 23 ± 3°C.
- When using the instrument in a place where the ambient humidity is 30% or less, take measures to prevent static electricity such as using an anti-static mat.
- Condensation may occur if the instrument is moved to another place where the ambient temperature or humidity is higher, or if the temperature changes rapidly. In such cases, before you use the instrument, allow it to adjust to the surrounding temperature for at least an hour.

Do Not Install the Instrument in the Following Places

- In direct sunlight or near heat sources
- In an environment with excessive amounts of soot, steam, dust, or corrosive gas
- Near strong magnetic field sources
- Near noise sources, such as high-voltage equipment or power lines
- In an environment that is subject to large levels of mechanical vibration
- On an unstable surface
- In an environment where ignition or explosion may occur, such as in explosive gas

Protection Level Using Protection Caps

This instrument complies* with protection level IP54.

* When the USB port cover is closed and the external pressure sensor input cap is attached.

IP54
- **Splashing of water (liquid ingress protection)**
- **Dust protected (solid particle protection)**
- **International Protection**

If the USB port cover is open or the external pressure sensor input cap is not attached, the instrument does not comply with IP54.

Installation Orientation

To measure pressure, install the instrument horizontally with the front panel facing up or using the rear panel stand.

After installation, perform zero calibration according to section 2.6.

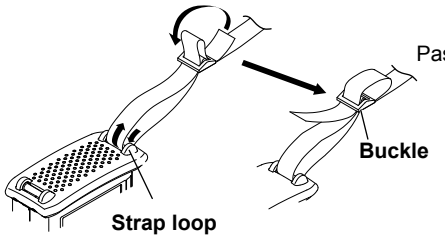
Measurement Category

The measurement category of this instrument is Other (O).

Measurement Category	Description	Notes
O (None, Other)	Other circuits that are not directly connected to the mains.	Circuits that are not powered from the mains
CAT II	For measurements performed on circuits that are connected to low-voltage installations	Household appliances, portable tools, etc.
CAT III	For measuring facility circuits	Distribution boards, circuit breakers, etc.
CAT IV	For measurements performed on power source circuits	Entrance cables, cable systems, etc.

Attaching the Shoulder Belt

Attach the strap to the loops on both the upper-left and upper-right sides of the CA700.
Pass the shoulder strap through the loops and then the buckle as shown in the figure. Attach the left and right sides in the same manner.



2.3 Inserting Batteries and Turning the Power On and Off

WARNING

- Insert batteries with the correct polarity. Otherwise, the batteries may leak, heat up, or burst.
- Do not mix new and old batteries or mix different brands or types of batteries. The batteries may leak, heat up, or burst due to their characteristic differences.

CAUTION

- If you do not intend to use the instrument for a long time, remove the batteries from the instrument. Leaving the batteries in the instrument may cause the batteries to leak.
- If the batteries go flat during use, the measurement data will not be saved. We recommend that you replace the batteries as soon as they start to run low.

French

AVERTISSEMENT

- Insérer les batteries en observant la polarité correcte. À défaut, les batteries risquent de fuir, de chauffer ou d'éclater.
- Ne pas mélanger des batteries neuves et des batteries usagées, ni des batteries de marques ou de types différents. Les batteries risquent de fuir, de chauffer ou d'éclater en raison de leurs différentes caractéristiques.

ATTENTION

- Si l'instrument ne doit pas être utilisé pendant une période prolongée, retirer les batteries de l'instrument. Si les batteries ne sont pas retirées de l'instrument, elles risquent de fuir.
- En cas de décharge complète des batteries en cours d'utilisation, les données de mesure ne sont pas enregistrées. Il est recommandé de remplacer les batteries dès que leur charge commence à être basse.

Inserting Alkaline Dry Cells

1. Check that the power is turned off and that cables are not connected.
2. Using a Phillips screwdriver, unfasten the screws holding the battery cover on the rear panel, and open the battery cover.
3. Insert dry cells into the battery holder. Pay attention to their polarity.

   Compatible dry cells: Six 1.5 V AA alkaline dry cells
4. Close the battery cover, and fasten it with the screws.

Removing Alkaline Dry Cells

1. Check that the power is turned off and that cables are not connected.
2. Using a Phillips screwdriver, unfasten the screws holding the battery cover on the rear panel, and open the battery cover.
3. Remove the dry cells from the battery holder.
4. Close the battery cover, and fasten it with the screws.

Remaining Battery Power Indicator

The remaining battery power is displayed with an indicator as shown below.

If the remaining power falls to zero during measurement, the measurement data at that point may not be saved. If the remaining power starts to run low, replace the dry cells as soon as possible.
Battery consumption increases when current or voltage is generated. You should keep this in mind when you use the current or voltage source or the loop power supply.

Turning the Power On

Before Turning On the Power, Check That:

- The instrument is installed properly. See section 2.2, “Installing the Instrument.”
- The batteries are inserted properly. See the previous page.

Turning the Power On

1. Press the power on/off key on the front panel.

Operations Performed When the Power Is Turned On

When the power is turned on, a self-test start automatically. After the self-test and calibration finish successfully, the top menu appears.

When the Power-on Operation Does Not Finish Normally

Turn off the power, and check the following items.

- Are the dry cells inserted properly?
- Are you using new and old dry cells together?
- Are you using batteries of different types or different brands together?

If the instrument still does not work properly, contact your nearest YOKOGAWA dealer for repairs.

Note

- After turning off the power, wait at least 10 seconds before you turn it back on.
- It may take a few seconds for the startup screen to appear.

Turning the Power Off

Turning the Power Off

1. Hold down the power on/off key until the message “Power Off?” appears.
2. Press **ENTER**. The power turns off.

Operations Performed When the Power Is Turned Off

The settings immediately before the power is turned off are stored. Therefore, the next time the power is turned on, the instrument will start with those settings.

To Make Accurate Measurements

- Allow the instrument to warm up for at least 30 minutes after turning on the power.

2.4 Connecting Source and Measurement Leads

WARNING

- Always turn off the power of the device under measurement before connecting the device to the instrument. It is extremely dangerous to connect or disconnect a measuring lead while the device under measurement is on.
- Do not apply voltage or current that exceeds the maximum input voltage or maximum input current.
  Maximum input voltage: 50 Vpk (to ground)
  Maximum input current: 120 mA
- Before connecting source leads to the source terminals, turn off the instrument.
- Do not apply voltage or current to the source terminals. Doing so may cause electric shock or damage the instrument.

French

AVERTISSEMENT

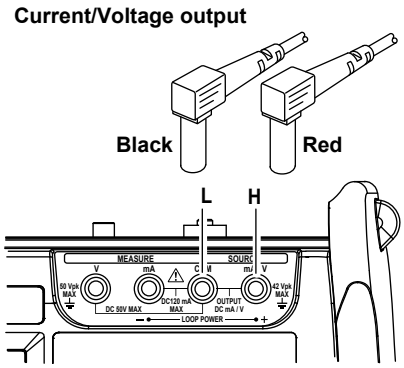
- Toujours mettre le dispositif hors tension avant de le connecter à l'instrument. Il est extrêmement dangereux de connecter ou de déconnecter un câble de mesure lorsque le dispositif mesuré est sous tension.
- Ne pas appliquer de tension ni de courant supérieurs à la tension/au courant d'entrée maximum.
  Tension d'entrée maximum : 50 Vpk (à la masse)
  Courant d'entrée maximum : 120 mA
- Avant de connecter les câbles de source aux bornes de source, mettre l'instrument hors tension.
- Ne pas appliquer de tension ni de courant aux bornes de source. Le cas échéant, un choc électrique et/ou un endommagement de l'instrument risque(nt) de se produire.

Connecting Current and Voltage Source and Measurement Leads

Connect the source and measurement leads (L4059PR) supplied with the instrument to the current and voltage input or output terminals.

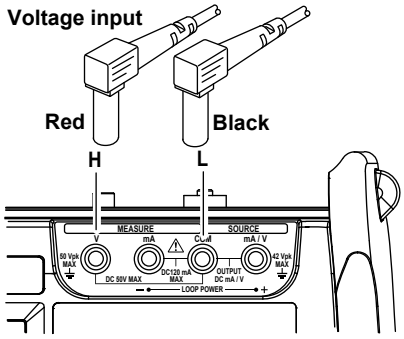
Current and Voltage Source

Current/Voltage output

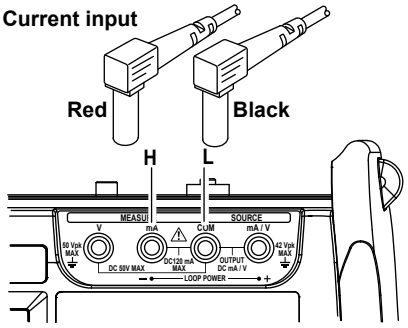


Current and Voltage Measurement

Voltage input

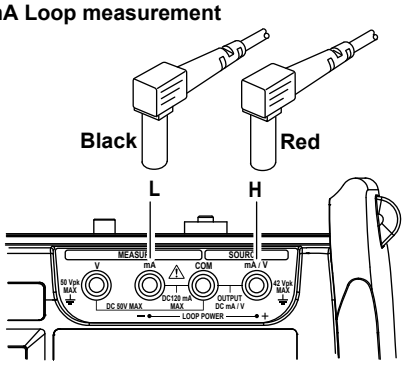


Current input

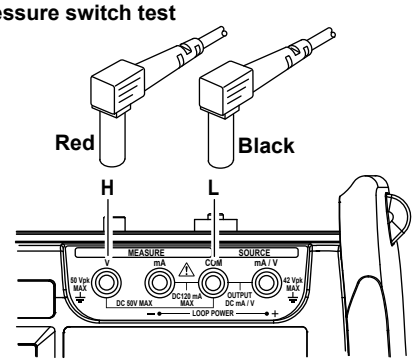


mA Loop Measurement and Pressure Switch Resistance Measurement

mA Loop measurement



Pressure switch test



Connecting to the Pressure Input Port

WARNING

- Do not apply pressure over the allowable input range. Excessive pressure may cause injury or damage to the instrument.

Model		CA700-*-01	CA700-*-02	CA700-*-03
Allowable input	Negative pressure	2.7 kPa abs	2.7 kPa abs	2.7 kPa abs
	Positive pressure	500 kPa	3000 kPa	4500 kPa

- Before applying pressure to the instrument, make sure that tubing is connected properly. Improper connection may cause gas or liquid to leak, which may in turn cause injury or damage to the instrument.
- After use, be sure to depressurize adequately so that compressed gas or liquid does not burst out. Then remove tubing.
- The withstand pressure of the connector supplied with the instrument is the same as the instrument's allowable input. Do not use the connector with other instruments.

CAUTION

When joining the connector, using a spanner only on the connector side may break the inside of the instrument. Be sure to use another spanner on the cut-out of the input port to tighten the connector.

French

AVERTISSEMENT

- Ne pas appliquer de pression supérieure à la plage d'entrée autorisée. Une pression excessive risquerait de provoquer des blessures ou d'endommager l'instrument.

Modèle		CA700-*-01	CA700-*-02	CA700-*-03
Entrée autorisée	Pression négative	2,7 kPa abs	2,7 kPa abs	2,7 kPa abs
	Pression positive	500 kPa	3000 kPa	4500 kPa

- Avant de mettre l'instrument sous pression, s'assurer que les tubes sont correctement connectés. Une connexion incorrecte peut provoquer une fuite de gaz ou de liquide, ce qui à son tour peut être à l'origine de blessures ou d'un endommagement de l'instrument.
- Après utilisation, veiller à effectuer une dépressurisation correcte, de façon à éviter que le gaz ou le liquide comprimé ne jaillisse hors de l'instrument. Retirer ensuite les tubes.
- La pression de résistance du connecteur fourni avec l'instrument est identique à l'entrée autorisée pour l'instrument. Ne pas utiliser le connecteur avec d'autres instruments.

ATTENTION

L'utilisation d'une clé uniquement sur le côté connecteur lors du raccordement du connecteur risque de casser l'intérieur de l'instrument. Pour serrer le connecteur, veiller à utiliser une autre clé sur la découpe du port d'entrée.

The pressure input port of this instrument has Rc1/4 (-P1) or 1/4NPT female threads (-P2). If the tubing connector does not match the port, use an accompany adapter.

91080 (connector for -P1 model): Converts to 1/8NPT female
91081 (connector for -P1 model): Converts to 1/4NPT female
91082 (connector for -P2 model): Converts to 1/8NPT female

1. Wrap seal tape around the threads of the tube.
2. Using two spanners, firmly attach the tubing connector to the pressure input port of the instrument.

Cleaning

CAUTION

- When you clean the CA700 using a cleaning unit, be sure not to reverse the IN and OUT connections. A reverse connection may damage the sensor inside the CA700.
- Use the output port (OUT) in the vent-open condition.
- Use the cleaning unit only for cleaning purposes.

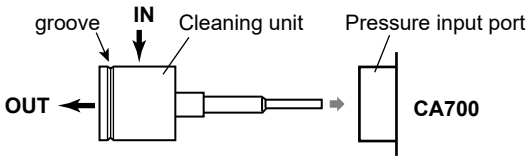
French

ATTENTION

- Lors du nettoyage du CA700 à l'aide d'une unité de nettoyage, veiller à ne pas inverser les connexions d'entrée et de sortie. Un raccordement inversé risque d'endommager le capteur intégré au CA700.
- Utiliser le port de sortie (OUT) à l'état évent ouvert.
- Utiliser l'unité de nettoyage uniquement à des fins de nettoyage.

After measuring the liquid pressure, use the optional cleaning unit accessory to clean the internal pressure sensor of the instrument.

91040(without groove): Cleaning unit Rc1/8 female thread (IN, OUT) for both -P1 and -P2
91041(with groove): Cleaning unit 1/8NPT female thread (IN, OUT) for both -P1 and -P2



1. Connect a cleaning unit to the CA700 pressure input port by tightening the connection by hand.
2. Apply dry cleaning air into the cleaning unit's input port (IN).
   The maximum input pressure is 500 kPa.

Connecting the External Pressure Seneor

WARNING

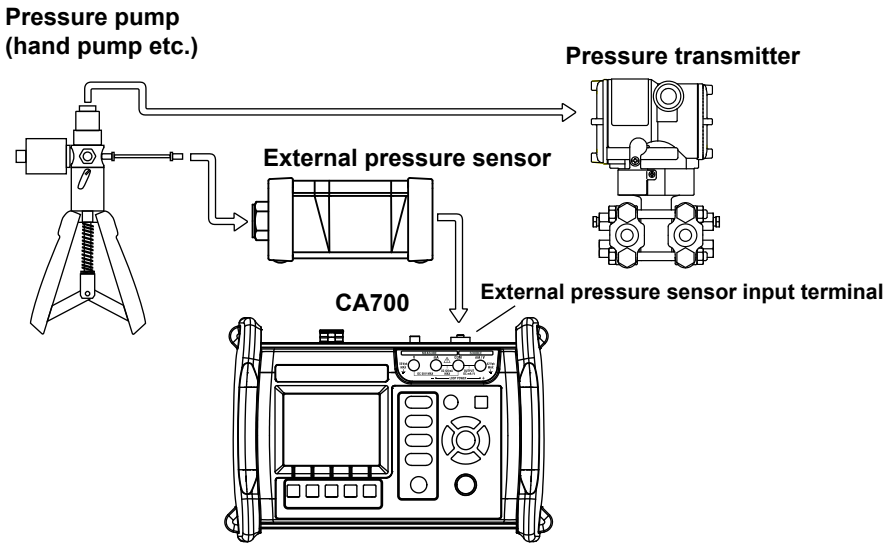
- Use the external pressure sensor correctly, following its operation manual. Improper use of the external pressure sensor causes considerable danger because high pressure is applied to it.
- Use only the pressure sensor specialized for the CA700.

French

AVERTISSEMENT

- Utilisez le capteur de pression externe correctement, en suivant son mode d'emploi. L'utilisation incorrecte du capteur de pression externe entraîne un danger considérable car une pression élevée est appliquée.
- Utilisez uniquement le capteur de pression spécialisé pour le CA700.

With the CA700 powered off, use the connection cable included with the external pressure sensor to connect the external pressure sensor input terminal of the CA700 to the CA700 connection terminal of the sensor.



Power on the CA700. When the external pressure sensor is recognized successfully, the icon indicating that sensor appears on the screen of the CA700.

Note

- Be sure to power off the CA700 and then connect the external pressure sensor.
- The external pressure sensor is available in the following firmware versions of the CA700.
  PM100-*-05 (16 MPa model): 1.10 or later
  PM100-*-06 (70 MPa model): 1.20 or later
  You can download the latest firmware version from our website.
- If you reconnect to an external pressure sensor with a different pressure range while the power of this instrument is on, a message is displayed and this instrument is restarted.

Hysteresis Warning

If the external pressure sensor receives the pressure exceeding its limit value, this may affect measurement for a while even when the pressure falls below the limit value.
In the CA700, if the pressure input to the external pressure sensor exceeds the limit value, HYS appears on the screen.
Even when the pressure falls below the limit value, HYS continues to appear for a period of time. This period depends on the range and input pressure. Wait for HYS to disappear, and then use the external pressure sensor.

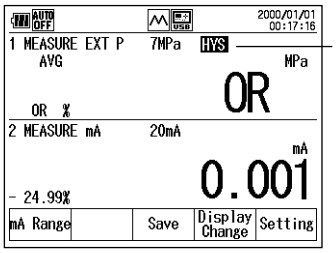
Period when HYS is displayed

PM100-*-05 (16 MPa model)

Range	Limit value		
	8.4 MPa	12.0 MPa	19.2 MPa
7 MPa	approx 110 second	approx 340 second	approx 450 second
10 MPa	-	approx 150 second	approx 220 second
16 MPa	-	-	approx 50 second

PM100-*-06 (70 MPa model)

Range	Limit value		
	30 MPa	60 MPa	77 MPa
25 MPa	approx 150 second	approx 380 second	approx 510 second
50 MPa	-	approx 130 second	approx 220 second
70 MPa	-	-	approx 60 second



Hysterisis warning

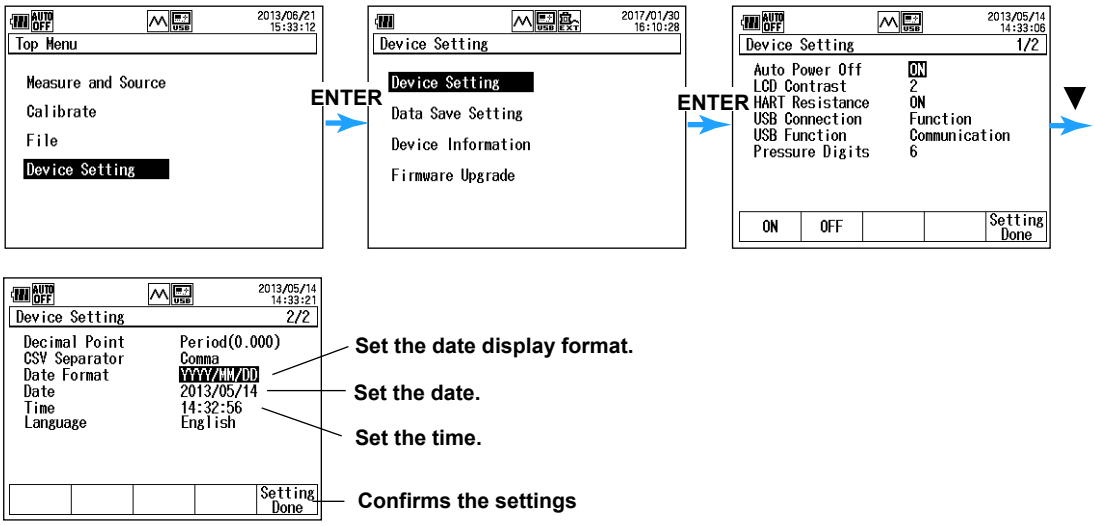
Note

Even when the CA700 is powered on or off within the above period, the hysteresis warning state remains unchanged within the period(HYS is displayed).

2.5 Setting the Date and Time

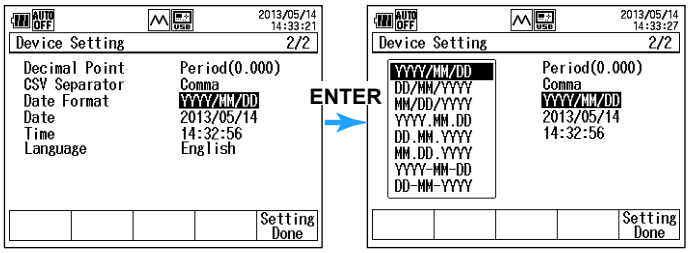
Procedure

1. Turn on the CA700. The top menu appears.
2. Select **Device Setting**, and press **ENTER**. The Device Setting menu appears.
3. Select **Device Setting**, and press **ENTER**.
4. Hold down the ▲ or ▼ key until the second page of the Device Setting menu appears.



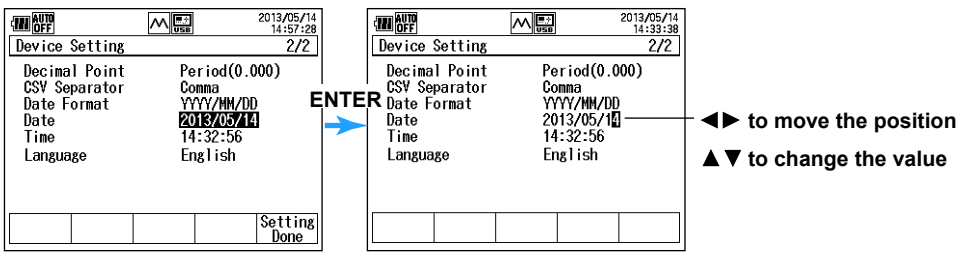
Setting the Date Display Format

5. Select **Date Format**, and press **ENTER**. A list of date display formats appears.
6. Select the format you want, and press **ENTER**.



Setting the Date

7. Select **Date**, and press **ENTER**. The date appears highlighted.
8. Press the ◀ or ▶ key to move to the location you want to change, press the ▲ or ▼ key to set the number, and press **ENTER**.



Changing the Time

9. Select **Time**, and press **ENTER**. The time appears highlighted.

10. Press the ◀ or ▶ key to move to the location you want to change, press the ▲ or ▼ key to set the number, and press **ENTER**.

Confirming the Changes

11. Press **Setting Done (F5)** on the function menu. The settings are confirmed, and the display returns to the previous menu.

Explanation

Date and Time Display Format

The display format symbols are explained below.

YYYY: Year (Gregorian)
MM: Month
DD: Day

2.6 Performing Zero Calibration

Procedure

1. Maintain the CA700 in an orientation for measuring pressure, and open the input.
   When the pressure measurement display is showing, press **ZERO**.
   A message appears for you to confirm the execution of the zero calibration.
2. Press **ENTER**. Zero calibration is executed.

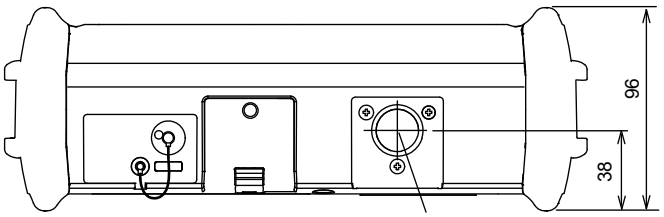
   To cancel zero calibration, press **ESC**.

Explanation

Zero calibration refers to the act of correcting the influence caused by changes in the temperature and installation environment in order to perform highly accurate pressure measurements.
Be sure to perform zero calibration before making measurements.
To use the external pressure sensor, you also need to perform zero calibration of the sensor. For the zero calibration of the external pressure sensor, see the manual of the sensor.
If the environmental conditions change while you perform continuous measurements, occasionally perform zero calibration.

Note

- Zero calibration is effective even if you change the unit of pressure.
- Perform zero calibration after warm-up.
- For liquid measurements, fill the pipe and the instrument (measurement system) with liquid first, and then perform zero calibration.
- Every time you change the orientation of the CA700, perform zero calibration.
- If it is necessary to match the pressure reference with a gauge, such as a pressure balance whose pressure reference position is clear, align it with the reference point of the pressure receiving section as shown below before starting zero calibration.



Measurement Orientation

To measure pressure, install the instrument horizontally with the front panel facing up or tilted using the rear panel stand. If you change the orientation of the CA700 when the measurement display is showing, the “ZERO CAL” indicator will blink in the display. If this happens, be sure to perform zero calibration.

3.1 Connecting to the Pressure Transmitter

This section provides an example of how to calibrate a pressure transmitter that outputs the measured pressure as current. Loop voltage is applied during calibration.

WARNING

- Do not apply pressure exceeding the allowable input range. Excessive pressure may cause injury or damage to the instrument.

Model		CA700-*-01	CA700-*-02	CA700-*-03
Allowable input	Negative pressure	2.7 kPa abs	2.7 kPa abs	2.7 kPa abs
	Positive pressure	500 kPa	3000 kPa	4500 kPa

- Before applying pressure to the instrument, make sure that tubing is connected properly. Improper connection may cause gas or liquid to leak, which may in turn cause injury or damage to the instrument.
- After use, be sure to depressurize adequately so that compressed gas or liquid does not burst out. Then remove tubing.

CAUTION

- When joining the connector, using a spanner only on the connector side may break the inside of the instrument. Be sure to use another spanner on the cut-out of the input port to tighten the connector.

French

AVERTISSEMENT

- Ne pas appliquer de pression supérieure à la plage d'entrée autorisée. Une pression excessive risquerait de provoquer des blessures ou d'endommager l'instrument.

Modèle		CA700-*-01	CA700-*-02	CA700-*-03
Entrée autorisée	Pression négative	2,7 kPa abs	2,7 kPa abs	2,7 kPa abs
	Pression positive	500 kPa	3000 kPa	4500 kPa

- Avant de mettre l'instrument sous pression, s'assurer que les tubes sont correctement connectés. Une connexion incorrecte peut provoquer une fuite de gaz ou de liquide, ce qui à son tour peut être à l'origine de blessures ou d'un endommagement de l'instrument.
- Après utilisation, veiller à effectuer une dépressurisation correcte, de façon à éviter que le gaz ou le liquide comprimé ne jaillisse hors de l'instrument. Retirer ensuite les tubes.

ATTENTION

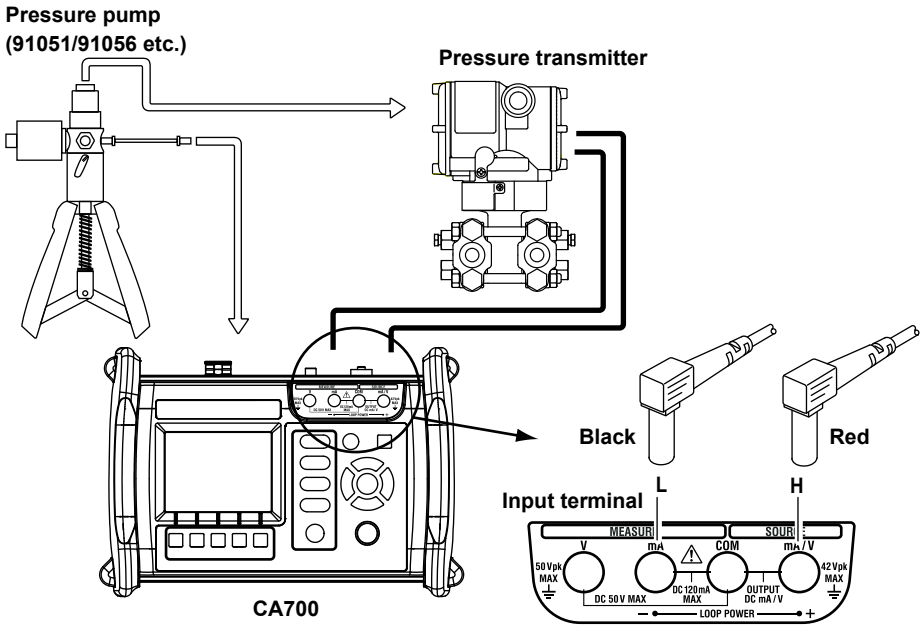
L'utilisation d'une clé uniquement sur le côté connecteur lors du raccordement du connecteur risque de casser l'intérieur de l'instrument. Pour serrer le connecteur, veiller à utiliser une autre clé sur la découpe du port d'entrée.

Connecting to the Pressure Transmitter to the CA700

Connect the pressure pump output to the transmitter input and the CA700 input through branching. Some pressure pumps have two output ports: one for applying pressure and another for the pressure meter.

Connect the electrical output of the pressure transmitter to the signal terminal of the CA700. Connect the H side of the pressure transmitter to the SOURCE mA/V terminal of the CA700 and the L side to the MEASURE mA terminal.

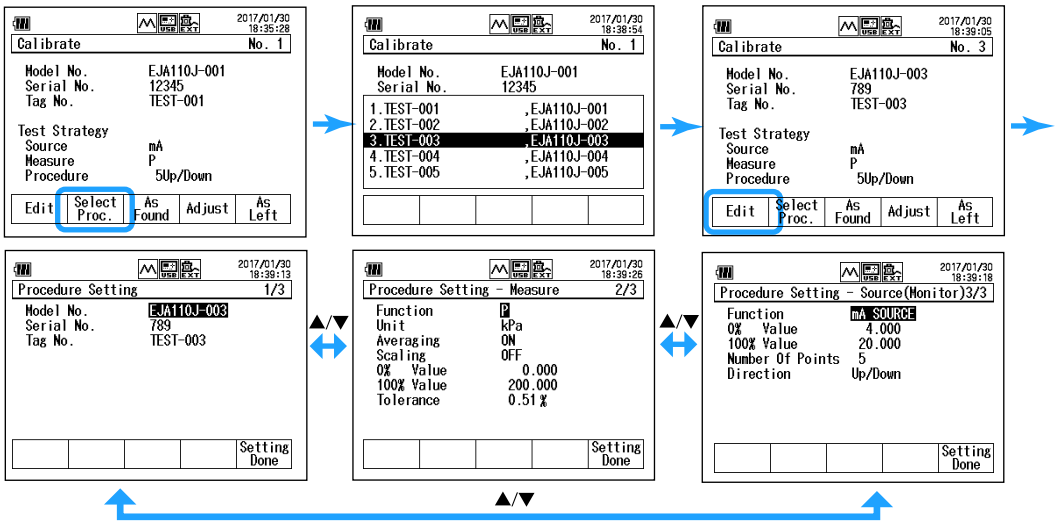
You can also use the external pressure sensor to calibrate a high-pressure pressure transmitter. For the connecting procedure, see section 2.4.



3.2 Setting the Device Information and the Calibration Conditions of the Pressure Transmitter

Procedure

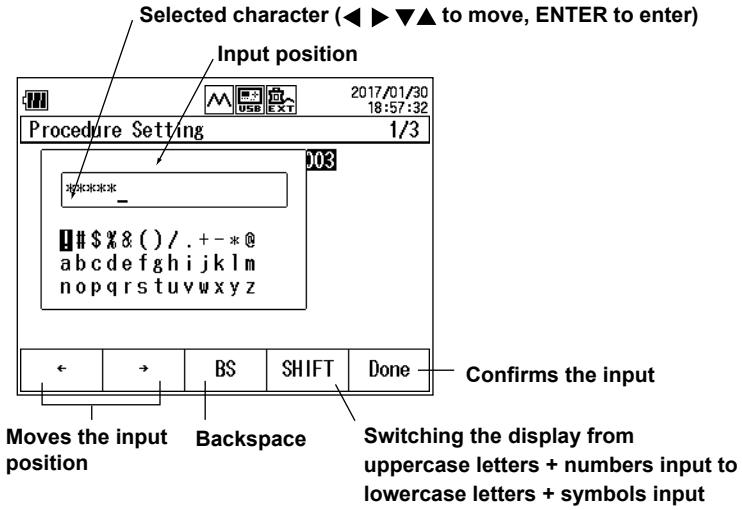
1. From the top menu, use the ▲ or ▼ key to select **Calibrate**, and press **ENTER**.
   The calibration display appears.
2. Press **Select Proc. (F2)**.
   A list of registered calibration procedures is displayed.
   The table lists tag numbers (first 20 characters of each one) and model numbers (first 15 characters of each one).
   Up to 20 sets of procedures can be registered. They are displayed in four windows.
3. Press ◀ or ▶ to change the page and ▲ or ▼ to select the calibration procedure you want to edit. Press ENTER.
   Information of the selected calibration procedure is displayed.
4. Press **Edit (F1)**.
   The calibration procedure setup screen appears. The setup screen is divided into three pages: Transmitter Information, Measure, and Source.
   Hold down ▲ or ▼ to change the screen.



Setting the Device Information of the Calibration Target

Entering the Model Number (Model No.)

5. Use the ▲ or ▼ key to select **Model No.**, and press **ENTER**.
   A character input screen appears.



6. Press ← (F1) or → (F2) to move the input position, press ◀, ▶, ▲, or ▼ to select a character, and press **ENTER** to enter the selected character.
7. After entering the characters, press **Done (F5)**.

Entering the Tag No. and Serial No.

8. Use the ▲ or ▼ key to select **Tag No.** or **Serial No.**, and press **ENTER**.
9. Like the model number, enter the tag number and serial number.

Setting Other Items or Confirming the Settings

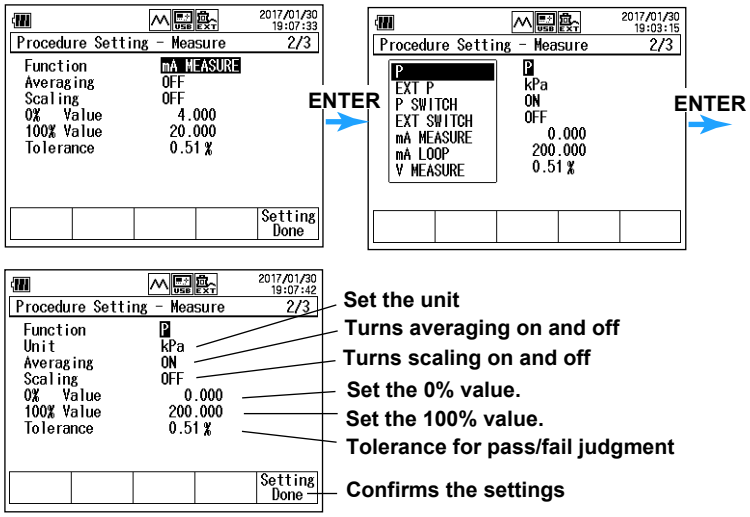
10. To set measurement conditions and source conditions in addition to product information, press ▲ or ▼ key repeatedly until the screen changes. When the measurement condition or source condition setup screen appears, continue with the procedure on the following pages.

    To finish changing the settings, press **Setting Done (F5)**. The settings are confirmed.

Setting Measurement Conditions

Setting Measurement Features

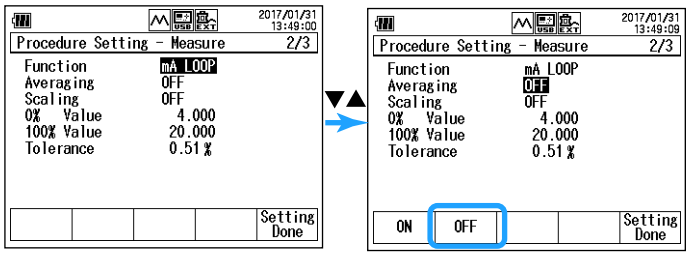
5. In the calibration procedure setting display, hold down the ▲ or ▼ key.
   The display switches to page 2/3 (measurement condition setting display).
6. Set the calibration target output.
   Use the ▲ **or** ▼ key to select **Function**, and press **ENTER**.
   The measurement feature options are displayed.
7. Use the ▲ or ▼ key to select **mA LOOP**, and press **ENTER**.



Setting Averaging and Scaling

Set averaging and scaling if necessary.
Here, we will set them to OFF.

8. Use the ▲ or ▼ key to select **Averaging**, and press **ENTER**.
9. Press **OFF (F2)**.



10. Turn scaling off.
    To use scaling, select **ON**, and press **ENTER**. A scaling setting menu appears.

Setting the 0% Value and 100% Value

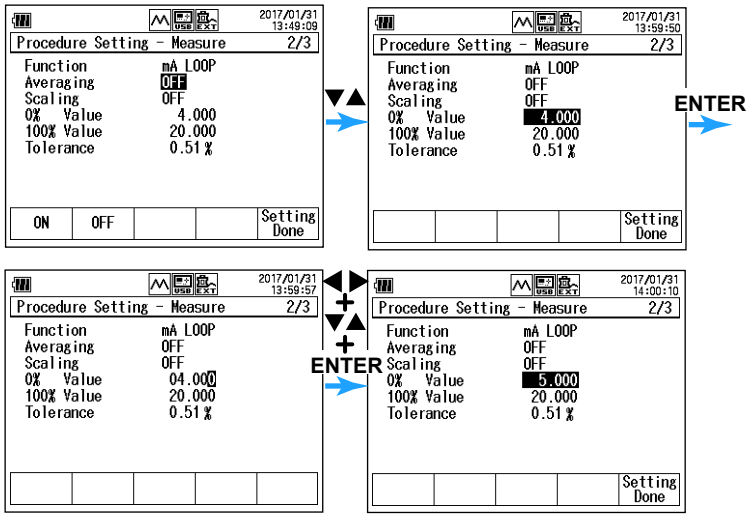
For the pressure transmitter output that the CA700 will measure, select the range to calibrate.

11. Use the ▲ or ▼ key to select **0% Value**, and press **ENTER**.

12. Press the ◀ or ▶ key to move to the digit you want to change, press the ▲ or ▼ key to set the number.

To confirm the value, press **ENTER**.

Likewise, set the 100% value.



Setting the Tolerance for Pass/Fail Judgment

13. Use the ▲ or ▼ key to select **Tolerance**, and press **ENTER**.

14. Press the ◀ or ▶ key to move to the digit you want to change, press the ▲ or ▼ key to set the number.

To confirm the value, press **ENTER**.

The values assigned to 0% and 100% will be used as references.

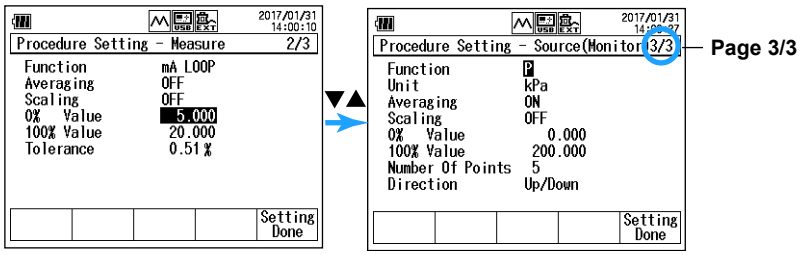
Setting Other Item or Confirming

15. To set items in addition to measurement conditions, press ▲ or ▼ key repeatedly until the screen changes.

To finish changing the settings, press **Setting Done (F5)**. The settings are confirmed.

Setting Source Conditions

5. In the calibration procedure setting display, hold down the ▲ or ▼ key.
The display switches to page 2/2 (source condition setting display).



Setting the Source Feature

Here, we will set the source feature to P.
If you change the source feature to anything other than pressure (P or EXT P) here, the measurement feature setting will change.

6. Use the ▲ or ▼ key to select **Function**, and press **ENTER**.
The source function options are displayed.

7. Use the ▲ or ▼ key to select P, and press **ENTER**.
The source function set.

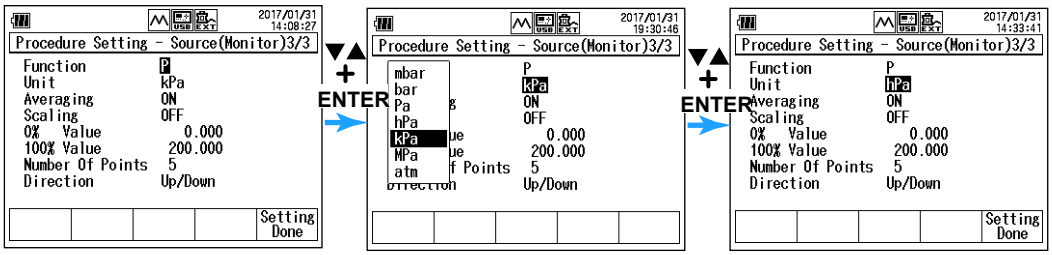
Note

- Even if you set the source feature to pressure (P or EXT P), the CA700 will not produce pressure. The CA700 will measure and display the pressure applied to the pressure transmitter.
- If the measurement feature is set to mA Loop when the source feature is set to anything other than pressure (P or EXT P), the source feature is automatically set to pressure (P).

Setting the Unit

8. Use the ▲ or ▼ key to select **Unit**, and press **ENTER**.
The pressure unit options are displayed.

9. Use the ▲ or ▼ key to select a unit, and press **ENTER**.
The unit is set.

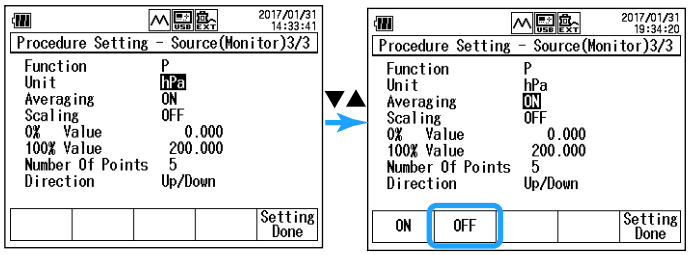


Setting Averaging and Scaling

The pressure transmitter input pressure can be averaged or scaled before it is displayed on the CA700. Here, we will set both of them to OFF.

10. Use the ▲ or ▼ key to select **Averaging**, and press **ENTER**.

11. Press **OFF (F2)**.



12. Turn scaling off.

To use scaling, select **ON**, and press **ENTER**. A scaling setting menu appears.

Setting the 0% Value and 100% Value

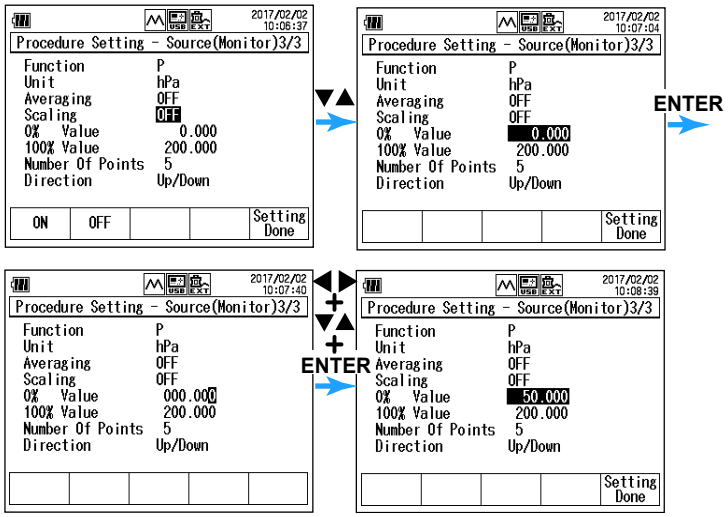
Set the pressure transmitter input pressure that correspond to the output current calibration range (0% and 100%) of the pressure transmitter, which was set in steps 5 and 6.

13. Use the ▲ or ▼ key to select **0% Value**, and press **ENTER**.

14. Press the ◀ or ▶ key to move to the digit you want to change, press the ▲ or ▼ key to set the number.

To confirm the value, press **ENTER**.

Likewise, set the 100% value.



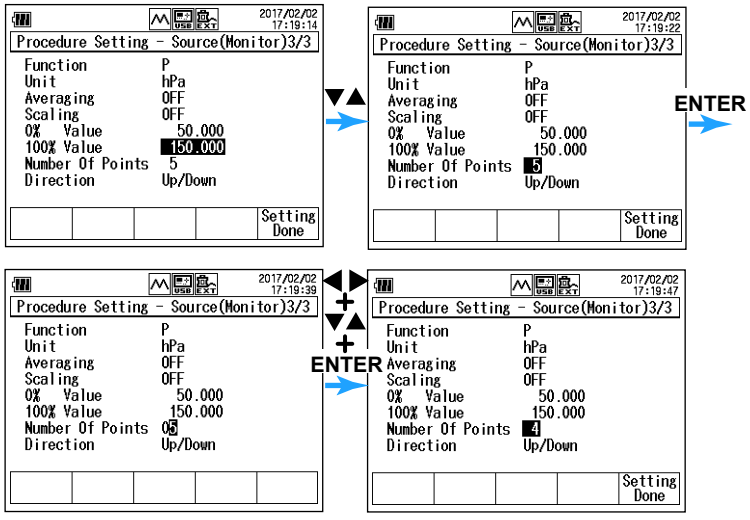
Setting the Number of Calibration Points (Number Of Points)

15. Use the ▲ or ▼ key to select **Number Of Points**, and press **ENTER**.

16. Press the ◀ or ▶ key to move to the digit you want to change, press the ▲ or ▼ key to set the number.

To confirm the value, press **ENTER**.

The range is 1 to 10.

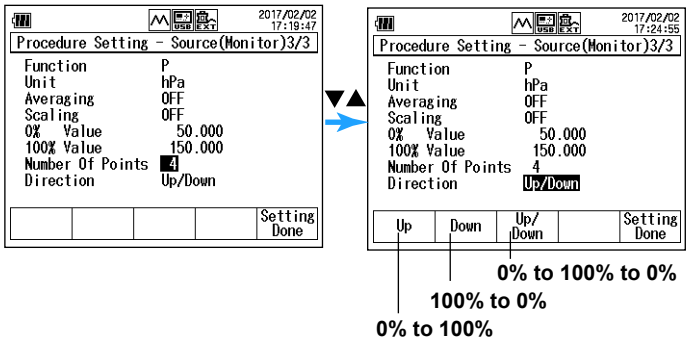


Setting the Calibration Direction (Direction)

Set the calibration direction.

17. Press the ▲ or ▼ key to select **Direction**.

The options appear on the function menu.



18. Press **Up (F1)**, **Down (F2)**, **or Up/Down (F3)**.

If you select Up/Down, the number of calibration points will be set to (the number of points set in step 16)x2 – 1.

Confirming the Settings

19. After entering the information, press **Setting Done (F5)**. The settings are confirmed.

Press **ESC** to return the display.

Explanation

Calibration Procedure

You can register up to twenty sets of calibration processes. A calibration procedure consists of a set of device information, measurement feature and source feature.

To calibrate a pressure device, select one of the registered processes to perform calibration.

Device Information

The device information that you set here is saved to a file along with the calibration data. This is convenient in associating the saved data with the device.

Input Characters

The number of characters that you can enter is as follows.

Model No.: Up to 20 alphanumeric characters

Tag No.: Up to 32 alphanumeric characters

Serial No.: Up to 15 alphanumeric characters

Measurement Feature and Source Feature

The measurement feature measures the output from the calibration target, and the source feature outputs the input to the calibration target. If you set the source feature to pressure, the CA700 only monitors the input to the calibration target.

The combinations of the measurement feature and source feature are as follows.

Measurement Feature	Source Feature
Pressure (P) Pressure (external pressure sensor, EXT P)	DC current (mA SOURCE)
	Simulation (mA SIMULATE)
	DC voltage (V SOURCE)
Pressure switch (P SWITCH) Pressure switch (external pressure sensor, EXT SWITCH)	—
DC current (mA MEASURE)	Pressure (P) Pressure (external pressure sensor, EXT P)
Loop current (mA LOOP)	
DC voltage (V MEASURE)	

When EXT P or EXT SWITCH (for only measurement functions) using the external pressure sensor is set for the measurement and source functions, set the type (Sensor Type) and range (Range) of the sensor. For details, see the User's Manual IM CA700-01JP contained in the CD-ROM.

Unit (Pressure)

You can select from mbar, bar, Pa, hPa, kPa, MPa, atm, mmHg, inHg, gf/cm^2, kgf/cm^2, mmH_2O@4°C, mmH_2O@20°C, ftH_2O@4°C, ftH_2O@20°C, inH_2O@4°C, inH_2O@20°C, Torr, psi.

Averaging

The CA700 displays moving average results.

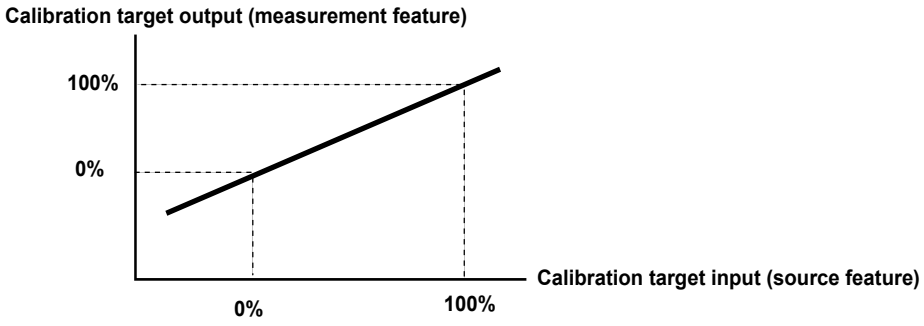
Scaling

The CA700 displays linearly scaled results. You can assign a unit appropriate for the values after scaling.

The scaling method is the same as pressure measurement. See section 2.1.

0% Value and 100% Value

Set the 0% and 100% of the calibration range in terms of the calibration target input and output (which corresponds to the input).



Tolerance for Pass/Fail Judgment

Set the tolerance for making pass/fail judgments on calibration results. The tolerance is set in reference to the 0% and 100% values described above.

Tolerance = ±((100% value of the measurement feature – 0% value of the measurement feature)×tolerance setting/100)

For example, when the calibration target output is 4 mA to 20 mA and this range is assigned to 0 to 100%, if the tolerance range is set to 0.02%, the tolerance is given by

±(20 mA – 4 mA)×0.02/100 = ±0.0032 mA.

Number of Calibration Points (Number Of Points)

Set the number of measurement points between 0% to 100%.

The range is 1 to 10. If you specify 1, the calibration is performed at 0% if the calibration direction (Direction) is set to Up or Up/Down and 100% if set to Down. If you specify a number between 2 and 10, the calibration is performed for the number of specified points. This includes calibration at 0% and 100%.

The calibration points are at equally divided points between 0% and 100%. For example, if the number of calibration points is set to 5, the calibration points are 0%, 25%, 50%, 75%, and 100%.

Calibration Direction (Direction)

Set whether to calibrate from 0% (Up), from 100% (Down), or from 0% to 100% back down to 0%.

Up: 0% to 100%
Down: 100% to 0%
Up/Down: 0% to 100% to 0%

If the calibration direction is Up/Down, the number of calibration points is given by

Number of calibration points = (Number Of Points setting)x2 – 1.

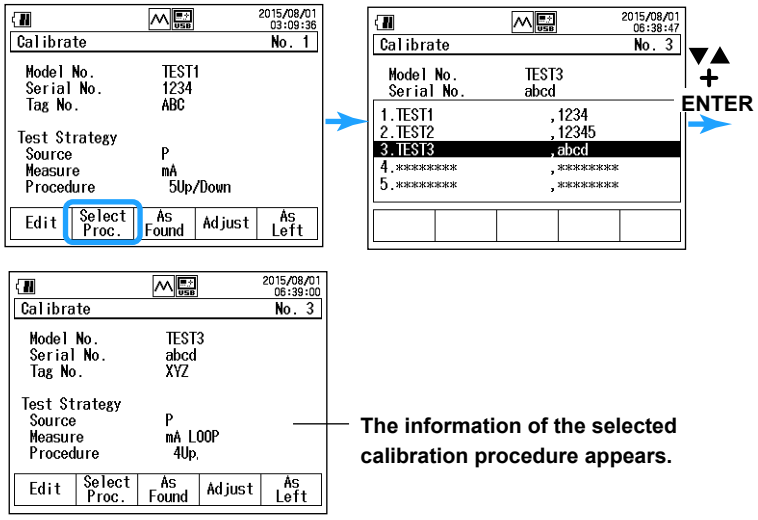
For example, if the number of calibration points is set to 5, the calibration points are 0%, 25%, 50%, 75%, 100%, 75%, 50%, 25%, and 0% (total of 9 points).

3.3 Calibrating the Pressure Transmitter

Procedure

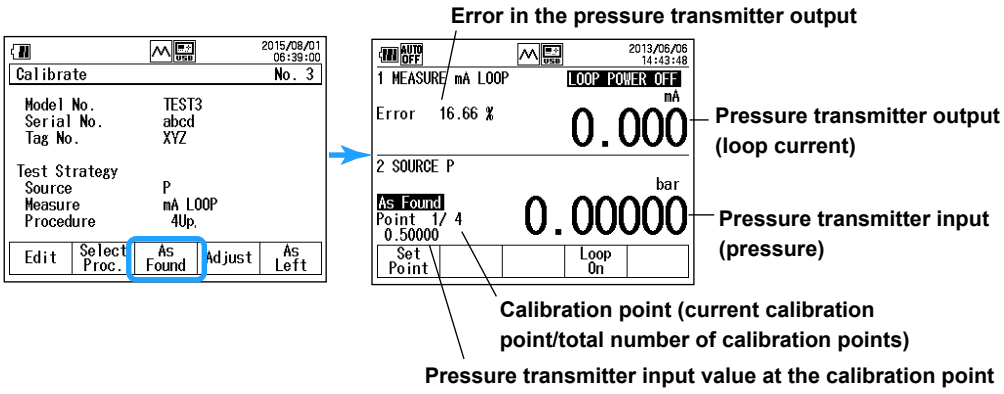
Selecting the Calibration Procedure

1. In the calibration display, press **Select Proc. (F2)**.
   The calibration procedure setting display appears.
   An asterisk is displayed next to the selected calibration procedure.
2. Use the ▲ or ▼ key to select a calibration procedure,and press **ENTER**. Here, select the calibration procedure whose Source is pressure (P) and Measure is mA Loop, as set in section 3.2.
   The calibration procedure is selected, and the calibration display returns.

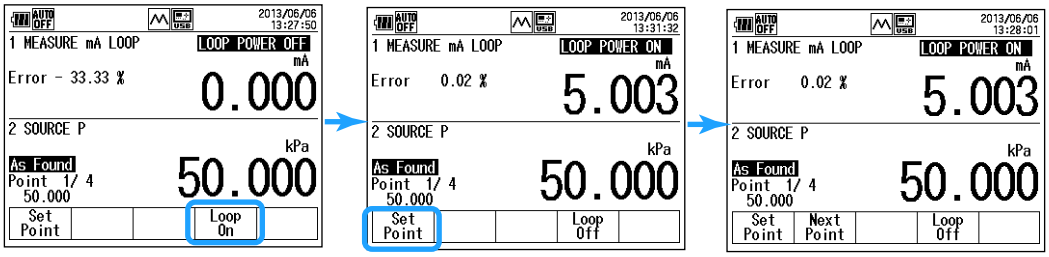


Saving Calibration Data at Calibration Points

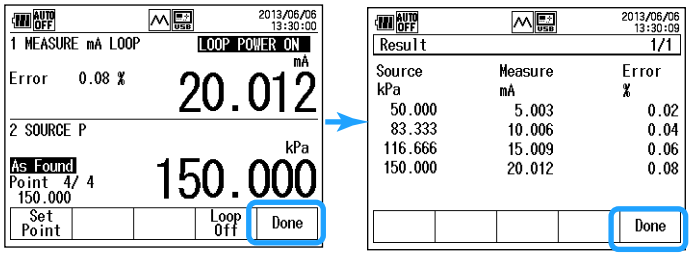
3. Press **As Found (F3)**.
   The display switches to the source and measure value display.



4. Press **Loop On (F4)**. The CA700 outputs a 24 VDC loop voltage and measures the loop current.
5. From the pressure pump, apply the pressure for the adjustment point. The pressure pump output is displayed on the CA700. Here, apply a pressure of 50.000 kPa.
6. Press **Set Point (F1)**. The pressure and loop current applied to the pressure transmitter are saved.
   The F2 key shows Next Point.



7. Press **Next Point (F2)**.
   The pressure transmitter input value, output value, and output error are saved.
   The CA700 proceeds to the next calibration point.
8. Repeat 4 to 6 for all the calibration points.
   When you save the data for the last calibration data, the F5 key shows Done.
9. Press **Done (F5)**.
   The calibration data of all calibration points are saved to a single CSV file, and the calibration result is shown on the display.

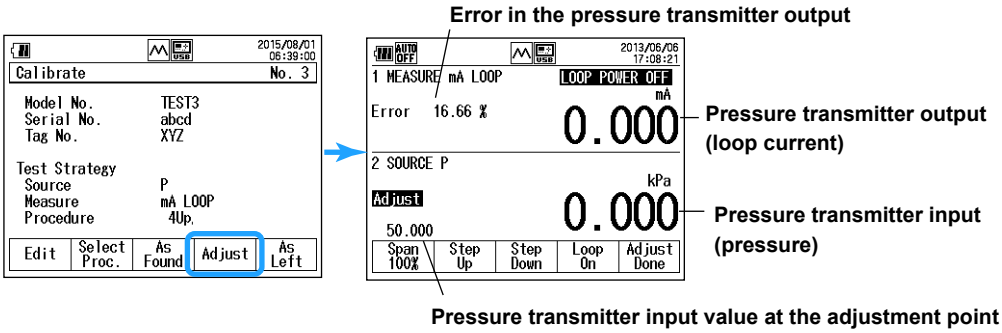


10. Press **Done (F5)**.
    The calibration display of step 1 appears.

Adjusting the Pressure Transmitter

11. In the calibration display, press **Adjust (F4)**.

A display for monitoring the pressure transmitter output appears.



12. Press **Span100% (0%) (F1)**, **Step Up (F2)**, and **Step Down (F3)** to set the adjustment point.

The adjustment points are the same as the calibration points.

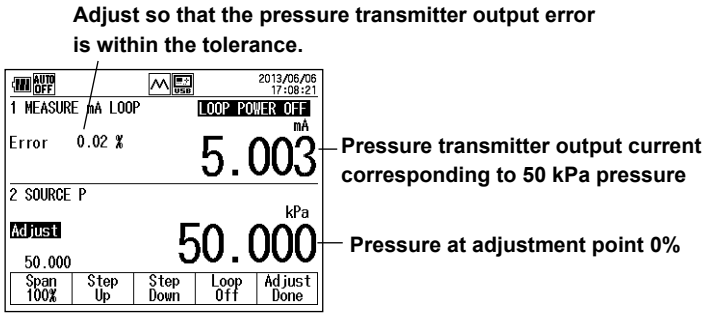
Here, we will adjust the 0% point.

13. Press **Loop On (F4)**. The CA700 outputs a 24 VDC loop voltage and measures the loop current.

14. From the pressure pump, apply the pressure for the adjustment point (50 kPa here). The pressure pump output is displayed on the CA700.

The pressure transmitter output is displayed on the CA700.

15. Adjust the pressure transmitter so that the loop current value displayed on the CA700 is within the tolerance.



16. Press **Span100% (0%) (F1), Step Up (F2)**, and **Step Down (F3)** to change the adjustment point, and repeat steps 13 to 15.

17. When you finish adjusting all adjustment points, press **Adjust Done (F5)** or **ESC**.

The calibration display returns.

Saving the Calibration Data after Adjustment

18. In the calibration display, press **As Left (F5)**.

The display switches to the source and measure value display.

19. Using the same procedure as in “Saving Calibration Data at Calibration Points,” save the calibration data after adjustment.

20. When you finish saving the data of all calibration points, press **Done (F5)**.

The calibration data of all calibration points are saved to a single CSV file, and the calibration result is shown on the display.

Explanation

Calibration Data File

The pressure transmitter calibration data before and after adjustment is saved to CSV files.

File Name

Calibration data before adjustment: MSxxF_y.CSV
Calibration data after adjustment: MAxxL_y.CSV

xx: 00 to 99 (calibration group number)
Same number between the calibration data file before and after adjustment

y: 0 to 9 Sequence number for calibration data files before adjustment or after adjustment

Because the number xx is the same for calibration data files before and after adjustment, the association is maintained.
If you change the device information or calibration procedure, the number xx is incremented.

Note

- If there are gaps in the calibration group numbers due to the deletion of files and the like, precedence is given to the missing numbers.
- If all the calibration group numbers or file sequence numbers are used up, an error will appear. Copy the necessary files to another location, and delete them.

Data That Is Saved

Calibration conditions, device information, date and time of calibration, pressure transmitter input (source) value at each calibration point, pressure transmitter output (measure) value, error (%), and judgment result are saved.

Judgment Result

If the pressure transmitter output value is within the tolerance set in section 3.3, PASS is displayed and saved. Otherwise, FAIL is saved.

Data Example

```
MODELCA700
FILE TYPE       3
FUNCTION        SOURCE P        MEASURE mA LOOP
UNITS  kPa      mA
AVERAGING       0       0
SCALING         0       0
SCALING UNITS
RANGE 0% VALUE      50      5
RANGE 100% VALUE    150     20
TOLERANCE       0.5
NUMBER OF POINTS    4
DIRECTION       UP
MODEL No.       ********
TAG No.         ********
SERIAL No.      ********
CALIBRATION DATE    2013/6/6
CALIBRATOR SERIAL No. 91N512849
CALIBRATOR CALIBRATION DATE 2012/2/15
EXTERNAL SENSOR MODEL NO. PM100-J-05-P3
EXTERNAL SENSOR SERIAL NO. 91T000000
EXTERNAL SENSOR CALIBRATION DATE 2013/4/27
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No.	DATE	TIME	SOURCE/MONITOR (Pa)	MEASURE (A)	ERROR%	PASS/FAIL
1	2013/6/6	13:31:50	5.00E+04	5.00E-03	2.00E-02	PASS
2	2013/6/6	13:32:16	8033E+04	1.00E-02	4.00E-02	PASS
3	2013/6/6	13:33:34	1.17E+05	1.50E-02	6.00E-02	PASS
4	2013/6/6	13:33:51	1.50E+05	2.00E-02	8.00E-02	PASS

4.1 If a Problem Occurs

Faults and Corrective Actions

If servicing is necessary, or if the instrument does not operate properly even after you have attempted to deal with the problem according to the instructions in this section, contact your nearest YOKOGAWA dealer.

Problems and Solutions		Refer to Section
The CA700 does not turn on.		
	Check that the remaining battery power is sufficient.	2.3
	Check that the batteries are inserted correctly.	2.3
The power turns off.		
	Check that there is sufficient remaining battery power.	2.3
The display is dark.		
	Adjust the contrast.	—[1]
	Press the backlight key to turn on the backlight.	1.1
The display is odd.		
	Confirm that the ambient temperature and humidity are within their specified ranges.	2.2
	Confirm that the display is not being affected by noise.	2.1
	Make sure that the measurement leads are properly connected.	2.4
	Restart the CA700.	2.3
Keys do not work.		
	Press HOLD to release the display hold mode.	1.1
The measured or source value is odd.		
	Check that the remaining battery power is sufficient.	2.3
	Check that the “Function” is set properly.	—[2]
	Check that the source and loop power supply are on.	3.3
	Check that connections are correct.	2.4
	Confirm that the ambient temperature and humidity are within their specified ranges.	2.2
	Allow the instrument to warm up for at least 30 minutes after turning on the power.	2.3
USB devices or the CA700 does not operate properly.		
	If you turned the CA700 on with USB devices connected to the USB ports for peripherals, turn the CA700 off, remove the USB devices, turn the CA700 back on, and then connect the USB devices. After turning off the power, wait at least 10 seconds before you turn it back on.	2.3
Unable to configure or control the instrument through the communication interface.		
	Check the address settings.	—[3]
	Match the address used in the program to the CA700 address.	
	Confirm that the interface meets the electrical and mechanical specifications.	

1 See section 6.1 in IM CA700-01EN, which is included in the accompanying CD.
2 See chapter 2 in IM CA700-01EN, which is included in the accompanying CD.
3 See chapter 5 in IM CA700-01EN, which is included in the accompanying CD.

4.2 Error Codes, Error Messages, and Actions

Number	Error description	Cause of Error	Corrective Action
0	No error	—	—
11	Command error	An undefined command was received (USB communication).	Check the command.*
12	Parameter error	Command parameter designation is incorrect (USB communication).	Check the command.*
13	Execution error	A command that cannot be executed in the current condition was received (USB communication).	Check the command.*
16	Adjustment error	An error was detected during adjustment.	Servicing is required.
17	Zero calibration error	Zero calibration error.	Check the installation orientation of the CA700.
20	Source error	24 V LOOP measurement power supply error	Check the connection.
23	Source error	Excessive current or voltage was detected in the source output.	Check the connection.
24	Source error	Insufficient current supply	Replace the batteries.
33	Storage error	The data storage destination is full. Data cannot be saved.	Check the save destination.
34	Storage error	Data cannot be saved due to some error occurring at the data storage destination.	Check the save destination.
50	Measurement error	Pressure sensor error	Servicing is required.
51	Measurement error	Tilt sensor error	Servicing is required.
52	Measurement error	A/D converter error	Servicing is required.

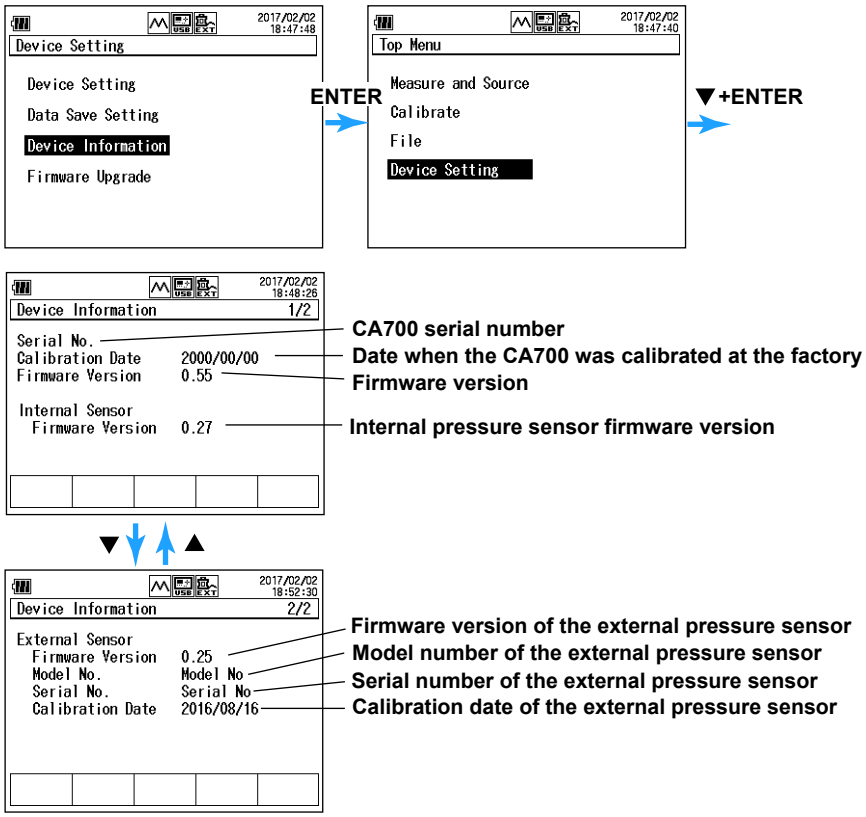
* See the communication commands (section 5.3) in IM CA700-01EN, which is included in the accompanying CD.

Error message	Symptom	Action
A communication error of the external pressure sensor. Reconnect the sensor.	A communication to the PM100 cannot be established	• Check the external pressure sensor icon • Reconnect the PM100 • Power on the main unit again • Replace the connection cable If the error cannot be resolved, a service is required.
A memory error of the external pressure sensor. Reconnect the sensor.	The memory inside the PM100 is faulty	• Reconnect the PM100 • Power on the main unit again If the error cannot be resolved, a service is required.
A measurement error of the external pressure sensor. Reconnect the sensor.	Pressure cannot be measured correctly	• Reconnect the PM100 • Power on the main unit again If the error cannot be resolved, a service is required.
The external sensor has been changed. Reboot the device.	Changed to an external pressure sensor with a different range while the instrument was on.	Press ESC or ENTER, and then restart the instrument.
The measured pressure value is "------"	· The connection cable of the PM100 is not connected properly · The PM100 is faulty	• Check the external pressure sensor icon • Reconnect the PM100 • Power on the main unit again If the error cannot be resolved, a service is required.

4.3 Viewing System Information (Overview)

Procedure

1. Turn on the CA700. The top menu appears.
2. Select **Device Setting**, and press **ENTER**. The Device Setting menu appears.
3. Select **Device Information**, and press **ENTER**.



Explanation

The following information is displayed:

- Serial number of the CA700 main unit
- Calibration date of the CA700 main unit
- Firmware version of the CA700 main unit
- Firmware version of the internal pressure sensor
- Firmware version of the external pressure sensor (when it is connected)
- Model name of the external pressure sensor (when it is connected)
- Serial number of the external pressure sensor (when it is connected)
- Calibration date of the external pressure sensor (when it is connected)

The calibration dates of the CA700 main unit and external pressure sensor are displayed differently depending on a calibration state.

Calibration Date: Date when we perform calibration (it is also displayed on delivery)
Calibration Date(User): Calibration date written with the communication command
Inspection Date: Delivery and inspection date (it is displayed when the firmware version is upgraded with no calibration since the delivery. After the calibration, the date returns to Calibration Date.)

4.4 Recommended Part Replacement and Calibration

Recommended Part Replacement and Consumable Parts

The following are consumable parts. We recommend replacing them at the following intervals. For part replacement, contact your nearest YOKOGAWA dealer.

Part Name	Recommended Replacement Interval
Backup battery (lithium battery)	5 years

Calibration

To ensure accurate measurement, we recommend periodic calibration.
Recommended calibration period: 1 year

Note

For details on calibrating the measurement and source features of the DC voltage and DC current, see the separate manual (IM CA700-01EN, included in the accompanying CD).

4.5 Disposing of the Instrument

When disposing of the instrument, follow the laws and ordinances of your country or region.

5.1 Pressure Measurement Feature

Pressure Measurement Range*

Suffix Code	-01	02	-03
Pressure type	Gauge pressure		
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	Up to 240.000 kPa	Up to 1200.00 kPa	Up to 4200.00 kPa
Measurement accuracy (6 months) after zero calibration[1, 2]	Positive pressure 20 to 200 kPa: ±(0.01% of reading + 0.003 kPa) 0 to 20 kPa: ±0.005 kPa	Positive pressure ±(0.01% of reading + 0.04 kPa)	Positive pressure ±(0.01% of reading + 0.15 kPa)
	Negative pressure ±(0.2% of reading + 0.080 kPa)	Negative pressure ±(0.2% of reading + 0.08 kPa)	Negative pressure ±(0.2% of reading + 0.08 kPa)
Measurement accuracy (1 year) after zero calibration[1, 2]	Positive pressure 20 to 200 kPa:±(0.01% of reading + 0.010 kPa) 0 to 20 kPa: ±0.012 kPa	Positive pressure ±(0.01% of reading + 0.08 kPa)	Positive pressure ±(0.01% of reading + 0.30 kPa)
	Negative pressure ±(0.2% of reading + 0.090 kPa)	Negative pressure ±(0.2% of reading + 0.09 kPa)	Negative pressure ±(0.2% of reading + 0.09 kPa)
Resolution	0.001 kPa	0.01 kPa	0.01 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 ± 0.3 kPa or less		
Measured medium	Gas and liquid (non-corrosive, non-flammable, non-explosive, and non-toxic fluids)		
Measured medium temperature[5]	–10 to 50°C		
Pressure sensor	Silicon resonant sensor		
Pressure sensing element	Diaphragm		
Pressure unit display	kPa and other units (Pa, hPa, MPa, mbar, bar, atm, mmHg, inHg, gf/cm^2, kgf/cm^2, mmH_2O@4°C, mmH_2O@20°C, ftH_2O@4°C, ftH_2O@20°C,inH_2O@4°C, inH_2O@20°C, torr, psi)		
Input port	Rc 1/4 or 1/4 NPT female thread (selectable)		
Measurement unit material	Diaphragm: Hastelloy C276, Input port: SUS316		

* 23°C ± 3°C

1 Zero-point calibration condition: Under atmospheric pressure

2 Yokogawa's pressure standards accuracy is excluded.

3 Conditions of response time measurement:
The response time is defined as the time for the readout to settle within ±1% of the full scale from the time when the positive pressure is released to atmosphere when it is at its full-scale value (where the input unit is under no load).

4 Full scale of each model
CA700-E-01: Positive pressure 200 kPa and negative pressure 80 kPa
CA700-E-02: Positive pressure 1000 kPa and negative pressure 80 kPa
CA700-E-03: Positive pressure 3500 kPa and negative pressure 80 kPa

5 Liquid temperature 5 to 50°C

Pressure switch test

Holds the pressure valued at the time the port switches between open and close.
Measures the resistance between ports when they are closed (measurement current < 1 mA)
Resistance measurement range 0 to 2.000 kΩ

Tilt Alarm

The zero adjustment indicator blinks when the orientation of the CA700 changes by approximately 10 degrees or more after the previous zero adjustment.
If the external pressure sensor selected as a function changes in position of about 10 degrees or more after zero adjustment, the zero adjustment indication blinks.

5.2 DC Current and DC Voltage Source Features

Item		Specifications (23°C ± 3°C, one year after calibration)	Notes
Current	20 mA range SOURCE	0 to 20.000 mA	Compliance voltage 24 V (when HART resistance is OFF), 18 V (when HART resistance is ON)
	Accuracy	0.015% of setting + 3 μA	The maximum setting is range×1.2.
	20 mA range SIMULATE	0 to 20.000 mA	External power supply 5 to 28 V (when HART resistance is OFF)
	Accuracy	0.015% of setting + 3 μA	External power supply 12 to 28 V (when HART resistance is ON) The maximum setting is range×1.2.
Voltage	5 V	0 to 5.0000 V	The maximum setting is range×1.1.
	Accuracy	0.015% of setting + 0.5 mV	Load current 1 mA max. (load resistance ≥ 5 kΩ)
Temperature coefficient		Add accuracy×(1/10)/°C	–10 to 20°C, 26°C to 50°C

Source load condition C ≤ 0.1 μF
L ≤ 10 mH
Source voltage to ground 42 Vpeak
Voltage limiter approx. 36 V
Current limiter approx. 30 mA
Loop feature Step and linear

5.3 DC Current and DC Voltage Measurement Features

Item		Specifications (23°C ± 3°C, one year after calibration)	Notes
Current	20 mA range	Measurement range 0 to ±20.000 mA	The maximum display value is range×1.2. Internal impedance < 10 Ω
		Resolution 1 μA	
		Accuracy 0.015% of reading + 3 μA	
	100mA range	Measurement range 0 to ±100.00 mA	The maximum display value is range×1.2. Internal impedance < 10 Ω
		Resolution 10 μA	
		Accuracy 0.015% of reading + 30 μA	
Voltage	5V range	Measurement range 0 to ±5.0000 V	The maximum display value is range×1.1. Internal impedance < 1 MΩ
		Resolution 0.1 mV	
		Accuracy 0.015% of reading + 0.5 mV	
	50V range	Measurement range 0 to ±50.000 V	The maximum display value is range×1.1. Internal impedance < 1 MΩ
		Resolution 1 mV	
		Accuracy 0.015% of reading + 5 mV	
LOOP	Supply voltage Supply current	24 V ± 1 V, 24 mA	HART resistance OFF, short current < 35 mA
		24 V ± 6 V, 20 mA	HART resistance ON, short current < 35 mA
	20 mA range	Measurement range 0 to 20.000 mA	The maximum display value is range×1.2.
		Resolution 1 μA	
		Accuracy 0.015% of reading + 3 μA	
Temperature coefficient		Add accuracy×(1/10)/°C	–10 to 20°C, 26°C to 50°C

CMRR: Approx. 120 dB (50/60 Hz)
NMRR: Approx. 60 dB (50/60 Hz)
Current terminal input protection: PTC protection
Measurement terminal maximum input: Voltage terminal 50 V DC
Current terminal 120 mA
Measurement unit voltage to ground: 50 Vpeak

5.4 Number of Saved Data Values

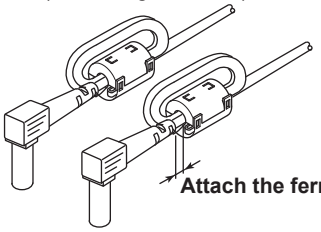
Instrument Operating Condition		Number of Data Values That Can Be Saved	Number of Files That Can Be Saved
Current	Save	2000	45
	Logging	2000	45
Leakage test		2000	45
Transmitter calibration (Number of calibration points: 5)	As Found	9	250
	As Left	9	250
Pressure switch calibration	As Found	1	250
	As Left	1	250

Total number of files: Up to 250

Total data size: Up to approx. 3.5 MB

5.5 General and Common Specifications

Item		Specifications
Standard temperature		23°C ± 3°C, 20 to 80%RH (no condensation)
Function	Common	HOLD, Min/Max, RELATIVE, %span, scaling, alarm
	Pressure	Zero calibration, unit change, pressure switch test, leak test (period: 00:00:01 to 24:00:00)
	Source	Linear sweep and step sweep (15, 30, 45, 60 second intervals) Internal HART communication resistor (250 Ω) ON/OFF
	Memory	Manual memory (date/time, display 1, display 2)
		Logging (2000 data points max. at 1, 2, 5, 10, 30, 60 s intervals) Device information, date/time, display 1 value, display 2 value
		Transmitter calibration data (As Found, As Left) Device information, calibration procedure, date/time, source value, measured value, error, and pass/fail
		Pressure switch test (As Found, As Left) Device information, date/time, open value, close value, deadband, resistance
		Leakage test Device information, start date/time and data, end date/time and data, deviation, leak rate
Display update rate		Approx. 300 ms (3 times per second)
Interface		Select and switch between USB A mass storage device, USB mini B Communication Device Class, and Mass Storage Class
External sensor		Dedicated external sensor can be connected to the connector.
Display		Dot matrix LCD (320×240 dots)
Backlight		LED
Warm-up time		Approx. 5 minutes
Power supply		Six AA alkaline dry cells
Battery life		Alkaline batteries 24 V loop power supply off during current measurement approx. 35 h (communication resistance on) 24 V loop power supply on during current measurement approx. 10 h (communication resistance on, supplying 10 mA loop current)
Auto power-off feature		Approx. 60 minutes; can be disabled
Insulation resistance		Between input terminal and case and between input port and case: At least 100 MΩ (500 VDC)
Withstand voltage		Between input terminal and case and between input port and case: 500 VAC for 1 minute
Protection level		IP54
External dimensions		Approx. 264 (W) × 188 (H) × 96 (D) (excluding protrusions)
Weight		Approx. 2 kg
Operating temperature and humidity		–10 to 50°C, 20 to 80%RH (no condensation)
Storage temperature and humidity		–20 to 60°C, 20 to 80%RH (no condensation)

Item	Specifications
Safety standards	Compliant standards EN 61010-1 Overvoltage Category I[1] Pollution degree 2[2] EN61010-2-030 No measurement category; O (Other)[3]
Emissions*	Compliant standards EN61326-1 class A EN55011 class A, group 1 EMC standards of Australia and New Zealand EN55011 Class A, Group 1 Korea Electromagnetic Conformity Standard (한국 전자파적합성기준) This product is a Class A (for industrial environment) product. Operation of this product in a residential area may cause radio interference in which case the user will be required to correct the interference.
	Cable conditions USB port (Function) Use a shielded USB cable (3 m in length or less). Measurement lead Pass each measurement lead (L4059PR) three times through the supplied ferrite core to attach it (see the figure below).  **Attach the ferrite core as close as possible.**
Immunity*	Compliant standards EN61326-1 Table 2 (for industrial environments) However, the measured values may receive noise effects.
	Cable conditions Same as the emission cable conditions.
Environmental standard*	Compliant standard EN50581 Monitoring and control instruments including industrial monitoring and control instruments.

* Applies to products with CE marks. For information on products without CE marks, contact your nearest YOKOGAWA dealer.

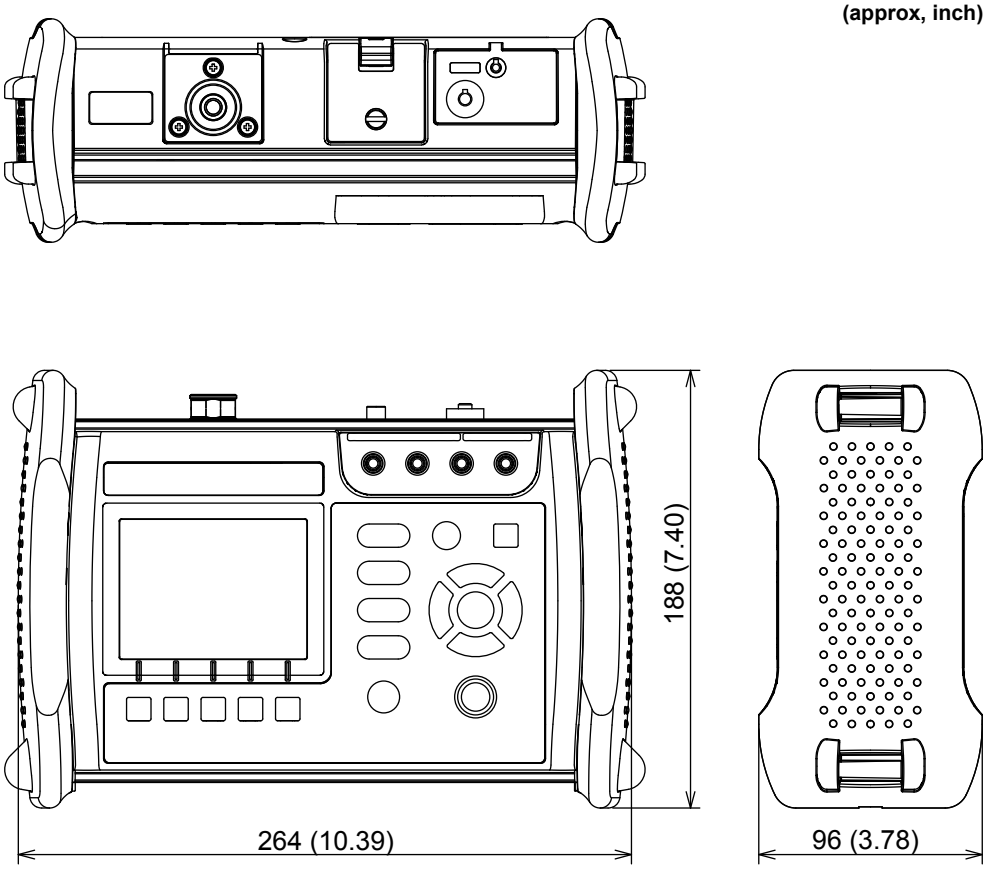
1 The overvoltage category (installation category) is a value used to define the transient overvoltage condition and includes the rated impulse withstand voltage. Overvoltage Category I applies to equipment that is connected to a circuit that has been designed to suppress overvoltage caused by transient phenomena to an adequately low level.

2 Pollution Degree applies to the degree of adhesion of a solid, liquid, or gas that deteriorates withstand voltage or surface resistivity. Pollution degree 2 applies to normal indoor atmospheres (with only non-conductive pollution).

3 The measurement category of the CA700 signal terminals is Other (O). Do not use it to measure the main power supply or for Measurement Categories II, III, and IV.
Measurement category O (Other) applies to measurement of circuits that are not directly connected to a main power source. This category applies to measurement of secondary electric circuits in equipment across a transformer. The estimated transient overvoltage that may appear at the CA700 signal input is 350 V.
Measurement category II applies to measurement of circuits, such as household electric appliances and portable electric tools, that are connected to low-voltage installations.
Measurement category III applies to measurement of facility circuits, such as distribution boards and circuit breakers.
Measurement category IV applies to measurement of power source circuits, such as entrance cables to buildings and cable systems, for low-voltage installations.

5.6 External Dimensions

Unit: mm
(approx, inch)



Unless otherwise specified, tolerances are ±3%
(however, tolerances are ±0.3 mm when below 10 mm).