



FC400-ECT-FA

Quick Manual

27JUN2019REV.101

UNIPULSE

Safety Precautions

For safety reasons, please read the following safety precautions

Installation, maintenance and inspection of the FC400 should be performed by personnel having technical knowledge of electricity. Notes indicated here are the serious contents related to safety. Please use FC400 after understanding the contents.

[Warning] Hazards that could result in serious injury or fatality might occur if FC400 is incorrectly handled

Warning on design

- For the entire system to function safely when the FC400 becomes faulty or malfunctions, provide a safety circuit outside the FC400.
- Before using the FC400 as described below, make sure to consult with our sales personnel.
 - Use in environments not described in the operation manual
 - Use greatly impacting human lives and assets, such as medical devices, transport devices entertainment devices, and safety devices.

Warning on installation and wiring

- Do not disassemble, repair, or modify the FC400. Doing so may cause a fire or an electric shock.
- Do not install in the following environments.
 - Places containing corrosive gas or flammable gas.
 - Where the product may be splashed with water, oil or chemicals.
- Be sure to ground the protective ground terminal.
- Before performing a wiring work, make sure that no power is applied.

Warning during startup and maintenance.

- Do not touch any signal input/output terminal while applying power. Doing so may cause electric shocks or malfunctions.
- In the case of smoke, an abnormal smell or strange sound, immediately turn off the power and disconnect the power cable.

[Caution] Hazards that could result in personnel injury or property damage might occur if FC400 is incorrectly handled

Caution on installation and wiring

- Since FC400 is defined as an open type(built-in device), it should be used to install and fix to a panel,etc.
- Do not install in the following environments.

(Where the temperature/humidity exceeds the range of the specifications. Where the temperature changes remarkably or there is a danger of freezing or condensing. Outdoors or where the altitude exceeds 2000m. Places containing large quantities of salt or iron powder. Where the main body is directly affected by vibrations or shocks.)
- Take adequate shielding measures when using at the following locations.

(Near a power line. Where a strong electric field or magnetic field is formed. Where static electricity, relay noise or the like is generated.)
- Install the FC400 as far away from devices generating high frequency, high voltage, large current, surge, etc., as possible. Also, carry out wiring separately from their power lines. Do not carry out parallel wiring and common wiring.
- Use shield cables for external input/output and load input.
- Be sure to ground the frame ground terminal(⏏).

Caution during startup and maintenance

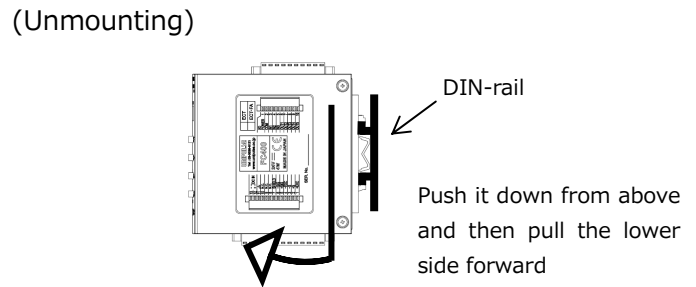
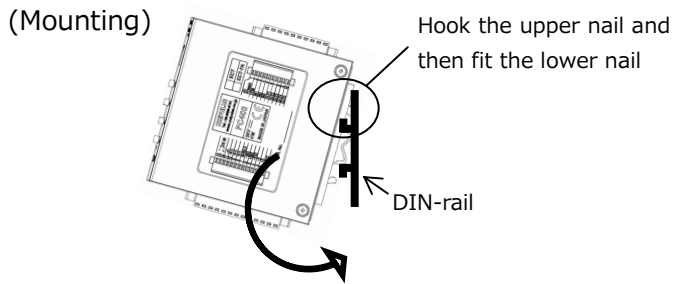
- For turning ON/OFF the power, be sure to keep intervals of 5 seconds or more. After power-on, make sure to warm up the FC400 for at least 30minutes before use.
- When performing maintenance, disconnect the power. Do not wipe with a wet rag, or with benzene, thinner, alcohol, etc.

Caution during disposal

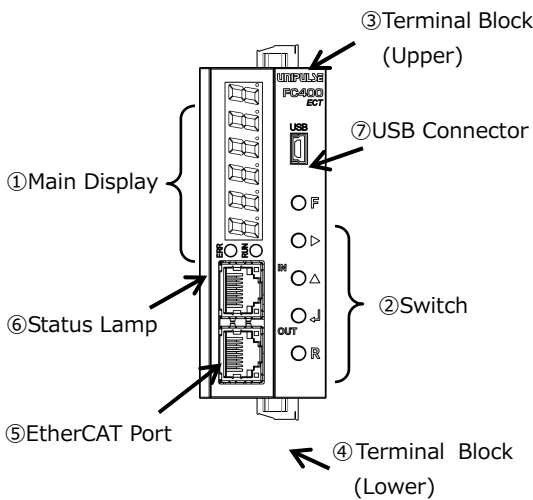
- If you dispose of the product, handle it as industrial waste.

1 INSTALLATION•CONNECTION

1-1. Mounting FC400 to DIN-rail / Unmounting FC400 from DIN-rail



1-2. Front panel / Terminal block



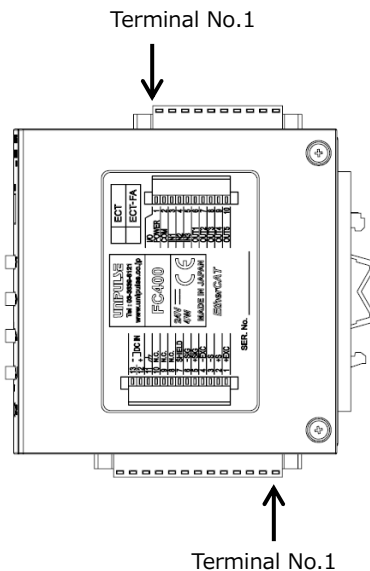
Name	Details	
① Main Display	1) Indicated value display 2) Over scale / error display 3) Setting value display	Display indicated value Over scale and other errors are displayed Each setting value is displayed
② Switch	<div>F FNC</div> <div>▶ HOLD</div> <div>△ ZERO</div> <div>↶ ENT(P/B)</div> <div>R RESET</div>	<div>Go into setting mode</div> <div>Hold operation/Setting operation</div> <div>Digital Zero/Setting operation</div> <div>Peak⇔bottom switching/setting operation</div> <div>EtherCAT reset</div>
③ Terminal Block (Upper)	For external I/O signal.	
④ Terminal Block (Lower)	For power supply/sensor	
⑤ EtherCAT Port	For LAN cable	
⑥ Status Lamp	Indicates communication state of EtherCAT	
⑦ USB Connector	For USB cable	

Terminal Block(Upper)

Uses	Terminal No.	Terminal Name	Details
Power supply for I/O signals	1	I/O POWER	For DC24V power supply which is used for I/O signals
	2	COM	Common terminal of I/O signals.
Input terminal	3	IN1	Input signal terminals (Functions are defined by setting)
	4	IN2	
	5	IN3	
Output terminal	6	OUT1	Output signal terminals (Functions are defined by setting)
	7	OUT2	
	8	OUT3	
	9	OUT4	
	10	OUT5	

Terminal Block(Lower)

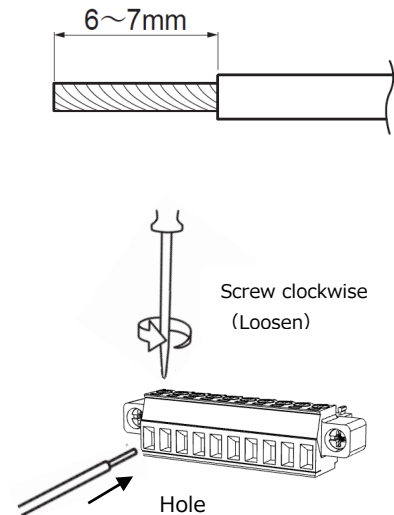
Uses	Terminal No.	Terminal Name	Details
Load input	1	+EXC	Terminals for connecting a strain gauge sensor.
	2	+S	
	3	-S	
	4	-EXC	
	5	+SIG	
	6	-SIG	
	7	SHIELD	
	8	N.C.	
	9	N.C.	
	10	N.C.	
Power supply input	11		For DC24V power supply which is used as power source of FC400.
	12	DC IN+	
	13	DC IN-	



1-3. Connection to the terminal block

1. Peel the sheath of the wire to be connected 6 - 7mm, and twist the end to such an extent that it will not become loose.
2. Loosen the screw with a screwdriver to open the hole.
A Screwdriver with a shaft diameter of 2.0mm is recommendable.
(Precision screwdriver, etc.)
3. Insert the wire into the hole so as not to loosen the end.
4. Tighten the screw with the screwdriver.
5. Lightly pull the wire to check that it is clamped securely.

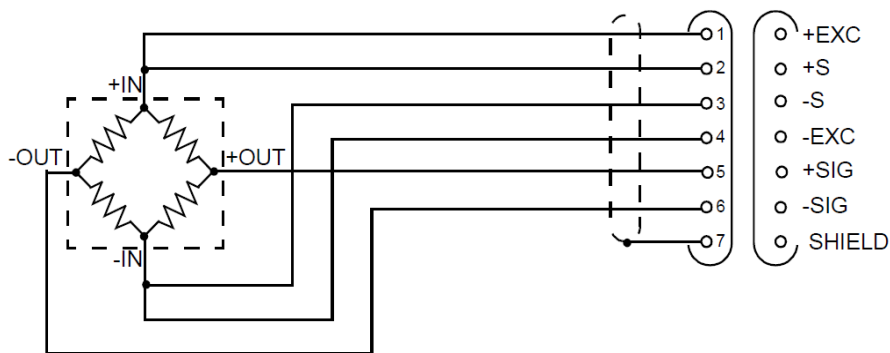
*Connectable wires are 0.13 – 1.31mm² (AWG16~26)
Recommendable tightening torque is 0.31 – 0.37Nm.



1-4. Strain gauge sensor connection

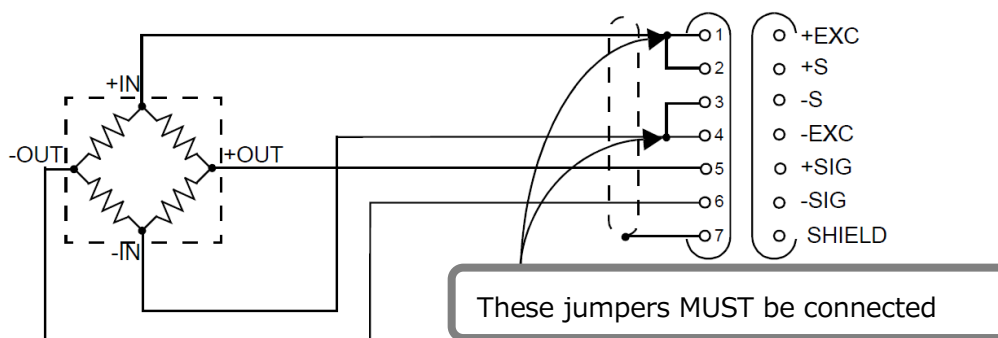
■ 6-wire connection

The load input of FC400 is a 6-wire connection. 6-wire shielded sensor cable should be used and kept separate from AC or other noise generating wire.

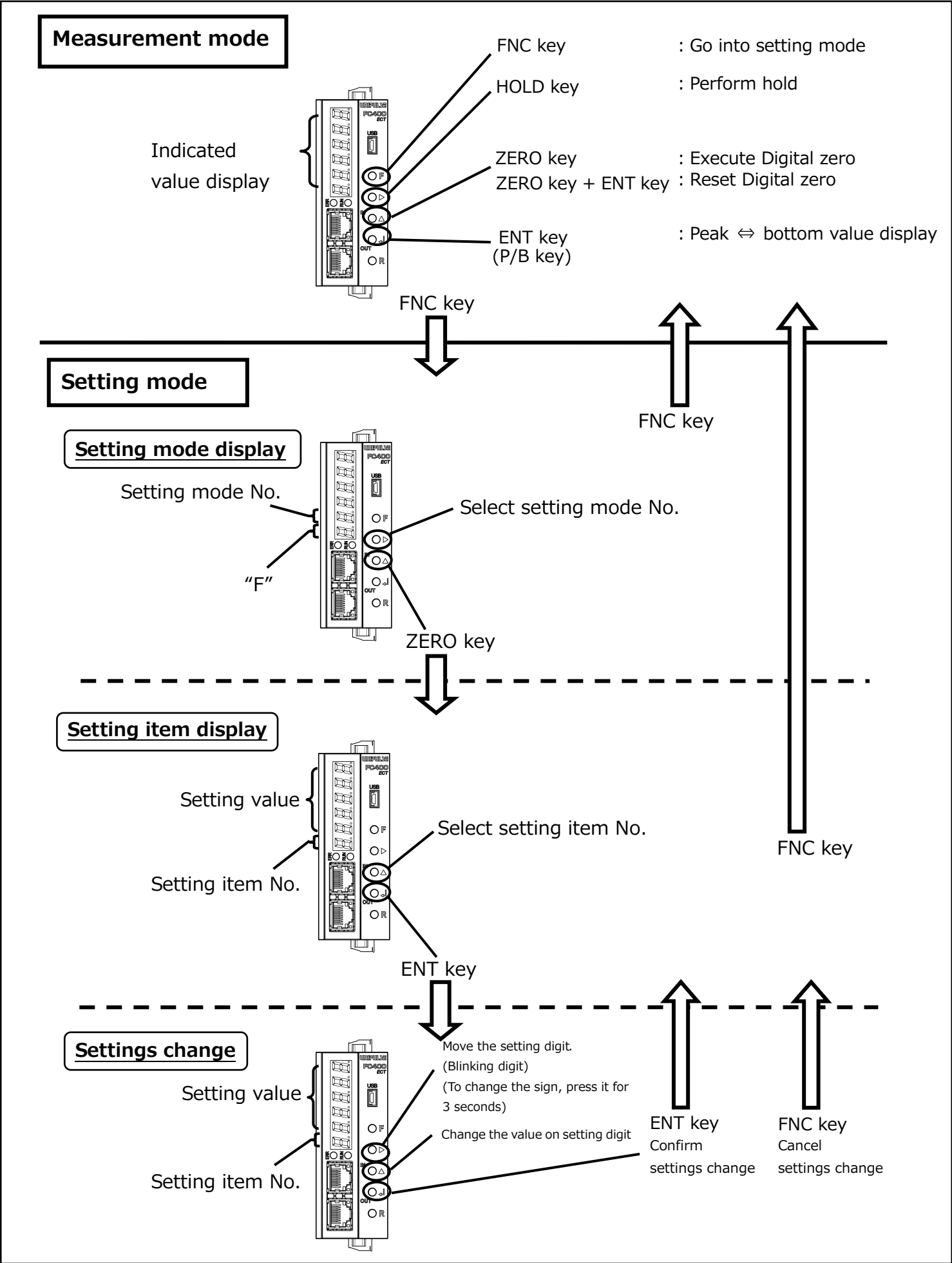


■ 4-wire connection

Connect 1 & 2, and 3 & 4 as shown below.



2 SETTING/OPERATION



3 CALIBRATION

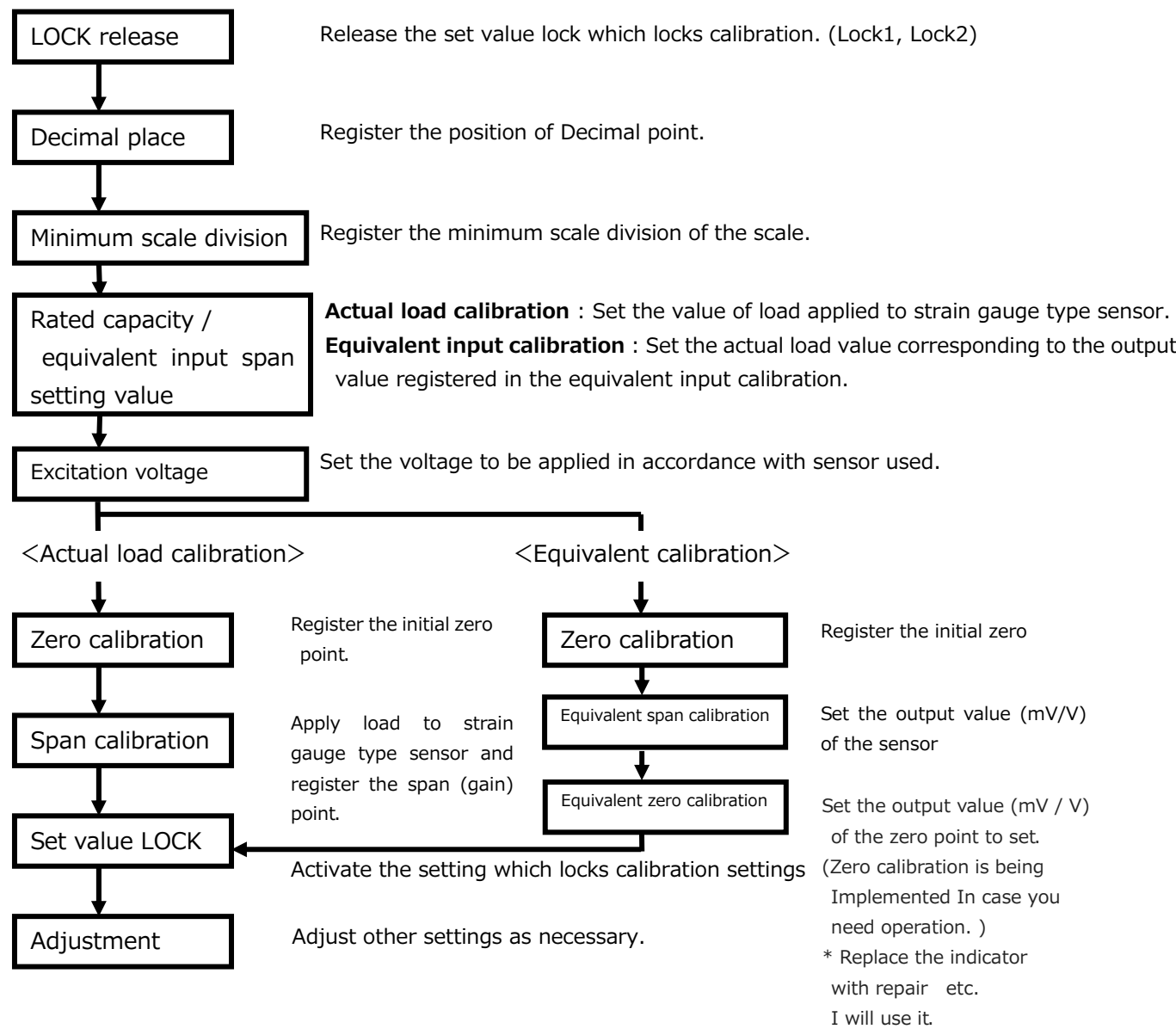
3-1. What is Calibration

Calibration is performed for matching the FC400 to a strain gauge type sensor. The following two types of calibration are available for the FC400.

<Actual load calibration> ...The way performing calibration by applying actual load to the sensor.

<Equivalent input calibration> ...The way performing calibration by simply inputting the rated output value (mV/V) and rated capacity described on the data sheet of the sensor.

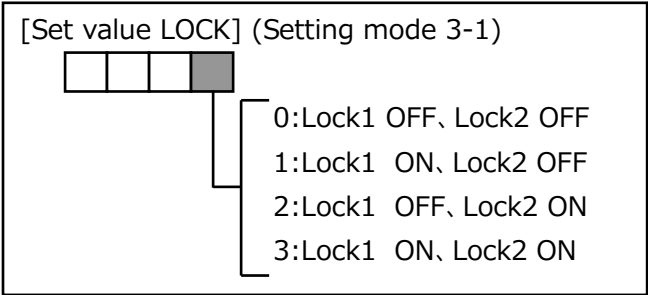
3-2. Calibration Procedure



3-3. Settings concerning calibration

3-3-1.Set value LOCK

This lock is intended to prevent changing set value by misoperation.



3-3-2. Decimal place

Set the decimal place which commonly used for displaying indicated value and setting items.

[Decimal place]	(Setting mode 5-4)
<div><div></div><div></div><div></div><div></div></div>	
	0:None 1:0.0 2:0.00 3:0.000 4:0.0000

3-3-3. Min scale division

Set the minimum unit (scale interval) for weighing.
Input range is 1 - 50.

[Min scale division]	(Setting mode 5-2)
<div><div></div><div></div><div></div></div>	(Input range : 1 - 50)

3-3-4. Rated capacity

Set the load applied to strain gauge type sensor during span calibration.
Input range is 1 - 99999.

[Rated capacity]	(Setting mode 5-1)
<div><div></div><div></div><div></div><div></div><div></div></div>	(Input range : 1 - 99999)

3-3-5. Excitation voltage selection

Set the voltage value applied to strain gauge type sensor.

[Excitation voltage selection]	(Setting mode 5-5)
<div><div></div></div>	(0 : 5V, 1 : 2.5V)

* Please check the specifications of the strain gauge sensor that you would like to use before changing the settings.

3-3-6. Zero calibration

Register the initial zero point.

- ① Select setting mode 9-1
- ② Make sure that unwanted load does not apply to the strain gauge type sensor.
- ③ Hit ENT key to start the zero calibration
- ④ "CAL-ZE" is displayed during calibration.
- ⑤ Zero calibration ends with the indicated value display of "0"

[Zero calibration]	(Setting mode 9-1)
<div><div></div><div></div><div></div><div></div><div></div><div>0</div></div>	Unable to input value (Displays "0")

3-3-7. Span calibration<Actual load calibration>

Apply load to strain gauge type sensor and register the span (gain) point. Select setting mode 9-2

- ① Enter the actual load value.
- ② Hit ENT key to start the Actual load calibration.
- ③ "CAL-SP" is displayed during calibration
- ④ Returns to indicated value display, and span calibration is complete

[Span calibration]	(Setting mode 9-2)
<div><div></div><div></div><div></div><div></div><div></div></div>	(Input range : 1 - 99999)

3-3-8. Equivalent span calibration<Equivalent calibration>

Perform calibration by inputting output of the sensor.

- ① Select setting mode 9-4
- ② Input the output value of the sensor
- ③ Hit ENT key to execute the Equivalent span calibration
- ④ Returns to indicated value display, and equivalent span calibration is complete

[Equivalent span calibration]	(Setting mode 9-4)
<div><div></div><div></div><div></div><div></div><div></div></div>	(Input range : 0.0100 - 3.8000)

3-3-9. Equivalent zero calibration<Equivalent calibration>

Input the output value (mV / V) of the sensor and register the initial zero point I will do.
Refer to 3-3-8 for operation method.

However, please select 9-3 for setting item.

* When performing actual load calibration, the output value (mV / V) at calibration is automatically input.

* Used when replacing the indicator with repair etc.

[Equivalent zero calibration]	(Setting mode 9-3)
<div><div></div><div></div><div></div><div></div><div></div></div>	(Input range : -3.0000 - 3.0000)

4 SPECIFICATIONS

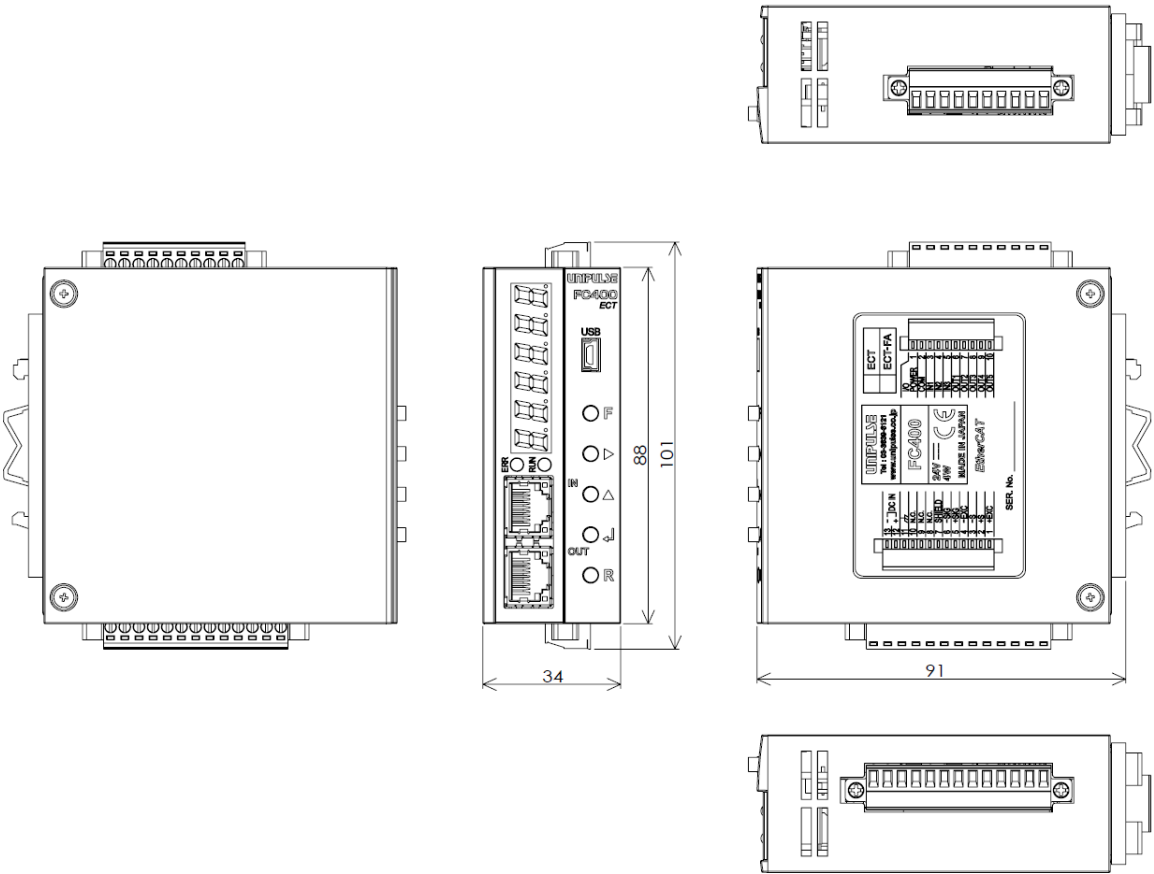
4-1. General specification

Power supply voltage	DC24V(±15%)		
Power consumption	4W		
Operation condition	Temperature	Operation temperature	-10 ~ 50℃
		Storage temperature	-20 ~ 85℃
	Humidity	Less than 85%RH (non-condensing)	
External dimension	34(W) × 88(H) × 91(D) (Not including protrusions)		
Weight	Approx. 230g		

4-2. Contents of the package

Small driver for terminal block	1 pc
Terminal block (10pin)	1 pc
Terminal block (13pin)	1 pc
Jumper wire	2 pcs
Quick manual	2 pcs

4-3. External dimension



Unit:mm

4-4. Compliance with EC directives

■ EMC Directive

EN61326-1 :2013

EN55011 :2009,A1:2010 Group1,Class A

EN61000-4-2:2009

EN61000-4-3:2006,A1:2008,A2:2010

EN61000-4-4:2012

EN61000-4-5:2006

EN61000-4-6:2009

EN61000-4-8:2010

Trademark

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