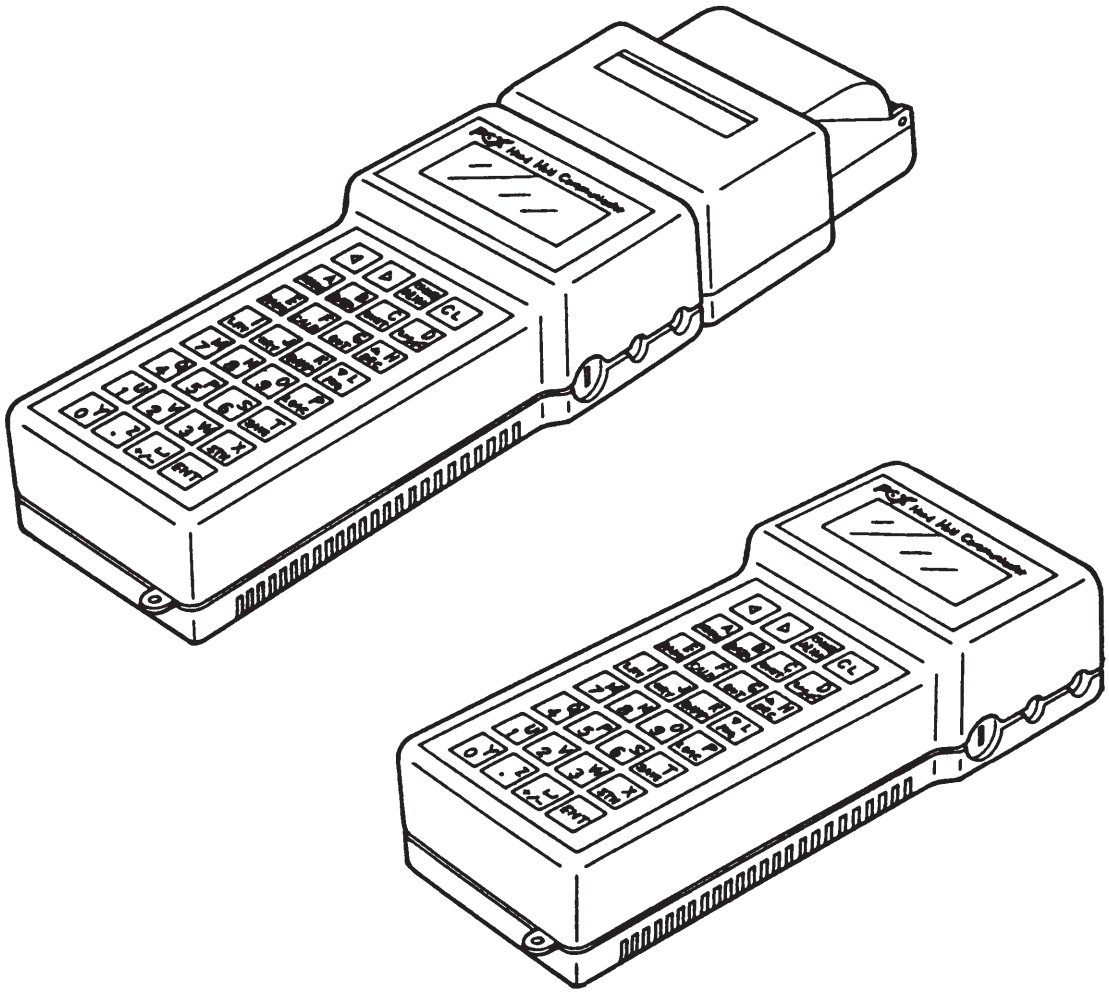
Instruction Manual

FCX SERIES
HAND HELD COMMUNICATOR
(HHC)

TYPE: FXW



Fuji Electric Co., Ltd.

INF-TN1FXWi-E

INTRODUCTION

Thank you very much for your purchase of the Fuji Hand Held Communicator (HHC) (Type : FXW).

- First read this instruction manual carefully until an adequate understanding is required, and then proceed to connection and operation of the hand held communicator.
- The specifications of the hand held communicator will be changed without prior notice for further product improvement.
- Modification of the hand held communicator without permission is strictly prohibited. Fuji will not bear any responsibility for a trouble caused by such a modification.
- This instruction manual should be kept by a person who is actually using the hand held communicator.
- After reading this manual, keep it at a place easier to access.
- This manual should be delivered to the end user without fail.

Export Precaution

This unit is not a strategic product (or service) prescribed by the foreign exchange and trade management regulations, but is required to follow the restriction items of the regulations when it is to be exported.

Manufacturer:	Fuji Electric Co., Ltd.
Type:	Described in nameplate on main frame (see Page iv)
Date of manufacture:	Described in nameplate on main frame
Product nationality:	Japan

Request

- Transcription of a part or the whole of this manual without permission is prohibited.
- The contents of this manual are subject to change without prior notice.

Issued in January, 1990
Rev. 6th edition June, 1999
Rev. 7th edition March, 2004
Rev. 8th edition June, 2009
Rev. 9th edition April, 2011

CAUTION ON SAFETY

• The cautionary descriptions listed here contain important information about safety, so they should be observed without fail. Those safety precautions are classified into ranks “DANGER” and “CAUTION”.

DANGER	Wrong handling may cause a dangerous situation, in which there is a risk of death or heavy injury.
CAUTION	Wrong handling may invite a dangerous situation, in which there is a possibility of medium-level trouble or slight injury or only physical damage is predictable.

On items listed under “⚠ CAUTION”, they may also lead to serious accidents depending on circumstances, and must be fully observed.

• The signs of prohibition and indication are explained in the following.

PROHIBITION	General items which pertain to prohibition (DO NOT)
INDICATION	General items which pertain to user's action

Connection
DANGER
• Non-explosion-proof HHC must not be used in hazardous area to prevent serious accidents such as explosion, fire, etc. • When using a flame-proof transmitter, do not connect HHC to the transmitter terminals and junction terminals in hazardous area.

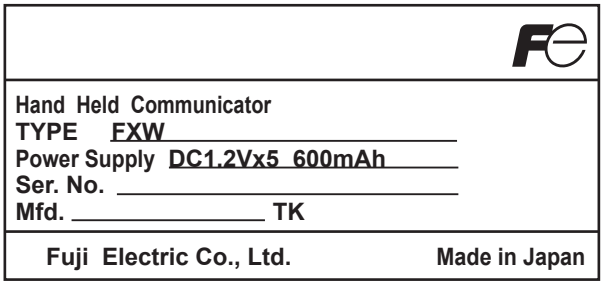
Operation I & II
CAUTION
• When changing set values, make sure that the control loop is in the manual mode.

Maintenance / Inspection
DANGER
• Do not attempt to charge the battery in hazardous area. • Do not attempt to replace the battery in hazardous area.

CONTENTS

CONFIRMATION OF TYPE OF UNIT

Instrument nameplate shown below is attached to the rear panel of the unit. Before using the unit, be sure to confirm the code symbols and specifications.



The following items are shown in this nameplate.

Type:	Type of unit
Power supply:	Power source (nickel-cadmium battery) specifications
Ser. No.:	Work No.
Mfd:	Date of manufacture

1. GENERAL

This instrument is designed for use with each smart type device of FCX series transmitter.
Setting changes and adjustments necessary for operation of each device can easily be made during communications with operator.

Applicable field devices

(1) FCX series transmitter

- Differential pressure/flow transmitter (FKC)
- Pressure transmitter (FKG)
- Absolute pressure transmitter (FKA)
- Level transmitter (FKE)
- Remote seal type differential pressure transmitter (FKD)
- Remote seal type pressure transmitter (FKB)

(2) FCX-A series transmitter

- Differential pressure/flow transmitter (FKC ... 2)
- Pressure transmitter (FKG ... 2)
- Absolute pressure transmitter (FKA ... 2)
- Level transmitter (FKE ... 2)
- Remote seal type differential pressure transmitter (FKD ... 2)
- Remote seal type pressure transmitter (FKB ... 2)
- Small flange level transmitter (FKY ... 2)
- Small flange remote seal type differential pressure transmitter (FKX ... 2)
- Small flange remote seal type pressure transmitter (FKW ... 2)

(3) FCX-C series transmitter

- Differential pressure/flow transmitter (FKK)
- Pressure transmitter (FKP)
- Absolute pressure transmitter (FKH)

(4) FCX-AX series transmitter

- Differential pressure/flow transmitter (FKC... 3)
- Pressure transmitter (FKG... 3)
- Absolute pressure transmitter (FKA... 3)
- Level transmitter (FKE... 3)
- Remote seal type differential pressure transmitter (FKD... 3)
- Remote seal type pressure transmitter (FKB... 3)
- Small flange level transmitter (FKY ... 3)
- Small flange remote seal type differential pressure transmitter (FKX ... 3)
- Small flange remote seal type pressure transmitter (FKW ... 3)

(5) FCX-AII series transmitter

- Differential pressure/flow transmitter (FKC ... 4)
- Pressure transmitter (FKG ... 4)
- Absolute pressure transmitter (FKA ... 4)
- Level transmitter (FKE ... 4)
- Remote seal type differential pressure transmitter (FKD ... 4)
- Remote seal type pressure transmitter (FKB ... 4)
- Small flange level transmitter (FKY ... 4)
- Small flange remote seal type differential pressure transmitter (FKX ... 4)
- Small flange remote seal type pressure transmitter (FKW ... 4)

(6) FCX-CII series transmitter

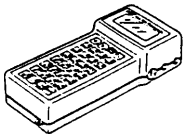
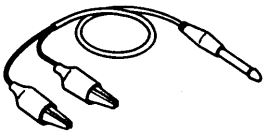
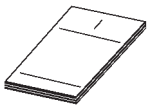
- Differential pressure/flow transmitter (FKK ... 4)
- Pressure transmitter (FKP ... 4)
- Absolute pressure transmitter (FKH ... 4)

(7) FCX-AIII series transmitter

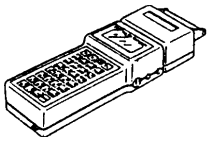
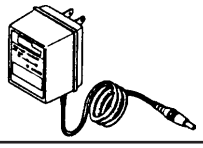
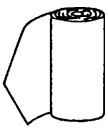
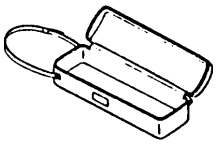
- Differential pressure/flow transmitter (FKC ... 5)
- Pressure transmitter (FKG ... 5)
- Absolute pressure transmitter (FKA ... 5)
- Level transmitter (FKE ... 5)
- Remote seal type differential pressure transmitter (FKD ... 5)
- Remote seal type pressure transmitter (FKB ... 5)
- Small flange level transmitter (FKY ... 5)
- Small flange remote seal type differential pressure transmitter (FKX ... 5)
- Small flange remote seal type pressure transmitter (FKW ... 5)
- Pressure transmitter (Direct mount type) (FKP ... 5)
- Absolute pressure transmitter (Direct mount type) (FKH ... 5)

2. PRODUCT CHECK

Check to make sure that the following products are included.

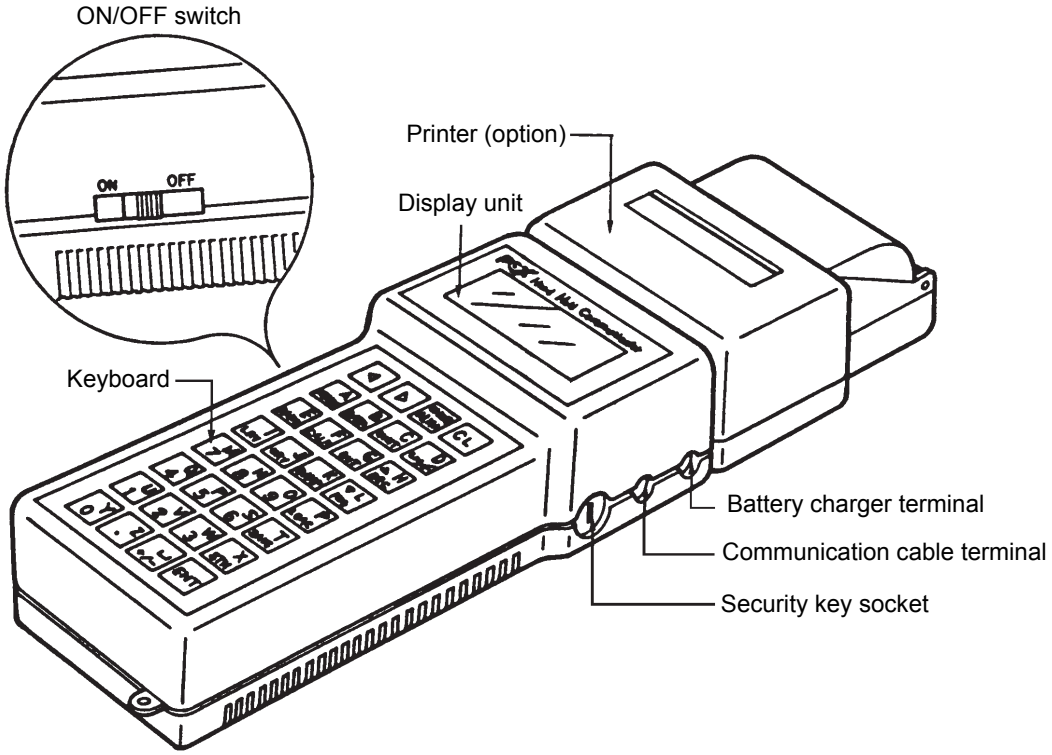
HHC (without printer)	
Communication cable (about 1 m)	
Security key (2 pcs)	
Instruction manual	

Option

HHC with printer	
Battery charger	
Roll paper	
Carrying case	

3. OPERATING PARTS AND DESCRIPTIONS

3.1 Name and description



* Battery charger terminal:
  Used to charge battery by using a special battery charger.

* Communication cable terminal:
  Used to connect communication cable.

* Security key socket:
  Used to connect security key.

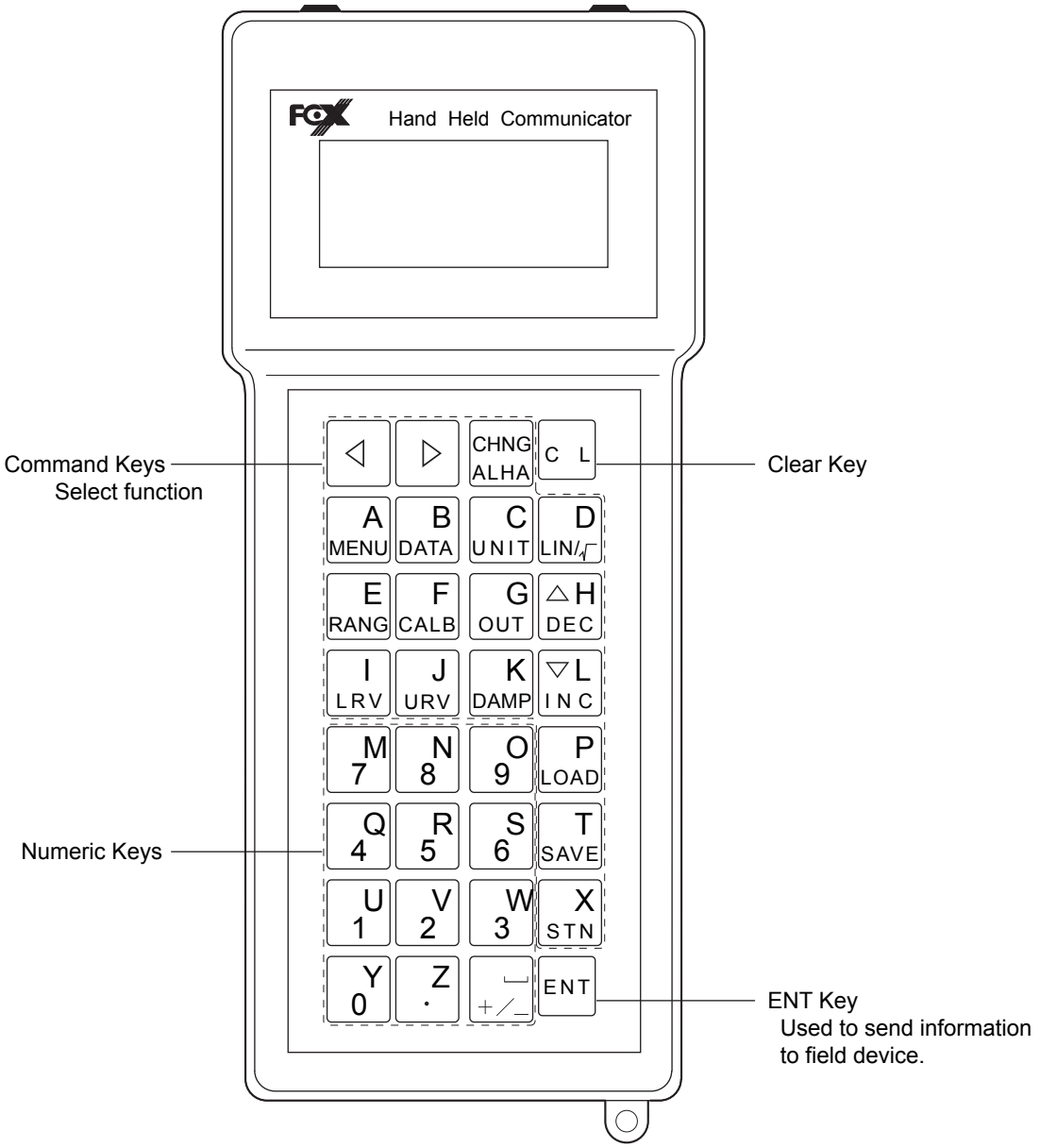
* Display unit:
  Displays data and set values.

* Printer (option):
  Prints data and set values.

* ON/OFF switch:
  Power ON/OFF switch

3.2 Descriptions of operating parts

The operating unit contains 4 kinds of keys; command keys (blue), numeric keys (yellow), ENT key (red) and CL key (green). For the function of these keys, please refer to “5. Operation”.



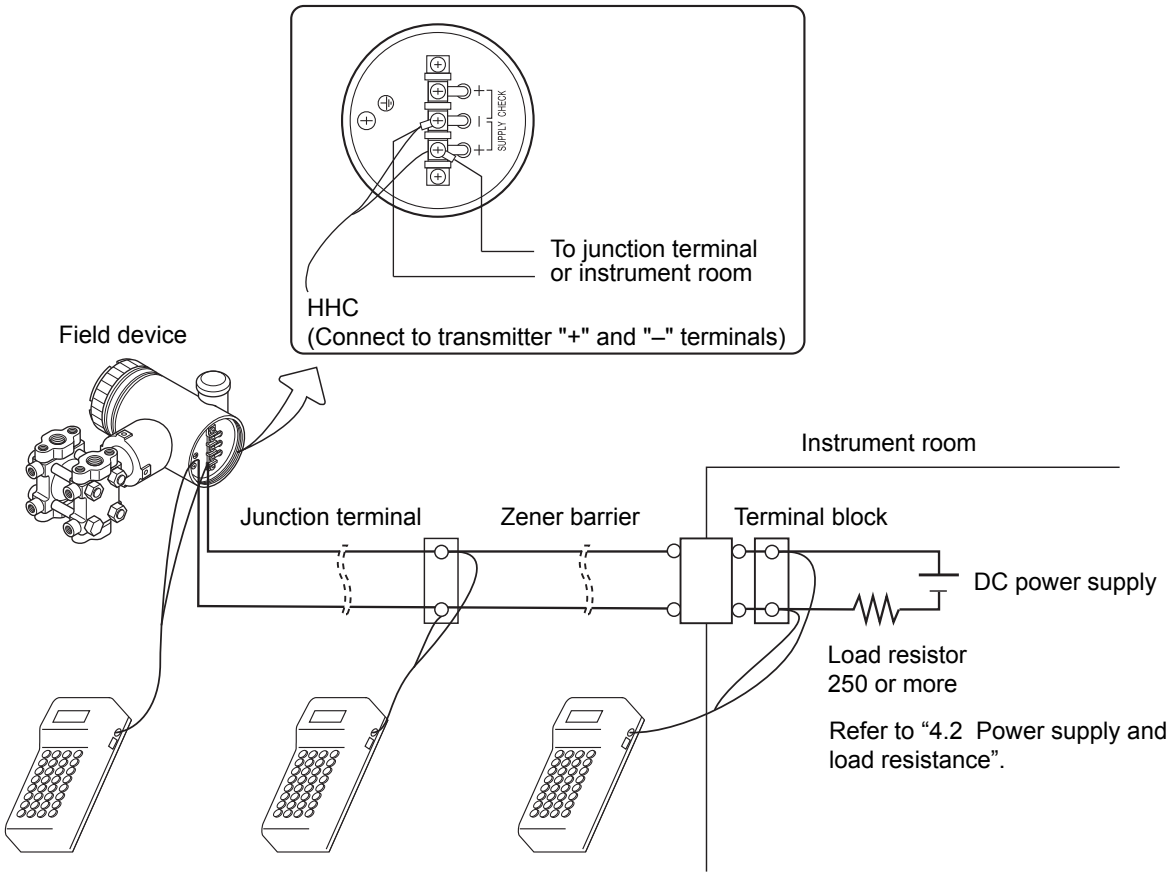
4. CONNECTION

4.1 Connection of HHC

Connect HHC in parallel with the current output of a field device.

Important

1. Connect HHC after holding the transmitter ON for about 10 seconds.
2. When connecting HHC, ensure ON/OFF switch is in the OFF position.
3. HHC communication cable has no polarity.

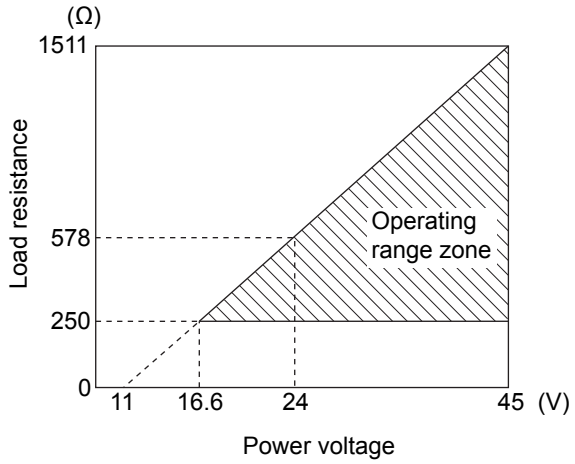


DANGER

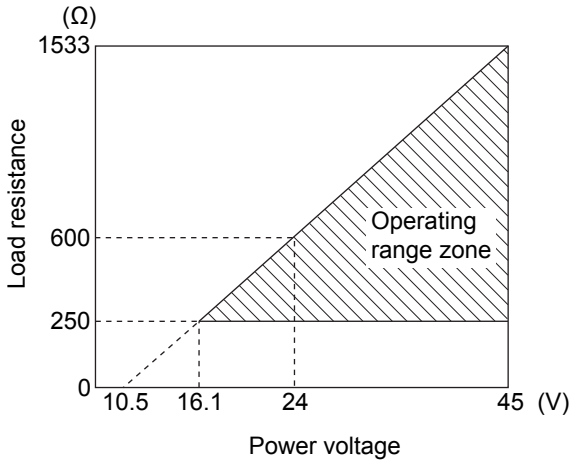
In the case of a flameproof transmitter, never connect the HHC to the terminal block of the transmitter in hazardous area installations.

4.2 Power supply and load resistance

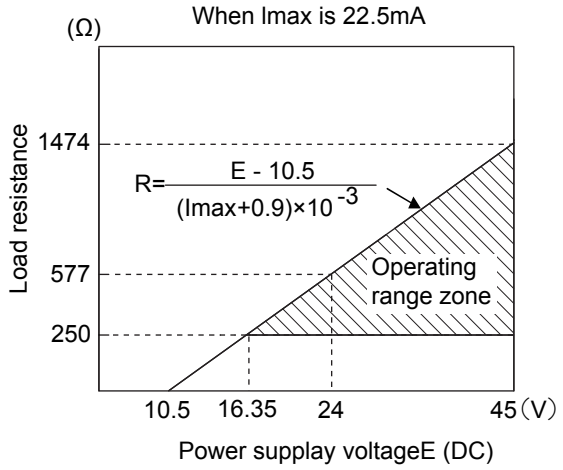
When using HHC, the output load resistance of the transmitter should be within the range shown in Fig. 4-1. (for transmitter)



(a) FCX transmitter



(b) FCX-A/C transmitter, FCX-AX transmisster and FCX-AII/CII transmitter



Note) Imax is the bigger one, either upper saturation current [mA] or upper burnout current [mA].
When Imax is from 20mA to 21.6mA, calculate load resistance using Imax of 21.6mA.
And when Imax is from 21.7mA to 22.5mA, calculate load resistance using the formula in the figure.

(c) FCX-AII/CII series transmitter (software version 4.06, amplifier revision 4FA) and FCX-AIII series transmitter

Fig. 4-1

CAUTION

The transmitter of intrinsic safety explosion-proof type has some limitations of supply voltage and load resistance in accordance with the safety barrier used in combination, installation of the transmitter, cable work and grounding work. Refer also to the instruction manual of the targeted transmitter for details.

5. OPERATION (FOR TRANSMITTER)

Cautions prior to operation

DANGER When changing a set value, make sure the control loop is in manual mode.

Important

1. Turn ON the power switch. If the battery alarm is displayed, the battery should be charged.
2. If standby indication is displayed before operation, press the CL key.

Common operation for all displays

* If the selected display is incorrect, press the CL key to return to the previous display.
  If the alphanumeric display is incorrect, move the cursor to the point to be changed by pressing the ◁ or ▷ key and reset it.
* When setting alphacharacters first press the CHNG ALHA key, then press an alphacharacters key.
  Alphacharacters cannot be set continuously.
  Press the CHNG ALHA key each time.
* When the ENT key is pressed at the completion of an operation, the information is transmitted to the field device.

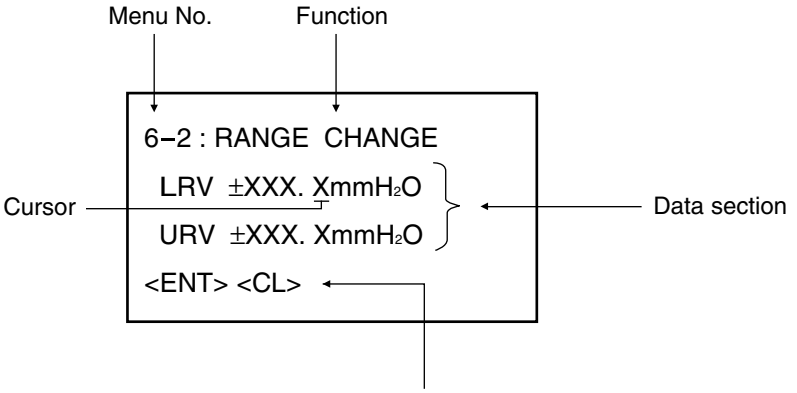
Cautions during operation

Important When the security key is in the OFF position, no changes can be make to the field device.

5.1 Descriptions of displays

Transmitter information can easily be checked and changed via the HHC using the messages shown on the display.

The display is a liquid crystal type shown the following contents in 4 lines with 16 characters.



Prompts (keys to take operator to next display)

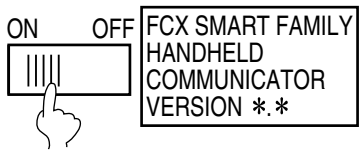
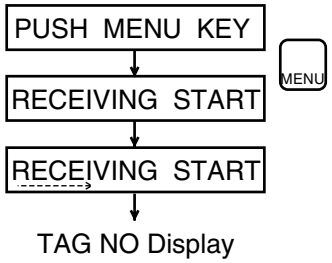
The meaning of the prompts are as follows.

<ENT>	: The contents displayed in the data section are inputted to the field device.
<INC>	: The cursor moves to the next option in the menu.
<CHANGE>	: The cursor moves to the lower display to change the data shown in the data section.
<CL>	: The inputted data is cleared according to the data section and the previous data display.

There are a total of 18 menu options, from No. 1 to I.

5.2 Operating procedures

Check the instrument for correct wiring and operate it according to the following procedures. (See “4. Connection, 4.1”)

The image shown at right is displayed when the power switch turns ON. (FXW program version is displyed for about 3 seconds after the power is ON.) The HHC of version 6.∗∗ or later does not support the electromagnetic flowmeter (type FMQ/FMT). In this case, contact our office to replace the versions of FXW ROM.	
When the printer is not connected to the HHC, “Push MENU KEY” is displayed after the software version is displayed. When the printer is connected to the HHC, please refer to the item 5.4. By pressing the MENU key “RECEIVING START” is displayed. The number of broken line arrow marks increases according to the data received. Next “TAG NO.” display is shown, press the key symbols shown in the following table to display setting items.	

5.3 Outline of HHC operation

The following shows the flow of key operations, explained for FXW version 7.1 (FXW□□□□1-□3). FXW prior to version 5.✻ (FXW□□□□1-□2) are not available of operation of FCX-AII/CII series transmitter and FCX-AIII series transmitter.

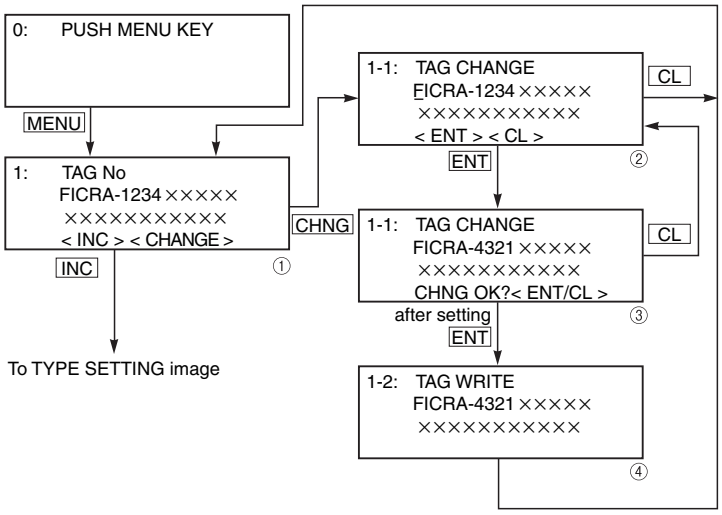
In this case, contact our office for ROM version up.

A part of the operation of the HHC of version 7.0 or earlier may differ or some items may not be set if the HHC is used for FCX series, FCX-A/C series, FCX-AX series transmitter or FCX-AII/CII series transmitter.

Classification		Display symbol	Key operation	Referential page
1	TAG No.	1: TAG No.	MENU	5-4
2	Type	2: TYPE	MENU ⇨ INC	5-5
3	Display of serial No.	3: SERIAL No.	MENU ⇨ INC ⇨ INC	5-5
4	Industrial value unit	4: UNIT	UNIT	5-6
5	Range limit	5: RANGE LIMIT	UNIT ⇨ INC	5-7
6	Range change (LRV,URV)	6: RANGE	RANG	5-7
7	Damping adjustment	7: DAMPING	DAMP	5-8
8	Output mode and value	8: OUTPUT MODE	LIN / √	5-9
9	Burnout direction	9: BURNOUT	LIN / √ ⇨ INC	5-10
A	Zero/span adjustment	A: CALIBRATE	CALB	5-11
B	Calibration of output circuit	B: OUTPUT ADJ	OUT	5-12
C	Indication of measured data	C: DATA	DATA	5-13
D	Self-diagnosis	D: SELF CHECK	DATA ⇨ INC	5-13 to 5-14
E	Printer function	E: PRINT	DATA ⇨ INC ⇨ INC	5-14
F	Lock of adjustment functions	F: XMTR EXT. SW	DATA ⇨ INC ⇨ INC ⇨ INC	5-15
G	Indication of digital indicat	G: XMTR DISPLAY	DATA ⇨ INC ⇨ INC ⇨ INC ⇨ INC	5-16 to 5-18
H	Programmable linearization function	H: LINEARIZE	DATA ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC	5-19 to 5-20
I	Rerange (Set LRV/URV calibration)	I: RERANGE	DATA ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC	5-21
J	Saturation current value and specification	J: SATURATE CUR	DATA ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC	5-22
K	Write protect	K: WRITE PROTCT	DATA ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC	5-23 to 5-24
L	History information	L: HISTORY	DATA ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC ⇨ INC	5-25

5.4 Operating procedure

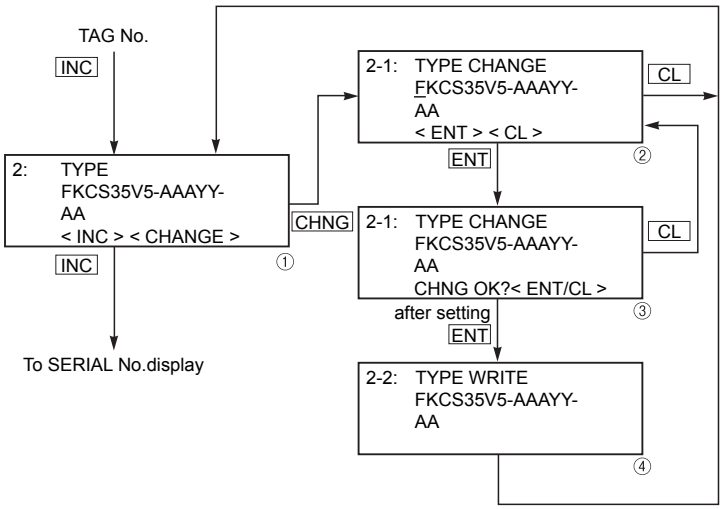
The following shows the operating procedure of HHC connecting to FCX-AIII series transmitter.
A part of the operation of the HHC of version 7.0 or earlier may differ or some items may not be set if the HHC is used for FCX series, FCX-A/C series, FCX-AX series transmitter or FCX-AII/CII series transmitter.



TAG NO.

To set the TAG NO. of each field device, use the procedures shown in the following diagram. TAG NO. can be inputted up to 26 character of alphanumeric codes.

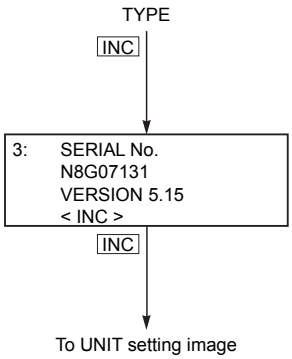
- After PUSH MENU KEY is displayed, press the <MENU> key to display TAG NO.
- To make changes press the <CHNG> key and the cursor will be displayed under display ① .
- Set the alphanumeric keys as necessary under display ② .
  To set the alphabet, press the <CHNG ALHA> key first.
  Using <v><u> keys, cursor position can be moved.
- At the completion of setting, press the <ENT> key and a prompt is displayed check entry under display ② .
- If the entry is correct, press the <ENT> key to input it to the field device under display ③ and ④ and the initial image ① is displayed.
- To display TYPE display, press the <INC> key under display ① .



TYPE

Type of field device is displayed and changed (example of differential pressure transmitter).

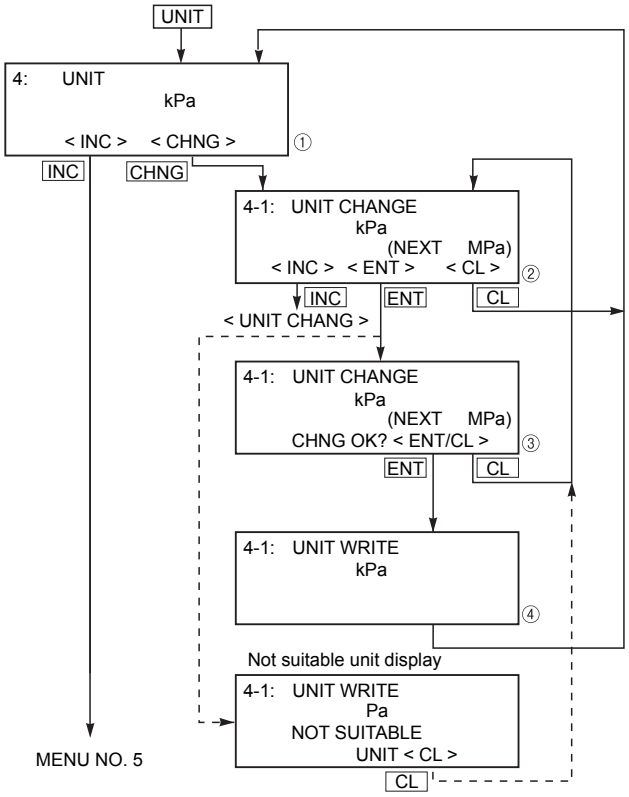
- After TAG NO. is displayed, press the <INC> key to display TYPE image.
- To make changes press the <CHNG> key under display ① and the cursor will be displayed under display ② .
- Set the alphanumeric keys as necessary under display ② .
  To set the alphabet, press the <CHNG ALHA> key first.
  Using <◁><▷> keys, cursor position can be moved.
- At the completion of setting, press the <ENT> key and a prompt is displayed check entry under display ② .
- If the entry is correct, press the <ENT> key to input it to the field device under display ③ and ④ and the initial image ① is displayed.
- To display SERIAL NO., press the <INC> key under display ① .



Display of SERIAL NO.

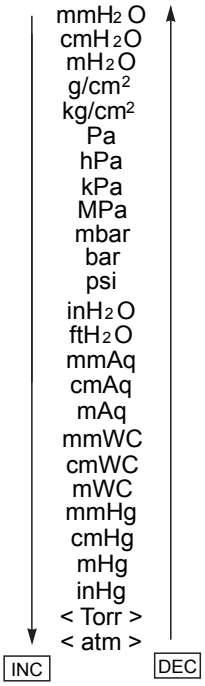
SERIAL NO. and transmitters software version are displayed.

- After setting TYPE, press the <INC> key to display SERIAL NO. and software version of transmitter.
- By pressing the <INC> key, UNIT setting image is displayed.



Industrial value unit

Available unit for FCX-AII/CII and FCX-AIII



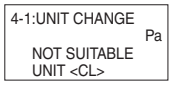
Note: The mark < > is settable for absolute pressure transmitter only.

- When pressing <CHNG> under display ①, the display for changing the unit of industrial value ② appears.
- The desired unit of industrial value is selectable by using <INC> or <DEC> under display ②.
- Display ③ is provided for confirming your change.
- Display ④ is for registering the unit of industrial value.

Important

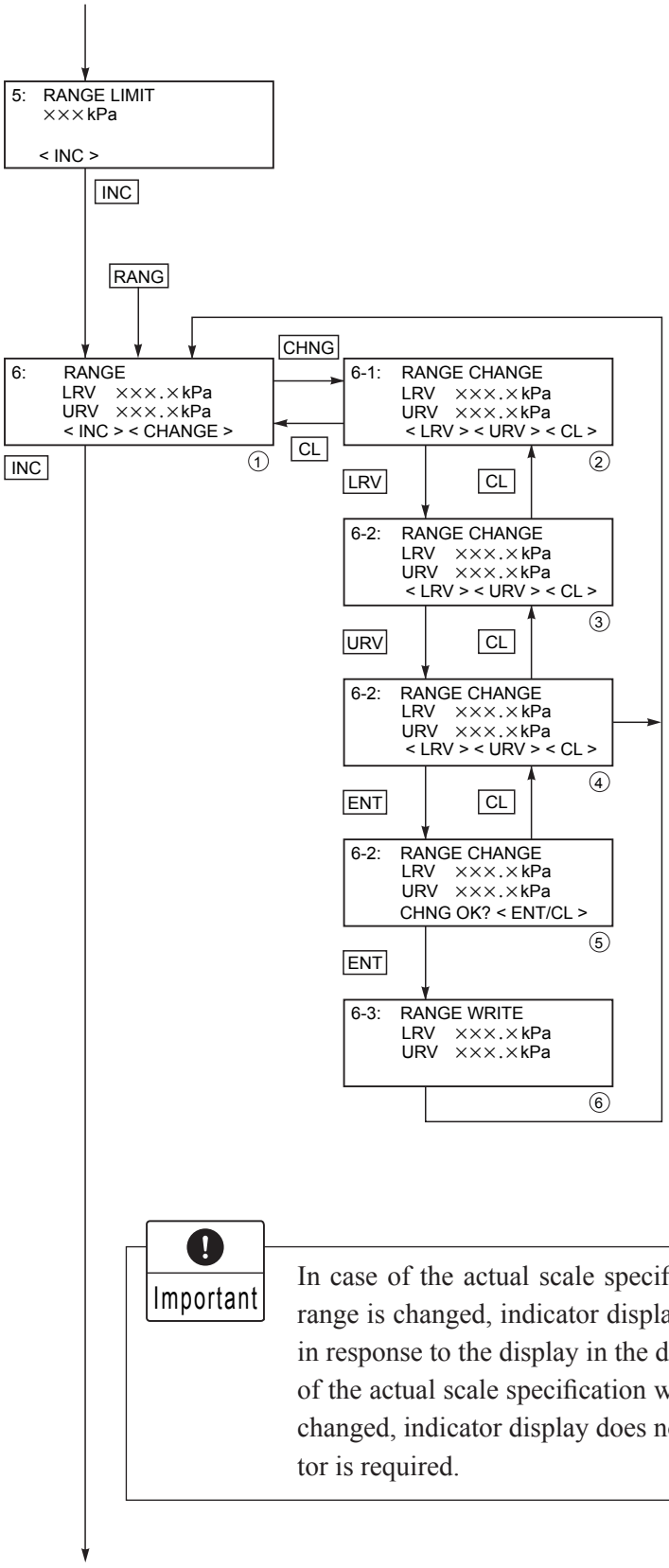
The unit of industrial value is set according to the range as ordered, but the display resolution lowers depending on the unit being set.

When



is displayed upon changing the unit of industrial value, output cannot be displayed in the engineering unit selected.

In this case, press the CL key and change the engineering unit to a different one.



Range limit

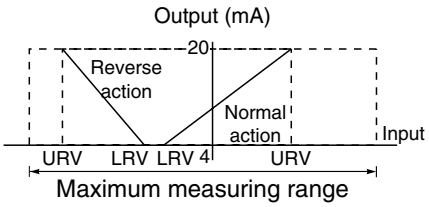
Indicates the maximum measuring range of this transmitter.

Range change (LRV, URV)

LRV: Lower range value (0% point)
URV: Upper range value (100% point)

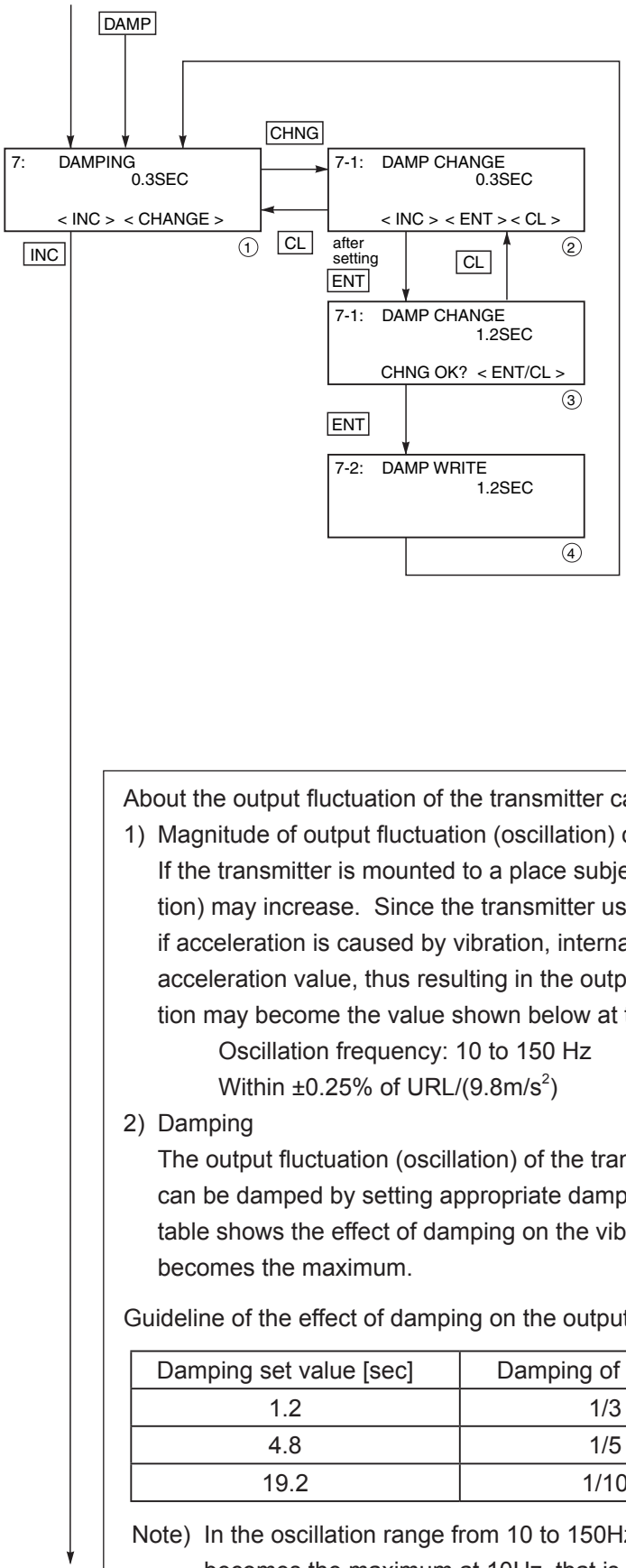
- When pressing <CHNG> under display ① , display changes to the LRV and URV selection screen.
  Press <LRV> for presenting the display for setting the zero point range (display ③), or <URV> for presenting the display for setting the span range (display ④).
- Under displays ③ and ④ , input zero point and span values.
  *Press <ENT> after setting LRV and URV.
- When pressing <+/–> under display ③ , ④ , negative value is available.

Selectable setting range



Important

In case of the actual scale specification with a digital indicator provided, if the range is changed, indicator display does not match. So, setting is required again in response to the display in the digital indicator (G: XMTR DISPLAY). In case of the actual scale specification with an analog indicator provided, if the range is changed, indicator display does not match. So, replacement of the analog indicator is required.



Damping adjustment

In the case where the process input fluctuation is large, the vibration of the installation site is large, and minute differential pressure is measured, if the output fluctuation is large, set appropriate damping time constant to suppress the output fluctuation.

Input time constant value under display ②, time constant can be changed.

Selectable time constant value:

0.12 to 32 sec (FCX-AII/CII series transmitter)

0.06 to 32 sec (FCX-AIII eries transmitter)

Note) The above damping constants are used only for the electronics unit. The detecting unit has its own constants independent of the electronics unit (for details, refer to the data sheet).

About the output fluctuation of the transmitter caused by vibration and damping

1) Magnitude of output fluctuation (oscillation) caused by vibration

If the transmitter is mounted to a place subject to severe vibration, output fluctuation (oscillation) may increase. Since the transmitter uses oil as internal pressure transmitting medium, if acceleration is caused by vibration, internal pressure is generated in accordance with the acceleration value, thus resulting in the output fluctuation. The magnitude of output oscillation may become the value shown below at the maximum.

Oscillation frequency: 10 to 150 Hz

Within ±0.25% of URL/(9.8m/s^2)

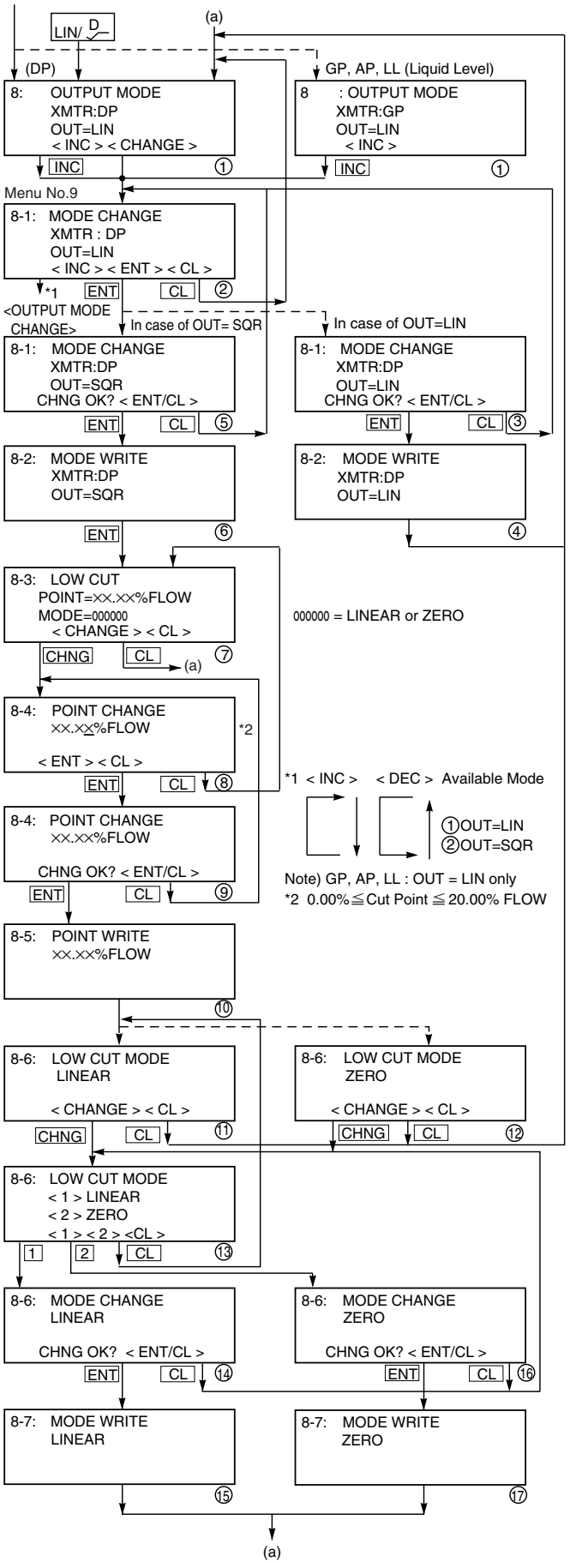
2) Damping

The output fluctuation (oscillation) of the transmitter in an environment subject to vibration can be damped by setting appropriate damping time constant using the HHC. The following table shows the effect of damping on the vibration of 10Hz where the output fluctuation becomes the maximum.

Guideline of the effect of damping on the output fluctuation (oscillation)

Damping set value [sec]	Damping of output oscillation	Remarks
1.2	1/3 or lower	
4.8	1/5 or lower	
19.2	1/10 or lower	

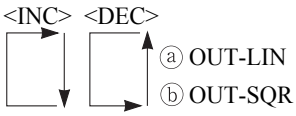
Note) In the oscillation range from 10 to 150Hz, the output fluctuation (oscillation) becomes the maximum at 10Hz, that is, the lowest frequency.



Output mode

The output mode is used to select the proportional mode (proportional to input differential pressure) or square root extraction mode (proportinal to flow rate) for output signal (4 to 20 mA). In case of square root extraction mode, the cut point and the mode below the cut point can be set. Under display ② , press <INC> or <DEC> for selection of the square root extraction mode or proportional mode.

Change of output mode



Since display ⑦ is presented when the square root extraction mode is selected, the low flow cut point should be set.

Cut point is adjustable within the range of 0.00 to 20.00%. Note that if the cut point is set to a small value around 0%, even a minute differential pressure change causes a sudden output fluctuation. The cut point is used for stabilizing output near 0% when the square root extraction mode is selected for output signal. There are two modes; in one mode, proportional output is selected for output below a cut point (Fig. A) and in the other mode, output is forcibly reduced to 0% for output below a cut point (Fig. B).

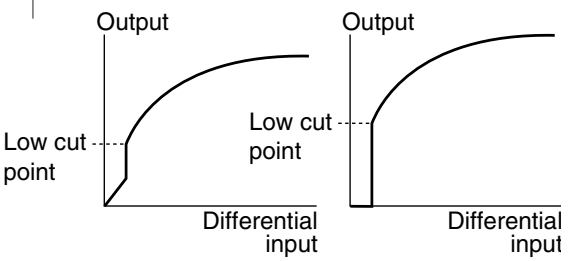
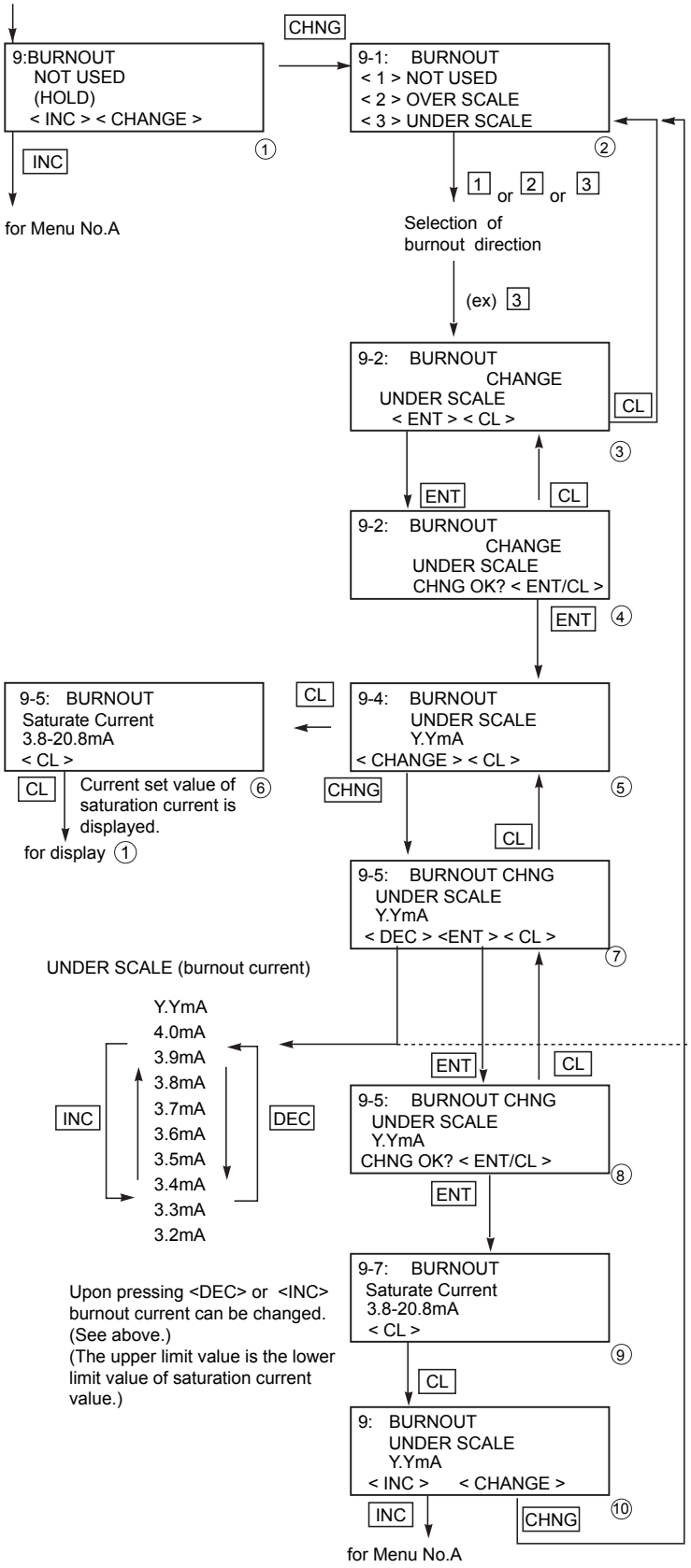


Fig. A: With linear output selected in low cut mode

Fig. B: With zero output selected in low cut mode

Under display ⑬ , linear or zero output is selectable for output below the cut point.



Burnout direction and value

Used for selecting output at occurrence of a fault in the detecting unit. Burnout direction is selectable under display ② .

- For selection of NOT USED, press <1>.
- For selection of OVER SCALE, press <2>.
- For selection of UNDER SCALE, press <3>

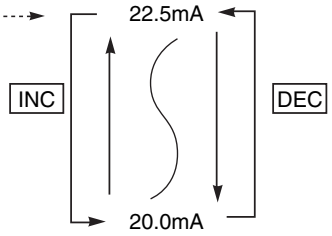
The meaning of each condition above is as follows.

- NOT USED → Not used (Output hold)
  Saturation current = Current set value

Note) Output value just before the occurrence of trouble is given in the output hold mode.

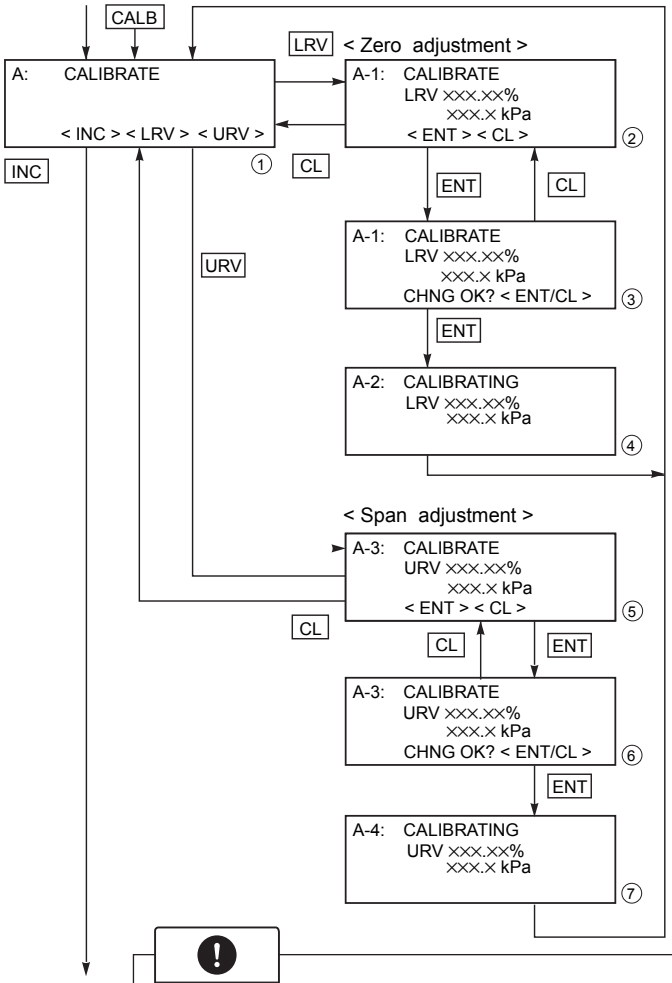
- OVER SCALE → Over scale (Output saturation current value to 22.5mA)
  Saturation current = Current set value
- UNDER SCALE → Under scale (Output 3.2mA to saturation current value)
  Saturation current = Current set value

Change of Over scale current



Settable in increments of 0.1mA.
(Lower limit value is the upper limit value of saturation current value.)

* Specification of the saturation current value (Upper limit, Lower limit) is changeable according to the "J. Saturation current value and specification setting". The lower limit value of saturation current value is settable up to 4.0mA at extended specifications. (3.2mA to 4.0mA)
Display symbol of Menu No.9 is "9: BURNOUT EXP." at extended specifications.



Zero/span adjustment

Zero and span are adjustable by applying an actual pressure.

When pressing <LRV> under display ① , the screen for zero adjustment ② appears, and that for span adjustment ⑤ appears when pressing <URV>.

Under display ② , after applying actual pressure equal to zero point, press <ENT> two times. Zero adjustment will be over.

When adjustment is made at any point other than zero, input the pressure value at that point at the display of ② , then press the <ENT> key at the display of ③ while applying a corresponding pressure to the transmitter.

Under display ⑤ , after applying actual pressure equal to desired span, press <ENT> two times. Span adjustment will be over.

When adjustment is made at any point other than span, input the pressure value at that point at the display of ⑤ , then press the <ENT> key at the display of ⑥ while applying a corresponding pressure to the transmitter.

Important

Press LRV or URV at display of ① .

When the following is displayed, it means that calibration can not be made because Menu No. H: LINEARIZE is effective. In this case, set INVALID on the panel of No. H: LINEARIZE.

```
A-1:CALIBRATE
Can't proceed.
Set Linearize
invalid          <CL>
```

1. Span adjustment should be performed after zero adjustment is completed.
2. When the actual input exceeds the adjustable range, [NOT CALB <CL>] is displayed. In this case, adjustment is required again.

Adjustable range

Zero adjustment: Within ±40% of maximum span

Span adjustment: Within ±20% of calibrated span

3. When the adjustment point does not meet the following condition, [SETTING ERR<CL>] is displayed. In this case, adjustment is required again.

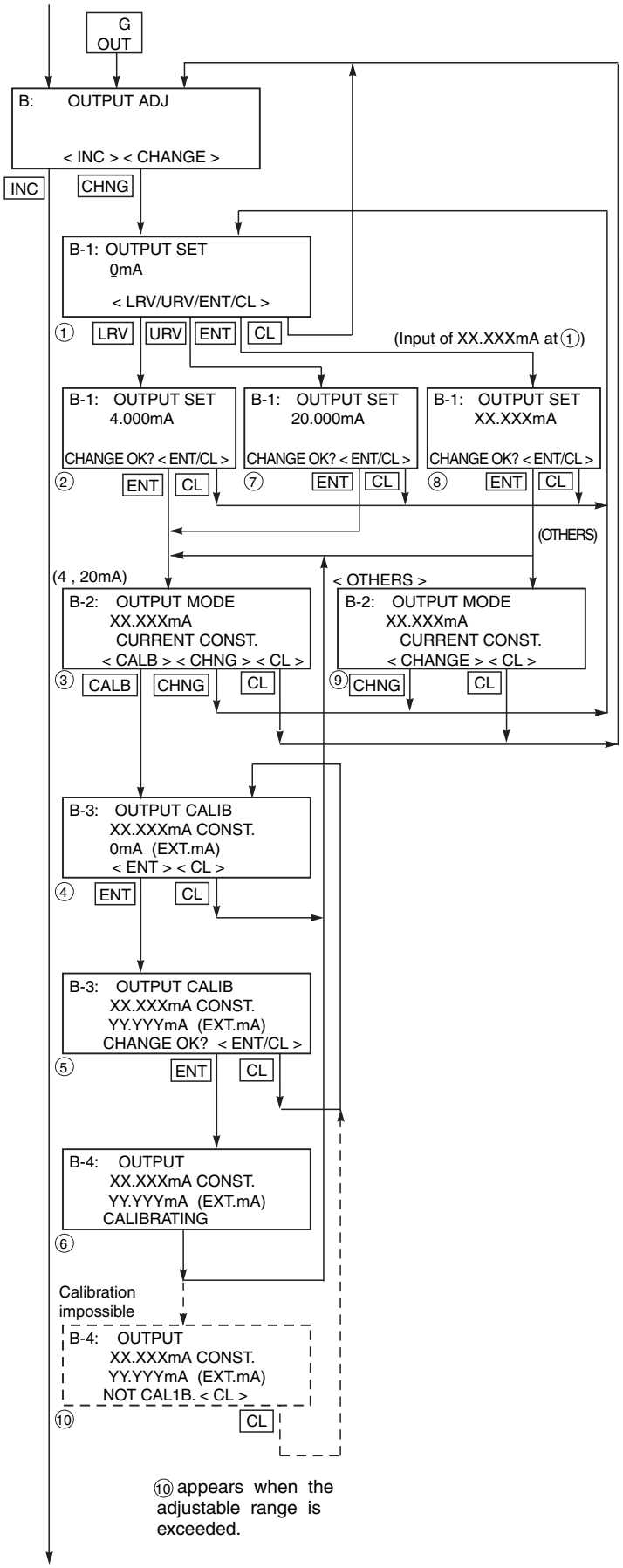
Adjustment point setting condition

$-1.000\%CS^{(*)} \leqq PL \leqq 100.000\%CS^{(*)}$ $\quad 0.000\%CS^{(*)} \leqq PH \leqq 105.000\%CS^{(*)}$

$$PL = \frac{\text{(Lower adjustment point)} - LRV}{URV - LRV} \times 100$$

$$PH = \frac{\text{(Higher adjustment point)} - LRV}{URV - LRV} \times 100$$

(*) : CS (Calibrated Span) is equal to measuring range.



Calibration of output circuit (D/A)

The output circuit (D/A) should be calibrated by the following procedure when necessary.

When the <LRV> key is pressed at the display of ① , the display ② for 4mA current output and its calibration will appear on the screen. When the <URV> key is pressed, the display ⑦ for 20mA current output and its calibration will appear on the screen.

Under display ① , input a desired value within a range of 3.2 to 22.5mA and then press <ENT> two times. At this input value, a regulated current output is available.

Under display ④ , input digital values measured by digital voltmeter.

Under display ⑤ , the output circuit is calibrated when pressing <ENT>.

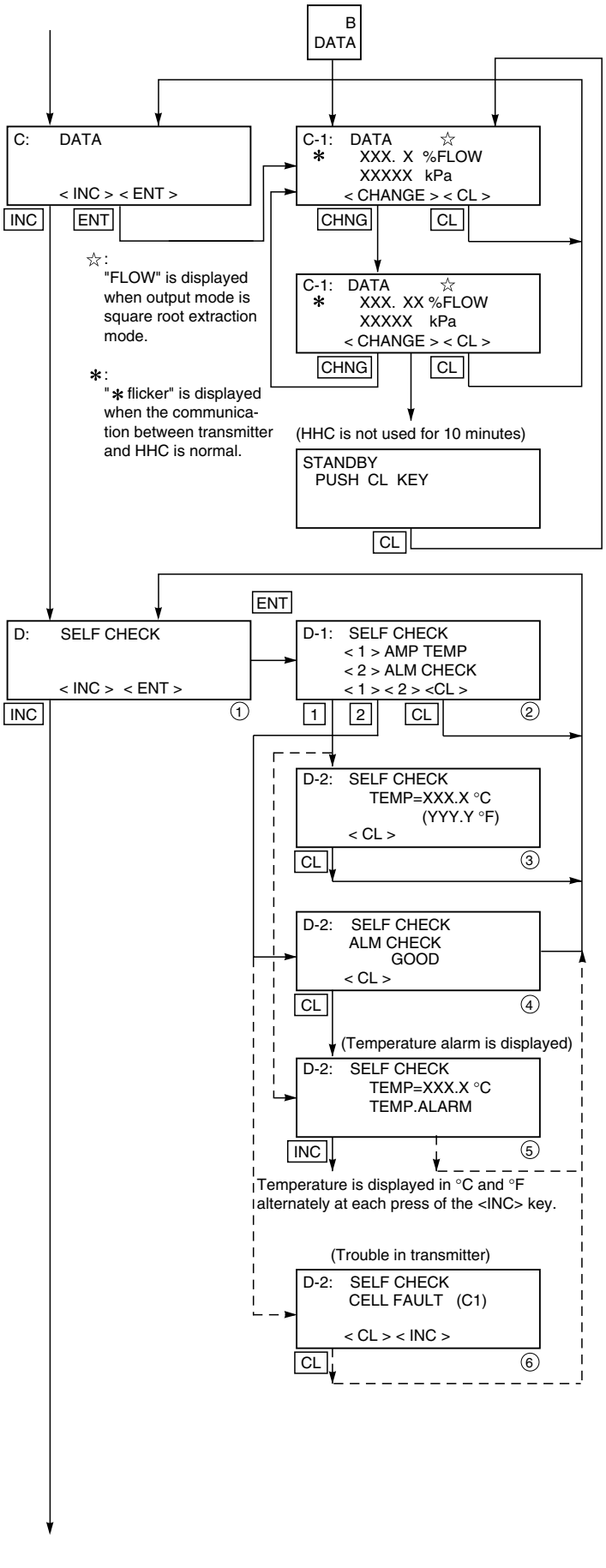
Important

After setting and calibrating the constant current output, be sure to reset the HHC display to the initial display.

B: OUTPUT ADJ

<ICL> <CHANGE>

In this way, the transmitter output is reset to the measurement output. It should be noted that if HHC is removed from the transmitter loop or the HHC power is turned OFF when the constant current output has been set, the transmitter output is retained at the constant current output.



Indication of measured data

The measured value can be indicated.

Self-diagnosis

Use for displaying the measured temperature in the transmitter and the alarm information.

When pressing <1> on display w, the temperature in the amplifier (AMP TEMP) is displayed. When pressing <2>, result of self-diagnosis about transmitter (ALM CHECK) is displayed.

Result of diagnosis

When the temperature in the amplifier is normal:

```
D-2: SELF CHECK
        TEMP= xxx.x°C

    <CL>
```

When temperature alarm is detected:

```
D-2: SELF CHECK
        TEMP= xxx.x°C
        TEMP.ALARM
    <CL>
```

When no error has occurred:

```
D-2: SELF CHECK
    ALM  CHECK
         GOOD
    <CL>
```

When an error has occurred:

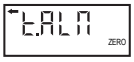
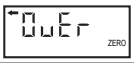
```
D-2: SELF CHECK
    CELL FAULT (C1)

    <CL> <INC>
```

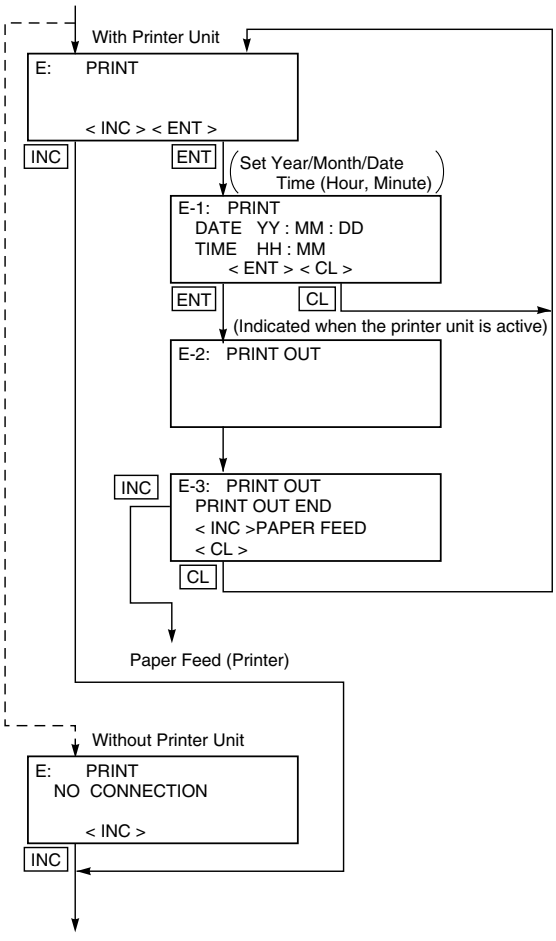
For contents of error, refer to “Contents of message” on the next page.

[Contents of message]

As a result of self-diagnosis with FCX-AIII series transmitters, the message below is appeared on the LCD display of HHC, when there are trouble in the transmitter. For each error, its cause and remedy are suggested.

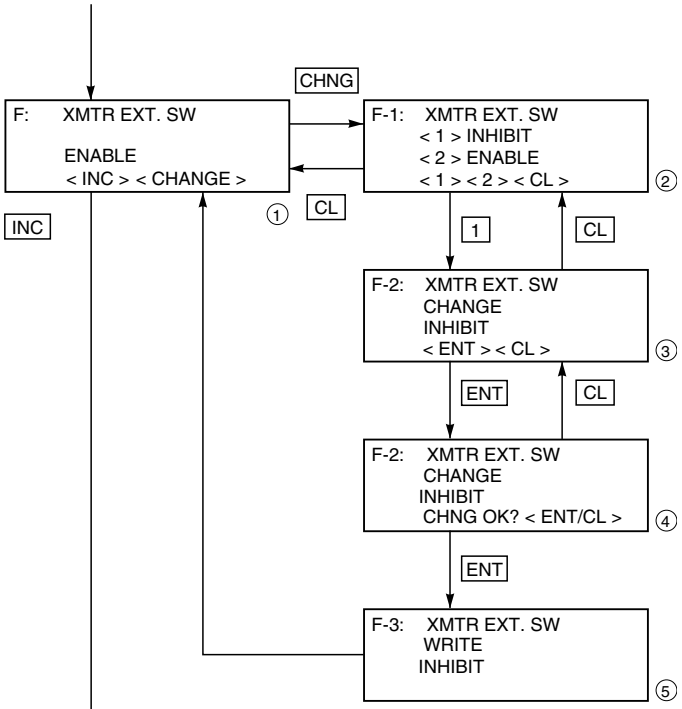
Message	Indication on digital indicator	Cause	Remedy
CELL FAULT (C1) to CELL FAULT (C9)	FL-1	Error of detecting unit	Replacement of detecting unit
EEPROM (AMP) FLT	FL-2	EEPROM error on amplifier side	Replacement of amplifier
EEPROM (CELL) FLT	FL-3	EEPROM error on cell side	Replacement of detecting unit
CELL FAULT (C1) to CELL FAULT (C9)	T.ALM  (*1)	Transmitter temperature is not within the allowable range –50 to 95°C.	Transmitter temperature is normalized.
XMTR FAULT	FL-1	Amplifier error	Replacement of amplifier
	OVER  (*1)	Input pressure is over saturation current value (upper limit).	Properly controlled.
	Under  (*1)	Input pressure is under saturation current value (lower limit).	Properly controlled.

(*1) Real indication



Printer function

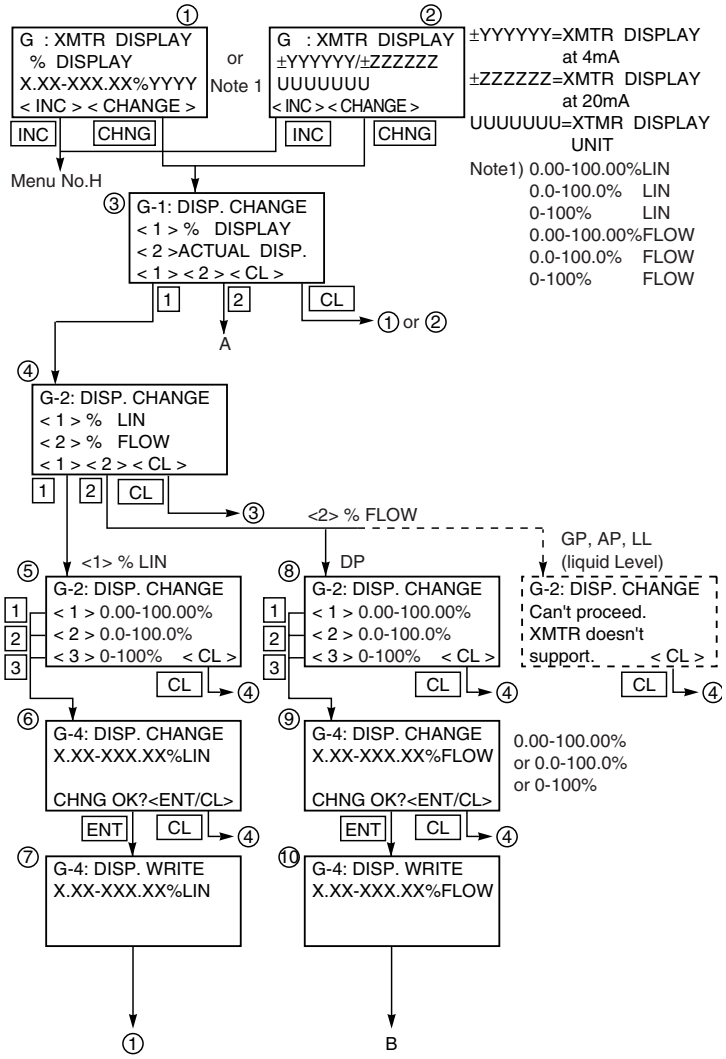
Usable only when a printer is connected.



Lock of adjustment function

The adjustment function by screw at the transmitter body can be locked.

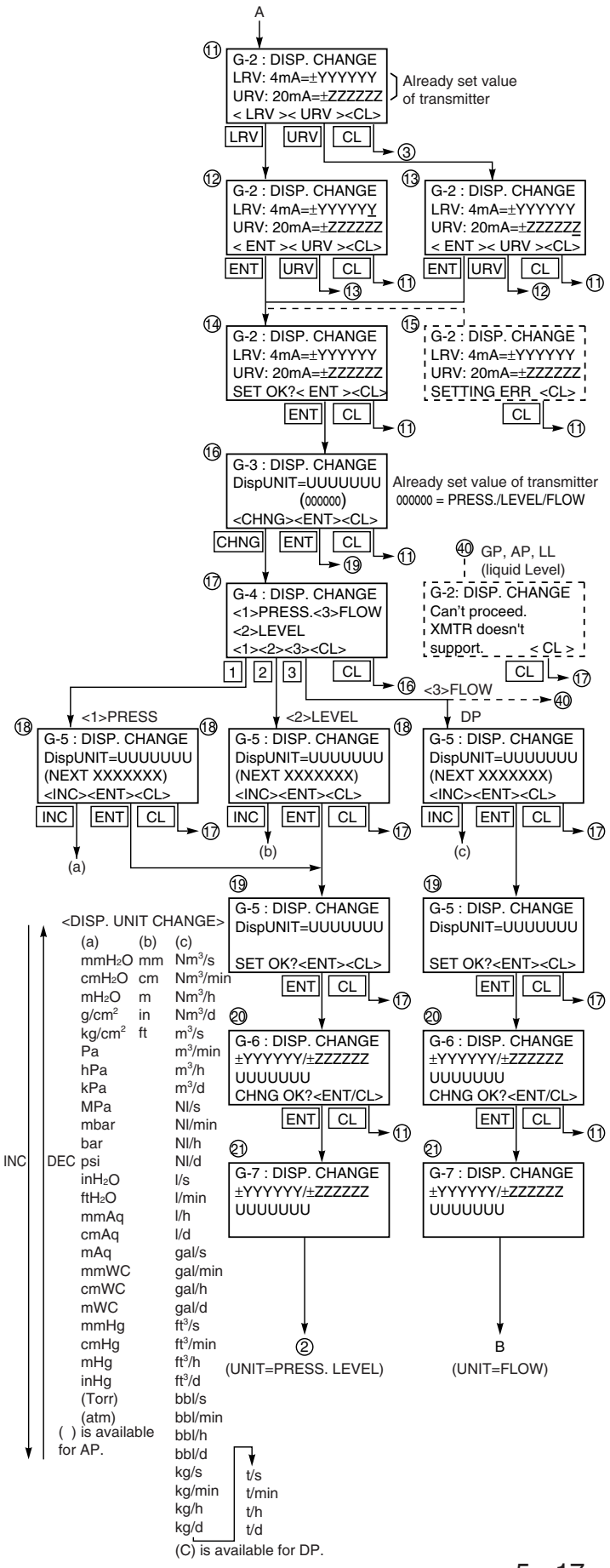
When pressing <1> (INHIBIT) under display ② , the external switch lock function is activated, and it is released when pressing <2> (ENABLE).



Indication of digital indicator

For digital indicator, either % display or actual-scale display is selectable. In display on the actual scale, display values corresponding to 0% (4mA) and 100% (20mA) are settable.

In setting % display, proportional mode and square root extraction mode is selectable as shown in ④ .
In ④ ,
<1> %LIN is displayed in % in the proportional mode
<2> %FLOW is set by % in the square root extraction mode (proportional to flow)
In case of pressure transmitter, absolute pressure transmitter and level transmitter, <2> % FLOW cannot be set in ④ .



When setting the actual-scale display, first select <2> ACTUAL DISP in ③. Next, after setting the actual-scale display value (⑪ to ⑭), perform the actual-scale display unit setting (⑯ to ⑲).

In case of pressure transmitter, absolute pressure transmitter and level transmitter, the flow units cannot be set as shown in ⑰. After making sure of the setting of the actual-scale display ⑳ , enter the [ENT] and then data is written in the transmitter.

[In case of FCX-AIII series transmitters]

Actual scale value setting conditions

① | Saturation current value (Lower limit) without decimal point | ≦ 99999

② | Saturation current value (Upper limit) without decimal point | ≦ 99999

③ 0 < | (value corresponding to 100% without decimal point) – (value corresponding to 0% without decimal point) | ≦15000

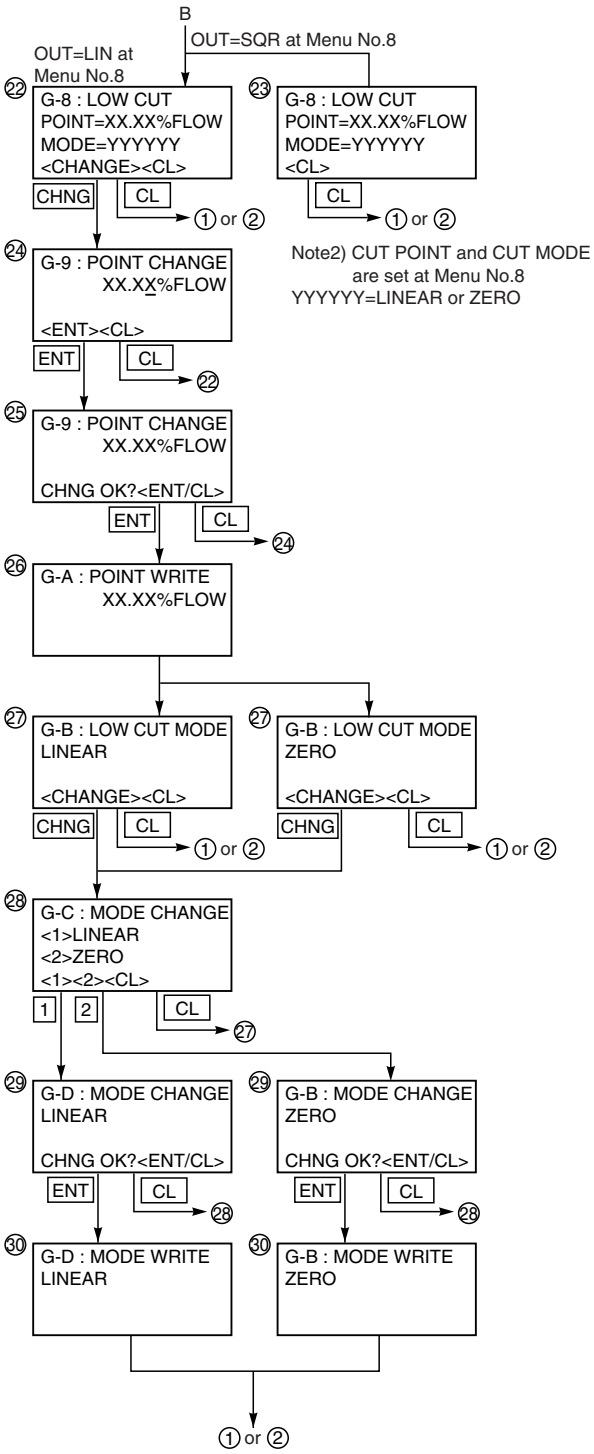
④ When decimal point is used for values corresponding to 0% and 100% respectively, the number of digits after the decimal point should be the same.

[Example] 0.0 to 500 : Not settable
0.0 to 500.0 : Settable

If SETTING ERR <CL> is displayed, press [CL] key and then set it again to meet the requirement.

⚠ CAUTION

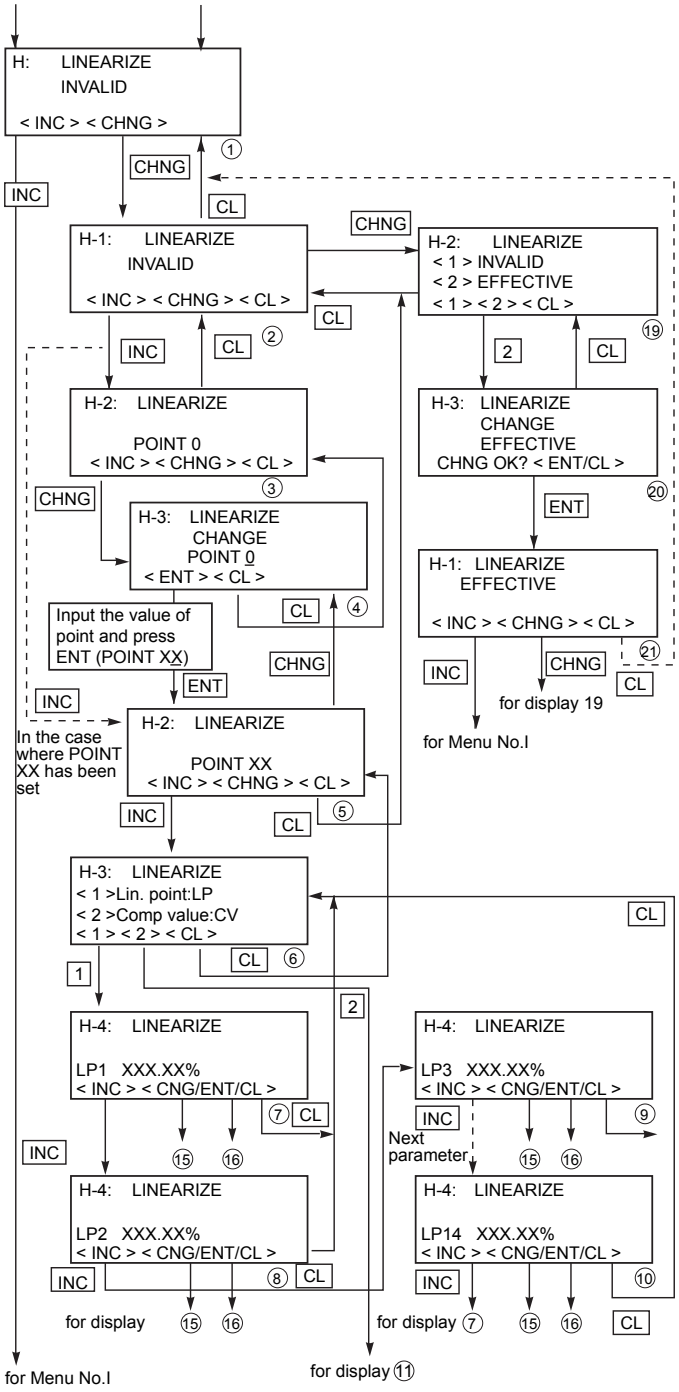
Indication of the transmitter digital indicator may have ±1 digit error against the setting by HHC.



When setting of % Flow in %display or Flow unit in actual scale display, low flow cut point and low flow cut mode are displayed (㉒ or ㉓).

When, in the OUTPUT MODE (Menu No. 8), OUT = SQR is set, already set low flow cut point and low flow cut mode are displayed (㉓).

With OUT = LIN set, the present low flow cut point and low flow cut mode are displayed (㉒). Then, enter <CHANGE>, and the setting can be renewed.



Important

Note) In the key stroke for Linearization, please set each parameter in the below sequence.

1. Set the number of compensation points in the range of 2 to 14.
2. Set each linearization option point (LP*) correctly, and write them.
3. Set each compensation value (CV*) correctly, and write them.
4. Set linearization option into EFFECTIVE and write.

Programmable linearization function

User can set output compensation against the input using 14 compensation points, (X_1, Y_1), (X_2, Y_2)…(X_{14}, Y_{14}). Each compensation value between (Xn, Yn) and (Xn+1, Yn+1) is connected by first order approximate formula.

This linearization function is useful to compensate the tank figure in level measurement application and the flow rate of steam or gas in flow measurement application .

Functions for LINEARIZE are available for FXW Version 6.0 and upward.

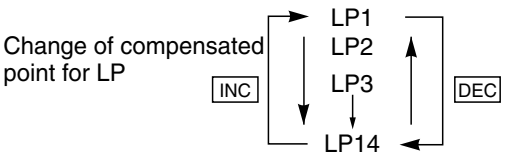
By pressing INC at display of ② , the display is shifted to the setting of LINEARIZE POINT ③ . Press CHNG at display of ③ and input POINT XX to be compensated. Then press ENT and the display will be shifted to ⑤ .

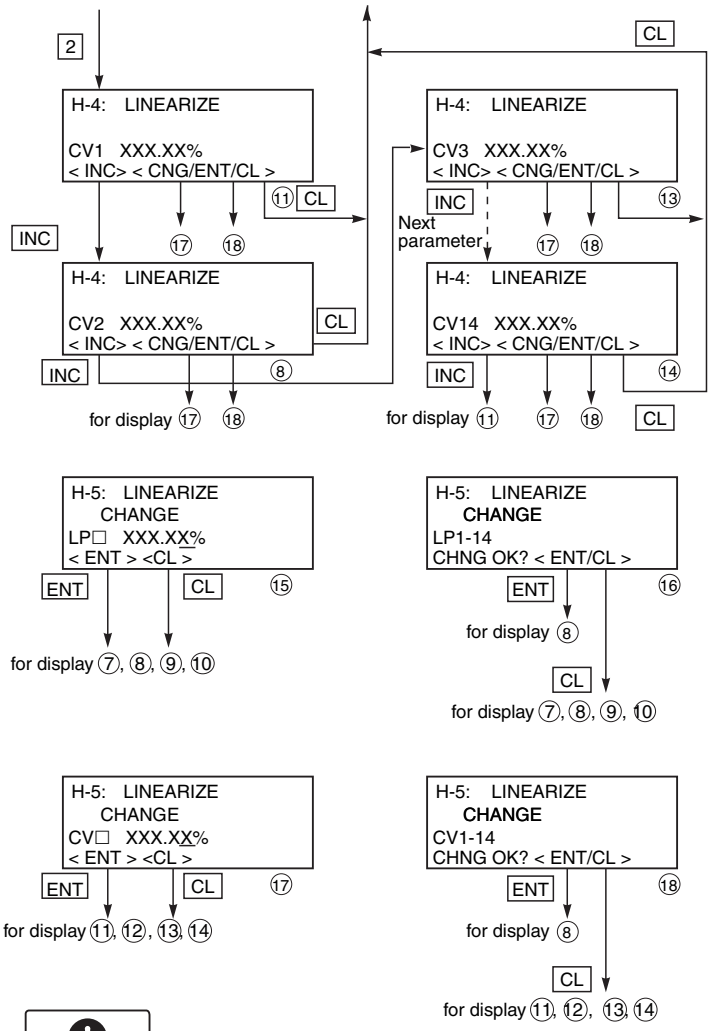
Press INC at display of ⑤ and the display will be shifted to ⑥ for selection of <1> Lin. point: LP and <2> Comp. value:CV. Select <1> Lin. point: LP at display of ⑥ and input XXX.XX% to each point (LP1-LP□).

At the completion of input to all the compensated points, press ENT twice and the write of LP will be finished.

At this time, the display is shifted to ⑥ . Select <2> Comp. point: CV at display of ⑥ and input XXX. XX% to each point (CV1-CV□) in the same manner as noted in <1> LP. At the completion of input to all the compensated points, press ENT twice and the write of CV will be finished.

At the completion of write of compensated program for LP/CV, press CL twice at the display of ⑥ for shifting to ② . Then, press CHNG for selection of <1> INVALID and <2> EFFECTIVE of ⑲ . At display of ⑲ , press <2> and the display will be changed to EFFECTIVE.





Important

When ENT is pressed at display of ⑳ , the following is displayed,

```
H-3: LINEARIZE
Set LINEARIZE
Point, LP and CV
correctly.  <CL>
```

Requirement of setting

1. LP≦LP2≦LP3…LP8≦LP9…LP13≦LP14 (In the case that LP1-LP14=All Zero, it is inhibited to be set enable)
2. If CVa≠CVb, then it must be LPa < LPb. (Note 1)
3. If LPa =LPb, then it must be CVa= CVb. (Note 1)

   Note 1) a, b show next numeral such as a=1 b=2 or a=2 b=3 or ……a=13 b=14.
4. The compensate value CV_1 and CV_n corresponding to start point LP_1 and last point LP_n, should be set as below;

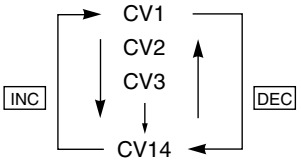
   CV_1=0.00% CV_n=0.00%

   or

the following is displayed.

```
H-3: LINEARIZE
Set OUTPUT MODE
LIN-LIN or
SQR-SQR   <CL>
```

Change of compensated point for CV



Important

When INC is pressed at display of ③ , the following is displayed,

```
H-2: LINEARIZE
     POINT  0
SETTING ERR <CL>
```

or

When ENT is pressed at display of ④ , the following is displayed,

```
H-3: LINEARIZE
     POINT  15
     POINT  SET
SETTING ERR <CL>
```

POINT=2≦(number of correction)≦14

setting err=00 or 01 or ≧ 15

When ENT is pressed at display of ⑮ , the following is displayed,

```
H-5: LINEARIZE
     CHANGE
LP□      150.01%
SETTING ERR <CL>
```

Requirement of setting

−1.25%≦LP1≦LP2…≦LP14≦+105%

When ENT is pressed at display of ⑰ , the following is displayed,

```
H-5: LINEARIZE
     CHANGE
CV□      100.01%
SETTING ERR <CL>
```

Requirement of setting

−100%≦CV1, CV2… CV14≦+100%

Before performing the LINEARIZE setting, set either of the following equations in the OUTPUT mode (Menu No. 8) and XMTR DISPLAY (Menu No. G):

OUT = LIN SMTR DISP = LIN or

OUT =SQR XMTR DISP = FLOW (Note 1)

Note 1) XMTR DISP = FLOW means the settings of % FLOW in %display or of FLOW units in actual-scale display.

Rerange (Set LRV/URV calibration)

(application to level measurement) at change of level (LRV/URV)

Functions of RERANGE can be made with FXW Version 6.0 or upward.

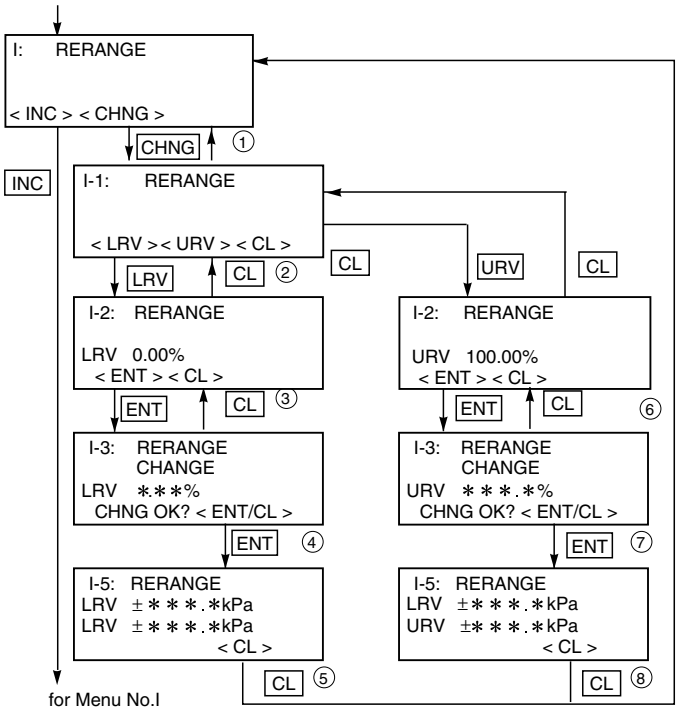
When the lower range value (LRV) and upper range value (URV) need to be adjusted again during measurement of tank level, the measurement levels can be changed at the same time by setting the LRV or URV to be adjusted from FXW.

Apply an input pressure required for rerange of LRV at display of ③ and press ENT twice. In this way, the rerange of LRV is completed, then the new measurement range LRV and URV, which conforms to the actual input pressure, is displayed.

When rerange is made at a point other than 0%, input the set value (PV%) of that point at display of ③ , and press ENT at display of ④ while applying a corresponding pressure. In this way, the measurement range can be changed to the input corresponding to that pressure.

Apply an input pressure required for rerange of URV at display of ⑥ and press ENT twice. The rerange of URV is completed, then the new measurement range LRV and URV corresponding to the actual input pressure is displayed. When rerange is made at a point other than 100%, input the set value (PV%) of that point at display of ⑥ and press ENT at display of ⑦ while applying a corresponding pressure. In this way, the measurement range can be changed to the input corresponding to that pressure.

Note) The unit of LRV/URV at ⑤ and ⑧ are displayed in the unit selected by Menu No. 4:UNIT.



Important

Adjustment point setting condition

−1.00% ≦ LRV (Note 1) ≦ 100.00%

0.00% ≦ URV (Note 2) ≦ Saturation current value (Upper limit)

Note 1)

LRV: Output value (%) corresponding to the input pressure when RERANGE / LRV was implemented.

Note 2)

URV: Output value (%) corresponding to the input pressure when RERANGE / URV was implemented.

In the case that point is out of setting limit.

(Ex)

```
1-2: RERANGE

LRV        100.01%
SETTING ERR <CL>
```

In case of the actual scale specification with a digital indicator provided, if the range is changed, indicator display might not match. So, setting is required again in response to the display in the digital indicator (G:XMTR DISPLAY).

In case of the actual scale specification with an analog indicator provided, if the range is changed, the scale for indicator might not ensure exact reading.

When CHNG is pressed at display of ① , the following is displayed.

```
1-1: RERANGE
Can't proceed.
Set Linearize
invalid.          <CL>
```

This means that RERANGE cannot be made because MENU No. H: LINEARIZE is set in EFFECTIVE. In this case, press the CL key and set in INVALID on the panel of No. H: LINEARIZE.

⚠ CAUTION

This rerange function adjusts input and output by range change.

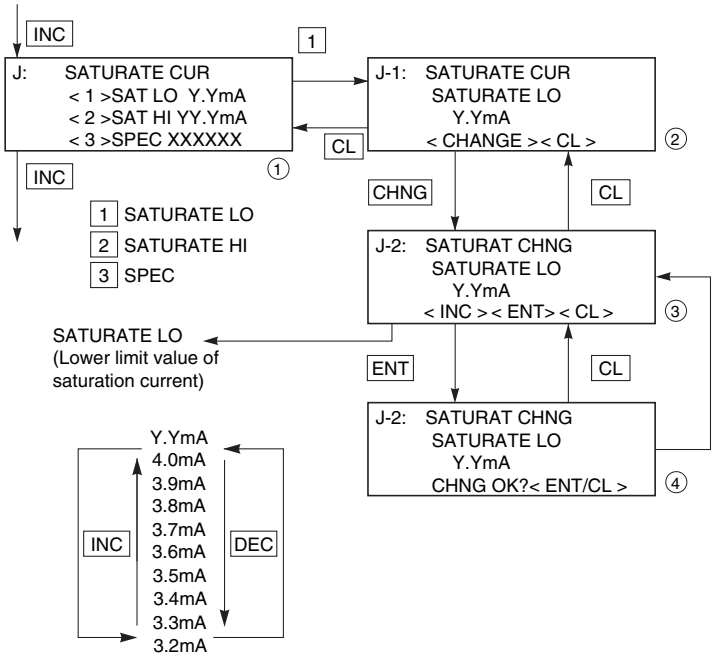
Upon implementation of rerange, the measurement range changes as follows.

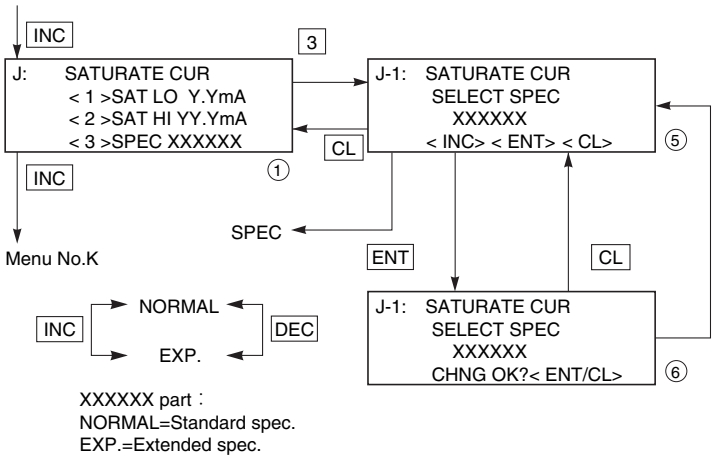
If RERANGE → LRV is implemented:

➡ Measurement range (LRV and URV) changes. However, span remains unchanged.

If RERANGE → URV is implemented:

➡ Only URV (span) of measurement range changes. Zero point (LRV) remains the same.





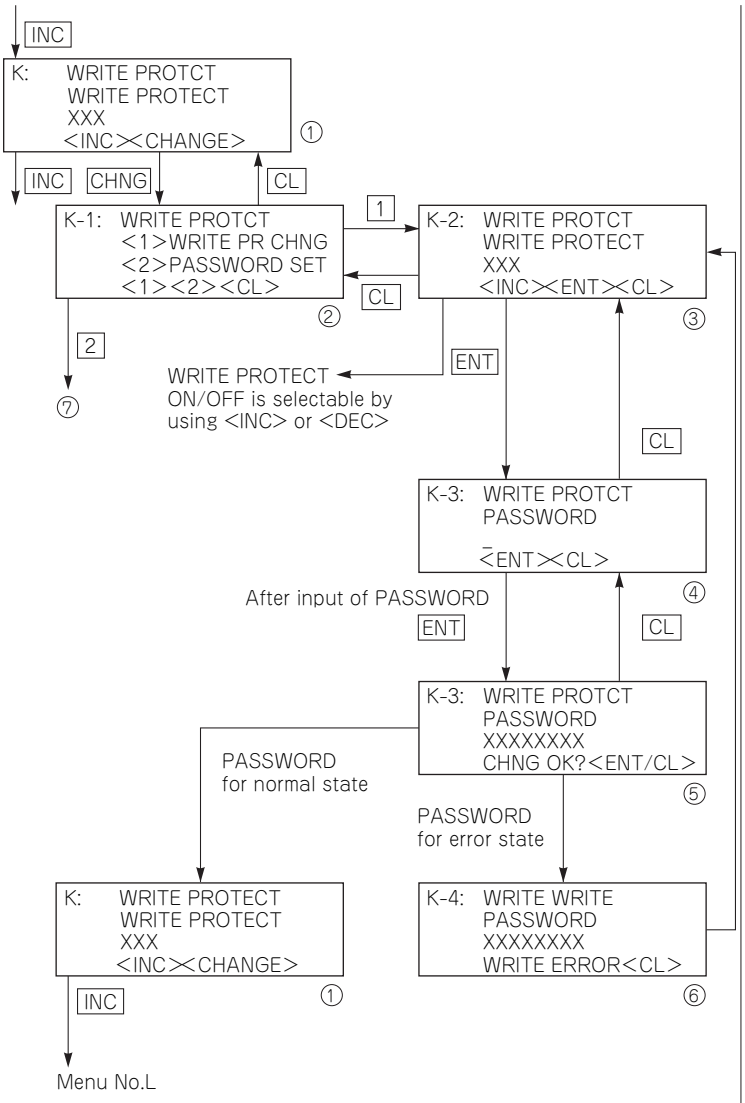
Saturation current value and specification

Saturation current value (Lower limit value=SAT LO, Upper limit value=SATO HI) and specification (NORMAL= Existing specification, EXP.=Extended specification) are settable.

When the setting of specification (SPEC) is for existing specification, saturation current is not be settable. When change the setting of saturation current, EXP. should be set for the SPEC setting.

- Change of saturation current value (Lower limit)
  (Changeable only for the extended specification)
  Settable setting range by <INC> or <DEC> key on the display ③ is as follows.
  3.2mA ≦ Burnout current (UNDER SCALE) ≦ Saturation current (Lower limit value) ≦ 4.0mA
- Change of saturation current value (Upper limit value)
  Make a setting as same as the setting of the lower limit value by input 2 from Menu.
  Selectable setting range by <INC> or <DEC> key is as follows.
  20.0mA ≦ Saturation current (Upper limit value) ≦ Burnout current (OVER SCALE) 21.6mA
  *Burnout current is settable according to "9. Burnout direction and value".

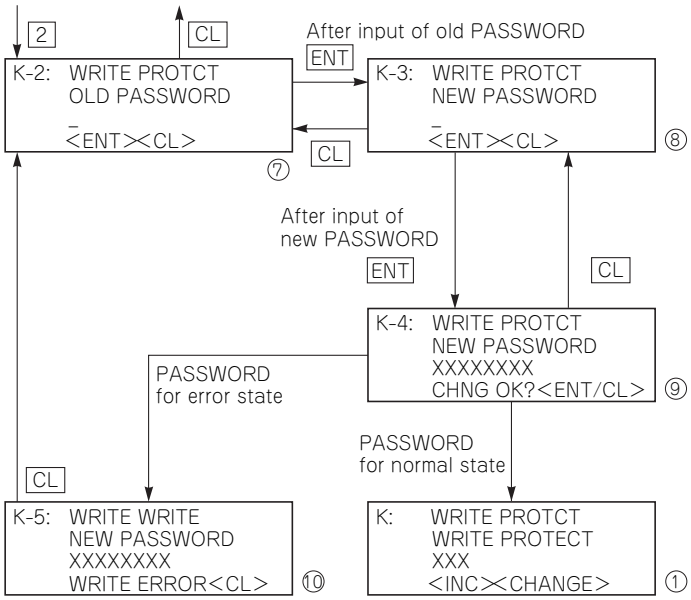
- Change of the specification
  Existing specification or enhanced specification is selectable.
  Refer to "J-3" in "J. Saturation current value and specification" of a local configurator unit with LCD display for details.

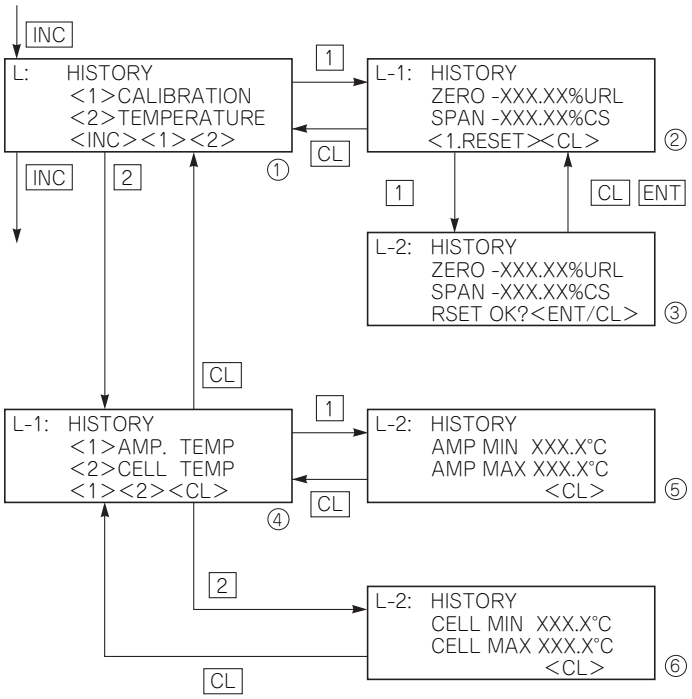


Write protect

Write protect is settable by setting a PASSWORD
When the write protect is ON by this function, the write protect can not be cancelled by 3-push button of local configurator unit with LCD display. Refer to "K Write protect" of Local configurator unit with LCD display for details.

* The target of write protect is same as the protect function of set value by 3-push button.


2
CL
After input of old PASSWORD
ENT
K-2: WRITE PROTCT
OLD PASSWORD
_
<ENT><CL>
⑦
K-3: WRITE PROTCT
NEW PASSWORD
_
<ENT><CL>
⑧
CL
After input of
new PASSWORD
ENT
CL
K-4: WRITE PROTCT
NEW PASSWORD
XXXXXXXX
CHNG OK?<ENT/CL>
⑨
PASSWORD
for error state
PASSWORD
for normal state
CL
K-5: WRITE WRITE
NEW PASSWORD
XXXXXXXX
WRITE ERROR<CL>
⑩
K: WRITE PROTCT
WRITE PROTECT
XXX
<INC><CHANGE>
①



History information

Display of ZERO/SPAN adjustment data for users

It is displayed by selecting <1> on the display ① .

ZERO means ZERO adjustment value.

SPAN means SPAN adjustment value.

Clear of ZERO/SPAN adjustment data for users

It is cleared by selecting <1> on the display ② .

Display of history information of AMP temperature (MIN/MAX)

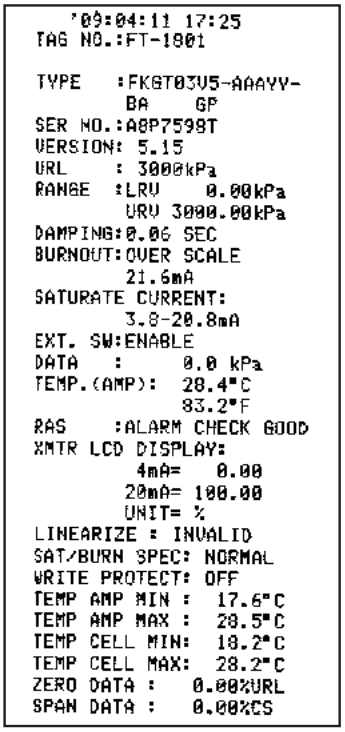
Displaying the min/max value of history information of AMP temperature.

Display of history information of CELL temperature (MIN/MAX)

Displaying the min/max value of history information of CELL temperature (display ⑥)

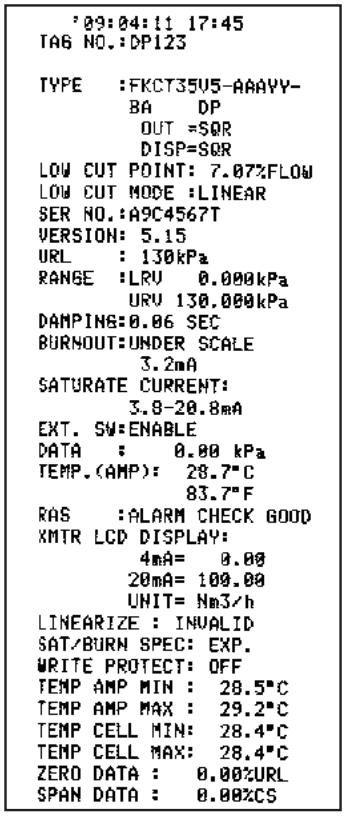
5.5 Printout format for smart transmitter

The data from FCX-AIII series transmitter that can be printed with HHC printer is shown by the following printing example. Printed items may differ slightly depending on the type and setting conditions.



'09:04:11 17:25	Date and time
TAG NO.:FT-1001	TAG NO.
TYPE :FKGT03V5-AAAYY-	Model code
BA GP	Type of transmitter
SER NO.:A8P7598T	Serial No.
VERSION: 5.15	Transmitter software version
URL : 3000kPa	Upper Range Limit
RANGE :LRV 0.00kPa	Measuring Range
URV 3000.00kPa	
DAMPING:0.06 SEC	Damping time constant
BURNOUT:OVER SCALE	Burnout setting
21.6mA	
SATURATE CURRENT:	Saturate current
3.8-20.8mA	
EXT. SW:ENABLE	External switch lock
DATA : 0.0 kPa	Data value (PV)
TEMP.(AMP): 28.4°C	Ambient temperature
83.2°F	
RAS :ALARM CHECK GOOD	RAS
XMTR LCD DISPLAY:	LCD display setting
4mA= 0.00	
20mA= 100.00	
UNIT= %	
LINEARIZE : INVALID	Linearize setting
SAT/BURN SPEC: NORMAL	Saturate/Burnout setting
WRITE PROTECT: OFF	Write protect setting
TEMP AMP MIN : 17.6°C	Ambient temperature history
TEMP AMP MAX : 28.5°C	
TEMP CELL MIN: 18.2°C	
TEMP CELL MAX: 28.2°C	
ZERO DATA : 0.00%URL	Calibration history
SPAN DATA : 0.00%CS	

In case of FCX-AIII gauge pressure transmitter

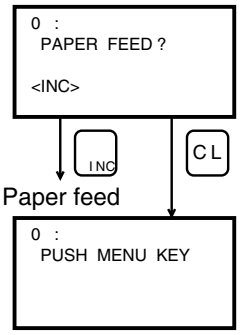


'09:04:11 17:45	Date and time
TAG NO.:DP123	TAG NO.
TYPE :FKCT35V5-AAAYY-	Model code
BA DP	Type of transmitter
OUT =SQR	Output type
DISP=SQR	LCD display type
LOW CUT POINT: 7.07%FLOW	Low cut point
LOW CUT MODE :LINEAR	Low cut mode
SER NO.:A9C4567T	Serial No.
VERSION: 5.15	Transmitter software version
URL : 130kPa	Upper Range Limit
RANGE :LRV 0.000kPa	Measuring Range
URV 130.000kPa	
DAMPING:0.06 SEC	Damping time constant
BURNOUT:UNDER SCALE	Burnout setting
3.2mA	
SATURATE CURRENT:	Saturate current
3.8-20.8mA	
EXT. SW:ENABLE	External switch lock
DATA : 0.00 kPa	Data value (PV)
TEMP.(AMP): 28.7°C	Ambient temperature
83.7°F	
RAS :ALARM CHECK GOOD	RAS
XMTR LCD DISPLAY:	LCD display setting
4mA= 0.00	
20mA= 100.00	
UNIT= Nm3/h	
LINEARIZE : INVALID	Linearize setting
SAT/BURN SPEC: EXP.	Saturate/Burnout setting
WRITE PROTECT: OFF	Write protest setting
TEMP AMP MIN : 28.5°C	Ambient temperature history
TEMP AMP MAX : 29.2°C	
TEMP CELL MIN: 28.4°C	
TEMP CELL MAX: 28.4°C	
ZERO DATA : 0.00%URL	Calibration history
SPAN DATA : 0.00%CS	

In case of FCX-AIII differential pressure/flow transmitter

5.6 Printer paper feed function

(1) On the type with printer, PAPER FEED is displayed at power ON.



(Displayed on the type with printer)

(2) Print menu

After setting day and time, press the ENT key and the data is printed according to "5.5 HHC print-out format for smart type transmitter".

(3) Printout of menu display

Press the X STN ⟶ ▷ keys continuously while selected display is shown and the image is printed out. (Common at any display)

Caution after operation:

Important

When setting and change to the field device has been completed, be sure to turn OFF the power.

6. ABNORMAL DISPLAY AND COUNTERMEASURE

If the following indication appear while using HHC, it means that a fault has occurred.

Display	Cause	Remedy
1 : BAT. ALM Displayed alternately 1 : TAG NO.	• Battery voltage drop alarm	⇨ Charge the battery (see “7. Maintenance and inspection”).
No display	• Power switch is OFF.	⇨ Turn ON the power switch
	• Battery is discharged.	⇨ Charge the batttery (see “7. Maintenance and inspection”).
SIGNAL ERR Communication error display	• Incorrect connection	⇨ Check the connection referring to this manual (see “4. Connection”).
	• Communication cable is disconnected.	⇨ Check for continuity using a tester.
	• Power for field device OFF.	⇨ Turn ON the power for field device.
	• Load resistance of field device current output circuit is less than 250Ω.	⇨ Increase the load resistance to 250Ω or larger.
	• Transmission line between HHC and fiield device is defective.	⇨ Change the wiring to meet load capacity, load inductance, etc.
PUSH CL KEY Standby display	• No key input on measurement data panel for more than 10 minutes.	⇨ Press the CL key to display the image before STANDBY.

In any indications other than above appear, contact Fuji distributor.

7. MAINTENANCE AND INSPECTION

7.1 Battery charging

⚠ DANGER	Do not attempt to charge the battery in hazardous area.

(1) Continuous operating time

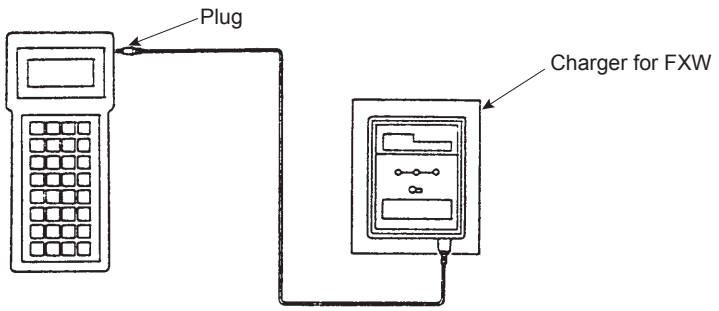
The HHC incorporates a built-in rechargeable nickel cadmium battery.

Under normal use of HHC (without printer), the continuous operating time with fully charged battery is about 24 hours.

When HHC (with printer) is used, the operating time becomes shortened with printing frequency. In the case of intrinsic safety explosion-proof HHC, the operating time is reduced to about a half of the standard time.

(2) Charging time

For charging the battery, connect the supplied charger to the charger terminal and insert the charger plug into the socket (BATTERY CONDUIT). The battery will be fully charged in about 5 hours.



Important

1. First connect the plug to HHC and then insert the charger to the socket. To disconnect the charger, follow this procedure in reverse order.
2. To ensure a long life of battery, avoid overcharge and overdischarge.
3. When charging, be sure to turn OFF the power switch.
4. HHC cannot be operated while the battery is being charged.
5. The battery charger is of a special type, and should be obtained from Fuji distributor.

Battery life

When the continuous operating time is less than about 12 hours with the battery charged for the standardtime (about 5 hours), it is an indication that the battery life is terminated. Replace the battery with a new one.

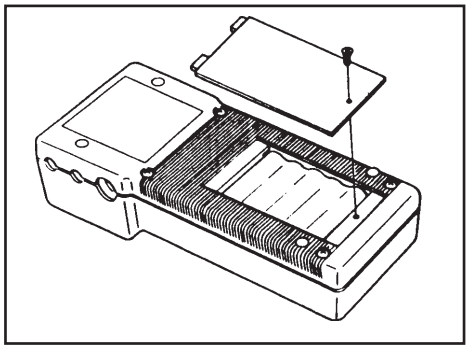
The battery is of a special type, and should be obtained from Fuji distributor.

7.2 Battery replacement

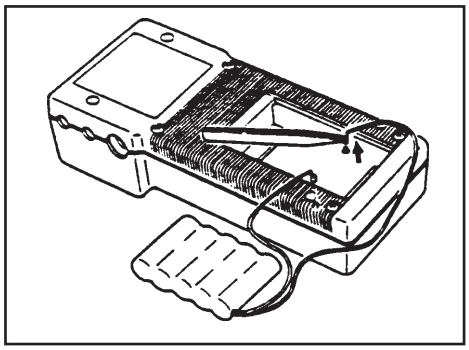
⚠ DANGER	Do not attempt to replace the battery in hazardous area.

To replace the battery, use the following procedures.

(1) Remove the battery cover from the rear of HHC.

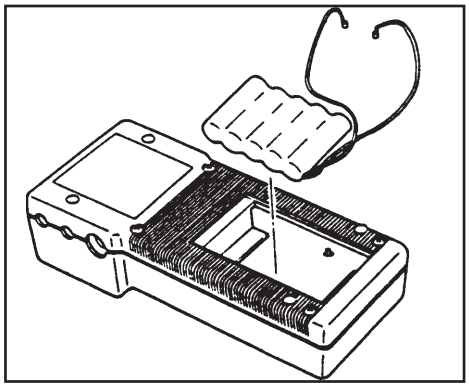


(2) Pull out the battery cord using a tweezers.
Care should be taken when it is pulled out to prevent damage to the connectors.



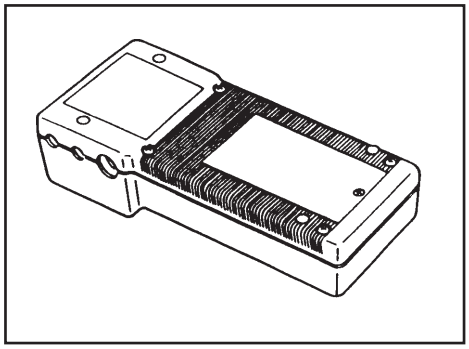
(3) Remove the battery.

⚠ Do not attempt to replace the battery in hazardous area.



(4) To load the battery, use the same procedures in reverse order.

⚠ When connecting the battery cord, make sure that the polarity is correct.
The contact pin of the battery cord must be inserted firmly into the pin on the FXW printed circuit board.



APPENDIX 1. SPECIFICATION SHEET

This communicator is a handy type battery-powered setter/indicator used for easy communications between FCX series “smart” transmitters and HHC.

FEATURES

1. **Simple operation**
   Owing to use of a large LCD (16 digits × 4 lines), setting and its change can easily be made in an interactive mode.
2. **Applicable to every “smart” SPECIFICATIONS**
   This communicator is usable for every “smart” type of FCX series transmitter.
3. **Operable online**
   4 to 20mA DC field signal remains unaffected by connection of this communicator.
4. **An abundance of protective functions**
   The communicator is standard-provided with transmitter error diagnosis function, data-write protection key, battery voltage drop alarm function, automatic power standby function, etc.
5. **Printer option**
   A printer can be built in the communicator at option for instant printout of set data.

SPECIFICATIONS

Functional specifications

- Applicable device:
  Each “smart” type of FCX, FCX-A/C , FCX-AX, FCX-AII/CII series transmitters and FCX-AIII series transmitter.
- Transmission signal connection:
  Exclusive cable of about 1 m with a clip at the end
- Transmission line requirements:

Line length	:	2 km at maximum (0.75 to 1.25 mm^2 cable. For 1 km or longer, twisted pair cable need be used.)
Load resistance	:	250 to 578 Ω in case of FCX transmitter (including cable resistance at 24V DC) 250 to 600 Ω in case of FCX-A/C, FCX-AX and FCX-AII/CII series transmitter (including cable resistance at 24 V DC) Refer to "Power supply and load resistance" in case of FCX-AIII series transmitter.
Load capacity	:	0.22 μF max.
Load inductance	:	3.3 mH max.
Separation from power line	:	15 cm or more (parallel wiring should be avoided.)

- Display section:
  LCD with 16 digits × 4 lines
- Operating section:
  Flat keys (32 keys), power switch, set value protection key switch
- Remote function:
  Refer to the tables in Page A-4.
- Power alarm function:
  Battery voltage drop is warned by flickering (BAT. ALM) in the display section.
- Data-write protection:
  Change of set value is allowed only through use of the key switch.
- Automatic power standby function:
  HHC automatically enters into standby mode when no key is used for longer than 10 minutes (in data measurement only).
- Power source:
  Built-in nickel-cadmium battery

- Continuously operable time:
  Approx. 24 hours (under standard operating conditions after charging the battery fully)
  In case of intrinsic safety explosion-proof HHC, the operating time is reduced to about a half of the standard time.
- Charging time:
  5 hours
- Printer (option):
  Printout of each remote function item
- Ambient temperature:
  −10 to 50°C
- Storage temperature:
  −20 to 60°C
- Ambient humidity:
  90% RH max.
- Hazardous locations:
  Designed to meet international intrinsic safety standards. Applications have been submitted for the following.

Authorities	
ATEX	EEx ia II C T3

Performance specifications

- Charger power source:
  100/115/230V AC, ±10%, 50/60Hz (as specified)
- Battery life:
  Approx. 24 hours (under standard operating conditions without option after full charging of battery)

Construction and material

- Material : Polycarbonate
- Finish color : Gray
- Dimensions (H × W × D) : 55 × 98 × 223 mm (without printer)
- Mass : Approx. 500 g (without printer)

Remote functions, in case of FCX-AIII series transmitter

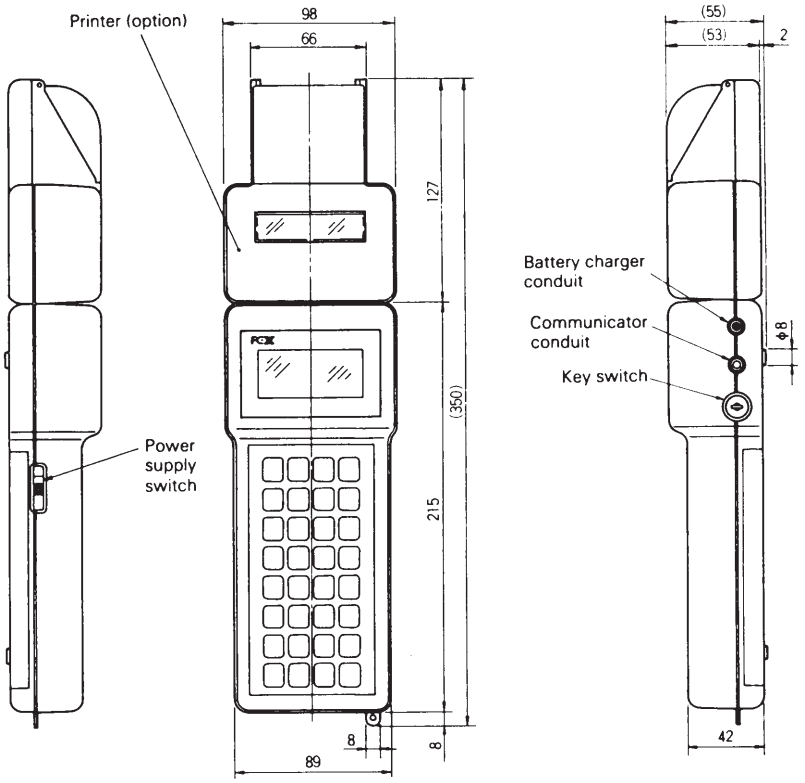
No.	Item	Display	Set	Description
1	Tag No.	○	○	Alphanumeric, 26 digits
2	Model No.	○	○	Type of device
3	Serial No.	○	—	Serial No. of device
4	Engineering unit	○	○	Setting of engineering unit
5	Range limit	○	—	Display of Max value of range
6	Measuring range	○	○	Measuring range setting, resetting
7	Damping	○	○	Setting within range from 0 to 32 sec.
8	Output mode	○	○	Linear / $\sqrt{}$ output mode selection
9	Burnout direction	○	○	Burnout direction and value at device fault
A	Calibration	○	○	Calibration of input value (A/D)
B	Output adjustment	—	○	Adjustment of output (A/D), 4mA to 20mA
C	Data	○	—	Data display
D	Self Diagnoses	○	—	RAS of transmitter and ambient temperature of amplifier
E	Printer	○	—	Print-out
F	External switch lock	○	○	Setting of transmitter external switch lock
G	Transmitter LCD Display	○	○	Setting of transmitter LCD display range
H	Linearize	○	○	Programmable linearization function up to 14 point
I	Rerange	○	○	Set range (LRV/URV) calibration
J	Saturate current	○	○	Setting of saturate current
K	Write protect	○	○	Setting of write protect On/Off
L	History −Calibration History	○	○	Read and reset user calibration data
	−Ambient temperature History	○	—	Read ambient temperature (Min/Max)

Note: HHC's version must be higher than7.1 (FXW□□□□1-□4) for FCX-AIII.

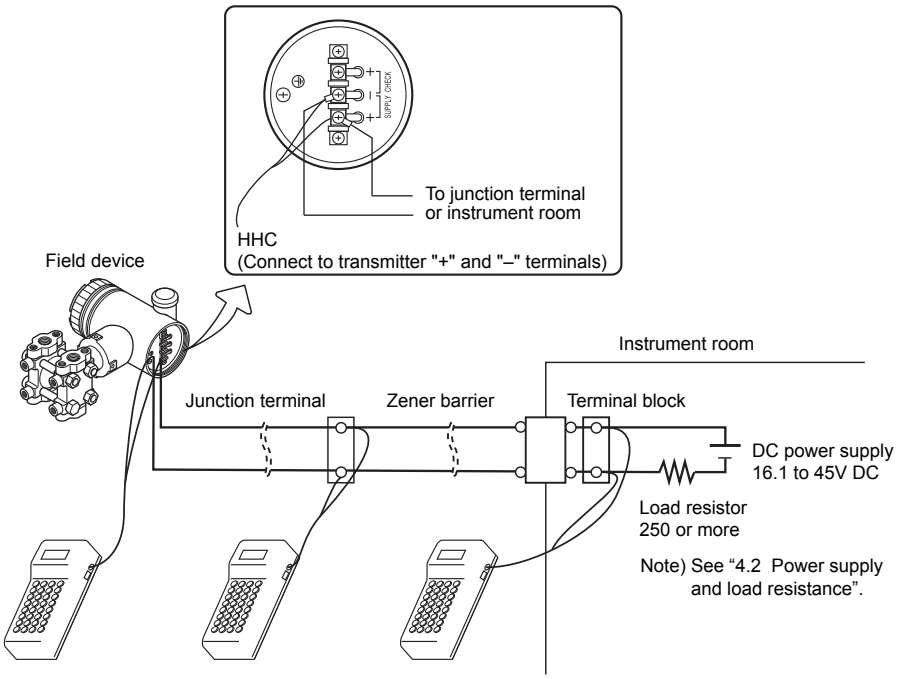
CODE SYMBOLS

1	2	3	4	5	6	7	8		9	10	Description
F	X	W					1	-	A	4	
			1								Printer Without
			2								With (explosion-proof structure is not applicable)
				0							Charger Without
				1							100V AC 50/60Hz
				2							115V AC 50/60Hz
				3							230V AC 50/60Hz
					A						Explosion-proof structure for hazardous locations Without
					K						Intrinsic safety explosion-proof (ATEX)
						Y					Carrying case Without
						A					With
									A		Application General
										4	Use FCX, FCX-A/C, FCX-AX, FCX-AII/CII, FCX-AIII transmitter (HHC software version 7.1 or higher)

OUTLINE DIAGRAM (Unit: mm)



CONNECTION (Example: Transmitter)



⚠ **DANGER**	In the case of a flameproof transmitter, never connect the HHC to the terminal block of the transmitter in hazardous area installations.

APPENDIX 2. HAZARDOUS LOCATION INSTALLATION INFORMATION

This appendix contains documents that present installation instruction for the FCX-AIII Series Transmitter in a hazardous location. Refer to these figures or instruction note when installing or servicing a transmitter mounted in a hazardous location.

Table 1 ATEX Certificate numbers of FCX-AII/CII series transmitter

Item	Certificate number
Transmitter EEx ia	INERIS 01ATEX0074X
Transmitter EEx nL	INERIS 01ATEX3009X
Transmitter EEx nAL	INERIS 03ATEX3006X
FXW EEx ia	INERIS 03ATEX0162
Transmitter EEx d	INERIS 02ATEX0038

Table 2 ATEX Certificate numbers of FCX-AIII series transmitter

Item	Certificate number
Transmitter EEx ia	KEMA 08ATEX 0120X
Transmitter Ex nA	KEMA 08ATEX 0119
FXW EEx ia	INERIS 03ATEX0162
Transmitter EEx d	KEMA 07ATEX 0144X

ATEX INSTRUCTIONS NOTE

For the safe use of hand held communicators intended for use in potentially explosive atmospheres

INTRODUCTION

- First, carefully read this manual. It contains essential information for the safe use of communicators in potentially explosive atmospheres.
- Any modification of the communicators without the permission of Fuji Electric is strictly prohibited. Fuji Electric will not bear any responsibility for trouble caused by such a modification.
- This manual must be kept by the end user of the communicators, therefore, it should be delivered to them without fail.
- After reading this manual, keep it in a place easy to access.

CAUTION

IN POTENTIALLY EXPLOSIVE ATMOSPHERE

NEVER USE A HAND HELD COMMUNICATOR (HHC) WHICH IS NOT APPROVED FOR USE IN HAZARDOUS AREA

NEVER CONNECT A HHC ON FLAMEPROOF PER HOUSING EQUIPMENT (EEx "d")

NEVER CONNECT A PRINTER ON THE HHC

NEVER REPLACE THE BATTERY

NEVER CHARGE THE BATTERY

ONLY CLEAN THE HHC WITH A DAMP CLOTH (POSSIBLE ELECTROSTATIC RISK)

Remark:

This manual only contains specific instructions for use in potentially explosive atmospheres. For all additional information, refer to the general Instruction manual supplied with the communicator.

1. PRESENTATION

FCX series Hand Held Communicators (FXW Type) comply with the directive 94/9/EC as they have been built, for the group IIC, according to the standards:

- EN 50014 (General requirements),
- EN 50020 (Intrinsic safety “i”) ,
- EN 60529 (Degrees of protection “IP”)
- EN 50284 (Group II cat. 1G requirements)

These Hand Held Communicators are manufactured:

Fuji Electric Co., LTD.
No.1 Fuji-machi, Hino-city
Tokyo, 191-8502
Japan

Only this company is entitled to repair the FXW hand held communicators.

2. BEFORE OPERATION

It is vital to ensure that the equipment supplied exactly meets your needs and that it is certified for safe use in your expected operating conditions.

2.1. For a use in Zone 0 :

(Area in which an explosive atmosphere is present continuously or during long periods).

Ensure that the following information appears on the label stuck at the back of the communicator:

Ⓔx II 1 G

EEx ia IIC T3 ; Ta = –10˚C to + 85˚C

Reminder :

- **“II”** means that the equipment has been built for use in surface industries (and not in mines endangered by firedamp).
- **“1”** equipment for use in Zero 0.
- **“G”** equipment for use with gas, vapours or mists.
- **“EEx”** equipment in compliance with European standards for potentially explosive atmospheres.
- **“ia”** equipment in compliance with specific building rules for intrinsically safe equipment.
- **“C”** equipment for use with gas of subdivision C (MIC < 0.45).
- **“T3; Ta = –10˚C to + 85˚C”** equipment whose surface temperature does not exceed 200˚C when used in an ambient temperature ≦ 85˚C.

Remark:

“ia” equipment, as described above, can also be used in Zone 1 or 2.

3. WIRING

CAUTION

Before connecting a Hand Held Communicator ("HHC"), be sure that the sum of capacitors and inductances (including HHC and cables) are in accordance with the limit values of the selected intrinsically safe power supply.

Remark:

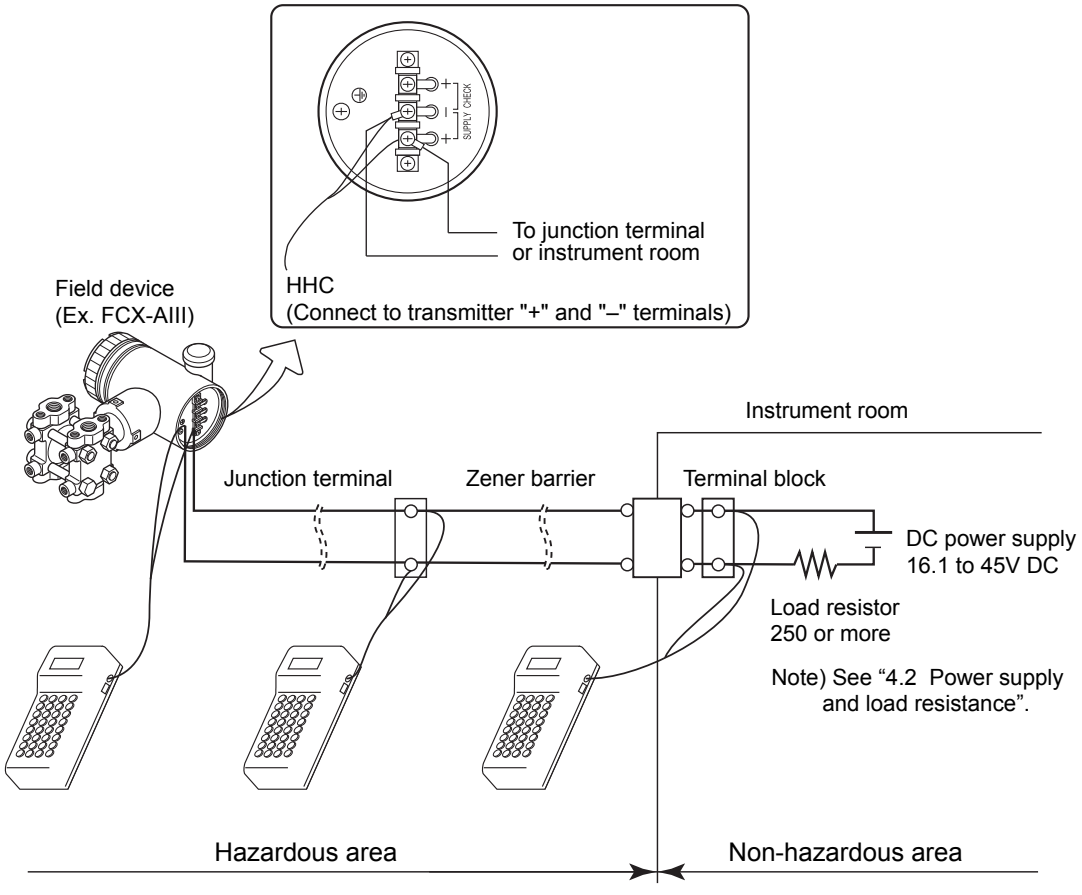
When connecting the hand held communicator, the switch ON/OFF must be on OFF. The HHC has no polarity, and it cannot be connected on CK+ and CK– terminals of FCX series transmitters (FCX-AII/FCX-CII or FCX-AIII).

CAUTION

FOR CONTROL LOOPS USING THE FLAMEPROOF ENCLOSURE (EEx "d") PROTECTION MODE, THE HHC MUST ONLY BE CONNECTED ON JUNCTION TERMINAL IN NON HAZARDOUS AREA.

3.1. Wiring diagram :

The hand held communicator can be connected in any point of the control loop. A load resistor of 250Ω or more is necessary for a perfect communication.



3.2. Electrical parameters :

These instruments must only be connected to an [ia] or [ib] certified type equipment intended for use in potentially explosive atmosphere; in addition, this association has to be intrinsic safety compatible.

The electrical parameters of the intrinsically safe circuit, on which the hand held communicator is connected, must not exceed the following values:

U_i : 28 Vdc I_i : 93 mAdc P_i : 0.65 W.

Maximum physical characteristics:

C_i : 0 µF L_i : 0 mH.

Electrical parameters at the signal connection socket of the communicator do not exceed the following values:

U_o : 5 Vdc I_o : 24 mAdc P_o : 0.03 W.

C_o : 100 µF L_o : 71.6 mH.

4. MAINTENANCE, SPARE PARTS

CAUTION

REPLACE OR CHARGE THE BATTERY ONLY IN NON HAZARDOUS AREA

ONLY CLEAN THE HHC WITH A DAMP CLOTH (IN ORDER TO AVOID ANY POSSIBLE ELECTROSTATIC RISK)

The replacement of components of the transmitter can only be done by a person trained to act on equipment intended for use in potentially explosive atmospheres.

Spare parts must only be genuine parts supplied by Fuji Electric.

For more details, refer to “Maintenance” chapter of the Instruction manual.

5. EC DECLARATION OF CONFORMITY

Fuji Electric Co., LTD.
No.1 Fuji-machi, Hino-city
Tokyo, 191-8502
Japan

Certify that the equipment intended for use in potentially explosive atmospheres, new product, indicated hereafter:

HAND HELD COMMUNICATOR
(HHC)
FCX Series
TYPE FXW

is in accordance with:

- directive 94/9/EC of 23 march 1994 (equipment and protective systems intended for use in potentially explosive atmospheres).
- directive 89/336/EEC of 03 may 1989 (Electromagnetic Compatibility)
- harmonized standards
  - EN 50014: 1997 (General rules),
  - EN 50020: 2002 (Intrinsic safety “i”),
  - EN50284: 1999 (Group II cat. 1G requirements),
  - EN 60529: 1991(Degrees of protection “IP”),
  - EN 61326: 1997 Class A (Electromagnetic compatibility - Emission in industrial location),
  - EN 61326: 1997 Annex A (Electromagnetic compatibility - Immunity in industrial location),
- the type (protection mode “ia”) which has been the subject of

EC-TYPE EXAMINATION CERTIFICATE

Nr. INERIS 03ATEX0162

delivered by the INERIS, rue J. Taffanel, 60550 Verneuil en Halatte France, notified body under the Nr, 0080,
manufacturing plant of Enzan which has been the subject of

PRODUCTION QUALITY ASSURANCE NOTIFICATION

Nr. NEMKO 02ATEX147Q

delivered by the NEMKO, Gaustadalléen 30, 0373 OSLO Norway, notified body under the Nr. 0470,

- technical file Nr. TN510414

Date: 28 October 2003

The product conforms to the requirements of the Electromagnetic compatibility Directive 2004/108/EC. The applicable standards used to demonstrate compliance are :-

EMI (Emission):

EN 61326-1: 2006 Group 1 Class 1

Frequency range	Limits	Reference standard
30 to 230 MHz	40 dB (V/m) quasi peak, measured at 10 m distance	EN55011
230 to 1000 MHz	47 dB (V/m) quasi peak, measured at 10 m distance	

EMS (Immunity):

EN 61326-1: 2006 Table 2 (for Industrial Location)

Phenomenon	Test value	Basic standard	Performance criteria
Electrostatic discharge	4 kV (Contact) 8 kV (Air)	EN 61000-4-2	B
Electromagnetic field	80 to 1000MHz : 10V/m 1.4 to 2.0GHz : 3V/m 2.0 to 2.7GHz : 1V/m 80% AM (1kHz)	EN 61000-4-3	A
Rated power frequency magnetic field	30 A/m 50Hz	EN 61000-4-8	A

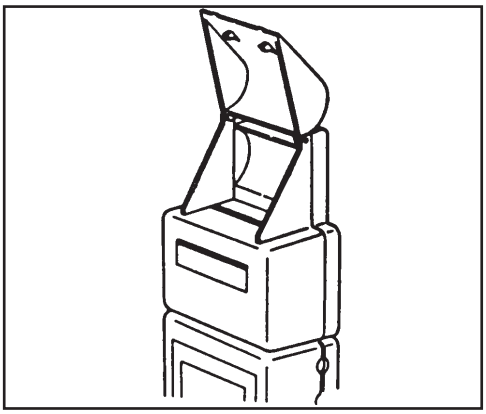
Definition of performance criteria:

A: During testing, normal performance within the specification limits.

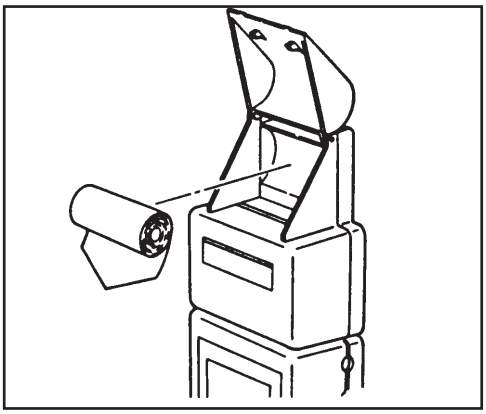
B: During testing, temporary degradation, or loss of function or performance which is self-recovering.

APPENDIX 3. SETTING OF PRINTER ROLL PAPER

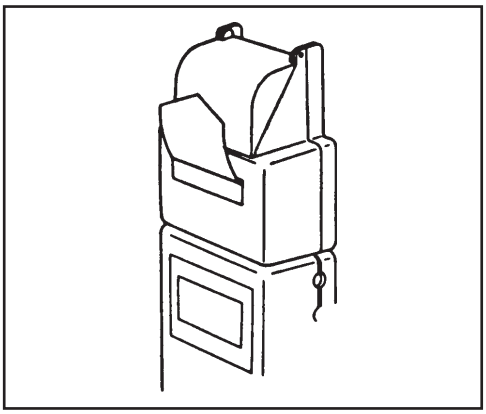
(1) Open the cover of the printer case.



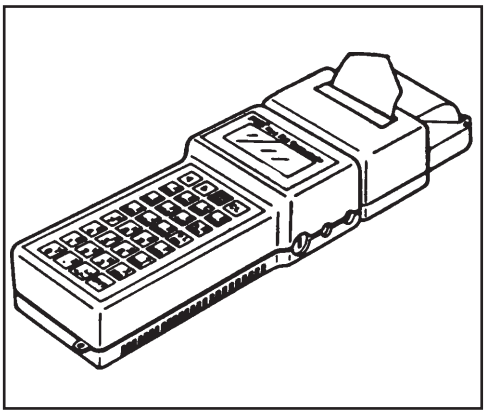
(2) Place a roll paper in the printer case.
Cut the end of the roll paper to form a triangle for easy setting to the cutting side.



(3) Tighten the cover and insert the roll paper through the slit on top of the printer until it reaches the cutting side.



(4) Turn ON the power switch.
Press the [INC] key to feed the roll paper. The paper is fed while the [INC] key is kept pressed.



APPENDIX 4. PARTS LIST

Thank you for your purchase of Fuji's product.
This parts list covers such parts that are considered as necessary for maintenance about the standard specifications of this product. Please read this list when you request a part of this product for supplementary use or other.

[EXPLANATION OF DESCRIPTION]

1. Item No. : Number described in each block diagram. Item No. (1 to 99) coincides with item No. (1 to 99) in the parts list.
2. Parts No. : Parts are supplied in the unit of this number (✻ZZPFXW1-A010 to ZZPFXW1-Z99Z). Parts are beyond the limits of parts No. in default.
3. Quantity : Quantity of parts in each block diagram.

[DESCRIPTION OF ABBREVIATIONS]

♦AR : as required ♦ass'y : assembly ♦pc : piece

[ORDERING METHOD OF MAINTENANCE PARTS]

Specify the following items when ordering of this product.

• Product type • Parts number • Parts name • Quantity

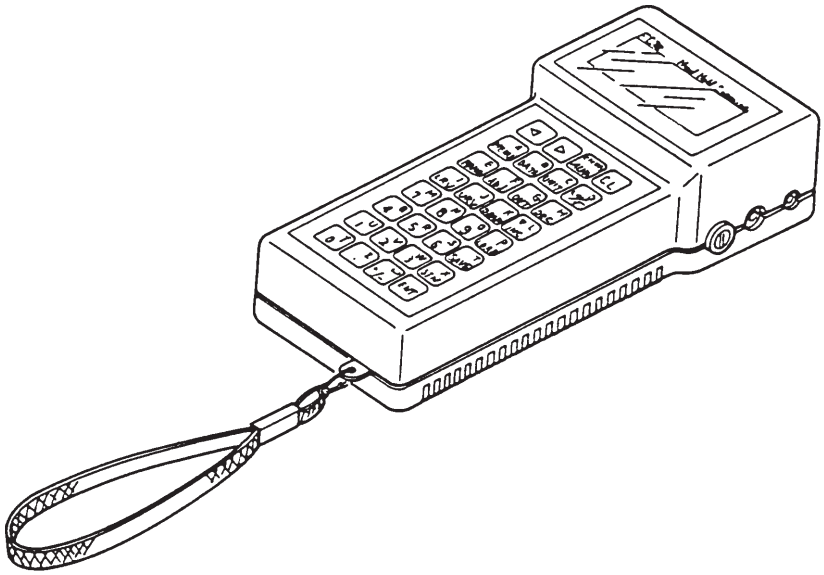
We would like to inform you that we will check the specifications (scale length, measuring range, etc.) as required for the purpose of correctly arranging the requested parts, provided that if a part having optional specifications is requested, you are requested to inform us of product type, manufacturing date, instrument number (serial number), specification (scale range, measuring range, etc.), parts name, and quantity, referring to the type nameplate of the product. If the part's name is unknown, show us its schematic diagram of the part of a sample, if possible.

[INQUIRY ABOUT PARTS]

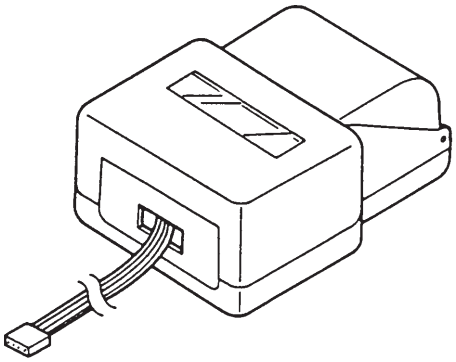
If any question arises about parts, contact your nearest service representative.
If you have purchased a part, irrespective of Fuji Electric Co., Ltd. and maintained or repaired your instrument, Fuji Electric Co., Ltd. will not be responsible for any resultant defect if the product does not fully display its specified functions.

CONTENTS

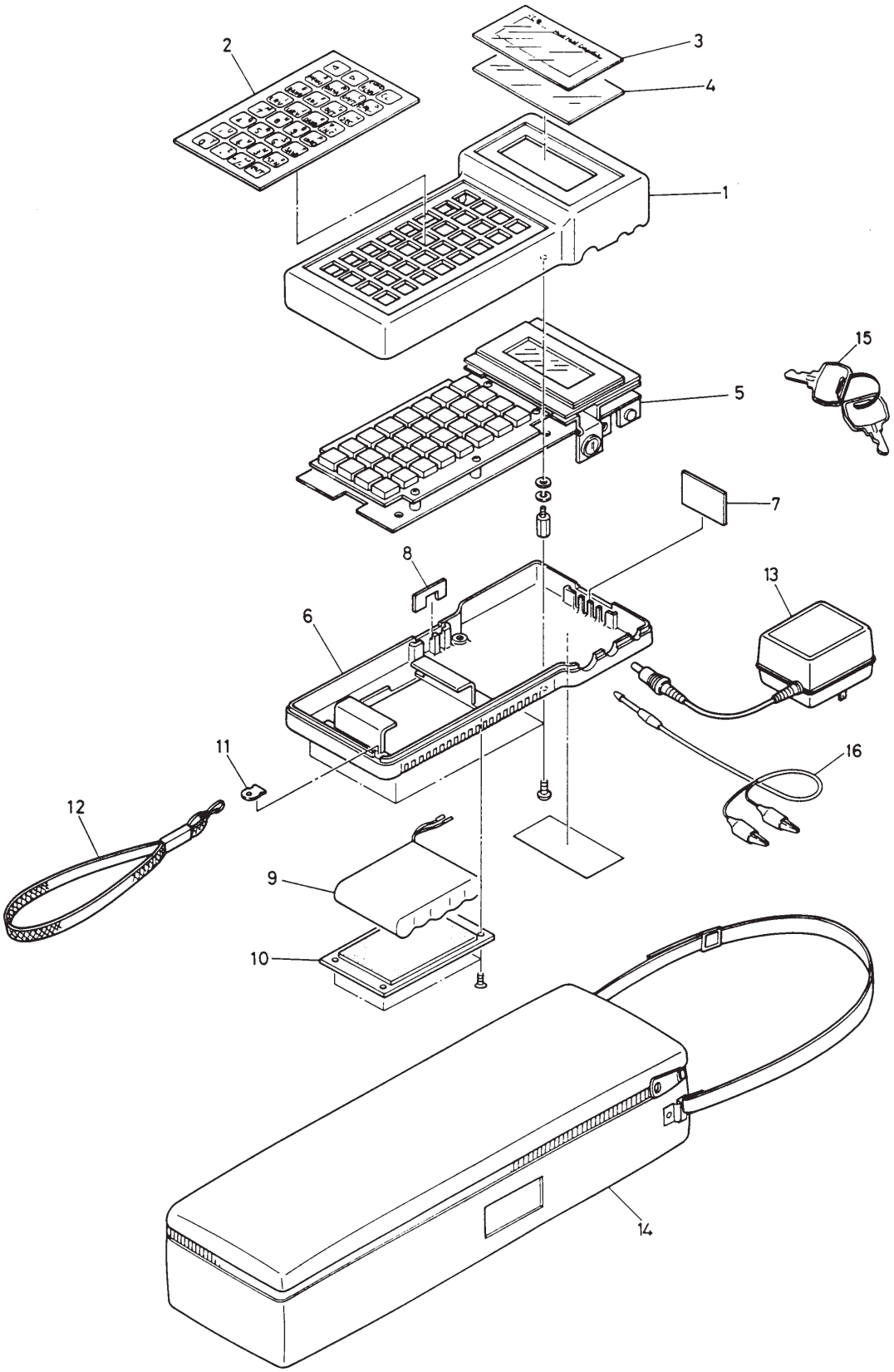
BLOCK A



BLOCK B



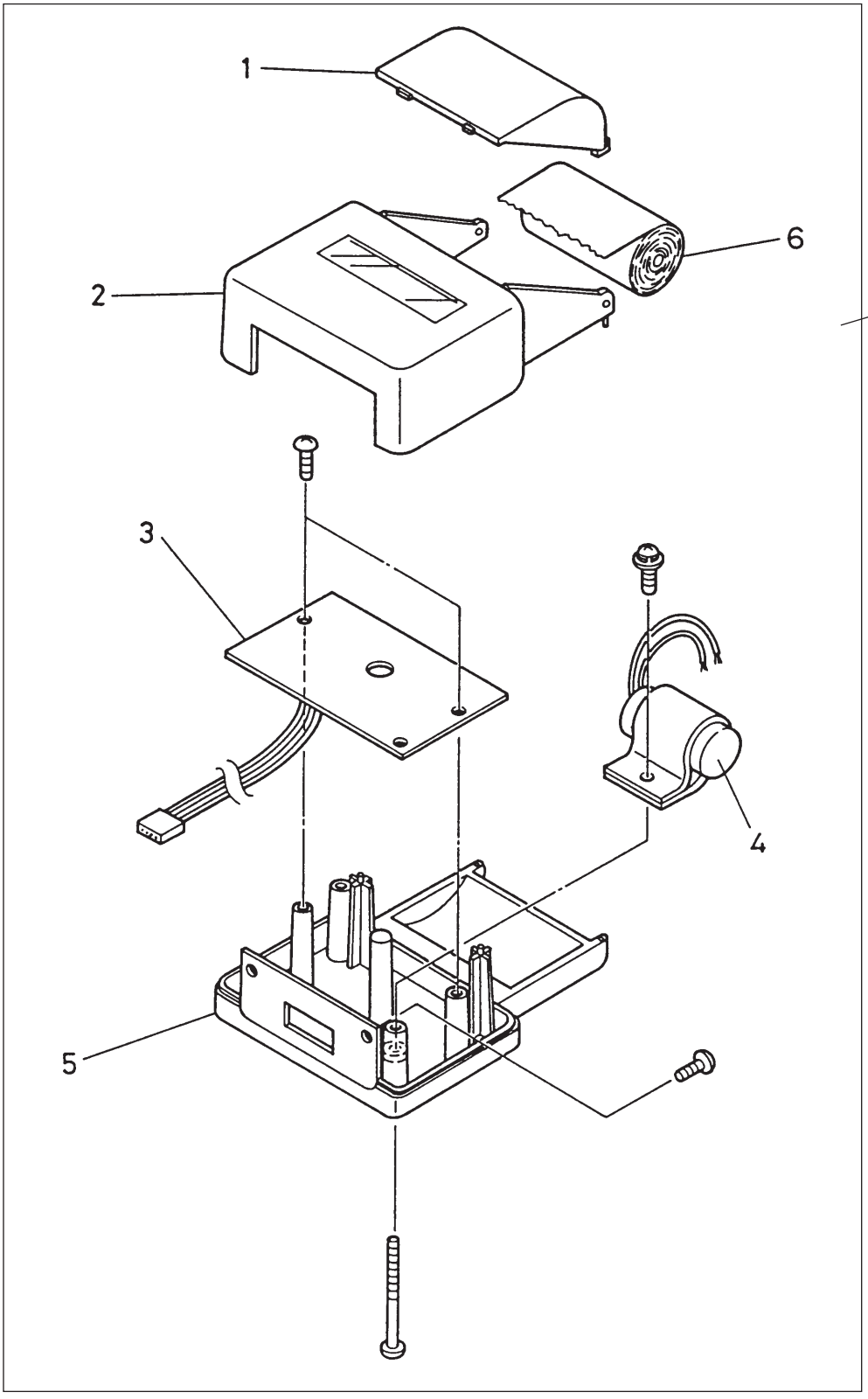
BLOCK A Main ass'y



BLOCK A Main ass'y

Item No.	Parts No.	Part Name	Q'ty	Remarks
1	＊ZZPFXW1-A010	Upper case	1	
2	＊ZZPFXW1-A020	Indicating sheet	1	
3	＊ZZPFXW1-A030	Make-up board	1	
4	＊ZZPFXW1-A040	Board	1	
				*5: 0, 1, 2, 3 → 6 *5: 0, 1, 2, 3 → A
5	＊ZZPFXW1-A050	P.C.B. ass'y	1	
	＊ZZPFXW1-A051	P.C.B. ass'y	1	*5: 0, 1, 2, 3 → C, H, J, K, L
6	＊ZZPFXW1-A060	Down case	1	
7	＊ZZPFXW1-A070	Partition board	1	
8	＊ZZPFXW1-A080	Display board	1	
9	＊ZZPFXW1-A090	Battery unit ass'y	1	
10	＊ZZPFXW1-A100	Case ass'y	1	
11	＊ZZPFXW1-A110	Mounting board	1	
12	＊ZZPFXW1-A120	Strap	1	
				*5: 1 → 100V AC
13	＊ZZPFXW1-A130	Battery charger	1	
	＊ZZPFXW1-A131	Battery charger	1	*5: 2 → 115V AC
	＊ZZPFXW1-A132	Battery charger	1	*5: 3 → 230V AC
				*7: A
14	＊ZZPFXW1-A140	Carring case	1	
15	＊ZZPFXW1-A150	Key	2	
16	＊ZZPFXW1-A160	Communication cable	1	

BLOCK B Printer ass'y (option)



BLOCK B Printer ass'y (option)

Item No.	Parts No.	Part Name	Q'ty	Remarks
1	＊ZZPFXW1-B010	Cover	1	
2	＊ZZPFXW1-B020	Printer upper case	1	
3	＊ZZPFXW1-B030	P.C.B. unit	1	
4	＊ZZPFXW1-B040	Condenser ass'y	1	
5	＊ZZPFXW1-B050	Printer down case	1	
6	＊ZZPFXW1-B060	Paper	1	
10	＊ZZPFXW1-B100	Printer ass'y	1	

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