MODEL 442C

Integrating Printer

Users Manual

Contents

General

- Please read this manual carefully before initial operation.
- Please operate this product by persons who have enough electric knowledge.
- Please make sure to reach this manual to the operators of this product.
- This product uses lithium batteries.
  Following regulations shall be preserved when using in California state, USA.

  ◆**Regulations for perchlorate in used batteries**◆
  About California DTSC's perchlorate best management practices.

  Perchlorate Material – special handling may apply,See
  http://www.dtsc.ca.gov/hazardouswaste/perchlorate.

Please confirm each product incorporates the following accessories.
(1) 442C Main body   (2) Chart paper (one roll)   (3) Users manual

1. For Safety

1.1 Safety operation
For safety operation, please follow the instruction herein under.   There are two symbols marks for safety in this manual.

⚠ WARNING
Operation error might be caused of human death or serious wound.

⚠ CAUTION
Operation error might be caused of slight wound to operators or damage to other instruments related to this product.

⚠ **WARNING**

- **Since this product do not have power switch, this product works immediately after connecting power line.**
- **Do not touch the power supply terminals while powered, otherwise it might be caused of electric shock.**

⚠ **CAUTION**

- **Described specification in this manual is the one 15 min. or longer passed after power supply.**
- **In case of installing this product to cabinet housing, make sure to exchange air inside to keep inside temperature under 50℃**
- **Keep space when installing more than 2 products.   No space installation between products might shorten products lifetime by their self-heating.**
- **Do not install this product in the following environment where;**
    - ➤ **Exposed to rain, water drops or directs sunlight.**
    - ➤ **High temperature or humidity, much dust or corrosive gas.**
    - ➤ **Affected by external noise, radio waves or static electricity.**
    - ➤ **Affected by vibration, shock.**
- **Store this product at –20 to 60 ℃.**
- **Wipe off front panel and housing with dry soft cloth. If necessary, use close with small amount of synthetic detergent for cleaning. Do not use an organic solvent such as thinner, benzine for front panel or housing cleaning, which might damage shape and color of front panel and housing.**

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2. Installation

2.1 Main body

Insert a main body to front side of panel, and fix it with screws at both side from back.

Panel cutout: 92 $^{+0.8}_{0}$ × 92 $^{+0.8}_{0}$ mm

Panel thickness: 1 to 6 mm

     Note) 1.5mm or more thickness is recommended in case of aluminum panel.

Tightening torque: 0.2 to 0.3N·m
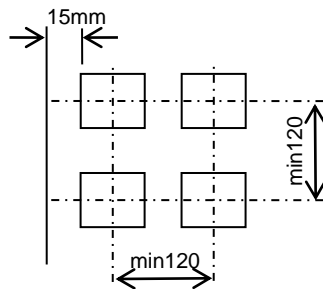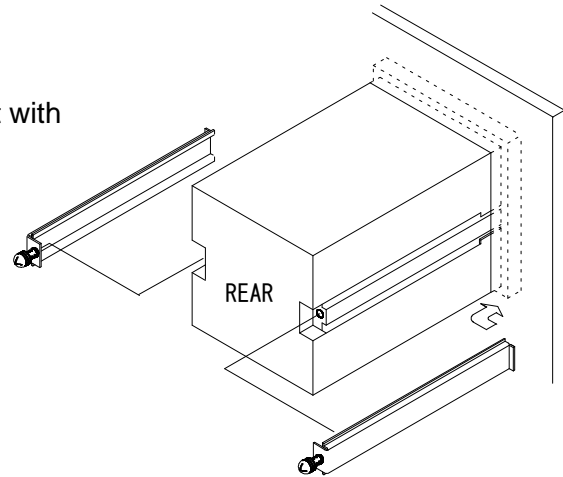
Installation pitch between two products

⚠ CAUTION

● **Do not tight too much a screw that might damage housing.**
● **Use fan, etc, for forced draft in case of installing more than 2 products.**

2.2 Roll chart

⚠ WARNNING

● **Do not touch thermal head and it's around after printing, where high temperature is supposed.**
● **Replace roll chart or clean head after the temperature of head falls.**

⚠ CAUTION

● **Do not insert fingers or alien substances into printer.   Printer cutter might injure fingers etc.**
● **Do not open a roll chart cover by pressing Open/Close button while printing.**
● **Do not press Open/Close button while holding a roll chart cover down.**
● **Do not pull up roll paper while closing a roll chart cover.**
● **Give full attention not to insert fingers when closing a roll chart cover.**
● **Do not insert alien substances to driving gear when closing a roll chart cover.**

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(1) Method of opening and shutting roll paper cover

●How to open a roll chart cover
Press Open/Close button for a roll chart cover.

●How to close a roll chart cover
Press both side of a roll chart cover.
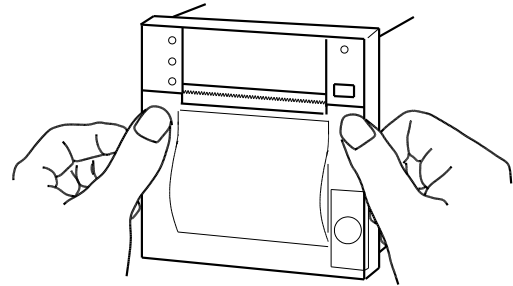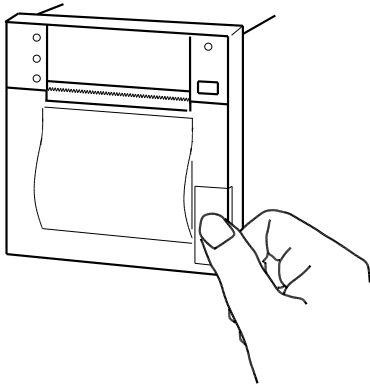
(2) Roll chart setup

Setup a roll chart in appropriate direction shown in the drawing below.
Draw a tip of chart paper outward, and close a roll chart cover.
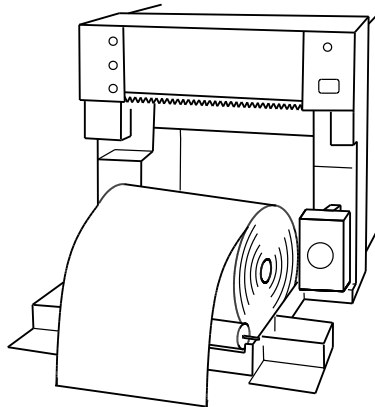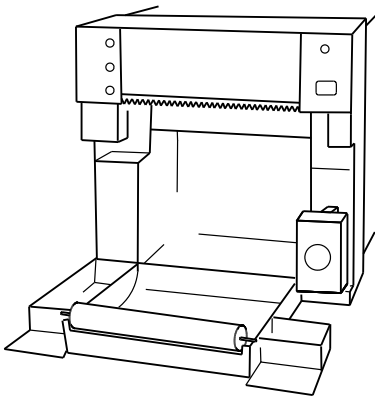
Method of installing roll chart.
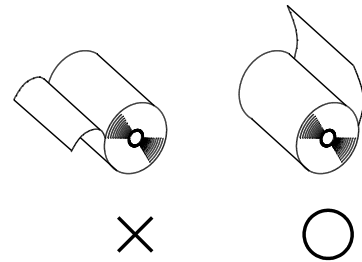
⚠ CAUTION

- **Do not bend roll chart inside.   Paper might be jammed.**
- **Do not use first turn of a roll chart where is pasting part.   No print is available in this part.**

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(3) FEED Key

Press FEED key, and confirm POWER LED turns ON.

POWER LED
   Confirm LED turns ON
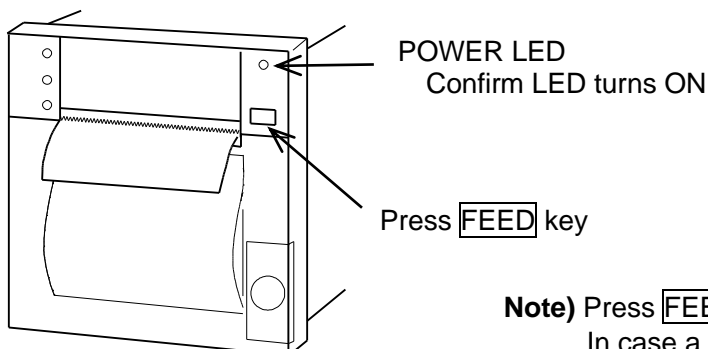
Press FEED key

Note) Press FEED key, and confirm paper feed.
In case a roll chart cover is not closed
completely, paper feed might not be done, and
be caused of printing error.

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2.3 Roll chart cutting

Pull up roll chart paper from the edge of paper while roll paper cover is closed.

⚠ **CAUTION**
● **Be careful not to cut a hand with an edge of cutter.** ● **Do not pull out paper while roll paper cover is closed.** ● **Cut paper after feeding a few lines since printed characters may be Remained.**

2.4 Dimensions

unit: mm
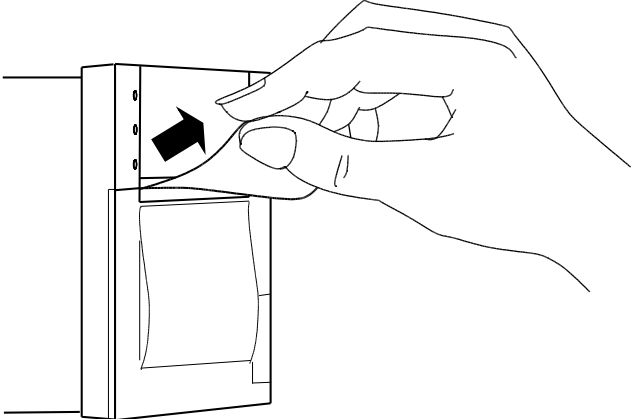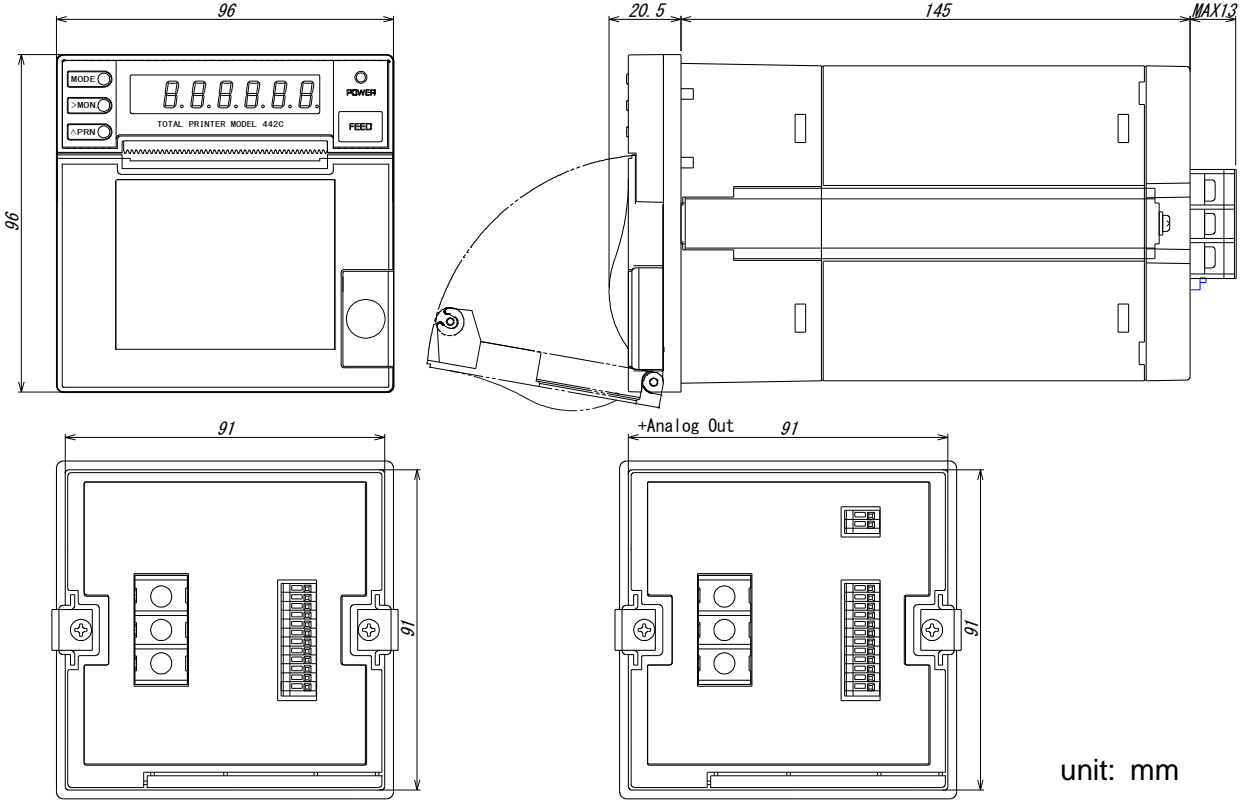
3. Description of parts

3.1 Front panel

Display

① MODE Key

② ＞MON Key

③ ∧PRN Key

④ POWER LED

⑤ FEED Key

⑥ Open/Close button
for chart roll cover
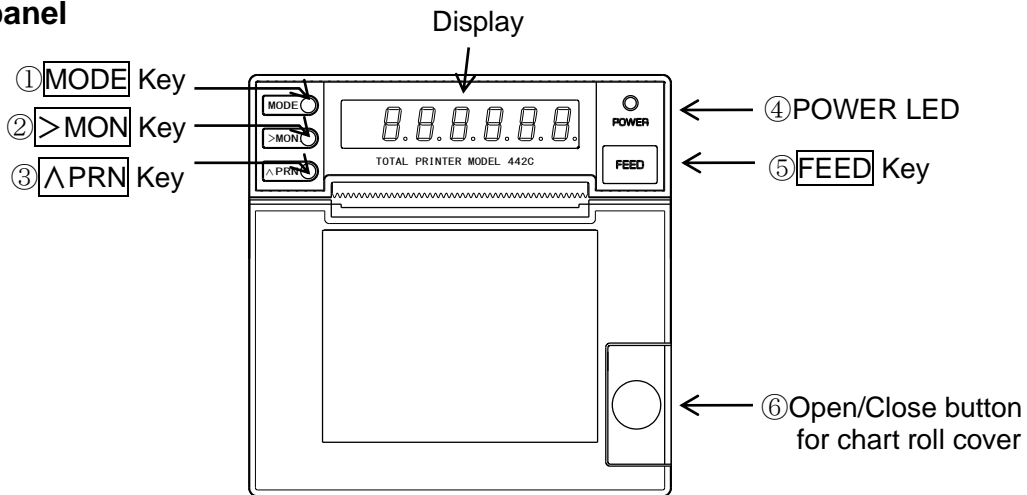
① MODE Key
   Switching Setting Mode during operation
   Switching each mode at Setting Mode
② ＞MON Key
   Digit selection for Set Value at Setting Mode
③ ∧PRN Key
   Set Value change at Setting Mode
④ POWER LED
   LED ON at powered.   LED blinking at paper end and temperature error.
⑤ FEED Key
   One line feeding per one press.   Continuous feeding by continuous pressing.
   This Key is to setup a chart roll, as well.
⑥ Open/Close button for chart roll cover
   Press this button to replace a chart roll.

3.2 Rear panel

⑧ Power terminal

442C-09,442C-29 with analogue output

⑩ Analogue
   output connector

100V~240V ∿
50/60Hz 20VA

G

At 24V DC.power

+   24V ⎓
−   0.7A
N C

⑨ Input connector
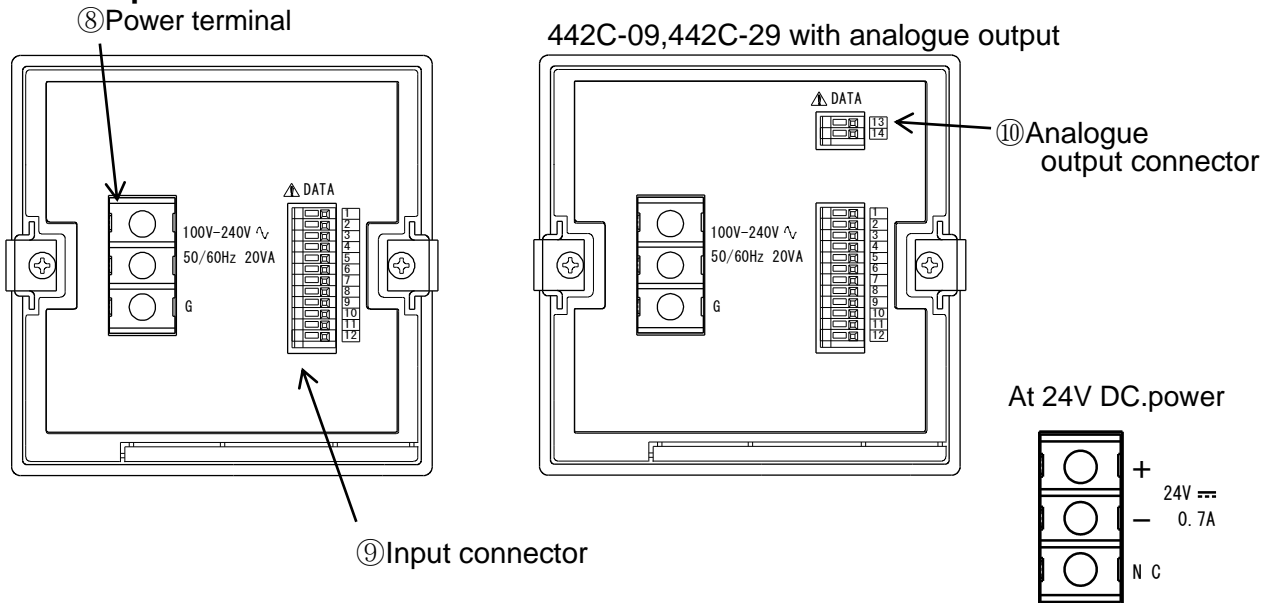
4. Wiring

Remove terminal cover at the backside of power terminal before wiring.
After wiring is completed, be sure to reinstall the cover.

⚠ WARNNING

- **After turn Power Off, do wiring works.   Otherwise, electric shock might be assumed.**
- **Don't do wiring works with wet hands or under high humid environment.   Otherwise, electric shock might be assumed.**
- **Do not touch power terminals while powered.   Otherwise, electric shock might be assumed.**

⚠ CAUTION

- **Do correct wiring.   Wrong wiring might be caused of product damages.**
- **Use specified power and load in specification.   Wrong power and load might be caused of product damage.**

4.1 Power supply terminals

4.1.1 Terminals

●Power terminal arrangement

A.C. power

100V–240V AC
50/60Hz
G

D.C. power

24V   24V DC
NC
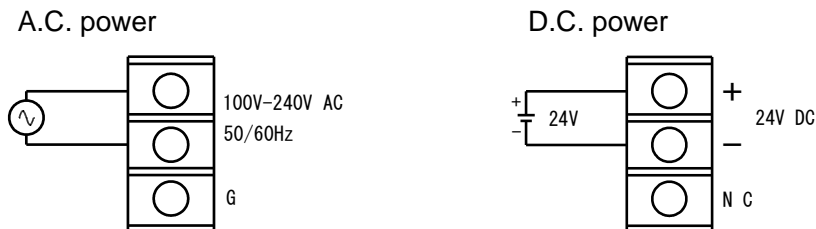
Terminal screws : M4
Tightening Torque : 0.82 to 1.11 N·m
Crimping terminal: see drawing (right)

8 max.
4.3 min.
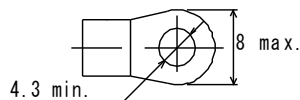
●Power supply
Power supply specification is described on nameplate of the product.
○ AC power… allowable range 90 to 250V AC. (-A: 100V/200V AC. rated)
○ DC power… allowable range 21.6 to 26.4V DC. (-9: 24V DC. rated)
Connect + side of DC power to + terminal, and – side to – terminal.
G, NC has no function.

⚠ CAUTION

- **Supply power specified.   Wrong power might damage the product.**
- **Get rated power within 1 sec. after supply power.**
- **Wait 10 sec. or more before re supply power.**

4.2 Connecter

●Pin arrangement

Analogue output connector (442C-09, 442C-29 at analogue output)

A. OUT ＋ [diagram] 13
A. OUT － [diagram] 14

Input/Output connector

TOTAL A   [diagram] 1
TOTAL B   [diagram] 2
COM   [diagram] 3
WORK A   [diagram] 4
WORK B   [diagram] 5
COM   [diagram] 6
ADJ   [diagram] 7
MANUAL   [diagram] 8
RESET   [diagram] 9
COM   [diagram] 10
PE   [diagram] 11
PE. COM   [diagram] 12
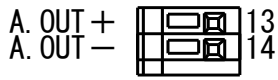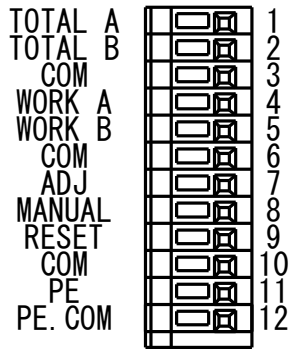
Wire material
Single ϕ 0.32mm(AWG28) to ϕ 0.65mm(AWG22)
Twisted 0.08mm^2(AWG28) to 0.32mm^2(AWG22)
Wire dia. ϕ 0.125mm or more
Stripped wire length 9 to 10mm

●Input signal   TOTAL A,TOTAL B,WORK A,WORK B,ADJ,MANUAL,RESET

TOTAL－A, B
WORK－A, B
RESET, MANUAL, ADJ

Photo coupler

COM

Dry contact   NPN Transistor
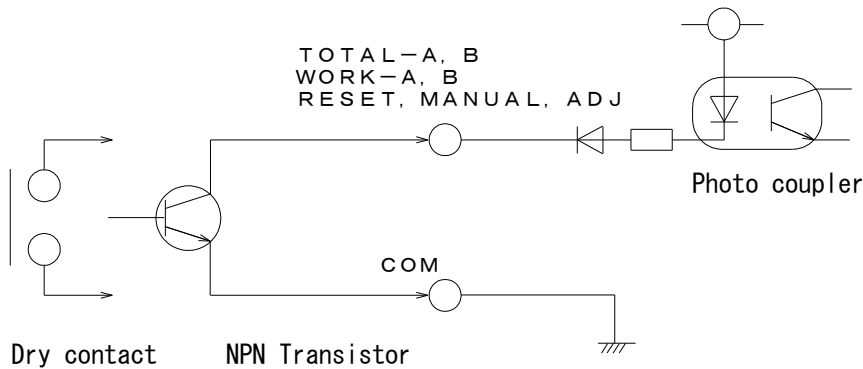
① TOTAL A: Integrated A value input
Dry contact or Open collector (NPN) input.
Rated 5V DC, 10mA.

② TOTAL B: Integrated B value input
Dry contact or Open collector (NPN) input.
Rated 5V DC, 10mA.

④ WORK A: Work A input
Measuring a time of short circuit between WORK A and COM
Dry contact or Open collector (NPN) input.
Rated 5V DC, 10mA, ON or OFF time 10msec. more longer, Minimum
printing resolution 1 sec.

⑤ WORK B: Work B input
Measuring a time of short circuit between WORK B and COM
Dry contact or Open collector (NPN) input.
Rated 5V DC, 10mA, ON or OFF time 10msec. more longer, Minimum
printing resolution 1 sec.

⑦ ADJ: Clock adjustment (30 min.)
Go to 00 min. 00 sec. when connecting ADJ and COM.
(When the minute's digit is 30 or more, it advances the hour digit.)
Dry contact or Open collector (NPN) input.
Rated: 5V DC. 10mA, Pulse width 1s or longer.
Note) When time announcing mode is being automatic printing, 30 min.
Adjustment in clock give time difference in working time, as well.

⑧ MANUAL: Manual printing input (Edge detection)
Manual printing when MANUAL and COM is connected.
Dry contact or open collector (NPN) input.
Rated: 5V DC. 10mA, Pulse width 10ms or longer.

⑨ RESET: Reset (Level detection)
The following data is rest to Zero;
Monthly, Daily, Time announcement, Total integration of Integrated A and B,
and Work time.
Dry contact or open collector (NPN) input.
Rated: 5V DC, 10mA, Pulse width 10msec or longer.

③⑥⑩ COM: Common
Common for ①②④⑤⑦⑧⑨.
No isolation between ⑫PE.COM.

● Paper end output (⑪PE, ⑫PE.COM)
Transistor turns ON when paper end.
Open collector (NPN), 30V DC, 30mA max.   Saturation voltage 1.6V or less.

● Analogue output   (⑬A.OUT+, ⑭A.OUT-)   (442C-09, 442C-29 with analogue output)
4-20mA DC or 1-5V DC output corresponding to an instantaneous value of integrated input.
Analogue signal is output by switching integrated input A or B.
Analogue output and Input circuit is isolated.
Connect signal after confirming polarity.
The frequency set as Max. Input frequency is input, 20mA or 5V is output.
Max. Input frequency range: 10Hz to 1250Hz
Example) Max. Input frequency set = 1000Hz
Input frequency = 1000Hz or more.   Output =20.00mA or 5V
Input frequency = 500Hz.   Output = 12.00mA or 3V
Input frequency = 5Hz.   Output = 4.08mA or 1.02V
Input frequency = Less than 0.5Hz.   Output = 4mA or 1V

+---+
| ⚠ **CAUTION** |
+---+
| ● **Do not charge voltage to analogue output terminal.   The instrument** |
| **may be damaged.** |
+---+

5. Function and Setting

5.1 Summary of function

code No.	Function	Display	Description	Factory set
01	Display setting	dl 5P	0 to 13	0: Hour/Minutes/Second
02	Clock setting	H.ก.5.	Hour, Minute	**Note 1)**
03	Date setting	Y.ก.d.	Year/Month/Date	**Note 1)**
04	Hourly report printing 6 points time setting	ГI ПE.	6 points, Hours, Minutes	00 hour 00 minute
05	Daily report printing time	dAY.	Hour, Minute	00 hour 00 minute
06	Monthly report printing time	∏o∩.	Day, Hour, Minute	1 day 00 hour 00 minute
07	Pulse parameter setting	PUL5	A/B 0.001 to 100	A:1, B:1
08	HF/LF setting	HF.LF.	LF, HF	LF
09	Decimal point setting	dP	A,B 0,1,2,3,4,5	A:0, B:0
10	Unit setting	Unl Г	A,B 0 to 255	A:0.75(m^3),B(0.75(m^3)
11	Initial integrated value of A	Al nГ	000000 to 999999	0
12	Initial integrated value of B	bl nГ	000000 to 999999	0
13	Equation setting	ЕAL.	Equation 0 (A+B), 1 (A-B)	0 (A+B)
14	Printing name setting	nAПE	A/B/Equation: A/B/Y Integration/Work: T/W Number: 0. to 5. Character code: 20 to FD	Integration A: セキサン_A Integration B: セキサン_B Work A: カドゥ_A Work B: カドゥ_B Equation : A+B
15	Printing item setting	PrI nГ	A/B/Equation: A/B/Y Integration/Work: T/W Total integration: 0/1 Auto. Printing: 0/1	Integration A,B: 1(print) Integration A,B Total integration : 1(print) Monthly report: 1(print) Daily report: 1 (print) Hour report: 1(every hour) Work A,B: 1 (print) Equation: 1 (print)
16	Print setting at power failure	PoYEr	0 (no print), 1 (print)	1 (print)
17	Start printing set	5ГAгГ	Integration A,B, Work A, B, Monthly report memory	Integration A, B Work time A, B
18	Analogue output **Note 2)**	AnLG	A/B, Max. input frequency 10 to 1250	A, Max. input frequency 1250

Note 1) Calendar clock is set at delivery.
Note 2) Setting available at 442C-09/-29

5.2 Explanation of function

Code No.01: Display setting
Selectable Clock or Integration display

0	Hour/Minute/Second	
1	Year/Month/Day	
2	Hourly report	Integrated A display
3	Daily report	
4	Monthly report	
5	Total integrated value	
6	Hourly report	Integrated B display
7	Daily report	
8	Monthly report	
9	Total integrated value	
10	Hourly report	Equation display
11	Daily report	
12	Monthly report	
13	Switching display Hour/Minute/Second-Integration A-Integration B. Note) 3 sec./cycle	

Note) Integration A and B display the hourly report.

Code No.02: Time setting
Adjusting Hour of calendar clock.
24 hour (0 to 23) adjustable.
Second unit setting is unavailable. (00 sec. only)

Code No.03: Date setting
Adjusting Year/Month/Date of calendar clock.
Setting the last two digits of A.D. (00 to 99)

Code No.04: Hourly report printing 6 points time setting
Hour/Minute setting of "6 points of specified time".
To print, set to 6 points of hourly report in Code No.15 Printing items.

```
          ┌──┤ 1  00.00 │
          │            └──── Minute
 Specified time points (1 to 6)
                       └──── Hour
```
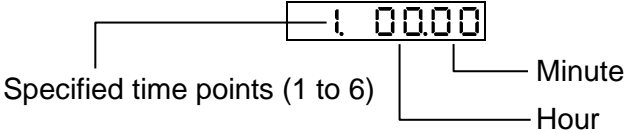
Code No.05: Daily report printing time setting
Setting time (Hour/Minute) of daily report printing
To print daily report automatically, set "with daily report" in Code No.15 Printing Items.

```
        │ 00.00 │
              └──── Minute
          └──── Hour
```
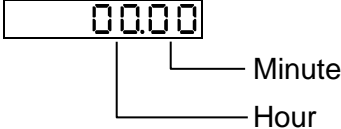
Code No.06: Monthly report printing time setting
Setting time (Day/Hour/Minute) of monthly report printing
To print monthly report automatically, set "with monthly report" in Code No.15 printing Items.
Example) If you provide 31, the report will be printed out in the last day of Feb., Apr., Jun., Sep., and Nov., automatically.

```
      │ 01 00.00 │
              └──── Minute
            └──── Hour
        └──── Day
```
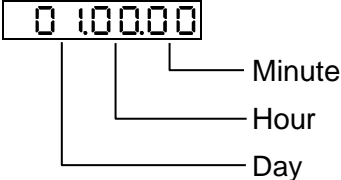
Code No.07: Pulse parameter setting
Setting parameter per pulse of integrated counter.
Each parameter of integrated A and B can be set independently.
Note) Once after changing set value, initialize integrated value by RESET or
Start Printing since count error may be suspected.

```
| A.      0.001 |
```

└── Pulse parameter

0.001	0.001
0.005	0.005
0.01	0.01
0.05	0.05
0.1	0.1
0.5	0.5
1	1
5	5
10	10
50	50
100	100

Switching integrated A/B

A.	Integrated A
b.	Integrated B

Code No.08: HF/LF setting
Switching frequency range of input pulse.
This setting is both for Integrated A and B.
Note) Once after changing set value, initialize integrated value by RESET or Start
Printing since count error may be suspected.

HF	High range 1250Hz MAX ON-OFF time : 400 μ sec or longer.
LF	Low range 100Hz MAX ON-OFF time : 5msec or longer.

Code No.09: Decimal setting
Setting decimal point of lower 6 digits of display and print.
Decimal point of Integrated A and B can be set separately.
The same decimal point position is required at printing along with computation
need.

```
| A.          0 |
```

└── Decimal point

0	0
1	0.0
2	0.00
3	0.000
4	0.0000
5	0.00000

Switching integrated A/B

A.	Integrated A
b.	Integrated B

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Code No.10: Unit setting
Setting unit code of integrated value.
Each parameter of integrated A and B can be set independently.
Use the same unit at computation printing.
Setting range: 0 to 255

```
A.    000
```
└── Unit
       6.2.10 Refer to Character/Unit code.

└── Switching integrated A/B

A.	Integrated A
b.	Integrated B
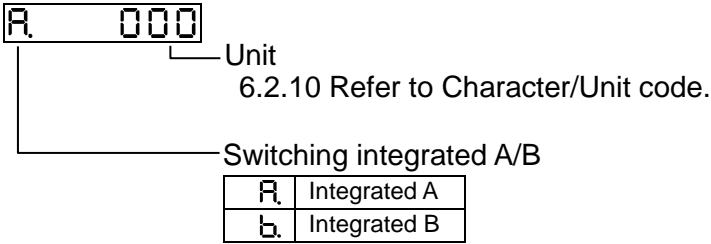
Code No.11: Initial value setting of integrated A
Setting Hourly report, Daily report, Monthly report, Initial value of total integrated A.
Setting range: 6 digits in 0 to 999999
If the setting is changed, the upper 2 digits become 00.

Code No.12: Initial value setting of integrated B
Setting Hourly report, Daily report, Monthly report, Initial value of total integrated B.
Setting range: 6 digits in 0 to 999999
If the setting is changed, the upper 2 digits become 00.

Code No.13: Computation setting
Selecting equation

0	Y= Integrated A + Integrated B
1	Y= Integrated A − Integrated B

Code No.14: Printing name setting
Setting printing name of Integrated A and B, Work A and B, and Computation.
Alphabet, Number, Kana, Up to 6 characters.

`A.r.  5.20`	Integrated A input	Integrated printing name
`A.y.  5.20`	Integrated A input	Work printing name
`b.r.  5.20`	Integrated B input	Integrated printing name
`b.y.  5.20`	Integrated B input	Work printing name
`y.r.  5.20`	Computation	Printing name

└── Character code
       6.2.10 Refer to Character・Code table Unit
└── Character line number
       0 to 5
└── Switching Integrated/Work

r.	Integrated
y.	Work

└── Switching Integrated A/Integrated B/Computation Y

A.	Integrated A
b.	Integrated B
y.	Computation

Code No.15: Printing item setting
Setting "with" or "without" automatic printing (Hourly report, Daily report, Monthly Report for integrated input A / B.)
Setting "with" or "without" of printing for Integration, Total integration, Work, Computation.

Printing item	Automatic printing	Manual printing	Integration over range printing	Monthly report memory printing
Total integration printing	○	○	○	−
Integration printing	○	○	○ Note)	○
Work printing	○	○	−	−
Computation printing	○	○	−	○

Note) No printing at without automatic printing.

A.Г. l l l l l l   Integrated A input

A.Ч. l   Work A input

b.Г. l l l l l l   Integrated B input

b.Ч. l   Work B input

Ч.Г. l   Computation

Hourly report auto printing
(Integrated input A/B setting, A/B common)

0.	No printing, No interval reset, No integration over range printing.
l.	Every hour, No interval time reset for every hour, Integration over range printing.
2.	Hourly report 6 points, Hourly report 6 points interval reset, Integration over range printing.
3.	No printing, Reset at manual printing, Integration over range printing.

Daily report auto printing
(Integrated input A/B setting, A/B common)

0.	No printing, No interval reset, No integration over range printing.
l.	Printing, Daily interval reset, Integration over range printing.

Monthly report auto printing
(Integrated input A/B setting, A/B common)

0.	No printing, No interval reset, No integration over range printing.
l.	Printing, Monthly interval reset, Integration over range printing.

Printing total integrated value (Setting integrated input A/B)

0.	No printing.
l.	Printing.

Printing Integrated/Work/Computation

0.	No printing.
l.	Printing.

Switching Integrated/Work

Г.	Integrated.
Ч.	Work.

Switching Integrated (A/B) /Computation(Y)

A.	Integrated A.
b.	Integrated B.
Ч.	Computation.

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[Example / Integrated A input setting]

Example 1) With auto printing. `A.r. l l l l l`
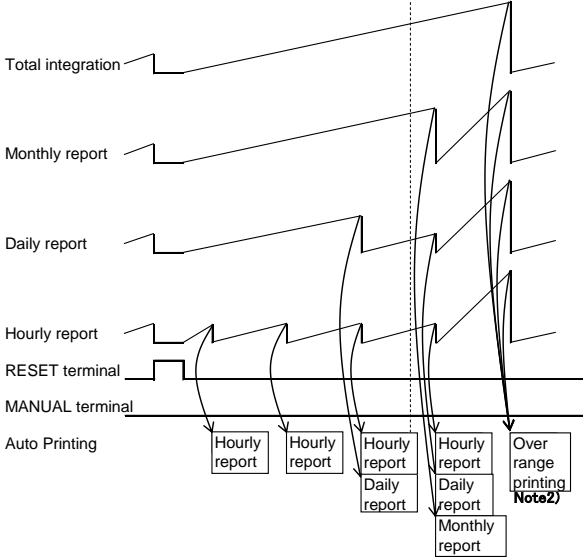
Printing interval integration value for Hourly report, Daily report, and Monthly report.

Total integration

Monthly report

Daily report

Hourly report

RESET terminal

MANUAL terminal

Auto Printing

| Hourly report | Hourly report | Hourly report Daily report | Hourly report Daily report Monthly report | Over range printing Note2) |

Example 2) Without auto printing. `A.r. l l0.0.0.`

Total integration

Monthly report

Daily report

Hourly report

RESET terminal

MANUAL terminal

Printing

| manual printing Note1) | manual printing Note1) | Over range printing Note2) |
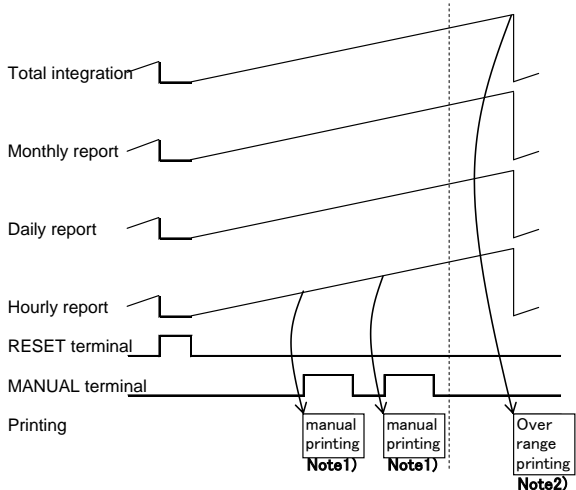
Example 3) Without auto Printing, Reset and manual printing. `A.r. l l0.0.3`

Total integration

Monthly report

Daily report

Hourly report

RESET terminal

MANUAL terminal

Printing

| manual printing Note1) | Over range printing Note2) |
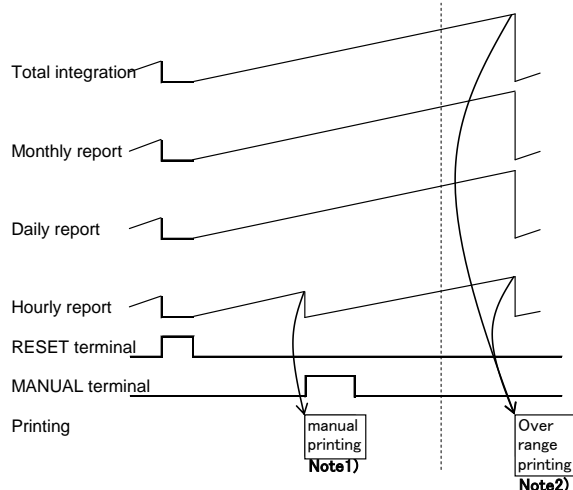
Manual Printing prints integrated value of Hourly report.
At without Auto Printing(Hourly report, Daily report, Monthly report), no interval reset at Hourly report, Daily report, and Monthly report.
It resets it for Hourly report auto printing ∃. (No printing, Reset at manual printing) by a manual print.

Note 1) At with integrated value print l(with print), printing integrated value of Hourly report by auto printing.
Note 2) At with integrated value printing l(with print) and with auto Printing (Hourly report, Daily report, Monthly report), over range printing of Hourly report, Daily report, and Monthly report once each integrated value exceed 99999999.
No over range printing at without auto printing (Hourly report, Daily report, and Monthly Report).   At hourly report, Without auto printing, and Reset ∃. at manual printing, over range printing is done.   At with total integrated value printing l(with printing), over range printing of total integrated value is done.

Code No.16: Print setting at power failure
Selecting Printing or No printing during power failure after power recovery.

| 0 | No printing |
| i | Printing |

Code No. 17: Setting start printing
Selecting Reset Items before start printing.

| i i i i i |

Monthly report memory

| 0 | No reset. |
| i | Reset. |

Work time B

| 0 | No reset. |
| i | Reset. |

Work time A

| 0 | No reset. |
| i | Reset. |

Integrated B

| 0 | No reset. |
| i | Reset. |

Integrated A

| 0 | No reset. |
| i | Reset. |
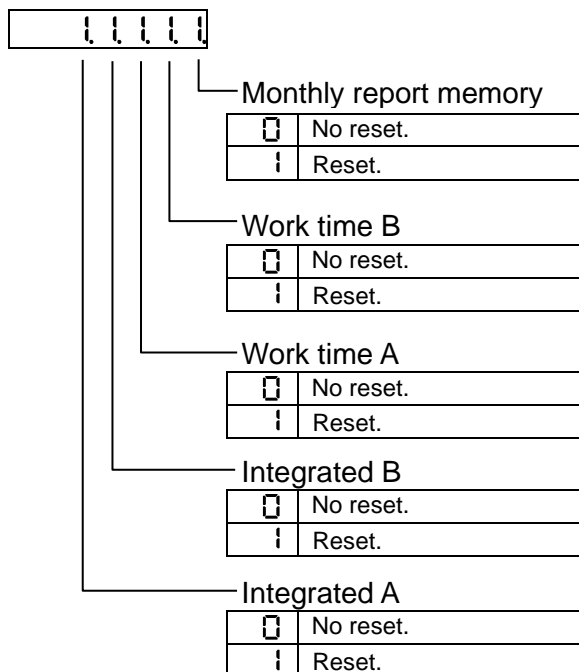
Code No.18: Analogue output setting (442C-09, 442C-29)
Switching output, Integrated A or B.   Setting Maximum input frequency.

| A. 1000 |

Maximum input frequency: 10 to 1250Hz

Switching integrated A/B

| A. | Integrated A output. |
| b. | Integrated B output. |

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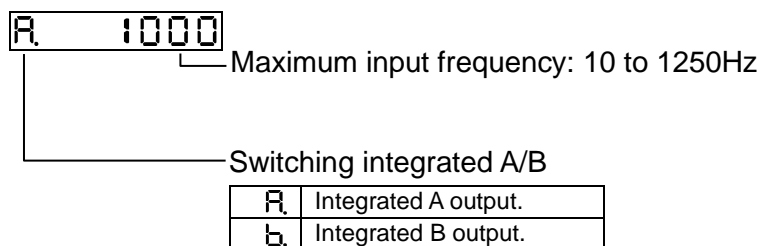
5.3 Setting

5.3.1 Display
Example) Set Hour/Minute/Second display to Year/Month/Day.

Press MODE Key for 1 sec. or more during operation to get setting mode. (Display:Cod.00)

In operation

MODE 1 sec

Memorized by ∧PRN Key

Setting code No.01 to change

>MON , ∧PRN

MODE

Back to Cod.00 by code No. to be set.

Code 01
Display setting

∧PRN

>MON

∧PRN
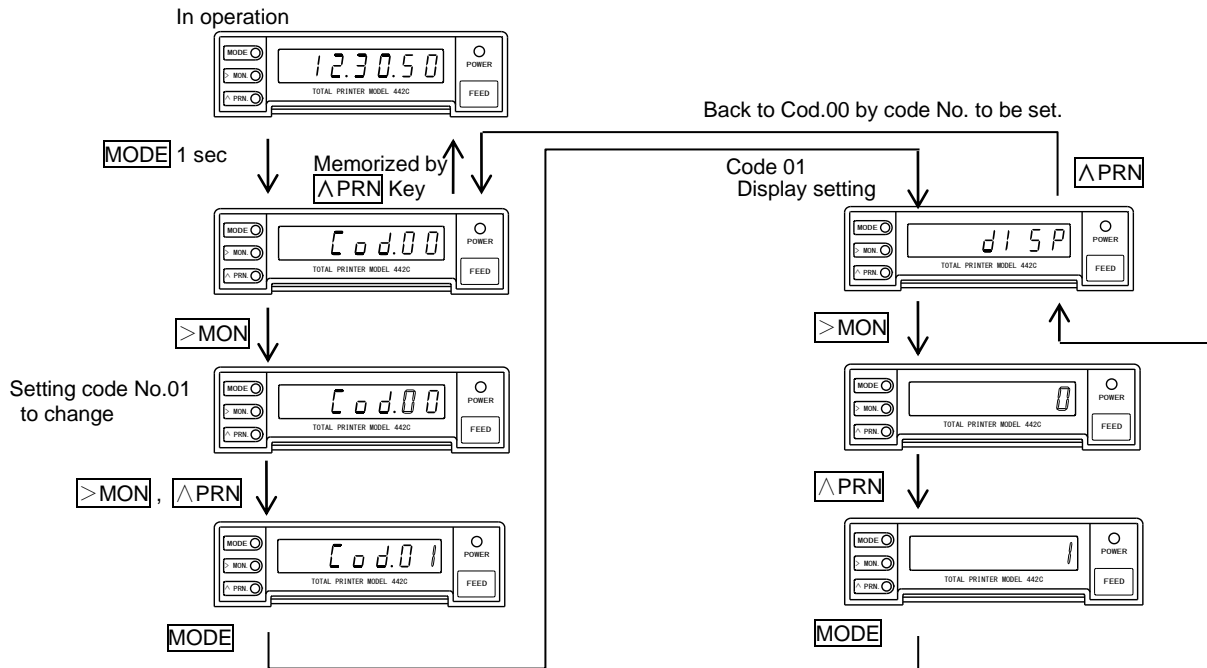
MODE

5.3.2 Clock
Example) Adjusting Clock 12. 30. 50 to 15. 52. 00.

Press MODE Key for 1 sec. or more during operation to get setting mode. (Display:Cod.00)

In operation

MODE 1 sec

Completed by ∧PRN Key

Setting code No.02 to change

>MON , ∧PRN

MODE

Back to Cod.00 by code No. to be set.

∧PRN

Code 02
Clock setting

>MON

Clock display

>MON

>MON , ∧PRN

MODE

Update Calendar clock.
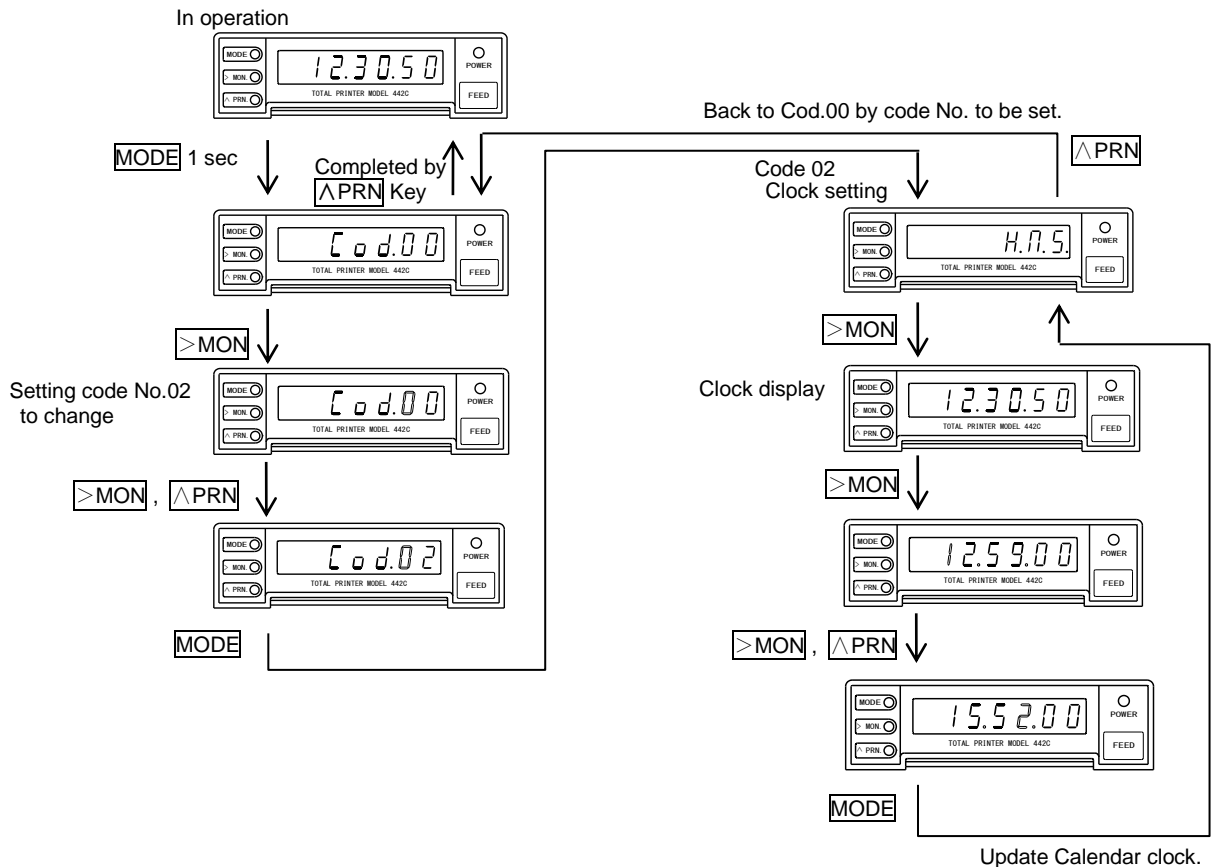
5.3.3 Date

Example) Adjusting Date 07. 01. 10 to 07. 01. 12.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)

In operation

MODE 1 sec ↓ Completed by ∧PRN Key

Back to Cod.00 by code No. to be set.

∧PRN

Setting code No.03 to change

Code 03
Date setting

Y.Π.d.

>MON ↓

Date display   07.01.10

>MON , ∧PRN ↓

Setting code No.03 to change   Cod.00

>MON , ∧PRN ↓   07.01.10

Cod.03

MODE

>MON , ∧PRN ↓

07.01.12

MODE

Update Calendar clock.
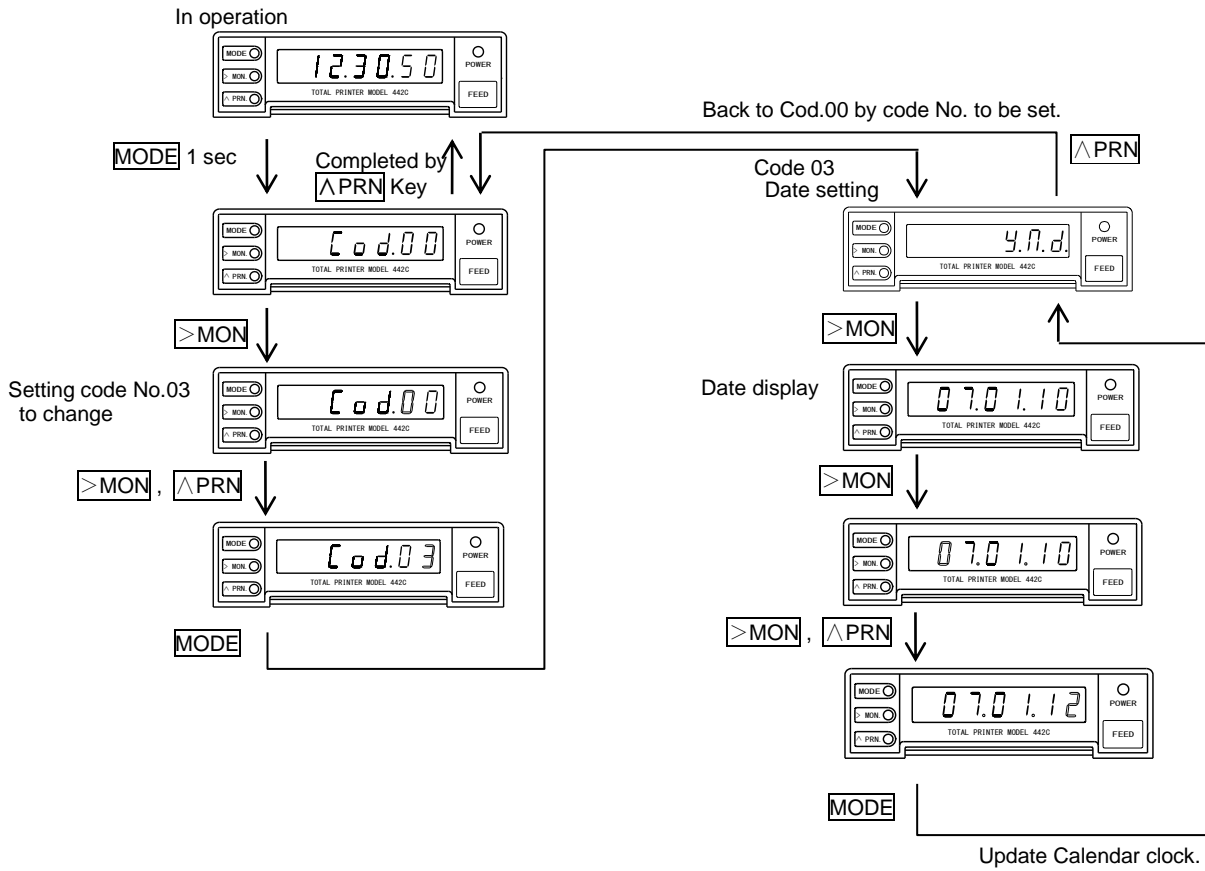
5.3.4 Hourly report printing 6 points time setting

Example) Adjusting one point of Hourly report printing among 6 points from 00 hour 00 minute to 00 hour 30 minute.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)

In operation

12.30.50

Back to Cod.00 by code No. to be set.

MODE 1 sec ↓   Memorized by ∧PRN Key

∧PRN

Cod.00

Code 04
Hourly report printing 6 points time.

Π Π E.

>MON ↓

Setting code No.04 to change   Cod.00

>MON ↓

1. 00.00

>MON , ∧PRN ↓

Cod.04

>MON , ∧PRN ↓

1. 00.30
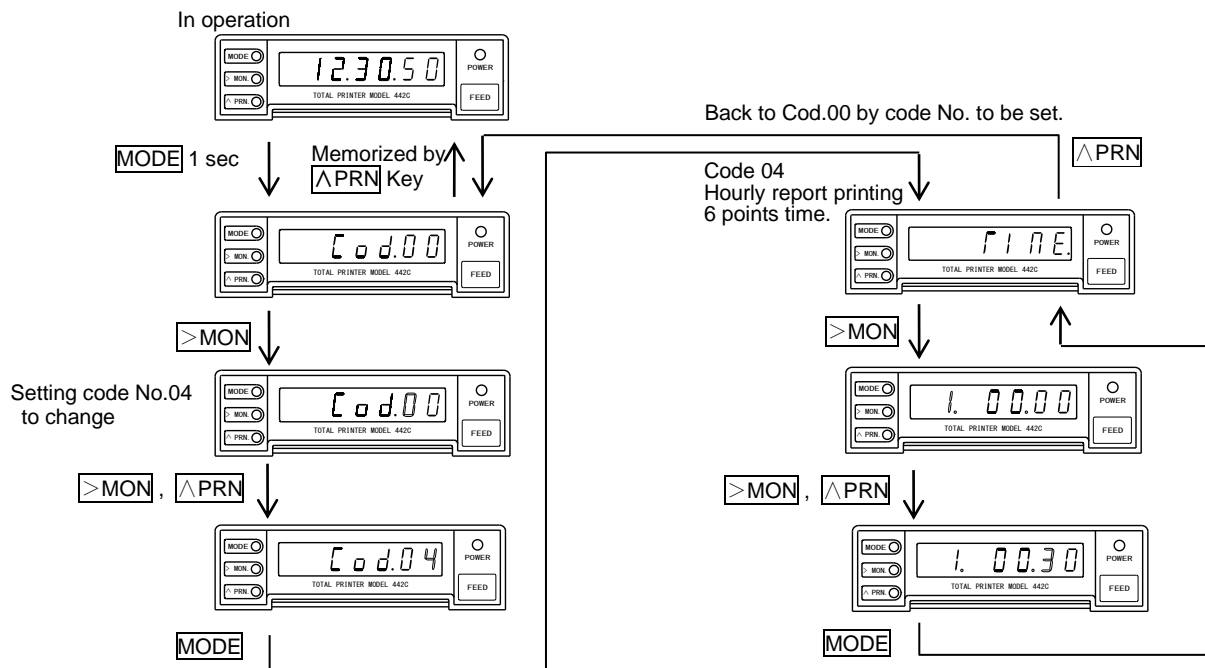
MODE

MODE

5.3.5 Daily report printing time setting
Example) Adjusting printing time from 00 hour 00 minute to 23 hour 59 minute.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:$Cod.00$)

In operation

12.30.50

MODE 1 sec ↓   Memorized by ↑ ∧PRN Key

Back to Cod.00 by code No. to be set.

Code 05
Daily report
printing time

$Cod.00$ ∧PRN

dAY.

>MON ↓

$Cod.00$

>MON ↓

00.00

Setting code No.05
to change

>MON , ∧PRN ↓

>MON , ∧PRN ↓

$Cod.05$

23.59
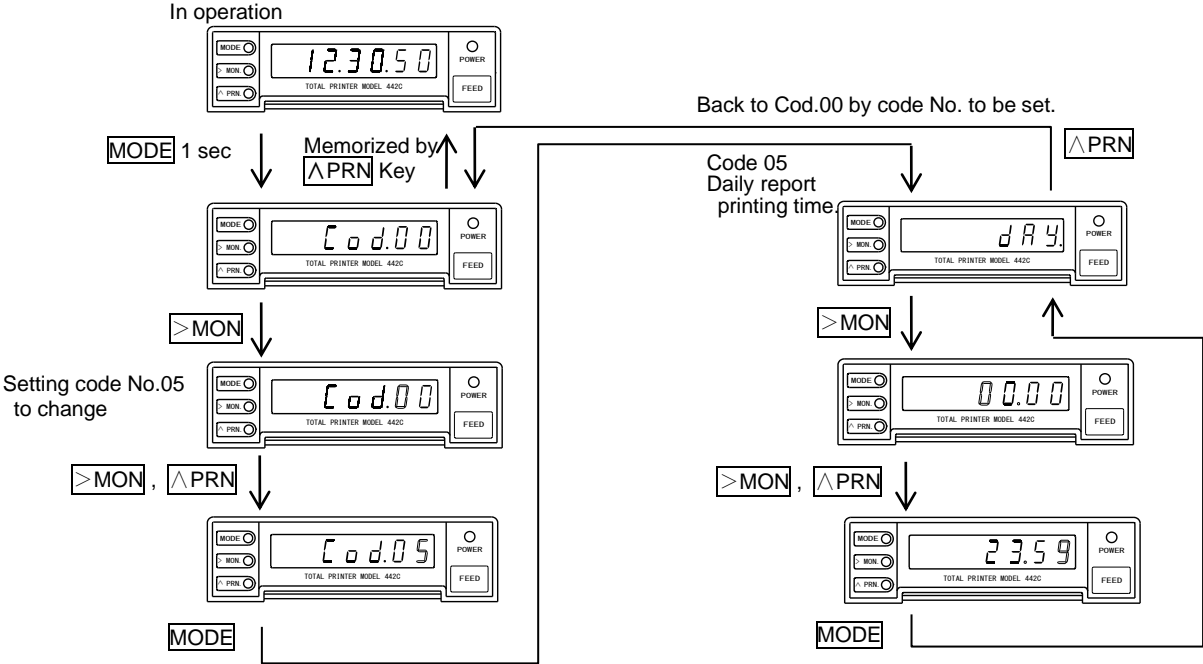
MODE

MODE

5.3.6 Monthly report printing time setting
Example) Adjusting printing time from 1st day 00 hour 00 minute to 31st day 23 hour 59 minute.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:$Cod.00$)

In operation

12.30.50

MODE 1 sec ↓   Memorized by ↑ ∧PRN Key

Back to Cod.00 by code No. to be set.

Code 06
Monthly report
printing time

∧PRN

$Cod.00$

Non.

>MON ↓

>MON ↓

Setting code No.06
to change

$Cod.00$

01.00.00

>MON , ∧PRN ↓

>MON , ∧PRN ↓

$Cod.06$

31.23.59
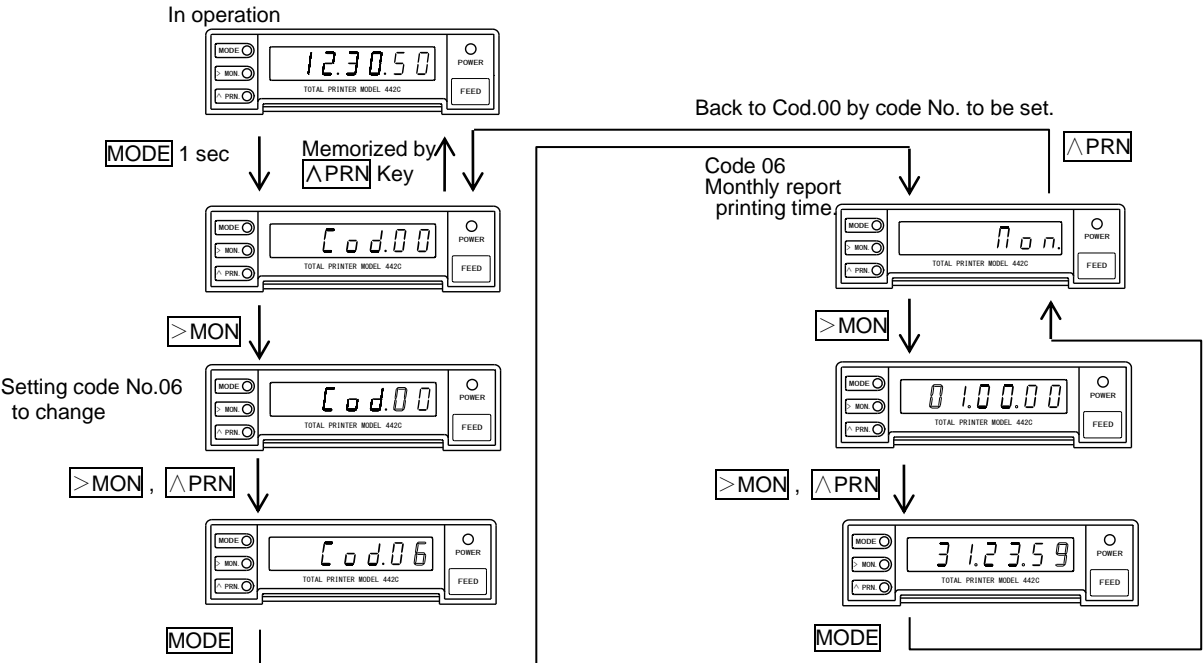
MODE

MODE

5.3.7 Pulse parameter setting

Example) Adjusting parameter of integrated A input from 0.001 to 0.005.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)

In operation

Back to Cod.00 by code No. to be set.

Code 07
Pulse parameter
setting.

MODE 1 sec   Memorized by ∧PRN Key

∧PRN

⟩MON

Setting code No.07
to change

⟩MON , ∧PRN

⟩MON , ∧PRN

MODE

MODE

5.3.8 HF/LF setting

Example) Adjusting from LF to HF.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)

In operation

Back to Cod.00 by code No. to be set.

Code 08
HF/LF setting.

MODE 1 sec   Memorized by ∧PRN Key

∧PRN

⟩MON

⟩MON

Setting code No.08
to change

⟩MON , ∧PRN

∧PRN

MODE

MODE

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5.3.9 Decimal setting
Example) Adjusting the decimal point of integrated A input from 0(0) to 1(0.0).

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:`Cod.00`)

In operation

Back to Cod.00 by code No. to be set.

MODE 1 sec — Memorized by ∧PRN Key

∧PRN

Code 09
Decimal setting

>MON

Setting code No.09 to change

>MON , ∧PRN

>MON , ∧PRN
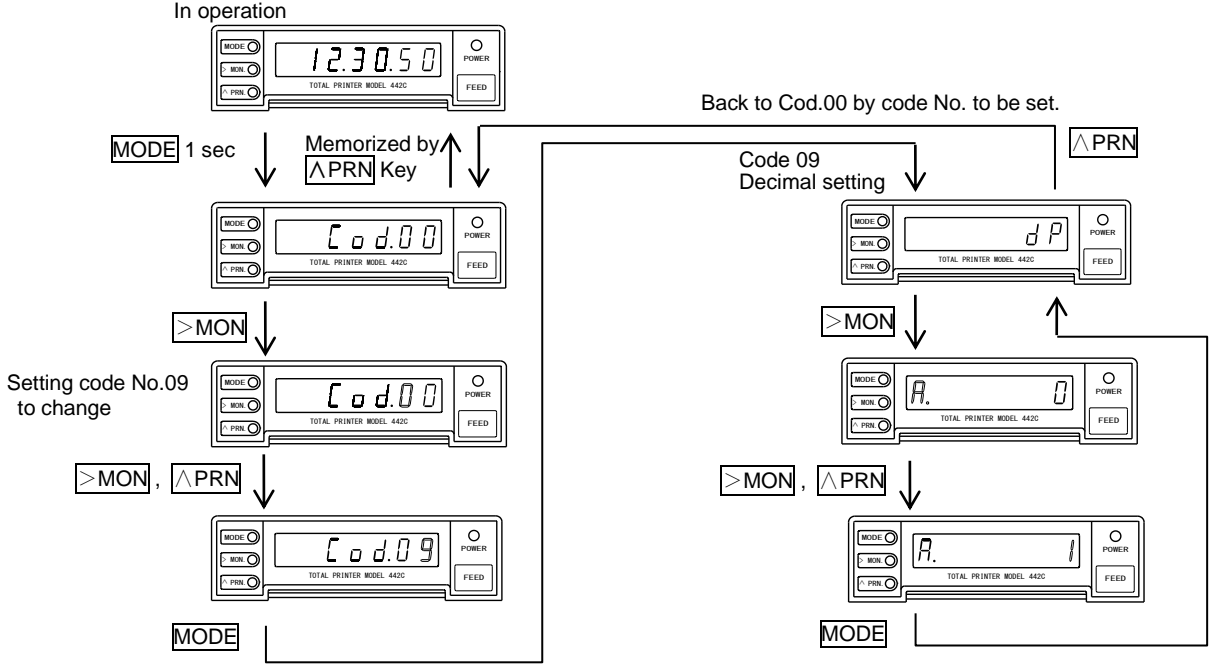
MODE

MODE

5.3.10 Unit setting
Example) Adjusting the unit of Integrated A input from 75(m^3) to 68(kg).

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:`Cod.00`)

In operation

Back to Cod.00 by code No. to be set.

MODE 1 sec — Memorized by ∧PRN Key

∧PRN

Code 10
Unit setting

>MON

Setting code No.10 to change

>MON , ∧PRN

>MON , ∧PRN

MODE

MODE

5.3.11 Integrated value A: initial value setting

Example) Adjusting the initial value of integrated A input from to 999999.
Setting lower 6 digits.
Press MODE Key for 1 sec. or more during operation to get setting mode (Display:$Cod.00$)

In operation

MODE 1 sec ↓   Memorized by ∧PRN Key

Back to Cod.00 by code No. to be set.

Code 11
Initial value of integrated value setting.

∧PRN

Setting code No.11 to change

>MON ↓

>MON , ∧PRN ↓

>MON ↓

>MON , ∧PRN ↓

MODE

MODE

5.3.12 Integrated value B: initial value setting

Example) Adjusting the initial value of Integrated B input to 999999.
Setting lower 6 digits.
Press MODE Key for 1 sec. or more during operation to get setting mode. (Display:$Cod.00$)

In operation

MODE 1 sec ↓   Memorized by ∧PRN Key

Back to Cod.00 by code No. to be set.

Code 12
Initial value of integrated value setting.

∧PRN

Setting code No.12 to change

>MON ↓

>MON , ∧PRN ↓

>MON ↓

>MON , ∧PRN ↓

MODE

MODE

5.3.13 Computation setting
Example) Adjusting the computation from 0 (A+B) to 1 (A-B).

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:C o d.00)

In operation

Back to Cod.00 by code No. to be set.

Code 13
computation setting.

MODE 1 sec　Memorized by ∧PRN Key

∧PRN

Setting code No.13
to change

>MON , ∧PRN

∧PRN

MODE

>MON
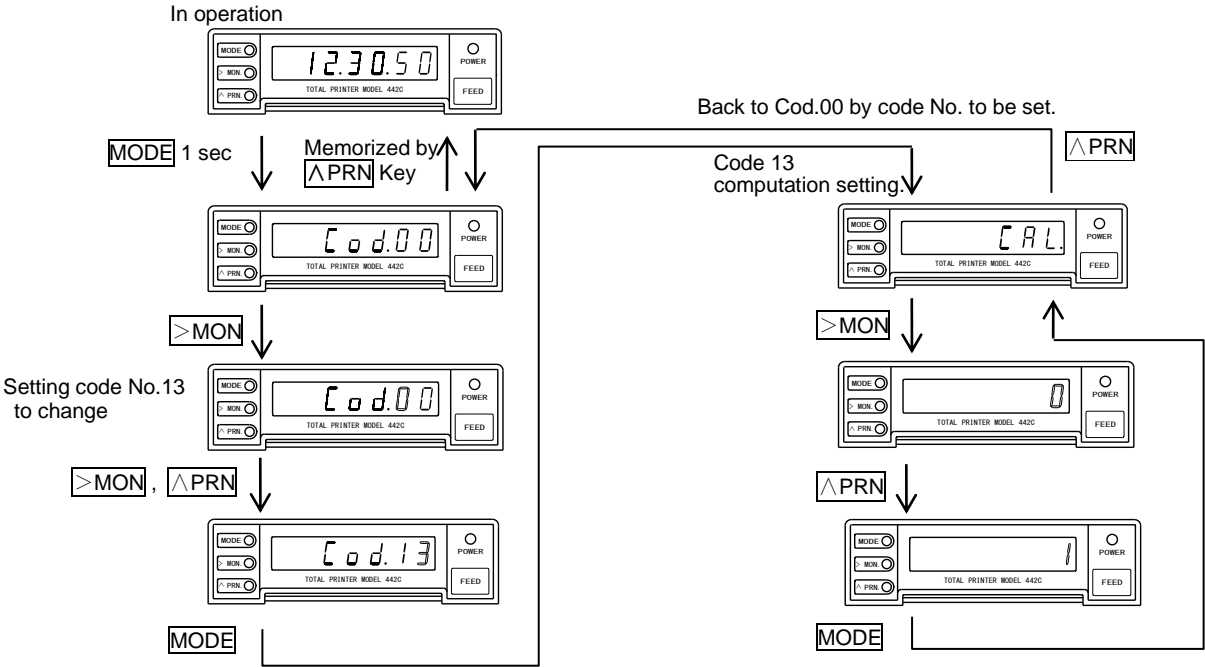
MODE

5.3.14 Printing name setting
Example) Adjusting the printing name of Integrated B input to "ソウスイ".

ソウスイ

Character position	Code	Setting example
1 digit	BF	b.r.　0.bF
2 digit	B3	b.r.　1.b3
3 digit	BD	b.r.　2.bd
4 digit	B2	b.r.　3.b2
5 digit	20	b.r.　4.20
6 digit	20	b.r.　5.20

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:C o d.00)

In operation

Back to Cod.00 by code No. to be set.

Code 14
Printing name setting.

MODE 1 sec　Memorized by ∧PRN Key

∧PRN

Setting code No.14
to change

>MON

>MON , ∧PRN

>MON , ∧PRN

MODE

MODE
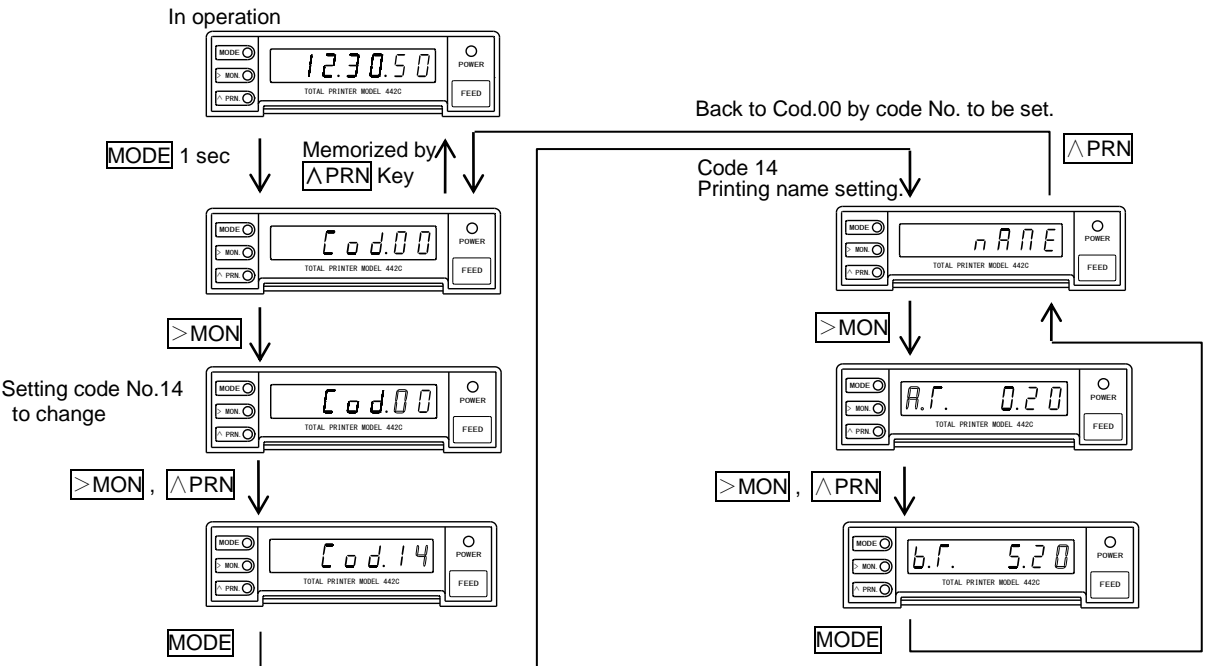
5.3.15 Printing item setting

Example) Adjusting the printing item of Integrated B input to "with integration printing", "without total integration printing", "without monthly report printing", "without daily report printing", and "hourly report printing 6 points".
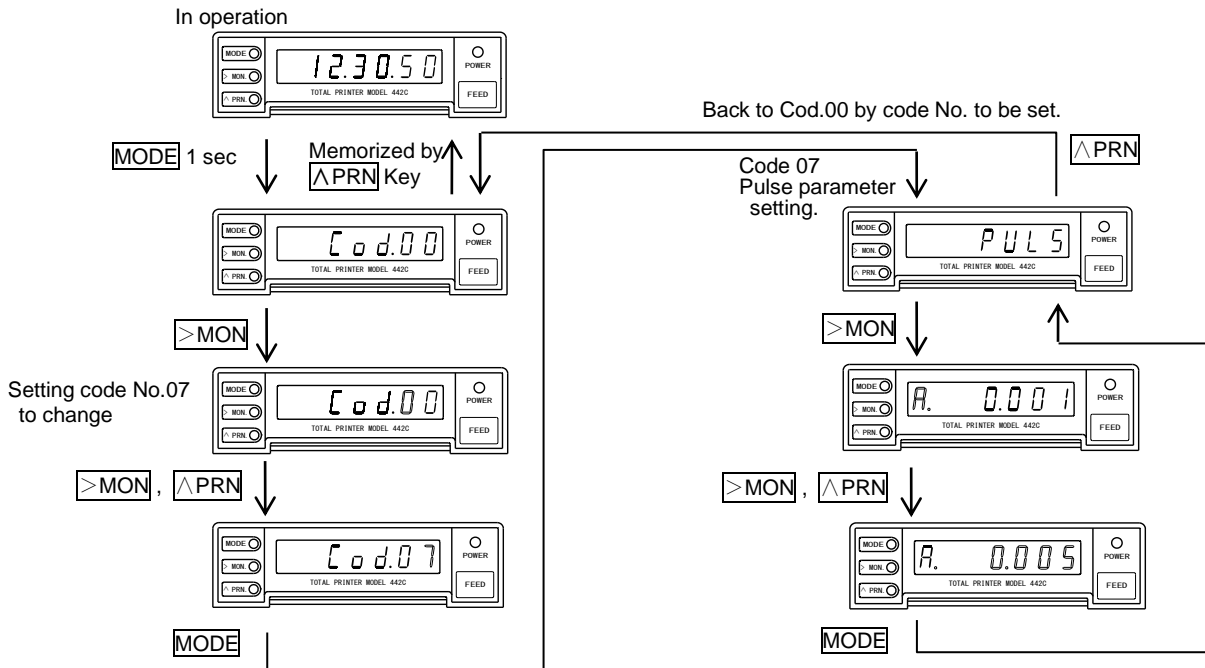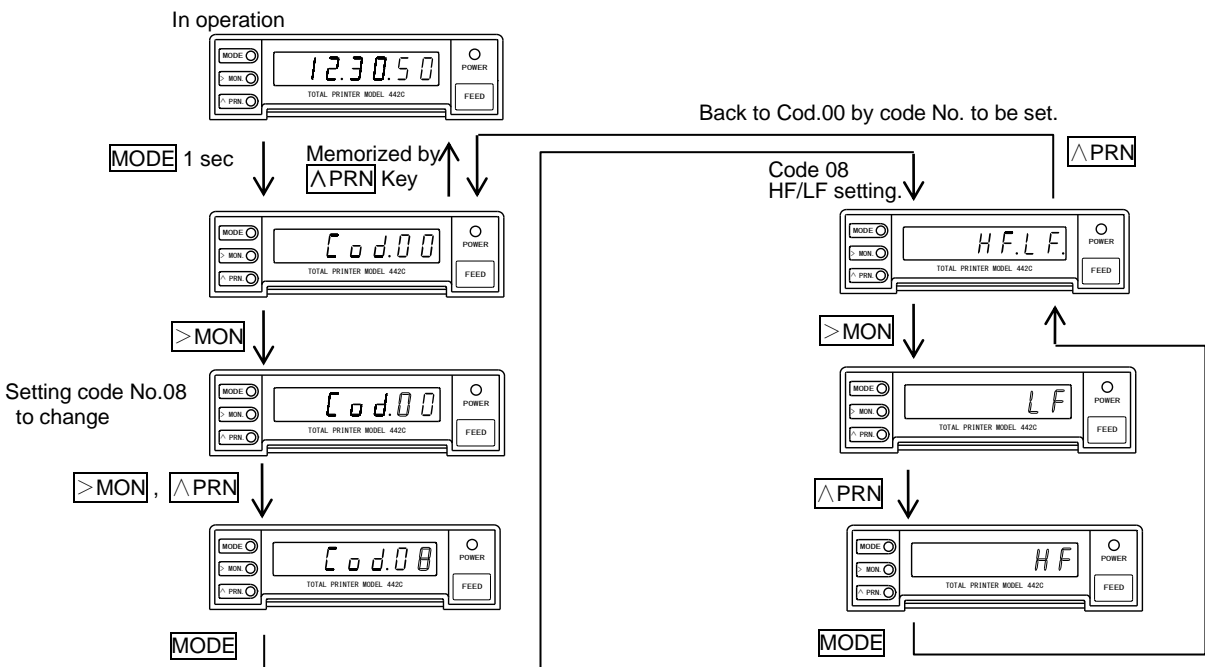
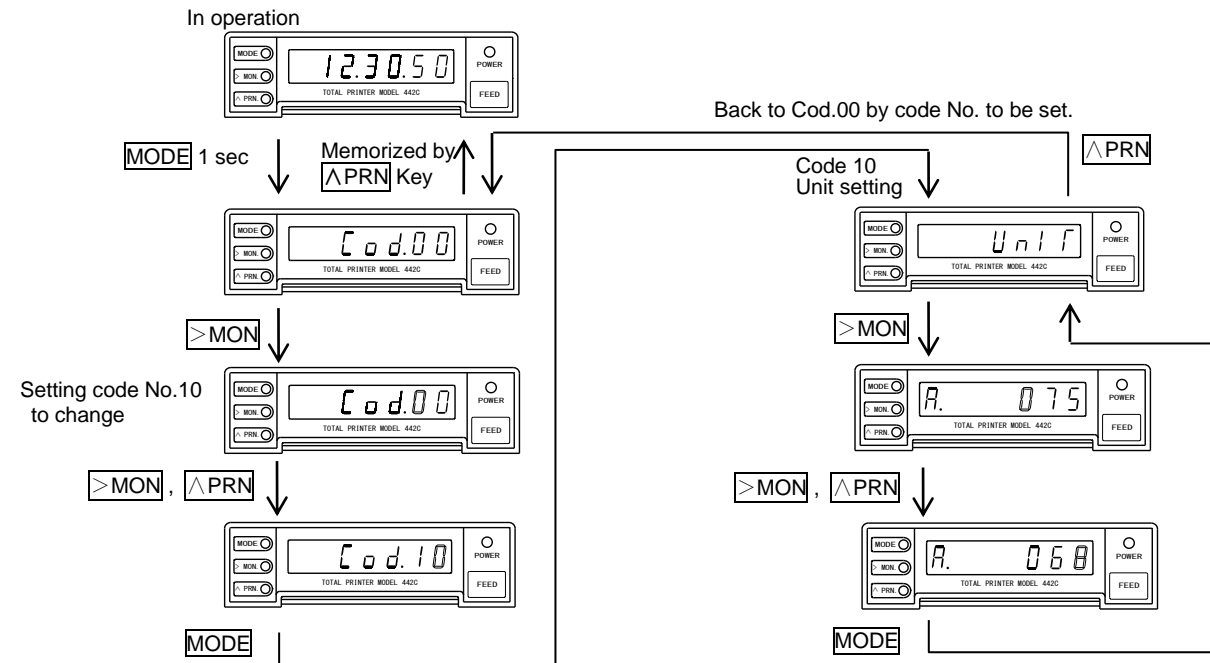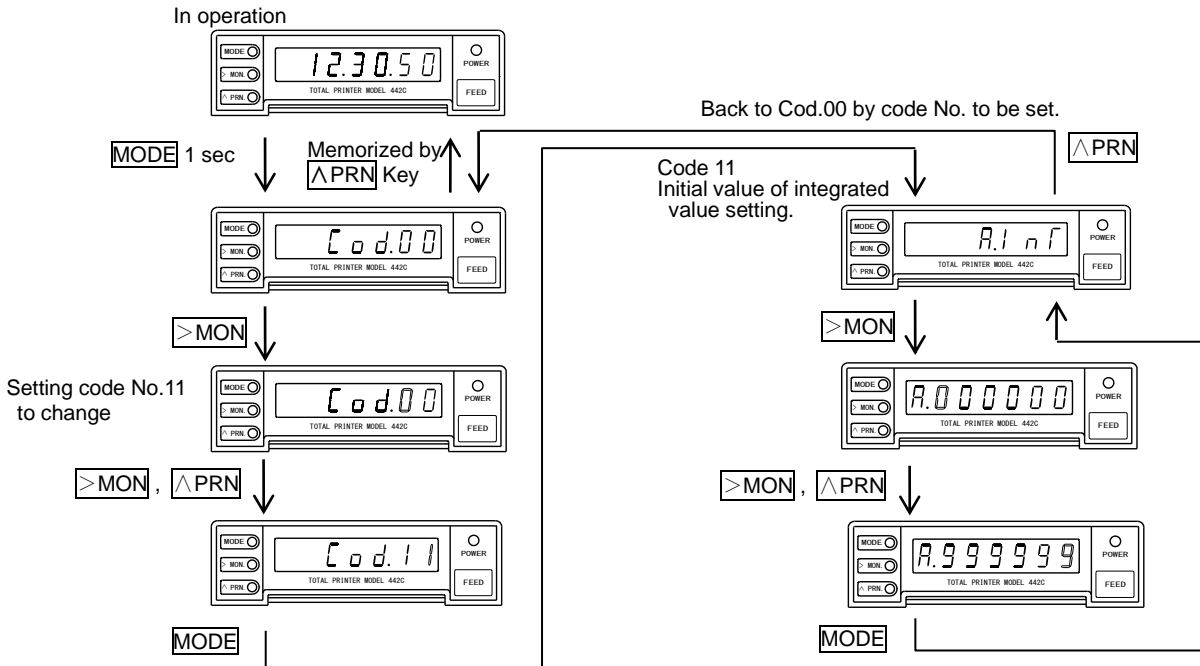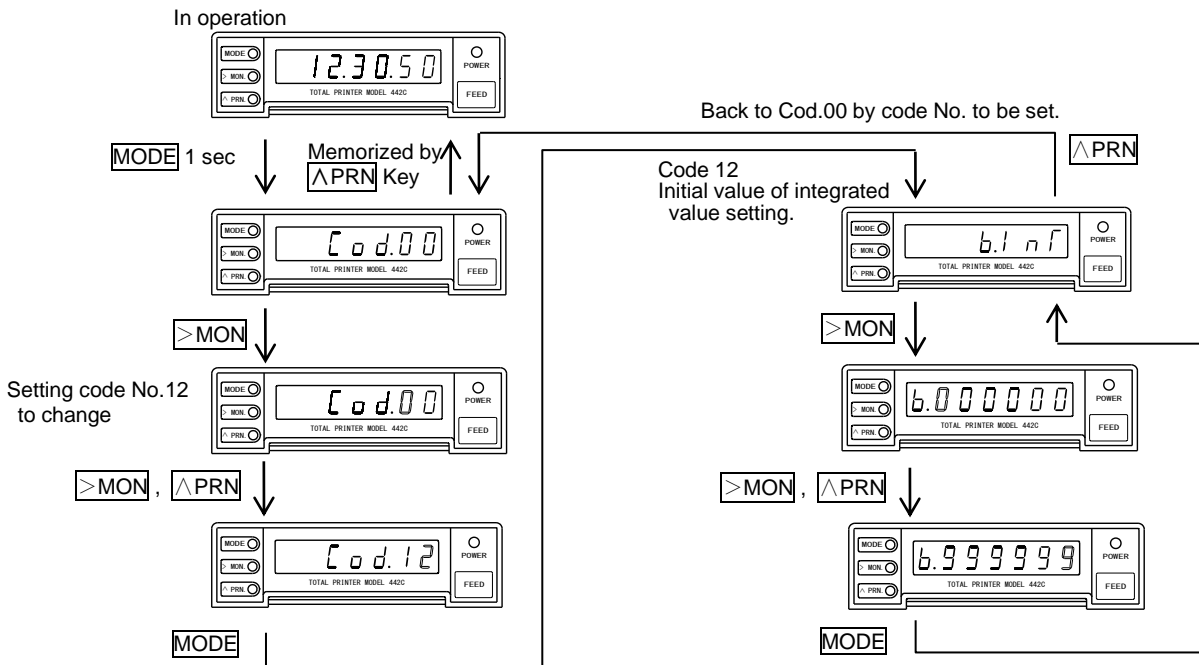Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)
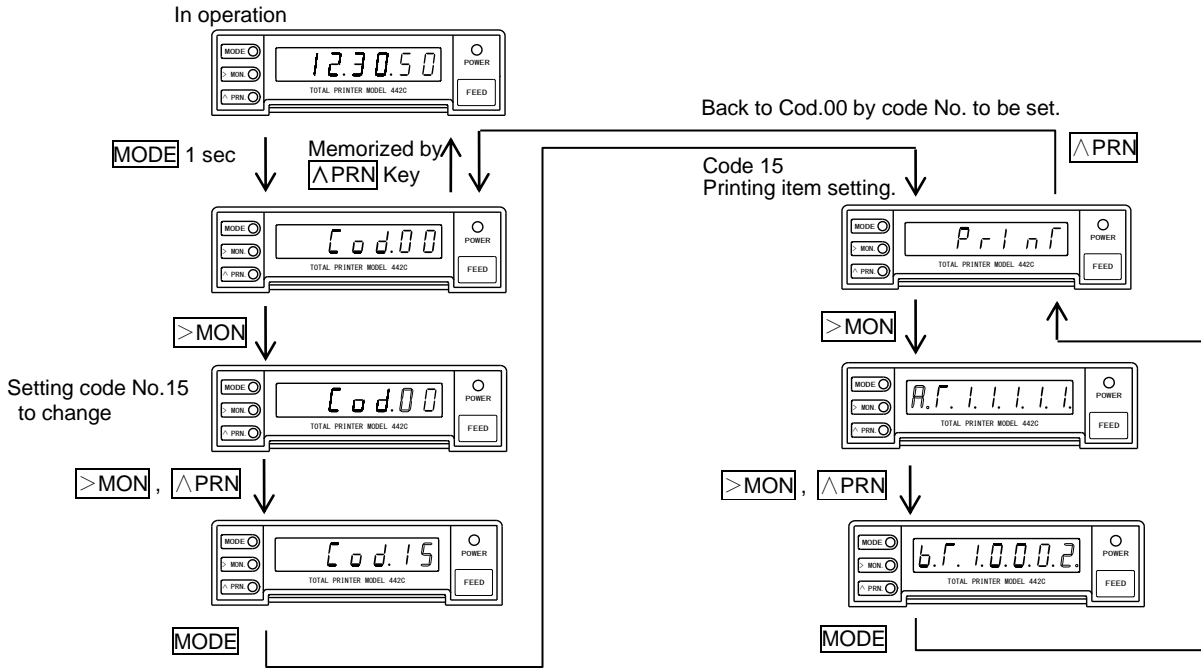
5.3.16 Power failure print setting

Example) Adjusting the power failure printing item to 0 (without printing).

Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)

TSURUGA ELECTRIC CORPORATION
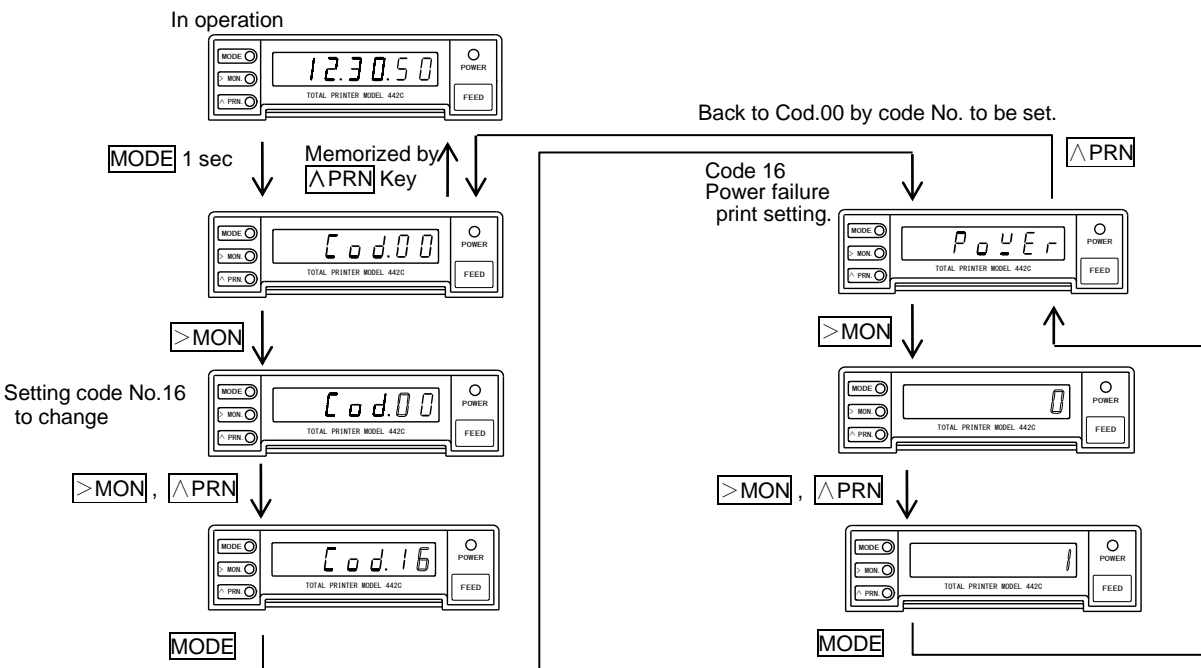
5.3.17 Printing start setting

Example) Adjusting the monthly report memory of start printing to "RESET".

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:$Cod.00$)

In operation

MODE 1 sec

Memorized by △PRN Key

Back to Cod.00 by code No. to be set.

Code 17 Printing start setting.

△PRN

>MON

Setting code No.17 to change

>MON , △PRN

>MON , △PRN
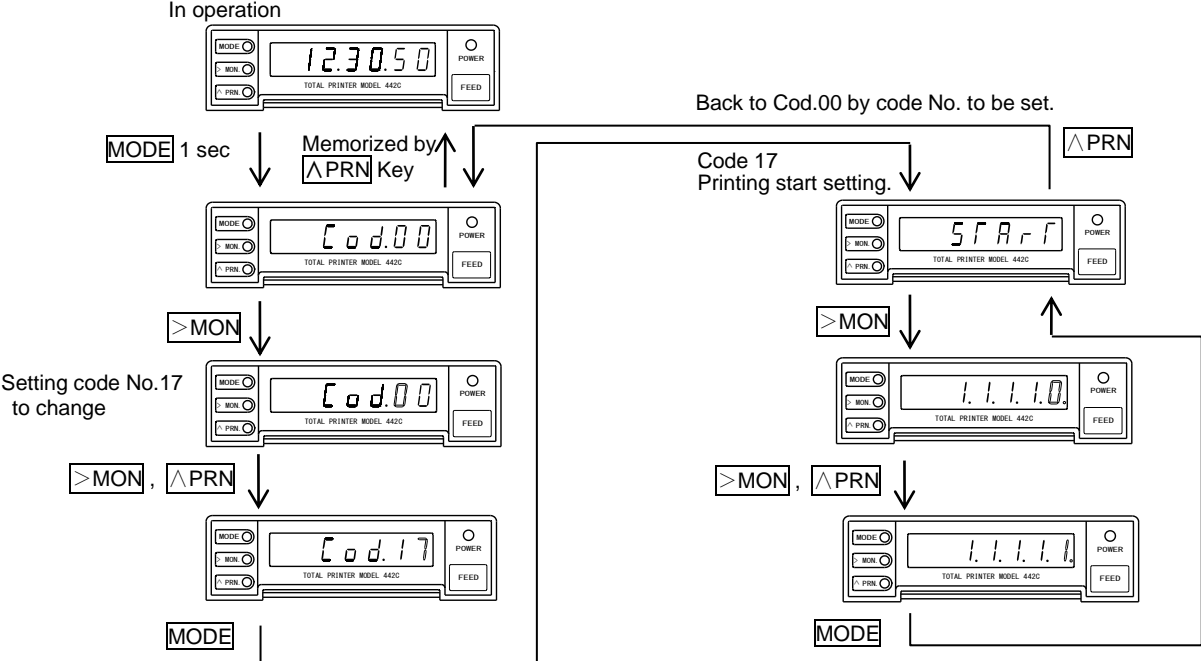
MODE

MODE

5.3.18 Analogue output setting

Example) Adjusting the integrated A input of analogue output setting from 1250Hz to 1000Hz.

Press MODE Key for 1 sec. or more during operation to get setting mode (Display:$Cod.00$)

In operation

MODE 1 sec

Memorized by △PRN Key

Back to Cod.00 by code No. to be set.

Code 18 Analogue output setting.

△PRN

>MON

Setting code No.18 to change

>MON , △PRN

>MON , △PRN
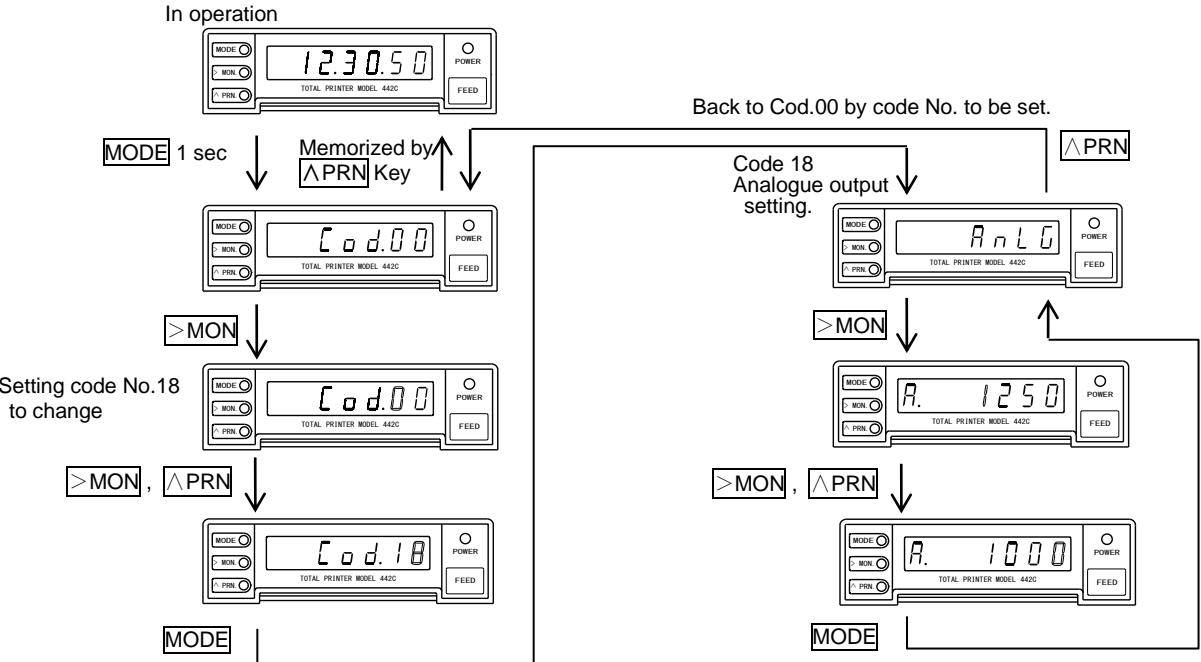
MODE

MODE

5.4 Reset to factory setting
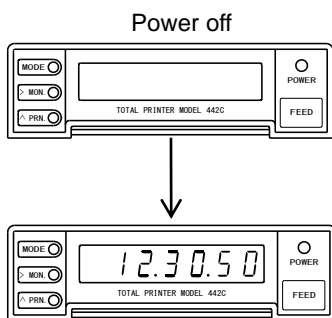
Power off

Turn power on while pressing both FEED and MODE key for test printing.
Keep on pressing MODE key till test printing is completed.
After the test printing is completed, the message "FACTORY SETTING" is printed, of which means the product is reset.

See 5.1 Summary of function in the detail of factory setting.
Calendar clock is not initialized.

Initializing count data

Hourly report counter:	0 (Integration A)	0 (Integration B)
Daily report counter:	0 (Integration A)	0 (Integration B)
Monthly report counter:	0 (Integration A)	0 (Integration B)
Monthly memory (12 months):	0 (Integration A)	0 (Integration B)
Total integration:	0 (Integration A)	0 (Integration B)
Work time:	0 (Work A)	0 (Work B)
Total work time:	0 (Work A)	0 (Work B)

5.5 Error message

Display	Root Cause	Measures
Err 1	The code No. to be set is not in function.	See 5.1 Summary of function, and use correct code No.
Err 2	The parameter to be set is not correct.	See 5.1 Summary of function, and use correct parameter.
Err 3	At computation display, the Unit and Decimal point of Integration A,B is not Correct.	Use the same Unit and Decimal Point for Integration A,B.

Note: During setting mode, the mode turns to operation mode automatically.
if no key operation is done for more than 5 min.
In this case, each parameter to be changed/adjusted is not memorized.

5.6 LED display

0 1 2 3 4 5 6 7 8 9 - .
0 1 2 3 4 5 6 7 8 9 minus DP

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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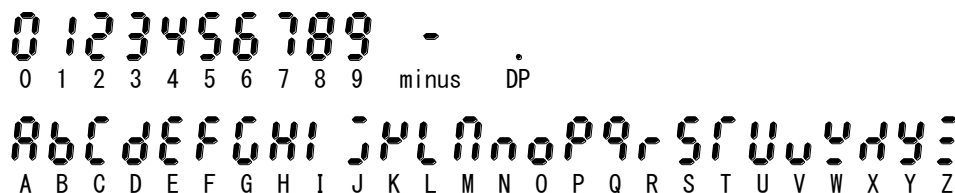
6. Printing and function

6.1 Auto printing function
Printing Monthly report, Daily report, and Hourly report, automatically at specified time.
Printing Monthly report, Daily report, and Hourly report for Work time.
"With" or "Without" of Auto Printing (Monthly report, Daily report, and Hourly report) is selectable in printing item setting (refer to 5.3.15).

6.2 Printing

6.2.1 Hourly report printing

Paper direction

```
ジホウ       07/04/15 12:00
 セキサン_A    123456.78m³
 セキサン_B    123456.78m³
 A+B         246913.56m³
 ソウセキサン A  123456.78m³
 ソウセキサン B  123456.78m³
           カドウジカン ソウカドウ
 カドウ_A     39m30s 123456h
 カドウ_B     39m30s 123456h
```

Hourly report auto printing: Every hour
Printing items   : Integration A   : printing
                     Integration B   : printing
                     Computation   : printing
                     Total integration A : printing
                     Total integration B : printing
                     Work A   : printing
                     Work B   : printing

6.2.2 Daily report printing

Paper direction

```
ニッツボウ     07/04/15 12:00
 セキサン_A     123456.78m³
 セキサン_B     123456.78m³
 A+B          246913.56m³
 ソウセキサン A   123456.78m³
 ソウセキサン B   123456.78m³
            カドウジカン ソウカドウ
 カドウ_A      20h30m 123456h
 カドウ_B      20h30m 123456h
```

Daily report auto printing : Printing
Daily report time   : 12:00
Printing items   : Integration A   : printing
                     Integration B   : printing
                     Computation   : printing
                     Total integration A : printing
                     Total integration B : printing
                     Work A   : printing
                     Work B   : printing

6.2.3 Monthly report printing

Paper direction

```
ゲッポウ      07/04/15 12:00
 セキサン_A     123456.78m³
 セキサン_B     123456.78m³
 A+B          246913.56m³
 ソウセキサン A   123456.78m³
 ソウセキサン B   123456.78m³
            カドウジカン ソウカドウ
 カドウ_A      130h30m 123456h
 カドウ_B      130h30m 123456h
```

Monthly report auto printing : Printing
Monthly report time : 15th, 12:00
Printing items   : Integration A   : printing
                     Integration B   : printing
                     Computation   : printing
                     Total integration A : printing
                     Total integration B : printing
                     Work A   : printing
                     Work B   : printing

6.2.4 Manual printing

Press ∧PRN Key for 1 sec. Or more during Measuring Mode or close MANUAL and COM to print out real time integrated value (interval integrated value of hourly report) and status (ON or OFF) of Work input.

```
シュドウ        07/04/15 12:00
 セキサン_A      123456.78m³
 セキサン_B      123456.78m³
 A+B           246913.56m³
 ソウセキサン A    123456.78m³
 ソウセキサン B    123456.78m³
 カドウ_A       ON
 カドウ_B       OFF
```

↑ Paper direction

Printing items :	Integration A	: printing
	Integration B	: printing
	Computation	: printing
	Total integration A	: printing
	Total integration B	: printing
	Work A	: printing
	Work B	: printing

6.2.5 Monthly report memory printing

Press >MON Key for 1 sec. Or more to get Monthly report memory for the past one year. Printing of Total integration and Work time is unavailable.

```
ゲッポウメモリ 06/01/01 00:00
 セキサン_A   123456.78m³
 セキサン_B   123456.78m³
 A+B        246913.56m³
ゲッポウメモリ 06/02/01 00:00
 セキサン_A   123456.78m³
 セキサン_B   123456.78m³
 A+B        246913.56m³
ゲッポウメモリ 06/03/01 00:00
 セキサン_A   123456.78m³
 セキサン_B   123456.78m³
 A+B        246913.56m³

ゲッポウメモリ 06/12/01 00:00
 セキサン_A   123456.78m³
 セキサン_B   123456.78m³
 A+B        246913.56m³
```

↑ Paper direction

Printing items :	Integration A	: printing
	Integration B	: printing
	Computation	: printing

6.2.6 Start printing

Press MODE Key and >MON key for 3 sec. Or more at the same time during measuring mode to reset (0) counter and to print the date and the name of counter to be reset. Items to be reset are selected by printing start setting. (Refer to 5.3.17)

```
スタート        07/02/15 12:25
 セキサン_A   カウンタ    0m³
 セキサン_B   カウンタ    0m³
 カドウ_A    カドウジカン 0h0m0s
 カドウ_B    カドウジカン 0h0m0s
```

↑ Paper direction

Start printing setting
Integration A	: reset
Integration B	: reset
Work time A	: reset
Work time B	: reset
Monthly report memory	: no reset

6.2.7 Over integration printing

Printing time and integrated value (99999999) when Hourly report, Daily report, Monthly report, and Total integrated value is beyond 99999999, then re counting from 0.

```
ゲッポウ       07/04/15 12:25
 セキサン_A     99999999 m³
```

↑ Paper direction

Example)
When monthly report integration is beyond 99999999.

6.2.8 Power failure recovery printing

Printing power failure time and its recovered time after the recovery of power failure.
With or without printing is selectable. (Refer to 5.3.16 Power failure print setting)

↑
Paper
direction

```
---- テイデン ガ アリマシタ ---
OFF  07/04/15 20:30:12
ON   07/04/25 20:30:20
```
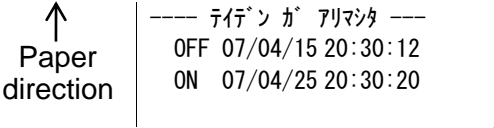
Power failure print setting: printing

6.2.9 Test printing

Turn power on while pressing both FEED Key for Test printing.
After test printing is completed, back to normal operation mode.

Test printing outputs Test Pattern and Setting Condition.
After test printing is completed, back to normal operation mode.

↑
Paper
direction
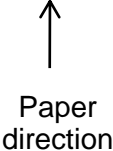
Printing sample

```
No. 588-100 442C
07/07/26 09:00
 !"♯$%&'()*+,-./01234567
89::<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[¥]^_`abcdefg
hijklmnopqrstuvwxyz{|}~
-1-2-30 1 2 3  °|¦↓┃█▓▒░□₁₂₃▲△￢
→←↑↓ 。「 」、・ ﾗ ｧｨｩｪｫｬｭｮ ｯ
ｰ ｱｲｳｴｵ ｶｷｸｹｺ ｻｼｽｾｿ ｱｨ ｳｴｵ ｶｷ ﾆ ﾇ ﾈ
ﾈ ﾉ ﾊ ﾋ ﾌ ﾍ ﾎ ﾏﾐﾑ ﾒﾓﾔﾕﾖ ﾗﾘﾙﾚﾛﾜﾝﾞﾟ
Σ ∬Ωπσφ∞ℓαβγ⊕○±÷×円年月日時分秒
〒市区町村人
1 DISPLAY      0:H.M.S
4 TIMELY 1:00:00
         2:00:00
         3:00:00
         4:00:00
         5:00:00
         6:00:00
5 DAILY   :00:00
6 MONTHLY :01 00:00
7 PULSE   A:1       B:1
8 HF/LF     :HF
9 DP  A:    0.00 B:    0.00
10UNIT A:kg      B:kg
13CAL    :A-B
14NAME   INPUT A:ﾃｷｻﾝ_A
         INPUT B:ﾃｷｻﾝ_B
         WORK  A:ｶﾄﾞｳ_A
         WORK  B:ｶﾄﾞｳ_B
         CAL    :A+B
15PRINT INPUT A:ON
         INPUT B:OFF
         TOTAL A:OFF
         TOTAL B:OFF
         WORK  A:OFF
         WORK  B:OFF
         TIMELY :ON
         DAILY  :ON
         MONTHLY:ON
         CAL    :ON
16POWER PRINTT :ON
17START PRINTT
   TOTAL A RESET:ON
   TOTAL B RESET:ON
   WORK  A RESET:ON
   WORK  B RESET:ON
   MONTH   RESET:OFF
18ANALOG   :A:     1250
```

6.2.10 Character code and Unit table

■ Character code table

		High order bit															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Low order bit	0			SP	0	@	P	`	p	-1	$_1$	SP	一	タ	ミ	Σ	×
	1			!	1	A	Q	a	q	-2	$_2$	。	ア	チ	ム	μ	円
	2			"	2	B	R	b	r	-3	$_3$	「	イ	ツ	メ	Ω	年
	3			#	3	C	S	c	s	^{0}	▲	」	ウ	テ	モ	π	月
	4			$	4	D	T	d	t	^{1}	△	、	エ	ト	ヤ	σ	日
	5			%	5	E	U	e	u	^{2}	−	・	オ	ナ	ユ	φ	時
	6			&	6	F	V	f	v	^{3}		ヲ	カ	ニ	ヨ	∞	分
	7			'	7	G	W	g	w	$^°$		ァ	キ	ヌ	ラ	ℓ	秒
	8			(	8	H	X	h	x	▎		ィ	ク	ネ	リ	α	〒
	9			)	9	I	Y	i	y	▊		ゥ	ケ	ノ	ル	β	市
	A			*	:	J	Z	j	z	▊		ェ	コ	ハ	レ	γ	区
	B			+	;	K	[	k	{	▊		ォ	サ	ヒ	ロ		町
	C			,	<	L	¥	l	|	▊	→	ャ	シ	フ	ワ	●	村
	D			−	=	M	]	m	}	■	←	ュ	ス	ヘ	ン	○	人
	E			.	>	N	^	n	~	■	↑	ョ	セ	ホ	゛	±	
	F			／	?	O	＿	o		□	↓	ッ	ソ	マ	゜	÷	

SP means "space".

TSURUGA ELECTRIC CORPORATION

■ Unit table

UNIT	Unit	UNIT	Unit	UNIT	Unit	UNIT	Unit	UNIT	Unit	UNIT	Unit
000		043	K	086	kWh	129	HP	172	inch	215	mol^{-1}
001	a	044	L	087	Ah	130	Hz	173	kA	216	ms
002	b	045	M	088	Lx·s	131	J/m^3	174	kHz	217	m^{-1}
003	c	046	N	089	lm·s	132	MHz	175	kPa	218	m^2
004	d	047	O	090	cal	133	MPa	176	kV	219	m^2/s
005	e	048	P	091	kcal	134	MW	177	kg/h	220	m^3/d
006	f	049	Q	092	Mcal	135	Mvar	178	kg/l	221	m^3/h
007	g	050	R	093	Gcal	136	MΩ	179	kg/m	222	m^3/s
008	h	051	S	094	Sv	137	MΩ/cm	180	kg/m^3	223	mΩ
009	i	052	T	095	rem	138	MΩ·cm	181	kg/s	224	nA
010	j	053	U	096	mol	139	N/m	182	kN·m	225	pA
011	k	054	V	097	Gy	140	N/m^2	183	kl	226	pF
012	l	055	W	098	rad	141	Nm^3/h	184	kl/h	227	pH
013	m	056	X	099		142	N·m	185	km/h	228	pW
014	n	057	Y	100	コ	143	MN	186	kN	229	phon
015	o	058	Z	101		144	N/mm^2	187	kvar	230	ppb
016	p	059		102	カートン	145	O_2%	188	kΩ	231	ppm
017	q	060	分	103		146	Pa	189	kΩ/cm	232	rad/s
018	r	061		104	cc	147	Pa·s	190	l/h	233	rph
019	s	062	Ω	105	Nm^3	148	S/m	191	l/min	234	rpm
020	t	063	$	106	Nl	149	VA	192	l/s	235	rps
021	u	064	m	107	Nkl	150	W/m^2	193	lb	236	sec
022	v	065	cm	108	kW	151	Wb	194	lm	237	s^{-1}
023	w	066	km	109	A·h	152	atm	195	lm/W	238	ton
024	x	067	mm	110	kA·h	153	bar	196	lm/m^2	239	t/h
025	y	068	kg	111	MW·h	154	cd	197	lx	240	t/min
026	z	069	mg	112	W·min	155	cd/m^2	198	m/h	241	t/s
027	°	070	g	113	m^3ntp	156	cm/s	199	m/min	242	var
028	′	071	t	114	L ntp	157	cm^2	200	m/s	243	Ω·m
029	″	072	s	115		158	cpm	201	m/s^2	244	Ω·cm
030	μ	073	min	116		159	cps	202	mA	245	μ A
031	¥	074	h	117		160	dB	203	mN	246	μ F
032	%	075	m^3	118	%CO	161	deg	204	mF	247	μ S/cm
033	A	076	l	119	%O_2	162	dps	205	mS/cm	248	μ Sv/h
034	B	077	ml	120	%RH	163	eV	206	mSv/h	249	μ V
035	C	078	kl	121	A/m	164	feet	207	mV	250	μ W
036	D	079	L	122	A/m^2	165	g/cc	208	mW	251	μ m
037	E	080	J	123	C/mol	166	g/cm^3	209	mg/h	252	μ s
038	F	081	W·s	124	Ci	167	g/h	210	mg/l	253	μ Ω
039	G	082	W·h	125	C·m	168	g/l	211	min^{-1}	254	μ Ω·cm
040	H	083	kW·h	126	F/m	169	g/min	212	mm/s	255	
041	I	084	Ws	127	GHz	170	g/m^2	213	mm^2		
042	J	085	Wh	128	H/m	171	h^{-1}	214	mol/l		

Note) Character and Unit style may be different from the ones in the table above due to printing condition.

6.3 Error

6.3.1 Paper end detection

Paper end detection sensor is incorporated to detect paper end.
When the paper is run out, POWER LED blinks, PE signal ("transistor ON") is output and the printing action is disabled.
In order to reset, after replacing the paper with new one, press FEED key, then the blinking POWER LED turns into steady light and the printing is abled.

6.3.2 Temperature error detection

The printing is unavailable when the temperature of Printer Head exceed 80℃ or more.
Then, the printer dose not work till the temperature falls to 60℃ or less.
POWER LED is blinking.

6.3.3 Low voltage alarm (backup battery for calendar clock)

When battery power is lower than the normal working level, following messages would be printed when supplying the power: "ERROR BATTERY LOW LEVEL".
In that case, please contact your distributor or sales team.

6.3.4 Computation

Error display and Error printing is come up when Unit and Decimal points of Integration A and B is different.

At computation indication $E\,r\,r\,3$
Example) Display setting, Hourly report, Computation indication

With computation printing

```
↑              ジホウ      07/04/15 12:00
Paper          セキサン_A   123456.78m³
direction      セキサン_B   123456.78kg
               A+B        タンイ エラー

               ジホウ      07/04/15 12:00
               セキサン_A   123456.78m³
               セキサン_B   1234567.8m³
               A+B        ショウスウテン エラー

               ジホウ      07/04/15 12:00
               セキサン_A   123456.78m³
               セキサン_B   1234567.8kg
               A+B        ショウスウテン タンイエラー
```

Example) Hourly report auto printing   : Every hour
Printing items   Integration A   : printing
                  Integration B   : printing
                  Computation   : printing
                  Total integration A,B, Work A,B
                                    : No printing

6.3.5 Timing chart

(1) Auto printing at error
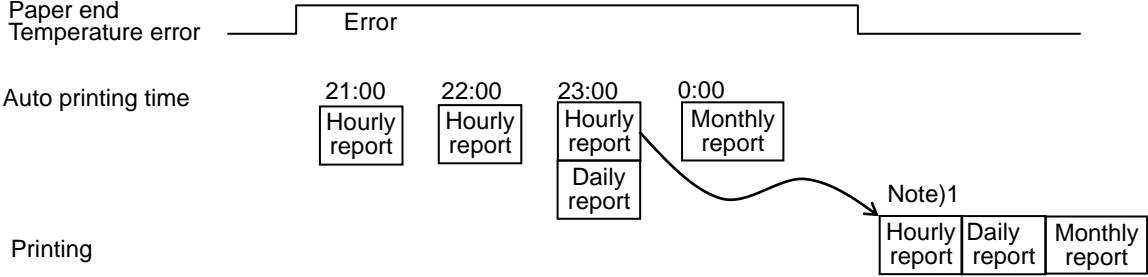
(2) Printing action at error

Note1) Updated auto printing only after recovery.   No printing at Hourly report of 21hr and 22hr.
Note2) Integrated value etc by Start printing operation during error is not reset.
Note3) Start printing, Manual printing, Monthly report memory printing is unavailable during error.
       When error is come up during printing operation, the printing is continued after reset.

6.4 Analogue output Adjustment

In the case of 442C-09, 442C-29
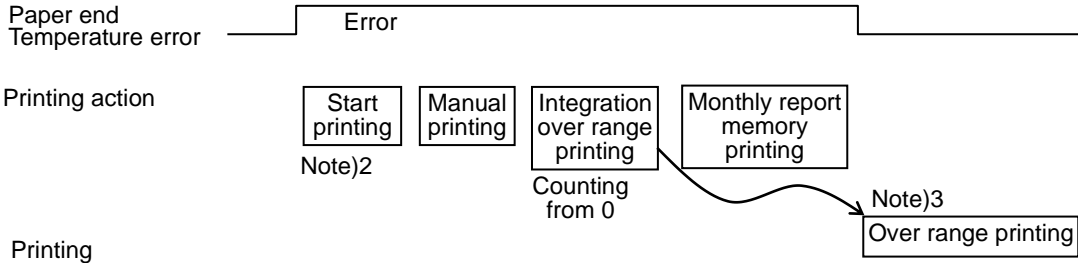(1) Connect Analogue output (Connector 13, 14) to Multi meter.
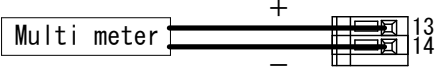
(2) Turn power on while pressing MODE and ▷MON keys to get Analogue Output Mode of
    which indication is ⎡𝖠𝖫.
(3) Adjustment
    Zero adjustment
    Pressing △PRN key provides minimum output.
    Adjust the value to get 4.00±0.01mA or 1.00V±0.005V by VR1.
    The indication is ⎡.𝖠.𝖫. (DP0, DP1 ON)
    MAX adjustment
    Pressing ▷MON key provides maximum output.
    Adjust the value to get 20.00±0.01mA or 5.00V±0.005V by VR2.
    The indication is ⎡.𝖠𝖫 (DP1, DP2 ON)
(4) Adjustment completed
    Turn power off.

442C-09, 442C-29 with analogue output

7. Specification

7.1 Model

442C $-\square-\square$
     1   2

               Analogue output
            Power supply

[1] Power supply

Code	Power Supply
A	100 to 240V AC
9	24V DC ±10%

[2] Analogue output

Code	Output	Output impedance	Load resistance
Blank	None	—	—
09	1 to 5V DC	0.1Ω or less	500Ω or more
29	4 to 20mA DC	5MΩ or more	0 to 500Ω

7.2 Performance

Power supply:	100 to 240V AC 50/60Hz, 24V DC±10%.
Power range:	90 to 250V AC, 21.6 to 26.4V DC.
Power consumption:	Approx. 16VA (at printing) / approx. 7VA (at waiting) at 100V AC.
	Approx.20VA (at printing) / approx. 10.5VA (at waiting) at 200V AC.
	Approx.500mA (at printing) / approx. 125mA (at waiting) at 24V DC.
Weight:	Approx.700g
Operating temperature:	0 to 50 ℃
Operating humidity:	85% RH or less (no condensation)
Storage temperature:	-20 to 60 ℃
Installation:	Panel mounting

7.3 Printer

Print style	Thermal line dot
Character	Alphabet, Numbers, Katakana, Symbols, etc.
Dot	16×16 (2mm×2mm)
Digit	24 digits, Max.
Printing speed	Approx. 22.5mm/sec, 6 lines/sec., Max.　　**Note)** Printing rate 16% or less
Paper feeding	3.75mm pitch
Printing width	46mm
Life time	At 25 ℃
	Head:10^9 pulse or more (pulse resistance)
	50km or longer except damage by foreign particle, alien substance. (abrasion resistance)

7.4 Chart roll paper

Paper   58mm width x 48ϕ (inside diameter 12ϕ)
         Length 25m (approx. 6500 lines printable)
         Use specified chart paper, otherwise printing quality and products lifetime will be out of warrantee.

Sold separately
   5860-01 Chart paper (10 rolls)

7.5 Calendar clock

Display:	6 digits Red LED Hour, Minute, Second
Accuracy:	$\pm$3 sec, per day. (at 25°C)
A leap year adjustment:	Automatic adjustment till 2099.
Power failure measure:	The calendar clock in the event of a power failure runs on a backup battery.

7.6 General

(1) Integrated input
Nos. of inputs:	2ch (no isolation btw. CH)
	Dry contact or Open collector (NPN)
	Contact rate: 5V DC, 10mA
Count range:	0 to 99999999. (Start from 0 when an integration value exceed 99999999)
Input frequency:	HF: 1250Hz MAX. Pulse width 400 μ sec or more.
	LF: 100Hz MAX. Pulse width 5msec or more.
Pulse parameter:	$\times$0.001,0.005,0.01,0.05,0.1,0.5,1,5,10,50,100.
Computation:	A+B, A-B for Integrated input A, B
Reset:	RESET or Start printing (Hourly report, Daily report, Monthly report, and Monthly report memory).

(2) Integrated indication
Indication:	0 to 999999 Last 6 digits, with Zero suppress.
Decimal point:	Adjust by front switch.
Indication:	Last 6 digits (A99999999). No indication.
	$\sqcap$:Integration A $\mathtt{b}$: Integration B
	$-$: When integration is "-". (Blank at "+")
	When the lower 6 digits exceed 999999, the decimal point at 10^6 is blinking.
Indication setting:	Integration A, Integration B, Integration computation (A+B, A-B), Switching indication (Date - Integration).
Indication cycle:	Approx. 0.1 sec.

(3) Work time
Nos. of inputs:	2 points.
Count range:	0 to 536870911 sec. (approx. 17 years)
	Total work time printing 0h to 149130h.
	Work time printing 00h00m to 999h59m.
	(Monthly report, Daily report, Hourly report)
	00m00s to 999m59s.(Hourly report, every hour)
Input signal:	Dry contact or Open collector (NPN)
	Contact rate: 5V DC. 10mA
Printing:	Auto printing: Hour, Minute, or Minute, Second.
	Manual printing: ON/OFF status.
Reset:	RESET or Start printing (Work)
(4) Clock indication:	Year/Month/Date or Hour/Minute/Second
(5) Power failure:	Set value, Integration value, Work time, Monthly reports are memorized by Non-volatilization memory.
	Note) Computed integrated value is out of memory.
(6) Control input:	MANUAL, ADJ, RESET
	Dry contact input or Open collector (NPN).
	Contact rating 5V DC. 10mA.
	MANUAL, RESET: Pulse width 10ms or more.
	ADJ: Pulse width 1s or more.

(7) Control output: PE Transistor ON at paper end.
Open collector (NPN) 30V DC. /30mA, Max. Voltage 1.6V or less.

(8) Dielectric strength: Input/Output − Power 1500V AC. For 1min. (AC powered)
500V AC. For 1min. (DC powered)

(9) Insulation resistance:Input/Output − Power 500V DC. 50MΩ or more. (AC powered)
500V DC. 50MΩ or more. (DC powered)

(10) Analogue output (442C-09, 442C-29)

Resolution:	1/2000
Cycle time:	Approx. 1 sec.
Accuracy:	$\pm$0.2% (23℃ $\pm$5℃) of instantaneous Maximum input.
Setting:	Switching instantaneous Maximum output of Integrated input A/B.
	Maximum frequency setting 10 to 1250Hz.

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