MODEL 442D

Recording Printer

Users Manual

TSURUGA ELECTRIC CORPORATION

I-01837-1

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) 442D 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.**

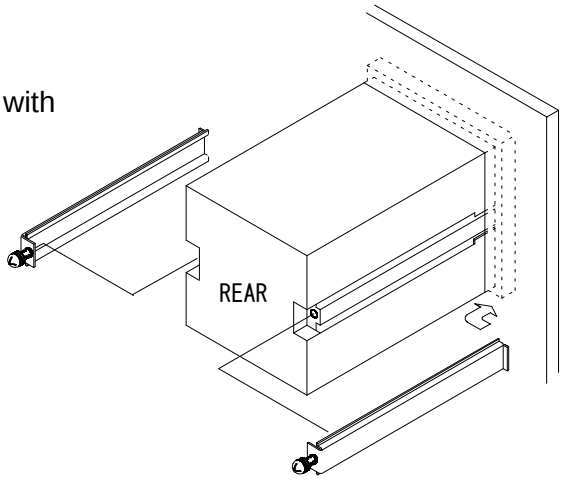
⚠ CAUTION

- **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.**

2. Installation

2.1 Main body

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

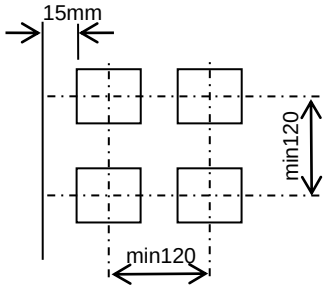


Panel cutout: 92 $^{+0.8}_{0}$ × 92 $^{+0.8}_{0}$ mm

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

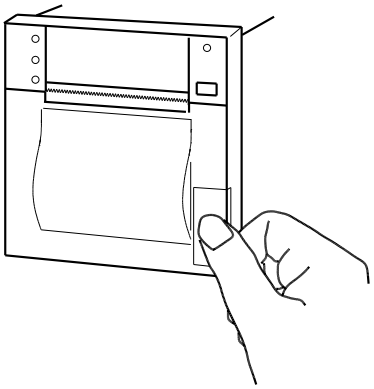
- **Do not touch thermal head and it's around after printing, where high temperature is supposed.**
- **Replace roll chart or clean head after the temperature of head falls.**

⚠ CAUTION

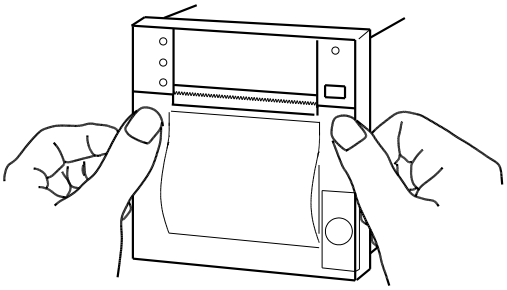
- **Do not insert fingers or alien substances into printer. Printer cutter might injure fingers etc.**
- **Do not open a roll chart cover by pressing Open/Close button while printing.**
- **Do not press Open/Close button while holding a roll chart cover down.**
- **Do not pull up roll paper while closing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

(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.

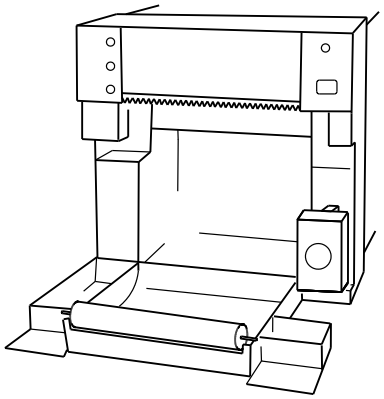


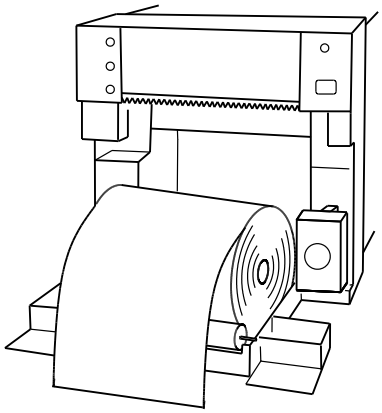
●How to close a roll chart cover
Press both side of a roll chart cover.



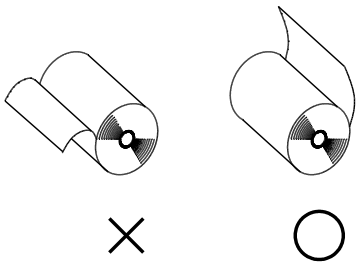
(2) Roll chart setup

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.

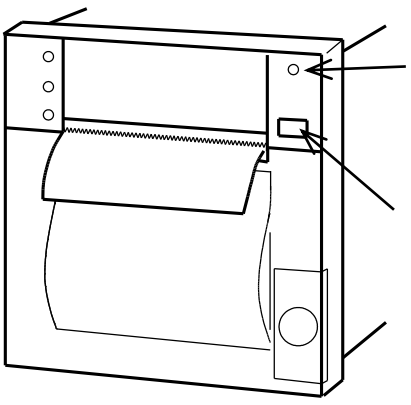


⚠ CAUTION

- **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.**

(3) FEED Key

Press FEED key, and confirm POWER LED turns ON.



POWER LED
Confirm LED turns ON

Press FEED key

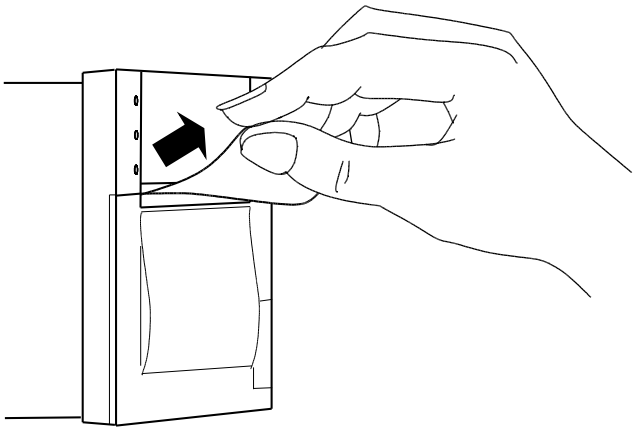
Note) Press FEED key, and confirm paper feed.
In case a roll chart cover is not closed completely, paper feed might not be done, and be caused of printing error.

2.3 Roll chart cutting

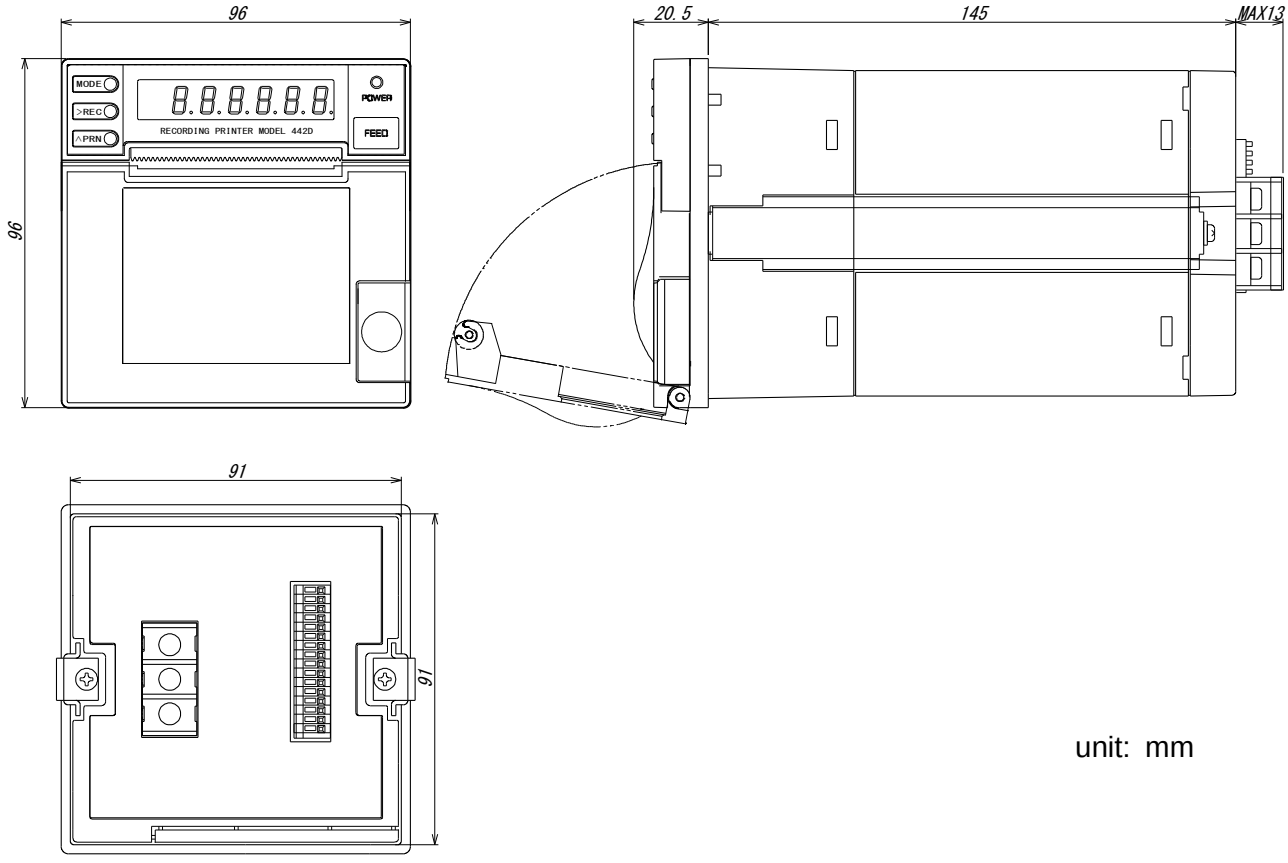
Pull up roll chart paper from the edge of paper while roll paper cover is closed.

⚠ 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.**



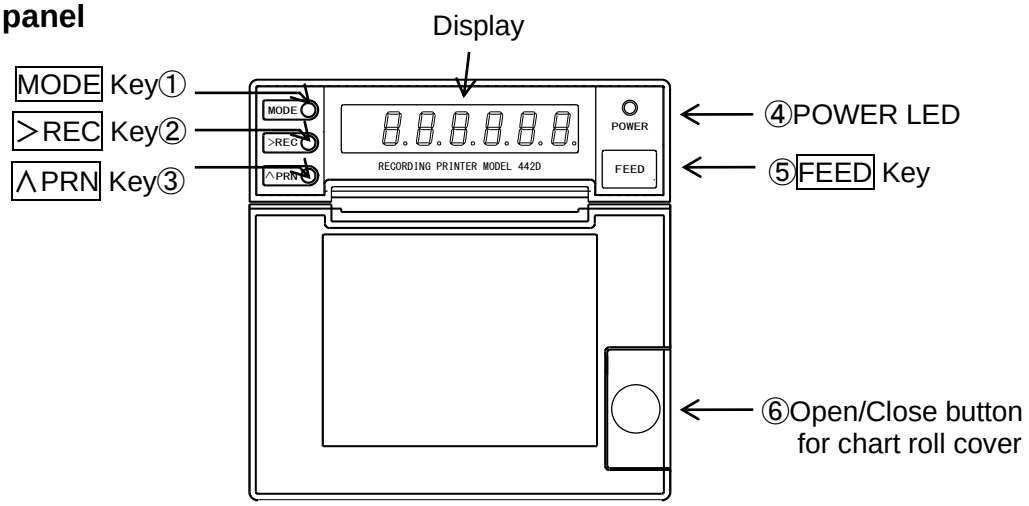
2.4 Dimensions



unit: mm

3. Description of parts

3.1 Front panel



① MODE Key
Switching Setting Mode during operation
Switching each mode at Setting Mode

② >REC Key
Digit selection for Set Value at Setting Mode

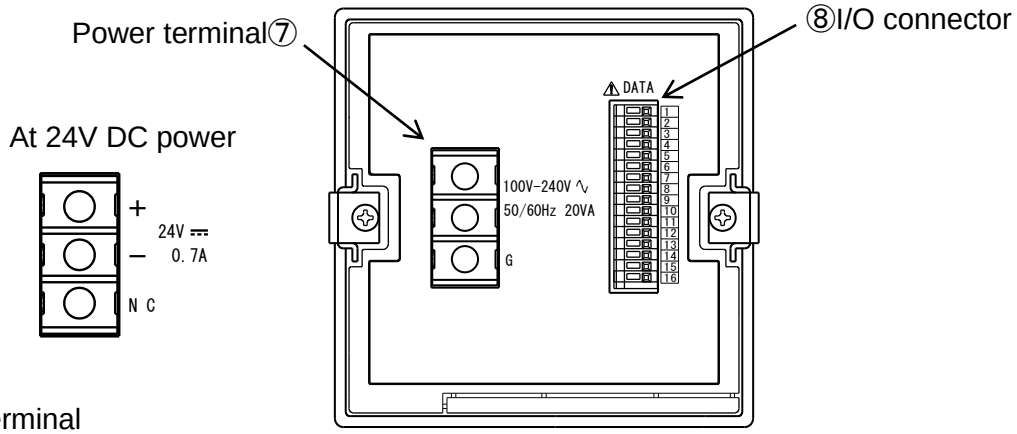
③ ∧PRN Key
Set Value change at Setting Mode

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



⑦ Power terminal
This is terminal for power supply.

⑧ I/O 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

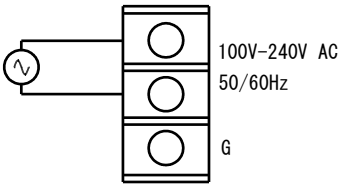
- **Do correct wiring. Wrong wiring might be caused of product damages.**
- **Use specified power and load in specification. Wrong power and load might be caused of product damage.**

4.1 Power supply terminals

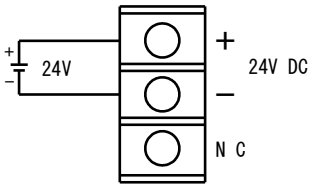
4.1.1 Terminals

●Power terminal arrangement

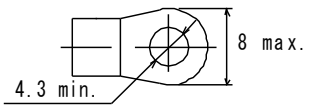
A.C. power



D.C. power



Terminal screws: M4
Tightening Torque : 0.82 to 1.11 N･m
Crimping terminal: see drawing (right)



●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.

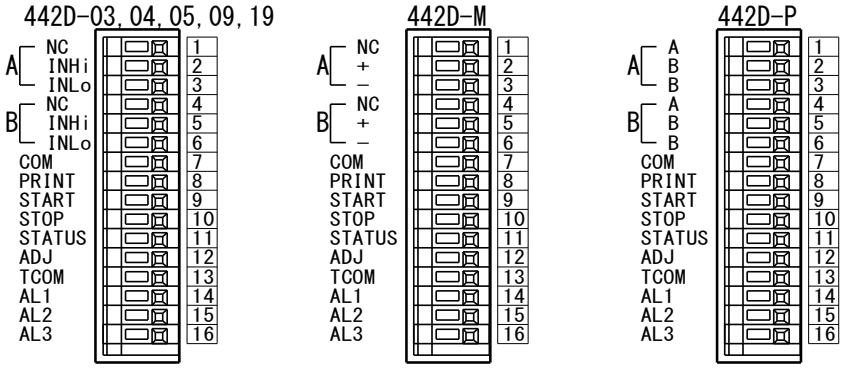
⚠ CAUTION

- **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

●Connector arrangement

○ I/O connector



Wire material
- Single ϕ0.32mm(AWG28) to ϕ0.65mm(AWG22)
- Twisted 0.08mm^2(AWG28) to 0.32mm^2(AWG22)

Wire dia. ϕ0.125mm or more

Stripped wire length 9 to 10mm

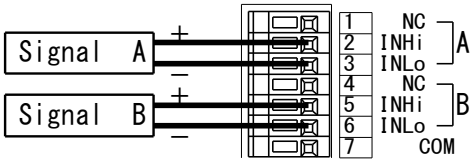
●Measuring input

○ DC Voltage, Current input (Input A: ②INHi, ③INLo, Input B: ⑤INHi, ⑥INLo) 442D-03,04,05,09,19.

Connect input signal to input connector with proper polarity.

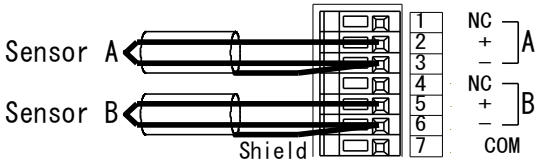
The high side of signal is connected to Hi.

Lo of Input A and Lo of Input B is connected in common inside.



○ Thermocouple input (Sensor A:②+, ③-, Sensor B: ⑤+, ⑥-) 442D-M

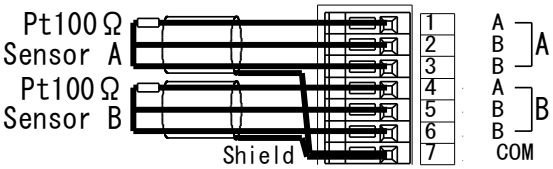
Connect input signal to input connector with proper polarity.



○ RTD input (Sensor A: ①A, ②B, ③B, Sensor B : ④A, ⑤B, ⑥B) 442D-P

Connect 3-wire Pt100Ω

Use COM to shield input wire.

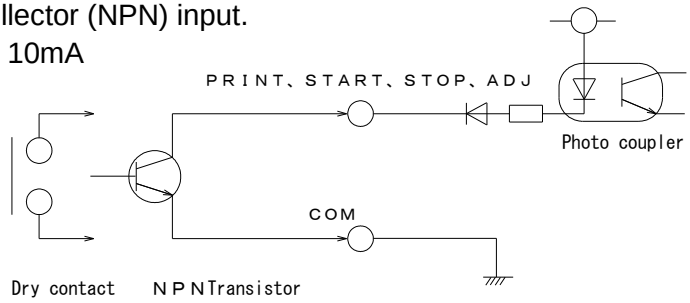


Note1) Separate wiring between input and power is required.
Otherwise, the indication will be unstable.

●Control input signal PRINT,START,STOP,ADJ

Dry contact or open collector (NPN) input.

Contact rating: 5V DC. 10mA



⑦ Common (COM)

This is common for ⑧⑨⑩⑪ and ⑫.

Note) No isolation between COM terminal and measuring input terminal.
When controlling each function terminal, take isolation by photo coupler switch, and so on.
(When the input is isolated from power circuit and control I/O signal circuit, it is necessary to isolate by photo couple etc.
When multiple units are used, take isolation independently to operate.)

⑧ Print input (PRINT)

Manual 1 mode: Printing measured data
Manual 2 mode: Printing measured data
Interval mode: Unavailable
Memory mode: Printing memorized data
Pulse width: 10ms or more Input cycle: 0.5s or more

⑨ Start input (START)

Manual 1 mode: Printing date
Manual 2 mode: Starting measuring signal
Interval mode: Starting measuring signal
Memory mode: Starting measuring signal
Pulse width: 10ms or more

Note) When START operation setting is being Level operation, 0.5s or more pulse width is required.

⑩ STOP input (STOP)

Manual 1 mode: Unavailable
Manual 2 mode: Stop measuring signal
Interval mode: Stop measuring signal
Memory mode: Stop measuring signal
Pulse width: 10ms or more

⑫ Clock 30 min adjustment input (ADJ)

Pulse width: 1s or more

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.)

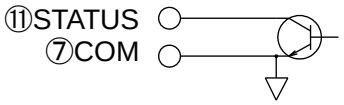
Note) Operation unavailable during measuring and recording by Manual 2, Interval, Memory card in setting mode.

●STATUS output ⑪STATUS

Open collector (NPN) 30V DC 30mA MAX, 1.6V or less.
When printing operation is failed, Transistor OFF is output.

- ▪When 442D's power off.
- ▪When paper end.
- ▪When printer error.
- ▪STATUS operation setting.

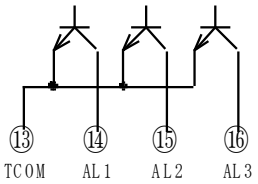
Output ON or OFF switching is available while printing.



0	STATUS output is ON while printing.
1	STATUS output is OFF while printing.

●Comparison output (⑬TCOM, ⑭AL1, ⑮AL2, ⑯AL3)

Isolated from measuring input and control input.
Open collector output (NPN)
30V DC 30mA (Max) DC1.6V or less.



5. Function and Setting

5.1 Summary of function

●Function 442D-03, 442D-04, 442D-05, 442D-09, 442D-19

code No.	Function	Display	Description	Factory set
01	Nos. of input Computation Display setting	InPUT	Nos. of input: 1,2 Computation printing: 0,1 Equation: 0 (A+B), 1 (A-B) Display: Hour, Minute, Second, Year, Month, Date, Input A,B, Computation, Switching Display.	Nos. of input: 1 (1point) Computation print: 0 (No print) Equation: 0 (A+B) Display: 0 (Hour, Minute, Second)
02	Clock setting	H.M.S.	Hour, Minute	Note 1)
03	Date setting	Y.M.d.	Year, Month, Date	Note 1)
04	———			
05	Input A scale	SCALA	Offset and Scale: -9999 to 9999, Decimal point	Scale 0 to 9999, no decimal
06	Input B scale	SCALb	Offset and Scale: -9999 to 9999, Decimal point	Scale 0 to 9999, no decimal
07	Unit setting	UnIT	A,B 0 to 255	A:000, B:000
08	START operation	StArT	0 (Edge operation) 1 (Level operation)	0 (Edge operation)
09	Rear terminal control	rEAr	0 (Front key and Rear plate available) 1 (Rear plate available)	0 (Front key and Rear plate available)
10	Printing operation	PrInT	Print mode: Manual 1, Manual 2, Interval, Memory Trend graph printing: 0,1 Data handling printing: 0,1,2 Interval time: 0.5 to 1 hour	Print mode: 0 (Manual1)
11	Trend graph scale	GrAPH	-9999 to 9999	Scale 0 to 9999
12	Status output during printing	outT	0 (ON), 1 (OFF)	0 (ON)

Note 1) Calendar clock is set at delivery.

●Function 442D-M

code No.	Function	Display	Description	Factory set
01	Nos. of input Computation Display setting	InPUT	Nos. of input: 1,2 Computation printing: 0,1 Equation: 0 (A+B), 1 (A-B) Display: Hour, Minute, Second, Year, Month, Date, Input A,B, Computation, Switching Display.	Nos. of input: 1 (1point) Computation print: 0 (No print) Equation: 0 (A+B) Display: 0 (Hour, Minute, Second)
02	Clock setting	H.M.S.	Hour, Minute	Note 1)
03	Date setting	Y.M.d.	Year, Month, Date	Note 1)
04	Sensor switching	SEn.	0, 1, 2, 3, 4, 5	0: K sensor
05	———			
06	———			
07	Note 2)			
08	START operation	StArT	0 (Edge operation) 1 (Level operation)	0 (Edge operation)
09	Rear terminal control	rEAr	0 (Front key and Rear plate available) 1 (Rear plate available)	0 (Front key and Rear plate available)
10	Printing operation	PrInT	Print mode: Manual 1, Manual 2, Interval, Memory Trend graph printing: 0,1,2 Data handling printing: 0,1 Interval time: 0.5 to 1 hour	Print mode: 0 (Manual1)
11	Trend graph scale	GrAPH	-9999 to 9999	Scale 0 to 9999
12	Status output during printing	outT	0 (ON), 1 (OFF)	0 (ON)

Note 1) Calendar clock is set at delivery.
Note 2) Unit: ℃ fixed.

●Function 442D-P

code No.	Function	Display	Description	Factory set
01	Nos. of input Computation, Display setting	InPUt	Nos. of input: 1,2 Computation printing: 0,1 Equation: 0 (A+B), 1 (A-B) Display: Hour, Minute, Second, Year, Month, Date, Input A,B, Computation, Switching Display.	Nos. of input: 1 (1point) Computation print: 0 (No print) Equation: 0 (A+B) Display: 0 (Hour, Minute, Second)
02	Clock setting	H.MS.	Hour, Minute	Note 1)
03	Date setting	Y.Md.	Year, Month, Date	Note 1)
04	———			
05	———			
06	———			
07	Note 2)			
08	START operation	StArt	0 (Edge operation) 1 (Level operation)	0 (Edge operation)
09	Rear terminal control	rEAr	0 (Front key and Rear plate available) 1 (Rear plate available)	0 (Front key and Rear plate available)
10	Printing operation	Print	Print mode: Manual 1, Manual 2, Interval, Memory Trend graph printing: 0,1,2 Data handling printing: 0,1 Interval time: 0.5 to 1 hour	Print mode: 0 (Manual1)
11	Trend graph scale	GrAPH	-9999 to 9999	Scale 0 to 9999
12	Status output during printing	out	0 (ON), 1 (OFF)	0 (ON)

Note 1) Calendar clock is set at delivery.
Note 2) Unit: ℃ fixed.

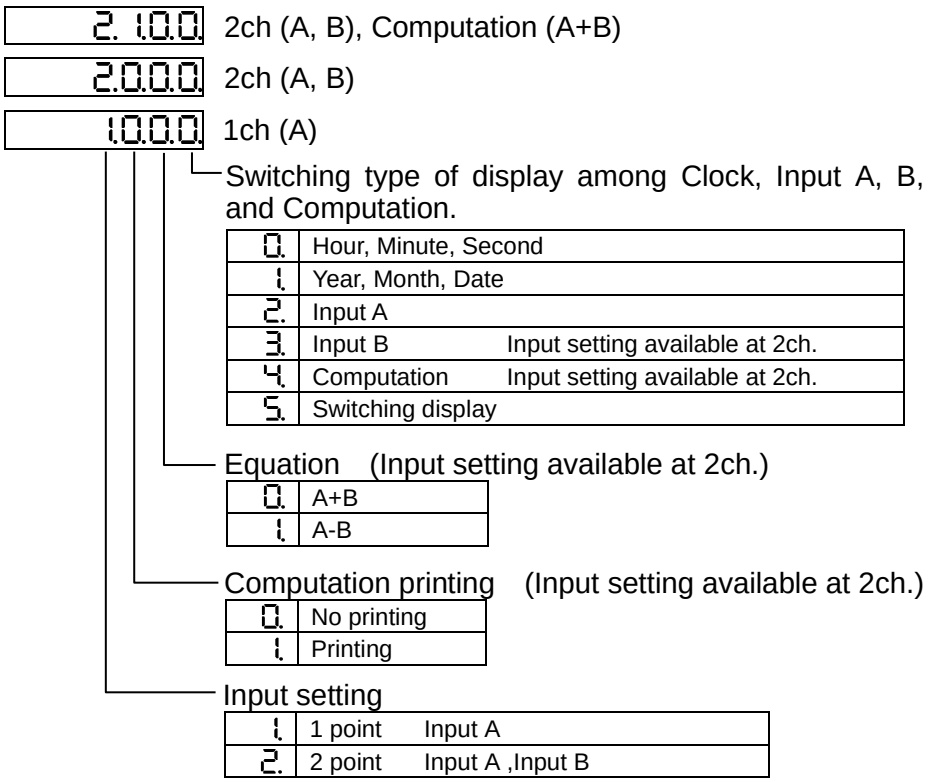
●Comparison output function (common specification)

code No.	Function	Display	Description	Factory set
41	AL1 Object of comparison, type, comparison value	AL.1	Object of comparison: A, B, Y Comparison type: H, L, OFF Comparison value: –9999 to 9999	Object of comparison: A, Comparison type: H, Comparison value: 9999
42	AL2 Object of comparison, type, comparison value	AL.2	Object of comparison: A, B, Y Comparison type: H, L, OFF Comparison value: –9999 to 9999	Object of comparison: A, Comparison type: H, Comparison value: 9999
43	AL3 Object of comparison, type, comparison value	AL.3	Object of comparison: A, B, Y Comparison type: H, L, OFF Comparison value: –9999 to 9999	Object of comparison: B, Comparison type: L, Comparison value: 0
44	Hysteresis	HYS.	1 to 999	1

5.2 Explanation of function

Code No.01: Nos. of inputs, Computation, and Display setting

Setting Nos. of inputs, Computation, and Display



Switching display Hour/Minute/Second – Input A – Input B – Computation
3 sec. cycle. No Display for Input B and Computation at Input setting 1ch..
No printing of B, Y at 1ch input setting.

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 AD. (00 to 99)

Code No.04: Input sensor switching (available at 442D-M)

Setting type of input sensor
Input A and B in common.

Display	Sensor
SEn.0	K
SEn.1	J
SEn.2	R
SEn.3	E
SEn.4	T
SEn.5	B

Code No.05: Input A scale setting

(Available at Voltage/Current input of 442D-03,04,05,09, and 19)
Setting Offset, Full scale, and Decimal points of Input A.
Use the same decimal point as Input B at computation printing.
Setting condition: Offset≠Full scale

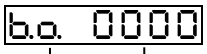
Offset value, Full scale value, Decimal point.

Switching Offset value, Full scale value, Decimal point.

o.	Offset
F.	Full scale
d.	Decimal point

Code No.06: Input B scale setting

(Available at Voltage/Current input of 442D-03,04,05,09, and 19)
Setting Offset, Full scale, and Decimal points of Input B.
Use the same decimal point as Input A at computation printing.
Setting condition: Offset≠Full scale



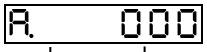
Offset value, Full scale value, Decimal point.

Switching Offset value, Full scale value, Decimal point.

o.	Offset
F.	Full scale
d.	Decimal point

Code No.07: Unit setting

(Available at Voltage/Current input of 442D-03,04,05,09, and 19)
Setting unit code of input A and B.
This individual setting A and B is available.
Use the same unit when computation printing.
Setting range: 0 to 255



Unit. Refer to 5.3.17 Unit code.

Input (A/B) switching.

A.	Input A
b.	Input B

Code No.08: START operation setting

Setting START input/Edge of STOP input/Level operation.

0	Edge operation	Start by ON pulse of START input, Stop by ON pulse of STOP terminal.
1	Level operation	Start while START input ON, STOP terminal unavailable.

Code No.09: Rear terminal control

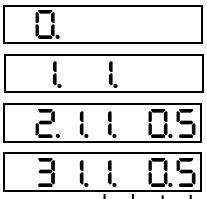
To set 1 makes Key operation of Manual 1, Manual 2, Interval, Memory mode unavailable, and rear terminal control (START input, STOP input, and PRINT input) available. The operation of front keys >REC and ∧PRN can be frozen.

0	Front key available, rear terminal control available.
1	Front key unavailable, rear terminal control available.

Code No.10: Printing operation setting

Setting print operation (Manual 1, Manual 2, Interval, Memory mode).

Printing mode	Trend graph printing	Data handling printing	Interval time
Manual 1 mode	—	—	—
Manual 2 mode	—	Setting	—
Interval mode	Setting	Setting	Setting
Memory mode	Setting	Setting	Setting



Interval time

0.5	0.5 seconds
1	1 second
2	2 seconds
5	5 seconds
10	10 seconds
30	30 seconds
1n	1 minute
5n	5 minutes
10n	10 minutes
30n	30 minutes
1H	1 hour

Data handling printing

0.	No printing
1.	Printing

Trend graph printing

0.	Data printing
1.	Data and Trend graph printing
2.	Trend graph printing Available at Memory mode

Printing mode

0.	Manual 1 mode
1.	Manual 2 mode
2.	Interval mode
3.	Memory mode

Code No.11: Trend graph scale setting

Setting X1 (Min. value) and X2 (Max. value) of trend graph.
These values X1 and X2 can be set without considering the position of decimal point.
Setting range: -9999 to 9999
Span: 100 to 9999

X1 (Minimum value), X2(Maximum value).

Switching X1 (Minimum value), X2(Maximum value)

1.	X1 (Min. value) setting
2.	X2 (Max. value) setting

Code No.12: Status output during printing

Setting STATUS output during operation

0	STATUS output ON at printing
1	STATUS output OFF at printing

●Comparison output function

3 set points AL1 to AL3 is available.
Providing comparison type (Hi, Lo, or none) and object of comparison (A, B, or Y) to each AL1 to AL3, these comparison is output and printed out. One character, “H” at High and “L” at Low is printed out after measured data.

When the object of comparison is the same, printing one character from AL1 in turn.

Example)

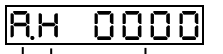
AL1 Comparison value: 3000 Comparison type: High limit Object of comparison: A
AL2 Comparison value: 2000 Comparison type: Low limit Object of comparison: A
AL3 Comparison value: 1000 Comparison type: High limit Object of comparison: A

Input A	Comparison output			Printed result
	AL1	AL2	AL3	
500	OFF	ON	OFF	500L
1500	OFF	ON	ON	1500L
2500	OFF	OFF	ON	2500H
3500	ON	OFF	ON	3500H

Note) When AL2 “L" and AL3“H" come in succession, AL2 is previously printed.

Code No.41: AL1 setting

Setting Comparison value, Comparison type, and Object of comparison of AL1.
Setting range: -9999 to +9999 (No setting of decimal point.)



Comparison value (AL1 value).

Switching comparison type.

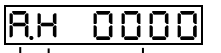
H	High limit action	ON at object of comparison ≧high limit value.
L	Low limit action	ON at object of comparison ≦high limit value.
o	OFF	Comparison output OFF.

Setting of object of comparison.

A.	Comparison against Input A.
b.	Comparison against Input B.
Y.	Comparison against computed result.

Code No.42: AL2 setting

Setting Comparison value, Comparison type, and Object of comparison of AL2.
Setting range: -9999 to +9999 (No setting of decimal point)



Comparison value (AL2 value).

Switching comparison type.

H	High limit action	ON at object of comparison ≧high limit value.
L	Low limit action	ON at object of comparison ≦high limit value.
o	OFF	Comparison output OFF.

Setting of object of comparison.

A.	Comparison against Input A.
b.	Comparison against Input B.
Y.	Comparison against computed result.

Code No.43: AL3 setting

Setting Comparison value, Comparison type, and Object of comparison of AL3.
Setting range: -9999 to +9999 (No setting of decimal point)

Comparison value (AL3 value).

Switching comparison type.

H	High limit action	ON at object of comparison ≧high limit value.
L	Low limit action	ON at object of comparison ≦high limit value.
o	OFF	Comparison output OFF.

Setting of object of comparison.

A.	Comparison against Input A.
b.	Comparison against Input B.
Y.	Comparison against computed result.

Code No.44: Hysteresis setting

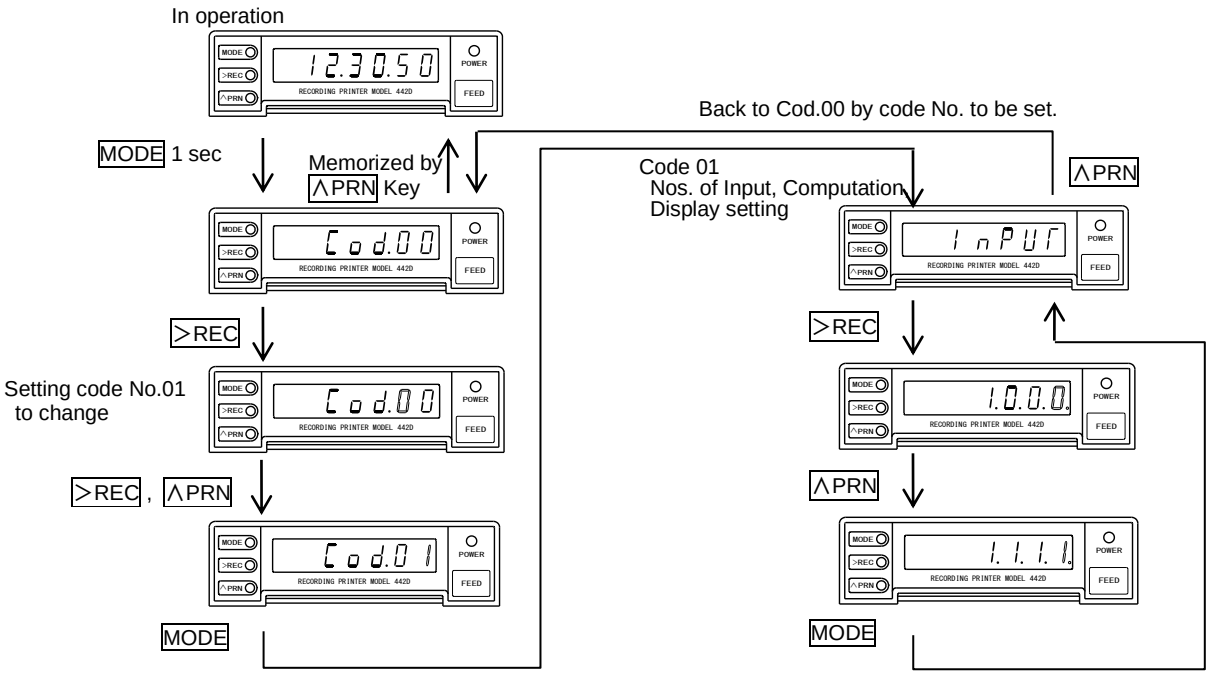
Setting hysteresis width (AL1, AL2, AL3 in common)
Setting range: 1 to 999

5.3 Setting

5.3.1 Input, Computation, Display

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

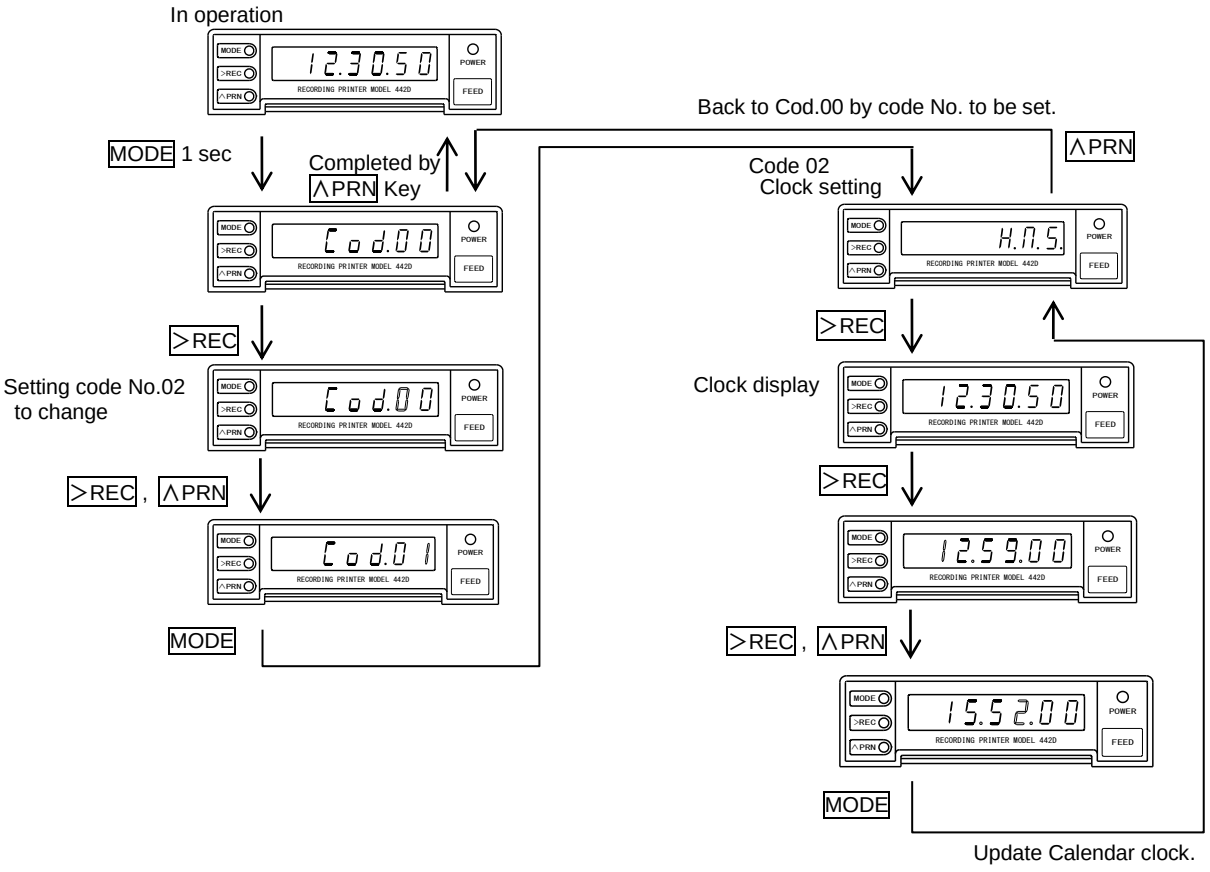
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.2 Clock

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

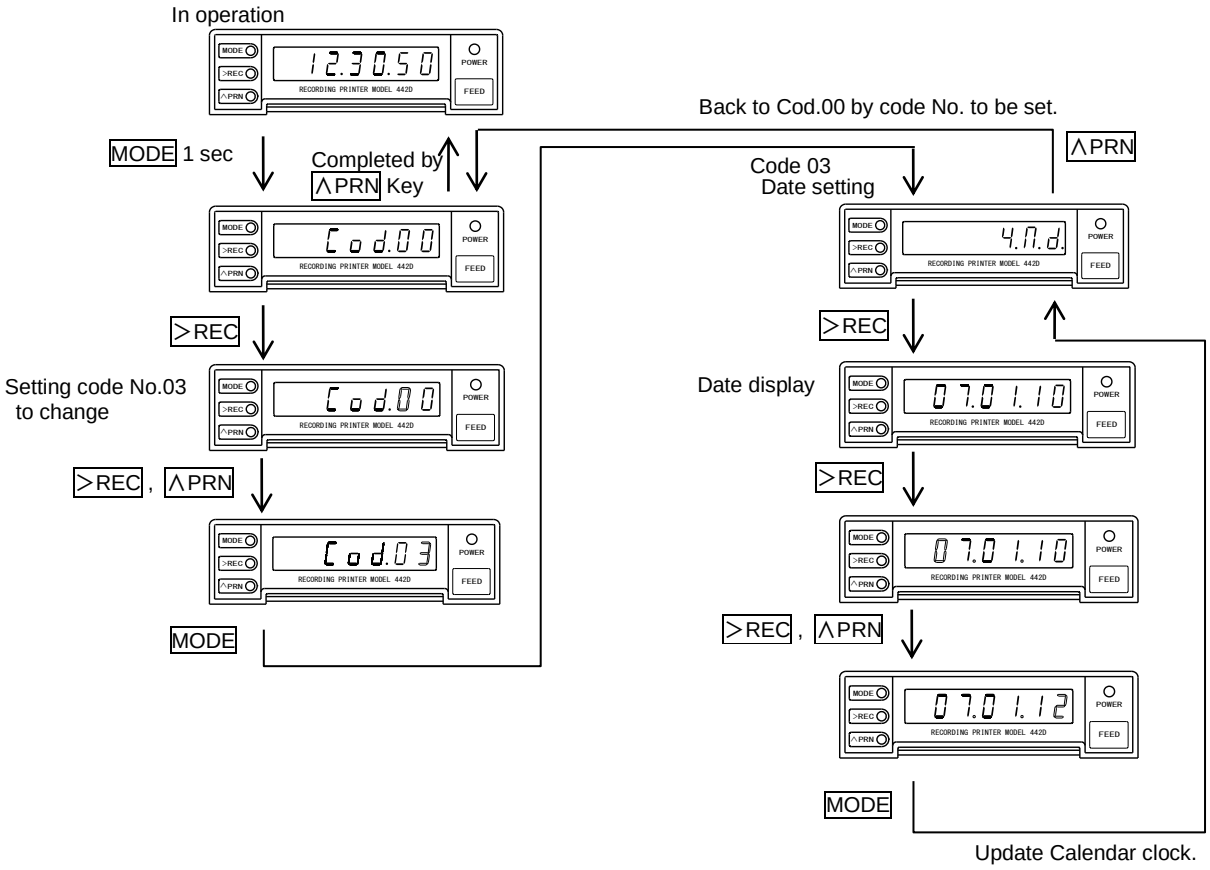
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.3 Date

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

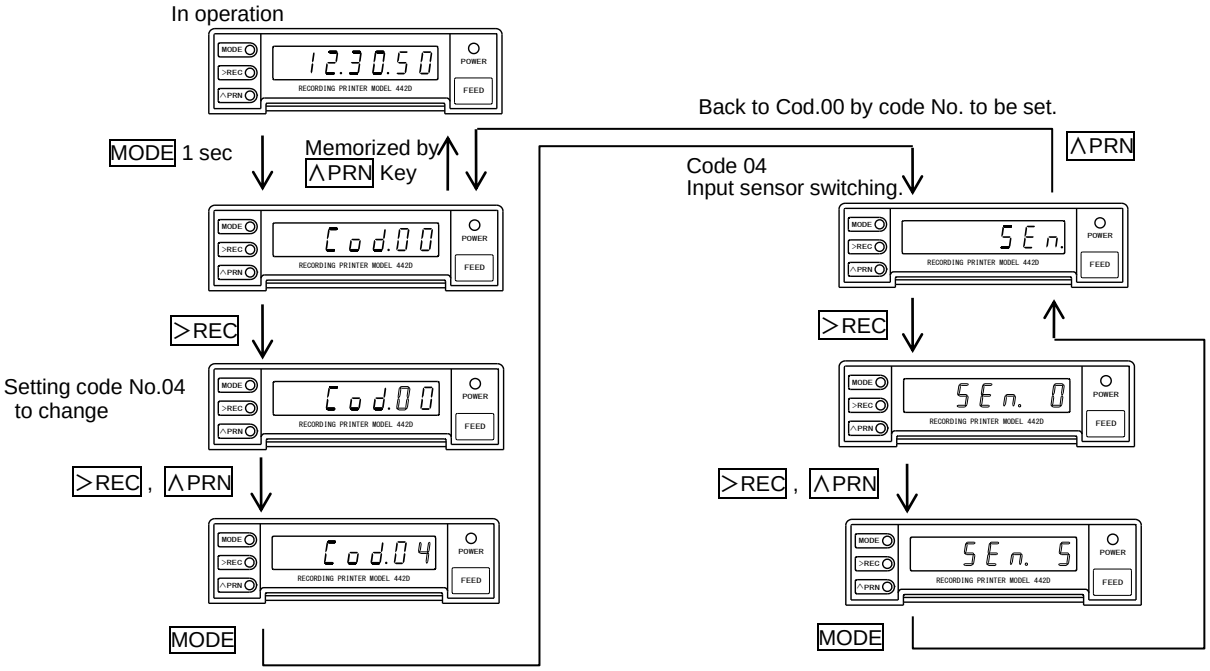
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.4 Sensor switching

Example) Switching K sensor to B sensor

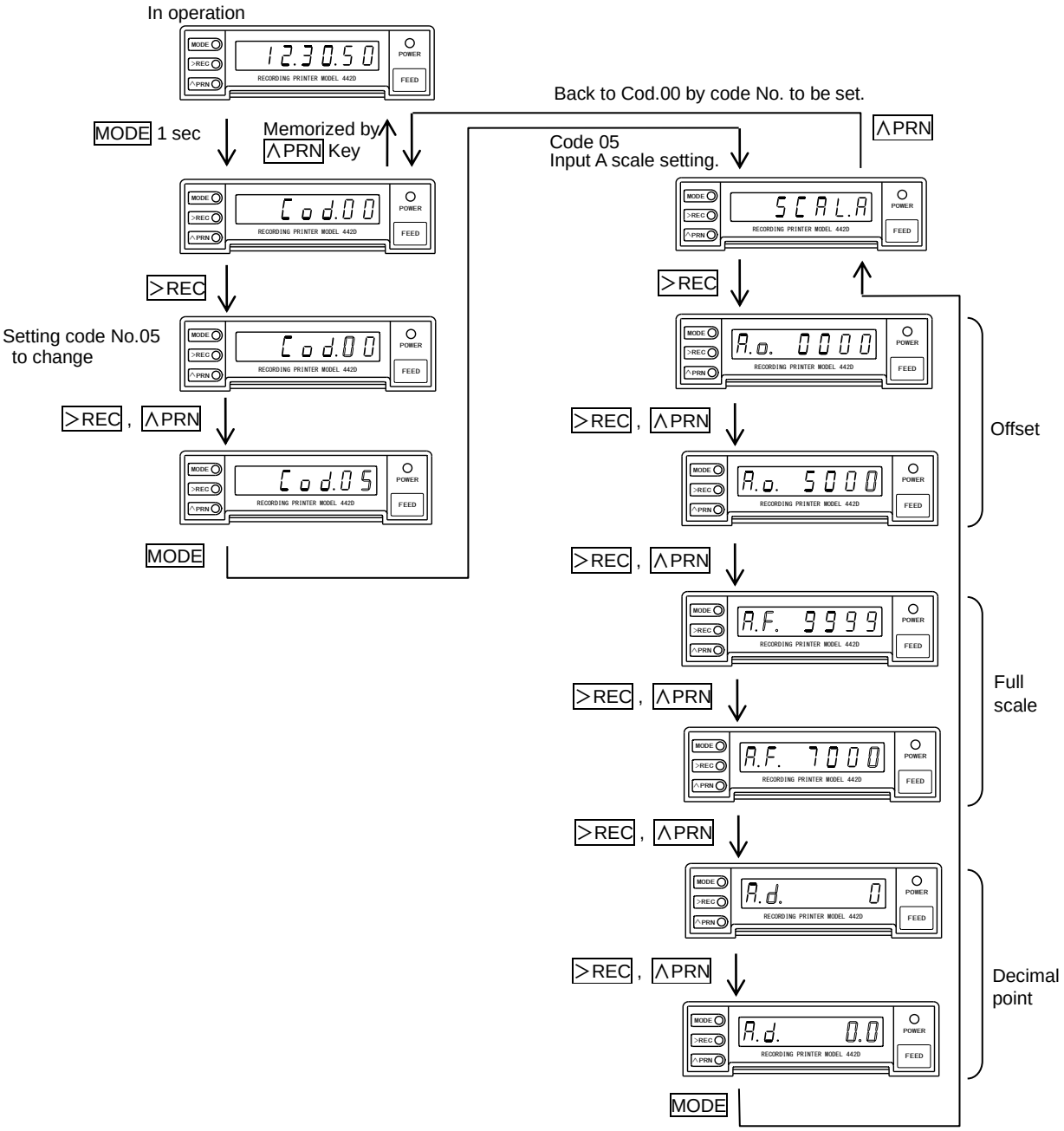
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.5 Input A scale setting

Example) Adjusting Offset 0000 to 5000, Full scale 9999 to 7000, Decimal point to 0.0

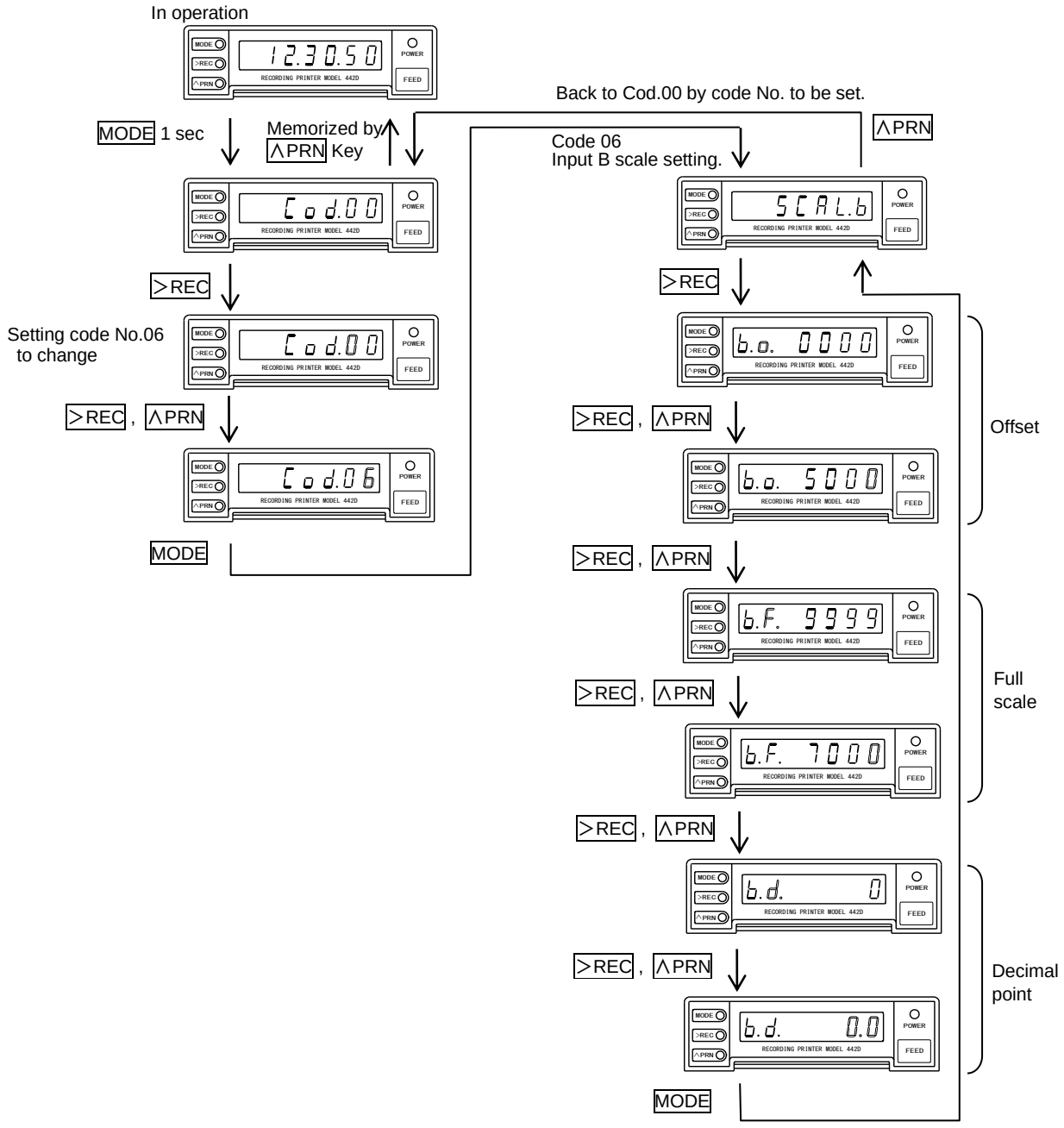
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.6 Input B scale setting

Example) Adjusting Offset 0000 to 5000, Full scale 9999 to 7000, Decimal point to 0.0

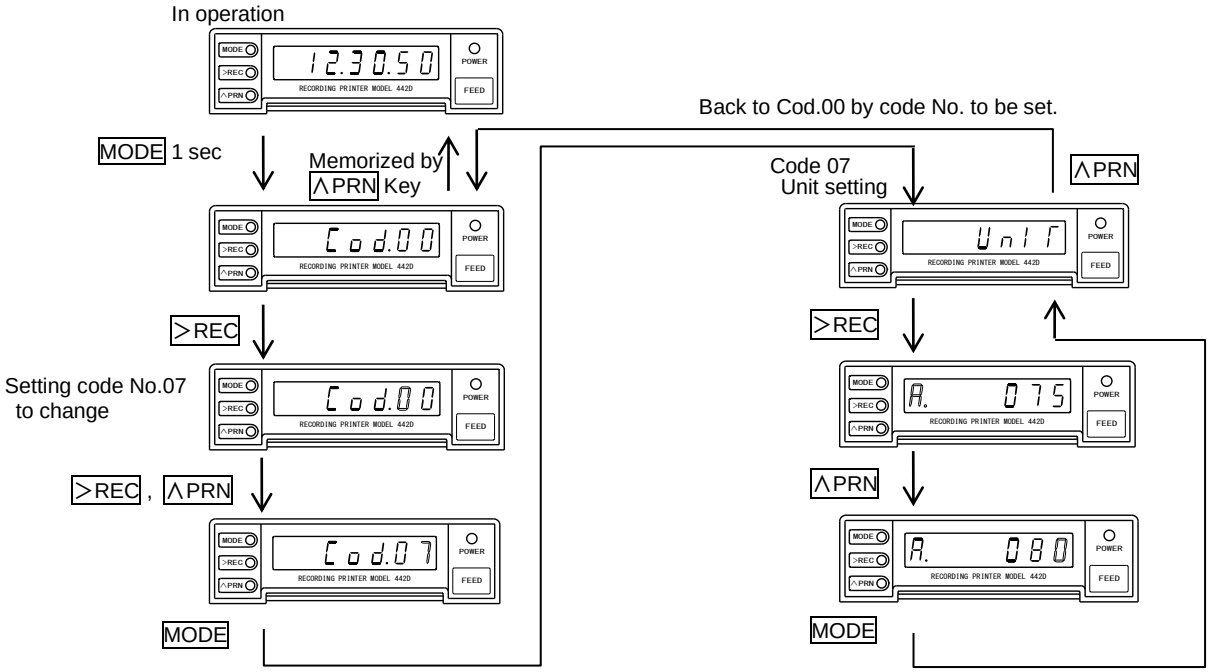
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.7 Unit setting

Example) Adjusting the unit setting Input A from 075(kHz) to 080(kg).

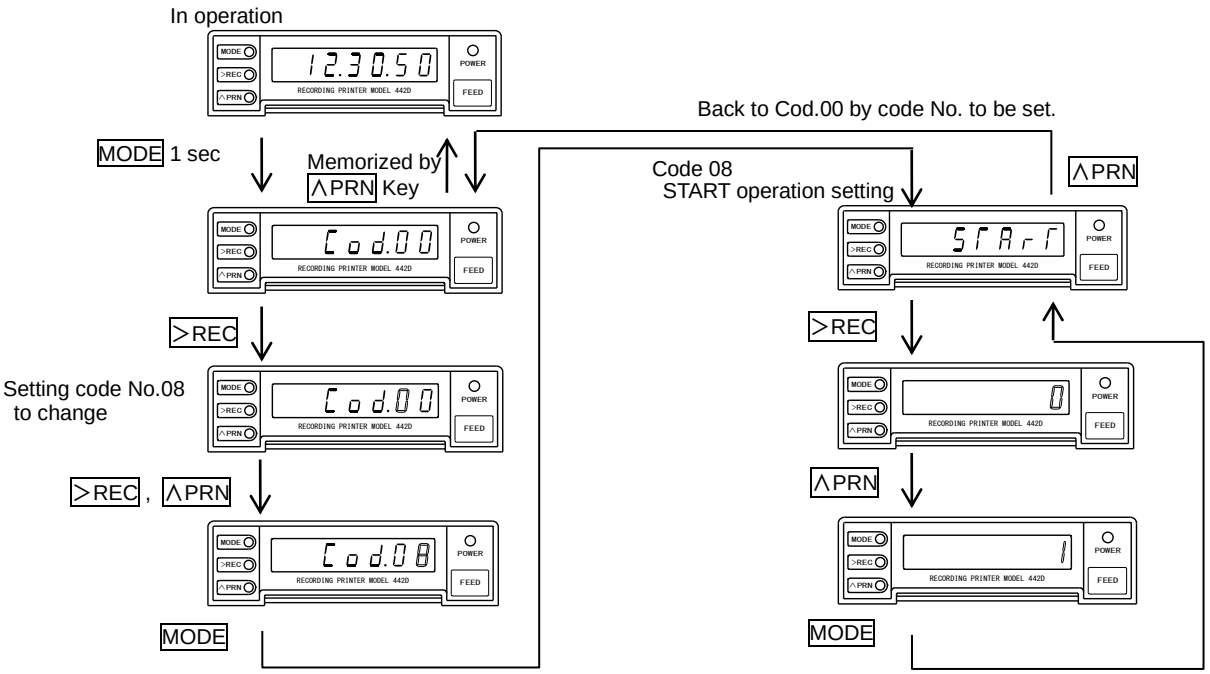
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.8 START operation setting

Example) Adjusting START operation from 0 (Edge operation) to 1 (Level operation).

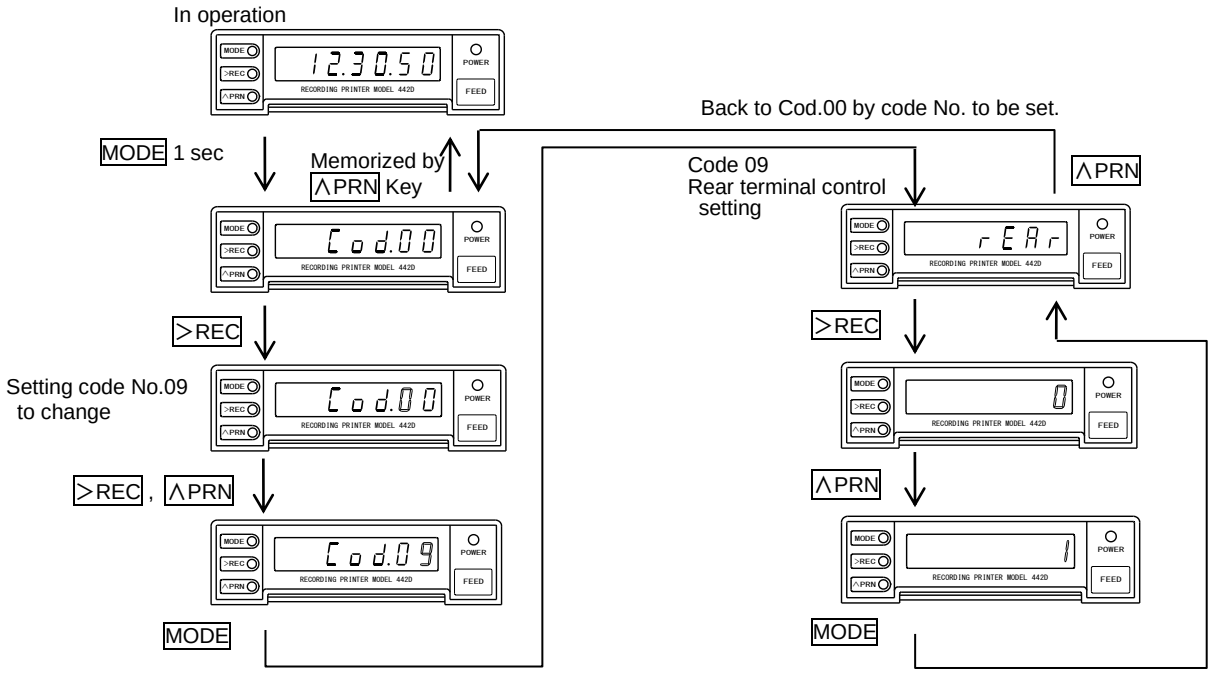
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.9 Rear terminal control setting

Example) Adjusting from 0 (Front Key available) to 1 (Front key unavailable).

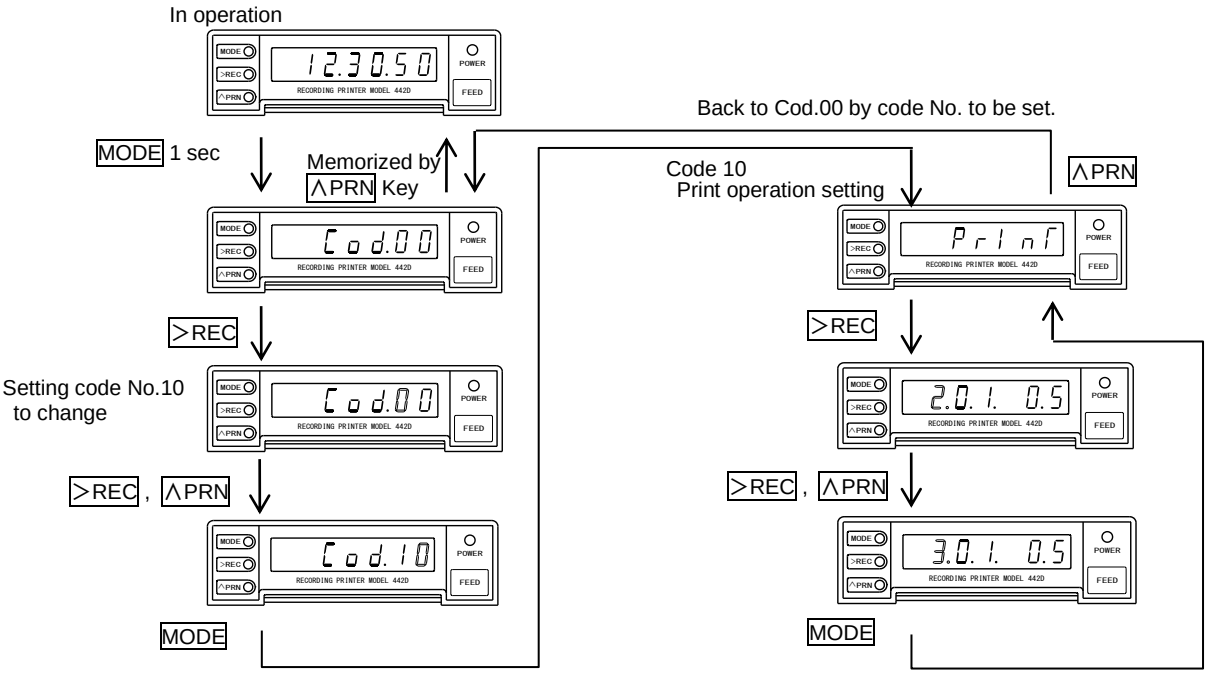
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.10 Print operation setting

Example) Adjusting Interval mode to Memory mode.

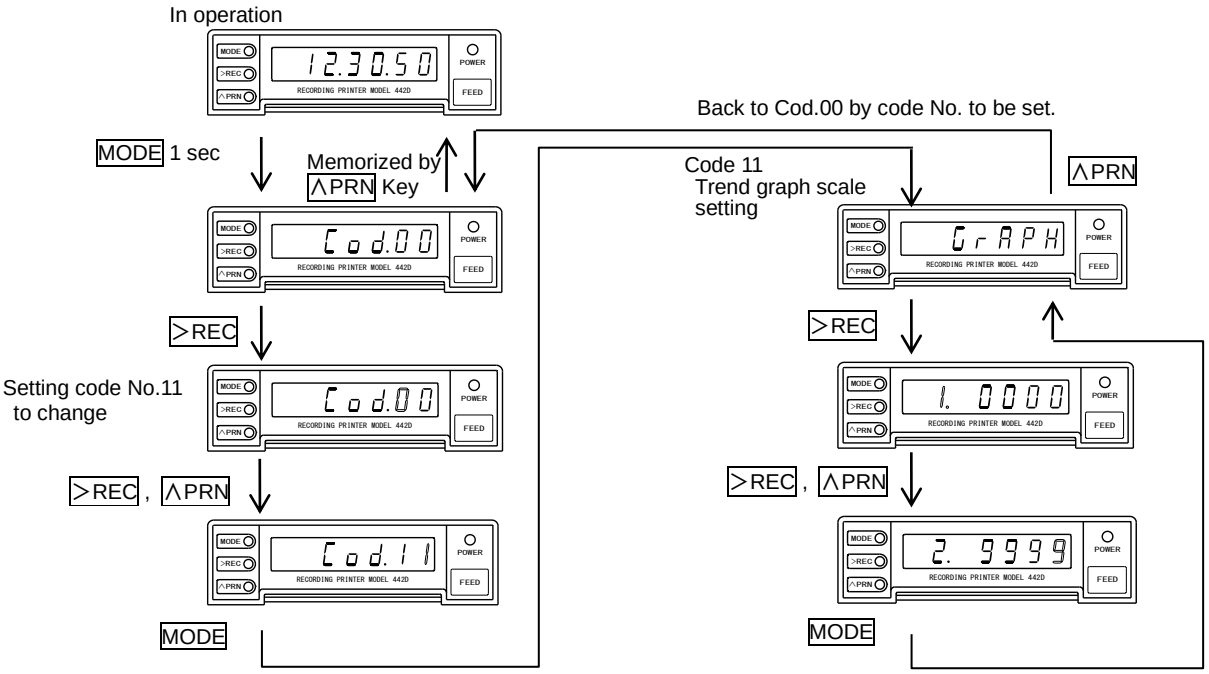
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.11 Trend graph scale setting

Example) Adjusting Trend graph MAX 0100 to 9999.

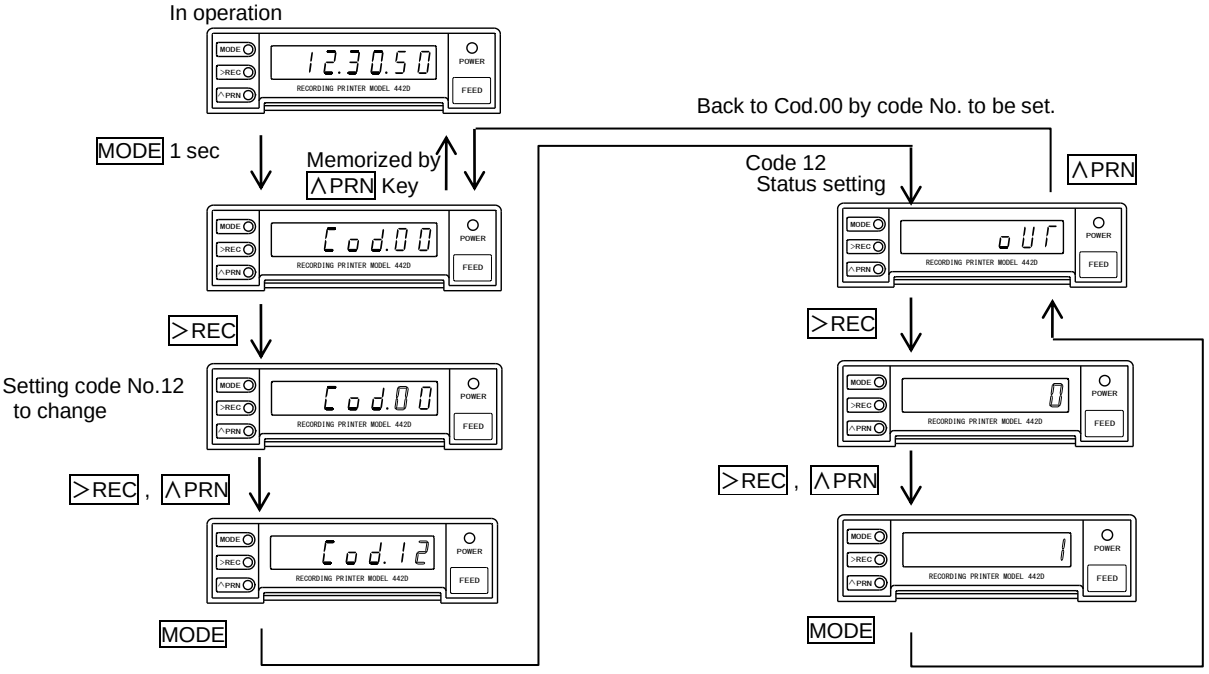
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.12 Printing status output setting

Example) Adjusting STATUS output ON to OFF.

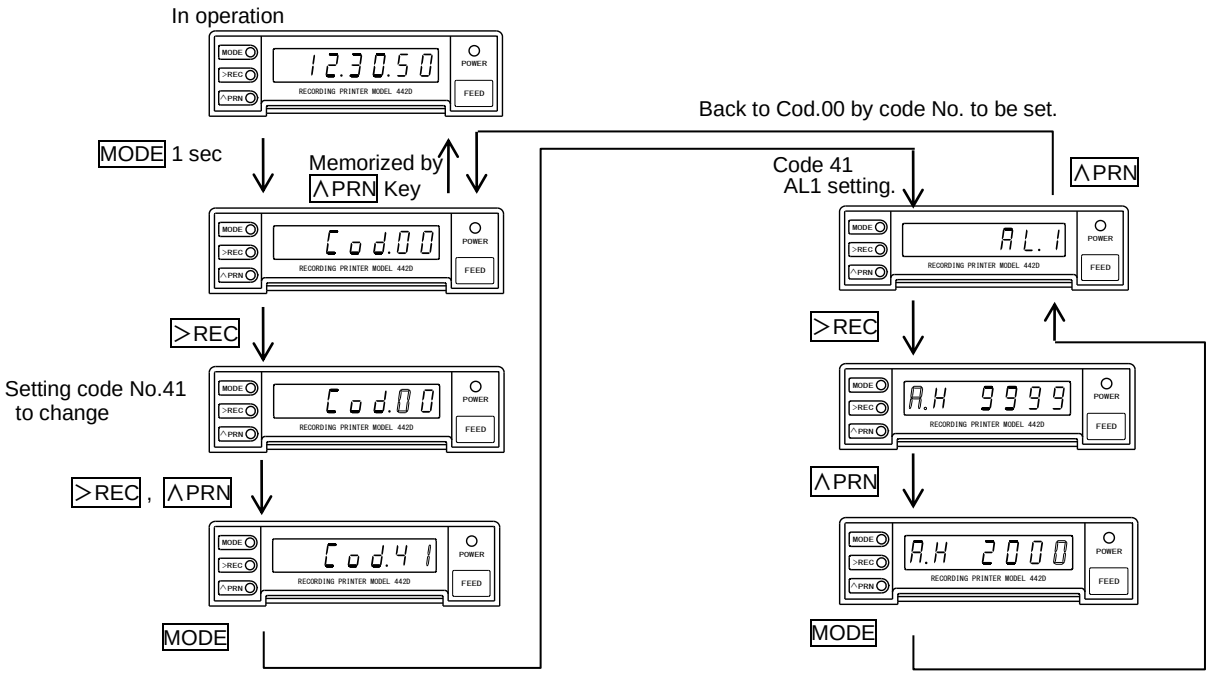
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.13 AL1 setting

Example) Adjusting AL1 value from 9999 to 2000.

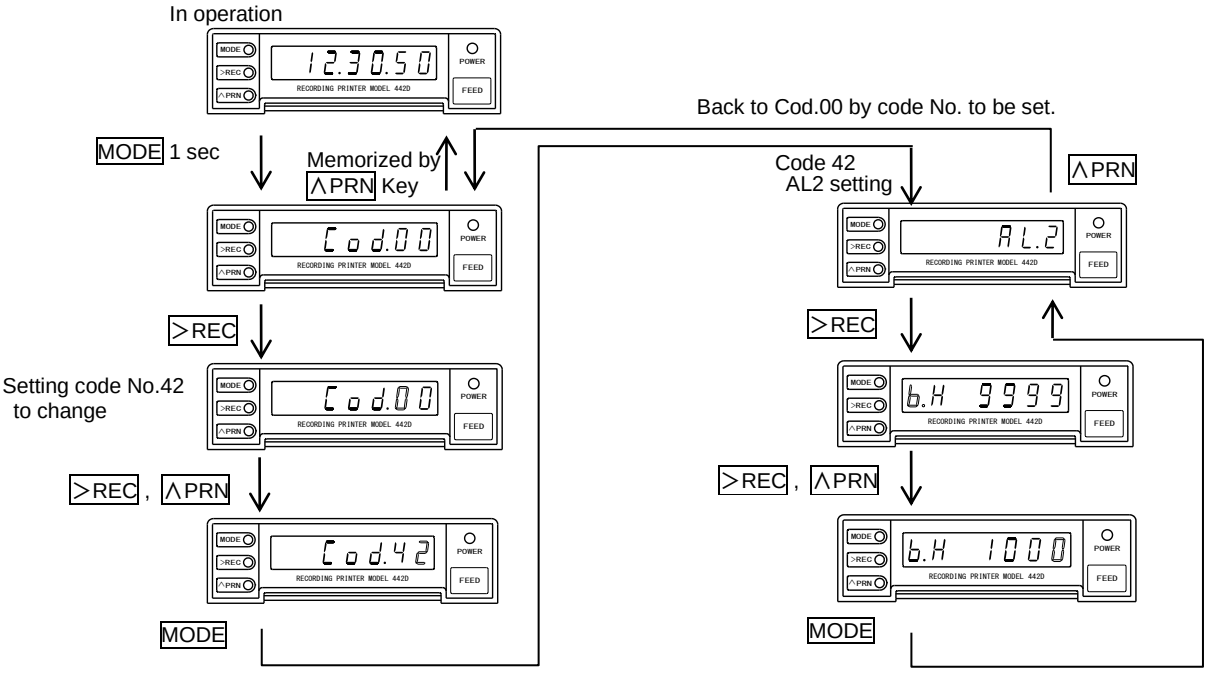
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.14 AL2 setting

Example) Adjusting AL2 value from 9999 to 1000.

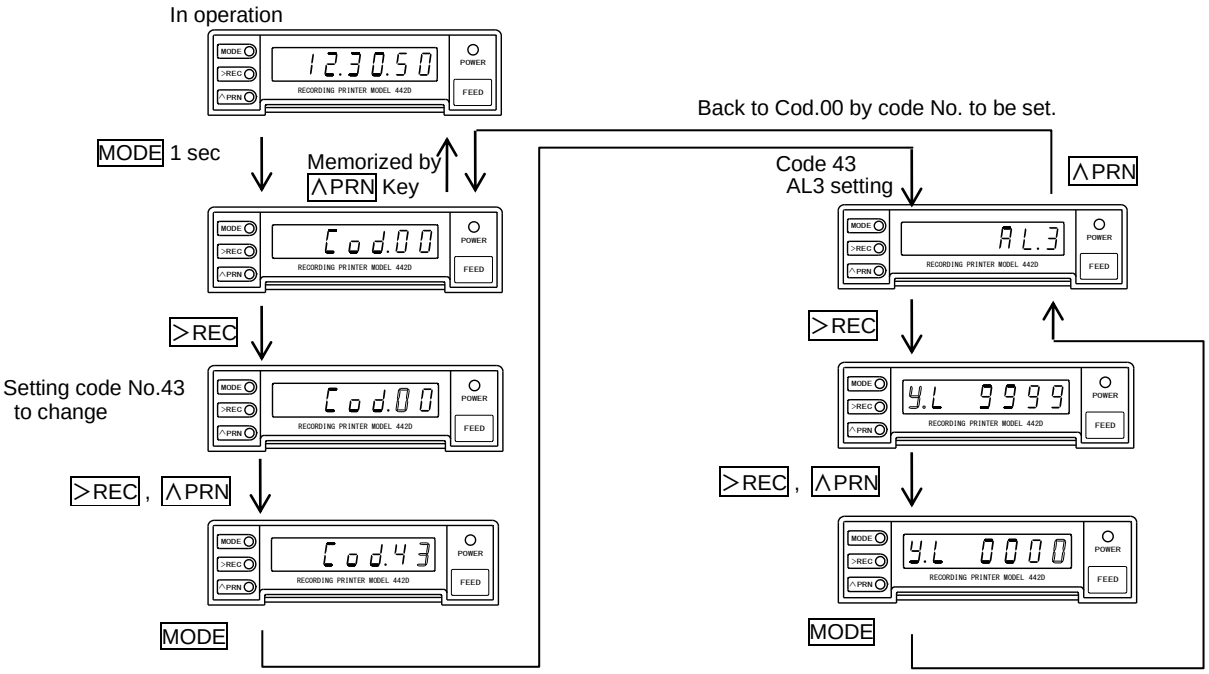
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.15 AL3 setting

Example) Adjusting AL3 value from 9999 to 0000.

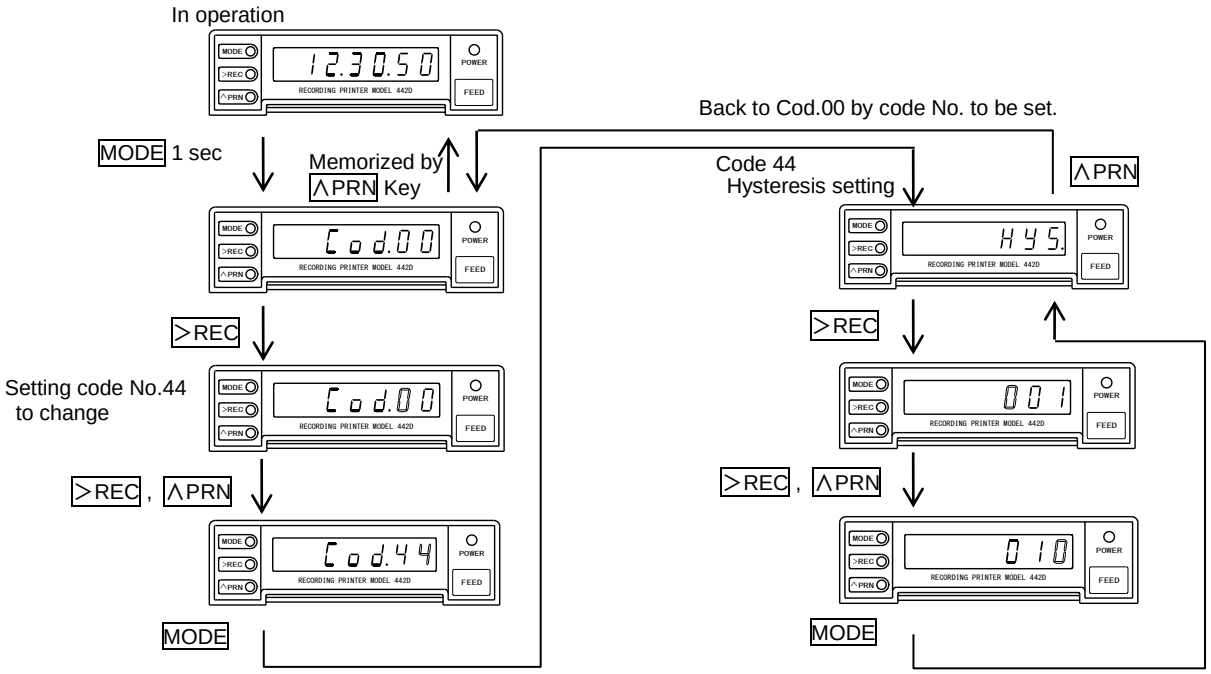
Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)



5.3.16 3 Hysteresis setting

Example) Adjusting Hysteresis setting from 001 to 010.

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



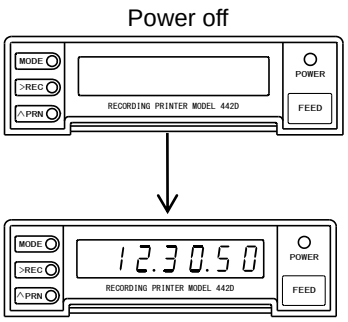
5.3.17 Unit code

■Unit table

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

Note) Font type may be different from the ones in table above.

5.4 Reset to factory setting



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.

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.
Err2	The parameter to be set is not correct.	See 5.1 Summary of function, and use correct parameter.
Err3	At computation display, the Unit and Decimal point of Input A, B is not Correct. (apply to 442D-03.04,05,09 and 19)	Use the same Unit and Decimal Point for Input A,B.
Err4	When switching to Setting mode during paper end in Manual 1mode. Or, When starting print during paper end in Manual 2 mode, Interval, Memory mode.	Paper end. Insert paper.

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

5.6 LED display

6. Printing and function

Data printing is selectable among 4 modes, Manual 1, Manual 2, Interval, and Memory.
Additional Data handling printing or Trend graph printing is available.
Refer to 5.3.10 Print operation setting in detail.

Printing type / Printing mode	Data printing	Selected printing function	
		Data handling printing	Trend graph printing
Manual 1 mode	with	–	
Manual 2 mode	with	with / without	–
Interval mode	with	with / without	with / without
Memory mode	with / without	with / without	with / without

●Data handling printing
Printing maximum, minimum, average, and medium value of measuring data.
Data handling printing is available at Manual 2, Interval, and Memory mode.
Note) At manual 2 mode and interval mode, the data exceeded 2000 data is deleted.
At memory mode, the measuring is stopped automatically after exceeding 2000 data.
Of which mean that no data storage after 2000 data.
When setting nos. of input is 1, B, Y is not printed.
When valid number is 0, " ------" is printed for AVE, MAX, MIN, and MID.

○ Printing sample (Nos. of inputs : 2, Computation printing : with, Equation A+B)

Data handling of Input A

Data handling of Input B

Data handling of Y

```
      ---A---
  N=  1790 (*  1790 )
AVE=  0.66152  kg
MAX=  0.982    kg
MIN=  0.338    kg
MID=  0.660    kg
      ---B---
  N=  1790 (*  1790 )
AVE=  1.32350  kg
MAX=  1.966    kg
MIN=  0.677    kg
MID=  1.322    kg
      ---Y=A+B---
  N=  1790 (*  1790 )
AVE=  1.98502 kg
MAX=  2.948    kg
MIN=  1.015    kg
MID=  1.982    kg
```

N= Total data numbers
(*Valid number)
AVE= Average value
MAX= Maximum value
MIN= minimum value
MID= Medium value

"N=1790(*1790)" means "Total data numbers is 1790" and "Valid numbers of data is 1790 among 1790." Valid data is the numbers excluded over range data (Data exceeded measuring range). Valid data for AVE, MAX, MIN, and MID is handled.
The valid numbers of digits for AVE (Average) is up to 6 digits, and invalid digits is rounding off numbers.

Average value = sum value / valid data numbers

The valid numbers of digits for MID (Medium) is up to 4 digits, and invalid digits is rounding off numbers.

Medium value = (maximum value + minimum value) / 2

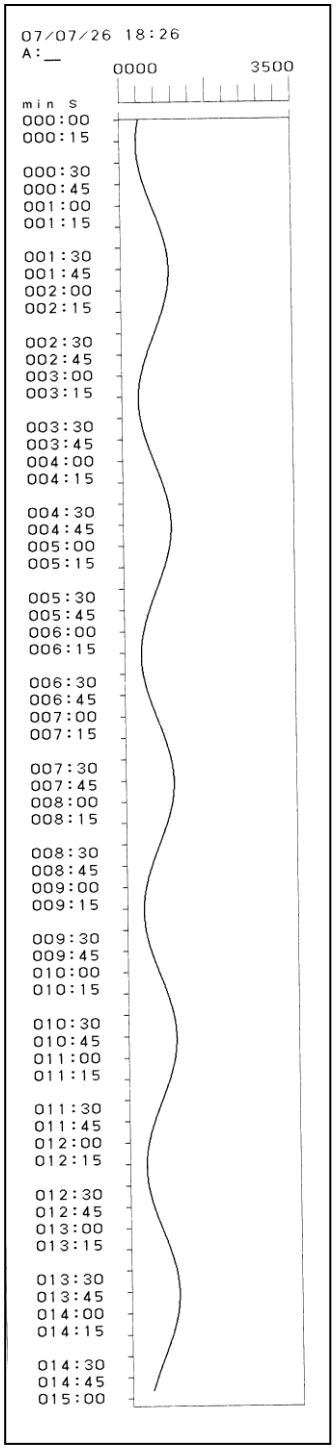
●Trend graph printing

Printing trend graph for Measured data 2 points (A and B) and Computation data (A+B or A-B).
Scale range of graph (X1, X2) can be set freely. Refer to 5.3.11 Trend graph scale setting.

Note) When numbers of input is 1, no printing of Trend graph B and Y.
When Decimal point of A and B, and Unit setting is different each other, no Printing of Trend graph Y.
Over range data (data exceeded measuring range) is not printed.
Decimal point to Scale value (X1, X2) in graph is not printed.
Scale on Time axis is being 30 sample numbers (fixed).

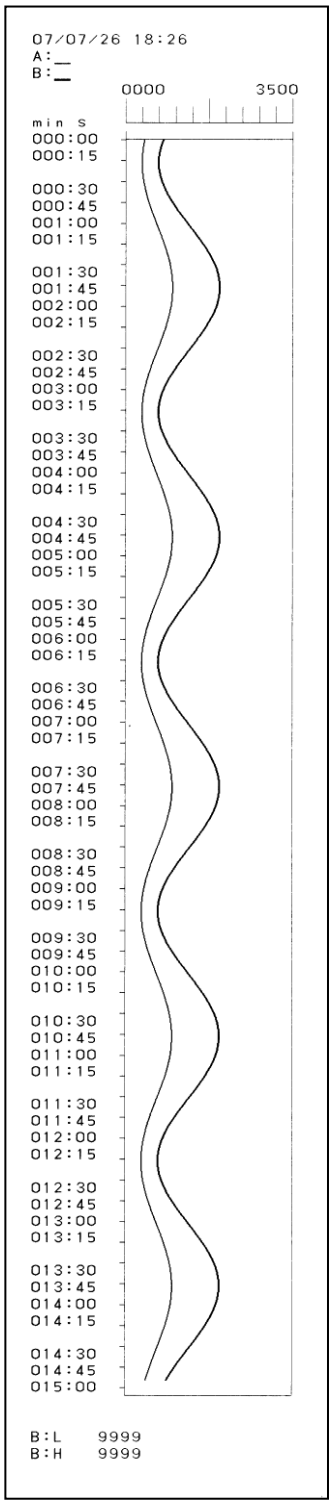
○ Printing sample (Interval time:0.5 sec., Trend graph scale setting: 0 to 3500)

[Nos. of input 1]

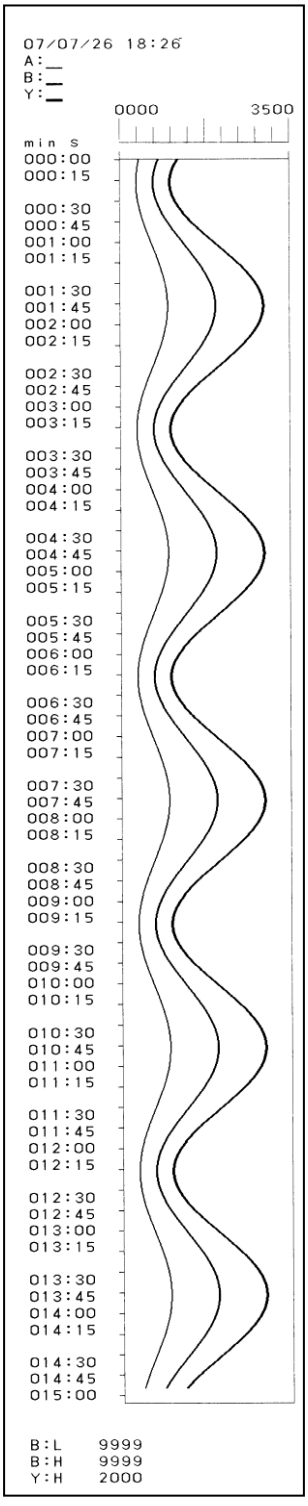


Time axis ↓

[Nos. of input 2]
No printing for computation

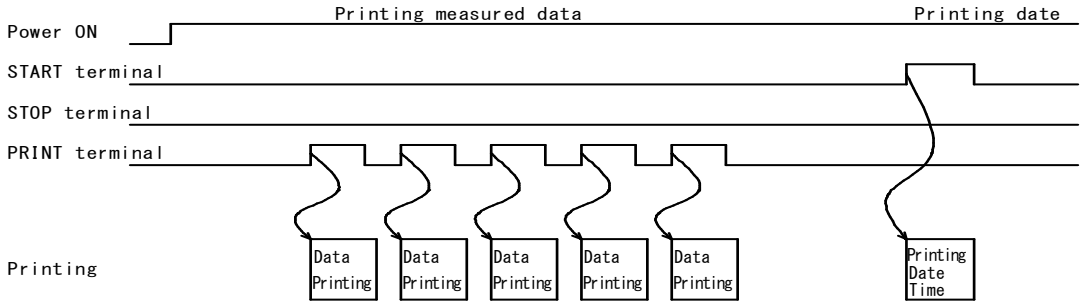


[Nos. of input 2]
Printing for computation



6.1 Manual printing 1 mode

Selecting Manual printing 1 mode by printing operation switching. (Refer to 5.3.10 Printing operation setting)　No printing for Data handling and Trend graph.



○External control

Printing real time measuring data by PRINT input from external, and its date By START input.

Note) Input cycle time 0.5sec. Or more is required for START, PRINT input.

○Control by front panel (Rear terminal control setting : 0 Front key valid)

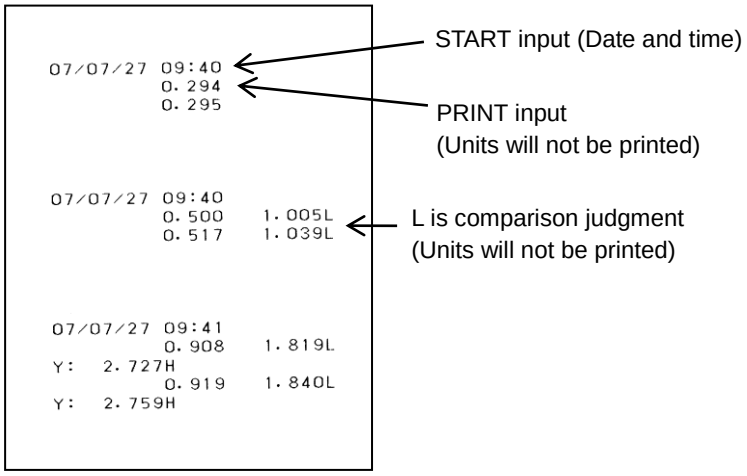
To press >REC key for 1 sec. or more prints real time measuring data.

○Printing sample

[Nos. of input 1]

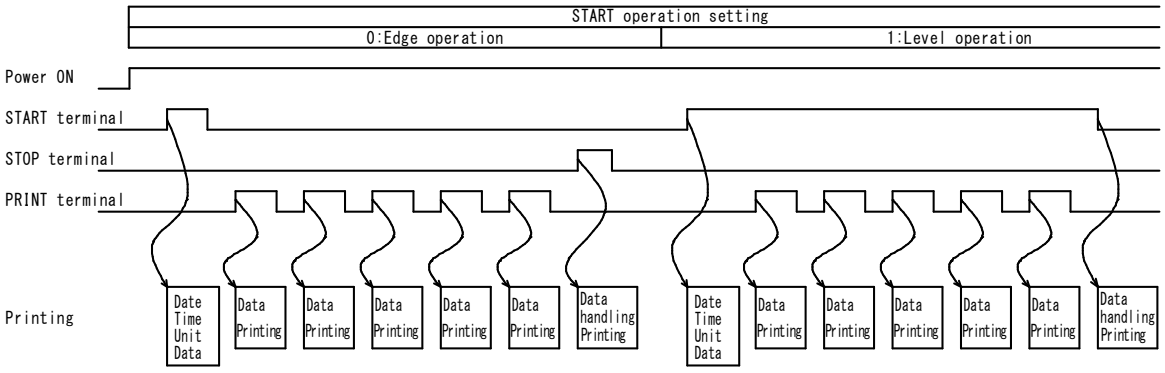
[Nos. of input 2]
No printing for computation

[Nos. of input 2]
Printing for computation



6.2 Manual printing 2 mode

Printing real time measuring data by PRINT input from external.
And data handling printing between START and STOP input, is available.
2000 data or more data is printable, however, targeted data for data handling printing is up to 2000 data from start point.



●Operation

Selecting Manual 2 printing mode by switching printing operation (Refer to 5.3.10 Printing operation setting), then setting each parameter. (Refer to 5.3 Setting)

○External control

①Start

Turn START input ON.

After printing the unit of Date, Input A, Input B, printing measuring data and back to waiting mode. (Decimal of 10^6 digits is blinking.)

Note) To enter set mode is unavailable before stopping.

Note) When START operation setting is being level operation, 0.5 sec. or more pulse width ore of START input is required.

②Measuring

To turn PRINT input ON prints real time measuring data.

Note) 0.5 sec. or more input cycle time for PRINT input is required.

③Stop

When START operation setting is being Edge operation

(Refer to 5.3.8 START operation setting)

To turn STOP input ON stops Manual 2 printing mode.

(Decimal of 10^6 digits turns off.)

When START operation setting is being Level operation

(Refer to 5.3.8 START operation setting)

To turn START input OFF stops Manual 2 printing mode.

(Decimal of 10^6 digits turns off.)

A setting value of the comparison value is printed, and data handling is printing.

○Front panel control (Rear terminal control setting: 0　Front key valid)

①Start

Press [∧PRN] key for more than 1 sec.

After printing the unit of Date, Input A, Input B, printing measuring data and back to waiting mode. (Decimal of 10^6 digits is blinking.)

Note) To enter setting mode is unavailable before stopping.

②Measuring

Press [>REC] key for more than 1 sec. for real time printing.

③Stop

Press [∧PRN] key for more than 1 sec. to stop Manual 2 printing mode.

(Decimal of 10^6 digits turns off.)

A setting value of the comparison value is printed, and data handling is printing.

○Printing sample (with data handling printing)

[Nos. of input 1]

```
07/07/27 10:29
        A: kg
 00001    0.653L
 00002    0.683L
 00003    0.713L
 00004    0.745L
 00005    0.791L
 00006    0.817L

A:L    1000



      ---A---
  N=     6 (*     6 )
AVE= 0.73367   kg
MAX= 0.817     kg
MIN= 0.653     kg
MID= 0.735     kg
```

[Nos. of input 2]
No printing for computation

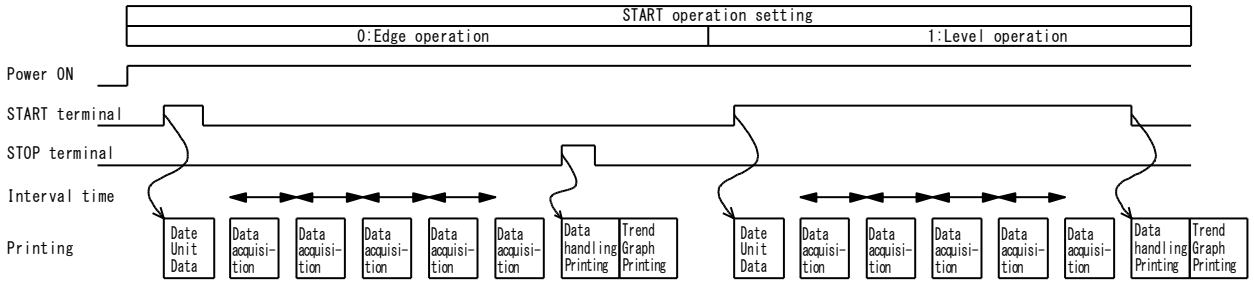
```
07/07/27 10:35
        A: kg      B: kg
 00001    0.850L   1.704H
 00002    0.873L   1.749H
 00003    0.886L   1.776H
 00004    0.898L   1.800H
 00005    0.910L   1.824H
 00006    0.921L   1.844H

A:L    1000
B:H    1000



      ---A---
  N=     6 (*     6 )
AVE= 0.88967   kg
MAX= 0.921     kg
MIN= 0.850     kg
MID= 0.886     kg
      ---B---
  N=     6 (*     6 )
AVE= 1.78283   kg
MAX= 1.844     kg
MIN= 1.704     kg
MID= 1.774     kg
```

[Nos. of input 2]
Printing for computation

```
07/07/27 10:35
        A: kg      B: kg
 00001    0.546L   1.097H
Y:  1.643
 00002    0.575L   1.157H
Y:  1.732
 00003    0.594L   1.194H
Y:  1.788
 00004    0.612L   1.229H
Y:  1.841
 00005    0.646L   1.297H
Y:  1.943
 00006    0.665L   1.335H
Y:  2.000H

A:L    1000
B:H    1000
Y:H    2000



      ---A---
  N=     6 (*     6 )
AVE= 0.60633   kg
MAX= 0.665     kg
MIN= 0.546     kg
MID= 0.606     kg
      ---B---
  N=     6 (*     6 )
AVE= 1.21817   kg
MAX= 1.335     kg
MIN= 1.097     kg
MID= 1.216     kg
      ---Y=A+B---
  N=     6 (*     6 )
AVE= 1.82450 kg
MAX= 2.000     kg
MIN= 1.643     kg
MID= 1.822     kg
```

6.3 Interval mode

Printing measuring data every 0.5 sec. to 1 hour.
Data handling printing of measuring printing data between START and STOP input,
And trend graph printing is available.



2000 data or more is printable, however, the target data of Data handling printing and Trend graph printing is up to 2000 data from start.

●Operation
Selecting interval mode by switching printing operation. (Refer to 5.3.10 Printing operation setting). Then, go to each setting. (Refer to 5.3 Setting)

○External setting
①Start
Turn START input ON.
After printing units of Date, Interval time, Input A, and Input B, printing measuring data.
(Decimal of 10^6 digits is blinking.)
Note) To enter setting mode is unavailable before stopping.
Note) When START operation setting is being level operation, 0.5 sec. or more pulse width of START input is required.
②Measuring
Printing data by interval time.
③Stop
When START operation setting is being Edge operation
(Refer to 5.3.8 START operation setting)
To turn STOP input ON stops Interval mode. (Decimal of 10^6 digits turns off.)
When START operation setting is being Level operation
(Refer to 5.3.8 START operation setting)
To turn START input OFF stops Interval mode. (Decimal of 10^6 digits turns off.)
A setting value of the comparison value is printed, and data handling and Trend graph is printing.

○Front key control (Rear terminal control setting: 0　Front key valid)

①Start

Press >REC key for more than 1 sec..

After printing the unit of Date, Interval time, Input A, and Input B, printing measuring data.

(Decimal of 10^6 digits is blinking.)

Note) To enter setting mode is unavailable before stopping.

②Measuring

Printing data by interval time.

③Stop

Press >REC key for more than 1 sec..

Stop Interval mode (Decimal of 10^6 digits turn off)

A setting value of the comparison value is printed, and data handling and Trend graph is printing.

○Printing sample (Data handling printing and Data printing + Trend graph printing)

[Nos. of input 1]

```
07/07/27 10:43
  s mS A: kg
000:000  0.305L
000:500  0.306L
001:000  0.308L
001:500  0.310L
002:000  0.311L
002:500  0.313L
003:000  0.315L
003:500  0.317L
004:000  0.319L
004:500  0.321L

A:L    1000



      ---A---
  N=    10 (*    10 )
AVE= 0.31250  kg
MAX= 0.321    kg
MIN= 0.305    kg
MID= 0.313    kg


07/07/27 10:43
A:_
          0000          3500
min s
000:00
A:L    1000
```

[Nos. of input 2]
No printing for computation

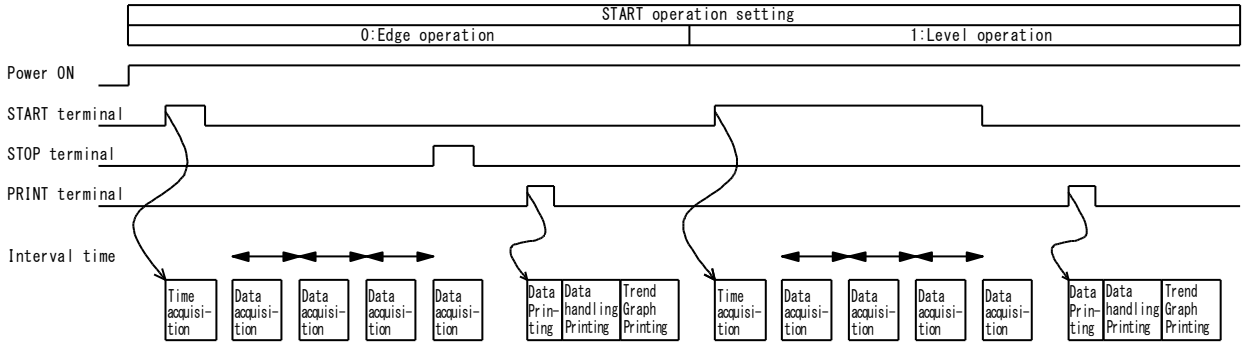
```
07/07/27 10:43
  s mS A: kg     B: kg
000:000  0.407L  0.811
000:500  0.403L  0.802
001:000  0.398L  0.793
001:500  0.394L  0.784
002:000  0.389L  0.776
002:500  0.386L  0.767
003:000  0.381L  0.760
003:500  0.377L  0.752
004:000  0.374L  0.745
004:500  0.370L  0.737

A:L    1000
B:H    1000



      ---A---
  N=    10 (*    10 )
AVE= 0.38790  kg
MAX= 0.407    kg
MIN= 0.370    kg
MID= 0.389    kg
      ---B---
  N=    10 (*    10 )
AVE= 0.77270  kg
MAX= 0.811    kg
MIN= 0.737    kg
MID= 0.774    kg


07/07/27 10:43
A:_
B:_
          0000          3500
min s
000:00
A:L    1000
B:H    1000
```

[Nos. of input 2]
Printing for computation

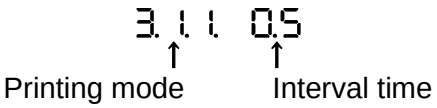
```
07/07/27 10:42
  s mS A: kg     B: kg
000:000  0.846L  1.689H
Y:  2.535H
000:500  0.842L  1.680H
Y:  2.522H
001:000  0.836L  1.669H
Y:  2.505H
001:500  0.832L  1.659H
Y:  2.491H
002:000  0.826L  1.649H
Y:  2.475H
002:500  0.821L  1.639H
Y:  2.460H
003:000  0.816L  1.629H
Y:  2.445H
003:500  0.811L  1.618H
Y:  2.429H
004:000  0.806L  1.607H
Y:  2.413H
004:500  0.800L  1.597H
Y:  2.397H

A:L    1000
B:H    1000
Y:H    2000


      ---A---
  N=    10 (*    10 )
AVE= 0.82360  kg
MAX= 0.846    kg
MIN= 0.800    kg
MID= 0.823    kg
      ---B---
  N=    10 (*    10 )
AVE= 1.64360  kg
MAX= 1.689    kg
MIN= 1.597    kg
MID= 1.643    kg
      ---Y=A+B---
  N=    10 (*    10 )
AVE= 2.46720 kg
MAX= 2.535    kg
MIN= 2.397    kg
MID= 2.466    kg


07/07/27 10:42
A:_
B:_
Y:_
          0000          3500
min s
000:00
A:L    1000
B:H    1000
Y:H    2000
```

6.4 Memory mode

Record measuring data every 0.5 sec. to 1 hour, and printing measuring data after stop.
Data handling printing and Trend printing for measuring data is available.
Up to 2000 data is memorized for every channel from start. When the nos. of data exceed 2000, this memory mode is automatically stopped.



Note) Even if these parameters such as Equation (A+B, A-B), Input A/B scale, Comparison type of AL1, AL2, AL3, Comparison value, and object of comparison are changed, no influence to recorded Data printing.
Code NO.10: Deleting recorded data if printing mode or Interval mode in printing operation setting (Refer to 5.3.10 Printing operation setting) is changed.



●Interval time and Recording time

Interval time	Maximum recording time
0.5 seconds	16 minutes and 40 seconds.
1 second	33 minutes and 20 seconds.
2 seconds	1 hour and 6 minutes and 30 seconds.
5 seconds	2 hours and 46 minutes and 30 seconds.
10 seconds	5 hours and 33 minutes and 20 seconds.
30 seconds	16 hours and 40 minutes and 0 seconds.
1 minute	33 hours and 20 minutes and 0 seconds.
5 minutes	166 hours and 40 minutes and 0 seconds.
10 minutes	333 hours and 20 minutes and 0 seconds.
30 minutes	1000 hours (41 days and 16 hours)
1 hour	2000 hours (83days and 8 hours)

●Operation

Selecting memory mode by switching printing operation. (Refer to 5.3.10 Printing operation setting) Then, go to each setting. (Refer to 5.3 Setting)

○External control

①Start

Turn START input on.

Start memory mode. (Decimal of 10^6 digits is blinking.)

Note) To enter setting mode is unavailable before stopping.

Note) 0.5 sec. or more pulse width of START input is required when START operation setting is being Level operation.

②Measuring

Recording data in interval time.

③Stop

When START operation setting is being Edge operation (Refer to 5.3.8 START operation setting)

To turn STOP input ON stops memory mode. (Decimal of 10^6 digits is turns off.)

When START operation setting is being Level operation (Refer to 5.3.8 START operation setting)

To turn START input OFF stops memory mode. (Decimal of 10^6 digits is turns off.)

When the numbers of data exceed 2000, automatically stopped.

④Printing memorized data

Turn PRINT input ON.

After printing Memorized data, printing data handling and trend graph.

Data is recorded till the next memory mode starts.

It is possible to print again by the print input.

Note) START, STOP and PRINT input is neglected while printing.

○Front panel control (Rear terminal control setting: 0 Front key valid)

①Start

Press [>REC] key for more than 1 sec..

Start memory mode. (Decimal of 10^6 digits is blinking.)

Note) To enter Set mode is unavailable before stopping.

②Measuring

Printing data by interval time.

③Stop

Press [>REC] key.

Stop memory mode (Decimal of 10^6 digits turn off.)

When the numbers of data exceed 2000, automatically stopped.

④Printing memorized data

Press [∧PRN] key for more than 1 sec..

After printing Memorized data, printing Data handling and Trend graph.

Data is recorded till the next Memory mode starts.

It is possible to print it again with the [∧PRN] key.

○Printing sample (Data handling printing and Data printing + Trend graph printing)

[Nos. of input 1]

```
07/07/27 10:47
  s ms A: kg
000:000  0.531L
000:500  0.534L
001:000  0.540L
001:500  0.546L
002:000  0.552L
002:500  0.558L
003:000  0.564L
003:500  0.570L
004:000  0.576L
004:500  0.582L
005:000  0.588L

A:L    1000



      ---A---
  N=    11 (*    11 )
AVE= 0.55827  kg
MAX= 0.588    kg
MIN= 0.531    kg
MID= 0.560    kg


07/07/27 10:47
A:_
          0000          3500
min s
000:00


A:L    1000
```

[Nos. of input 2]
No printing for computation

```
07/07/27 10:47
  s ms A: kg     B: kg
000:000  0.864L  1.732H
000:500  0.869L  1.742H
001:000  0.873L  1.750H
001:500  0.878L  1.760H
002:000  0.882L  1.767H
002:500  0.886L  1.776H
003:000  0.890L  1.784H
003:500  0.895L  1.793H
004:000  0.898L  1.800H
004:500  0.903L  1.808H
005:000  0.906L  1.816H

A:L    1000
B:H    1000



      ---A---
  N=    11 (*    11 )
AVE= 0.88582  kg
MAX= 0.906    kg
MIN= 0.864    kg
MID= 0.885    kg
      ---B---
  N=    11 (*    11 )
AVE= 1.77527  kg
MAX= 1.816    kg
MIN= 1.732    kg
MID= 1.774    kg


07/07/27 10:47
A:_
B:_
          0000          3500
min s
000:00


A:L    1000
B:H    1000
```

[Nos. of input 2]
Printing for computation

```
07/07/27 10:48
  s ms A: kg     B: kg
000:000  0.930L  1.858H
Y:  2.788H
000:500  0.926L  1.851H
Y:  2.777H
001:000  0.923L  1.844H
Y:  2.767H
001:500  0.920L  1.837H
Y:  2.757H
002:000  0.917L  1.830H
Y:  2.747H
002:500  0.913L  1.823H
Y:  2.736H
003:000  0.909L  1.815H
Y:  2.724H
003:500  0.905L  1.808H
Y:  2.713H
004:000  0.902L  1.800H
Y:  2.702H
004:500  0.897L  1.792H
Y:  2.689H
005:000  0.894L  1.784H
Y:  2.678H

A:L    1000
B:H    1000
Y:H    2000


      ---A---
  N=    11 (*    11 )
AVE= 0.91236  kg
MAX= 0.930    kg
MIN= 0.894    kg
MID= 0.912    kg
      ---B---
  N=    11 (*    11 )
AVE= 1.82200  kg
MAX= 1.858    kg
MIN= 1.784    kg
MID= 1.821    kg
    ---Y=A+B---
  N=    11 (*    11 )
AVE= 2.73436 kg
MAX= 2.788    kg
MIN= 2.678    kg
MID= 2.733    kg


07/07/27 10:48
A:_
B:_
Y:_
          0000          3500
min s
000:00


A:L    1000
B:H    1000
Y:H    2000
```

6.5. Test printing

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

Printing sample

442D-03

```
No. 589-100 442D-03
00/01/29 16:27
 !"#$%&' ()*+,-./01234567
89:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[¥]^_`abcdefg
hijklmnopqrstuvwxyz{|}~
→←↑↓ 。「」・ヲ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タチツテトナニヌ
ネノハヒフヘホマミムメモヤユヨラリルレロワン゛゜
ΣμΩπσΦ∞ℓαβγ⊕○±÷×円年月日時分秒
〒市区町村人
1  INPUT   :2 CAL:A+B.ON
   DISPLAY:CHANGE
5  A SCAL : 0000. 9999
6  B SCAL : 0000. 9999
   DP     A:     0 B:     0
7  UNIT   A:       B:
8  START  :EDGE
9  REAR   :OFF
10 PRINT  :INTERVAL
   DATA   :OFF
   TREND  :OFF
   TIME   :0.5s
11 TREND  : 0000. 0100
12 STATUS :OFF
41 AL1    :A H    9999
42 AL2    :B H    9999
43 AL3    :Y L    9999
44 HYS    :001
```

442D-M

```
No. 589-100 442D-M
07/07/25 13:49
 !"#$%&' ()*+,-./01234567
89:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[¥]^_`abcdefg
hijklmnopqrstuvwxyz{|}~
→←↑↓ 。「」・ヲ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タチツテトナニヌ
ネノハヒフヘホマミムメモヤユヨラリルレロワン゛゜
ΣμΩπσΦ∞ℓαβγ⊕○±÷×円年月日時分秒
〒市区町村人
1  INPUT   :2 CAL:A-B.OFF
   DISPLAY:CH B
4  SENSOR :B
8  START  :LEVEL
9  REAR   :OFF
10 PRINT  :INTERVAL
   DATA   :OFF
   TREND  :OFF
   TIME   :1s
11 TREND  : 0250. 0350
12 STATUS :ON
41 AL1    :A H     265
42 AL2    :A L     260
43 AL3    :Y L    9999
44 HYS    :001
```

Paper direction

6.6 Error

6.6.1 Paper end detection

Paper end detection sensor is incorporated to detect paper end.
STATUS output is provided when paper end, and no printing.
POWER LED is blinking.

6.6.2 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.

6.6.3 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.

6.6.4 Computation (442D-03,04,05,09 and 19 only)

Error display and Error printing is come up when Unit and Decimal points of Input A and B is different. The comparison output (AL1, AL2, and AL3) is provided for the computed result.
Example) Nos. of inputs, Computation, Display setting:
Nos. of input 2 points, Computation printing, A-B, Computation Display
Display : Err 3
Printing

○Data printing

```
          9999H   9.999H
Y: ショウスウテン エラー

          9.999H   9.999H
Y: タンイ エラー

          9999H   9.999H
Y: ショウスウテン タンイエラー
```

○Data handling printing

```
        ---A---
  N=    21 (*    21 )
AVE= 1193.52   kg
MAX= 1277      kg
MIN= 1110      kg
MID= 1194      kg
        ---B---
  N=    21 (*    21 )
AVE= 1.19014   m³
MAX= 1.273     m³
MIN= 1.107     m³
MID= 1.190     m³
        ---Y=A-B---
 ショウスウテン タンイエラー
```

○Trend graph printing
When Unit and Decimal point is different, no printing the trend graph of Computation Y.

6.6.5 Operation after paper end, temperature error detection

○Manual 1 mode
When paper end and temperature error is occurred, printing the measured data, which is required to print during error, after error is released.
Up to 2000 measured data is printed. The nos. of data exceed 2000 is deleted.
No printing date by START input during error.

○Manual 2, Interval mode
When paper end and temperature error is occurred, printing up to 2000 data from start, which is required to print during error, after error is released.
When error is occurred after the nos. of data exceed 2000, printing data for one cycle just after error is released.
The pause operation during paper end and temperature error is neglected till error is released.

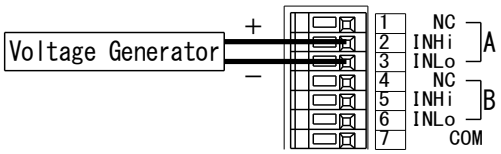
○Memory mode
The print is restarted continuously after the error is released when becoming paper end and a temperature error while printing it.

7. Calibration

Calibration once a year for long time use is required.
The calibration is required at 23℃ ±5℃, 75% RH or less.

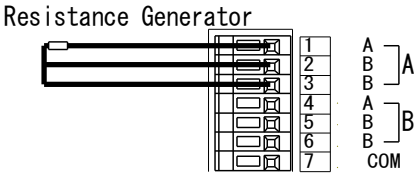
●Connection

[442D-03,04,05,09,19 and 442D-M]
Connect Voltage Generator according to the following drawing.



The above drawing show Input A connection.
When input B, connect ⑤⑥.

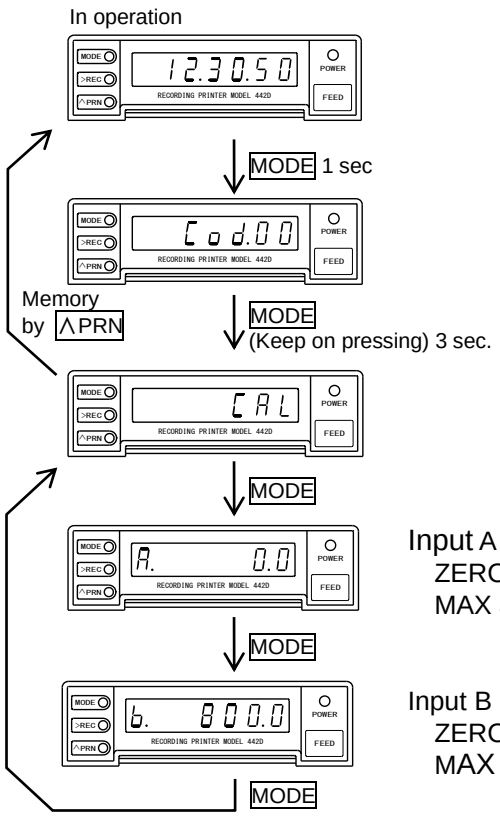
[442D-P]
Connect Resistance Generator according to the following connection.



The above drawing show Input A connection.
When input B, connect ④⑤⑥.

●Calibration

Press MODE Key for 1 sec. or more during operation to get setting mode (Display: Cod.00)
Then, keep on pressing to get CAL Display, of which mean Calibration mode.



Model		ZERO		MAX	
		Display	Input value	Display	Input value
442D-03		Offset value	0.000V	Full scale value	1.000V
442D-04			0.000V		5.000V
442D-05			0.000V		10.000V
442D-09			1.000V		5.000V
442D-19			4.000mA		20.000mA
442D-P		0.0℃	100.00Ω	800.0℃	375.70Ω
442D-M	K sensor	0.0℃	0.000mV	1300.0℃	52.410mV
	J sensor	0.0℃	0.000mV	1200.0℃	69.553mV
	R sensor	0.0℃	0.000mV	1700.0℃	20.222mV
	E sensor	0.0℃	0.000mV	1000.0℃	76.373mV
	T sensor	0.0℃	0.000mV	400.0℃	20.872mV
	B sensor	0.0℃	0.000mV	1800.0℃	13.591mV

Input A
ZERO adjustment: Provide ZERO value and enter by ∧PRN key
MAX adjustment: Provide MAX value and enter by >REC key

Input B
ZERO adjustment: Provide ZERO value and enter by ∧PRN key
MAX adjustment: Provide MAX value and enter by >REC key

8. Specification.

8.1 Model

442D – □ – □
1 2
2: Power supply
1: Measuring input

[1] Measuring input

○DC voltage and current (2ch. in common)

Model	Measuring range	Input impedance	Overload	Accuracy Note1
442D-03	0 to 1 V DC	1MΩ	DC±250V	±(0.1% of Fs+1digit) Note2
442D-04	0 to 5 V DC	1MΩ	DC±250V	
442D-05	0 to 10 V DC	1MΩ	DC±250V	
442D-09	1 to 5 V DC	1MΩ	DC±250V	
442D-19	4 to 20 mA DC	12.5Ω	DC±150mA	

Note1) Accuracy : at 23℃ ±5℃, 45 to 75% RH
Note2) Computation result Y :±(0.2% of Fs+1digit)
Temperature coefficient:±150ppm/℃/ch at 0 to 50℃

○Thermocouple (2ch. in common)

Model	Sensor	Measuring range	Display range	Accuracy Note1
442D-M	K	-100 to 1300℃	-200 to 1350℃	±(0.3% of rdg+2℃) Note2
	J	-140 to 1200℃	-200 to 1250℃	
	R	100 to 1700℃	-50 to 1750℃	
	E	-130 to 1000℃	-250 to 1050℃	
	T	-200 to 400℃	-250 to 420℃	
	B	600 to 1800℃	-20 to 1802℃	

Note1) Accuracy : at 23℃±5℃, 45 to 75% RH
Note2) Computation result Y :±(0.6% of rdg+4℃)
Temperature coefficient:±300ppm/℃ at 0 to 50℃
Cold junction compensation:±1℃ at 0 to 50℃
Calibration: JIS, per C-1602 (1995)

○RTD (2 ch. in common)

Model	Sensor	Measuring range	Display range	Accuracy Note1）
442D-P	Pt100Ω	-200.0 to 850.0℃	-200.0 to 870.0℃	±(0.2% of rdg+0.5℃) Note2)

Note1) Accuracy : at 23℃ ±5℃, 45 to 75% RH
Note2) Computation result Y :±(0.4% of rdg+1.0℃)
Temperature coefficient:±200ppm/℃ at 0 to 50℃
Sensing current: approx. 1mA
Calibration: JIS, per C-1604 (1997)

[2] Power supply

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

8.2 Installation

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. 13VA (at printing) / approx. 5.5VA (at waiting) at 100V AC Approx.18VA (at printing) / approx. 8VA (at waiting) at 200V AC Approx.500mA (at printing) / approx. 80mA (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

8.3 General

Nos. of Inputs:	2 points (A, B)
Equation:	Y= A+B, Y= A-B
Sampling cycle:	500msec.
Display cycle:	500msec
Display:	[442D-03,04,05,09,19] 0 to 9999, with zero suppress function [Computation display] ±19998
Decimal points:	[442D-03,04,05,09,19] 2 points independent free setting
Over range display:	[442D-03,04,05,09,19] Blinking at 130% of input Blinking when 9999 or more. [442D-M, 442D-P] Blinking at minimum value or maximum value display when display range is over. [Computation display]] Indicate computed result
Resolution:	[442D-03,04,05,09,19] 1/10000 [442D-M] 1℃ [442D-P] 0.1℃
Load resistance:	[442D-M] 500Ω or less
Lead wire resistance:	[442D-P] 5Ω or less / wire
Burnout:	[442D-M] Blinking at min. value. [442D-P] Blinking at max. value.
Interval time:	0.5 sec., 1 sec., 2 sec., 5 sec., 10 sec., 30 sec., 1 min., 5 min., 10 min.,30 min., 1 hr.
Data printing:	Nos, of data memory･･･max. 2000 data each for A and B. (Memory mode)
Data handling printing:	Nos, of data memory･･･max. 2000 data each for A and B. (Manual 2, Interval, memory mode) Maximum (MAX), minimum (MIN), Average (AVE), Medium (MID)
Trend graph printing:	Nos. of data memory･･･max. 2000 data each for A and B (Interval, memory mode)
Control input:	Printing operation･･･START, STOP, PRINT Clock adjustment･･･ADJ Dry contact or Open collector (NPN) input, 5V DC 10mA
Control output:	STATUS Open collector output (NPN) 30V DC, 30mA Max. Saturation voltage 1.6V DC or less
Comparison output:	AL1, AL2, AL3 Open collector output (NPN) 30V DC, 30mA Max. Saturation voltage 1.6V DC or less
Dielectric strength:	Input/Output – Power 1500V AC at 1min. (At AC powered) 500V AC at 1min. (At DC powered) Comparison output – Measuring Input/Control Input 500V AC at 1min.
Insulation resistance:	Input/Output – Power 500V DC 50MΩ or more. (At AC powered) 500V DC 50MΩ or more. (At DC powered)

8.4 Printer

Print style	Thermal line dot
Character	Alphabet, Numbers, Katakana, Symbols, etc
Dot	16x16 (2mmx2mm)
Digit	24 digits, Max.
Printing speed	Approx. 22.5mm/sec. 6 lines/sec. Max. Note) Printing rate 16% or less
Paper feeding	3mm 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)

8.5 Chart roll paper

Paper: 58mm width x 48ϕ(Inside diameter 12ϕ)
Length 25m (Approx. 8300 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)

8.6 Calendar clock

Display: 6 digits Red LED Hour, Minute, Second
Accuracy: ±3 sec. Per day. (At 25℃)
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.

Contact Information

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