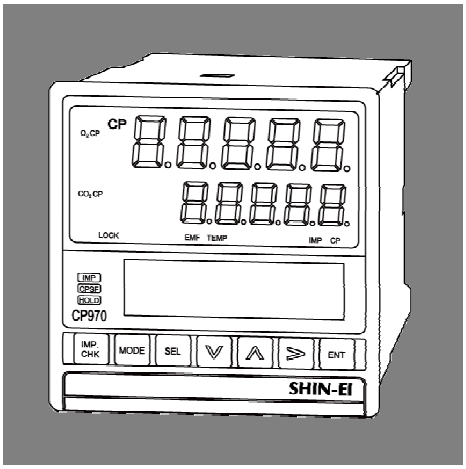
INST No.CP970-2



CP Computing unit

Model CP970

Instruction Manual

INSTRUCTIONS

Important Notice

Keep this manual with due care after understanding operation.

新栄熱計装株式会社

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Preface

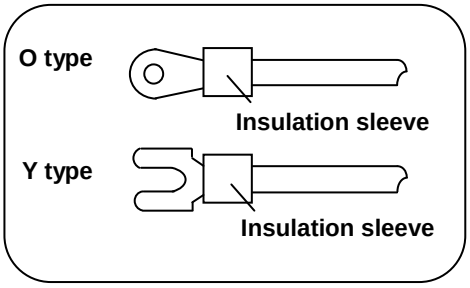
Please be sure to observe the following warnings for safe use.

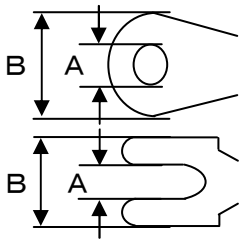
1. Mounting location and terminal cover

This instrument has been designed to be mounted on a panel. For preventing electric shock, take safety measures to avoid contact with power and input/output terminals.
Keep 50cm or more away from power line and other communication line to avoid noises. After connections, mount the terminal cover at all times.

2. Use crimp style terminals

Use the crimp style terminals with insulations sleeve. Use the O type termination for power terminal and ground terminal. Recommend to use the O type termination for other than above terminals.





Size

A: 3.7mm or above

B: 7.0mm or above

3. Take safety measures separately

When this instrument is assembled into the final product (equipment) requiring security measures, take safety measures on the final product side to be observed, if a control failure occurred due to a temperature sensor trouble, wrong operation or other circumstances.

4. Prepare a power switch separately

Neither power switch nor fuse is mounted in this instrument. Mount them on the final product side.

1) For the contents of this manual, alteration is reserved without notice in the future.
2) This manual has been prepared by making assurance doubly sure about its contents. However, if any question arises or if any error, an omission, or other deficiencies were found, please inform your nearest CHINO's sales agent of them.
3) You are requested to understand that CHINO is not responsible for any operation results in spite of item 2).

1 Outline

This CP computing unit computes CP (carbon potential) value by inputting O_2, temperature, CO, and CO_2, and outputs the result.
Input type is switched by “CP computation mode selection parameter” of setting mode.

- Type 1: 3 inputs of O_2, temperature, and CO_2
  Display CP value computed from O_2 in upper of display 1, and display computed result of CO_2 in display 2.
- Type 2: 3 inputs of CO_2, temperature, and CO
  Display CP value computed from CO_2 in upper of display 1, and display analog input value of CO_2 in display 2.
- Type 3: 4 inputs of O_2, temperature, CO, and CO_2
  Display CP value computed from O_2 in upper of display 1, display CP value computed from CO_2 in lower of display 1 (depending on setup), and display analog input value of CO_2 in display 2 (depending on setup).

2 Specifications

1. Input specifications

1) Mesured value input

- Input signals:
  1. Temperature input — 0 to 1200℃ (K thermocouple)
     0 to 1200℃ (N thermocouple)
     0 to 1700℃ (R thermocouple)
     0 to 1700℃ (S thermocouple)
  2. CO input — 1 to 5V DC (0.00 to 50.00%)
  3. O_2 input — 0 to 1500mV DC
  4. CO_2 input — 1 to 5V DC
     (0.000 to 5.000%, setting change of scale upper limit is possible)
- Input isolation: Without isolation between CO input and CO_2 input
  Isolation between O_2 input and other input
- Sampling period: 2 seconds or less
- Burn-out: Thermocouple input — Upper limit Scale out
  CO, O_2, and CO_2 input — None
- Rated measuring accuracy: Thermocouple input ±0.2% ±1 digit for temperature range (in the standard operation condition)
  O_2 input ±0.1% ±1 digit for 0 to 1500mV DC
  CO, O_2 input ±0.1% ±1 digit for 1 to 5V DC
- Reference junction compensation accuracy: K, N ±0.5℃ or equivalent value of 20μV, whichever is greater. (Ambient temperature: 23℃±10℃)
  Others ±1.5℃ or equivalent value of 60μV, whichever is greater.
- Input resistance: Temperature, CO, CO_2 input 1MΩ or more
  O_2 input 20MΩ or more
- Allowable signal source resistance: Temperature, CO, CO_2 input 100MΩ or more
  O_2 input 30MΩ or more
- Maximum input voltage range: Temperature input -2 to 2V
  O_2 input -1 to 2V
  CO, CO_2 input -0.3 to 10V

2) Temperature input
There are four types of thermocouple (K, N, R, and S), and selected by front setup.
Less than -50℃ is lower limit scale out and more than upper limit +50℃ of used thermocouple is upper lime scale out.

3) CO input (fixed value is available by inside setup)
Full scale of CO input is 0.00 to 50.00%. Less than -0.10% is lower limit scale out and more than 60.00% is upper limit scale out.

4) O_2 input
Full scale of O_2 input is 0 to 1500. Less than -100 is lower limit scale out, and more than 1600 is upper limit scale out.

5) CO_2 input
Full scale of CO_2 input is 0.000 to 5.000% and set by front setup. (Available to change the setting of scale upper limit) Less than -0.01% is lower limit scale out and more than scale upper limit is upper limit scale out.

6) First order leg computation
Perform first order leg computation for all analog inputs and use in internal processing.

7) Contact input: 3 points

1. Impedance check	Execute after ON more than 3 seconds
2. CP value shift	During ON, effective CP value correction constant
3. CP value hold	During ON, fix CP value display and output signal

2. Output specifications

1) Transmission output
- Output points: 3 points
- Output signal: 1 to 5V DC (output 1, output 2), 0 to 10mV DC (output 3)
  Output kinds of output 1 to 3 are different for each type of selection, and computation result is as follows.
  Type 1 O_2CP value/temperature/EMF
  Type 2 CO_2CP value/temperature
  Type 3 O_2CP value/ CO_2CP value/temperature/EMF
- Output scale: available to set each computation method

1.	O_2CP value	0.000 to 2.000
2.	CO_2CP value	0.000 to 2.000
3.	Temperature	K, N thermocouple: 0 to 1200/R, S thermocouple: 0 to 1700

- Output update period: Less than 2 seconds at 3 points
- Output resolution: About 1/10000
- Output accuracy: 1. Output 1 (DAC): ±0.1% (for indication value)
  2. Output 2 (PWM): ±0.3% (for indication value)
  3. Output 3 (PWM): ±0.3% (for indication value)
- Isolation: Isolate between each input and output, do not isolate among outputs
- First order leg computation: Available to set first order leg computation of output (OFF, 1 to 100 seconds)

2) Impedance abnormal output
- Output signal: Relay output: ON during abnormal
- Contact capacity: Resistive load 100V AC 3A、200V AC 3A、30V DC 3A
  Inductive load 100V AC 1.5A、200V AC 1.5A、30V DC 1.5A
- Electrical life duration: About more than 100,000 times

3) Deviation alarm output of CP computation value
Make the determine of follows by computation result of CP value
| CP value (O_2) – CP value (CO_2) | ＞ Deviation set value
Alarm output is ON during the above formula
・Output signal: Relay output ON during alarm
・Contact capacity: Resistive load 100V AC 3A、200V AC 3A、30V DC 3A
Inductive load 100V AC 1.5A、200V AC 1.5A、30V DC 1.5A
・Setting range: 0.000 to 0.999 (0.000 is without alarm computation.)
・Dead band: 0.1% fixed
・Electrical life duration: About more than 100,000 times

3. Impedance check function

1) O_2 input perform the impedance check once when contact input for impedance is ON more than 3 seconds or front IMP. CHK key is pressed more than 3 seconds.
However, not perform it for temperature less than 800℃.
Front IMP lamp is lighted during operation.
2) Impedance check measure O_2 input by inserting 1MΩ resistance to O_2 input circuit and waiting for about 10 seconds.
3) Display calculated impedance value in display 2 for 5 seconds.
4) Abnormal output signal is ON for impedance abnormality when calculated result is over the set value. (Set value: 0 to 30kΩ)
Abnormal output signal is reset by following situations. (Without backup)
1. Perform the impedance check again and be in normal range.
2. Turn on the power again.
3. Execute impedance abnormality reset of setting mode.
Note) During impedance check operation, computation function is stopped and last value (computation result, analog output) is stored, and key operation is rejected.

4. Computation specifications

1) Computation for O_2 input (Require CP value of temperature, O_2, and CO)
Exception of CP value computation
CP value is fixed 2.000 when temperature input is less than 500℃ (including lower limit scale out).
CP value is fixed 2.000 when temperature input is less than 1350℃ (including upper limit scale out).
CP value is proportion to O_2 input and reaches 2.000 when CP value is more than 1.68.

2) Computation for CO_2 input (Require CP value of temperature, CO_2, and CO)
Exception of CP value computation
CP value is fixed 2.000 when temperature input is less than 500℃ (including lower limit scale out).
CP value is fixed 2.000 when temperature input is less than 1350℃ (including upper limit scale out).
CP value is fixed 2.000 when CP value is more than 1.68.

5. CP value correction function

1) There is the function which is CP value is corrected by following formula. Corrected CP value is used display and output.
Available to set in range of -19.9 to 19.9 (A) and -0.999 to 0.999 (B and C).
Available to set each computation of O_2 input and computation of CO_2 input.

$CPn = CP \times A + B + C$

A: Ratio
B: Bias
C: Bias
CPn: CP value after correcting
CP: CP value before correcting

2) Setting of A and B is always effective and C is added when external shift contact signal is ON. Front CPSF lamp lights when external shift contact signal is ON.

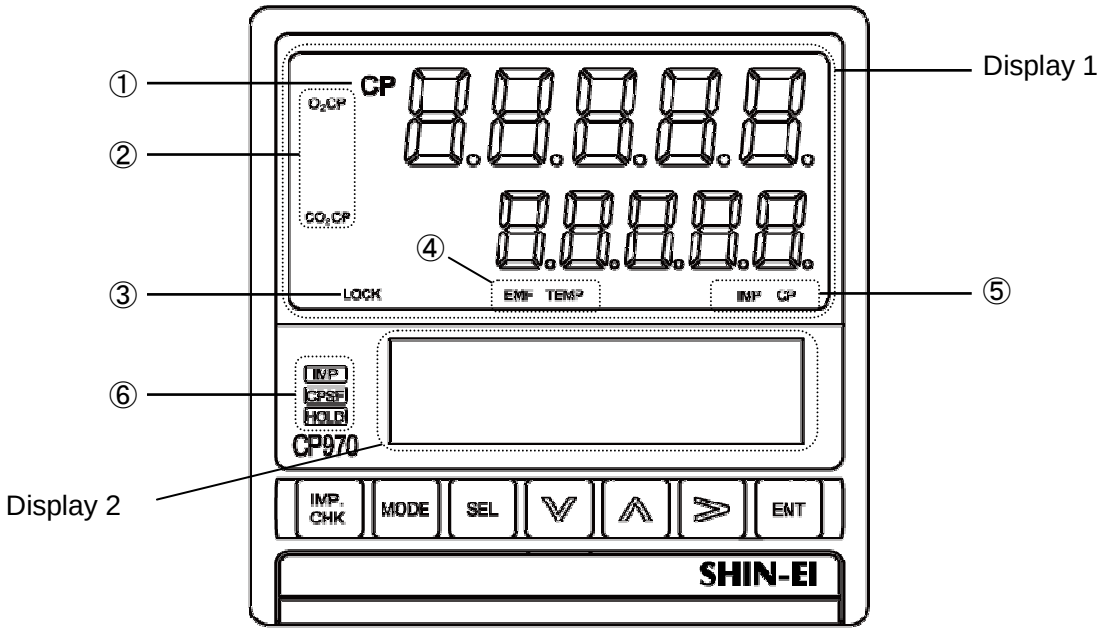
Example) A = 1.1, B = 0.05, C = -0.06 is set and computation result of CP value is 1.234.
CP value after correcting is

$CPn = 1.234 \times \underline{1.1}_{A} + \underline{0.05}_{B} = 1.4074$

When external shift contact signal is ON, CP vale after correcting is

$CPn = 1.234 \times \underline{1.1}_{A} + \underline{0.05}_{B} - \underline{0.06}_{C} = 1.3474$

6. Explanation of status



① (green) Display CP value
Light for O_2CP mode and CO_2CP mode

② (yellow green) Upper stage displays O_2CP and lower stage displays CO_2CP
Light for O_2CO_2CP mode

③ (yellow green) Display lock status
Light for setting key lock

④ (yellow green) Display lower display item which is set by setting mode
In case of extinction, display CO_2 calculation result

⑤ (red) Display alarm status
IMP Impedance abnormality
CP CP value deviation alarm

⑥ (yellow green) Display external signal input status
IMP Impedance check
CPSF CP correction value C
HOLD CP value hold

7. Explanation of operation key

Operation key	Description
IMP. CHK	Execution impedance check by pressing the key more than 3 seconds
MODE	Into setting mode screen
SEL	Move to next parameter for operation mode and setting mode
∨	Change the number down of each parameter and each digit
∧	Change the number up of each parameter and each digit
>	Change the digit of each parameter, Cursor movement of each parameter selection item Switch effective/invalid of key lock by pressing the key more than 3 seconds during operation mode
ENT	Settlement of parameter changes

8. General specifications

・Rated power voltage: 100V to 240V AC 50/60Hz free
・Allowable power voltage: 90 to 264V AC
・Working temperature range: -10 to 50℃ (Maximum 40℃ during closed instrumentation)
・Working humidity range: 10 to 90%RH (no dew condensation)
・Insulation resistance: Between primary terminal and secondary terminal 500V DC more than 20MΩ
Between primary terminal and ground terminal 500V DC more than 20MΩ
Between secondary terminal and ground terminal 500V DC more than 20MΩ
*Primary terminal: Each terminal of power supply and alarm terminal
Secondary terminal: Terminal of other than those above
・Withstand voltage: Between primary terminal and secondary terminal 1500V AC for 1 minute
Between primary terminal and ground terminal 1500V AC for 1 minute
Between secondary terminal and ground terminal 500V AC for 1 minute
*Primary terminal: Each terminal of power supply and alarm terminal
Secondary terminal: Terminal of other than those above
・Power failure protection: Settings are stored by EEPROM (number of rewriting less than 100,000 times)
・Power consumption: Maximum 20VA
・Case assemble material: Nonflammable polycarbonate
・Color: Grey
・Weight: About 580g

3 Operation procedure

1. Operation mode
   Display 1 is always displayed CP value, EMF, and etc. Switch the display 2 every pressing [SEL] key and switch to setting mode screen after pressing [MODE] key.

2. Setting mode

   1) Type selection
      Switch to setting mode (CP computation mode selection screen) after pressing [MODE] key in operation mode.

      Type 1 Display CP value computed from O_2 in upper of display 1, and display computed result of CO_2 in display 2.
      Type 2 Display CP value computed from CO_2 in upper of display 1, and display analog input value of CO_2 in display 2.
      Type 3 Display CP value computed from O_2 in upper of display 1, display CP value computed from CO_2 in lower of display 1 (depending on setup), and display analog input value of CO_2 in display 2 (depending on setup).

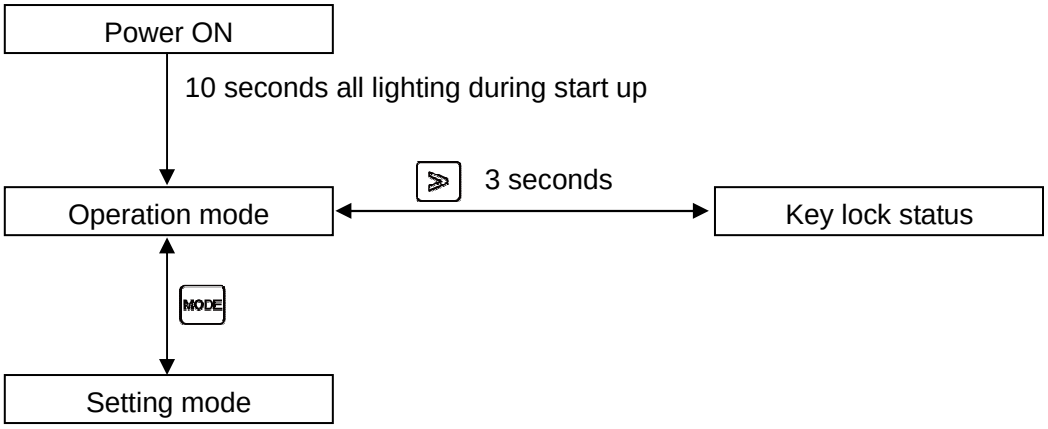
   2) Setting parameter
      Switch to setting mode (CP computation mode selection screen) after pressing [MODE] key in operation mode. Switch each parameter setting screen of setting mode every pressing [SEL] key.
      There are following items of setting mode.

      ①CP computation mode selection, ②Lower stand display item selection,
      ③Thermocouple type, ④Temperature unit, ⑤CP value decimal point,
      ⑥EMF/temperature decimal point, ⑦Transmission type,
      ⑧Output scale of O_2 computation CP value, ⑨Output scale CO_2 computation CP value,
      ⑩EMF output scale, ⑪Temperature output scale, ⑫CP deviation alarm set value,
      ⑬O_2 scale upper limit value, ⑭With or without of first order leg computation of output,
      ⑮CO correction, ⑯CO_2 correction, ⑰Key lock setting, ⑱Impedance abnormal reset,
      ⑲Impedance abnormal determine value, ⑳Initialize of set value

3. Key lock
   Become the key lock status after pressing [≫] key more than 3 seconds in operation mode.
   Reset the key lock after pressing [≫] key more than 3 seconds in key lock status.
   Light the lock lamp during key lock.
   Available to set following level for setting mode parameter.

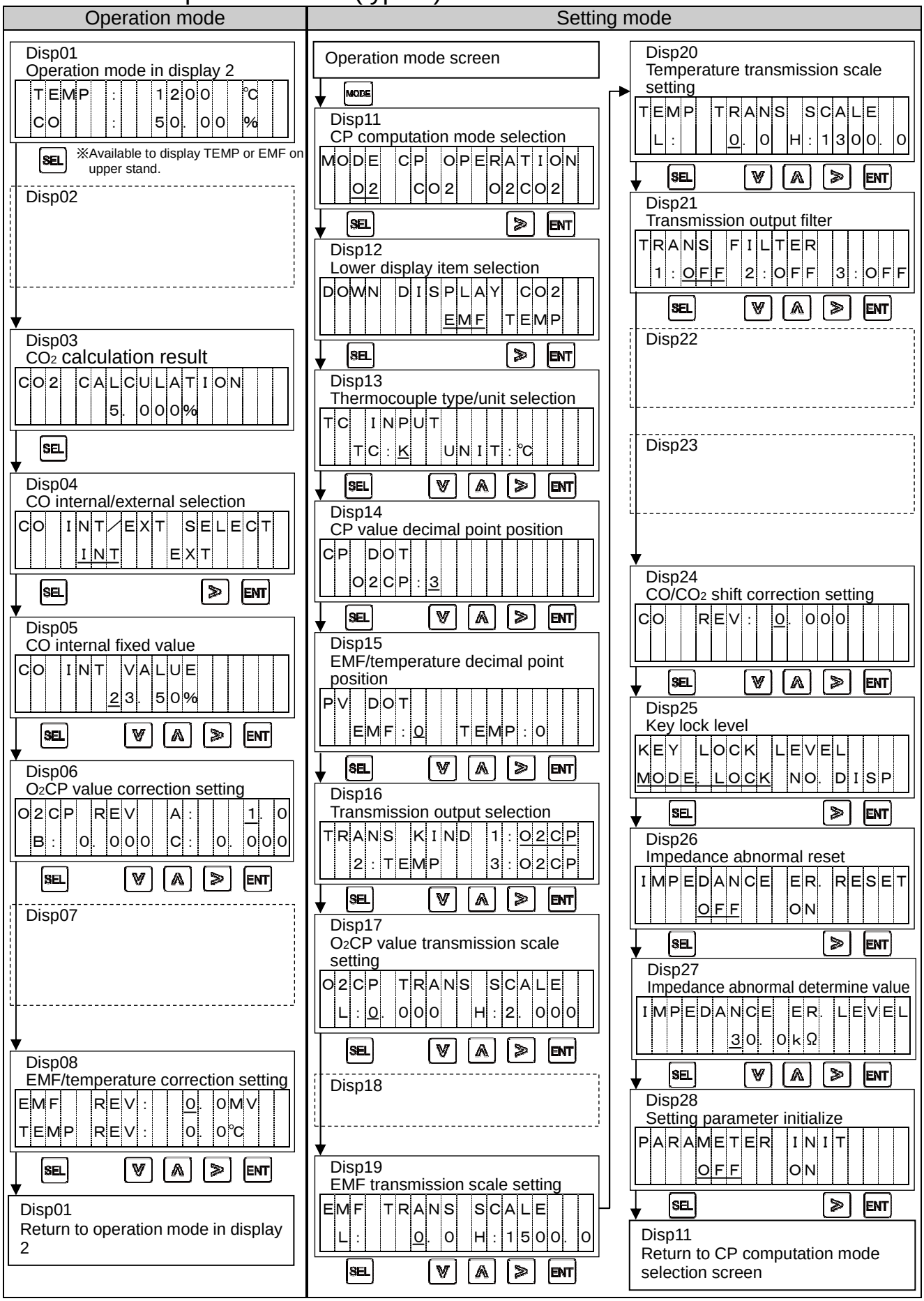
   MODE. LOCK Display mode screen, but do not change setting.
   NO. DISP Do not display mode screen.

[Flow chart]

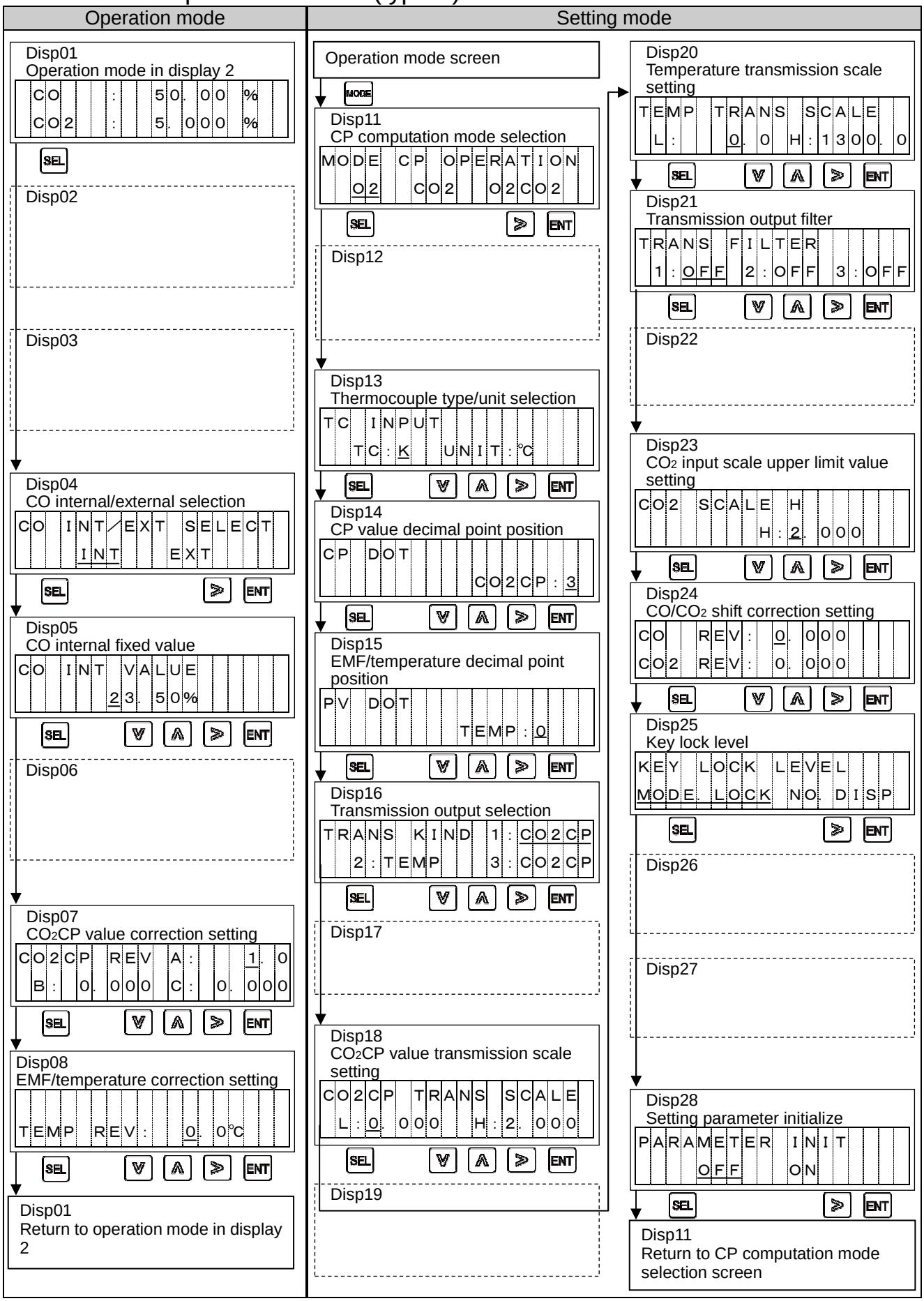


4 Parameter directory

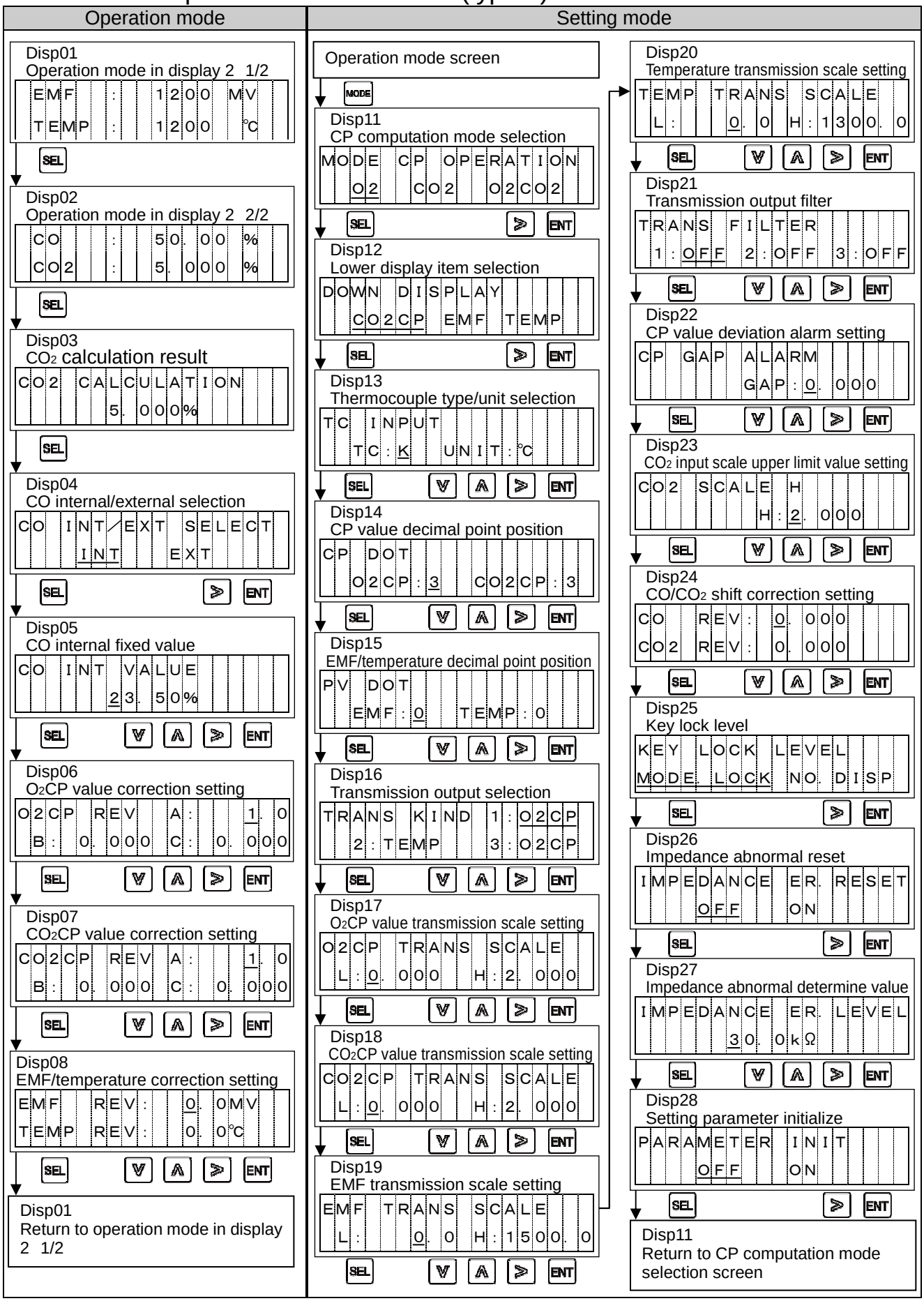
CP value computed from O_2 (type 1)



CP value computed from CO_2 (type 2)



CP value computed from O_2 and CO_2 (type 2)



5 Parameter list

1. Operation mode

Disp No.	Operation parameter	Initial value	Setting range	Each type of display*1		
				1	2	3
01	Operation mode display 2 1/2			◎	◎	◎
02	Operation mode display 2 2/2			-	-	◎
03	CO_2 calculation result			◎	-	◎
04	CO internal/external selection	INT	INT…Internal set value EXT…External analog input value	◎	◎	◎
05	CO internal fixed value	23.50%	0.00 to 50.00	◎	◎	◎
06	O_2CP value correction setting	A:1.0 B:0.000 C:0.000	A…±19.9 B…±0.999 C…±0.999	◎	-	◎
07	CO_2CP value correction setting	A:1.0 B:0.000 C:0.000	A…±19.9 B…±0.999 C…±0.999	-	◎	◎
08	EMF/temperature correction setting	EMF: 0.0MV TEMP: 0.0℃	EMF…±19.9mV Temperature…±19.9℃	◎	◎*2	◎

*1 Displayed parameter is different by selection of setting mode (CP computation mode selection screen).

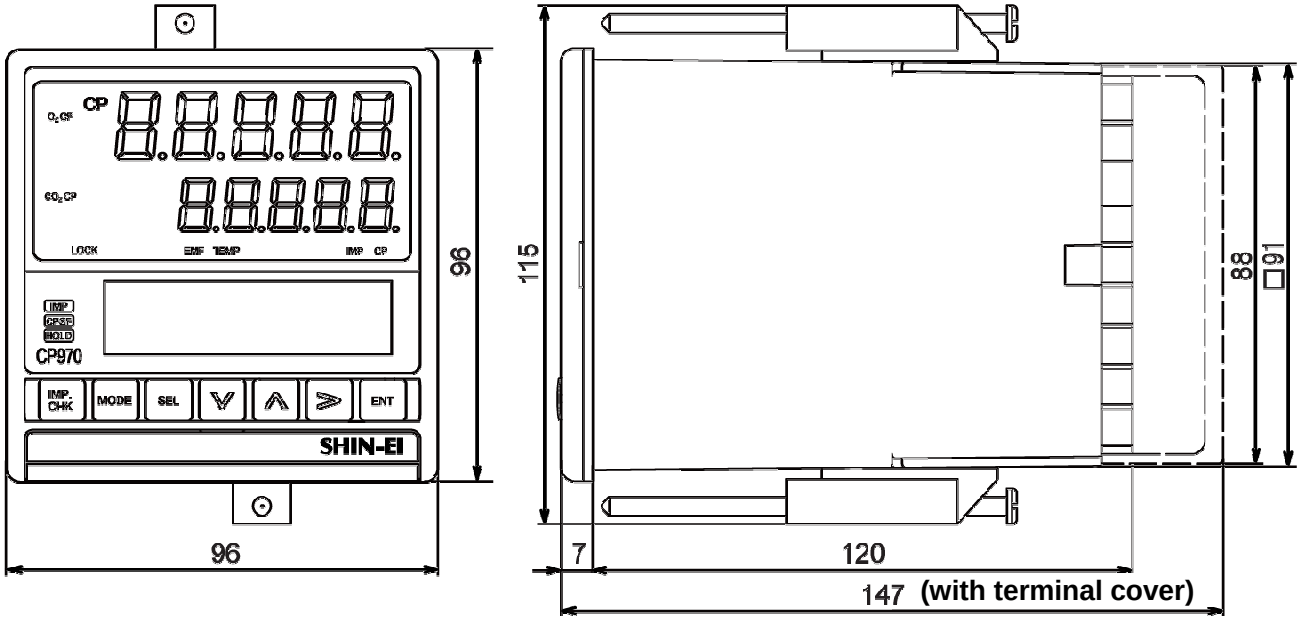
- ・Type 1 CP value computed from O_2
- ・Type 2 CP value computed from CO_2
- ・Type 3 CP value computed from O_2 and CO_2

*2 EMF is not displayed and set when select type 2 (CO_2CP value) in CP computation mode.

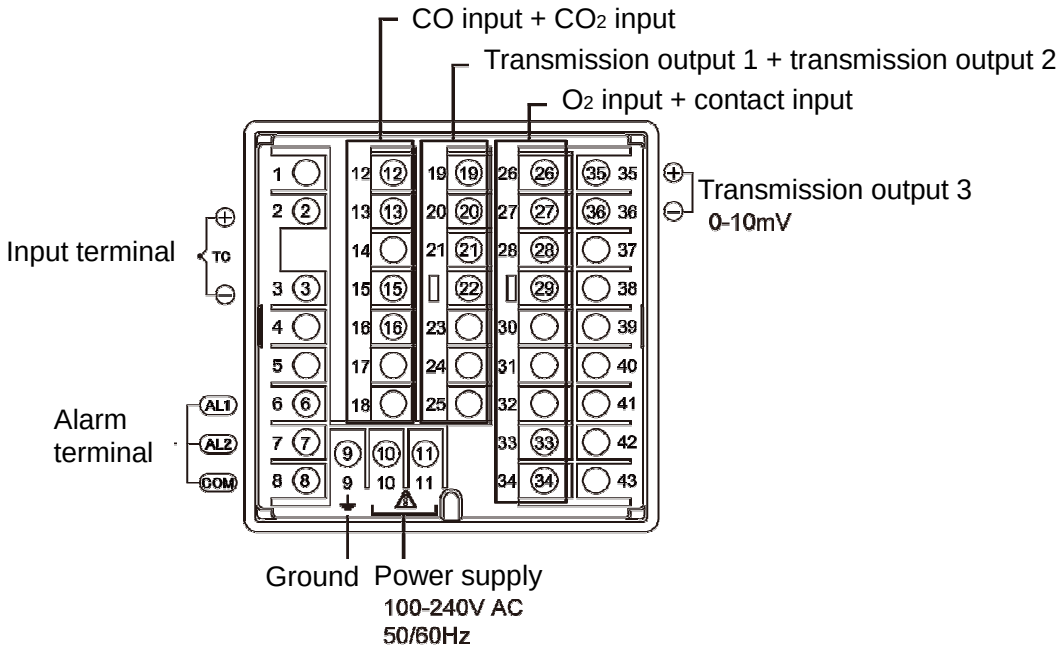
2. Setting mode

Disp No.	Operation parameter	Initial value	Setting range	Each type of display *1		
				1	2	3
11	CP computation mode selection Type 1 Display CP value computed from O_2 in upper of display 1, and display computed result of CO_2 in display 2. Type 2 Display CP value computed from CO_2 in upper of display 1, and display analog input value of CO_2 in display 2. Type 3 Display CP value computed from O_2 in upper of display 1, display CP value computed from CO_2 in lower of display 1 (depending on setup), and display analog input value of CO_2 in display 2 (depending on setup).	O2	O_2/CO_2/O_2CO_2	◎	◎	◎
12	Lower display item selection	Type 1 EMF Type 2 - Type 3 CO2CP	CO_2CP/EMF/ TEMP/CO_2 CO_2CP selection is not displayed during O_2CP mode. CO_2 selection is not displayed during O_2CO_2CP mode.	◎	-	◎
13	Thermocouple type/unit selection	TC: K UNIT: ℃	Thermocouple…K/N/R/S Unit…℃/F	◎	◎	◎
14	CP value decimal point position	O2CP: 3 CO2CP: 3	O_2CP…1 to 3 CO_2CP…1 to 3 CO_2CP value is not displayed during O_2CP mode. O_2CP value is not displayed during CO_2CP mode.	◎	◎	◎
15	EMF/temperature decimal point position	EMF: 0 TEMP: 0	EMF…0/1 TEMP…0/1 EMF decimal point is not displayed during CO_2CP mode.	◎	◎	◎
16	Transmission output selection	Type 1 Output 1: O2CP Output 2: TEMP Output 3: O2CP Type 2 Output 1: CO2CP Output 2: TEMP Output 3: CO2CP Type 3 Output 1: O2CP Output 2: TEMP Output 3: O2CP	O_2CP/CO_2CP/ TEMP/EMF CO_2CP transmission is not appeared in selection during O_2CP mode. O_2CP/EMF transmission is not appeared in selection during CO_2CP mode.	◎	◎	◎
17	O_2CP value transmission scale setting	L: 0.000 H: 2.000	L…0.000 to 0.500 H…0.000 to 2.000 But, L<H	◎	-	◎
18	CO_2CP value transmission scale setting	L: 0.000 H: 2.000	L…0.000 to 0.500 H…0.000 to 2.000 But, L<H	-	◎	◎
19	EMF transmission scale setting	L: 0.0 H: 1500.0	L…0.0 to 1500.0 H…0.0 to 1500.0 But, L<H	◎	-	◎
20	Temperature transmission scale setting	L: 0.0 H: 1300.0	L…Input lower limit value to input upper limit value H…Input lower limit value to input upper limit value But, L<H Scale L and H are linked to thermocouple input range K/N…0.0 to 1300.0 R/S…0.0 to 1700.0	◎	◎	◎
21	Transmission output filter	Output 1: OFF Output 2: OFF Output 3: OFF	OFF, 1 to 10 seconds Available to set transmission 1 to 3 individually OFF for every output, set 1 to 10 seconds	◎	◎	◎
22	CP value deviation alarm setting	0.000	0.000 to 0.999	-	-	◎
23	CO_2 input scale upper limit value setting	2.000	0.000 to 5.000	-	◎	◎
24	CO/CO_2 shift correction setting	CO: 0.000 CO2: 0.000	CO correction…±0.099 CO_2 correction…±0.099	◎	◎	◎
25	Key lock level	MODE. LOCK	MODE. LOCK/NO. DISP MODE. LOCK…Display mode, but no setting change NO. DISP…No mode display	◎	◎	◎
26	Impedance abnormal reset	OFF	OFF/ON Automatically change to OFF after ON	◎	-	◎
27	Impedance abnormal determine value	30.0kΩ	0.0 to 30.0kΩ	◎	-	◎
28	Setting parameter initialize	OFF	OFF/ON Return to cursor OFF after initialize	◎	◎	◎

6 External dimensions



Unit: mm



[Terminal arrangement]

Thermocouple input K, N, R, S Alarm output	
1	
2	TC ・
3	TC ・
4	
5	
6	Impedance abnormality
7	CP deviation alarm
8	COM

CO input + CO_2 input		Transmission output 1 1 to 5V Transmission output 2 1 to 5 V		O_2 input + Contact input	
12	CO ・	19	Output 2 ・	26	Impedance check
13	CO ・	20	Output 2 ・	27	CP shift
14		21	Output 1 ・	28	PV hold
15	CO_2 ・	22	Output 1 ・	29	COM
16	CO_2 ・	23		30	
17		24		31	
18		25		32	
				33	O_2 ・
				34	O_2 ・

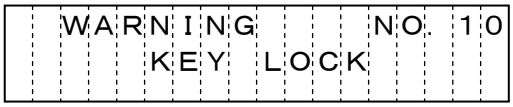
Transmission output 3 0 to 10mV	
35	Output 3 ・
36	Output 3 ・

7 Error and warning

1. Error

Display	Content	Cause/action on error
	Calibration data error	Calibration data is destroyed. Contact your dealer or our nearest office.
	A/D conversion error for thermocouple	A/D conversion of analog input is not functioning properly. When this error is displayed after pressing ENT key, turn off the power once and turn on the power. If the error is not improved, contact your dealer or our nearest office.
	A/D conversion error for RJ	
	A/D conversion error for EMF	
	A/D conversion error for CO/CO_2	

2. Warning

Display	Content	Cause/action on error
	Key lock	Display for tying to setting change during key lock. Reset the key lock for setting change. (Press ≫ key more than 3 seconds in operation mode.)
	Transmission scale setting range error	Display for L≧H in transmission scale. Check the setting range.

8 Parameter sheet

Date :
Number :

1. Operation mode

(Parameter sheet 1/2)

Disp No.	Operation parameter	Set value	Initial value	Setting range	Each type of display*1		
					1	2	3
01	Operation mode in display 2 1/2				◎	◎	◎
02	Operation mode in display 2 2/2				-	-	◎
03	CO_2 calculation result				◎	-	◎
04	CO internal/external selection		INT	INT…Internal setting value EXT…External analog input value	◎	◎	◎
05	CO internal fixed value		23.50%	0.00 to 50.00	◎	◎	◎
06	O_2CP value correction setting		A: 1.0 B: 0.000 C: 0.000	A…±19.9 B…±0.999 C…±0.999	◎	-	◎
07	CO_2CP value correction setting		A: 1.0 B: 0.000 C: 0.000	A…±19.9 B…±0.999 C…±0.999	-	◎	◎
08	EMF/temperature correction setting		EMF: 0.0MV TEMP: 0.0℃	EMF…±19.9mV Temperature…±19.9℃	◎	◎*2	◎

*1 Displayed parameter is different by selection of setting mode (CP computation mode selection screen).

- Type 1 CP value computed from O_2
- Type 2 CP value computed from CO_2
- Type 3 CP value computed from O_2 and CO_2

*2 EMF is not displayed and set when select type 2 (CO_2CP value) in CP computation mode.

Date :
Number :

2. Setting mode

(Parameter sheet 2/2)

Disp No.	Operation parameter	Set value	Initial value	Setting range	Each type of display*1		
					1	2	3
11	CP computation mode selection Type 1 Display CP value computed from O_2 in upper of display 1, and display computed result of CO_2 in display 2. Type 2 Display CP value computed from CO_2 in upper of display 1, and display analog input value of CO_2 in display 2. Type 3 Display CP value computed from O_2 in upper of display 1, display CP value computed from CO_2 in lower of display 1 (depending on setup), and display analog input value of CO_2 in display 2 (depending on setup).		O2	O_2/CO_2/O_2CO_2	◎	◎	◎
12	Lower display item selection		Type 1 EMF	CO_2CP/EMF/ TEMP/CO_2 CO_2CP selection is not displayed during O_2CP mode. CO_2 selection is not displayed during O_2CO_2CP mode.	◎	-	◎
			Type 2 -				
			Type 3 CO2CP				
13	Thermocouple type/unit selection		TC: K UNIT: ℃	Thermocouple…K/N/R/S Unit…℃/F	◎	◎	◎
14	CP value decimal point position		O2CP: 3 CO2CP: 3	O_2CP…1 to 3 CO_2CP…1 to 3 CO_2CP value is not displayed during O_2CP mode. O_2CP value is not displayed during CO_2CP mode.	◎	◎	◎
15	EMF/temperature decimal point position		EMF: 0 TEMP: 0	EMF…0/1 TEMP…0/1 EMF decimal point is not displayed during CO_2CP mode.	◎	◎	◎
16	Transmission output selection		Type 1 Output 1: O2CP Output 2: TEMP Output 3: O2CP	O_2CP/CO_2CP/ TEMP/EMF CO_2CP transmission is not appeared in selection during O_2CP mode. O_2CP/EMF transmission is not appeared in selection during CO_2CP mode.	◎	◎	◎
			Type 2 Output 1: CO2CP Output 2: TEMP Output 3: CO2CP				
			Type 3 Output 1: O2CP Output 2: TEMP Output 3: O2CP				
17	O_2CP value transmission scale setting		L: 0.000 H: 2.000	L…0.000 to 0.500 H…0.000 to 2.000 But, L<H	◎	-	◎
18	CO_2CP value transmission scale setting		L: 0.000 H: 2.000	L…0.000 to 0.500 H…0.000 to 2.000 But, L<H	-	◎	◎
19	EMF transmission scale setting		L: 0.0 H: 1500.0	L…0.0 to 1500.0 H…0.0 to 1500.0 But, L<H	◎	-	◎
20	Temperature transmission scale setting		L: 0.0 H: 1300.0	L…Input lower limit value to input upper limit value H…Input lower limit value to input upper limit value But, L<H Scale L and H are linked to thermocouple input range K/N…0.0 to 1300.0 R/S…0.0 to 1700.0	◎	◎	◎
21	Transmission output filter		Output 1: OFF Output 2: OFF Output 3: OFF	OFF, 1 to 10 seconds Available to set transmission 1 to 3 individually OFF for every output, set 1 to 10 seconds	◎	◎	◎
22	CP value deviation alarm setting		0.000	0.000 to 0.999	-	-	◎
23	CO_2 input scale upper limit value setting		2.000	0.000 to 5.000	-	◎	◎
24	CO/CO_2 shift correction setting		CO: 0.000 CO2: 0.000	CO correction…±0.099 CO_2 correction…±0.099	◎	◎	◎
25	Key lock level		MODE. LOCK	MODE. LOCK/NO. DISP MODE. LOCK…Display mode, but no setting change NO. DISP…No mode display	◎	◎	◎
26	Impedance abnormal reset		OFF	OFF/ON Automatically change to OFF after ON	◎	-	◎
27	Impedance abnormal determine value		30.0kΩ	0.0 to 30.0kΩ	◎	-	◎
28	Setting parameter initialize		OFF	OFF/ON Return to cursor OFF after initialize	◎	◎	◎

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Printed in Japan