

**INTELLIGENT THERMO METER  
TYPE MDP-TEM**

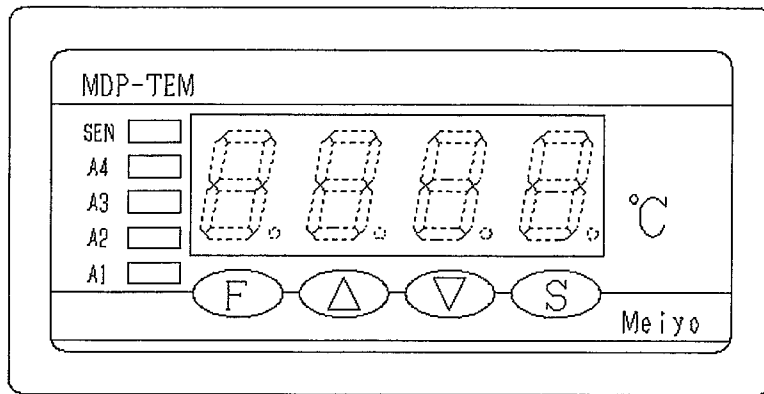
**INSTRUCTION MANUAL**

MEIYO ELECTRIC CO.,LTD.

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## 1. Overview

This product is a temperature monitoring equipment with digital display, which is a compact and highly functional thermometer using microcomputer and is characterized by high level of accuracy, flexible alarm setting and wide applicable range.

## 2. Features and functions

Input specification conforms to platinum resistance thermometer (Pt100Ω), K-type thermocouple and current (4 to 20 mA). (For each special circuit board)

High level of measuring accuracy (0.5% (at input F.S.)  $\pm$  1 digit)

Digital display of max. 4 digits

Alarm detection comes in 4 types, (the upper limit, lower limit, N/O and N/C) can be set

Highly withstand voltage semiconductor contact output (withstand voltage 1500V, 100VAC 0.1A)

Sensor disconnection detectable (being co-used with CPU fault)

4 to 20 mA analog output

Using a load/unload type terminal block, with sensor input terminal being gold-plated

### 3. Specifications

Measuring accuracy

0.5% (at input FS.)  $\pm 1$  digit

Performance guarantee temperature range

+5 to +55°C

Temperature coefficient

$\pm 0.03\%/^{\circ}\text{C}$

Display range

0 to 9999 (decimal point being displayed according to range)

Power supply

DC24V  $\pm 25\%$  Max.3W

Input specifications

Not insulated from power supply

Platinum resistance thermometer Pt100 $\Omega$ , for low temperature (200°C) or high temperature (700°C)

K-type thermocouple, for low temperature (300°C) or high temperature (1200°C)

Current 4 to 20 mA

Software adjustment (resolution: about 0.05% of input range)

Setting range

Range corresponding to input specification is set.

Analog output range and sensor fault detection range ( $-5\%$  or less,  $105\%$  or more) are specified.

Analog output

Not insulated from power supply

Output range is specified by the range setting.

4 to 20 mA accuracy  $\pm 0.5\%$ , load resistance: 500 $\Omega$  or less

Resolution 1000 (0.1%)

Software adjustment ( $\pm 9.9\%$ )

Contact output

5 ch (SF, A1, A2, A3 and A4), insulated from power supply and internal system

No-voltage semiconductor contact

AC100V 0.1A, withstand voltage 1500V

SF (sensor fault) is fixed to N/C. A1, A2, A3 and A4 shall select N/O or N/C.

In time of sensor fault, however, all contact outputs are OFF.

Sensor fault signal (indicator, contact output) includes CPU fault function.

Sensor fault is detected immediately, and recovered in 5 seconds delay.

Display

Numeric values in max.4 digits, with brightness adjustable (20 steps)

Display update speed

About 0.5 seconds

Contact output response speed

Within 0.3 seconds

## 4. Set values and operational specifications

### 4.1. Input and scale range

This equipment uses following three types of input signals (type of circuit board).

- (1) Platinum resistance thermometer Pt100Ω, for low temperature (200°C) or high temperature (700°C)
- (2) K-type thermocouple, for low temperature (300°C) or high temperature (1200°C)
- (3) Current 4 to 20 mA

#### ① Scale range 0 to 44

In the above input, a scale range (measuring range) should be set from the following table as the detection ranges for analog output and sensor fault.

Sensor type	Scale	Span	Offset	Display	Number
Pt100Ω Low temp.	-50.0 ~ 50.0	1000	-500	XX.X	1
	-75.0 ~ 75.0	1500	-75	XX.X	2
	-100 ~ 100	200	-100	XXX	3
	-70.0 ~ 30.0	1000	-700	XX.X	4
	-50.0 ~ 100.0	1500	-500	XX.X	5
	-50 ~ 150	2000	-500	XXX	6
	0.0 ~ 100.0	1000	0	XX.X	8
	0.0 ~ 150.0	1500	0	XX.X	9
	0 ~ 200	200	0	XXX	10
Pt100Ω High temp	-200 ~ 100	300	-200	XXX	13
	-100 ~ 200	300	-100	XXX	14
	0 ~ 300	300	0	XXX	15
	0 ~ 400	400	0	XXX	16
	0 ~ 600	600	0	XXX	17
	0 ~ 700	700	0	XXX	18
K type thermocouple Low temp.	-100 ~ 100	200	-100	XXX	21
	-100 ~ 200	300	-100	XXX	22
	0 ~ 200	200	0	XXX	25
	0 ~ 300	300	0	XXX	26
K type thermocouple High temp.	0 ~ 600	600	0	XXX	31
	0 ~ 700	700	0	XXX	32
	0 ~ 800	800	0	XXX	33
	0 ~ 1000	1000	0	XXXX	34
	0 ~ 1200	1200	0	XXXX	35
Current 4~20mA	□□□□	Free	Free	XXXX	41
	□□□.□			XXX.X	42
	□□.□□			XX.XX	43
	□.□□□			X.XXX	44

The high temperature and low temperature of "Pt100Ω" and "K-type thermocouple" are selected by internal jumper setting.

If the type is a negative range other than "Current", the circuit constant should be changed.

If the type is "4 to 20 mA", set the position of decimal point and set the scale range separately.

Sensor fault shall be detected in case the measured value is the range set as above minus 5% or less, or in case the measured value becomes 105% or more.

#### 4.2. Current signal input

If the measured input is a current, display scale should be set.

Scale shall be set by span and offset.

This value shall be set automatically (to fixed value) in case the input sensor type in Item a. is "Pt100Ω" or "K-type thermocouple", and set separately in the case of "Current".

##### ② Input span 10 to 999

Divide the value by 10 by removing decimal point, and result shall be set in the range of 10 to 999.

If the offset of c. is not "0", be sure to include offset.

[Example]

-0.100 to +0.400 → Span is "50".

##### ③ Input offset -999 to 999

If the measuring range starts from zero, the offset is zero. If the measuring range starts from negative number, divide the value by 10 by removing sign and decimal point, and then, the result shall be set in the range of -999 to 999.

#### 4.3. Alarm mode and contact output

This equipment enables four alarms to be set for the measured temperatures, and either of the upper limit detection and lower limit detection shall be set. Also as for the contact output, either of OFF in Normal (N/O) and ON in Normal (N/C) may be set. (If, however, any sensor fault occurs, all the contact outputs are OFF.)

##### ④ A1 alarm mode

Upper/lower limit modes are set by H (upper limit alarm)/L (lower limit alarm), and the contact output modes are set by A (N/O)/B (N/C).

##### ⑤ A2 alarm mode

Upper/lower limit modes are set by H (upper limit alarm)/L (lower limit alarm), and the contact output modes are set by A (N/O)/B (N/C).

##### ⑥ A3 alarm mode

Upper/lower limit modes are set by H (upper limit alarm)/L (lower limit alarm), and the contact output modes are set by A (N/O)/B (N/C).

##### ⑦ A4 alarm mode

Upper/lower limit modes are set by H (upper limit alarm)/L (lower limit alarm), and the contact output modes are set by A (N/O)/B (N/C).

#### 4.4. Setting A1 alarm

When using the A1 alarm, the following values shall be set.

##### ⑧ A1 ON set: within measuring range

Operating point of the alarm shall be set.

##### ⑨ A1 alarm delayed 0 to 99 seconds.

Alarm delay shall be set.

#### 4.5. Setting A2 alarm

When using the A2 alarm, the following values shall be set.

##### ⑩ A2 ON set: within measuring range

Operating point of the alarm shall be set.

##### ⑪ A2 alarm delayed 0 to 99 seconds.

Alarm delay shall be set.

#### 4.6. Setting A3 alarm

When using the A3 alarm, the following values shall be set.

- ⑫ A3 ON set: within measuring range  
Operating point of the alarm shall be set.
- ⑬ A3 alarm delayed 0 to 99 seconds.  
Alarm delay shall be set.

#### 4.7. Setting A4 alarm

When using the A4 alarm, the following values shall be set.

- ⑭ A4 ON set: within measuring range  
Operating point of the alarm shall be set.
- ⑮ A4 alarm delayed 0 to 99 seconds.  
Alarm delay shall be set.

#### 4.8. Hysteresis (A1, A2, A3 and A4)

Operating points of the alarms A1 to A4 are set individually. This setting shall be applied to the operation OFF point.  
Setting is made by % value against the measuring range.

- ⑯ Hysteresis  
0.0 to 10.0% (at FS)

## 5. Basic operation

### 5.1. Startup

When power is turned ON, all the LEDs go ON for about 1 seconds, and then become normal indication. In the meantime, regardless of input signal, the sensor fault output is OFF, and output is given thereafter according to input.

If [F]+[S] are pressed when power is turned ON, all the set values are cleared, and initialized to the following settings.

(Caution: It is necessary to calibrate because the adjustments of measured values and output value are also cleared.)





1.Scale range	9
2.Input span	-(1,500)
3.Input offset	-(0)
4.Measured input value zero (internal value)	2,000
5.Measured input value full (internal value)	17,800
6.Alarm mode	A1 to A4 Upper limit and N/O only
7.A1 ON value	40.0°C
8.A1 ON delay	0 sec
9.A2 ON value	50.0°C
10.A2 ON delay	0 sec
11.A3 ON value	60.0°C
12.A3 ON delay	0 sec
13.A4 ON value	70.0°C
14.A4 ON delay	0 sec
15.Hysteresis	2.0% at F.S.
16.Analog zero	±0.0%
17.Brightness	31(Maximum)

### 5.2. Normal status/display (normal mode)

In the normal display, the currently measured values are indicated. If any measured value is the alarm's set value or more (lower limit or less), the relevant contact output is ON, and the relevant indicator goes ON at the same time.

The sensor fault/CPU fault indicator is usually OFF. If either of them fails, the indicator goes ON, and the contact output is ON when normal and OFF when abnormal.

Under these conditions, the following keys are accepted.

-  Switches to the set value display mode.  
If held down for 3 seconds or so, the display is switched to the initialization mode.
-  Raises the brightness of the display.
-  Lowers the brightness of the display.
-  If held down for 3 seconds or so, the current brightness is saved.

\* When the power is turned ON at the next time, the saved brightness is used in the display.



## 6. Display of set value/set mode

If the [F] key is pressed in the normal mode, the display is switched to set value display mode. If brightness is lowered in the normal mode, display of max. brightness is selected temporarily when entering the set value display mode. When returning to the normal mode, the original brightness resumes.

In this mode, the following displays are shown sequentially each time the [F] key is pressed. If the [F] key is pressed in the last item, normal mode resumes.

- |                     |   |
|---------------------|---|
| ①Setting A1 ON      | Setting A1 alarm ON point                       |
| ②Setting A1 delay   | Setting A1 alarm delay time (sec.)              |
| ③Setting A2 ON      | Setting A2 alarm ON point                       |
| ④Setting A2 delay   | Setting A2 alarm delay time (sec.)              |
| ⑤Setting A3 ON      | Setting A3 alarm ON point                       |
| ⑥Setting A3 delay   | Setting A3 alarm delay time (sec.)              |
| ⑦Setting A4 ON      | Setting A4 alarm ON point                       |
| ⑧Setting A4 delay   | Setting A4 alarm delay time (sec.)              |
| ⑨Setting hysteresis | Setting A1 to A4 alarm ON-OFF width (%) at F.S. |

If the [S] key is held down when each item is being displayed, the set value display mode of the relevant item is selected. When entering the value setting mode, measurement stops, and the external output and external contacts are frozen temporarily.

If no action is taken for 3 minutes while either of the set values is being displayed or set, normal mode resumes automatically.

### 6.1. Setting A1 ON

ON point set value of A1 alarm is displayed.

When entering this mode, the [A1] lamp starts to blink, and the currently set value is displayed in the numeric value display (goes ON continuously).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.2).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

When changing the set value by pushing the "▲" or "▼" key, the value increases or decreases by  $\pm 1$  step if each single key is pressed. If, however, the same key is held down, the repeat mode is selected to allow for continuous entry. If the key continues to be held down further thereafter, fast forward starts, thus allowing the value to be changed by steps of 10/50 times as large. Please note that the setting range shall be within the measuring range.

## 6.2. Setting A1 delay

Delay time of A1 alarm is displayed (unit: seconds).

When entering this mode, the [A1] lamp starts to blink, and "d" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed in the 3 digits to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.3).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 0 to 99 (seconds).

## 6.3. Setting A2 ON

ON point set value of A2 alarm is displayed.

When entering this mode, the [A2] lamp starts to blink, and the currently set value is displayed in the numeric value display (goes ON continuously).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.4).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be within the measuring range.

#### 6.4. Setting A2 delay

Delay time of A2 alarm is displayed (unit: seconds).

When entering this mode, the [A2] lamp starts to blink, and "d" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed in the 3 digits to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.5).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 0 to 99 (seconds).

#### 6.5. Setting A3 ON

ON point set value of A3 alarm is displayed.

When entering this mode, the [A3] lamp starts to blink, and the currently set value is displayed in the numeric value display (goes ON continuously).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.6).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be within the measuring range.

#### 6.6. Setting A3 delay

Delay time of A3 alarm is displayed (unit: seconds).

When entering this mode, the [A3] lamp starts to blink, and "d" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed in the 3 digits to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.7).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 0 to 99 (seconds).

#### 6.7. Setting A4 ON

ON point set value of A4 alarm is displayed.

When entering this mode, the [A4] lamp starts to blink, and the currently set value is displayed in the numeric value display (goes ON continuously).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.8).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be within the measuring range.

## 6.8. Setting A4 delay

Delay time of A4 alarm is displayed (unit: seconds).

When entering this mode, the [A4] lamp starts to blink, and "d" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed in the 3 digits to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.9).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 0 to 99 (seconds).

## 6.9. Setting hysteresis

ON-OFF width (% of full scale) of the A1 to 4 alarms is displayed.

When entering this mode, the [A1], [A2], [A3] and [A4] lamps start to blink, and "H" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 6.10).  
If held down for 3 seconds or so, display is switched to the initialization mode (See Item 7).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 0.0 to 10.0%.

## 7. Initialization display/setting mode

This mode is selected by holding down the [F] key in the "Normal mode" or "Set value display/setting mode". If the brightness is lowered in the normal mode, display of max. brightness is selected temporarily when entering the set value display mode. When returning to normal mode, the original brightness resumes. In this mode, the following displays are shown sequentially each time the [F] key is pressed. If the [F] key is pressed again at the last item, the normal mode resumes.

- ① Setting of scale range;  
Setting of measuring range
- ② Setting of input span;  
Width of input range
- ③ Setting of input offset;  
Offset of input
- ④ Setting of alarm mode;  
Upper/lower limit of alarm, N/O, N/C mode
- ⑤ Adjustment of measured values;  
Check and adjustment of measured values
- ⑥ Analog output;  
For adjustment of analog output

When entering the initialization mode, measurement is stopped, and the external output and external contacts are frozen temporarily. (When returning to normal mode again, measurement is restarted. However, delay of 1 to 2 seconds occurs.)

If the [S] key is held down while each item is being displayed, the set value display mode of the relevant item is selected. If no action is taken for 3 min while either of the set values is being displayed, normal mode resumes automatically.

### 7.1. Setting scale range

As the detecting range for analog output or sensor fault, scale range (measuring range) should be set. (See the table of scale range in Item 4.1.)

When entering this mode, "1" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 7.2).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 1 to 44.

## 7.2. Setting input span

This is set in case the scale range is a current range (41 to 44). If any other range is set, the setting of this item is skipped, and the setting in Item 7.4 starts.

Set value is the value divided by 10 by removing decimal point. If the input offset in Item 7.3 is anything other than "0", the value including offset shall be set.

When entering this mode, "2" is displayed in the extreme left digit of the numerical value display, and the currently set value is displayed to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 7.3).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be 10 to 999.

## 7.3. Setting input offset

Similar to Item 7.2, this is set in case the scale range is a current range (41 to 44). If any other range is set, the setting of this item is skipped, and the setting in Item 7.4 starts.

When entering this mode, "3" is displayed in the extreme left digit of the numerical value display, and the currently set value divided by 10 is displayed to the right (continuously ON).

Under these conditions, the following keys are accepted.

- F** Switches to the next set value display mode (See Item 7.4).
- S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the numerical value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

- F** Cancels the change mode, and switches to the set value display mode resumes.
- ▲** Increases the set value.
- ▼** Decreases the set value.
- S** If held down for 3 seconds or so, the currently displayed value is set and saved.

For the repeat function of the "▲" and "▼" keys, see Item 6.1. Please note that the setting range shall be -999 to 999.

#### 7.4. Setting alarm mode

Upper limit, lower limit and output contact N/O and N/C modes in each alarm function are displayed.

When entering this mode, the [A1] lamp starts to blink, and "4" is displayed in the extreme left digit of the numerical value display, and the set value showing the current alarm mode is displayed to the right (continuously ON).

In the set value, the left digit is the upper/lower limit mode (H: upper limit, L: lower limit), and the right digit is the contact output mode (A: N/O, b: N/C).

First, the "A1" mode is displayed.

Under these conditions, the following keys are accepted.

**F** Each time the key is pressed, the display changes like A2, A3 and A4, and moves to the set value display mode thereafter (See Item 7.5).

**S** If held down for 3 seconds or so, the set value display mode of the relevant item is selected.

[Set value change mode]

When entering this mode, the set value display starts to blink, so that the set value can be changed.

Under these conditions, the following keys are accepted.

**F** Cancels the change mode, and the set value display mode.

**▲** Changes like HA switches to Hb switches to LA switches to Lb switches to HA each time this is pressed.

**▼** Changes like HA switches to Lb switches to LA switches to Hb switches to HA each time this is pressed.

**S** If held down for 3 seconds or so, the currently displayed value is set and saved.

Either of HA, Hb, LA and Lb shall be set.





### 7.5. Adjustment of measured values

Measured value of input is checked and adjusted.

When entering this mode, all the decimal points in all the digits go ON in the numerical value display, and the numerical value unit displays the currently measured value as an internal logical value in the full scale of 5000 (continuously ON).





Under these conditions, the following keys are accepted.

-  **F** Switches to the analog output adjustment mode.
-  **S** If held down for 3 seconds or so, input zero-adjustment mode is selected.

[Input zero-adjustment mode]

When entering this mode, the decimal point and number in 2 digits to the right of the numerical value display start to blink, and the currently measured value is displayed by logical value.





Reference signal of scale 0% is entered for the external sensor input, and adjustments are made by the following keys so that the displayed value may be zero.

-  **F** Cancels the setting, and switches to the full adjustment mode.
-  **▲** Increases the displayed value.
-  **▼** Decreases the displayed value.
-  **S** If held down for 3 seconds or so, the currently displayed value is set and saved, and switches to the full adjustment mode.

[Input full-adjustment mode]

When entering this mode, the decimal point and number in 2 digits to the left of the numerical value display start to blink, and the currently measured value is displayed by logical value.

Reference signal of 100% is entered for the external sensor input, and adjustments are made by the following keys so that the displayed value may be full (5000).



-  **F** Cancels the setting, and switches to the display mode of logical measured value.
-  **▲** Increases the displayed value.
-  **▼** Decreases the displayed value.
-  **S** If held down for 3 seconds or so, the currently displayed value is set and saved, and switches to the display mode of logical measured value.

## 7.6. Analog output

Analog output value is checked and adjusted.

When entering this mode, "A" is displayed in the extreme left digit of the numerical value display, and the current output value is displayed to the right (continuously ON).





Under these conditions, the following keys are accepted.

-  Switches to normal mode.
-  If held down for 3 seconds or so, the analog output adjustment mode is selected.

[Analog zero output adjustment mode]

When entering this mode, "b" is displayed continuously in the extreme left digit of the numerical value display, and the current zero-corrected value is displayed in blinking to the right. Analog output is fixed to "4.00 mA". Corrected value is added to the standard status by a % value.

Here, the output value (4 mA) is fine-adjusted by the following keys.





-  Cancels the setting, and switches to the Analog full output adjustment mode.
-  Increases the corrected value (output going up at the same time).
-  Decreases the corrected value (output coming down at the same time).
-  If held down for 3 seconds or so, the currently displayed value is set and saved.

Please note that the setting range shall be  $\pm 9.9\%$ , and no correction shall occur in time of 0.0%.

[Analog full output adjustment mode]

When entering this mode, "c" is displayed continuously in the extreme left digit of the numerical value display, and the current full-corrected value is displayed in blinking to the right. Analog output is fixed to "20.00 mA". Corrected value is added to the standard status by a % value.

Here, the output value (20 mA) is fine-adjusted by the following keys.

-  Cancels the setting, and switches to the output value display mode.
-  Increases the corrected value (output going up at the same time).
-  Decreases the corrected value (output coming down at the same time).
-  If held down for 3 seconds or so, the currently displayed value is set and saved.

Please note that the setting range shall be  $\pm 9.9\%$ , and no correction shall occur in time of 0.0%.