Instruction Manual

Digital Meter Relay Model 4256

I-01327

1. Preface

- Please take care that this instruction manual is certainly delivered to the person in charge of operating this instrument.
- Unpack the product and confirm that the following items are included.
  (1) 4256 main unit (2) Instruction manual (3) Stickers of units
  (4) Sticker to indicate comparison system (models provided with HI, GO, and LO only)
  (5) A connector is attached when the meter relay is provided with an optional GO open collector output.
- Cautions for use
  For safety use, please observe the following cautions.

• CAUTION

- **No power on-off switch is provided on the model 4256 so it immediately starts to work when connected to the power source. The rated data of this instrument is, however, defined with the pre-heating for 15 minutes or more.**
- **When the model 4256 is mounted into a system cabinet, take care for ventilation so that the inside temperature will not exceed 50°C.**
- **Do not use the instrument in such places as follows as it may cause break-down or malfunction of the instrument.**
  Places where: - exposed to rain, water drops or direct sunlight.
  - high temperature or humidity, much dust or corrosive gas.
  - affected by external noise, radio waves or static electricity.

2. Standard Specifications

■Model Designation

Model Name 4256 -□-□-□-□-□-□
1 2 3 4 5 6

【1】Measuring Input

●DC Input

Model	Measuring Range	Input Resistance	Accuracy *	Overload
4256-01	±9.999mV	100MΩ	±(0.1% of rdg + 2digits)	DC±50V
4256-02	±99.99mV	100MΩ	±(0.05% of rdg + 1digit)	DC±250V
4256-03	±999.9mV	100MΩ	±(0.05% of rdg + 1digit)	DC±250V
4256-04	±9.999V	10MΩ	±(0.05% of rdg + 1digit)	DC±250V
4256-05	±99.99V	10MΩ	±(0.05% of rdg + 1digit)	DC±500V
4256-06	±699.9V	10MΩ	±(0.1% of rdg + 2digits)	DC±750V
4256-09	1~5V	1MΩ	±(0.05% of rdg + 2digits)	DC±250V
4256-V2	0~5V	1MΩ	±(0.05% of rdg + 2digits)	DC±250V
4256-11	±9.999μA	10kΩ	±(0.1% of rdg + 1digit)	DC±2mA
4256-12	±99.99μA	1kΩ	±(0.1% of rdg + 1digit)	DC±20mA
4256-13	±999.9μA	100Ω	±(0.1% of rdg + 1digit)	DC±50mA
4256-14	±9.999mA	10Ω	±(0.1% of rdg + 1digits)	DC±150mA
4256-15	±99.99mA	1Ω	±(0.1% of rdg + 1digit)	DC±500mA
4256-16	±999.9mA	0.1Ω	±(0.2% of rdg + 2digits)	DC±2A
4256-19	4~20mA	12.5Ω	±(0.1% of rdg + 2digits)	DC±150mA

***** Accuracy: Defined at 23°C±5°C, 45~75%RH.
Temperature coefficient:
4256-01, -04~09, V2, -11~15, -19 …….. ±150ppm/°C
4256-02~03 …….. ±100ppm/°C
4256-16 ……..±200ppm/°C
Defined at the working temperature range 0~50°C.

●**AC Input (real effective value)**

Model	Measuring Range	Input Resistance	Accuracy *	Overload
4256-22	99.99mVrms	10MΩ	±(0.2% of rdg + 5digits)	AC10V
4256-23	999.9mVrms	10MΩ	±(0.2% of rdg + 5digits)	AC100V
4256-24	9.999Vrms	10MΩ	±(0.2% of rdg + 5digits)	AC700V
4256-25	99.99Vrms	10MΩ	±(0.2% of rdg + 5digits)	AC700V
4256-26	699.9Vrms	10MΩ	±(0.3% of rdg + 5digits)	AC700V
4256-32	99.99μArms	1kΩ	±(0.3% of rdg + 5digits)	AC20mA
4256-33	999.9μArms	100Ω	±(0.3% of rdg + 5digits)	AC50mA
4256-34	9.999mArms	10Ω	±(0.3% of rdg + 5digits)	AC150mA
4256-35	99.99mArms	1Ω	±(0.3% of rdg + 5digits)	AC500mA
4256-36	999.9mArms	0.1Ω	±(0.5% of rdg + 10digits)	AC2A
4256-37	5.000Arms	0.01Ω	±(0.5% of rdg + 10digits)	AC10A

***** Accuracy: Defined at 23°C±5°C, 45~75%RH.
Defined for sine wave input of input frequency 40Hz~1kHz.
±0.15% of FS for the input 10% or less of max. input value.
Temperature coefficient: ±300ppm/°C
Crest factor: 4 (up to 1000V for the model –26)

[2] Power Supply Voltage

Code	Power Source Voltage
A	AC100~240V
B	DC12~24V

[3] Alarm Output

Code	Specifications
Blank	Relay contact output
TN	Open collector output (NPN)

[4] Comparison System

Code	Description
Blank	HI, GO, LO ※
H	HI, GO , −
L	−, GO, LO

※HH, GO, H (Higher High, High limit) can be changed to L, GO, LL (Low, Lower Low limit).

[5] Display Color

Code	Description
Blank	Red LED
G	Green LED

[6] GO Open Collector Output (relay contact output model)

Code	Description
Blank	Not provided
AO1	Provided

■General Specifications

Display	:	0~9999 red or green LED (character height 15mm) with zero-suppress function.
Scaling Function	:	Full scale display value -9999~+9999 (0~9999 AC input) Offset display value -9999~+9999 (0~9999 AC input)
Zero-Set Function	:	Function to electrically set an initial input value to zero.
Offset Fixing Function	:	Function to fix a display reading of input less than offset value to the offset value.
Decimal Point	:	Arbitrary setting (front setting or remote control).
Over-range Indication	:	Blinking with 130% display. When exceeded 9999, blinking with 0000. For the model of the rated value 699.9V, blinking with full scale value.
Resolution	:	1/10000
Sampling Rate	:	Approximately 15 times/sec. For DC power source, either rate can be selected.
Display Cycle	:	Function to select either cycle of 67ms, 400ms, 1s, 2s, 4s, or 5s is provided.
Input Type	:	Single ended, floating input.
A/D Conversion	:	Δ-Σ conversion system.
Noise Rejection	:	Normal mode (NMR) 50dB or more (DC input models) Common mode (CMR) 110dB or more Power source line penetrating noise 1000V
Peak/Bottom Memory, Amplitude Display	:	Display of max., min. or amplitude between them is possible. Selectable by switch on front panel.
Averaging Function	:	Average of display data is calculated in fixed duration or in moving.
Cut-off Function	:	0~19.9%.
Comparison Digits	:	4 digits for numeral and 1 digit for polarity (no polarity for AC input models).
Output Selection	:	Comparison output is selectable by switch setting for actual value, peak memory value, bottom memory value or amplitude.
Comparator System	:	Independent setting for 2 points. Arbitrary setting for 2 high limits and 2 low limits. (for the models with HI, GO, LO specifications only) CPU comparison judgement system Function to switch over equal GO judgement or equal NG judgement is provided.
Setting Method	:	Digital switch setting.
Hysteresis Width Setting	:	1~999 Common setting for 2 comparison outputs.
Comparator Display	:	LED display. HI (red), GO (green), LO (yellow)

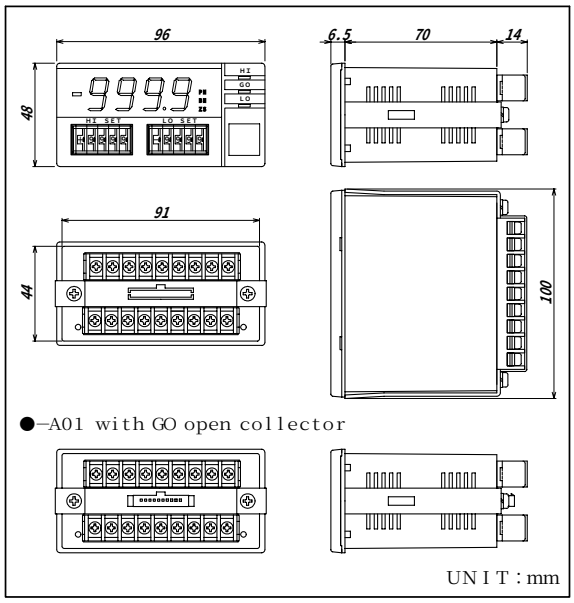
Comparator Output	:	Relay contact output:	One 1c contact each for HI, LO Contact capacity AC250V 1A resistive load.
		Open collector output (NPN):	HI, GO, LO Output rate DC30V 30mA (Max) Output saturated voltage DC1.6V or less
Output Delay	:	ON delay. 0~60 sec., resolution 1 sec., adjustable to arbitrary value by the front panel switch.	
Hold Function	:	Measured data, peak/bottom memory value, amplitude and comparator output are held. Not isolated from the input.	
Reset Function	:	Resets (makes OFF) the alarm output. Not isolated from the input.	
Insulation Resistance	:	DC500V 100MΩ or more.	
Withstanding Voltage	:	Input output terminals - Case : AC1500V each for 1 min. Power supply terminals - Case : AC1500V each for 1 min. Power supply terminals - Input output terminals : AC1500V each for 1min.	
Power Source Voltage	:	AC100~240V 50/60Hz DC12~24V	
Tolerance of Source Voltage	:	AC90~250V DC9~32V	
Power Consumption	:	Approx. 4.5VA at AC100V input, approx. 6VA at AC200V input. Approx. 150mA at DC12V input, approx. 75mA at DC24V input.	
Operating Temperature	:	0~50°C	
Storage Temperature	:	-20~70°C	
Weight	:	Approx. 250g	
Mounting Method	:	Fastening from rear of the panel by metal brackets.	

■Unit Labels (attached)

Labels of different units are attached to the instruments. Select and adhere the label of required unit:
V, mV, kV, rpm, ppm, A, mA, μA, m^3/h, Torr, W, kW, %, mm, mmHg, °C,kg, m, Pa, m/min, kPa, MPa, N

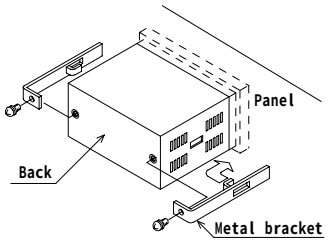
Note: Actual characters of the units printed on the stickers may be different from the above characters.

■Dimensions



■Installation

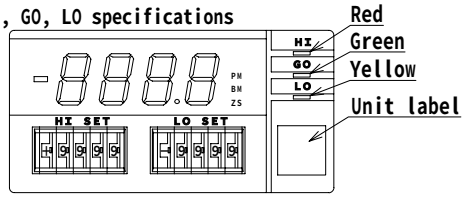
Remove the metal brackets at both sides, insert the instrument from the front and fix it by the brackets.



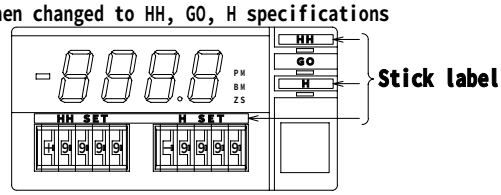
Panel cut-out dimension: $92^{+0.8}/_{0}$ × $45^{+0.6}/_{0}$ mm
Allowable panel thickness: 0.6~6mm
Note: Recommended thickness for the panel of aluminum is 1.5mm or more to avoid deformation of the panel.
Optimum torque of fixing screws: 0.25~0.39N・m

■Front Panel View of Each Comparator System

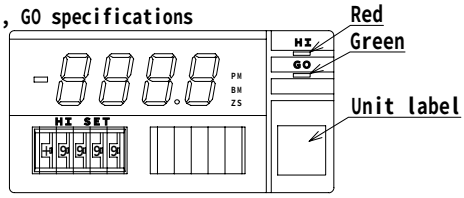
HI, GO, LO specifications



When changed to HH, GO, H specifications

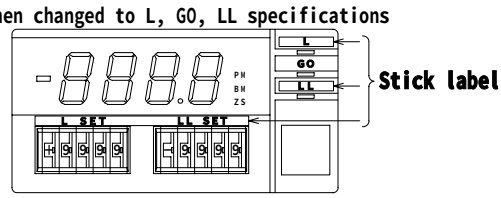


HI, GO specifications

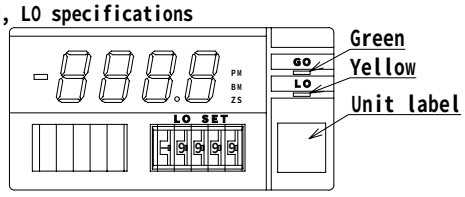


Digital switch 2 is replaced with spacer, and display LED for comparator output of LO is not mounted.

When changed to L, GO, LL specifications



GO, LO specifications



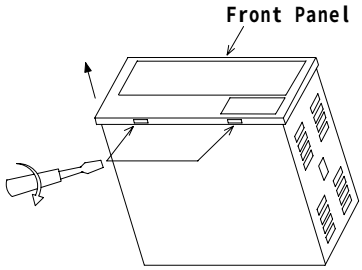
Digital switch 1 is replaced with spacer, and display LED for comparator output of HI is not mounted.

○ For the AC input models, the polarity section of digital switch is replaced with the spacer.
○ In case that the comparator system is changed for the HI, GO, LO specifications model, stick a label of comparator system attached to the instrument.

3. Setting of Each Function

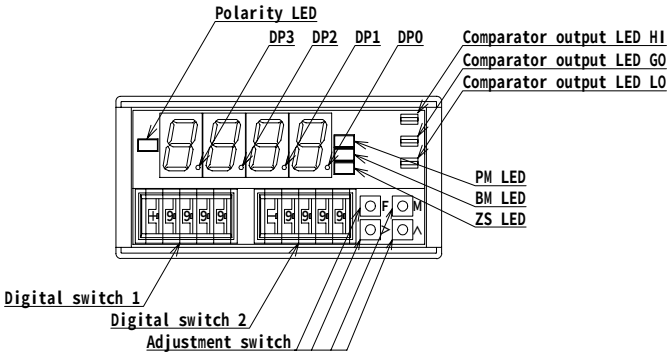
■Removal of Front Panel

Insert (-) screwdriver into the dips at the low end of instrument and remove the front panel.



Wrench the panel open with (-) screwdriver.

■Layout of Front Panel Inside



● Function of Each Switch

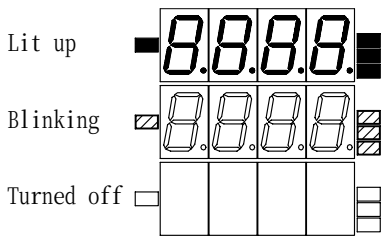
Function Switch [F] : Change of mode between measuring and setting.
Change of function group in setting mode.

Mode Switch [M] : Change of memory display in measurement mode.
Change of setting parameters in setting mode.

Shift Switch [>] : Setting of value of each function and change.

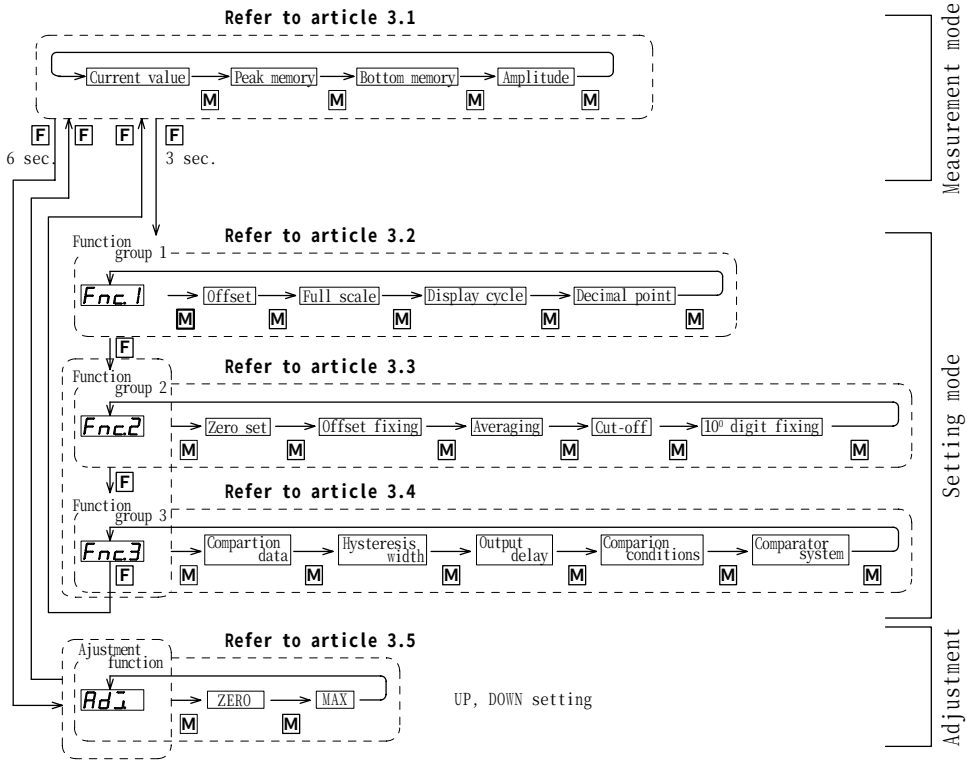
Up Switch [∧] : Setting of value of each function and change.
(When ∧ and > are simultaneously pressed for 3 seconds ore more in measuring mode, it resets the memory.)

● Status of LED



■Outline of Setting

Functions such as display scaling, averaging etc. are divided into 3 groups.
Depending upon the function to set, select the setting from among the following outline.
Note) During the setting mode, comparator output just before entering the setting is held.

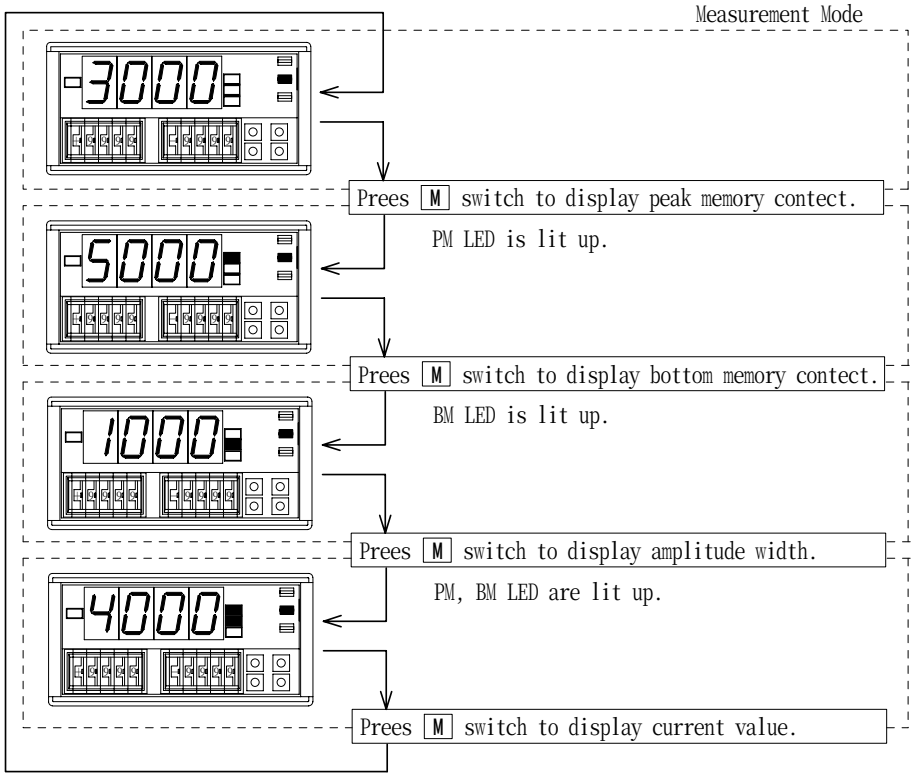


- To change each setting, press [>] switch.
- When returning from setting mode to measuring mode, the setting is memorized in the EEPROM. Display is then turned off once.
- Comparator system can not be set in case of single point setting of HI, GO or GO, LO.
- When the average calculation is moving average, the display cycle is fixed to 67ms and it can not be changed.

3.1 Change of display, memory

3.1.1 Change of display

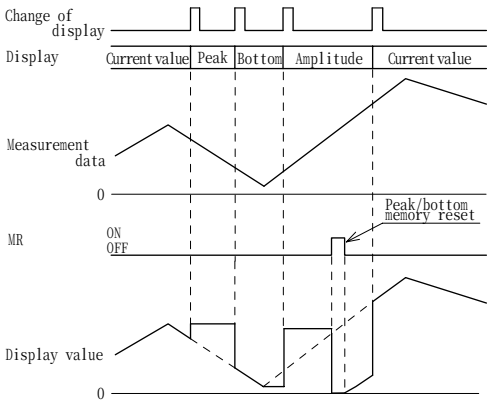
It is possible to select a data to display.



3.1.2 Explanation of memory function

● Peak/bottom memory, amplitude function
Max. value (peak value), min. value (bottom) can be memorized and displayed. An amplitude (max. - min. value) can also be displayed.

● Reset of peak/bottom memory
- Reset from the panel front:
When [∧] and [>] are simultaneously pressed for 3 sec. or more, the display is turned off once and the memory is reset.
- Reset from the memory reset terminal (MR):
Refer to the lower terminal arrangement and its explanation.
- Reset by power OFF:
When the power is turned OFF, the peak/bottom memory values are reset.

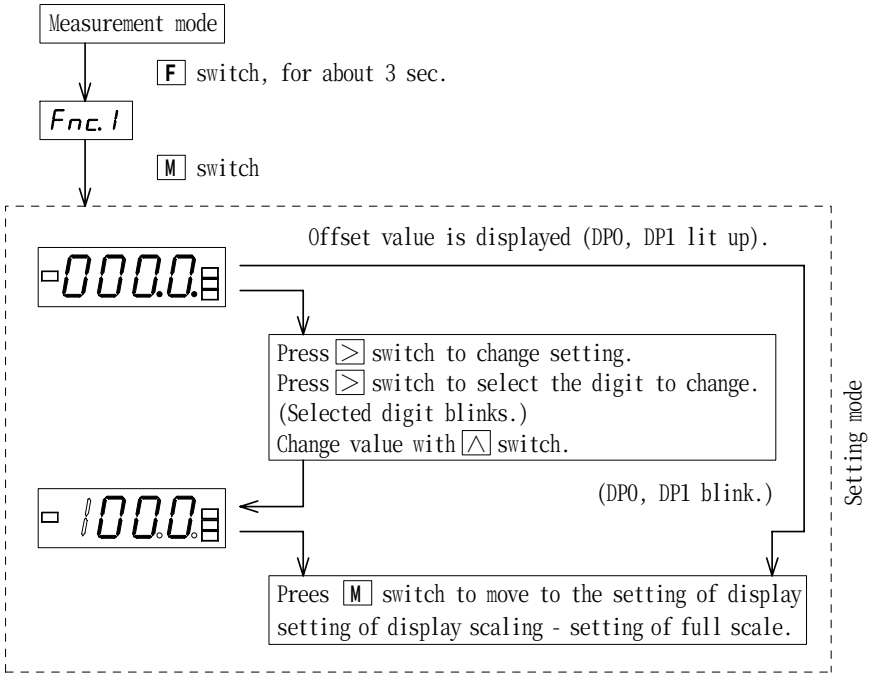


When the MR input terminal is ON, the memory data is continuously updated, so the current value is displayed and output. In case of amplitude, however,
it is current value – current value, making 0 display.

3.2 Setting of function group 1

3.2.1 Display scaling - offset

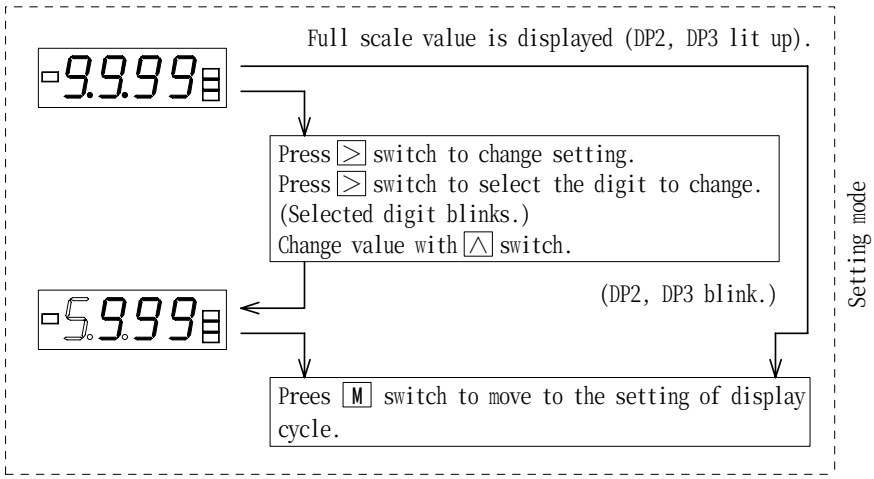
● Offset display can be set to an arbitrary value.
Adjustable range of offset value: -9999~9999 (0~9999 in case of AC input)
Example: With the rated input 1~5V, the display at the input 1V is adjusted from 0 to 1000.



● Offset value display means the display at the input of 0mV(V, μA, mA, A).
It is however, at the input of 1V and 4mA respectively for the input rate 1~5V, 4~20mA.

3.2.2 Display scaling - full scale

● Full scale display can be set to an arbitrary value.
Adjustable range of offset value: -9999~9999 (0~9999 in case of AC input)
Example: With the rated input 1~5V, the display at the input 5V is adjusted from 9999 to 5999.

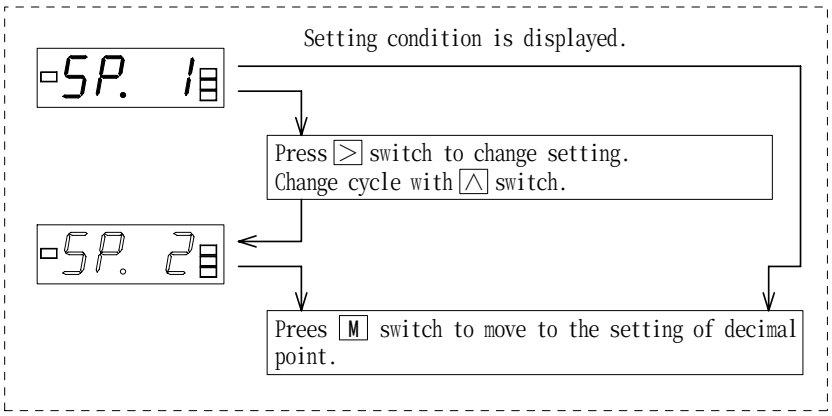


● Full scale display means the display at the input of max. value of the rated input.

● If the scaling is changed, peak memory and bottom memory are reset to the current value.

3.2.3 Display cycle

● Display cycle of the display data can be slowed.
Sampling rate of the measurement does not vary even if the display cycle is slowed.
Example: Display cycle is changed from 67ms to 400ms.

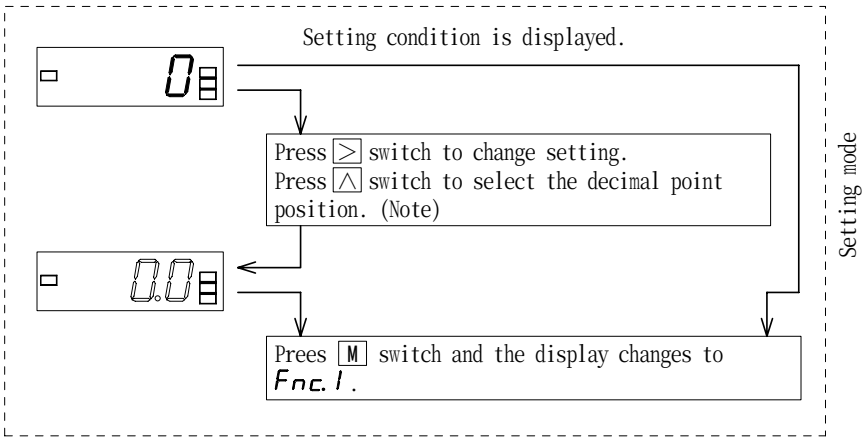


Display	Display Cycle
SP.1	67ms
SP.2	400ms
SP.3	1 s
SP.4	2 s
SP.5	4 s
SP.6	5 s

When the average calculation is of moving average, • • • is displayed.
If a change of setting is tried in this case, • • • is displayed and returns to • • • display.

3.2.4 Decimal point

● Decimal point can be set to an arbitrary position.
Example: No decimal point is changed to the digit 10^1.



Note:

• : Nil
• • : DP1
• • • : DP2
• • • • : DP3
• • • : Remote control ※

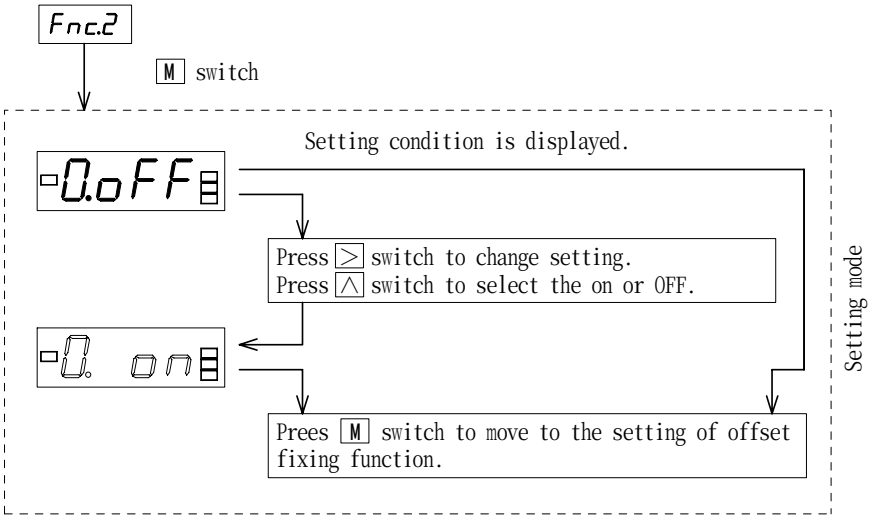
∧ switch: changes the setting in the order of Nil→DP1→DP2→DP3→Remote-control→Nil

※ When the remote control is selected, it allows the control of decimal point from the terminal block.

3.3 Setting of function group 2

3.3.1 Zero set

● Initial input value can be set to zero electrically.
Example: Disabled zero set function is made to be able.



● When the zero set function is made to be able and the zero set terminal is short-circuited to the COM terminal, the display becomes the offset value (the value set at the article 3.2.1)

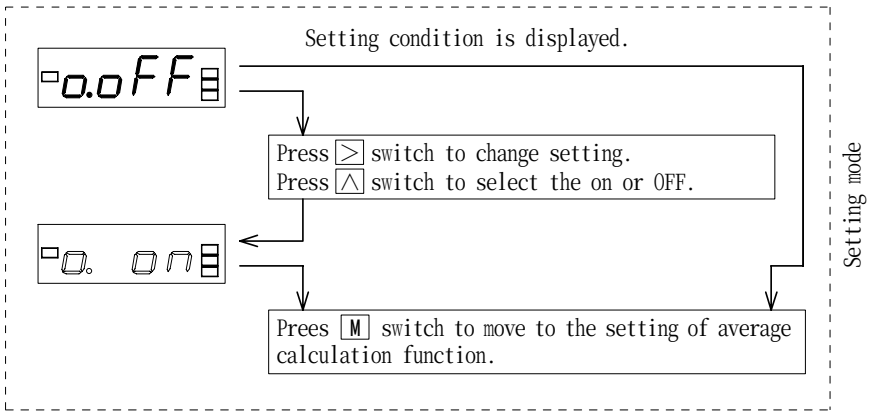
Example: When the scaling is 0~1000 and the zero set is made with the display 100, the original scaling 0~1000 corresponds to -100~0~900.

• • • : Zero-set functions
• • • • : Zero-set does not function

When the setting is made to on, zero set LED is lit up.

3.3.2 Offset fixing

● Display of the input less than offset value can be fixed to the offset value.
Example: Disabled offset function is made to be able.



● When the offset fixing function is allowed and the display scaling is set to 1000~5000, with the rated input 4~20mA, the display is fixed to 1000 even if the input 4mA or less is applied.

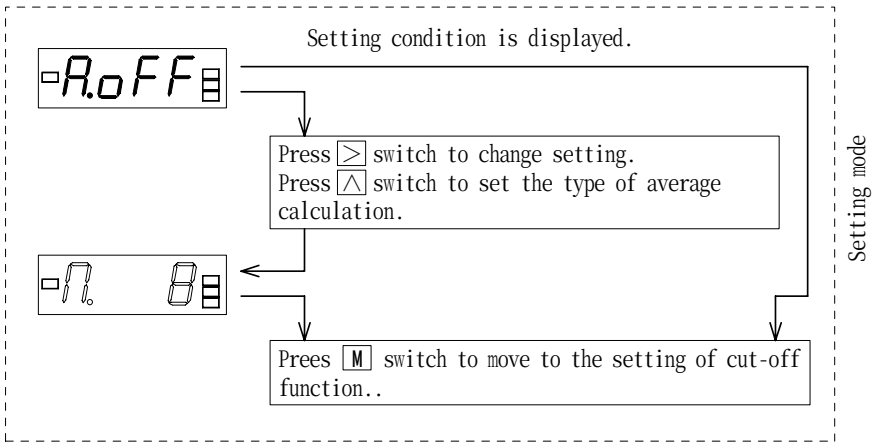
● For the AC input models, they work as the offset fixing function is able, regardless of setting of the function is disabled or able.

• ˙ ˙ ˙ : Offset fixing functions
• ˙ ˙ ˙ ˙ : Offset fixing does not function

When the offset fixing function is changed, peak memory and bottom memory are set to current values.

3.3.3 Average calculation

● Average calculation is made either in fixed duration (fixed sample data during display cycle time) or in moving (continuously updated sample data).
Example: No average calculation is changed to moving average of 8 sample data.



Relation between display cycle and the numbers of data sampling of per-display-cycle averaging:

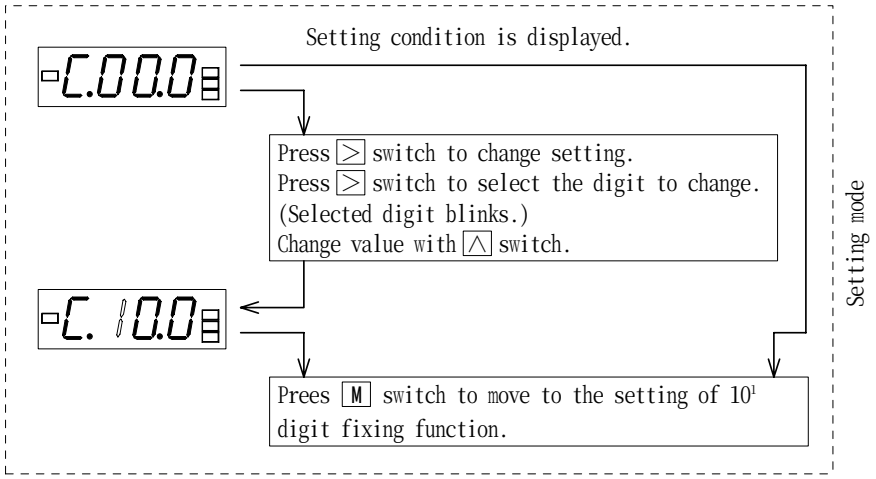
Display cycle	Numbers of data
SP.1	No averaging
SP.2	6 times
SP.3	15 times
SP.4	30 times
SP.5	60 times
SP.6	75 times

Content of averaging

Display	Content
• ˙ ˙ ˙	No averaging
• ˙ ˙	Per-display-cycle Av.
• •	Moving Av., 2 times
• •	Moving Av., 4 times
• •	Moving Av., 8 times
• • •	Moving Av., 16 times
• • •	Moving Av., 32 times

3.3.4 Cut-off

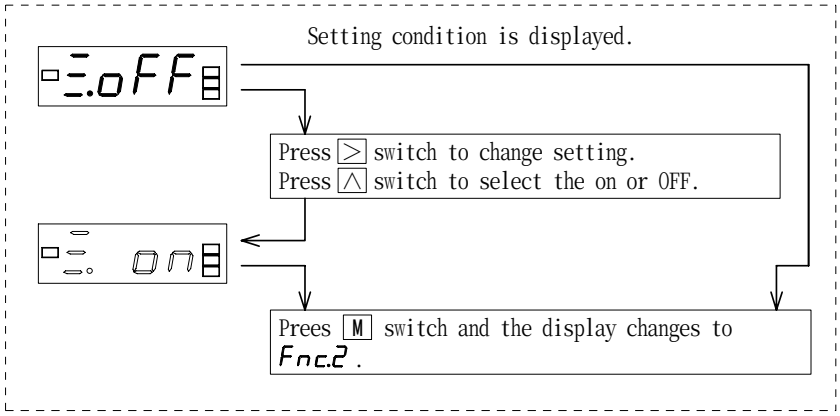
● This is the function to cut an unstable zone around input of zero.
The zone cut off becomes offset value. The value of zone to cut is set by % to the rated input.
Example: No cut-off function is changed to have cut-off of the input 10% or less.



Adjustable range: 00.0~19.9%, however, the cut-off function is disabled when 00.0 is set.
Adjustable range for the AC input models is 00.1~19.9%.

3.3.5 Fixing of 10^0 digit

● 10^0 digit can forcedly be set to zero.
Example: Disabled 10^0 digit fixing function is made to be able.

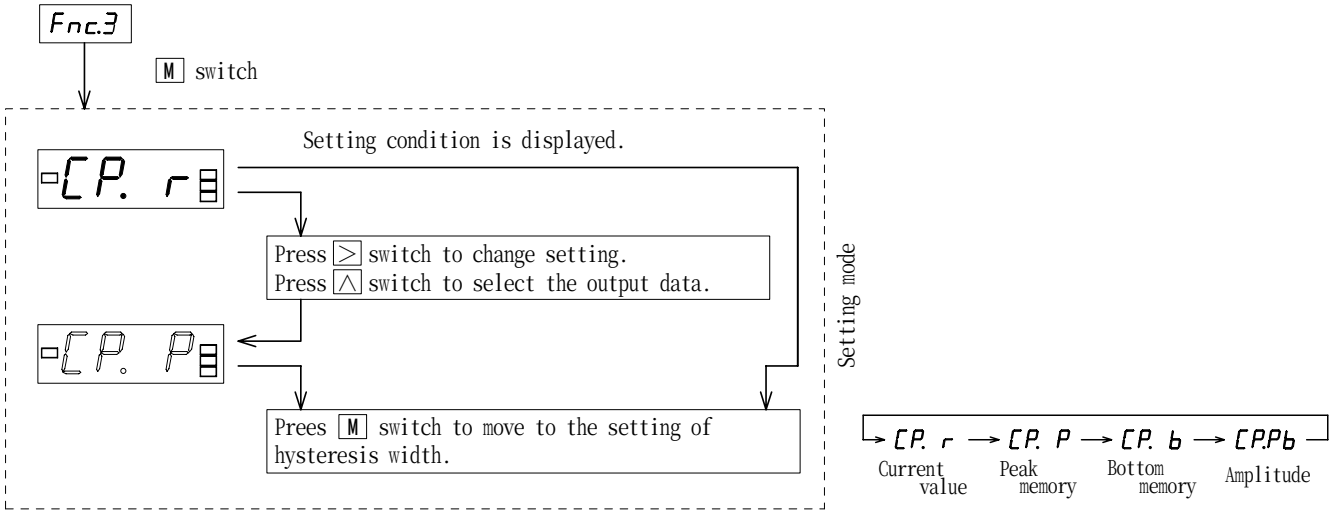


• • • : 10^0 digit fixing functions.
• • • • : 10^0 digit fixing does not function.

3.4 Setting of function group 3

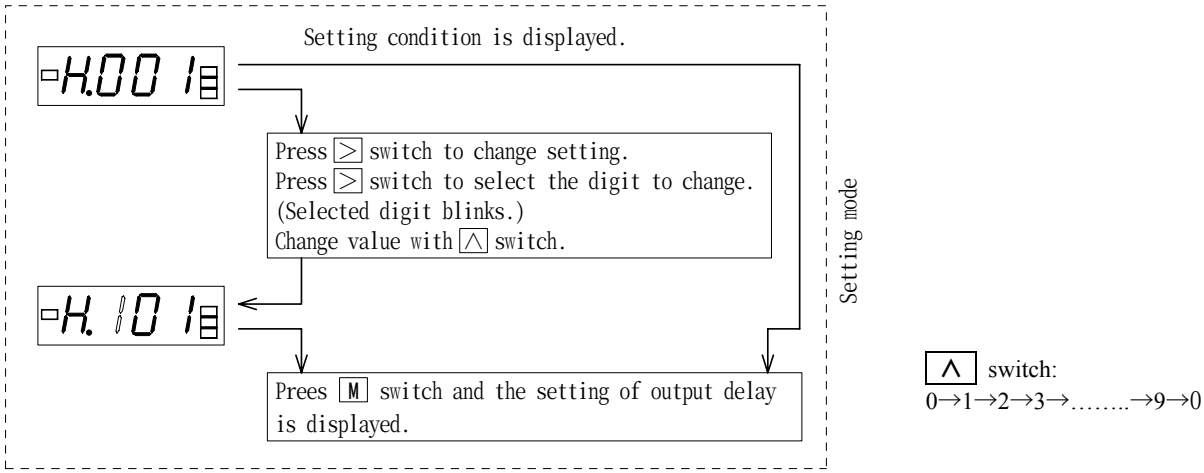
3.4.1 Comparison data

● Data to compare can be selected from actual value, peak memory value, bottom memory value or amplitude.
Example: Data to compare for alarm setting is changed from actual value to peak memory value.



3.4.2 Hysteresis width

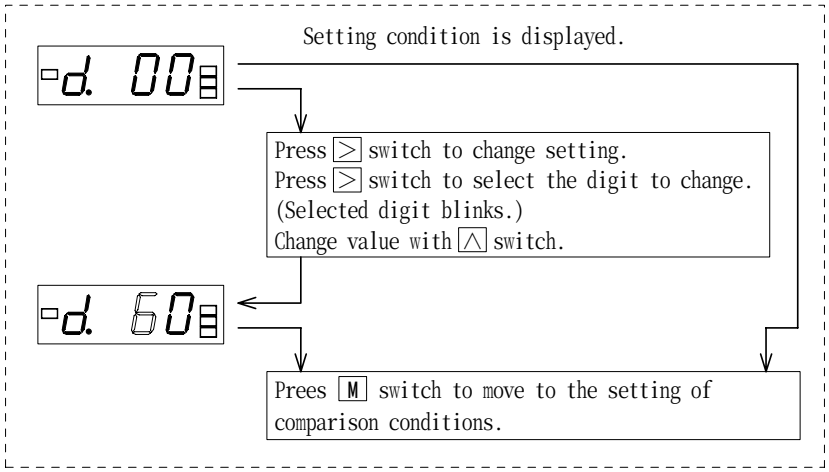
● Width of hysteresis can be set (common for two points).
Adjustable rage: 1~999
Example: Set value of hysteresis width is changed from 1 to 101.



∧ switch:
0→1→2→3→……..→9→0

3.4.3 Output delay

● Output delay can be set (common for two points).
Adjustable rage: 0~60 sec. (resolution 1 sec.)
Example: On delay time of comparator output is changed from 0 sec. To 60 sec.

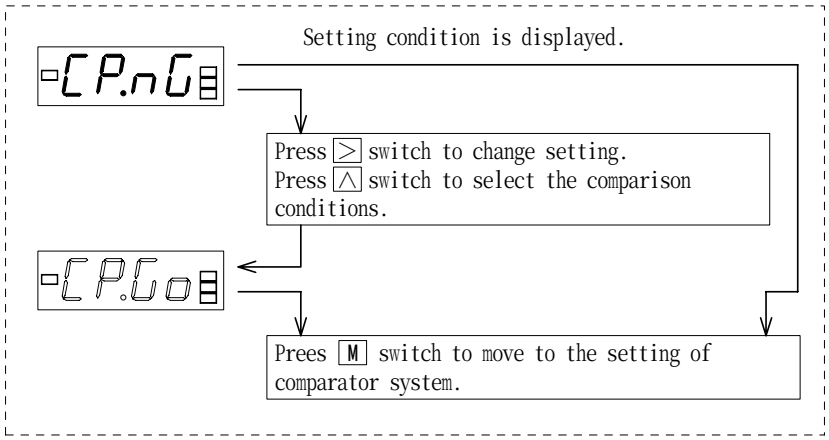


∧ switch:
0→1→2→3→……..→9→0
In case of 10^1:
0→1→2→……..→6→0

Note: It is not possible to set the value more than 60.
If the value more than 60 is set, it is not allowed to exit from the setting mode.

3.4.4 Comparison conditions

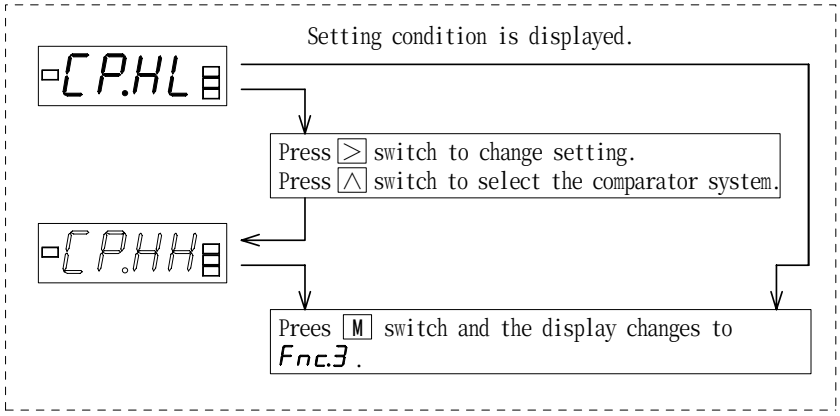
● Change-over of equal GO/NG
Example: Transaction to be taken when the comparator data and the comparator set value are equal, from NG (alarm output) to GO (no alarm output).



∧ switch:
• • • • → • • • • → • • • •
• • • • : Equal GO
• • • • : Equal NG

3.4.5 Comparison conditions

● Models of comparator system HI, GO, LO can be changed to have HH, GO, H (Higher High limit, High limit) or L, GO, LL (Low limit, Lower Low limit).
● Models of comparator system HI, GO (High limit only) or GO, LO (Low limit only) do not have this function.
Example: Comparator output is changed from HI, GO, LO to HH, GO, H (High limit, High limit)



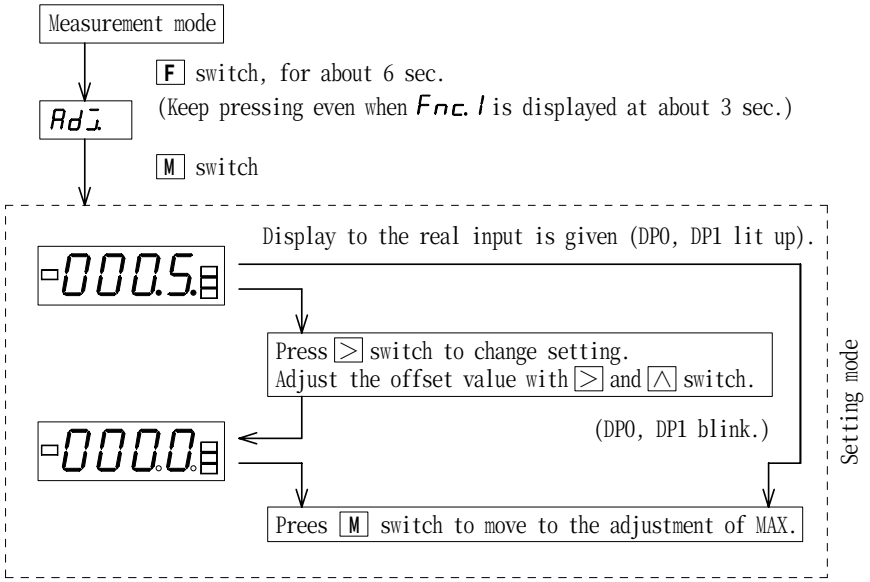
∧ switch, when comparator system is set:
• • • • → • • • • → • • • • → • • • •
• • • • : HI, GO, LO action
• • • • : HH, GO, H action
• • • • : L, GO, LL action

HH and H, or L and LL, are not bigger or smaller than the other.

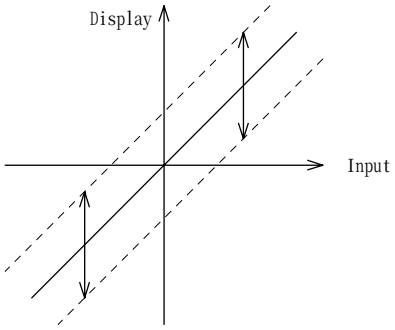
3.5 Adjustment function

3.5.1 Zero adjustment

● Fine adjustment for the displayed offset value of calibration data is possible with real input.
Example: Adjust a 5, which is displayed at the input of 1V with rated input 1~5V, to 0.



Display line vertically moves.

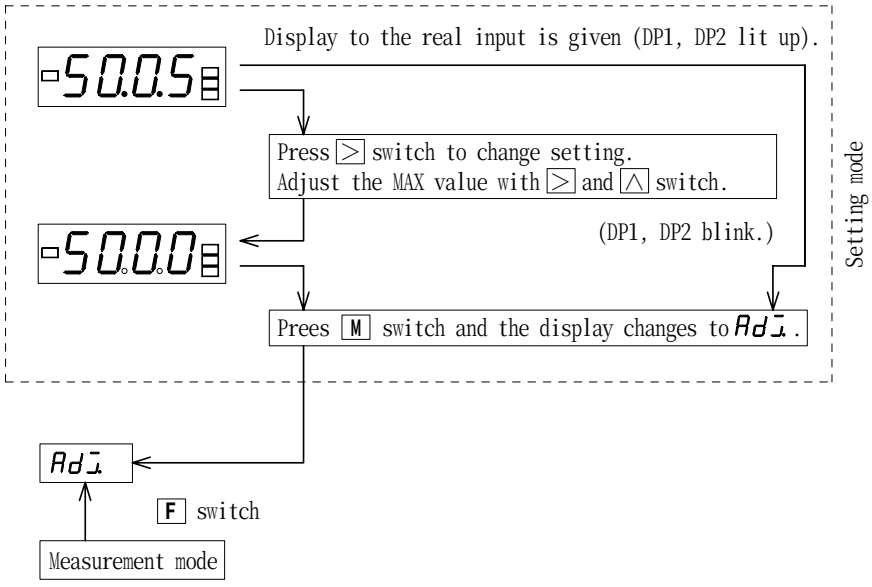


> switch counts down
^ switch counts up

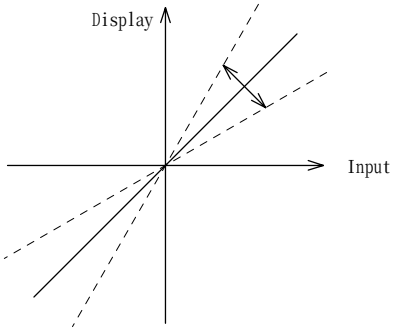
When the scaling width is narrow,
It takes some time to start count.
Keep pressing the switch for a while.

3.5.2 Max adjustment

● Fine adjustment for the max. value of calibration data is possible with real input.
In this case, make an adjustment with the input as close as possible to the max. value of the rated input.
Example: Adjust a 50055, which is displayed at the input of 5V with rated input 1~5V, to 5000.



Inclination of display line changes.



> switch counts down
^ switch counts up

When the scaling width is narrow,
It takes some time to start count.
Keep pressing the switch for a while.

■Initial setting at factory before delivery

Mode	Function	Set Value
Measurement display	Change of display	Display of current value
• • • •	Offset	• • • •
	Full scale	• • • • ※1
	Display cycle	• • •
	Decimal point	• • •
• • • •	Zero set	• • • •
	Offset fixing	• • • •
	Average calculation	• • •
	Cut-off	• • • • DC input • • • • AC input
	10^0 digit fixation	• • • •
• • • •	Comparator data	• • •
	Hysteresis width	• • • •
	Output delay	• • •
	Comparison conditions	• • • •
	Comparator system	• • • • ※2

※1: Product of the rated input 699.9V is set to ・・・・.

※2: This function is not provided for the model of either contact (-H or -L) only.

3. Terminal Arrangement and Explanation

• CAUTION

- **Do not use the meter with wrong wiring as it may cause breakage of meter or equipment connected.**
- **To avoid an electric shock;**
  - **Turn off the power when the wiring work is done.**
  - **Do not do the wiring work in the humid environment or with the wet hands.**
  - **Do not touch the power source terminals while the meter is powered.**

■Terminal Arrangement

● Upper Row Terminals

Terminal Code	IN Hi	IN Lo	COM	DP1	DP2	DP3	MR	HOLD	ZS
	1	2	3	4	5	6	7	8	9
Function	+	−	Common	10^1 dig.	10^2 dig.	10^3 dig.	Memory Reset	Hold	Zero-Set
	Input			Decimal Point					

● Lower Row Terminals

(Relay contact output) **Note**: ( )=DC power source models

Terminal Code	Ha	Hc	Hb	La	Lc	Lb	RESET	P2(+)	P1(-)
	1	2	3	4	5	6	7	8	9
Function	a contact	Common	b contact	a contact	Common	b contact			
	HI Relay Output			LO Relay Output			Reset	Power Source	

○ Terminal numbers 4, 5 and 6 of the models of HI, GO comparator output are NC.
○ Terminal numbers 1, 2 and 3 of the models of GO, LO comparator output are NC.
○ When the comparator system of the model with comparator output HI, GO, LO is changed, stick the attached label of comparator system on to the existing label of the lower row terminals as shown below.

- When changed to HH, GO, H specifications

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Label→	HHa	HHc	HHb	Ha	Hc	Hb	¦ RESET	P2(+)	P1(-)

- When changed to L, GO, LL specifications

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Label→	La	Lc	Lb	LLa	LLc	LLb	¦ RESET	P2(+)	P1(-)

(Open collector output)

Terminal Code	HI	TCOM	GO	TCOM	LO	TCOM	RESET	P2(+)	P1(-)
	1	2	3	4	5	6	7	8	9
Function	Collector	Common	Collector	Common	Collector	Common			
	HI output		GO output		LO output		Reset	Power Source	

○ Terminal numbers 5 and 6 of the models of HI, GO comparator output are NC.
○ Terminal numbers 1 and 2 of the models of GO, LO comparator output are NC.
○ When the comparator system of the model with comparator output HI, GO, LO is changed, stick the attached label of comparator system on to the existing label of the lower row terminals as shown below.

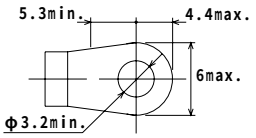
- When changed to HH, GO, H specifications

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Label→	HH	TCOM	GO	TCOM	H	TCOM	¦ RESET	P2(+)	P1(-)

- When changed to L, GO, LL specifications

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Label→	L	TCOM	GO	TCOM	LL	TCOM	¦ RESET	P2(+)	P1(-)

Terminal screws: M3
Fastening torque: 0.46~0.62N･m
Crimp terminal: As shown on the right.



● **Middle Row Connector** (Open collector output of GO, option)

Terminal Code	GO	TCOM	NC	NC	NC	NC	NC	NC	NC	NC
	1	2	3	4	5	6	7	8	9	10
Function	Collector	Common								
	GO output									

○ Coloring of attached leads (length of leads 1m)
Brown: GO Red: TCOM

■Explanation of Terminals

● Measurement Inputs (IN Hi, IN Lo)

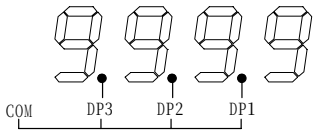
Make connections of measurement inputs with correct polarity. Connect the measurement input of higher electric potential to Hi. Ensure to make an independent wiring respectively for the input and power source line. If the wiring of input and power source line
are made in parallel, it may cause unstable reading.

● Common (COM)

Common terminal for hold, zero-set, memory reset, decimal point and reset.

● Remote Control of Decimal Point (DP1~DP3)

Decimal point can be displayed at an arbitrary position by remote control, by setting the decimal point setting switch inside the front panel. Make a short-circuit between between the decimal point 10^1~10^3 (DP1~DP3) and DPCOM. (Active "L")
No decimal point is lit up if two or more of DP1~DP3 are set together.



● Hold (HOLD)

The measured data are held by making a short-circuit between
Active "L" $I_{IL} \leqq 1$mA, "L"=0~0.8V, "H"=3.5~5V

● Zero Set (ZS)

Zero set function can be effected by making the zero-set ON with front switch operation. When the zero-set function is in operation,
the ZS LED is lit up. The zero-set value is stored in the EEPROM (retaining term for about 10 years).
Active "L" $I_{IL} \leqq 1$mA, "L"=0~0.8V, "H"=3.5~5V

○ How to set

1. Make zero-set ON by the switch inside the front panel.
2. Input a zero-set value and have the zero-set terminal short-circuited with the common terminal. The display value becomes 0 at this time (in case that the offset value is 0).
3. Open the zero-set terminal. Then, the zero-set value is stored in the memory and the zero-set functions starts.
   Display value = Input value - Zero-set value

○ Reset of Zero-set Function

1. The zero-set function can be reset by making the zero-set OFF the switch inside the front panel.
   The zero-set value is still stored in the memory.

● Memory Reset Terminal (MR)

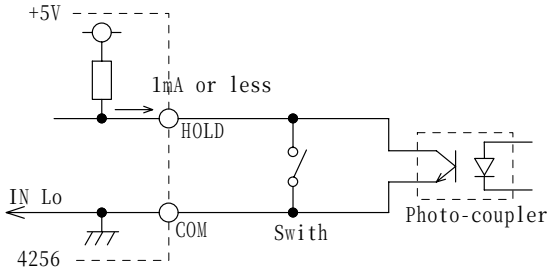
○ By short-circuiting the memory reset terminal to the COM terminal, the peak memory value and bottom memory value are cleared
and a new memory is started.

○ During the short-circuiting of the memory reset terminal, the peak memory value and bottom memory value are current values.
Active "L" I_{IL}≦1mA, "L"=0~0.8V, "H"=3.5~5V

● Reset Terminal (RESET)

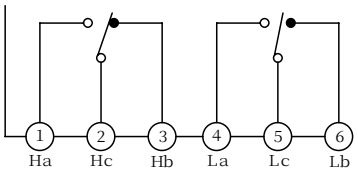
By short-circuiting the reset terminal to the COM terminal, the comparator output is reset.
Active "L" I_{IL}≦1mA, "L"=0~0.8V, "H"=3.5~5V

Note: COM, DP1~DP3, HOLD, ZS, MR and RESET terminals are not isolated from the input, so, in case of controlling the terminal of each function, it is recommended to use a photo-coupler, relay, switch and so on. Also, in case that the plural numbers of the instruments are controlled, make the control insulating each instrument individually.



● Comparator Output

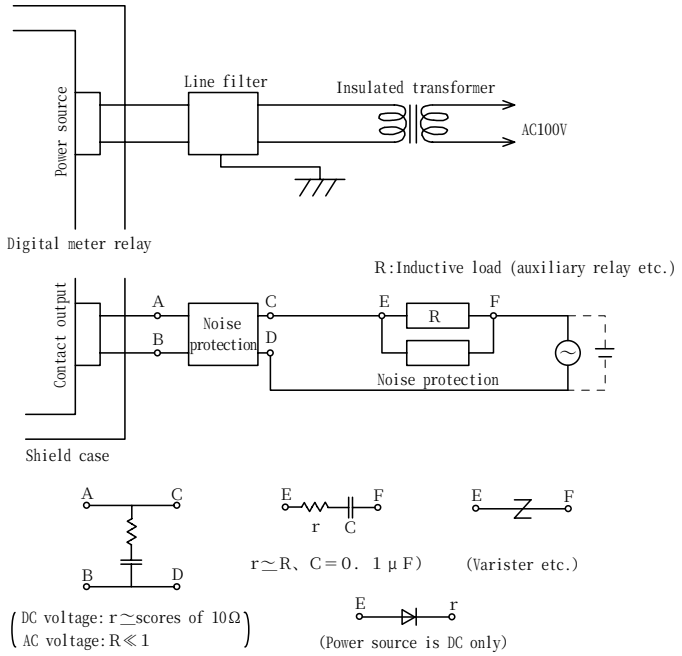
○ Relay contact output (Ha, Hc, Hb, La, Lc, Lb)



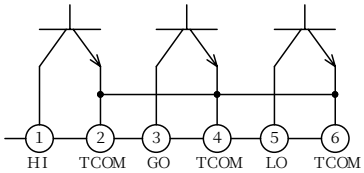
Case of the model with comparator output HI, GO, LO

Contact capacity AC250V 1A (resistive load)

When an electromagnetic contactor or big size relay is operated with an auxiliary relay connected to the relay output, be sure to take a protective measure to noise.
In case that the noise is frequently generated, it is effective to put the digital meter relay in the shielded case and to insert a power line filter or isolation transformer.
For the protective circuits of contact output, refer to the following figures.



○ Open collector output (HI, TCOM, GO. TCOM, LO, TCOM)



Case of the model with
comparator output HI, GO, LO

Output capacity: DC30V 30mA
Output saturated voltage: DC1.6V or less
Transistor output is isolated from the input terminals.

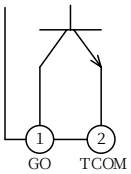
● Power Supply [P1(-), P2(+)]

The power source voltage to be supplied to the instrument is specified on the terminal plate at delivery from factory.
○AC power source ..... Use the instrument within the range AC90~250V
○DC power source ..... Use the instrument within the range DC9~32V
Connect + side to P2(+) and - side to P1(-).

• CAUTION
● **Do not use the product with the voltage out of the rated range as it may cause breakage of the products.**

■Explanation of Middle Row Connector

● Open Collector Output of GO (GO, TCOM)



Output capacity: DC30V 30mA
Output saturated voltage: DC1.6V or less
Transistor output is isolated from the input terminals.

■Maintenance

Store the instrument within the rated storage temperature (-20~70°C). When the front panel or the case is cleaned, use soft cloth dipped with cleaner liquid. Do not use organic solvent like benzene or paint thinner as they may deform or discolor the case.

■Calibration

In order to maintain long term accuracy, periodical calibration at an interval of about one year is recommended.
For calibration, refer to the article 3.5 Adjustment function.
Also, make a calibration in the ambient condition of 23°C±5°C, 75%RH or less.