

LOOP POWERED DIGITAL PANEL METER (4 digits, process meter)	MODEL	40DN
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BEFORE USE

Thank you for choosing us. Before use, please check contents of the package you received as outlined below. If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

- Digital panel meter (body + mounting bracket × 2).....(1)
- Engineering unit sticker label sheet.....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures. For detailed explanations to operate this product, please refer to Operating Manual (EM-9534-B), downloadable at our web site.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the input signal for safety.
- Be sure to put the terminal cover on while the input signal is supplied.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.
- Be sure that the ventilation slits are not covered with cables, etc.

■ WIRING

- Make sure for safety that only qualified personnel perform the wiring.
- Do not install cables close to noise sources (high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ EX-FACTORY SETTING (/SET)

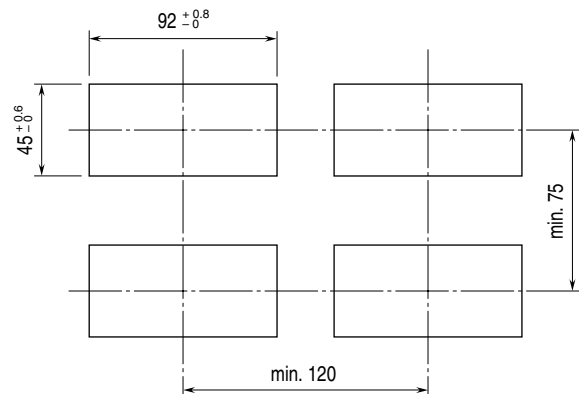
- Activating “initialization” of Display Setting Mode, Ex-factory settings or user’s specified parameters will be deleted and overwritten with the factory default values. Notice that after this, Ex-factory settings will be irrecoverable.

■ AND

- The unit is designed to function as soon as input signal is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

INSTALLATION

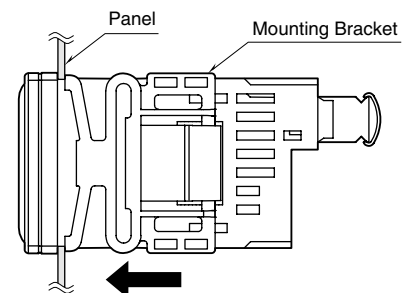
■ PANEL CUTOUT unit: mm



Panel thickness: 1.6 to 8.0 mm

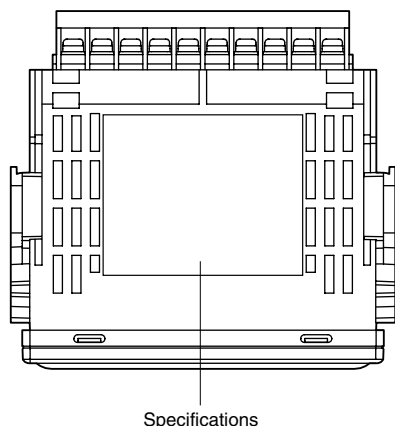
■ HOW TO MOUNT THE UNIT ON A PANEL

- 1) Insert the unit into the panel cutout.
- 2) Push the mounting brackets into the grooves on both sides of the rear module, until they hit the panel’s rear side.

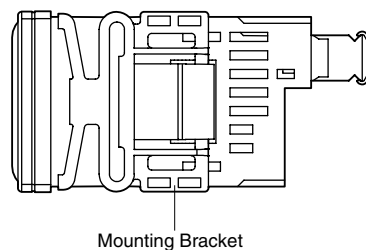


COMPONENT IDENTIFICATION

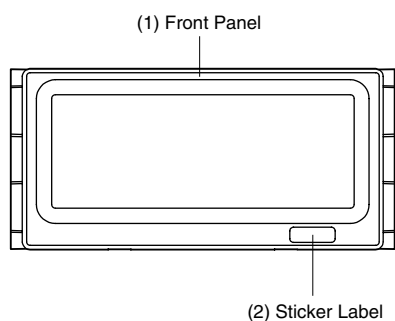
■ TOP VIEW



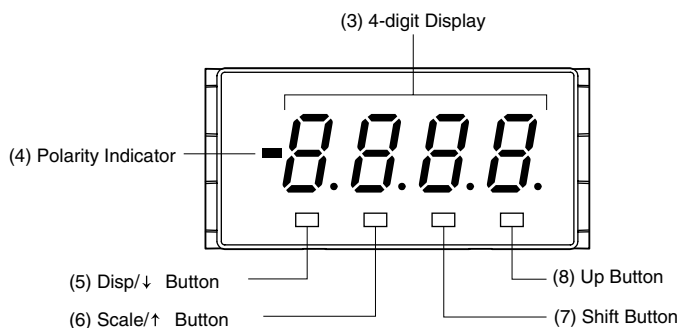
■ SIDE VIEW



■ FRONT VIEW



• Front View without the Front Panel

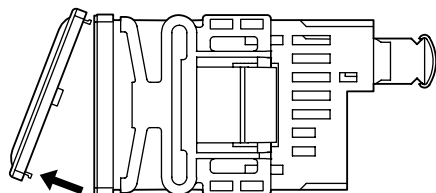


■ COMPONENT IDENTIFICATION

No.	COMPONENT	FUNCTION
(1)	Front Panel	Removed at configuration.
(2)	Sticker Label	Engineering unit label position
(3)	4-digit Display	4-digit LED display. Range: 0 to 9999 (not including decimal point)
(4)	Polarity Indicator	Turns on when negative value is displayed
(5)	Disp/↓ Button	Used to move on to the display setting modes; or to shift through setting items in each setting mode.
(6)	Scale/↑ Button	Used to move on to the scaling setting modes; or to shift through setting items in each setting mode.
(7)	Shift Button	Used to move on to the setting standby status and shift through display digits in each setting item.
(8)	Up Button	Used to select setting value.

■ HOW TO REMOVE THE FRONT PANEL AT CONFIGURATION

Hold up the front panel and remove it from downside.



■ HOW TO MOUNT THE FRONT PANEL

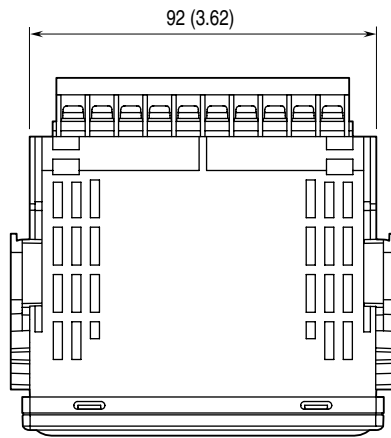
- 1) Insert the front panel hook into the case upside slots of the unit.
- 2) Push the front panel hook into the case downside slots of the unit.

TERMINAL CONNECTIONS

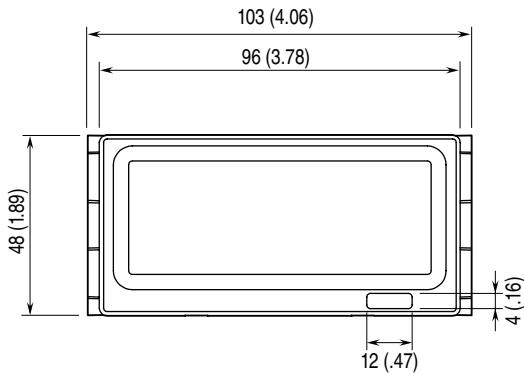
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

EXTERNAL DIMENSIONS unit: mm (inch)

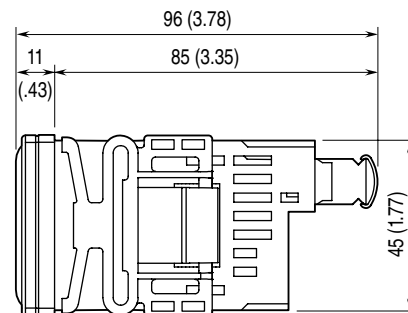
TOP VIEW



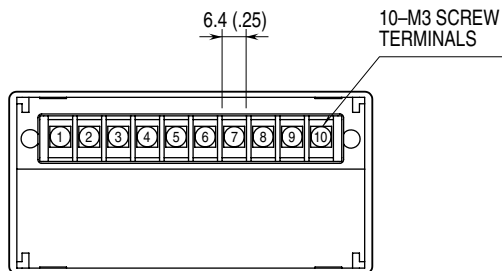
FRONT VIEW



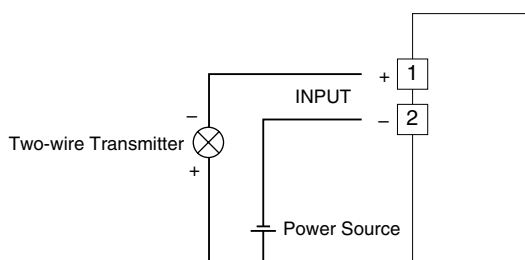
SIDE VIEW



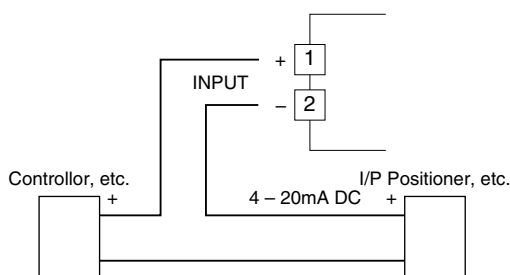
REAR VIEW



■ CONNECTION DIAGRAM



■ 4-WIRE CONNECTION EXAMPLE



WIRING INSTRUCTIONS

■ SCREW TERMINAL

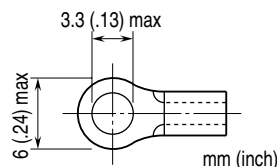
Torque: 0.6 N·m

■ SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.

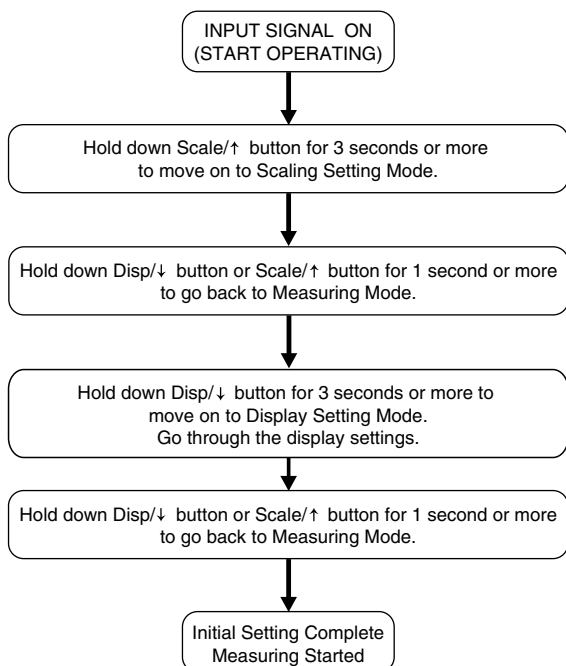
Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)

Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,Ltd



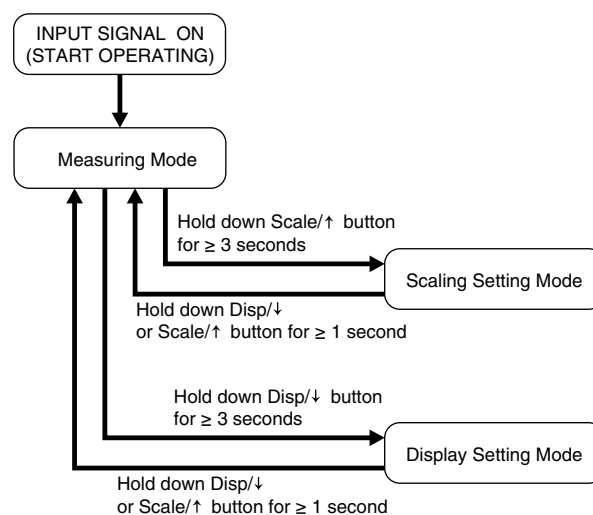
SETTING PROCEDURE

■ INITIAL SETTING FLOWCHART



Note: For 4 to 20mA DC current meter, the initial setting is not necessary.

■ GENERAL SETTING FLOWCHART



■ OPERATIONS IN SETTING MODES

• Display

4 digits numeric display including polarity display (referred hereafter as 'display') shows the current settings while the panel meter is in the setting mode.

• Shifting through setting parameters

In any setting mode, pressing Disp/↓ button shifts one parameter to the next. Pressing Scale/↑ button shifts one to the previous.

• Changing parameters

Pressing Shift button while one of the parameter settings is indicated on the display shifts the panel meter into the setting standby mode. The digit to which you can apply changes starts blinking.

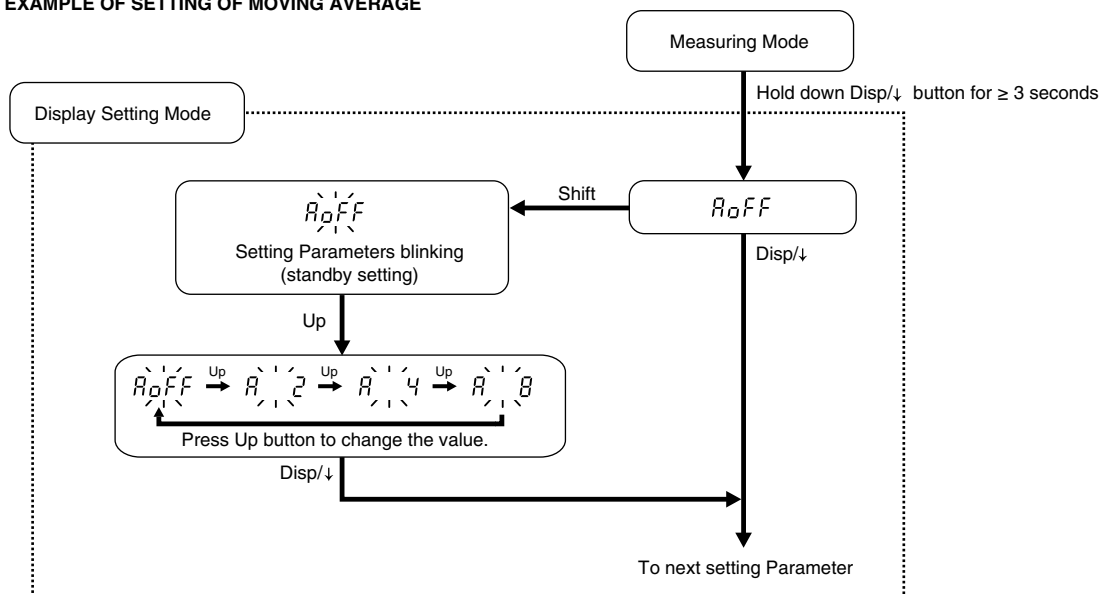
Press Up button to change the blinking value.

Press Shift button to go to the next digit.

Press Disp/↓ or Scale/↑ button to apply the new value and go to the next parameter setting.

If no operation continues more than one minute, while the parameter is blinking, it returns to the parameter before setting. Otherwise it returns to measuring mode.

■ EXAMPLE OF SETTING OF MOVING AVERAGE

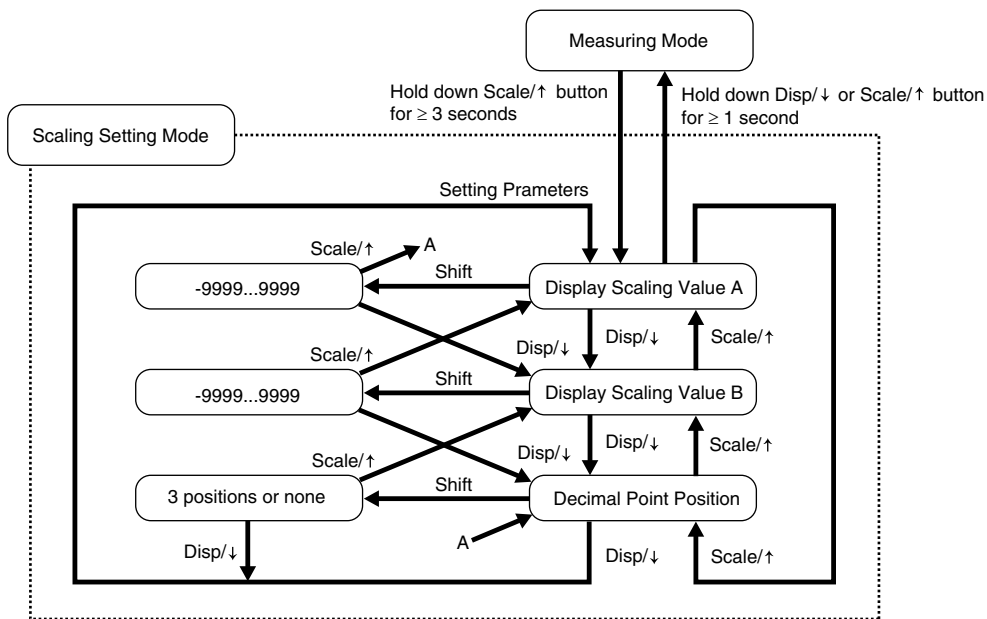


Note: For Scaling setting mode the method for using the Shift and Up button is the same as for changing the Setting Parameters.

• If you get lost...

Hold down Shift button for 3 seconds or more to return to the measuring mode without applying the last changes. (Those which have been already applied by pressing Disp/↓ or Scale/↑ button are not canceled.)

■ SCALING SETTING MODE

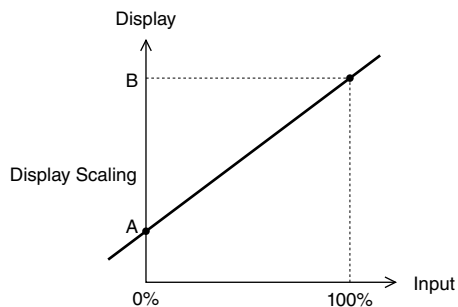


• PARAMETER LIST

PARAMETER	DISPLAY	FUNCTION	DEFAULT VALUE
Display Scaling Value A	- 9999 ... 9999	Display value for 4 mA input To distinguish from B, the first decimal point is blinking.	04.00
Display Scaling Value B	- 9999 ... 9999	Display value for 20 mA input	20.00
Decimal Point Position	3 positions or none	Decimal point position	8888

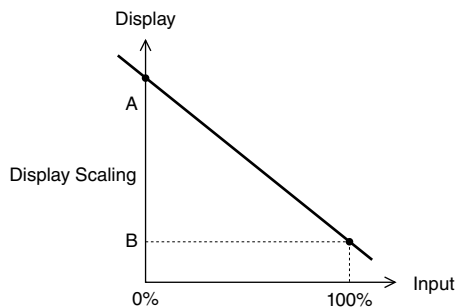
• Normal Scaling

The display value increases when the input signal increases.



• Inverted Scaling

The display value decreases when the input signal increases.



The decimal point position can be set to any digit. Set it according to the 100% value.

• Scaling settings

Set scaling the range between -9999 to +9999 for measurement range 4 to 20 mA.

Display scaling value has two types, A and B. Decimal point can be set at any place.

- Display scaling A is the display value for 4 mA DC.
- Display scaling B is the display value for 20 mA DC.
- Set display scaling decimal point commonly for the display scaling value A and B.

Example) For display value 0.0 to 100.0%

Display scaling value A: 0.0%

Display scaling value B: 100.0%

Display scaling decimal point: 888.8 (one place of decimal)

When input signal is other than 4 to 20 mA DC (available input range: approx. 3.7 to 23 mA DC), obtain the value parallel shifted from intended display value for the input signal to 4 to 20 mA DC (measurement range). Set the obtained value as the display scaling value A and B. In next paragraph, how to calculate the display scaling value A and B when input signal is other than 4 to 20 mA DC is explained.

• Scaling examples

$$SA = (Rz \times Dspan + Dz \times Is - Ds \times Iz) / Ispan$$

$$SB = (Rs \times Dspan + Dz \times Is - Ds \times Iz) / Ispan$$

Iz: 0% value of input

Is: 100% value of input

Dz: Display value for 0% input

Ds: Display value for 100% input

Rz: 0% value of conformance range

Dspan: Display span (Ds - Dz)

Ispan: Input span (Is - Iz)

Example)

Input: 6 – 16 mA

Intended display value: -5.00 – +5.00

Measurement range: 4 – 20 mA

1) Calculate “Display Scaling Value A” with following formula.

$$SA = (Rz \times Dspan + Dz \times Is - Ds \times Iz) / Ispan$$

$$= [400 \times (500 + 500) - 500 \times 1600 - 500 \times 600] / (1600 - 600)$$

$$= -700$$

In the above formula, for intended display value, decimal points are omitted as following.

$$-5.00 - +5.00 \rightarrow -500 - +500$$

From the above calculation, the Display Scaling Value A is “-700.”

2) Calculate “Display Scaling Value B” with following formula.

$$SB = (Rs \times Dspan + Dz \times Is - Ds \times Iz) / Ispan$$

$$= [2000 \times (500 + 500) - 500 \times 1600 - 500 \times 600] / (1600 - 600)$$

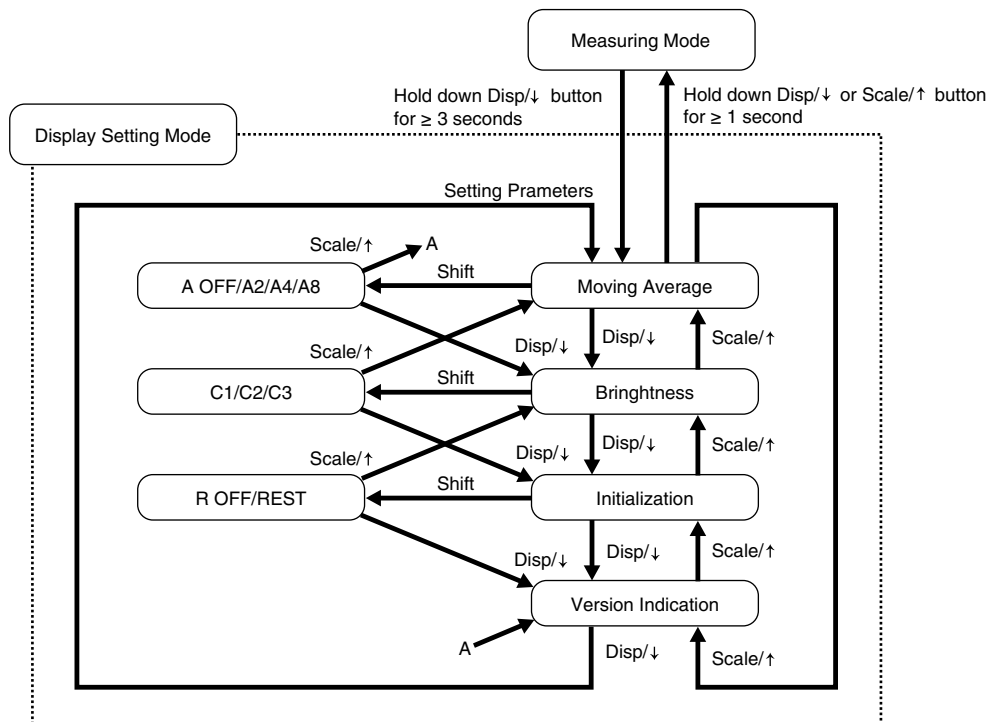
$$= 900$$

From the above calculation, the Display Scaling Value B is “900.”

3) Set scaling with the above parameters.

According to the display value, -5.00 – +5.00, set decimal point at the third position from LSD.

■ DISPLAY SETTING MODE



■ PARAMETER LIST

PARAMETER	DISPLAY	FUNCTION	DEFAULT VALUE
Moving Average	R _o FF	No moving averaging	R _o FF
	R 2	Moving average with 2 samples	
	R 4	Moving average with 4 samples	
	R 8	Moving average with 8 samples	
Brightness	[1	Brightness level 1 (dark)	[3
	[2	Brightness level 2	
	[3	Brightness level 3 (bright)	
Initialization	r _o FF	Non-initialization	r _o FF
	r _E S _t	Initialize settings (change to factory settings) *1	
Version Indication	-	Version number, indication only	-

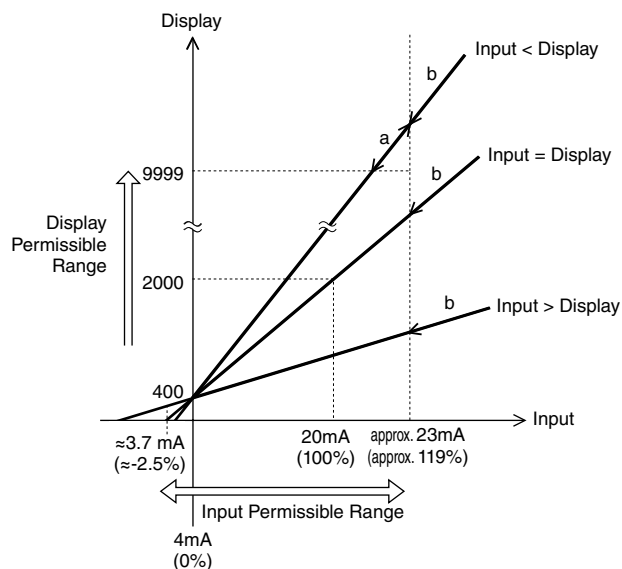
*1. While “r_ES_t” is shown, pressing Disp/↓ button or Scale/↑ button initializes settings.

Activating “initialization”, user’s specified parameters will be deleted and overwritten with the factory default values. Notice that after this, Ex-factory settings will be irrecoverable.

ERROR MESSAGES

DISPLAY	ERROR MESSAGE	WHAT TO DO
S.ERR blinking	The input signal is out of the permissible range.	Set the input signal within the permissible range.
-9999 or 9999 blinking	The value after scaling is out of the permissible display range.	Set the input signal within the permissible range.

INPUT AND ERROR CORRELATION



a: 9999 blinking

If the value to display after scaling is out of the permissible range, the maximum (9999) or minimum (-9999) value is blinking.

b: S.ERR blinking

If the input signal is out of the permissible range, the indicator will blink "S.ERR".

CHARACTER SET

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F	G	H	,	U	P	L	n	n	a	P	q	r	S	t	U	u	y	ū	Y	z

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protectors for protection against induced lightning surges. Please contact us to choose appropriate models.