OPERATING MANUAL

AC INPUT DIGITAL PANEL METER
(4 1/2 digit, LED display type, true RMS sensing)

MODEL **47LAC**

BEFORE USE ....

Thank you for choosing M-System. 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 M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Digital panel meter .... (1)
Engineering unit sticker label sheet .... (1)

■ MODEL NO.

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

■ OPERATING MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection, basic maintenance procedures and detailed operations.

POINTS OF CAUTION

■ CONFORMITY WITH EC DIRECTIVES

• This equipment is suitable for use in a Pollution Degree 2 environment and in Installation Category II, with the maximum operating voltage of 300V.
Reinforced insulation is maintained between signal input, output and power input, basic insulation is between the input and DC output. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
• Altitude up to 2000 meters
• The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
• In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-1 and IEC 60947-3 and properly indicate it.

■ POWER INPUT RATING & OPERATIONAL RANGE

Locate the power input rating marked on the product and confirm its operational range as indicated below:
100 – 240V AC rating: 85 – 264V, 50/60 Hz, approx. 6.5VA
24V DC rating: 24V ±10%, approx. 3W
110V DC rating: 85 – 150V, approx. 3W

■ GENERAL PRECAUTIONS

• Before you remove the unit or mount it, turn off the power supply and input signal for safety.
• Be sure to put the terminal cover on while the power 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.

■ REQUIREMENTS TO ENSURE IP66

• Observe the designated panel cutout size (W92 × H45 mm).
• The watertight packing included in the product package must be placed behind the front cover.
• Both mounting brackets must be fastened tightly until they hit the panel.
• Confirm visually that the packing is not contorted or excessively run off the edge after installation.
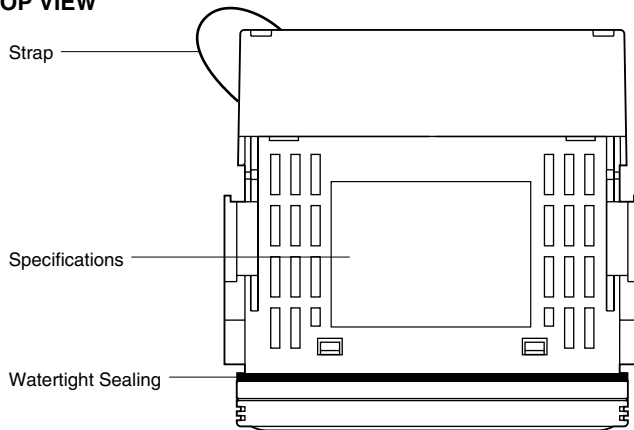
■ WIRING

• Make sure for safety that only qualified personnel perform the wiring.
• Do not install cables (power supply, input and output) 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.
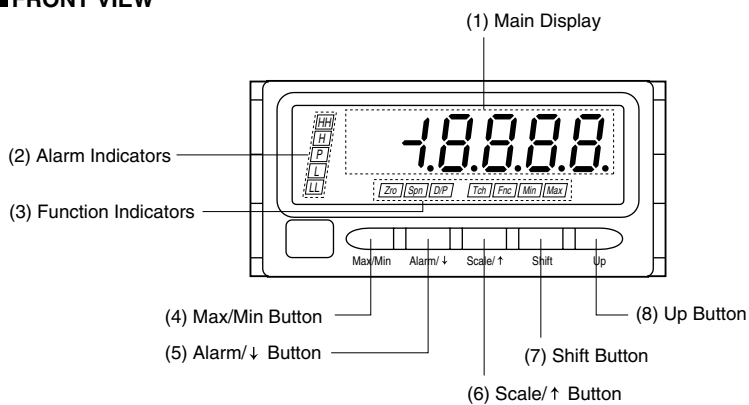
■ AND ....

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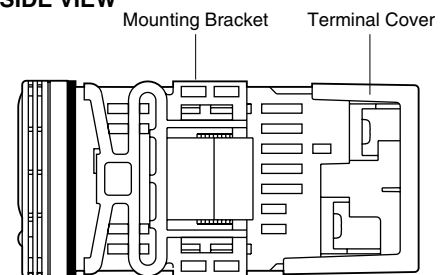
COMPONENT IDENTIFICATION

■TOP VIEW

Strap

Specifications

Watertight Sealing

■FRONT VIEW

(1) Main Display

(2) Alarm Indicators

(3) Function Indicators

(4) Max/Min Button

(5) Alarm/↓ Button

(6) Scale/↑ Button

(7) Shift Button

(8) Up Button

■SIDE VIEW

Mounting Bracket   Terminal Cover

• COMPONENT IDENTIFICATION

No.	COMPONENT	FUNCTION
(1)	Main display	Indicates present values, setting values.
(2)	Alarm indicators *1	Indicate alarm status of the input signal. LL turns on when the LL alarm is tripped. L turns on when the L alarm is tripped. H turns on when the H alarm is tripped. HH turns on when the HH alarm is tripped. P turns on when none of the other alarms is tripped.
(3)	Function indicators	Indicate setting modes and status.
(4)	Max/Min button	Used to switch the main display to show present values, maximum values or minimum values.
(5)	Alarm/↓ button	Used to move on to the alarm setting mode; or to shift through setting items in each setting mode.
(6)	Scale/↑ button	Used to move on to the scaling setting mode; 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 change setting values, to execute/cancel Forced Zero, or to set input signal values during 'Teach' calibration.

*1. Only the 'P' indicator turns on with 'no alarm output' option. For dual alarm type, 'LL' or 'HH' does not turn on.

INSTALLATION

■ **PANEL CUTOUT unit: mm**

$92 ^{+0.8}_{-0}$

$45 ^{+0.6}_{-0}$

min. 75

min. 120
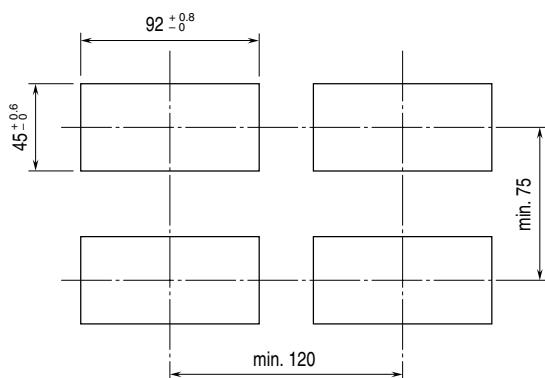
Panel thickness: 1.6 to 8.0 mm

■ **HOW TO MOUNT THE UNIT ON A PANEL**
The watertight packing must be in place to hold the meter.
Do not remove it.
1) Insert the unit into the panel cutout.
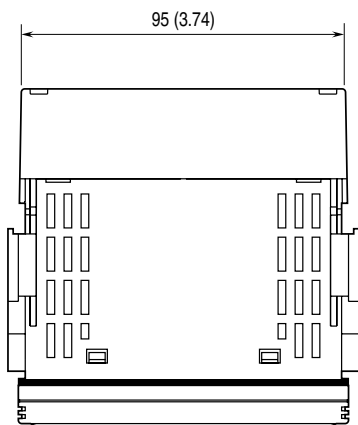2) Push the mounting brackets into the grooves on both sides of the rear module, until they hit the panel's rear side.

Watertight packing   Panel   Mounting Bracket
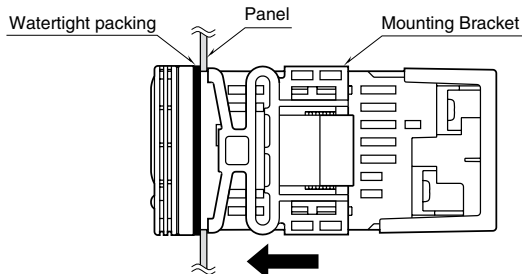
TERMINAL CONNECTIONS

Connect the unit as in the diagram in the following page or refer to the connection diagram on the terminal cover.

■ **EXTERNAL DIMENSIONS unit: mm (inch)**

■ **TOP VIEW**

95 (3.74)

■ **FRONT VIEW**

103 (4.06)
96 (3.78)
48 (1.89)

■ **SIDE VIEW**

98.5 (3.88)
12.5 (.49)   86 (3.39)
2 (.08)
47 (1.85)
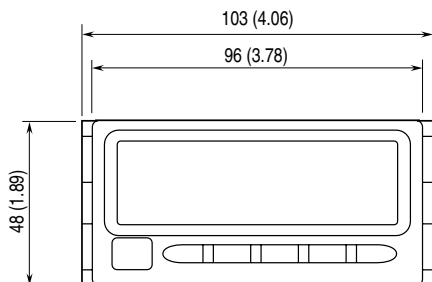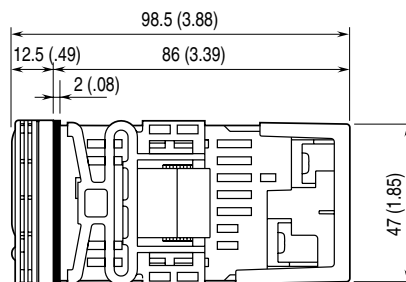
■ **REAR VIEW**
• **No Alarm Output**

10–M3 SCREW TERMINAL
2–M3 SCREW
45 (1.77)
1 2 3 4 5 6 7 8 9 10
91.5 (3.60)

•†**Alarm Output**

20–M3 SCREW TERMINAL
4–M3 SCREW
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
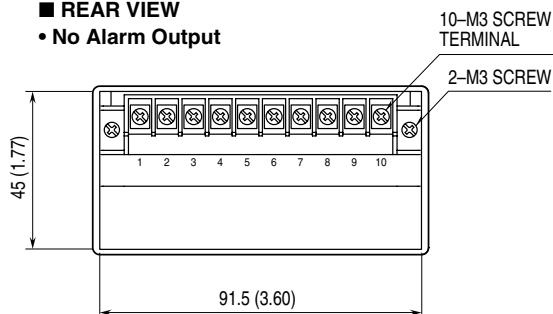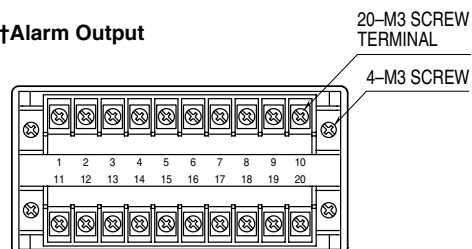
■ **CONNECTION DIAGRAM**

■ **ALARM SUFFIX CODE 0: No alarm output**

• **Input Terminal Assignments**

INPUT TYPE (indicator)	MEASURING RANGE	INPUT TERMINALS
A2	0 – 2mA	2 – 3
A20 A200	0 – 20mA 0 – 200mA	1 – 3
V0.1 V1	0 – 0.1V 0 – 1V	2 – 3
V10	0 – 10V	1 – 3

■ **ALARM SUFFIX CODE 1: N.O. contact, 4 points**
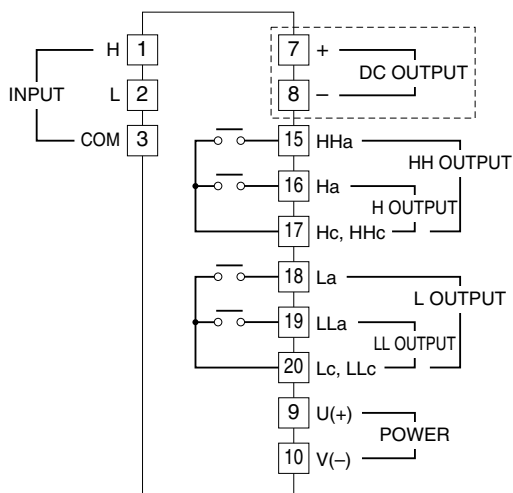
■ **ALARM SUFFIX CODE 2: SPDT contact, 2 points**
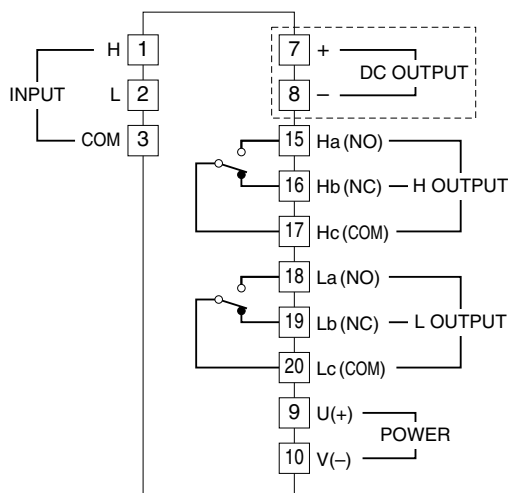
Note: The section enclosed by broken line is only with DC output option.

■ **Relay Protection**
• **AC Powered**
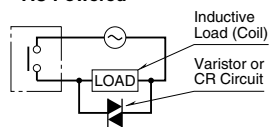
• **DC Powered**
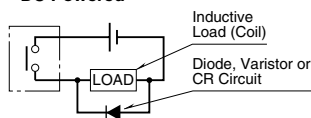
■ **TERMINAL BLOCK**

• **How to remove the terminal block cover**
Insert the minus tip of a screwdriver into each hole at the four corners of the cover and pull it to the direction as indicated below to separate the terminal block cover.
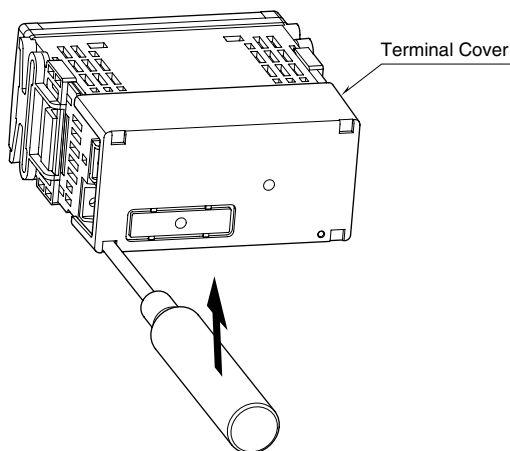
• **How to remove the terminal block**
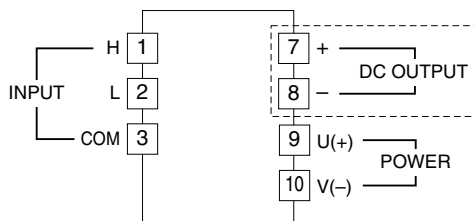The terminal block is separable in two pieces. Loosen two screws on both sides of the terminal block to separate.
Be sure to turn off the power supply, input signal and power supply to the output relays before separating the terminal block.
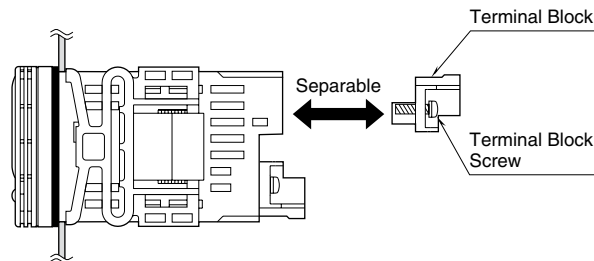
SETTING PROCEDURE

■ INITIAL SETTING FLOWCHART

POWER ON

↓

Hold down Scale/↑ button for 3 seconds or more to move on to Scaling Setting Mode.

↓

Choose an input type and display scale values.

↓

Hold down Alarm/↓ button for 3 seconds or more to move on to Alarm Setting Mode.
Go through the alarm settings.

↓

Hold down Alarm/↓ + Scale/↑ buttons at once for 3 seconds or more
to move on to Advanced Setting Mode. Go through the advanced settings.   *1

↓

If necessary, hold down Max/Min button + Alarm/↓ buttons at once
for a preset time duration to enter Lockout Setting Mode.
Go through the lockout settings.

↓

Hold down Alarm/↓ button or Scale/↑ button for 1 second or more
to go back to Measuring Mode.

↓

Initial Setting Complete
Measuring Started

*1. Optional settings for parameters in a broken-line section.
    Alarm Setting Mode is locked with no-alarm-output type.

■ GENERAL SETTING FLOWCHART

POWER ON

Hold down Max/Min + Alarm/↓ buttons at once
for a preset time duration*1

Lockout Setting Mode ← Measuring Mode

Hold down Alarm/↓ or Scale/↑
button for ≥1 second

Hold down Scale/↑ button
for ≥3 seconds → Scaling Setting Mode

Hold down Alarm/↓ or Scale/↑ button
for ≥1 second

Hold down Alarm/↓ button
for ≥3 seconds → Alarm Setting Mode   *2

Hold down Alarm/↓ or Scale/↑ button
for ≥1 second

Hold down Alarm/↓ + Scale/↑ buttons at once
for ≥3 seconds → Advanced Setting Mode

Hold down Alarm/↓ or Scale/↑ button
for ≥1 second

Hold down Alarm/↓ + Scale/↑ + Shift buttons at once
for ≥5 seconds → Loop Test Output Mode
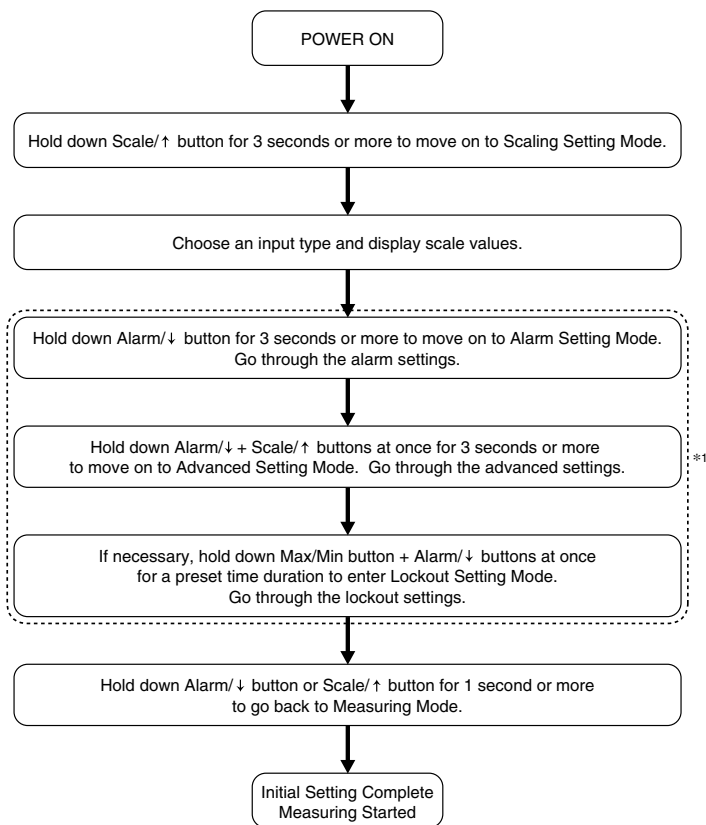
Hold down Alarm/↓ or Scale/↑ button
for ≥1 second

Measuring

Measuring stopped*3

Mode transition

*1. Preset time can be specified with "Transition Time to Lockout Setting Mode" in Advanced Setting Mode.
*2. Alarm Setting Mode is locked with no-alarm-output type.
*3. The last measured values or status are held for DC and alarm outputs while the measuring is stopped.
    (Except the analog output adjustments during the loop test and the scaling)

■ **OPERATIONS IN MEASURING MODE**
• **Switching the main display to MAX or MIN values**
Press Max/Min button to switch the main display to MAX or MIN values.
'Max' or 'Min' indicator turns on during the MAX/MIN display mode.
Press Max/Min button again for 1 second or more, or turn the power supply off and on to cancel the MAX/MIN display mode.

```
                    Max/Min         | Max | ON       Max/Min        | Min | ON
                    button                           button
  ┌─────────────┐   ─────────→   ┌──────────────┐   ─────────→   ┌──────────────┐
  │  Measuring  │                │  Max. Value  │                │  Min. Value  │
  │    Mode     │                │   Display    │                │   Display    │
  └─────────────┘                └──────────────┘                └──────────────┘
        ↑                                                               │
        └───────────────────────────────────────────────────────────────┘
                              Max/Min
                              button
```
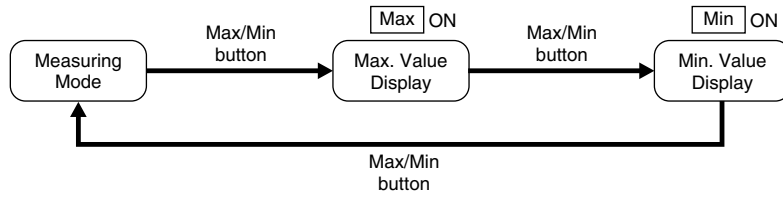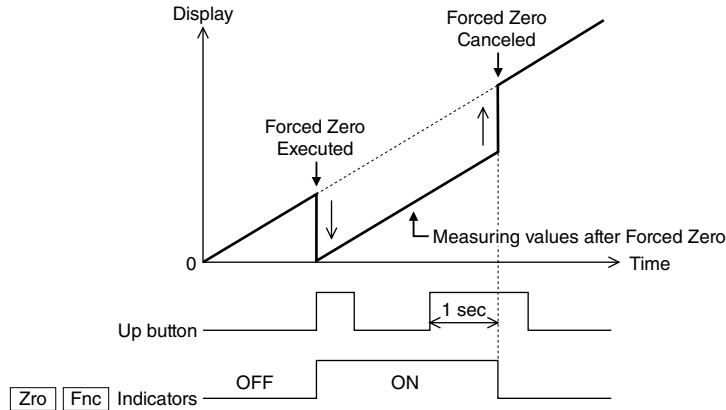
• **Forced Zero**

Press Up button to shift the present display value to 0 and to continue measuring in reference to this point.
'Zro' and 'Fnc' indicators turn on during the Forced Zero mode.
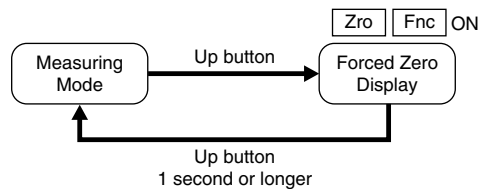Press Up button again for 1 second or more to cancel the mode.
Forced Zero is effectively used when '0' is within the scaled range.
The command cannot be executed when the operation is prohibited with the lockout protection setting.
MAX/MIN display mode cannot be cancelled while in the Forced Zero mode.
Forced Zero cannot be cancelled while in the MAX/MIN display mode.
Forced Zero value is stored in memory even when the power is removed.

```
                                      | Zro | Fnc | ON
                    Up button
  ┌─────────────┐   ─────────→   ┌──────────────┐
  │  Measuring  │                │ Forced Zero  │
  │    Mode     │                │   Display    │
  └─────────────┘                └──────────────┘
        ↑                               │
        └───────────────────────────────┘
                    Up button
                 1 second or longer
```

• **Confirming alarm setpoints**
Press Alarm/↓ button to confirm alarm setpoints.

```
              Alarm/↓           Alarm/↓           Alarm/↓           Alarm/↓
              button            button            button            button
 ┌──────────┐ ──────→ ┌────────┐ ──────→ ┌───────┐ ──────→ ┌───────┐ ──────→ ┌────────┐
 │Measuring │         │Alarm LL│         │Alarm L│         │Alarm H│         │Alarm HH│
 │  Mode    │         └────────┘         └───────┘         └───────┘         └────────┘
 └──────────┘                                                                     │
      ↑                                                                           │
      └───────────────────────────────────────────────────────────────────────────┘
                                    Alarm/↓
                                    button
```
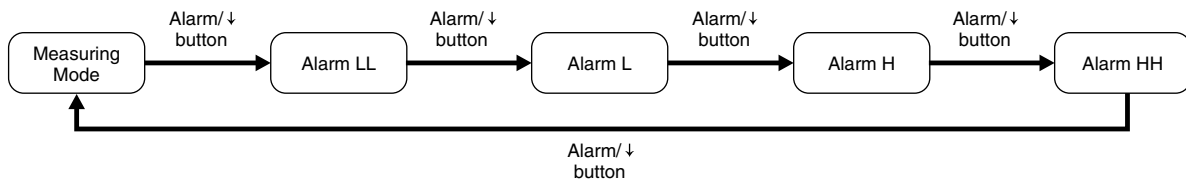
■ OPERATIONS IN SETTING MODES

• Main display

The main display shows the current settings while the panel meter is in the setting mode.

• Shifting through setting parameters

In any setting mode, pressing Alarm/↓ 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 Alarm/↓ or Scale/↑ button to apply the new value and go to the next or previous parameter setting.

• If you get lost...

Hold down Max/Min button for 1 second or more to return to the measuring mode without applying the last changes. (Those which have been already applied by pressing Alarm/↓ or Scale/↑ button are not cancelled.)

■ SCALING SETTING MODE
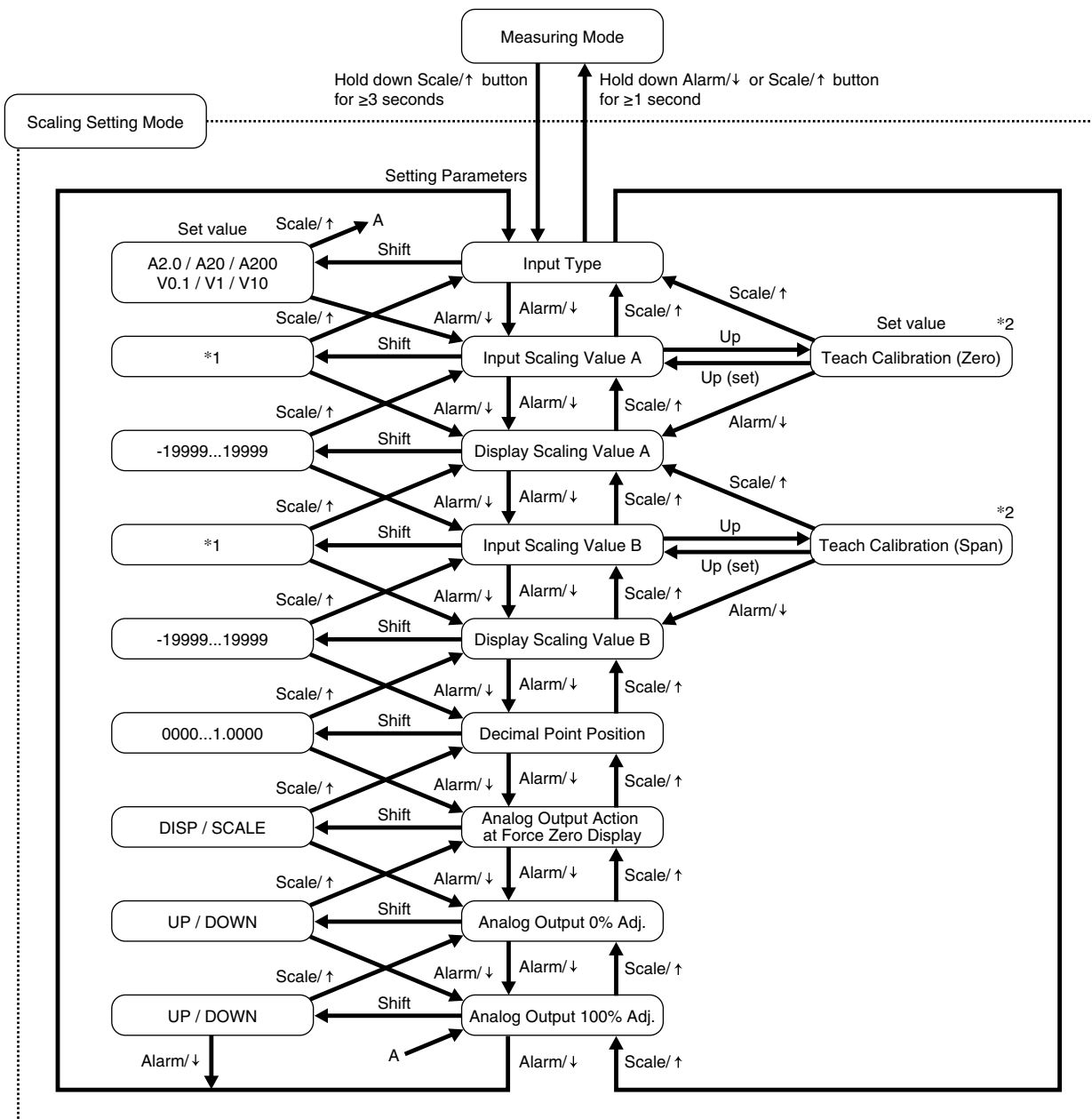
*1. Depends upon model suffix code. Refer to the following parameter list.
*2. Refer to Teach Calibration for detailed procedures.

PARAMETER	INDICATORS	DISPLAY		FUNCTION	DEFAULT VALUE
Input type	Zro Spn	*A 2.0*		Measuring range 0 to 2.0mA	*A200*
		A 20		Measuring range 0 to 2mA	
		A200		Measuring range 0 to 20mA	
		u 0.1		Measuring range 0 to 0.1V	*u 10*
		u 1		Measuring range 0 to 1V	
		u 10		Measuring range 0 to 10V	
Input scaling value A	Zro Tch	*A 2.0*	*0 ... 2.000*	Input value for Zero point: Set to a specific value by using the buttons, or by Teach Calibration	*000.0*
		A 20	*0 ... 20.00*		
		A200	*0 ... 200.0*		
		u 0.1	*0 ... .1000*		*0.000*
		u 1	*0 ... 1.0000*		
		u 10	*0 ... 10.000*		
Display scaling value A	Zro D/P	*- 19999 ... 19999*		Display value for Input Scaling Value A	*000.0 / 0.000*
Input scaling value B	Spn Tch	*A 2.0*	*0 ... 2.000*	Input value for Full-scale point: Set to a specific value by using the buttons, or by Teach Calibration	*200.0*
		A 20	*0 ... 20.00*		
		A200	*0 ... 200.0*		
		u 0.1	*0 ... .1000*		*10.000*
		u 1	*0 ... 1.0000*		
		u 10	*0 ... 10.000*		
Display scaling value B	Spn D/P	*- 19999 ... 19999*		Display value for Input Scaling Value B	*200.0 / 10.000*
Decimal point position	D/P	4 positions or none		Decimal point position	*000.0 / 0.000*
Analog output action	Fnc	*di SP*		Proportional to the display value	*di SP*
		SCALE		Proportional to the scaling value	
Analog output 0% adjustment	Zro Fnc	*UP* (increasing)		Analog output 0% adjustment: adjustable range -5 to 105%	*Adj*
		down (decreasing)			
Analog output 100% adjustment	Spn Fnc	*UP* (increasing)		Analog output 100% adjustment: adjustable range -5 to 105%	*Adj*
		down (decreasing)			

Default value X / Y: X = Current input, Y = Voltage input
Scaling setting:
The 0% and 100% of the measurement range can be set to the desired values by setting parameters.
Note: After initialization, the parameters will return to the default values.

Input Scaling Value A
Enter the desired zero value (0%). (Input scaling value A < Input scaling value B)

Input Scaling Value B
Enter the desired full scaling value (100%).

Note: For setting input scaling value A and B, proceed with the same method. The combination of inputting parameter and Teach Calibration is unable.

For product version 1.05 or eariler;
Input Scaling Value A
"0.0" is displayed as factory default setting or after initialization. For setting desired input scaling value A, calculate by using the formula shown below. (Input scaling value A < Input scaling value B)

(Example)
Input type: 0 to 200mA
Input scaling: 50 to 150
    50   +   (200 x (5 / 100))   =   60
  (Zero value)   (5% value of full scale of input type 0 to 200mA)

Input Scaling Value B
Enter the desired full scaling value (100%).

Decimal point position: Decimal point position is specified independently from the scaling. When you set the display scaling, include zeros for fractions (10000 to show 10.000).
Analog output: When the forced zero or low-end cutout is ON, the analog output is proportional to the display value.
Analog output 0% / 100% adjustment: Pressing [Shift] button switches the signal to increase or decrease, and then pressing [Up] button controls it toward the desired output value. 0% value < 100% value
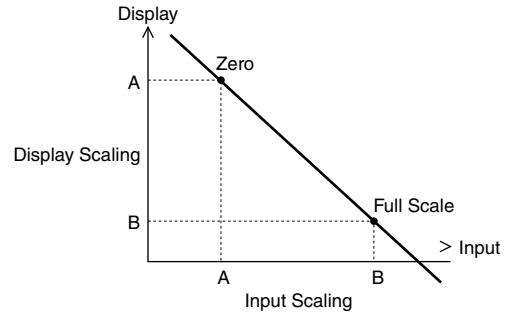
• **Nor**mal S**caling**
The display value increases when the input signal increases.
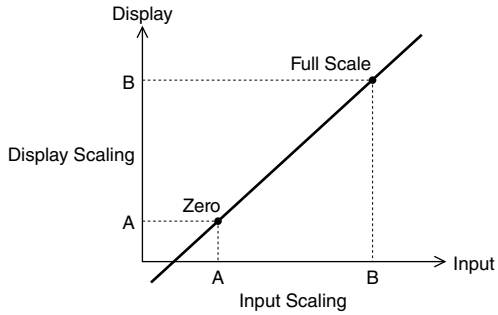
• **Inverted Scaling**
The display value decreases when the input signal increases.

• **'Teach' Calibration**
'Input scaling value A' and 'Input scaling value B' can be adjusted by applying actual input signals. These settings will be lost after an initialization.
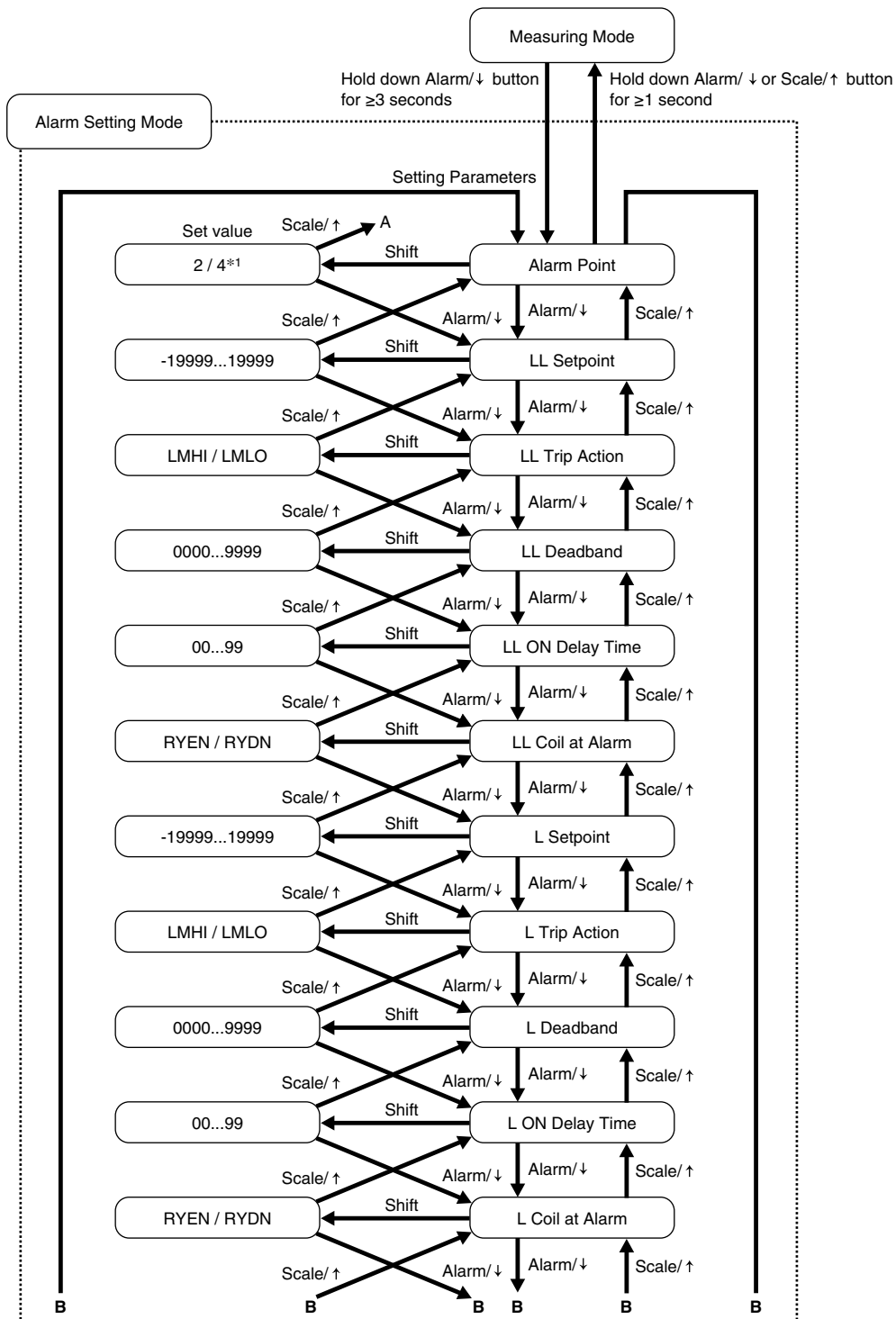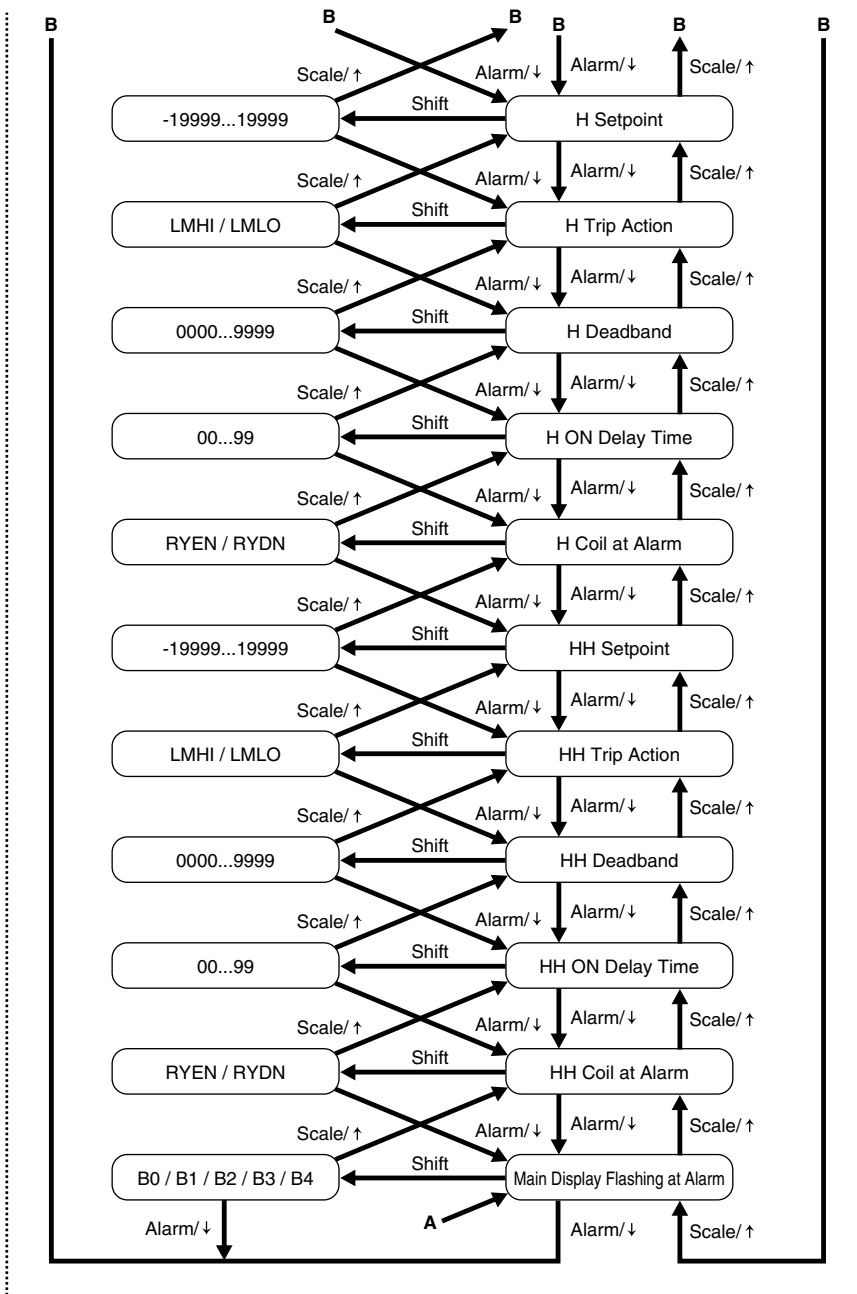
How to 'Teach' Input Values
1) Hold down Scale/↑ button for 3 seconds or more to enter the scaling setting mode.
2) Choose an appropriate input type and press Alarm/↓ button to move on to Input scaling value A.
3) 'Zro' and 'Tch' indicators turn on.
4) Zero point: Press Up button and 'Tch' indicator starts blinking.
5) Apply (5%) input signal. Press Up button again and 'Tch' indicators returns to ON.
6) Press Alarm/↓ button to move on to Display scaling value A.
7) Press Alarm/↓ button again to move on to Input scaling value B.
8) 'Spn' and 'Tch' indicators turn on.
9) Full-scale point: Press Up button and 'Tch' indicator starts blinking.
10) Apply 100% input signal. Press Up button again and 'Tch' indicators returns to ON.
Note 1: For setting input scaling value A and B, proceed with the same method. The combination of inputting parameter and Teach Calibration is unable.
Note 2: The Teach Calibration is a function to calibrate by applying actual input signal of 5% and 100%. The error might increase depending on the way of the Teaching Calibration.

■ ALARM SETTING MODE

Measuring Mode

Hold down Alarm/↓ button
for ≥3 seconds

Hold down Alarm/↓ or Scale/↑ button
for ≥1 second

Alarm Setting Mode

Setting Parameters

Set value | Scale/↑ → A

2 / 4*1 | Shift | Alarm Point

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

-19999...19999 | Shift | LL Setpoint

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

LMHI / LMLO | Shift | LL Trip Action

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

0000...9999 | Shift | LL Deadband

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

00...99 | Shift | LL ON Delay Time

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

RYEN / RYDN | Shift | LL Coil at Alarm

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

-19999...19999 | Shift | L Setpoint

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

LMHI / LMLO | Shift | L Trip Action

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

0000...9999 | Shift | L Deadband

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

00...99 | Shift | L ON Delay Time

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

RYEN / RYDN | Shift | L Coil at Alarm

Scale/↑ | Alarm/↓ | Alarm/↓ | Scale/↑

B | B | B | B | B | B

```
B                          B      B   B         B              B
          Scale/↑      Alarm/↓   │ Alarm/↓    ↑ Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  -19999...19999 │◄───────│   H Setpoint    │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  LMHI / LMLO   │◄───────│   H Trip Action  │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  0000...9999   │◄───────│   H Deadband    │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │   00...99      │◄───────│  H ON Delay Time │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  RYEN / RYDN   │◄───────│  H Coil at Alarm │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  -19999...19999 │◄───────│   HH Setpoint   │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  LMHI / LMLO   │◄───────│  HH Trip Action  │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  0000...9999   │◄───────│   HH Deadband   │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │   00...99      │◄───────│ HH ON Delay Time │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌─────────────────┐
   │  RYEN / RYDN   │◄───────│ HH Coil at Alarm │
   └──────────────┘          └─────────────────┘
          Scale/↑      Alarm/↓     Alarm/↓       Scale/↑
   ┌──────────────┐  Shift   ┌──────────────────────────┐
   │ B0/B1/B2/B3/B4 │◄───────│ Main Display Flashing at Alarm │
   └──────────────┘          └──────────────────────────┘
       Alarm/↓            A     Alarm/↓    Scale/↑
```

*1. Alarm point is fixed at "2" when the alarm model suffix code 2 is specified.

PARAMETER	INDICATORS	DISPLAY	FUNCTION	DEFAULT VALUE
Alarm points	H L Fnc	*ALm2*	Dual alarm: L, H	*ALm2*
	HH H L LL Fnc	*ALm4*	Quad alarm: LL, L, H, HH	*ALm4*
LL setpoint	LL Fnc	*-19999 ... 19999*	LL: Setpoint value	*20.0 / 1.000*
LL trip action	LL Fnc	*LmHi*	LL: Hi trip	*LmLo*
		LmLo	LL: Lo trip	
LL deadband (hysteresis)	P LL Fnc	*0000 ... 9999*	LL: Deadband (hysteresis) value	*0001*
LL ON delay time	LL D/P Fnc	*00 ... 99*	LL: ON delay time (seconds)	*00*
LL coil at alarm	LL Fnc	*rYEn*	LL: Coil energized at alarm	*rYEn*
		rYdn	LL: Coil de-energized at alarm	
L setpoint	L Fnc	*-19999 ... 19999*	L: Setpoint value	*60.0 / 3.000*
L trip action	L Fnc	*LmHi*	L: Hi trip	*LmLo*
		LmLo	L: Lo trip	
L deadband (hysteresis)	P L Fnc	*0000 ... 9999*	L: Deadband (hysteresis) value	*0001*
L ON delay time	L D/P Fnc	*00 ... 99*	L: ON delay time (seconds)	*00*
L coil at alarm	L Fnc	*rYEn*	L: Coil energized at alarm	*rYEn*
		rYdn	L: Coil de-energized at alarm	
H setpoint	H Fnc	*-19999 ... 19999*	H: Setpoint value	*140.0 / 7.000*
H trip action	H Fnc	*LmHi*	H: Hi trip	*LmHi*
		LmLo	H: Lo trip	
H deadband (hysteresis)	P H Fnc	*0000 ... 9999*	H: Deadband (hysteresis) value	*0001*
H ON delay time	H D/P Fnc	*00 ... 99*	H: ON delay time (seconds)	*00*
H coil at alarm	H Fnc	*rYEn*	H: Coil energized at alarm	*rYEn*
		rYdn	H: Coil de-energized at alarm	
HH setpoint	HH Fnc	*-19999 ... 19999*	HH: Setpoint value	*180.0 / 9.000*
HH trip action	HH Fnc	*LmHi*	HH: Hi trip	*LmHi*
		LmLo	HH: Lo trip	
HH deadband (hysteresis)	P HH Fnc	*0000 ... 9999*	HH: Deadband (hysteresis) value	*0001*
HH ON delay time	HH D/P Fnc	*00 ... 99*	HH: ON delay time (seconds)	*00*
HH coil at alarm	HH Fnc	*rYEn*	HH: Coil energized at alarm	*rYEn*
		rYdn	HH: Coil de-energized at alarm	
Main display flashing at alarm	Fnc	*b 0*	No flashing	*b 0*
		b 1	Flashing in 1.0 sec. intervals	
		b 2	Flashing in 0.5 sec. intervals	
		b 3	Flashing in 0.2 sec. intervals	
		b 4	Flashing in 0.1 sec. intervals	

Note 1: Alarm Setting Mode is locked with no-alarm-output type.
　　　　Alarm points depend upon the model suffix code. LL and HH setpoints are usable only for quad alarm type.
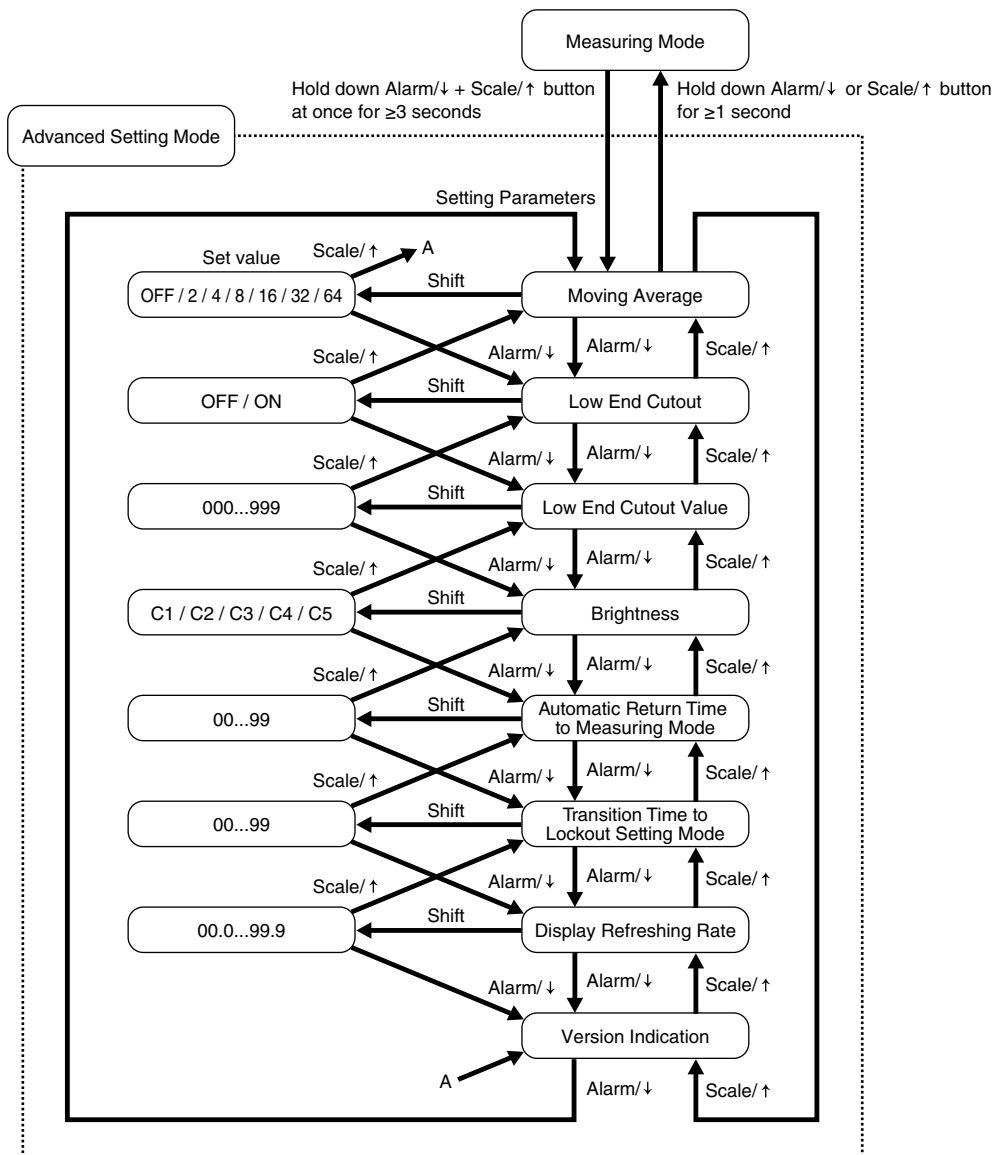Note 2: LED status: ☐ = ON, ☐ = Blinking
Note 3: Specify setpoint and deadband in the scaled range values. Alarm is disabled when ' – – – – ' is specified for the setpoint.
Note 4: All alarm setpoints are disabled (reset to ' – – – – ' status) when the input type has been changed. Re-setting is required.
Note 5: Decimal point is not indicated when setting deadband values.

■ **ADVANCED SETTING MODE**

PARAMETER	INDICATORS	DISPLAY	FUNCTION	DEFAULT VALUE
Moving average	Fnc	*RoFF*	No moving averaging	*RoFF*
		R 2	Moving average with 2 samples	
		R 4	Moving average with 4 samples	
		R 8	Moving average with 8 samples	
		R 16	Moving average with 16 samples	
		R 32	Moving average with 32 samples	
		R 64	Moving average with 64 samples	
Low-end cutout	Fnc	*EoFF*	Low-end cutout OFF	*E on*
		E on	Low-end cutout ON	
Low-end cutout value	Zro Fnc	*E000 ... E999*	Low-end cutout value setting	*E100 / E500*
Brightness	D/P Fnc	*C 1*	Brightness level 1 (dark)	*C 3*
		C 2	Brightness level 2	
		C 3	Brightness level 3	
		C 4	Brightness level 4	
		C 5	Brightness level 5 (bright)	
Automatic return time to Measuring Mode	D/P Fnc	*r 00 ... r 99*	Specify in seconds	*r 15*
Transition time to Lockout Setting Mode	D/P Fnc	*P 00 ... P 99*	Specify in seconds	*P 05*
Display refreshing rate *1	Fnc	*F00.0 ... F99.9*	Specify in seconds	*F00.0*
Version indication	Fnc	N/A	Version number, indication only	N/A

Low-end cutout: Input signal below the preset cutout value is forcibly cut to 0.
    Set for the three lowest digits of the scaled range (disregarding the decimal point)
   With the cutout set to OFF, the low-end cutout value setting is locked.
Automatic return time to Measuring Mode: The display goes back automatically to Measuring Mode if the front buttons are left untouched
    for the specified time period while it is in one of the setting modes (except the loop test output mode).
    With this value set to 0, the display must always be exited manually from the setting mode.
Transition time to Lockout Setting Mode: The display goes to Lockout Setting Mode only when the designated buttons are pressed for the
   specified time duration.
*1. F00.0 = 25 msec. refreshing rate

■ LOCKOUT SETTING MODE
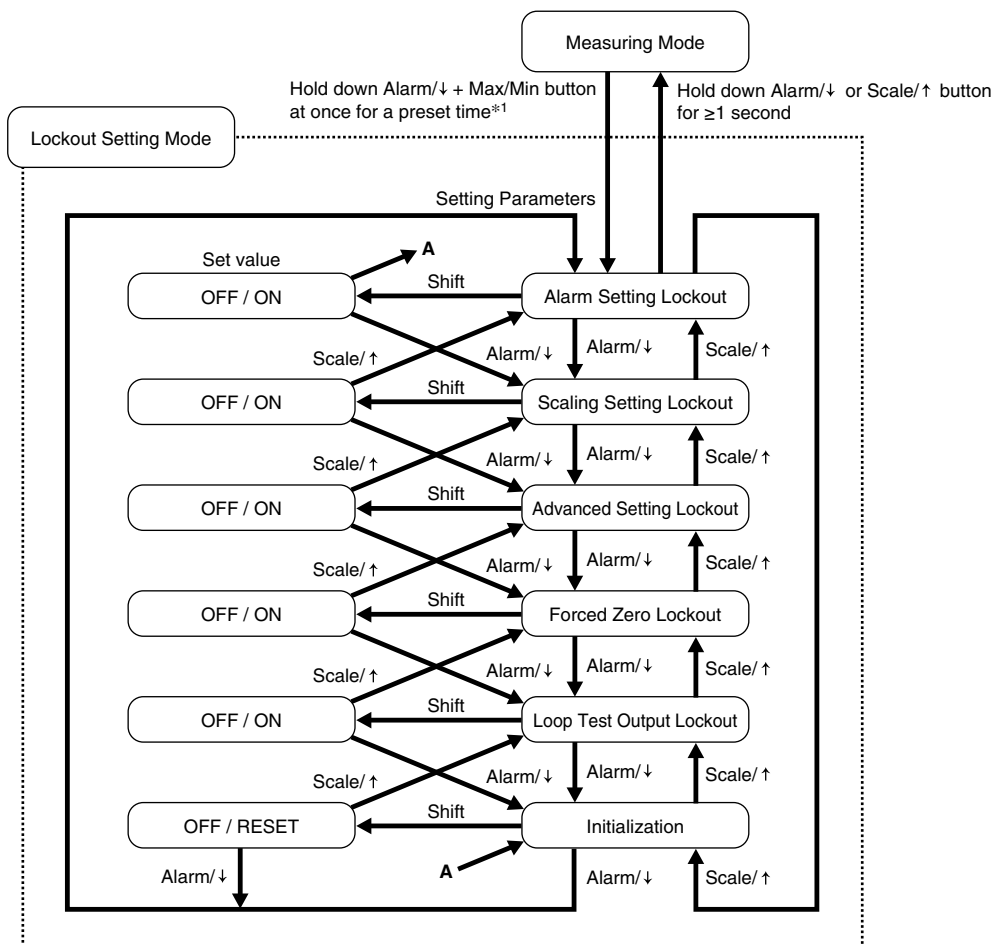
*1. Preset time can be specified with "Transition Time to Lockout Setting Mode" in Advanced Setting Mode.

PARAMETER	INDICATORS	DISPLAY	FUNCTION	DEFAULT VALUE
Alarm setting lockout	D/P Fnc	$AoFF$	Unlock Alarm Setting Mode	$AoFF$
		$A\ on$	Lock Alarm Setting Mode	
Scaling setting lockout	D/P Fnc	$SoFF$	Unlock Scaling Setting Mode	$SoFF$
		$S\ on$	Lock Alarm Setting Mode	
Advanced setting lockout	D/P Fnc	$doFF$	Unlock Advance Setting Mode	$doFF$
		$d\ on$	Lock Advanced Setting Mode	
Forced zero lockout	D/P Fnc	$\bar{-}oFF$	Unlock (Enable) Forced Zero operation	$\bar{-}oFF$
		$\bar{-}\ on$	Lock (Disable) Forced Zero operation	
Loop test output lockout	D/P Fnc	$toFF$	Unlock Loop Test Output Mode	$toFF$
		$t\ on$	Lock Loop Test Output Mode	
Initialization	D/P Fnc	$roFF$	Initialization prohibited	$roFF$
		$rESt$	Execute Initialization	

■ **LOOP TEST OUTPUT MODE**
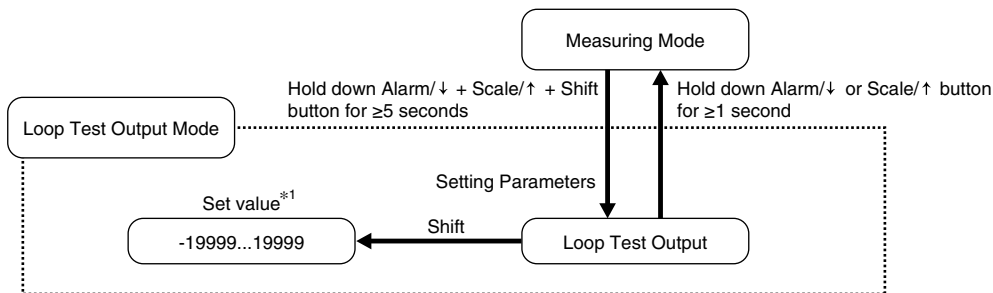
*1. Hold down Alarm/↓ or Scale/↑ button for ≥1 second to return to the measuring mode while setting parameters.

PARAMETER	INDICATORS	DISPLAY	FUNCTION	DEFAULT VALUE
Loop test output	Zro Spn D/P Tch Fnc Min / Max	- 19999 ... 19999*1 (display blinking)	Scaling value for the loop test output	N/A

Loopt test output: Pressing [Shift] button switches the signal to increase (Max ON) or decrease (Min ON), and then pressing [Up] button controls it toward the desired output value.
Alarm trip functions according to the scaling values during the loop test.
*1. The specified decimal point position is applied to the loop test output value. -19999 to 19999 when 'No decimal fraction' is specified.

ERROR MESSAGES

MAIN DISPLAY	ERROR MESSAGE	WHAT TO DO
5.Err	Input error, Out of the measuring range	Increase/decrease the input signal until it is back within the measuring range.
1.Err	Non-volatile memory error (reading)	While the error message is on the display, press Up button for 3 seconds or more, go to the lockout setting mode and initialize the unit to its factory default status.*1
4.Err	Non-volatile memory error (writing)	
r.Err	Internal data error	Repair is needed if the display does not recover after the power is reset.

*1. If the unit does not recover its function after the initialization, repairing in the factory may be required.

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

LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protectors for protection against induced lightning surges. Please contact M-System to choose appropriate models.