

KN-1000B Series

Features

- High accuracy with 16bit ADC ($\pm 0.2\%$ F.S.)
- Multi-input
 - : Thermometer 12 types, RTD 5 types, analog (mV, V, mA) 6 types
- Bar graph with 101 LEDs (green), 4-digit display (red)
- Various output options
 - : 4 or 2 alarm output, 4-20mA transmission output (isolated), RS485 communication output
- Various functions
 - : High/Low peak monitoring, sensor break alarm output (burn-out), input correction, digital input (DI), user input range, display scale, transmission output scale, bar graph alarm display, etc.
- Built-in power supply for sensor (24VDC)
- Compact size (rear length: 70mm)

CE



⚠ Please read "Safety Considerations" in operation manual before using this unit.

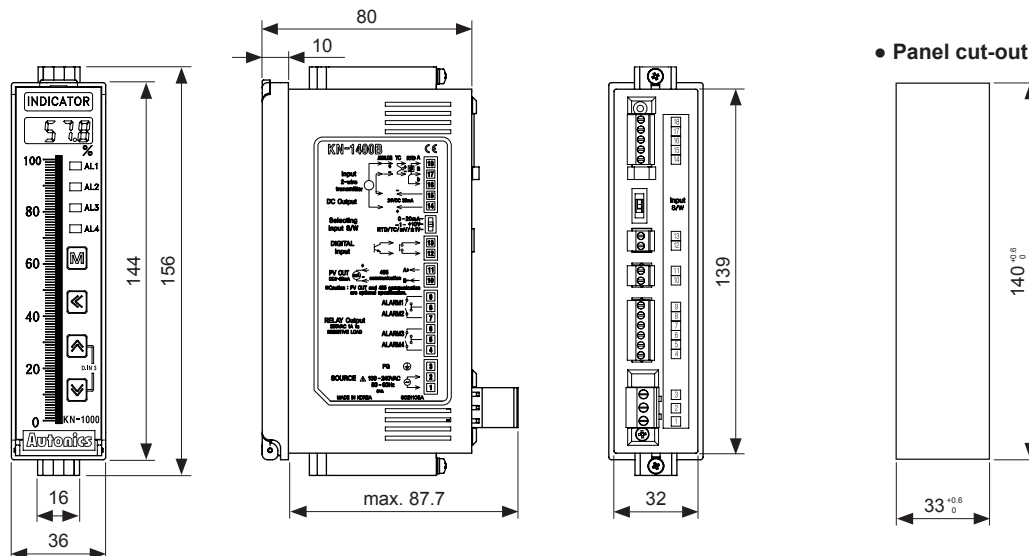
Ordering Information

KN - 1 0 0 0 B

| | | |
|---------------|------|------------------------------|
| Size | B | DIN W36×H144mm |
| Power supply | 0 | 100-240VAC 50/60Hz |
| | 1 | 24VDC |
| Option output | 0 | No option |
| | 1 | Transmission output (4-20mA) |
| | 4 | RS485 communication output |
| Alarm output | 0 | No alarm output |
| | 2 | Alarm output: 2 |
| | 4 | Alarm output: 4 |
| Item | KN-1 | Bar Graph Indicator |

Dimensions

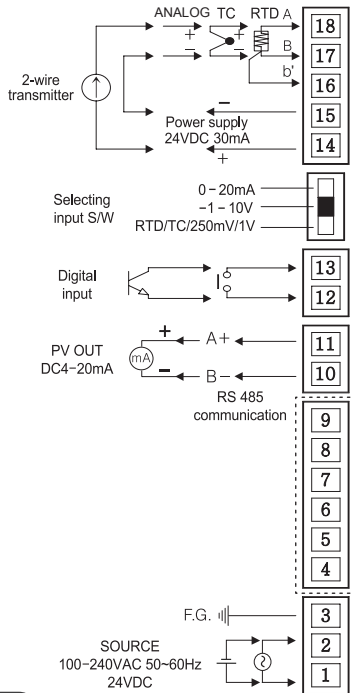
(unit: mm)



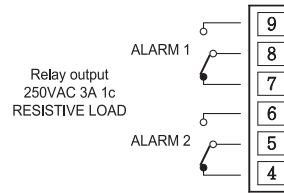
Bar Graph Digital Indicator

Connections

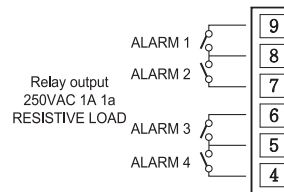
• KN-10□□B



• KN-12□□B



• KN-14□□B



Specifications

| | | |
|-------------------------|---|---|
| Series | KN-1000B | |
| Power supply | AC voltage | 100-240VAC ~ 50/60Hz |
| | DC voltage | 24VDC |
| Allowable voltage range | 90 to 110% of rated voltage | |
| Power consumption | AC voltage | Max. 6VA |
| | DC voltage | Max. 4W |
| Display method | 7-segment LED (red), graphic bar (green) LED method | |
| Input type | RTD | JPt100Ω, DPt100Ω, DPt50Ω, Cu50Ω, Cu100Ω (5 types) |
| | Thermocouple | K, J, E, T, R, B, S, N, C (W5), L, U, PLII (12 types) |
| | Analog | · Voltage: ±1.000V, ±50.00mV, -199.9-200.0mV, -1.00-10.00V (4 types) · Current: 4.00-20.00mA, 0.00-20.00mA (2 types) |
| Digital input | · Contact input: max. 2kΩ in ON, min. 90kΩ in OFF · Non-contact input: residual voltage max. 1.0V in ON, leakage current max. 0.03mA in OFF · Outflow current: approx. 0.2mA | |
| Sub output | Alarm output | · 2-point: relay contact capacity 250VAC ~ 3A 1c · 4-point: relay contact capacity 250VAC ~ 1A 1a |
| | Transmission output | ISOLATED DC4-20mA(PV transmission) load resistance max. 600Ω |
| | Communication output | RS485 (Modbus RTU) |
| Display accuracy | ±0.2% F.S. ±1-digit (25°C±5°C) ±0.3% F.S. ±1-digit (-10°C to 20°C, 30°C to 50°C) In case of thermocouple and below -100°C input, [±0.4%F.S.] ±1-digit ※TC-T, TC-U is min. ±2.0°C | |
| Setting method | Set by front keys, or RS485 communication | |
| Alarm output hysteresis | Set ON/OFF interval (1 to 999-digit) | |
| Sampling cycle | Analog input: 100ms, temperature sensor input: 250ms | |
| Dielectric voltage | 2000VAC 50/60Hz for 1 min (between input terminal and power terminal) | |
| Vibration | 0.75mm amplitude at frequency 5 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours | |
| Relay life cycle | 2-point | Mechanical: min. 10,000,000, electrical: min. 100,000 (250VAC 3A resistance load) |
| | 4-point | Mechanical: min. 20,000,000, electrical: min. 500,000 (250VAC 1A resistance load) |
| Insulation resistance | Over 100MΩ (at 500VDC megger) | |
| Noise immunity | ±2kV the square wave noise (pulse width 1μs) by noise simulator | |
| Memory retention | Approx. 10 years (non-volatile semiconductor memory type) | |
| Environment | Ambient temperature | -10 to 50°C, storage: -20 to 60°C |
| | Ambient humidity | 35 to 85%RH, storage: 35 to 85%RH |
| Approval | CE | |
| Weight ※1 | Approx. 304g (approx. 182g) | |

※1: The weight includes packaging. The weight in parenthesis is for unit only.

※ Environment resistance is rated at no freezing or condensation.

A. Recorders

B. Indicators

C. Converters

D. Controllers

E. Thyristor power controllers

F. Pressure transmitters

G. Temperature transmitters

H. Accessories

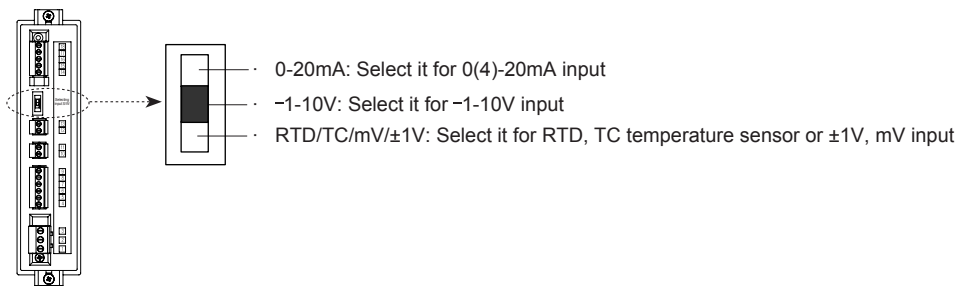
KN-1000B

KN-2000W

KN-1000B Series

Input Type and Range

◎ Input type selection switch



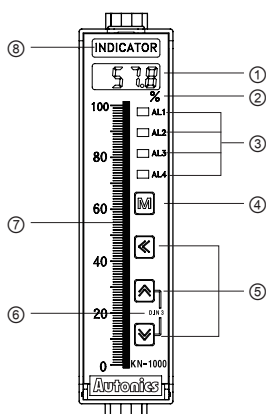
This unit is multi input product. Select the proper input with the input type selection switch and select this input type in $I n - P$ in program mode. The setting of input type selection switch and the input type $I n - P$ parameter should be same and it can display the proper measurement value. Factory default is 0-20mA.

| Input type | Parameter | Input range(°C) | Input range(°F) | |
|----------------|-----------|------------------|-----------------|--|
| Thermocouple | K(CA) | EC1 | -200 to 1350 | -328 to 2462 |
| | K(CA) | EC2 | -199.9 to 999.9 | -328 to 1832 |
| | J(IC) | EC-J | -199.9 to 800.0 | -328 to 1472 |
| | E(CR) | EC-E | -199.9 to 800.0 | -328 to 1472 |
| | T(CC) | EC-t | -199.9 to 400.0 | -199.9 to 752.0 |
| | B(PR)* | EC-b | 100 to 1800 | 212 to 3272 |
| | R(PR) | EC-r | 0 to 1750 | 32 to 3182 |
| | S(PR)* | EC-S | 0 to 1750 | 32 to 3182 |
| | N(NN)* | EC-n | -200 to 1300 | -328 to 2372 |
| | C(W5)* | EC-C | 0 to 2300 | 32 to 4172 |
| | L(IC)* | EC-L | -199.9 to 900.0 | -328 to 1652 |
| | U(CC)* | EC-U | -199.9 to 400.0 | -199.9 to 752.0 |
| Platinel II* | EC-P | 0 to 1390 | 32 to 2534 | |
| RTD | Cu50Ω* | CU50 | -199.9 to 200.0 | -199.9 to 392.0 |
| | Cu100Ω* | CU10 | -199.9 to 200.0 | -199.9 to 392.0 |
| | JPt100Ω | JPt.1 | -199.9 to 600.0 | -328 to 1112 |
| | DPt50Ω | dPt.5 | -199.9 to 600.0 | -328 to 1112 |
| | DPT100Ω | dPt.1 | -199.9 to 850.0 | -328 to 1530 |
| Analog | Current | 0.00 - 20.00mA | AA1 | -1999 to 9999 (display range depends on the decimal point position) |
| | | 4.00 - 20.00mA | AA2 | |
| | Voltage | -50.0 - 50.0mV | Au1 | |
| | | -199.9 - 200.0mV | Au2 | |
| | | -1.000 - 1.000V | A-u1 | |
| -1.00 - 10.00V | A-u2 | | | |

※Above input types which have the * mark are not displayed.

※To display the above input types, supply the power with pressing the **[M]** key.

Part Descriptions



① Display part (red)

- Run mode: Displays current measurement value.
- Parameter set mode: Displays parameter and SV.

② Unit sticker part (unit sticker is an accessory.)

③ Alarm output indicator: Turns ON when the alarm is ON.

④ **[M]** key: Used to enter parameter set mode, move to parameters, save SV and return to RUN mode.

⑤ **[Left Arrow]**, **[Right Arrow]**, **[Checkmark]** key: Used to enter and change parameter SV.

⑥ D.IN3: Press the **[Left Arrow]** and **[Checkmark]** keys for 3 sec at the same time, it operates the set function (alarm clear, display hold, zero-point adjustment) at $dI - P$ at program mode.

⑦ Bar Graph (with 101 bar LEDs, green): Displays measured value as bar graph.

⑧ Space for recognition device by user

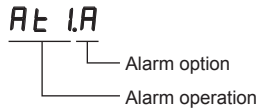
Bar Graph Digital Indicator

Functions

Alarm [AL-1, AL-2, AL-3, AL-4]

This product has 2 or 4 alarms to operate individually when the value is too high or low. Alarm function is set by the combination of alarm operation and alarm option. To clear alarm, use digital input function (setting $di-1, di-2$ as $RL-E$) or turn the power OFF and ON.

※For the model (KN-10□□B) without alarm output, these parameters are not displayed.



Alarm operation

| Mode | Name | Alarm operation | Descriptions |
|---------|--------------------|--------------------------------------|--|
| $AL-0$ | — | — | No alarm operation |
| $AL-1$ | High limit alarm | <p>High limit alarm value: 800°C</p> | $PV \geq$ alarm temperature, alarm is ON |
| $AL-2$ | Low limit alarm | <p>Low limit alarm value: 200°C</p> | $PV \leq$ alarm temperature, alarm is ON |
| $SB-AL$ | Sensor break alarm | — | It will be ON when it detects sensor disconnection. Sensor break alarm does not have alarm option. |

※ H: Alarm output hysteresis

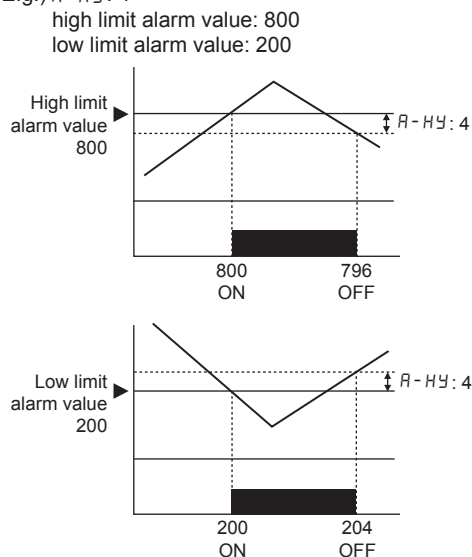
Alarm option

| Mode | Name | Descriptions |
|---------|----------------------------------|---|
| $AL-AR$ | Standard alarm | If it is an alarm condition, alarm output is ON. Unless an alarm condition, alarm output is OFF. |
| $AL-Ab$ | Alarm latch | If it is an alarm condition, alarm output is ON. Before clearing the alarm, an ON condition is latched. (Holding the alarm output) |
| $AL-AL$ | Standby sequence | First alarm condition is ignored. From the second alarm condition, standard alarm operates. When power is ON and it is an alarm condition, it is ignored. From the second alarm condition, standard alarm operates. |
| $AL-Ad$ | Alarm latch and standby sequence | If it is an alarm condition, it operates both alarm latch and standby sequence. When power is ON and it is an alarm condition, it is ignored. From the second alarm condition, alarm latch operates. |

Alarm output hysteresis [Program mode: $R-HY$]

Set the interval of ON/OFF alarm output. The set hysteresis is applied to AL1 to AL4 and it is as below.

※E.g.) $R-HY: 4$



High/Low peak monitoring [Monitoring mode: $H-PEE, L-PEE$]

This function is to save high/low peak to check the invisible abnormal condition of system at [$H-PEE$] or [$L-PEE$] in monitoring mode.

When the high/low peak is out of the temperature range, it displays $HHHH$ or $LLLL$.

To initialize high/low peak, press the \boxtimes , \boxdot keys at the same time for 3 sec at [$H-PEE$] or [$L-PEE$].

In this case, peak value is the present input value.

Error

| Display | Descriptions | Troubleshooting |
|---------|---|--|
| $LLLL$ | Flashes when measured sensor input is lower than the temperature range. | When input is moved within the temperature range, it is cleared. |
| $HHHH$ | Flashes when measured sensor input is higher than the temperature range | |
| $bUrn$ | Flashes when the sensor is break or not connected. | Check temperature sensor connection. |
| Err | Flashes when there is error to SV | Check set conditions and re-set it. |

A. Recorders

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H. Accessories

KN-1000B

KN-2000W

Temperature unit [Program mode: $U_{n1} E$]

Temperature unit ($^{\circ}C/^{\circ}F$) is selectable. When changing temperature unit, user input range, display scale, output scale, alarm SV are initialized. You should set the parameters again for your purpose.

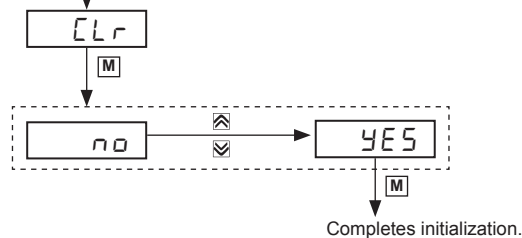
※When selecting analog input, temperature unit [$U_{n1} E$] parameter is not displayed.

Parameter initialization

To initialize all parameter as factory default, supply the power to the product with pressing the **M** and **⏏** keys at the same time and it enters initialization parameter.

Press the **M** + **⏏** keys at the same time.

Supply the power.



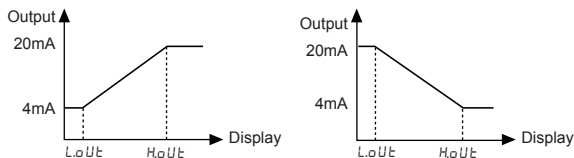
Decimal point [Program mode: $d.P$]

It is able to change decimal point position for high/low limit scale value. It changes decimal point position of display value.

Transmission output scale [Program mode: $L.O.U.t, H.O.U.t$]

For 4-20mA current output, this function is to set the display value for 4mA [$L.O.U.t$] and the display value for 20mA [$H.O.U.t$].

The interval between $L.O.U.t$ and $H.O.U.t$ is 10% F.S. If it is below 10%, it is fixed as 10% of SV.



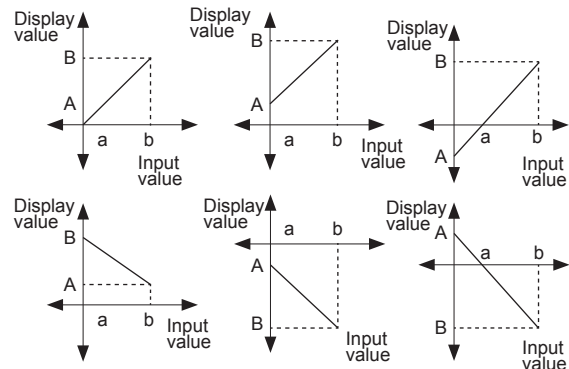
User input range [Program mode: $L-r.G, H-r.G$]

When selecting analog input, you can set the input range for your purpose. Set low limit input value [$L-r.G$] and high limit input value [$H-r.G$] to limit the input range.

- Setting range
 - : Low limit input value [$L-r.G$] +20%F.S.
 - < High limit input value [$H-r.G$]

Display scale [Program mode: $L-S.C, H-S.C$]

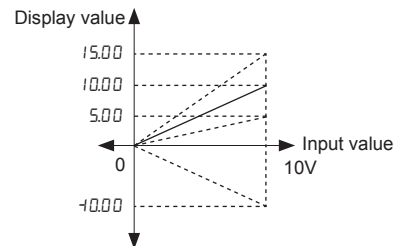
For analog input, this function is to set (-1999 to 9999) for particular high/low limit value in order to display high/low limit value of measurement input. If measurement inputs are 'a' and 'b' and particular values are 'A' and 'B', it will display $a=A, b=B$ as below graphs.



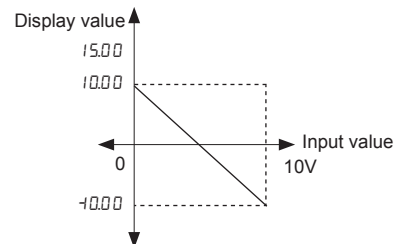
Display scale function is able to change display value for max./min. measured input by setting high limit scale [$H-S.C$] and low limit scale [$L-S.C$] in program mode.

※E.g.) Set high/low scale value (input range is 0 to 10V)

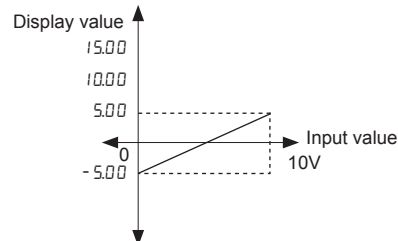
- $L-S.C = 0.00$
- $H-S.C = 5.00, 10.00, 15.00, 10.00$



- $L-S.C = 10.00, H-S.C = 10.00$



- $L-S.C = -5.00, H-S.C = 5.00$



※When changing input type, high/low scale is changed as factory default.

Bar Graph Digital Indicator

Input correction [Program mode: $i n - b$]

This function is to correct the error occurring from a thermocouple, a RTD or analog input out of allowable error range of this unit.

This is also available to correct error when a sensor cannot contact the subject position by calculating the error temperature.

Variable temperature sensors have accuracy level. Because high accuracy type is expensive, standard thermocouples are generally used.

In this case, temperature sensor may occur error. By executing this function, you can get more accurate temperature.

When executing input correction function, you should measure the error from a sensor accurately. If the measured error is not correct, error may be greater. (If $i n - b = L - b$, $i n - b$ as atmospheric pressure input value not as input correction function. Refer to 'Two unit function'.)

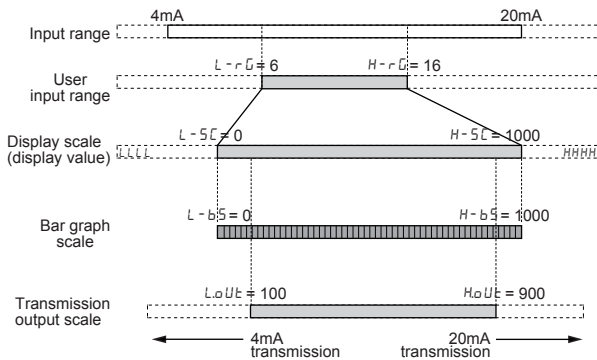
E.g.)When measured temperature is 4°C and actual temperature is 0°C. Set $i n - b$ as -4, and display value is 0°C.

Bar graph scale [Program mode: $L - b5$, $H - b5$]

This is to set display range for bar graph. Display range is as below.

| Parameter | Input | Display range |
|-----------|--------------------|--|
| $L - b5$ | Temp. sensor input | Input range (low limit) $\leq L - b5 \leq (H - b5 - 1)$ |
| | Analog input | $L - 5C \leq L - b5 \leq (H - 5C - 1)$ |
| $H - b5$ | Temp. sensor input | $(L - b5 + 1) \leq H - b5 \leq$ Input range (high limit) |
| | Analog input | $(L - 5C + 1) \leq H - b5 \leq H - 5C$ |

※Relation among input range, user input range, display scale, bar graph scale, and transmission scale
The below figure is the example for 4 to 20mA.



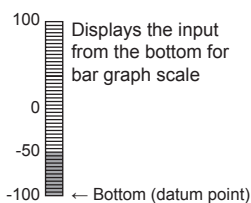
Bar graph display method [Program mode: bRR]

There are two methods for bar graph display; full bar and center bar.

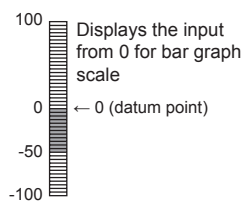
Full bar [$FbRR$] displays input from the bottom, and center bar method [$CbRR$] displays input from "0" as below figures.

※ E.g.)When $L - b5 = -100$, $H - b5 = 100$, $PV = -50$,

Full Bar: $FbRR$



Center Bar: $CbRR$



Input and transmission output extension [Program mode: $E4i0$]

This function is to extend analog input and 4 to 20mA transmission output to 5% or 10% range.

| Mode | Operation |
|-------|--|
| $0P$ | Outputs 4 to 20mA within analog input range. |
| $5P$ | Outputs 3.2 to 20.8mA for 5% out of the analog input range. |
| $10P$ | Outputs 2.4 to 21.6mA for 10% out of the analog input range. |

※ This parameter is displayed only for transmission output (4-20mA) model. But it is not displayed when selecting temperature sensor input.

※ The below of 0mA, 0V cannot be extended.

※ $\pm 1V$, 10V inputs are only available for 5% extension.

Alarm display in bar graph

When setting or occurring the alarm, it displays the status by the bar graph.

You can check the alarm status. When setting alarm value, the bar LED for this alarm value turns ON. When alarm occurs, the bar LED for this alarm value flashes.

① When setting alarm value,

The bar LED for alarm SV flashes. When alarm set is complete, the bar LED for this alarm value turns ON.

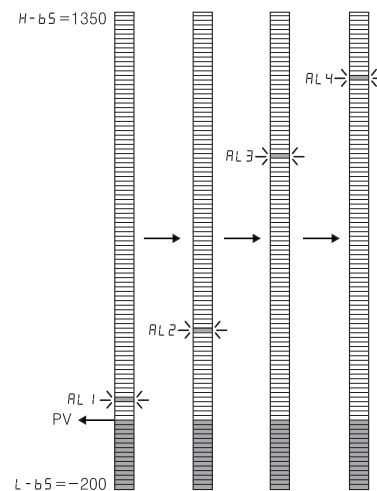
② RUN mode

- All set alarm values are displays in RUN mode.
- When it is alarm value, the bar LED for this alarm value flashes.

※If alarm set value is out of bar graph scale when setting the value or in RUN mode, this value does not display in bar graph.

③ When setting alarm value in monitoring mode,

When all alarms are OFF,



※ The bar LED for the alarm value flashes.

A. Recorders

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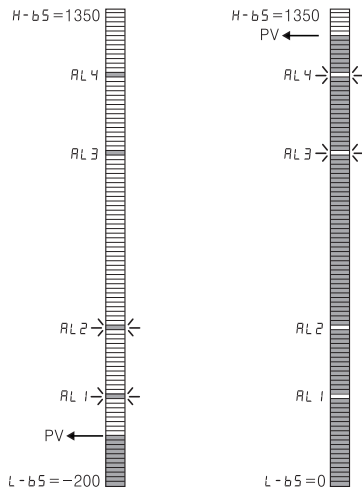
KN-1000B

KN-2000W

KN-1000B Series

◎ Alarm display in RUN mode

When $RL\ 1$ and $RL\ 2$ are low limit alarm, and $RL\ 3$ and $RL\ 4$ are high limit alarm.



■ Input special function [Program mode: I_nSF]

When selecting analog input, this function is to display the calculated actual value by square, root ($\sqrt{\quad}$), or two unit function (TUF) as display value.

| Parameter | Functions | Graph | Applications |
|-----------|---|-------|---|
| LIn | Outputs as input value | | Standard characteristics. Input for linearity. |
| $root$ | Outputs the rooted ($\sqrt{\quad}$) input value | | Used for measuring flows by pressure signal. |
| SQR | Outputs the squared input value | | Used for outputting differential pressure by flow signal. |
| LUF | Refer to 'Two unit function' | | |

※ Display value and mA output value for SQR

$$\text{Display value} = \left(\frac{\text{Input value} - L - rG}{H - rG - L - rG} \right)^2 \times (H - 5C - L - 5C) + L - 5C$$

(output value)

※ Display value and mA output value for $root$

$$\text{Display value} = \sqrt{\left(\frac{\text{Input value} - L - rG}{H - rG - L - rG} \right) \times (H - 5C - L - 5C) + L - 5C}$$

(output value)

■ Two unit function [Program mode: LUF]

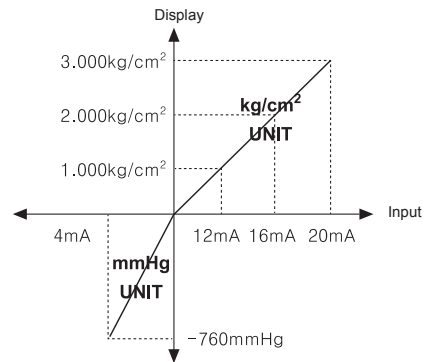
When connecting a pressure sensor, compound pressure which is below atmospheric pressure (0) is for vacuum as mmHg and which is atmospheric pressure or over it is for positive pressure as kg/cm^2 .

Atmospheric pressure is $0kg/cm^2$. When this unit does not display $0kg/cm^2$, you can correct zero-point adjustment function.

When using two unit function, $L - 5C$ is fixed as -760.0

$L - 5C$ parameter is displayed but you cannot set this. You can set $H - 5C$ within 0 to 9999 range.

E.g.) When pressure range is $-760.0mmHg$ to $3.000kg/cm^2$, and pressure transmitter outputs 4-20mA, set the scale as $H - 5C : 3000$, $dP : 0000$. This unit displays for 4mA input as -760.0 , and for 20mA input as 3.000 .



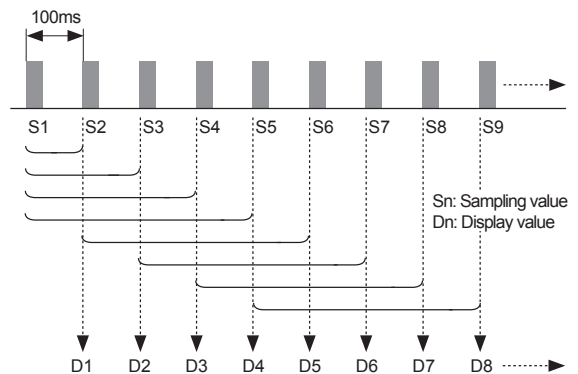
■ Digital filter [Program mode: $nRUF$]

Moving average digital filter is able to stably display and output the noise from input line and irregular signals as software.

• Filter Setting range: 01 to 16

(When setting as 01, digital filter function does not run.)

※ Display cycle is same when executing moving average digital filter.



$D1=S1, D2=S2, D3=S3$

: Initial operation before averaging 4

$$D4 = \frac{S1+S2+S3+S4}{4} \quad D5 = \frac{S2+S3+S4+S5}{4}$$

$$D6 = \frac{S3+S4+S5+S6}{4} \quad D7 = \frac{S4+S5+S6+S7}{4}$$

$$D8 = \frac{S5+S6+S7+S8}{4}$$

■ Burn out [Program mode: *bUrn*]

When disconnecting input sensor, you can set the status of transmission output.

- When setting *bUrn* as *oN*, 4-20mA transmission output is fixed as 20mA.
- When setting *bUrn* as *oFF*, 4-20mA transmission output is fixed as 4mA.

※It is available only for temperature sensor input and 4-20mA transmission output.

■ Digital input [Program mode: *di - t*, *di - t'*]

By digital input terminal [*di - t*] (terminal 12, 13) or digital input key [*di - t'*] (D.IN3: + for 3 sec), one of three functions executes as the below table.

| Function | | Operaiton |
|-------------|-----------------------|--|
| <i>ALrE</i> | Alarm clear | When alarm is ON in RUN mode, it clears alarm forcibly. (It applies only for alarm latch, alarm latch and standby sequence options.) Alarm clear operates only when the value is out of the alarm value range. After clearing alarm, alarm operates its option normally. ※ For the model without alarm output (KN-10□□B), this parameter is not displayed. |
| <i>HoLd</i> | Display HOLD | Temporarily indicated value is stopped in order to check indicated value in unstable input. |
| <i>ΞErO</i> | Zero-point adjustment | Set preset display value as 0. This function is related with input correction [<i>i n - b</i>]. When executing zero adjustment function in display value as 4, input correction value [<i>i n - b</i>] is set as -4 automatically. |

■ Lock [Program mode: *LoCk*]

It limits to check parameter set value and to change it.

| | <i>oFF</i> | <i>LoCk1</i> | <i>LoCk2</i> |
|-----------------|------------|--------------|--------------|
| Program mode | ● | ◐ | ○ |
| Monitoring mode | ● | ● | ◐ |

●: Enable to check/set

◐: Enable to check, disable to set

○: Disable to check

※In *LoCk2*, only *LoCk1* parameter displays in program mode.

Communications

■ Communication set [Program mode: *Addr*, *bRUd*]

You can set communication address [*Addr*] and communication speed [*bRUd*] for RS485 communication.

■ Communication manual

Refer to communication manual for RS485 communication.

Visit our web site (www.autonics.com) to download communication manual.

■ Communication specifications

| Item | Specifications |
|---------------------------|--------------------------------------|
| Communication method | RS485 2-wire half duplex |
| Communication speed (BPS) | 9600, 4800, 2400, 1200 |
| Converter | Converter built in RS232 |
| Max. connections | 32 units |
| Communication distance | Max. 1200m (within 700m recommended) |
| Protocol | Modbus 1.1 RTU |
| Parity | None |
| Stop Bit | 1-bit |
| Data length | 8-bit |

A. Recorders

B. Indicators

C. Converters

D. Controllers

E. Thyristor power controllers

F. Pressure transmitters

G. Temperature transmitters

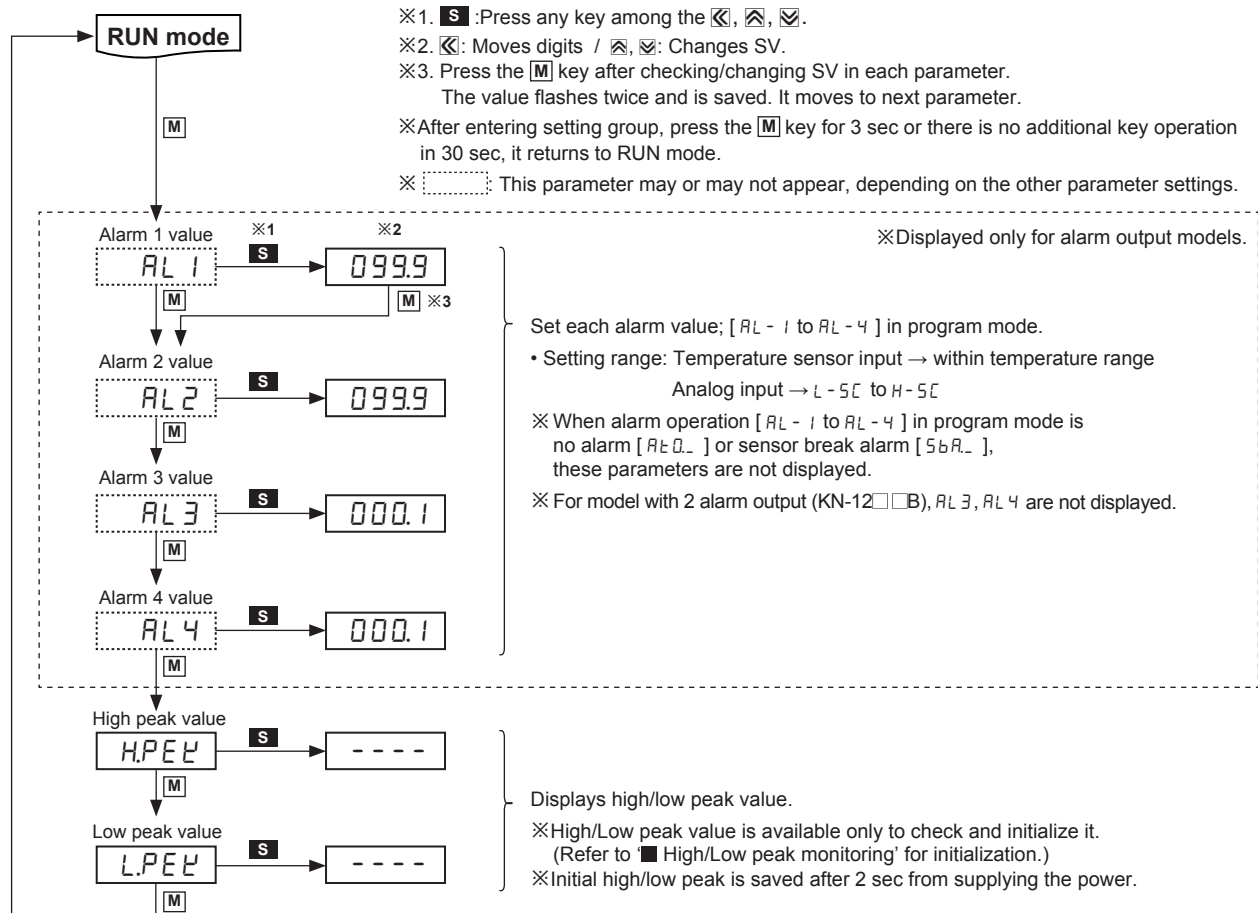
H. Accessories

KN-1000B

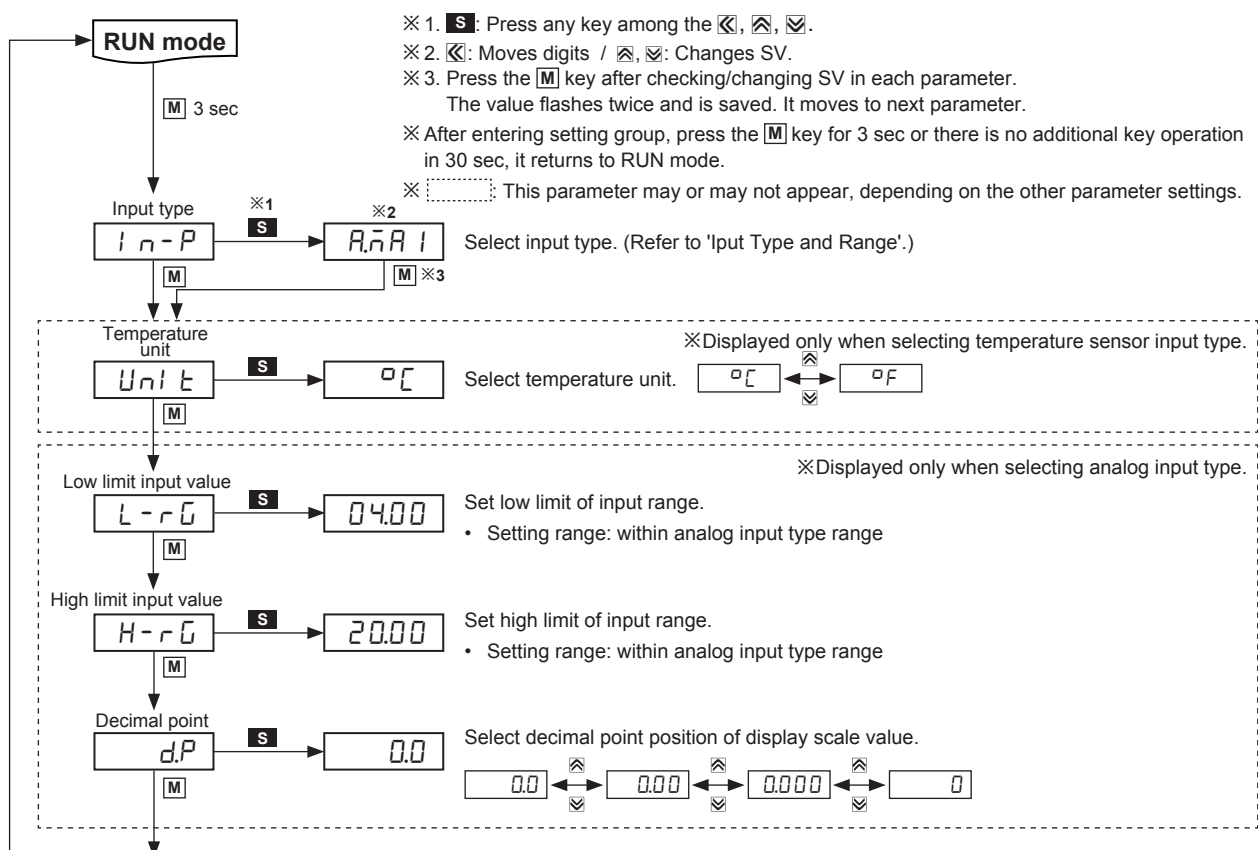
KN-2000W

KN-1000B Series

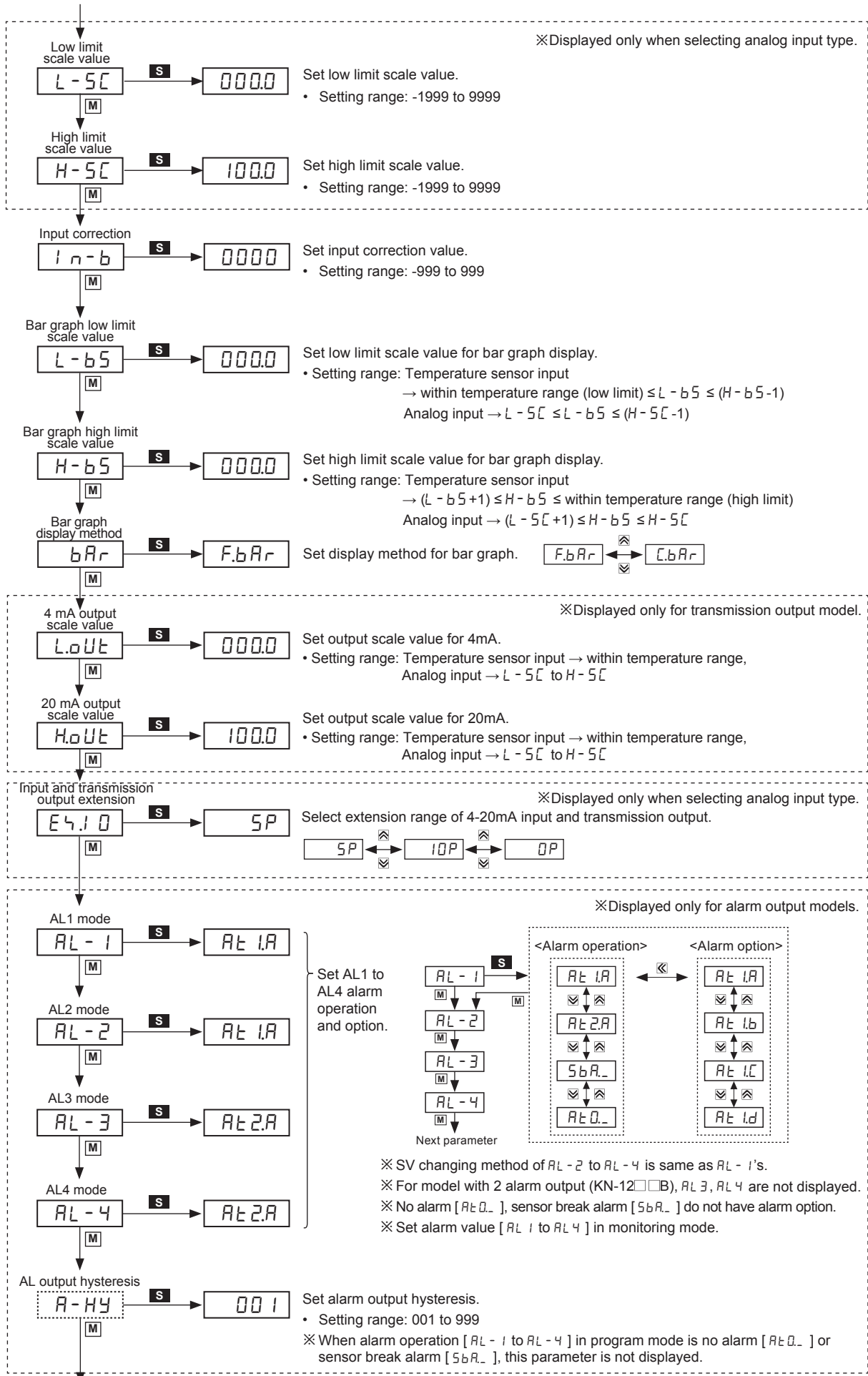
Monitoring Mode



Program Mode



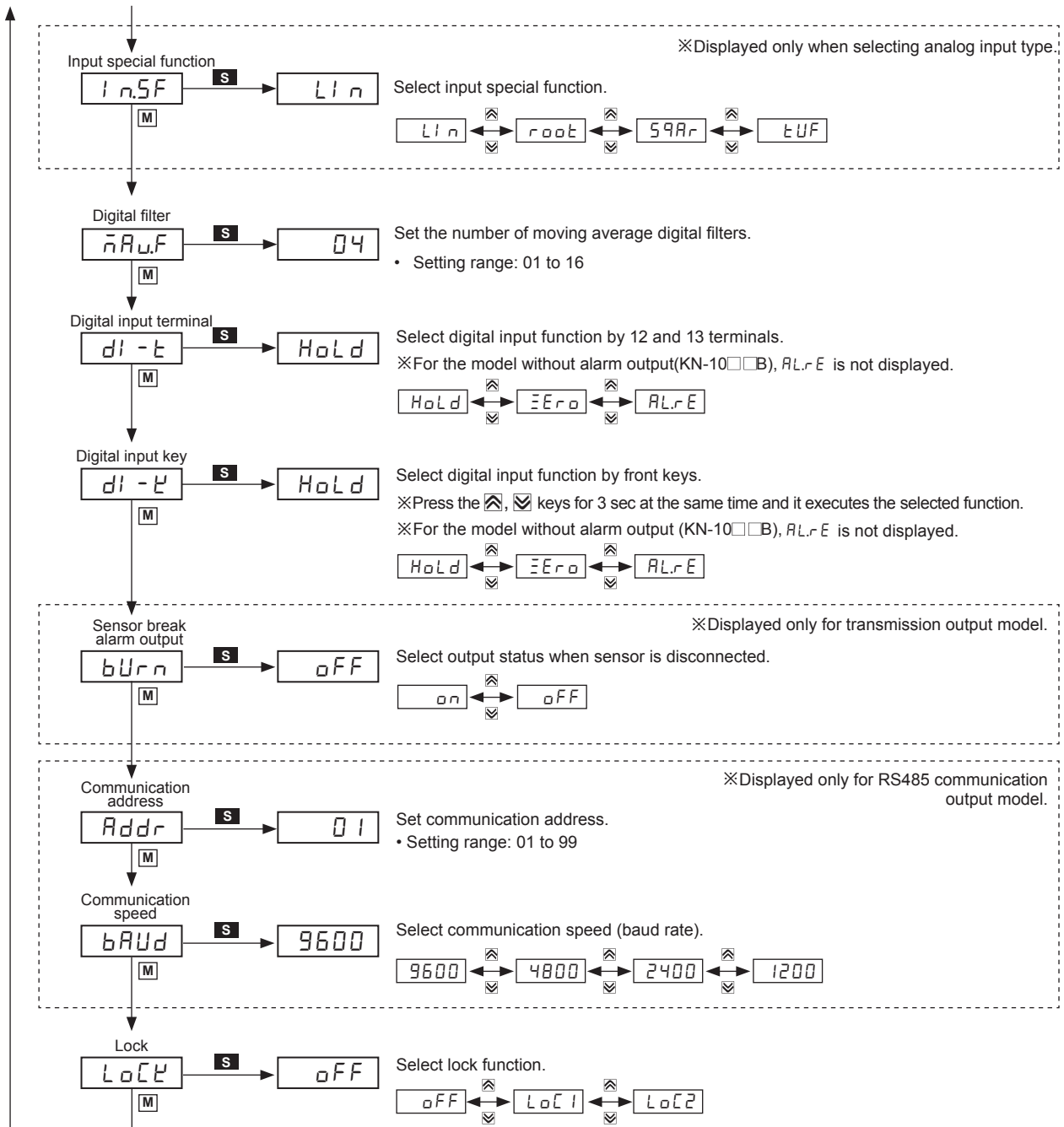
Bar Graph Digital Indicator



- A. Recorders
- B. Indicators
- C. Converters
- D. Controllers
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- KN-1000B
- KN-2000W

KN-1000B Series



Bar Graph Digital Indicator

Factory Default

■ Monitoring mode

| Parameter | Default | Parameter | Default | Parameter | Default |
|------------|--------------|------------|--------------|-------------|-------------|
| <i>AL1</i> | <i>099.9</i> | <i>AL3</i> | <i>000.1</i> | <i>HPEE</i> | <i>----</i> |
| <i>AL2</i> | <i>099.9</i> | <i>AL4</i> | <i>000.1</i> | <i>LPEE</i> | <i>----</i> |

■ Program mode

| Parameter | Default | Parameter | Default | Parameter | Default | Parameter | Default |
|-------------|--------------|-------------|--------------|-------------|-------------|--------------|-------------|
| <i>In-P</i> | <i>AA.A</i> | <i>In-b</i> | <i>0000</i> | <i>AL-1</i> | <i>At1A</i> | <i>d1-t</i> | <i>HoLd</i> |
| <i>Unit</i> | <i>°C</i> | <i>L-b5</i> | <i>0000</i> | <i>AL-2</i> | <i>At1A</i> | <i>d1-t</i> | <i>HoLd</i> |
| <i>L-rG</i> | <i>0000</i> | <i>H-b5</i> | <i>1000</i> | <i>AL-3</i> | <i>At2A</i> | <i>bUr n</i> | <i>oFF</i> |
| <i>H-rG</i> | <i>2000</i> | <i>bAr</i> | <i>F.bAr</i> | <i>AL-4</i> | <i>At2A</i> | <i>Addr</i> | <i>01</i> |
| <i>dP</i> | <i>0.0</i> | <i>LoUt</i> | <i>0000</i> | <i>A-HY</i> | <i>001</i> | <i>bAUd</i> | <i>9600</i> |
| <i>L-5C</i> | <i>000.0</i> | <i>HoUt</i> | <i>1000</i> | <i>In5F</i> | <i>LIn</i> | <i>LoCk</i> | <i>oFF</i> |
| <i>H-5C</i> | <i>100.0</i> | <i>EL10</i> | <i>5P</i> | <i>nAUF</i> | <i>04</i> | | |

Proper Usage

- Do not use the unit outdoors. Failure to follow this instruction may result in shorten the life cycle of the unit, or electric shock.
- For connecting the power, use a crimp terminal (M3.5, max. 7.2mm).
- The connection of this unit should be separated from the power line and high voltage line in order to prevent inductive noise.
- Install a power switch or a circuit breaker to supply or cut off the power.
- Switch or circuit breaker should be installed nearby users for convenient control.
- Do not use this unit near the high frequency instruments (high frequency welding machine & sewing machine, large capacity SCR controller).
- When supplying input, if *HHHH* or *LLLL* is displayed, measured input may have problem. Turn off the power and check the line.
- This product may be used in the following environments.
 - ① Indoors
 - ② Pollution degree 2
 - ③ Altitude max. 2,000m
 - ④ Installation category II
- Failure to follow these instructions may result in product damage.

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