
# Autonics KN-1000B Series Bar Graph Indicators Instruction Manual



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# Autonics KN-1000B Series Bar Graph Indicators Instruction Manual


## Thank you for choosing our Autonics product.

**Read and understand the instruction manual and manual thoroughly before using the product.**

**For your safety, read and follow the below safety considerations before using. For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**

Keep this instruction manual in a place where you can find easily.
The specifications, dimensions, etc are subject to change without notice for product improvement Some models may be discontinued without notice.
Follow Autonics website for the latest information.

| **Safety Considerations** |
|---|
| • Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.<br>• symbol indicates caution due to special circumstances in which hazards may occur. |
| **Warning** Failure to follow instructions may result in serious injury or death |

**01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)** Failure to follow this instruction may result in personal injury, economic loss or fire.

**02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**

Failure to follow this instruction may result in explosion or fire.

**03. Install on a device panel to use.**

Failure to follow this instruction may result in fire or electric shock.

**04. Do not connect, repair, or inspect the unit while connected to a power source.**

Failure to follow this instruction may result in fire or electric shock.

**05. Check 'Connections' before wiring.**

Failure to follow this instruction may result in fire.

**06. Do not disassemble or modify the unit.**

Failure to follow this instruction may result in fire or electric shock.

**Caution** Failure to follow instructions may result in injury or product damage

**01. Use the unit within the rated specifications.**

Failure to follow this instruction may result in fire or product damage

**02. Use a dry cloth to clean the unit, and do not use water or organic solvent.**

Failure to follow this instruction may result in fire or electric shock.

**03. Keep the product away from metal chip, dust, and wire residue which flow**

**into the unit.**

Failure to follow this instruction may result in fire or product damage.

**04. Check the polarity of the measurement input before wiring.**

Failure to follow this instruction may result in explosion or fire.

## Cautions during Use

- For connecting the power, use the crimp terminal (M3.5, max. 2 mm).

- 24 VDC  power supply should be insulated and limited voltage/current or Class 2, SELV power supply
- Keep away from high voltage lines or power lines to prevent inductive noise. Do not use near the equipment which generates strong magnetic force or high frequency
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Use twisted pair wire for communication
- This unit may be used in the following
    - Indoors (in the environment condition rated in ‘Specifications’)
    - Altitude Max. 2,000 m
    - Pollution degree 2
    - Installation category II

| **Ordering Information** |
| --- |
| This is only for reference, the actual product does not support all combinations. For selecting the specified mod el, follow the Autonics website . |

| K | N | - | 1 | ❶ | ❷ | ❸ | B |
| --- | --- | --- | --- | --- | --- | --- | --- |

| | | |
| --- | --- | --- |
| **❶ Alarm output**<br>0: No mark<br>2: 2 alarm<br>4: 4 alarm | **❷ Option output**<br>0: No mark<br>1: PV Transmission<br>4: Communication | **❸ Power supply**<br>0: 100-240 VAC  50/60 Hz<br>1: 24 VDC |

| **Product Components** | | |
|---|---|---|
| • Product | • Instruction manual | • Bracket ×2 |
| • Unit sticker ×1 | • Connector (KN-10□□B: ×3, KN-12□□B: ×4, KN-140□B: ×4, KN-141□B: ×5, KN-144□B: ×5) | |

| **Software** |
|---|
| Download the installation file and the manuals from the Autonics website. |
| ■ **DAQMaster** |
| DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring. |

## Specifications

| | |
|---|---|
| **Series** | **KN-1000B Series** |
| | |

| | | | |
|---|---|---|---|
| | | **AC voltage** | **DC voltage** |
| **Power supply** | | 100 – 240 VAC  50/60 Hz | 24 VDC |
| **Allowable voltage range** | | 90 to 110% of rated voltage | |
| **Power consumption** | | ≤ 6 VA | ≤ 4 W |
| **Sampling period** | | • Thermocouple, RTD: 250 ms • Analog: 100 ms | |
| **Input specification** | | Refer to ‘Input Type and Using Range’. | |
| **Digital input** | Contact | • ON: ≤ 2 kΩ • OFF: ≥ 90 kΩ | |
| | Non contact | • Residual voltage: ≤ 1.0 V • leakage current: ≤ 0.03 mA | |
| | Outflow current | ≈ 0.2 mA | |

| | | |
|---|---|---|
| **Option out put** | Alarm | • 2 point relay: 250 VAC 3 A 1c • 4 point relay: 250 VAC 1 A 1a |
| | PV transmission | ISOLATED DC 4-20 mA (Load resistance: ≤ 600 Ω) |
| | RS485 comm. | Modbus RTU |
| **Display type** | | 7 Segment (red), Graph bar (green) |
| **Alarm output Hysteresis** | | 1 to 999 digit |
| **Relay life c ycle** | Mechanical | • 2 point: ≥ 10,000,000 operations<br>• 4 point: ≥ 20,000,000 operations |
| | Electrical | • 2 point: ≥ 100,000 operations (load resistance: 250 VAC 3 A)<br>• 4 point: ≥ 500,000 operations (load resistance: 250 VAC 1 A) |
| **Dielectric strength** | | Between input terminal and power terminal: 2,000 VAC 50/60 Hz for 1 min |

| | |
|---|---|
| **Vibration** | 0.75 mm amplitude at frequency of 5 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours |
| **Insulation resistance** | ≥ 100 MΩ (500 VDC  megger) |
| **Noise immunity** | ±2 kV square shaped noise (pulse width 1  ) by noise simulator |
| **Memory retention** | ≈ 10 years (non-volatile semiconductor memory type) |
| **Ambient temperature** | -10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation) |
| **Ambient humidity** | 35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation) |
| **Approval** | |
| **Unit weight (packaged)** | ≈ 182 g (≈ 304 g) |

## Communication Interface

■ **RS485**

| | |
|---|---|
| **Comm. protocol** | Modbus 1.1 RTU |
| **Maximum connection** | 32 units |
| **Synchronous method** | Asynchronous |
| **Comm. method** | Two-wire half duplex |
| **Comm. effective range** | ≤ 1,200 m (≤ 700 m recommended) |
| **Comm. speed** | 9,600 (default) / 4,800 / 2,400 / 1,200 bps (parameter) |
| **Data bit** | 8 bit (fixed) |
| **Parity bit** | None (fixed) |
| **Stop bit** | 1 bit (fixed) |

### Input Type and Using Range

| **Input type** | | **Display** | **Using range (°C)** | | | **Using range (°F)** | | |
|---|---|---|---|---|---|---|---|---|
| | K (CA) | TcK | 200 | to | 1350 | -328 | to | 2,462 |
| | K (CA) | TcK2 | -199.9 | to | 999.9 | -328 | to | 1,832 |
| | J (IC) | TC-J | -199.9 | to | 800.0 | -328 | to | 1,472 |
| | | | | | | | | |

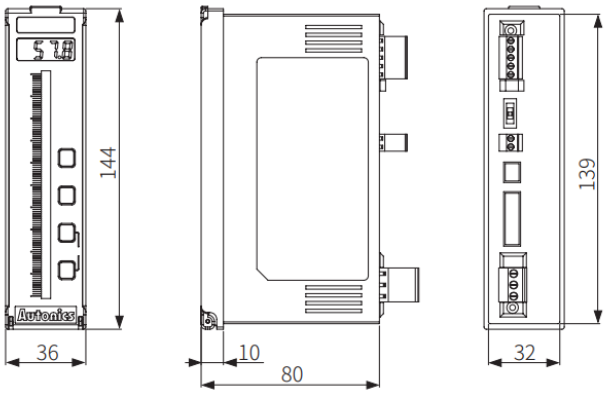
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Thermo-couple | E (CR) | TC-E | -199.9 | to | 800.0 | -328 | to | 1,472 |
| | T (CC) | TC-T | -199.9 | to | 400.0 | -199.9 | to | 752.0 |
| | B (PR)* | TC-B | 100 | to | 1,800 | 212 | to | 3,272 |
| | R (PR) | TC-R | 0 | to | 1,750 | 32 | to | 3,182 |
| | S (PR)* | TC-S | 0 | to | 1,750 | 32 | to | 3,182 |
| | N (NN)* | TC-N | -200 | to | 1,300 | -328 | to | 2,372 |
| | C (W5)* | TC-C | 0 | to | 2,300 | 32 | to | 4,172 |
| | L (IC)* | TC-L | -199.9 | to | 900.0 | -328 | to | 1,652 |
| | U (CC)* | TC-U | -199.9 | to | 400.0 | -199.9 | to | 752.0 |
| | Platinel II* | TC-P | 0 | to | 1,390 | 32 | to | 2,534 |
| RTD | Cu50Ω* | Cu50 | -199.9 | to | 200.0 | -199.9 | to | 392.0 |
| | Cu100Ω* | Cu 0 | -199.9 | to | 200.0 | -199.9 | to | 392.0 |
| | JPt100Ω | JPt | -199.9 | to | 600.0 | -328 | to | 1,112 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | DPt50Ω | | | | DPt5 | -199.9 | to | 600.0 | -328 | to | 1,112 |
| | DPt100Ω | | | | DPt | -199.9 | to | 850.0 | -328 | to | 1,530 |
| Analog | Current | 0.00 | – | 20.00 mA | aM | -1,999 to 9,999<br>(Display range is variable according to decimal point position.) | | | | | |
| | | 4.00 | – | 20.00 mA | aM 2 | | | | | | |
| | Voltage | -50.0 | – | 50.0 mV | aMV | | | | | | |
| | | -199.9 | – | 200.0 mV | aMV2 | | | | | | |
| | | -1.000 | – | 1.000 V | -V | | | | | | |
| | | -1.00 | – | 10.00 V | -V2 | | | | | | |

**Display accuracy**

| Input type | Using temperature | Display accuracy |
|---|---|---|
| Thermocouple R TD<br>Analog | At room temperature<br>(25 ℃ ±5 ℃) | PV ±0.2% F.S. ±1 digit<br>• Thermocouple below -100 ℃: (PV ±0.4% F.S.) ±1digit |
| | Out of room temperature range | PV ±0.3% F.S. ±1 digit |

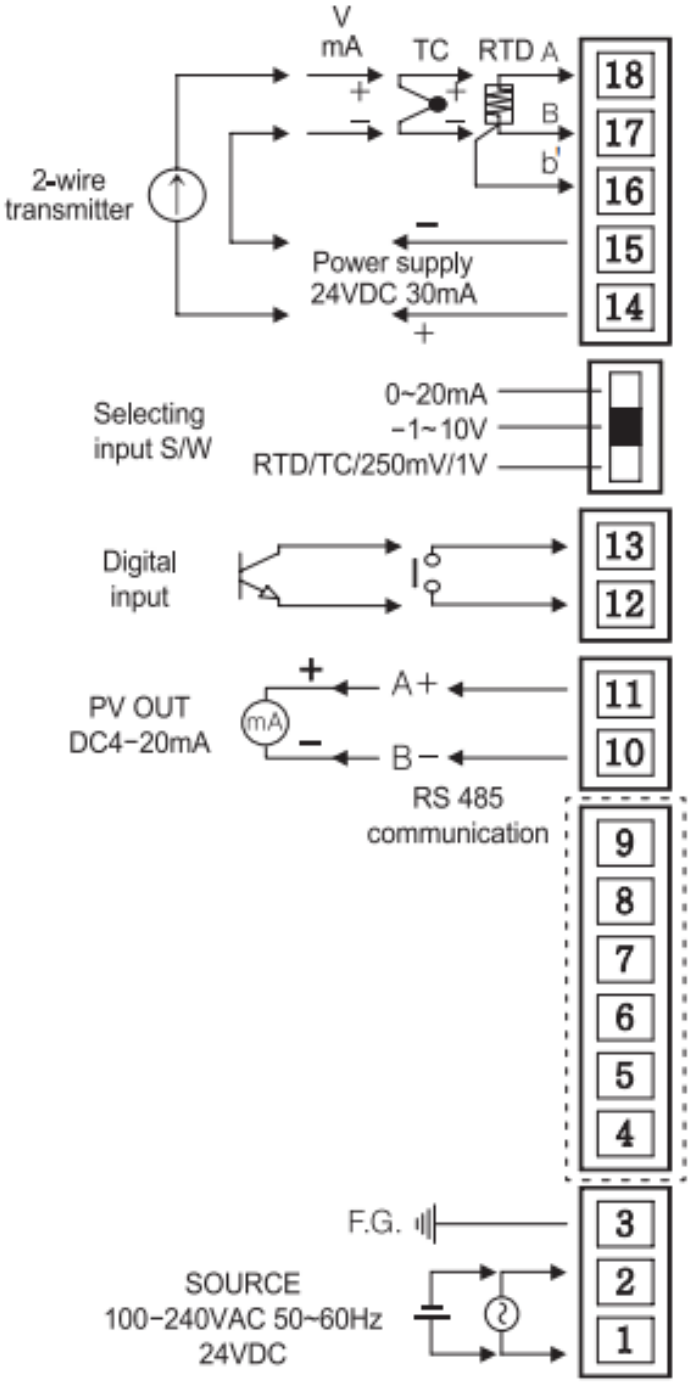
## Unit Descriptions




## Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics
- Below is based on KN-1000B series.

## ■ KN-10□□B

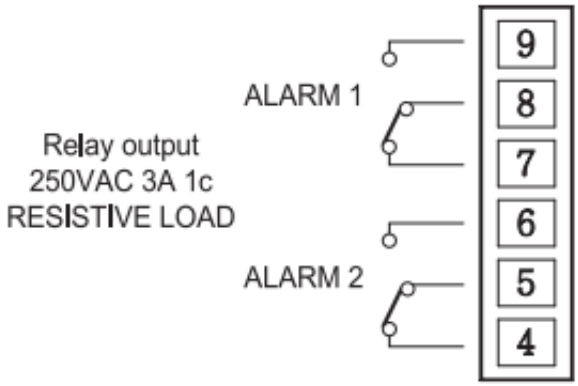



**Errors**

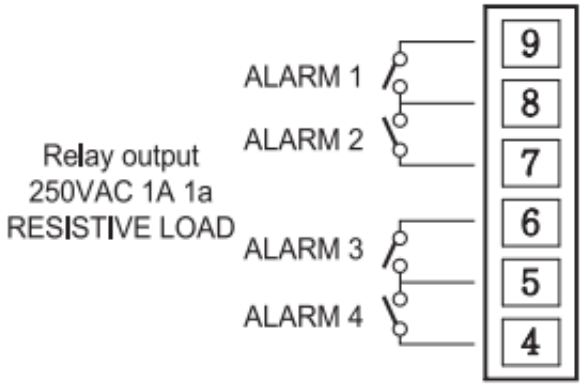
| Display | Description | Troubleshooting |
|---|---|---|
| BURN | Flashes when input sensor is disconnected or sensor is not connected. | Check input sensor status. |
| | Flashes when PV is higher than input range. | When input is within the rated input range, this display disappears. |
| LLLL | Flashes when PV is lower than input range. | |
| ERR | Flashes when there is an error of setting value | Check the setting condition and reset. |

**Mode Setting**

■ KN-12□□B




■ KN-14□□B



**Program mode**

| Parameter | | Display | Default | Setting range | Condition |
|---|---|---|---|---|---|
| 2-1 | Input specification | IN-P | aM | Refer to ‘Input Type and Using Range’. | – |
| 2-2 | Temperature unit | UNIT | ?C | ℃, ℉ | 2-1 Input specification: Thermocouple, RTD |
| 2-3 | Low limit input | L-RG | 0)00 | Using range low limit ≤ L-RG ≤ using range high limit – 10% of F.S. | 2-1 Input specification: Analog |
| 2-4 | High limit input | -RG | 2)00 | L-RG + 10% of F.S. ≤ H-RG ≤ using range high limit | |
| 2-5 | Decimal point | P | )0 | 0.0, 0.00, 0.000, 0 | |
| 2-6 | Low limit scale | L-SC | 00)0 | -1,999 ≤ L-SC  H-SC ≤ 9,999<br>• When setting ‘2-24 Input special function: TUF’<br>L-SC: -760.0, H-SC: 0 to 9,999 | |

| | | | | | |
|---|---|---|---|---|---|
| 2-7 | High limit scale | -SC | 0)0 | | |
| 2-8 | Input correction [01)] | IN-B | 0000 | -999 to 999,<br>L-SC IN-B H-SC | 2-1 Input specification: Thermocouple,<br>RTD |
| | | | | -999 to 999,<br>L-SC ≤ L-RG≤ IN-B ≤ H-RG ≤ H-SC | 2-1 Input specification:<br>Analog |
| 2-9 | Bar graph display low limit scale | L-BS | 00)0 | • Input: Thermocouple, RTD<br>Input range low limit ≤ L-BS ≤ (H- BS-1)<br>(L-BS+1) ≤ H-BS ≤ Input range high limit<br>• Input: Analog<br>L-SC ≤ L-BS ≤ (H-SC-1) (L-SC+1) ≤ H-BS ≤ H-SC | – |
| 2-10 | Bar graph display high limit scale | -BS | 0)0 | | |
| 2-11 | Bar graph<br>display method | BR | fBR | F.BAR: Full bar, C.BAR: Center bar | – |

<table>
<tr><td>2-12</td><td>4 mA transmission output scale</td><td>IOUT</td><td>00)0</td><td colspan="4" rowspan="2">[Transmission output model]<br>• Input: Thermocouple, RTD:<br>Within input range<br>• Input: Analog<br>L-SC ≤ L.OUT ≤ 10% of F.S.<br>≤ H.OUT ≤ H-SC</td><td rowspan="2">–</td></tr>
<tr><td>2-13</td><td>20 mA transmission output scale</td><td>OUT</td><td>0)0</td></tr>
<tr><td></td><td></td><td rowspan="5">ExI0</td><td rowspan="5">SP</td><td colspan="4">[Transmission output model]</td><td rowspan="5">2-1 Input specification: Analog</td></tr>
<tr><td rowspan="3">2-14</td><td rowspan="3">Input and transmission output extension 02)</td><td>Setting value</td><td>Input range</td><td>Transmission output range</td></tr>
<tr><td>0P</td><td>No extension</td><td>4 – 20 mA</td></tr>
<tr><td></td><td>5P</td><td>±5% extension</td><td>3.2 – 20.8 mA</td></tr>
<tr><td></td><td></td><td>10P</td><td>±10% extension</td><td>2.4 – 21.6 mA</td></tr>
</table>

| | | | | | | |
|---|---|---|---|---|---|---|
| 2-15 | AL1 alarm operation | | | [Alarm output model]<br>□□□<br>AT0: Off<br>AT1: Absolute high limit alarm AT2: Absolute low limit alarm SBA: Sensor break alarm | | – |
| 2-16 | AL1 alarm option | L- | T!<br>□□□.<br>■ | ■<br>A: Standard alarm<br>C: Standby sequence | B: Alarm latch<br>D: Alarm latch and standby sequence | – |
| | | | | • Enter to option setting: Press [◀] key in 2-15 AL-1 alarm operation. | | |
| 2-17 | AL2 alarm operation | L-2 | T! | [Alarm output model]<br>Same as 2-15/16 AL1 alarm operation/ option | | – |
| 2-18 | AL2 alarm option | | | | | |
| 2-19 | AL3 alarm operation | L-3 | T | [4 alarm output model] | | |
| 2-20 | AL3 alarm option | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 2-21 | AL4 alarm operation | L-4 | T | Same as 2-15/16 AL1 alarm operation/ option | – |
| 2-22 | AL4 alarm option | | | | |
| 2-23 | Alarm output hysteresis | – Y | 00 | 001 to 999 | 2-15/17/19/21 AL-1/2/3/4 alarm operation: AT1, AT2 |
| 2-24 | Input special function | In SF | LIN | LIN: Linear, ROOT: Root, SQAR: Square, TUF: Two unit function | 2-1 Input specification: Analog |
| 2-25 | Input digital filter | MF | 04 | 01 (OFF) to 16<br>• It does not affect the display cycle. | – |
| 2-26 | Digital input Terminal | DI-T | OLD | HOLD: Hold, ZERO: Zero-point adjustment, AL.RE*: Alarm reset<br>*[Alarm output model] | * 2-16/18/20/22 AL1/2/3/4 Alarm option: B, D |

| | | | | | |
|---|---|---|---|---|---|
| 2-27 | Digital input key | DI-K | OLD | | |
| 2-28 | Sensor break alarm output | BURN | OFF | [Transmission output model]<br>OFF: 4 mA, ON: 20 mA | – |
| 2-29 | Comm. address | DRR | 0 | [Communication output model]<br>01 to 99 | – |
| 2-30 | Comm. speed | BUD | 00 | [Communication output model]<br>9600, 4800, 2400, 1200 bps | – |
| 2-31 | Lock | LOC | OFF | OFF<br>LOC1: Program mode lock (check only)<br>Monitoring mode unlock LOC2: Checking and setting program mode lock<br>Monitoring mode setting lock<br>(check only) | – |

| | | |
|---|---|---|
| **Function: Bar Graph** | | |
| ■ **Display method setting** | | |
| It is possible to set in bar graph display method parameter. | | |

| **Full bar** | **Center bar** | |
|---|---|---|
| 100 Displays the input from the bottom for bar graph scale following to bar graph display scale<br>0 parameter setting value<br>• L-BS= 100, H-BS= 100,<br>-50 PV = 50<br>-100 ← **Bottom** | 100 Displays the input from zero point (0) for bar g raph scale following to bar graph display scale param eter setting value<br>0 ← **Zero point**<br>-50 • L-BS= 100, H-BS= 100,<br>PV = 50<br>-100 | |
| ■ **Alarm display in bar graph** | | |
| When setting or occurring the alarm, it displays the status by the bar graph. It is possible to check the alarm stat us. When setting alarm value, the bar LED for this alarm value turns ON. When alarm occurs, the bar LED for th is alarm value flashes.<br>• If alarm set value is out of bar graph scale when setting the value or in RUN mode, this<br>value does not display in bar graph. | | |
| **Monitoring mode: setting alarm value** | **Run mode: alarm display** | |
| The bar LED for alarm setting value flashes. When alar m set is complete, the bar LED for this alarm value turn s ON. | All set alarm values are displays and when it is alarm value, the bar LED for this alarm value flashes. | |
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| • The bar LED for the alarm value flashes. | • AL1/2:<br>Low limit alarm | • AL3/4:<br>High limit alarm |

***Read More About This Manual & Download PDF:***

**Documents / Resources**

| | |
|---|---|
|  | Autonics KN-1000B Series Bar Graph Indicators [pdf] Instruction Manual<br>KN-1000B Series Bar Graph Indicators, KN-1000B Series, Bar Graph Indicators, Graph Indicators, Indicators |

**References**

- autonics.com