

50 mm Hybrid Recorder



KRN50 Series PRODUCT MANUAL

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

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- 50mm thermal transfer method of paper recorder
- Enables to record data without paper with the data logger function
- Support two recording modes: graph mode, digital mode
- Simultaneous recording of two channels
- Enables to set parameters and monitor with RS485 communication and dedicated communication port
- Multi-input with high accuracy 0.2% level (RTD, TC, Voltage, Current (shunt))
- Supports various option I/O function
- Small size (W96×H96×L100mm), light weight

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ 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 connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire or electric shock.
- 03. Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
- 04. Do not touch the unit during or after operation for a while.**
Failure to follow this instruction may result in burn or electric shock due to high temperature of the surface.
- 05. 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.
- 06. Install on the device panel, and ground to the F.G. terminal separately. When connecting the F.G. terminal, use AWG16 (1.25 mm²) or over.**
Failure to follow this instruction may result in fire or electric shock.
- 07. Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.
- 08. Since Lithium battery is embedded in the product, do not disassemble or burn the unit.**
Failure to follow this instruction may result in fire.

⚠ 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. When connecting the power input or measurement input, use AWG20 (0.50 mm²) cable or over, and tighten the terminal screw with a tightening torque of 0.74 N·m to 0.90 N·m.**
Failure to follow this instruction may result in fire or malfunction due to contact failure.
- 05. Do not use the load beyond rated switching capacity contact.**
Failure to follow this instruction may result in fire, relay broken, contact melt, insulation failure or contact failure.
- 06. When connecting the temperature sensor (TC, RTD) or analogue input (voltage, current) as input to the universal input card, set the jumper pin to the correct place for the connected input type.**
If the jumper pin is placed improperly, it may result in product damage or malfunction.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Install a surge absorber at each end of inductive load coil when controlling high-capacity power relay or inductive load (e.g. magnet).
- 24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Check the polarity of the terminals before wiring the temperature sensor. For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length. For thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire.
- Keep away from high voltage lines or power lines to prevent inductive noise. In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line. Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.
 - 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.
For selecting the specified model, follow the Autonics website.

KRN50 - ① 0 0 ② - ③ ④

① No of input channel

01: 1 CH
02: 2 CH

② Alarm output

0: None
2: 2
4: 4

③ Option output

0: None
4: RS485 communication output

④ Power supply

0: 100-240 VAC~ 50/60 Hz
1: 24 VDC=

Manual

For proper use of the product, refer to the manuals and be sure to follow the safety considerations in the manuals.
Download the manuals from the Autonics website.

Software

Download the installation file and the manuals from the Autonics website.

■ DAQMaster

It is the comprehensive device management program for Autonics' products, providing parameter setting, monitoring and data management.

Product Components

- Product
- Recording paper × 2
- Bracket × 2
- User manual
- 50 Ω B class (0.1 %) high-accuracy resistor × 2

Specifications

| | |
|-------------------------------------|--|
| Series | KRN50 |
| LCD type | LCD dot matrix display |
| Resolution | 128 × 32 pixel |
| No of input channel | 1 / 2 CH model |
| Input type | Refer to 'Input/Output' for detailed information. |
| Alarm output | CH1 (AL1, AL2), CH2 (AL1, AL2) relay output |
| Alarm output adjustment sensitivity | Alarm output ON/OFF interval setting: 1 to 999 digit variable |
| Communication output | RS485 communication output (Modbus RTU protocol method) |
| Setting method | Setting with front key |
| Sampling cycle | 500 ms/CH (2 CH = 1,000 ms) |
| Recording accuracy | ± 0.5 % F.S. |
| Graph mode recording speed | 10, 30, 60, 120, 240, 480, 960 mm/H |
| Graph mode memo speed | 30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 1 hour, 2 hour, 3 hour, 4 hour, 8 hour, 16 hour, 24 hour |
| TEXT mode recording speed | 00m 05s to 99m 59s |
| Recording paper | Thermal Direct Receipt Paper (57 mm × 16 m) |
| Recording paper supply method | Clamshell type |
| Print method | Direct thermal line print |
| Print resolution | 80 dot/mm |
| No. of print dot | 384 dot/Line |
| Print life cycle | 50 km |
| Language | Korean, English |

| | AC voltage type | DC voltage type |
|-------------------------|--|-----------------------------|
| Power supply | 100-240 VAC~ 50/60 Hz | 24 VDC= |
| Allowable voltage range | 85 to 110 % of power supply | 90 to 110 % of power supply |
| Power consumption | ≤ 34 VA | ≤ 79 W |
| Dielectric strength | 2300 VAC~ 50/60 Hz for 1 minute (charging terminal of the different polarity) | |
| Vibration | 0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each of X, Y, Z directions for 1 hour | |
| Insulation resistance | ≥ 100 MΩ (500 VDC= megger) | |
| Noise immunity | Square shaped noise by noise simulator (pulse width 1 μs) ± 2 kV | |
| Ambient temperature | 0 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 | CE [E] | |
| Unit weight | ≈ 700 g | |

Input/Output

■ Universal input

• Input specifications

| | | |
|--------------|--|---|
| RTD | JPt100Ω, DPt100Ω, DPt50Ω, Cu100Ω, Cu50Ω | |
| Thermocouple | K, J, E, T, B, R, S, N, C, G, L, U, PLII | |
| Analog | Voltage | -50.0-50.0 mV, -199.0-200.0 mV, -1.000-1.000 V, -1.00-10.00 V |
| | Current | 0.00-20.00 mA, 4.00-20.00 mA (external connection of 50 Ω B class (0.1 %) high-accuracy resistor) |

If sensor input line is longer, it is recommended to use shield cable to reduce noise.

• Display accuracy

| Input type | Temperature | Display accuracy |
|--------------|---------------------------------------|--|
| RTD | Room temperature range (25 °C ± 5 °C) | ± 0.2 % F.S. ± 1 digit |
| | Out of room temperature range | ± 0.3 % F.S. ± 1 digit |
| Thermocouple | Room temperature range (25 °C ± 5 °C) | ± 0.2 % F.S. ± 1 digit • TC-K2 has same accuracy with TC-K1 and -200 to 1350 °C range • J (-200 ≤ T ≤ -100): (higher one between ± 0.2 % F.S. and ± 2.7 °C) ± 1 digit • R, S, C, G (0 ≤ T ≤ 100): (higher one between ± 0.2 % F.S. and ± 5.2 °C) ± 1 digit • U, T (-200 ≤ T ≤ -100): (higher one between ± 0.2 % F.S. and ± 3.5 °C) ± 1 digit • U, T (-100 ≤ T ≤ 400): (higher one between ± 0.2 % F.S. and ± 2.5 °C) ± 1 digit • Below 400 °C of B: there is no accuracy standards. • Below -100 °C of all thermocouples: ± 0.4 % F.S. ± 1 digit |
| | Out of room temperature range | ± 0.3 % F.S. ± 1 digit |
| Analog | Room temperature range (25 °C ± 5 °C) | ± 0.2 % F.S. ± 1 digit |
| | Out of room temperature range | ± 0.3 % F.S. ± 1 digit |

■ Event input

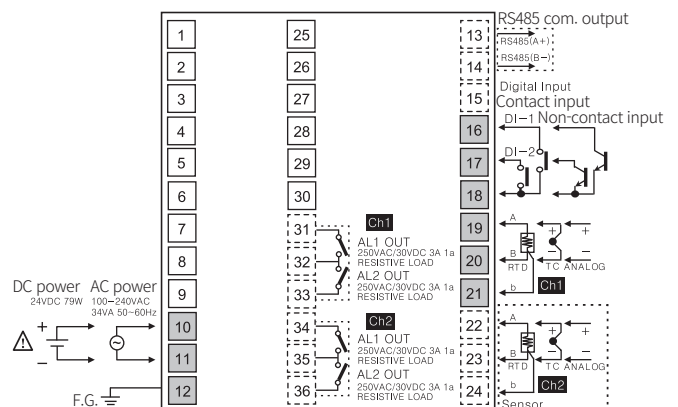
| | |
|-------------------|--|
| Non-contact input | ON: residual voltage ≤ 1 V, OFF: leakage current ≤ 0.05 mA |
| Contact input | ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ |
| Outflow current | ≈ 0.3 mA |

■ Alarm output

| | |
|--------------------------------|---------------------------|
| Relay capacity | 250 VAC~ 3 A, 30 VDC= 3 A |
| Contact type | 1 Form A |
| Mechanical life cycle of relay | ≥ 5,000,000 operations |
| Electrical life cycle of relay | ≥ 100,000 operations |

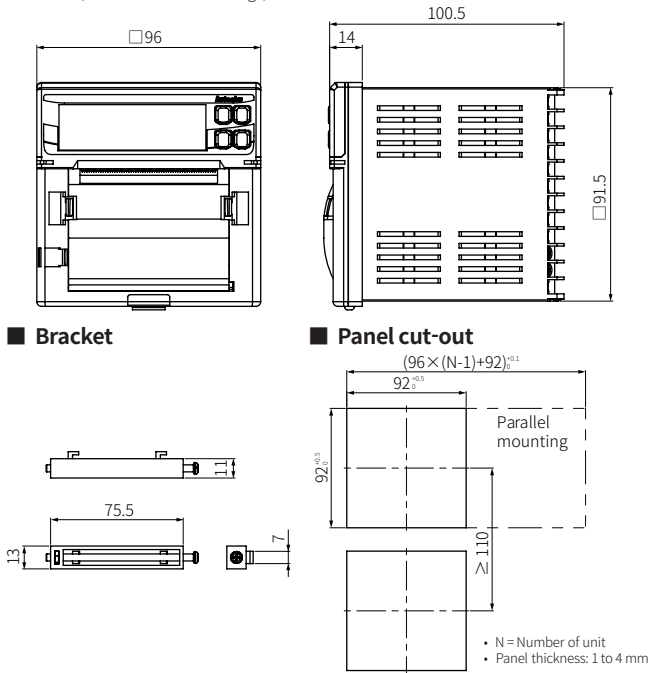
Connections

- Shaded terminals are for the standard model. (power terminal, CH1 input terminal, DI input terminal)
- Terminals in dotted line are for the option model. (CH2 input terminal, alarm output terminal, communication output terminal)
- The DC power model does not have F.G.
- When using 2-wire RTD, short B and b terminals.
- For current input, connect external 50Ω B class (0.1 %) high-accuracy resistor.

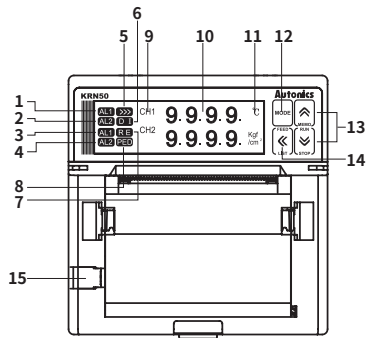


Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.



Unit Descriptions



- Channel 1 alarm (AL1) output indicator:** Turns ON when AL1 of input channel 1 operates.
- Channel 1 alarm (AL2) output indicator:** Turns ON when AL2 of input channel 1 operates.
- Channel 2 alarm (AL1) output indicator:** Turns ON when AL1 of input channel 2 operates.
- Channel 2 alarm (AL2) output indicator:** Turns ON when AL2 of input channel 2 operates.
- Recording start / stop indicator:** turns ON when recording starts and turns ON when recording stops.
- Digital input indicator:** Turns ON when setting digital input.
- Recording reservation indicator:** turns ON when recording reservation operates.
- Recording paper status indicator:** turns ON in running out of recording paper during recording.
- Channel display part:** Displays input channel of currently displayed PV on the PV display part.
- PV display part:** In RUN mode, displays PV of the current channel and in setting mode, displays parameters and mode setting values.
- Unit display part:** Displays unit of relevant channel
- [MODE] key:** Used to enter setting mode and changing SV mode.
- [>>] key:** Used to move parameters or increase/decrease digits.
 - key: Digital memo key
 - key: Recording Run/Stop key
- [<<] key:** Used to move parameters to upper group or move digits.
 - Paper feeding key (STOP), printing parameter setting information key (RUN)
- PC loader port:** It is a PC loader port for serial communication to set or monitor parameters by PC. Used to connect SCM-US (USB to Serial converter, sold separately).