

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 or store 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, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

KRN50 - ① ② ③ ④ - ⑤ ⑥

① No of input channel

1: 1 CH
2: 2 CH

② Channel 1 control output

0: None

③ Channel 2 control output

0: None

④ Alarm output

0: None
2: 2
4: 4

⑤ Option output

0: None
4: RS485 communication output

⑥ 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 × 1
- Recording paper × 2
- Bracket × 2
- Instruction manual × 1
- 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≒
Permissible voltage range	85 to 110 % of power supply	90 to 110 % of power supply
Power consumption	≤ 34 VA	≤ 79 W
Dielectric strength	Between the charging part and the case: 2300 VAC ~ 50/60 Hz for 1 minute	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction 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)	
Certification	CE UK ENEC	
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	
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

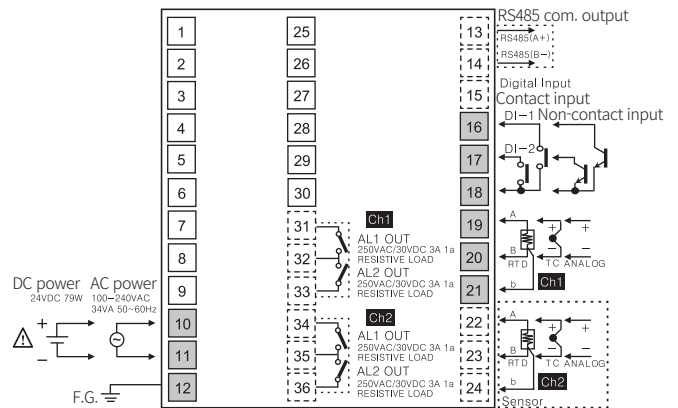
Non-contact input	ON: residual voltage ≤ 1 V, OFF: leakage current ≤ 0.05 mA
Contact input	ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ
Outflow current	≈ 0.3 mA

■ 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

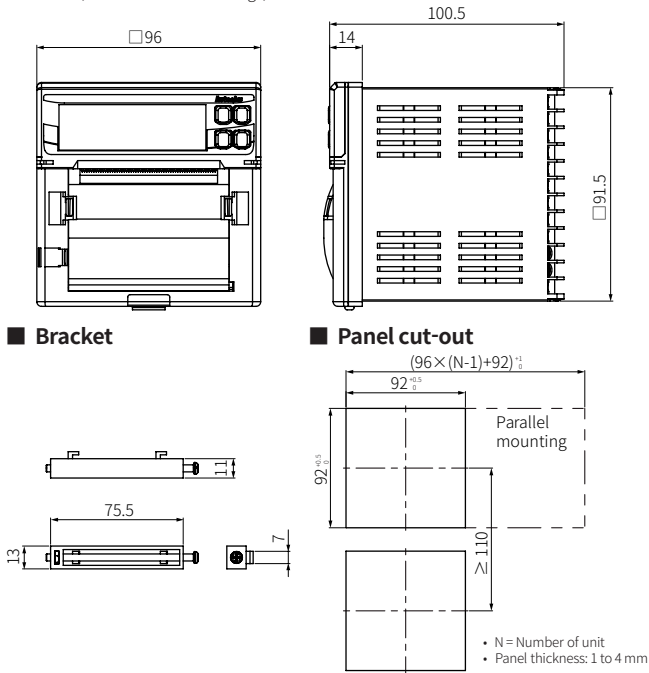
Connections

- 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 50 Ω B class (0.1 %) high-accuracy resistor.

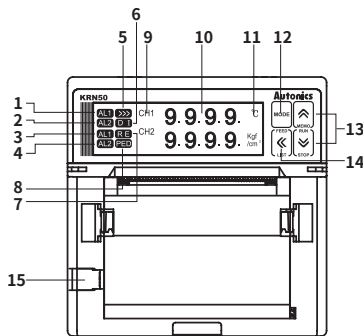


Dimensions

- 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).