Autonics
100mm Hybrid Recorder
KRN100 SERIES
INSTRUCTION MANUAL

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.
※⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ **Warning** Failure to follow these instructions may result in serious injury or death.
⚠ **Caution** Failure to follow these instructions may result in personal injury or product damage.

⚠ Warning

1. **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.
2. **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.
3. **Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
4. **Do not touch the product during operation or for a certain period of time after stopping.**
Failure to follow this instruction may result in burn or electric shock.
5. **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.
6. **Install on the device panel or DIN rail, and ground to the F.G. terminal separately. When connecting the F.G. terminal, use AWG16 (1.25mm²) or over.**
Failure to follow this instruction may result in fire or electric shock.
7. **Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire or electric shock.
8. **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

1. **Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
2. **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.
3. **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.
4. **When connecting the power input or measurement input, use AWG20 (0.50mm²) cable or over and tighten the terminal screw with a tightening torque of 0.74 to 0.9N·m.**
Failure to follow this instruction may result in fire or malfunction due to contact failure.
5. **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.
6. **Do not disassemble or assemble input/output card, when power is supplied.**
Failure to follow this instruction may result in product damage.
7. **Use the transmitter output terminals only as the power for the transmitter.**
Failure to follow this instruction may result in product damage.
8. **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 method.**
If the jumper pin is placed improperly, it may result in product damage or malfunction.
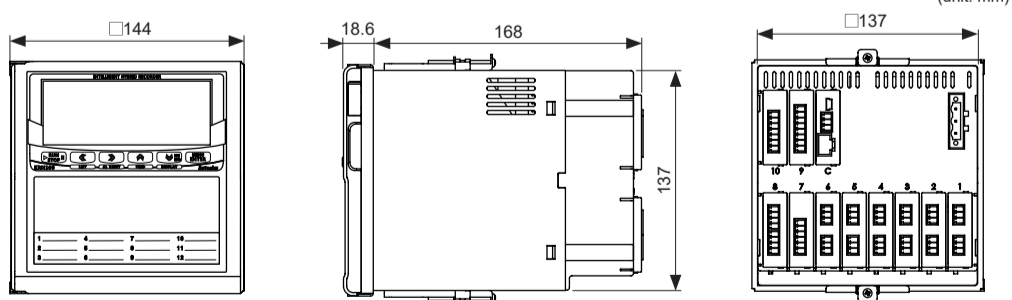
■ Specifications

Series	KRN100	
Power voltage	100-240VAC∼ 50/60Hz	
Allowable voltage range	85 to 110% of rated voltage	
Power consumption	Max. 55VA	
Screen	LCD type	STN Graphic LCD
	Resolution	320×120 Pixel
	Adjusting brightness	4-level (OFF/Min/Standard/Max)
	Backlight	White LED, 2-level (Temp/Always)
Input channels	2 / 4 / 6 / 8 / 10 / 12-channel (2-channel/card)	
Universal input	Temperature sensor (RTD, thermocouple), analog (voltage, current)	
Sampling cycle	1 to 4-channel: 25ms/125ms/250ms, 5 to 12-channel: 125ms/250ms (inner sampling cycle is operation unit time for average movement filter and alarm output function.) ※Min. sampling cycle for TC-R, U, S, T sensor is 50ms.	
Recording speed in graph mode	10, 20, 40, 60, 120, 240mm/H	
Recording speed accuracy	F.S. ±0.5%	
Storage cycle	1 to 3600 seconds (storage interval time to inner log file is 1 seconds)	
Inner memory	512MB	
USB memory※1	Recognizes max. 32GB, enables to use cable up to 1.5m	
Dielectric voltage	2500VAC 50/60Hz for 1 minute (power terminal and case) ※Excepts USB Device and Ethernet	
Vibration strength (for convey and storage) and operating vibration	Vibration strength: 10 to 60Hz 4.9m/s² (each X, Y, Z axis for 1 hour) Operating vibration: 10 to 60Hz 1m/s² (each X, Y, Z axis for 10 minutes)	
Insulated resistance	Over 20MΩ (at 500VDC megger)	
Noise immunity	±2kV the square wave noise (pulse width 1μs) by the noise simulator	
Time accuracy	Within ±2 min/year (enables to use up to 2100 year)	
Mechanism	Ink cartridge	Enables to normal print with going and returning printing max. 5 times within 7 days after opening the unit
	Ink dry time	Max. 15 minutes
Protection	IP40 (front panel, IEC Standard)	
Recording paper	113mm×9m	
Environment	Ambient temperature	0 to 50℃, storage : -20 to 60℃ (without ink cartridge)
	Ambient humidity	35 to 85% RH, storage : 35 to 85% RH
Approval	CE ⓀⒸ	
Weight※2	Approx. 2.4 to 2.7kg (approx. 1.7 to 2.0kg)	

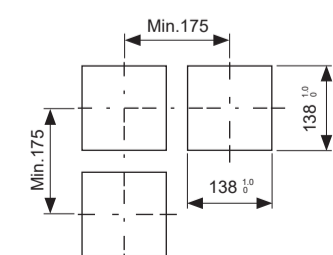※1: USB memory is included in the box. If you use USB memory you purchased separately, it could not be recognized.
※2: The weight includes packaging. The weight in parentheses is for unit only.
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

(unit: mm)

● Panel cut-out

※Use a steel plate which is 2 to 8mm thickness.

※ The above specifications are subject to change and some models may be discontinued without notice.
※ Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, website).

■ Connections

This figure is the rear side of KRN100-04000-00-0S.

SOURCE 100-240VAC 50/60Hz, 55VA

F.G.
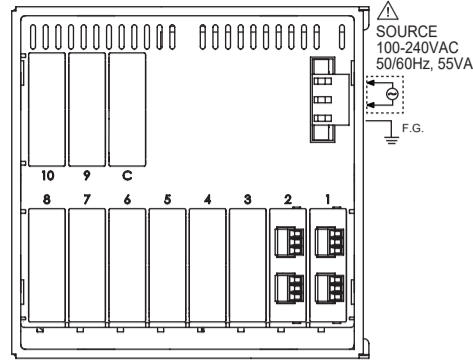
Slot	Description
1 to 6	Connects universal input card(KRN-UI2).
7 to 10	Connects digital input card(KRN-DI6), alarm output card(KRN-AR4, KRN-AT6), transmitter power output card(KRN-24V3).
C	Connects communication output card(KRN-COM).

■ Input Type Setting

Before setting the parameters, set the jumper pin channel 1/2 of universal input card (KRN-UI2) depending on input specification as below figure.
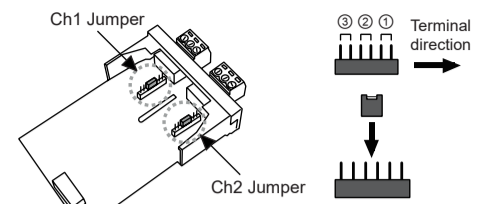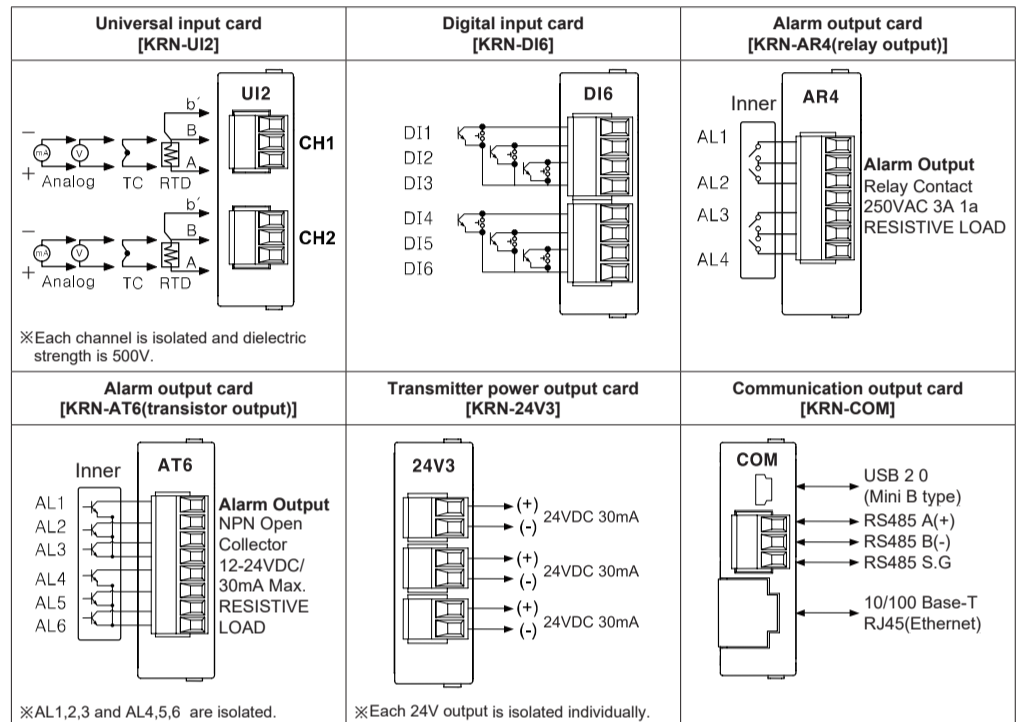

| Jumper pin	Input specification	Input break alarm
①	0 to 20mA, 4 to 20mA	Enables only 4 to 20mA
②	TC, RTD, ±60mV, ±200mV	Enables
③	±2V, 1 to 5V, ±5V, -1 to 10V	Disables

■ User Manual

For the detail information and instructions, please refer to user manual and user manual for communication.

■ I/O Card

Universal input card [KRN-UI2]

※Each channel is isolated and dielectric strength is 500V.

Digital input card [KRN-DI6]

Alarm output card [KRN-AR4(relay output)]

Alarm Output Relay Contact 250VAC 3A 1a RESISTIVE LOAD

Alarm output card [KRN-AT6(transistor output)]

Alarm Output NPN Open Collector 12-24VDC/ 30mA Max. RESISTIVE LOAD

※AL1,2,3 and AL4,5,6 are isolated.

Transmitter power output card [KRN-24V3]

24VDC 30mA

※Each 24V output is isolated individually.

Communication output card [KRN-COM]

USB 2.0 (Mini B type)
RS485 A(+)
RS485 B(-)
RS485 S.G
10/100 Base-T RJ45(Ethernet)

■ Screen Layout and Status Display

Screen layout is divided as two; upper screen for status display, lower screen for measuring value display, virtual keyboard display, parameter setting display.
Upper screen displays recorder status and information of recorder as icon.
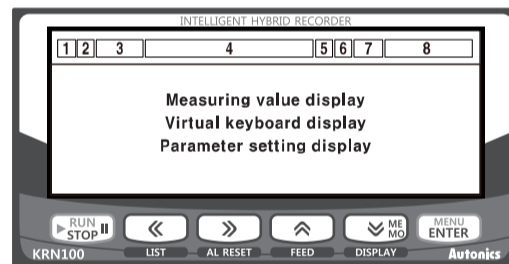
Section	Icon	Name	Description
1	▶	Record start icon	Marks if for starting recording measuring value of recordable channels.
	■	Record stop icon	Stops recording measuring value.
	▶	List record icon	Flashes during list recording.
	RE	Reservation record icon	Flashes during reservation recording.
	FEED	FEED icon	Flashes during feeding recording paper.
	RECORD BACKUP	Backup data print icon	Flashes during backup data printing.
2		Digital mode icon	Marks it for digital record mode.
		Graph mode icon	Marks it for graph record mode.
		Record memory status icon	Marks it storage capacity of record memory in digital mode or graph mode.
	P END	No recording paper icon	Marks it for no recording paper. Please replace new recording paper.
3		USB communication icon	Marks 🖵 icon during Modbus RTU communication using USB.
		Ethernet communication icon	Marks 🖵 icon during Modbus TCP communication using Ethernet.
		RS485 communication icon	Marks 🗙 icon during Modbus RTU communication using RS485.
4	1 2 ...12	Alarm ON icon	Marks 1 2 ...12 channel icon which alarm occurs.
5		Digital input(DI) icon	Marks the below icon according to input function setting during digital input (DI).
	MEMO	Digital input(DI)-memo icon	Marks it when digital memo of digital input or front ▼ is input in recording status.
	RESET	Digital input(DI)-alarm reset icon	Marks it when alarm reset signal of digital input (DI) is input.
	RUN	Digital input(DI)-start record icon	Marks it when start record signal of digital input (DI) is input.
	STOP	Digital input(DI)-stop record icon	Marks it when stop record signal of digital input (DI) is input.
	LIST	Digital input(DI)-LIST output icon	Marks it when LIST output signal of digital input (DI) is input.
	SPEED	Digital input(DI)-record speed icon	Marks it when changing record speed signal of digital input (DI) is input.
6		Unlock icon	Marks it for unlock status.
		User(general user) lock icon	Marks it for user (general user) lock status.
	A	Administrator lock icon	Marks it for administrator and general user lock status.
7		Inner and external (USB) memory capacity icon	Displays data capacity of internal memory as bar graph.
8	2011 / 02 / 07 MON 15: 17: 34	Date/Time display	Displays current date and time. In summer time season, (S) mark is also displayed in front of year.

▣ QUICK MENU

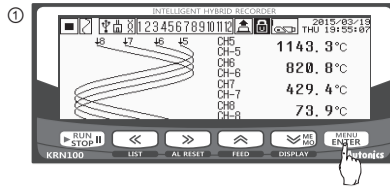QUICK MENU consists of usually used parameters for quickly parameter setting.
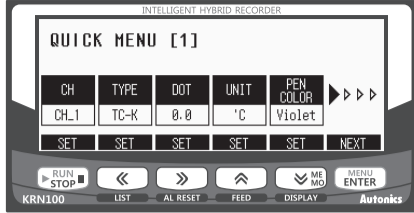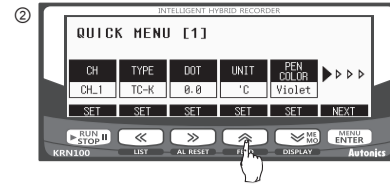

1) Parameters of QUICK MENU

| Page	Parameter	Description	Linked parameters
QUICK MENU [1]	CH	Select channel for the QUICK MENU[1] setting.	
	TYPE	Input type	[INPUT SETUP]-[Input Type]
	DOT	Decimal point	[INPUT SETUP]-[Range/Scale Point]
	UNIT	Display/Temperature unit	[INPUT SETUP]-[Display/Temp Unit]
	PEN COLOR	Pen color	[INPUT SETUP]-[Pen Color]
QUICK MENU [2]	CH	Select channel for the QUICK MENU[2] select.	
	LOW RANGE	Low-limit input value or graph scale value	[INPUT SETUP]-[Low Range] or [INPUT SETUP]-[Low Graph Scale]
	HIGH RANGE	High-limit input value or graph scale value	[INPUT SETUP]-[High Range] or [INPUT SETUP]-[High Graph Scale]
	LOW SCALE	Low-limit scale value	[INPUT SETUP]-[Low Scale]
	HIGH SCALE	High-limit scale value	[INPUT SETUP]-[High Scale]
QUICK MENU [3]	PRINT MODE	Record mode	[RECORD SETUP]-[Record Mode]
	PRINT SPEED	Standard record speed	[RECORD SETUP]-[Standard Speed]
	PRINT MEMO	Digital memo period	[RECORD SETUP]-[Memo Period]
	BACK LIGHT	LCD backlight	[SYSTEM SETUP]-[Backlight]
	LCD ON/OFF	LCD backlight On/Off	[SYSTEM SETUP]-[Backlight On/Off]
QUICK MENU [4]	USB REC	Memory save	[FILE/MEMORY SETUP]-[USB LogData Save]
	USB COPY	Call USB COPY window	[FILE/MEMORY SETUP]-[USB Memory Copy/Move]
	UPGRADE	Call upgrade window	[USER/INFORMATION SETUP]-[Firmware Upgrade]
	CANCEL	Cancel the settings	
	SAVE	Save the setting of QUICK MENU[1] to [4].	

※Refer to "KRN100 user manual".

2) QUICK MENU Setting

① Press the ENTER key once in RUN mode and it enters to QUICK MENU.
QUICK MENU consists of usually used parameters for quickly parameter setting.

② Set the keys following the each parameter. Press the NEXT(ENTER) key and it moves to next page.
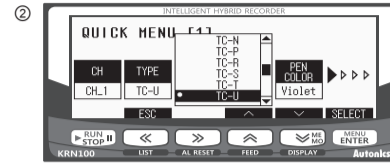E.g) When changing the temperature unit (℃→°F) of CH1, press the SET key.
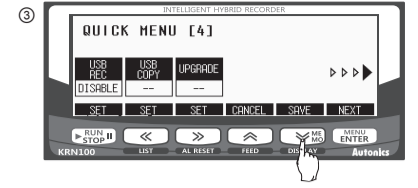
③ After completing the set ing, press the SAVE(ENTER) key at QUICK MENU[4] and save the settings. It returns to RUN mode.
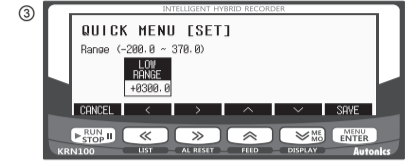
• E.g.) In case of CH1, recording as input type=TC-U, low-limit input value=300, standrad record speed= 240mm/h
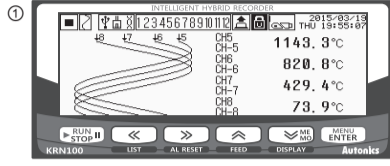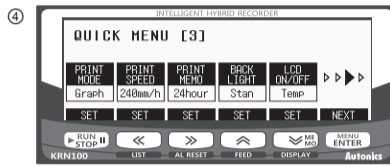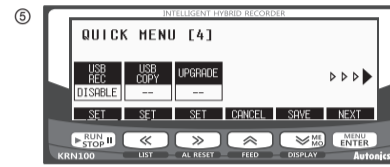

① Press the MENU key in RUN mode to enter QUICK MENU.

② Press the SET key at QUICK MENU [1] and below screen is displayed. Set input type [TYPE] as TC-U by pressing SET keys and press the MENU key.

③ Press he NEXT(ENTER) key once and it moves to QUICK MENU [2]. Press the SET key using keys to set low-limit input range [LOW RANGE] as 300 and press the ENTER key.
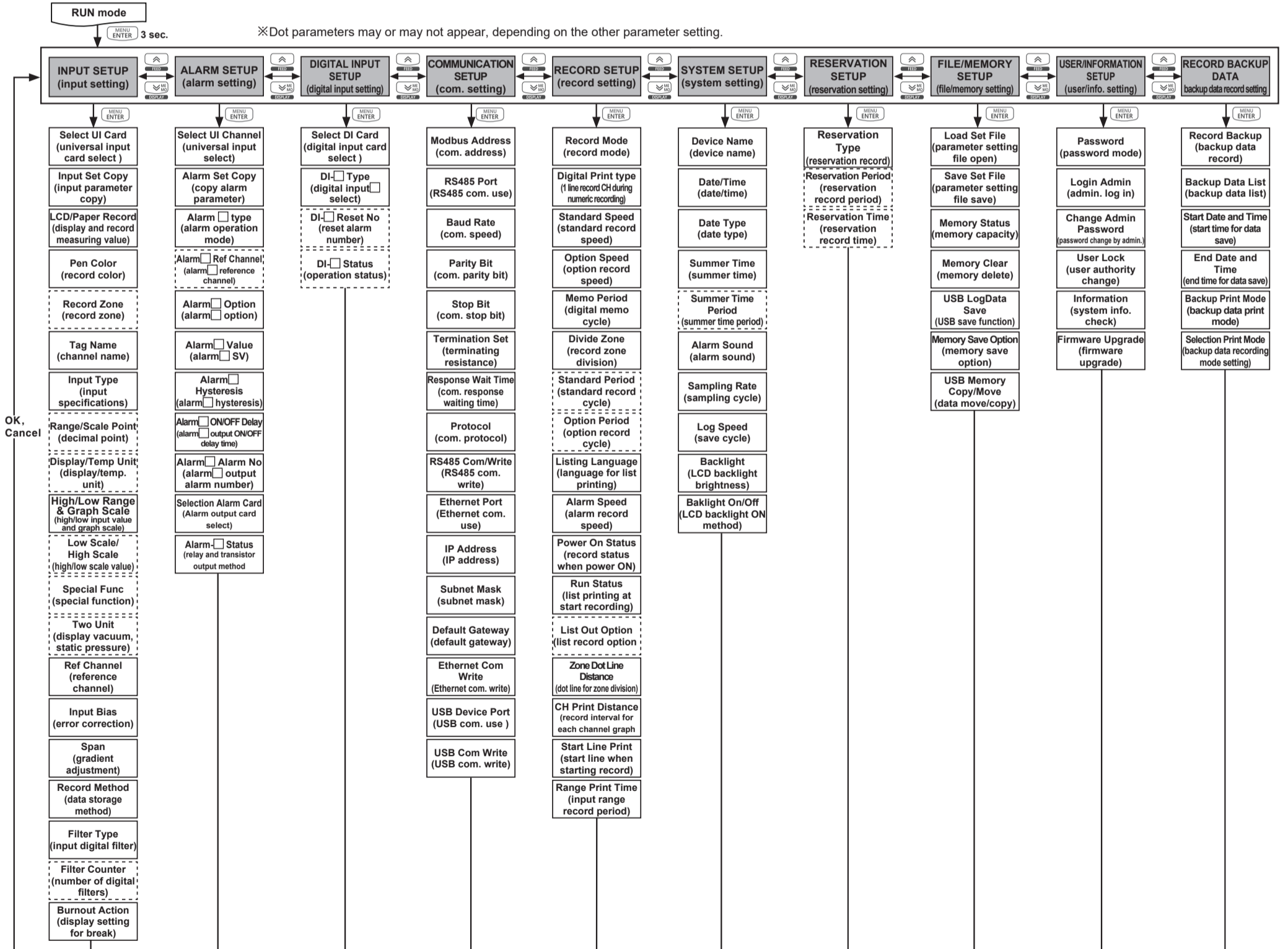
④ Press the NEXT(ENTER) key once and it moves to QUICK MENU [3]. Press the SET key and set standard record speed [PRINT SPEED] as 240mm/h.
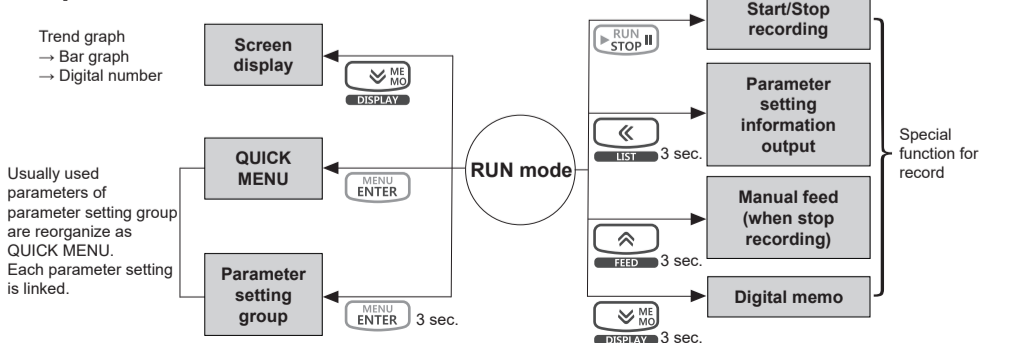
⑤ Press the NEXT(ENTER) key once and it moves to QUICK MENU [4]. Press the SAVE key to save the set ings of QUICK MENU [1] to [4] and it returns to RUN mode.

▣ Parameters

RUN mode → MENU ENTER 3 sec.

※Dot parameters may or may not appear, depending on the other parameter setting.

INPUT SETUP (input setting)	ALARM SETUP (alarm setting)	DIGITAL INPUT SETUP (digital input setting)	COMMUNICATION SETUP (com. setting)	RECORD SETUP (record setting)	SYSTEM SETUP (system setting)	RESERVATION SETUP (reservation setting)	FILE/MEMORY SETUP (file/memory setting)	USER/INFORMATION SETUP (user/info. setting)	RECORD BACKUP DATA backup data record setting
Select UI Card (universal input card select)	Select UI Channel (universal input select)	Select DI Card (digital input card select)	Modbus Address (com. address)	Record Mode (record mode)	Device Name (device name)	Reservation Type (reservation record)	Load Set File (parameter setting file open)	Password (password mode)	Record Backup (backup data record)
Input Set Copy (input parameter copy)	Alarm Set Copy (copy alarm parameter)	DI-☐ Type (digital input☐ select)	RS485 Port (RS485 com. use)	Digital Print type (1 line record CH during numeric recording)	Date/Time (date/time)	Reservation Period (reservation record period)	Save Set File (parameter setting file save)	Login Admin (admin. log in)	Backup Data List (backup data list)
LCD/Paper Record (display and record measuring value)	Alarm ☐ type (alarm ☐ operation mode)	DI-☐ Reset No (reset alarm number)	Baud Rate (com. speed)	Standard Speed (standard record speed)	Date Type (date type)	Reservation Time (reservation record time)	Memory Status (memory capacity)	Change Admin Password (password change by admin.)	Start Date and Time (start time for data save)
Pen Color (record color)	Alarm☐ Ref Channel (alarm☐ reference channel)	DI-☐ Status (operation status)	Parity Bit (com. parity bit)	Option Speed (option record speed)	Summer Time (summer time)		Memory Clear (memory delete)	User Lock (user authority change)	End Date and Time (end time for data save)
Record Zone (record zone)	Alarm☐ Option (alarm☐ option)		Stop Bit (com. stop bit)	Memo Period (digital memo cycle)	Summer Time Period (summer time period)		USB LogData Save (USB save function)	Information (system info. check)	Backup Print Mode (backup data print mode)
Tag Name (channel name)	Alarm☐ Value (alarm☐ SV)		Termination Set (terminating resistance)	Divide Zone (record zone division)	Alarm Sound (alarm sound)		Memory Save Option (memory save option)	Firmware Upgrade (firmware upgrade)	Selection Print Mode (backup data recording mode setting)
Input Type (input specifications)	Alarm☐ Hysteresis (alarm☐ hysteresis)		Response Wait Time (com. response waiting time)	Standard Period (standard record cycle)	Sampling Rate (sampling cycle)		USB Memory Copy/Move (data move/copy)		
Range/Scale Point (decimal point)	Alarm☐ ON/OFF Delay (alarm☐ output ON/OFF delay time)		Protocol (com. protocol)	Option Period (option record cycle)	Log Speed (save cycle)				
Display/Temp Unit (display/temp. unit)	Alarm☐ Alarm No (alarm☐ output alarm number)		RS485 Com/Write (RS485 com. write)	Listing Language (language for list printing)	Backlight (LCD backlight brightness)				
High/Low Range & Graph Scale (high/low input value and graph scale)	Selection Alarm Card (Alarm output card select)		Ethernet Port (Ethernet com. use)	Alarm Speed (alarm record speed)	Baklight On/Off (LCD backlight ON method)				
Low Scale/ High Scale (high/low scale value)	Alarm-☐ Status (relay and transistor output method)		IP Address (IP address)	Power On Status (record status when power ON)					
Special Func (special function)			Subnet Mask (subnet mask)	Run Status (list printing at start recording)					
Two Unit (display vacuum, static pressure)			Default Gateway (default gateway)	List Out Option (list record option					
Ref Channel (reference channel)			Ethernet Com Write (Ethernet com. write)	Zone Dot Line Distance (dot line for zone division)					
Input Bias (error correction)			USB Device Port (USB com. use)	CH Print Distance (record interval for each channel graph)					
Span (gradient adjustment)			USB Com Write (USB com. write)	Start Line Print (start line when starting record)					
Record Method (data storage method)				Range Print Time (input range record period)					
Filter Type (input digital filter)									
Filter Counter (number of digital filters)									
Burnout Action (display setting for break)									

OK, Cancel

▣ Operation

Trend graph → Bar graph → Digital number

Usually used parameters of parameter setting group are reorganize as QUICK MENU. Each parameter setting is linked.

Special function for record

▣ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
2. Install a surge absorber at each end of inductive load coil when controlling high-capacity power relay or inductive load (e.g. magnet).
3. 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.
4. 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.
5. This unit may be used in the following environments.
   ①Indoors (in the environment condition rated in 'Specifications') ②Altitude max. 2,000m
   ③Pollution degree 2 ④Installation category II

Autonics