KR2000 series are network-compatible paperless recorders with high performance and high operating function employed high visibility 5.7" TFT color LCD display. High speed of sampling rate 100ms and high accuracy of ±0.1% were realized, and measured data is stored into internal memory and maximum 8GB compact flash card (CF card). As it can be monitored by a web browser display on several computers on intranet or internet, FTP transfer of data file and E-mail notification are also available.

**FEATURES**

- **Employing clear 5.7" TFT color LCD display**
  - Large-sized high visibility display with various display functions.
  - Real time/historical trend screen, bar-graph screen, data screen are selectable for various applications.

- **Large capacity of data memory and various recording method**
  - Compact flash card (CF card) slot is equipped as standard external memory.
  - Large capacity storage of maximum 8GB is available.
  - Various data storing methods are selectable such as schedule programming by time of day and time of date, recording start-up by external signal, and event and data logging of before and after trigger points for alarm.

- **Multi points recording with high speed/accuracy**
  - High-speed recording of approximately 100ms and high accuracy of ±0.1% were realized. Stable measuring and recording are possible with high speed.
  - High withstand voltage of 1000V AC between input channels. (Except resistance thermometer input)

- **Easy operating and programming without manual**
  - Easy operating by dedicated keys for each function

- **USB port prepared in front compartment**
  - USB port is prepared for connecting maximum 8GB USB memory and PC.
  - Readout of data and files are possible by connecting the panel mounted recorder.

- **LAN network capability**
  - Various networked environment such as remote monitoring by browser, FTP server and E-mail notification are applied as Ethernet is equipped as standard.

- **Safety system and reliability**
  - No battery backup needed for external memory for recorded data storage.

- **Analyzing/data acquisition application software (option)**
  - It is easy to replay and edit the recorded data file. Replay display has various mode of vertical/horizontal trend, circular trend, and also has wave-analyzing and marking by using the cursor.

- **Custom graphic screen for per each applications (NEW)**
  - By using optional custom graphic screen function, it can display the graphic screen which the user created by PC software KR Screen Designer (optional). Create letters, rectangle, oval, line, etc by drawing tool and allocate KR measuring data while making the background by JPEG or other images. By lower communication, controller SV, MV, PID can also be changed. Register up to 5 screens and its screens are switchable.

**MODELS**

<table>
<thead>
<tr>
<th>Measuring points/sampling rate*</th>
<th>KR21</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 : 6 points/100ms</td>
<td></td>
</tr>
<tr>
<td>20 : 12 points/100ms</td>
<td></td>
</tr>
<tr>
<td>61 : 6 points/1s</td>
<td></td>
</tr>
<tr>
<td>21 : 12 points/1s</td>
<td></td>
</tr>
</tbody>
</table>

**USB port**

- M : USB memory stick (type A)
- : PC (type B)

**Communications interface (option)**

- N : None
- R : High-order (RS232C/RS485)
- Q : High-order (RS232C/RS485) + Low-order (RS485)

**Digital input/ alarm output (option)**

- 0 : None
- 1 : Mechanical relay output -12 points (a contact)
- 2 : Mechanical relay output - 6 points (c contact)
- 7 : Digital input - 8 points + MOS relay output 8 points

**Carrying handle and feet (option)**

- A : None
- T : With carrying handle and feet

**Others (option)**

- (Blank) : None
- -1NN : Custom graphic screen

* 1 to 4 channels input (4 points) when setting faster than 500ms sampling rate with model of 1sec sampling rate.
- **Real-time trend screen**
  Displays data (measured and virtual) of selected group.
  Vertical trend and horizontal trend selectable.

- **Bar-graph screen**
  Displays data (measured and virtual) of selected group.
  Combination display with real-time trend is available.

- **Data screen**
  Displays data (measured and virtual) of selected group.
  Simultaneous display of alarm status.

- **Dual trend screen**
  2 split display for real-time trend and historical trend.
  Scroll available for historical trend.

- **Graphic screen**
  Enable to create custom display for each user*.

- **Information screen**

- **HOME setting screen**

- **Channel setting screen**

- **Schedule setting screen**

*Graphic screen feature is provided optionally. BMP image has to be prepared by customer.
### INPUT SPECIFICATIONS

- **Measuring points:** 6 points, 12 points
- **Input types:** Universal
  - DC voltage: ±13.8mV, ±27.6mV, ±69.0mV
  - ±200mV, ±500mV, ±1V, ±5V, ±10V, ±20V, ±50V, ±100V
  - (with built-in voltage divider)
  - DC current: With external shunt resistor (sold separately)
  - Resistance thermometer: Pt100, NiCr-AlF, Pt-Rh, Pt-Rh100, Pt50

#### Alarm Specifications

- **Alarm types:** Upper limit, lower limit, differential upper limit, differential lower limit (deadband is selectable), abnormal data
- **Alarm settings:** AND/OR selectable
- **Alarm outputs:** Refer to option specification

#### Communication Specifications

- **Memory:**
  - CF card (Up to 8GB)
  - USB (12MB standard attached, Apacer Technology made)
- **Recording cycle:** 100, 200, 500mS
- **Logging data:** Measured data: Name (group name), time of day, year of recording start, tag, measured data, alarm status, and marker text
- **Storing types:** Binary/CSV
- **File transfer by connecting as removable disk drive**
  - USB: Communication type --- USB1.1
  - FTP: Communication type --- FTP

### COMMUNICATION FUNCTIONS

- **Network**
  - FTP server: Data file can be read from the network computer
  - FTP client: Transfer a data file to a network server
  - SNTP client: The time can be synchronized to the time of SNTP server
  - Web server: Conformed to HTTP1.0 --- Displays the alarm, information of maintenance by browser software (InternetExplorer 5.0 or later, Netscape6.0 or later, Opera 7 or later)

### COMMUNICATIONS

- **USB Communications**
  - Communication type --- USB1.1
  - Transfer systems --- Bulk transfer, control transfer
  - File transfer by connecting as removable disk drive

### DISPLAY SPECIFICATIONS

- **Display:** 5.7" TFT color LCD
- **Display types:** Measured data display (Trend screen, Data screen, Bar-graph screen)
- **Trend screen:**
  - Display points --- 5 screens (5 groups)
  - Display points --- Max. 44 points/screen
  - Time axis direction --- Vertical or horizontal
- **Alarm display:**
  - Tag: Show/hide selectable
  - Marker display
  - Display contents --- Measured value, channel/tag, unit, alarm status

### COMPUTER SPECIFICATIONS

- **CPU:**
  - Processor: MD68320 (RISC)
  - Clock: 32 MHz
  - Memory: 128MB standard attached, 256MB recommended
- **Display:**
  - 5.7" TFT color LCD
- **Brightness:**
  - 4 levels adjustment
- **Power:**
  - Battery: 3.7V Rechargeable lithium-ion battery
  - Rechargeable time: 5.2 yrs (when 12 channels recorded in sampling mode (real data))
  - Consumption: 1W (when 12 channels recorded in sampling mode)

###_alarm

- **Input types:** Universal
  - DC voltage: ±13.8mV, ±27.6mV, ±69.0mV
  - ±200mV, ±500mV, ±1V, ±5V, ±10V, ±20V, ±50V, ±100V
  - (with built-in voltage divider)
  - DC current: With external shunt resistor (sold separately)
  - Resistance thermometer: Pt100, NiCr-AlF, Pt-Rh, Pt-Rh100, Pt50

### Alarm Specifications

- **Alarm types:** Upper limit, lower limit, differential upper limit, differential lower limit (deadband is selectable), abnormal data
- **Alarm settings:** AND/OR selectable
- **Alarm outputs:** Refer to option specification
PROGRAMMING/OPERATION SPECIFICATIONS

Operation key:
- HOME, MENU, DISP MARKER, SCROLL, CURSOR,
- START, STOP, DIRECTION keys, ENTER, ESC

HOME settings:
- Simple recording settings — Common setting to all channels
- Parameter programming for all channels together, recording cycle, selection settings

MENU settings:
- Input/ computation programming --- Input parameter, computation parameter
- DSP settings --- Data channel parameter, group parameter, common parameter (combination display, trend vertical/horizontal)
- Alarm settings
- File settings (5 individual files) --- Storing method settings
- Marker text settings
- System settings --- Communication, clock, maintenance, key lock, password, screen, etc.

DISP operations:
- Operating screen selection --- Trend, data, bar-graph, historical trend, alarm display, marker list
- Display selection on each screen --- Group 1 to 5 selectable

GENERAL SPECIFICATIONS

Rated power voltage: 100 to 240 V AC (universal power supply) 50/60Hz
Maximum power consumption:
- 50VA

Reference operating condition:
- Ambient temperature --- 21 to 25°C
- Ambient humidity --- 45 to 65%RH
- Power voltage --- 100V AC±1.0%
- Power frequency --- 50/60Hz±0.5%
- Power factor --- 0.95 or more at 500V DC
- Temperature coefficient --- ±0.1% or more at 500V DC
- Life --- Better than 5 years
- Life --- (Minimum 5 years)

Normal operating condition:
- Ambient temperature --- 0 to 50°C
- Ambient humidity --- 20 to 80%RH
- Power voltage --- 90 to 264 V AC
- Power frequency --- 50/60Hz±2%
- Power factor --- 0.95 or more at 500V DC
- Storage condition:
  - Ambient temperature --- 20 to 60°C
  - Ambient humidity --- 5 to 90%RH (No dew condensation)

Power failure protection:
- Setups and data are backed up by flash memory
- Clock --- Lithium battery backs up RAM

Reference operating condition:
- Ambient temperature --- 21 to 25°C
- Ambient humidity --- 45 to 65%RH
- Power voltage --- 100V AC±1.0%
- Power frequency --- 50/60Hz±0.5%
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- Power frequency --- 50/60Hz±2%
- Power factor --- 0.95 or more at 500V DC
- Storage condition:
  - Ambient temperature --- 20 to 60°C
  - Ambient humidity --- 5 to 90%RH (No dew condensation)

Signal input:
- Secondary terminals: measuring input terminals, digital input terminals, communications terminals
- Primary terminals: power terminals (L,N), alarm output terminals
- Secondary terminals: measuring input terminals, digital input terminals, communications terminals
- Diodelectric strength:
  - Secondary terminals and protective conductor terminals --- 1 minute at 500V AC
  - Primary terminals and protective conductor terminals --- 1 minute at 1500V AC
  - Primary terminals and protective conductor terminals --- 1 minute at 2300V AC
  - Primary terminals: power terminals (L,N), alarm output terminals
  - Secondary terminals: measuring input terminals, digital input terminals, communications terminals

Case assembly material:
- Front bezel --- ABS resin
- Case --- Steel

Color:
- Front bezel --- Black (equivalent to Munsell N3,0)
- Case --- Painting color, gray (equivalent to Munsell N7,0)

Weight:
- 2.2kg

Mounting:
- Panel mounting

Terminal screws:
- Power terminals/protective conductor terminals --- M4 0
- Measuring input terminals/alarm output terminals/digital input terminals --- M3.5

STANDARDS

CE:
- EM Directive --- EN61326-1: 2006 Class A
- EN61000-3-3
- EN61000-3-2
- EN61000-3-3
- Low voltage directive --- EN61010-1(2001)

Protection:
- Conformed to IEC60529 IP65 (recorder front bezel)

OPTION SPECIFICATIONS

Options | Specifications
--- | ---
Mechanical relay alarm output | Mechanical relay contact output for abnormal input and alarm activation
MOS relay alarm output | MOS relay contact output for abnormal input and alarm activation
Communications interface | Communications interface for high-order units RS232C/RS485 (MODBUS) switchable Ethernet is standard equipped
High-order communications | Communications interface for low-order units RS232C/RS485 (MODBUS)
Low-order communications | Input data storing of units connected to low-order unit
ON/OFF signal | ON/OFF input recording
Pulse input | Maximum 10Hz pulse input
Digital inputs | The following operations are available by contact input 8 points and common signal 4 points
Remote contact | Start data recording by conductive signal from OFF to ON
Custom Graphic Screen | Reset data for integration operations (all channels simultaneously)

KR SCREEN DESIGNER (sold separately) (NEW)

Model:
- KS3200-000
- Windows Vista/7/8

Others:
- Your OS recommended requirements or better
### MEASURING RANGES

<table>
<thead>
<tr>
<th>Input type</th>
<th>Measuring range</th>
<th>Accuracy ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage</td>
<td>-13.80 to 13.80mV</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-27.60 to 27.60mV</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-69.00 to 69.00mV</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 200.0mV</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-500.0 to 500.0mV</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-2,000 to 2,000V</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>(with built-in voltage divider)</td>
<td>-5.000 to 5.000V</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-10.00 to 10.00V</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-20.00 to 20.00V</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-50.00 to 50.00V</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>K</td>
<td>-200.0 to 200.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 600.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 1300C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>E</td>
<td>-200.0 to 200.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 350.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 900C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>J</td>
<td>-200.0 to 250.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 1200C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>T</td>
<td>-200.0 to 250.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 400.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>R</td>
<td>0 to 1760C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 1200C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>S</td>
<td>0 to 1760C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>N</td>
<td>-200.0 to 400.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 750.0C</td>
<td>±0.1% ±1digit</td>
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<tr>
<td></td>
<td>-200.0 to 1300C</td>
<td>±0.1% ±1digit</td>
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<tr>
<td>T/C W-WRe26</td>
<td>0 to 2315C</td>
<td>±0.2% ±1digit</td>
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<tr>
<td></td>
<td>0 to 2315C</td>
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</tr>
<tr>
<td></td>
<td>0 to 2315C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 2315C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 2315C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>PRh40-PRh20</td>
<td>0 to 1888C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 1888C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 1888C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 1888C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>-50.0 to 290.0C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-50.0 to 600.0C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-50.0 to 1310C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>CR-AuFe</td>
<td>0.0 to 280.0K</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0.0 to 280.0K</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0.0 to 280.0K</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0.0 to 280.0K</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>Platinell</td>
<td>0.0 to 350.0C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0.0 to 650.0C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0.0 to 1395C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td>U</td>
<td>-200.0 to 250.0C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 600.0C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 1395C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td>L</td>
<td>-200.0 to 250.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 900C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 900C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>Pr100</td>
<td>-140.0 to 150.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 300.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 850C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>Jp100</td>
<td>-140.0 to 150.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 300.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 850C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>Pt50</td>
<td>-200.0 to 649.0C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>Pt-Co</td>
<td>4.0 to 374.0K</td>
<td>±0.15% ±1digit</td>
</tr>
</tbody>
</table>

Note: The accuracy ratings are converted into the measuring range under reference operating condition. Thermocouple input does not contain reference junction compensation accuracy.

### APPLICATION SOFTWARE ZAILA

(sold separately)

The software is applied for replay display/wave editing operation of recorded data in KR2000 series. It has replay display of vertical/horizontal trend and circular trend function, and also analyzing function such as magnify/reduce/partially magnify of graphs and message insert.

- **Display examples**
  - Trend display window (vertical flow)
  - Trend display window (horizontal flow)
  - Trend display window (circular trend)
  - Bar-graph

- **Main functions**
  - **Trend display**
    - Selectable from trend display window (vertical flow, horizontal flow) and circular trend display window.
  - **Continuous replay display window**
    - Trend is scrolled continuously (automatically).
    - Scroll changes by speed and renewal data no.
  - **Data list display window**
    - Displays registered data as list display.
  - **Bar-graph**
    - Displays by bar. Message can be inserted into bar-graph.
  - **Data between markers**
    - Displays date/time, time difference between 2 data, data difference, maximum, minimum, average, standard deviation and median among all data.
  - **Alarm display**
    - Points for alarm activation at each level are displayed on a trend graph.
  - **Settings**
    - Cursor, trend line, scale axis, time axis, title input on the graph, graph assistant and magnify/reduce/rotation of graphs
  - **Data conversion**
    - Exporting to Excel, and converting to CSV file or TEXT file are available.

### ENVIRONMENT

<table>
<thead>
<tr>
<th>CPU</th>
<th>Your OS recommended CPU and/or upper grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>Windows VISTA / 7 / 8 *Internet Explorer 6.0 or later</td>
</tr>
<tr>
<td>Others</td>
<td>Your OS recommended memory or larger</td>
</tr>
<tr>
<td>Disk drive</td>
<td>CD-ROM drive: 1 drive or more</td>
</tr>
<tr>
<td></td>
<td>Hard disk drive: Disk space of 1 drive or more for 100MB or more</td>
</tr>
<tr>
<td>Language</td>
<td>Japanese, English, Chinese (simplified and traditional characters), Korean</td>
</tr>
</tbody>
</table>
## TERMINAL ARRANGEMENT

- **Alarm mechanical relay alarm output 12 points (option)**
  - Communications terminals (option)
  - N.O. terminals
  - COM terminals (Mechanical relay a contact output)
  - Alarm output terminals (option)
  - Thermocouple DC voltage (+)
  - Resistance thermometer (A) terminals
  - Thermocouple DC voltage (−)
  - Resistance thermometer (B) terminals
  - Measuring input terminals
  - Channels
  - Channels 1 to 6
  - Channels 7 to 12

- **Mechanical relay alarm output 6 points (option)**
  - Communications terminals (option)
  - N.O. (M3.5) terminals
  - COM (M3.5) terminals
  - Alarm output terminals (option)
  - Thermocouple DC voltage (+)
  - Resistance thermometer (A) terminals
  - Thermocouple DC voltage (−)
  - Resistance thermometer (B) terminals
  - Measuring input terminals
  - Channels
  - Channels 1 to 6
  - Channels 7 to 12

- **Digital input 8 points + MOS relay alarm output 8 points (option)**
  - Communications terminals (option)
  - Contact input terminals
  - Alarm output terminals (option)
  - Thermocouple DC voltage (+)
  - Resistance thermometer (A) terminals
  - Thermocouple DC voltage (−)
  - Resistance thermometer (B) terminals
  - Measuring input terminals
  - Channels
  - Channels 1 to 6
  - Channels 7 to 12

## DIMENSIONS

- ## PANEL CUTOUT

Specifications subject to change without notice. Printed in Japan (I) 2017. 7