KR2000 series are network-compatible paperless recorders with high performance and high operating function. They employ 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>KR21</th>
<th>Measuring points/sampling rate*1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 : 6 points/100ms</td>
</tr>
<tr>
<td></td>
<td>20 : 12 points/100ms</td>
</tr>
<tr>
<td></td>
<td>61 : 6 points/1s</td>
</tr>
<tr>
<td></td>
<td>21 : 12 points/1s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USB port</th>
</tr>
</thead>
<tbody>
<tr>
<td>M : USB memory stick (type A)</td>
</tr>
<tr>
<td>– : PC (type B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications interface (option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N : None</td>
</tr>
<tr>
<td>R : High-order (RS232C/RS485)</td>
</tr>
<tr>
<td>Q : High-order (RS232C/RS485) + Low-order (RS485)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital input/ alarm output (option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 : None</td>
</tr>
<tr>
<td>1 : Mechanical relay output -12 points</td>
</tr>
<tr>
<td>(a contact)</td>
</tr>
<tr>
<td>2 : Mechanical relay output - 6 points</td>
</tr>
<tr>
<td>(c contact)</td>
</tr>
<tr>
<td>7 : Digital input - 8 points</td>
</tr>
<tr>
<td>+ MOS relay output 8 points</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carrying handle and feet (option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A : None</td>
</tr>
<tr>
<td>T : With carrying handle and feet “2”</td>
</tr>
<tr>
<td>Others (option)</td>
</tr>
<tr>
<td>(Blank) : None</td>
</tr>
<tr>
<td>-1NN : Custom graphic screen</td>
</tr>
</tbody>
</table>

*1 1 to 4 channels input (4 points) when setting faster than 500ms sampling rate with model of 1sec sampling rate.

*2 Non-conformance to CE
### SCREENS

- **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**

*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, ±5V, ±10V, ±20V, ±50V
- With built-in voltage divider
- DC current: With external shunt resistor (sold separately)
- Resistance thermometer: Pt100, Pt-100, Ni-Al, Pt-Co, Pt-50, Ni-Mo-Ni, Ni-Cr-Al, Cu, L
- Accuracy ratings:
  - Refer to the table of measuring range and accuracy ratings
- Reference junction compensation accuracy:
  - K, E, J, T, Ni-Al, Pt-Co, Pt-50, Ni-Mo-Ni, Cr-Al, Cu, L

**RECORDING SPECIFICATIONS**

- Measuring points: 6 points, 12 points
- Sampling rate: 100ms --- Approximately 100ms for all points
- Accuracy ratings:
  - Refer to the table of measuring range and accuracy ratings
- Reference junction compensation accuracy:
  - K, E, J, T, Ni-Al, Pt-Co, Pt-50, Ni-Mo-Ni, Cr-Al, Cu, L

**ALARM SPECIFICATIONS**

- Alarm types: Upper limit, lower limit, differential upper limit, differential lower limit
- Alarm settings: AND/OR selectable
- Alarm outputs: Refer to option specification

**COMPUTATION SPECIFICATIONS**

- Calculation types: Arithmetic operations --- Addition, subtraction, multiplication, division, remainder, exponential
- Comparison operations --- Equality, inequality, great, less, equal, great, equals or less
- Logical operations --- AND, OR, XOR, NOT
- General functions --- Round-up, round-down, absolute value, square root, exponential of natural logarithm
- Integration operations --- Integrating, digital integration
- Channel data operations --- Measured data, calculated data
- Others --- Dew point, relative humidity, F-value

**DISPLAY SPECIFICATIONS**

- Display: 5.7" TFT color LCD
- Display types:
  - Measured data display (Trend screen, Data screen, Bar-graph screen)
- Trend screen:
  - Display points --- Maximum 44 points/screen
  - Time axis direction: Vertical or horizontal
  - Line width: 1/35 dot selectable
  - Scale display: 4 scales
  - Tag/data display --- Show/hide selectable

**COMMUNICATION FUNCTIONS**

- Connectors:
  - USB Communications: Type A
  - USB Communications: Type B

**TP3**

- Display: 5.7" TFT color LCD
- Display types:
  - Measured data display (Trend screen, Data screen, Bar-graph screen)
- Trend screen:
  - Display points --- Maximum 44 points/screen
  - Time axis direction: Vertical or horizontal
  - Line width: 1/35 dot selectable
  - Scale display: 4 scales
  - Tag/data display --- Show/hide selectable

**CONNECTIVITY**

- FTP server:
  - User’s ID and password registration available
  - Corresponds to SSL and TLS.
  - File transfer by connecting as removable disk drive

**COMMUNICATIONS**

- Communication type:
  - Ethernet (10BASE-T/100BASE-TX)
  - FTP server: Data file can be read from the network computer
  - FTP client: Transfer a data file to a network server
  - SNTP: The time can be synchronized to the time of SNTP server
  - Web server: Conformed to HTTP/1.0 --- Displays the alarm, information of maintenance by browser software (InternetExplorer 5.0 or later, Netscape 6.0 or later, Opera 7 or later)

**MOBDUS TCP**

- Transfer systems --- Bulk transfer, control transfer
- File transfer by connecting as removable disk drive

**NETWORK**

- Notification address --- Maximum 8 contacts
- Read and write the data of compatibles units.

**USB**

- Communication type --- USB1.1
- Transfer systems --- Bulk transfer, control transfer
- File transfer by connecting as removable disk drive
■ PROGRAMMING/OPTION SPECIFICATIONS

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

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

**MENU settings:**
- Input/output 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
- Maker list
- Display selection on each screen — Group 1 to 5 selectable

■ GENERAL SPECIFICATIONS

- Rated power voltage: 100 to 240V 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%
  - Altitude — Left/right 0°, forward/backward 0°
  - Warm-up time — Longer than 30 minutes

- Normal operating condition:
  - Ambient temperature: 0 to 50°C
  - Ambient humidity: 20 to 80%RH
  - Power voltage: 90 to 264V AC
  - Power frequency: 50/60Hz ±2%
  - Altitude — Left/right 0°, forward/backward 0°
  - Backward tilting 0° to 20°

- Transport condition (at the packed condition on shipment from our factory):
  - Ambient temperature: -20 to 60°C
  - Ambient humidity: 5 to 90%RH
  - Power frequency: 50/60Hz
  - Power voltage: 100V AC
  - Power voltage: 30V DC
  - Ambient humidity: 45 to 65%RH
  - Ambient temperature: -20 to 60°C

- Power failure protection:
  - Setups and data are backed up by flash memory
  - Clock — Lithium battery backs up RAM
  - (Minimum 5 years)

- Insulation resistance:
  - Secondary terminals and protect conductor terminals — 20MΩ or more at 500V DC
  - Primary terminals and protective conductor terminals — 20MΩ or more at 500V DC
  - Primary and secondary terminals — 20MΩ or more at 500V DC
  - Primary terminals: power terminals (L,N), alarm output terminals
  - Secondary terminals: measuring input terminals, digital input terminals, communications terminals

- Dielectric strength:
  - Secondary terminals and protective conductor terminals — 1 minute at 500V AC
  - Primary terminals and protective conductor terminals — 1 minute at 1500V AC
  - Primary and secondary 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
  - Measuring input terminals/alarm output terminals/digital input terminals — M3.5

■ STANDARDS

**CE:**
- EMC directive — EN61326-1: 2006 Class A
- EN61000-3-2
- EN61000-3-3
- EN61000-3-2

- Low voltage directive — EN61010-1(2001)

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

■ OPTION SPECIFICATIONS

**Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical relay</td>
<td>Contact output for abnormal input and alarm activation</td>
</tr>
<tr>
<td>MOS relay</td>
<td>Output: 12 points (contact), 6 points (c contact)</td>
</tr>
<tr>
<td>Communications interface</td>
<td>Input data storing of units connected to low-order units RS485 (MODBUS)</td>
</tr>
<tr>
<td>High-order communications</td>
<td>Communications interface for high-order units RS232C/RS485 (MODBUS) switchable Ethernet is standard equipped</td>
</tr>
<tr>
<td>Low-order communications</td>
<td>Input data storing of units connected to low-order units RS485 (MODBUS)</td>
</tr>
<tr>
<td>Remote contact</td>
<td>Contact ratings: MOS relay — 240V (DC, AC) 50mA</td>
</tr>
<tr>
<td>Digital inputs</td>
<td>The following operations are available by contact input 8 points and common signal 4 points (Select able by parameter)</td>
</tr>
<tr>
<td></td>
<td>• Data memory triggering</td>
</tr>
<tr>
<td></td>
<td>• Marker display</td>
</tr>
<tr>
<td></td>
<td>• Registration makers display by conductive signal</td>
</tr>
<tr>
<td></td>
<td>• Integration operations</td>
</tr>
<tr>
<td></td>
<td>Reset data for integration operations</td>
</tr>
<tr>
<td></td>
<td>(all channels simultaneously)</td>
</tr>
<tr>
<td>Custom Graphic Screen</td>
<td>Custom Graphic Screen by KR Screen Designer (optional), create graphic screen by PC and display to KR screen via CF card. KR measuring value can be located to the screen.</td>
</tr>
<tr>
<td>Others</td>
<td>Handle and feet, white front bezel, point indication card</td>
</tr>
</tbody>
</table>

■ KR SCREEN DESIGNER (sold separately) (NEW)

**Model:**
- KS3200-000
- QnAS, FX series
- MELSEC AnA, QnA, QnA5, FX series
- SYSMAC series

**OS:**
- 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% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-27.60 to 27.60mV</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-69.00 to 69.00mV</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 200.0mV</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-500.0 to 500.0mV</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-2,000 to 2,000V</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>(with built-in voltage divider)</td>
<td>-5,000 to 5,000V</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-10,000 to 10,000V</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-20,000 to 20,000V</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td></td>
<td>-50,000 to 50,000V</td>
<td>±0.1% + 1 digit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T/C</th>
<th>Measuring range</th>
<th>Accuracy ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>200.0 to 300.0°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>E</td>
<td>200.0 to 350.0°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>J</td>
<td>200.0 to 900°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>T</td>
<td>200.0 to 1200°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>R</td>
<td>0 to 1200°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>S</td>
<td>0 to 1300°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>N</td>
<td>400.0 to 2315°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>Wh-We26</td>
<td>2315°C</td>
<td>±0.2% + 1 digit</td>
</tr>
<tr>
<td>Wr5-We26</td>
<td>2315°C</td>
<td>±0.2% + 1 digit</td>
</tr>
<tr>
<td>Prrh40-Prrh20</td>
<td>1888°C</td>
<td>±0.2% + 1 digit</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>290.0 to 1310°C</td>
<td>±0.2% + 1 digit</td>
</tr>
<tr>
<td>Cr-AuFe</td>
<td>280.0K</td>
<td>±0.2% + 1 digit</td>
</tr>
<tr>
<td>PlatineII</td>
<td></td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>U</td>
<td>250.0 to 650.0°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>L</td>
<td>250.0 to 650.0°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>Pt100</td>
<td>150.0 to 850°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>JPt100</td>
<td>150.0 to 850°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>Pt50</td>
<td>649.0 to 850°C</td>
<td>±0.1% + 1 digit</td>
</tr>
<tr>
<td>Pt-Co</td>
<td>374.0 to 850°C</td>
<td>±0.1% + 1 digit</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 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)
  - Ethernet connector
  - Low-order: RS485
  - High-order: RS232C/RS485 (switchable)
  - Protective conductor terminals
  - Power terminals
  - N.O. terminals
  - COM terminals
  - Alarm output terminals (option)
  - Measuring input terminals
  - Thermocouple DC voltage (+)
  - Thermocouple DC voltage (−)
  - Resistance thermometer (A) terminals
  - Resistance thermometer (B) terminals
  - Contact types:
    - a contact: Normally open
    - c contact: Switch contact
  - Channels 1 to 6
  - Channels 7 to 12

- Mechanical relay alarm output 6 points (option)
  - Communications terminals (option)
  - Ethernet connector
  - Low-order: RS485
  - High-order: RS232C/RS485 (switchable)
  - Protective conductor terminals
  - Power terminals
  - N.C. (M3.5) terminals
  - COM (M3.5) terminals
  - Alarm output terminals (option)
  - Measuring input terminals
  - Thermocouple DC voltage (+)
  - Thermocouple DC voltage (−)
  - Resistance thermometer (A) terminals
  - Resistance thermometer (B) terminals
  - Channels 1 to 6
  - Channels 7 to 12

- Digital input 8 points + MOS relay alarm output 8 points (option)
  - Communications terminals (option)
  - Ethernet connector
  - Low-order: RS485
  - High-order: RS232C/RS485 (switchable)
  - Protective conductor terminals
  - Power terminals
  - Contact input terminals
  - Alarm output terminals (option)
  - Measuring input terminals
  - Thermocouple DC voltage (+)
  - Thermocouple DC voltage (−)
  - Resistance thermometer (A) terminals
  - Resistance thermometer (B) terminals
  - Channels 1 to 6
  - Channels 7 to 12

DIMENSIONS

PANEL CUTOUT

Specifications subject to change without notice. Printed in Japan (I) 2020. 3