KR2S series are advance touch screen display (Keyless) paperless Graphic Recorder with high performance and high operating function along with high visibility 5.7" VGA TFT color LCD display. Universal input with high speed of sampling rate 100msec and high accuracy rating of ±0.1% realized. Measured data is stored into memory and support up to 8GB through USB and 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"VGA TFT color LCD display
  - Large-sized high visibility display with various display functions.
  - Real time/historical trend screen, circular trend screen, bar-graph screen, data screen are selectable for various applications.
- Large capacity of data memory and various recording method
  - USB slot and CF card slot is equipped as standard memory and optionally expandable up to 8 GB. 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 100msec for 4 points and 1 sec for 6/12 points and high accuracy of ±0.1% were realized. Stable measuring and recording are possible with high speed. Withstand voltage between input channels is as high as 1000V AC (Excluding resistance thermometer input).
- Direct writing on the screen
  - With attached touch pen, various comments can be written on the screen.
- Extend inputs with CHINO controllers
  - KR2S can communicate with up to 16 CHINO controllers for parameter settings and read/record of measuring values through low-order communications (Option).
- Easy operating and programming without manual
  - USB port provided in front
  - Readout of data and files are possible by connecting through an USB memory stick for PC.
- LAN network capability (Option)
  - Various networked environment such as remote monitoring by browser, FTP, HTTP, SNTP and DHCP server and E-mail notification are applied when Ethernet communication interface is used.
- Safety system and reliability
  - No battery backup needed for recorded storage data.
- 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 (option). 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.
- 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.

**MODELS**

- Measurement point/sampling rate
  - 6: 6 points/1 sec.
  - 2: 12 points/1 sec.
- Communication interface (option)
  - N: None
  - E: Ethernet
  - R: Low/high order communications (RS485)
  - G: Ethernet + low/high order communications(RS485)
- Alarm output, Contact input (option)
  - 0: None
  - 2: Mechanical relay output (4 points ‘c’ contact)
  - 7: Digital input (4 points)
  - 8: Mechanical relay output (2 points ‘c’ contact) + Digital input (2 points)
- Installation type
  - A: Device mounting (panel mounting type)
  - T: Portable type (Grip and rubber feet attached)
- Others (option)
  - -NNN : None
  - -1NN : Custom graphic screen

* If the recording cycle is set less than 500ms (100 to 500 ms), input channel point becomes 100ms for 4 points automatically.
**SCREENS**

Sharp touch panel display based on Human Engineering such as color, line, thickness, key position. Adopts VGA (640X480) which has 4 times better resolution of conventional model.

- **Data screen**
  - Displayed for each user

- **Bar-graph screen**
  - Displayed for each user

- **Real-time trend screen**
  - Displayed for each user

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

- **Pen writing**
  - Free writing by 16 colors.

- **Circular trend screen**
  - High-resolution color and easy to read curve.

- **2-Zone screen**
  - Split the trend in 2-zones and monitor.

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

- **Historical trend screen**
  - Displayed for each user

- **Math functions**
  - Easy to set and manage the formula.

*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
  - AC voltage: ±200mV, ±500mV, ±2V
  - (*with built-in voltage divider*)
- **DC current:** With external shunt resistor (sold separately)

**Accuracy ratings:** Refer to the table of measuring range and accuracy ratings

**Reference junction compensation accuracy:**
- K, E, J, T, N, Platiniell: ±0.5°C or less
- R, S, W-Re25, Re55-Re25, NiMo-Ni, CR-AuFe, U, L: ±1°C or less

**Sampling rate:** Approximately 1sample/20 points, 0.1 second/4 points

**Burnout:**
- Disconnection of input signal is detected on thermocouple and resistance thermometer input.
- UP/DOWN/DISABLE is selectable.

**Scaling:** Rangescale is selectable.

**Digital filter:** Programming FIR filter for each point (common to Series mode rejection ratio: 50dB or more (50 or 60Hz) Common mode rejection ratio: 120dB or more (50 or 60Hz)

**Input resistance:**
- Thermocouple input (burnout disabled): DC voltage input (±2V or less): ±1000Ω or more
- Resistance: Per wire 10Ω (same resistance for 3 wires)

**Maximum input voltage:**
- DC voltage input (±2V or less): ±10V
- Thermocouple input (burnout enabled): ±10VDC
- Resistance thermometer input: ±1VDC
- DC voltage input (±5V or more): ±50V

**Dielectric strength between channels:**
- 1000V AC or more between each channel
- (High strength semiconductor relay used)
- (B terminal of resistance thermometer is shorted inside between channels)

**Common mode rejection ratio:**
- 120Ω or more (50 or 60Hz)

**Series mode rejection ratio:**
- 50Ω or more (50 or 60Hz)

**RECORDING SPECIFICATIONS**

- **Memory for history:** 264MB
- **Additional memory:** CF card (Up to 8GB)
- **Recording cycle:** 100, 200, 500ms
- **Logging data:** Measured data --- File name (group name), time of day
  - Measuring numbers of pre-trigger: 950 data
- **Trigger signal (alarm event, digital input)**
- **Trigger signal type:**
  - Digital input (threshold trigger)
  - Digital input (change trigger)
- **Channels:** 12 channels recorded in sampling mode (real data)
- **When 6 channels recorded in sampling mode (real data):**
  - Recording cycle: 256MB, 512MB
  - Recording cycle: 1 sec, 1.26 days, 253 days

**COMPUTATION SPECIFICATIONS**

- **Computation points:** Maximum 44 points
- **Computation types:** Arithmetic operations
  - Addition, subtraction, multiplication, division, remainder, exponential
  - Equivalence, inequality, great, less, equality (great, equality / less)
  - AND, OR, XOR, NOT
- **Logical operations:**
  - Logical operations
  - Comparison operations
- **General functions:**
  - Round-up, round-down, absolute value, square root, exponent of e, natural logarithm, common logarithm
- **Integration operations:**
  - Analog integration, digital integration
- **Channel data operations:**
  - Measured data computation, calculated data computation
- **Others:**
  - Numerical data, remaining amount of CF card

**DISPLAY SPECIFICATIONS**

- **Display:** 5.7"VGA TFT color LCD VGA (640x480 dots)
  - Trend screen: Measured data display
    - Trend screen: Data screen, Bar-graph screen
    - Historical trend display (simultaneous display with Real-time trend is available)
    - Information display (alarm display, marker list, file list)
- **Setup:**
  - Alarm settings: Alarm output
    - Switch setting (alarm, computation, memory, system, maintenance, communication, etc.)
  - Alarm setting: Alarm output
    - Refer to option specification

**COMMUNICATION FUNCTIONS**

**Network**

- **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
  - SFTP: The time can be synchronized to the time of SFTP server
- **Web server:**
  - Conformed to HTTP1.0 --- Displays the alarm, information of maintenance by browser software (Internet Explorer5.0 or later, Netscape6.0 or later, Opera7 or later)
  - User’s ID and password registration available
  - E-Mail: E-Mail notification at specified time for alarm activation
  - Report data at specified time is selectable from all registered data
- **DHCP client:** Notification address — Maximum 8 contacts

**USB Communications**

- **USB Communication type:** USB1.1
- **Transmit system:** Bulk transfer, control transfer
- **File transfer by connecting as removable disk drive**

**CONNECTIVITY**

- **Data storage in USB memory stick**
  - USB port for USB memory stick
  - RS485 (Low-order communication)
  - Ethernet
  - FTP server
  - Data browser
  - Application
  - KE
  - DB
PROGRAMMING/OPERATION SPECIFICATIONS

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
DISP 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 240V AC (universal power supply) 50/60Hz
Maximum power consumption: 35VA
Reference operating condition:
Ambient temperature — 21 to 25°C
Ambient humidity — 45 to 65%RH
Power voltage — 100VAC±1.0%
Power frequency — 50/60Hz±0.5%
Ambient temperature — 20 to 80%RH
Ambient humidity — 45 to 65%RH
Power voltage — 90 to 264V AC
Power frequency — 50/60Hz±2%
Ambient temperature — 5 to 50°C
Ambient humidity — 20 to 60% RH

Transport condition (at the packed condition on shipment from our factory):
Primary and secondary terminals — 20M
20M
20M
Primary terminals and protective conductor terminals — 1 minute at 2300V AC
1 minute at 1500V AC
1 minute at 500V AC

Protection: Conformed to IEC60529 IP54 (recorder front bezel)

STANDARDS

CE : EMC directive — EN61326-1
Class A
Low voltage directive — EN61010-1, EN61010-2-030
Protection: Conformed to IEC60529 IP54 (recorder front bezel)

OPTION SPECIFICATIONS

Options Specifications

Alarm output
Mechanical relay (c contact) output for alarm activation and input error.
Output point: 4 or 2 points
Contact capacity: resistive load 3A, inductive load 1.5A

Digital input (Non-voltage contact input/4 or 2 points)
ON/OFF signal
ON/OFF input recording
Pulse input
Maximum 10Hz pulse input
Used for flow rate, operation time and frequency
External drive
The following operations are available
(selectable by parameter)
Data memory triggering
Marker display
Integrated calculation reset

Communications interface
High and low-order communication
Communications interface for high and low-order unit
RS485 (MODBUS)
Choose one function from the following 3 functions.
Communication interface for high-order unit
Recording input data of CHINO products connected to a low-order unit and data in PLC register.
Display and record parameter setting, measured value, setting value, etc. of up to 16 CHINO controllers.
Recording points:
6-channel specification – 34 points
12-channel specification – 28 points
Connectable models: KE, KR2S, KR3S,
KR2000, KR3000,
LE5000, AL3000,
AL4000, AH3000,
AH4000,
DB1000, 2000,
LT230, 830, 350, 370,
450, 470,
KP1000, KP2000,
DP-G
(data collection only)
JU, JW, SE3000
Transfer input data of KR2S to PLC.
The input data can be written on PLC only.
Data writing points: 44 points
Connectable PLC: Mitsubishi Electric
Corporation
MELSEC AnA, QnA,
QnAS, FX series
OMRON Corporation
SYSMAC series
Note) Separate purchase of protocol converter
SC8-10 (optional) is required for connection to OMRON PLC.

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.

Others
Handle and rubber feet

ACCESSORIES (SOLD SEPARATELY)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistor for DC current input 100Ω</td>
<td>For 50mA</td>
</tr>
<tr>
<td>Resistor for DC current input 250Ω</td>
<td>For 20mA</td>
</tr>
<tr>
<td>CF card</td>
<td>128MB, 256MB, 512MB, 1GB, 2GB, 4GB, 8GB</td>
</tr>
<tr>
<td>Card adapter</td>
<td>For PC card</td>
</tr>
</tbody>
</table>

KR SCREEN DESIGNER (sold separately) (NEW)

Model: KS3200-000
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% ±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 200.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 600.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 1300°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>E</td>
<td>-200.0 to 200.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 350.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 900°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>J</td>
<td>-200.0 to 250.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 500.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 1200°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>T</td>
<td>-200.0 to 250.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 400.0°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td>R</td>
<td>0 to 1200°C</td>
<td>±0.1% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 1760°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>S</td>
<td>0 to 1300°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>0 to 1760°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>N</td>
<td>-200.0 to 400.0°C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 750.0°C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-200.0 to 1300°C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td>T/CR-26</td>
<td>0 to 2315°C</td>
<td>±0.15% ±1digit</td>
</tr>
<tr>
<td>WRs5-26</td>
<td>0 to 2315°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>PtRh40-PtRh20</td>
<td>0 to 1888°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>-50.0 to 290.0°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-50.0 to 600.0°C</td>
<td>±0.2% ±1digit</td>
</tr>
<tr>
<td></td>
<td>-50.0 to 1310°C</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>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

The software is applied for replay display/wave editing operation of recorded data in KR2S 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>Parameter</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Your OS recommended CPU and/or upper grade</td>
</tr>
<tr>
<td>OS</td>
<td>Windows XP Home / XP Pro / VISTA / 7</td>
</tr>
<tr>
<td>Memory</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>Language</td>
<td>Japanese, English, Chinese (simplified and traditional characters), Korean</td>
</tr>
</tbody>
</table>
**TERMINAL ARRANGEMENT**

- **Alarm relay output (4 points 'c' contact)**
  - Alarm output terminal No.1 to 4
  - N.C terminals
  - COM terminals
  - N.O terminals

- **Alarm relay output (2 points 'c' contact) + Digital input (No voltage contact input 2 points)**
  - Alarm output terminal No.1 to 2
  - No voltage contact input
  - Digital input terminal No.1 to 2
  - N.C terminals
  - COM terminals
  - N.O terminals

- **Digital input (No voltage contact input 4 points)**
  - No voltage contact input
  - Digital input terminal No.1 to 4
  - COM terminals

- **Communication terminal**
  - RS485 Ethernet connector

**DIMENSIONS**

- Same dimensions for the unit with options

**PANEL CUTOUT**

Unit: mm

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