Induction Heating

- Infrared radiation thermometer
  - IR-FA series Page 7
- Digital indicating controller
  - DB600 series Page 5
- Graphic recorder

Vacuum Furnace

- Hybrid memory recorder
  - AH4000 series Page 3
- Program controller
  - KP series Page 6
- Thyristor regulator
  - JM series Page 11

Film Drying Process

- Infrared radiation thermometer
  - IR-CZ series Page 7
- Moisture meter
  - IRMA series Page 10
- Graphic recorder
  - KR2S series Page 3
RECORDERS

HYBRID MEMORY RECORDER
AH4000 AL4000 SERIES

These recorders are a hybrid recorder which employs bright and clear, easy to view LCD display. Measuring value display is prepared as 1 point display, multi-points simultaneous display and digital display + bar graph display. Various measuring and recording setting can be easily done by front key switch and confirmed by LCD digital display.

•  SD card as data storage (512MB, 1GB, 2GB)
•  Setting/Recording software available (Standard attached)
•  CE Marking, UL-CSA

Main Specifications
No. of measuring points:
  (AL) 6 points (AH) 6, 12, 24 points
  (AL/AH) 1 pen, 2 pens, 3 pens, 4 pens
Input types:
  DC voltage, DC current, Thermocouple, Resistance thermometer
Accuracy rating:
  ±0.1% ±1 digit (DC voltage input)
Chart speed:
  1 to 1500mm/h (Dotting type)
  1 to 600mm/h, 1 to 200mm/min (pen type)
Power supply:
  100 to 240VAC, 50/60Hz
Communications:
  Ethernet, RS232C, RS422A, RS485 (Option)
Dimensions:
  (AL) 144 X 144 X 216mm
  (AH) 288 X 288 X 216mm

GRAPHIC RECORDER
KR2000 KR2S SERIES

KR2000 & KR2S Series are network-compatible paperless recorders with high performance and high operating function employed high visibility 5.6" & 5.7" TFT color LCD display. Furthermore KR2S series has touch panel function. The recorder can be used for various applications such as data management, research, development, remote and wide range monitoring by utilizing internet environment.

•  6 or 12 channels measurement at sampling rate of 1sec or 100ms
•  Simple no-manual operations. Large data memory
•  CE Marking, UL-CSA (KR2S)

Main Specifications
No. of measuring points:
  6, 12 points
Input types:
  DC voltage, DC current, Thermocouple, Resistence thermometer
Accuracy rating:
  ±0.1% ±1 digit (DC voltage input)
Power supply:
  100 to 240VAC, 50 / 60Hz
Communications:
  Ethernet, RS232C, RS422A, RS485 (Option)
Dimensions:
  (KR2000) 144X144X204mm
  (KR2S) 144X144X182.8mm

GRAPHIC RECORDER
KR3000 KR3S SERIES

KR3000 & KR3S Series are network-compatible paperless recorders with high visibility max. 12.1" TFT color LCD display and touch panel operation system. High speed of fastest sampling rate 100ms for 48 points 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.

•  Max large sized 12.1" TFT color LCD touch panel display
•  Large capacity of data memory and various recording method
•  Multi points recording with high speed/high accuracy
•  CE Marking

Main Specifications
No. of measuring points:
  12, 24, 36 and 48 channels
Input types:
  DC voltage, DC current, Thermocouple, Resistence thermometer
Accuracy rating:
  ±0.1% ±1 digit (DC voltage input)
Power supply:
  100 to 240VAC, 50 / 60Hz
Communications:
  Ethernet, RS232C, RS422A, RS485 (Option)
Dimensions:
  (KR3000) 288X288X218mm
  (KR3S) 288X288X180mm
HYBRID RECORDER
KH4000 KL4000 SERIES

KH4000 & KL4000 Series hybrid recorders realize simple and easy operation as analog recorders. Not only can each measured value be read from the custom made analog scale plate which incorporates input type and measurement value input, but a comprehensive LED display also enables precise digital measurements to be taken by the user. Conforming to CE Marking.

Main Specifications
No. of measuring points: (KL) 6 points (KH) 6, 12, 24 points
Input types: DC voltage, DC current, Thermocouple, Resistance thermometer
Accuracy rating: ±0.1% ±1 digit (DC voltage input)
Power supply: 100 to 240VAC, 50 / 60Hz
Communications: Ethernet, RS232C, RS422A, RS485 (Option)
Dimensions: (KL) 144 X 144 X 216mm
(KH) 288 X 288 X 216mm

HYBRID RECORDER
LE5000 SERIES

LE5000 series are 250mm hybrid recorders with multi-range input. Innovative design high performance recorder provides high accuracy ±0.05%; high speed sampling 0.1 second for 36 points and high speed recording, 3 seconds/line. Simple operational keys and PC setting functions drastically improved usability of recording system.

Main Specifications
No. of measuring points: 12, 24 or 36 channels
Input signals: DC voltage 8 kinds, Thermocouple 28 kinds, Resistance thermometer 8 kinds, DC current (shunt resistors)
Accuracy ratings: ±0.05% ±1 digit (DC voltage)
Power supply: 100 to 240VAC, 50/60Hz
Communications: Ethernet, RS422A, RS485 (option)

ANALOG RECORDERS
EH3000 EL3000 ES600 SERIES

EH3000 DOT EH3000 PEN

1 to 12-point, dotting types and 1 to 3-pan types are available.

● Various options for many applications
● High accuracy on 100mm industrial recorders
● Robust analog recorders
● CE Marking

Main Specifications
No. of measuring points: (EH3000 DOT) 1 to 12 points (EH3000/EL3000 PEN) 1 to 3 pens
Input types: DC voltage, DC current, Thermocouple, Resistance thermometer
Accuracy rating: (EH) ±0.25% ±1 digit (DC voltage input)
(EL) ±0.5% ±1 digit (DC voltage input)
Power supply: 100 to 240VAC, 50 / 60Hz

EL3000 DOT EL3000 PEN

1-point, 2-point, 3-point, 6-point dotting types and 1 to 3-pan types are available.

● Small and lightweight
● Various models and options
● CE Marking

Main Specifications
No. of measuring points: 1 to 6 points, 1pen
Input types: DC voltage, DC current, Thermocouple, Resistance thermometer
Accuracy rating: ±1.0% ±1 digit (DC voltage input)
Power supply: 100 to 240VAC 50 / 60Hz

ES600

1-point, 2-point, 3-point, 6-point dotting type and 1-pan types are available in the recorders.

● Small and lightweight (depth-200mm)
● Reliable self-balancing type

Main Specifications
No. of measuring points: 1 to 6 points, 1pen
Input types: DC voltage, DC current, Thermocouple, Resistance thermometer
Accuracy rating: ±1.0% ±1 digit (DC voltage input)
Power supply: 100 to 240VAC 50 / 60Hz

4
The DB600 series have three types of size (DB670...96 x 96mm, DB650...48 x 96mm, DB630...48 x 48mm). Various functions including universal input and multiple setting values (8 types) are provided as standard.

- Large easy-to-view 5 digit display
- Highly-functional operation screen and setting screen
- Simple program (4 patterns, 12 steps)
- CE Marking, UL-CSA

### Main Specifications

<table>
<thead>
<tr>
<th>Input type</th>
<th>Thermocouple (B,R,S,K,E,J,T,N,others)</th>
<th>Resistance thermometer (Pt100, JPt100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage</td>
<td>±20mV, ±100mV, ±5V, ±10V</td>
<td>0 to 5V</td>
</tr>
<tr>
<td>DC current</td>
<td>4 to 20mA</td>
<td></td>
</tr>
<tr>
<td>Accuracy rating</td>
<td>±0.1% of FS ± 1 digit</td>
<td></td>
</tr>
<tr>
<td>of measuring range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control system</td>
<td>PID system or Z control</td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>ON-OFF pulse output, ON-OFF servo output (DB650 and DB670 only), Current output, SSR drive pulse output, Voltage output</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>100 to 240VAC or 24VAC/24VDC</td>
<td></td>
</tr>
<tr>
<td>Communication interface</td>
<td>DB670 RS422A, RS485(option)</td>
<td>DB650 RS422A, RS485(option)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>96 x 96 x 73mm</td>
<td>48 x 48 x 73mm</td>
</tr>
</tbody>
</table>

### Z Control (Economical control)

Z control is a control algorithm learned from plants. Compared to conventional control algorithms, Z control is the algorithms that keeps start-up speed and improves overshoot suppressive effect, energy saving effect, disturbance suppressive effect and shorten the settling time. Hemothermal nature of organism is robust to the environmental change and energy saving structure. Z control includes this ecological algorithm and compared to conventional control, it improves robustness of energy saving effect, parameter variation and load variation. For the compatibility with PID control, parameter is similar parameter as PID control.
DIGITAL INDICATING CONTROLLERS

**DB SERIES**

The DB series is a 96 x 96mm digital indicating controller with the indicating accuracy of ±0.1% and the control cycle of approximately 0.1 seconds.

Various function including universal input and multiple setting values (8 types) are provided as standard.

- Large easy-to-view 5 digit display
- Highly-functional operation screen and setting screen
- Outstanding controllability
- Conforming to international safety standards and CE Marking, UL-CSA

**Main Specifications**

- **Input type:** Thermocouple (B,R,S,K,E,J,T,N,others)
- Resistance thermometer (Pt100,Pt-Co,others)
- DC voltage (±10mV,±20mV,±50mV,±100mV, ±5V,±10V)
- **Accuracy rating:** ±0.1% of measuring range ± 1 digit
- **Control system:** PID system or Z control
- **Output type:** ON-OFF pulse, ON-OFF servo, Current output, SSR drive pulse, Voltage output
- **Power supply:** 100 to 240VAC or 24VAC/24VDC
- **Communication interface:** RS232C, RS422A, RS485(option)
- **Dimensions:** 96 x 96 x 127mm

**PROGRAM CONTROLLERS**

**KP SERIES**

The KP1000 series is a 96 x 96mm digital program controller with the indicating accuracy of ±0.1% and the control cycle of approximately 0.1 seconds and maximum 19 program patterns (maximum 19 steps/pattern).

Various function including the whole program pattern display screen and universal input are provided as standard.

- Large easy-to-view 5 digit display
- Highly-functional operation screen and setting screen
- Easily identifiable pattern progress display
- Outstanding controllability
- Conforming to international safety standards and CE Marking, UL-CSA

**Main Specifications**

- **Input type:** Thermocouple (B,R,S,K,E,J,T,N,others)
- Resistance thermometer (Pt100,Pt-Co,others)
- DC voltage (±10mV,±20mV,±50mV,±100mV, ±5V,±10V)
- **Accuracy rating:** ±0.1% of measuring range ± 1 digit
- **Control system:** PID system
- **Output type:** ON-OFF pulse, ON-OFF servo, Current output, SSR drive pulse, Voltage output
- **Power supply:** 100 to 240VAC or 24VAC/24VDC
- **Communication interface:** RS232C, RS422A, RS485 (option)
- **Dimensions:** 96 x 96 x 127mm

**DIGITAL INDICATING CONTROLLERS**

**CP SERIES**

CP350/370 series is CHINO new digital indicating controller. High function and optional programmed control mode are provided.

- Adopt MODBUS communications mode, CE marking
- Universal power supply (100-240V AC)
- More programmed control mode
- Can select the PID mode from total PID type or differential type

**Main Specifications**

- **Input type:** Thermocouple (B,R,S,K,E,J,T,N,others)
- Resistance thermometer (Pt100,Pt-JP100)
- DC voltage (±5V)
- **Accuracy rating:** ±0.25% of measuring range ± 1 digit
- **Control system:** PID system
- **Output type:** ON-OFF pulse, Current output, SSR drive pulse, Voltage output
- **Power supply:** 100 to 240VAC
- **Dimensions:** CP350...48 x 96 x 132 mm
  CP370...96 x 96 x 132 mm

**PROGRAM CONTROLLERS**

**DP-G SERIES**

The DP-G series is graphic program controller employed high visibility 5.6” TFT color LCD display. Maximum 200 types of program pattern (Maximum 4000 steps) are stored and performance pattern is selectable.

- Easy program pattern setting on graphic screen
- High performance and universal input
- Storing settings in CF card

**Main Specifications**

- **Input type:** Thermocouple (B,R,S,K,E,J,T,N,others)
- Resistance thermometer (Pt100,Pt-JP100,others)
- DC voltage (±10mV,±20mV,±50mV,±100mV, ±5V,±10V)
- DC current(20mA)
- **Accuracy rating:** ±0.1% of measuring range ± 1 digit
- **Control system:** PID system
- **Output type:** ON-OFF pulse type, ON-OFF servo type, Current output type, SSR drive pulse type, Voltage output type
- **Power supply:** 100 to 240VAC, 50/60Hz
- **Dimensions:** 144 x 144 x 252mm
INFRARED RADIATION THERMOMETERS

HIGH-SPEED INFRARED RADIATION THERMOMETER
IR-CZ SERIES

- Reduced optical error measurement caused by dust and contaminants
- High response, 2 to 15ms
- Significantly effective for distinctive applications:
  - Ceramic high-temp. baking process
  - Crystal growing
- CE Marking

Main Specifications
Temperature range: 30 to 3500°C depending on the model
Response time: 2 to 15ms
Analog output: 4 to 20mA DC

INFRARED RADIATION THERMOMETER
IR-BA SERIES

The IR-BA series is a non-contact and high-speed compact radiation thermometer. The card-sized detector with built-in converting function of 4-20mA output signal can easily be installed in narrow places, production lines and small equipment.
A standard speed type and a high speed type (50ms/95%) are respectively available for these standard type and small-target/short-distance type and small-target/long-distance type, and also various applicable types like as glass, lamp-anneal, film and burning gas.
- High response: Standard: 100ms, High-speed: 50ms
- Compact & lightweight: W32XH56XD100mm, 220g
- CE Marking (Certain models)

Main Specifications
Detecting element/measuring wavelength: Thermopile
Temperature range: 0 to 300°C, 0 to 600°C
Output: 4 to 20mA DC
Power supply: 12 to 24V DC

INFRARED RADIATION THERMOMETER
IR-CA SERIES

The IR-CA product line of non-contact infrared thermometers provides broad selection of units to match your applications and requirements for non-contact temperature measurement. The product line consists of 15 different series grouped into general purpose and application specific models.
- Functional digital display and parameter setup keys
- High accuracy, high-speed response, high reliability
- High distance factor in focusable model to enable ease of installation
- Optional RS485 communications
- Remote setup and monitoring by IR-GZA connectable up to 32 IR-CA
- Software package IR-VXC1E
- Variety of accessories to protect the IR-CA under harsh environment
- CE Marking (Certain models)

FIBER OPTIC RADIATION THERMOMETER
IR-FA SERIES

The IR-FA series is a fiber optic radiation thermometer featuring multi-function and high-speed response (10ms). Three types: single-color type for low temperature; single-color type for medium/high temperature and two-color type, are available.
- Low temperature type with high-speed response and short wavelength enables to measure objects with low emissivity like as metals.
- Medium/high temperature type with high accuracy ±0.5 to 1% for 1000 to 2000°C and high-speed response is for various temperature measurement fields.
- Two-color type is stable with less effectiveness of smoke, vapor, dust and lack-of-view.
- CE Marking (Certain models)

Main Specifications
Detecting element/measuring wavelength:
  - Single-color type: PbS / 2.0μm, InGaAs / 1.55μm, Si / 0.9μm,
  - Two-color type: Hybrid element 0.9 / 1.55μm
Output: 4 to 20mA DC
Power supply: 24V DC

COMPACT INFRARED THERMOMETER
IR-BZ SERIES

IR-BZ has separated detector and main unit to make the detector smaller and can be used at high temperature condition. Main unit has digital temperature displays and parameter setting function. Enables long stable measurement at affordable price.
- High accuracy and stable measurement even the environment temperature changes.
- High speed response time 15ms, corresponds to production line requiring quick tracking.
- Wide range temperature range from low to high temperature (0 to 1000°C).
- CE Marking (Certain models)

Main Specifications
Measuring range: 0 to 1000°C
Accuracy rating: Below 20°C : ±2°C, 20°C to below 100°C : ±1°C,
100°C or above : ±1% of measuring value
Response time: 15ms
Power supply: 8 to 36V DC
NON-CONTACT TEMPERATURE MEASUREMENT

PALM SIZED
INFRARED RADIATION THERMOMETER
IR-TE2

Washable!!
Non-contact temperature measurement in one second!!
Model IR-TE2 palm-sized infrared thermometer is designed to measure the surface temperature of objects without making contact with them. The built-in laser sighting pinpoints the center of the area being measured on the target.

- Conforms to IP67 (dustproof and waterproof) and washable.
- ABS resin housing with sanitary specification fits in your safety program. CE marking.
- Wide temperature range of -40 to 300°C (-40 to 572°F) - °C/°F selectable

HAND-HELD TYPE
INFRARED RADIATION THERMOMETER
IR-TAP

The IR-TA series hand-held type thermometer is easy to use and can be applied to a variety of applications. The built-in laser sight helps to pinpoint a measured spot accurately.

- Temperature range: -40 to 500°C
- Spot size: ø30 / 1000mm

ON-LINE INFRARED RADIATION THERMOMETER
IR-SA SERIES

The IR-SA series of infrared Radiation thermometer provides a broad selection of small and robust units to match your on-line applications for non-contact temperature measurement from 0 to 2900°C under harsh environment. Four models are available with MODBUS connectivity for parameter setup through remote setting unit or PC.

- Withstand temperature 90°C, IP67
- Fast response time of 0.002 seconds for IR-SA1/IR-SAS
- RS485 MODBUS connectivity
- Telescope or laser pointer for targeting
- CE Marking (Certain models)

PORTABLE RADIATION THERMOMETER
IR-HA SERIES

The portable thermometer is a small and lightweight with a clear view-finder. The direct view-finder enables to measure a small object with a long distance.

- Temperature range from 400°C to 3000°C (IR-HAQ)
- Low temperature area measurable and emissivity settable by connecting a K-type thermocouple separately prepared.
- Easy data management using SD card.
- CE marking

Main Specifications
Detecting element: Si (IR-HAS), InGaAs (IR-HAI), Si/InGaAs (IR-HAQ)
Response time: 0.2 seconds
Power supply: 2AA batteries

RADIATION DIGITAL THERMOMETER
IR-AH SERIES

The hand-held thermometer offers a wide measuring range of 600°C to 3000°C for IR-AHS, 900°C to 3000°C for IR-AHU, and 50°C to 1000°C for IR-AHT, digital display of the measured value in view-finder and LCD display, plus storage of measured data.

- Data logging software package for easy data treatment

Main Specifications
Detecting element: Si, Thermopile
Power supply: 4AA batteries

THERMAL IMAGING SENSOR
HAND-HELD TYPE
THERMAL IMAGING SENSOR
TP-S

The TP-S series is a ultra small handy thermal image sensor both industrial and commercial use.

- Temp.range of -10 to 300°C
- 2000 pixel resolution
- Just one click operation and instant glance
- ABS resin(anti bacterial)
- CE marking

THERMAL IMAGING SENSOR
TP SERIES

The TP series is a compact infrared thermal imaging sensor utilizing a thermopile array detector.

- Easy to use and implement
- 2000 pixel resolution
- Built-in alarms
- IP65/NEMA4, CE marking

Main Specifications
Temperature range: -20 to 300°C, 100 to 800°C
Resolution: ±0.5°C (At black body temperature of 100°C)
Accuracy: ±2% of reading or ±3°C whichever lager (At ambient temp of 25°C±2°C)
Power supply: 12 to 24VDC

Fixed mount type thermal image measuring device for online monitoring, measurement, and inspection

The CPA-L series consists of a fixed mount type camera using an uncooled element and a controller (Certain models are directly settable from your PC without using the controller).

The camera, supporting measuring wavelengths of 8 to 14μm and a temperature detecting range of -20°C to 500°C, is compact, lightweight, and excellent in dust and drip proofing performance.

The controller has image processing functions such as binarization and particle analysis functions in addition to the temperature measurement processing function and can provide output via a LAN and as analog/digital signals.
TEMPERATURE / HUMIDITY SENSORS

HANDHELD TYPE
TEMPERATURE/HUMIDITY METER
HN-EH SERIES
Speedy, lightweight, high accuracy !!
Measurement in 30-seconds level !!

HN-EH series is accurate handheld type temperature/humidity meter with the measuring range of -20 to 70°C (sensor built-in type) -10 to 45°C and 5 to 95%RH. Two types of model, simple basic type (sensor built-in type only) and standard type (sensor built-in type and probe type), can be selected to meet various applications requirement.

- Overriding fast response time, measurement 30-seconds level
- Small, lightweight (sensor built-in type approx. 120g) and easy operation
- Low running cost, built-in type sensor unit is interchangeable by user
- CE Marking

Main Specifications
Measuring range: Temperature
-10 to 45°C (Sensor built-in type)
-20 to 70°C (Probe type)
Relative humidity 5 to 95%RH (no dew condensation)
Dew point temperature -35 to 55°C (standard type only)
Measuring resolution: Temperature 0.1°C, Relative humidity 0.1%RH
Response:
Temperature 40 seconds or less (under 0.5m/s ventilation, 90% step response of approx. 50°C→25°C)
Humidity 40 seconds or less (25°C constant, under 0.1m/s ventilation, 90% step response of approx. 30%/RH→50%/RH)

DIGITAL THERMOMETER FOR FOODS
MODEL MF1000

The portable thermometer model MF1000 is combined with a needle type sensor for measurement of internal temperature of foods or liquid temperature.

- Washable and anti-bacteria surface housing
- CE Marking

Main Specifications
Temperature range: -40 to 260°C
Measuring accuracy: ±0.5°C
Response time: 2 seconds
Sensor: K type thermocouple
Sealing: IP67 (waterproof and dustproof)

PALM-SIZED
TEMPERATURE/HUMIDITY METER
HN-CH SERIES

The HN-CH series is reliable and accurate palm-sized temperature/humidity meter with the humidity range of 0 to 100%RH by using a newly developed capacitance type humidity sensor. The data logging function capable to store each 8000 readings of temperature and humidity into memory is built-in.

- Three types of sensors, sensor built-in type, probe type and separated type available for various applications

Main Specifications
Relative humidity
Sensor: High-polymer capacitance type
Measuring range: 0 to 100% RH
Accuracy rating: ±2%RH (0 to 90%RH at 25°C)
Temperature
Sensor: Semiconductor type
Measuring range: -10 to 50°C
Accuracy rating: ±0.5°C (0 to 50°C)
Data logging: Temperature and humidity -each 8000 data (16000 data in total)
Display: Current data, replaying data, parameters
Communications interface: RS232C or RS485
Power supply: 2AA batteries or 100-240 V AC (with AC adapter; sold separately)

ROLLER SURFACE THERMOCOUPLES
CO15 SERIES

The thermocouples are designed for non-contact measurement of surface temperature of moving or rolling materials such as heating rollers, moving belts and plastic sheets.

- Built-in compensating circuit for the difference between actual temperature and adjustment atmospheric temperature
- Affection-free from emissivity of surface

Main Specifications
Element: K type thermocouple
Measuring accuracy: Within ±5°C in 200°C span
Measuring distance: 1 to 2mm (fixed)
Output: E.M.F. of K type thermocouple
**HANDHELD DIGITAL THERMOMETER**

**MC1000 SERIES**

MC1000 is a handheld digital thermometer having an easy-to-read large LCD display and light weight. A range of temperature probes with a variety of shapes and sizes to suit the application requirements.

- Dual displays for measured data and arithmetic result
- Multi-input (thermocouple/RTD) allows various applications
- Exclusive connector prevents accidental probe disconnection
- CE Marking

**Main Specifications**

- Measuring range: Thermocouple type K -200 to 1370°C
- RTD PT100 -200 to 500°C
- Display: 3-1/2 digital LCD with backlight
- Computation: Max/min/average/relatives
- Power supply: 2AA batteries
- Dimensions: 76(W) X 164(H) X 36.3(D)mm

**CARD LOGGER**

**MR SERIES**

MR series is a small size and lightweight card logger. Various types of external mounting sensors including a built-in type are available.

- A traceability or inspection certificate, which can be used for HACCP or ISO9000, is available.
- Separate purchase required
- Capable to store up 6000 data per channel
- Conforms to CE marking and IP64

**Main Specifications**

- Measuring range: -40 to 60°C, 0 to 100°C, 50 to 150°C
- Accuracy rating: ±1.0°C ±1 digit

**Sensor:**
- Automatic switchover of built-in/external sensor.
- External sensor operates when it is connected

**Number of storing data:**
- 6000 data (about 8-month data storage at: 60-minute measuring interval)

**Storing mode:**
- Automatic stop mode under specified conditions or endless mode by a PC

**Communications:**
- Built-in (connection to a PC through a data readout unit)

**External dimensions:**
- 54(W) X 110(H) X 20.5(D)mm

**Weight:**
- 95g (including batteries)

**Power supply:**
- 2AAA batteries

**Battery life:**
- Approx. 1 year (at 25°C and 10-minute interval)

**THERMO HYGROMETER**

**HN-C SERIES**

HN-C series using developed humidity element features high performance and reliability 2-wire transmission type thermo-hygrometers for the wide measuring range of 0 to 100%RH. Models with temperature output of 3-wire type Pt100 is available.

Wall-mount type, separated type and inserting type are available for various application.

Heat-resistive and separated type, which can be used in operating temperature of -40 to 180°C is available, too.

**Main Specifications**

**Humidity**
- Measuring range: 0 to 100%RH (no dew condensation)
- Accuracy range: ±2%RH (at 0 to 90%RH and 25°C)
- ±3%RH (at 90 to 95%RH and 25°C)

**Coefficient of relative humidity / temperature:**
- ±0.1%RH / °C (at 5 to 60°C)

**Temperature**
- Measuring range: -40 to 180°C
- Accuracy range: ±0.3°C ±0.5°C Heat-resistive separated type

**HANDY LOGGER**

**MR2041 SERIES**

Handy logger MR2041 is a palm size data logger, it is capable of storing up to 1000 temperature data per each channel. Power supply of logger is selectable from AA battery or AC adaptor, so it is usable as a portable type logger or fixing type logger.

Using the exclusive software, recording/recalling of data and programming of logging parameters can be executed with logger or through a PC.

- Input signals: thermocouple, K, E, J, T, 0 to 5V, 0 to 20mA
- Simultaneous 4 channels, measurement and display
- Data processable through a PC
- CE Marking

**Main Specifications**

- Measuring range: Thermocouple:
  - K -200.0 to 1370.0°C
  - E 200.0 to 700.0°C
  - J 200.0 to 700.0°C
  - T 200.0 to 400.0°C

- DC voltage: 0 to 5V (scale -9999 to 9999)
- DC current: 0 to 20mA (scale -9999 to 9999)

- Accuracy rating: Thermocouple
  - ±0.1% of measuring value ±0.3°C to 100°C
  - ±0.1% of measuring value ±0.0°C to 100°C

- DC voltage (0.1% of measuring value +0.2% of range)

**ON-LINE MEASUREMENT OF INFRARED MULTI ANALYZER, MOISTURE (THICKNESS) METERS**

**INFRARED MULTI ANALYZER**

**IM SERIES**

- Up to 10 wavelength, capable of measuring 4 constituents
- Ethernet, MODBUS communications
- High-speed & High-repeatability (28ms)
- Self-diagnostic function, easy maintenance
- CE Marking (Certain models)

**Main Specifications**

- Measuring system: Infrared reflection type
- Measuring wavelength: Up to 10 wavelengths
- Measuring scope: Up to 4 constituents
- Computing function: Ratio calculation for 2-color or 3-color, and multiple regression calculation
- Calibration curve: Linear, quadratic, cubic and multiple regression line

**The IM series is on-line multi analyzer utilizing the infrared absorption. Converting capabilities are built into the compact designed detector unit for easy installation and operation.**
THYRISTOR REGULATORS

SINGLE/THREE-PHASE
THYRISTOR REGULATORS

JU/JW SERIES

The JU/JW series of thyristor regulators feature a compact size and light weight and enable high-density installation. Their methods of control include two ways, the phase-angle control and zero-cross control systems. In the phase-angle control systems, the voltage, current and power feedback control types and a type without feedback control are available for the selection of an optimum type according to the characteristics of the heater used.

- Compact, lightweight and high-density installation
- Phase-angle firing and zero-cross firing are selectable
- Setting communication unit displays voltage, current, power and heater measurement values, and enables parameter setup and operation selection
- Prepare heater disconnection alarm and current limiter

Main Specifications

**JU**
- Phase: Single phase
- Rated voltage: 100, 110, 120, 200, 220, 240, 380, 400, 440V AC (to be specified)
- Rated frequency: 50/60Hz (automatic selection)
- Rated current: 10, 20, 30, 50, 75, 100, 150, 200, 250, 300, 400, 500, 750, 1000A (to be specified)

**JW**
- Phase: Three phase
- Rated voltage: 200V AC (200V/220V/240V selectable) 400V AC (380V/400V/440V selectable)
- Rated frequency: 50/60Hz (automatic selection)
- Rated current: 10, 20, 30, 50, 75, 100, 150, 200, 250, 300, 400, 500, 750, 1000A (to be specified)

SINGLE-PHASE
THYRISTOR REGULATORS

JB SERIES

The small and lightweight thyristor regulators for single-phase loads are characterized with high panel installation density.

Two control systems, a phase-angle firing system for continuous power control and a zero-cross firing system, are built-in and selectable for various applications and power environment. The applications include small electric furnaces, calibration bath, casting dies heating and heating units for laboratory use.

Main Specifications

**JAB**
- Phase: Single-phase
- Rated voltage: 100 to 120VAC and 200 to 240VAC (selection by terminals)
- Rated frequency: 50/60Hz (automatic selection)
- Rated current: 20, 30, 40, 50, 75, 100A (to be specified)
- Input signal: 4 to 20mA DC, 1 to 5VDC or on-off contact
- Output range: 0 to 99% of rated voltage
- Minimum load current: 0.5A (at 98% output)
- Applicable loads: Resistive load
- Control system: Phase-angle firing and zero-cross firing (selectable)

SHEATH THERMOCOUPLES
SHEATH RESISTANCE THERMOMETERS

The temperature sensors filled with high-purity magnesium oxide in protective tube provide excellent response along with vibration resistance and corrosion resistance.

Main Specifications

**Thermocouples**
- Class: JIS 1 (class 0.4), 2 (class 0.75)
- Element: K, J, E, T, N, Chino Arroy B (NB), X (XL)
- Measuring temperature: -200 to 1050°C
- Protective tube diameter: 0.15, 0.3, 0.5, 1.0, 1.6, 3.2, 4.8, 6.4, 8.0mm φ
- Protective tube length: 300, 500, 750, 1000, 1500, 2000mm ～
- Protective tube material: SUS316, SUS310S, NCF600, J, E, T ～ SUS316
  (Protection tube of 0.3 and 0.5mm φ: only available on K element and NCF600)

**Resistance thermometers**
- Class: JIS A, B
- Element: Pt100, JPt100, 3-wire
- Nominal current: 2mA, 1mA DC
- Measuring temperature: -200 to 500°C
- Protective tube diameter: 3.2, 4.8, 6.4, 8.0mm φ
- Protection tube length: 300, 500, 750, 1000, 1500, 2000mm
- Protection tube material: SUS316
TRACEABILITY

SMALL TYPE LOW TEMPERATURE COMPARATIVE CALIBRATION EQUIPMENT

KT-H SERIES
Realize low temperature calibration at -100°C and compact & light weight body.
For on-site calibration of resistance thermometer and thermocouple!

Main Specifications
Calibration Temperature Range: -100 to 50°C (KT-H503), -30 to 155°C (KT-H504), -20 to 155°C (KT-H504S)

FIXED POINT BLACKBODY FURNACE
IR-R0A SERIES
Fixed point black body furnace, model: IR-R0A is a highly precise fixed point black body furnace that can use for the temperature standard for radiation thermometer.
IR-R0A has 6 kinds of fixed point cell from In (157°C) in low temperature to Cu(1086°C) in high temperature.

- Realization of a good plateau by the improvement of the temperature distribution
- Lineup In to Cu point
- Changeable to other fixed points by cell exchange easily
- Compact size (184 X 370 X 360mm), weight (13kg)

Main Specifications
Fixed point cell In point: 156.60°C, Sn point: 231.93°C
Zn point: 419.53°C, Al point: 660.32°C
Ag point: 961.78°C, Cu point: 1086.52°C

COMPARISON MODELS BLACKBODY FURNACE
IR-R24, IR-R26, IR-R27
The comparison type blackbody furnaces were developed jointly with National Research Laboratory of Metrology for calibration of radiation thermometers and have large aperture diameters.

Main Specifications
Temperature range: 50 to 450°C (low temperature type)
200 to 1050°C (medium temperature type)
800°C to 1450°C (high temperature type)
Aperture diameter: 60mm (low temperature type)
50mm (medium temperature type)
30mm (high temperature type)

STANDARD RESISTANCE THERMOMETER R800 SERIES
The standard platinum resistance thermometers, which have been commercialized under the guidance of National Research Laboratory of Metrology, conform to International Temperature Scale, 1990 (ITS-90).

- From vapor point of helium to freezing point of silver

Main Specifications
Measuring range: 13K to 30°C (R800-0), 90K to 661°C (R800-2)
0 to 962°C (R800-3, 3T), 4K to 0°C (R800-4)

STANDARD RADIATION THERMOMETER IR-RST SERIES
Standard Radiation Thermometer IR-RST series has been developed under collaborative research with the National Metrology Institute of Japan (NMIJ), which is applicable for traceability of calibrating conventional radiation thermometers.

Main Specifications
Detecting element: Silicon Photo Diode, InGaAs Photo Diode
Measuring range: 400 to 2000°C (0.9 μm) 3-step selection
1000 to 3000°C (0.65 μm) 3-step selection
150 to 1100°C (1.6 μm) 3-step selection
Standard: CE Marking (0.9 μm, 0.65 μm)

HEAT PIPE TYPE FIXED POINT CALIBRATION FURNACE
KT-F116
KT-F116 conducts fixed point calibration of resistance thermometer and thermocouple by realizing freezing point of Al and Ag, combing with shield fixed point cell.

- No heat pipe is used for soaking pipe and realize 0.1°C p-p/200nm.
- No need of gas exchange, adopts shield fixed point cell, which is easy to use.
- Able to maintain more than 10 hours of plateau by adjusting furnace temperature.

Main Specifications
Furnace operating temperature range: 600 to 1000°C
Fixed point: Metal. Al and Ag

STANDARD THERMOCOUPLE C800 SERIES
The standard thermocouples are for calibration of thermocouples.
Three kinds of S type, R type and B type thermocouples are available.

- Temperature-thermoelectromotive force tables are prepared on request.

Main Specifications
Element diameter: 0.5mm
Measuring range: Maximum 1100°C (S, R)
Maximum 1554°C (B)