

**KUSAM-MECO**<sup>®</sup>

An ISO 9001:2015 Company

# 4-5/6 DIGIT 60,000 COUNTS AUTORANGING TRUE RMS DMM WITH DATALOGGING & PC INTERFACE MODEL - KM 891

**THINK SAFETY**  
 THINK **KUSAM-MECO**<sup>®</sup>

KM 891 is a datalogging TRMS Multimeter with Features such as Trend Capture, Low Pass Filter, nS Conductance, Dual Temperature, & more Storage 20000 sets of measurements data & display them on a trend graph for long term monitoring.

**21 FUNCTIONS 63 RANGES**
**20,000  
Records  
Data Logging**
**NEW****SPECIAL FEATURES :**

- Basic DC Voltage Accuracy : 0.03%
- Waterproof and dustproof : IP65
- 20,000 records Data Logging
- Recording Measurement Data
- Power Saving Mode
- Test Lead Alarm Buzzer
- Date & Time function
- Auto power save
- LPF Measurement
- dBV & dBm function
- Maximum & Minimum Value
- Relative value
- Peak detection
- Compare mode COMP & Pass Mode
- Low Value or High Value or Value function.
- Diode & Continuity Test
- Type-K Temperature
- AC Current + DC Current
- Duty Cycle, Conductance, Pulse width,
- USB Communication
- Bluetooth Communication (Optional)
- PC Interface

**IP65**
**CAT III 1000V  
CAT IV 600V**
**GENERAL SPECIFICATIONS**

- \* **Sensing** : True RMS Sensing
- \* **Display** : 4-5/6 digits 60,000 counts Backlight LCD display
- \* **Range** : Auto / Manual
- \* **Polarity** : Auto
- \* **Electromagnetic compatibility** : In the RF-Field of 1V/m :  
Overall Accuracy = specified accuracy + 5% of range.  
No specified index for the RF-Field over 1V/m.
- \* **Operating Temperature** : -20°C to 50°C
- \* **Storage Temperature** : -30°C to 60°C
- \* **Relative Humidity** : ≤ 80% (0°C ~ 30°C), ≤ 75% (30°C ~ 40°C), ≤ 45% (40°C ~ 50°C).
- \* **Temperature Coefficient** : 0.1 x (specified accuracy) / °C @ (<18°C or >28°C)
- \* **Low Battery** : The symbol  shows on the LCD.
- \* **Power Supply** : Lithium battery of 7.4V 2200mAh battery.
- \* **Power Adapter** : Input of 100V ~ 240V, 50/60Hz 0.2A max, output of DC10V 500mA (short-circuit protection for output). External diameter of 5.5mm & internal diameter of 2.5mm.
- \* **Dimension** : Approx. 225 x 100 x 60 mm
- \* **Weight** : Approx. 608gm (including battery).

- **ACCESSORIES** : Test leads (pair), User's Manual, 2 K-Type Temperature probes, Charging Adapter, Charging Connector, USB Cable, Software CD & carrying case.
- **OPTIONAL ACCESSORIES** : Bluetooth Communication (Optional)

**SAFETY**

- **Safety** : IEC / EN61010-1, EN61010-2-030, EN61010-2-033, CAT III 1000V and CAT IV 600V.

Preliminary Data

**SOFTWARE CD****USB CABLE**

All Specifications are subject to change without prior notice.

## ELECTRICAL SPECIFICATIONS : KM 891

Accuracy is  $\pm$  (% reading digits + number of digits) or otherwise specified @ 23°C  $\pm$  5°C & less than 75% R.H.

### AC VOLTAGE

| Range  | Resolution | Accuracy Tolerance : $\pm$ (%reading + Digits) |                             |                            |                                  |
|--------|------------|------------------------------------------------|-----------------------------|----------------------------|----------------------------------|
| 60 mV  | 0.001 mV   | 45~1kHz<br>$\pm(0.6\%+60)$                     | 1k~10kHz<br>$\pm(1.2\%+60)$ | 10k~20kHz<br>$\pm(3\%+60)$ | 20k~100kHz<br>$\pm(4\%+60)$      |
| 600 mV | 0.01 mV    | 45~1kHz<br>$\pm(0.3\%+30)$                     | 1k~10kHz<br>$\pm(1.2\%+40)$ | 10k~20kHz<br>$\pm(3\%+40)$ | 20k~100kHz<br>$\pm(4\%+40)$      |
| 6 V    | 0.0001 V   | 45~1kHz<br>$\pm(0.3\%+30)$                     | 1k~10kHz<br>$\pm(1.2\%+40)$ | 10k~20kHz<br>$\pm(3\%+40)$ | 20k~100kHz<br>$\pm(4\%+40)$      |
| 60 V   | 0.001 V    | 45~1kHz<br>$\pm(0.3\%+30)$                     | 1k~10kHz<br>$\pm(1.2\%+40)$ | 10k~20kHz<br>$\pm(3\%+40)$ | 20k~100kHz<br>$\pm(4\%+40)$      |
| 600 V  | 0.01 V     | 45~1kHz<br>$\pm(0.3\%+30)$                     | 1k~10kHz<br>$\pm(1.2\%+40)$ | 10k~20kHz<br>$\pm(3\%+40)$ | 20k~100kHz<br>Only for reference |
| 1000 V | 0.1 V      | 45~1kHz<br>$\pm(0.6\%+30)$                     | 1k~5kHz<br>$\pm(3\%+40)$    | 5k~10kHz<br>$\pm(6\%+40)$  | 10k~100kHz<br>Only for reference |

Input Impedance : About 10M $\Omega$

Overload protection : 1000V

Display : True virtual value for 10% to 100% of the range.

### AC VOLTAGE + DC Voltage

| Range  | Resolution | Accuracy Tolerance : $\pm$ (%reading + Digits) |                                |                                 |
|--------|------------|------------------------------------------------|--------------------------------|---------------------------------|
| 60 mV  | 0.001 mV   | 50~1kHz<br>$\pm(1\% + 80)$                     | 1k~10kHz<br>$\pm(3\% + 40)$    | 10k~35kHz<br>$\pm(6\% + 40)$    |
| 600 mV | 0.01 mV    | 50~1kHz<br>$\pm(1\%+80)$                       | 1k~10kHz<br>$\pm(3\% + 40)$    | 10k~20kHz<br>$\pm(3\%+40)$      |
| 6 V    | 0.0001 V   | 50~1kHz<br>$\pm(1\%+80)$                       | 1k~10kHz<br>$\pm(3\% + 40)$    | 10k~20kHz<br>$\pm(3\%+40)$      |
| 60 V   | 0.001 V    | 50~1kHz<br>$\pm(1\%+80)$                       | 1k~10kHz<br>$\pm(3\% + 40)$    | 10k~20kHz<br>$\pm(3\%+40)$      |
| 600 V  | 0.01 V     | 50~1kHz<br>$\pm(1\%+80)$                       | 1k~10kHz<br>Only for reference | 10k~20kHz<br>Only for reference |
| 1000 V | 0.1 V      | 50~1kHz<br>$\pm(1.2\%+80)$                     | 1k~5kHz<br>Only for reference  | 5k~10kHz<br>Only for reference  |

Input Impedance : About 10M $\Omega$

Overload protection : 1000V

Display : True virtual value for 10% to 100% of the range.

### AC Current

| Range        | Resolution   | Accuracy Tolerance : $\pm$ (%reading + Digits) |                                 |
|--------------|--------------|------------------------------------------------|---------------------------------|
| 600 $\mu$ A  | 0.01 $\mu$ A | 45 ~ 1kHz<br>$\pm(0.6\% + 40)$                 | 1k ~ 10kHz<br>$\pm(1.2\% + 40)$ |
| 6000 $\mu$ A | 0.1 $\mu$ A  | 45 ~ 1kHz<br>$\pm(0.6 + 20)$                   | 1k ~ 10kHz<br>$\pm(1.2\% + 40)$ |
| 60 mA        | 0.001mA      | 45 ~ 1kHz<br>$\pm(0.6\% + 40)$                 | 1k ~ 10kHz<br>$\pm(1.2\% + 40)$ |
| 600 mA       | 0.01 mA      | 45 ~ 1kHz<br>$\pm(0.6\% + 20)$                 | 1k ~ 10kHz<br>$\pm(1.2\% + 40)$ |
| 10 A         | 0.001 A      | 45 ~ 1kHz<br>$\pm(1\% + 20)$                   | 1k ~ 10kHz<br>$\pm(3\% + 40)$   |

Display : True virtual value for 10% to 100% of the range.

Overload protection :  $\mu$ AmA range : 0.8A H 1000V Fuse Type  $\Phi$  6 x 32 mm

10A range : 10A H 1000V Fuse Type  $\Phi$  10 x 38 mm

Switch on for 30 seconds and suspend for 10 minutes for 20A.

Not specified for over 10A.

### DC VOLTAGE

| Range  | Resolution | Accuracy                   |
|--------|------------|----------------------------|
| 60 mV  | 0.001 mV   | $\pm(0.025\%rdg + 20dgts)$ |
| 600 mV | 0.01 mV    | $\pm(0.025\%rdg + 5dgts)$  |
| 6 V    | 0.0001 V   |                            |
| 60 V   | 0.001 V    |                            |
| 600 V  | 0.01 V     | $\pm(0.03\%rdg + 5dgts)$   |
| 1000 V | 0.1 V      |                            |

Input Impedance : About 10M $\Omega$

Overload protection : 1000V

Relative mode (REL) is required to compensate bias voltage for 60mV.

### DC CURRENT

| Range        | Resolution   | Accuracy                  |
|--------------|--------------|---------------------------|
| 600 $\mu$ A  | 0.01 $\mu$ A | $\pm(0.08\%rdg + 20dgts)$ |
| 6000 $\mu$ A | 0.1 $\mu$ A  | $\pm(0.08\%rdg + 10dgts)$ |
| 60 mA        | 0.001mA      | $\pm(0.08\%rdg + 20dgts)$ |
| 600 mA       | 0.01 mA      | $\pm(0.15\%rdg + 10dgts)$ |
| 10 A         | 0.001 A      | $\pm(0.5\%rdg + 10dgts)$  |

Overload protection :

$\mu$ AmA range : 0.8A H 1000V Fuse Type  $\Phi$  6 x 32 mm

10A range : 10A H 1000V Fuse Type  $\Phi$  10 x 38 mm

Switch on for 30 seconds and suspend for 10 minutes for 20A. Not specified for over 10A.

### RESISTANCE

| Range          | Resolution        | Accuracy                                 |
|----------------|-------------------|------------------------------------------|
| 600 $\Omega$   | 0.01 $\Omega$     | In REL state:<br>$\pm(0.05\%rdg+10dgts)$ |
| 6 k $\Omega$   | 0.0001 k $\Omega$ | $\pm(0.05\%rdg + 2dgts)$                 |
| 60 k $\Omega$  | 0.001 k $\Omega$  |                                          |
| 600 k $\Omega$ | 0.01 k $\Omega$   | $\pm(0.3\%rdg + 10dgts)$                 |
| 6 M $\Omega$   | 0.0001 M $\Omega$ |                                          |
| 60 M $\Omega$  | 0.001 M $\Omega$  | $\pm(2\%rdg + 10dgts)$                   |

Overload protection : 1000V Humidity for 60M $\Omega$  : < 50%

### CONDUCTANCE

| Range | Resolution | Accuracy               |
|-------|------------|------------------------|
| 60 nS | 0.01 nS    | $\pm(2\%rdg + 10dgts)$ |

Overload protection : 1000V Humidity for 60M $\Omega$  : < 50%

### DUTY CYCLE

| Range                      | Resolution | Accuracy                 |
|----------------------------|------------|--------------------------|
| 10% ~ 90%<br>(10Hz ~ 2kHz) | 0.01%      | $\pm(1.2\%rdg + 30dgts)$ |

• Overload protection : 1000V

• When the rise time is less than 1 $\mu$ s, the signals center on trigger level.

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## ELECTRICAL SPECIFICATIONS : KM 891

Accuracy is  $\pm$  (% reading digits + number of digits) or otherwise specified @ 23°C  $\pm$  5°C & less than 75% R.H.

### AC CURRENT + DC CURRENT

| Range        | Resolution   | Accuracy Tolerance : $\pm$ (%reading + Digits) |                   |
|--------------|--------------|------------------------------------------------|-------------------|
| 600 $\mu$ A  | 0.01 $\mu$ A | 50 ~ 1kHz                                      | 1k ~ 10kHz        |
|              |              | $\pm$ (0.8% + 40)                              | $\pm$ (2.0% + 40) |
| 6000 $\mu$ A | 0.1 $\mu$ A  | 50 ~ 1kHz                                      | 1k ~ 10kHz        |
|              |              | $\pm$ (0.8 + 20)                               | $\pm$ (2.0% + 40) |
| 60 mA        | 0.001mA      | 50 ~ 1kHz                                      | 1k ~ 10kHz        |
|              |              | $\pm$ (0.8% + 40)                              | $\pm$ (2.0% + 40) |
| 600 mA       | 0.01 mA      | 50 ~ 1kHz                                      | 1k ~ 10kHz        |
|              |              | $\pm$ (0.8% + 20)                              | $\pm$ (2.0% + 40) |
| 10 A         | 0.001 A      | 50 ~ 1kHz                                      | 1k ~ 10kHz        |
|              |              | $\pm$ (1.2% + 20)                              | $\pm$ (3% + 40)   |

**Display** : True virtual value for 10% to 100% of the range.

**Overload protection** :  $\mu$ AmA range : 0.8A H 1000V Fuse Type  $\Phi$  6 x 32 mm

10A range : 10A H 1000V Fuse Type  $\Phi$  10 x 38 mm

**Switch on for 30 seconds and suspend for 10 minutes for 20A.**

**Not specified for over 10A.**

### CONTINUITY TEST

| Range                                                                               | Resolution    | Remark                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 0.01 $\Omega$ | Open-circuit voltage is around 3V; when the buzzer selects short circuit for sound warning, the resolution is less than 10 $\Omega$ . The buzzer continuously sounds, the resolution is greater than 50 $\Omega$ . The buzzer does not sound. When the buzzer selects open circuit for sound warning, the resolution is greater than 50 $\Omega$ . The buzzer continuously sounds, the resolution is less than 10 $\Omega$ . The buzzer does not sound. |

- **Overload protection** : 1000V

### DIODE TEST

| Range                                                                               | Resolution | Remark                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 0.0001V    | Open -circuit voltage is around 3V. The forward voltage drop value of the measured PN junction is approximately $\leq$ 3V. When the buzzer activates, it will beep briefly for the normal semiconductor junction; if the semiconductor junction shorts out, it will beep continuously. Silicon PN junction drops between 0.5 ~ 0.8V as the normal value. |

- **Overload protection** : 1000V

### PULSE WIDTH

| Range  | Resolution       | Accuracy                 |
|--------|------------------|--------------------------|
| 250 mS | 0.001mS ~ 0.01mS | $\pm$ (1.2%rdg + 30dgts) |

- **Overload protection** : 1000V
- When the rise time is less than 1 $\mu$ s, the signals center on trigger level.
- The pulse width is greater than 2 $\mu$ s for 10Hz to 200kHz. The pulse width depends on signal frequency.

### CAPACITANCE

| Range       | Resolution    | Accuracy                |
|-------------|---------------|-------------------------|
| 6 nF        | 0.001 nF      | $\pm$ (3%rdg + 10dgts)  |
| 60 nF       | 0.01 nF       | $\pm$ (2.5%rdg + 5dgts) |
| 600 nF      | 0.1 nF        | $\pm$ (2%rdg + 5dgts)   |
| 6 $\mu$ F   | 0.001 $\mu$ F |                         |
| 60 $\mu$ F  | 0.01 $\mu$ F  |                         |
| 600 $\mu$ F | 0.1 $\mu$ F   | $\pm$ (5%rdg + 5dgts)   |
| 6 mF        | 1 $\mu$ F     |                         |
| 60 mF       | 10 $\mu$ F    | Not specified           |

**Overload protection** : 1000V

**Display Digits** : 6000

### FREQUENCY

| Range   | Resolution | Accuracy                  |
|---------|------------|---------------------------|
| 60 Hz   | 0.001 Hz   | $\pm$ (0.02%rdg + 8 dgts) |
| 600 Hz  | 0.01 Hz    | $\pm$ (0.01%rdg + 5dgts)  |
| 6 kHz   | 0.0001 kHz |                           |
| 60 kHz  | 0.001 kHz  |                           |
| 600 kHz | 0.01 kHz   |                           |
| 6 MHz   | 0.0001 MHz |                           |
| 60 MHz  | 0.001 MHz  |                           |

**Overload protection** : 1000V

**Input amplitude** :

10Hz ~ 30MHz : 600mV  $\leq$  a  $\leq$  30V<sub>rm</sub>.

Greater than 30MHz : Not specified

### TEMPERATURE

| Range          | Resolution | Accuracy                 |
|----------------|------------|--------------------------|
| -40°C ~ 40°C   | 0.1 °C     | $\pm$ (2.0%rdg + 30dgts) |
| 40°C ~ 400°C   |            | $\pm$ (1.0%rdg + 30dgts) |
| 400°C ~ 1000°C |            | $\pm$ (2.5%)             |
| -40°F ~ 104°F  | 0.2 °F     | $\pm$ (2.5%rdg + 50dgts) |
| 104°F ~ 752°F  |            | $\pm$ (1.5%rdg + 50dgts) |
| 752°F ~ 1832°F |            | $\pm$ (2.5%)             |

- **Overload protection** : 1000V
- Two-channel temperature measurement can be performed via temperature connectors.
- **Temperature Sensor** : Applicable to K type (chromel-silicel) thermocouple. Spare parts are point contact K-type (chromel-silicel) thermocouple (only applicable to the measurement when temperature is below 230°C).

**All Specifications are subject to change without prior notice.**

## KM 891 RECORDING MODE

### ● Recording Measurement Data

Press the function key SAVE (Menu) to enter the modes of single recording, continuous recording & inquire recording. Press the cursor keys  to select the following modes.

#### 1. Save

Press the function key SAVE (Menu) to record the current measuring data for once up to 20000 pieces.

#### 2. View Save

Press the function key VIEW (Menu) to view one-time recorded data. Press or long press the function key PREV(Menu) to view the previous recorded data. Press or long press the function key NEXT (Menu) to view the next recorded data. Press the function key DELETE (Menu) to delete the current recorded data. Press the function key RETURN (Menu) to return to the last menu. In addition to displaying the recorded data, the location & total number of current recorded data are displayed in the lower left corner. The date & time of current data recording are displayed in the lower right corner.

#### 3. Delete All Save

Press the function key DELETE (Menu) to delete all one-time recorded data. Press the function key YES (Menu) to confirm. To cancel the operation, press the function key NO (Menu).

#### 4. Record

Press the function key ENTER (Menu) to enter the continuous recording mode with maximum recording pieces upto 10000. Press  or  & move cursors to select the three settings as follows.

##### Edit Name

Press the function key EDIT (Menu) to name the continuous recording items. Press  or  to move the cursor & select edit locations. Press the F1 key to switch the input mode to "Uppercase" mode, then press  or  to input uppercase letters. Press the F2 key to switch the input mode to "Lowercase" mode, then press  or  to input lowercase letters. Press the F3 key to switch the input mode to "Digital" mode, then press  or  to enter numbers or symbols. Press the F4 key to save exit & exit edit mode.

##### Set Interval

Press the function key EDIT (Menu) to set the interval time of continuous recording. Press or long press  or  to move the cursors to select edit locations. Press or long press  or  to enter different numbers.

The interval time can be set as 1Sec ~ 60Min

##### Set Duration

Press the function key EDIT (Menu) to set the duration time of continuous recording. Press or long press  or  to move the cursors to select edit locations. Press or long press  or  to enter different numbers. The duration time can be set as days, hours & minutes.

##### Max Duration

Indicates the maximum time for continuous recording After completing the settings, Press the function key START (Menu) to start a continuous recording as shown in Figure 13.

The character REC shows on the display & flashes with red dot. The relevant display information is shown in the following table.

| Information    | Description                                        |
|----------------|----------------------------------------------------|
| Elapsed Time   | Run time displayed in hours:minutes:seconds        |
| Remaining Time | Time left displayed in hours:minutes:seconds       |
| Samples        | Total recording points for present recorded events |
| Start          | Time & date started from recording period          |

To manually stop recording, press the function key STOP (Menu). When stop recording, return to the menu View Recorded to view the record events. See the relevant operations in the following menu View Record.



Figure 13

| Information | Description                                                         |
|-------------|---------------------------------------------------------------------|
| Name        | Run time displayed in hours:minutes:seconds                         |
| Interval    | Time left displayed in hours:minutes:seconds                        |
| Duration    | Total recording points for present recorded events                  |
| Samples     | Time & date started from recording period                           |
| Maximum     | Maximum value for present record data                               |
| Average     | Average value for all data of present record                        |
| Minimum     | Minimum value for present record data                               |
| REC         | Position of present record incident & total number of record events |
| Start       | Time & date started from recording period                           |

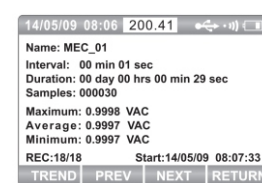


Figure 14

### 5. View Record

Press the function key (Menu) to view the information on record events as shown in Figure 14. The basic display information is in the following table.

Press the function key PREV (Menu) to display basic information on the previous record. Press the function key NEXT (Menu) to display basic information on the next record. Press the function key RETURN (Menu) to return to the previous menu. Press the function key TREND (Menu) to

view the trend chart of present record as shown in Figure 15. The display information of trend data is in the following table:

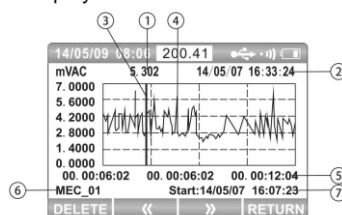


Figure 15

| No. | Description                                         |
|-----|-----------------------------------------------------|
| 1   | Measured value corresponding to cursor              |
| 2   | Date & time for measurement corresponding to cursor |
| 3   | Cursor                                              |
| 4   | Trend line                                          |
| 5   | Time label of X-axis to display during elapsed time |
| 6   | Name of record event                                |
| 7   | Time & date started from recording period           |

View the trend chart. Press or long press the F2 key to move the cursor left. The cursor moves one data t the left for each pressing. Long pressing, the cursor speeds up to move left. Press or long press the F3 key to move the cursor right. The cursor moves one data to the right for each pressing. Long pressing, the cursor speeds up to move right. Press  or  to scale the graph vertically. Press  or  to scale the graph horizontally.

Press the F1 key to delete this record. Press the function key YES (Menu) to confirm the deletion. To cancel the deletion, press the function key N0 (Menu).

### 6. Delete All Record

Press the function key DELETE (Menu) to delete all record events. Press the function key YES (Menu) to confirm. To cancel the operation, press the function key N0 (Menu).

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