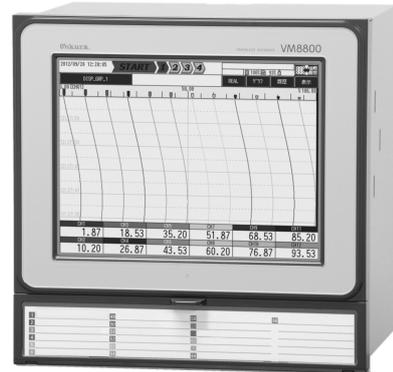


VM8800A**PAPERLESS RECORDER****OUTLINE**

This is a paperless recorder that displays measured data on the TFT-LCD in real time and stores data in CompactFlash.

The type of input such as thermocouple, RTD, D.C. voltage (current), etc. can be arbitrarily set to 48 channels at the maximum.

The data stored in Compact Flash card can be regenerated on the screen, and the use of supplied support software allows the data to be regenerated on a PC screen.

**FEATURES**

- 10.4 Inches TFT-LCD with Touch Panel
- Universal Input and Range
- Selectable Input 6, 12, 18, 24, 30, 36, 48 CH
- Various Calculation functions
- Large capacity internal storage 450MB
- Recording medium CF card and USB
- Ethernet function as standard
- PC support software supplies as standard (Data viewer, Parameter Loader)

1. Specifications**Number of inputs:**

Select one of the following according to the model type (when purchasing the product):
 6-ch terminal block type: 6, 12, 18, 24, or 30 inputs
 12-ch terminal block type: 12, 24, 36, or 48 inputs

Input circuit: Inter-channel isolation

Measurement accuracy:

See the "Accuracy ratings" table in Section 2

Measuring cycle: 100 milliseconds at every point

Input type:

DC voltage, DC current (shunt resistor required*), Thermocouple, RTD, or Other channel
 * An internal-shunt model is also available.

Burnout protection:

Provided as a standard feature for thermocouple and mV inputs. Select UP, DOWN, or None.

Reference junction compensation:

Select None, Internal, DE connection, or DH connection.

Reference junction compensation accuracy:

R, S, PR40-20, Au-Fe: ± 1 °C or lower (Internal compensation)
 K, E, J, T, G, C, N, PLII, U, L: ± 0.5 °C or lower

CMRR: 140 dB or more (at 50/60 ± 0.5 Hz)

NMRR: 60 dB or more (at 50/60 ± 0.5 Hz)

Input resistance:

mV or TC (without burnout protection): 9 M Ω or higher
 mV or TC (with burnout protection): 1 M Ω or higher
 V: 500 k Ω or higher
 mA: 100 Ω
 (External or internal shunt resistor provided)

Allowable signal source resistance:

mV or TC (without burnout protection): 10 K Ω or less
 mV or TC (with burnout protection) : 0.14 μ V/ Ω or less
 V: 500 Ω or less
 RTD: 5 Ω or less (per wire)

Decimal point position:

Can be freely specified in the range from 0 to 4. Note however that the measurement value upper and lower limits are ± 32000 as digital values.

Unit of measurement:

Any unit can be created for display (up to 8 characters can be used for each unit).

TAG name:

Up to 8 one-byte characters can be registered.

Channel exposition:

Up to 52 one-byte characters can be registered.

Channel skip:

Channel skip can be enabled or disabled for each channel. If skip is enabled for a channel, the channel will be ineligible for display and recording.

Input filtering function:

Can be enabled or disabled for each channel (first order lag filter) The time constant can be specified in the range from 0 to 99 seconds.

Moving average function:

Can be enabled or disabled for each channel. The number of samples for averaging can be specified in the range from 1 to 64.

Scaling function:

Available for DC voltage (current) input.
 Scalable range: ± 32000

Square root extraction function:

Scaling is based on the result of applying square root extraction to input values.

Scalable range: ± 32000

Cut level: Always 1%. Linear scaling is assumed for the input range from 0 to 1%.

Multiple adjustment:

Piecewise linear approximation can be applied to up to four points within the linear scaling.

2. Accuracy Ratings

Type	Range code	Range	Measurement Range		Unit	Maximum resolution	Accuracy	
DC Voltage	000	mV	-10.00	~ 10.00	-	10 μ V	$\pm(0.1\%FS + 1 \text{ digit})$	
	001	mV	-50.00	~ 50.00	-	10 μ V	$\pm(0.1\%FS + 1 \text{ digit})$	
	002	mV	-200.0	~ 200.0	-	100 μ V	$\pm(0.1\%FS + 1 \text{ digit})$	
	003	V	-1.000	~ 1.000	-	1mV	$\pm(0.1\%FS + 1 \text{ digit})$	
	004	V	-5.000	~ 5.000	-	1mV	$\pm(0.1\%FS + 1 \text{ digit})$	
	005	V	-20.00	~ 20.00	-	10mV	$\pm(0.1\%FS + 1 \text{ digit})$	
	006	V	0.000	~ 5.000	-	1mV	$\pm(0.1\%FS + 1 \text{ digit})$	
Current Input	007	V	1.000	~ 5.000	-	1mV	$\pm(0.1\%FS + 1 \text{ digit})$	
	008	mA	4.00	~ 20.00	-	0.01mA	$\pm(0.1\%FS + 1 \text{ digit})$	
Thermo Couple	010	R1	0.0	~ 1200.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	011	R2	0.0	~ 1760.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	012	S	0.0	~ 1760.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	013	B	0.0	~ 1820.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	014	K1	0.0	~ 100.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.2\%FS + 1 \text{ digit})$	
	015	K2	0.0	~ 600.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	016	K3	-200.0	~ 1370.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	017	K4	0.0	~ 1000.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	018	E1	0.0	~ 150.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	019	E2	0.0	~ 400.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	020	E3	-200.0	~ 900.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	021	E4	-200.0	~ 700.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	022	J1	0.0	~ 150.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	023	J2	0.0	~ 500.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	024	J3	-200.0	~ 650.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	025	J4	-200.0	~ 300.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	026	J5	-200.0	~ 900.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	027	T1	0.0	~ 150.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	028	T2	0.0	~ 400.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	029	T3	-200.0	~ 400.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	030	G(W-W26Re)	0.0	~ 2315.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	031	C(W5Re-W26Re)	0.0	~ 2315.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	032	N	0.0	~ 1300.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	033	PR40-20	0.0	~ 1880.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.2\%FS + 1 \text{ digit})$	
	034	U	-200.0	~ 400.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	035	L	-200.0	~ 900.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	036	Au-Fe	0.0	~ 300.0	K	0.1K	$\pm(0.5\%FS + 1 \text{ digit})$	
037	PL II	0.0	~ 1360.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$		
Resistance Temperature Detector	038	JPt100-1	-50.0	~ 200.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	039	JPt100-2	-200.0	~ 600.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	040	Pt100-1	-50.0	~ 200.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
	041	Pt100-2	-200.0	~ 600.0	$^{\circ}C$	0.1 $^{\circ}C$	$\pm(0.1\%FS + 1 \text{ digit})$	
Other	050	Other CH	-	~ -	-	-	-	

* For extended ranges of up to 3 times, the digital display accuracy is $\pm(0.3\% + 1 \text{ digit})$. In the case of DC voltage input, for extended ranges of up to 4 times, the digital display accuracy is $\pm(0.3\% + 1 \text{ digit})$.

The above table assumes the base conditions indicated below. The digital display accuracy does not include the reference junction compensation accuracy.

- Base conditions: Ambient temperature: 23 \pm 2 $^{\circ}C$
- Ambient humidity: 55 \pm 10% RH
- Supply voltage: 85 to 264 VAC
- Power frequency: 50/60 Hz \pm 1%
- Warm-up time: 30 minutes or longer since power-on

3. Calculation Channel Specifications

Number of inputs: 48 (fixed to CH49 to CH96)

Calculation cycle: 100 milliseconds

Function: Select the function from the following:

Absolute value, Power, Square root, Common logarithm, Natural logarithm, Exponentiation, Relative humidity, Maximum (of 2 inputs, continuous input, or time series), Minimum (of 2 inputs, continuous input, or time series), Average (of 2 inputs, continuous input, or time series), Integrated value, F-value calculation, Rate of change, time elapsed (second, minute, hour, or day), Dew point, or Conditional branching

Timer: Available for the following functions:

Maximum (time series), Minimum (time series), Integrated value, and Rate of change
Select either Absolute timer (second, hour, week, day) or Relative timer (second or minute). The function will be reset at the specified time.

DI trigger: Available for the following functions:

Maximum (time series), Minimum (time series), Integrated value, and Rate of change. Select one DI trigger from 1 to 4. The function will be reset upon DI trigger input.

4. Alarm Specifications

Number of alarms that can be set:

Up to four alarms can be set for each channel.

Alarm types:

Upper limit, lower limit, change rate upper limit, and change rate lower limit

Display: When an alarm occurs, it is displayed on the digital display. The color of the right border of the horizontal trend display area or the bottom border of the vertical trend graph changes to red to indicate that an alarm has occurred.

Hysteresis: Can be configured for each channel.

Alarm delay:

Delay time setting range: 0 to 3600 seconds

Alarm output (standard): None

(Option): Either DO or Relay can be selected.

Alarm display latch function: A channel where an alarm has occurred is kept blinking until the user confirms the alarm. Select ON or OFF.

New alarm:

If an alarm event occurs, a new alarm is output to a specified relay for a specified time.

Relay: Can be selected from relays Nos. 1 to 8 or inner DOs 101 to 108.

Time: 0 to 999.9 seconds

A value of "0" specifies that the alarm should be output until it is reset.

5. Relay Output Specifications

Number of outputs:

One common alarm output - C contact (standard)
One FAIL alarm output - C contact (standard)
8-relay output: C contact (No.1 to 8) (optional)
30-relay output: A contact (Nos. 1 to 30) (optional)

Contact capacity:

250 VAC at 3 A max. (resistive load)

30 VDC at 3 A max. (resistive load)

125 VDC at 0.5 A max. (resistive load)

Relay operation: Either OR or AND can be selected.

6. DO Output Specifications

Number of outputs: 16 (Nos. 9 to 24) (optional)

Contact capacity:

30 VDC at 20 mA max. (resistive load)

DO operation:

Same as in the relay output specifications

7. Inner DO Specifications

Inner Dos: 48 DOs (Nos. 101 to 148)

Auxiliary inner Dos: 20 DOs (Nos. 201 to 220)

Always ON, Always OFF, Common alarm output, Fail output, Recording started/stopped state, Record group state, CF card empty, Reserved

Contacts: Can be assigned to 30 relays and 16 DOs.

8. Record Function

External recording media:

CF card (up to 8 GB, FAT16/FAT32 only)

Mount the card from the front slot.

Available for measurement data recording/reading and parameter reading/writing. Use genuine Ohkura supplies.

USB memory (optional, up to 8 GB, FAT32 only)

Mount the memory from the front slot.

Available for measurement data recording/reading and parameter reading/writing. Use our supplies.

Internal memory:

About 450 MB; used for setting data storage and temporary measurement data storage

Recording method: Select from the following:

Start/stop recording by START/STOP button

Start/stop recording by the FUNC button

Start/stop recording by DI

Start/stop recording based on common alarm ON/OFF state

Perform recording according to the schedule (date/time specification)

* A new file name will be used each time recording starts.

Record content: Trends, events, and comment data

These types of data are integrated and recorded into a single file.

Extension: dpk

Data format: Binary only

Pre-record: A function that records the data that existed before recording is triggered by an alarm occurrence or DI ON/OFF.

Data record cycle :

Can be specified for each record group.

The cycle at which data should be recorded can be selected from 100 ms, 1 s, 2 s, 3 s, 5 s, 10 s, 15 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min, 10 min, 15 min, 20 min, 30 min, or 60 min.

Record groups: 4 groups

Display groups are assigned to record groups.

Record type: Select the data to be recorded during each record cycle, from the following:

Maximum/minimum values

Average values

Instant values

File save cycle: Record data is first saved in the internal memory, then written to the CF card at file save cycles. For one record file, you can select a file save cycle from 10 minutes, 1 hour, 2 hours, 6 hours, 12 hours, 1 day, 1 week, or 1 month.

Trend data: From the measurement data sampled, average values, instant values, or maximum and minimum values are saved at record cycles.

Event data: Recording started/stopped state, alarm ON/OFF, message content, etc. are displayed in the event log window.

Comment data: Comments on the record data can be registered at any point on the time axis. Once a comment is registered, you can confirm it in the comment list window and can jump from the list to the location where the event is registered.

Remaining memory capacity display:

The remaining capacity of the internal memory or CF card is displayed as a percent value on the top of the recorder screen. It is possible to specify whether to stop saving to the CF card or delete the oldest data when the CF card capacity is exhausted. (Recording will continue in either case.)

Save capacity: In the following conditions, data can be recorded for the time indicated in the table below.

[Conditions]

- CF card capacity: 1 GB
- Record type: Maximum/minimum recording
- Events (such as alarms and messages) are not included

Record cycle	File save cycle	1CH	24CH	48CH
0.1 second	10minute	68 days	18 days	10 days
1 second	1Hour	1 years	100 days	50 days
1 minute	1day	27 years	16 years	8 years

* If the product lifetime has expired, recording is not guaranteed.

9. Display Unit

Display screen:

10.4-inch TFT color LCD (640 x 480 dots)
The liquid crystal display may contain some pixels that are always on or always off or may be unevenly bright. Please note that these are due to LCD characteristics, not signifying a failure.

Resolution: 640 x 480 dots (VGA)

Display types:

Real-time display
(Vertical/horizontal trend display, digital display, bar graph display, and overview display)
History display
(Historical trends, event log, communication log, and security log)

Trend display color: 16 colors

Group display: 8 groups

Up to 12 channels can be registered with one group.

Split display function:

Splits the screen display so that up to 4 groups can be displayed at the same time.

Hardware buttons : Four buttons provided (START/STOP, MENU, FUNC, and LOCK)

START/STOP button: Starts and stops recording.

MENU button: Displays various setting windows.

FUNC button: Executes the assigned function based on the user selection.

LOCK button: Displays the key lock/unlock window.

Touch panel: Resistance membrane type

Screen savers: Backlight auto-OFF and alarm recovery functions

Brightness setting: 5 steps

Display language: Japanese or English

Backlight lifetime: 50,000 hours (it can be extended if the screen saver function is used)

Bitmap scaling function: A scale (such as triple scale) can be created. (For auxiliary support) (Vertical/horizontal trend display, bar graph display)

Screen capture: The displayed content can be captured and output as a file.

File type: PNG

Output destination: CF card

9.1 Vertical Trend Display

Number of display channels:

Up to 12 channels, displayed in display groups

Scale display: None, 1-level, 2-level, or 3-level can be selected.

Scale change: Touch the scale to switch to the desired channel's scale.

Alarm value display: The scale can be marked to indicate an alarm value.

Trip lines: Fixed lines can be added at any positions on the trend display. Up to four trip lines can be set on each screen. Select from the range of 0-100%.

Trend display refresh cycle: Refreshed in synchronization with the record cycle.

Digital display: Show (ON) or hide (OFF) can be selected.

Either 6-point or 12-point display is automatically selected according to the number of registered display groups.

TAG display: The display content can be selected from the channel number, TAG name, and channel exposition. The display can be scrolled if the entire TAG cannot be displayed within the field.

Alarm display: The digital values of channels on which an alarm has occurred are displayed in red (digital values are normally displayed in black.)

Split display: Can display in split-screen mode.

Digital display refresh cycle:

Always refreshed in 1-second cycles.

9.2 Horizontal Trend Display

Number of display channels:

Up to 12 channels, displayed in display groups

Scale display: None, 1-level, 2-level, or 3-level can be selected.

Scale change: Touch the scale to switch to the desired channel's scale.

Alarm value display: The scale can be marked to indicate an alarm value.

Trip lines: Fixed lines can be added at any positions on the trend display. Up to four trip lines can be set on each screen. Select from the range of 0-100%.

Trend display refresh cycle: Refreshed in synchronization with the record cycle.

Digital display: Show (ON) or hide (OFF) can be selected.

Either 6-point or 12-point display is automatically selected according to the number of registered display groups.

TAG display: The display content can be selected from the channel number, TAG name, and channel exposition.

The display can be scrolled if the entire TAG cannot be displayed within the field.

Alarm display: The digital values of channels on which an alarm has occurred are displayed in red (digital values are normally displayed in black.)

Split display: Can display in split-screen mode.

Digital display refresh cycle:

Always refreshed in 1-second cycles.

9.3 Bar Graph Display

Number of display channels:

Up to 12 channels, displayed in display groups

Scale display:

1-level, 2-level, or 3-level can be selected.

Scale change: Touch the scale to switch to the desired channel's scale.

Alarm value display:

Alarm value marks can be set near the bar.

Bar graph refresh cycle:

Always refreshed in 1-second cycles.

Digital display: Show (ON) or hide (OFF) can be selected.

Either 6-point or 12-point display is automatically selected according to the number of registered display groups.

TAG display: The display content can be selected from the channel number, TAG name, and channel exposition.

The display can be scrolled if the entire TAG cannot be displayed within the field.

Alarm display: The digital values of channels on which an alarm has occurred are displayed in red (digital values are normally displayed in black.)

Split display: Can display in split-screen mode.

Digital display refresh cycle:

Always refreshed in 1-second cycles.

9.4 Digital Display

Number of display channels:

Up to 12 channels, displayed in display groups

Scale display: None

Alarm value display: None

TAG display: The display content can be selected from the channel number, TAG name, and channel exposition.

The display can be scrolled if the entire TAG cannot be displayed within the field.

Alarm display: All alarms in levels 1 to 4 are displayed at the same time.

Split display: Can be displayed in split-screen mode.

Digital display refresh cycle:

Always refreshed in 1-second cycles.

9.5 Overview Display

Number of display channels: Up to 96 channels and effective channels are displayed regardless of groups.

Scale display: None

Alarm value display: None

TAG display: Channel numbers are always displayed as the TAG names.

Alarm display: If an alarm occurs, the channel is displayed in a red background. Channels where no alarm has occurred are displayed in a green background.

Split display: Can be displayed in split-screen mode.

Digital display refresh cycle:

Always refreshed in 1-second cycles.

9.6 Historical Trend Display

Number of display channels:

Up to 12 channels, displayed in display groups

Scale display: None, 1-level, 2-level, or 3-level can be selected.

Scale change: Touch the scale to switch to the desired channel's scale.

Digital display: Show (ON) or hide (OFF) can be selected.

Either 6-point or 12-point display is automatically selected according to the number of registered display groups.

TAG display: The display content can be selected from the channel number, TAG name, and channel exposition.

The display can be scrolled if the entire TAG cannot be displayed within the field.

Alarm display: The digital values of channels on which an alarm has occurred are displayed in red (digital values are normally displayed in black.)

Compressed time axis display: Compressed display in the ratio of 1/1, 1/2, 1/4, 1/8, or 1/16 is possible.

Split display: Not possible

9.7 Event Log Display

Display content: Alarm ON/OFF, recording started/stopped, message events, and various types of errors

Up to 200 event history records can be displayed.

9.8 Communication Log

Display content: FTP client/server connection log
Up to 200 communication history records can be displayed.

9.9 Comment Log

Display content:

Comments registered for historical trend
Up to 200 comment history records can be displayed.

Comment jump: Jump to the historical trend display of the date/time the event occurred

9.10 Security Log

Display content: Recording started/stopped, CF card/USB memory attachment/detachment, and parameter change

Up to 200 security history records can be displayed.

10. Security Specifications

10.1 Key Lock Function

Parameter lock: A function that places restrictions on viewing and/or changing of parameter settings.

System lock: A function that places restrictions on viewing and/or changing of system settings.

User registry: Up to 20 users who can use the product can be registered. For each user, a level can be specified.

10.2 Communication Security Function

Modbus security: Places restrictions on Modbus write accesses using the login function. Enable (ON) or disable (OFF) Modbus security can be specified.

10.3 Falsification Prevention Function

Damage warning function: A function that detects whether any change has been made to a measurement file after it is output to the recorder. (Data Viewer)

10.4 Parameter Log

Parameter log: A function that automatically saves parameter settings in an internal parameter file each time a setting change is made so that history data can be retained. The log can hold up to 200 entries.

Parameter log output : Log data can be output to a CF card or USB memory in form of a parameter file.

11. Communication Specifications

11.1 Ethernet (Standard)

Communication medium: 100BASE-TX

Connection: Rear connection

FTP server :

File access: Record files saved in the CF card or USB memory can be downloaded or deleted.

Access authentication:

FTP server access permission authentication can be configured.

FTP client: Data can be transferred to the FTP server.

HTTP server: Measurement values display:

Measurement values and alarm states of individual channels can be displayed as digital values on the PC.

SNTP client: The time can be synchronized with the SNTP server time.

MODBUS TCP/IP:

Data loading: Measurement values and settings can be loaded using the Modbus TCP protocol.

Data write: Settings can be written using the Modbus TCP protocol.

11.2 RS-485 (Optional)

Protocol: MODBUS RTU

Communication speed: 9600, 19200, or 38400 bps

Communication method:

Two-wire half-duplex, start-stop synchronization

Data format:

Data length: 8 bits

Stop bit: 1 bit

Parity: Even, odd, or none

Maximum device connections:

32 including the master (multi-drop)

Communication distance: Up to 500 m (total length)

12. Power Supply Unit

Rated supply voltage: 100 to 240 VAC

Operating supply voltage range: 85 to 264 VAC

Rated power frequency: 50/60 Hz

Operating power frequency: 45 to 65 Hz

Instantaneous power failure: Normal operation possible if the failure duration is 50 ms or shorter.

Withstand voltage:

2 kVAC, 1 min between power and ground terminals

0.5 kVAC, 1 min between input and ground terminals

0.5 kVAC/1 min between input terminals

Insulation resistance: 20 MΩ or higher at 0.5 kVDC between each terminal and the ground terminal

Power consumption:

Supply voltage	Power consumption
100 VAC	65 VA or less
240 VAC	100 VA or less

13. Standards compliance

CE Marking: EMC Directive: EN61326-1

Low Voltage Directive:

EN61010-1 (certification pending)

14. Conditions for Normal Operation

Ambient temperature: 0 to 50°C

Ambient humidity: 20 to 80% RH (at 0 to 40°C)

Mounting position: Front inclination of 0°, rear inclination of within 30°, and horizontally level

Mounting method:

Panel-embedded (panel thickness: 2 to 15 mm)

Shock resistance : 2 m/s² or less

Seismic specification

(when the product is secured by seismic support):

Vertical direction

2 to 5 Hz, amplitude of ±10 mm

5 to 33 Hz, 9.8 m/s² or less

Horizontal (front/rear or left/right) direction

2 to 9 Hz, amplitude of ±10 mm

29.4 m/s² or less at 9 to 33 Hz

15. Structure

Mounting method:

Panel-embedded mounting (vertical panel)

Material: Case: Steel sheet

Front panel: Aluminum die cast

Coating color: Case: Metallic silver

Front panel: Black (standard)

Outside dimensions:

Long type: 288 mm (W) x 288 mm (H) x 340 mm (D)

Short type: 288 mm (W) x 288 mm (H) x 260 mm (D)

Weight: Short type: About 10 kg (30 inputs, no option)
Long type: About 11 kg (30 inputs, no option)
External terminal block: M4 screw terminals

16. Other

Clock: Calendar function provided (calendar year)
 Accuracy ± 10 ppm (monthly error of approximately 30 seconds) or less
 This value does not include errors at power ON/OFF.

Memory backup: Parameter data is saved in internal memory.
 The clock data is backed up by the built-in lithium battery (the lifetime of which is about 10 years).

17. Transportation and Storage Conditions

Temperature: -10 to 60°C
Humidity: 5 to 90% RH
Vibration: 2.45 m/s² at 10 to 60 Hz
Shock: 249 m/s² or less (when packaged)

18. Support Software

Supported PC models: PC/AT-compatible PCs
Disk device: CD-ROM drive supporting Windows XP/Vista/7/8/8.1
Hard disk capacity: Free space of at least 500 MB
OS: Windows XP/Vista/7/8/8.1
Printer: Printer and printer driver supporting Windows XP/Vista/7/8/8.1

18.1 Loader Software Running on PCs

Functions: Recorder parameter set-up and change
 Calculation channel setting
 File write

18.2. Data Viewer Software Running on PCs

Functions: Measurement data file viewing
 Graph printing
 Comment entry

19. Option 2

This option is unnecessary when setting up by a user.

CODE	FUNCTION	DESCRIPTION
A01	Open input protection	Sets Indicator at over 100% or 0% per Inputs when input becomes open for TC or ± 50 mV max. Input.
A02	Zone indicate	Indicating on the Chart track ranged per Inputs. (*1)
A03	Expanded/compression indicate	Partial compression and enlargement in the same range can be done. (*1)
A08	Digital Filter	Applies a digital filter (first-order-lag filter) to measurement value, and performs display and record.
A10	Integration sum	Indicates and records sum among channels. (*2)
A11	Integration balance	Indicates and records balance among channels. (*2)
A12	Average among channels	Indicates and records average among channels. (*2)

A13	Moving average	Indicates and records the moving average results of the measurement value of a specification channel.
A14	Calculation channels	Uses the independent calculation function of a maximum of 48 channels, and indicates and records a result.
A15	Logarithmic scale	Indicates and records measurement value by logarithmic scale. (*2)
A16	Alarm display	Indicates the specified H and L alarm values on the scale.
A17	Trip line	Indicates a fixed line on the arbitrary parts on a graph.
A18	Auto display	Changes display groups automatically by a fixed cycle.
A19	Progress Time Counter	Indicates progress time, such as the record time, ON time of DI, alarm occurrence time.
E01	Temperature balance	The actual temperature after subtracting the reference temperature of reference channel is designated and recorded.
E02	New alarm	New alarm channel is output in one-shot relay.
E03	Multipoint Adjustment	Adjusts the input of a specification channel by a multipoint, and performs directions and record.
E10	Key lock	Restricts operation on the items specified in Locked items area when the lock applies. Once the lock is reset, operation on all setting items is permitted User control.
E11	User control	Permits each user to perform operations on the items specified for the user when the user is logged in. When the user is logged out, operation on all setting items is restricted.
E12	Special scale	Indicates arbitrary image on a scale. (only as for the recorder)
D02	DE connection	To execute the compensating temperature, taking in, the inside temperature of outside compensating box by thermocouple input of the set channel.
D03	DH connection	To execute the compensating temperature, taking in, the inside temperature of outside compensating box by the voltage wire (copper wire) of the set channel.
N01	FTP server	Enables access of a CF card from an external FTP client.
N02	FTP client	Outputs record data to an external FTP server automatically.
N03	SNTP Client	Acquires time information from an external SNTP server, and synchronizes.

*1 Indication accuracy rating may change by setup.

*2 Carry out using A14 operation channel. Please unite A14 and specify.

●DI REMOTE FUNCTION

CODE	FUNCTION	DESCRIPTION
B01	DI Record	Close : Recording start Open : Recording stop It can assign each recording group.
B02	LCD ON/OFF	Close : LCD ON Open : LCD OFF (according to the LCD settings)
B03	DI Trigger	Close : executes DI Trigger function.
B04	Alarm Reset	Close : execute Alarm reset
B05	Message Record	Close : execute Message recording

20. Additional Functions (Optional)

20.1 Dis

Number of DI inputs:

Non-voltage contact inputs (5 or 24 inputs) sharing a common ground

DI input function:

Selected from the following

Record group start/stop

Message

LCD backlight ON/OFF control

DI trigger

Alarm display unlatch

A DI input can also be used as a measurement value.

Recognizable pulse width: 500 ms or wider

20.2 Relays

Number of relay outputs: 8 or 30

Relay output function: See Section 5 for details.

20.3 Dos

Number of DO outputs:

Open-collector output (16 outputs) sharing a common ground

DO output function: See Section 6 for details.

20.4 RS-485

See Section 11.2 for details.

20.5 USB Port

Number of ports: One port at the front. The USB-A port is a female connector.

Function: USB memory connection

USB memory connection: Mass Storage Class

USB 2.0 High-Speed (HS) compatible. Used for measurement data recording/reading and for parameter reading/writing.

21. MODEL CODE NUMBER

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
V **M** **8** **8** **A** **O**

[Input points]

Col.	Specification	Code
5-6	06 points	06
	12 points	12
	18 points	18
	24 points	24
	30 points	30
	36 points	36
	48 points	48

[Communication, USB]

Col.	Specification	Code
8	Ethernet	1
	Ethernet+USB	2
	Ethernet+RS485	3
	Ethernet+USB+RS485	4
	Auxiliary	9

[DI, DO, relays]

Col.	Specification	Code
9-10	None	00
	DO(16)	01
	DI(24)	02
	DI(5)	03
	8 relays	04
	DO(16)+DI(24)	05
	DO(16)+DI(5)	06
	DO(16)+8 relays	07
	DI(24)+DI(5)	08
	DI(24)+8 relays	09
	DI(5)+8 relays	10
	DO(16)+DI(24)+DI(5)	11
	DO(16)+DI(24)+8 relays	12
	DO(16)+DI(5)+8 relays	13
	DI(24)+DI(5)+8 relays	14
	DO(16)+DI(24)+DI(5)+8 relays	15
30 relays	16	

[Painting]

Col.	Specification	Code
12	<Door paint color>	
	N1.5 (standard)	1
	Auxiliary	9

[Structure]

Col.	Specification	Code
13	<Structure>	
	6-ch terminal block, short-depth, non-antiseismic (standard)	A
	6-ch terminal block, short-depth, antiseismic	B
	6-ch terminal block, long-depth, non-antiseismic	C
	6-ch terminal block, long-depth, antiseismic	D
	12-ch terminal block, short-depth, non-antiseismic	E
	12-ch terminal block, short-depth, antiseismic	F
	12-ch terminal block, long-depth, non-antiseismic	G
12-ch terminal block, long-depth, antiseismic	H	

[Software option]

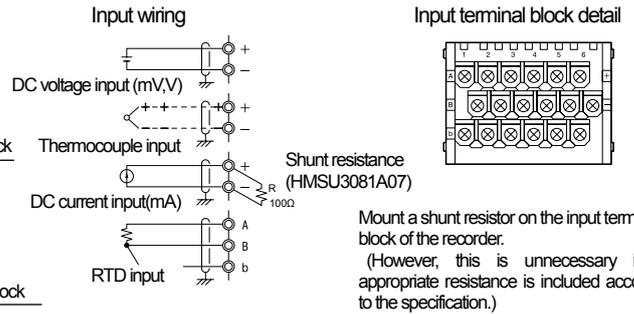
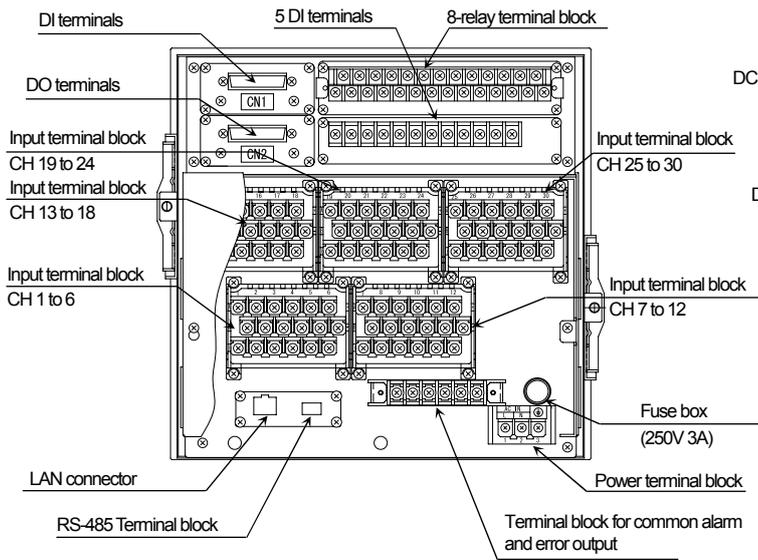
Col.	Specification	Code
14	<Option>	
	No	0
	Yes	1

[Auxiliary]

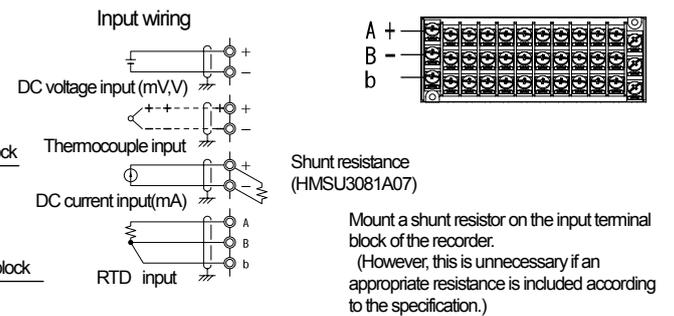
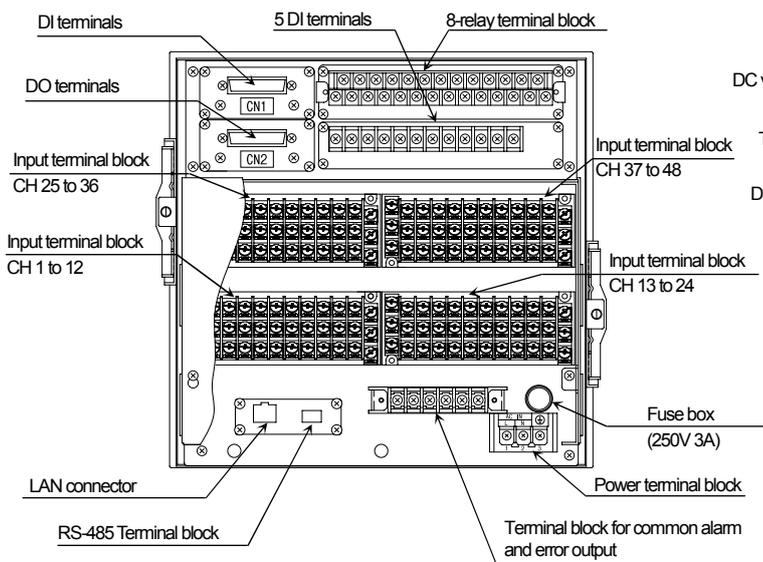
Col.	Specification	Code
15	<Auxiliary specification>	
	No	0
	Auxiliary hardware	X
	Auxiliary software	Y
	Aux. HW and spec. SW	Z

22. Terminal Layout and Power Wiring

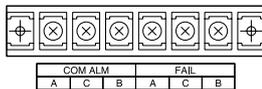
Terminal Block Layout (6-channel Terminal Block)



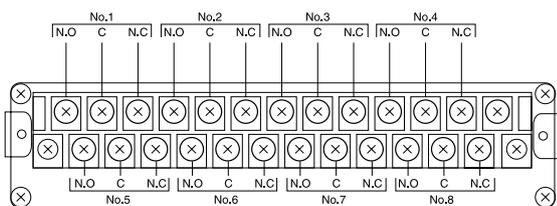
Terminal Block Layout (12-channel Terminal Block)



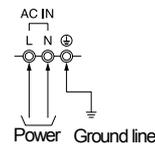
COM alarm output and FAIL output terminal block detail



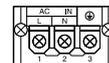
Alarm outputs (8 contacts) terminal block



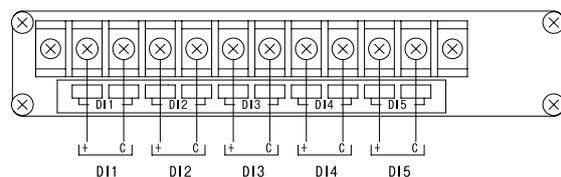
Power terminal block wiring



Power terminal block detail

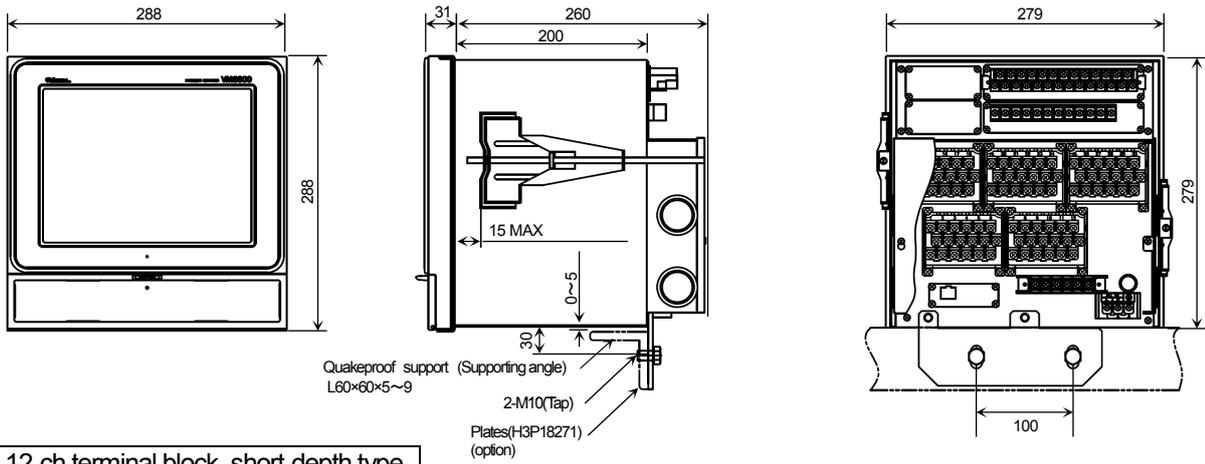


5 DI inputs terminal block

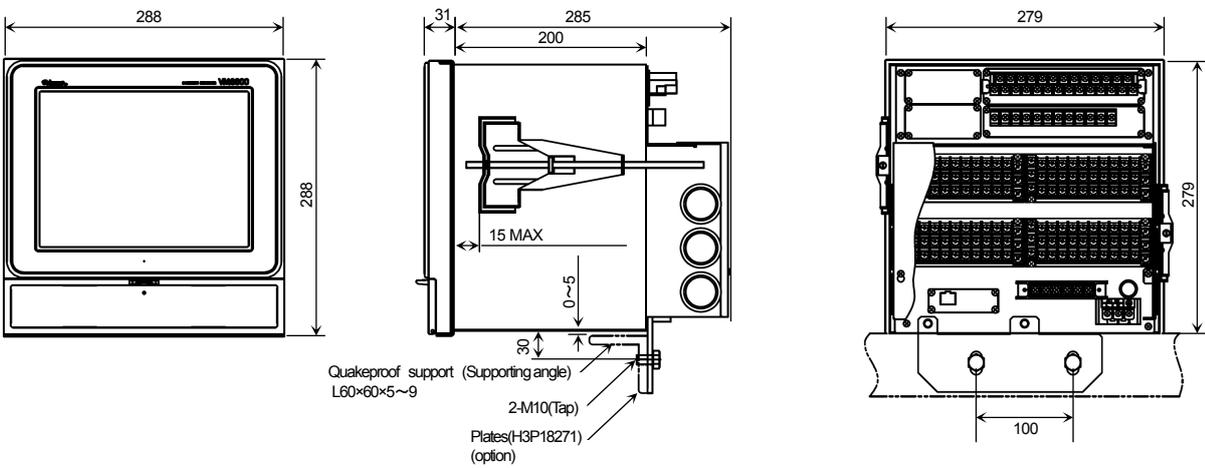


23. Outside Dimensions

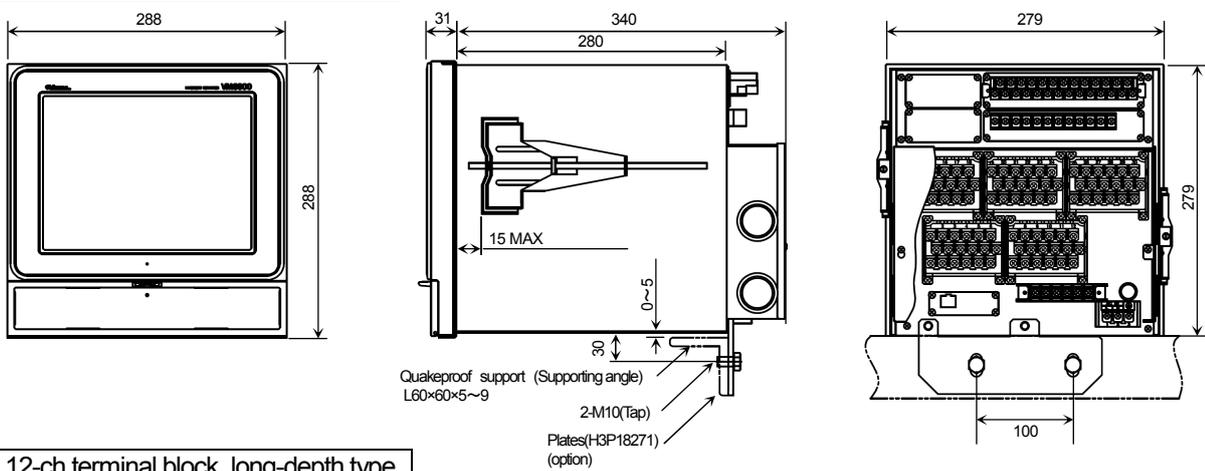
6-ch terminal block, short-depth type



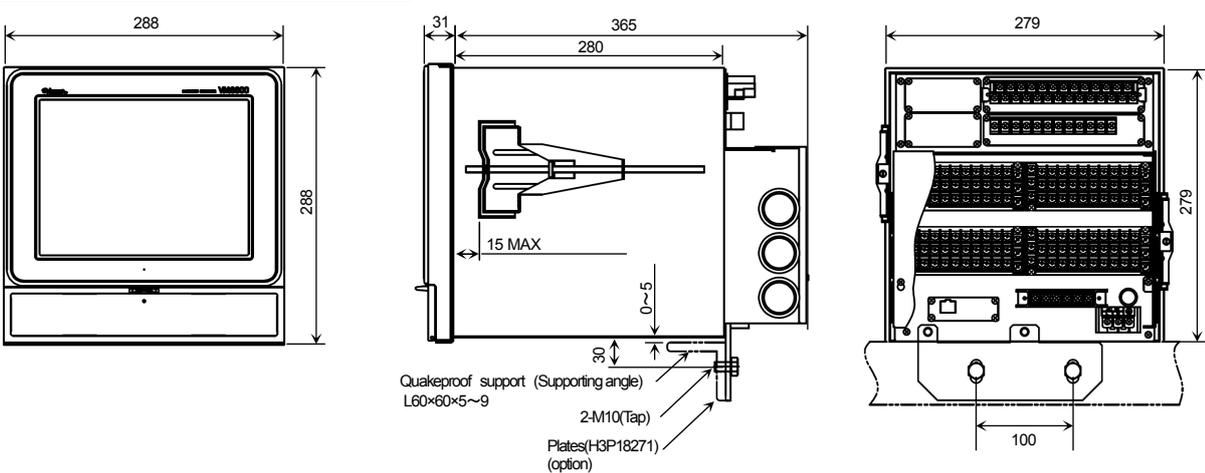
12-ch terminal block, short-depth type



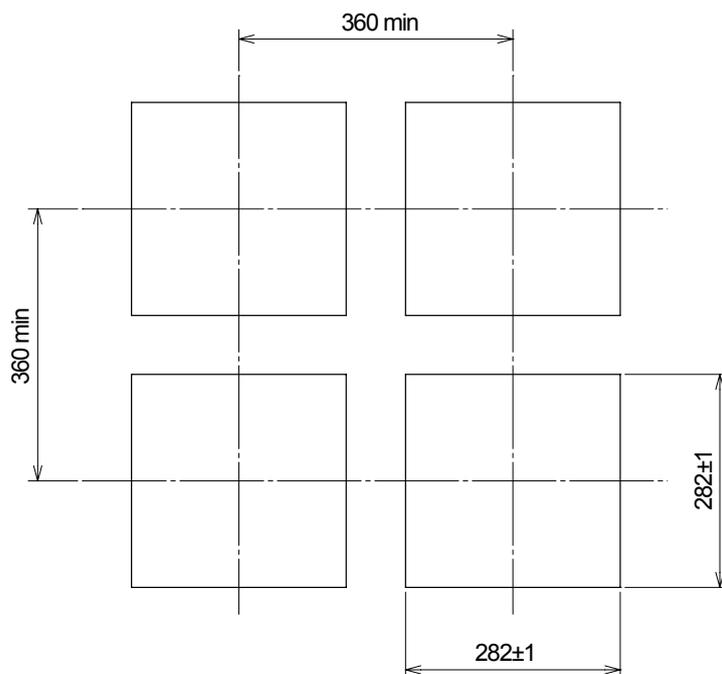
6-ch terminal block, long-depth type



12-ch terminal block, long-depth type



24. Panel Cut Dimensions



25. STANDARD ACCESSORY

Item	Model	Quantity
Panel mounting bracket	H4A13299	2
CD-ROM	PC support software	1
	Instruction manual	
CF card (1 GB)	WMSU0682A01	1
Fuse(250V 3A)	WPSJ011D000002A	1

(Note) CF card is not attached.

Please purchase in a personal computer shop etc.

26. OPTIONAL ITEMS

Name	Model
Shunt resistor for DC current input (100Ω±0.1%)	HMSU3081A07
CF card (1 GB)	WMSU0682A01
CF card (8 GB)	WMSU0682A08
USB memory (2 GB)	WMSU0683A02
Instruction Manual for the Paperless Recorder (printed version)	WXPVM88mnA0001
Data Viewer Instruction Manual (printed version)	WMSU0685A0001
Parameter Loader Instruction Manual (printed version)	WMSU0685A0002

Note 1) Windows XP/Vista, Excel are the registered trademarks of Microsoft Corporation of the U.S.A.

Note 2) Modbus is the registered trademark of Schneider Electric.

Note 3) Ethernet is the registered trademark of Xerox Corporation.

⚠ CAUTION

Do not install this device before consulting instruction manual

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Specifications are subject to change without notice.

For further information, a quotation or a demonstration please contact to:

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