

## Standard specifications

### Weight and dimensions

MV1000 external dimensions:	189 (W) × 177 (H) × 259 (D)
MV1000 weight:	Approx. 3.5 kg (MV1024)
MV2000 external dimensions:	307 (W) × 273 (H) × 260 (D)
MV2000 weight:	Approx. 5.6 kg (MV2048)

### Input components

Number of inputs:	MV1000: 4, 6, 8, 12, or 24 channels MV2000: 8, 10, 20, 30, 40 or 48 channels
Measurement intervals:	MV1004, MV1008, MV2008: 125 ms, 250 ms, or 25 ms in High-Speed mode MV1006, MV1012, MV1024, MV2010, MV2020, MV2030, MV2040, MV2048: 1 s (100 ms not possible for A/D integration time), 2 s, 5 s, or 125 ms in High-Speed mode * A/D integration time is fixed at 1.67 ms in High-Speed mode
Points to consider when using High-Speed mode:	When using High-Speed mode (an A/D integration time of 1.67 ms) with the MVAdvanced, power supply noise and other factors may cause the measured values to fluctuate. If this is the case, then measure using Normal mode (an A/D integration time of 16.7 ms, 20 ms, or 100 ms).
Input types:	DCV (DC voltage: 20, 60, 200 mV, 2, 6, 20, 50 V, 1-5 V) TC (thermocouple type: R, S, B, K, E, J, T, N, W, L, U, WR) RTD (resistance temperature detector: Pt100, JPt100) DI (at the contact input or the TTL level) DCA (DC current; with external shunt resistor)
Measuring range, measurement accuracy, and display resolution by typical input type	

Input	Range	Measurement accuracy (when the integration time is 16.7 ms or more)	Display resolution
DCV	1-5 V	±(0.05% of rdg+3 digits)	1 mV
Thermocouple*	K	±(0.15% of rdg+0.7°C)	0.1°C
Resistance thermometer detector	Pt100	±(0.15% of rdg+0.3°C)	0.1°C

\* Does not include the accuracy of reference junction compensation

### Display

Display device:	MV1000: 5.5-inch TFT color LCD (320 × 240 dots) MV2000: 10.4-inch TFT color LCD (640 × 480 dots) Note: The LCD may contain some pixels that are always lighted or that never light, and variations in brightness may occur due to the characteristics of liquid crystals. Please note that these are not defects.
Display groups:	Number of display groups: MV1000: 10 groups, MV2000: 36 groups Maximum number of channels assignable per group: MV1000: 6 channels, MV2000: 10 channels
Displayed colors:	Trend/bar graph display: 24 available colors Background: White or black
Trend display:	Display types: Vertical, horizontal, horizontal wide, separated horizontal.
Bar graph display:	Direction: Vertical or horizontal
Digital display:	Update rate: 1 s
Overview display:	Channel number: Displays a list of all measurement and MATH channels along with their alarm states. Information display: Alarm Summary display, Message Summary display, Memory Summary display, Report display, Relay Condition display, Modbus Condition display
Log display:	Log display content: Log-in log, Error log, Transmission log, FTP log, Web log, E-mail log, SNMP log, DHCP log, Modbus log
Tag display:	Max. displayable characters: 16 Displayable characters: Alphanumeric characters
Message display:	Max. displayable characters: 32 Displayable characters: Alphanumeric characters Historical display function: Allows for the display of data stored to internal or external memory.
LCD screen saver function:	You can dim or turn OFF the LCD backlight if there are no keystrokes for a set time (1, 2, 5, 10, 30 min, or 1 hour).
Display screen registration function:	You can assign a name to a display screen and register it. Max. registered screens: 8

### Memory functions

External media:	Media: Compact Flash (CF) card
Internal memory:	Media: Flash memory Memory size: 80 MB or 200 MB (selected when purchasing)
Sample time:	Examples of internal memory sample times (with the MV1012 recording only event data files for 12 measuring channels and no calculation channels).

Save interval	125 ms	1 s	5 s	10 s	60 s	120 s
Sample time (with 200 MB of memory)	Approx. 217 hours	Approx. 72 days	Approx. 362 days	Approx. 723 days	Approx. 12.1 years	Approx. 24 years
Sample time (with 80 MB of memory)	Approx. 86 hours	Approx. 28 days	Approx. 144 days	Approx. 289 days	Approx. 4.8 years	Approx. 9.6 years

Max. savable data files:	400 (savable display data files and event data files combined)
Manual save:	Saves data files to the internal memory manually. You can save all data or only selected data. Destination drive: CF card or USB memory
Auto save:	Save displayed data: Saves data to the CF card at a set interval Save event data: Saves data to the CF card at a set interval (in Free Trigger mode) Save when finished sampling (when setting the trigger)
Data formats:	When saving to external media, both event data and display data can be saved in either binary or text format (data is always stored to internal memory in binary format).
Sampling interval:	Display data: Varies according to the waveform update rate Event data: User-set
Manual sample data:	You can choose when to save measurement/MATH channel data files to the internal memory or to a CF card.
Report data (only available if the unit is equipped with the calculation option):	Saves calculation results as data files to a CF card at the set times.
Types:	Hourly, daily, hourly + daily, daily + weekly, daily + monthly
Trigger function:	Data can be saved using Free mode or Trigger mode. When using Trigger mode, the user must set the data length, pre-trigger, and trigger source.
Snapshot function:	Saves the displayed screen image data to a CF card.
Data file loading:	Data files saved to a CF card or to USB memory (if equipped with the USB option) can be loaded and displayed. Loading and saving setup data: Settings data can be saved and loaded in Binary format.
USB interface:	USB specification 1.1 host
Ports:	2 (front and back)
Connectable devices:	Keyboards: 104 keyboards (US) compliant with USB HID Class Version 1.1 109 keyboards (Japanese) External media: USB memory (not all types of USB memory are guaranteed to work)

### Alarm functions

Alarms settable per channel:	4
Alarm types:	High/low limit, delay high/low limit, difference high/low limit, high/low limit on rate of change
Delay alarm time:	Can be set according to channel (cannot be set according to level) Range: 1 to 3600 seconds
Time intervals for the rate-of-change alarm:	A factor of 1 to 32 times the measurement interval (applies to all channels)
Display:	When an alarm occurs, the state (the alarm type) or common alarm state appears on the digital display

### Event action function

Description:	A set action occurs in response to a set event.
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### Security functions

Description:	You can customize key lock and login security functions for any transmission or keyboard command.
Key Lock:	Sets a password-protected key lock on all command keys and FUNC screen operations.
Login:	Limits access to the MVAdvanced with a login that prompts for username and password.
Security levels and user numbers:	System administrators: 5 General users: 30

### Clock functions

Clock:	Comes with a calendar function (for the western calendar)
Clock accuracy:	±10 ppm (does not include the less than one second delay that occurs when turning the power on)

### Communication functions (Ethernet)

Electrical specifications:	IEEE 802.3 compliant (DIX frame)
Transmission media:	Ethernet (10BASE-T)
Protocols implemented:	TCP, UDP, IP, ICMP, ARP, DHCP, HTTP, FTP, SMTP, SNMP, Modbus, and MV dedicated protocol
E-mail transmission functions (E-mail client):	Automatically sends an e-mail in response to alarms and other events.

FTP client functions:	Automatically sends data files to an FTP server Transmittable files: Display data files, event data files, report data files, screen snapshot data files
FTP server functions:	Can transfer and delete files, manipulate directories, and produce file lists remotely from a network computer.
Web server function:	Displays MV screen images on a Web browser.
SNTP client function:	Queries a specified SNTP server for the time and synchronizes with it. Time query methods: Set interval, start of memory sample, manual
SNTP server function:	Transmits the MV time settings via SNTP protocol.
DHCP client function:	Automatically retrieves the network address settings from a DHCP server. Information retrieved automatically: IP address, subnet mask, default gateway, DNS information
Modbus client function:	Loads data from other devices using Modbus protocol.* * The calculation option (/M1) or the external input channel option (/MC1) is required to load data.
Modbus server function:	Data can be read from the MV using the Modbus protocol.

### Batch function

Description:	Allows for data display, data management, text field functions, and batch comment input using batches.
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### Power supply

AC power supply:	Rated supply voltage: 100 to 264 VAC (auto switching)
DC power supply:	Rated supply voltage: 12 VDC/24 VDC
AC power supply:	Operating supply voltage range: 90 to 132, 180 to 264 VAC
DC power supply:	Operating supply voltage range: 10.0 to 28.8 VDC

Power consumption  
MV1000 power consumption

Supply voltage	With LCD screen saver on	Normal use	Maximum
100 VAC	15 VA	30 VA	45 VA
240 VAC	25 VA	40 VA	60 VA
12 VDC	7 VA	14 VA	24 VA

MV2000 power consumption

Supply voltage	With LCD screen saver on	Normal use	Maximum
100 VAC	28 VA	40 VA	65 VA
240 VAC	38 VA	54 VA	90 VA
12 VDC	9 VA	18 VA	35 VA

Rechargeable battery drive (MV1000 only)	Powered by a dedicated AC adapter or the dedicated Ni-MH battery pack. The dedicated Ni-MH battery pack can only be charged when connected to the main unit. If both the AC adapter and battery pack are connected, the AC adapter will be used.
Continuous operation time	13 hours maximum (room temperature) under the following conditions: No USB connection; no option terminals; LCD backlight saver: OFF; transition time: 1 minute; external media saving: Auto-save. Continuous operation time differs according to various conditions.
Normal operating conditions	
Supply voltage:	AC power supply: 90 to 132, 180 to 250 VAC DC power supply: 10.0 to 28.8 VDC
Supply frequency:	50 Hz±2%, 60 Hz±2%
Ambient temperature:	0 to 40°C
Ambient humidity:	20 to 80% RH (at 5 to 40°C)

### Optional specifications

- Alarm output relays (/A1, /A2, /A3, /A4)
 

Output points:	Activates the relay output on the rear panel when an alarm occurs Choose from 2, 4, 6, or 12* * Only with the MV2000 Not installable on the MV1008 or MV1024
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- Serial communication (/C2, /C3)
 

Media:	EIA RS-232 (/C2) and RS-422/485 (four-wire) (/C3) compatible
Protocols implemented:	The dedicated protocol and the Modbus (master/slave) protocol
Settings/measurement server functions:	Using the dedicated protocol, the following functions are available Settings and commands equivalent to the unit's key commands. Data output
Modbus master/slave functions:	Loads data from other devices using Modbus protocol.* * The calculation option (/M1) or the external input channel option (/MC1) is required to load data.
- Fail/status output relay (/F1)
 

	Activates a relay output upon the detection of a CPU abnormality on the MV or a set condition.
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- Calculation functions (/M1)
 

	Performs calculations as well as displays and records the trends or numeric values of calculation channels
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- Max. calculation channels:
 

listed below.
MV1004, MV1008: 12 channels
MV1006, MV1012, MV1024: 24 channels
MV2008: 12 channels
MV2010, MV2020, MV2030, MV2040, MV2048: 60 channels
- Max. equation length: 120 characters
- Calculation types:
 

General calculations: Basic arithmetic, square root, absolute value, common logarithm, natural logarithm, exponent, power, relational operations (<, ≤, >, ≥, =, ≠), logical operations (AND, OR, NOT, XOR)
Statistical calculations: TLOG (maximum value, minimum value, average value, integrated value, and P-P value for time series data)
CLOG (maximum value, minimum value, average value, integrated value, and P-P value for a set channel)
Special calculations: PRE, HOLD(a):b, RESET(a):b, CARRY(a):b
Conditional statement: [a?b:c]
Max. settable constants: 60 (K01 to K60)
- Report function:
 

Report types: Hourly, daily, hourly + daily, daily + weekly, daily + monthly
Calculation types: Reports can be calculated using a combination of up to four of the following: Average, maximum value, minimum value, integrated value, and instantaneous value.
- Cu10/Cu25 RTD input/3-wire isolated RTD input (/N1)
 

Enables the use of Cu10 and Cu25 inputs in addition to the standard inputs.
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- 3-wire isolated RTD input (/N2)
 

All RTD (resistance thermometer detector) terminals (A, B, and b) are isolated.
Note: Only available with the MV1006, MV1012, MV2010, MV2020, MV2030, MV2040, and MV2048
- External input (/N3)
 

Enables the use of the following thermocouples and RTDs in addition to the standard inputs.
TC: Kp vs Au7Fe, PLATINEL, PR40-20, NiNiMo, W/Wre26, TypeN(AWG14)
RTD: Pt25, Pt50, Ni100(SAMA), Ni100(DIN), Ni120, J263°B, Cu53, Cu100
- Remote control (/R1)
 

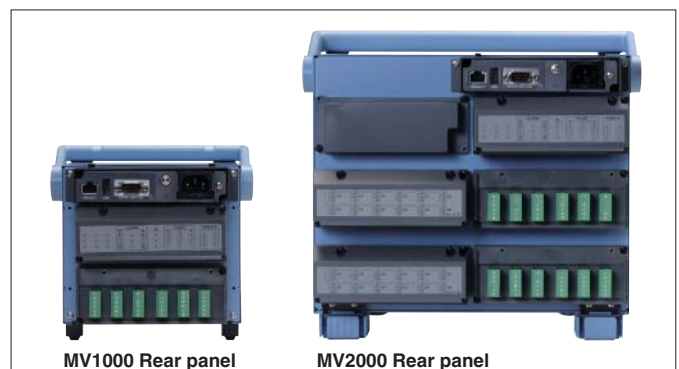
The MV can be controlled through contact input (up to 8 inputs can be set).
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- 24 VDC transmitter power supply (/TPS2\*, /TPS4\*)
 

Output voltage: 22.8 to 25.2 VDC (for rated current load)
Rated output current: 4 to 20 mADC
Maximum output current: 25 mADC (overcurrent protection level: approximately 68 mADC)
* /TPS2 is only available for the MV1000, /TPS4 is only available for the MV 2000
- Pulse input (/PM1)
 

Contact and open-collector pulse input is possible through the use of special remote input terminals.
The calculation functions (/M1) and remote control (R1) options are included in the pulse input option.
Number of Inputs: 3 channels (however, if the remote control input terminals are used for pulse input, then up to 8 channels can be made available)
Input methods: Photocoupler isolation (no isolation between channels)
Internal isolated power supply (approx. 5 V)
Input types: Dry contact, open collector (TTL or transistor)
- Input value correction (/CC1)
 

Ten-segment linearizer approximation can be used on every measurement channel to correct input values.
Settable broken-line points: 2 to 16
- Channel expansion (/MC1, only available on the MV2000)
 

You can use the Modbus master function to load data from other devices, and set data through the use of communication input commands. Additional channels are provided for communication input.
Note 1: Only available with the MV2010, MV2020, MV2030, MV2040, and MV2048
Note 2: When equipped with the external input channel option, the High-Speed mode measurement interval is unavailable.
Number of external input channels: 240 channels (channel numbers 201 to 440)



MV1000 Rear panel

MV2000 Rear panel