INSTRUCTION MANUAL

PAPERLESS RECORDER
(color LCD display)

MODEL **VR4896E-G2**

BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.

This product is for use in general industrial environments, therefore may not be suitable for applications which require higher level of safety (e.g. safety or accident prevention systems) or of reliability (e.g. vehicle control or combustion control systems).
For safety, installation and maintenance of this product must be conducted by qualified personnel.

■ PACKAGE INCLUDES:

Paperless recorder
(body + mounting bracket × 2 pcs.+ watertight packing) ...(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.
For more details, refer to the operating manual (EM-7061-B) downloadable at our web site.

■ SD CARD

To record the data, prepare the following model number:
Available for purchase from us. Consult us.

- Manufacturer: Hagiwara Solutions
  Model: MSDB-016GS(V01SLS
  Capacity: 16 GB

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures* to ensure the CE conformity.
  * For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.
- In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-2 and properly indicate it.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  24V DC ±10%,
  ≤ 2.4W, ≤ 100mA (at 24V DC)
- Supplying any level of power other than specified above can damage the unit or the power source.
- Power supply start-up characteristics must reach within 5 seconds to the operational voltage range of the unit.
- Power cables and signal I/O cables for the unit must be located separately.
- Power cables, signal I/O cables and communication cables for the unit should not be bundled together.
- To increase noise resistance of the power input wires, twist the strands before connecting.

■ GENERAL PRECAUTIONS

- Before you remove the unit, turn off the power supply and I/O signals for safety.
- Do not disassemble or modify the unit in any way. Doing so may result in a fire or an electrical shock.
- Do not block the unit's ventilation openings or use it in areas where heat accumulates.
  Additionally, do not store or use it under high-temperature conditions.
- Do not use this unit in an environment where flammable/corrosive gases are present.
- Do not store or use this unit in locations subject to direct sunlight, or where excessive dust, dirt or metal particles are present.
- This unit is a precision instrument. Do not store or use it where large shocks or excessive vibration can occur.
- Do not store or use this unit in environments subject to chemical evaporation (such as that of organic solvents), or where there are chemicals and/or acids present in the environment.
- Do not use paint thinner or organic solvents to clean this unit.
- Observe the environmental conditions when using this unit.
- Wait at least 15 seconds before turning on the power supply after it was turned off.

MG CO., LTD. www.mgco.jp
5-2-55 Minamitsumori, Nishinari-ku, Osaka 557-0063 JAPAN

■ ENVIRONMENT

- Indoor use.
- This unit is designed to be mounted on a vertical panel. It is not suitable for a slanted or a horizontal panel surface.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 10 to 90% RH in order to ensure adequate life span and operation.

■ GROUNDING

- Be sure to determine in advance the most stable grounding point in the environment and earth the unit's FE terminal and that of connected devices to it in order to protect the devices from dielectric breakdown.
- Grounding is also effective to eliminate noise that could cause errors in the unit's operation.

■ SD CARD

- Do not turn off the power supply to the unit or reset it during data recording or history recording. The SD card may be destroyed.
- Observe the described procedure when you need to replace the SD card during recording.
- Confirm the sides and the connector position of the SD card when inserting one to the card slot.
- Do not touch the metal terminal with your hands or metallic tools.
- SD cards have a life span. Back up your important data.

■ LCD PANEL

- The LCD panel's liquid contains an irritant. If the panel is damaged and the liquid contacts your skin, rinse immediately the contact area with running water for at least 15 minutes. If the liquid gets in your eyes, rinse immediately your eyes with running water for at least 15 minutes and consult a doctor.
- The following phenomena are LCD characteristics, and NOT a product defect:
  - LCD screen may show uneven brightness depending upon displayed images or contrast settings.
  - The LCD screen pixels may contain minute black-and-white-colored spots.
  - The color displayed on the LCD screen may appear different when seen from outside the specified viewing angle.
  - When the same image is displayed on the screen for a long time period, an afterimage may appear when the image is changed. If this happens, turn off the unit and wait for a while before restarting it.
- To prevent an afterimage:
  - Set the screensaver when you plan to display the same image for a long time period.
  - Plan to change the screen image periodically so that the same image does not remain for the long time period.
- The LCD surface is covered with a protective film at the factory shipment. Remove it once the unit is installed.

■ MINIMIZING NOISE INTERFERENCE TO ANALOG SIGNAL CABLES

- Noise entering through the analog signal cables may cause irregular measurement values, degradation of overall accuracy, and malfunction of the product. We recommend that you would conduct wiring to the unit with the following points of caution.
- Do not install cables close to noise sources (high frequency line, etc.).
- Do not bind the analog input cables together with those in which noises are present. Do not install them in the same duct.

■ DO NOT APPLY OVERRANGE INPUT

- Do not apply voltages beyond the maximum input range to prevent failure.

■ INTERNAL CLOCK

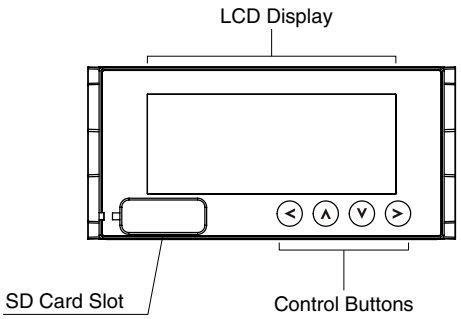
- The internal clock data is stored in memory powered by a backup battery while the unit is without external power supply.
- The data will be reset to its default status when the battery is used up while the unit is left without power supply for a long time period. The clock adjustment will be necessary once the power is restored.
- Once the power is restored, the unit starts recharging the battery. It will be full in approximately in 36 to 48 hours.
- Battery backup: approx. 2 month

■ AND ....

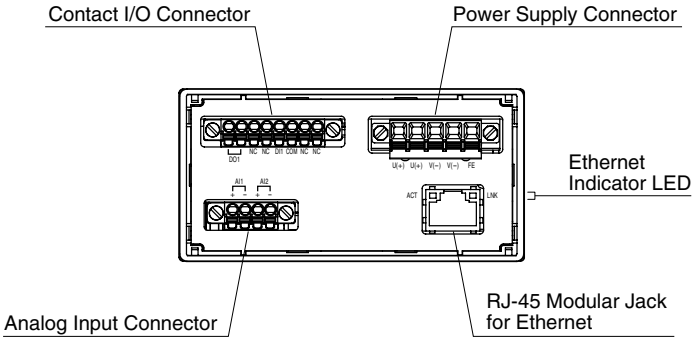
- We recommend use of an UPS to supply power backups.
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

■ **FRONT VIEW**



■ **REAR VIEW**



■ LCD DISPLAY

TFT Color Display. Various displays are performed.

■ CONTROL BUTTONS

Various settings are made.

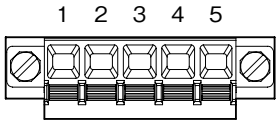
■ SD CARD SLOT

Remove the watertight cap and insert the SD card.
The SD card should be inserted with the terminal end facing up.
After inserting the SD card, be sure to attach the watertight cap.

■ TERMINAL ASSIGNMENT

• POWER SUPPLY TERMINAL ASSIGNMENT

Unit side connector: MSTB2,5/5-GF-5,08 (Phoenix contact)
Cable side connector: FKCN2,5/5-STF-5,08 (Phoenix contact) included in the package

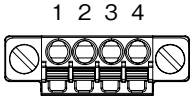


PIN NO.	ID	FUNCTION
1	+24V	Power supply (24V DC)
2	+24V	Power supply (24V DC, for cross-wiring)
3	0V	Power supply (0V)
4	0V	Power supply (0V, for cross-wiring)
5	FE	Function earth

* For cross-wiring, ensure the total current consumption is 2 A or less.

• ANALOG INPUT TERMINAL ASSIGNMENT

Unit side connector: MC1,5/4-GF-3,5 (Phoenix contact)
Cable side connector: FMC1,5/4-STF-3,5 (Phoenix contact) included in the package



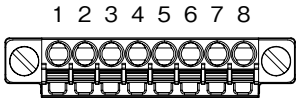
PIN NO.	ID	FUNCTION
1	AI1+	Input 1+
2	AI1–	Input 1-
3	AI2+	Input 2+
4	AI2–	Input 2-

■ ETHERNET INDICATOR LED

LED	COLOR	STATUS	ACTION
LNK	Yellow	ON	Link is established
		OFF	No link
ACT	Green	Blinking	Sending/receiving data
		OFF	No sending/receiving data

• CONTACT INPUT/OUTPUT TERMINAL ASSIGNMENT

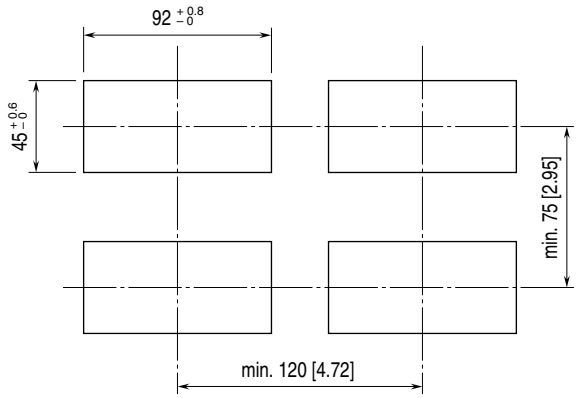
Unit side connector: MC1,5/8-GF-3,5 (Phoenix contact)
Cable side connector: FMC1,5/8-STF-3,5 (Phoenix contact) included in the package



PIN NO.	ID	FUNCTION
1	DO1	Photo MOSFET relay output 1
2	DO1	Photo MOSFET relay output 1
3	NC	No connection
4	NC	No connection
5	DI1	Contact input 1
6	COM	Common
7	NC	No connection
8	NC	No connection

INSTALLATION

■ PANEL CUTOUT unit: mm [inch]



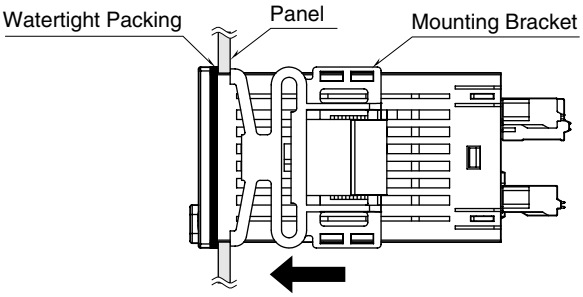
Panel thickness: 1.6 to 8.0 mm [0.06 to 0.31 inch]

■ CAUTION

- Degree of protection, IP55 is applicable to the front panel of the unit with single mounting according to the specified panel cutout. Not applicable in case of re-mounting. After installation ensure waterproof of the mounting.
- Install the unit to vertical panel so that its function buttons are at the bottom side. Installing by other direction will cause degradation of life span or performance due to rise of the internal temperature.
- Ensure that there is sufficient space for ventilation inside a panel. Do not install above the devices that generate high heat such as heaters, transformers or resistors. Observe at the minimum of 30 mm (1.2") in all directions for maintenance purpose.

■ HOW TO MOUNT THE UNIT ON A PANEL

1) Insert the unit into the panel cutout.
2) Push the mounting brackets into the grooves on both sides of the rear module, until they hit the panel's rear side. (DO NOT remove the watertight packing as it works as stopper.)

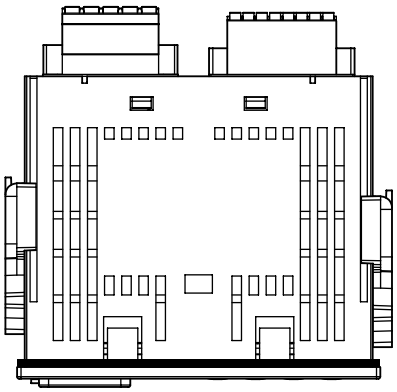


TERMINAL CONNECTIONS

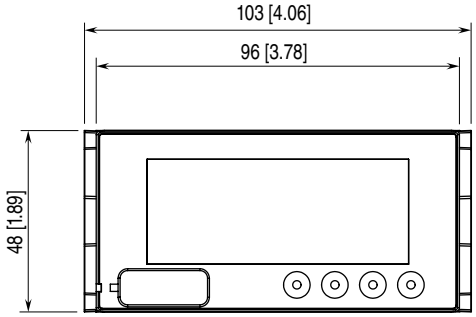
Connect the unit as in the diagram below or refer to the connection diagram.

■ EXTERNAL DIMENSIONS unit: mm [inch]

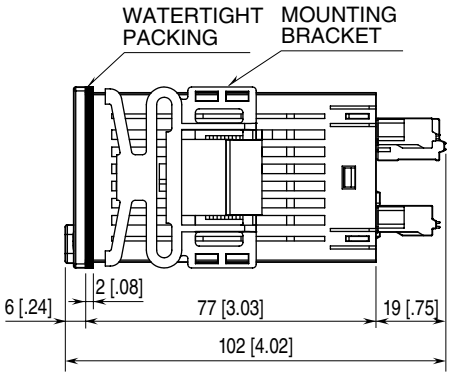
■ TOP VIEW



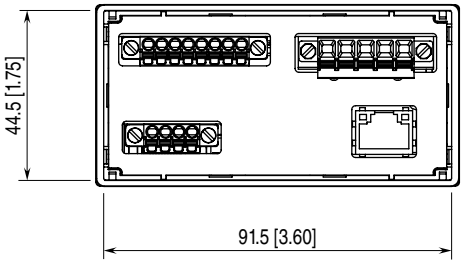
■ FRONT VIEW



■ SIDE VIEW

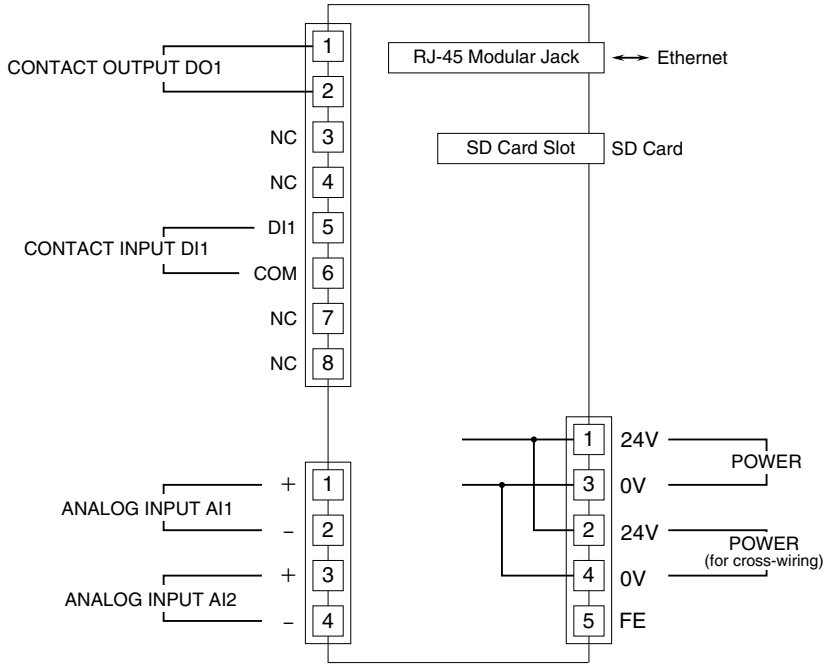


■ REAR VIEW



■ CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE terminal to ground.
Caution: FE terminal is NOT a protective conductor terminal.



WIRING

■ POWER SUPPLY TERMINAL ASSIGNMENT

Applicable wire size: 0.2-2.5 mm²
Stripped length: 10 mm
Recommended solderless terminal:

- AI0,25-10YE 0.25 mm² (Phoenix contact)
- AI0,34-10TQ 0.34 mm² (Phoenix contact)
- AI0,5-10WH 0.5 mm² (Phoenix contact)
- AI0,75-10GY 0.75 mm² (Phoenix contact)
- AI1-10RD 1.0 mm² (Phoenix contact)
- AI1,5-10BK 1.5 mm² (Phoenix contact)
- AI2,5-10BU 2.5 mm² (Phoenix contact)

■ ANALOG INPUT TERMINAL ASSIGNMENT

Applicable wire size: 0.2-1.5 mm²
Stripped length: 10 mm
Recommended solderless terminal:

- AI0,25-10YE 0.25 mm² (Phoenix contact)
- AI0,34-10TQ 0.34 mm² (Phoenix contact)
- AI0,5-10WH 0.5 mm² (Phoenix contact)
- AI0,75-10GY 0.75 mm² (Phoenix contact)
- A1-10 1.0 mm² (Phoenix contact)
- A1,5-10 1.5 mm² (Phoenix contact)

■ CONTACT INPUT/OUTPUT TERMINAL ASSIGNMENT

Applicable wire size: 0.2-1.5 mm²
Stripped length: 10 mm
Recommended solderless terminal:

- AI0,25-10YE 0.25 mm² (Phoenix contact)
- AI0,34-10TQ 0.34 mm² (Phoenix contact)
- AI0,5-10WH 0.5 mm² (Phoenix contact)
- AI0,75-10GY 0.75 mm² (Phoenix contact)
- A1-10 1.0 mm² (Phoenix contact)
- A1,5-10 1.5 mm² (Phoenix contact)

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.