



READ THE INSTRUCTION MANUAL BEFORE USING

SPECIFICATIONS,  
INSTRUCTION MANUAL

GAS MIXER

GMX-SD001

No. TR-GMX-SD001-E02

 **Yamamoto Electric Works Co., Ltd.**

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## Introduction

Thank you for purchasing the Gas Mixer GMX-SD001.

 <b>CAUTION</b>	<p>For your safety</p> <ul style="list-style-type: none"><li>- Please read this instruction manual beforehand to use the product safely and correctly. Misuse may cause failure and lead to damage or accidents.</li><li>- Please keep this instruction manual nearby so that it can be referenced by workers whenever needed.</li></ul>
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## I. Precautions

 <b>WARNING</b>
<ul style="list-style-type: none"><li>- This device is intended for mixing Ar gas and CO<sub>2</sub> gas. DO NOT use any type of gas other than the Ar gas or CO<sub>2</sub> gas or liquids.</li><li>- DO NOT use oxygen gas. This device is not oil free. Use of oxygen gas may cause ignition.</li><li>- DO NOT use any combustible, flammable, corrosive, or toxic gas.</li><li>- DO NOT apply pressure exceeding the withstand pressure. The maximum withstand pressure of this device is 0.5 MPa. If the pressure exceeds the limit, the diaphragm in the pressure control section is damaged and may result in injury or disaster, such as an accident.</li><li>- DO NOT use the device in locations exposed to high vibration or shock. Doing so may cause performance degradation or failure and may result in injury or disaster.</li><li>- DO NOT disassemble or modify the device. Doing so may not only invalidate the warranties but also cause performance degradation or failure and may result in injury or disaster.</li><li>- DO NOT use the device in locations exposed to rainwater, etc. This device is not waterproofed. If it is exposed to rainwater, etc., it may lead to injury or disaster.</li><li>- DO NOT turn the pressure control knob located inside the device. Doing so will change the settings for the scales of flow volume and mixture ratio disabling correct operation.</li></ul>

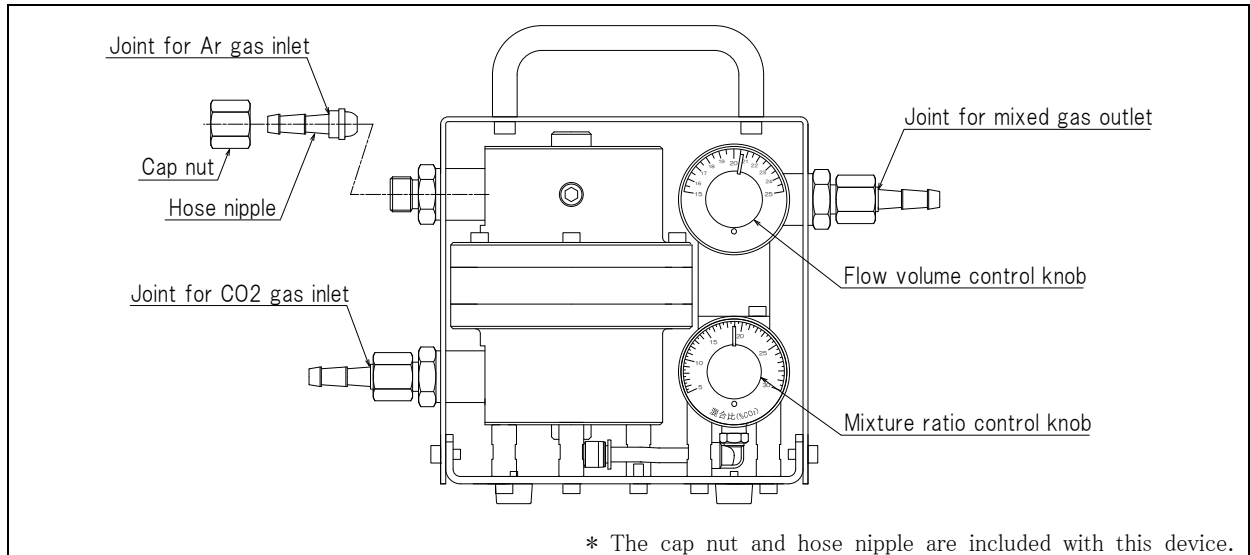
 <b>CAUTION</b>
<ul style="list-style-type: none"><li>- This device shall be installed in horizontal orientation. Place the bottom of the device horizontally to prevent it from affecting the accuracy of mixture ratio.</li><li>- Securely perform installation and piping work in accordance with the instruction manual and check that there is no leakage of gas from joints and piping connections.</li><li>- Choose piping materials that withstand the maximum pressure applied to the use location.</li><li>- Use Ar gas and CO<sub>2</sub> gas compliant with JIS standards described in the specifications. If moisture contained in the gas enters and condensates inside the device, the flow volume and mixture ratio characteristics will vary and may make it impossible to obtain the standard accuracy.</li><li>- DO NOT use the device in locations exposed to direct sunlight or strong heat source.</li><li>- DO NOT connect a buffer tank with this device.</li><li>- After completing the operation, release the internal pressure as described on page 4 section 3 "Completion of operation."</li></ul>

## II. Specifications

Product name	GMX Gas Mixer SD001 Ar+CO <sub>2</sub>
Model	GMX-SD001
Usage	For mixing shield gas for MAG welding, etc.
Features	<ul style="list-style-type: none"> <li>- Highly precise gas mixer supporting mixture ratio from 5% CO<sub>2</sub> to 30% CO<sub>2</sub></li> <li>- An optimum mixture ratio and flow volume can be obtained by just turning the knobs to the desired positions of each scale.</li> <li>- A stable supply of mixed gas is enabled without the need for a buffer tank even during intermittent gas supply.</li> </ul>
Supported gas	Ar gas, CO <sub>2</sub> gas Quality class Ar : Class 2 specified in JIS K1105 or higher CO <sub>2</sub> : Class 1 specified in JIS K1106 or higher
Installation posture	Horizontal installation Place the bottom of the device horizontally.
Standard mixture ratio	Ar:CO <sub>2</sub> = 80:20
Range of scale for mixture ratio	5% to 30% CO <sub>2</sub>
Setting accuracy of mixture ratio	±1% CO <sub>2</sub> abs.
Range of scale for flow volume	15-25 L/min
Inlet pressure range	0.3-0.5 MPa
Inlet pressure setting	Ar gas and CO <sub>2</sub> gas shall be set at the same pressure
Max. withstanding pressure	0.5 MPa
Check valve	A check valve is mounted at the piping connections on the inlet side
Dust-proof measures	A metal mesh (Ø0.06 × 150 mesh) is mounted at the piping connections on the inlet side
Inlet joint screw	9/16-18 UNF
Outlet joint screw	9/16-18 UNF
Installation method	<ul style="list-style-type: none"> <li>- Floor standing (using rubber feet in four corners at the bottom)</li> <li>- Wall mounted ... A set of wall installation board (separately available) is required (See page 5)</li> </ul>
Accessories	Hose nipple for Ø1/4 (6.4 mm) for the hose 3 pcs Cup nut (9/16-18UNF) 3 pcs
External dimensions	See the external drawing Y3-7400-100-01B
Weight	Approx. 4.4 kg

 <b>CAUTION</b>	While ensuring gas mixture accuracy, this device does not ensure the quality of welds.
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### III. Names of Components



### IV. Installation

#### 1. Use environment

- A) Use this device in a well-ventilated location.
- B) Do not expose it to direct sunlight or strong heat sources.
- C) Do not use it in locations exposed to large vibration, shock, rainwater, etc.

 <b>CAUTION</b>	<p>When using the device in a narrow space, be sure to sufficiently ventilate the area and install an alarm for monitoring the reduction of oxygen concentration in the atmosphere.</p>
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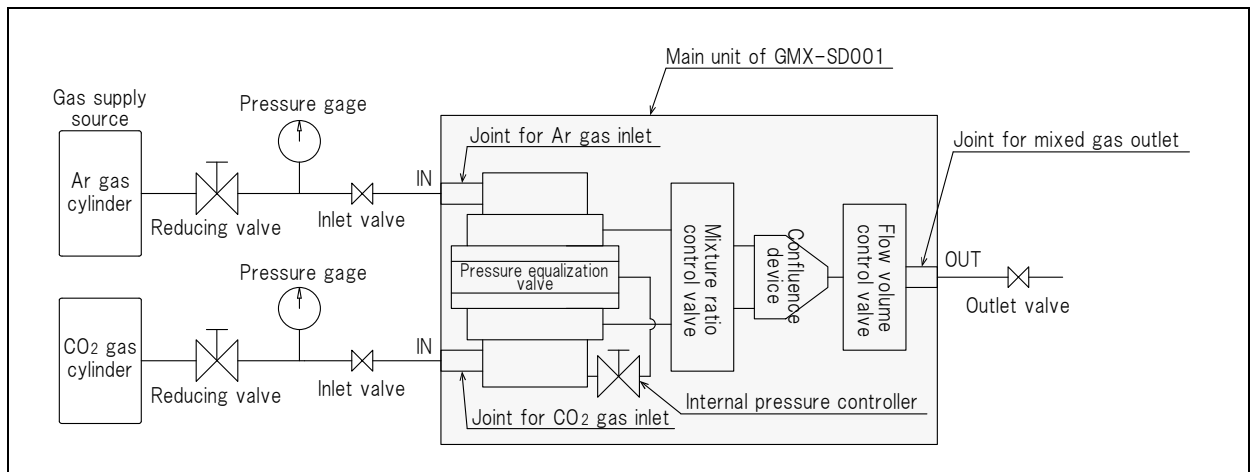
#### 2. Installation location

This device shall be installed in a horizontal orientation. Place the bottom part horizontally for use.

#### 3. Piping

Connect piping equipment as shown in the figure below.

- Install a reducing valve, pressure gage, and inlet valve (ball valve, etc.) between both the gas supply sources and inlet joints of this device.
- Install an outlet valve (ball valve or opening/closing valve on the welded nozzle side) after the joint for mixed gas outlet on this device.




## V. Operation

### 1. Start of operation

#### 1) Adjustment of inlet pressure


Please adjust the inlet pressure in accordance with the following procedure.

- (i) Turn the mixture ratio control knob and flow volume control knob to set them at 20% CO<sub>2</sub> and 20 L/min respectively.
- (ii) Close the inlet valves for both gases and open the outlet valve.
- (iii) Adjust the gas pressure of the both gas supply sources to the same pressure within the range of 0.3–0.5 MPa by using the reducing valve located on the inlet side.
- (iv) Be sure to open the Ar gas inlet valve first, and then open the CO<sub>2</sub> gas inlet valve.  
\* By following this step, it is possible to reduce the load of the rush pressure applied to the diaphragm in the pressure control section.
- (v) The device discharges a mixed gas of 20% CO<sub>2</sub> at the rate of 20 L/min.

 CAUTION	When mixed gas is discharged, it may change the setting pressure of the reducing valves on the inlet side of both gases. In such a case, adjust the gas pressure of the both gas supply sources again to the same pressure within the range of 0.3–0.5 MPa by using the reducing valve located on the inlet side.
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#### 2) Adjustment of concentration and flow volume of mixed gas

Turn the mixture ratio control knob and flow volume control knob to set concentration and flow volume of mixed gas at the desired values. The order of adjusting the mixture ratio and flow volume is arbitrary.

 CAUTION	When the outlet piping is opened on this device, the flow volume scale shows the value preset on the scale by design. If the output flow volume is reduced, the actual flow volume will be different from the value indicated on the scale.
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### 2. Stop and resume of operation

To stop:

Close the mixed gas outlet valve.

To resume:


Open the mixed gas outlet valve. The device discharges mixed gas with the same mixture ratio and flow volume as those before the stop. A stable supply of mixed gas is enabled without the need for a buffer tank even during intermittent gas supply.

 CAUTION	DO NOT connect a buffer tank to this device.
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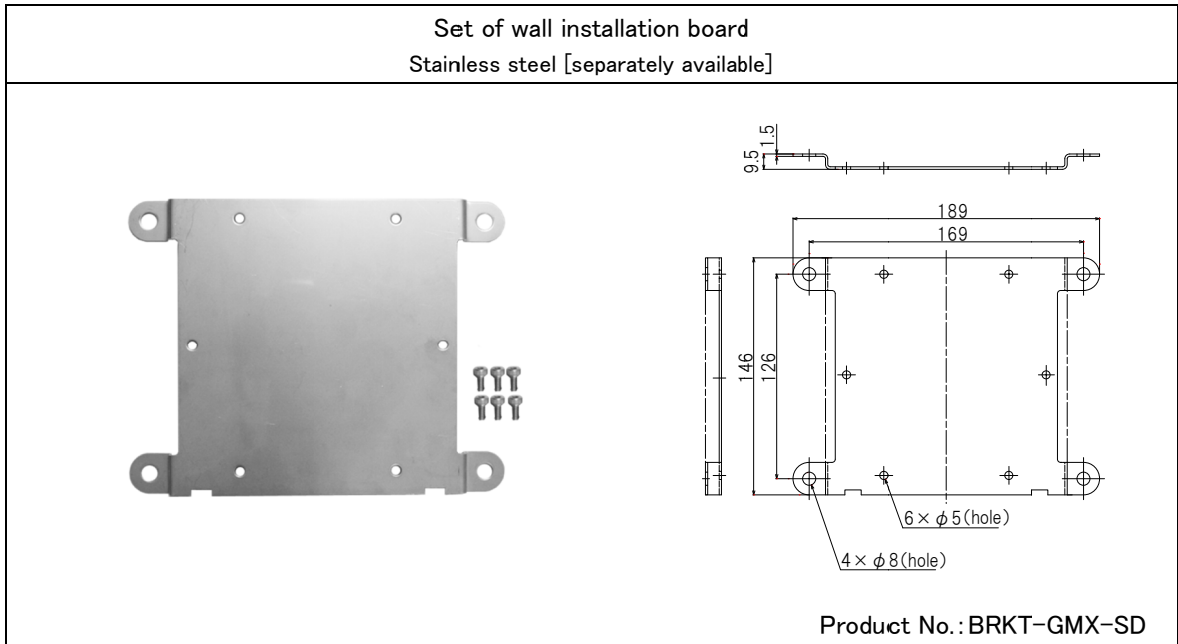
### 3. Completion of operation

Release the internal pressure of this device in accordance with the following procedure.

- (i) Turn the mixture ratio control knob to set the ratio at 20% CO<sub>2</sub>, and then open the mixed gas outlet valve.  
\* Make sure to adjust it around 20% CO<sub>2</sub> because CO<sub>2</sub> gas will not be discharged if it is set at 0% CO<sub>2</sub>.
- (ii) Stop the supply of Ar gas and exhaust Ar gas from this device until the pressure inside the piping reaches 0.
- (iii) Stop the supply of CO<sub>2</sub> gas and exhaust CO<sub>2</sub> gas from this device until the pressure inside the piping reaches 0.
- (iv) Close the inlet valves for both gases and the mixed gas outlet valve to complete operation.

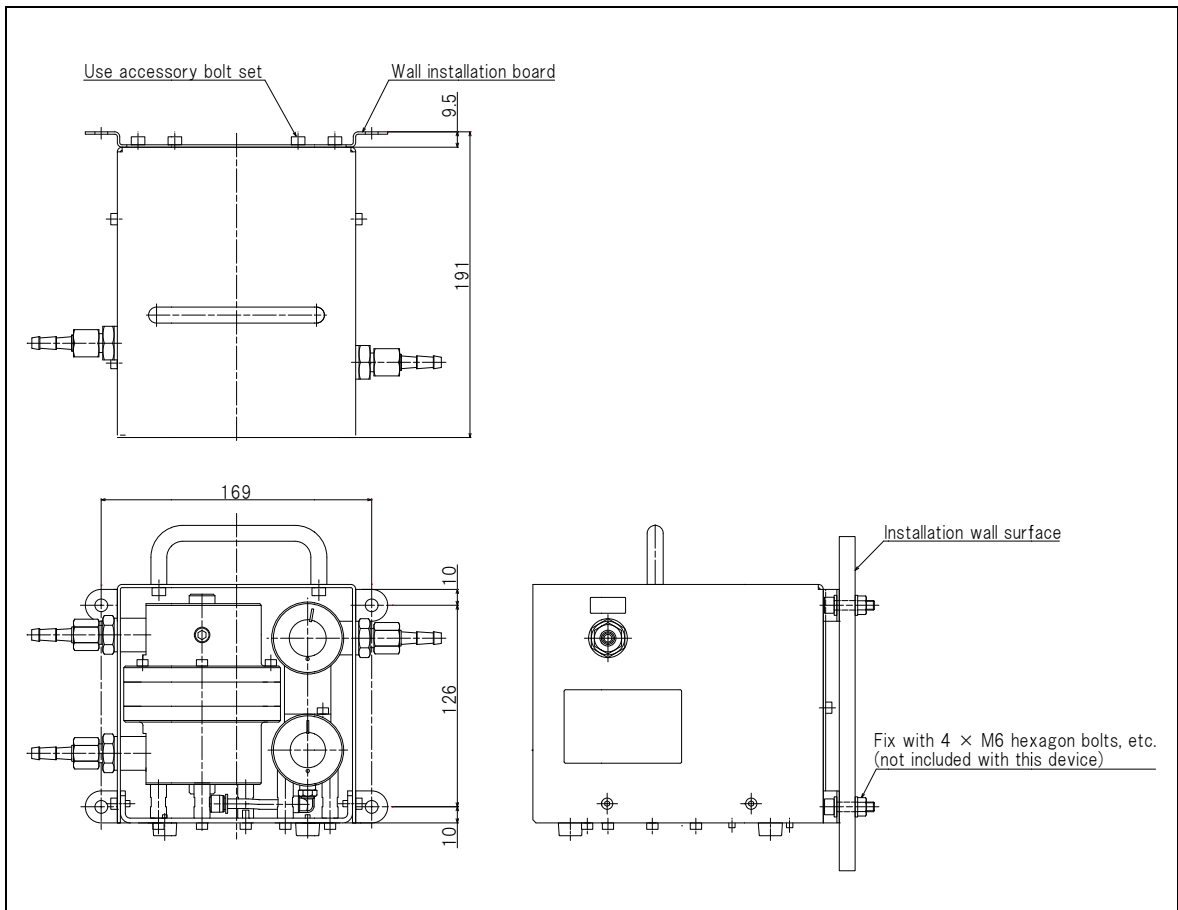
 CAUTION	If CO <sub>2</sub> gas is exhausted first, Ar gas remaining in the device is not exhausted, which makes the pressure source and piping of the device still pressurized. If you exhausted CO <sub>2</sub> gas first, supply CO <sub>2</sub> gas again, and then exhaust both gases in accordance with step 2 and onward.
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## VI. Accessories



By replacing the back board with this board, it is possible to install the device on a wall surface.

### External dimensions when the set of wall installation board is mounted



  
**CAUTION**

Install on a strong wall surface.

## VII. Periodic inspection

For replacement of the rubber components and gaskets, we recommend overhaul inspections at intervals of around every five years.

## VIII. Product Warranty

### Warranty Period

The warranty period shall be for one year from the date that the product has been delivered to the location specified by the purchaser.

### Warranty Scope

In the event of any failure or defect in the product or non-conformity of specifications due to the reasons solely attributable to Yamamoto Electric Works, Yamamoto Electric Works shall remedy such malfunctioning or defective product at its own cost in one of the following ways to be selected by Yamamoto Electric Works:

- i ) repair such product, ii ) replace such product.

However, this Warranty shall not cover the damages or defects that arise due to any of the following reasons.

- (1) Any failure resulting from improper conditions, improper environments, improper handling, or improper usage other than described in the instruction manual or the specifications arranged between the purchaser and Yamamoto Electric Works.
- (2) Any failure resulting from factors other than a defect of our product, such as the purchaser's equipment or the design of the purchaser's software.
- (3) Any failure resulting from modifications or repairs carried out by any person other than Yamamoto Electric Works' staff.
- (4) Any failure caused by a factor that cannot be foreseen at a scientific/technical level at the time when the product has been shipped from Yamamoto Electric Works.
- (5) Any disaster such as fire, earthquake, and flood, or any other external factor, such as abnormal voltage, for which we are not liable.

Yamamoto Electric Works specifically disclaims all implied warranties of merchantability and/or fitness for a particular use or purpose, as well as liability for incidental, special, indirect, consequential or other damages relating to the product.

\*This product warranty is only valid within Japan.

### Product Applicability

Our products are designed and manufactured as general-purpose products for general industries. Therefore, our products are not intended for the applications below and are not applicable to them.

- (1) Facilities where the product may greatly affect human life or property, such as nuclear power plants, aviation, railroads, ships, motor vehicles, or medical equipment
- (2) Public utilities such as electricity, gas, or water services
- (3) Usage outdoors, under similar conditions or in similar environments

This document has been translated from the original Japanese version, and the original Japanese version takes first priority.

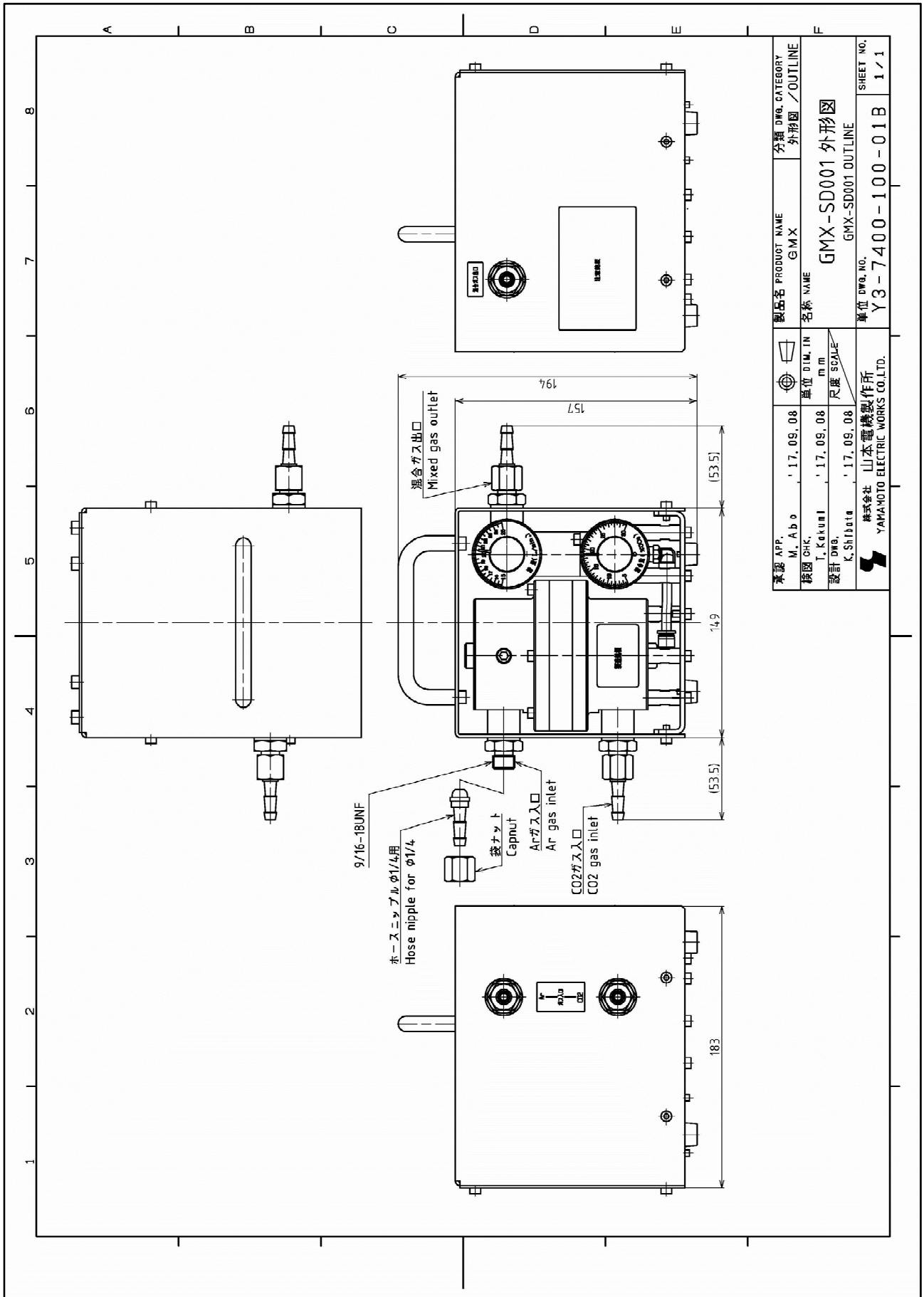
Be sure to refer to the original Japanese for the details of this warranty.

### <Prior notice>

The specifications and description of the product explained in this instruction manual may be subject to change without prior notice because of modification and the like.



Outline



承認 APP. M. Abo	17.09.08	分類 DWG. CATEGORY 外形図 / OUTLINE
検図 CHK. T. Kakuni	17.09.08	製品名 PRODUCT NAME GM X
設計 DWG. K. Shibata	17.09.08	名称 NAME GMX-SD001 外形図
株式会社 山本電機製作所 YAMAMOTO ELECTRIC WORKS CO.,LTD.		単位 DWG. NO. Y3-7400-100-01B
		尺度 SCALE 1/1
		SHEET NO. 1/1