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## RESTRICTIONS ON USE

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This product has been designed, developed and manufactured for general-purpose application in machinery and equipment.

Accordingly, when used in applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- Safety devices for plant worker protection
- Start/stop control devices for transportation and material handling machines
- Aeronautical/aerospace machines
- Control devices for nuclear reactors

Never use this product in applications where human safety may be put at risk.

## REQUEST

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Ensure that this User's Manual is handed over to the user before the product is used.

Copying or duplicating this User's Manual in part or in whole is forbidden. The information and specifications in this User's Manual are subject to change without notice.

Considerable effort has been made to ensure that this User's Manual is free from inaccuracies and omissions.

If you should find any inaccuracies or omissions, please contact Yamatake Corporation.

In no event is Yamatake Corporation liable to anyone for any indirect, special or consequential damages as a result of using this product.

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# SAFETY PRECAUTIONS

## ■ About Icons

Safety precautions are for ensuring safe and correct use of this product, and for preventing injury to the operator and other people or damage to property. You must observe these safety precautions. The safety precautions described in this manual are indicated by various icons.

As the following describes the icons and their meanings, be sure to read and understand the descriptions before reading this manual:



### **WARNING**

Warnings are indicated when mishandling this product might result in death or serious injury to the user.



### **CAUTION**

Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to this product.

## ■ Examples

	<p>Triangles warn the user of a possible danger that may be caused by wrongful operation or misuse of this product.</p> <p>These icons graphically represent the actual danger. (The example on the left warns the user of the danger of electric shock.)</p>
	<p>White circles with a diagonal bar notify the user that specific actions are prohibited to prevent possible danger.</p> <p>These icons graphically represent the actual prohibited action. (The example on the left notifies the user that disassembly is prohibited.)</p>
	<p>Black filled-in circles instruct the user to carry out a specific obligatory action to prevent possible danger.</p> <p>These icons graphically represent the actual action to be carried out. (The example on the left instructs the user to remove the plug from the outlet.)</p>

# WARNING



This unit is not equipped with the pre-purge timer and sequence functions necessary for the burner ignition. The overall equipment must be designed carefully by taking the timer and sequence functions into consideration.



Never touch any terminal of this unit while the power is being supplied. Doing so may cause an electric shock.



Before wiring the AUR300C, be sure to turn the power OFF. Failure to do so might cause electric shock



Do not connect the solenoid valve to the high electric potential side. If a ground fault occurs, the ground fault current may flow into the solenoid valve. Regardless of this unit, the valve is opened, causing the fuel to flow out.



The pilot and main burner ignition time must not exceed the ignition time specified by the burner or equipment manufacturer. Failure to do so may cause the fuel to accumulate in the combustion chamber to form explosive mixing, causing a serious explosion trouble.



Never touch any terminal of this unit during trial-run adjustment. Doing so may cause an electric shock.



Before removing or mounting the AUR300C, be sure to turn the power OFF. Failure to do so might cause electric shock.



Before starting the pilot turndown test or ignition spark response test, always check that all manual fuel valves are closed.



Do not start the actual operation unless the trial-run adjustment tests and tests specified by the equipment manufacturer are completed.



The terminal 11 (F) is electrically alive within 1 min. after the power to this unit has been turned OFF. Never touch the terminal 11 (F) immediately after the power has been turned OFF. Doing so may cause an electric shock.



If the AUD300C detects a small pilot flame, which cannot ignite the main burner, this unit does not recognize the flame failure even though the flame failure occurs in the main burner. Therefore, the fuel flows out continuously, causing a serious explosion trouble. To prevent such troubles, always perform the pilot turndown test firmly.



When performing the pilot turndown test repeatedly, stop the equipment completely every time the pilot turndown test is completed in order to completely discharge the unburnt gas or oil accumulated in the combustion chamber or flue. If the unburnt gas or oil is not discharged completely, this may cause an explosion accident.

# **WARNING**



After the pilot turndown test has been completed, turn OFF the POWER switch to shut-down the power. Always restore all the test jumpers and limit/regulator settings to their previous statuses.

If the operation is started without above restoration, this may cause damage to the equipment, or gas leak or explosion.



Do not use the AUD300C for detection of ultraviolet rays other than those of the burner.

If the AUD300C responds to other ultraviolet rays, the status that the flame failure occurs in the burner is determined as flame presence. Thus, the fuel flows out continuously, causing an explosion.

# **CAUTION**



This unit is specially designed for intermittent burner operation (system is started and stopped once or more within 24 hrs.) and 24-hour continuous burner operation (system continues the combustion for 24 hrs. or longer). The AUD300C having the self-check function must be used as a flame detector to be combined with.



This unit is equipped with important functions necessary to safely operate the equipment. Always operate this unit according to the user's manual.



Do not mount this unit in the following places:

- Place where special chemical or corrosive gas exists, such as ammonia, sulfur, chlorine, ethylene compound, acid, or others.
- Place where it is exposed to water drops or damp atmosphere.
- Place where it is exposed to the high temperature.
- Place where vibration continues for an extended period of time.



Carefully perform the mounting and/or wiring work while referring to this user's manual, as well as the instruction manuals published by the equipment or set manufacturers.



Carry out the wiring work in conformity with the specified standards.



Always connect the power supply finally.

If any terminal is touched accidentally, this may cause an electric shock or damage.



A load to be connected to each terminal must not exceed the rating shown in the specifications.



Always supply the electric power having the same voltage and frequency as those stated on the model label of this unit.

# CAUTION



If timers and auxiliary relays need to be used as additional functions, always select those having high reliability to construct a correct circuit.



This unit must be grounded with the resistance less than  $100\Omega$  as described in the electric facility technical standards. The grounding line must be connected to the burner chassis.



The power cable and high-voltage cable of the ignition transformer must be separated from the power cable of the AUD300C.



The high-voltage cable of the ignition transformer must be individual and kept 10 cm or more away from this unit.



Connect the high-voltage cable of the ignition transformer firmly so that no faulty contacts exist.  
If any faulty contact exists, high-frequency radio wave is produced, causing noise to be produced in the radio or the radio to malfunction.  
Additionally, mount the ignition transformer directly on the burner main unit or metallic part electrically connected to the burner main unit.



After the wiring has been completed, always check that the wiring is correct. Incorrect wiring may cause damage or malfunction.



Only authorized personnel who have the technical skill about the combustion equipment and flame safeguard control must carry out the pilot turndown test.



Only authorized personnel who have the technical skill about the combustion equipment and flame safeguard control must carry out the mounting, wiring, inspection, adjustment, and maintenance work.



If the safety shut-off is activated and the equipment is restarted, carry out all the inspection items stated in Chapter 3, TRIAL-RUN ADJUSTMENT.



When performing the maintenance and inspection of the burner, always carry out the pilot turndown test. Additionally, this inspection must be carried out once a year or more frequently.



When cleaning the burner, clean also the AUD300C.

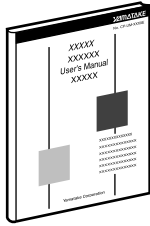
# The Role of This Manual

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In all, two manuals have been prepared for the AUR300C and AUD300C. Read the manual according to your specific requirements.

The following lists all the manuals that accompany the AUR300C and AUD300C and gives a brief outline of the manual:

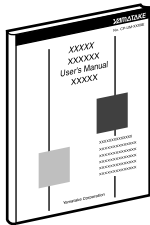
If you do not have the required manual, contact Yamatake Corporation or your dealer.



## **Advanced UV Sensor AUD300C**

**Manual No. CP-SP-1141E**

The manual describes the mounting, wiring, maintenance and inspection, and troubleshooting when the AUD300C is built-into the combustion equipment.



## **Advanced UV Relay AUR300C**

**Manual No. CP-SP-1142E**

This manual  
The personnel in charge of design, mounting, operation, and maintenance of the combustion equipment using the AUR300C must read this manual.  
The manual describes the mounting, wiring, trial-run adjustment, and maintenance and inspection of the AUR300C.

# Conventions Used in This Manual

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The following conventions are used in this manual:

## **! Handling Precaution**

: Handling Precautions indicate items that the user should pay attention to when handling the AUR300C.

(1), (2), (3) : The numbers with the parenthesis indicate steps in a sequence or indicate corresponding parts in an explanation.

>> : Indicates the result of operation or the state of the device after operation.

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# Chapter 1. OVERVIEW

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## ■ Overview

This Advanced UV Relay AUR300C (hereafter referred to as AUR300C) is a relay with a dynamic self-checking function and is used in combination with the Advanced UV Sensor AUD300C (hereafter referred to as AUD300C).

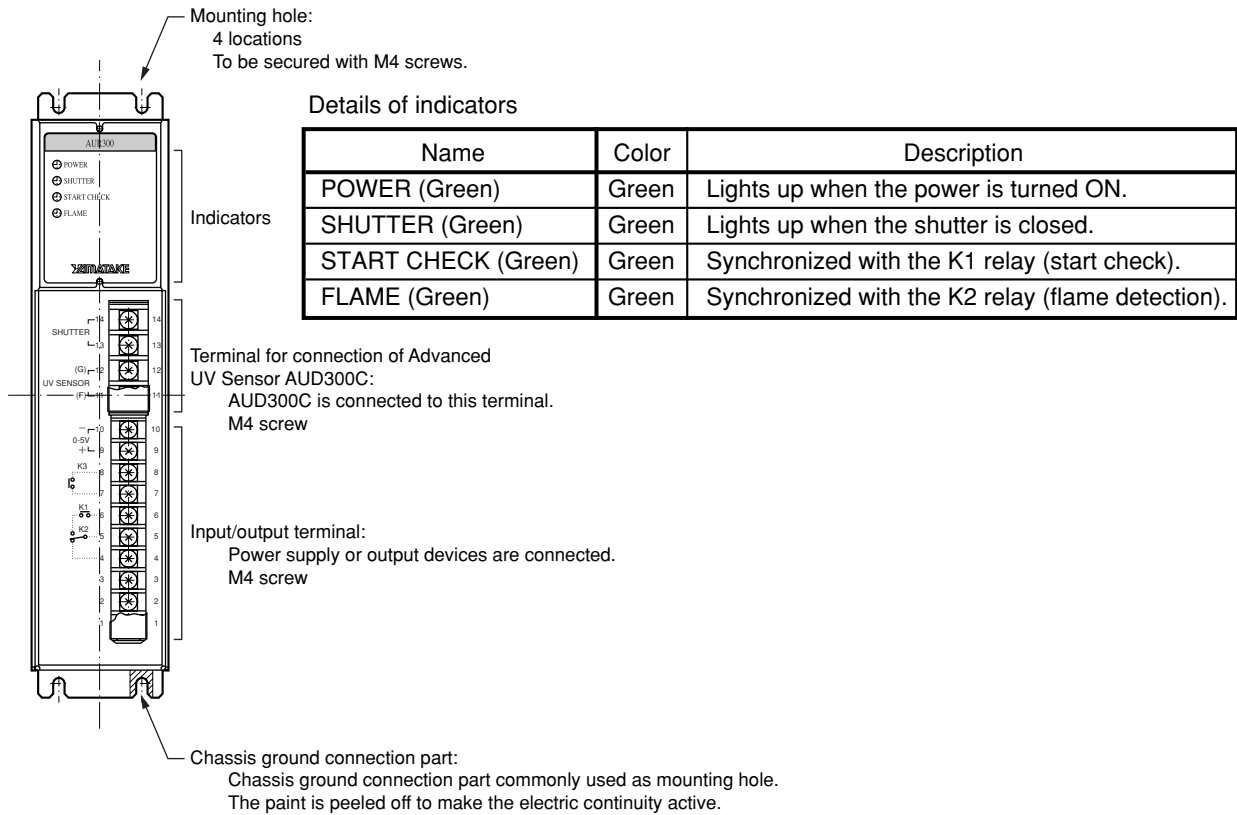
As the shutter of the AUD300C is driven, the AUR300C drives the flame relay while checking the AUD300C or AUR300C for faulty part.

If a fault occurs in the flame detection circuit of the AUD300C or AUR300C, the AUR300C turns OFF the relay firmly to ensure the operational safety.

## ■ Features

- The AUR300C can monitor each burner.
- The dynamic self-checking function continuously performs the self-checking of the flame detection circuits of the AUD300C and AUR300C to ensure the operational safety.
  - If a fault occurs in the circuit of the AUD300C or AUR300C before starting the operation, the main valve is not opened to ensure the safety even though the start operation is performed.
  - If a fault occurs in the flame amplifier of the AUD300C or AUR300C during combustion, the main valve and pilot valve are shut-off.
- If a fault is found during start-up operation, the check relay is not turned ON and the output (flame output) to the main valve is not performed.
- The operation status can be checked using various LED indicators (POWER, SHUTTER, START CHECK, and FLAME).
- A flame signal output (0 to 5Vdc) is provided as a standard function. This is useful for burner adjustment and flame status control.

■ Part names



● Terminal pin assignments

Terminal No.	Description	Electrical rating
14	Flame sensor Shutter (white)	24Vdc 150mA *3
13	Flame sensor Shutter (white)	
12	Flame sensor G-terminal (yellow)	
11	Flame sensor F-terminal (blue)	0 to 5Vdc *2
10	Flame voltage output (-)	
9	Flame voltage output (+)	3A 250V (cos φ =1) *1
8	Combustion lamp output (K3)	
7	Combustion lamp output (K3)	5A 250V (cos φ =1)
6	Flame output (K1, K2)	
5	Contact output common	—
4	K2 relay NC (Flame relay NC)	5A 250V (cos φ =1)
3	Start input	
2	Power supply (R) high voltage side	100/200Vac 50/60Hz
1	Power supply (S) ground side	

\*1: Functions in the same manner as the K2 relay. (However, since the start check is not performed, this is not used for the combustion control, but used for the combustion monitor.)

\*2: Always use a measuring instrument having an input impedance of 100 kΩ or more. Additionally, when connecting any measuring instrument to this terminal, use an IV lead wire with a cross sectional area of 0.75 mm<sup>2</sup> or more and a length of 10 m or less.

\*3: The shutter has no polarities.

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**■ Model No.**

Model No.	Description
AUR300C13100	Advanced UV relay, 100Vac 50/60Hz
AUR300C13200	Advanced UV relay, 200Vac 50/60Hz
AUR300C131D0	Advanced UV relay, 100Vac 50/60Hz with inspection certificate
AUR300C132D0	Advanced UV relay, 200Vac 50/60Hz with inspection certificate

**■ Configuration**

- **Combined flame detector**

Description	Model No.
Advanced UV sensor	AUD300C

- **Optional parts**

Description	Model No.
Flame simulator	123514B
Surge absorber	83968019-001

# Chapter 2. MOUNTING AND WIRING

## 2 - 1 Mounting

### ⚠ CAUTION



Do not mount this unit in the following places:

- Place where special chemical or corrosive gas exists, such as ammonia, sulfur, chlorine, ethylene compound, acid, or others.
- Place where it is exposed to water drops or damp atmosphere.
- Place where it is exposed to the high temperature.
- Place where vibration continues for an extended period of time.



Only authorized personnel who have the technical skill about the combustion equipment and flame safeguard control must carry out the pilot turn down test.

#### ● Mounting posture

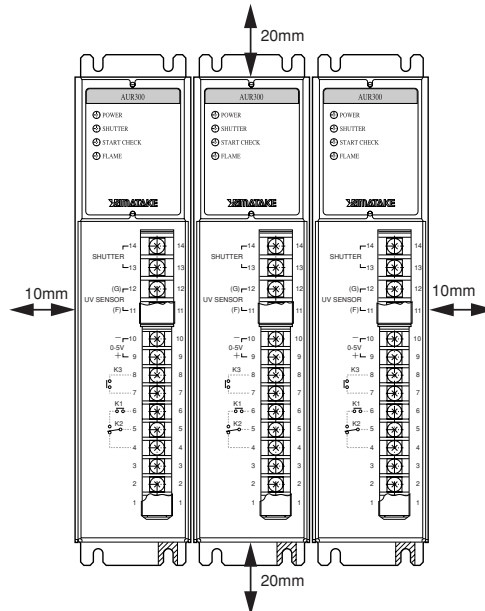
Mount this unit on a wall.

When mounting this unit vertically, it is possible to tightly mount the unit.

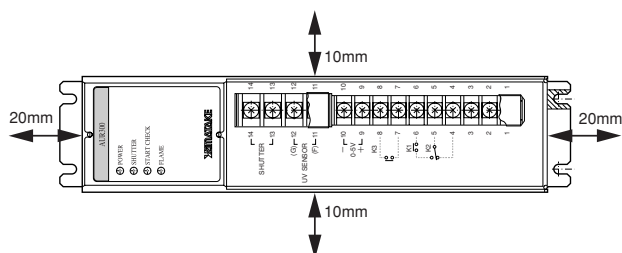
#### ● Mounting procedures

- (1) To allow easy removal, heat radiation, wiring, and maintenance work, keep a work space that is 20 mm or more in the vertical direction and 10 mm or more in the horizontal direction as shown in the Fig. below.

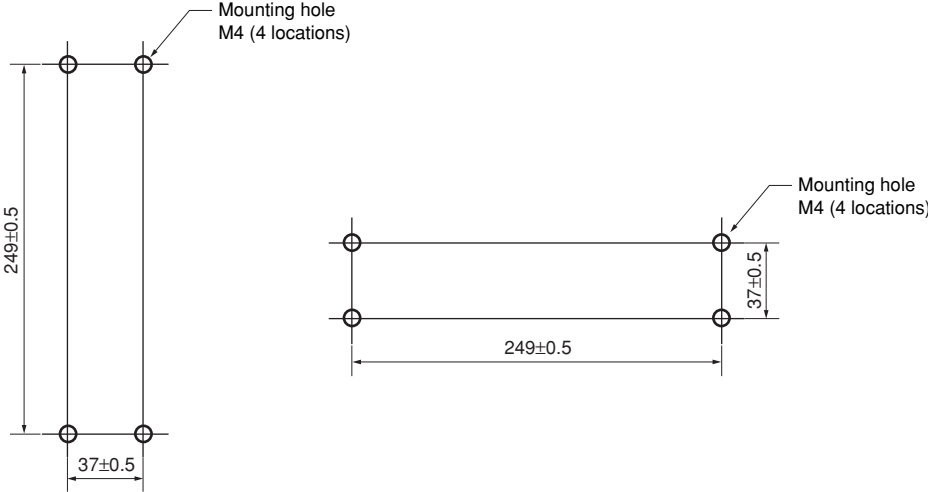
Vertical mounting (It is possible to tightly mount the unit.)



Horizontal mounting



(2) According to the mounting dimension drawing, make mounting holes in the panel.



Vertical mounting

Horizontal mounting

Mounting dimension drawing

(3) Secure this unit to the mounting holes (four locations) with M4 screws.

**! Handling Precautions**

- The paint of the lower right mounting hole of this unit is peeled off to make the electric continuity active, and then this part is used as the chassis ground connection part. Secure this part with the toothed lock washer to perform the electric connection firmly.
- When mounting this unit horizontally, it is not possible to tightly mount the unit.

## 2 - 2      Wiring

### **WARNING**



Before wiring the AUR300C, be sure to turn the power OFF. Failure to do so might cause electric shock.

### **CAUTION**



Carefully perform the mounting and/or wiring work while referring to this user's manual, as well as the instruction manuals published by the equipment or set manufacturers.



Check the insulation of each wiring.  
If any insulation is faulty, this may cause a ground fault or an electric shock.



Carry out the wiring work in conformity with the specified standards.



Always connect the power supply finally.  
If any terminal is touched accidentally, this may cause an electric shock or damage.



A load to be connected to each terminal must not exceed the rating shown in the specifications.



Always supply the electric power having the same voltage and frequency as those stated on the model label of this unit.



If timers and auxiliary relays need to be used as additional functions, always select those having high reliability to construct a correct circuit.



This unit must be grounded with the resistance less than 100Ω as described in the electric facility technical standards. The grounding line must be connected to the burner chassis.



The power cable and high-voltage cable of the ignition transformer must be separated from the power cable of the AUD300C.



The high-voltage cable of the ignition transformer must be individual and kept 10 cm or more away from this unit.



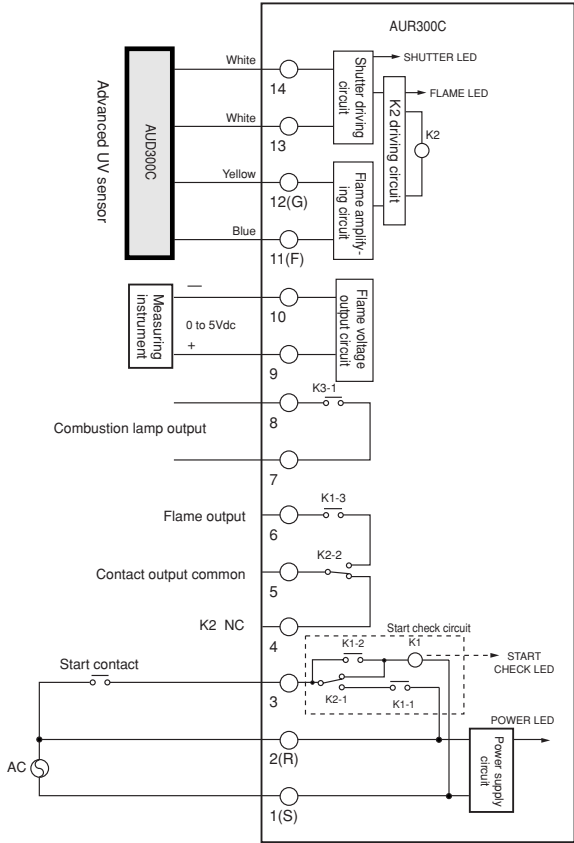
Connect the high-voltage cable of the ignition transformer firmly so that no faulty contacts exist.  
If any faulty contact exists, high-frequency radio wave is produced, causing noise to be produced in the radio or the radio to malfunction.  
Additionally, mount the ignition transformer directly on the burner main unit or metallic part electrically connected to the burner main unit.



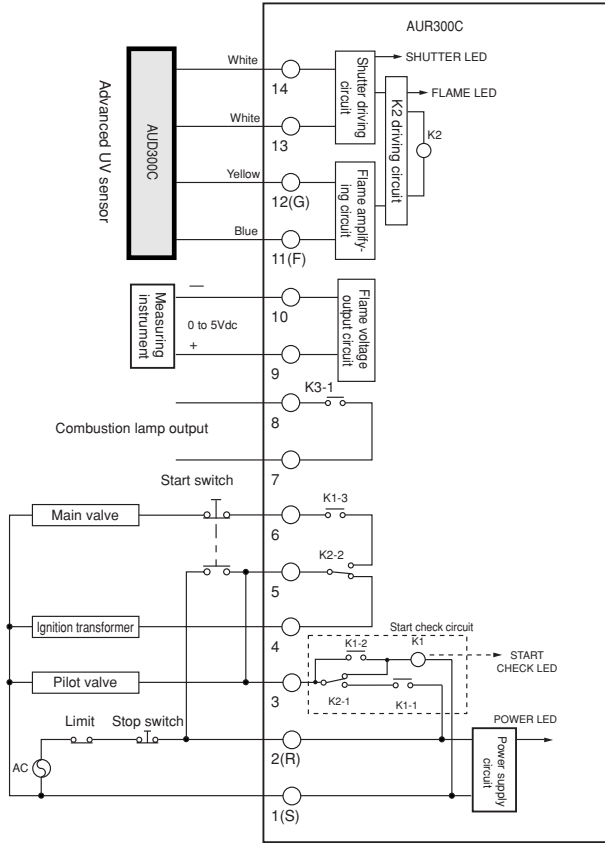
After the wiring has been completed, always check that the wiring is correct. Incorrect wiring may cause damage or malfunction.

■ Wiring diagram

● Monitoring of burner flame



● Manual ignition (Intermittent pilot)



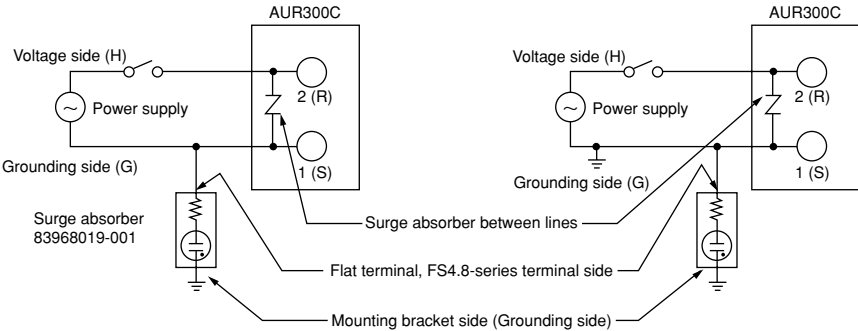
\* K1: Start check  
K2: Flame detection  
K3: Combustion lamp

! Handling Precautions

- If the high voltage side (H) of the power supply is distinguished from the grounding side (G), the high electrical potential side (H) is connected to the terminal 2 (R) and the grounding side (G) to the terminal 1 (S).
- When necessary, an overload prevention device is used for the power supply.

● Wiring to surge absorber

When using the surge absorber model 83968019-001 (optional unit) as protective measures against lightning, connect it as shown below.

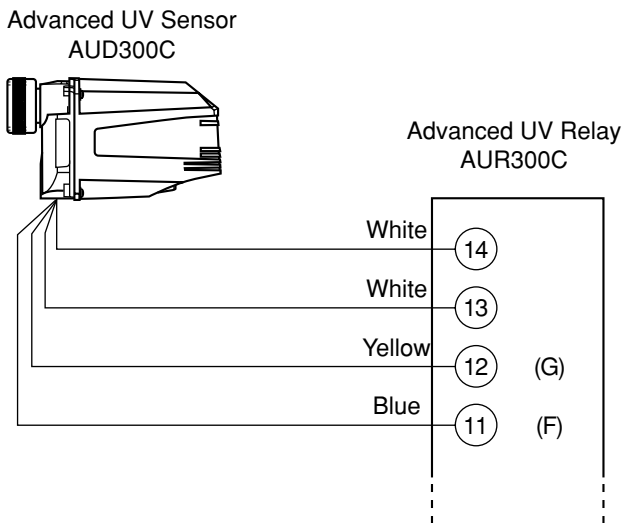


**! Handling Precautions**

- For wiring of the power supply, use an electric cable JIS C 3306 having an cross sectional area of 0.75 mm<sup>2</sup> or more (wire diameter: φ0.18, number of strand wires: 30).
- Connect the flat connector FS4.8-series (AMP's 187-series receptacle or equivalent) to one end of the electric cable and make the wiring as short as possible.
- The grounding side of the metallic bracket for mounting of the surge absorber is crimped internally to make the electric continuity active. Mount this bracket on a metallic part, such as burner chassis to connect the grounding line.

**■ Wiring to AUD300C**

Make the wiring to the AUD300C as shown below.



**! Handling Precautions**

- The signal lines of the AUD300C (blue and yellow) have specific polarities. Connect the blue line to the terminal 11 (F) of the AUR300C and the yellow line to the terminal 12 (G). If the signal lines are connected reversely, this may cause the tube unit to break or malfunction.
- To extend the wiring, use a 600V-vinyl insulated IV cable having a cross sectional area of 2 mm<sup>2</sup> and a length of 200 m or less.

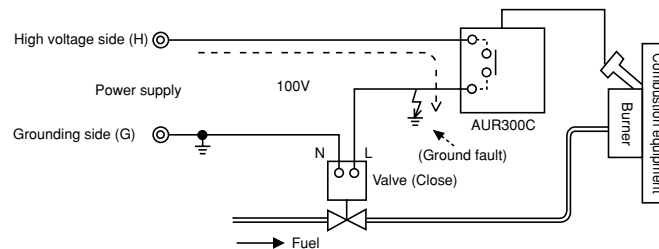
## ■ Wiring to solenoid valve

### ⚠ WARNING



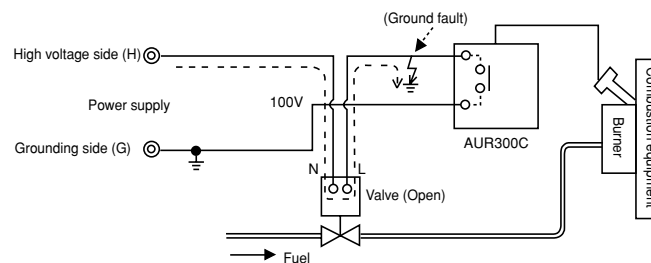
Do not connect the solenoid valve to the high voltage side. If a ground fault occurs, the ground fault current may flow into the solenoid valve. Regardless of this unit, the valve is opened, causing the fuel to flow out.

#### ● Correct connection



When the valve wiring is connected correctly as shown in the Fig., the ground fault current does not flow through the solenoid valve even though a ground fault occurs due to faulty insulation of the high electrical potential side. Therefore, the valve is not opened and the fuel does not flow out.

#### ● Incorrect connection



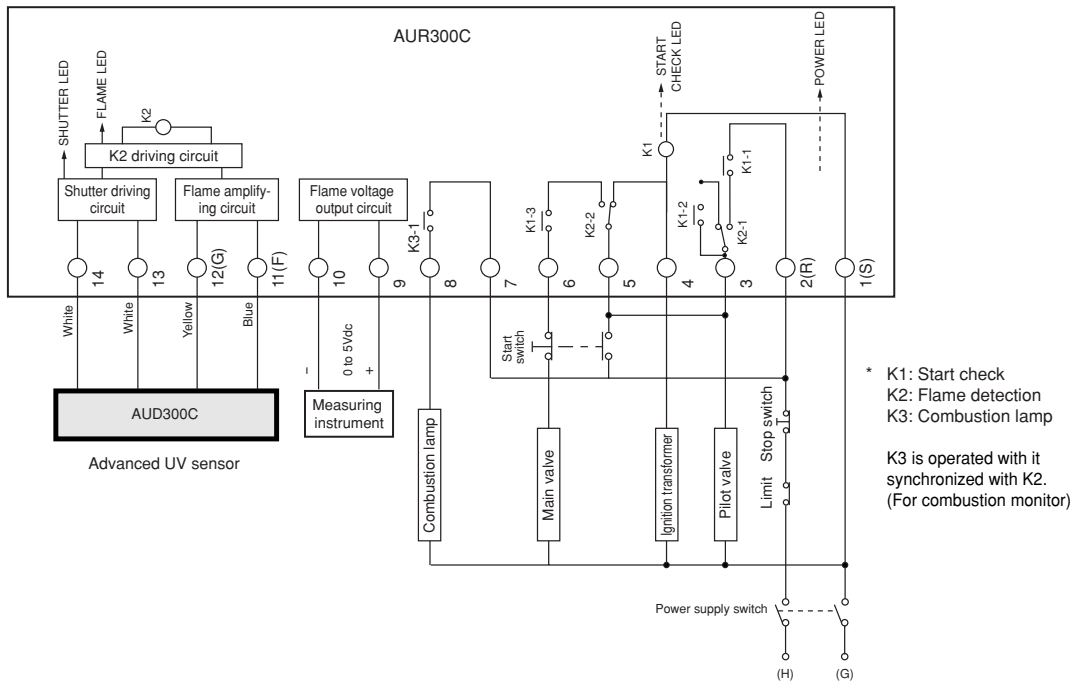
When the valve wiring is connected to the high electrical potential side, the ground fault current flows through the solenoid valve if a ground fault occurs as shown in the Fig. Therefore, the valve is opened regardless of this unit and the fuel flows out.

## ■ Cautions for continuous measurement of flame voltage

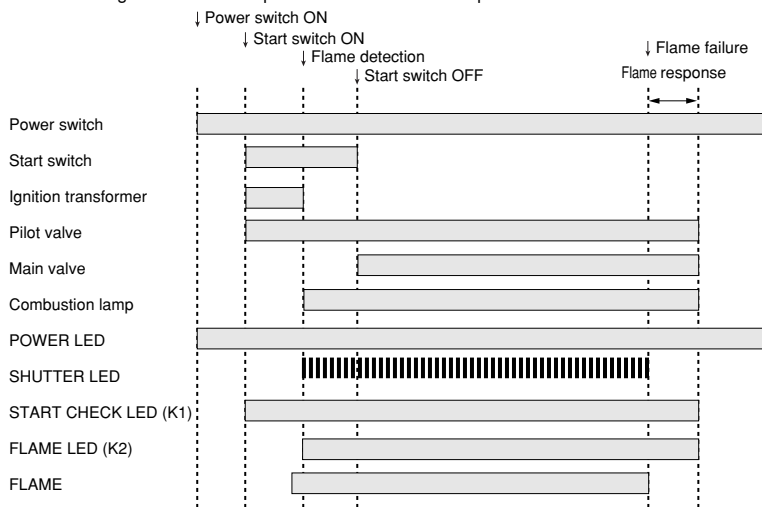
- Connect a measuring instrument having an input impedance of  $100\text{k}\Omega$  or more and a pen recorder having an input impedance of  $1\text{M}\Omega$  to this unit.
- Always use an IV cable with a cross sectional area of  $0.75\text{ mm}^2$  or more for signal lines. The wiring length must be 10 m or less.

# 2 - 3 Operational Description

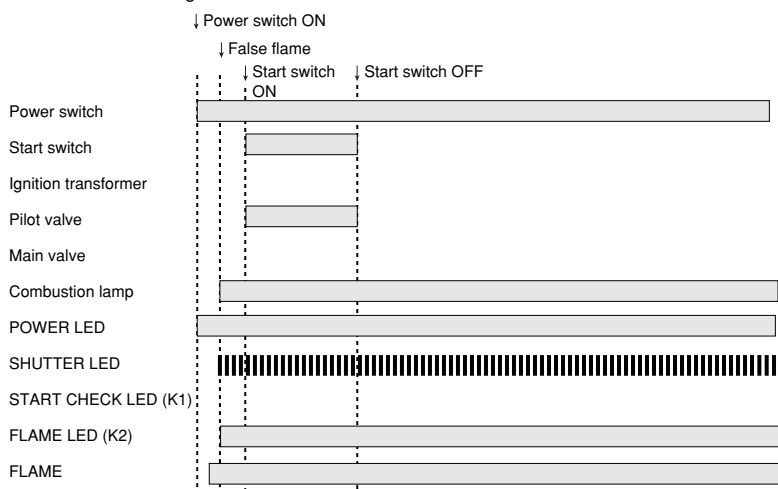
## Manual ignition method (Intermittent pilot)



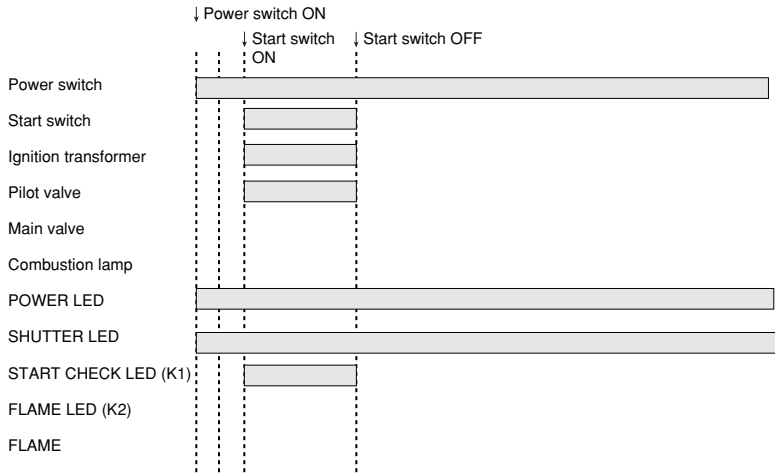
- Operation is changed from normal operation to flame shut-off operation



- False flame exists before ignition.



• Flame signal exists when the shutter is closed.



Operation	Operation of this unit	POWER LED	SHUTTER LED	START CHECK LED	FLAME LED
Power ON Limit ON	• Voltage is applied to the terminal 1 (S) and 2 (R). (Voltage is applied to the UV relay.)	●	○	○	○
Start SW ON	• As the electric power is applied to the terminal 3, the K1 relay is turned ON through the flame relay contact K2-1 (close: false flame check)	●	○	●	○
	• As the pilot flame is detected, the flame relay (K2) is turned ON. The output of the pilot valve is kept at the same time when the K1 relay is kept turned ON as the contacts K1-1 and K1-2 are closed.	●	◎	●	●
	• As K2-2 and K1-3 are closed, the main valve enters the stand-by mode. • As K3-1 is closed, the combustion lamp lights up.	●	◎	●	●
Start SW OFF	• As the electric power is applied from the terminal 3 to terminals 5 and 6 to operate the main valve.	●	◎	●	●
Stop operation Stop SW OFF	• All relays are turned OFF.	○	○	○	○
Flame shut-off during operation	• All relays are turned OFF.	●	○	○	○

●: Lit, ○: Off, ◎: Flash



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## ■ Pre-operational inspection

- (1) Inspect all wiring parts.
- (2) Check that the unit is mounted in a place where the ambient temperature is within its allowable range.
- (3) Check that the AUD300C is mounted correctly.  
In particular, the blue lead wire (to terminal 11) and yellow lead wire (to terminal 12) of the AUD300C are connected correctly.  
For details, refer to the user's manual for AUD300C, CP-SP-1141E.
- (4) Check that the valves and cocks of each fuel system are closed and that the inside of the fuel chamber is exhausted sufficiently.
- (5) After above items (1) to (4) have been checked, supply the power and start the trial-run adjustment.

## ■ Measurement of flame signal (flame voltage)

Start the equipment and measure the voltage under several conditions, such as start-up operation or normal operation.

- (1) Set the multi-meter to the 0 to 5Vdc range.
- (2) Connect the + (positive) probe of the multi-meter to terminal 9 and the - (negative) probe to terminal 10.
- (3) Check that the voltage is stable at a recommended flame voltage of 1.5V or more.
- (4) If the flame voltage fluctuates largely, check the mounting position of the AUD300C and wiring status.

## ! Handling Precautions

Even during normal operation, the flame voltage is synchronized with the shutter operation of the AUD300C and fluctuates in a range of 0.1 to 0.3V.

## ■ Pilot turndown test

This test is intended to check that the flame is carried over to the main burner correctly when the AUD300C detects the pilot flame if the gas pressure and air pressure are changed to their worst conditions.

### **WARNING**



If the AUD300C detects a small pilot flame, which cannot ignite the main burner, this unit does not recognize the flame failure even though the flame failure occurs in the main burner. Therefore, the fuel flows out continuously, causing a serious explosion trouble. To prevent such troubles, always perform the pilot turndown test firmly.



When performing the pilot turndown test repeatedly, stop the equipment completely every time the pilot turndown test is completed in order to completely discharge the unburnt gas or oil accumulated in the combustion chamber or flue.

If the unburnt gas or oil is not discharged completely, this may cause an explosion accident.



After the pilot turndown test has been completed, turn OFF the POWER switch to shut-down the power. Always restore all the test jumpers and limit/regulator settings to their previous statuses.

If the operation is started without above restoration, this may cause damage to the equipment, or gas leak or explosion.

### **CAUTION**



Only authorized personnel who have the technical skill about the combustion equipment and flame safeguard control must carry out the pilot turndown test.

## **Handling Precautions**

If the limit of the fuel pressure (if used) is opened, make it turned ON with a jumper cable during this test.

To carry out the pilot turndown test, follow the steps below.

### ● **Preparations before starting test**

- (1) Turn OFF the POWER switch.
- (2) Close the manual valves of the pilot passage and main passage to stop the gas.
- (3) Open the manual valve of the pilot passage.

### ● **Check a gas pressure level, at which the AUD300C cannot detect the pilot flame.**

- (4) Turn ON the POWER switch and START switch.

>> The ignition operation is then started, the pilot valve is opened, and the ignition transformer is operated.

The flame relay is turned ON and combustion lamp lights up.

- 
- (5) Slowly close the manual valve of the pilot passage.  
The pilot flame becomes small gradually. Gradually throttle the valve until the AUD300C cannot detect the flame.
  - (6) Record the gas pressure immediately before the flame relay is turned OFF and the combustion lamp goes off.

● **Check that the main burner can be ignited with the minimum pilot flame.**

- (7) Press the START switch again.
- (8) Slowly open the manual valve of the pilot passage to adjust the pressure to a level immediately before the combustion lamp goes off.  
At this time, check that the flame relay is turned ON and the combustion lamp lights up.
- (9) Release the IGNITION switch.
- (10) Check that the main burner is ignited smoothly within 1 sec. after the manual valve of the main passage has been opened.
- (11) Change the gas pressure level between the minimum and maximum levels and ignite the main burner five or six times. At this time, check that the main burner is ignited smoothly every time.

● **Main burner is not ignited with the minimum pilot flame.**

- (12) Adjust the mounting position of the AUD300C and the incoming light amount so that the AUD300C cannot detect the ignition of the main burner.  
There are two kinds of adjustment procedures as shown below.
  - Keep the monitoring wire of the monitoring pipe slightly away from the pilot flame.
  - Throttle the monitoring pipe to decrease the incoming light amount from the pilot flame.
- (13) Slowly open the manual valve of the pilot passage to make the pilot flame larger than the previous flame.

● **After the adjustment has been completed, check again that the main burner can be ignited with the minimum flame.**

- (14) Perform the steps stated in "Check that the main burner can be ignited with the minimum pilot flame" again.

● **Measures to be taken after completion of the test**

- (15) After the test has been completed, return the manual valve of the main passage to its fully opened position.
- (16) Check that the flame voltage is proper.
- (17) If any limit is connected with jumper cables, disconnect them to return the limit to its previous state.

■ Ignition spark response test

**⚠ WARNING**



Do not use the AUD300C for detection of ultraviolet rays other than those of the burner. If the AUD300C responds to other ultraviolet rays, the status that the flame failure occurs in the burner is determined as flame presence. Thus, the fuel flows out continuously, causing an explosion.

- (1) Close the manual fuel valves of the pilot and main burners.
- (2) Start the operation and measure the flame voltage in the pilot ignition sequence to check whether or not the flame voltage is influenced.
- (3) If the "FLAME" LED is lit, make the adjustment using the following procedures while referring to the instruction manual for the equipment:
  - Move the position of the AUD300C or ignition spark rod so that they do not affect adversely.
  - Put a shield plate in the optical path of the AUD300C so that the effect of the spark is a flame signal value of 0.4Vdc or less.

**! Handling Precautions**

Do not use this unit to detect ultraviolet rays other than those of the flame.

The following shows various ultraviolet ray sources other than flame that may activate the AUD300C:

Examples:

Ultraviolet ray source	Scorching furnace wall (within 50 cm of furnace wall)
	Spark
	Ignition transformer and welding arc
	Gas laser
	Sunlamp
	Disinfecting lamp, ultraviolet radiation lamp, fluorescent lamp
	Strong flash light (toward UV sensor)
Gamma ray and X ray source	Regression analyzer
	Electron microscope
	X ray camera
	High voltage vacuum switch
	High voltage capacitor
	Radioisotope
	Other sources producing ultraviolet rays, gamma rays, and X rays

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## ■ Safety shut-off test

After all operational adjustments have been completed, carry out the safety shut-off test.

### ● Pilot ignition failure (Ignition failure)

(1) Close the pilot and main manual fuel valves.

(2) Press the START switch.

>> The operation is then started.

(3) Normally, as the pilot burner is ignited, the pilot valve is opened. Check that the "FLAME" LED does not light up and the main valve is not opened if the flame fails.

### ● Flame failure during normal combustion

(1) Open the pilot and main manual fuel valves.

(2) Press the START switch to start the operation.

(3) When the sequence advances correctly and it enters the normal combustion (main valve is opened), close the pilot and main manual fuel valves to put off the burner flame. At this time, check that the flame failure is detected and the safety shut-off is activated correctly.

# Chapter 4. MAINTENANCE AND INSPECTION

## WARNING



Before removing or mounting the AUR300C, be sure to turn the power OFF. Failure to do so might cause electric shock.

## CAUTION



Only authorized personnel who have the technical skill about the combustion equipment and flame safeguard control must carry out the mounting, wiring, inspection, adjustment, and maintenance work.



If the safety shut-off is activated and the equipment is restarted, carry out all the inspection items stated in Chapter 3, TRIAL-RUN ADJUSTMENT.



When performing the maintenance and inspection of the burner, always carry out the pilot turndown test. Additionally, this inspection must be carried out once a year or more frequently.



When cleaning the burner, clean also the AUD300C.

### ■ Frequency of maintenance and inspection

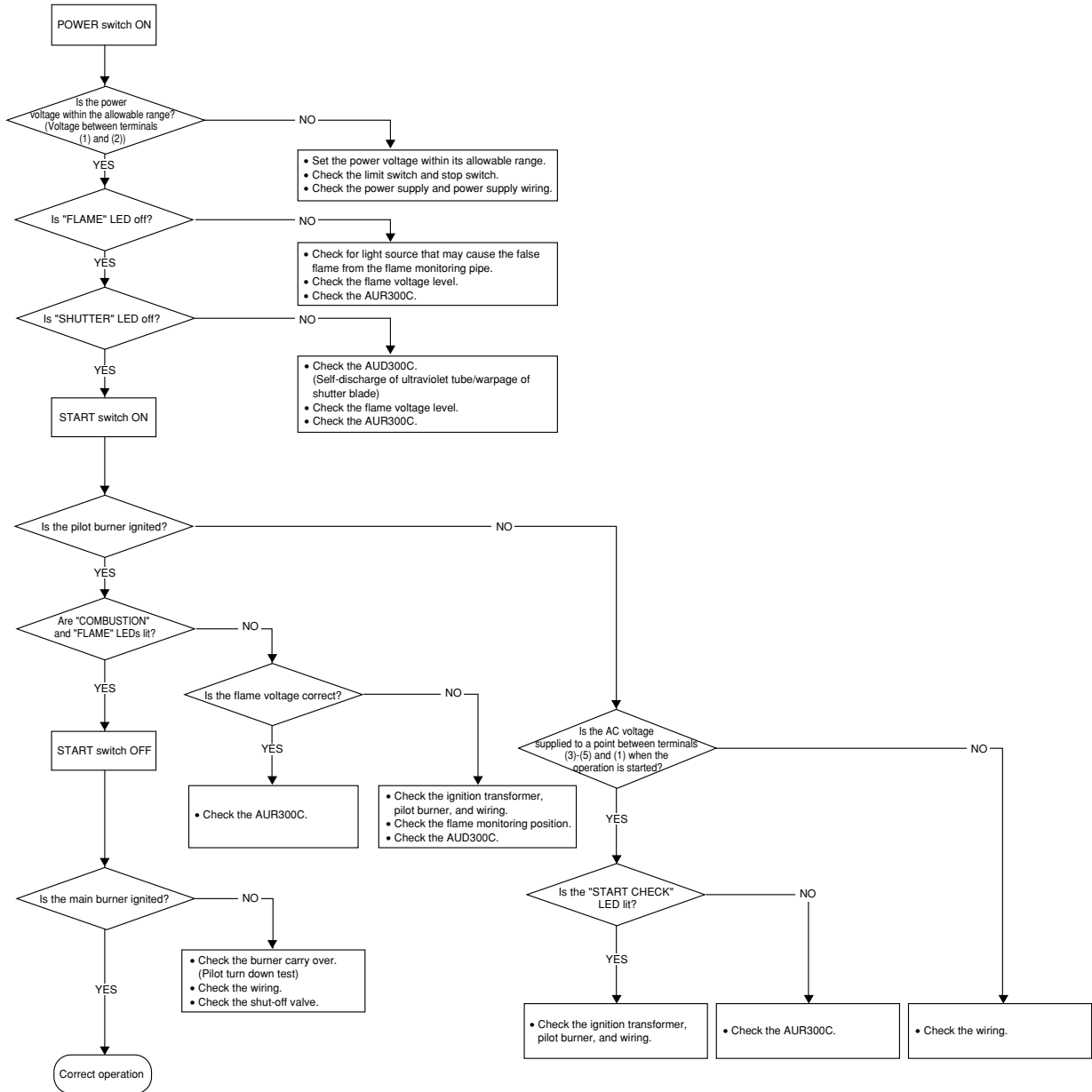
Determine an appropriate frequency of the maintenance and inspection work by considering the equipment type, ambient conditions (dust or ambient temperature) of the mounting place, and damage or influence if the burner is shut-off for some reason during operation of the equipment.

Inspection contents	Inspection frequency
Safety shut-off test (For details, refer to Chapter 3, TRIAL-RUN ADJUSTMENT.)	Once a month or more
Contamination of monitoring window and monitoring pipe of AUD300C	Once a month or more
Measurement of flame voltage	Once a month or more
Pilot turndown test	Once a year or more

### Handling Precautions

- If the burner shut-off operation may cause a serious accident, perform the inspection more frequently.
- If the burner manufacturer provides specific instructions about the maintenance and inspection, always strictly observe them.

● Fault inspection flowchart



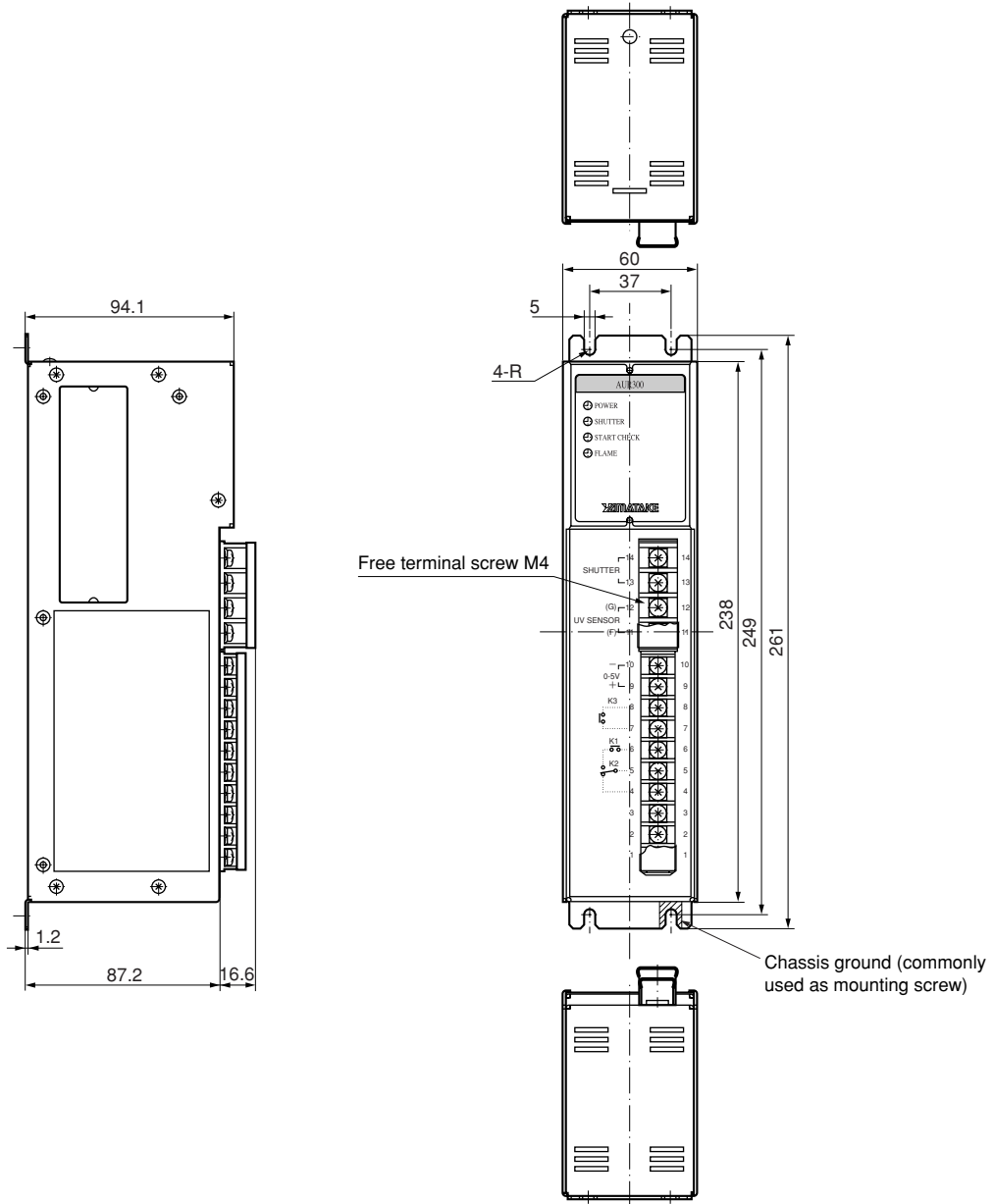
# Chapter 5. SPECIFICATION

## ■ Specification

Item	Description
Flame detector	AUD300C1000
Flame response time	Nominal 3s, (Max. 4s) at 3V flame voltage
Flame voltage range	<ul style="list-style-type: none"> <li>• When ignited: 1.2 to 4.0Vdc at room temperature, humidity and rated voltage</li> <li>• When flame fails: 0.0 to 0.6Vdc at room temperature, humidity and rated voltage</li> </ul>
Recommended flame voltage	1.5Vdc min. when ignited
Rated power supply voltage	100Vac or 200Vac at 50/60Hz
Allowable voltage range	85 to 110% of rated power supply voltage
Power consumption	10W max. (with AUD300C)
Contact rating	Flame output (K1, K2) : 5A 250V (cos $\phi$ = 1) Flame output (K2) : 5A 250V (cos $\phi$ = 1) Combustion Lamp output (K3) : 3A 250V (cos $\phi$ = 1)
Dielectric strength	1500Vac 50/60Hz 1 min or 1800Vac 50/60Hz 1s Application points: Between ground and primary terminals 1 to 8 units (except 9 to 14)
Insulation resistance	100M $\Omega$ min. by 500Vdc megger Measurement points: Between ground and primary terminals 1 to 8 units (except 9 to 14)
Induced thunderbolt surge	10kV, 1.2/50 $\mu$ s (JEC-187: 75 $\Omega$ min. surge impedance) The surge absorber listed hereunder must be connected between the power supply terminal (No.1 terminal) and the ground. • Recommended surge absorber: Part No. 83968019-001
Service life	7 years or 100,000 cycles (operation cycles of each relay)
Ambient temperature	-20 to +60°C
Storage temperature	-20 to +70°C
Ambient humidity	90% RH at 40°C max.
Vibration resistance	4.9m/s <sup>2</sup> max., 10 to 55Hz for 2 h each in X, Y and Z directions
Terminal screw tightening torque	1.4N·m max.
Mounting posture	Wall mounting (vertical or horizontal mounting)
Color	White
Mass	Approx. 1.2kg

■ Dimensions

Unit: mm







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