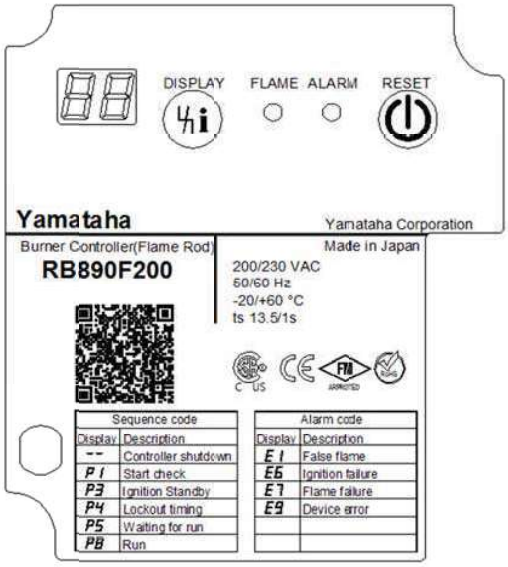
Yamataha Corporation

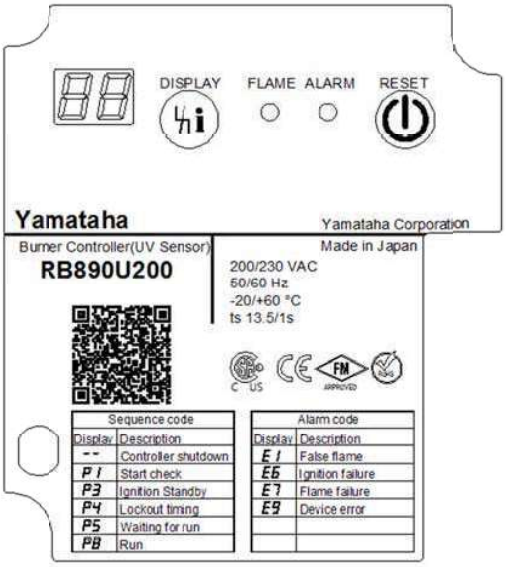
No. 2021-09-09-RB890

Burner Controller

Model RB890F/U Series

User's Manual





Thank you for purchasing your Yamataha Corporation product.

This manual contains information for ensuring the safe and correct use of the product.

Those designing or maintaining equipment that uses this product should first read and understand this manual. This manual contains information not only for installation, but also for maintenance, troubleshooting, etc. Be sure to keep it nearby for handy reference.

Yamataha Corporation

NOTICE

Please make sure that this manual is available to the user of the product.

Unauthorized duplication of this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is complete and accurate, but if you should find an omission or error, please contact us.

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

Conventions Used in This Manual

■ The safety precautions explained below aim to prevent injury to you and others, and to prevent property damage.

WARNING	**Warnings are indicated when mishandling this product may result in death or serious injury.**
CAUTION	**Cautions are indicated when mishandling this product may result in minor injury or property damage only.**

■ In describing the product, this manual uses the icons and conventions listed below.

	Indicates that caution is required in handling.
	The indicated action is prohibited.
	Be sure to follow the indicated instructions.
Handling Precautions:	Information to be aware of when handling.
Note:	Indicates information that may be useful.
:	Indicates an item or page to which the user may refer.
(1) (2) (3):	Steps in a sequence or parts of a figure, etc.

Safety Precautions

⚠WARNING

This device must be used with combustion equipment that starts and stops at least once every 24hours.
This device cannot be used with combustion equipment that operates continuously for 24 hours or longer.
This device does not have a prepurge function. Use this device as part of a system whose design gives careful consideration to the prepurge timer and ignition sequence timing, following established safety guidelines.
To connect this device to the power supply, connect the high potential side (L1) to terminal 2[*1] and the low potential side (L2(N)) to terminal 3.[*2] Use a circuit to which power is constantly supplied after the circuit breaker (or power switch) is turned on. *1. Terminal 1 if the replacement base unit (Q890A100) is used *2. Terminal 2 if the replacement base unit (Q890A100) is used
Never short-circuit the start contact in order to start and stop this device by switching the power on and off. This is very important for reliable activation of the self-check circuit at device startup. Failure to observe this warning could lead to an explosion.
Connect the load (ignition transformer, solenoid valve, etc.) directly to the output terminals of this device. If it is not directly connected, combustion safety cannot be ensured.
The ignition time for the pilot and main burners should not exceed the time defined by the burner or device manufacturer. If it does, fuel will accumulate in the combustion chamber and form an explosive mixture, resulting in a very dangerous situation in which an explosion could occur.
Before mounting, removing, or wiring, be sure to turn off the power to this device and all connected devices. Failure to do so may result in an electric shock.
Do not reset this device until the cause of the problem has been eliminated when lockedout occurs.
Do not reset this device repeatedly when lockout occurs. If this device is misused, a serious combustion equipment accident may occur.
Do not connect the solenoid valve to the high potential side (L1). If it is connected to L1 and a ground fault occurs, current can leak to the solenoid valve and open it, allowing fuel to flow out, regardless of the status of the burner controller.
This device is equipped with functions that are extremely important for the safe operation of combustion equipment. Be sure to follow the instructions stated in this user's manual.
Check the model number carefully and check that the sequence timing is as specified by the combustion equipment manufacturer. Installing the wrong model can result in an explosion hazard.
Do not touch terminal 14 (F) after turning the power off. An electric charge may remain in the terminal 14 (F) and may cause an electric shock.
Do not operate this device without first completing its adjustment and testing, and also the testing specified by the combustion equipment manufacturer.

⚠WARNING

	**Do not disassemble this device.** **Doing so may cause malfunction, device failure, or electric shock.**
	**Do not use alarm relay output as safety output.**
●	**This device has a limited product life. Beyond the product life, the risk of device failure becomes higher. Replace this device within its product life.**
●	**Be sure to do a prepurge before restarting the system when lockout occurs. If the combustion chamber and gas flue are not ventilated to remove any unburned gas, the ignition process may cause an explosion.**
●	**Make sure that the AUD flame sensor does not detect UV rays from a source other than the burner.**
	**Do not reset this device from a remote location. Because it is difficult to make a safety check when far from the equipment, there is an increased risk of explosion.**

⚠CAUTION

To ensure proper operation of this device, follow the directions given in this user's manual and in the manuals for the combustion equipment and for any other devices that are used. When planning a combustion safety control system, please discuss the details with our sales representatives.
Installation, wiring, maintenance, inspection, and adjustment must be carried out by a professional with technical training in combustion equipment and combustion safety equipment.
Use this product correctly within the range of the rated specifications stated in the user's manual. Not doing so may cause device failure or malfunction.
Make sure that the flame detector does not detect the ignition spark. If the ignition spark is detected, change the position of the flame detector or ignition electrode.
Do not install where exposed to any of the following: • Certain chemicals or corrosive gases (ammonia, sulfur, chlorine, ethylene compounds, acids, etc.) • Splashing water or excessive humidity • High temperatures • Prolonged vibration
For mounting and wiring, follow the instructions in this user's manual or in manuals provided by the combustion equipment manufacturer.
All wiring and installation must comply with applicable local electrical codes, ordinances and regulations.
Provide appropriate maintenance and inspection for the product, following the methods, procedures, replacement cycle, etc., specified by this user's manual.
When disposing of this device, dispose of it as industrial waste, following local regulations.
Do not connect a load that exceeds the rating stated in the specifications to the control load terminals (6,7,8), and do not short-circuit the load. Doing so will burn out the internal fuse, making this device unusable.
Do not provide instrumentation to stop the power to the device as soon as the alarm operates. When the power to this device is turned on again, an alarm may be activated (E908).
If timers and auxiliary relays are needed for additional functions, select ones with high reliability, and be sure to design the circuit correctly.
Use this device within the operating ranges given in the specifications for temperature, humidity, voltage, vibration, shock, mounting position, atmosphere, etc.

Contents

Chapter 1. Overview

RB890 burner controllers were developed as an upgrade for the RB890 burner controller, and are designed for batch operation of combustion equipment (at least one start and stop in a 24-hour period). This device is used in combination with an AUD100 series Advanced Ultraviolet Flame Detector or a flame rod.

For combustion equipment that operates continually for 24 hours or longer, use a burner controller designed for continuous operation instead of this device.

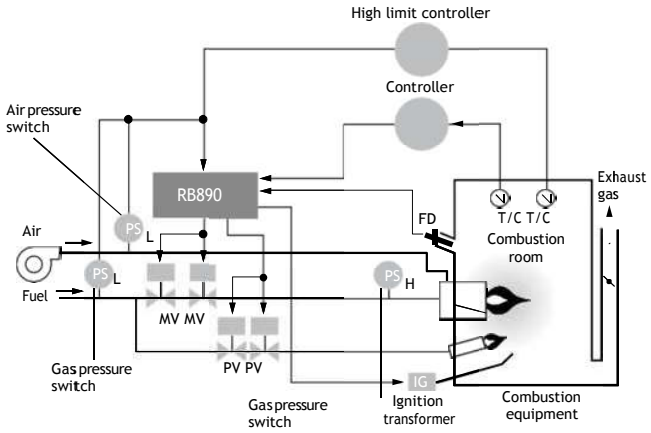
This device is structured for external instrumentation of the prepurge function. It automatically ignites the pilot and main burners and monitors the flame. In addition, when flame failure occurs, this device locks out the combustion equipment.

■ Features

- 7-segment display for sequence codes and alarm codes.
- LED indicators show whether there is a flame signal and whether lockout is present.
- The product is designed so that it cannot be restarted in the case of lockout due to ignition failure, false flame or other causes, unless it is reset manually.
- If there is a false flame signal during startup, the controller will be locked out.
- It is possible to output the operational status to external devices. Alarms can be reset by an input signal (contact input).
- Perform fault diagnosis for the internal control relay circuit.
- DIN rail mounting and sub-base structure for easy installation and replacement.
- A base unit, Q890A100, is available for use when replacing the RB890. Attach the cables that were connected to the Q270A1024 sub-base of the RB890 to the new base unit. The terminals have the same numbers to facilitate upgrading from RB890 to RB890.

■ System configuration

The facilities that use the combustion safety device must be designed taking into careful consideration the following safety guidelines and the like.



■ Ensuring safety

This device plays an important role in the safety of burner operation and flame monitoring, and is designed to ensure safety.

- Combustion monitoring and safety shutoff
  - Immediately executes a safety shutoff of the fuel when the flame sensor detects a flame failure of the burner.
  - Stops each device in a predefined sequence in the event of an ignition failure, flame failure, or cessation of combustion.
- Starting, running, and stopping of combustion equipment according to a predefined sequence
  - Operates each device according to the predefined sequence and timing.
- Safety startup
  - Checks the flame detector and the flame detection circuit for flame detection error each time the start signal is issued.
  - Will not start the burner if a failure is detected.
- Design that anticipates part failure modes
  - At startup, the self-inspection circuit errs on the side of safety if a failure is detected.
  - Never deviates from the ignition sequence.
  - The sequence timing cannot cause a dangerous failure. (The ignition time will not be lengthened.)

■ Instructions for proper use

- This device has functions that are extremely important for the safe operation of combustion equipment. Therefore, use the device correctly, according to this user's manual.
- The device must be installed, wired, maintained, inspected and adjusted by experienced specialists who have gained knowledge and skills concerning combustion equipment and combustion safety devices.

■ Equipment design cautions

The facilities that use the combustion safety equipment must be designed in compliance with relevant laws, standards, safety guidelines, and the like.

If the system is designed to a foreign specification, please observe the local laws and standards.

■ Most important points for ensuring safety

Design the equipment observing the following points to ensure safety.

1. Connect loads directly to the device.
2. Make sure that the start check runs correctly at startup.
3. Do not add a bypass circuit that allows manual operation for any loads.
4. Both the main valve and pilot valve must have redundant shutoff.

■ Precautions for instrumentation

Since this device does not have a purge function, use an external circuit to implement one.

■ Model number

Basic model No.	Flame detector	Power	Flame response	Additional function	Add'l No.	Description
RB890						Burner controller
	F					Flame rod
		1				120 V AC
			1			1 s max. *1
			3			3 ± 1 s *2
				0	-1	None
				D	-1	With inspection data

Basic model No.	Flame detector	Power	Flame response	Additional function	Description
RB890					Burner controller
	U				Honeywell C7027A, C7035A, Azbil AUD100/110/120 Advanced Ultraviolet Flame Detector
		1			120 V AC
			3		3 ± 1 s *2
				0	None
				D	With inspection data

*1 Flame voltage at 2 V DC
*2 Flame voltage at 3 V DC

Note

- The dedicated sub-base and sideboard are not provided with the RB890 controller. Order them separately.

■ Related equipment

● Compatible flame detector (sold separately)

● Flame detector ultraviolet sensor

Model number	Name	Notes
AUD15C1000	Advanced ultraviolet sensor Tube unit	Use a dedicated socket for the AUD100C/110C/120C
AUD100C100_	Advanced ultraviolet flame detector (Lead wire model without AUD15C)	AUD15C1000, sold separately
AUD100C1000-A15	Advanced ultraviolet flame detector (Lead wire model with AUD15C)	AUD15C1000 in package
AUD110C100_	Advanced ultraviolet flame detector (Terminal block model without AUD15C)	AUD15C1000, sold separately
AUD110C1000-A15	Advanced ultraviolet flame detector (Terminal block model with AUD15C)	AUD15C1000 in package
AUD120C120_	Advanced ultraviolet flame detector (1/2-inch mounting model)	Without G1/2 adapter, AUD15C1000, sold separately
AUD120C121_		With G1/2 adapter, AUD15C1000, sold separately

_ : The box stands for one of the following codes. 0: standard product. D: with inspection record (with data).
T: tropicalization (AUD110C only). B: with inspection record (with data) and tropicalization (AUD110C only).

● Flame rod

Model number	Name	Notes
C7007A	Flame rod holder	Discontinued
C7008A	Flame rod assembly	Discontinued

● Optional parts (sold separately)

Model number	Product name	Notes
RB890 SUB-BASE	Dedicated sub-base	Not required if the RB890 replacement base unit (Q890A100) is used.
81447514-001	Connector for front wiring *	Contains one Weidmueller model number : BL3.5/11F Compatible wire: 0.2–1.5 mm^2 (28–14 AWG)
81447514-002	Connector for front wiring* (for right-side wiring)	Contains one Weidmueller model number : BL3.5/11/270F Compatible wire: 0.2–1.5 mm^2 (28–14 AWG)
81447515-001	Side boards (2)	Contains two Not included in the sub-base
Q890A100	Base unit for RB890 replacement	The mounting holes and terminal numbers are the same as those of the sub-base (Q270A1024) of the RB890.
FSP136A100	Analog flame meter	
81447519-001	Loader jack cover	Contains one
81447531-001	Front connector cover	Mounting screw supplied

* Used for flame voltage measurement.

Chapter 2. Installation, Wiring

■ Installation, Precautions for wiring

⚠ WARNING
● This device is equipped with functions that are extremely important for the safe operation of combustion equipment. Be sure to follow the instructions stated in this user's manual.
● Check the model number carefully and check that the sequence timing is as specified by the combustion equipment manufacturer. Installing the wrong model can result in an explosion hazard.
● To connect this device to the power supply, connect the high potential side (L1) to terminal 2*1 and the low potential side (L2(N)) to terminal 3.*2 Use a circuit to which power is constantly supplied after the circuit breaker (or power switch) is turned on. *1. Terminal 1 if the replacement base unit (Q890A100) is used *2. Terminal 2 if the replacement base unit (Q890A100) is used
⊘ Never short-circuit the start contact in order to start and stop this device by switching the power on and off. This is very important for reliable activation of the self-check circuit at device startup. Failure to observe this warning could lead to an explosion.
● Connect the load (ignition transformer, solenoid valve, etc.) directly to the output terminals of this device. If it is not directly connected, combustion safety cannot be ensured.
⊘ Do not connect the solenoid valve to the high-potential (L1). If it is connected to L1 and a ground fault occurs, current can leak to the solenoid valve and open it, allowing fuel to flow out, regardless of the status of the burner controller.
⊘ Do not extend the lead wires of the contact reset for more than the allowable length of 10 meters. If the device is reset from a location where it is difficult to check the safety of combustion, there is a risk of explosion.

⚠ CAUTION
● This device should be installed and connected based on this user's manual or manuals provided by the combustion equipment manufacturer.
● All wiring and installation must comply with applicable local electrical codes, ordinances and regulations.
● The power should be connected as the last step of wiring. Otherwise, if the wrong terminal is touched by mistake, electrical shock or damage to this device may result.
⊘ Make sure that loads connected to the terminals do not exceed the rating indicated in the specifications.
● Always supply electricity at the voltage and frequency stated on the model label of this device.
● Make sure bunner frame is properly grounded compling with applicable local electrical codes, ordinances and regulations.

CAUTION
Keep power lines and ignition transformer high-voltage cables separate from the flame detector wires.
Run the high-voltage cable of the ignition transformer separately and keep it at least 30 cm away from the device.
Make sure that ignition transformer high-voltage cables are properly connected to prevent faulty contact. Faulty contact may generate high-frequency radio waves, causing malfunction.
The ignition transformer ground lead should be connected directly to the burner itself or to a metallic part electrically connected to the burner.
Check that the wiring is correct before use. Incorrect wiring may cause damage or faulty operation.
If the wiring from this device exceeds the recommended length, prevent malfunction due to the effects of external noise by running wires from the control panel to the case through a conduit, keeping power lines and input lines apart from each other, and other measures. Check the operation of the system after installation.
In the case of model RB890G, do not connect terminal G to the ground.
Use non-voltage contacts for connections to the input terminals of this device (20 through 24).
This device does not start operation until about 8 seconds after power-on.
Do not provide instrumentation to stop the power to the device as soon as the alarm operates. When the power to this device is turned on again, an alarm may be activated (E908).
Take countermeasures based on the instruction manual for that device if there is a device such as an inverter nearby that generates strong electrical noise.
Do not wire this device so that it starts when the power is switched on. Doing so may prevent execution of the start check.
Do not use unused terminals on the device as relay terminals.

■ Installation method

WARNING

Before mounting, removing, or wiring, be sure to turn off the power to this device and all connected devices. Failure to do so may result in an electric shock.

CAUTION

Installation, wiring, maintenance, inspection, and adjustment must be carried out by a professional with technical training in combustion equipment and combustion safety equipment.

Do not install where exposed to any of the following:
- **Certain chemicals or corrosive gases (ammonia, sulfur, chlorine, ethylene compounds, acid, etc.)**
- **Splashing water or excessive humidity.**
- **High temperatures**
- **Prolonged vibration**

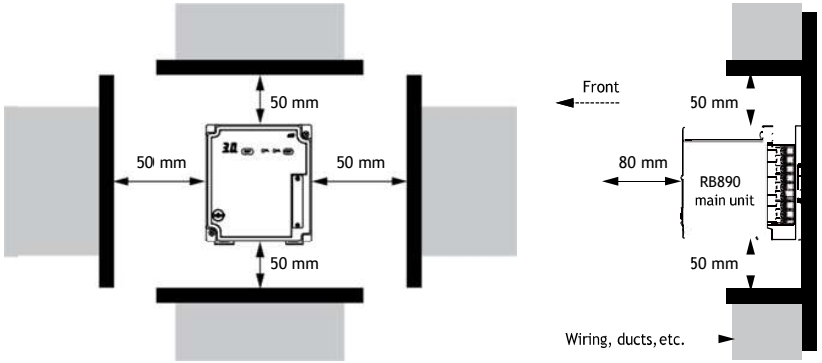
For mounting and wiring, follow the instructions in this user's manual or in manuals provided by the combustion equipment manufacturer.

Do not connect a load that exceeds the rating stated in the specifications to the control load terminals (6, 7, 8), and do not short-circuit the load. Doing so will burn out the internal fuse, making this device unusable.

When using this device as a burner control system, install it to a control panel that supports IP40 or more. If IP40 is required for this single device, also use a side board (sold separately). The protective structure of this device is equivalent to IP10.

■ Cautions regarding installation

- Leave space 50 mm above and below, 50 mm on the left and right, and 80 mm in the front as space for removal, wiring, and maintenance. Also, do not install this device close to electrical power devices or other sources of heat.

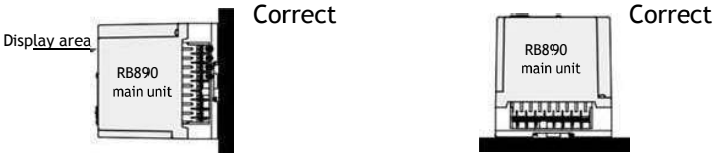


- This device must be grounded within a grounded and conductive control panel to ensure safety.
- Do not pull on the wiring while it is attached to the device. Doing so can cause failure of the connectors or this device itself.
- If there is room, leave as much space as possible between them for heat dissipation.

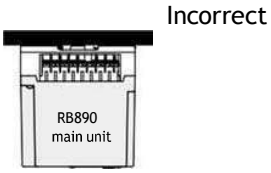
■ When the sub-base (Model RB890 SUB-BASE) is used

● Installation orientation

Attach the device in the orientation shown below.



Do not install it in the orientations illustrated below.

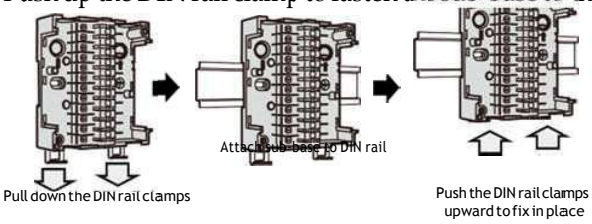


■ Mounting on a DIN Rail

(1) Pull down the sub-base's DIN rail clamp.

(2) Attach the sub-base to the DIN rail, making sure that the sub-base is not upside-down.

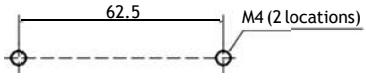
(3) Push up the DIN rail clamp to fasten the sub-base to the DIN rail.



■ Mounting in a Panel

unit: mm

(1) Cut 2 M4 threaded holes into the panel.



(2) Use screws to mount the sub-base in the panel. (Maximum tightening torque: 1.2 N·m)

⚠ CAUTION

Turn the power off before mounting the device on the sub-base. Otherwise, device failure may result.

■ Mounting/removing the unit and the sub-base

● MOUNTING

(1) Align the indentation in the center of the top of the device with the projection on the sub-base.

(2) Once aligned as in (1), slowly push the base of the device in toward the sub-base.

(3) Tighten the device's retaining screws to secure it in the sub-base.
(Maximum tightening torque: 0.5 N·m)

● Removing

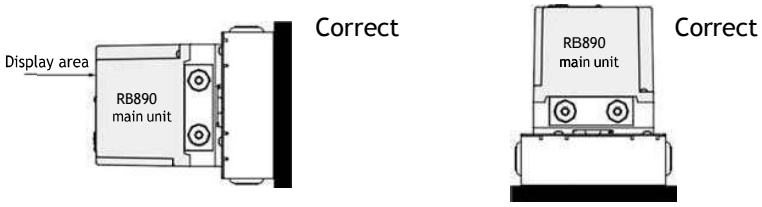
(1) Remove the mounting screws.

(2) Pull the device out toward you while holding down the sub-base.

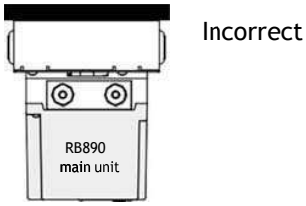
■ When the base unit (Q890A100) for model RB890 replacement is used

● Installation orientation

Attach the device in the orientation shown below.



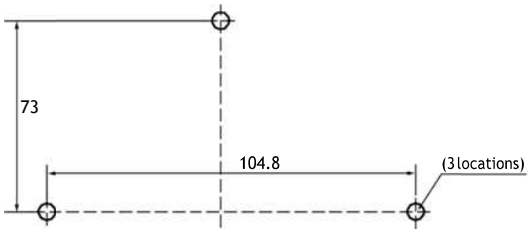
Do not install it in the orientations illustrated below.



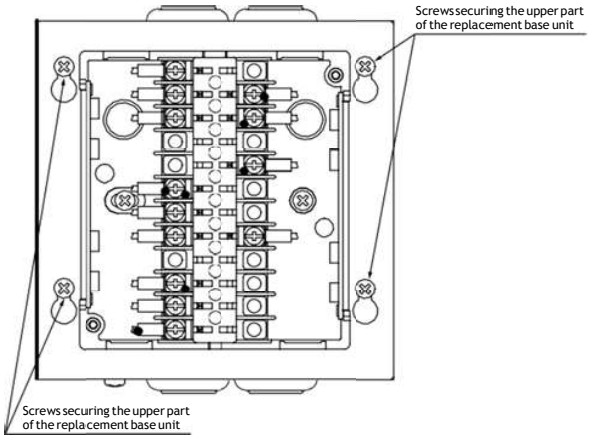
● Mounting in a panel

(1) Cut three 5 mm diameter holes in the panel.

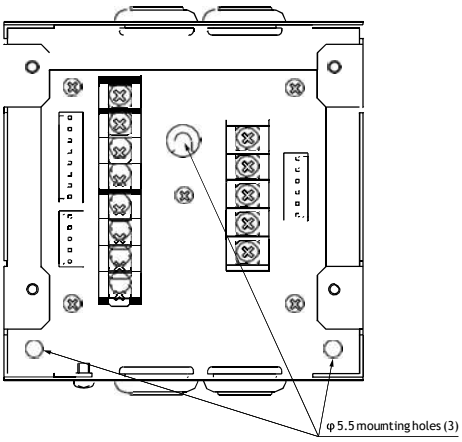
Unit: mm



(2) Loosen the four retaining screws to remove the upper part of the replacement base unit.



(3) Insert screws into the three mounting holes in the lower part of the base unit, and tighten the screws.

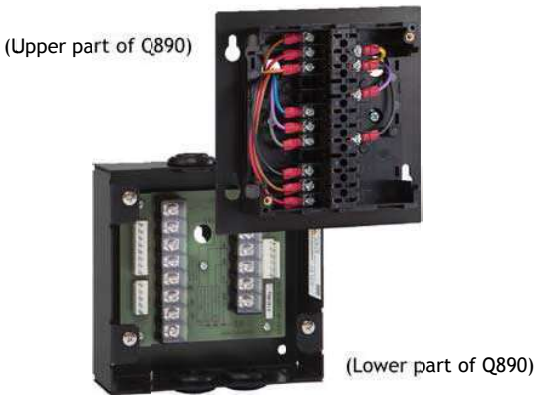


(4) Wire the external connections to the terminal block on the lower part of the replacement base unit, and then connect the cable connectors of the upper part of the base unit to the connectors on the lower part.

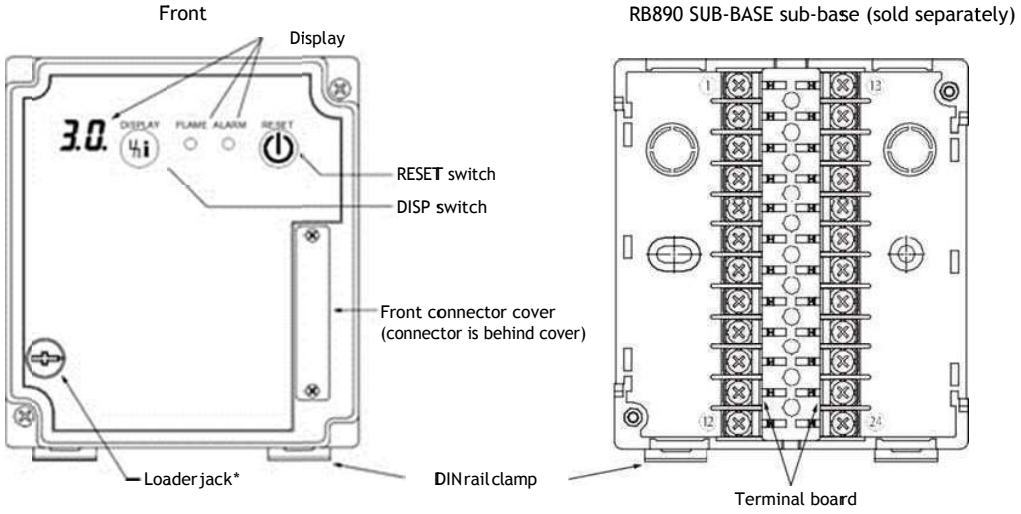
(5) After connecting the connectors, attach the upper part to the lower part using the four retaining screws (maximum tightening torque: 1.2 N·m).

Note

- Structure of the replacement base unit (Q890A100)



■ Terminal numbers, front panel item names



* Not used
(for inspection and adjustment before shipment)

● Terminal No.

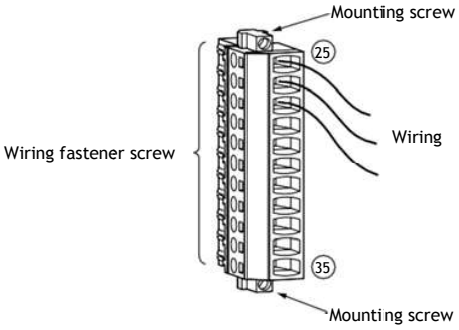
Front connector terminals

No.	Function	No.	Function
25	Flame voltage output (+)	31	NC
26	Flame voltage output (-)	32	NC
27	NC	33	NC
28	NC	34	NC
29	NC	35	NC
30	NC	-	-

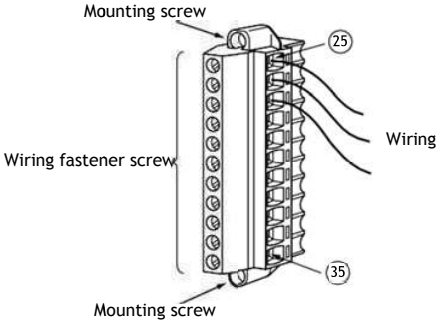
RB890 SUB-BASE sub-base terminals

No.	Function	No.	Function
1	Line voltage temp. controller	13	NC
2	AC power supply (L1)	14	Flame detector (F)
3	AC power supply (L2 (N))	15	Flame detector (G)
4	NC	16	Input common 1
5	NC	17	Input common 2
6	Ignition transformer output	18	NC
7	Pilot valve output	19	NC
8	Main valve output	20	External controller for low voltage (use non-voltage contacts betw. Nos. 17 & 20)
9	NC	21	NC
10	Alarm output COM	22	NC
11	Alarm output NO	23	NC
12	Alarm output NC	24	Contact reset

● **Connector for front wiring (81447514-001) terminal layout**

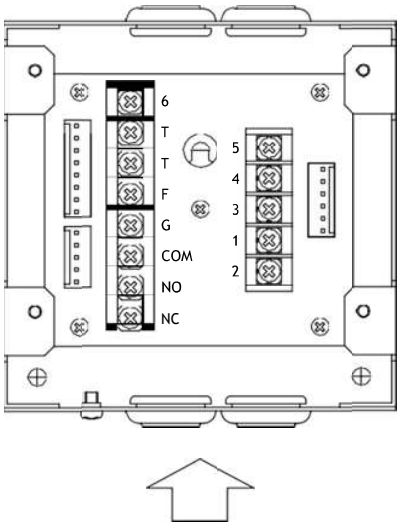


● **Connector for front wiring (for right side wiring) (81447514-002) terminal layout**



● External connection terminals of the RB890 replacement base unit (Q890A100)

External connection terminals of Q890A100

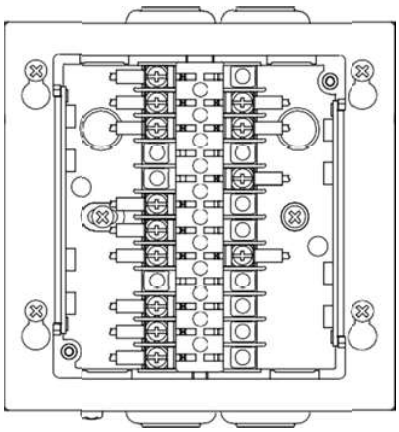


Q890A100 external-connection terminal Nos.

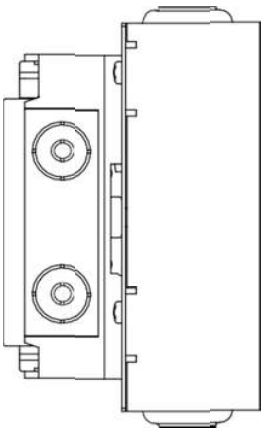
No.	Function
1	AC power supply (L1)
2	AC power supply (L2 (N))
3	Pilot valve output
4	Ignition transformer output
5	Main valve output
6	Line voltage temp. controller
T	Low voltage temp. controller (Non-voltage contacts)
T	
F	Flame detector
G	

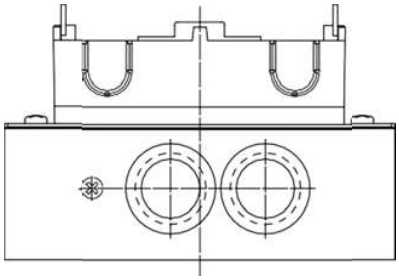
COM	Alarm output
NO	
NC	

When the upper part of the replacement base unit is removed, the external connection terminals can be viewed.



Q890A100





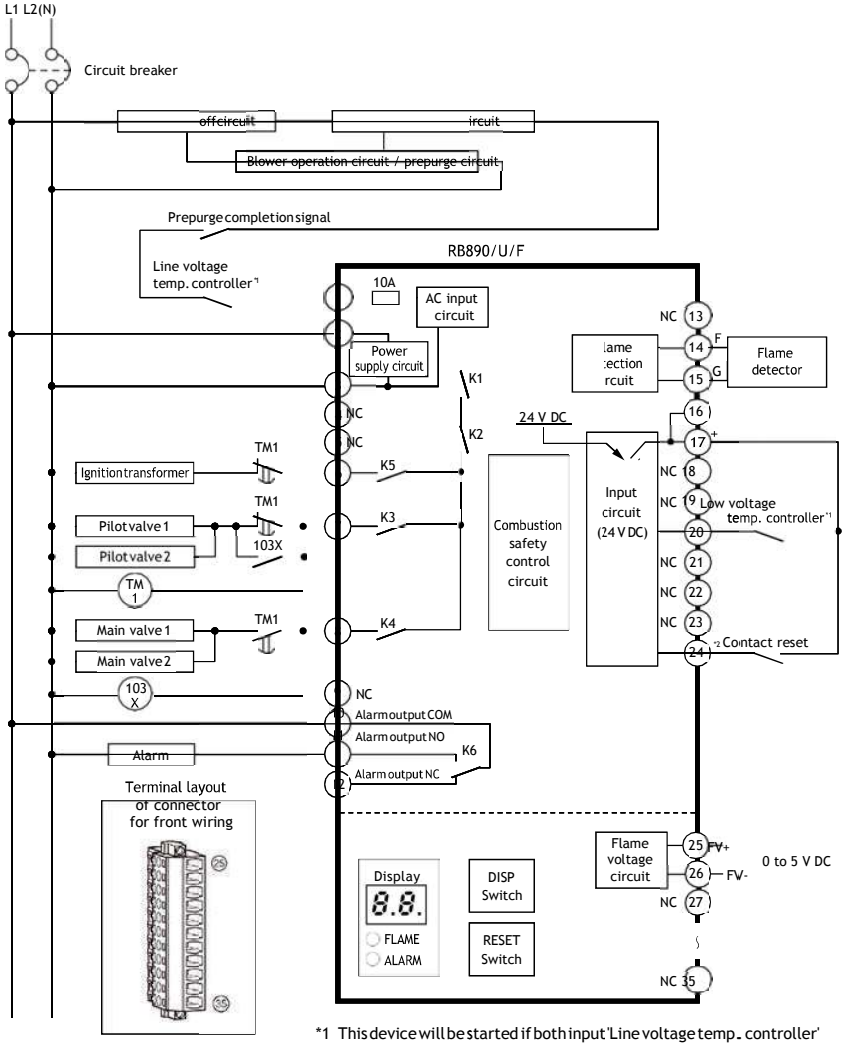
■ Example of wiring connection with external device

⚠ WARNING

This device does not have a prepurge function. Use this device as part of a system whose design gives careful consideration to the prepurge timer and ignition sequence timing, following established safety guidelines.

● When the RB890 SUB-BASE sub-base is used (terminals 1–24 are on sub-base, 25–35 on front connector)

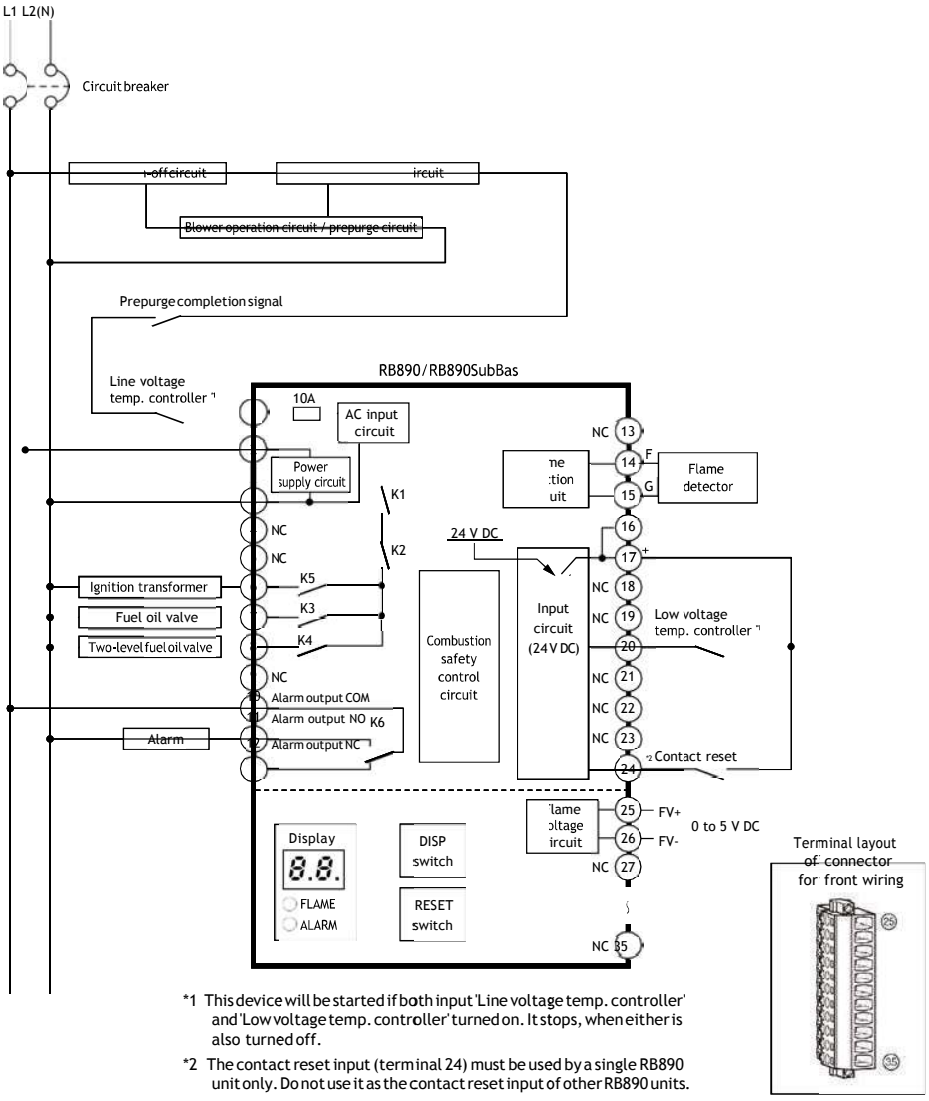
● Non-recycling gas-fired combustion



*1 This device will be started if both input 'Line voltage temp. controller' and 'Low voltage temp. controller' turned on. It stops, when either is also turned off.

*2 The contact reset input (terminal 24) must be used by a single RB890 unit only. Do not use it as the contact reset input of other RB890 units.

● Non-recycling oil-fired combustion (2-level combustion)

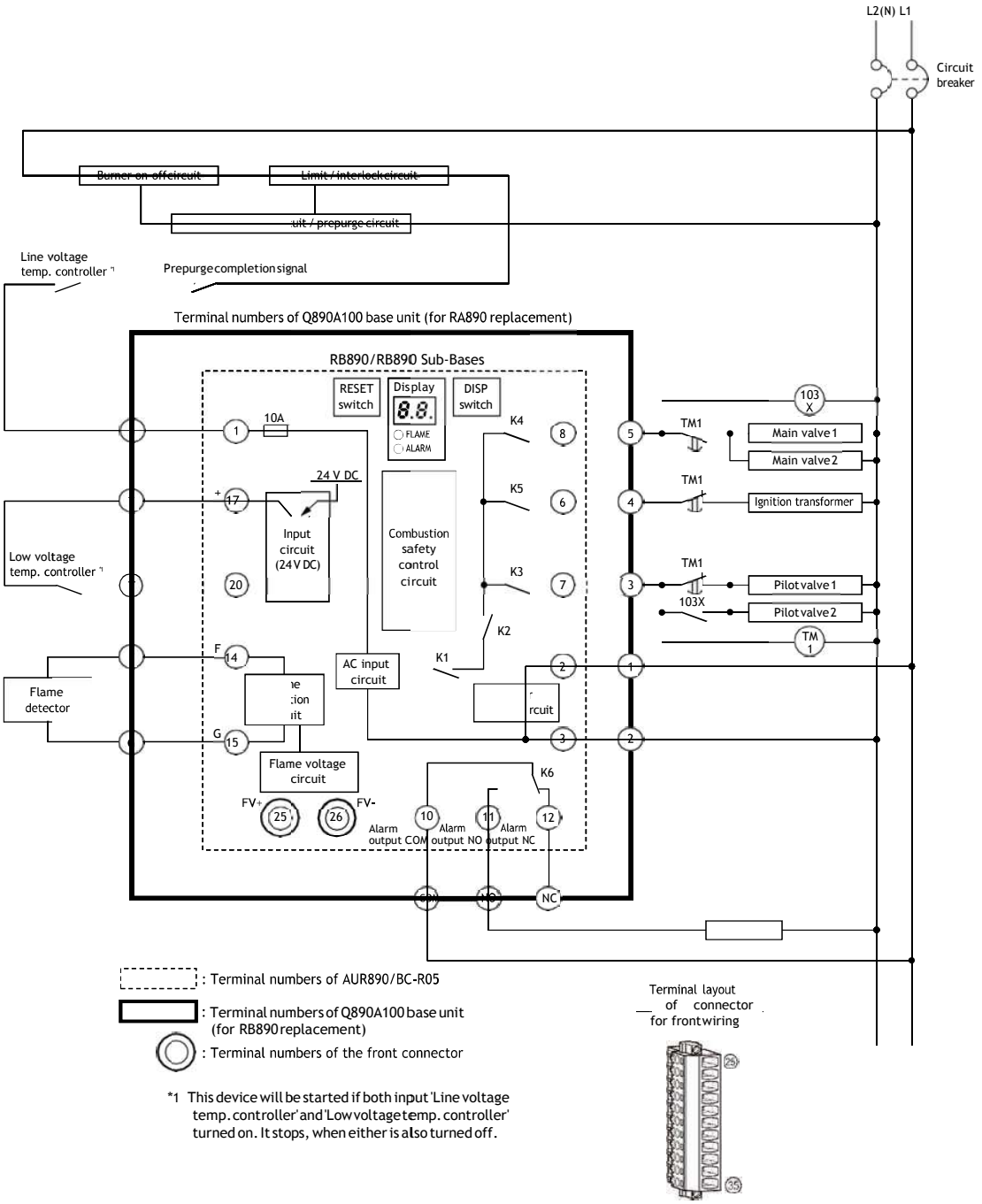


*1 This device will be started if both input 'Line voltage temp. controller' and 'Low voltage temp. controller' turned on. It stops, when either is also turned off.

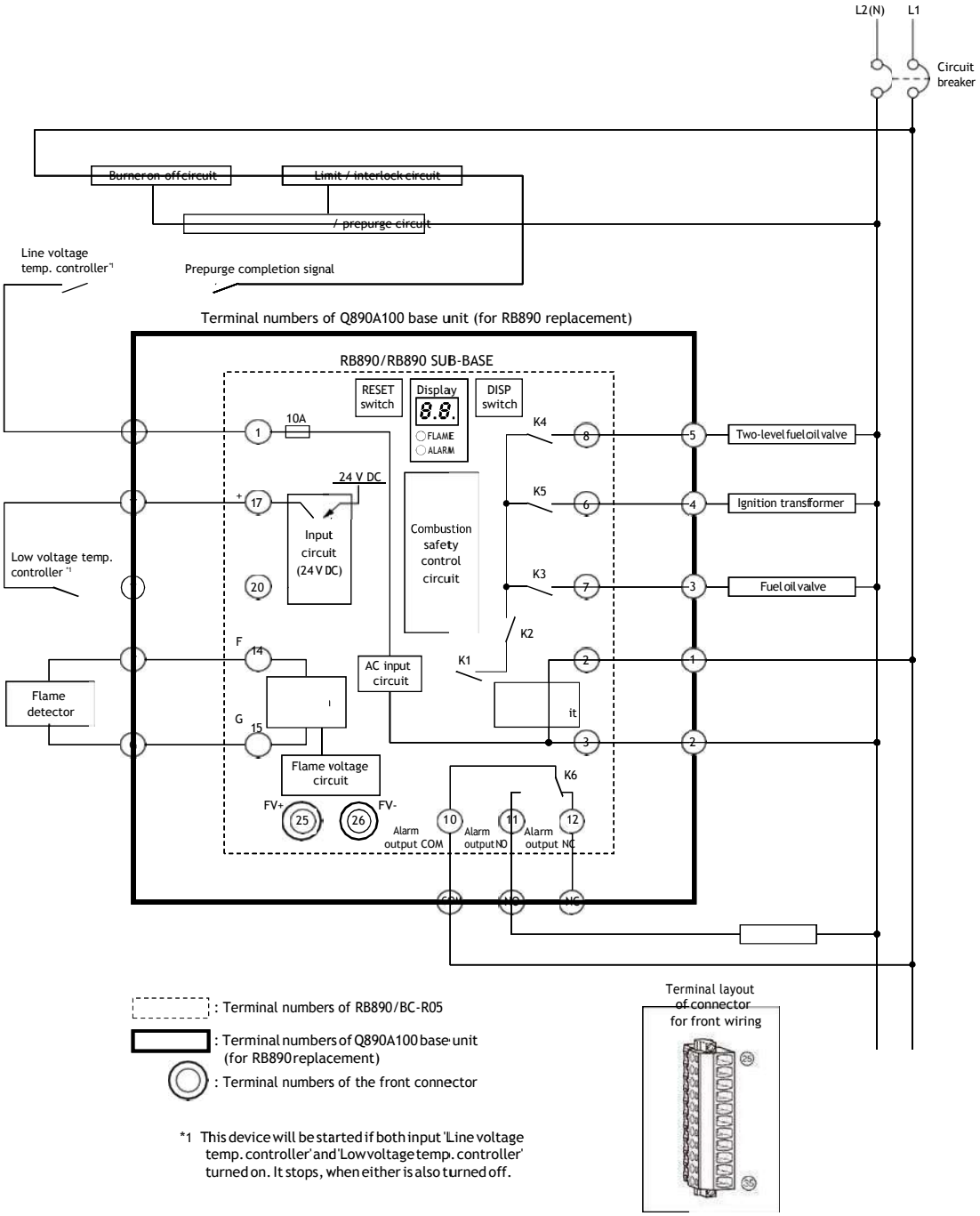
*2 The contact reset input (terminal 24) must be used by a single RB890 unit only. Do not use it as the contact reset input of other RB890 units.

● Q890A100 base unit for RB890-RB890 replacement

● Non-recycling gas-fired combustion



● Non-recycling oil-fired combustion (2-level combustion)

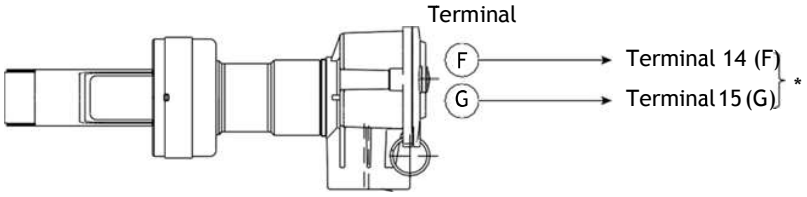


*1 This device will be started if both input 'Line voltage temp. controller' and 'Low voltage temp. controller' turned on. It stops, when either is also turned off.

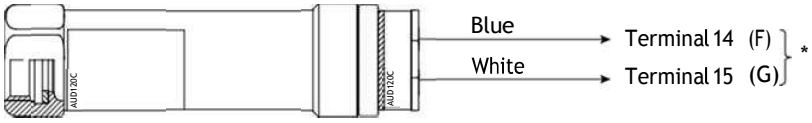
● Wiring to a flame detector (ultraviolet sensor)

● AUD100C+AUD15C

● AUD110C+AUD15C

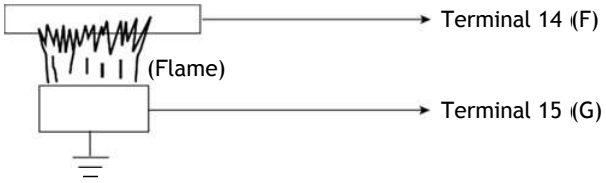


● AUD120C+AUD15C



* If connection of the blue and white lead wires is reversed, or if the connections to terminals (F) and (G) are reversed, the AUD15C tube unit may be damaged.

● Wiring to a rectification flame rod



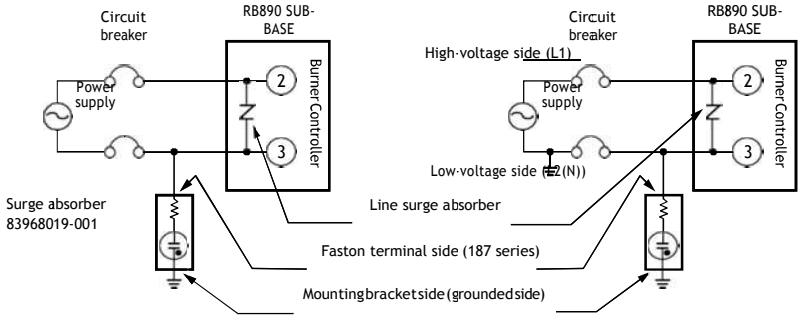
● Example countermeasures against power surges caused by lightning

When using a line surge suppressor as a countermeasure against power surges caused by lightning, connect it between Terminal 3 and the ground, as shown below.

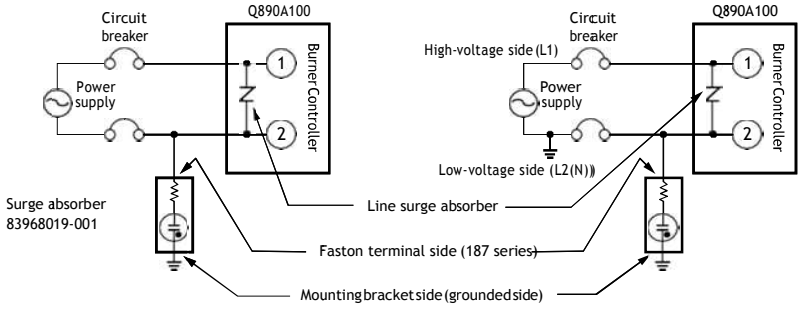
The mounting brackets of the surge absorber are electrically connected internally by crimping to the ground side of the absorber.

Therefore, they can be grounded by simply attaching them to a grounded metal part such as the device cabinet.
When wiring to the power supply, use a lead wire of 0.75 mm^2 (diameter: 0.18, strand count: 30) or more, which complies with JIS C 3306. Attach #187 Faston receptacle at one end and make the wire length as short as possible when connecting it.

● Connections when RB890 SUB-BASE sub-base is used



● Connections when Q890A100 replacement base unit is used

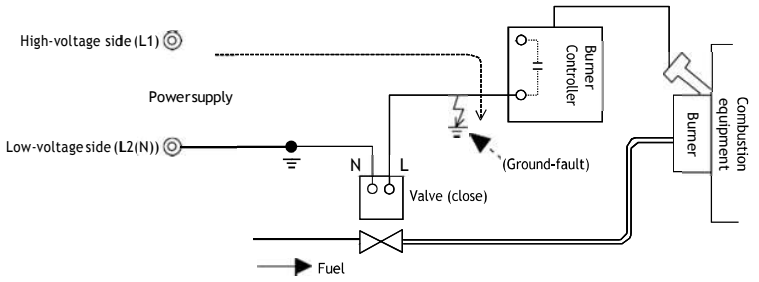


● **Connections to solenoid valve**

⚠ WARNING

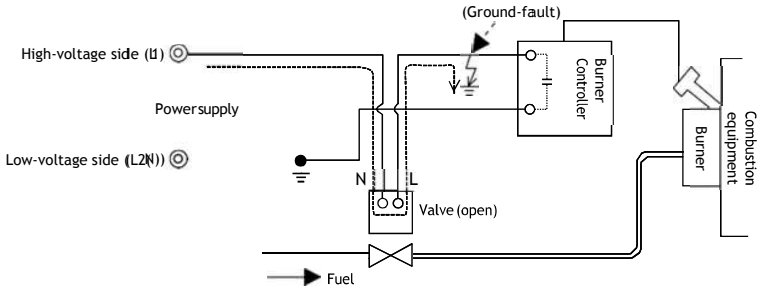
Do not connect the solenoid valve to the high potential side (L1). If it is connected to L1 and a ground fault occurs, current can leak to the solenoid valve and open it, allowing fuel to flow out, regardless of the status of the burner controller.

● **Correct method of connection**



If the solenoid valve is properly connected as shown above, current will not leak to the solenoid valve and an uncontrolled fuel flow will not occur if there is a ground fault due to insulation failure on the high potential side (H).

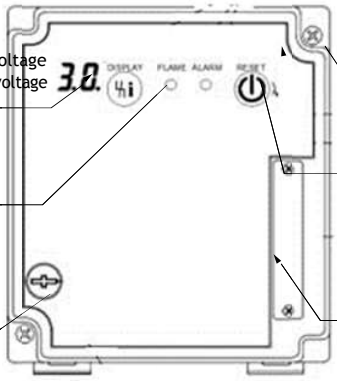
● **Wrong method of connection**



If the solenoid valve is connected to the high potential side (H) as shown in the figure above, and a ground fault occurs, current can leak to the solenoid valve and open it, causing an uncontrolled flow of fuel regardless of the status of the burner controller.

Chapter3. Operation

■ Part names



All the LEDs are lit for 4 seconds after the power is turned on, and then they are turned off, and the display of the sequence code begins.

When a lockout occurs, an alarm code is displayed automatically.

When an alarm occurs, the sequence code and alarm code issued when the lockout occurred are displayed alternately.

■ Operation

● Reset switch

Lockout is canceled when the reset switch is pressed and held for 1 second.

Note: After the lockout is canceled, a stabilization time of approximately 5 seconds should be maintained.
During the stabilization time, no start input can be accepted.

● Contact reset input (terminal 24)

Lockout is canceled by connecting the contact reset input (terminal 24) and the input common (terminal 16 or 17) for 1 second.

Note: After the lockout is canceled, start input is not accepted for approximately 5 seconds.

● DISP switch

● During normal operation

The 7-segment display shows a sequence code.