

# BC-R35 Series Burner Controllers

## Summary

BC-R35 Series burner controllers are combustion safety controllers specifically designed for batch operation (systems which start and stop at least once within 24 hours). They ensure safety by automatically controlling the ignition, combustion monitoring, and fuel shutoff of oil and gas burners with proportional control. They are also equipped with a 7-segment display that can be used in maintenance, a trial operation mode that is convenient for trial-run operation and adjustment, and other features.

Additionally, the BC-R35 is equipped with host communications (RS-485) and Smart Loader Package functions, allowing troubleshooting and more detailed observation of status.

## Features

### Compliant with JIS standards

- Safe construction of combustion systems and equipment
  - Pre-purge and ignition timing in compliance with JIS B 8407:2012 (forced-air burners) and JIS B 8415:2008 (combustion equipment in compliance with the safety principles for industrial incinerators).
  - POC (proof of closure), based on shutoff valve closure confirmation switch input
- JIS-compliant burner controller safety design
  - Safety design in compliance with JIS C 9730 (automatic electrical controls for household and similar use)
  - EN 298 compliance (certification pending)

### Easy mounting and replacement

- DIN rail mounting
  - Easily mountable in the same way as other control devices and control relays
- Uses sub-base structure
  - Structure separates the sub-base from the main unit
  - It is possible to change only the main unit, leaving the wired-in sub-base in place



### Extensive communications with external devices

- Equipped with a 7-segment display
  - 7-segment display for sequence codes and warning codes
  - Press the DISP switch to display the flame voltage.
- External status output
  - States such as ignition failure, flame failure, and combustion detected are output digitally (and used as panel displays)
- Warning reset by contact input
- Equipped with a trial-run operation mode
  - The control motor can be forced to full open and full closed outputs to adjust the high and low fire positions and check the airflow volume
- Equipped with host communications (RS-485), allowing remote observation of status
- Status checking by the Smart Loader Package

## ■ Precautions on equipment instrumentation

- (1) The equipment used in the combustion safety system was designed with careful consideration of laws, standards, safety guidelines, and the like. If the system is designed to a foreign specification, refer to laws and standards in the relevant country.

### Main Safety Policies in Japan

- Technical policy on Safety Standards for Combustion Equipment in Industrial Furnaces: Ministry of Health, Labour and Welfare
  - Combustion equipment in compliance with the safety principles for industrial incinerators - JIS B 8415
  - Forced Draught Burners - Part 1: Gas Burners - JIS B 8407-1
  - Forced Draught Burners - Part 2: Oil Burners - JIS B 8407-2
  - The index of safety technology of industrial gas combustion equipment: Japan Gas Association
  - Index of safety technology of gas boiler combustion facilities: Japan Gas Association
- (2) This device monitors for failures in the relay contacts used for combustion load (IG, PV, MV) output. An E09 error is output if a voltage occurs at a load terminal, due to a ground fault or wiring error, when this device is not outputting a load. If an E09 error occurs when this device is installed, recheck the wiring and eliminate the factors causing the error.
  - (3) 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 casing through a conduit, keeping a distance between power lines and input lines, and other measures. Check the operation of the system on installation.
  - (4) A reset signal must always be input near the equipment (burner, etc.), not remotely.  
If a reset is input while it is not possible to confirm safety, there is the risk of explosion.

# Specifications

| Item                                     |                                       | Description   |                        |   |  |  |                            |  |   |
|--|---------------------------------------|---|------------------------|---|--|--|----------------------------|--|---|
| <b>Application</b>                       |                                       | Batch-operated combustion systems burning gas, oil, or gas/oil mixture  |                        |   |  |  |                            |  |   |
| <b>Compatible flame detector</b>         |                                       | AUD100/ 100/ 120 series UV sensor, flame rod<br>AFD100/110 series visible light flame detector , contact input  |                        |   |  |  |                            |  |   |
| <b>Sequence</b>                          | <b>Sequence timing</b>                | Pre-purge   | Ignition standby       | Pilot ignition (main ignition) *1   | Pilot only (Hi solenoid valve ignition standby) *1 | Main ignition (Hi solenoid valve ignition) *1  | Main burner stabilization  | Low fire shutdown  | Postpurge                               |
|  |                                       | 35 s, 45 s, 60 s, 3 min (select by model number)*2  | 7.5±1 s                | 4.5±0.5 s   | 8.5±1 s  | 4.5±0.5 s  | 8.5±1 s                    | 45 s max.  | 20±2 s                                  |
|  | <b>Flame response</b>                 | AUD100/110/120 series UV sensor   |                        | Flame rod   |  | AFD series visible light flame detector  |                            | Contact input  |   |
|  |                                       | 2 s max (nominally 1.5 s) (when flame voltage is 3 V)   |                        | 2 s max (nominally 1.5 s) (when flame voltage is 2 V)   |  | 2 s max (nominally 1.5 s) (20 lx → 0 lx)   |                            | 1 s max (nominally 0.8 s)<br>(3 s max. when combined with AUR300 series controller (with flame response 2s max.) for continuous operation) |   |
|  | <b>Reset timing</b>                   | 1 s or longer (main unit reset switch or contact reset input) *4  |                        |   |  |  |                            |  |   |
|  | <b>Warning detection timing</b>       | False flame   | Airflow switch error 1 | Airflow switch error 2  | Interlock error                                    | Low fire interlock error 1   | Low fire interlock error 2 | High fire interlock error  | POC (shutoff valve closure check) error |
|  |                                       | 5 s   | 1 s max.               | 180 s   | 1 s  | 1 s max.   | 180 s                      | 180 s  | 3 s                                     |
|  | <b>Airflow switch monitoring</b>      | Yes (checks for switch error #1, error #2)  |                        |   |  |  |                            |  |   |
|  | <b>Ignition failure</b>               | Lockout   |                        |   |  |  |                            |  |   |
|  | <b>Flameout</b>                       | Lockout   |                        |   |  |  |                            |  |   |
|  | <b>Low fire shutdown</b> *3           | After confirming low combustion position when stopped, moves to postpurge (selected according to model).  |                        |   |  |  |                            |  |   |
| <b>Electrical specifications</b>         | <b>Rated power supply voltage</b>     | AUD100/110/120 series UV sensor   |                        | Flame rod   |  | AFD series visible light flame detector  |                            | Contact input  |   |
|  |                                       | 100 Vac, 200 Vac, or 220 Vac, 50/60 Hz  |                        |   |  | 100 to 230 Vac, 50/60 Hz   |                            |  |   |
|  | <b>Allowable power supply voltage</b> | 85 to 110 % of rated power supply   |                        |   |  |  |                            |  |   |
|  | <b>Power consumption</b>              | 10 W or less  |                        |   |  |  |                            |  |   |
|  | <b>Voltage resistance</b>             | 1,500 Vac for 1 min, or 1,800 Vac for 1s<br>Between each terminal and ground, except for combustion sensor connection terminals (terminals 14, 15)  |                        |   |  |  |                            |  |   |
|  | <b>Insulation resistance</b>          | At least 50 MΩ, 500 Vdc megger<br>Between each terminal and ground, except for combustion sensor connection terminals (terminals 13, 14)  |                        |   |  |  |                            |  |   |
|  | <b>Contact rating</b>                 | Blower motor (electromagnetic breaker)  | Ignition transformer   | Pilot valve (main valve Lo solenoid valve) *1   | Main valve (main valve Hi solenoid valve) *1       | Warning  |                            | Control motor open output, close output, proportional output   |   |
| 100 VA                                   |                                       | 300 VA  | 200 VA                 | 200 VA  | 75 VA  |  | 200 VA                     |  |   |
|  | <b>Monitor outputs</b>                | 4, maximum 30mA each  |                        |   |  |  |                            |  |   |
|  | <b>Combustion detection level</b>     | AUD100/110/120 series UV sensor   |                        | Flame rod   |  | AFD100/110 series visible light flame detector   |                            | Contact input  |   |
|  |                                       | When ignition is detected: 1.5 to 4.5 Vdc<br>When extinction is detected: 0.2 to 0.6 Vdc  |                        | When ignition is detected: 1.5 to 4.5 Vdc<br>When extinction is detected: 0.0 to 0.2 Vdc                  |  | When ignition is detected: 1.3 Vdc or less<br>When extinction is detected: 0.5 Vdc or more |                            | When ignition is detected: Short between F and G<br>When flame is not detected: Open between F and G                                       |   |
|  | <b>Flame voltage output</b>           | Recommended flame voltage: must be stable at 2 Vdc or above<br>Flame voltage output range: 0.2 to 4.5 Vdc   |                        | Recommended flame voltage: must be stable at 2 Vdc or above<br>Flame voltage output range: 0.0 to 4.5 Vdc |  | Flame voltage output range: 0.2 to 4.8 Vdc   |                            | When ignition is detected: 4.0 Vdc or more<br>When flame is not detected: 0.5 Vdc or less  |   |
|  | <b>Input</b>                          | Start input, lockout interlock input, contact reset input, airflow switch input, POC (shutoff valve closure check) input, high fire interlock, low fire interlock<br>* Each input is a non-voltage contact input, with allowable contact resistance up to 500 Ω |                        |   |  |  |                            |  |   |
|  | <b>Lifespan</b>                       | 10 years when used for eight hours per day, or 100,000 start/stop cycles (at 25 °C, room temperature, rated voltage)  |                        |   |  |  |                            |  |   |
| <b>Host communication specifications</b> | <b>Communications standard</b>        | RS-485  |                        |   |  |  |                            |  |   |
|  | <b>Transmission route</b>             | 3-wire system   |                        |   |  |  |                            |  |   |
|  | <b>Transmission speed</b>             | 4800, 9600, 19200 bps   |                        |   |  |  |                            |  |   |
|  | <b>Transmission distance</b>          | Max. 500 m  |                        |   |  |  |                            |  |   |
|  | <b>Communication method</b>           | Semi-duplex   |                        |   |  |  |                            |  |   |
|  | <b>Synchronization method</b>         | Asynchronous  |                        |   |  |  |                            |  |   |
|  | <b>Data format</b>                    | 8 data bits, 1 stop bit, even parity, odd parity<br>8 data bits, 2 stop bits, even parity, odd parity   |                        |   |  |  |                            |  |   |
|  | <b>Device address</b>                 | 1 to 32   |                        |   |  |  |                            |  |   |
| <b>Connection method</b>                 | 1: N (max. 15 units)                  |   |                        |   |  |  |                            |  |   |
| <b>Miscellaneous</b>                     | Based on RS-485                       |   |                        |   |  |  |                            |  |   |

|  |  |  |
|--|--|--|
| <b>Transportation and storage conditions</b> | <b>Ambient temperature</b>   | -20 to +70°C   |
|  | <b>Ambient humidity</b>  | 5 to 95 % RH (no condensation)   |
|  | <b>Vibration</b>   | 0 to 9.8 m/s <sup>2</sup> (10 to 150 Hz, 1 octave/minute, 10 cycles, in each of XYZ directions)  |
|  | <b>Shock</b>   | 0 to 300 m/s <sup>2</sup>  |
|  | <b>Packaged drop test</b>  | 60 cm drop height (free drop onto 1 corner, 3 edges, 6 sides)  |
| <b>Operating conditions</b>                  | <b>Ambient temperature</b>   | -20 to +60 °C  |
|  | <b>Ambient humidity</b>  | 10 to 90 % RH (no condensation)  |
|  | <b>Vibration</b>   | 0 to 3.2 m/s <sup>2</sup> (10~150Hz, 1 octave/minute, 10 cycles, in each of XYZ directions)  |
|  | <b>Shock</b>   | 0 to 9.8 m/s <sup>2</sup>  |
|  | <b>Mounting angle</b>  | Reference plane +/-10 °  |
|  | <b>Dust</b>  | 0.3 mg/m <sup>3</sup> or less  |
| <b>General specifications</b>                | <b>Protective structure</b>  | IP40 (with a sideboard ( 81447515-001) attached to the sub-base (BC-R05))<br>IP10 (sub-base (BC-R05) only)   |
|  | <b>Excess voltage category</b>   | II   |
|  | <b>Pollution degree</b>  | PD2  |
|  | <b>Case color</b>  | Black  |
|  | <b>Case material</b>   | Denatured PPE resin (UL94-V0 PTI materials group IIIa)   |
|  | <b>Structure</b>   | Sub-base and main unit   |
|  | <b>Mounted orientation</b>   | Vertical or horizontal<br>However, in horizontal mounting the 7-segment display must face directly upward<br>(DIN rail mounting or direct mounting through base screw holes)   |
|  | <b>Standards</b>   | JIS C 9730-2-5:2010 (Automatic Electrical Controls For Household And Similar Use - Part 2-5: Particular Requirements For Automatic Electrical Burner Control Systems)<br>Compliant with JIS C 9730-1:2010 (Automatic Electrical Controls For Household And Similar Use - Part 1: General Requirements) |
|  | <b>Dimensions</b>  | W95 × H105 × D110 mm   |
|  | <b>Weight</b>  | Approximately 600 g (incl. sub-base)   |
| <b>Wiring types and max. wiring length</b>   | <ul style="list-style-type: none"> <li>- Start, airflow switch, lockout interlock, POC (shutoff valve proof of closure), low fire interlock, high fire interlock<br/>Copper IV wire with 600 V vinyl insulation, 1.25 mm<sup>2</sup>, recommended condition: 20 m or less, maximum wiring length: 100 m</li> <li>- Contact reset<br/>Copper IV wire with 600 V vinyl insulation, 1.25 mm<sup>2</sup>, maximum wiring length: 10 m</li> <li>- AUD100/110/120 (F, G)<br/>Copper IV wire with 600 V vinyl insulation, 1.25 mm<sup>2</sup>, maximum wiring length: 100 m</li> <li>- Flame rod (F, G)<br/>RG-11U (JAN standard: US DoD compliant specification) or equivalent, 5C2V, 7C2V (JIS standard)<br/>Recommended condition: 20 m or less, maximum wiring length: 30 m</li> <li>- AUD100/110 (F, G)<br/>Copper IV wire with 600 V vinyl insulation, 1.25 mm<sup>2</sup>, maximum wiring length: 10 m</li> <li>- RS-485 communications (3-wire system)<br/>0.2 to 1.5 mm<sup>2</sup> shielded, twisted pair cable (recommended) Maximum wiring length: 500 m</li> <li>- Signal line for flame voltage output<br/>IV wire, 0.75 mm<sup>2</sup> or larger, max. wiring length 10 m</li> </ul> |  |

\*1 Item in ( ) is for the case of direct ignition.

\*2 Visible light flame detector and contact input are 35s only.

\*3 Visible light flame detector and contact input model do not have the low fire shutdown function.

\*4 During postpurge after a warning, no reset input is accepted until postpurge is complete.

Also, reset input is not accepted if no warning has occurred.

## Model number composition

(Note: The dedicated sub-base and sideboard are not provided with the BC-R35 controller. Order them separately.)

### ● Flame detector: Flame rod / UV sensor (AUD100/110)

I II III IV V VI VII Example: BC-R35B1G0500

| I                 | II                      | III            | IV           | V             | VI          | VII                  | Description                                     |
|-------------------|-------------------------|----------------|--------------|---------------|-------------|----------------------|---|
| Base model number | Communications function | Flame detector | Power supply | Function code | Timing code | Additional functions |   |
| BC-R              |                         |                |              |               |             |                      | Burner Controller                               |
|                   | 35                      |                |              |               |             |                      | RS-485, with Smart Loader Package function      |
|                   |                         | B              |              |               |             |                      | Flame rod (ionization)                          |
|                   |                         | C              |              |               |             |                      | UV sensor (AUD100/110/120)                      |
|                   |                         |                | 1            |               |             |                      | 100 Vac   |
|                   |                         |                | 2            |               |             |                      | 200 Vac   |
|                   |                         |                | 6            |               |             |                      | 220 Vac   |
|                   |                         |                |              | G             |             |                      | Interrupted pilot type, No low fire stop        |
|                   |                         |                |              | J             |             |                      | Interrupted pilot type, Low fire stop available |
|                   |                         |                |              | L             |             |                      | Direct ignition type, No low fire stop          |
|                   |                         |                |              | N             |             |                      | Direct ignition type, Low fire stop available   |
|                   |                         |                |              |               | 050         |                      | Pre-purge time 35 s                             |
|                   |                         |                |              |               | 086         |                      | Pre-purge time 45 s                             |
|                   |                         |                |              |               | 122         |                      | Pre-purge time 60 s                             |
|                   |                         |                |              |               | 158         |                      | Pre-purge time 3 min                            |
|                   |                         |                |              |               |             | 0                    | None  |
|                   |                         |                |              |               |             | D                    | With inspection record (with data)              |

### ● Flame detector: Visible light flame detector AFD100/110 series

I II III IV V VI VII Example: BC-R35A7G0500

| I                 | II                      | III            | IV           | V             | VI          | VII                  | Description                                |
|-------------------|-------------------------|----------------|--------------|---------------|-------------|----------------------|--|
| Base model number | Communications function | Flame detector | Power supply | Function code | Timing code | Additional functions |  |
| BC-R              |                         |                |              |               |             |                      | Burner Controller                          |
|                   | 35                      |                |              |               |             |                      | RS-485, with Smart Loader Package function |
|                   |                         | A              |              |               |             |                      | Visible light flame detector               |
|                   |                         |                | 7            |               |             |                      | 100-230 Vac                                |
|                   |                         |                |              | G             |             |                      | Interrupted pilot type, No low fire stop   |
|                   |                         |                |              | L             |             |                      | Direct ignition type, No low fire stop     |
|                   |                         |                |              |               | 050         |                      | Pre-purge time 35 s                        |
|                   |                         |                |              |               |             | 0                    | None                                       |
|                   |                         |                |              |               |             | D                    | With inspection record (with data)         |

### ● Flame detector: Contact input

I II III IV V VI VII Example: BC-R35F7G0490

| I                 | II                      | III            | IV           | V             | VI          | VII                  | Description  |
|-------------------|-------------------------|----------------|--------------|---------------|-------------|----------------------|--|
| Base model number | Communications function | Flame detector | Power supply | Function code | Timing code | Additional functions |  |
| BC-R              |                         |                |              |               |             |                      | Burner Controller  |
|                   | 35                      |                |              |               |             |                      | RS-485, with Smart Loader Package function                   |
|                   |                         | F              |              |               |             |                      | Contact input  |
|                   |                         |                | 7            |               |             |                      | 100-230 Vac  |
|                   |                         |                |              | G             |             |                      | Interrupted pilot type, No low fire stop                     |
|                   |                         |                |              | L             |             |                      | Direct ignition type, No low fire stop                       |
|                   |                         |                |              |               | 049         |                      | Pre-purge time 35 s<br>Flame failure response timing 1 s max |
|                   |                         |                |              |               | 121         |                      | Pre-purge time 60 s<br>Flame failure response timing 1 s max |
|                   |                         |                |              |               |             | 0                    | None   |
|                   |                         |                |              |               |             | D                    | With inspection record (with data)                           |

## Compatible flame detector (sold separately)

### ● UV sensor

| Model number    | Name                           | Notes   |
|-----------------|--------------------------------|---|
| AUD15C1000      | Advanced UV sensor tube unit   | Use a dedicated socket for the AUD100C/110C/120C  |
| AUD100C100_     | Dedicated socket for the AUD15 | AUD15C1000, sold separately                       |
| AUD100C1000-A15 | Lead wire type                 | AUD15C1000 in package                             |
| AUD110C100_     | Dedicated socket for the AUD15 | AUD15C1000, sold separately                       |
| AUD110C1000-A15 | Terminal board type            | AUD15C1000 in package                             |
| AUD120C120_     | Dedicated socket for the AUD15 | Without G1/2 adapter, AUD15C1000, sold separately |
| AUD120C121_     | 1/2-inch mounting type         | With G1/2 adapter, AUD15C1000, sold separately    |

\_ : 0: standard product, D with inspection record (with data), T tropicalization treatment (AUD110C only), B with inspection record (with data) + tropicalization treatment (AUD110C only)

### ● Flame rod

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

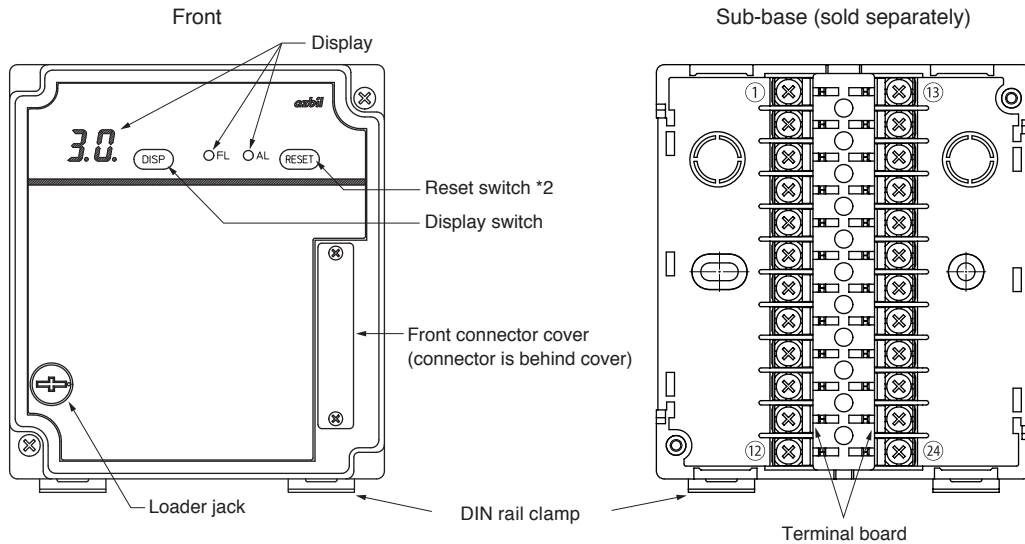
### ● Visible light flame detector

| Model number | Name                         | Notes   |
|--------------|------------------------------|---|
| AFD100A0700  | Visible light flame detector | Light reception direction: front, top-view type |
| AFD100B0700  |                              | Light reception direction: side, side-view type |
| AFD110A0000  |                              | G3/4-inch flange mounting type                  |

## Options (sold separately)

| Model number | Product name                                       | Notes  |
|--------------|--|--|
| BC-R05A100   | Dedicated sub-base for BC-R                        | Required for all products in the BC-R35 series   |
| 81447514-001 | Connector for front wiring                         | Weidmueller model number : BL3.5/11F, compatible wire: 0.2-1.5mm <sup>2</sup> (AWG28-14)     |
| 81447514-002 | Connector for front wiring (For right-side wiring) | Weidmueller model number : BL3.5/11/270F, compatible wire: 0.2-1.5mm <sup>2</sup> (AWG28-14) |
| 81447515-001 | Sideboards   | Contains two. Not included in the sub-base.  |
| SLP-BCRJ71   | Smart Loader Package (No cable)                    |  |
| 81441177-001 | USB loader cable                                   |  |
| FSP136A100   | Analog flame meter                                 |  |
| 81447519-001 | Jack cover   | (Included with the controller.)  |
| 81447531-001 | Front connector cover                              | Packaged with mounting screws (Included with the controller.)                                |
| 81447596-001 | R4780/R4715-compatible mounting plate              | For use when replacing R4715, R4780, R440H, R4751, or R4781                                  |

## Terminal numbers, front panel item names



## Terminal numbers

### Front terminals

| No. | Function                        | No. | Function                                |
|-----|---------------------------------|-----|---|
| 25  | Flame voltage output (+)        | 31  | Power supply for monitor output         |
| 26  | Flame voltage output (-)        | 32  | Monitor output, combustion              |
| 27  | Host communications (RS-485) DA | 33  | Monitor output, ignition failure        |
| 28  | Host communications (RS-485) DB | 34  | Monitor output, flame failure           |
| 29  | Host communications (RS-485) SG | 35  | Monitor output, lockout interlock input |
| 30  | NC                              |     |   |

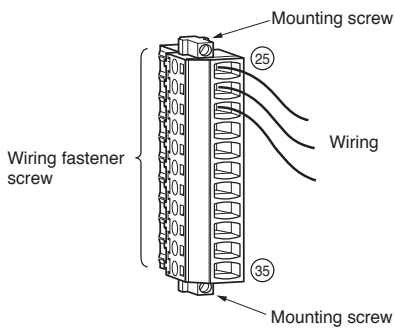
### Sub-base terminals

| No. | Function  | No. | Function                                |
|-----|---|-----|---|
| 1   | Output for the blower motor (electromagnetic breaker) | 13  | Warning output                          |
| 2   | AC power supply (L1)                                  | 14  | Flame detector (F)                      |
| 3   | AC power supply (L2 (N))                              | 15  | Flame detector (G)                      |
| 4   | Output common 1                                       | 16  | Input common 1                          |
| 5   | Output common 2                                       | 17  | Input common 2                          |
| 6   | Ignition transformer output                           | 18  | Low fire interlock input                |
| 7   | Pilot valve output                                    | 19  | High fire interlock input               |
| 8   | Main valve output                                     | 20  | Start input *1                          |
| 9   | Control motor output common                           | 21  | Airflow switch input                    |
| 10  | Control motor proportional output                     | 22  | Lockout interlock input                 |
| 11  | Control motor open output                             | 23  | POC (shutoff valve closure check) input |
| 12  | Control motor closed output                           | 24  | Contact reset input *2                  |

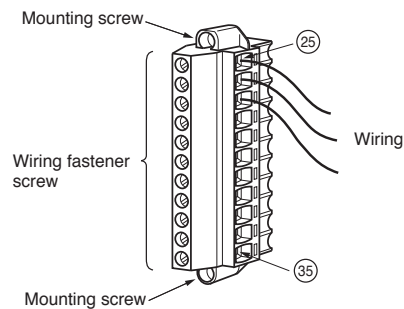
\*1 After lockout is released, even if the start input is ON, the unit will not start for 5 seconds to ensure operation stability.

\*2 During postpurge, reset is disabled for 20 seconds.

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



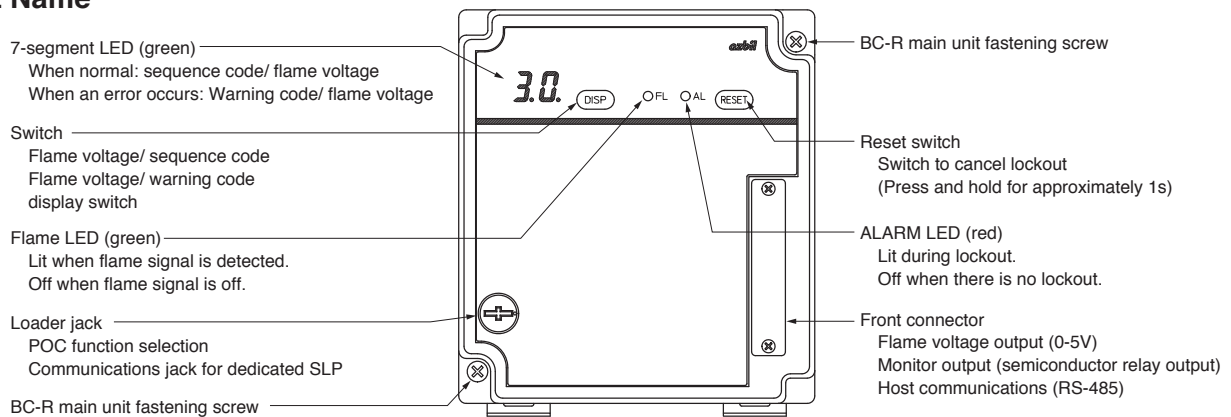
### ● Connector for front wiring (for right side wiring) (81447514-002) terminal layout



## 7-segment display, LED display, switches

If this device detects a flame failure etc., it isolates the load and applies a lockout. During lockout, the relevant diagnostic function code is displayed on the 7-segment display.

### Part Name



### Warning codes

| Display                     | Name  | Content   |
|-----------------------------|---|---|
| E0                          | Interlock error                             | Lockout interlock   |
| E1                          | False flame                                 | Combustion signal was detected for 5s during start check and pre-purge  |
| E2                          | Airflow switch error 1                      | The airflow switch turned Off during combustion   |
| E3                          | Airflow switch error 2                      | The airflow switch stayed On for 3 minutes during start check<br>The airflow switch stayed off for 3 minutes during pre-purge   |
| E4                          | High fire interlock error                   | During pre-purge, no high fire interlock input was detected for three minutes after high fire position output.  |
| E5                          | Low fire interlock error 1                  | The low fire interlock turned off between pilot ignition and main stabilization   |
|                             | Low fire interlock error 2                  | The low fire interlock remained Off for three minutes during ignition standby   |
| E6                          | Ignition failure                            | Ignition could not be detected with pilot ignition (interrupted pilot type)<br>Ignition could not be detected with main trial (direct ignition type)  |
| E7                          | Flame failure                               | The flame signal disappeared in the sequence after pilot ignition (interrupted pilot type)<br>The flame signal disappeared in the sequence after main trial (direct ignition type)                        |
| E8                          | POC (shutoff valve proof of closure) error* | The shutoff valve closure check switch was detected to be Off (open) when the main valve was closed<br>The shutoff valve closure check switch was detected to be On (closed) when the main valve was open |
| E9 +<br>Sub-code (2 digits) | Device error                                | Voltage error detected in output from the ignition transformer, pilot valve, or main valve, etc.  |

\* Replace the burner controller, and if there is a warning code E8, POC may have been set by the equipment manufacturer as disabled.

### Sequence codes

#### • Interrupted pilot type

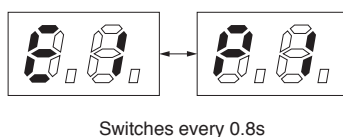
| Display | Status content     |
|---------|--------------------|
| P1      | Start check        |
| P2      | Pre-purge          |
| P3      | Ignition standby   |
| P4      | Pilot ignition     |
| P5      | Pilot only         |
| P6      | Main ignition      |
| P7      | Main stabilization |
| P8      | Steady combustion  |
| P9      | Low fire shutdown  |
| P9      | Postpurge          |
| --      | Stop               |

#### • Direct ignition type

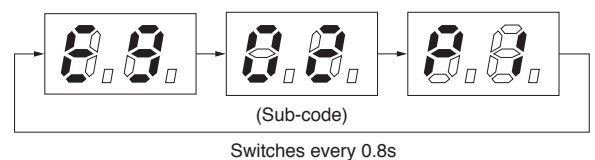
| Display | Status content                     |
|---------|------------------------------------|
| P1      | Start check                        |
| P2      | Pre-purge                          |
| P3      | Ignition standby                   |
| P4      | Main ignition                      |
| P5      | Hi solenoid valve ignition standby |
| P6      | Hi solenoid valve ignition         |
| P7      | Main stabilization                 |
| P8      | Steady combustion                  |
| P9      | Low fire shutdown                  |
| P9      | Postpurge                          |
| --      | Stop                               |

### Examples of sequence codes and warning codes

#### • Warning code: E0 to E8

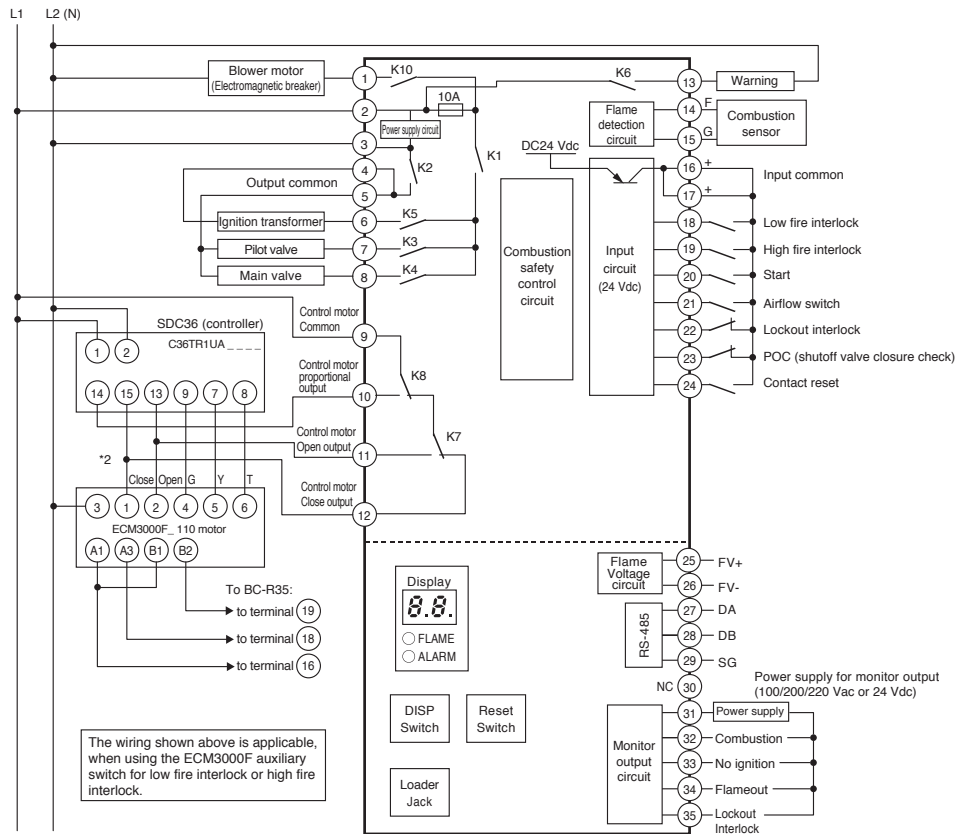


#### • Alarm code: E9 + sub-code (2 digits)

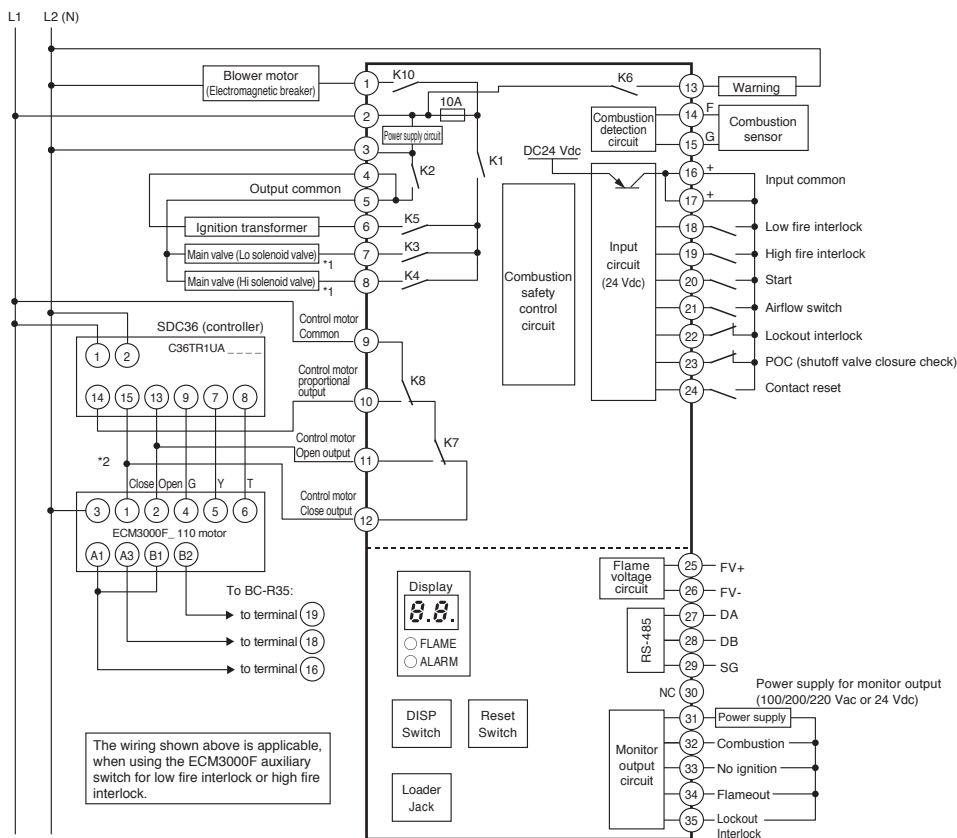


## Internal block circuit, external connection terminals (1-24 on sub-base, 25-35 on front connector)

### ● Interrupted pilot type (excluding the BC-R35F)



### ● Direct ignition type



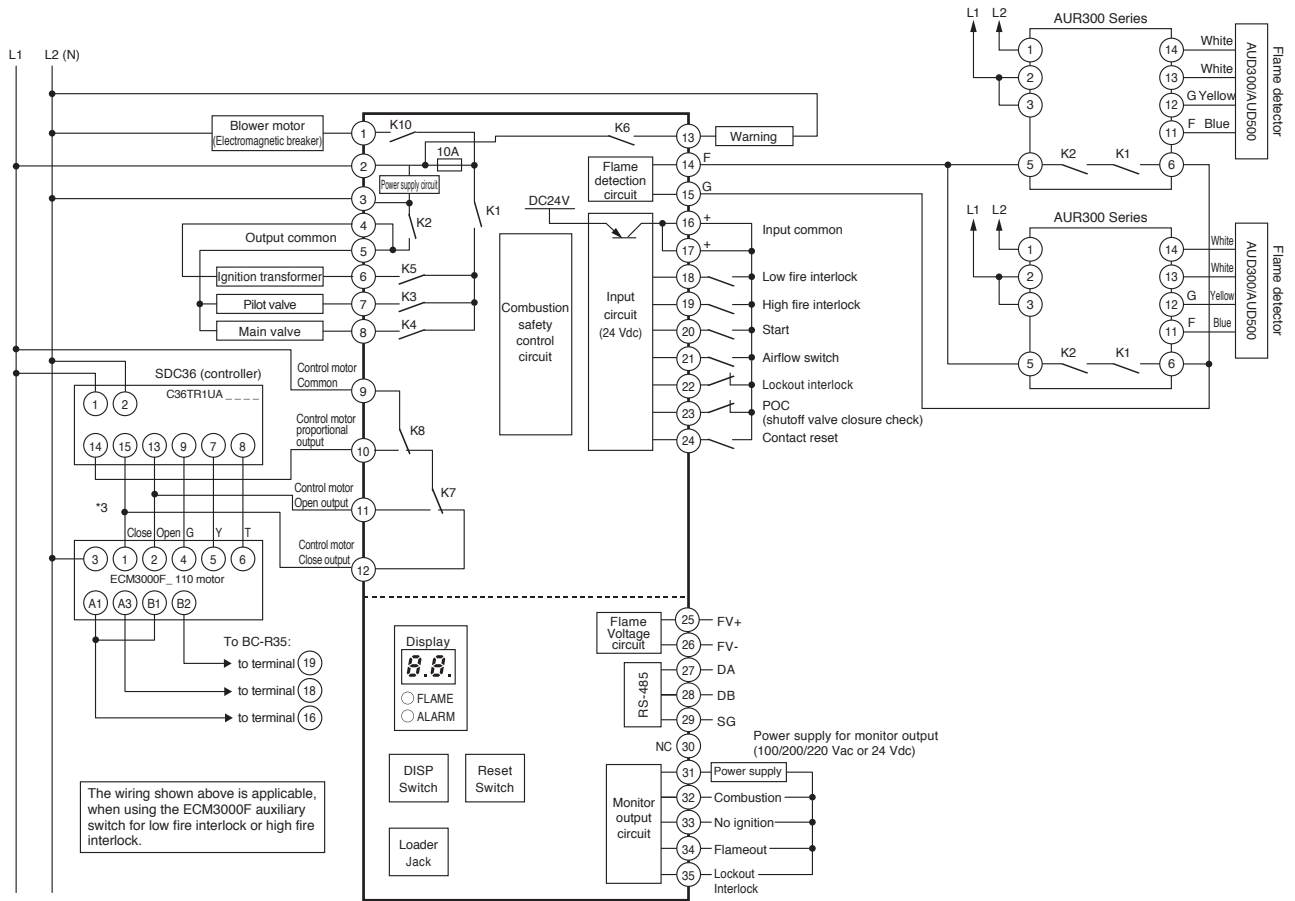
- Note - Use contact reset (terminal 24) input in isolation. It cannot be used in conjunction with other BC-R contact reset inputs.  
 - Output common (terminals 4, 5) and input common (terminal 16, 17) cannot be used in conjunction with other BC-R contact reset inputs.  
 - Host communications (RS-485) and Smart Loader Package compatibility are only available on the BC-R35.

\*1 Content in ( ) describes the situation when three-position (Off-Lo-Hi) control is used. If other than three-position control is used, connect to main valve (terminal 7).

\*2 See Page 9 for the wiring for using a proportional controller and ECM3000E.

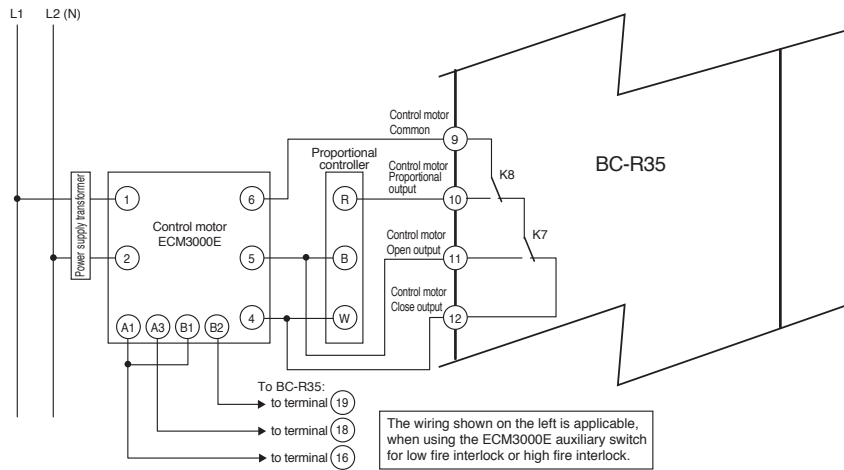


● For compliance with the standard on remote control of boilers (Standards circular No. 0331001) when using the BC-R35F

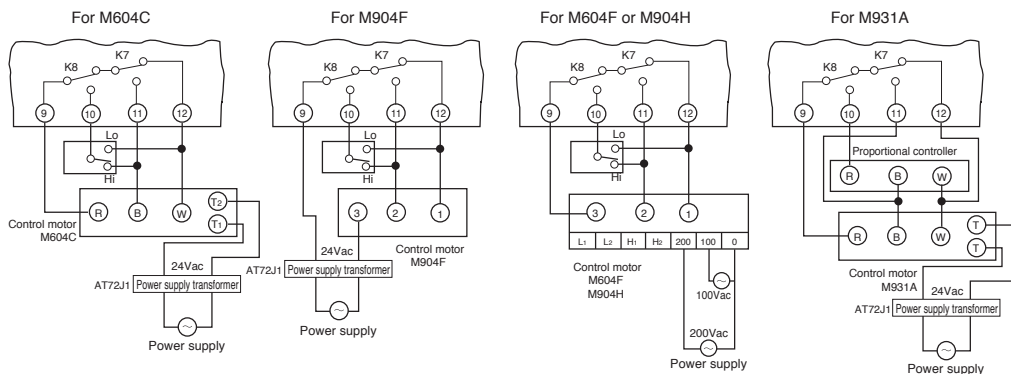


Note: This is not suitable for continuous operation, even if a flame detector for continuous operation is used.

\*3 • The following wiring is applicable, when using a proportional controller/ECM3000E, instead of the SDC36 controller/ECM3000F.



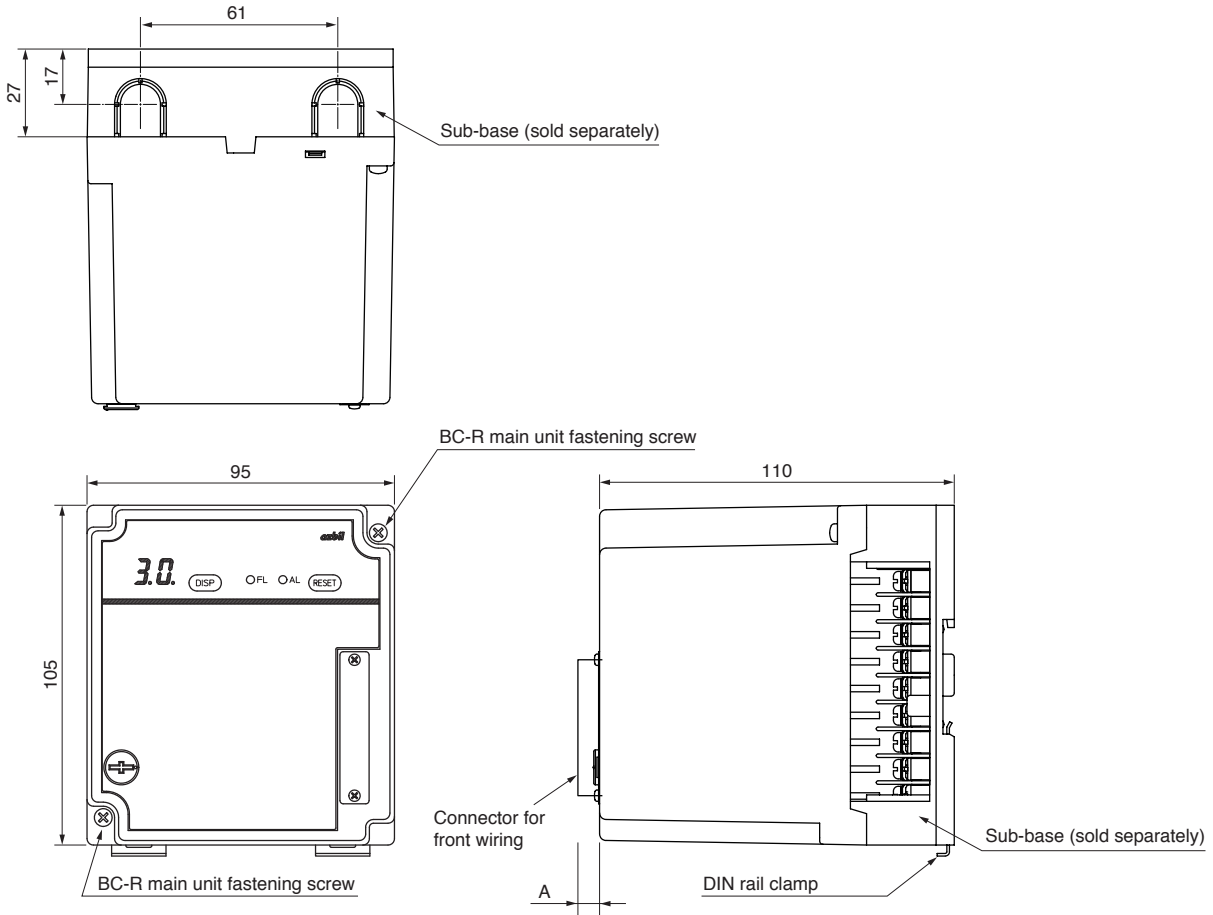
• Wiring with other control motors



# External Dimensions

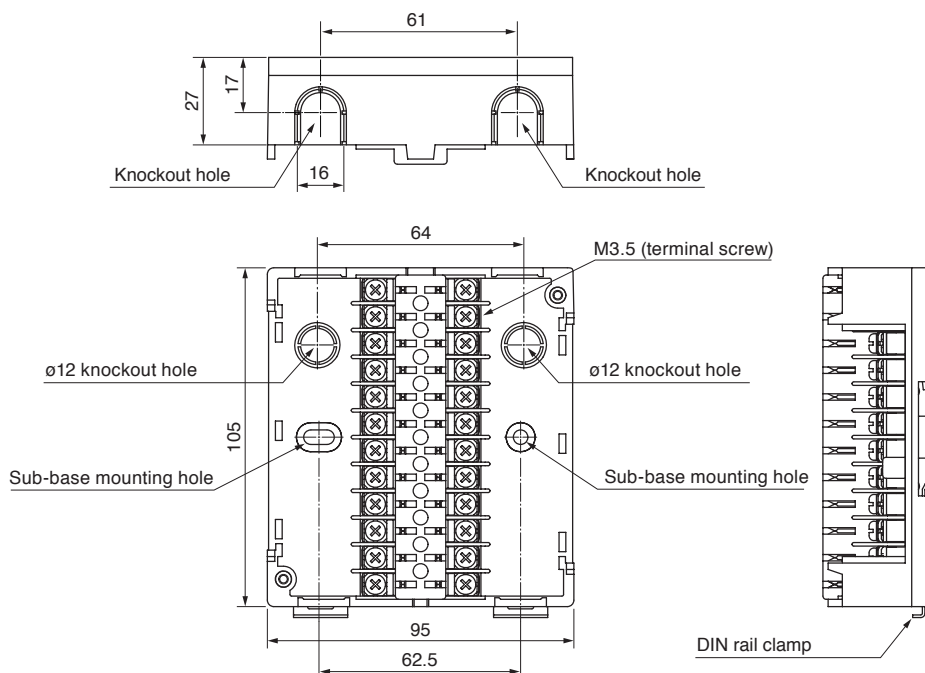
(Unit: mm)

- BC-R35 Burner Controller



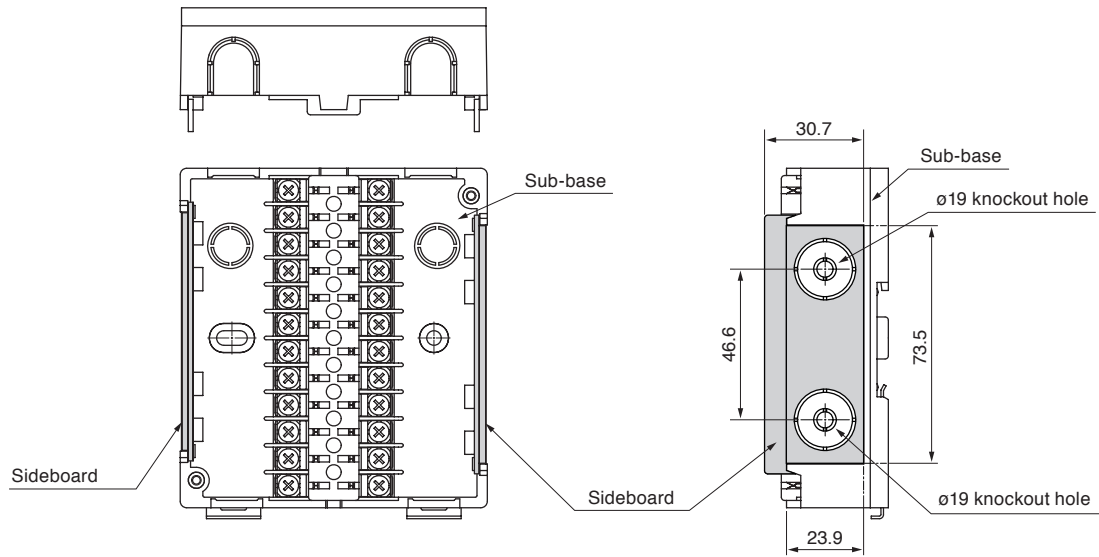
| Model number | A    |
|--------------|------|
| 81447514-001 | 10.6 |
| 81447514-002 | 14.6 |

- Sub-base BC-R05A100 (sold separately)



- Sideboard 81447515-001 (sold separately)

(Unit: mm)

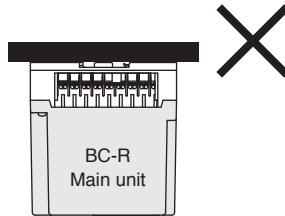


## Installation orientation

Install the device in the orientation shown below.



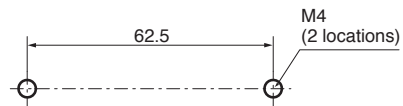
Do not install it in the orientations illustrated below.



## Mounting in a Panel

- [1] Screw two M4 screws into the panel.
- [2] Use the screws to mount the sub-base on the panel.  
(Maximum tightening torque: 1.2 N·m)

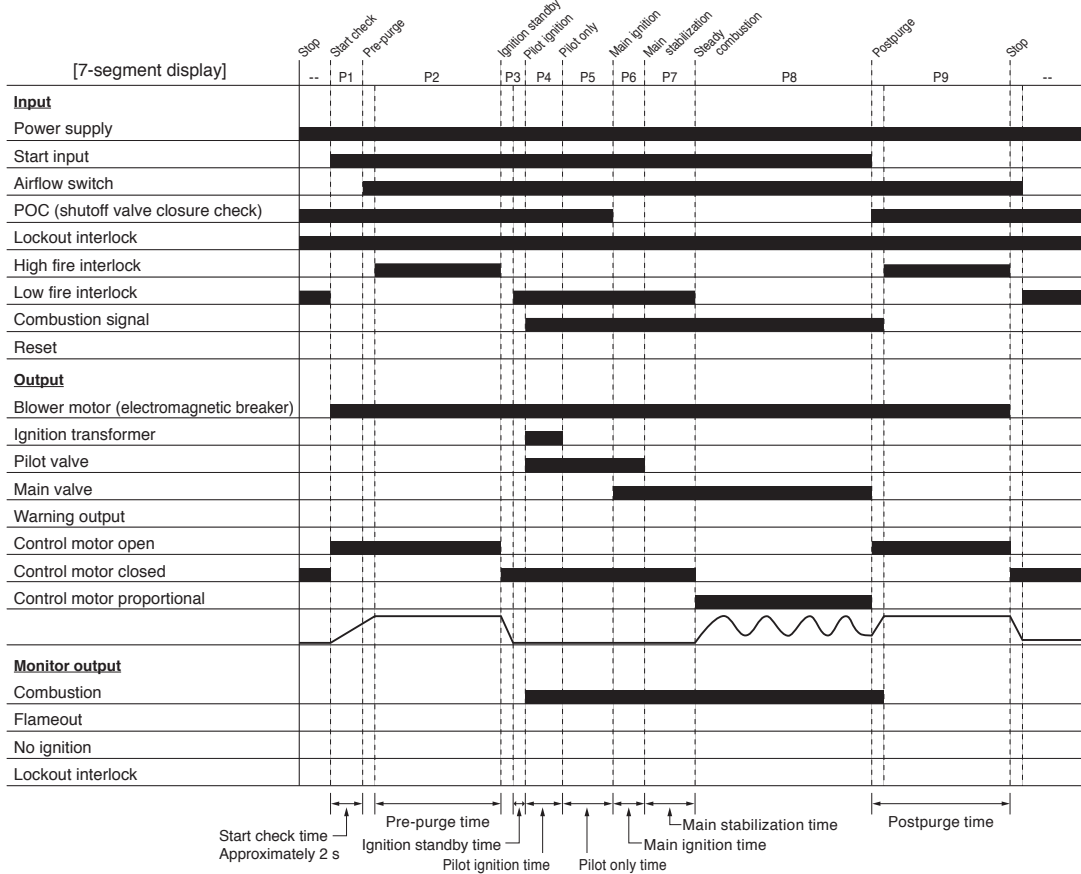
(Unit: mm)



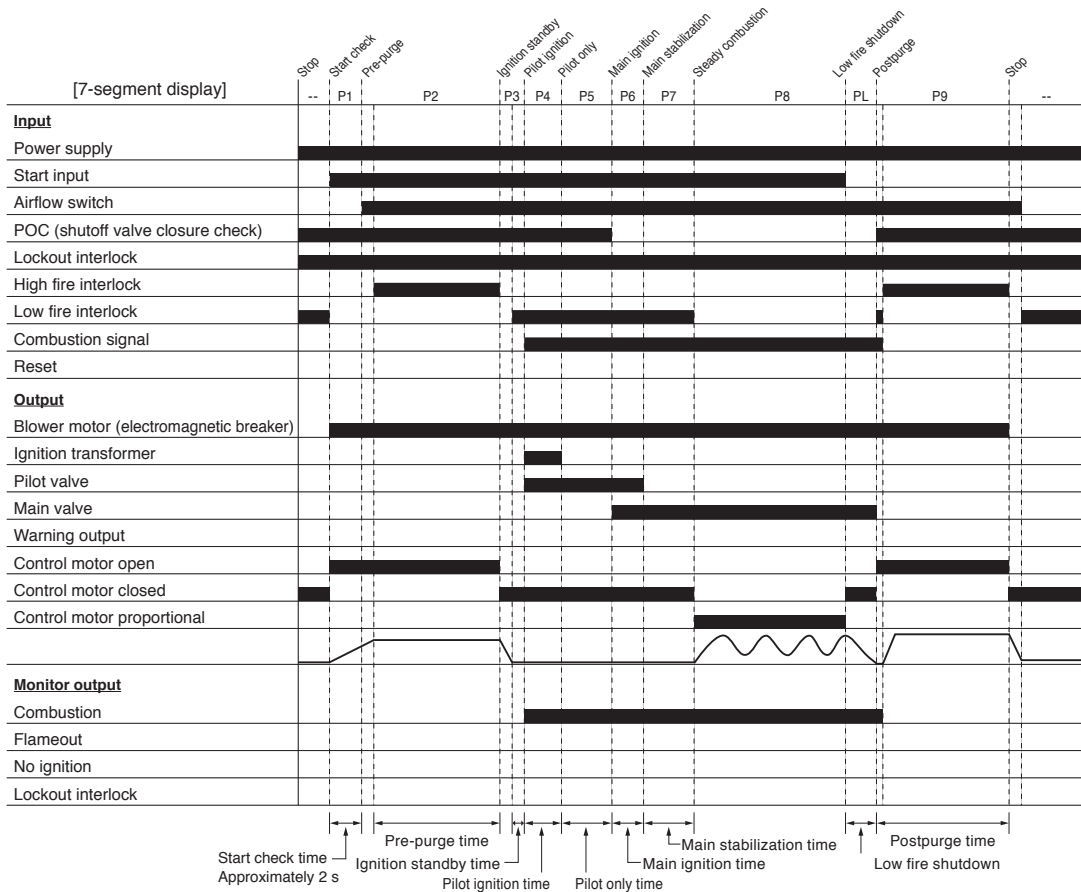
## Operation Sequence

About the sequence except Normal Operation, please watch "BC-R35 User's manual No. CP-SP-1389E".

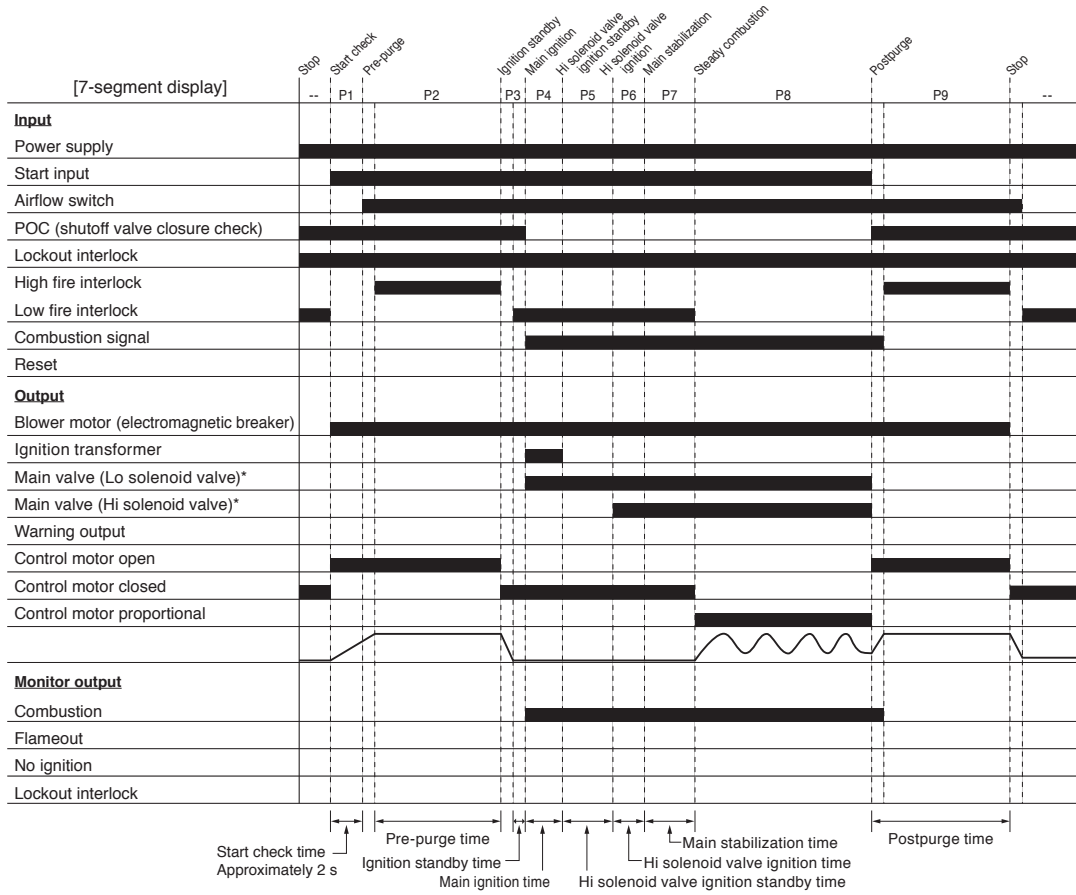
### 1-1. Normal operation (interrupted pilot type, without low fire shutdown)



### 1-2. Normal operation (interrupted pilot type with low fire shutdown)

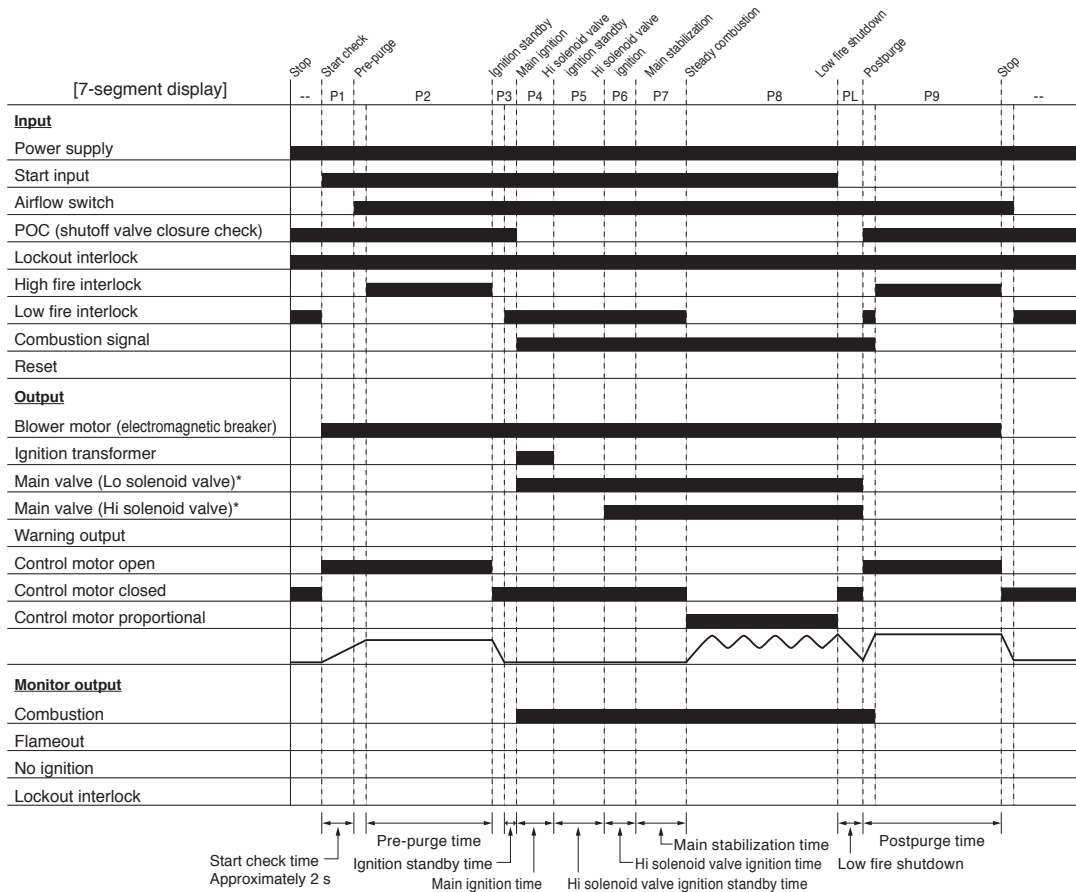


### 1-3. Normal operation (direct ignition type without low fire shutdown)



\* Content in ( ) describes the situation when three-position (Off-Lo-Hi) control is used. If other than three-position control is used, only look at the main valve (Lo solenoid valve)

### 1-4. Normal operation (direct ignition type with low fire shutdown)



\* Content in ( ) describes the situation when three-position (Off-Lo-Hi) control is used. If other than three-position control is used, only look at the main valve (Lo solenoid valve)

## Customer Specification Check Sheet, BC-R35 Series

This sheet is for selecting the optimum BC-R35 Series product to suit the customer's specification.  
Use it to facilitate communications with our sales staff.

|   |  |   |
|---|--|---|
| <b>Equipment name</b>   |  |   |
| <b>Equipment summary</b>  |  |   |
| <b>Flame detector used<br/>(draw a circle around the applicable product)</b>    |  | Flame rod / UV sensor (AUD100 series) /<br>Visible light flame detector (AFD100 series) / contact input |
| <b>(For a UV sensor: Write the model No.)</b>                                   |  |   |
| <b>(With a visible light flame detector: Write the model No.)</b>               |  |   |
| <b>Ignition method (circle the applicable product)</b>                          |  | Direct ignition type / time-limited pilot ignition type   |
| <b>Low fire shutdown</b>  |  | Yes/No  |
| <b>Power supply voltage (circle the applicable voltage)</b>                     |  | 100 Vac / 200 Vac / 220 Vac   |
| <b>Sequence</b>   | <b>Pre-purge</b>                               | Seconds or minutes  |
|   | <b>Ignition standby</b>                        | s   |
|   | <b>Pilot only</b>                              | s   |
|   | <b>Main ignition</b>                           | s   |
|   | <b>Main stabilization</b>                      | s   |
|   | <b>Postpurge</b>                               | s   |
| <b>Input<br/>(Write whether or not there is input, the specification, etc.)</b> | <b>Lockout interlock input</b>                 |   |
|   | <b>Start input</b>                             |   |
|   | <b>Contact reset input</b>                     |   |
|   | <b>Airflow switch input</b>                    |   |
|   | <b>High fire interlock input</b>               |   |
|   | <b>Low fire interlock input</b>                |   |
|   | <b>POC (shutoff valve closure check) input</b> |   |
| <b>MEMO</b>   |  |   |

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before ordering and use.

<http://www.azbil.com/products/factory/order.html>

*Specifications are subject to change without notice.*

**azbil**

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