Thank you for purchasing Burner controller BC-R2S Series. This manual contains information for ensuring correct use of the BC-R2S Series. It also provides necessary information for installation, maintenance, and troubleshooting. This manual should be read by those who design and maintain before ordering or use: http://www.azbil.com/products/bi/order.html

This device is not packaged with a sub-base. To use it, you must have a BC-R05A100 sub-base, which is sold separately.

Be sure that the user receives this manual 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 manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is free from inaccuracies and omissions. If you should find an error or omission, please contact the azbil Group.

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

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### Notices

**NOTICE**

This manual should be read by those who design and maintain, installation, maintenance, and troubleshooting.

This manual contains information for ensuring correct use of this device. It also provides necessary information for installation, maintenance, and troubleshooting. This manual should be read by those who design and maintain before ordering or use: http://www.azbil.com/products/bi/order.html

Be sure to keep this manual nearby for handy reference. Please read the “Terms and Conditions” from the following URL before ordering or use: http://www.azbil.com/products/bi/order.html

### Unpacking

- **Model number:** CP-UM-5790E
- **User manual:** 1

This document should be carried out by a professional with technical training in mounting, wiring, maintenance, inspection, calibration, etc.

### SAFETY PRECAUTIONS

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. Also, be sure to read and understand the contents of this user’s manual.

#### WARNING

- **Warnings are indicated when mishandling this product might result in death or serious injury to the user.**
- **Cautions are indicated when mishandling this product might result in minor injury to the user, or physical damage to this product.**

#### CAUTION

- **Use this device with a combustion equipment that is started and stopped at least once in a 24-hour period.**
- **This device cannot be used for equipment with combustion power.**
- **This device has functions that are extremely important for the safe operation of combustion equipment. Use it correctly in accordance with the user’s manual.**
- **Do not install this device where exposed to any of the following:**
  - High temperatures
  - Sparking
  - Corrosive gases
  - Shock
  - Vibration

### Overview

**BC-R2S series burner controllers are combustion safety controllers specifically designed for batch operation (systems which start and stop at least once within 24 hours), ensuring safety for oil and gas burners with on/off control and by automatic ignition and combustion supervision.**

**IS-compliant safety design**

- **POC (proof of closure) function based on shutoff valve closure confirmation switch input**
- **7-segment display for sequence codes and alarm codes**
- **Alarm reset can be done by external signal (contact input)**
- **Host communication (RS-485) allowing remote observation of status**
- **DIN rail mounting and sub-base structure for easy installation and replacement**
- **Power supply (AC 220V, 50/60Hz, 50VA maximum)**
- **Dimensions:** 92 (W) x 92 (H) x 56 (D)mm

### Names of Parts

- **Flame rod (Ionization)**
- **Model number:** BC-R2A100
- **Product name:** Dedicated BC-R series basic function board for the BC-R2S series

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<td>Dedicated BC-R series basic function board for the BC-R2S series</td>
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### Optional Parts (sold separately)

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### Unpacking

- **Use this device correctly within the range of the rated specifications stated in the user’s manual.**
- **Do not do so may cause device failure or malfunction.**
- **Make sure that the flame detector does not detect the ignition spark.**
- **If the flame detector can detect the spark, change the detector’s line of sight or change the ignition electrode’s position.**
- **Do not connect a load that exceeds the rated voltage in the specifications to the control equipment terminals (terminals 2–1, 2–4, 2–7, or 2–8), and do not short-circuit the load.**
- **Doing so will burn out the internal fuse, making the device unusable.**

### MOUNTING

- **Ensure you turn off the power of this device and all auxiliary devices when mounting, removing or connecting the wires of this device.**
- **There is a risk of electrical shock.**

### Warning

- **Wiring, maintenance, inspection, calibration, etc., should be carried out by a professional with technical training in combustion equipment installed.**
- **Do not pull the wiring while it is attached to the device.**
- **Do not install this device close to electric power devices or other equipment where there is a risk of field interference.**
- **Do not install this device on metal or metal structures.**
- **Do not install this device on a ceiling or floor.**
- **Do not pull down the DIN rail clamps while the DIN rail is mounted.**
- **Do not install this device where exposed to any of the following:**
  - High temperatures
  - Sparking
  - Corrosive gases
  - Shock
  - Vibration

### Mounting on DIN Rail

1. **Pull down the sub-base’s DIN rail clamps.**
2. **Attach to the DIN rail while checking above and below the sub-base.**
3. **Push up the DIN rail clamps to attach the sub-base (sold separately) to the DIN rail.**

### Mounting in a Panel

1. **Drill two M4 screw holes into the panel.**

### Cautions regarding Installation

- **Take space 50 mm above and below, 50 mm to the left and right, and 80 mm to the front, as space for removal, wiring, and maintenance.**
- **Do not install this device close to electric power devices or other sources of heat.**
- **This device must install within a grounded and conductive control panel to ensure safety.**
- **Do not install where exposed to any of the following:**
  - High temperatures
  - Sparking
  - Corrosive gases
  - Shock
  - Vibration

### Trial Operation Mode

- **For details on the trial operation mode, refer to Section CP-SP-1388E.**

### Function Selection Mode

- **For details on the POC selection method and various settings, refer to Section CP-SP-1388E.**

### Installation Orientation

- **Attach the device in the orientation shown below.**

### Mounting Device on DIN Rail

- **(1) Pull down the sub-base’s DIN rail clamps.**
- **(2) Attach to the DIN rail while checking above and below the sub-base.**
- **(3) Push up the DIN rail clamps to attach the sub-base (sold separately) to the DIN rail.**

### Mounting Device on DIN Rail

- **(1) Drill two M4 screw holes into the panel.**
- **(2) Use screws to mount the sub-base on the panel.**

### Mounting / Removing the Device

#### Mounting

1. **Align the indentation in the center of the top of this device with the projection on the sub-base.**
2. **Once aligned as in (1), push straight downward.**
3. **Tighten the device’s retaining screws to secure it in the sub-base.**

#### Removing

1. **(1) Remove the retaining screws from this device.**
2. **(2) Pull it out horizontally while holding down the sub-base.**
**WIRING CONNECTION**

**WARNING**
- 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.

**CAUTION**
- Make sure that the ignition transformer high-voltage cables are properly connected to prevent faulty contact. Faulty contact can 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 earth ground by a wire with a resistance of less than 100 Ω.
- If the wires from this device exceed the recommended length, to prevent malfunction due to external electrical noise, take measures such as keeping power lines away from the input lines between the control panel and the burner controller. After wiring, check that the equipment is operating properly.
- Be sure to connect non-voltage contacts to the inputs of this device with incorrect wiring, the AUD15C tube unit will be damaged.

**Example of Wiring Connection with External Device**

- **Interrupted pilot type**

**SEQUENCE CODES**

- **Interrupted pilot type**
  - **Display**
    - **Header**
    - **Data**
    - **Description**
    - **Status**
  - **P** Start check
  - **P** Post-purge
  - **P** Ignition trial
  - **P** Main trial
  - **F** Flame
  - **F** Post-purge
  - **F** Ignition trial
  - **F** Main trial

- **Direct ignition type**
  - **Display**
    - **Header**
    - **Data**
    - **Description**
    - **Status**
  - **P** Start check
  - **P** Post-purge
  - **P** Ignition trial
  - **P** Main trial
  - **F** Flame
  - **F** Post-purge
  - **F** Ignition trial
  - **F** Main trial

- **Examples of sequence codes and alarm codes**
  - **Alarm code 50-EB**
  - **Alarm code 09-1 sub-code (2 digits)**

- **Note**
  - Use terminal 24 input in isolation. It cannot be used in conjunction with other BC-R control units.
  - The wires from this device exceed the recommended length, to prevent malfunction due to external electrical noise, take measures such as keeping power lines away from the input lines between the control panel and the burner controller. After wiring, check that the equipment is operating properly.
  - Do not connect a load that exceeds the ratings stated in the specifications to the control load terminals (terminals 1-16, 1-2, 1-3, 1-24), and do not short-circuit the load. Doing so will burn out the internal fuse, making the device unusable.

**WIRING CONNECTION**

**Example of Wiring Connection with External Device**

- **Interrupted pilot type**

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  - **P** Main trial
  - **F** Flame
  - **F** Post-purge
  - **F** Ignition trial
  - **F** Main trial

- **Direct ignition type**
  - **Display**
    - **Header**
    - **Data**
    - **Description**
    - **Status**
  - **P** Start check
  - **P** Post-purge
  - **P** Ignition trial
  - **P** Main trial
  - **F** Flame
  - **F** Post-purge
  - **F** Ignition trial
  - **F** Main trial

- **Examples of sequence codes and alarm codes**
  - **Alarm code 50-EB**
  - **Alarm code 09-1 sub-code (2 digits)**

- **Note**
  - Use terminal 24 input in isolation. It cannot be used in conjunction with other BC-R control units.
  - The wires from this device exceed the recommended length, to prevent malfunction due to external electrical noise, take measures such as keeping power lines away from the input lines between the control panel and the burner controller. After wiring, check that the equipment is operating properly.
  - Do not connect a load that exceeds the ratings stated in the specifications to the control load terminals (terminals 1-16, 1-2, 1-3, 1-24), and do not short-circuit the load. Doing so will burn out the internal fuse, making the device unusable.

**WIRING CONNECTION**

**Example of Wiring Connection with External Device**

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  - **P** Ignition trial
  - **P** Main trial
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  - **F** Main trial

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  - **Display**
    - **Header**
    - **Data**
    - **Description**
    - **Status**
  - **P** Start check
  - **P** Post-purge
  - **P** Ignition trial
  - **P** Main trial
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  - **F** Main trial

- **Examples of sequence codes and alarm codes**
  - **Alarm code 50-EB**
  - **Alarm code 09-1 sub-code (2 digits)**

- **Note**
  - Use terminal 24 input in isolation. It cannot be used in conjunction with other BC-R control units.
  - The wires from this device exceed the recommended length, to prevent malfunction due to external electrical noise, take measures such as keeping power lines away from the input lines between the control panel and the burner controller. After wiring, check that the equipment is operating properly.
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