azbi

Specification

Burner Control Module RX-R40/20

Overview

The RX series consists of new combustion safety controllers that combine a burner interlock module and a burner control module in order to provide a wide variety of combustion furnaces with interlock monitoring, automatic ignition, flame monitoring, and other features that ensure safe and correct operation. The RX-R series includes the RX-R40 series for continuous operation and the RX-R20 series for batch operation. Various operation and ignition methods are available by

selecting pre-installed functions using a PC loader.

Features of the RX series

- Combustion safety that suits the equipment's specifications
- Modular structure and a wealth of selectable functions ensure safety functions that are suitable for the equipment specifications.
- Simply select from safety functions that are already created. This reduces the time required to review and verify the safety circuits.
- Functions can be selected using the dedicated PC loader. It is not necessary to study or create special software.
- Minimizes wiring and saves space
- Shutoff signals and other such safety signals are transmitted by connectors between modules. Both the number of wires and the amount of space required can be reduced without the need to relay the safety signals through external wiring.

Maintenance support functions

- Device operation history (operation count, operating hours, warning history, etc.) is automatically recorded without the need to configure any special settings.
- Operation history can be checked at any time by connecting the PC loader.
- Various types of monitor output tailored to the equipment size are implemented to support status investigation and cause identification work during maintenance/troubleshooting. Status check on the product: 7-segment LED display

Lamp check on the front panel: Open collector monitor output Remote monitoring of status: RS-485 communication (standard feature)



Major functions of the Burner Interlock Module (RX-R)

- Ignition function (of the six models below)
 - Ignition sequence selection model (RX-R40/20) Interrupted pilot, intermittent pilot and continuous pilot, direct ignition, flame relay function (selectable using the PC loader)
 - Individual monitoring model (RX-R44)
 - To monitor the pilot and main burner flames separately, use the RX-R44 in combination with the RX-R40.

Individual monitoring and external relay drive model (RX-R46)

Used when controlling the load frequently in such applications as time proportional control or ON/OFF control.

- Direct ignition and external relay drive model (RX-R42/22) Used when controlling the load frequently using the direct ignition method.
- Interlock input

Number of inputs: 4

- Displays on the main unit Status display (7-segment LED) Status display (LED indicators)
- Monitor output Open collector outputs (11, freely allocable)

- Equipment design precautions
 - When designing equipment that uses a combustion safety device, give due consideration to the following safety guidelines.
 Safety Engineering Directives for Industrial Heating Furnace Combustion Equ ipment (by the Ministry of Health, Labour and Welfare [of Japan])
 - General Safety Code for Industrial Combustion Furnaces: JIS B 8415
 - Safety Guidelines for Industrial Gas Combustion Equipment (by the Japan Gas Association)
 - Safety Guidelines for Gas Boiler Combustion Equipment (by the Japan Gas Association)

Important points for ensuring safety

- 1. Connect loads directly to this device.
- 2. Connect interlocks directly to the interlock input of this device. (They should not be connected to this device via a relay)
- 3. Do not set up a bypass circuit for manual operation, etc., for any load.
- 4. Ensure that both main and pilot valves have a redundant shutoff feature.

Specifications

Operation method	Continuous operation (RX-R40 series), batch operation (RX-R20 series)						
Compatible flame detector	AUD100 series, AUD300C/500C, flame rod						
Model	RX-R40/20: Ignition sequence selection model (Interrupted pilot, intermittent pilot and continuous pilot, direct ignition, flame relay function*) RX-R44: Individual monitoring model RX-R46: Individual monitoring and external relay drive model RX-R42/22: Direct ignition/external relay drive model						
Sequence timing	P	ilot ignition tim	e	Pilot-only time	Main ignition time	Flame response*1	
	4.5±0.5 * Selec	5 s, 9±1 s. t using the loa	der	5±1 s	4.5±0.5 s	3±1 s	
Range of flame voltage (normal temperature and humidity, rated voltage)	For RX	-RC: 1 0	.5 to 4.0).0 to 0.6	5 to 4.0 V DC at ignition 0 to 0.6 V DC when extinguished For RX-R _ B: 1.0 to 4.0 V DC at ignition 0.0 to 0.2 V DC when extinguis		4.0 V DC at ignition 0.2 V DC when extinguished	
Recommended flame voltage	Stable	at 2.0 V DC m	in.				
Flame voltage output	0 to 5 V	/ DC					
Environmental specifications	Allowat tempera	ole ambient ature	-20 to	+55 °C			
	Storage	e temperature	-20 to ·	+70 °C			
	Allowat	ole humidity	10 to 9	0 % RH (without condensation	on)		
	Vibratio	on	0 to 3.2	2 m/s ² (10 to 150 Hz for two l	hours each in the X, Y, and Z	directions)	
	Impact		0 to 9.8	0 to 9.8 m/s ²			
Electrical specifications	Rated p	ower	24 V DC				
	Allowat	ole power	21.6 to	26.4 V DC			
	Load	Rated power	100 V /	AC, 110 V AC, 200 V AC, 220	0 V AC (depending on the m	odel No.)	
	Allowable voltage		-15 % to +10 % of rated voltage				
	Power consumption		8 W or less				
	Withstand voltage		 DC terminals 500 V AC for 1 min or 600 V AC for 1 s between: 24 V DC power terminal and input function terminal 24 V DC power terminal and monitor output connector 24 V DC power terminal and RX-R control signal terminal AC terminals 1500 V AC for 1 min or 1800 V AC for 1 s between: (1) relay output and power supply terminals H and G and (2) DC terminals and connectors 				
	Insulation	on resistance	50 M Ω or more with a 500 V DC megger between: (1) relay output and power terminal H and (2) DC terminals and connectors				
	Produc	t life	Seven years when used continuously, 10 years when used eight hours per day (25 °C). Relay contact life is 100,000 cylcles (at rated load)				
	Startup	input	Contact input (24 V DC, 10 mA) ²				
	Reset i	nput	Contact input (24 V DC, 20mA) ⁻²				
	Interloc	k input	Contact input (24 V DC, 20mA) ²				
	Contac	t capacity	Ignition transformer: 300 VA. Pilot valve: 200 VA. Main valve: 200 VA				
	Monitor	outputs	11 (0.1 A or less/output, 0.8 A or less/module, 30 V DC max.)				
General specifications	Dimens	sions	80 (W) × 134.2 (D) × 105.3mm (H)				
	Weight		Approximately 600 g				
	Color of the main unit		Black				
	Structu	re	I wo-piece structure: separable base and main unit				
Mining a shire	Certification*3		Gas Appliance Directive (CE): 0063CN6671				
specifications	Flame detector		 Signal wires F and G: 600 V PVC-insulated wires ("IV wire"), 2 mm², allowable wire length: 200 m max. Flame rod Signal wires F and G: high-frequency coaxial cables, 5C2V, 7C2V, allowable wire length: 30 m max. 				
	Reset		Wiring length: 10 m max.				
	Interlock	contact input	Wiring	length: 200 m max.			
	Signal cab	le type and length	See Table 1.				

*1. • For RX-R _ C, at a flame voltage of 3 V. • For RX-R _ B, at a flame voltage of 2 V. *2. Can be used for equipment that has a contact resistance of 250 Ω or less.

*3. The RX-R4 _ C is certified if it is combined with the AUD300C.

(Table 1)

Signal	Cable type	Maximum wiring length
RX-R control signal	0.2 to 1.5 mm ² (#28-14 AWG)*	50 m
Reset signal	0.3 to 1.25 mm ² (#22-16 AWG)	10 m
Start signal		200 m
IN1 to IN4 signals		
M-1 to M-11		100 m
Monitor output		

* Recommended: JCS4364 cables for light electrical instruments (twisted shielded cables for instruments), eight cores (four pairs)

List of setting functions

Item		Setting No.	Description
Model settings	Combustion mode change	1-1	Selects the combustion mode.
	RX-R purge conditions	1-2	Selects whether to check air pressure switch startup.
	760 °C mode setting	1-5	Selects whether to enable the 760 °C mode.
Process settings	Startup conditions	2-1	Selects conditions for starting the RX-R.
	Reset conditions	2-2	Selects conditions for canceling lockout.
Timer settings	Standby time after recovery from abnormal state	2-3	Sets the time to wait before ignition after a locked-out RX-R is restarted. During this time, the process will not proceed even if the start signal is input.
	Delay time for start	2-4	Sets the wait time before beginning the start-check process.
	Delay time for air solenoid valve OFF	2-5	Sets the wait time before turning the air solenoid valve output OFF.*1
	Time-out time for air pressure OFF check	2-6	Sets the time-out time if the air pressure switch input OFF check, performed dur- ing the state check, fails.*2
	Pilot ignition safety time	1-3	Selects the pilot ignition safety time.
Input settings	Input function	3-1	Selects the input functions for IN1 to IN4.
	Interlock OFF delay	3-2	Selects the OFF delay time for IN1 to IN4.
Monitor out- put settings	Blink operation	5-1	Selects whether to use blinking display (alternate ON/OFF output) for interlock- operated output.
	Monitor output assignment	5-2	Selects signals to be assigned to monitor outputs 1 to 11 (M-1 to M-11).
	Monitor output logic setting	5-3	Select the monitor output logic (direct, reverse), excluding the alarm output (MS-AL-P, MA-AL-N).
Display settings	Alarm display setting	6-1	Sets the method of displaying alarms on the 7-segment LED on the front of the module.
RX-R control setting	X-R control RX-R equipment address etting		Selects the equipment address used for RX-R control communication.

*1. Valid with the following settings.

• "Purge condition for RX-R" (1-2) = ON

• "AV-DRV" must be set for monitor outputs (M-9 to 11) in "Monitor output" (5-2).

*2. Valid when RX -R purge condition" (1-2) = ON.

Part names

Main unit

The terminal area is shown with its cover removed for explanatory purposes.





Installation

Module connection

This device can be connected to RX-Ls using the side connectors on the base.

When modules are connected, their power and communication link are also connected, reducing the amount of wiring required.

Connect the modules before installing them on the DIN rail. Connection examples are shown below.

Multiburner



• Multizone



Model No.

RX-R40/20 ignition sequence selection model

Model No.	Flame detector	Flame	Certifi-
RX-R40C013 00	AUD300C/500C	3+1 s*1	CE
RX-R20C013 00	AUD100/110 (AUD15)	3±1 s ^{*1}	CE
	Flame rod	3±1 s*2	CE
RX-R20B013_00	Flame rod	3±1 s*2	CE

Underscore (_): load power (1 = 100 V AC, 2 = 200 V AC, 4 = 110 V AC, 6 = 220 V AC)

*1. When the flame voltage is 3 V

*2. When the flame voltage is 2 V

Select interrupted pilot, intermittent pilot, direct ignition, etc., using the loader.

The suffix "D" indicates that an inspection record is included. Ex.: RX-R40C01310D

RX-R44 individual monitoring model

		5		
Model No.	Flame detector	Flame response	Certifi- cation	
RX-R44C013_00	AUD300C/500C	3±1 s*1	CE	
RX-R44B013_00	Flame rod	3±1 s*2	CE	
$1 = 100 \times 100 = 100 \times 1000 \times 100 \times$				

Underscore (_): load power (1 = 100 V AC, 2 = 200 V AC, 4 = 110 V AC, 6 = 220 V AC)

*1. When the flame voltage is 3 V

*2. When the flame voltage is 2 V

The suffix "D" indicates that an inspection record is included. Ex.: RX-R44C01310D

RX-R46 individual monitoring and external relay drive model

Model No.	Flame detector	Flame response	Certifi- cation	
RX-R46C013_00	AUD300C/500C	3±1 s*	CE	
Underscore (_): load power (1 = 100 V AC, 2 = 200 V AC, 4 = 110 V				
AC, 6 = 220 V AC)				

* When the flame voltage is 3 V

This model enables a load to be connected outside of an RX-R to control the load frequently during time proportional control or ON/OFF control.

The suffix "D" indicates that an inspection record is included. Ex.: RX-R46C01310D

RX-R42/22 direct ignition/external relay drive model

Model No.	Flame detector	Flame response	Certifi- cation
RX-R42C013_00	AUD300C/500C	3±1 s*	CE
RX-R22C013_00	AUD100/110 (AUD15)	3±1 s*	CE

Underscore (_):load power (1 = 100 V AC, 2 = 200 V AC, 4 = 110 V AC, 6 = 220 V AC)

* When the flame voltage is 3 V

The suffix "D" indicates that an inspection record is included. Ex.: RX-R22C01310D

Optional accessories (sold separately)

Name	Azbil model/part No.	Description
RX-R/RX-L control signal connector	81447402-001	For connection of CN6 (male) connector made by Weidmueller BL3.5/7SNSW (Part No.: 161019) Set contains two pcs.
Smart loader package	SLP-RXMJ70 SLP-RXMJ71 SLP-RXEJ70 SLP-RXEJ71	For maintenance (with cable) For maintenance (without cable) For selecting functions (with cable) For selecting functions (without cable)
Surge absorber	83968019-001	

Wiring

Cautions for wiring

- Before wiring, verify the model No. and terminal No. on the label attached to the side of the module.
- Use a crimp terminal suitable for M3 screws to connect each terminal.
- Exercise care not to allow crimp terminals to touch adjacent terminals.
- Route the signal wires, power wires, etc., of this device at least 30 cm away from other input and power wires. Also, do not pass these wires through the same conduit or wiring duct.
- When wiring is completed, check that the wires are correctly connected. Incorrect wiring may cause damage or malfunction.
- Terminal blocks A and B use the same product. Exercise care to ensure that wiring is carried out correctly.

Combination and wiring of RX-L80 and RX-R40/20

- 1. Combine an RX-L80 and an RX-R40/20 according to the type of operation of the pilot burner and main burner.
- 2. Combinations depending on the type of operation, and the wiring of RX-R40/20 terminal block A
- Interrupted pilot
 - For continuous operation equipment (can also be used for batch operation)



Wiring of RX-R40 terminal block A> (1) Basic wiring (RX-R40/44)

- For batch operation equipment





- Intermittent pilot, continuous pilot
 - For continuous operation equipment (can also be used for batch operation)



<Wiring of RX-R44 terminal block A>
(1) Basic wiring (RX-R40/44)
<Wiring of RX-R40 terminal block A>
(3) Wiring for main monitoring (RX-R40) in individual monitoring

- For external relay drive on continuous operation equipment (can also be used for batch operation)



<Wiring of RX-R46 terminal block A> (\$\circ\$(4) Individual monitoring (external relay drive) Model wiring (RX-R46) <Wiring of RX-R40 terminal block A> (\$\circ\$(3) Wiring for main monitoring (RX-R40) in individual monitoring

- Direct ignition
 - For direct ignition and external relay drive on batch operation equipment



<Wiring of RX-R22 terminal block A> (5) Direct ignition (external relay drive) Wiring of model (RX-R42/22)

- For external relay drive on direct ignition and continuous equipment



<Wiring on RX-R42 terminal block A> (5) Direct ignition (external relay drive) Wiring of model (RX-R42/22) Wiring of terminal block A (AC) (1) Basic wiring (for RX-R40/44)



* If direct ignition is selected with the SLP-RX as the ignition method, connect the main safety shutoff valve to terminal (B1).





(2) Basic wiring (for RX-R20)



* If direct ignition is selected with the SLP-RX as the ignition method, connect the main safety shutoff valve to terminal (B1).



(3) Wiring for monitoring main flame during individual monitoring (RX-R40)

Use in combination with RX-R44 individual monitoring model.



(Note)

 When using terminal block A of the RX-R40 in the wiring configuration shown above, do not connect wires to B2 to B6 (IN1 to IN4, COM) on terminal block B (DC).





(4) Wiring of individual monitoring (external relay drive) model (RX-R46)

Use in combination with the ignition sequence selection model (RX-R40). For ignition sequence selection, select "Flame relay."



(5) Wiring of direct ignition (external relay drive) model (RX-R42/22)



For RX-R22



Wiring of terminal block B (DC)



- *1: Use the reset input independently. It cannot be used together with the reset input of other RX-R40/20s.
- *2: The COM terminal cannot be used together with other RX- R40/20s.

Wiring of power terminals



Wiring of AC power, DC power, external relay, and surge absorber

When using a surge absorber as a countermeasure against lightning, use the connection shown below. Model No.: 83968019-001 (sold separately)



! Handling precautions

- Install an FS4.8 series flat connector (Tyco Electronics AMP's 187 series receptacle or equivalent) on one end of the wire and use a wire that is as short as possible.
- The mounting bracket of the surge absorber, 83968019-001, is crimped internally and on the grounding side to ensure conductivity. It is grounded when installed on the metallic surface of the housing or other grounded parts of the burner.
- Make sure the 24 V DC power is supplied to the RX-R/RX-L together with AC power H, G. If the 24 V DC power is supplied to the RX-R/RX-L and AC power is not supplied, a malfunction may occur.

External dimensions



If RX-Rs cannot be connected together using a side connector,

connect the RX-R control signal line to the CN6 connector.



I/O isolation

The solid line indicates isolation from the rest of the circuits.

DC power (TB1, TB2) Reset input (reset/COM)	Interlock input (IN1 to IN4/COM) Shutter output (S1/S2)
RX-R control signal connector (CN6) Flame detector (F/G)	Flame voltage output (FV+/FV-)
Relay output (IG/PV/MV/ COM-H/COM-G)	AC power supply (H/G)
Startup input	Monitor output connector





Please read "Terms and Conditions" from the following URL before ordering and use. http://www.azbil.com/products/factory/order.html

Specifications are subject to change without notice.

Azbil Corporation Advanced Automation Company

1-12-2 Kawana, Fujisawa Kanagawa 251-8522 Japan URL: http://www.azbil.com/

