Handling Precautions

Remote I/O RT series

Analog I/O unit

RT-X□AGA02N

Thank you for purchasing CKD product.
Please review the precautions in this Handling Precautions thoroughly for safe operation of this product.
Incorrect usage may result in malfunction and dangers.
Keep this Precautions in a safe and convenient place for future reference.
For further information, refer to the instruction manual and product catalog.

Refer to the Handling Precautions of End unit for assembling and installing devices, and the Handling Precautions of Power supply unit for wiring power supply.

⚠ CAUTION

- An electric shock may occur by touching the electrical wiring connection (bare live part). Make sure to power off before wiring. Also, do not touch the live parts with bare hands.
- This product is DC dedicated. Use the product within the specified power supply voltage.
- Fully understand the contents of other units connected to this product before use.
- For details on the entire remote IO system including this product, refer to the "Remote I/O RT Series Instruction Manual: System Construction".
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Accessories	This Handling Precautions, tie rod (2 pieces)

1 Specifications

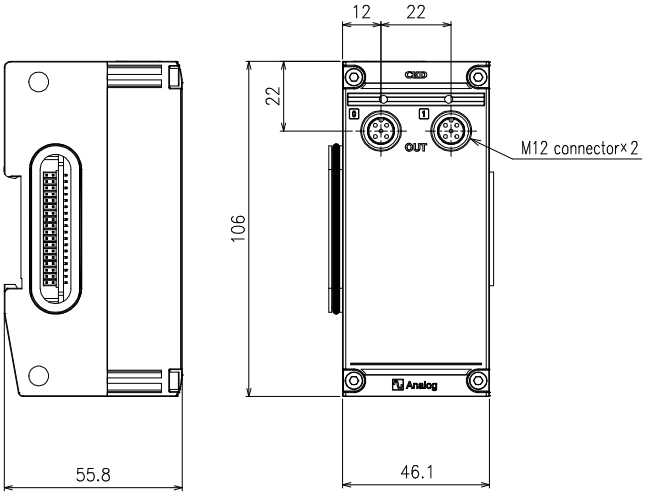
Always use the product within its specifications.

Item		Specifications	
Model No.		RT-XAAGA02N	RT-XBAGA02N
Size (W x H x D)	mm	46.1×106×55.8	
Net weight	g	Approx. 230	
Degree of protection		IP65 / IP67 (when connected) Note 1	
Working temperature range	℃	-10 to +55	
Relative humidity	%RH	30 to 85	
Ambient atmosphere		No corrosive gases or heavy dust	
Installation location		Indoor use	
Altitude	m	Up to 2000	
Pollution degree		3	
Input/Output		input	output
Connector		M12 (A) 5pin female	
Number of CHs		2CH	
Resolution		12bit / 16bit	16bit
Data length		2byte × 2CH	
Protection/Error detection functions		Yes	
Forced input/output setting		Input value can be set regardless of the actual input	Output can be set regardless of the process data
Maximum sensor supply current	A	0.5/CH	-
Input impedance	Ω	Voltage: 100k, Current: 50	-
Absolute accuracy (25 ℃)	%F.S	Voltage: ± 0.5 or less, Current: ± 0.6 or less	-
Sampling cycle	ms	1 to 65535	-
Power supply (for unit/input)	V	24 DC	-
Maximum load supply current	A	-	0.5/CH

Load impedance	Ω	-	Voltage: 1k or more, Current: 600 or less
Absolute accuracy (25 ℃)	%F.S	-	Voltage: ± 0.5 or less, Current: ± 0.6 or less
Power supply (for output)	V	-	24 DC
Signal response range	V DC	-10 to +10, -5 to +5, 0 to +10, 0 to +5, 1 to +5	0 to +10, 0 to +5, 1 to +5
	mA DC	-20 to +20, +4 to +20, 0 to +20	+4 to +20, 0 to +20
Internal current consumption (for unit / input)	mA	70 or less	25
Internal current consumption (for output)	mA	1 or less	65
LED		For indicating device and Input/output status/ 2 pieces	

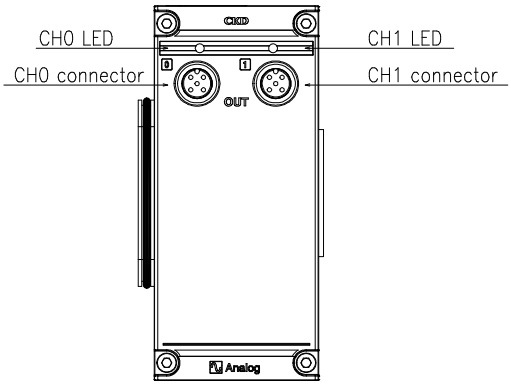
Note 1: IP65/IP67 is not part of the UL certification.

2 External dimensions (common to input and output)



Dimensional unit: mm

3 Names and functions of each part (common to input and output)



4 LED indicators

These LEDs indicate the status of each point.

Input unit

Status	Meaning
Red on	Internal bus communication disconnected (Note 1)
Red blinking (fast)	Hardware error (Note 1)
Red blinking (slow)	Power line error detection
Yellow blinking (fast)	Max/min range error triggered
Yellow blinking (slow)	User set value upper/lower limit error triggered
Green blinking (slow)	Input power supply is OFF
Green on	Input power supply is ON
OFF	Power OFF or CH disable status

Output unit

Status	Meaning
Red on	Internal bus communication disconnected (Note 1)
Red blinking (fast)	Hardware error (Note 1)
Red blinking (slow)	Power line error detection
Yellow on	Output power supply voltage error (detected by the device unit)
Yellow blinking (fast)	Max/min range error triggered
Yellow blinking (slow)	User set value upper/lower limit error triggered
Green blinking (slow)	output power supply is OFF
Green on	output power supply is ON
OFF	Power OFF or CH disable status

Note 1: It will still be on for the CH set to disable.

5 Wiring

Function description and connection of the terminals are as following.

⚠ CAUTION

- An electric shock may occur by touching the electrical wiring connection (bare live part). Make sure to power off before wiring. Also, do not touch the live parts with bare hands.
- Do not apply tension or impact to the M12 connector and network cable. Long cables can exert unexpected momentum and impact due to its weight, and this can consequently damage the connectors and devices. Take appropriate measures such as secure the wiring to the machine or device midway.
- Do not wire the input/output line and other power line in parallel to prevent problems caused by noise.
- Discharge static electricity that has built up on your body by touching a grounded metal object before handling the device. Static electricity may cause damage to the product.

5.1 Connecting and wiring to the M12 connector

The connector plug for input/output is not supplied with the product. Separately purchase a plug that satisfies the specifications. Wiring the cable to the connecter plug enables the plug to connect to the connector socket for input/output on the product.

Recommended connector with cable

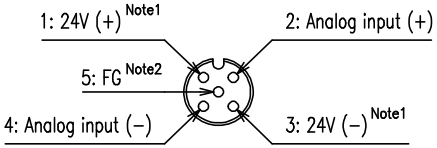
XS2H-D421-□□/XS2H-D521-□□ (cable with connector plug at one end) Mfd by Omron Corporation

⚠ CAUTION

- Use a cable suitable for the working voltage and current.
- Provide sufficient bending radius for the cable and do not bend it forcibly.

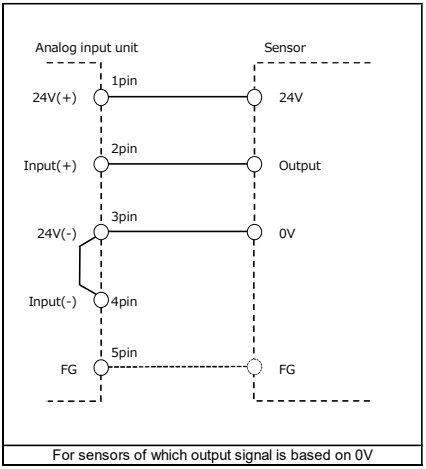
5.2 Pin arrangement and connecting example

5.2.1 Input unit

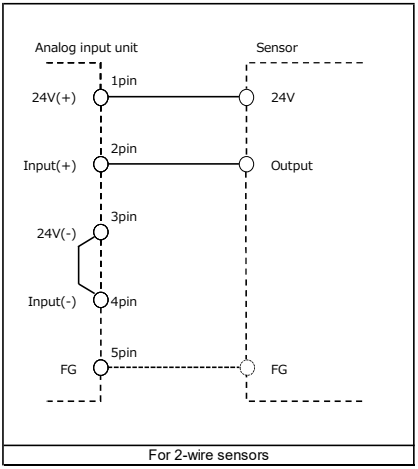


Note 1 Power supply for unit/input (ex.sensor)
Note 2 FG terminal (for improving noise resistance)

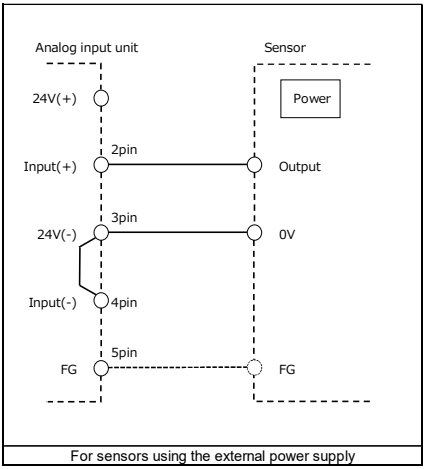
Pin arrangement



For sensors of which output signal is based on 0V



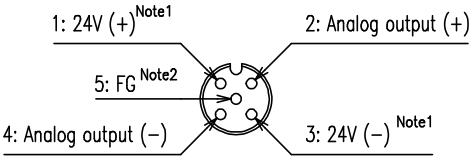
For 2-wire sensors



For sensors using the external power supply

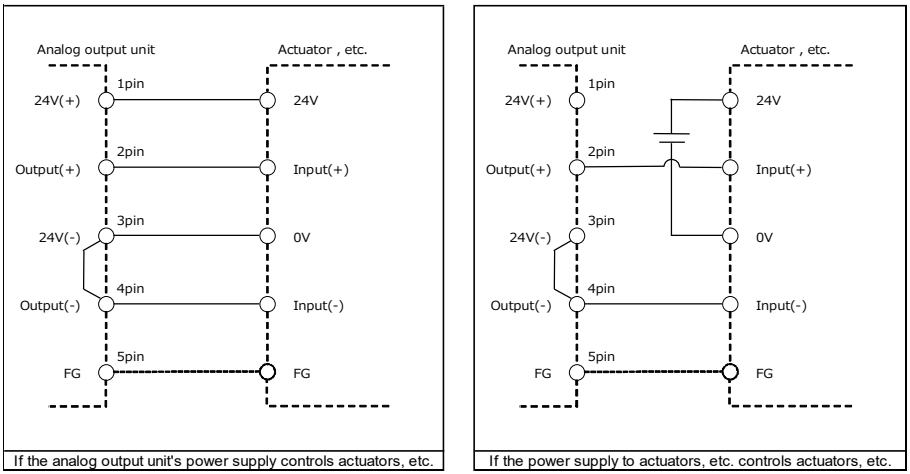
Connecting example

5.2.1 Output unit



Note 1 Power supply for output (ex.actuator)
Note 2 FG terminal (for improving noise resistance)

Pin arrangement



Example of wiring

6 Maintenance

Refer to the "Remote I/O RT Series Instruction Manual: System Construction" for installing and removing this product.

⚠ CAUTION

- Do not pull the cable or connector forcibly as it may cause cable disconnection or damage.
- An electric shock may occur by touching the electrical wiring connection (bare live part).
- Do not install the unit with dirt or dust on the unit opening, gasket, O-ring, etc.

7 Function List

7.1 Input unit

Function	Description	Related settings
Input range switching	Selects the input signal of the analog input unit.	[Input range]
Process data format conversion selection	Selects how the analog input is converted to process data.	[Data format]
Input power supply ONOFF setting	Sets whether to supply the external device with input power according to the need for the external device's signal power supply.	[Input power supply ONOFF]
Sampling period setting	Sets the sampling period of the analog input.	[Sampling period]
Power line error detection	Detects short circuits, disconnections, and overheating in the analog input unit's power line (pin 1 line of each connector) Whether detection is performed depends on the "Power line error detection" setting	[Power line error detection]
Average filter	Sets the average sampling count for the analog input from the following: 2 (factory setting), 4, 8, 16 times	[Averaging sampling count]
Forced input setting	Forces the analog input unit's input signal to be set to any value (regardless of actual input value) from the PC software.	-
Max/min range error	An error function for the selected max or min range. If the analog input value is +5% or more than the selected max range, or -5% or less than the selected min range, max/min range error will be triggered. Hysteresis processing exists depending on the setting.	[Max/min range error]
User set value upper/lower limit error	An error function for the user set upper or lower limit. It can trigger an error when the set threshold is exceeded. Hysteresis processing exists depending on the setting.	[User set value upper/lower limit error, upper /lower limit error threshold]
Hysteresis setting on the measured values	Sets whether to have a range of measured values when the device returns from the error status to the non-error status in the max/min range and user set value upper/lower limit errors.	[Measured hysteresis]
CH disable setting	It's possible to set it so the target CH is not used as a unit. No internal power is used with the disable setting.	[Enable/Disable CH]
CH diagnostic information for the unit	The diagnostic information for each of the analog input unit's CH. 16 bit per CH, and the corresponding bit is 1 (ON) if an error is detected. The information can be read from the PC software or upper master. The types of errors are as follows: Bit: Error description (genres of device diagnostics) 15: Power line error (unit input) 14: Max range error (unit input) 13: Min range error (unit input) 12: User set value upper limit error (unit input) 11: User set value lower limit error (unit input) 10: Set parameter check (system error) 9: Hardware error (hardware)	-

7.2 Output unit

Function	Description	Related settings
Input range switching	Selects the output signal of the analog output unit.	[Input range] [Data format]
Process data format conversion selection	Selects how the analog output is converted to process data.	
Output power supply ONOFF setting	Sets whether to supply the external device with output power according to the need for the external device's signal power supply.	[Output power supply ONOFF]
Power line error detection	Detects short circuits, disconnections, and overheating in the analog output unit's power line (pin 1 line of each connector). Whether detection is performed depends on the "Power line error detection" setting	[Power line error detection]
Power line error recovery operation setting	Sets whether to maintain the same behavior as during the power line error when it has been recovered from, or return to normal from the most recent data update after recovery. If it maintains the same behavior as during the error, it will wait for the user to turn the power off and on again.	[Power line error recovery operation]
Forced output setting	Forces the analog output unit's output signal to be set to any value (regardless of actual output value) from the PC software.	-
Max/min range error	An error function for the selected max or min range. If the analog output value is +5% or more than the selected max range, or -5% or less than the selected min range, max/min range error will be triggered.	[Max/min range error]
User set value upper/lower limit error	An error function for the user set upper or lower limit. It can trigger an error when the set threshold is exceeded.	[User set value upper/lower limit error, upper /lower limit error threshold]
Communication error operation setting	If the device unit's DIP switch setting SW3 (output settings in the event of a communication error / priority to hardware) is OFF, the output operation in the event of a communication (upper communication or internal bus communication) error is set individually on the Analog output unit side.	[Communication error operation] [Customized output value at communication error]
CH disable setting	It's possible to set it so the target CH is not used as a unit. No internal power is used with the disable setting.	[Enable/Disable CH]
CH diagnostic information for the unit	The diagnostic information for each of the analog output unit's CH 16 bit per CH, and the corresponding bit is 1 (ON) if an error is detected. The information can be read from the PC software or upper master. The types of errors are as follows: Bit: Error description (genres of device diagnostics) 15: Power line error (unit output) 14: Max range error (unit output) 13: Min range error (unit output) 12: User set value upper limit error (unit output) 11: User set value lower limit error (unit output) 10: Set parameter check (system error) 9: Hardware error (hardware) 8: On power line error recovery, power line error maintained (operation waiting)	-

PRECAUTIONS

- Make sure that cables and connectors are securely connected before turning on the power.
- Do not disassemble, modify, or repair the product as that may cause failure or malfunction.
- Do not drop or apply excessive vibrations or shocks to the product as the part inside are made precisely.
- Do not attach or detach the connector while the power is ON as that may cause a failure or malfunction.
- Mold and rust may develop on the product if it is exposed to high humidity during transportation. Include moisture absorbers and tightly seal the package.

For inquiries regarding this product, please contact the following or the nearest sales office.

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