



INSTRUCTION MANUAL

ABLE

FULL AUTOMATIC EXTINGUISHING SYSTEM
FOR INDUSTRIAL MACHINERY

YAC-3A

Table of Contents

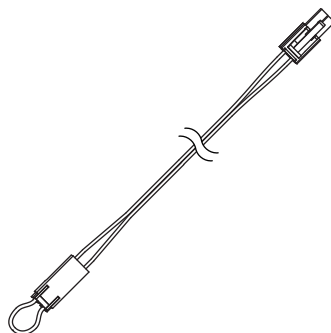
Checking the package contents.....	1
Before using this product	2
1. Structural diagram	3
2. Installation work procedure.....	4
3. Installation of the cabinet.....	4
4. Installation of the nozzle and thermistor.....	5
5. Wiring work.....	6 to 7
6. Installation of the storage vessel.....	8
7. Piping work.....	9
8. Operational testing and setting.....	10 to 11
9. Activation of the fire alarm.....	12
10 Procedure after the fire alarm is activated.....	12
11 In case of a system error	13
12 When the battery is dead	13
13 Installation checking procedure.....	14
14 Part replacement.....	14
*Product Specifications.....	Back cover

YAMATO PROTEC CORPORATION

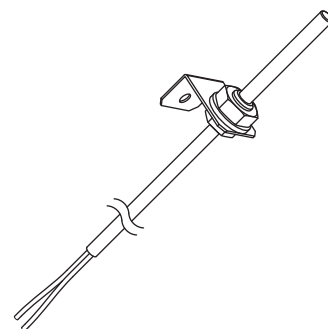
Checking the package contents



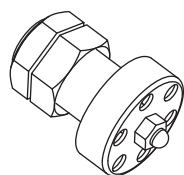
Main unit
1



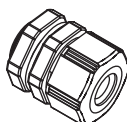
Releasing device cable
(with a dummy connector)
1 set



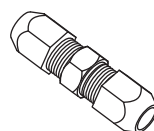
Thermistor
(with a 5m-long connector cable)
1



Nozzle
(with a fitting and dust prevention cap)
1 set



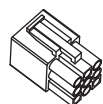
SC lock
(for $\phi 8$)
1



Straight joint
(for $\phi 8$)
1



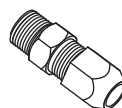
Elbow joint
(for $\phi 8$)
1



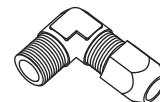
Connector for
the signal transmission units
1



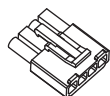
Spare rings for pipe fittings
(for $\phi 8$)
5



Half union
(for $\phi 8$)
1



Elbow half union
(for $\phi 8$)
1



Thermistor connector
1



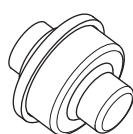
Socket contacts
(for the connector of the
signal transmission units)
12



Pipe bands for
fixing the copper pipe
5



Pipe band screws (with W and SW)
and hexagon head bolts
for fixing the copper pipe
5 sets



Rubber cap for the nozzle
(option)
1



Function check seal to be used
for the installation work
1





Delivery notice
1





Instruction Manual
1

Before using this product

To use this product correctly and to prevent injuries to users and other individuals or damage to their assets, this document (Instruction Manual) uses graphic symbols for the items requiring attention. The symbols and meanings are as follows. Please read this document to thoroughly understand the contents. After reading this document, ensure that it is kept within easy reach.

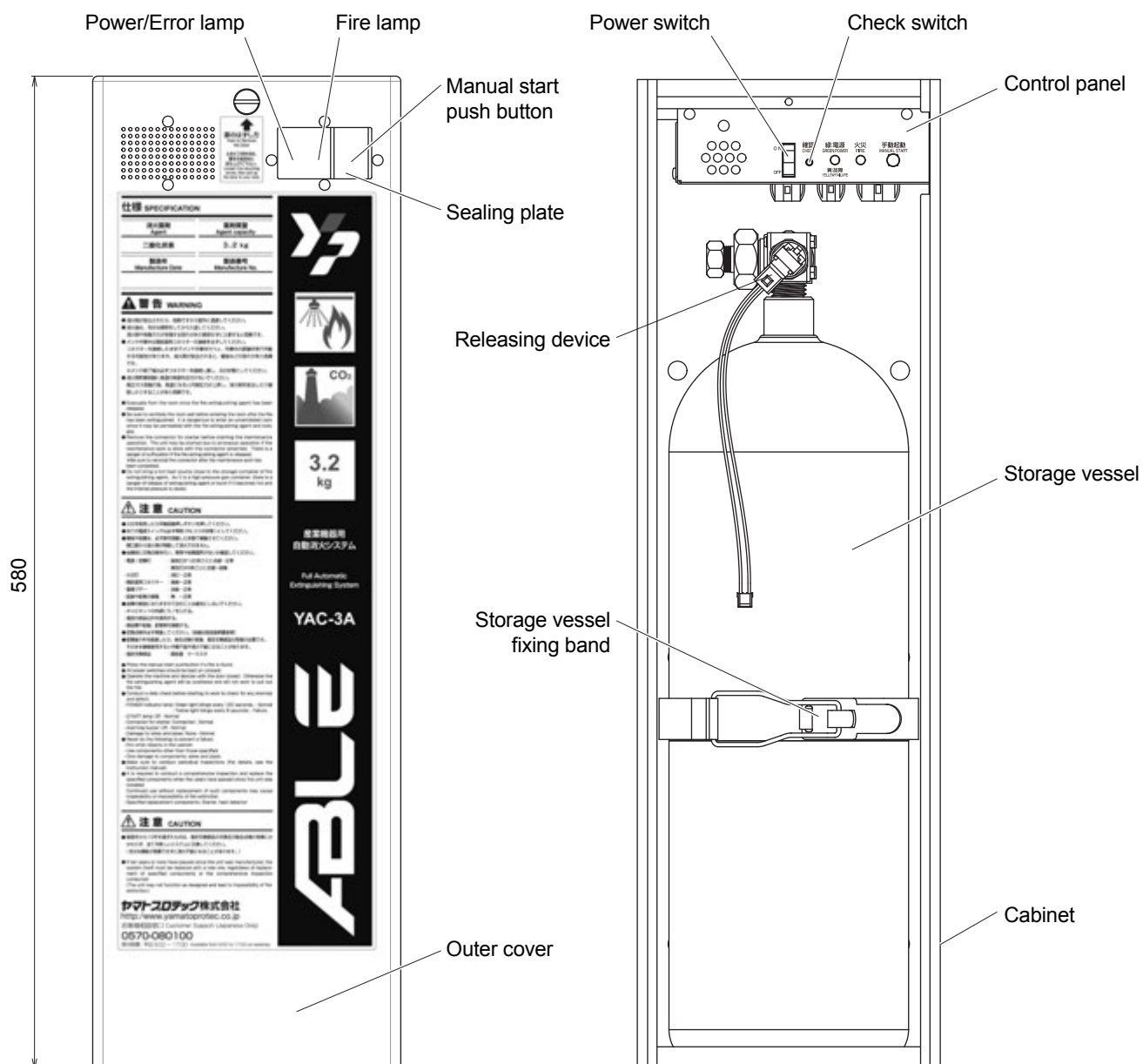
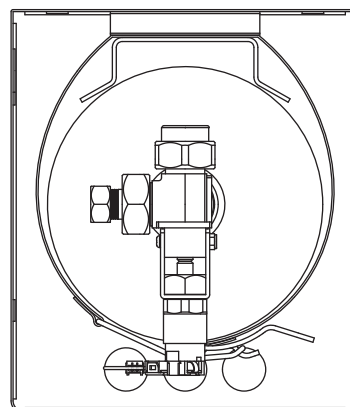
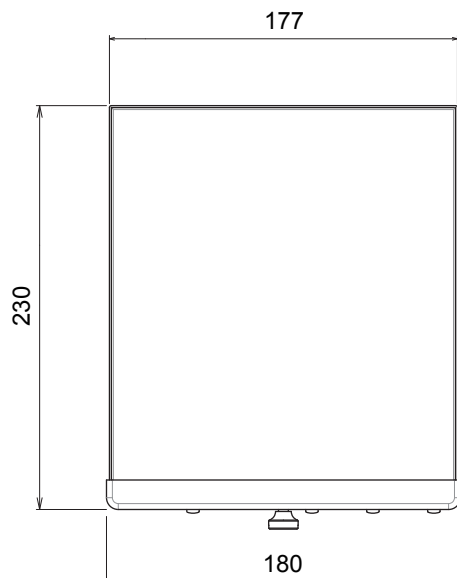
Meaning of symbols	 Warning	This indicates that mishandling as a result of neglecting this symbol may cause death or serious injuries to users or significant adverse impacts on part of the alarm function.
	 Caution	This indicates that mishandling as a result of neglecting this symbol may cause injuries to users, and physical damage, or have significant adverse impacts on the fire extinguishing performance.

■ Make sure to observe the following instructions for your safety.

 Warning	<p>In case of fire, immediately move away from the fire.</p> <ul style="list-style-type: none"> Exposure to burning objects and the extinguishing agent may cause accidents such as burning yourself. <p>If an air exhauster is installed, it must be configured to stop (close the duct or stop the fan) in conjunction with the start or detection of this system.</p> <ul style="list-style-type: none"> Otherwise, the extinguishing agent is exhausted, causing the system to fail to extinguish a fire.
 Caution	<p>Installation instructions</p> <ul style="list-style-type: none"> Install the system at a location where the control panel can be kept away from water drops, oil drops, metal powder, etc. Installation locations must be free of vibration and impact. When installing the system, avoid places where the temperature exceeds the operating temperature range (0 to +40°C) or where dew condensation occurs. When installing the system, prevent the cabinet from deforming. Take care to prevent foreign materials from entering the pipes. Make sure to firmly fasten the screws at the joint of the pipe. Perform the tests of the thermistor and signal transmission units according to the Instruction Manual. If a high temperature is required when performing operational testing, pay particular attention not to burn yourself. <p>Installation and maintenance instructions</p> <ul style="list-style-type: none"> Check regularly that the amount of the extinguishing agent in the storage vessel is within the specified range (within 10% reduction in the volume). Make sure that there is no damage or deformation in the copper pipe, and it must be installed at a location where the nozzle is set. Prevent damage of the coated electric wires. Do not press the manual start push button except when a fire occurs. Do not change the installation position of the thermistor, and prevent foreign substances from attaching to the thermistor. Make sure to replace the releasing device and thermistor once 5 years have elapsed since the installation. Ask an inspection company to perform inspections on a regular basis. (approx. every six months) <p>The procedure and instructions after the extinguishing agent is used</p> <ul style="list-style-type: none"> After the extinguishing agent is sprayed, it must be completely removed from the surface of the sprayed object, and it must be dried sufficiently. Do not access the object that has been sprayed while a fire is being extinguished. If the sprayed object has a cover, do not open it until the extinguishment of the fire is confirmed. After a fire is extinguished, turn OFF the power switch and take necessary steps for the signal transmission units to confirm the safety. After the system is used, the nozzle and pipes must be cleaned sufficiently. After the system is used, contact an inspection company to ask them to replace the extinguishing agent, releasing device and nozzles, and to perform functional testing of the system.

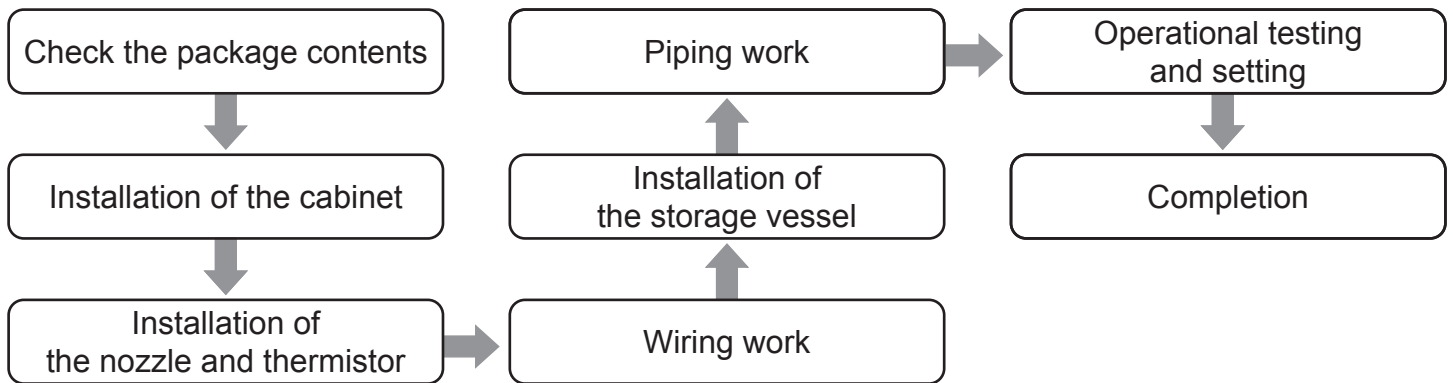
*Make sure that the installation and inspection are performed according to the Instruction Manual to obtain sufficient system performance.

1. Structural diagram



2. Installation work procedure

Perform installation work according to the following procedure:

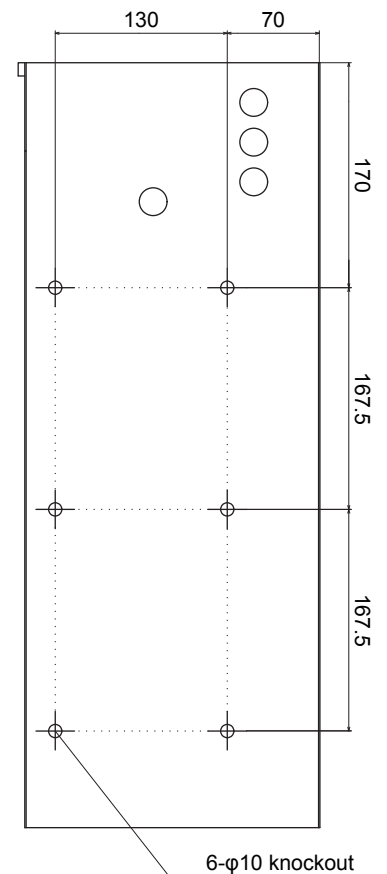
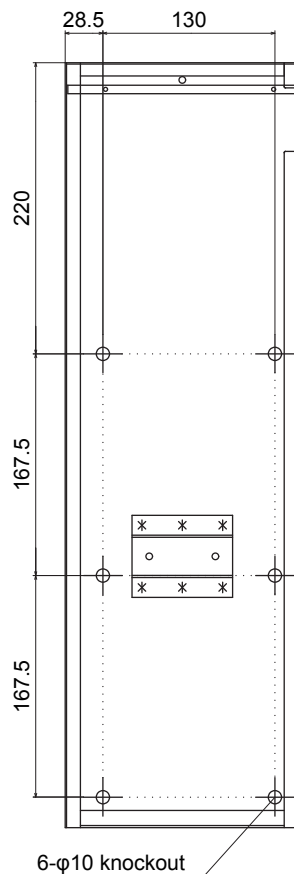
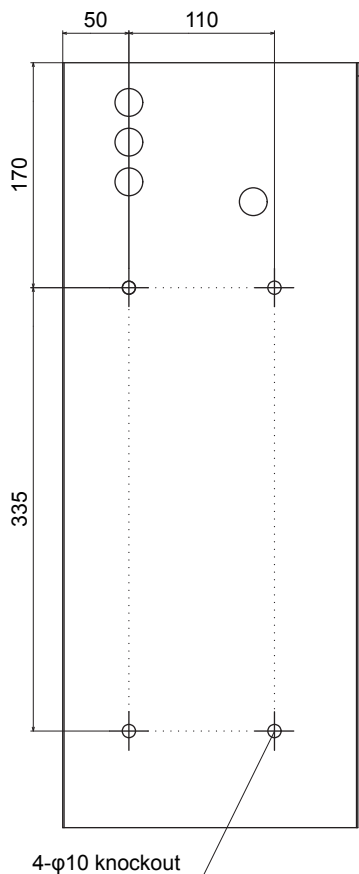


3. Installation of the cabinet

Using the mounting hole ($\phi 10$) provided on the cabinet, secure it firmly on the installation surface.

Cabinet Installation locations

- where the manual start push button can be easily operated.
- where the pipe length to the nozzle is within 5 m.
- where the cabinet can be kept away from water.
- where daily inspections can be easily performed.



(Unit: mm)

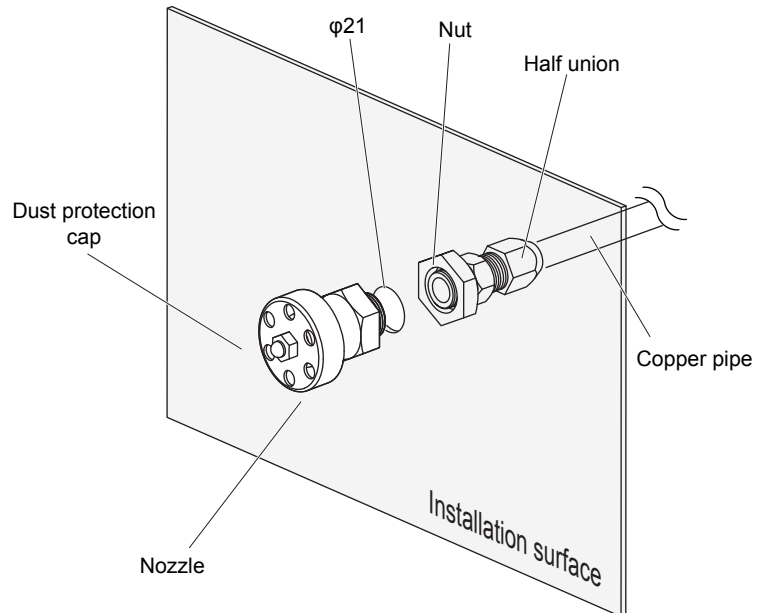
4. Installation of the nozzle and thermistor

The thermistor detects a fire and the nozzle sprays a fire extinguishing agent; therefore, they must be installed near the object to be monitored.

Installation of the nozzle

- 1) Drill a hole of 21mm in diameter on the nozzle installation surface.
- 2) Fix the nozzle firmly with the washer and nut attached to the nozzle.

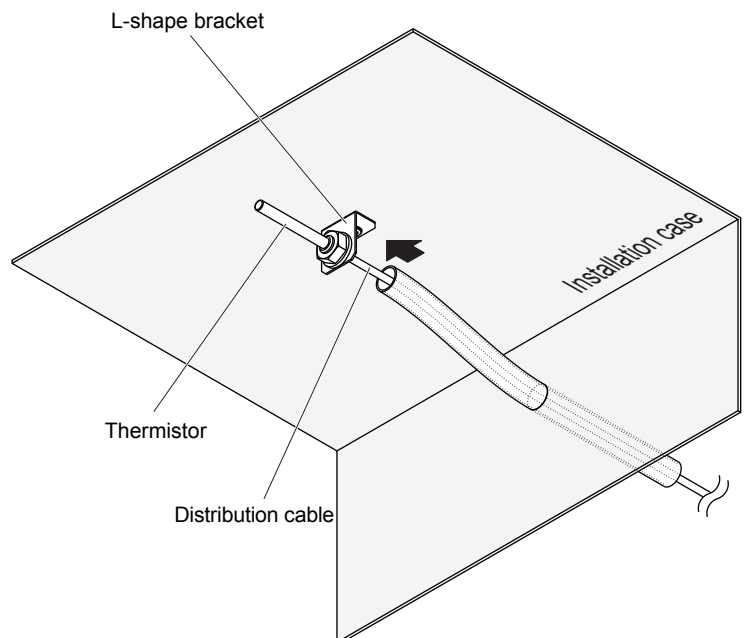
- * If the nozzle cannot be fixed firmly, use a support near the nozzle.
- * Up to two nozzles can be installed on this system. (An additional nozzle is available as an optional part)
- * Basically, this system requires only one nozzle.
- * The nozzle must be installed at a position appropriate for fire fighting activities.
- * The nozzle installation height must be within 1 m of the object to be sprayed.



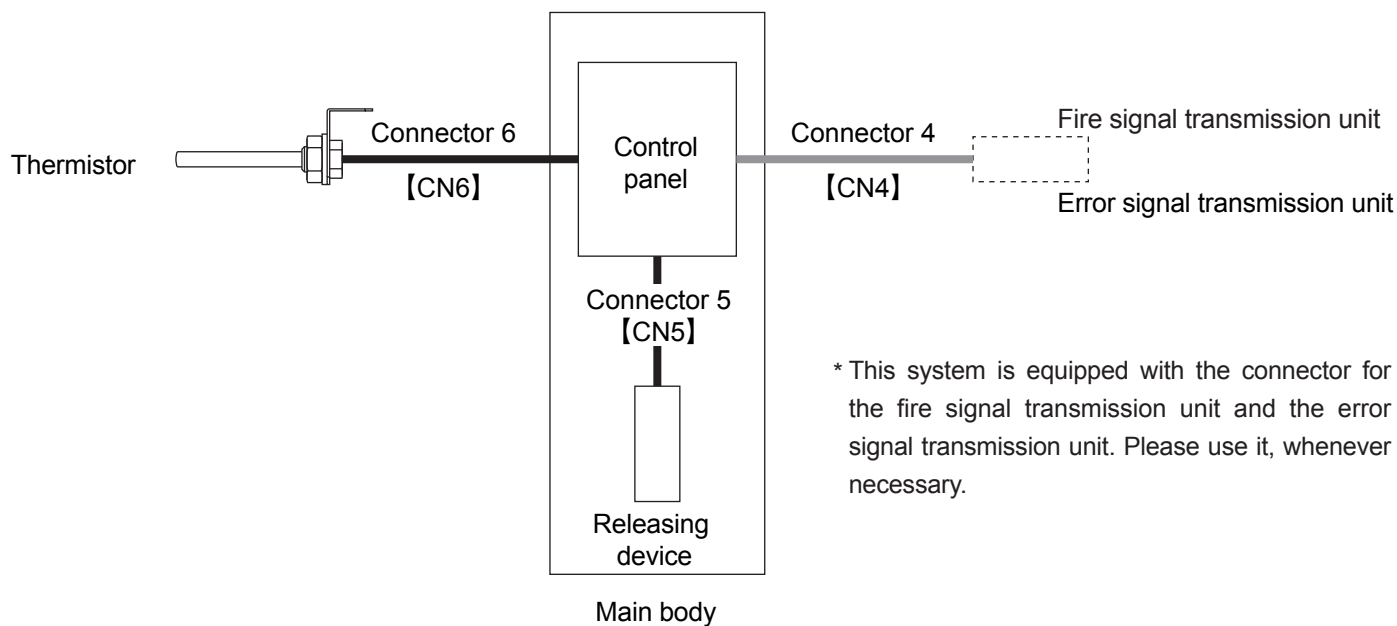
Installation of the thermistor

- 1) Using the L-shape bracket connected to the thermistor, install the thermistor firmly on the mounting case. To protect the distribution cable from dust and oil, cover
- 2) the distribution cable and seal the joint.

- * This system is equipped with one thermistor.
- * The thermistor must be installed near a place where fire is likely to occur, or a place that will be exposed to flame in the event of a fire.
- * If it is impossible to install the thermistor near the above mentioned place, it can be installed near the ceiling surface only when the circumference of machinery is protected and the ceiling is low.

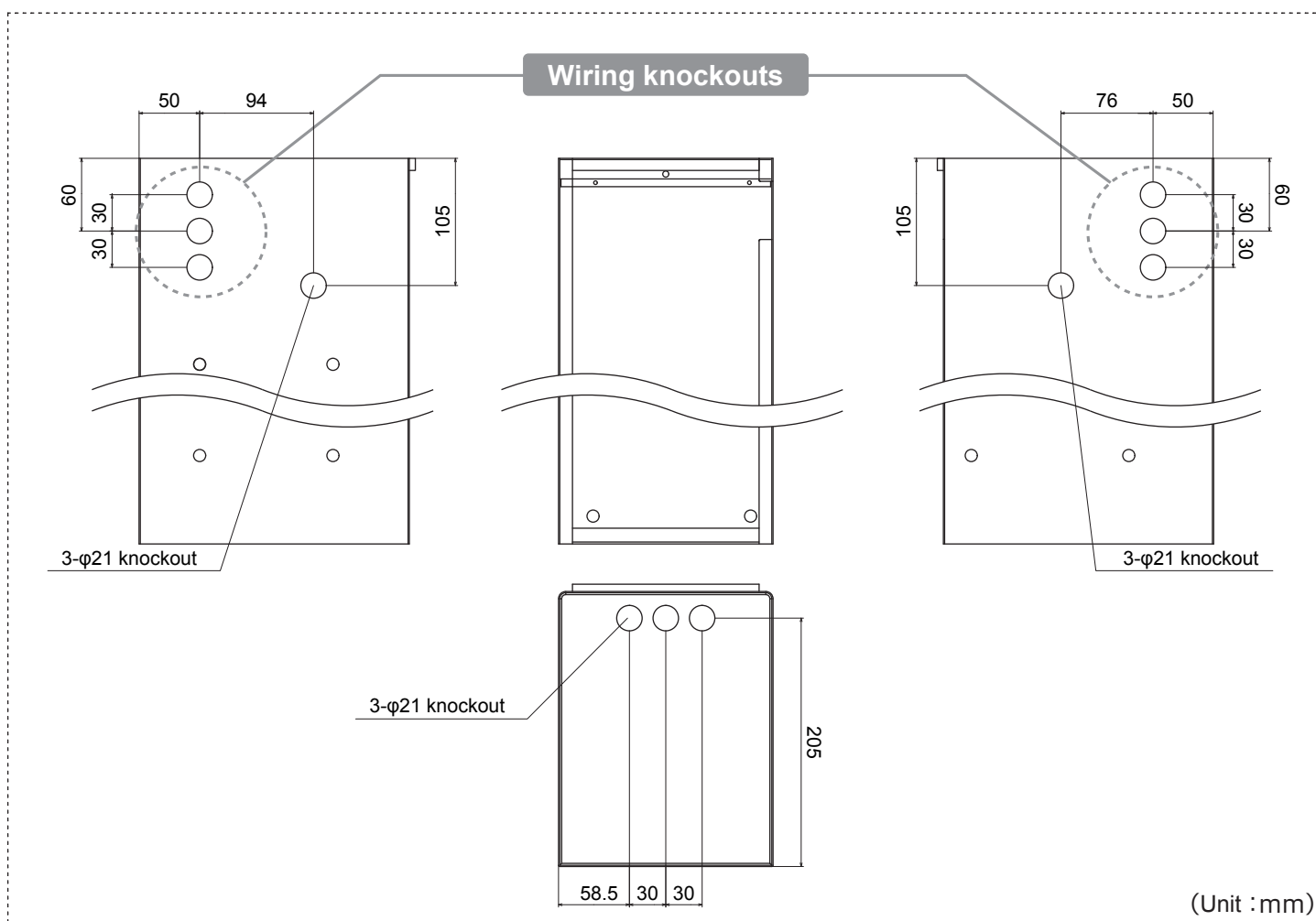


System configuration

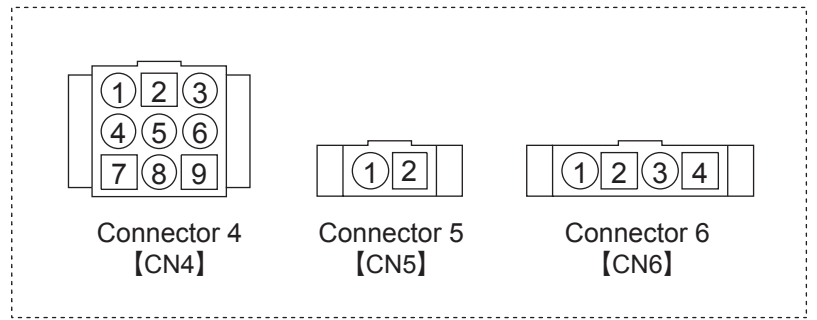
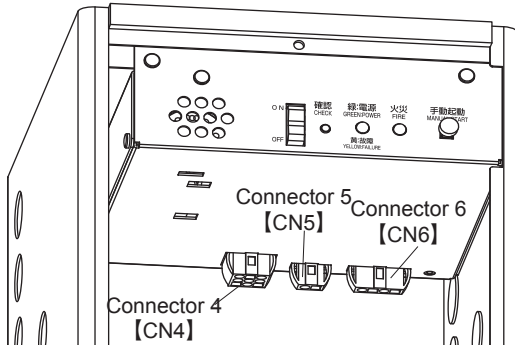


Wiring information

*After wiring work and before making connections to each device, make sure to measure the insulation resistance to ground. (Using a 250V-insulation resistance tester, check that the insulation resistance to ground is 10MΩ or more.)



Connector names and functions



Connector	No.	Usage	Name	Description	Applicable Connector	Contact Type
Connector 4 【CN4】	1	Error signal transmission unit	COM1	COM1 to NC1 will be OFF in case of an error. (b contact)	ELP-09V	LLF-41T-P1.3E ×8
	2		NC1			
	3		COM2	COM2 to NO2 will be ON in case of an error. (a contact)		
	4		NO2			
	5	Fire signal transmission unit	COM3	COM3 to NC3 will be OFF in case of a fire. (b contact)		
	6		NC3			
	7		COM4	COM4 to NO4 will be ON in case of a fire (a contact)		
	8		NO4			
	9	(Not in use)				
Connector 5 【CN5】	1	Releasing device	Output (+)	For connecting to the releasing device using the attached connector and cable.	ELP-02V	(Already connected)
	2		Output (-)			
Connector 6 【CN6】	1	Thermistor	Input (+)	For connecting the attached thermistor.	ELP-04V	LLF-41T-P1.3E ×2
	2		Input (-)			
	3		Not in use			
	4		Not in use			

* Instructions for use

The relays used for the fire signal transmission unit and the error signal transmission unit are “1a1b type.” When using the relays, note that both a and b contacts are sometimes turned ON simultaneously while the relays are in operation or while they are reset.

Connecting the connectors

1) Connecting the thermistor

Connect the thermistor to connector 6 【CN6】 .
(One thermistor is included in this system.)

* Use the thermistor included in this system.

2) Connecting the signal transmission units

Connect the signal transmission units to connector 4 【CN4】 when the signal transmission units are connected to outside equipment to send signals.

* This connector is for the fire signal transmission unit and the error signal transmission unit. For more details, refer to the above table. (The figure on the right shows both the fire signal transmission unit and the error signal transmission units are in use.)

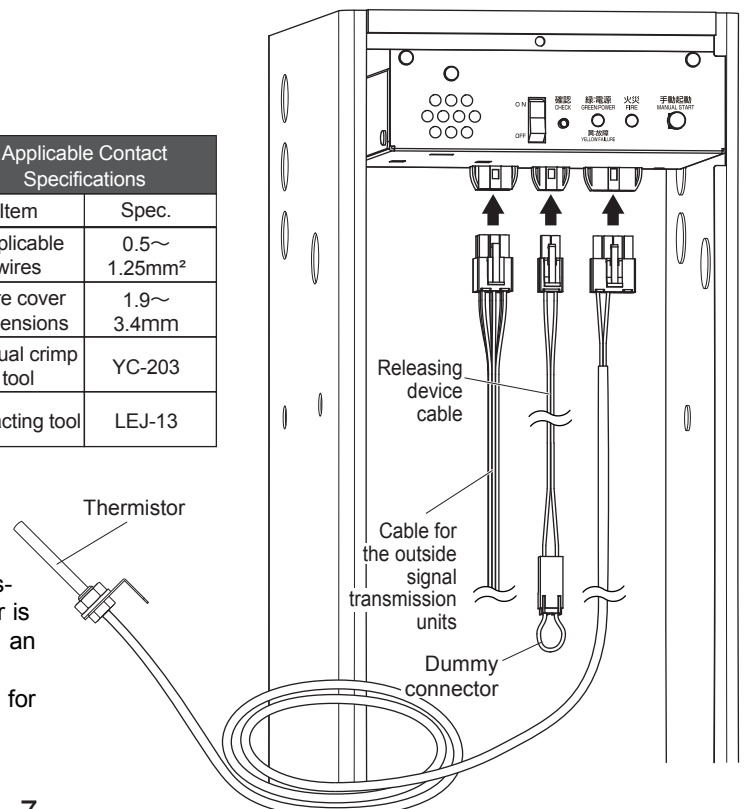
3) Connecting the releasing device

Check that the dummy connector is inserted into the cable of the releasing device. Then, connect the releasing device to connector 5 【CN5】 .

* The dummy connector is installed on connector 5 【CN5】 . Do not remove it until operational testing and releasing device installation are completed. If the dummy connector is removed, the power/error lamp (yellow) starts blinking and an alarm sound continues intermittently.

* Do not lose the dummy connector because it is necessary for inspections.

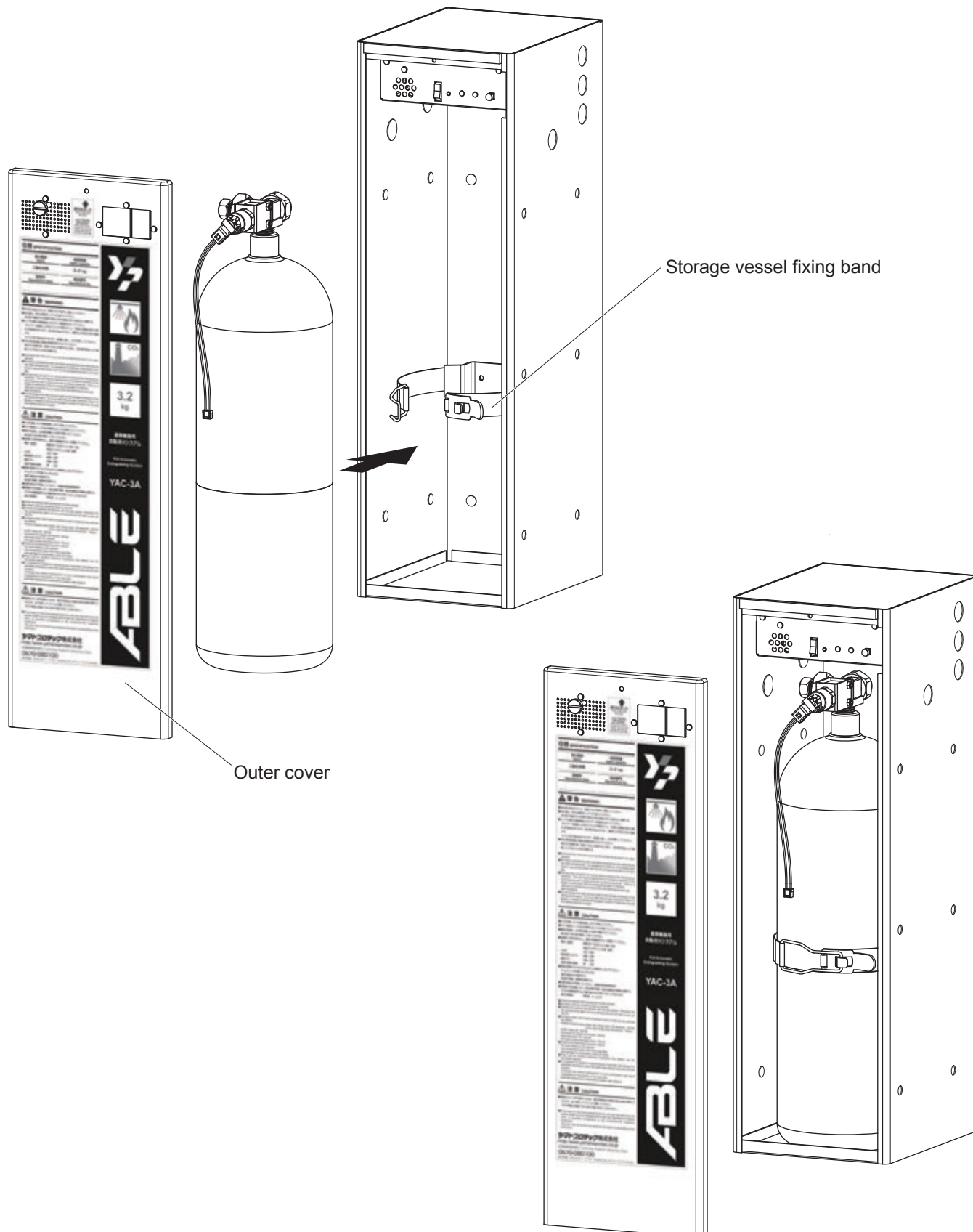
Applicable Contact Specifications	
Item	Spec.
Applicable wires	0.5~1.25mm ²
Wire cover dimensions	1.9~3.4mm
Manual crimp tool	YC-203
Extracting tool	LEJ-13



6. Installation of the storage vessel

Install the storage vessel of the extinguishing agent in the cabinet.

- 1) Remove the outer cover of the cabinet.
- 2) Put the storage vessel in the cabinet, and fasten it firmly with the storage vessel fixing band.



7. Piping work

Pipes

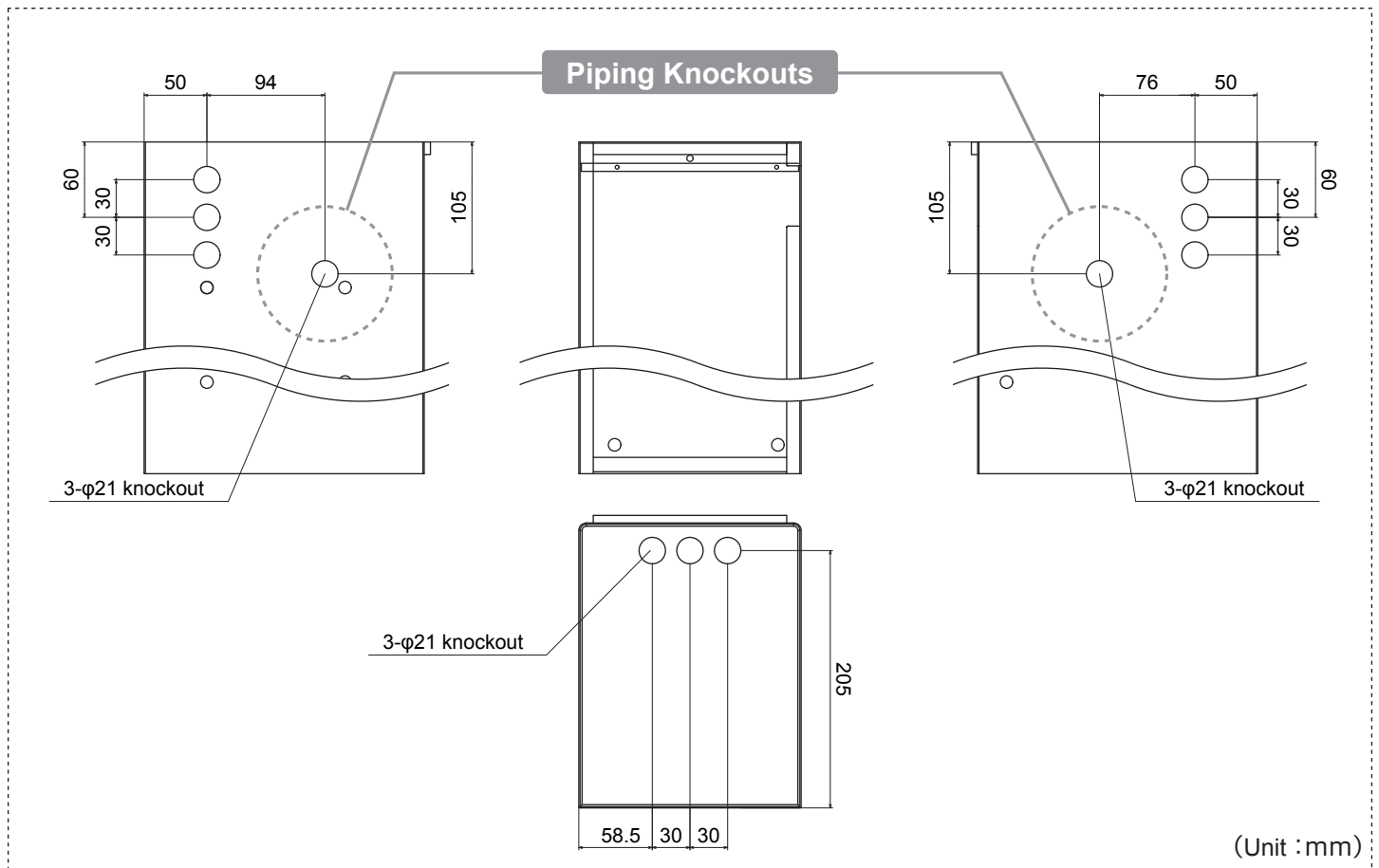
Install the attached copper pipe from the fire extinguishing agent storage vessel to the nozzle, so that the fire extinguishing agent can be sprayed from the nozzle.

*The attached JIS H3300 pipe (8mm in outside diameter) must be used.

*The piping length from the cabinet to one nozzle must be within 5m.

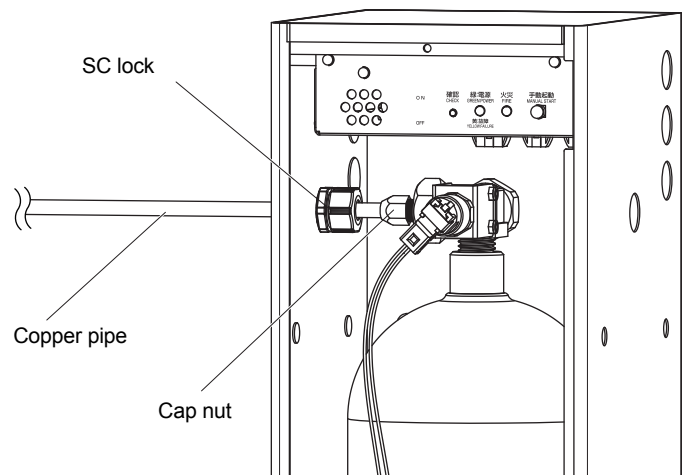
*A bender must be used for bending the pipe. (The pipe can be bent up to 8 points.)

*The attached pipe band must be used for fixing the pipe.



Connecting to the cabinet

- 1) Remove the knockout (φ21) to be used for the cabinet.
- 2) Fix the attached SC lock on the cabinet. Then, put the cap and rubber sleeve through the copper pipe, and insert it into the cap nut of the connecting fitting.
- 3) Tighten the cap nut with the tightening torque of 1080 to 1270 N·cm. The cap nut can also be turned manually by turning it 1 and 1/4 turn to 1 and 1/2 turn from the position where the cap nut becomes heavy to turn.



8. Operational testing and setting

Before operational testing



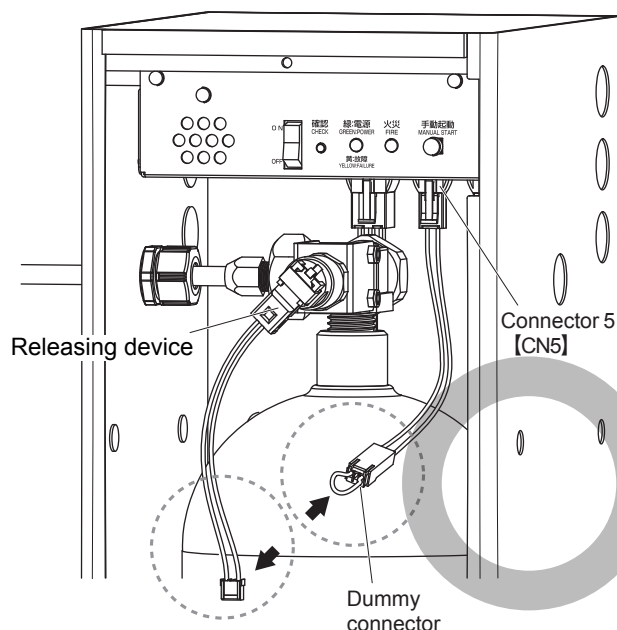
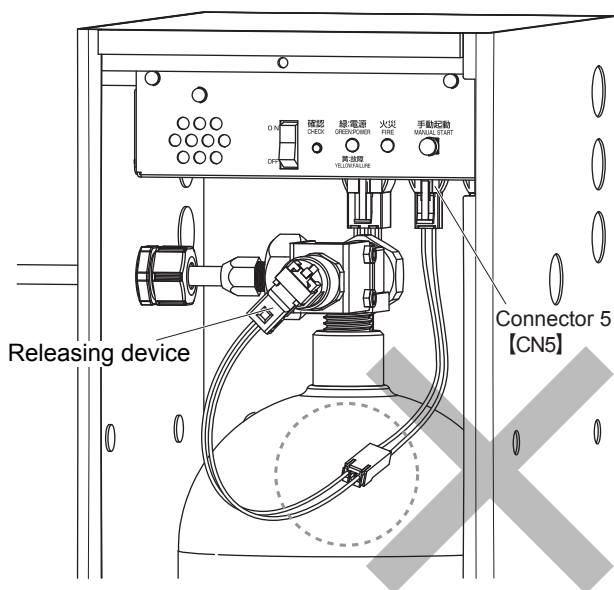
Warning

Before starting operational testing, make sure that the connector of the releasing device is removed. If the connector is connected, the extinguishing agent will be sprayed during the test.

1) Check that the connector of the releasing device is not connected to connector 5 [CN5] but the dummy connector is connected to connector 5.

* Do not remove the dummy connector until the releasing device is connected after operational testing is completed. If it is removed, the power/error lamp (yellow) starts blinking and the alarm sound continues intermittently.

2) Check that all wires other than the wire for the releasing device are correctly connected.



Operational testing

Before setting the system to the normal monitoring state, perform operating testing to check that the system can work properly. According to the procedure, perform operational testing by the thermistor heat detection function and by the manual start push button.

(1) Operational testing by the thermistor heat detection function

1) Turn ON the power switch. Then, the fire lamp (red) and the power/error lamp (green) blink once and a beeping sound is produced.

* If the fire lamp is blinking, turn OFF the power switch. Then, turn it ON while pressing the check switch.

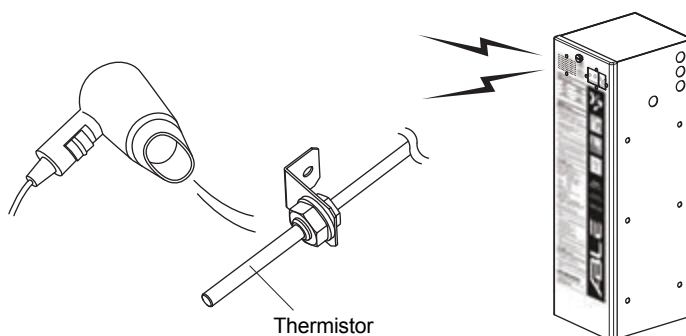
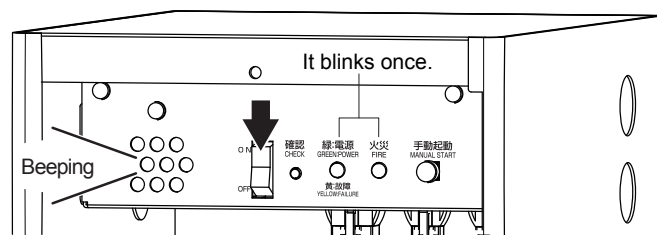
2) Warm (70°C) the thermistor with an electric dryer or hot water to activate the fire alarm. If the fire lamp (red) blinks and a sweeping sound is produced repeatedly, the thermistor is working properly.

* If the thermistor is connected to the outside equipment, check that the outside equipment is working properly.

* Take care not to burn yourself.

3) Turn OFF the power switch to cut the power.

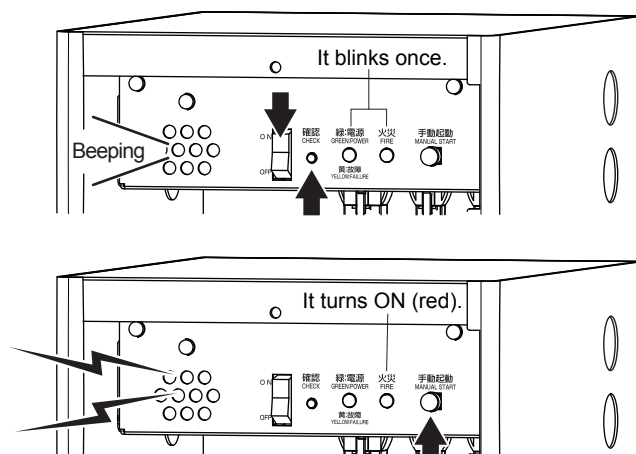
4) Turn ON the power switch while pressing the check switch (resetting operation).





Operational testing

(2) Testing with the manual start push button

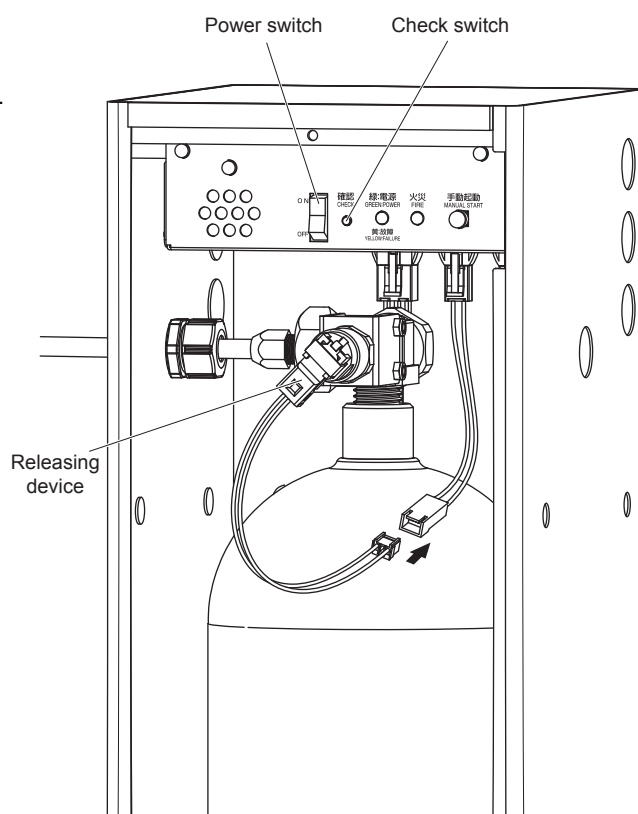
- 1) Turn ON the power switch. Then, the fire lamp (red) and the power/error lamp (green) blink once and a beeping sound is produced.
- 2) Press the manual start push button to activate the fire alarm. If the fire lamp blinks and a sweeping sound is repeated, the thermistor is working properly.
* If the thermistor is connected to outside equipment, check that the outside equipment is working properly.
- 3) Turn OFF the power switch to cut the power.
- 4) Turn ON the power switch while pressing the check switch (resetting operation).



Setting the system to the normal monitoring state

 Warning	<p>Before setting the system to the normal monitoring state, make sure that the cabinet is firmly fastened on the installation location, that wiring work is completed and that the storage vessel is fastened on the cabinet with the fastening belt. If these are not completed, do not set the system to the normal monitoring state.</p>
 Warning	<p>Before setting the system to the normal monitoring state, perform operational testing according to the procedure given in the “operational testing” in the preceding section to check that the system is working properly. If the system is not working during the operational testing, do not set the system to the normal monitoring state.</p>

- 1) Turn OFF the power switch.
- 2) Turn ON the power switch, and check that the fire lamp (red) and the power/error lamp (green) blink once and a beeping sound is produced. Then, check that the power/error lamp (yellow) and the fire lamp are not blinking, and no beeping sound is produced. Check as well that the error alarm produces no sound.
* If the fire lamp is blinking, turn OFF the power switch. Then, turn ON the power switch while pressing the check switch.
- 3) Turn OFF the power switch.
- 4) Remove the dummy connector installed on connector 5 [CN5], and connect the releasing device to connector 5 [CN5].
* The dummy connector is necessary for inspections, so take care not to lose it.
- 5) Turn ON the power switch, and make sure that the fire lamp (red) and the power/error lamp (green) blink once and a beeping sound is produced. Then, check as well that the power/error lamp (yellow) and the fire lamp are not blinking and the error alarm is not producing an alarm sound.
- 6) Hold down the check switch. If the fire lamp (red) starts blinking and a sweeping sound starts, the system is set to the normal monitoring state.
* If the error lamp (yellow) blinks and a sound other than the sweeping sound is produced, refer to “11. In case of a system error” (p.13).
- 7) Close the outer cover.



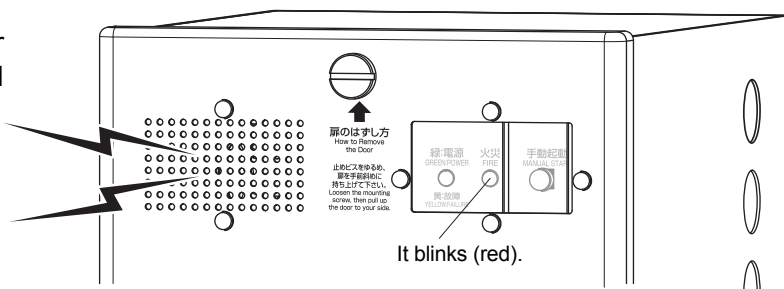
9. Activation of the fire alarm

Automatic fire extinguishing (by the heat detection of the thermistor)

When the thermistor detects heat of 70°C or more, the system is in the fire alarm state, and the extinguishing agent will be sprayed from the nozzle.

Fire lamp (red): Blinking

Fire alarm sound: Sweeping sound



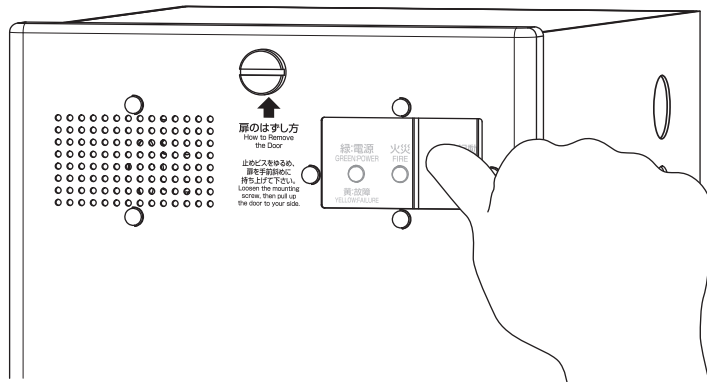
Manual fire extinguishing

When the fire extinguishing agent needs to be sprayed manually, push the sealing plate strongly to break it, and press the manual start push button.

* It takes about two seconds to start the fire alarm and to spray the fire extinguishing agent.

Fire lamp (red): Blinking

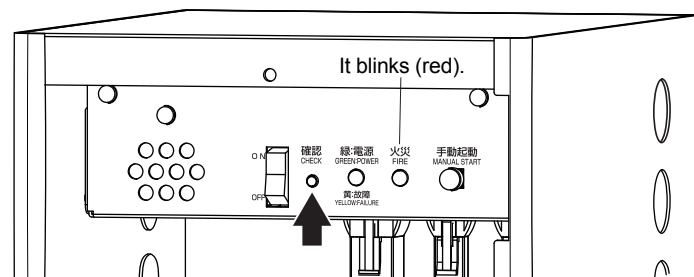
Fire alarm sound: Sweeping sound



Temporary stop of the fire alarm sound

Press the check switch to temporarily stop the alarm sound.

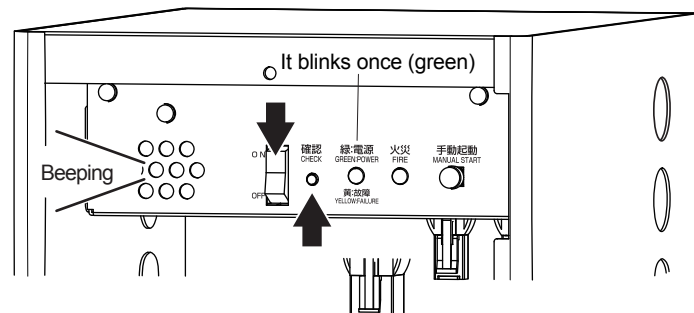
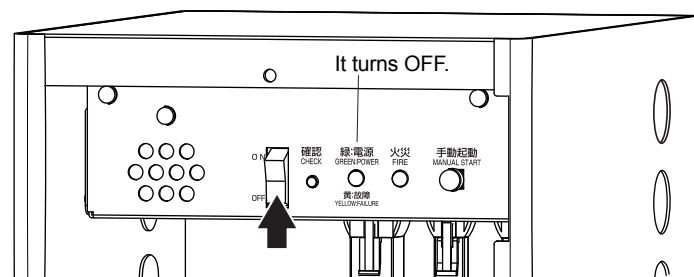
* Even if the alarm sound stops, the fire lamp (red) continues to blink.
If outside equipment is connected to connector 4 【CN4】 , the outside equipment will remain in the fire state.



10. Procedure after the fire alarm is activated

Reset the system to the ordinary monitoring state, and refill the fire extinguishing agent. Then, replace the releasing device.

- 1) Turn OFF the power switch.
- 2) Turn ON the power switch while pressing the check switch to reset the system. Then, the fire lamp (red) and the power/error lamp (green) will blink once, and a beeping sound will be produced.
* If the power switch is turned ON without pressing the check switch, the fire alarm temporarily stops, but the fire lamp (red) continues blinking.
- 3) After the fire extinguishing agent is sprayed, the fire extinguishing agent, nozzle, thermistor and control panel must be replaced, and functional testing of the system must be performed. Contact an inspecting company and ask them to perform inspections and replace the system parts.



11. In case of a system error

An error of the thermistor (disconnection and short-circuit)

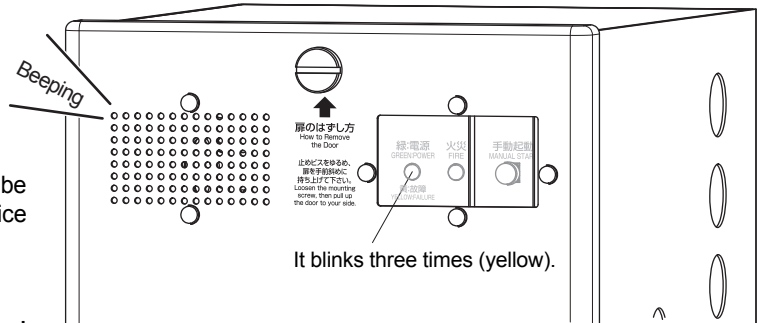
In case of disconnection or short-circuit of the thermistor, the power/error lamp (yellow) blinks and a beeping sound is produced.

Power/error lamp (yellow): It blinks three times.

Error alarm sound: Beeping

* In case of an error, the fire extinguishing agent may not be sprayed. In this case, please contact our customer service office immediately.

Press the check switch, so that the alarm sound can be stopped for 24 hours. However, the power/error lamp (yellow) continues to blink.



An error of the releasing device

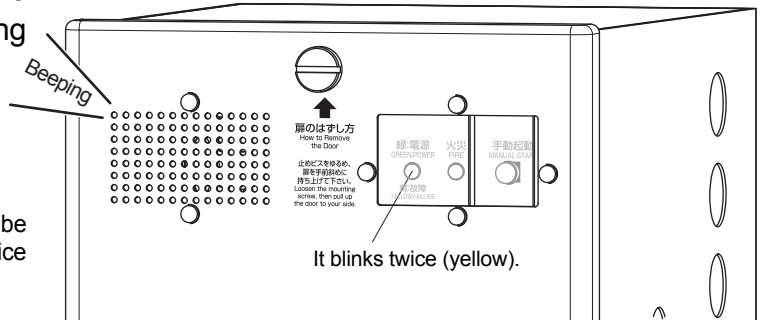
In case of an error of the releasing device, the power/error lamp (yellow) blinks and a beeping sound is produced.

Power/error lamp (yellow): It blinks twice.

Error alarm sound: Beeping

* In case of an error, the fire extinguishing agent may not be sprayed. In this case, please contact our customer service office immediately.

Press the check switch, so that the alarm sound can be stopped for 24 hours. However, the power/error lamp (yellow) continues to blink.



12. When the battery is dead

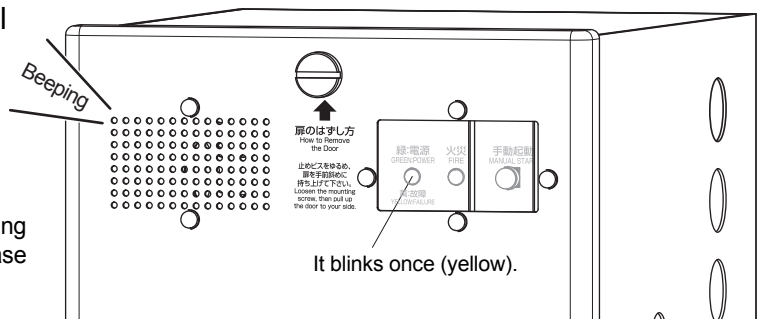
When the battery is getting low, the power/error lamp (yellow) will blink and a beeping sound will be produced.

Power/error lamp (yellow): It blinks once

Error alarm sound: Beeping

* When the battery has run out completely, the fire extinguishing agent cannot be sprayed. If a dead battery is detected, please contact our customer service office immediately.

Press the check switch, so that the alarm sound can be stopped for 24 hours. However, the power/error lamp (yellow) continues to blink.



13. Installation checking procedure

Check Item			Installer	User	
1	Checking after the installation	Are the installation and fixing work of the system and components completed?			
		Are the piping and wiring work completed?			
2	Checking before operational testing	: Refer to P.10 “Before operational testing.	Is the gas generator (CN5) removed from the control panel?		
3	Checking during operational testing	Testing by the heat detection function of the thermistor. : Refer to P.10 “Operational testing (1).”	Turn ON the power switch.		
			Warm the thermistor with an electric dryer, etc.		
			Did the fire alarm produce the sound (sweeping sound)?		
			Were the signal transmission outputs (fire and error signal transmission units) working properly?		
			Was resetting operation performed by turning ON the power switch while the check switch is pressed?		
		Testing with the manual start push button : Refer to P.11 “Operational testing (2).”	Turn ON the power switch.		
			Press the manual start push button.		
			Did the fire alarm produce a sound (sweeping sound)?		
			Were the signal transmission outputs (fire and error signal transmission units) working properly?		
			Was resetting operation performed by turning ON the power switch while the check switch is pressed?		
4	Checking the normal monitoring state	: Refer to P.11 “Setting the system to the normal monitoring state.”	completed properly?		
			Was the dummy connector of the control panel (CN5) removed? Was the releasing device connected?		
			Is the fire alarm producing the sound (sweeping sound) when the power is turned ON and the check switch is pressed?		
			Is the error alarm not producing sound?		
			Was the outer cover closed?		
			Inspection date		

Fire Extinguishing System Manufacturing Number	User's Signature

14. Part replacement

If the fire extinguishing agent is sprayed for a fire, or a long period of time has elapsed since the installation of the system, the following parts must be replaced to maintain the performance of the product. For more details, please contact us or our dealer.

After the fire extinguishing agent is used for a fire	1. Gas generator	When 5 years have elapsed since the system installation	1. Gas generator
	2. Releasing device, Gas generator (refilling)		2. Thermistor
	3. Fire extinguishing agent	When 10 years have elapsed since the manufacturing of the system	The entire system must be replaced with a new one.
	4. Thermistor		
	5. Control panel		

Product Specifications		
Extinguishing agent		Carbon dioxide gas
Extinguishing agent amount		3.2kg
Cabinet outside dimensions		580mm×180mm×212mm
Coating specification		Melamine coated, Coating color: JPMA Y22-90B
Gross weight		Approx. 17kg
Starting method		Activation by a gas generator
Spraying time		Approx. 11 seconds
Connected pipe		Copper pipe, φ8 x φ6, 5m or less
Connected pipe type		Phosphorus-deoxidized copper seamless pipe (JIS H 3300)
Connecting method		Bite-type ring compression method
Control panel	Type name	GCA-3A
	Power source	Custom-made lithium battery
	Manual start push button	Momentary, gold contact, red color
	Alarm sound	Sweeping sound, sound pressure of 85dB or more
	Power/error lamp	Normal: Blinking in green Error: Blinking in yellow
	Fire lamp	Fire: Blinking in red
	Thermistor input	1 system (with the disconnection detection function)
	Starting output	Connector joint (one gas generator)
	Error signal transmission unit	2A 250V AC、2A 30V DC
	Fire signal transmission unit	2A 250V AC、2A 30V DC
	Operating temperature range	0 to 40°C

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*When you contact us, we may ask you the product name, type and serial number to ensure our service quality.