Installation Manual

CNC Two-component Coating System

ACW Control Unit

ACW4200EX

The instruction manual for ACW4200EX is composed by control unit and mixing unit.
The manuals are divided as below.

ACW control unit
- 1. Operation manual
- 2. Installation manual
- 3. Maintenance manual

ACW mixing unit
- 4. Instruction manual

And this document is **2. Installation manual**.

This manual contains important information on warnings and cautions. Read the manual thoroughly before starting to operate the pump, and follow the instructions. Always keep the manual handy until such time as the pump is no longer being used. If your manual is lost or worn badly, do not hesitate to contact our agency that is closest to you, or the Asahi Sunac Corporation, directly, and ask us to send you a new one.

5th Edition: November, 14, 2022

Preface

Thank you very much for choosing our CNC Two-component Mixing System (ACW).

In order to keep this equipment in the best condition for an extended period, please carefully read this manual before use. Above all, the specifications, warnings and prohibitory or cautionary instructions shown herein shall be fully understood and observed during the use of this equipment.

The equipment covered by this manual is designed for industrial coating work.
It shall be used by those who have been duly trained regarding the handling and scope of application and have an understanding of the operating procedure.

If you need further information about this manual, please call any of our branches listed on the back cover by specifying the “model” and “serial No.” of your equipment.

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1 For Safety and Correct Use

Contents of this instruction manual shall be fully understood and the instructions shown herein strictly observed. Using the system without following instructions in this manual may lead to bodily injury or damage to properties.

The safety measures described herein are the minimum requirements and additional measures may also be required. All requirements provided by laws and legislations as well as rules and guidelines laid by your company or office shall be observed.

The cautionary instructions shown below shall be construed as minimum basic requirements for safety in the use of our product.

● Cautionary instructions are shown in three levels as defined below.

⚠	**WARNING**	Calls the user's attention to a situation that may lead to bodily injury and describes how to avoid that situation.
⚠	**CAUTION**	Calls the user's attention to a situation that may lead to damage or breakdown to the equipment and describes how to avoid that situation.
	NOTE	Gives important or helpful information.

* Please remember that the situation mentioned under CAUTION may also lead to a serious disaster under certain circumferences. All instructions are important for your safety and prevention of system disorder and shall be strictly observed.

⚠ WARNING

SCOPE OF SUITABLE USE FOR THE EQUIPMENT

- For mixed fluid coating, the ACW Control Unit is used with the ACW Mixing Unit.
  Do not use them in another composition or for another purpose than mixed fluid being obtained by mixing base resin and hardener.
- Use the primary power and air supplies complying with the specifications.
  Doing so may lead to equipment disorder, damage, malfunction, electric shock and fire.
- The ACW Control Unit is not explosion-proof type. Never install or operate it in an explosive hazardous area.
- Do not wet the electric components in the ACW Control Unit with any liquid (water, alcohol, solvent, etc.).
  Doing so may lead to equipment disorder, damage, malfunction, electric shock or fire.
- Never use any acid or corrosive substance or halogenated hydrocarbon solvent for any paint control unit around the equipment.
  Doing so may lead to equipment explosion, fire, malfunction, or disorder.
- If you have any doubt about the intended use of the product or the paint to be used, please contact us.
- The use of the equipment under conditions other than specified above is considered as abuse unless our company approves such use.

<<GENERAL SAFETY INSTRUCTIONS>>

- Never apply a fluid or air pressure exceeding the allowable maximum to the equipment
  all components and accessories to be used shall be durable against the maximum operating pressures mentioned above.
- Class D (Regulation in Japan) grounding is required for the equipment (to ensure an electric resistance not exceeding 100 ohms).
- Check the whole equipment every day. If any unusual condition is found, turn off the main power switch and, if the problem can be solved within the specified scope of maintenance work, repair or replace faulty parts as necessary. If the unusual condition cannot be corrected within the specified scope of maintenance work, please contact us, or any of our distributors for repair.
- When checking the equipment, never fail to turn off the main power switch on the ACW Control Unit and reduce all the air and paint pressures to zero.
- To ensure a safe operation of the system, all operators shall read and understand this manual and labels attached to each unit. Adequately trained personnel can only operate the equipment.
- Fire and electric codes and safety related regulations provided by the national or local government should be observed during the work.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

<<SOURCES OF IGNITION>>

When the paint flows through a pump or hose, it generates static electricity, which may spark at any part of the coating equipment if not properly grounded. Sparks may ignite combustible volatile components of solvents, particles of sprayed paint, dust suspended in the air and other combustible substances to cause fire or explosion, resulting in serious injury or damage to the equipment.

- Always check that the coating equipment, the products to be coated and all conductive materials are correctly grounded.
- Do not perform the coating operation in the vicinity of open flame, pilot lamp, drive unit such as electric motor or engine or another source of ignition.
- Never smoke in or around a spray booth or in the atmosphere containing solvent.
- Adequately ventilate the spray coating place so that it will not be filled with a combustible (solvent containing) atmosphere generated by the solvent.
- If you feel shocked even slightly by static electricity when handing the coating equipment, immediately stop the coating operation and check that all components are grounded. Never restart the coating operation until the cause is located and corrective action taken.
- Fire extinguishers with a sufficient capacity must be provided in the place where the spray coating operation is performed.
- The ACW Control Unit is not explosion-proof. Do not operate it in an explosive hazardous area.
- If the ACW Control Unit or another electric component generates excessive heat or smokes, immediately turn off the main power switch to stop the equipment.

<<ELECTRIC SHOCK HAZARD>>

- Do not overhaul or remodel any electric component or ACW controller installed in the ACW Control Unit.
- Do not exposure the electrical component in the ACW control unit by the neighboring atmospheres of the facilities place carelessly.
- Do not wet the ACW Control Unit or another electric component with any liquid (water, alcohol, solvent, etc.).
- When checking the equipment, never fail to turn off the main power switch on the ACW Control Unit.
- Be sure to shut off all phases of the external power supply used by the system before wiring.
- When power is on, do not open the door of the ACW Control Unit, and do not touch the terminals.

⚠ WARNING

<<GROUNDING>>

Class D (Regulation in Japan) grounding is required for the equipment (to ensure an electric resistance not exceeding 100 ohms).

The pump, products to be coated and all other coating equipment components (in use or around the unit in use) shall be grounded to prevent accidents from static electricity. If no adequate grounding means is provided, the grounding work (Class D grounding) shall be performed according to the technical standard for electric equipment.

The coating equipment components shall be grounded as specified below.

(1) Grounding the pump

- Attach a grounding wire to the grounding terminal provided at the pump body or car and connect the other end of the wire to a Class D (Regulation in Japan) grounding means.

(2) Grounding the hoses

- All high-pressure hoses must be grounded to ground the whole coating system.
  When connecting additional hoses for extension, check that each hose is grounded.
- The paint hoses in use shall be checked every week to measure the electric resistance.
  The electric resistance shall be 100 ohms or less as obtained with Class D (Regulation in Japan) grounding. If the maximum electric resistance is not indicated on the hose, contact the hose distributor or manufacturer.
  Connect an ohmmeter to metal parts such as the joint of the hose to measure the resistance and, if it exceeds the permissible limit, immediately replace the hose with another one.

(3) Grounding the products to be coated

- If hangers and earth clips are contaminated, complete grounding cannot be achieved.
  Keep hangers and earth clips clean and conductive (grounded).

(4) Grounding the paint containers

- The containers, if made of a conductive metal, shall be placed on a grounded floor or table.

(5) Grounding the container of solvent used for flushing

- The container, if made of a conductive metal, shall be placed on a grounded floor or table.
  Do not place it on a non-conductive sheet such as paper or corrugated cardboard.

<<SAFE FLUSHING>>

- Before flushing, check that the mixing unit, whole coating equipment and paint and solvent containers has been correctly grounded.
- Adequately ventilate the workplace so that it will not be filled with a combustible (solvent containing) atmosphere.
- When doing the spray coating work, always wear the protective goggles, protection clothes and gas mask for organic solvents.

⚠ WARNING

TOXIC SUBSTANCES HAZARD

<<SOLVENTS>>

Halogenated hydrocarbon solvents may explode if brought into contact with aluminum or plated part of a pressure vessel (pump, heater, filter, valve, spray gun, etc.).
The explosion may consequently lead to fatal bodily injury.

Never use halogenated hydrocarbon solvents.

<<Examples of halogenated hydrocarbon solvents>>

Chlorine group	Trichloroethylene, tetrachloroethylene, chlorinated ethylene
Bromine group	n-propyl bromide
Fluorine group	HCFC-225, HFC-43-10mee, HFE-449s1 (HFE-7100)

(The above list does not include all halogenated hydrocarbons. For detail, contact the paint distributor or manufacturer.)

<<INFLUENCES ON THE HUMAN BODY>>

If a solvent containing atmosphere or fluid comes into contact with your eyes or mouth or a toxic substance is inhaled or swallowed and brought into your body, your nervous tissue may be destroyed to cause serious injury such as lifetime functional disorder. Immediately ask for adequate medical treatment.

NECESSITY OF MEDICAL TREATMENT

Immediately receive medical treatment by a medical specialist such as orthopedist, not by a layman. At this time, you should tell him (her) the exact type of the paint you used.

- You may lapse into dyspnea or be poisoned by organic solvent in the mist of paint or spraying atmosphere. Do not use the equipment in a closed room, tunnel, tank or another poorly ventilated place. The user shall take enough care of persons and livestock around him as well as himself.
- The isocyanate used for two-component fluid may hurt mucous membranes in your noise or throat. You should be acquainted with components of the paint, hardener, solvent and other volatile substances to be used. If you need further information, contact the paint or solvent manufacturer.
- When doing the spray coating work, always wear the protective goggles, protection clothes and gas mask for organic solvents, recommended by the paint or solvent manufacturer.
  Additional protective devices may be required depending on the paint components or ventilation level. Contact the paint or solvent manufacturer.

⚠ WARNING

INJECTION AND PRESSURES HAZARD

This system uses the paint under a very high pressure. Therefore, the spray gun is filled with the highly pressurized paint. If the sprayed or leaking paint hits a person at a close distance, it huts his skin and a lot of toxic substances penetrate into his body. If he fails to receive adequate medical treatment, his nervous tissue may be destroyed to cause serious injury such as lifetime functional disorder or surgical amputation of damaged part of his body. You may be seriously injured if the paint is only pinged into your eyes or skin.

NECESSITY OF MEDICAL TREATMENT

If you are hit by the sprayed paint, immediately receive medical treatment by a medical specialist such as orthopedist, not by a layman. At this time, you should tell him (her) the exact type of the paint you used.

- Never aim the head of a spray gun to your body or another person or draw any part of your body near the spray.
- Never cover the nozzle of the spray gun with your finger, palm or another part of your body.
- Do not start using the system before fully understanding how to operate it.
- Before using the system, always make sure that hose joints and all connections in the paint circuit are tight. Above all, check that joints of the hoses that move during operation are locked tight.

<<SAFETY DEVICE ON SPRAY GUN>>

- Each spray gun is provided with a safety device. Before using the spray gun, make sure that the safety device correctly functions.
- Do not remove or modify any part of a safety device. Doing so may lead to a malfunction or injury.
- Use the spray gun according to the instruction manual provided with it.

<<FOR SAFETY AGAINST NOZZLE>>

- Do not put your finger, palm or any article in your hand onto the nozzle.
- Take special care when cleaning or replacing the nozzle. If the nozzle is clogged during the spraying operation, immediately fasten the safety lock on the gun trigger, reduce the paint and air pressures to zero and remove the nozzle for cleaning. It is dangerous to start removing the paint sticking around the nozzle before fully releasing the pressures or with the trigger not locked.

⚠ WARNING

<<SAFETY OF HOSES>>

- ●Handle hoses with much care. Be sure that hoses are not caught or pulled by another object or brought into contact with sharp edges.
- ●Do not bend or collapse any hose. Doing so raises the pressure in the hose and possibly breaks the hose to cause the paint to be injected in a dangerous manner.
- ●Do not expose hoses to temperatures higher than 50 deg C or lower than -20 deg C.
- ●Before starting the equipment, always make sure that hose joints and all connections in the paint circuit are tight. Above all, check that joints of the hoses that move during operation are locked tight.
- ●Do not pull any hose to drag or move the equipment.
- ●Never use any damaged hose. Check each hose throughout its length for scars, leak, wear, swell, cracks and loose fittings. In any of them is found, immediately withdraw the hose from service and replace it with a new one.
- ● Any hose with paint leak must be replaced with a new one. Use a standard hose complying with our specifications.

<<DANGER FROM MISUSE OF THE EQUIPMENT>>

- ●When checking the equipment, never fail to turn off the main power switch on the ACW Control Unit and reduce the air and paint pressures supplied to the ACW Control Unit and ACW Mixing Unit to zero.
- ●Never apply a fluid or air pressure exceeding the allowable maximum to the equipment during the coating operation. All components and accessories to be used shall be durable against the maximum operating pressures mentioned above.
- ●When power is on, do not open the door of the ACW Control Unit, and do not touch the terminals.
- ●To ensure a safe operation of the system, all operators shall read and understand this manual and labels attached to each unit. Adequately trained personnel can only operate the equipment.
- ●Fire and electric codes and safety related regulations provided by the national or local government should be observed during the work.

⚠ CAUTION

TROUBLE AND MALFUNCTION BY THE WRONG USE

<<GENERAL SAFETY INSTRUCTIONS>>

- Use the ACW Control Unit in the environment that satisfies the general specifications described in this manual. Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- Always check the protective ground terminal of the ACW Control Unit is correctly grounded by Class D (Regulation in Japan) grounding (Class 3 grounding Method) or higher. Not doing so may cause an electric shock or malfunction.

<<WIRING PRECAUTIONS OF THE ACW CONTROL UNIT >>

- Be sure to shut off all phases of the external power supply used by the system before wiring.
  Failure to do so may result in an electric shock, product damage or malfunctions.
- Before starting wiring, always check Class D (Regulation in Japan) grounding correctly grounds the protective ground terminal of the ACW Control Unit. Perform an electric resistance not exceeding 100 ohms.
- Correctly wire the power supply section after confirming the rated voltage and terminal arrangement of the product.
  Not doing so can cause a fire or failure.
- Tighten the terminal screws of the power supply section in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws.
- Terminal screws, witch are not to be used, must be tightened always at torque 0.6 to 0.8 N·m.
  Otherwise there will be a danger of short circuit against the solderless terminals.
- Use applicable solderless terminals and tighten them with the specified torque.
  If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the ACW controller.
  Not doing so can cause a fire, failure or malfunction.
- The ACW controller has an ingress prevention label on its top to prevent foreign matter, such as wire off-cuts, from entering the module during wiring.
  Do not peel this label during wiring.
  Please be sure to remove this label for heat dissipation the time of system operation.
- Tighten the mounting screws within the specified torque range.
  Undertightening can cause the GOT to drop, short circuit or malfunction.
  Overtightening can cause a drop, short-circuit or malfunction due to the damage of the screws.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases.
  Not switching the power off in all phases can cause the ACW controller failure or malfunction.

⚠ CAUTION

<<WIRING PRECAUTIONS OF FLOW METER CABLE >>

- Be sure to shut off all phases of the external power supply used by the system before wiring.
  Failure to do so may result in an electric shock, product damage or malfunctions.
- The flowmeter cables connected to the unit must be run in ducts or clamped.
  Not doing so can cause the unit or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- Do not bundle flowmeter cables with main-circuit, power or robot wiring. Run the flowmeter cables separately from such wiring and keep them a minimum of 100mm (3.94in.) apart.
  Lay wiring of the flowmeter cables through the conductive piping and duct.
  Not doing so noise can cause a malfunction.
- The shield lines of the flowmeter cables are firmly connected to SG terminal in the ACW Control Unit.
  The ACW Control Unit must be grounded.
- It has the influence of a noise on a grounding (ground) line.
  When a flowmeter cable carries out malfunction in spite of the wiring construction that is not influenced by a noise, It has the influence of a noise on a grounding (ground) line.
  Connection with SG terminal and the protective earth (PE) terminal in an ACW Control Unit are removed, and ground SG terminal independently.
- It has the influence of a noise from an ACW Mixing Unit.
  When a flowmeter cable carries out malfunction in spite of the wiring construction that is not influenced by a noise, grounding of an ACW Mixing Unit may be inefficient. Please check the grounding state and ground resistance of an ACW Mixing Unit.
  If a grounding screw is loose, a noise cannot be removed but it will become a cause of malfunction.
  When it has the influence of a noise on the grounding (ground) line by the side of the ACW Mixing Unit, a grounding place must change or it dissociates with other earth lines.
- When unplugging the cable connected to the ACW Control Unit, do not hold and pull the cable portion.
  Not doing so can cause a fire, failure or malfunction.
- When attaching the flowmeter cable, the mounting screws in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws.

⚠ CAUTION

<< OPERATION OF ACW CONTROLLER PRECAUTIONS >>

●The display section of the ACW controller is an analog-resistive type touch panel.
If you touch the display section simultaneously in 2 points or more, the switch that is located around the center of the touched point, if any, may operate. Do not touch the display section in 2 points or more simultaneously. Doing so may cause an accident due to incorrect output or malfunction.

●Do not press the ACW controller display section with a pointed material as a pen or driver.
Doing so can result in a damage or failure of the display section.

<<MEMORY CARD PRECAUTIONS>>

●When inserting/removing the memory card into/from the ACW controller, turn the access switch off in advance. Failure to do so may corrupt data within the memory card.

●When removing the memory card from the ACW controller, make sure to support the memory card by hand, as it may pop out.
Failure to do so may cause the memory card to drop from the ACW controller and break.

●Do not wet the memory card with any liquid. Do not fall or a shock to memory card.
Failure to do so may cause the memory card break.

●When inserting the memory card into the ACW controller, push it into the insertion slot until the Card Eject button will pop out. Failure to do so may cause a malfunction due to poor contact.

<< ACW CONTROLLER REPLACEMENT PRECAUTIONS >>

●Before touching the ACW controller, always touch grounded metal, etc. to discharge static electricity from human body, etc. Not doing so can cause the ACW controller to fail or malfunction.

●Do not drop the ACW controller or subject it to strong shock.
The ACW controller damage may result.

●Do not touch the conductive and electronic parts of the ACW controller directly.
Doing so can cause the ACW controller malfunction or failure.

●When mounting the ACW controller to an ACW Control Unit, tighten the mounting screws in the specified torque range.
Undertightening can cause the GOT to drop, short circuit or malfunction.
Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws

●Also where a backlight is turned off, the touch key operates. When the display of a backlight becomes hard to see, please contact our company, in order to perform early exchange.

●Do not perform exchange of the backlight or the liquid crystal display (LCD).
It becomes a cause of ACW controller breakage. Please inform our company of repair etc.

⚠ CAUTION

<< CLEANING OF ACW CONTROLLER PRECAUTIONS >>

- Use the display section of the ACW controller always in a clean condition.
  To clean the display section, wipe the dirty part with a soft cloth using neutral detergent or ethanol.
- Do not use solvents such as acetone, benzene, toluene and alcohol.
  It becomes a cause of the protective sheet to be deformed or peel off.
- Do not use spray solvents to cleaning. It becomes a cause of failure of the ACW controller.

<< TRANSPORTATION PRECAUTIONS >>

- ACW controller is a precision device. Please avoid the shock, which exceeds the value of the general specification of a statement to this instructions manual in transportation of an ACW controller. Check if the ACW controller operates correctly after transportation.

<< DISPOSAL PRECAUTIONS >>

- When disposing of the product, handle it as industrial waste.

2 Outline of System

2-1 Outline

Different from the conventional volume type simultaneous pumping to the mixer, this system employs new measuring and mixing systems, in which each of base resin and hardener is precisely measured and fed alternately into the mixer by the computer control.

Necessary quantities of base resin and hardener are very precisely measured by flowmeters and alternately fed into the Power-mixer or the Mixing Hose. The Mixing Hose changes base resin and hardener in the style of simultaneous (primary mixed fluid). After that, the primary mixed fluid is sent into the Static Mixer for complete mixing and then fed into the spray gun. In power mixer use, base resin and hardener, which fed alternately, are completely mixed by the Power Mixer. Then the mixed fluid supplies a spray gun.

Once necessary parameters are defined, only switching on with the mode button can spray the mixed fluid.

The parameters are divided into two groups; the ones related with the equipment conditions and the ones frequently used such as mixing ratio and flushing time, all of which are protected by passwords.

The mixing ratio, flow rate, quantities of base resin and hardener put into the system, the remaining time of Pot Life, etc. are very clearly indicated on the ACW controller.

2-2 Principles of operation

In this system, two-component fluid are metered and mixed as long as the spray gun is on (spraying) and the Base Resin and the Hardener Mixing Valves close to stop mixing control when the gun is off.

(See Figure 2.2.1)

In the state of the READY lamp-off, the mixed fluid is not sprayed even if the spray gun trigger is pulled.

The mixing process of two components is as below.

(1) As the trigger of a spray gun is pulled, the solenoid valve of Hardener Mixing Valve will be operated to start feeding hardener.

(2) Hardener is fed through the flowmeter to the Mixing Hose or the Power Mixer. (See Figure 2.2.2)

(3) The ACW controller controls the Mixing Valve according to the signals sent from the flowmeter to obtain the calculated target flow rate and accurately measures hardener feed into the Mixing Hose.

(4) After supply of hardener is completed, the Base Resin Mixing Valve is operated to feed base resin in the similar manner. (See Figure 2.2.3)

(5) Those steps are repeated to alternately feed base resin and hardener into the Mixing Hose or the Power Mixer.

(6) The mixed fluid is prepared in the Mixing Hose for Static Mixer. It is supplied to the Static Mixer to completely mix, before supplying to the spray gun. In power mixer use, base resin and hardener are completely mixed by the Power Mixer.

(7) When the spraying operation is stopped, the Mixing Valves of the side that supplies fluid is closed. (This means that both of the Base Resin and Hardener Mixing Valve have closed). When the spray was begun again, the mixing valve that is closed side is opened to start mixing. The trouble of hardening by the back-flow of mixed fluid is not generated between spray stops.

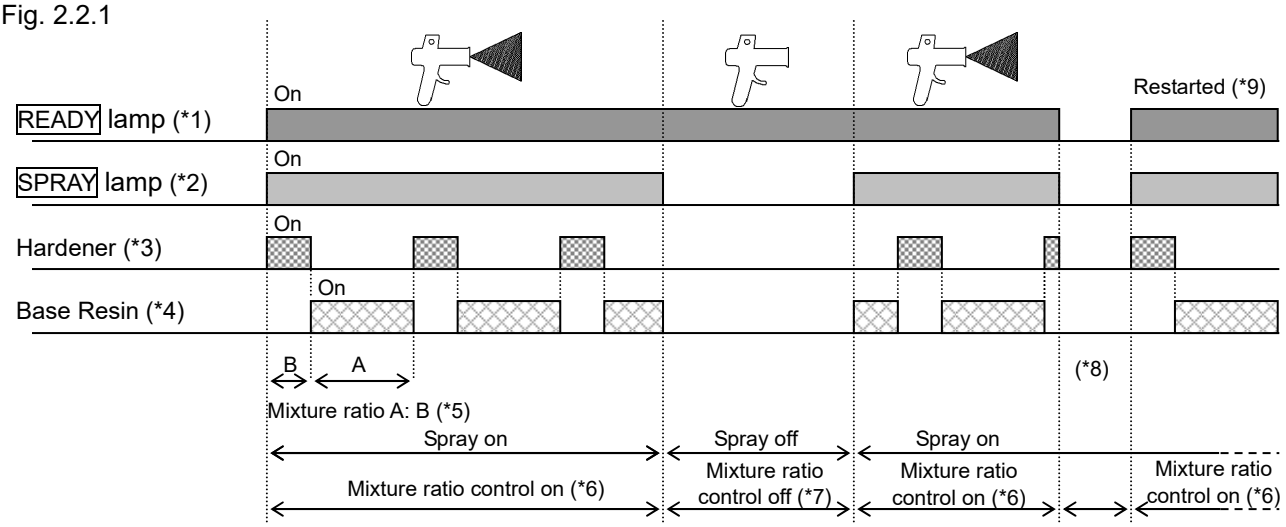
The Pot Life counter starts counting down right after the system is filled with the mixed fluid.

As the spray gun trigger is pulled and the resetting point (flow rate) is reached, the Pot Life counter is reset for restarting.

In short, the countdown continues as long as the mixed fluid is left unused for spraying.

During the flushing process at the end of coating work, the Pot Life counter does not count down.

Fig. 2.2.1



(*1): The READY lamp (READY mode) state of the ACW controller is shown.

(*2): The state of the trigger signal of a spray gun is shown.

(*3): The state of hardener supply is shown. (The status of the Hardener Mixing Valve is shown).

(*4): The state of base resin supply is shown. (The status of the Base Resin Mixing Valve is shown).

(*5): A mixing ratio is shown.

(*6): The alternately supply state of base resin and hardener is shown.

(*7): Under a spray stop is shown. Both Mixing Valves are closed to stop mixing control.

(*8): READY lamp-off state is shown. The state where control was once reset is shown.
(The Pot Life counter is not reset.)

(*9): READY lamp-on state is shown. It becomes a new start from supply of hardener.

Fig. 2.2.2

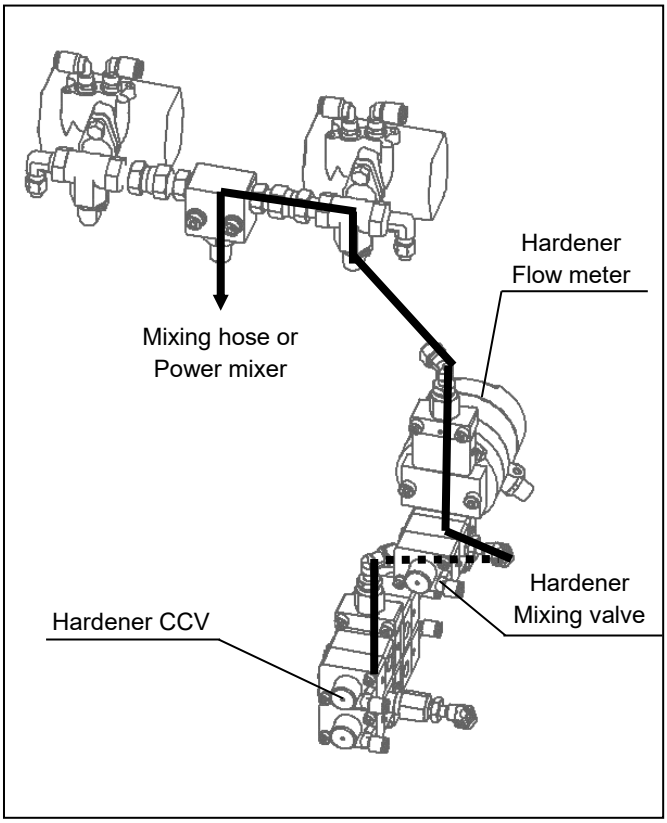
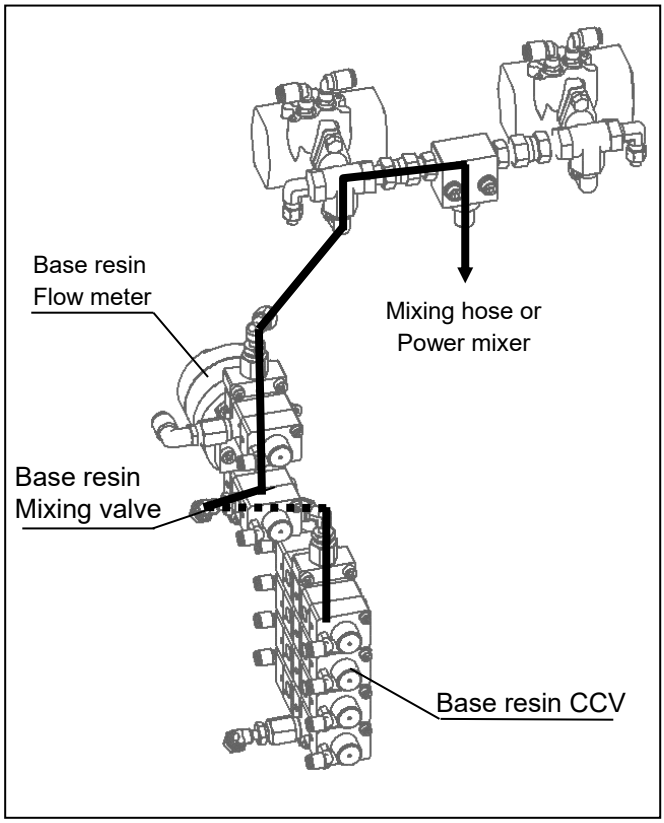


Fig. 2.2.3



3 Specifications

3-1 System specifications

System specification is the combination of an ACW Control Unit and ACW Mixing Unit.
The instructions manual of “ACW Mixing Unit” is referred to for the specification of the ACW Mixing Unit.

Designation	CNC Two-component Mixing System
Mixing ratio range	1:1 to 12:1 (Max 1:5 to 30:1)
Mixture control accuracy	±5% or less (*1)
Components of fluid	Max.21 types (colors) of base resin and 21 types of hardener
Viscosity ranges	25mPa·s to 300mPa·s for base resin/hardener (for low-pressure type) (*2) 25mPa·s to 3000mPa·s for base resin/hardener (for high-pressure type) (*2)
Flow rate ranges	50 to 700 ml/min for type 1 (for low-pressure type) (*3) 100 to 1000 ml/min for type 2 (for low-pressure type) (*3) 200 to 2000l/min for type 3 (for high-pressure type) (*3)
Compressed air pressure	0.4 MPa to 0.7 Mpa

(*1): The mixing control accuracy depends on the conditions of use including the paint viscosity and flow rate.
(*2): For the paint with a viscosity above 100mPa·s (30 seconds/FC#4), the pump pressure shall be 0.5MPa or higher. The specified mixing control accuracy cannot be maintained with a viscosity below 30mPa·s (12 seconds/FC#4).
(*3): Depends on the specification of configured flowmeter. For the paint with a viscosity below 30mPa·s (12 seconds/FC#4), the flow rate may not be controlled within this range.
The flow rate during the fill-up shall not exceed the specified limit.

3-2 ACW Control Unit Specification

3-2-1 ACW Control Unit Specification (Operator control panel)

Model:	ACW42*** See [3-4-1 How to assign model]
Operating conditions	Temperature: 0 to +40 °C Humidity: 10 to 80 %, No condensation allowed.
Operating atmosphere	No exposures to corrosive gas, dust, vapor, dripping water and direct sunlight allowed.
Operating altitude	2000 m (6562 ft) or less (*1)
Transporting and storing conditions	Temperature: -10 to +50 °C Humidity: 10 to 90 %, No condensation allowed.
Supply voltage	100 VAC ±10%, 50 to 60 Hz 200 to 240 VAC ±10% (For international order) (*2)
Current capacity	1A (at 100 VAC) (*3)
Overvoltage category	II or less
Weight	65kg
Dimensions	550 mm wide x 800 mm high x 300 mm deep (*4)
Explosion protection	Non explosion-proof

(*1) Do not use or store the ACW Control Unit under pressure higher than the atmospheric pressure of altitude 0m (0ft.).
(*2) It becomes the transformer specification in an operator control panel.
(*3) It is a case where it has not connected with an electrostatic controller. When it connects, it is 3A (AC100V).
(*4) It is a size of an operator control panel. It is not height including a leg.

3-2-2 ACW Control Unit Input / output specification (ALB Terminal Block)

Input specification	Input voltage: 24VDC
	Input current: 10mA or less at each terminal
	ON voltage: 15VDC min. (Between input terminals and com+ terminals)
	OFF voltage: 5VDC max. (Between input terminals and com+ terminals)
	Solderless terminal size: 1.25-3s (for M3 screw)
Output specification	Output voltage: 24VDC
	Input current: 0.5A or less at each terminal
	(Total 2A or less at each ALB Terminal Block)
	Output form: NPN transistor, Open collector Output
	Solderless terminal size: 1.25-3s (for M3 screw)

3-2-3 ACW controller specification

Model	ACW4000EX
Operating conditions:	Temperature: 0 to +40 °C
	Humidity: 10 to 80 %, No condensation allowed.
Operating atmosphere:	No exposures to corrosive gas, dust, vapor, dripping water and direct sunlight allowed.
Operating altitude	2000 m (6562 ft) or less (*1)
Transporting and storing conditions:	Temperature: -10 to +50 °C
	Humidity: 10 to 90 %, No condensation allowed.
Supply voltage	100 VAC ±10%, 50 to 60 Hz
Current capacity	Max 0.5A (at 100 VAC)
Protective structure	Outside the enclosure: IP54 (JEM1030) (*2)
	Inside the enclosure: IP10 (JEM1030)
Overvoltage category	II or less
Pollution degree	2 or less (*3)
Dimensions	300 mm wide x 280 mm high x 182.5 mm deep
Weight:	5.5kg
Display type	TFT color liquid crystal display (*4)
Display size	15” (8.4 inch)
Display life	Approx. 52,000 h (Operating ambient temperature: 25°C)
Backligh life	Approx. 50,000 h (Time when display luminance reaches 50% at the operating ambient temperature of 25°C)
Touch panel type	Analog resistive film
Touch panel life	1 million times (operating force 0.98N max.)
Card slot	Memorry Card slot 1ch

(*1) Do not use or store the ACW Controllor under pressure higher than the atmospheric pressure of altitude 0m (0ft.).

(*2) It is complied at the time of USB environmental protection cover wearing. Note that this does not guarantee all users' operation environment.

(*3) This index indicates the degree to which conductive material is generated in the environment where the equipment is used. In pollution degree 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensation.

(*4) Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. Please note that these dots appear due to its characteristic and are not caused by product defect.

3-2-4 Power supply part specifications of ACW controller

Dielectric withstand voltage	1500VAC for 1 minute across power terminals and earth
Applicable wire size	1.25 to 2 mm^2 (16-14AWG)
Terminal screw size	M4
Applicable tightening torque	1.2 to1.8 N·m (Terminal block terminal screw)

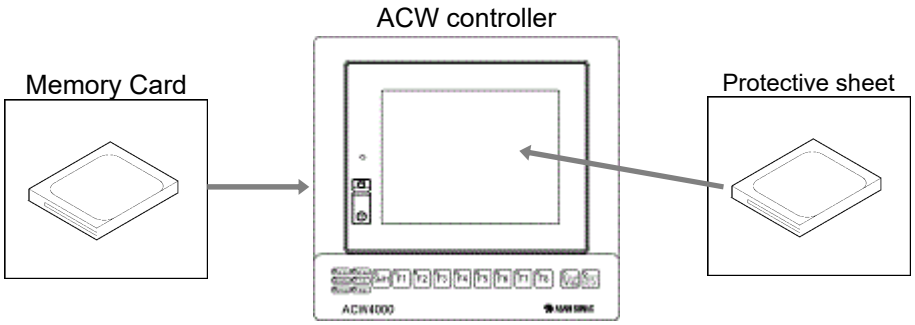
3-2-5 Control signal connection specification of ACW controller

Applicable wire size	0.5 to 0.75 mm^2 (20-18AWG)
Terminal screw size	M3
Applicable tightening torque	0.6 to0.8 N·m (Terminal block terminal screw)

3-2-6 General tools of ACW controller

(1) Memory Card (The control program is included)

(2) Protective sheet (Attachment preliminary: 3 sheets)



⚠ CAUTION

POSSIBILITY OF DAMAGE OR MALFUNCTION

●A control program is contained in the memory card. Do not use the ACW controller without inserting the memory card. Neither control nor backup data is performed correctly.

3-3 Interface option (Option board)

(1) CC-Link communication unit

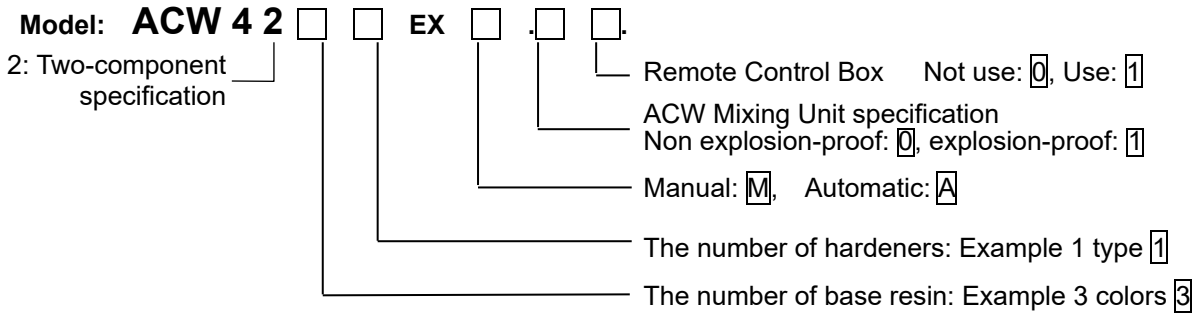
(2) Ethernet communication unit

(3) LAN cable (For Ethernet communication unit)

NOTE: For the specification of an interface option (option board), refer to “ACW extension and the option instructions manual” separately available.

3-4 ACW Control Unit Model

3-4-1 How to assign model



<< Example of assign model >>

Model ACW4231M01	The number of base resin	3	
	The number of hardeners	1	
	Color Change Operation	Manual	Switch operation of Remote Control Box is possible.
	ACW Mixing Unit specification	Non	Non explosion-proof type
	Remote Control Box	Use	Available of Remote Control Box

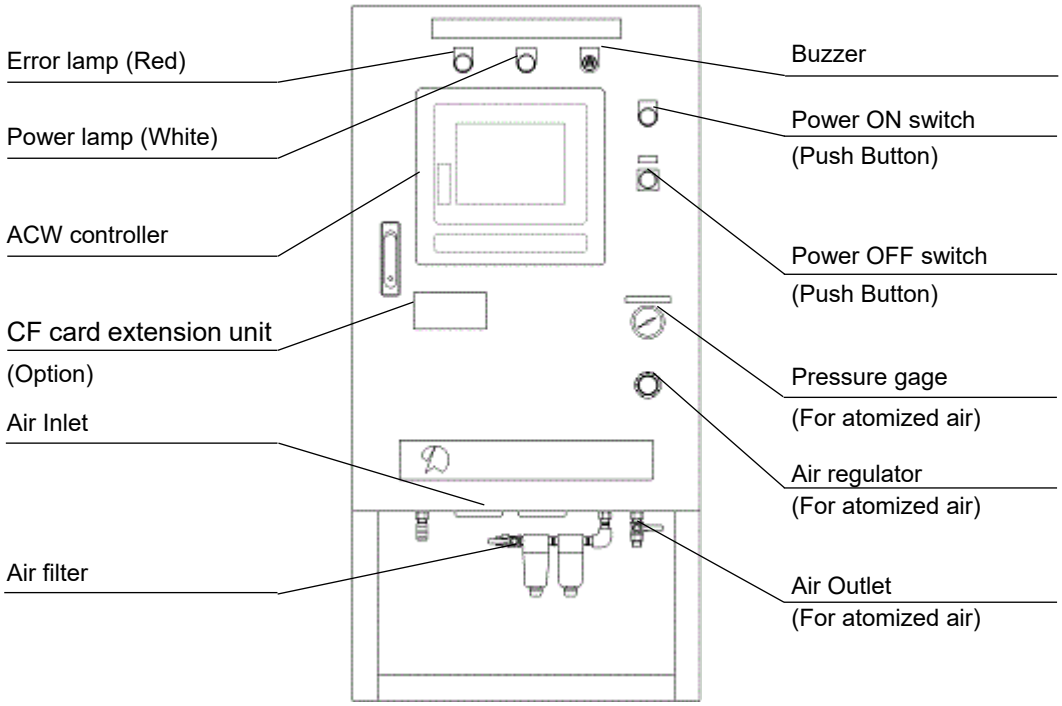
3-4-2 Model and specification

Color Change Operation		Manual	Manual	Manual	Manual	Automatic	Automatic
ACW Mixing Unit specification		Non explosion-proof type	Non explosion-proof type	Explosion-proof type	Explosion-proof type	Non explosion-proof type	Explosion-proof type
Remote Control Box		Not use	Use	Not use	Use	Not use	Not use
The number of [A], [B]	[A]: 1 [B]: 1	ACW 4211M00	ACW 4211M01	ACW 4211M10	ACW 4211M11	ACW 4211A00	ACW 4211A10
	[A]: 3 [B]: 1	ACW 4231M00	ACW 4231M01	ACW 4231M10	ACW 4231M11	ACW 4231A00	ACW 4231A10
	[A]: 3 [B]: 2	ACW 4232M00	ACW 4232M01	ACW 4232M10	ACW 4232M11	ACW 4232A00	ACW 4232A10
	[A]: 3 [B]: 3	ACW 4233M00	ACW 4233M01	ACW 4233M10	ACW 4233M11	ACW 4233A00	ACW 4233A10
	[A]: 5 [B]: 1	ACW 4251M00	ACW 4251M01	ACW 4251M10	ACW 4251M11	ACW 4251A00	ACW 4251A10
	[A]: 5 [B]: 2	ACW 4252M00	ACW 4252M01	ACW 4252M10	ACW 4252M11	ACW 4252A00	ACW 4252A10
	[A]: 5 [B]: 3	ACW 4253M00	ACW 4253M01	ACW 4253M10	ACW 4253M11	ACW 4253A00	ACW 4253A10
	[A]: 7 [B]: 1	ACW 4271M00	ACW 4271M01	ACW 4271M10	ACW 4271M11	ACW 4271A00	ACW 4271A10
	[A]: 7 [B]: 2	ACW 4272M00	ACW 4272M01	ACW 4272M10	ACW 4272M11	ACW 4272A00	ACW 4272A10
	[A]: 7 [B]: 3	ACW 4273M00	ACW 4273M01	ACW 4273M10	ACW 4273M11	ACW 4273A00	ACW 4273A10
ACW Control Unit Type (*1)		1	2	3	4	1	3

(*1):It is the classification by the electronic autoparts constitutes an ACW Control Unit.
Chapter 4 shows a type.

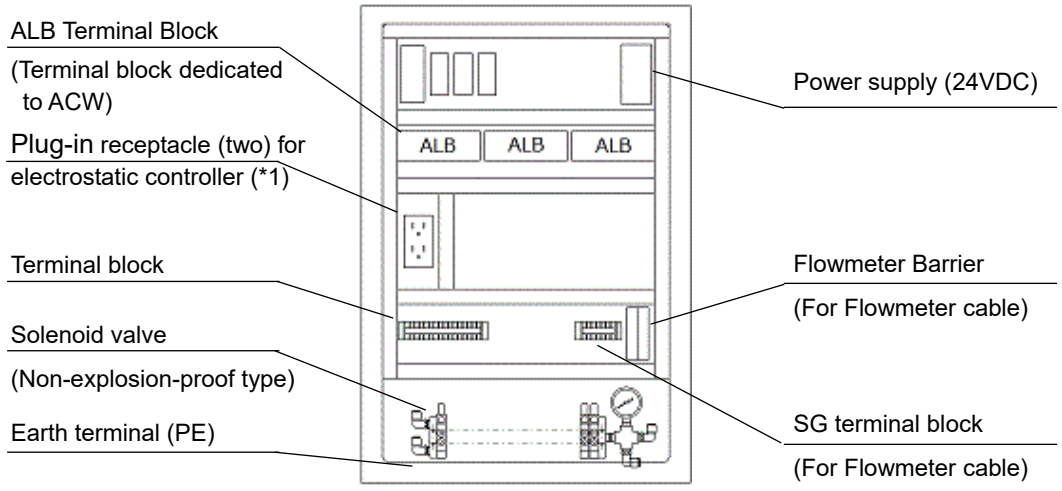
4 Name of Main Parts

4-1 Name of Main Parts (Outside)



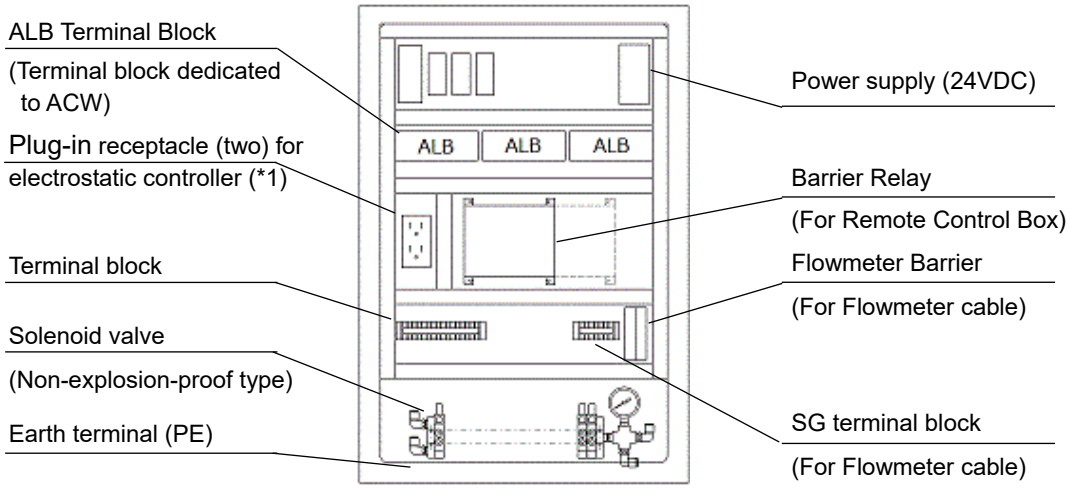
4-2 Name of Main Parts (Inside)

4-2-1 Type 1



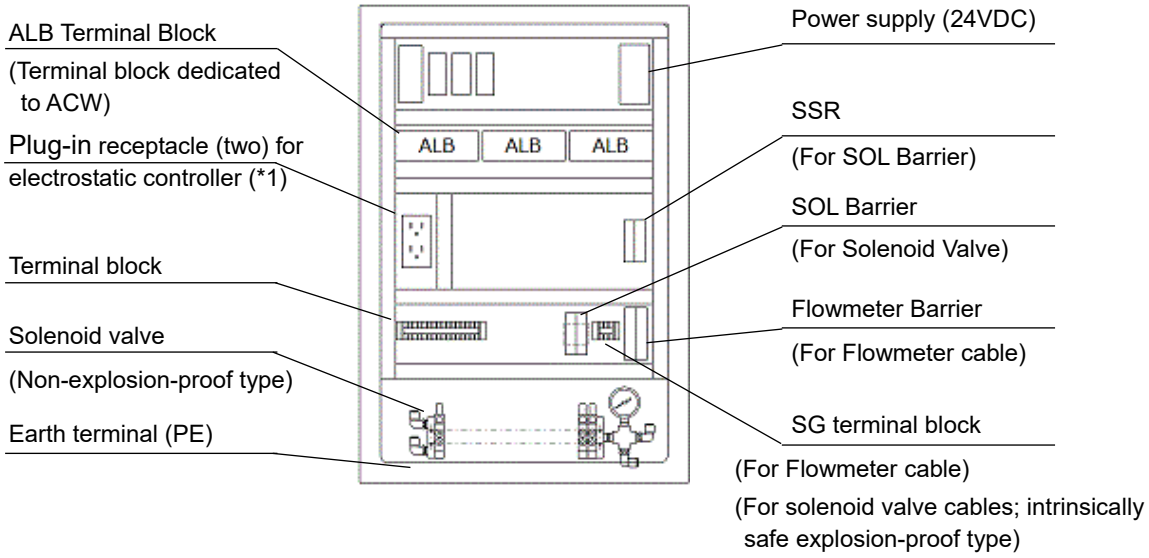
(*1): Outlet for electrostatic controller (two pieces) is intended for power supply (100VAC) for our BPS controller. When flushing fluid (solvent) is chosen in flushing, power is off.

4-2-2 Type 2



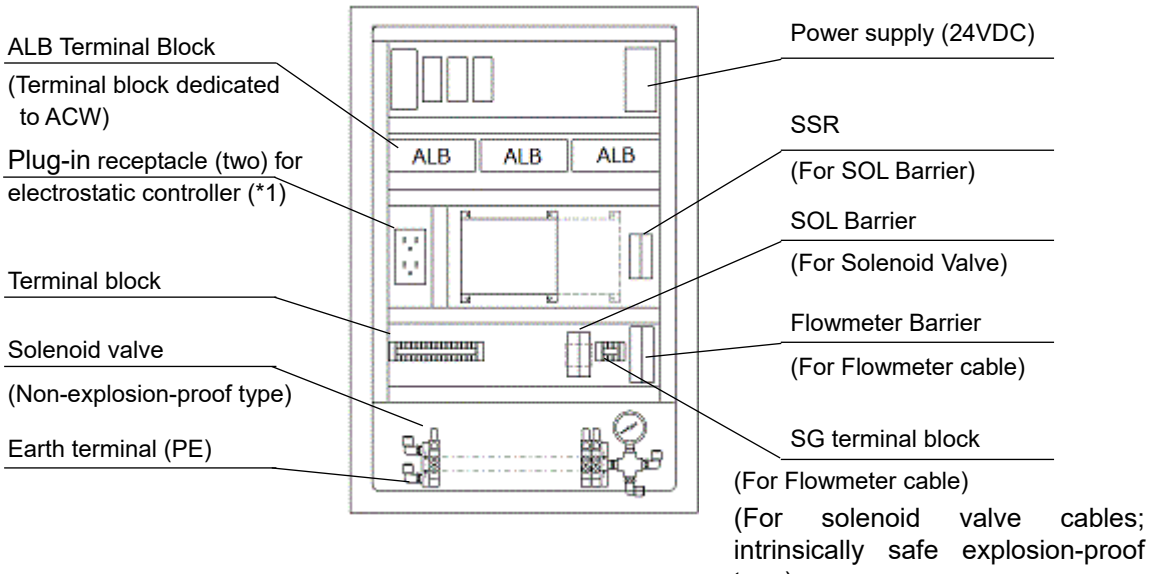
(*1): Outlet for electrostatic controller (two pieces) is intended for power supply (100VAC) for our BPS controller. When flushing fluid (solvent) is chosen in flushing, power is off.

4-2-3 Type 3



(*1): Outlet for electrostatic controller (two pieces) is intended for power supply (100VAC) for our BPS controller. When flushing fluid (solvent) is chosen in flushing, power is off.

4-2-4 Type 4



(*1): Outlet for electrostatic controller (two pieces) is intended for power supply (100VAC) for our BPS controller. When flushing fluid (solvent) is chosen in flushing, power is off.

⚠ CAUTION

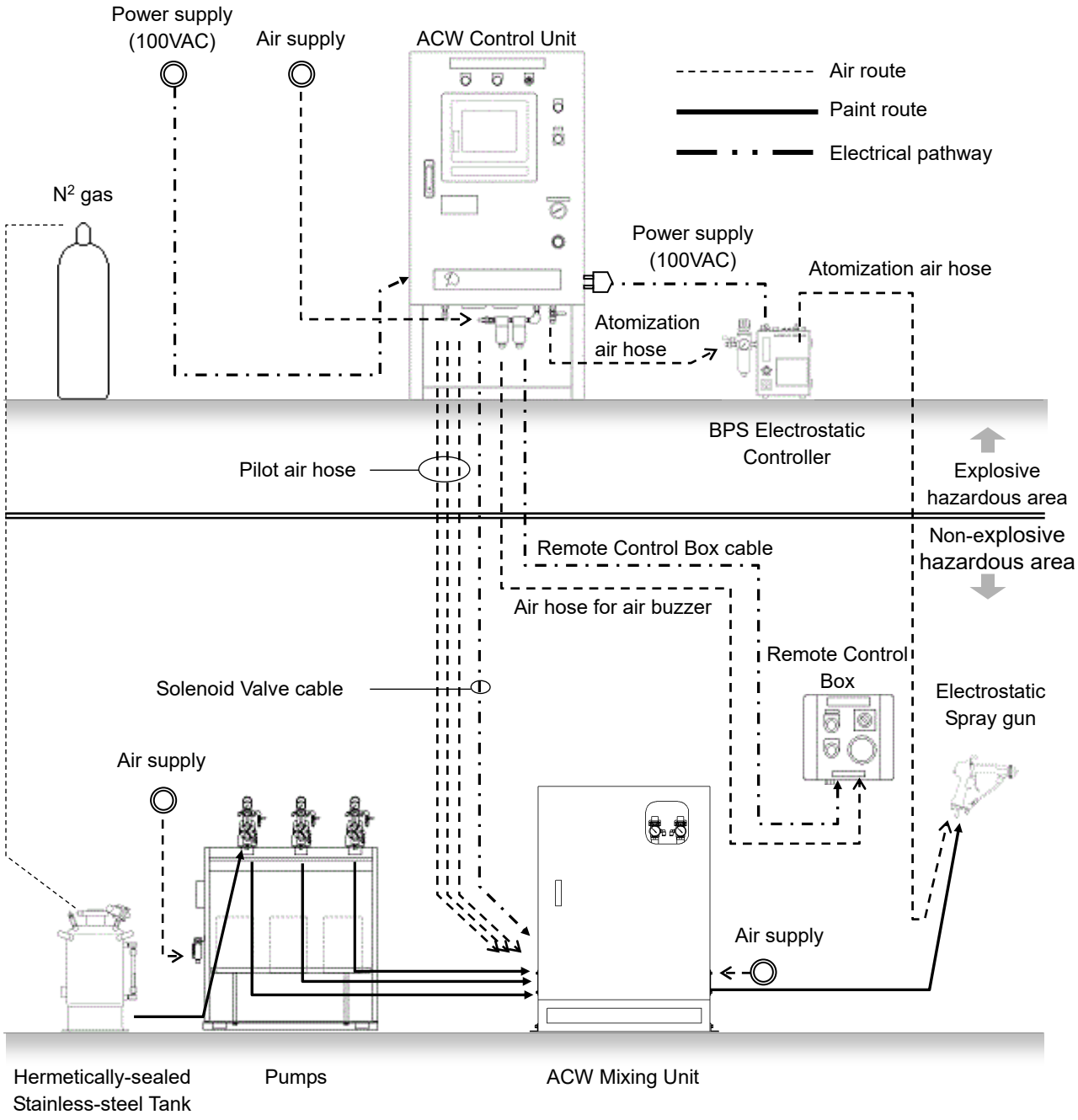
POSSIBILITY OF DAMAGE OR MALFUNCTION

Do not use the plug-in receptacle for electrostatic controller (2 pieces) for other purposes than controlling the BPS Controller.

5 System Configuration

5-1 System configuration example

The fundamental example of a system configuration is shown. (Low-pressure specification, electrostatic spray gun)

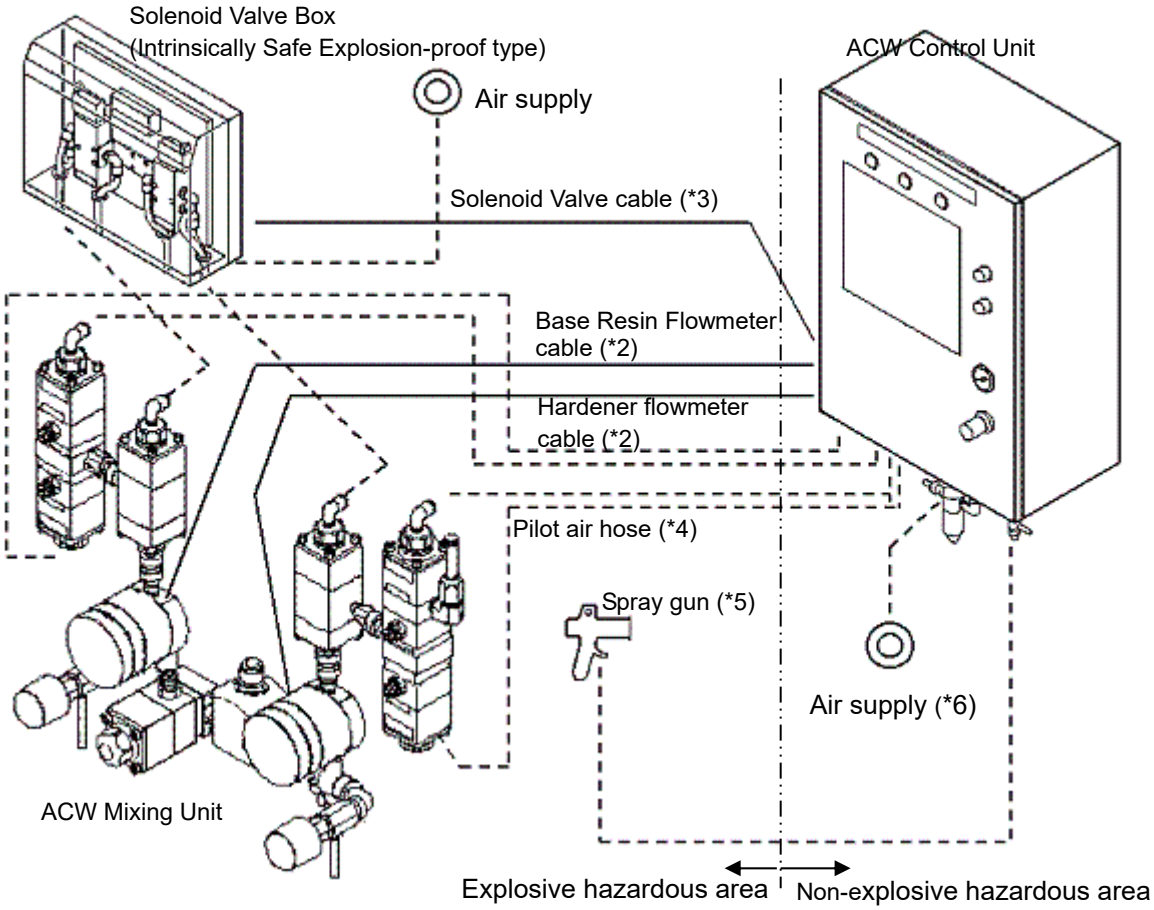


NOTE: System depends on specification.

5th Edition: November, 14, 2022

5-2 Air system / Electric circuit diagram

This equipment detects the signal from flowmeter with an ACW controller, and controls Mixing Valves and CCV valves with pilot air of each solenoid valve. Configuration of such pilot air and electric circuit is shown below.



(*1): System depends on specification.
(*2): See [7-3-2 wiring of flowmeter cable]
(*3): See [7-3-3 Wiring of Explosion-proof Solenoid Valve cable]
See [7-3-4 Wiring of Solenoid Valve cable. (For not explosion-proof type of an ACW Mixing Unit)]
(*4): See [7-4-2 Pilot air between ACW Control Unit and ACW Mixing Unit CCV]
(*5): See [7-4 Connection of air hoses]
See [18-2-2 Operation of spray gun (manual spray gun, automatic spray gun)]
(*6): See [7-4 Connection of air hoses], [9-2 Compressed air supply]
(*7): See [9-1 Hoses]

6 ACW control Function and Two-component

6-1 Ratio by weight and ratio by volume

This system controls the flow rates by volume. To convert a ratio by weight to that by volume or the weight of the paint sampled for mixing ratio test to a volumetric value, calculation is required using the specific gravity of the paint.

(1) Calculation of mixing ratio (by weight → by volume)

- Mixture ratio (by volume) = Weight of base resin / specific gravity of base resin:
  weight of hardener / specific gravity of hardener

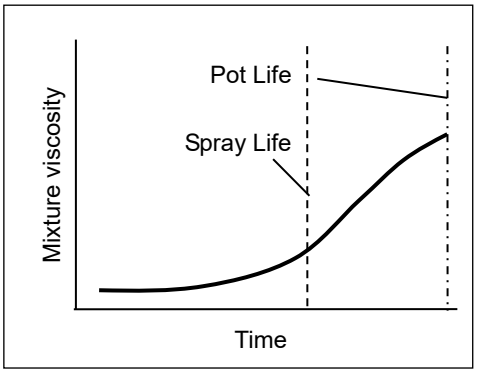
(2) Calculation of sampled paint quantity (weight→ volume)

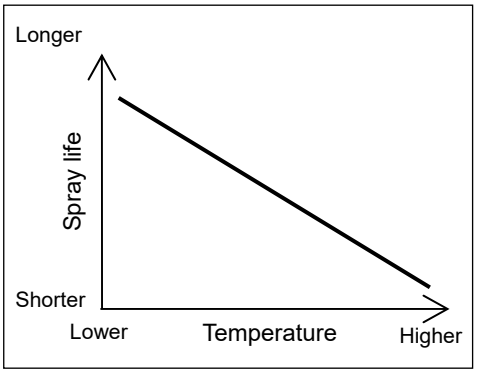
- Volume of sampled paint (ml) = Weight of sampled paint (g) / specific gravity

6-2 Spray Life and Pot Life

(1) Spray Life: A length of time in which the mixed fluid can be sprayed to obtain a desired coating quality.

(2) Pot Life: A length of time from the point of mixing to the point when the mixed fluid is hardened (gelled).





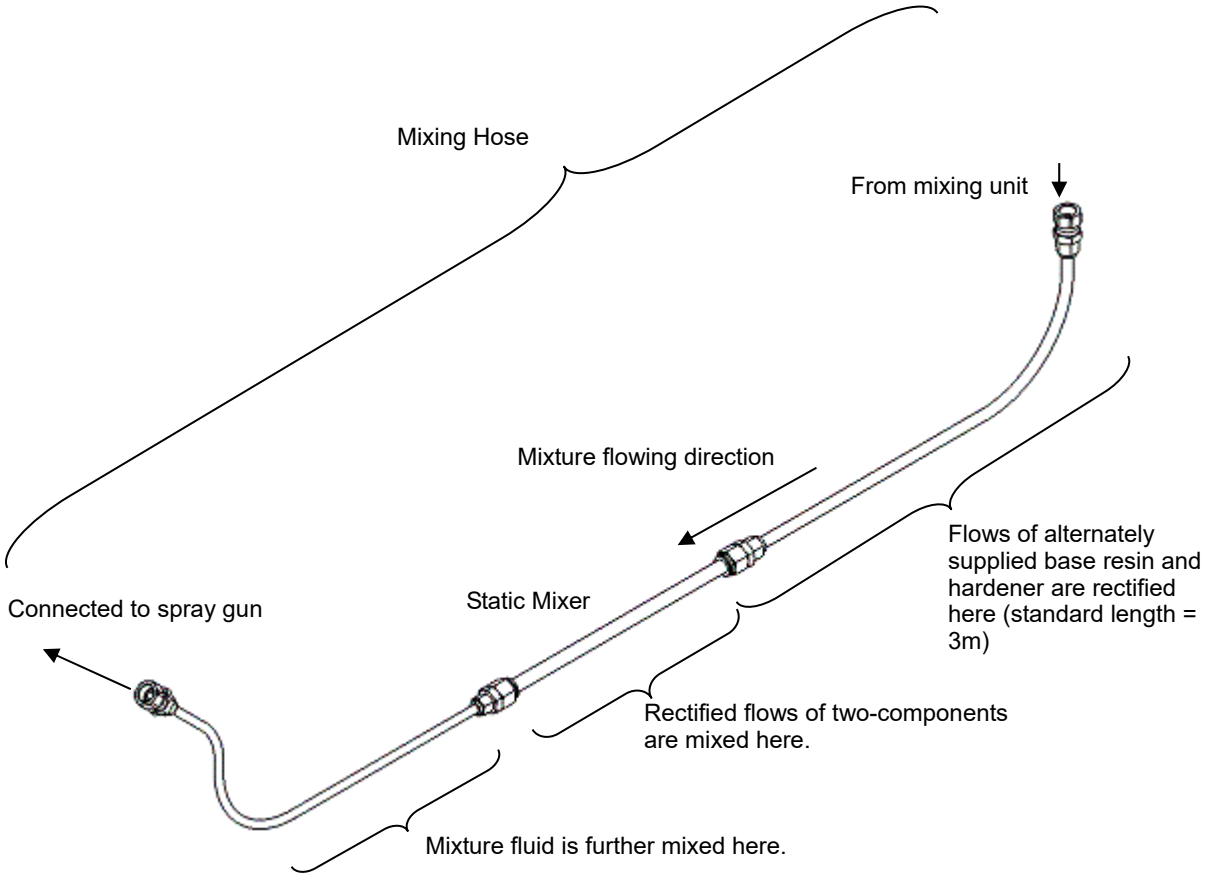
The viscosity more quickly increases after the end of the Spray Life, in general.

The Spray Life becomes shorter with the increase of the air and fluid temperatures.

6-3 Mixing Hose

The Mixing Hose serves to rectify the flows of the alternately supplied base resin and hardener to ensure complete mixing by the Static Mixer.

6-3-1 Parts and functions of Mixing Hose



The figure shows for low pressure as a model <4433>.

Refer to the instructions manual of “ACW Mixing Unit” for details, specification, etc.

⚠ CAUTION

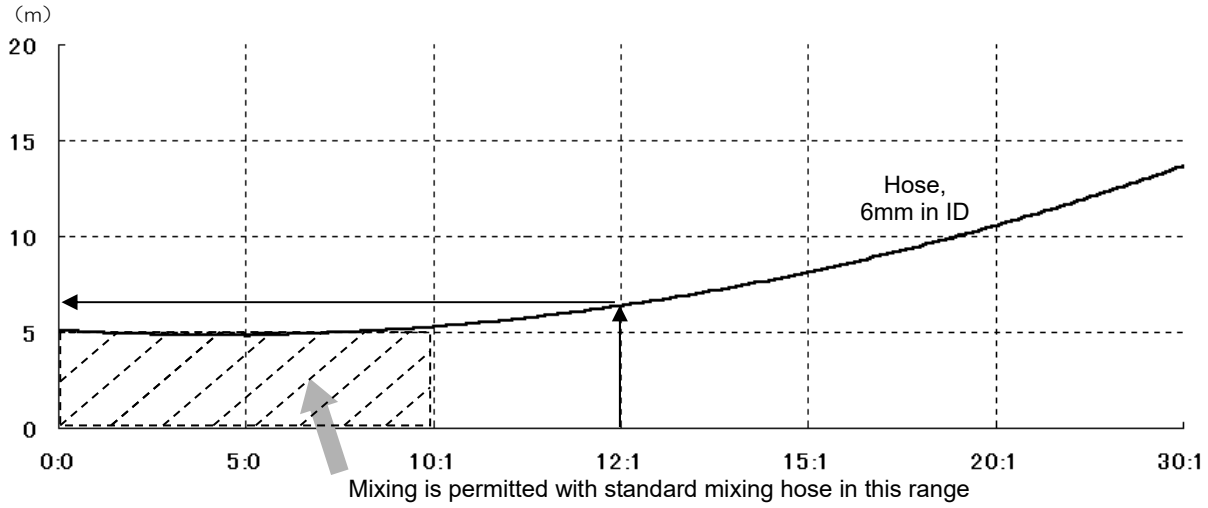
POSSIBILITY OF POOR MIXING OR INTERNAL HARDENING

- **If the hose length to the Static Mixer is too small, the paint cannot be thoroughly mixed by the Static Mixer, possibly resulting in poor hardening. Do not reduce the hose length to the Static Mixer or change the hose diameter.**
- **The hose portion downstream the Static Mixer also serves to ensure the mixture quality. Do not directly connect the Static Mixer to the spray gun.**

6-3-2 Effect of Mixing Hose length on mixing ratio

The hose length to the Static Mixer has an effect on the mixing ratio. To achieve a larger mixing ratio, the hose length from the Static Mixer to the spray gun shall be increased.

Adjust the hose length according to the following chart.



<Example> The ratio of 12:1 (Low Pressure Specification)

The Mixing Hose shall be 7m long. This means that the hose length from the Static Mixer shall be changed to 5m.

If the hose length can't be changed, change the mixing amount of 1 cycle. Please contact to us in the case.

Refer to the instructions manual of "ACW Mixing Unit" for details, specification, etc.

See the following table for extension hoses. Cut them to a necessary length before use.

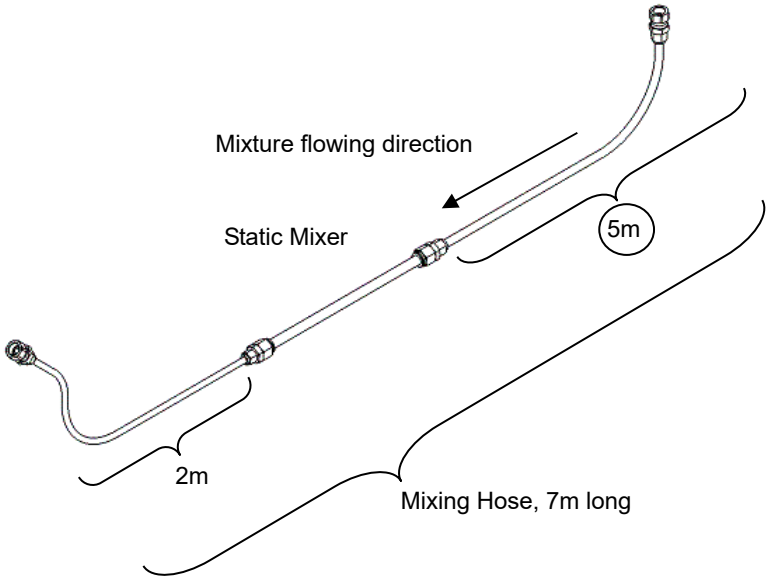
ϕ6mm Teflon Hose

Hose	Part No.	Remark
5m	52C-0050	For ϕ8-6
10m	52C-0100	For ϕ8-6

〈Reference〉 ϕ4mm Teflon Hose

Hose	Part No.	Remark
5m	570-0050	For ϕ6-4
10m	570-0100	For ϕ6-4

For Hose after Static Mixer



7 Unpacking and Installation

This equipment is 100% inspected at the manufacturer's factory. However, some parts may be damaged or lost during transportation. After unpacking, please check carefully for missing or damaged parts and, if any, contact our distributors.

⚠ WARNING

FIRE AND ELECTRIC SHOCK HAZARD

- **The ACW Control Unit is not explosion-proof. Do not operate it in an explosive hazardous area.**
- **Do not wet the electric components in the ACW Control Unit with any liquid.**
- **Be sure to shut off all phases of the external power supply used by the system before wiring.**
- **Ventilate sufficiently to avoid filling with inflammable atmosphere (solvent atmosphere).**
- **Be sure to ground the protective ground terminal of ACW Control Unit by Class D (Regulation in Japan) grounding.**

⚠ CAUTION

POSSIBILITY OF DAMAGE OR MALFUNCTION

- **Use this equipment in the environment written in the instructions manual. If useing them in environments other than the range, it will become electric shock, fire, malfunction, and the damage to product, or cause of degradation.**

7-1 Check and deal in follow order at the time of unpacking

(1) Check the ACW Control Unit for gouges and dents around the periphery.
(2) Check the monitor device of the ACW controller for gouges, dents, and for any scratch or crack
(3) Check the ACW controller for any broken attachment lug and broken screws.
(4) Retighten loose screws, nuts and joints if any.
(5) Check the air pressure gauges, air regulator, switches, and lamps for damage. Replace them with a new one if damages.
(4) Check the electric components in the ACW Control Unit and remount them if disconnected.

7-2 Installation site

(1) Install the ACW Control Unit in the environment that satisfies the general specifications described in this manual.

See [3-2 ACW Control Unit Specification]

(2) The ACW Control Unit is not explosion-proof. It cannot be installed an explosive hazardous area.
(3) Each unit shall be installed with enough space reserved around it for routing of the each **cable** and air tubes, and for ease of maintenance.
(4) Be sure to fix equipment to floor using an anchor bolt for fall prevention.
(5) Class D (Regulation in Japan) grounding work is required for the ACW Control Unit.

See[8-2-1 Ggrounding construction standard (Class D grounding)]

7-3 Wiring

7-3-1 Wiring of power supply cable

100VAC power supply is supplied to the terminal block for signals and power supply (L, N mark).
An earth wire is connected to a grounding terminal (Inside and bottom of the ACW Control Unit).

See [8-2 Grounding]

7-3-2 Wiring of flowmeter cable

Connect the barrier in the ACW Control Unit and flowmeter of the ACW Mixing Unit with the flowmeter cable (dedicated cable).
Refer to the instructions manual of “ACW Mixing Unit” for connecting cablea to a flowmeter.

⚠ CAUTION

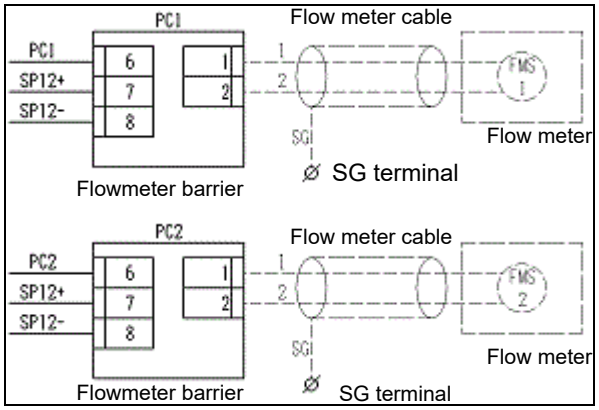
POSSIBILITY OF MALFUNCTION

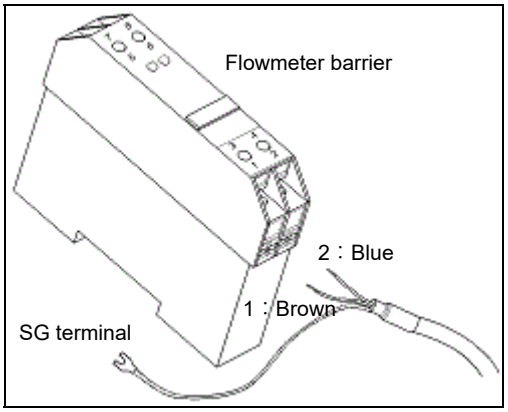
- **If a noise influences a flow instrument cable, an error will be outputted from ACW controller. Since it becomes a malfunction of a line stop or equipment, be sure to ground a shield line and to take the measures against a noise.**
  See [8-1-1 The measure against the noise which influences flowmeter cable]
- **When the value of the hardener or base resin counts on an ACW controller screen by a spray halt condition, the influence of a noise has occurred.**

(1) Be sure to shut off all phases of the external power supply used by the system before wiring.
(2) Before starting wiring, always check Class D (Regulation in Japan) grounding correctly grounds the protective ground terminal of the ACW Control Unit.

See[8-2-1 Ggrounding construction standard (Class D grounding)]

(3) Cables are wiring at separate from other cables. Lay wiring of the cables through the conductive piping and duct, and ground them.
(4) Flow meter cable is with a connector and it is 40m long at the maximum. A connector is connected to a flowmeter of the ACW Mixing Unit.
(5) Opposite side of connector is connected to the flowmeter barrier in the ACW Control Unit.
(6) The shield line of flowmeter cable is connected to SG terminal in the ACW Control Unit.



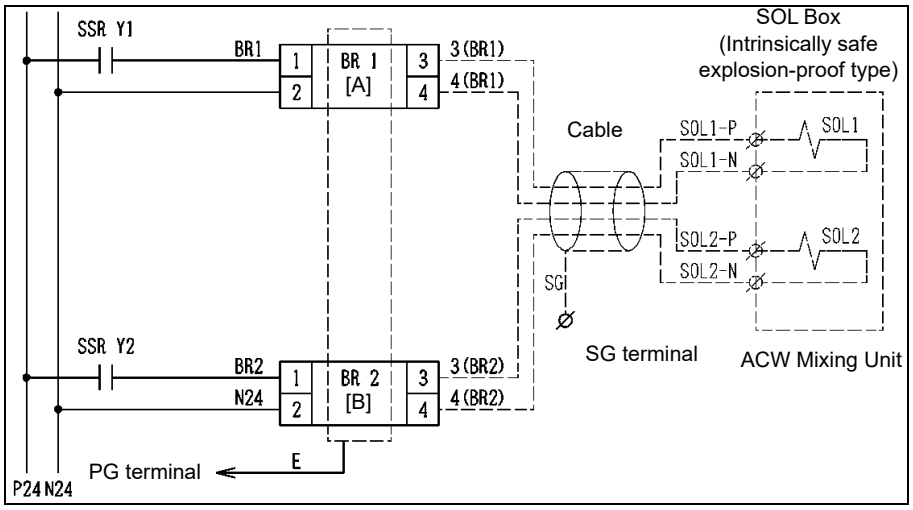


(7) When you attach a cable, terminal screws must be tightened always at torque 0.6 to 0.8 N·m.
(8) The surplus cable is packed into about two to three rolls in an ACW Control Unit. There is a possibility that three or more cable itself may become a noise source. In this case, cut a cable and wire.
(9) A cable should not add a tension or should not crush it with a heavy load.

7-3-3 Wiring of Explosion-proof Solenoid Valve cable

When the ACW Mixing Unit is explosion-proof type, intrinsically safe explosion-proof type solenoid valve of the ACW Mixing Unit is connected with the SOL barrier of the ACW Control Unit with a shielded cable. Refer to the instructions manual of “ACW Mixing Unit” for connecting cables to the ACW Mixing Unit.

(1) Be sure to shut off all phases of the external power supply used by the system before wiring.
(2) Before starting wiring, always check Class D (Regulation in Japan) grounding correctly grounds the protective ground terminal of the ACW Control Unit.
See[8-2-1 Ggrounding construction standard (Class D grounding)]
(3) Cables are wiring at separate from other cables. Lay wiring of the cables through the conductive piping and duct, and ground them.
(4) Wiring uses a shielded cable. Four-core shielded wire. Wire size is approx. 0.75 mm^2.
(5) Connect cables to the SOL Barrier (BR1, BR2) inside the ACW Control Unit.
(6) Connect the shield of a cable to SG terminal inside the ACW Control Unit.



(7) When you attach a cable, terminal screws must be tightened always at torque 0.6 to 0.8 N·m.
(8) A cable should not add a tension or should not crush it with a heavy load.

7-3-4 Wiring of Solenoid Valve cable

(1) Be sure to shut off all phases of the external power supply used by the system before wiring.

(2) Before starting wiring, always check Class D (Regulation in Japan) grounding correctly grounds the protective ground terminal of the ACW Control Unit.

See[8-2-1 Ggrounding construction standard (Class D grounding)]

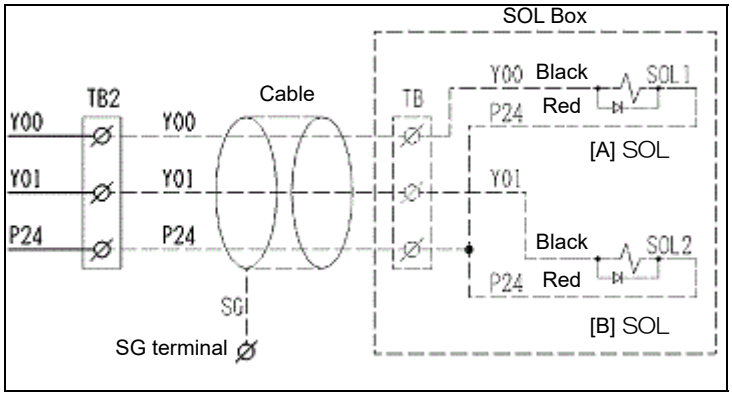
(3) Cables are wiring at separate from other cables. Lay wiring of the cables through the conductive piping and duct, and ground them.

(4) Wiring uses a shielded cable. Triplex cable shielded wire. Wire size is approx. 0.75 mm^2.

(5) Connect cables to the terminal (TB2) inside the ACW Control Unit.

(6) Connect the shield of a cable to SG terminal inside the ACW Control Unit.

Wiring of Explosion-proof Solenoid Valve cable



(7) When you attach a cable, terminal screws must be tightened always at torque 0.6 to 0.8 N·m.

(8) A cable should not add a tension or should not crush it with a heavy load.

7-3-5 Wiring of Remote Control Box (option)

There is a type of the ACW Control Unit with which the barrier amplifier (Barrier Relay) for Remote Control Box, which can be used in a booth, is installed. It connects with this Barrier Relay and a Remote Control Box (option) by a multi-core shielded wire.

Refer to the instructions manual of “Remote Control Box” for connecting cable to Remote Control Box.

(1) Be sure to shut off all phases of the external power supply used by the system before wiring.

(2) Before starting wiring, always check Class D (Regulation in Japan) grounding correctly grounds the protective ground terminal of the ACW Control Unit.

See[8-2-1 Ggrounding construction standard (Class D grounding)]

(3) Wiring uses a shielded cable. The number of multi-core shielded wire changes with numbers of base resin valves. Wire size is approx. 0.75 mm^2.

Base resin valves	Specification of Remote Control Box	Model No.	Multi-core shielded wire
1	Only operation switch	RCB01-C	Over 4
	With one Airflow switch	RCB01-A	Over 5
3	Only operation switch	RCB03-C	Over 6
	With one Airflow switch	RCB03-A	Over 7
5	Only operation switch	RCB05-C	Over 8
	With one Airflow switch	RCB05-A	Over 9
7	Only operation switch	RCB07-C	Over 10
	With one Airflow switch	RCB07-A	Over 11

(4) Connect cables to the Barrier Relay inside the ACW Control Unit.

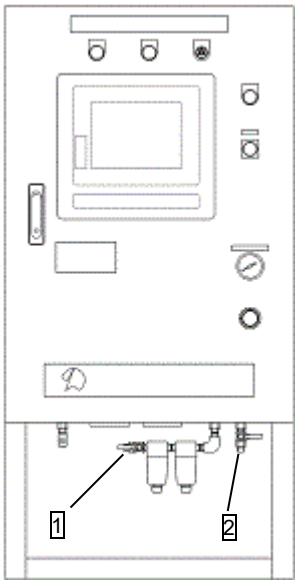
(5) Connect the shield of a cable to SG terminal inside the ACW Control Unit.

(6) When you attach a cable, terminal screws must be tightened always at torque 0.6 to 0.8 N·m.

(7) A cable should not add a tension or should not crush it with a heavy load.

7-4 Connection of air hoses

7-4-1 ACW Control Unit



(1) Compressor air

Connect to the joint (G 1/4 screw) of air filter at the bottom of control panel. 1

(2) Air hose for spray gun

Connect the air cock 2 at the bottom of control panel. Adjust pressure for spray gun with the air regulator on the front of control panel. (Only air regulator installation type)

Air hose for automatic gun supplies air to the spray gun from another system such as automatic control device. Read the instruction manual of pertinent system well enough before use.

(3) Keep supply air away from other drive air in connection, and ensure that the Airflow switch is not actuated when the spray gun is out of use.

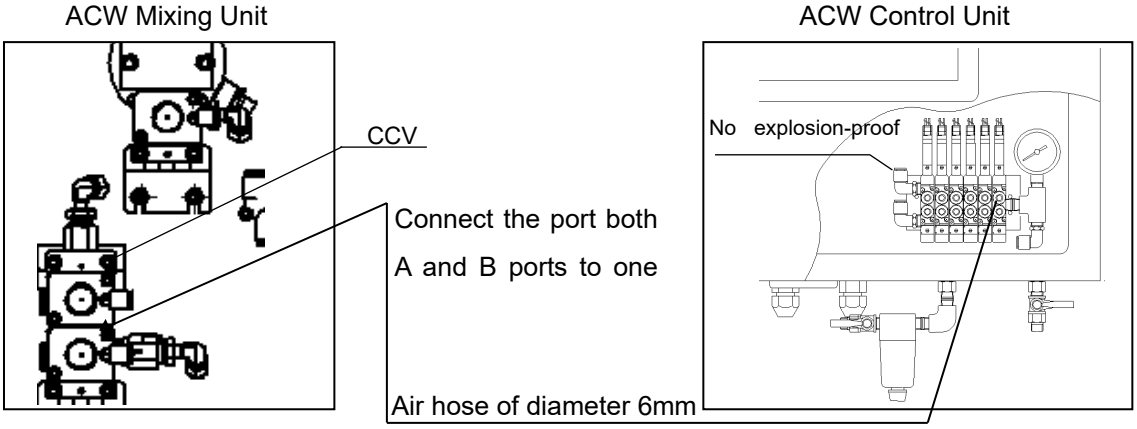
(4) It is recommended to use an air hose 3/8 inches (ID 8mm) or more.

NOTE

The compressed air for spray gun shall be taken from the cock mentioned above. The air supply on/off control of spray gun is linked with the control of the mixing on/off.

7-4-2 Pilot air between ACW Control Unit and ACW Mixing Unit CCV

Connect the air hose of diameter 6 to CCV of the ACW Mixing Unit from no explosion-proof Solenoid Valve in the ACW Control Unit.



8 Measure Against Noise, and Grounding

8-1 The cause and measure against noise

The influences of the noise in the CNC Two-component Mixing System, which consists of an ACW Control Unit and ACW Mixing Unit, are roughly classified into two causes. The measure in consideration of these is required.

8-1-1 The measure against the noise which influences flowmeter cable

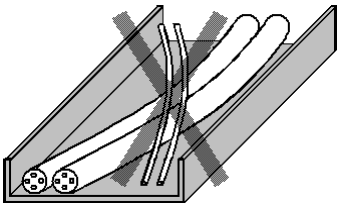
If the influences of a noise are received in a flowmeter cable from other power apparatus etc., an ACW Control Unit will carry out malfunction.

(1) Other cables which have the influence of a noise
A power cable, a robot cable, AC/DC servomotor, an inverter

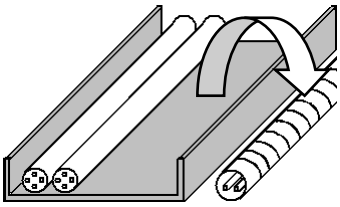
(2) Construction, which has the influence of a noise
The wiring in the same duct, intersection with the above-mentioned cable, and contact

(3) The feature of a noise
- ◆ It is easy to generate at the time of power supplying at the time of operation of a robot and a motor.
- ◆ It is easy to generate when new equipment is installed.
- ◆ It generates constantly and irregularly. It will not be subsided once it generates.

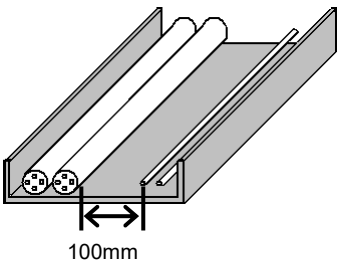
(4) Solution
- ◆ It is made to intersect neither a robot cable nor other power cables.



- ◆ Flow meter cables prepare an independent route and wires conductive piping and duct.



- ◆ When an independent route cannot be prepared, it separates from a robot cable or other power cables 100mm or more, and wires.



8-1-2 The noise which influences from the grounding (ground) side

Depending on a building, grounding may be inadequate. In this case, a noise is transmitted from the ground of other instruments and equipment, and an ACW Control Unit carries out malfunction.

(1) The ground of other equipments, which has the influence of a noise

An arc-welding machine, an oil pressure unit, utility equipment of air-conditioner

The ground of a motor, a machine tool, an ultrasonic generator

(2) Equipment, which needs an independent ground

The control device for a robot, robots, a transformer, AC/DC servomotor, an inverter

(3) The feature of a noise

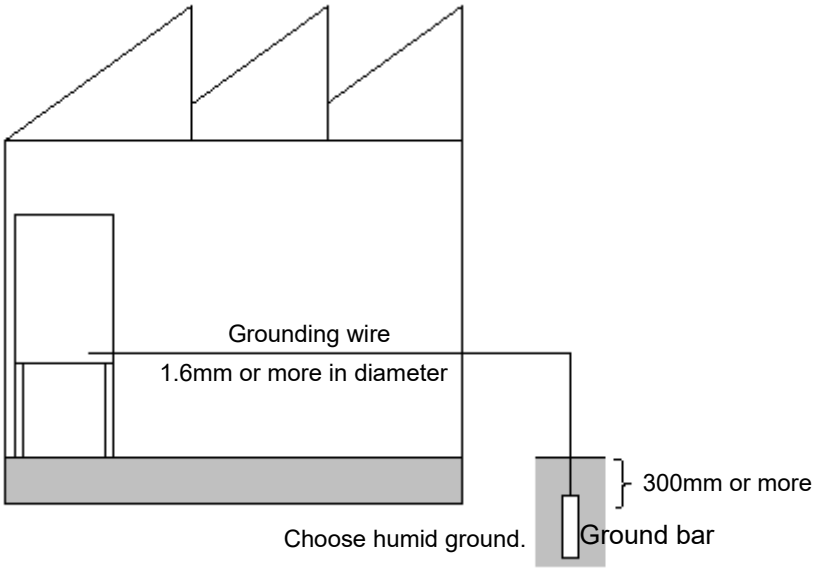
- It is easy to generate at the time of operation of other equipment, such as welding equipment and a robot, and equipment.
- It generates, even if it uses engine and welding equipment at the place that the same building left distantly.
- There is no reproducibility and generating frequency is not constant, either.

(4) Solution

- Since grounding of the building itself is inadequate, and since the equipment that needs an independent ground is not carrying out the independent ground, an ACW Control Unit carries out Class D (Regulation in Japan) independent grounding that used the ground bar.

See[8-2-1 Ggrounding construction standard (Class D grounding)]

NOTE: Ground construction is not included in a main part price. The ground bar is not attached.



8-2 Grounding

8-2-1 Ggrounding construction standard (Class D grounding)

Class D (Regulation in Japan) grounding is required for the equipment (to ensure an electric resistance not exceeding 100 ohms).

Grounding construction	Ground resistance	Wire size	Coverage
Class A	10ohms or less	2.6mm or more in diameter (5.5mm^2 or more)	The machine instrument high pressure or specially for high pressures
Class B	150ohms	2.6mm or more in diameter (5.5mm^2 or more)	The machine instrument of line grounding of a grounding type electricity course
Class C	10ohms or less	1.6mm or more in diameter (2mm^2 or more)	The machine instrument exceeding 300V for low pressures
Class D	100ohms or less	1.6mm or more in diameter (2mm^2 or more)	The machine instrument for the low pressures not more than 300V

The grounding constructions in above list are regulation in Japan.

8-2-2 Grounding standard and grounding noise

The grounding standard is considering the function on safety and security as the first priority, and only the resistance of the above-mentioned table is defined.

It is not set about the high frequency impedance that is related to noise propagation.

If grounding wire is wired over power lines and a distance long together in the inside of a cable duck and the wiring becomes long, the impedance of grounding wire will become large, and a noise is produced that electromagnetic induction current is transmitted easily.

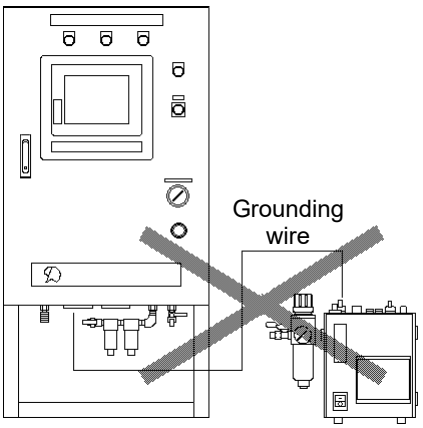
8-2-3 Grounding (Connect to ground)

(1) Grounding conductor (Grounding wire)

- Use a short and thick cable. Wire size: 1.6mm or more in diameter.
- Passage wiring is not performed but one-point grounding is carried out.

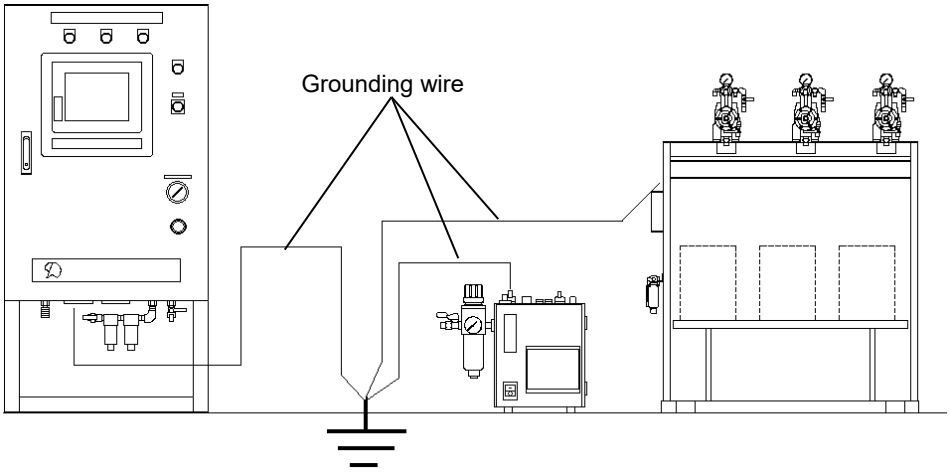
(2) The wiring method of grounding wire.

- The grounding wire of an electrostatic controller (Model: BPS series) is not connected to an ACW Control Unit.



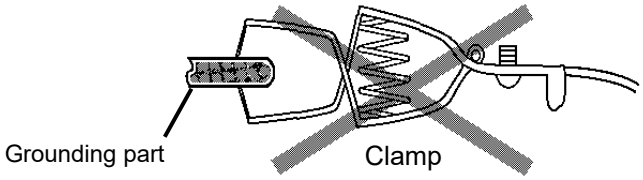
◆ Equipment is grounded one point to Class D (Regulation in Japan) grounding.　Grounds of other engine, robots, control device, and ground of an ACW Control Unit are detached and grounded.

See[8-2-1　Ggrounding construction standard (Class D grounding)]

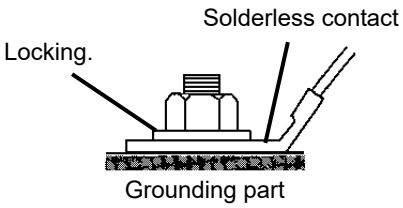


(3) The attachment method of a grounding wire

◆ Neither a clip nor a clamp is used.



◆ A solderless contact is attached to a grounding wire (Wire size: more than 1.6mm (2.6mm or more in diameter)), and a screw fastens in a grounding part.



9 Preparation of Compressed Air

⚠ WARNING

BREATHING DISORDER AND INTOXICATION HAZARD

- **Wear toxic fluid protecting mask, safety glasses, and protective clothes. Isocyanate, a chemical agent used as hardener, may hurt mucous membranes in your nose or throat. Wear the mask for protection from organic solvents during the work. Additional protective devices may be required depending on the paint components or ventilation level. Contact the paint manufacturer.**
- **Ventilate sufficiently to avoid filling with inflammable atmosphere (solvent atmosphere).**

FIRE AND EXPLOSION HAZARD

- **Check that all units have been correctly grounded.**
- **Ventilate sufficiently to avoid filling with inflammable atmosphere (solvent atmosphere).**

9-1 Hoses

(1) Check each hose throughout its length for scars, leak, wear, swells, cracks and loose fittings. In any of them is found, replace the hose with a new one and restore the equipment to the normal state before use.

(2) Check hose connectors and joints for loose fittings and air leak. If any leak is found, tighten or replace them.

9-2 Compressed air supply

(1) Use compressed air at 0.4MPa or higher.

(2) The compressed air to be supplied shall be adjustable in pressure and free of oils and debris.

(3) Prepare for air consumption enough to satisfy the spray gun specifications.

(4) If the air pressure at the gun head is too low, change the air hose to the next larger size to reduce the pressure loss.

9-3 Procedures to charge fluid to the CCV

Purge air along the route of base resin, hardener, and Flushing fluid in conformance with the Measurement operation procedure. Discharge fluid from the measuring valve till air mixed left in a hose is eliminated.

(1) Display the MEASUREMENT screen.

(2) Perform operation from (2) to (10) of the MEASUREMENT operation procedure to discharge base resin supplied to CCV through the measuring valve. Discharge until air mixed in the route is eliminated.

(3) Follow the procedure sequentially for base resin, hardener, and flushing fluid (solvent).

(4) Finally clean the measuring tube according to the Measurement operation procedures 11.

See [20-2 Calibration (Measurement) operation]

10 Warranty

ASAHI SUNAC CORPORATION (the “Company”) shall provide the original purchaser (the “Purchaser”) with warranty service for a period of one (1) year from the date of purchase of the product, as follows:

- Should you find defects in design or workmanship with regard to parts, ship them back to the Company, with freight prepaid. The Company shall repair or replace the parts free of charge and reimburse the freight charges, provided that, as a result of an inspection and investigation of the parts conducted by the Company, the defects are deemed to be to attributable to the factors within the Company’s responsibility.

- In the following cases, free after-sales service is not provided.

1. Failure resulting from an inappropriate method of installing this equipment.
2. Failure resulting from a use method not conforming to this instruction manual or mishandling.
3. Failure resulting from insufficient maintenance management of this equipment and incorrect handling such as non-conformance to the procedures specified in this instruction manual.
4. Failure resulting from unauthorized alteration or structure change of this equipment without the Company’s consent.
5. Failure due to force majeure such as earthquake, disaster, flood disaster or lightening.
6. Warranty for consumables worn or deteriorated even in the case where this equipment is used correctly.
7. Repair after the machine has been used outside Japan, and shipping cost.
8. In addition to the above, failure due to circumstances beyond our control.

- As for items such as parts purchased by the Company from another manufacturer, the warranty of that manufacturer shall apply.

- As for any parts deemed to be defective, the Company shall not be held liable for any expenses beyond the provision of repair or replacement parts free of charge.

- The Company shall not be held liable for any damage to the Purchaser caused by factors not attributable to the Company, such as misuse of product, etc.

【MEMO】

【MEMO】

- When transferring this equipment to another owner, attach the instruction manual to the equipment.
- This equipment has been manufactured according to the laws and legislations of Japan and may only be used in Japan.
  When using the equipment in another country, it is necessary to observe the safety standards in that country.

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