

# Operation and Maintenance Manual

## Single Color CNC Two-component Coating Machine

# ACW Control Unit ACW1200EX *Maintenance Manual*

The instruction manual of ACW Control Unit (ACW1200EX) is composed three part as below;

- ① Operation manual
- ② Installation/device manual
- ③ Maintenance manual

And this document is Maintenance Manual.



This manual contains important information on warnings and cautions. Read the manual thoroughly before starting to operate this equipment, and follow the instructions.

This manual shall be kept at your hand until the equipment is thrown away. In case it is lost or damaged, please contact us or any of our distributors.

# Introduction

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Thank you very much for choosing our computerized single-color CNC two-component coating machine (ACW).

In order to keep the 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 the equipment.

The equipment described in the instruction manual is designed for coating operations. 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.

Should you have any questions about the manual, please get in touch with us at the addresses, phone and fax numbers as shown on the back of this manual. In order for us to give you an answer that's relevant to your particular needs, don't forget to give us the "model" and "serial number" of your equipment at that time.

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Please read and fully understand the contents of the instruction manual and thoroughly observe the technical and safety instructions.



Using the machine 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.

Shown below and in the pages that follow are the basic minimum safety precautions in connection with use of our product.

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

	<b>WARNING</b>	Alerts a hazardous situation which may result in personal injury, along with hazard avoidance measures.
	<b>CAUTION</b>	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.
	<b>NOTE</b>	Indicates important methods and practical information.

※ Please remember that the situation mentioned under CAUTION may also lead to a serious disaster under certain circumstances.

To ensure your own safety and prevent equipment failure, always observe the safety precautions and follow the hazard avoidance measures.

## **WARNING**

### **Scope of suitable use for the equipment**

- For mixed paint coating, the ACW control unit is used with the ACW mixing unit. Do not use them in another composition or for another purpose than mixing two-component paint.
- Use the primary power and air supplies complying with the specifications. Using power input not complying with the specifications may lead to machine failure, damage, malfunction, electric shock or fire.
- The ACW control unit is not explosion-proof. Never install or use it in a dangerous area. Do not leave it in a place exposed to rain, considerably filled with oil or dust, or with the temperature reaching 60 deg C. Also, do not use the unit when the door of the control panel is open.
- Do not wet electric parts inside the ACW control unit with any liquid (water, alcohol, solvent, etc.). The ACW control unit is composed of delicate and sensitive parts. Do not open the door of the control panel except for inspections by the administrator. Doing so may lead to machine failure, damage, malfunction, electric shock or fire.
- Never use any acid or corrosive substance or halogenated hydrocarbon solvent around the equipment. Doing so may lead to machine explosion, fire, malfunction or failure.
- 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 such use is approved by us.

### **<<General safety instructions>>**

- Never apply a fluid or air pressure exceeding the allowable maximum specified in the specifications to the equipment. All components and accessories to be used shall be durable against the maximum operating pressures mentioned above.
- Class D grounding is required for the equipment (to ensure an electric resistance not exceeding 100 ohms).
- Check the whole equipment everyday. 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 or repairing the equipment, never fail to turn off the main power switch and reduce all fluid and air pressures (gauge pressure, etc.) to zero.
- To ensure a safe operation of the system, all operators shall read and understand this manual and labels attached to each unit. The equipment can only be operated by adequately trained personnel.
- Fire and electric codes and safety related regulations provided by the national or local government shall be observed during the work.

## **WARNING**

### **Danger from fire, explosion and electric shock**

#### **<<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 machine 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 machine, 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 handling the coating machine, 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 install it in a dangerous 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.

#### **<<Electrification>>**

- Do not overhaul or remodel any electric component or ACW controller installed in the ACW control unit.
- Do not carelessly expose electric parts inside the ACW control unit to the ambient atmosphere of the equipment place.
- Do not wet electric parts inside the ACW control unit 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.
- When performing wiring work, never fail to turn off all external power supplies used by the system.
- Do not open the door of the ACW control unit when the equipment is energized. Also, do not touch wiring connection terminals.

## **WARNING**

### <<Grounding>

Class D 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 machine 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, class D grounding shall be performed according to the technical standard for electric equipment.

The coating machine 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 cart and connect the other end of the wire to a class D 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 high-pressure 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 grounding. Connect an ohmmeter to metal parts such as the joint of the hose to measure the resistance and, if it exceeds the permissible limit, it is dangerous to use the hose. 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

- Containers to be used shall be made of a conductive metal and placed on a grounded floor or table.

#### (5) Grounding the container of solvent used for flushing

- Containers to be used shall be made of a conductive metal and placed on a grounded floor or table.

It is dangerous to place them on a non-conductive sheet such as paper or corrugated cardboard because they may be electrically charged.

### <<Safe flushing>>

- Before flushing, check that the mixing unit, pump, whole coating machine and paint and solvent cans or containers have been correctly grounded.
- Adequately ventilate the workplace so that it will not be filled with a combustible (solvent containing) atmosphere.
- When working, wear a face mask, safety goggles and protective clothes for protection against organic solvents.

## **WARNING**

### **Danger from toxic substances**

#### **<<Solvents>>**

Halogenated hydrocarbon solvents may explode if brought into contact with aluminum or plated part of a pressure vessel (pump, heater, filter, valve, gun, etc.).

The explosion may consequently lead to fatal bodily injury.

**Never use halogenated hydrocarbon solvents.**

#### **<<Examples of halogenated hydrocarbon solvents>>**

Chlorine group	Trichlorethylene, Tetrachlorethylene and dichloroethylene
Bromine group	n- propyl bromide
Fluorocarbon 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 paint may hurt mucous membranes in your nose 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 a face mask, safety goggles and protective clothes for protection against 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**

### **Danger from spray and pressures**

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 highly pressurized paint hits a person at a close distance, it hurts 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 (gauge pressure, etc.) 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 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.
- 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, swells, cracks and loose fittings. If 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 (gauge pressure, etc.) 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.  
All components and accessories to be used shall be durable against the maximum operating pressures mentioned above.
- Do not open the door of the ACW control unit when the equipment is energized. Also, do not touch wiring connection terminals.
- To ensure a safe operation of the system, all operators shall read and understand this manual and labels attached to each unit. The equipment can only be operated by adequately trained personnel.
- Fire and electric codes and safety related regulations provided by the national or local government shall be observed during the work.

## CAUTION

### Failure or malfunction from misuse

#### <<General precautions>>

- Use the equipment in the environment specified in this instruction manual. Using it in an environment outside the range of the specifications may lead to a malfunction, damage or deterioration of the product.
- Electrification or malfunction may occur. Never fail to ground the grounding terminal of the ACW control unit to at least a class D grounding means.

#### <<Precautions for wiring, etc. in the ACW control unit>>

- When performing wiring work, never fail to shut off the power at all external switches.  
Failure to do so may lead to electrification, damage of the product, or malfunction.
- Before starting wiring work, make sure to perform class D grounding for the grounding terminal of the ACW control unit.  
Check that an electric resistance not exceeding 100 ohms is ensured with class D grounding.
- Perform wiring to the power unit correctly after checking the rated voltage and terminal arrangement of the product.  
Connecting a power supply different from the rated voltage or making an incorrect wiring may lead to fire or failure.
- Tighten the terminal screws of the power unit within the specified torque range.  
Loose screws may lead to a short circuit or malfunction.  
If the terminal screws are too tight, it may cause a short circuit or malfunction.
- Make sure to tighten any unused terminal screws with a torque of 0.6 to 0.8 N · m.  
Leaving them as is may cause a short circuit due to contact with a solderless terminal.
- Use applicable solderless terminals and tighten them with the specified torque (0.6 to 0.8 N · m) using a driver suitable for the screw size.  
Loose screws may fall and cause failure.
- Make sure that no foreign objects such as screws, filings or wire chips get inside the ACW controller.  
It may lead to fire, failure or malfunction.
- A contamination prevention label is affixed to the top surface of the ACW controller unit to prevent foreign objects such as wire chips from getting inside the controller during wiring work.  
Do not remove this label until all the wiring work is complete.  
Before operating the system, make sure to remove the label to release heat.
- Tighten the screws within the specified torque range.  
Loose installation screws or terminal screws may lead to malfunction due to poor contact or a short circuit accident due to a detached terminal. If the installation screws or terminal screws are too tight, it may damage the screws, resulting in malfunction due to poor contact or a short circuit accident due to a detached terminal.
- When cleaning the equipment or tightening the terminal screw, never fail to shut off the power at all external switches.  
Failure to do so may lead to failure or malfunction of the ACW controller.

## CAUTION

### <<Precautions for flow meter cable wiring>>

- When performing cable wiring work, never fail to turn off the power of the equipment.  
Failure to do so may lead to electrification, product damage or malfunction.
- Be sure to place the flow meter cable in a duct or fasten it.  
If the cable is not stored in a duct or fastened, the dangling cable may be inadvertently pulled by a worker tripping over it, resulting in damage to the cable or malfunction due to poor cable contact.
- Noise from the grounding (earth) wires may lead to malfunction.  
If the equipment malfunctions in the state where the flow meter cable is routed independently and free from noise impacts, separate the grounding wire from other grounding points and arrange single grounding.
- Arrange not to have the flow meter cable crossed with the robot cable or other power cables or not to have it close to them within 100mm.  
Noise impacts may lead to malfunction of the flow meter cable. Lay out a single route for the cable.  
Wire the cable in a conductive pipe or the duct.
- Firmly connect a shielded line of the flow meter cable to the SG terminal in the ACW control unit and apply class D grounding to the ACW control unit.

Refer to [Main Components] in the Grounding Manual.

- Noise from the ACW mixing unit may affect the equipment.  
If the equipment malfunctions despite the state where the flow meter cable is routed independently and free from noise impacts, the grounding of the ACW mixing unit may be inadequate. Inspect the grounding state and grounding resistance of the ACW mixing unit.  
Loose grounding screws may lead to malfunction as noise is not cancelled.  
Moreover, if noise affects the grounding (earth) line on the ACW mixing unit side, change the grounding location or separate the grounding wire from other grounding points and arrange single grounding to remove the noise influences.
- When disconnecting a cable from the equipment, do not pull the cable line by hand.  
It may lead to fire, failure or malfunction.
- When installing a cable, tighten screws or terminal screws within the specified torque range.  
Loose installation screws or terminal screws may lead to malfunction due to poor contact or a short circuit accident due to a detached terminal.  
If the installation screws or terminal screws are too tight, it may damage the screws, resulting in malfunction due to poor contact or a short circuit accident due to a detached terminal.

## CAUTION

### <<Precautions for ACW controller operation>>

- The display of the ACW controller is analog resistance film type.  
If two points or more are simultaneously pressed on the display, that may activate a switch different from the operator's intention.  
Do not press two points or more simultaneously on the display.  
Pressing simultaneously two points or more may lead to an accident from incorrect outputs or malfunction.
- Do not use a sharp object on the display of the ACW controller such as pen or screwdriver.  
It may lead to damage or failure.

### <<Precautions for memory cards>>

- Turn off the card access switch before inserting or ejecting a memory card of the ACW controller. If the switch is not turned off, it may lead to data damage in the card.
- Support the memory card with hand while ejecting it from the ACW controller.  
If the card is not supported with hand and ejected, it may fall, resulting in card damage or failure.
- Do not wet memory cards with water or solvent. Also, do not drop them or subject them to shock.  
Doing so may lead to card damage or failure.
- When inserting a memory card into the ACW controller, push the card until the card eject button comes up to prevent malfunction due to poor contact.

### <<Precautions for ACW controller replacement>>

- Before touching the ACW controller, be sure to touch a grounded metal and discharge retained static electricity in human body. If you are electrically charged, that may cause a failure or malfunction.
- Do not drop the ACW controller or subject it to strong shock.  
It may lead to damage of the ACW controller.
- Do not make direct contact with a conductive section or electronic parts inside the ACW controller.  
It may lead to malfunction or failure of the ACW controller.
- Tighten the installation screws without looseness when installing the ACW controller on the ACW control unit.  
Loose installation screws may lead to falling, short-circuit, or malfunction.  
If the installation screws are too tight, it may damage the screws, resulting in falling, short-circuit, or malfunction.
- You can still operate the touch keys even when the backlight is out. If the backlight display is getting difficult to see, contact us for early replacement.
- The backlight or LCD must not be replaced by the user.  
It may lead to damage of the ACW controller. Contact us for repair.



## CAUTION

### <<Precautions for ACW controller cleaning>>

- Keep the display of the ACW controller clean at all times.  
When cleaning the display, wipe off dirt gently with a soft cloth slightly moistened with neutral detergent or ethanol.
- Do not use solvents such as acetone, benzene, or toluene.  
It may cause the protection sheet to become deformed or peel off.
- Do not use spray type solvents. That may lead to a failure.

### <<Transportation precautions>>

- This unit is precision equipment. When transporting it, avoid shock over the value of the general specification described in this manual. Shock during transportation may lead to failure of the ACW controller.  
After transportation, check that the ACW controller operates correctly.

### <<Disposal precautions>>

- When disposing of this product, treat it as industrial waste.

# 2

## Maintenance (calibration/learning/mixture ratio test)

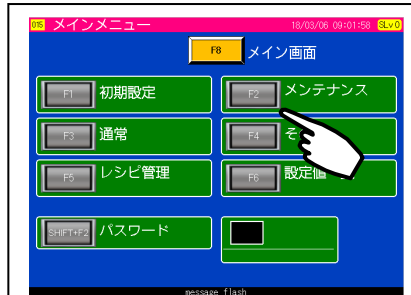
### 2-1 Switching to “Maintenance menu” screen (SLv1)

Set the security level to 1 (SLv1) or higher.

Refer to [Changing security levels] in the Operation Manual.



(1) Main  
Check SLv1.  
Press **F8**.



(2) Main menu  
<Screen No.015>  
Press **F2**.



(3) Maintenance  
<Screen No.050>  
Select the item.

Refer to [ACW controller: Basic operations] in the Operation Manual.

### 2-2 Calibration (Measurement)

Measurement is the operation to correct the flow meter for each type of fluid.

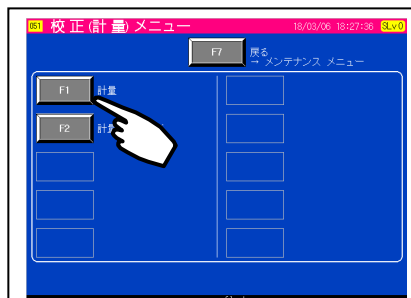
This is intended to store in advance the difference between the flow meter's readings and actual measurement values for the base component and hardener. If measurement is not performed, an accurate mixture ratio will not be maintained, leading to a problem of paint hardening. Never fail to perform measurement when the paint to be used or the dilution ratio (viscosity) is changed. The calibration values are stored as “correction factors”.

Refer to [Correction factor conditions] in the Operation Manual.

#### 2-2-1 Switching to “Measurement” screen



(1) Maintenance  
<Screen No.50>  
Press **F1**.



(2) Calibration (Measurement) menu  
<Screen No.51>  
Press **F1**.



(3) Measurement  
<Screen No.52>

## 2-2-2 Measurement procedure

When changing the measurement conditions, refer to [Initial setting list: Measurement setting] in the Operation Manual.



Refer to [ACW controller: Basic operations] in the Operation Manual.

### ⚠ WARNING

#### Risk of respiratory failure or solvent poisoning

- When working, wear a face mask, safety goggles and protective clothes for protection against organic solvents.
- Adequately ventilate the workplace so that it will not be filled with a combustible (solvent containing) atmosphere.

### NOTE

- Use a (sampling) cup that is appropriate for pre-measurement filling and the capacity of measurement.
- Make sure not to enter wrong values.

(1) Prepare the following tools for use in measurement.

	Tool used	Description
1	Two cups with a capacity about 300ml	Used for adjusting the flow rate.
2	Two cups with a known weight and a capacity about 300ml	The cups shall be weighed in advance so that the components can be accurately weighed with a precision scale in determining the mixture ratio.
3	Electronic scale	Used for weighing the paint. The scale shall be capable of weighing to each 0.1g and up to 1kg.

(2) Select the fluid and valve to measure.

- Press **F1** "SELECT FLUID" and select.
- The item displayed switches A => B => A (Base component => Hardener => Base component).
- Press **F2** "SELECT VALVE" and select the valve to measure.

(Example) In the case of two-color base component, the item displayed switches "0" => "1" => "2" => "0".

(3) Prepare the mixing unit.

- Put the Teflon tubes below the metering valve for the fluid to measure (base component or hardener) in the cups prepared for adjustment.
- Displaying the measurement screen automatically switches the route and the paint is drained from the metering valves.
- Open the metering valves.

(4) Fill the paint into the Teflon tubes.

- Press **F3** "START FILLING" to fill the paint.
- Adjust the metering valves as shown in "NOTE".
- Check the flow rates from the "FLOW METER" indication on the screen.
- To cancel filling, press **F4** "CANCEL FILLING".

## NOTE

- **An excessive fluid velocity leads to larger measuring errors while an insufficient fluid velocity raises the "Flow Too Low" alarm.**
- **Adjust the metering valves to obtain a flow rate of about 150 to 250 ml/min (g/min) when the actual flow rate is 200 ml/min (g/min).**

(5) Start measurement.

- After the adjustment, put the Teflon tubes in the measuring cups.
- Press **F5** "START MEASUREMENT".
- The amount of measurement shall be the amount specified in "Target value".

Refer to [Initial Setting List: Measurement setting] in the Operation Manual.

(6) When the measurement is complete, the screen changes to the "Actual input" screen.

ml setting in screen property display change : When the measured values are entered in ml units ->  
Go to (7).

ml setting in screen property display change : When the measured values are entered in g units ->  
Go to (8).

※: This is allowed only when this is entered in the specific gravity condition. Refer to [Specific gravity condition] in the Operation Manual.

g setting in screen property display change : -> Go to (9).

※: This is allowed only when this is entered by weight ratio.

Refer to [Mixture ratio and pot life conditions] in the Operation Manual.

(7) In the case of ml setting in screen property display change (when the measured values are entered in ml units)

- Press **SELECT** of "Volume input" on the "Actual input" screen.
- Weigh the measured fluid using a scale, calculate the volume by dividing it by gravity (specified in the paint manufacturer's document), and enter the value in "Measured value input".
- Press **F3** "CALCULATE". The correction factor is displayed in "New correction value".
- Press **F4** "ENT" to register the correction factor.

Refer to [Ratio by weight and ratio by volume] in the Installation Manual.

(8) In the case of ml setting in screen property display change (when the measured values are entered in g units)

- Press **SELECT** of “Weight input” on the “Actual input” screen.
- Weigh the measured fluid using a scale and enter the value in “Measured value input”.
- Press **F3** “CALCULATE”. The correction factor is displayed in “New correction value”.
- Press **F4** “ENT” to register the correction factor.



(9) In the case of g setting in screen property display change

- Weigh the measured fluid using a scale and enter the value in “Measured value input”.
- Press **F3** “CALCULATE”. The correction factor is displayed in “New correction value”.
- Press **F4** “ENT” to register the correction factor.



(10) Before measuring the next color (fluid), flush the route once.

- Press **F7** “RETURN” on the “Actual input” screen to move to the “Measurement” screen.
- Put the Teflon tubes in the measuring cups.
- Press **F2** “SELECT VALVE” and change the value to “0”.
- Press **F3** “START FILLING” and flush the route to the Teflon tubes.

(11) Repeat the operation.

- After the flushing, repeat the steps from (2) to (10) to measure all base components and hardeners (CCV valve).

(12) Finish measurement.

- Lastly, flush the route again according to the step (11).
- Close the metering valves.
- Press **F7** "RETURN (CALIBRATION)" to change the screen.

(13) Confirm data.

- Move to the "Main menu" screen, press **F1** "Normal setting menu" and then **F4** "Correction factor conditions", and note the settings on paper.

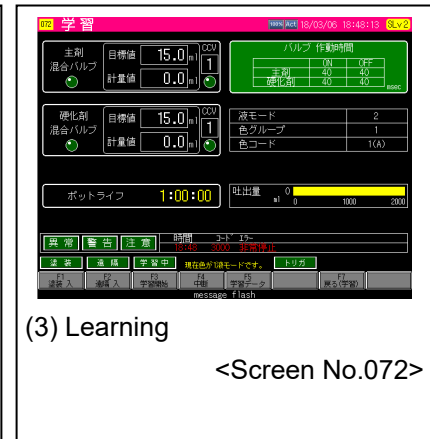
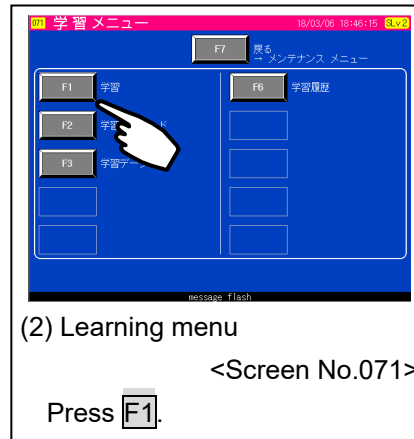
Refer to [Correction factor conditions] in the Operation Manual.

## 2-3 Learning

This is intended to determine the mixing valve opening/closing timings according to the actual flow rate. When the flow rate is significantly changed (to more than twice the initial level), the learning operation shall be performed to let the system recognize the opening/closing timings again.

The learning operation shall also be performed to let the system recognize the valve response timings again when system has been operated for about six months.

### 2-3-1 Switching to “Learning” screen



### 2-3-2 Learning procedure



(1) Change the color to the one that is to be learned.

Refer to [Color change operation] in the Operation Manual.

(2) Press **F1** “PAINT ON” to turn on the coating mode “ON”(“Paint” lamp on).

(3) Start learning.

- Press **F3** “START LEARNING” to start learning. The “Learning in process” lamp turns on.
- A message showing the operation status is displayed at the screen bottom during the learning operation.

Refer to [Message flash list] in the Operation Manual.

- To cancel learning, press **F4** “CANCEL LEARNING”. In this case, learning data is not updated.

(4) Finish learning.

- The “Learning in process” lamp turns off. Continue spraying until the lamp turns off.
- Press **F5** “LEARNING DATA” and note the settings.

## ⚠ CAUTION

### Accurate mixture control may be prevented.

- Mixture correction data is collected and the accurate mixture ratio is not maintained during the learning process. Stopping spraying in the middle of the learning process prevents the system from learning.
- The mixture ratio errors are not detected during the learning process. Never press the learning button in the middle of the production (during coating of mixed paint on workpieces) or color change process.

### 2-3-3 Learning data

## NOTE

- Do not change the numeric value on this screen.
- Make sure to note data after the learning operation.

<Screen No.074>

項目	単位	現在色グループ										
		0(W)	1(A)	2(B)	3(C)	4(D)	5(E)	6(F)	7(G)			
主剤 O.F.F.パルス	msec	40	40									
玉剤 O.N.V.パルス	msec	40	40									
硬化剤 O.F.F.パルス	msec	40	40									
硬化剤 O.N.V.パルス	msec	40	40									
学習時 40" 時間	msec	40	40									
d11 パルス数	pulse	1	1									
d12 パルス数	pulse	5	5									
d13 パルス数	pulse	10	10									

※: Any value exceeding the preset "Learning criteria" is highlighted in red.

Refer to [Detection condition setting details 21, 22] in the Operation Manual.

※: Error level "CAUTION" is issued in the case of initial setting.

Refer to [Detection condition setting details 19] in the Operation Manual.

Refer to [3-4 Cause of errors and troubleshooting 46, 47, 49, 50].

## NOTE

- When the numeric value is red (initial value: 150 msec or more), it means that the responsiveness of the mixing valve is declining. It is necessary to service the mixing valve and solenoid valve of the ACW mixing unit. Refer to the instruction manual of the "Installation/device" for details on the maintenance of the ACW mixing unit.



## 2-4 Mixing test

This is performed to check the preset mixture ratio.

When the paint mixture ratio is changed, the mixture ratio test shall be performed.

### NOTE

- Unlike the measurement operation, the flow rate is controlled with high precision during mixture ratio test. The mixture ratio measured in the test may be affected when the actual flow rates are significantly different from the flow rates used for the test. Never fail to adjust the flow rates during the test.

### 2-4-1 Switching to “Mixing test” screen



(1) Maintenance menu

<Screen No.050>

Press **F3**.



(2) Mixing test menu

<Screen No.091>

Press **F1**.



(3) Mixing test

<Screen No.092>

### 2-4-2 Mixing test procedure

The number of times the components are alternately supplied in the mixture ratio test is specified in advance.

When changing the number of times, refer to [Initial setting list: Mixing test conditions] in the Operation Manual.

<Screen No.092>



## **WARNING**

### **Risk of respiratory failure or solvent poisoning**

- **When working, wear a face mask, safety goggles and protective clothes for protection against organic solvents.**
- **Adequately ventilate the workplace so that it will not be filled with a combustible (solvent containing) atmosphere.**

(1) Prepare the following tools for use in the mixture ratio test.

	Tool used	Description
1	Two cups with a capacity about 300ml	Used for adjusting the flow rate.
2	Two cups with a known weight and a capacity about 300ml	The cups shall be weighed in advance so that the components can be accurately weighed with a precision scale in determining the mixture ratio.
3	Electronic scale	Used for weighing the paint. The scale shall be capable of weighing to each 0.1g and up to 1kg.

(2) Color change

- Change the color to the one for which the mixture ratio test is performed and fill the gun with the paint to the gun tip.
- Note the spray flow rates during the coating operation.

(3) Prepare the mixing unit.

- Put the Teflon tubes below the metering valves for the base component and hardener in the cups prepared for adjustment.
- Displaying the mixture ratio test screen on the ACW controller switches to the measurement route automatically.
- Rotate 360 degrees and open the metering valves for both base component and hardener.

(4) Fill the paint into the Teflon tubes.

- Pull the spray gun trigger and let the base component and hardener come out of the Teflon tubes.
- Adjust the metering valves to approximately obtain the noted flow rates while checking the flow rates indicated on the display.
- Release the spray gun trigger to stop the feeding.

(5) Start mixing test.

- When the filling is complete, put the Teflon tubes for the base component and hardener in the measuring cups.
- Press **F3** "START TEST". The "Test in process" lamp turns on.
- The base component and hardener are alternately fed three times. (The number of repetitions can be changed.)

Refer to [Initial Setting List: Mixing test conditions] in the Operation Manual.

- The total amount of the base component and hardener fed is indicated on the display.

## NOTE

- **An excessive fluid velocity leads to larger measuring errors while an insufficient fluid velocity raises the “Flow Too Low” error. Adjust the metering valves to obtain the flow rates almost equivalent to the actual levels.**

(6) Check the mixture ratio.

- Weigh the base component and hardener using a scale and calculate the mixture ratio (by volume).
- Check the ratio of the measured components.

Refer to [Ratio by weight and ratio by volume] in the Installation Manual.

(7) Adjust the equipment.

- If the difference is too large, repeat the measurement and learning operations.
- Check the flow meter setting and the scale status.

Refer to [Initial Setting List: Basic setting 1] in the Operation Manual.

(8) Repeat the operation.

- Repeat the same procedure of mixture ratio test for each color.
- Close the metering valves.
- After color change, repeat the steps from (2) to (8) to perform mixing test for all color groups.

(9) Finish mixture ratio test.

- Lastly, flush the whole route to the spray gun again according to the step (8).
- Flush the metering valves and Teflon tubes by flowing the flushing fluid.
- At this time, perform flushing according to the step (11) of the “measurement” procedure in the previous section or open the metering valves and pull the spray gun trigger to drain the flushing fluid through the Teflon tubes.
- Receive the flushing fluid drained through the Teflon tubes into an appropriate container.
- Close the metering valves.
- Press **F7** “RETURN (TEST)” to change the screen.

## NOTE

- **Never fail to adjust the metering valves to approximately obtain the noted flow rates. If the flow rates during the actual spraying operation and those used for the test are different, the mixture ratio cannot be accurately measured.**
- **Calculate the mixing ratio by volume.**
- **If the base component and hardener viscosities are not within the specified limits, accurate measurements cannot be obtained.**

### 2-4-3 Mixing test history

This screen shows the history of mixing test performed.

Data is saved in the memory card at every 20 items. Up to 20 items can be displayed on this page.

Refer to [Handling memory card] in the Operation Manual.



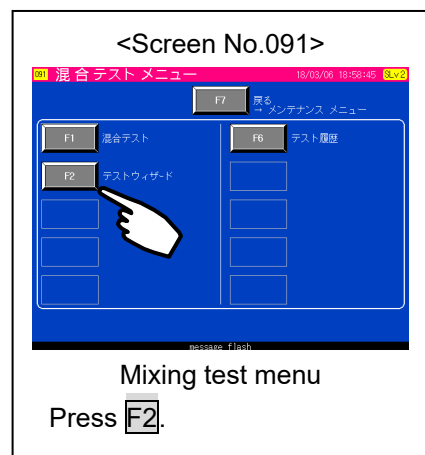
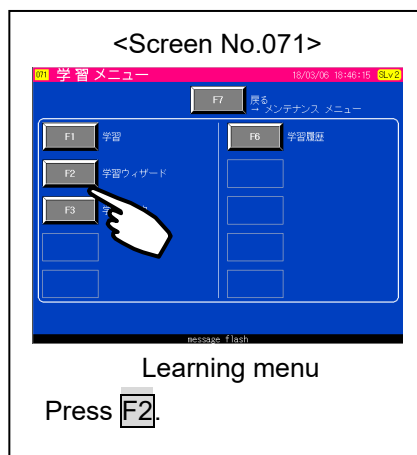
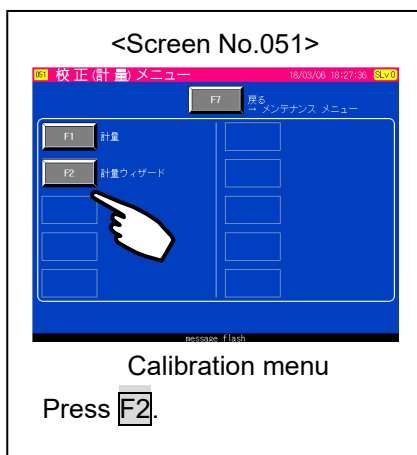
### 2-5 Wizard (measurement/learning/mixing test)

The measurement, learning and mixing test wizards are available in the calibration (measurement), learning and mixing test functions on the “Maintenance menu”.

A wizard guides the user through the operation procedure by prompting the user to select from options on the screen.

Perform the operation following the instructions on the display.

Each wizard screen can be accessed from the calibration (measurement) menu, learning menu or mixing test menu.

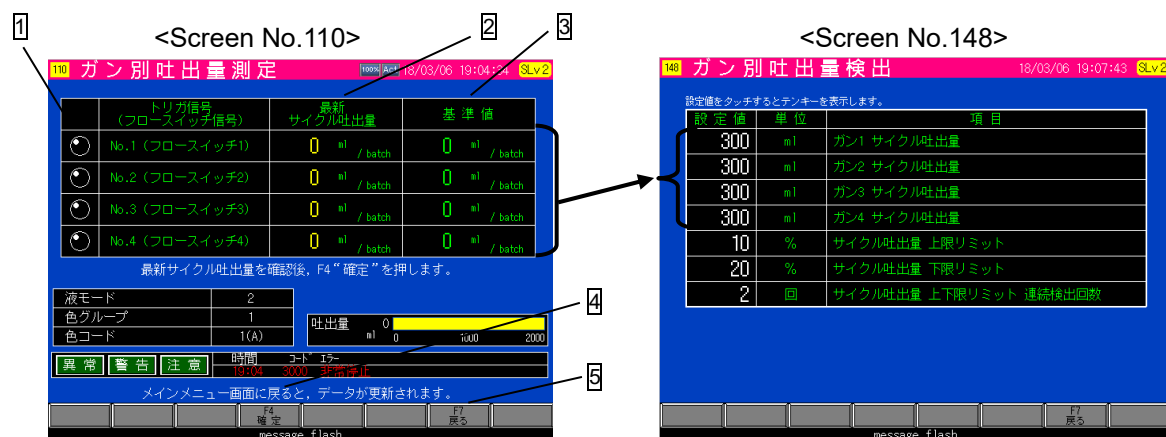


Refer to [ACW controller: Basic operations] in the Operation Manual.

## 2-6 Measurement of discharge rate by gun

This discharge rate detection function stores the discharge rate for each gun easily and issues an error when the discharge rate exceeds the permissible range preset by “Gun discharge detection rate” of the detection condition. It can detect nozzle clogging in one of the multiple guns used. It is particularly effective for detecting nozzle tip clogging of airless guns.

When using this function, the trigger signal (flow switch signal) of each gun shall be entered individually.



No.	Item	Description
1	Trigger lamp	The operation of the spray gun is indicated.
2	Latest cycle discharge rate	The spray gun's discharge rate per cycle is indicated. When the trigger signal is continuously entered during one cycle, the discharge rate is calculated and indicated. ※: The value is updated at every cycle.
3	Standard value	The standard discharge rate of each gun is indicated. This value is the same as “Gun discharge detection rate” of the detection condition. Refer to [Detection condition setting details 23] in the Operation Manual.
4	<b>F4</b> “ENT”	A key for storing “Latest cycle discharge rate” in “Standard value”.
5	<b>F7</b> “RETURN”	A key for moving to the “Maintenance menu”. <Screen No.050>

### 2-6-1 Setting of detection of discharge rate by gun

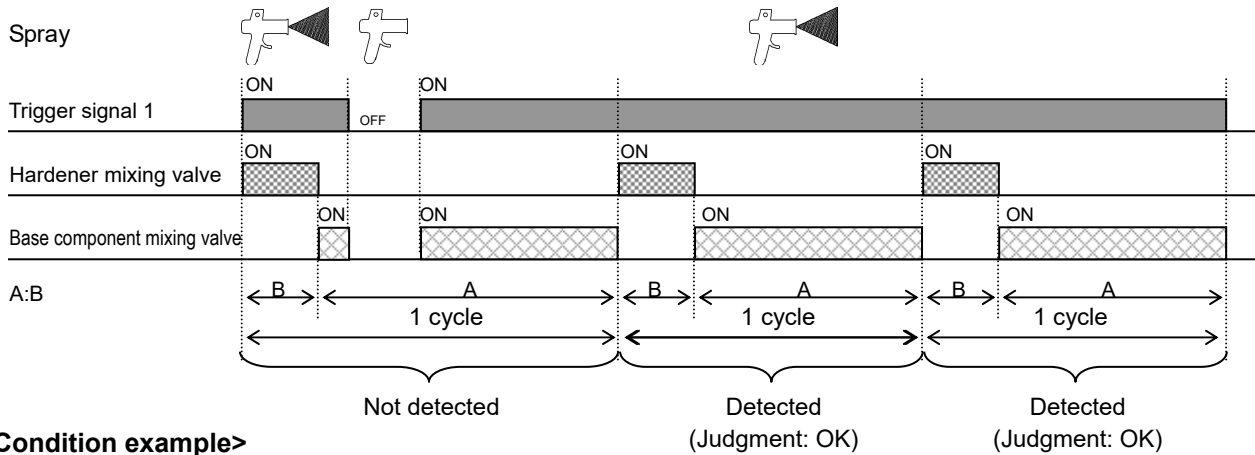
- Confirm that the trigger signal (flow switch signal) of each gun has been entered individually.
- Have only one gun discharge to update the indication of the latest cycle discharge rate.  
※: When multiple guns discharge simultaneously (when two or more trigger lamps turn on), the value is not updated.
- Press **F4** “ENT” to copy the latest cycle discharge rate to the standard value.
- Going back to the “Main menu” screen automatically reflects the standard value data into “Gun discharge detection rate”.
- Change the error level to “1” or higher in the “Error level setting 4” screen.  
Refer to [Detection condition setting details 18] in the Operation Manual.
- When the discharge rate exceeds the permissible range preset by “Gun discharge detection rate” during the coating operation, an error is issued.  
Refer to [3-4 Cause of errors and troubleshooting 36, 37, 38, 39, 40, 41, 42, 43].

## NOTE

- This function cannot be used for the coating operation in which the discharge rate varies significantly. This is intended for airless coating.
- The discharge rate cannot be detected if the trigger signal is turned off during a feeding cycle of the base component and hardener (one cycle).

## 2-6-2 Mechanism of detection of discharge rate by gun

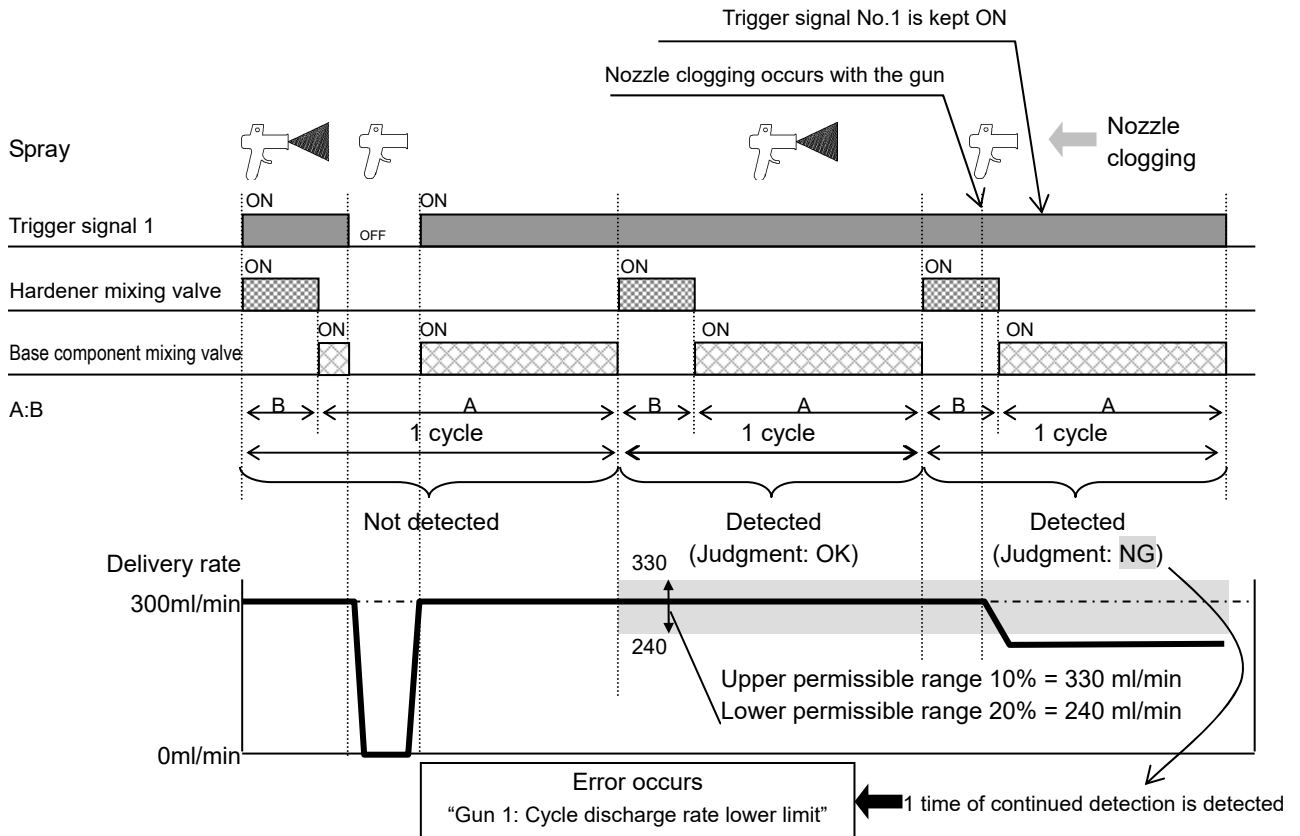
The discharge rate by gun is detected when the trigger signal (flow switch signal) is continuously turned on during a feeding cycle of the base component and hardener (one cycle). It is not detected when the gun is turned on and off during one cycle. In that case, the permissible range is detected in the next cycle.



### <Condition example>

Detection condition setting by gun	Setting	Description
Gun 1: Cycle discharge rate	300ml/min	300 ml/min is obtained in discharge rate measurement by gun.
Cycle discharge rate: Upper limit	10%	$300 \text{ ml/min} \times 110\% = 330 \text{ ml/min}$ for upper limit
Cycle discharge rate: Lower limit	20%	$300 \text{ ml/min} \times 80\% = 240 \text{ ml/min}$ for lower limit

If nozzle clogging occurs, the discharge rate decreases while the trigger signal is kept ON. This state is judged during one cycle.



### 2-6-3 In case of multiple guns

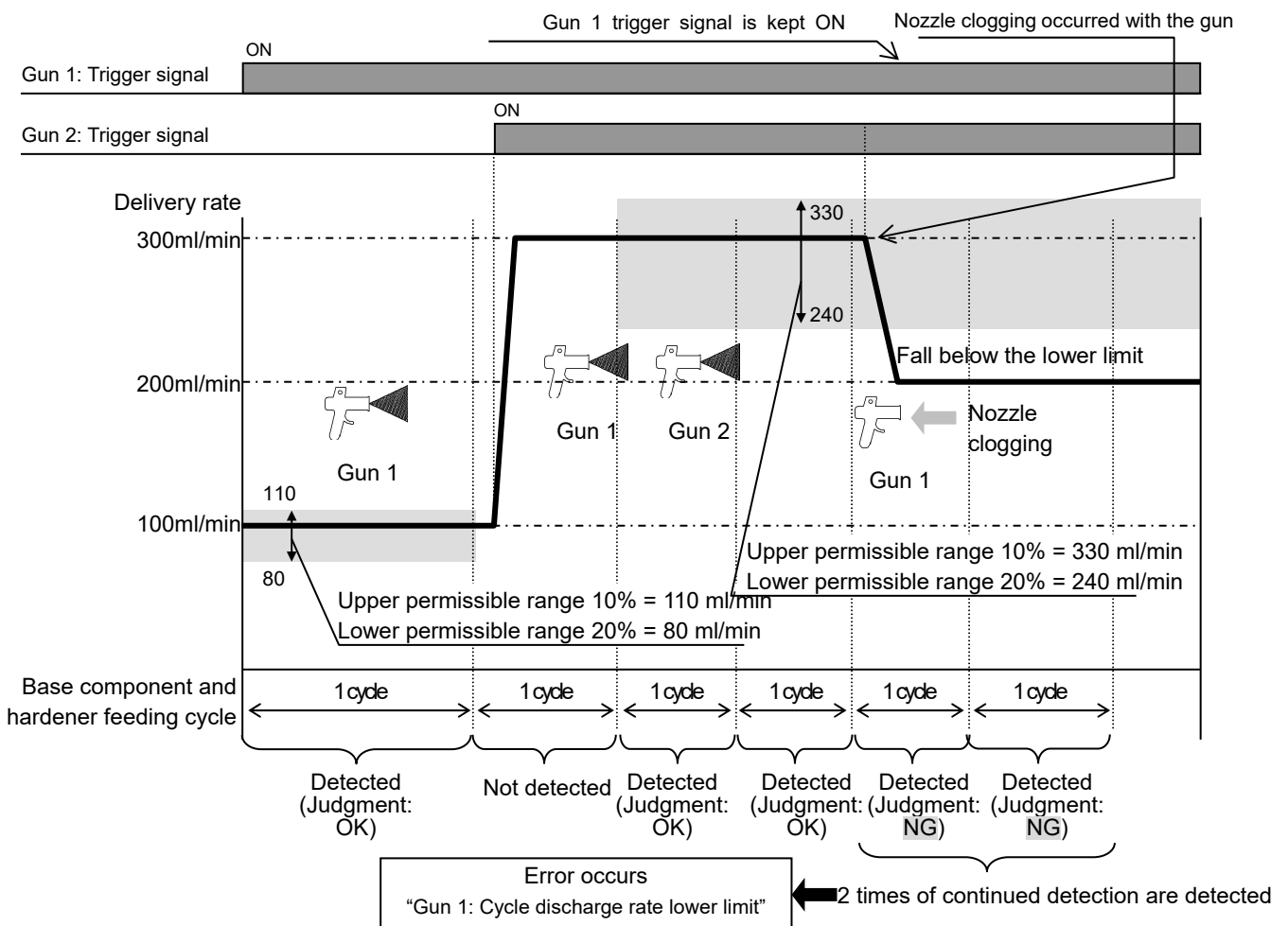
When multiple guns are used, the detection works only when all guns are on.

#### <Condition example>

Detection condition setting by gun	Setting	Description
Gun 1: Cycle discharge rate	100ml/min	100 ml/min is obtained in discharge rate measurement by gun.
Gun 2: Cycle discharge rate	200ml/min	200 ml/min is obtained in discharge rate measurement by gun.
Cycle discharge rate: Upper limit	10%	The upper limit is 330 ml/min at the time of simultaneous spraying by two guns.
		The upper limit is 110 ml/min at the time of individual spraying by one gun.
		The upper limit is 220 ml/min at the time of individual spraying by two guns.
Cycle discharge rate: Lower limit	20%	The lower limit is 240 ml/min at the time of simultaneous spraying by two guns.
		The lower limit is 80 ml/min at the time of individual spraying by one gun.
		The lower limit is 160 ml/min at the time of individual spraying by two guns.
Upper/lower limit: Continuous detection count	2	An error is issued when the above condition is detected twice continuously.

This is a state when the gun 1 has been completely clogged in the middle of simultaneous spraying.

The gun 2, which is not clogged, continues discharging, but the total discharge rate decreases. This state is judged during two cycles.



# 3

## Troubleshooting

The following describes the causes of errors and how to correct them.

If any error occurs, stop working, locate the cause and take corrective action before restarting the coating operation.

### 3-1 If any error occurs

The main screen displays the error that has occurred. Refer to [Error history] in the Operation Manual. If any error occurs, it is indicated by a buzzer and error lamp (red).



### 3-2 Error indication and the state of ACW control unit

Error indication	Error level	Description
ERROR	3	The coating mode is turned "OFF". The control functions are suspended. "ERROR" of the ALB terminal block is issued. Refer to [7-3-1 OUT 1], Each error of the ALB terminal block is issued. Refer to [7-3-6 OUT 6], [7-3-7 OUT 7], This is recorded in error history. Refer to [Error history] in the Operation Manual.
ALARM	2	The coating mode is not turned "OFF". The control functions are not suspended. "ERROR" of the ALB terminal block is issued. Refer to [7-3-1 OUT 1], Each error of the ALB terminal block is issued. Refer to [7-3-6 OUT 6], [7-3-7 OUT 7], This is recorded in error history. Refer to [Error history] in the Operation Manual.
CAUTION	1	The coating mode is not turned "OFF". The control functions are not suspended. Each error of the ALB terminal block is issued. Refer to [7-3-6 OUT 6], [7-3-7 OUT 7], This is recorded in error history. Refer to [Error history] in the Operation Manual.
Not detected	0	Error detection is not performed.

Refer to [Detection condition setting list] in the Operation Manual.

### 3-3 How to reset in case of error

Usually, pressing **RESET** clears the error indication.

If the error is related with worn parts or poor operation of the ACW mixing unit, incorrect pump motion or electric noise, the same error will be indicated again after pressing **RESET**. Locate the cause and take necessary action such as repair of faulty parts or removal of electric noise before restarting the coating operation.

"Pot life error" and "Forced flushing start" cannot be cleared by pressing **RESET**.

Refer to [Forced flushing after Pot Life error (automatic flushing)] in the Operation Manual.

### 3-4 Cause of errors and troubleshooting

1	Code	3000	Item	Emergency stop
Description	The emergency stop signal was entered. Refer to [7 Inputs/Outputs].			
	To clear	Press <b>RESET</b> after clearing the emergency stop signal.		
Cause	The emergency stop signal was entered. The emergency stop switch was pressed.			
Remedy	Prevent the emergency stop switch from being pressed.			
2	Code	3001	Item	External device error 1
Description	The external device error 1 was entered. Refer to [7 Inputs/Outputs].			
	To clear	Press <b>RESET</b> after clearing the error.		
Cause	(1) An abnormality in an external system (when an external system is connected) (2) Detection by the lower limit level sensor for tanks (when a lower limit level sensor is connected)			
Remedy	(1) Reset the error signal. (2) Put material into the tank. The detection signal of the level sensor can be cleared by refilling material.			
3	Code	3002	Item	Mixture ratio error
Description	The mixture ratio of base component and hardener exceeded the specified limit. Refer to [Detection condition setting details 1, 2] in the Operation Manual.			
	To clear	After locating the cause and taking preventive action, press <b>RESET</b> .		
Cause	(1) Inappropriate learning values (2) A malfunction of the solenoid valve (3) Disorder of the intrinsically safe explosion-proof solenoid valve barrier (4) Noise influence on the flow meter cables Refer to [Noise affecting the flow meter cables and countermeasures] in the Installation Manual. (5) Poor balance between the base component and hardener pressures (6) A malfunction of the mixing valve			
Remedy	(1) Perform the learning operation. Refer to [2-3 Learning]. Perform the learning operation when the valve or flow meter is serviced or replaced or the coating condition or paint is changed.			
	(2) Perform the measurement operation and check the following. Refer to [2-2 Calibration (Measurement)]. Remove the pilot air tube connected to the valve and check if air comes out. If air does not come out, replace the solenoid valve with a new one. If the air tube is bent or crushed, replace it with a new one. (3) Replace the intrinsically safe explosion-proof solenoid valve with a new one and perform the measurement operation. If air does not come out, replace the barrier a new one. (4) If the "ACTUAL" indicator on the main screen counts up when the spray is not on, the cable may be affected by noise. Because the flow meter cable is vulnerable to noise, route it independently not to have it crossed with the robot cable or other power cables and wire it in a grounded conductive pipe or duct. Ground the earth points of the mixing unit and control unit to a pillar of the building. Do not bring an electrostatic spray gun near to the mixing unit. Do not install the control unit or mixing unit near the robot. (5) Adjust the fluid pressure so that the base component and hardener pressures will be the same. For the high-pressure type, the hardener pressure shall be about 10% higher than the base component pressure. Adjust the pumps and regulators to prevent pulsation. Make the setting so that their dynamic (not static) pressures will be the same. (6) Perform the measurement operation and check the following. Refer to [2-2 Calibration (Measurement)]. Check the discharge of each fluid. If no fluid is discharged, overhaul and clean the mixing valve and replace the consumables with new ones. Refer to the instruction manual of the "Installation/device" for details on mixing valves and solenoid valves.			

4	Code	3004	Item	Upper cycle load limit
Description	One-cycle load of the base component and hardener exceeded the specified upper limit. Refer to [Detection condition setting details 3, 4] in the Operation Manual.			
To clear	After locating the cause and taking preventive action, press <b>RESET</b> .			
Cause	(1) The preset value of "Upper load limit" is too low. (2) Inappropriate learning values (3) A malfunction of the solenoid valve (4) Noise influence on the flow meter cables Refer to [Noise affecting the flow meter cables and countermeasures] in the Installation Manual. (5) Poor balance between the base component and hardener pressures (6) A malfunction of the mixing valve			
Remedy	(1) Change the setting according to the delivery specifications. (2) Perform the learning operation.      Refer to [2-3 Learning]. Perform the learning operation when the valve or flow meter is serviced or replaced or the coating condition or paint is changed. (3) Perform the measurement operation and check the following.      Refer to [2-2 Calibration (Measurement)]. Remove the pilot air tube connected to the valve and check if air comes out. If air does not come out, replace the solenoid valve with a new one. If the air tube is bent or crushed, replace it with a new one. (4) If the "ACTUAL" indicator on the main screen counts up when the spray is not on, the cable may be affected by noise. Because the flow meter cable is vulnerable to noise, route it independently not to have it crossed with the robot cable or other power cables and wire it in a grounded conductive pipe or duct. Ground the earth points of the mixing unit and control unit to a pillar of the building. Do not bring an electrostatic spray gun near to the mixing unit. Do not install the control unit or mixing unit near the robot. (5) Adjust the fluid pressure so that the base component and hardener pressures will be the same. For the high-pressure type, the hardener pressure shall be about 10% higher than the base component pressure. Adjust the pumps and regulators to prevent pulsation. Make the setting so that their dynamic (not static) pressures will be the same. (6) Perform the measurement operation and check the following.      Refer to [2-2 Calibration (Measurement)]. Check the discharge of each fluid. If no fluid is discharged, overhaul and clean the mixing valve and replace the consumables with new ones. Refer to the instruction manual of the "Installation/device" for details on mixing valves and solenoid valves.			

5	Code	3006	Item	Forced flushing start
Description	A specified time passed after the expiration of the pot life and forced flushing started. Refer to [Forced flushing after Pot Life error (automatic flushing)] in the Operation Manual.			
To clear	Press <b>F5</b> "COLOR CHANGE SCREEN" on the main screen to switch to the color change screen and perform flushing. Cannot be cleared by pressing <b>RESET</b> .			
Cause	A specified time passed after a pot life error occurred without flushing by manual operation (such as pressing the O (W) switch).			
Remedy	Flush the mixing unit when it is not to be used for a while. Refer to [Color change operation] in the Operation Manual.			

6	Code	3007	Item	Pot life error
Description	Pot life has expired.			
To clear	Press <b>F5</b> "COLOR CHANGE SCREEN" on the main screen to switch to the color change screen and perform flushing. Cannot be cleared by pressing <b>RESET</b> .			
Cause	The preset length of "Pot life" is too short. The coating operation was suspended until the pot life expires.			
Remedy	Increase the preset length of "Pot life". Perform flushing before the pot life expires. Refer to [Mixture ratio and pot life conditions] in the Operation Manual.			

7	Code	3008	Item	Base component flow rate lower limit (short)
8	Code	3009	Item	Hardener flow rate lower limit (short)
Description	<p>The flow rate dropped below the specified lower limit during the base component supply.  The flow rate dropped below the specified lower limit during the hardener supply.  Refer to [Detection condition setting details 5, 6] in the Operation Manual.</p>			
To clear	After locating the cause and taking preventive action, press <b>RESET</b> .			
Cause	<p>(1) Nozzle clogging  (2) Clogging in the mixing route  (3) Clogging paint or foreign matter in flow meters  (4) Poor balance between the base component and hardener pressures  (5) Low pump pressure  (6) A malfunction of the pump  (7) A malfunction of the regulator or pressure gauge  (8) Disorder of the air flow switch, keeping the spray signal on  (9) A malfunction of the mixing valve  (10) A malfunction of the solenoid valve</p>			
Remedy	<p>(1) Clean the nozzle to remove clogging.  (2) Press F5 "COLOR CHANGE SCREEN" on the main screen to switch to the color change screen and perform flushing.  Refer to [Color change operation] in the Operation Manual.  If flushing fluid is not discharged, overhaul and clean the static mixer, paint hose and check valve or replace them with new ones.  (3) Overhaul and clean the flow meters according to the instruction manual of the "Installation/device".  (4) Adjust the fluid pressure so that the base component and hardener pressures will be the same.  For the high-pressure type, the hardener pressure shall be about 10% higher than the base component pressure.  Adjust the pumps and regulators to prevent pulsation.  Make the setting so that their dynamic (not static) pressures will be the same.  (5) Raise the pump pressure. For the low-pressure type, the pressure shall be usually set to 0.3 MPa or higher.  To ensure a stable flow rate, the paint supply pressure shall be three times the pressure required for spraying.  The tripled pressure shall not exceed the maximum withstanding pressure of the paint circuit.  (6) Inspect the pump (feeder) according to the instruction manual of the pump.  (7) The pressure gauge is out of order and needs to be replaced if it does not read zero.  Reduce the primary fluid pressure to zero to check that the pressure gauge reads zero.  If the pressure gauge shows the same value as the pump pressure, the regulator is out of order. Replace the regulator with a new one.  (8) Release the gun trigger and if the trigger lamp is on, replace the air flow switch with a new one.  (9) Perform the measurement operation and check the following. Refer to [2-2 Calibration (Measurement)].  Check the discharge of each fluid. If no fluid is discharged, overhaul and clean the mixing valve and replace the consumables with new ones.  (10) Perform the measurement operation and check the following.  Remove the pilot air tube connected to the valve and check if air comes out.  If air does not come out, replace the solenoid valve with a new one.  If the air tube is bent or crushed, replace it with a new one.</p>			
Cause (in flushing)	<p>(1) Clogging in the drain valve and drain pipe  (2) Low flushing pump pressure</p>			
Remedy (in flushing)	<p>(1) Overhaul and clean the drain valve and drain pipe or replace them with new ones.  (2) Raise the pump pressure. For the low-pressure type, the pressure shall be usually set to 0.3 MPa or higher.</p>			
Cause (in measurement)	<p>(1) The metering valves are closed or not fully open.  (2) Hardening in the metering valve or the Teflon tube downstream the metering valve  (3) Clogging paint or foreign matter in flow meters  The flow meters do not count up when the paint is sprayed through the tube.</p>			
Remedy (in measurement)	<p>(1) Open the metering valves.  (2) Overhaul and clean the metering valves.  Replace the Teflon tubes. Overhaul and clean the tube joints.  (3) Overhaul and clean the flow meters according to the instruction manual of the "Installation/device".</p>			

Refer to the instruction manual of the "Installation/device" for details on mixing valves, drain valves and metering valves.

9	Code	3011	Item	Base component: Valve OFF flow rate detection
10	Code	3012	Item	Hardener: Valve OFF flow rate detection
Description	The base component flow meter counted up when the base component mixing valve is off. The hardener flow meter counted up when the hardener mixing valve is off. Refer to [Detection condition setting details 10] in the Operation Manual.			
To clear	After locating the cause and taking preventive action, press <b>RESET</b> .			
Cause	(1) Learning was not performed correctly. (The valve response timings are incorrect.) (2) Flow meter cables are affected by noise. Refer to [Noise affecting the flow meter cables and countermeasures] in the Installation Manual.			
Remedy	(1) Perform the learning operation. Perform the learning operation when the valve or flow meter is serviced or replaced or the coating condition or paint is changed. (2) If the "ACTUAL" indicator on the main screen counts up when the spray is not on, the cable may be affected by noise. Because the flow meter cable is vulnerable to noise, route it independently not to have it crossed with the robot cable or other power cables and wire it in a grounded conductive pipe or duct. Ground the earth points of the mixing unit and control unit to a pillar of the building. Do not bring an electrostatic spray gun near to the mixing unit. Do not install the control unit or mixing unit near the robot.			
11	Code	3014	Item	Cleaning reminder
Description	The function to detect trigger operation during color change worked. Refer to [Color change operation] in the Operation Manual.			
To clear	Press <b>F4</b> "CANCEL COLOR CHANGE" and then <b>RESET</b> .			
Cause	(1) The preset time of "Cleaning reminder time" is too short. (2) The spray (trigger) was suspended during cleaning for longer than the specified time. (3) The trigger was not pulled for longer than the specified time after "Start color change" was pressed. (4) The air flow switch is out of order. (5) The preset value of "Self-spray signal retention during color change" is incorrect.			
Remedy	(1) Change the setting according to the working condition. Refer to [Initial setting details 21] in the Operation Manual. (2) Keep pulling the spray gun trigger during the color change operation. (3) Pull the trigger within the specified time after pressing "Start color change". (4) Pull the gun trigger and if the trigger lamp does not turn on, replace the air flow switch with a new one. (5) Change the setting. If the system is equipped with the control function to turn off atomization air during color change (air master valve), set the value of "Self-spray signal retention during color change" to "1". Refer to [Initial Setting List] in the Operation Manual.			
12	Code	3015	Item	Measurement reminder
Description	The function to detect the flow and flow rate during the filling or measurement process worked. Refer to [2-2 Calibration (Measurement)].			
To clear	During filling: Press <b>F4</b> "CANCEL FILLING" and then <b>RESET</b> . During measurement: Press <b>F6</b> "CANCEL MEASUREMENT" and then <b>RESET</b> .			
Cause	(1) The preset time of "Measurement reminder time" is too short. (2) The metering valves are closed or not fully open. (3) Hardening in the metering valve or the Teflon tube downstream the metering valve			
Remedy	(1) Change the setting according to the working condition. Refer to [Initial setting details 35] in the Operation Manual. (2) Open the metering valves. (3) Overhaul and clean the metering valves. Replace the Teflon tubes. Overhaul and clean the tube joints. Refer to the instruction manual of the "Installation/device" for details on metering valves.			

13	Code	3016	Item	Mixture ratio test reminder
Description	The function to detect the flow and flow rate during the test process worked. Refer to [2-4 Mixing test].			
To clear	Press <b>F4</b> "CANCEL TEST" and then <b>RESET</b> .			
Cause	(1) The preset time of "Mixing test reminder time" is too short. (2) The metering valves are closed or not fully open. (3) Hardening in the metering valve or the Teflon tube downstream the metering valve			
Remedy	(1) Change the setting according to the working condition. Refer to [Initial setting details 41] in the Operation Manual. (2) Open the metering valves. (3) Overhaul and clean the metering valves. Replace the Teflon tubes. Overhaul and clean the tube joints. Refer to the instruction manual of the "Installation/device" for details on metering valves.			

14	Code	3017	Item	Base component: Flow rate upper limit (over)
15	Code	3018	Item	Hardener: Upper flow rate limit (over)
Description	The flow rate exceeded the specified upper limit during the base component supply. The flow rate exceeded the specified upper limit during the hardener supply.			
To clear	After locating the cause and taking preventive action, press <b>RESET</b> .			
Cause	(1) The preset value of "Flow rate upper limit (over)" is too low. (2) A malfunction of the pump The feeder (pump) runs with nothing in it to feed air. (3) Too much thinner flow during cleaning (4) Too much flow during filling			
Remedy	(1) Change the setting according to the delivery specifications. Refer to [Detection condition setting details 3, 4] in the Operation Manual. (2) Inspect the pump (feeder) according to the instruction manual of the pump. Fill the pump with the fluid. (3) For the high-pressure type, an orifice or cock shall be installed on the input end of the thinner valve of CCV to reduce the flow. (4) Reduce the flow rate for the filling of the next color. For the high-pressure type, attach the nozzle tip for filling.			

16	Code	3020	Item	RAM initialization
Description	The counter on the display and history data (production, learning, test) were initialized. Data stored in the memory card is not initialized.			
To clear	Press <b>RESET</b> .			
Cause	(1) The power had been off for a week. (2) The power was turned on while DIP switch No.8 on the back of the controller was on.			
Remedy	(1) Make sure to note data before turning off the power for a week. (2) Turn on the power with DIP switch No.8 off.			

17	Code	3021	Item	ALB terminal block communication error
Description	There is an abnormality in communication between the ALB terminal block and the controller. Refer to [7 Inputs/Outputs].			
To clear	Press <b>RESET</b> .			
Cause	(1) Two or more stations with the same station No. set on the ALB terminal block (2) Two or more termination settings on the ALB terminal block or no termination setting (3) Disorder of the ALB terminal block. The communication LED does not turn on. (4) Disconnection of the communication cable			
Remedy	(1) Check the station No. and set it correctly. Refer to [7 Inputs/Outputs]. (2) Check the termination setting and set it correctly. (3) If the communication LED is off, replace the ALB terminal block with a new one. (4) If no electrical continuity is confirmed with the communication cable, replace the cable with a new one. Disorder of output/input contacts of the ALB terminal block itself cannot be detected.			

18	Code	3022	Item	Memory card error
Description	There is an abnormality in the memory card.		Refer to [Handling memory card] in the Operation Manual.	
	The memory card is placed on the left side of the controller unit.		Refer to [ACW controller accessories] in the Installation Manual.	
To clear	Press <b>RESET</b> .			
Cause	(1) No memory card for ACW controller is inserted. (2) The access switch on the left side of the controller unit is off. (3) The memory card for ACW controller is damaged. (4) The memory card for ACW controller is short of capacity.			
Remedy	(1) Insert the memory card for ACW controller. (2) Turn on the access switch. Refer to [Handling memory card] in the Operation Manual. (3) Replace the memory card for ACW controller with a new one. When the memory card for ACW controller is replaced, all settings are initialized. Reenter all setting values. (4) Move csv file data in the memory card for ACW controller to PC and save.			

19	Code	3023	Item	Recipe not registered
Description	Incorrect recipe switching operation was performed.			
To clear	Press <b>RESET</b> .			
Cause	An unregistered recipe No. was selected. Error is detected only when recipe change by I/O is performed.			
Remedy	Select a registered recipe No. correctly.			

20	Code	3024	Item	External device error 2
Description	The external device error 2 was entered.		Refer to [7 Inputs/Outputs].	
To clear	Press <b>RESET</b> after clearing the error.			
Cause	(1) An abnormality in an external system (when an external system is connected) (2) Detection by the lower limit level sensor for tanks (when a lower limit level sensor is connected)			
Remedy	(1) Reset the error signal. (2) Put material into the tank. The detection signal of the level sensor can be cleared by refilling material.			

21	Code	3025	Item	Learning reminder
Description	The function to detect trigger operation during the learning process worked. The function to detect the flow and flow rate during the learning process worked. Refer to [2-3 Learning].			
To clear	Press <b>F4</b> "CANCEL LEARNING" and then <b>RESET</b> .			
Cause	(1) The preset time of "Learning reminder time" is too short. (2) The trigger was not pulled for longer than the specified time after "Start learning" was pressed. The spray (trigger) was suspended during the learning process.			
Remedy	(1) Change the setting according to the working condition. Refer to [Initial setting details 37] in the Operation Manual. (2) Keep pulling the spray gun trigger during the learning operation.			

22	Code	3026	Item	Trigger error
Description	Multiple trigger signals were entered simultaneously during individual cleaning of multiple guns.			
To clear	Press <b>RESET</b> .			
Cause	Simultaneous spraying by multiple guns was performed during individual cleaning of multiple guns.			
Remedy	Change the operation to prevent simultaneous spraying by multiple guns.			

23	Code	3027	Item	Communication error ch1
Description	There is an abnormality in communication between the controller control unit and the display. DC power supply is used for communication and there is an abnormality in the power circuit.			
To clear	Press <b>RESET</b> .			
Cause	(1) Poor contact in terminal connection (2) Disorder of the DC power supply (24VDC) in the control panel. Refer to [Names of Parts (internal)] in the Installation Manual. (3) Disconnection of the 24VDC power supply connected to the controller (4) Writing into the screen program was performed. We do not guarantee any of the functions including control and accuracy when unauthorized modification or change is made to the screen program without our consent.			
Remedy	(1) Check electrical continuity using a tester and repair the points of poor contact or no connection. (2) Check the voltage output using a tester. If no output is confirmed, replace the DC power supply (24VDC) with a new one. (3) If no electrical continuity is confirmed with the 24VDC line, replace the line with a new one. (4) Never perform writing into the program without our consent.			

24	Code	3028	Item	Clock error
Description	The current time is incorrect.			
To clear	Press <b>RESET</b> after resetting the clock.			
Cause	(1) The power had been off for a week. (2) The power was turned on while DIP switch No.8 on the back of the controller was on.			
Remedy	(1) Reset the clock. Refer to [Clock setting] in the Operation Manual. Make sure to note data before turning off the power for a week. (2) Turn on the power with DIP switch No.8 off. Reset the clock.			

25	Code	3029	Item	Base component: Consumption count-up
26	Code	3030	Item	Hardener: Consumption count-up
Description	The counter exceeded the specified upper limit.			
	To clear	Initialize the counter and then press <b>RESET</b> .		
		Cause	(1) The counter exceeded the specified upper limit. (2) The preset value of the counter is incorrect.	
	Remedy		(1) Move to the paint consumption counter (for the base component or hardener) screen. Set the counter to "0". If it is used as the consumption lower limit, check the remaining amount in the tank and container. (2) Change the setting according to the coating specifications. Refer to [Paint consumption counter] in the Operation Manual.	

27	Code	3032	Item	Base component: Mixing valve count-up
28	Code	3033	Item	Hardener: Mixing valve count-up
Description	The counter exceeded the specified upper limit.			
	To clear	Initialize the counter and then press <b>RESET</b> .		
		Cause	(1) The counter exceeded the specified upper limit. (2) The preset value of the counter is incorrect.	
	Remedy		(1) Move to the valve counter (for the base component or hardener) screen. Set the counter to "0". Service or replace the mixing valve. (2) Change the setting according to the coating specifications. Refer to [Valve counter] in the Operation Manual.	

29	Code	3035	Item	Gun 1: Cycle discharge rate lower limit
30	Code	3036	Item	Gun 2: Cycle discharge rate lower limit
31	Code	3037	Item	Gun 3: Cycle discharge rate lower limit
32	Code	3038	Item	Gun 4: Cycle discharge rate lower limit
Description	The cycle flow rate dropped below the specified lower limit.			
	To clear	Press <b>RESET</b> .		
		Cause	The preset value of "Discharge detection rate by gun" is incorrect.	
	Remedy		Switch to the "Discharge rate measurement by gun" screen and have the latest discharge rate recognized. Refer to [2-6 Measurement of discharge rate by gun]. When changing the setting directly, move to the "Gun discharge detection rate" screen. Refer to [Detection condition setting details 23, 24] in the Operation Manual.	

33	Code	3043	Item	Flow meter counter count-up
Description	The counter exceeded the specified upper limit.			
	To clear	Initialize the counter and then press <b>RESET</b> .		
		Cause	(1) The counter exceeded the specified upper limit. (2) The preset value of the counter is incorrect.	
	Remedy		(1) Move to the paint consumption counter (for the base component or hardener) screen. Set the flow meter counter (No.1) to "0". Service or replace the flow meter. (2) Change the setting according to the coating specifications. Refer to [Paint consumption counter] in the Operation Manual.	

34	Code	3044	Item	Valve counter count-up
Description	The counter exceeded the specified upper limit.			
To clear	Initialize the counter and then press <b>RESET</b> .			
Cause	(1) The counter exceeded the specified upper limit. (2) The preset value of the counter is incorrect.			
Remedy	(1) Move to the valve counter (for the base component or hardener) screen. Set the counter to "0". Service the valve that counts up. (2) Change the setting according to the coating specifications.  Refer to [Valve counter] in the Operation Manual.			

35	Code	3045	Item	Base component: Mixing valve ON response error (Learning criteria setting)
36	Code	3046	Item	Hardener: Mixing valve ON response error (Learning criteria setting)
37	Code	3048	Item	Base component: Mixing valve OFF response error (Learning criteria setting)
38	Code	3049	Item	Hardener: Mixing valve OFF response error (Learning criteria setting)
Description	The preset value to detect the responsiveness of the valve was exceeded. The detection works only during learning.  Refer to [2-3 Learning].			
To clear	Press <b>RESET</b> .			
Cause	The preset value is not appropriate for the equipment specifications.			
Remedy	Perform the learning operation again. Refer to [2-3 Learning]. If the learning result is the same, perform the following. - Overhaul and clean the mixing valve and replace consumable parts. - Replace the solenoid valve. Never fail to perform learning after maintenance of the valves, etc. ※: The valve responsiveness cannot be judged when the values of learning data are changed. Do not change the settings except special cases.			

39	Code	3051	Item	GOT system alarm (ACPU)
Description	There is an abnormality in the display status.			
To clear	Press <b>RESET</b> .			
Cause	There is an abnormality on the sequencer side when the CC-Link communication board (option) is attached.			
Remedy	Refer to the instruction manual of the sequencer and take corrective action.			

40	Code	3053	Item	GOT system alarm (Main unit function 1)
Description	There is an abnormality in the display status.			
To clear	Press <b>RESET</b> .			
Cause	The way of attaching the option board is incorrect.  Refer to [Interface options] in the Installation Manual.			
Remedy	Adjust the display setting to the specifications of the option board. Refer to [ACW extension: Optional parts manual] for the specifications of interface options.			

# 4

## List of Consumable Parts

Durable lives of the parts may vary depending on the type of paint used and coating and equipment conditions. The values shown below should be taken as reference lives under the conditions of 20 working days per month and 6 hours per day.

### 4-1 Short-term consumable parts (up to 2 years)

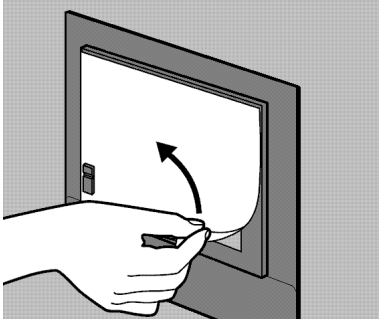
Part No.	Name	Qty	Durable life	Remarks
E0QX0100J0500	Protective sheet	1	Replace as necessary.	For protection of the ACW controller display Refer to [5-1 Replacing a protective sheet].

### 4-2 Long-term consumable parts (2 years or more)

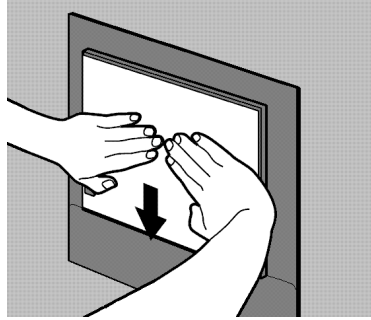
Part No.	Name	Qty	Durable life	Remarks
467-0025	SOL barrier	2	Replace as necessary.	For intrinsically safe solenoid valve
301-0025	Air regulator	1	Ditto	
303-0030	Air filter※1	1	Ditto	
303-0037	Mist separator※1	1	Ditto	
398E	Air flow switch	1	Ditto	For hand gun

※1: The air filter and mist separator of the ACW control unit are the minimum specifications for solenoid valve driving and atomization air of one spray gun. Replace them with appropriate ones according to the coating specifications and air quality.

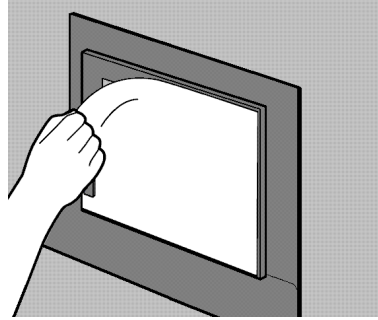
## 5-1 Replacing a protective sheet



(1) Remove the old protective sheet and clean the surface of the ACW controller.



(2) Peel the release paper on the back of a new protective sheet and affix the adhesive surface to the display.  
\* When affixing the protective sheet, take care not to make a space between the bonded surfaces.



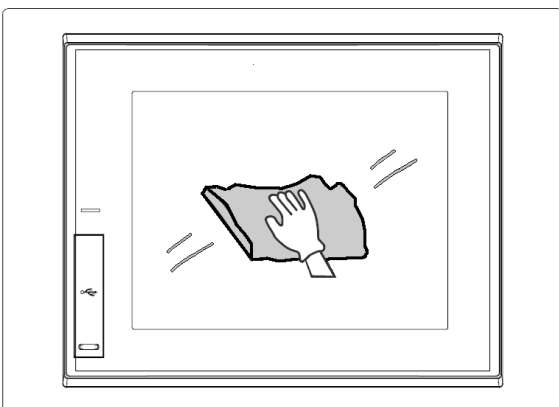
(3) Remove the protective film on the protective sheet surface.

※: Refer to [4-1 Short-term consumable parts (up to 2 years)] for part no. of protective sheet.

## &lt;Replacing a protective sheet&gt;

Visually check the state of the protective sheet in daily inspection. The protective sheet, if heavily contaminated or damaged, deteriorates visibility, causing malfunction. It shall be replaced with a new one immediately.

## 5-2 Display cleaning procedure



Wipe off dirt gently with a soft cloth slightly moistened with neutral detergent or ethanol.

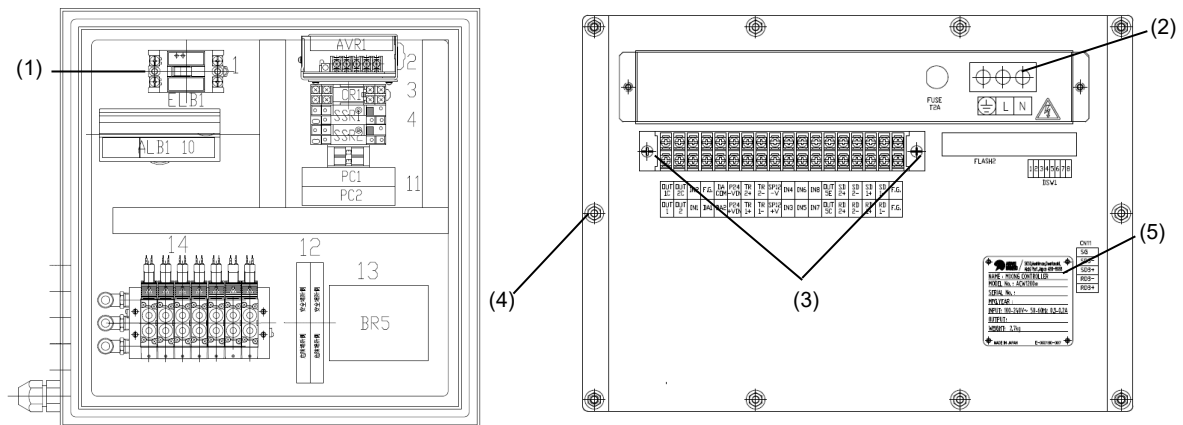
※: Do not use the solvent such as acetone, benzene, or toluene. It may cause the protection sheet to become deformed or peel off.

### 5-3 Replacing the ACW controller

## **⚠ WARNING**

### **Risk of electrification**

- Be sure to turn off the main power switch on the ACW control unit before replacing the controller.
- Do not wet electric parts inside the ACW control unit with any liquid (water, solvent, etc.).



- (1) Turn off the power circuit breaker (NFB) in the ACW control unit.  
Never fail to check that 100VAC power is off.
- (2) Remove the power supply line.
- (3) Unscrew two installation screws (M4) of the interface terminal. Leave the wiring connected to the interface terminal as is.
- (4) Unscrew 10 installation fittings of the ACW controller.
- (5) Note the model No. and serial No.
- (6) Mounting shall be performed in the procedure from (4) to (1).  
When installing the installation fittings, interface terminal and power terminal, tighten them with the specified torque (1.2 to 1.8 N·m).

## **⚠ CAUTION**

### **Risk of malfunction of the equipment**

- Before touching the ACW controller, be sure to touch a grounded metal and discharge retained static electricity in human body.
- Do not drop the ACW controller or subject it to strong shock.
- Do not make direct contact with a conductive section or electronic parts inside the ACW controller.
- Tighten the screws within the specified torque range when installing the ACW controller on the ACW control unit.

#### 5-4 Display (liquid crystal display)

A touch-panel liquid crystal display (LCD) is used for the ACW controller display.  
Because LCD has a service life, inspect the touch panel operation and backlight periodically.

When an abnormality is found during inspection, contact us.

The ACW controller needs to be overhauled when replacing the backlight.

The overhaul may damage the printed board, so the backlight or LCD must not be replaced by the user.

Display life:                    Approx. 52,000 hours (ambient temperature for use: 25 °C)

Backlight life:                Approx. 50,000 hours (number of hours when display luminance is 50% at the ambient temperature for use of 25 °C)

Touch panel type:          Analog resistive type

Touch panel life:            1 million times (operational ability: 0.98 N or less)



### CAUTION

#### **Risk of malfunction of the equipment**

- **You can still operate the touch keys even when the backlight is out. If the backlight display is getting difficult to see, contact us for early replacement.**
- **The backlight or LCD must not be replaced by the user. It may lead to damage of the ACW controller. Contact us for repair.**

# 6

## Inspection Items

### 6-1 Pre-work inspection

Check the following items at the start of the everyday work.

Check item	Check	Result	Corrective action
Cleanliness of the ACW controller display	Check with eyes.	No dirt allowed.	Perform cleaning. Refer to [5-2 Display cleaning procedure]. Replace the protective sheet with a new one, as necessary. Refer to [5-1 Replacing a protective sheet].
Air supply pressure to control panel	Check with eyes.	The pressure gauge shall read 0.4MPa or higher.	Raise the source air pressure. Check air hose for bends.
Operation of the air flow switch	"Trigger" lamp on the "Main screen"	The trigger indication lamp shall turn on when the gun trigger is pulled.	Raise the source air pressure. Replace the air flow switch.
Alarm indication	Presence of indication	No error indication allowed.	Locate and remove the cause so that no error will be indicated. Refer to [3 Troubleshooting].
		No pot life error allowed.	There may be internal hardening. Inspect the entire equipment. Never fail to flush after that. Refer to [3 Troubleshooting].

### 6-2 Inspection after work

Check the following items at the end of the everyday work.

Check item	Check	Result	Corrective action
Flush check	Spray gun	Flushing fluid shall come out of gun head.	Pull the spray gun trigger with "0 (W)" lamp lit until a sufficient quantity of flushing fluid comes out.
	Color code	Indication of the current color "0 (W)"	Perform cleaning.
Alarm indication	Presence of indication	No error indication allowed.	Locate and remove the cause so that no error will be indicated. Never fail to flush after that. Refer to [3 Troubleshooting].
Installation environment of the ACW control unit	Panel temperature	0 ~ 40 °C	Lower the ambient temperature of the ACW control unit.
	Check with eyes. Take a smell.	Mark or smell of burned wire	If burning is found, stop the equipment, locate the cause and replace the unit and wire.

### 6-3 Monthly inspection

Check the following items every month.

Check item	Check	Result	Corrective action	
Ambient environment	Panel temperature	Measure with a thermometer.	0 ~ 40 °C	Lower the ambient temperature of the ACW control unit.
	Panel humidity	Measure with a hygrometer.	10~80 %RH	Lower the ambient humidity of the ACW control unit.
	Atmosphere	Measure corrosive gas.	No corrosive gas allowed.	Eliminate corrosive gas.
ACW controller display	Touch key operation	Shall be operable.	Contact us. The ACW controller needs to be removed for maintenance and part replacement. Refer to [5-4 Display (liquid crystal display)].	
	LCD, Backlight	Shall not be dark.		

## 6-4 Regular inspection

Check the following items every 3 to 6 months.

Check item	Check method	Criteria	Corrective action
Power-supply voltage check	Measure voltage between terminals.	AC95~105V	Change the supply power.
Responsiveness of mixing valves (base component and hardener)	Learning※1	30% or higher than the level obtained by learning at the time of delivery	Replace consumable parts of valves (V-packing, needle and O-ring). Replace intrinsically safe solenoid valves. Refer to the instruction manual of the "Installation/device". Refer to [2-3 Learning].
Installation status of the ACW controller	Check the looseness of installation screws.	Shall be installed firmly.	- Tighten the screws with the specified torque. Refer to [5-3 Replacing the ACW controller].

※1: The "learning" is a function to determine the responsiveness of valves. After the learning operation, note the learning data.

## 6-5 Miscellaneous

Check the following items as necessary.

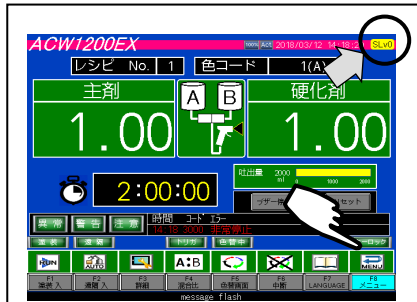
Check item	Check method	Criteria	Corrective action
Flow meter operation	"ACTUAL" count-up on the "Main" screen	Shall be smoothly counted up.	Overhaul or replace flow meter. Refer to the instruction manual of the "Installation/device".

※: Refer to the instruction manual of the "Installation/device" for details on the maintenance of flow meters.

# 7

## Inputs/Outputs

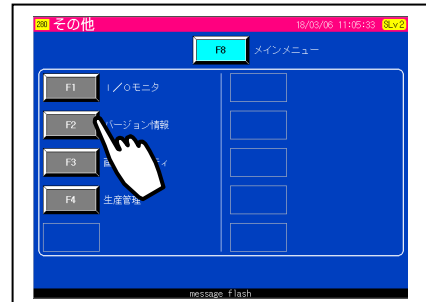
### 7-1 Switching to "I/O monitor menu" screen (SLv0)



(1) Main  
Check SLv0.  
Press **F8**.



(2) Main menu  
Press **F4**.  
<Screen No.015>



(3) Other menu  
Press **F1**.  
<Screen No.280>

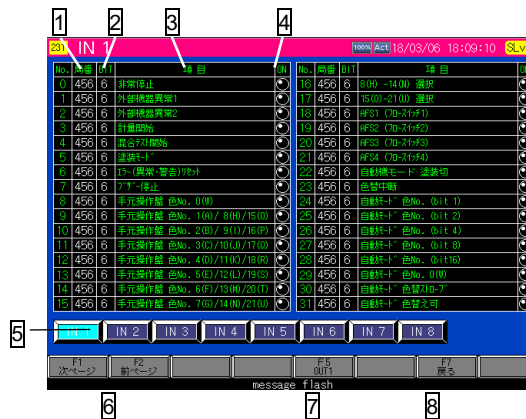


(4) I/O monitor menu  
<Screen No.230>

Refer to [ACW controller: Basic operations] in the Operation Manual.

### 7-2 Input screen (SLv0)

<Screen No.231>



	Item	Description
1	Station No.	Indicates the station No. of the ALB terminal block. Refer to [7-4 ALB terminal block (Input/output terminal block)].
2	BIT	Indicates the terminal No. (BIT) of the ALB terminal block. Refer to [7-4 ALB terminal block (Input/output terminal block)].
3	Item	I/O name
4	ON	The lamp turns on when there is an input.
5	IN1 ~ IN5	A key for switching the screen.
6	F1 "NEXT PAGE" F2 "PREV Page"	A key for switching the page. Pages are switched between Screen No.231 and No.235.
7	F5 "OUT1-1"	A key for moving to OUTPUT1.
8	F7 "RETURN"	A key for moving to "I/O monitor menu". <Screen No.230>

## 7-2-1 IN 1

<Screen No.231>		
No.	Name	Description
0	Emergency stop	Stops the equipment.
1	External device error 1	An input port for issuing an external device error. Issues an external device error when it is on.
2	External device error 2	
3	Start measurement	Triggers the start of measurement.
4	Start mixing test	Triggers the start of mixing test.
5	Coating mode	Operates "ON"/"OFF" of the coating mode.
6	Error (error/alarm) reset	Resets the error (error/alarm/caution) indication.
7	Buzzer stop	Stops the buzzer.
8	Local operation panel: Color No. 0 (W)	For the reception of color change for the local operation panel. Connects with the local operation panel barrier and changes the color according to switch operation of the local operation panel. Input No.16 and No.17 are required for Color H or later and Color 0 or later, respectively. ※: Effective only when "Remote on".
9	Local operation panel: No. 1 (A)/ 8 (H)/15 (O)	
10	Local operation panel: No. 2 (B)/ 9 (I)/16 (P)	
11	Local operation panel: No. 3 (C)/10 (J)/17 (Q)	
12	Local operation panel: No. 4 (D)/11 (K)/18 (R)	
13	Local operation panel: No. 5 (E)/12 (L)/19 (S)	
14	Local operation panel: No. 6 (F)/13 (M)/20 (T)	
15	Local operation panel: No. 7 (G)/14 (N)/21 (U)	
16	Select local operation panel 8 (H) - 14 (N)	For the reception of color change for the local operation panel.
17	Select local operation panel 15 (O) - 21 (U)	Used as a key to switch to Color H or later.
18	AFS1 (Flow switch 1)	For the "Detection of discharge rate by gun" function. Individually inputs the gun trigger signal of each gun. (up to 4 guns) Refer to [2-6 Measurement of discharge rate by gun].
19	AFS2 (Flow switch 2)	
20	AFS3 (Flow switch 3)	
21	AFS4 (Flow switch 4)	
22	Automatic machine mode: READY off	Cancels the coating status in automatic mode.
23	Cancel color change	Cancels color change.
24	Automatic mode: Color No. (bit 1)	For the reception of color change binary signals. Combines binary signals and inputs the change number for the next color.
25	Automatic mode: Color No. (bit 2)	
26	Automatic mode: Color No. (bit 4)	※: Effective only when "Remote on". (Ex.) When changing to the color group 3 Have bit 1 and bit 2 entered simultaneously and enter the color change strobe shown in the following section.
27	Automatic mode: Color No. (bit 8)	
28	Automatic mode: Color No. (bit 16)	
29	Automatic mode: Color No. 0 (bit 1)	Changes the color to Wash "0 (W)".
30	Automatic mode: Color change strobe	Triggers the start of color change.
31	Automatic mode: Color change possible	An input port for enabling the reception of color change signals in automatic mode.

7-2-2 IN 2

Screen No.232		
No.	Name	Description
0	Recipe selection ( 1)	For reading of recipe No. Combines binary signals and inputs the recipe number.  ※: Effective only when "READY off". (Ex.) When changing to the recipe No. 3 Have 1 and 2 entered simultaneously and enter the recipe selection strobe shown in the following section.
1	Recipe selection ( 2)	
2	Recipe selection ( 4)	
3	Recipe selection ( 8)	
4	Recipe selection ( 16)	
5	Recipe selection ( 32)	
6	Recipe selection ( 64)	
7	Recipe selection (128)	
8	Recipe selection (256)	
9	Recipe selection (512)	
10	Recipe selection strobe	Triggers recipe switching. (Effective on time: 1 second or more)
11	Log request	Separates the production result information by lot.
12	Start learning	Triggers the start of learning.
13	Ignore flow rate pulse for base component	Disables the reception of pulse signals of flow meters.  ※: Not used except for special purposes.
14	Ignore flow rate pulse for hardener	
15	Ignore flow rate pulse for diluent	
16	Base component tank remaining amount reset	Resets the remaining amount calculation for the base component tank.
17	Hardener tank remaining amount reset	Resets the remaining amount calculation for the hardener tank.
18	*** Not used 51	
19	Eco clean pressure gauge upper limit	Upper limit signal for route pressure when using eco cleaning.
20	Eco clean pressure gauge lower limit	Lower limit signal for route pressure when using eco cleaning.
21	*** Not used 54	
22	PM1 rotation ON	
23	PM2 rotation ON	
24	PM1 memory No. (bit 1)	Not used for ACW1200EX
25	PM1 memory No. (bit 2)	
26	PM1 memory No. (bit 4)	
27	PM1 memory No.T mode	
28	PM2 memory No. (bit 1)	
29	PM2 memory No. (bit 2)	
30	PM2 memory No. (bit 4)	
31	PM2 memory No.T mode	

7-2-3 IN 3

Screen No.233		
No.	Name	Description
0	W (OPS200)	An option input port. Exclusively for OPS200 (color change operation unit). Uses Station No. 18 for physical allocation of OPS200.
1	A (OPS200)	
2	B (OPS200)	
3	C (OPS200)	
4	D (OPS200)	
5	E (OPS200)	
6	F (OPS200)	
7	G (OPS200)	
8	H (OPS201)	An option input port. Exclusively for OPS201 (color change operation unit). Uses Station No. 19 for physical allocation of OPS201.
9	I (OPS201)	
10	J (OPS201)	
11	K (OPS201)	
12	L (OPS201)	
13	M (OPS201)	
14	N (OPS201)	An option input port. Exclusively for OPS202 (color change operation unit). Uses Station No. 20 for physical allocation of OPS202.
15	O (OPS202)	
16	P (OPS202)	
17	Q (OPS202)	
18	R (OPS202)	
19	S (OPS202)	
20	T (OPS202)	
21	U (OPS202)	
22	AUTO/MANU (OPS200)	Exclusively for OPS200 (color change operation unit).
23	F1/F6 (OPS220)	An option input port. Exclusively for OPS200 (color change operation unit). Not used.
24	F2/F7 (OPS220)	
25	F3/F8 (OPS220)	
26	F4/F9 (OPS220)	
27	F5/F10 (OPS220)	
28	※※※ Not used 93	
29	RESET	An option input port. Exclusively for OPS200 (color change operation unit). Not used.
30	Buzzer stop	
31	SHIFT	

7-2-4 IN 4

Screen No.234		
No.	Name	Description
0	Base component: Thinner valve forced operation	Turns on the base component thinner valve forcibly.
1	Base component: Air valve forced operation	Turns on the base component air valve forcibly.
2	Base component: Flushing fluid valve forced operation	Turns on the base component flushing fluid valve forcibly.
3	Base component: Mixing valve forced operation	Turns on the base component control valve forcibly.
4	Base component: Drain valve forced operation	Turns on the base component drain valve forcibly.
5	Hardener: Thinner valve forced operation	Turns on the hardener thinner valve forcibly.
6	Hardener: Air valve forced operation	Turns on the hardener air valve forcibly.
7	Hardener: Flushing fluid valve forced operation	Turns on the hardener flushing fluid valve forcibly.
8	Hardener: Mixing valve forced operation	Turns on the hardener control valve forcibly.
9	Hardener: Drain valve forced operation	Turns on the hardener drain valve forcibly.
10	Diluent: Thinner valve forced operation	Turns on the diluent thinner valve forcibly.
11	Diluent: Air valve forced operation	Turns on the diluent air valve forcibly.
12	Diluent: Flushing fluid valve forced operation	Turns on the diluent flushing fluid valve forcibly.
13	Diluent: Mixing valve forced operation	Turns on the diluent control valve forcibly.
14	Diluent: Drain valve forced operation	Turns on the diluent drain valve forcibly.
15	Route cleaning: Air valve forced operation	Turns on the route cleaning air valve forcibly.
16	Route cleaning: Thinner valve forced operation	Turns on the route cleaning thinner valve forcibly.
17	Route cleaning: Drain valve forced operation	Turns on the route cleaning drain valve forcibly.
18	Route cleaning: Switching valve forced operation	Turns on the route cleaning switching valve forcibly.
19	Drain valve forced operation	Turns on the drain valve forcibly.
20	*** Not used 117	
21	*** Not used 118	
22	*** Not used 119	
23	*** Not used 120	
24	*** Not used 121	
25	*** Not used 122	
26	*** Not used 123	
27	*** Not used 124	
28	*** Not used 125	
29	*** Not used 126	
30	*** Not used 127	
31	*** Not used 128	

7-2-5 IN 5

Screen No.235		
No.	Name	Description
0	Base component: Mixture ratio change code 0.1	For changing the mixture ratio.  Combines binary signals and inputs the base component ratio.
1	Base component: Mixture ratio change code 0.2	
2	Base component: Mixture ratio change code 0.4	
3	Base component: Mixture ratio change code 0.8	
4	Base component: Mixture ratio change code 1.6	
5	Base component: Mixture ratio change code 3.2	
6	Base component: Mixture ratio change code 6.4	
7	Base component: Mixture ratio change code 12.8	
8	Hardener: Mixture ratio change code 0.1	For changing the mixture ratio.  Combines binary signals and inputs the hardener ratio.
9	Hardener: Mixture ratio change code 0.2	
10	Hardener: Mixture ratio change code 0.4	
11	Hardener: Mixture ratio change code 0.8	
12	Hardener: Mixture ratio change code 1.6	
13	Hardener: Mixture ratio change code 3.2	
14	Hardener: Mixture ratio change code 6.4	
15	Hardener: Mixture ratio change code 12.8	
16	Diluent: Mixture ratio change code 0.1	Not used for ACW1200EX
17	Diluent: Mixture ratio change code 0.2	
18	Diluent: Mixture ratio change code 0.4	
19	Diluent: Mixture ratio change code 0.8	
20	Diluent: Mixture ratio change code 1.6	
21	Diluent: Mixture ratio change code 3.2	
22	Diluent: Mixture ratio change code 6.4	
23	Diluent: Mixture ratio change code 12.8	
24	Mixture ratio change code Color No. (bit 1)	For selecting the color for which the mixture ratio is changed.  Combines binary signals and inputs the color group. Bit 0 (no input) for "0 (W)".
25	Mixture ratio change code Color No. (bit 2)	
26	Mixture ratio change code Color No. (bit 4)	
27	Mixture ratio change code Color No. (bit 8)	
28	Mixture ratio change code Color No. (bit 16)	
29	※※※ Not used 158	
30	※※※ Not used 159	
31	Mixture ratio change code writing	Triggers the change of the mixture ratio. Effective only when "Remote on".

7-2-6 IN 6

Screen No.236		
No.	Name	Description
0	Test mode	Moves to the mixture ratio test screen.
1	Measurement mode	Moves to the measurement mode screen.
2	Test/measurement: Filling	Fills the paint set in mixture ratio test/measurement mode.
3	Test/measurement: Start	Starts mixture ratio test/measurement mode with the preset paint.
4	Test/measurement: Cleaning	Cleans the route with thinner in mixture ratio test/measurement mode.
5	Test/measurement: Cancel	Cancels the filling, start, cleaning of mixture ratio test/measurement mode.
6	Test/measurement: Color No.0 A/B	Selects the color No. in mixture ratio test. Selects the fluid No. in measurement mode.
7	Test/measurement: Color No.1/8/15 A/B	
8	Test/measurement: Color No.2/9/16 A/B	
9	Test/measurement: Color No.3/10/17A/B	
10	Test/measurement: Color No.4/11/18A/B	
11	Test/measurement: Color No.5/12/19A/B	
12	Test/measurement: Color No.6/13/20A/B	
13	Test/measurement: Color No.7/14/21A/B	
14	Measurement: Select base component	Selects the base component in measurement mode.
15	Measurement: Select hardener	Selects the hardener in measurement mode.
16	Mixture ratio: Base component correction +5%	Fine-tunes the base component load and adjusts the mixture ratio. Check by concurrently using the mixture ratio test mode.
17	Mixture ratio: Base component correction +4%	
18	Mixture ratio: Base component correction +3%	
19	Mixture ratio: Base component correction +2%	
20	Mixture ratio: Base component correction +1%	
21	Mixture ratio: Base component correction -1%	
22	Mixture ratio: Base component correction -2%	
23	Mixture ratio: Base component correction -3%	
24	Mixture ratio: Base component correction -4%	
25	Mixture ratio: Base component correction -5%	
26	※※※ Not used 187	
27	※※※ Not used 188	
28	※※※ Not used 189	
29	※※※ Not used 190	
30	※※※ Not used 191	
31	※※※ Not used 192	

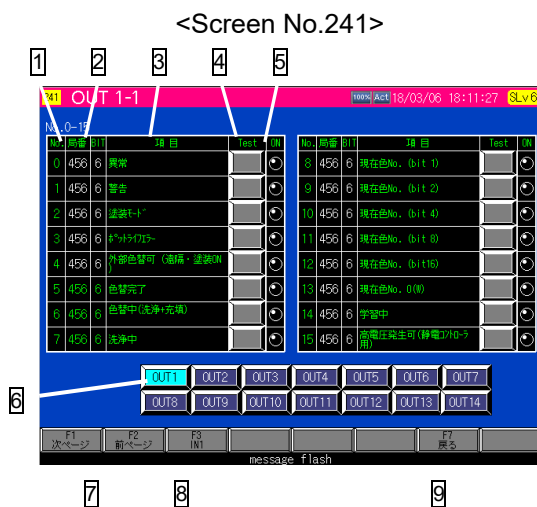
7-2-7 IN 7

Screen No.237		
No.	Name	Description
0	A/D input Ch1	Not used for ACW1200EX
1	A/D input Ch1	
2	A/D input Ch1	
3	A/D input Ch1	
4	A/D input Ch1	
5	A/D input Ch1	
6	A/D input Ch1	
7	A/D input Ch1	
8	A/D input Ch1	
9	A/D input Ch1	
10	A/D input Ch1	
11	A/D input Ch1	
12	A/D input Ch1	
13	A/D input Ch1	
14	A/D input Ch1	
15	A/D input Ch1	
16	A/D input Ch2	Not used for ACW1200EX
17	A/D input Ch2	
18	A/D input Ch2	
19	A/D input Ch2	
20	A/D input Ch2	
21	A/D input Ch2	
22	A/D input Ch2	
23	A/D input Ch2	
24	A/D input Ch2	
25	A/D input Ch2	
26	A/D input Ch2	
27	A/D input Ch2	
28	A/D input Ch2	
29	A/D input Ch2	
30	A/D input Ch2	
31	A/D input Ch2	

**7-2-8 IN 8**

Screen No.237		
No.	Name	Description
0	A/D input Ch3	Not used for ACW1200EX
1	A/D input Ch3	
2	A/D input Ch3	
3	A/D input Ch3	
4	A/D input Ch3	
5	A/D input Ch3	
6	A/D input Ch3	
7	A/D input Ch3	
8	A/D input Ch3	
9	A/D input Ch3	
10	A/D input Ch3	
11	A/D input Ch3	
12	A/D input Ch3	
13	A/D input Ch3	
14	A/D input Ch3	
15	A/D input Ch3	
16	A/D input Ch4	Not used for ACW1200EX
17	A/D input Ch4	
18	A/D input Ch4	
19	A/D input Ch4	
20	A/D input Ch4	
21	A/D input Ch4	
22	A/D input Ch4	
23	A/D input Ch4	
24	A/D input Ch4	
25	A/D input Ch4	
26	A/D input Ch4	
27	A/D input Ch4	
28	A/D input Ch4	
29	A/D input Ch4	
30	A/D input Ch4	
31	A/D input Ch4	

### 7-3 Output screen (SLv0)



	Item	Description
1	Station No.	Indicates the station No. of the ALB terminal block. Refer to [7 Inputs/Outputs].
2	BIT	Indicates the terminal No. (BIT) of the ALB terminal block. Refer to [7 Inputs/Outputs].
3	Item	I/O name
4	TEST	The switch is used to operate the output forcibly. Used in the security level SLV3. Can be used when the coating mode is "OFF" (with coating lamp off). Refer to [8 Test mode].
5	ON	The lamp turns on when the output is issued.
6	OUT 0 ~ OUT 12	A key for switching the screen.
7	F1 "NEXT PAGE" F2 "PREV Page"	A key for switching the page. Pages are switched between Screen No.241 and No.264.
8	F3 "IN1"	A key for moving to the IN1 screen.
9	F7 "RETURN"	A key for moving to "I/O monitor menu". <Screen No.230>

## 7-3-1 OUT 1

### OUT 1-1

Screen No.241		
No.	Name	Description
0	ERROR	Issued when an error level "ERROR" occurs.
1	ALARM	Issued when an error level "ALARM" occurs.
2	Coating mode	Issued during "Paint ON".
3	Pot life error	Issued when a "Pot life error" occurs.
4	External color change possible (Remote/Paint ON)	Issued during both "Remote ON" and "Paint ON". ※ Except for "Color Change In Process"
5	Color change complete (Color change posture released)	Issued for one second at the completion of color change.
6	Color change in process	Issued during the color change (flushing + filling) operation.
7	Flushing in process	Issued during the color change (flushing) operation.
8	Current color No. (bit 1)	Issued in binary signals when the current color is Color A. The color group No. before color change is issued during color change (flushing operation). The color group No. after color change is issued during color change (flushing operation).
9	Current color No. (bit 2)	
10	Current color No. (bit 4)	
11	Current color No. (bit 8)	
12	Current color No. (bit 16)	
13	Current color No. 0 (W)	The current color group No. "0 (W)" is issued.
14	Learning in process	Issued during the learning operation.
15	High voltage possible (for electrostatic controller)	Not issued during the state of "0 (W)" or "Color change in process".

### OUT 1-2

Screen No.242		
No.	Name	Description
16	For buzzer	Issued when "ERROR" or "ALARM" occurs. Turns off when the buzzer is stopped.
17	For error lamp	Issued when "ERROR" or "ALARM" occurs. Turns off when reset.
18	Drain valve	For controlling drain valve.
19	Remote mode on	Issued during remote mode operation.
20	Eco cleaning: Gate valve	For controlling gate valve when the eco cleaning mode is on.
21	Base component pulse (half frequency)	Base component flow meter signals are issued in half frequency.
22	Hardener pulse (half frequency)	Hardener flow meter signals are issued in half frequency.
23	Diluent pulse (half frequency)	Not used for ACW1200EX
24	Caution	It outputs at the time of generating "CAUTION".
25	Operation preparation	It outputs, when the <b>READY</b> and <b>REMOTE</b> lamp is on.
26	Route cleaning in process	Issued when the state of the route cleaning system is "route cleaning in process".
27	Route cleaning: Air valve	For controlling ACW1200EX air valve.
28	Route cleaning: Thinner valve	For controlling ACW1200EX thinner valve.
29	Route cleaning: Drain valve	For controlling ACW1200EX drain valve.
30	Route cleaning: Switching valve	For controlling the switching valve of the route cleaning system.
31	Route cleaning: Spray on request	For controlling the spray gun of the route cleaning system.

**7-3-2 OUT 2**

**OUT 2-1**

Screen No.243		
No.	Name	Description
0	Base component thinner valve No. 0 (W)	For controlling the base component thinner valve.
1	Base component valve No. 1 (A)	For controlling the base component valve ( 1) Color A.
2	Base component valve No. 2 (B)	For controlling the base component valve ( 2) Color B.
3	Base component valve No. 3 (C)	For controlling the base component valve ( 3) Color C.
4	Base component valve No. 4 (D)	For controlling the base component valve ( 4) Color D.
5	Base component valve No. 5 (E)	For controlling the base component valve ( 5) Color E.
6	Base component valve No. 6 (F)	For controlling the base component valve ( 6) Color F.
7	Base component valve No. 7 (G)	For controlling the base component valve ( 7) Color G.
8	Base component valve No. 8 (H)	For controlling the base component valve ( 8) Color H.
9	Base component valve No. 9 (I)	For controlling the base component valve ( 9) Color I.
10	Base component valve No. 10 (J)	For controlling the base component valve (10) Color J.
11	Base component valve No. 11 (K)	For controlling the base component valve (11) Color K.
12	Base component valve No. 12 (L)	For controlling the base component valve (12) Color L.
13	Base component valve No. 13 (M)	For controlling the base component valve (13) Color M.
14	Base component valve No. 14 (N)	For controlling the base component valve (14) Color N.
15	Base component valve No. 15 (O)	For controlling the base component valve (15) Color O.

**OUT 2-2**

Screen No.244		
No.	Name	Description
16	Base component valve No. 16 (P)	For controlling the base component valve (16) Color P.
17	Base component valve No. 17 (Q)	For controlling the base component valve (17) Color Q.
18	Base component valve No. 18 (R)	For controlling the base component valve (18) Color R.
19	Base component valve No. 19 (S)	For controlling the base component valve (19) Color S.
20	Base component valve No. 20 (T)	For controlling the base component valve (20) Color T.
21	Base component valve No. 21 (U)	For controlling the base component valve (21) Color U.
22	Base component: Flushing fluid valve	Not used for ACW1200EX
23	Base component: Air valve	Not used for ACW1200EX
24	Base component: Mixing valve	For controlling the base component mixing valve.
25	Base component: Drain valve	Not used for ACW1200EX
26	Base component: Route switching	Not used for ACW1200EX
27	*** Not used 316	
28	*** Not used 317	
29	*** Not used 318	
30	*** Not used 319	
31	*** Not used 320	

**7-3-3 OUT 3**

**OUT 3-1**

Screen No.245		
No.	Name	Description
0	Hardener thinner valve No. 0	For controlling the hardener thinner valve.
1	Hardener valve No. 1	For controlling the hardener valve No. 1.
2	Hardener valve No. 2	For controlling the hardener valve No. 2.
3	Hardener valve No. 3	For controlling the hardener valve No. 3.
4	Hardener valve No. 4	For controlling the hardener valve No. 4.
5	Hardener valve No. 5	For controlling the hardener valve No. 5.
6	Hardener valve No. 6	For controlling the hardener valve No. 6.
7	Hardener valve No. 7	For controlling the hardener valve No. 7.
8	Hardener valve No. 8	For controlling the hardener valve No. 8.
9	Hardener valve No. 9	For controlling the hardener valve No. 9.
10	Hardener valve No. 10	For controlling the hardener valve No. 10.
11	Hardener valve No. 11	For controlling the hardener valve No. 11.
12	Hardener valve No. 12	For controlling the hardener valve No. 12.
13	Hardener valve No. 13	For controlling the hardener valve No. 13.
14	Hardener valve No. 14	For controlling the hardener valve No. 14.
15	Hardener valve No. 15	For controlling the hardener valve No. 15.

**OUT 3-2**

Screen No.246		
No.	Name	Description
16	Hardener valve No. 16	For controlling the hardener valve No. 16.
17	Hardener valve No. 17	For controlling the hardener valve No. 17.
18	Hardener valve No. 18	For controlling the hardener valve No. 18.
19	Hardener valve No. 19	For controlling the hardener valve No. 19.
20	Hardener valve No. 20	For controlling the hardener valve No. 20.
21	Hardener valve No. 21	For controlling the hardener valve No. 21.
22	Hardener flushing fluid valve	Not used for ACW1200EX
23	Hardener air valve	Not used for ACW1200EX
24	Hardener mixing valve	For controlling the hardener mixing valve.
25	Hardener drain valve	Not used for ACW1200EX
26	*** Not used 347	
27	*** Not used 348	
28	*** Not used 349	
29	*** Not used 350	
30	*** Not used 351	
31	*** Not used 352	

**7-3-4 OUT 4**

**OUT 4-1**

Screen No.247		
No.	Name	Description
0	Diluent thinner valve No. 0	Not used for ACW1200EX
1	Diluent valve No. 1	
2	Diluent valve No. 2	
3	Diluent valve No. 3	
4	Diluent valve No. 4	
5	Diluent valve No. 5	
6	Diluent valve No. 6	
7	Diluent valve No. 7	
8	Diluent valve No. 8	
9	Diluent valve No. 9	
10	Diluent valve No. 10	
11	Diluent valve No. 11	
12	Diluent valve No. 12	
13	Diluent valve No. 13	
14	Diluent valve No. 14	
15	Diluent valve No. 15	

**OUT 4-2**

Screen No.248		
No.	Name	Description
16	Diluent valve No. 16	Not used for ACW1200EX
17	Diluent valve No. 17	
18	Diluent valve No. 18	
19	Diluent valve No. 19	
20	Diluent valve No. 20	
21	Diluent valve No. 21	
22	Diluent: Flushing fluid valve	
23	Diluent: Air valve	
24	Diluent: Mixing valve	
25	Diluent: Drain valve	
26	*** Not used 379	
27	*** Not used 380	
28	*** Not used 381	
29	*** Not used 382	
30	*** Not used 383	
31	*** Not used 384	

## 7-3-5 OUT 5

### OUT 5-1

Screen No.249		
No.	Name	Description
0	Local operation panel lamp color W (0)	<p>The state of Color W or Color A is issued. The output signal flashes during the filling process.</p> <p>※: Used for lamp output. ※: Cannot be used for controlling the sequencer. The current color No. (bit *) is used.</p>
1	Local operation panel lamp color A (1)	
2	Local operation panel lamp color B (2)	
3	Local operation panel lamp color C (3)	
4	Local operation panel lamp color D (4)	
5	Local operation panel lamp color E (5)	
6	Local operation panel lamp color F (6)	
7	Local operation panel lamp color G (7)	
8	Local operation panel lamp color H (8)	
9	Local operation panel lamp color I (9)	
10	Local operation panel lamp color J (10)	
11	Local operation panel lamp color K (11)	
12	Local operation panel lamp color L (12)	
13	Local operation panel lamp color M (13)	
14	Local operation panel lamp color N (14)	
15	Local operation panel lamp color O (15)	

### OUT 5-2

Screen No.250		
No.	Name	Description
16	Local operation panel lamp color P (16)	<p>The state of Color W or Color A is issued. The output signal flashes during the filling process.</p> <p>※: Used for lamp output. ※: Cannot be used for controlling the sequencer. The current color No. (bit *) is used.</p>
17	Local operation panel lamp color Q (17)	
18	Local operation panel lamp color R (18)	
19	Local operation panel lamp color S (19)	
20	Local operation panel lamp color T (20)	
21	Local operation panel lamp color U (21)	
22	※※※ Not used 407	
23	※※※ Not used 408	
24	※※※ Not used 409	
25	※※※ Not used 410	
26	※※※ Not used 411	
27	※※※ Not used 412	
28	Measurement in process	Issued when the measurement screen is displayed.
29	Mixture ratio test in process	Issued when the mixture ratio test screen is displayed.
30	Mixture ratio test select reception	Issued when color information is entered during mixture ratio test.
31	Mixture ratio test select OK	Issued when the color information changed during mixture ratio test is normal.

## 7-3-6 OUT 6

### OUT 6-1

No.	Screen No.251		
	Name	Error code	Description
0	Emergency stop	<3000>	<p>The error item that has occurred is issued individually. Turns off when reset.</p> <p>※1: Not used for ACW1200EX</p>
1	External device error 1	<3001>	
2	Mixture ratio error	<3002>	
3	Mixture ratio error (secondary mixing) <sup>※1</sup>	<3003>	
4	Upper cycle load limit	<3004>	
5	Upper cycle load limit (secondary mixing) <sup>※1</sup>	<3005>	
6	Forced flushing start	<3006>	
7	Pot life error	<3007>	
8	Base component: Flow rate lower limit (short)	<3008>	
9	Hardener: Flow rate lower limit (short)	<3009>	
10	Diluent: Flow rate lower limit (short) <sup>※1</sup>	<3010>	
11	Base component: Valve OFF flow rate detection	<3011>	
12	Hardener: Valve OFF flow rate detection	<3012>	
13	Diluent: Valve OFF flow rate detection <sup>※1</sup>	<3013>	
14	Cleaning reminder	<3014>	
15	Measurement reminder	<3015>	

### OUT 6-2

No.	Screen No.252		
	Name	Error code	Description
16	Mixture ratio test reminder	<3016>	<p>The error item that has occurred is issued individually. Turns off when reset.</p> <p>※1: Not used for ACW1200EX</p>
17	Base component: Flow rate upper limit (over)	<3017>	
18	Hardener: Upper flow rate limit (over)	<3018>	
19	Diluent: Flow rate upper limit (over) <sup>※1</sup>	<3019>	
20	RAM initialized	<3020>	
21	ALB terminal block communication error	<3021>	
22	Memory card error	<3022>	
23	Recipe not registered	<3023>	
24	External device error 2	<3024>	
25	Learning reminder	<3025>	
26	Trigger error	<3026>	
27	Communication error ch1	<3027>	
28	Clock error	<3028>	
29	Base component: Paint tank lower limit	<3029>	
30	Hardener: Paint tank lower limit	<3030>	
31	Diluent: Consumption count-up <sup>※1</sup>	<3031>	

## 7-3-7 OUT 7

### OUT 7-1

No.	Screen No.253		
	Name	Error code	Description
0	Base component: Mixing valve count-up	<3032>	<p>The error item that has occurred is issued individually. Turns off when reset.</p> <p>※1: Not used for ACW1200EX</p>
1	Hardener: Mixing valve count-up	<3033>	
2	Diluent: Mixing valve count-up※1	<3034>	
3	Gun 1: Cycle discharge rate lower limit	<3035>	
4	Gun 2: Cycle discharge rate lower limit	<3036>	
5	Gun 3: Cycle discharge rate lower limit	<3037>	
6	Gun 4: Cycle discharge rate lower limit	<3038>	
7	Base component: Air pressure upper limit error	<3039>	
8	Hardener: Air pressure upper limit error	<3040>	
9	Equipment air pressure upper limit error	<3041>	
10	Factory air pressure upper limit error	<3042>	
11	Flow meter counter count-up	<3043>	
12	Valve counter count-up	<3044>	
13	Base component: Mixing valve ON response error	<3045>	
14	Hardener: Mixing valve ON response error	<3046>	
15	Diluent: Mixing valve ON response error※1	<3047>	

### OUT 7-2

No.	Screen No.254		
	Name	Error code	Description
16	Base component: Mixing valve OFF response error	<3048>	<p>The error item that has occurred is issued individually. Turns off when reset.</p> <p>※1: Not used for ACW1200EX</p>
17	Hardener: Mixing valve OFF response error	<3049>	
18	Diluent: Mixing valve OFF response error※1	<3050>	
19	GOT system alarm (ACPU)	<3051>	
20	PM sensor	<3052>	
21	GOT system alarm (Main unit function 1)	<3053>	
22	Base component air pressure: Lower limit error	<3054>	
23	Hardener air pressure: Lower limit error	<3055>	
24	Device air pressure: Lower limit error	<3056>	
25	Factory air pressure: Lower limit error	<3057>	
26	Total thinner amount during color change: Lower limit	<3058>	
27	Eco cleaning: High-pressure detection	<3059>	
28	Eco cleaning error	<3060>	
29	Notification before pot life error	<3061>	
30	PM RPM (upper limit)	<3062>	
31	PM RPM (lower limit)	<3063>	

7-3-8 OUT 8

OUT 8-1

Screen No.255		
No.	Name	Description
0	Currently selected recipe No. ( 1)	The recipe No. currently selected is issued in binary signals.  (Ex.) When Recipe No. 3 is displayed on the screen No. 1 and 2 are issued simultaneously.
1	Currently selected recipe No. ( 2)	
2	Currently selected recipe No. ( 4)	
3	Currently selected recipe No. ( 8)	
4	Currently selected recipe No. ( 16)	
5	Currently selected recipe No. ( 32)	
6	Currently selected recipe No. ( 64)	
7	Currently selected recipe No. (128)	
8	Currently selected recipe No. (256)	
9	Currently selected recipe No. (512)	
10	※※※ Not used 491	
11	※※※ Not used 492	
12	※※※ Not used 493	
13	※※※ Not used 494	
14	※※※ Not used 495	
15	※※※ Not used 496	

OUT 8-2

Screen No.256		
No.	Name	Description
16	Instantaneous flow rate analog signal (D00)	Analog signal of the flow rate (discharge rate) is issued.  ※: Used for digital indicator, etc.
17	Instantaneous flow rate analog signal (D01)	
18	Instantaneous flow rate analog signal (D03)	
19	Instantaneous flow rate analog signal (D04)	
20	Instantaneous flow rate analog signal (D04)	
21	Instantaneous flow rate analog signal (D05)	
22	Instantaneous flow rate analog signal (D06)	
23	Instantaneous flow rate analog signal (D07)	
24	Instantaneous flow rate analog signal (D08)	
25	Instantaneous flow rate analog signal (D09)	
26	Instantaneous flow rate analog signal (D10)	
27	Instantaneous flow rate analog signal (D11)	
28	Instantaneous flow rate analog signal (D12)	
29	Instantaneous flow rate analog signal (D13)	
30	Instantaneous flow rate analog signal (D14)	
31	Instantaneous flow rate analog signal (D15)	

**7-3-9 OUT 9**

**OUT 9-1**

Screen No.257		
No.	Name	Description
0	OPS200 lamp color W	Not used for ACW1200EX
1	OPS200 lamp color A	
2	OPS200 lamp color B	
3	OPS200 lamp color C	
4	OPS200 lamp color D	
5	OPS200 lamp color E	
6	OPS200 lamp color F	
7	OPS200 lamp color G	
8	OPS200 lamp color H	
9	OPS200 lamp color I	
10	OPS200 lamp color J	
11	OPS200 lamp color K	
12	OPS200 lamp color L	
13	OPS200 lamp color M	
14	OPS200 lamp color N	
15	OPS200 lamp color O	

**OUT 9-2**

Screen No.258		
No.	Name	Description
16	OPS200 lamp color P	Not used for ACW1200EX
17	OPS200 lamp color Q	
18	OPS200 lamp color R	
19	OPS200 lamp color S	
20	OPS200 lamp color T	
21	OPS200 lamp color U	
22	AIR (OPS200)	
23	THIN (OPS200)	
24	DRAIN (OPS200)	
25	MANU (OPS200)	
26	AUTO (OPS200)	
27	COMM (OPS200)	
28	※※※ Not used 541	
29	※※※ Not used 542	
30	※※※ Not used 543	
31	※※※ Not used 544	

**7-3-10 OUT 10**

**OUT 10-1**

Screen No.259		
No.	Name	Description
0	Base component: Thinner valve	Not used for ACW1200EX
1	Base component: Air valve	
2	Base component: Flushing fluid valve	
3	Base component: Mixing valve	For controlling the base component mixing valve.
4	Base component: Drain valve	Not used for ACW1200EX
5	Hardener: Thinner valve	
6	Hardener air valve	
7	Hardener flushing fluid valve	
8	Hardener mixing valve	For controlling the hardener mixing valve.
9	Hardener drain valve	Not used for ACW1200EX
10	Diluent: Thinner valve	
11	Diluent: Air valve	
12	Diluent: Flushing fluid valve	
13	Diluent: Mixing valve	
14	Diluent: Drain valve	For controlling ACW1200EX air valve.
15	Route cleaning: Air valve	

**OUT 10-2**

Screen No.260		
No.	Name	Description
16	Route cleaning: Thinner valve	For controlling ACW1200EX thinner valve.
17	Route cleaning: Drain valve	For controlling ACW1200EX drain valve.
18	Route cleaning: Switching valve	Not used for ACW1200EX
19	Drain valve	
20	Route cleaning: Spray on request	For controlling the spray gun of the route cleaning system.
21	Color change complete	Issued for one second at the completion of color change.
22	Color change in process (flushing + filling)	Issued during the color change (flushing + filling) operation.
23	Flushing in process	Issued during the color change (flushing) operation.
24	Route cleaning in process	Issued during the route cleaning process of the route cleaning system.
25	C.C. general output W2	Reserved
26	C.C. general output W3	
27	C.C. general output W4	
28	C.C. general output W5	
29	C.C. general output W6	
30	C.C. general output W7	
31	C.C. general output W8	

7-3-11 OUT 11

OUT 11-1

Screen No.261		
No.	Name	Description
0	※※※ Not used 577	
1	※※※ Not used 578	
2	※※※ Not used 579	
3	※※※ Not used 580	
4	※※※ Not used 581	
5	※※※ Not used 582	
6	※※※ Not used 583	
7	※※※ Not used 584	
8	※※※ Not used 585	
9	※※※ Not used 586	
10	※※※ Not used 587	
11	※※※ Not used 588	
12	※※※ Not used 589	
13	※※※ Not used 590	
14	※※※ Not used 591	
15	※※※ Not used 592	

OUT 11-2

Screen No.262		
No.	Name	Description
16	Route cleaning: Drain valve 1	Not used for ACW1200EX
17	Route cleaning: Drain valve 2	
18	Route cleaning: Drain valve 3	
19	Route cleaning: Drain valve 4	
20	Gun No. 1: Flushing in process	
21	Gun No. 2: Flushing in process	
22	Gun No. 3: Flushing in process	
23	Gun No. 4: Flushing in process	
24	Gun No. 1: Filling in process	
25	Gun No. 2: Filling in process	
26	Gun No. 3: Filling in process	
27	Gun No. 4: Filling in process	
28	※※※ Not used 605	
29	※※※ Not used 606	
30	※※※ Not used 607	
31	※※※ Not used 608	

7-3-12 OUT 12

OUT 12-1

Screen No.263		
No.	Name	Description
0	Mixture ratio code back: Base component 0.1	The base component ratio is issued in binary signals after the mixture ratio change code is entered in IN5.
1	Mixture ratio code back: Base component 0.2	
2	Mixture ratio code back: Base component 0.4	
3	Mixture ratio code back: Base component 0.8	
4	Mixture ratio code back: Base component 1.6	
5	Mixture ratio code back: Base component 3.2	
6	Mixture ratio code back: Base component 6.4	
7	Mixture ratio code back: Base component 12.8	
8	Mixture ratio code back: Hardener 0.1	The hardener ratio is issued in binary signals after the mixture ratio change code is entered in IN5.
9	Mixture ratio code back: Hardener 0.2	
10	Mixture ratio code back: Hardener 0.4	
11	Mixture ratio code back: Hardener 0.8	
12	Mixture ratio code back: Hardener 1.6	
13	Mixture ratio code back: Hardener 3.2	
14	Mixture ratio code back: Hardener 6.4	
15	Mixture ratio code back: Hardener 12.8	

OUT 12-2

Screen No.264		
No.	Name	Description
16	Mixture ratio code back: Diluent 0.1	Not used for ACW1200EX
17	Mixture ratio code back: Diluent 0.2	
18	Mixture ratio code back: Diluent 0.4	
19	Mixture ratio code back: Diluent 0.8	
20	Mixture ratio code back: Diluent 1.6	
21	Mixture ratio code back: Diluent 3.2	
22	Mixture ratio code back: Diluent 6.4	
23	Mixture ratio code back: Diluent 12.8	
24	Mixture ratio code back: Color No. (bit 1)	The changed color No. is issued in binary signals after the mixture ratio change code is entered in IN5. Bit 0 (no output) for "0 (W)".
25	Mixture ratio code back: Color No. (bit 2)	
26	Mixture ratio code back: Color No. (bit 4)	
27	Mixture ratio code back: Color No. (bit 8)	
28	Mixture ratio code back: Color No. (bit 16)	
29	※※※ Not used ※※※	
30	Mixture ratio code back: Mixture ratio range OK	Issued if the mixture ratio is within the input range after IN5 No.31 is entered.
31	Mixture ratio code back: Writing reception	Issued after IN5 No.31 is entered.

**7-3-13 OUT 13**

**OUT 13-1**

Screen No.263		
No.	Name	Description
0	DA output CH1	Not used for ACW1200EX
1	DA output CH1	
2	DA output CH1	
3	DA output CH1	
4	DA output CH1	
5	DA output CH1	
6	DA output CH1	
7	DA output CH1	
8	DA output CH1	
9	DA output CH1	
10	DA output CH1	
11	DA output CH1	
12	DA output CH1	
13	DA output CH1	
14	DA output CH1	
15	DA output CH1	

**OUT 13-2**

Screen No.264		
No.	Name	Description
16	DA output CH2	Not used for ACW1200EX
17	DA output CH2	
18	DA output CH2	
19	DA output CH2	
20	DA output CH2	
21	DA output CH2	
22	DA output CH2	
23	DA output CH2	
24	DA output CH2	
25	DA output CH2	
26	DA output CH2	
27	DA output CH2	
28	DA output CH2	
29	DA output CH2	
30	DA output CH2	
31	DA output CH2	

**7-3-14 OUT 14**

**OUT 14-1**

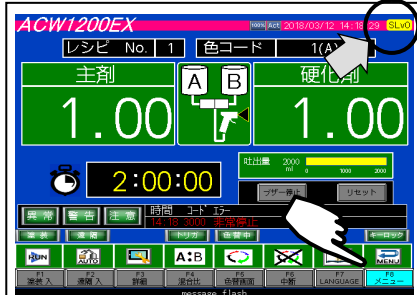
Screen No.263		
No.	Name	Description
0	DA output CH3	Not used for ACW1200EX
1	DA output CH3	
2	DA output CH3	
3	DA output CH3	
4	DA output CH3	
5	DA output CH3	
6	DA output CH3	
7	DA output CH3	
8	DA output CH3	
9	DA output CH3	
10	DA output CH3	
11	DA output CH3	
12	DA output CH3	
13	DA output CH3	
14	DA output CH3	
15	DA output CH3	

**OUT 14-2**

Screen No.264		
No.	Name	Description
16	DA output CH4	Not used for ACW1200EX
17	DA output CH4	
18	DA output CH4	
19	DA output CH4	
20	DA output CH4	
21	DA output CH4	
22	DA output CH4	
23	DA output CH4	
24	DA output CH4	
25	DA output CH4	
26	DA output CH4	
27	DA output CH4	
28	DA output CH4	
29	DA output CH4	
30	DA output CH4	
31	DA output CH4	

The test mode of the ACW controller is used when forcibly operating the output on the ACW controller display and checking the solenoid valve operation (valve operation) and communication signals.

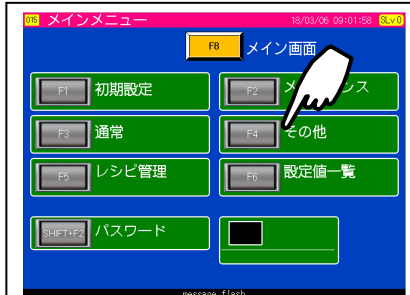
### 8-1 Switching to the test mode (SLv3)



(1) Main

Check SLv0.

Press **F8**.



(2) Main menu

<Screen No.015>

Press **F4**.



(3) Other menu

<Screen No.280>

Press **F1**.



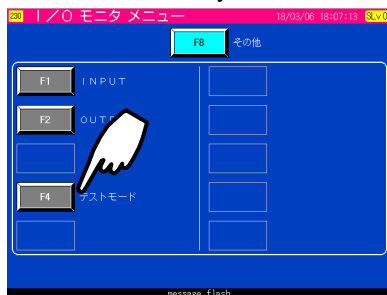
(4) I/O monitor menu

<Screen No.230>

Refer to [ACW controller: Basic operations] in the Operation Manual.

### 8-2 Test mode conditions

Ordinary state



Test mode state



- (1) Turn off the "Paint" lamp (coating mode "OFF").
- (2) Set the security level to SLv3. Refer to [Changing security levels] in the Operation Manual.
- (3) Press **F4** "TEST MODE" on the "I/O monitor menu" screen. The "Test mode" indication changes to "Test mode in process" and flashes. "Test mode in process" flashes also on the "IN" and "OUT" screens.  
Refer to [7 Inputs/Outputs].
- (4) To cancel the test mode, press **F4** "TEST MODE" on the "I/O monitor menu" screen.  
Or press **F8** "MAIN MENU" on the "I/O monitor menu" screen to go back to the main screen.

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 attributable to the factors within the Company’s responsibility.
  
- In the following cases, our 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】

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- When transferring this machine to another owner, attach the instruction manual to the machine.
  - This machine has been manufactured according to the laws and legislations of Japan and may only be used in Japan.

When using the machine in another country, it is necessary to observe the safety standards in that country.

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Leading Manufacturer of Coating FA Systems

**ASAHI SUNAC CORPORATION**

Head office & Factory: 5050 Asahimae-cho, Owariasahi, Aichi 488-8688 Japan

TEL 81-561-52-0717 FAX 81-561-54-8847

e-mail: [ctrd01@sunac.co.jp](mailto:ctrd01@sunac.co.jp)

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