ASAHI SUNAC

Operation and Maintenance Manual

Power Mixer

PWM-S
PWM-L

Ec'Coater™ エコーター

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

3rd Edition, July 12, 2022

Introduction

Thank you very much for buying our product, the Power Mixer <PWM-S/L>.

Before you use the equipment, carefully read this manual and get to know how to use it safely, efficiently and effectively. Please pay particular attention to major specifications, warnings and precautions, including prohibited items. Use the equipment appropriately and with care, following the instructions. We hope that by doing so you win benefit from use of the product over a long period of time.

The painting equipment in this manual is for professional use only, calling for a qualified person to operate. Use of the equipment should, therefore, be limited to those who have acquired operation and application skills through an authorized training course.

Should you have any questions with regard to the manual, please give us the “Model Name” and “Serial Number” of your equipment, so that we may be able help you with your questions. You can reach us at any of the addresses, phone numbers and fax numbers shown on the back cover.

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1 For Your Safety

Please read and understand this manual. Always follow the instructions in it.
Failure to do so may result in **personal injury and/or property damage**.

While all the safety precautions in the manual are very important, you should not consider them to be as cure-all. They are nothing but minimum requirements. You may need some other types of safety precautions: in fact, you must strictly observe the governmental laws and regulations or in-house rules.

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

● **Safety precautions are classified into three categories based on the severity of hazards involved.**

⚠ **WARNING**	Alerts a hazardous situation which may result in personal injury, along with hazard avoidance measures.
⚠ **CAUTION**	Alerts a hazardous situation which may result in equipment damage or breakage, along with hazard avoidance measures.
NOTE	Indicates important methods and practical information.

* Safety precautions classified into the CAUTION category could cause personal injury if not properly followed.
To ensure safety and prevent equipment failure, always observe the safety precautions and follow the hazard avoidance measures in any categories.

⚠ WARNING

For correct use of the product

- The paint type, coating conditions and place of installation shall conform to specifications.
- Primary power and air supplies shall conform to specifications to prevent equipment failures, damage, malfunctions, electric shocks and fires.
- Do not wet the tacho sensor connector with any liquid (e.g. water, alcohol or solvent).
  Doing so may lead to equipment failures, damage, malfunctions, electrical shocks and/or fires.
- Never use any acid or corrosive material or halogenated hydrocarbon solvent.
- If you have any doubt about the intended use of the product or the paint to be used, please consult us.
- The use under conditions other than specified above is always considered misuse unless specially approved by us and may lead to an unexpected accident.

<<General safety notes>>

- Never apply fluid or air pressures exceeding the maximum limit during coating operations.
  In addition, all other components and accessories of the equipment shall withstand the maximum operating pressure specified above.
- The Power Mixer requires class D or superior grounding work (contact resistance not exceeding 100Ω).
- Check the whole equipment every day. If any problem is found, shut off the power supply to the explosion-proof barrier for sensors, reduce the air and paint pressures supplied to the Power Mixer to zero and repair or replace faulty parts within the specified scope of maintenance.
  If the problem is out of the specified scope of maintenance, please ask the nearest distributor or us for repair.
- For safety, all operators shall read and understand this manual and labels on the Power Mixer and receive appropriate training before working with the Power Mixer.
- Also comply with national and local regulations for fire prevention and electrical safety.

⚠ WARNING

Possibilities of fire, explosion and electric shock

<<Sources of ignition>>

Static electricity is generated when the paint or solvent runs through the Power Mixer. Unless the Power Mixer is appropriately grounded, static electricity may cause sparks. Those sparks may ignite combustible, volatile components of the solvent, sprayed paint mist, suspending debris and other combustible substances, possibly resulting in serious injury or damage to the equipment.

- Never fail to check that the Power Mixer has been correctly grounded.
- An extinguisher with a sufficient capacity must be provided in the area where spraying operations are performed.
- When inspecting the Power Mixer, always shut off the power supply to the explosion-proof barrier for sensors and reduce the air and paint pressures supplied to the Power Mixer to zero.
- Do not wet the tacho sensor connector with any liquid (e.g. water, alcohol or solvent).
  Doing so may lead to equipment failures, damage, malfunctions, electrical shocks and/or fires.

<<Grounding>>

The Power Mixer requires class D or superior grounding work (contact resistance not exceeding 100Ω).

To prevent hazards from static electricity, completely ground the pump, products to be coated, and all other coating machines (in use or in the vicinity of those in use). If there is no proper ground, ground them according to the methods specified by the technical standards for electric equipment (class D grounding).

- Connect the free end of the grounding wire connected to the grounding terminal on the Power Mixer to a class D grounding object.
  It shall be firmly connected so that it will not come off.
- When the Power Mixer is removed once and installed again, never fail to check the electric resistance at the Power Mixer and the grounding terminal. When the electric resistance meter reads a value exceeding 100Ω, paint may be sticking to the grounding terminal. Clean the Power Mixer to remove sticking paint.

<<Safe cleaning>>

- Before cleaning, check that the Power Mixer and paint and solvent cans have been correctly grounded.
- Thoroughly ventilate the work area to avoid accumulating combustible atmospheres (solvent vapors).

⚠ WARNING

Hazards of toxic substances

<<Solvents>>

Never use halogenated hydrocarbon solvents.

A halogenated hydrocarbon-based solvent may explode if brought into contact with an aluminum or plated part in a pressure vessel (e.g. pump, filter, valve or spray gun).
This explosion possibly results in fatal injury.

<<Examples of halogenated hydrocarbon solvents>>

Chlorines	Trichloroethylene, Tetrachloroethylene and Ethylene chloride
Bromines	n-Propyl Bromide
Carbon-fluorines	HCFC-225, HFC-43-10mee and HFE-449s1 (HFE-7100)

Shown above are typical examples and there are, of course, other kinds of halogenated hydrocarbon solvents in the marketplace. Please check with your paint vendor or manufacture for detail.

<<Effects on the human health>>

If your eyes or mouth is exposed to or you inhale or swallow a solvent vapor or splashes of a liquid solvent, toxic substances will enter your body to destroy your nerve system, possibly resulting in a serious situation, e.g. lifetime functional disorders.
Immediately receive adequate treatment.

Necessity of treatment

Do not undergo home treatment but immediately see a medical specialist such as orthopedist.
It is necessary at this time to notify him or her of the correct type of the paint used.

- The paint mist or sprayed atmosphere may cause dyspnea or organic solvent poisoning. Do not use the product in a room, tunnel, tank or other poorly ventilated place. Take enough care of not only yourself but also the surrounding people and domestic animals.
- Isocyanate, which is used for two-component paints, may inflame nasal and throat mucus.
  In addition, the paint, curing agent, solvent and other volatile substances shall be used with a full understanding of their properties.
  Please consult the paint or solvent manufacture for further information.
- When performing a spraying operation, always wear the safety goggles, working clothes and face mask recommended by the paint and solvent manufacturers. Special protective devices may also be required depending on the paint type or ventilation. Please consult the paint and solvent manufacturers.

⚠ WARNING

Hazards of pressures

<<Safety of hoses>>

- Hoses shall be handled with care. Ensure that hoses will not be caught, tensed or brought into contact with sharp edges and consequently damaged.
- Hoses shall not be bent or collapsed. When a hose is bent or collapsed, pressure will be concentrated to damage the hose. Paint will spout out of damaged part of the hose to impose a possibility of danger.
- Do not expose hoses to temperatures of 50°C or higher, or -20°C or lower. Doing so may lead to hose damage.
- Tighten hose joints and paint circuit connectors each time you use the Power Mixer. Especially, connections around a moving hose or such must be firmly tightened. Insufficient tightening is dangerous because it may allow paint to spout out.
- Do not pull the Power Mixer using a hose. Doing so may lead to hose damage.
- Never use damaged hoses. Check each hose from the one end to the other for cuts, leakage, wearing, swelling, damage and loose fittings. If any of those problems is found, immediately replace the hose with a new one.

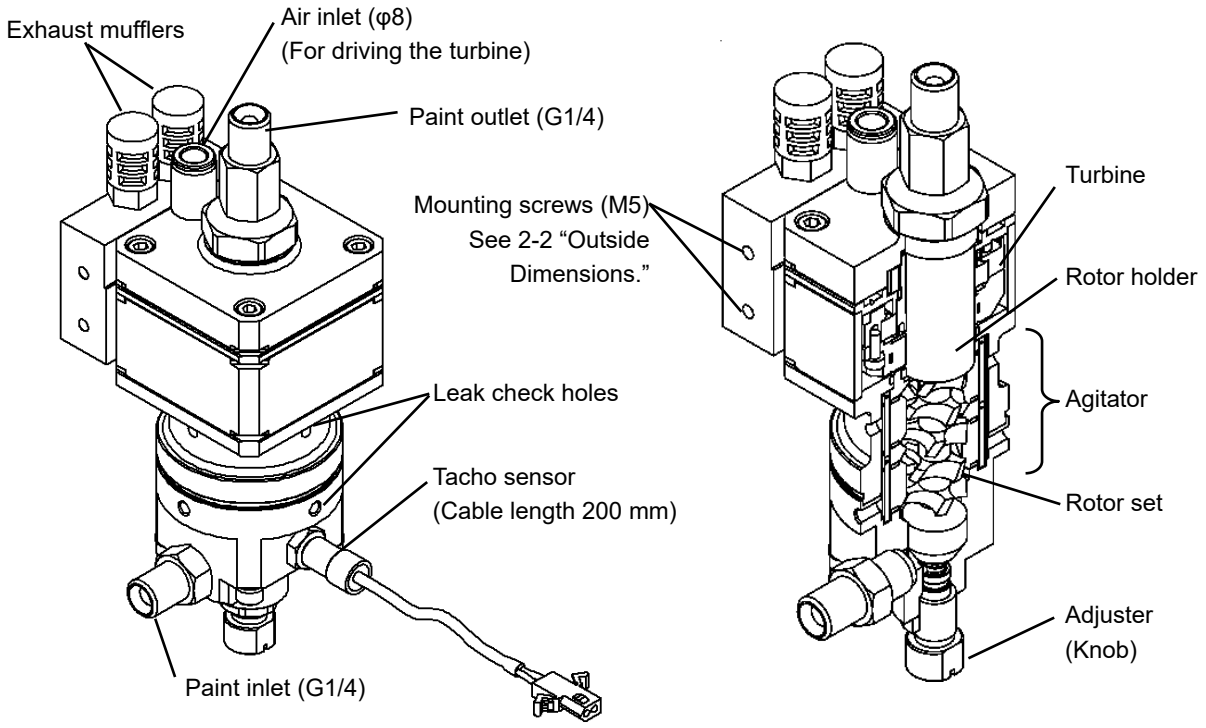
<<Danger of the misuse of the Power Mixer>>

- Reduce the air and paint pressures to zero before inspecting the Power Mixer.
- Do not move the Power Mixer with pressurized state. Damage to the paint circuit may allow paint to spout out, resulting in personal injury.
- Never apply fluid or air pressures exceeding the maximum limit during coating operations. In addition, all other components and accessories of the equipment shall withstand the maximum operating pressure specified above.

2 Equipment Overview

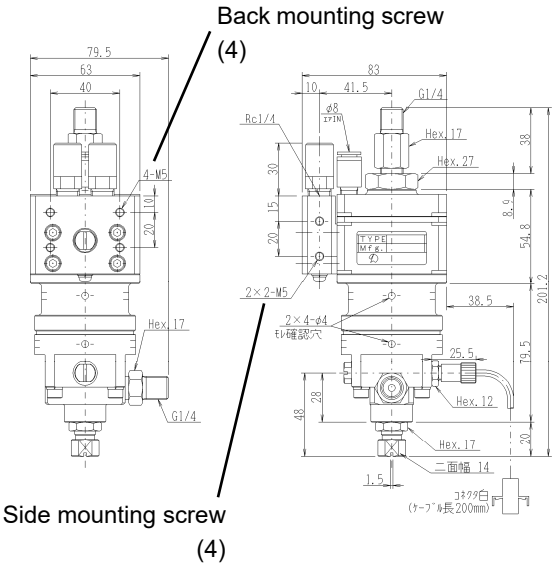
2-1 Outlines

The Power Mixer transmits rotational forces from a built-in, air-driven turbine to a rotor set in the paint circuit, which is separated by a rotor holder, with the use of magnetism. The rotor set has mixing blades, which rotate to mix a paint.

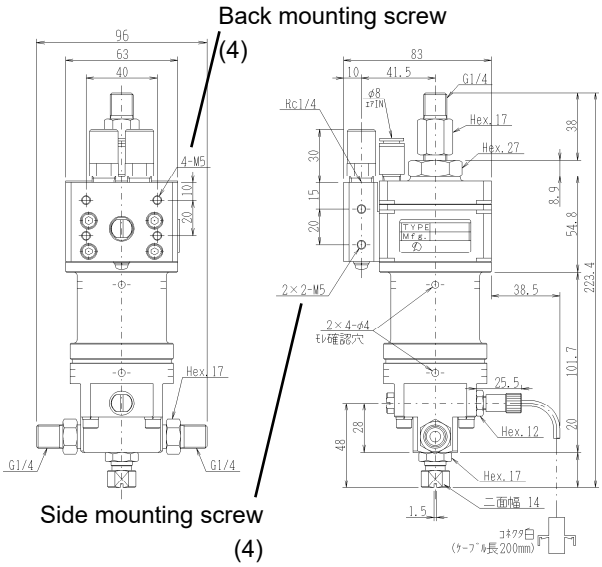


2-2 Outside Dimensions

Typical outside dimensions are shown below. Install using a bracket (separately prepared), which shall be screw-connected at mounting screw holes.



<Model PWM-S1B, PN 4401>

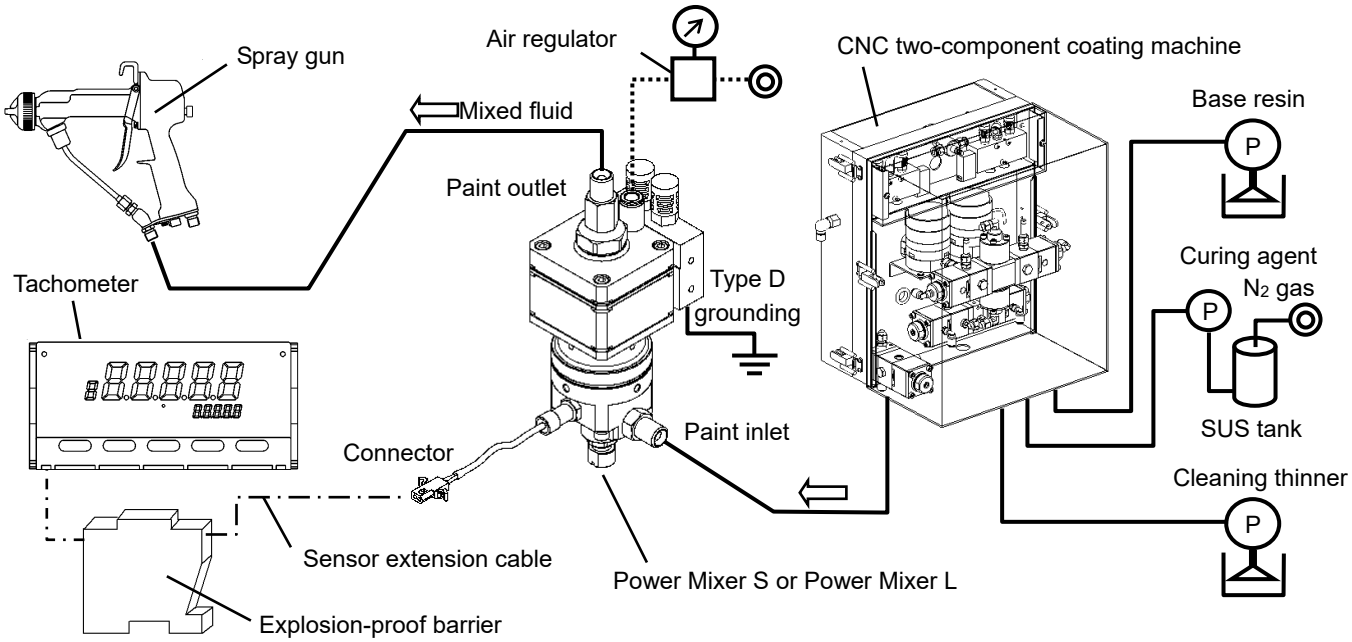


<Model PWM-L2B, PN 4402-2>

2-3 Examples of Coating Machine Composition

2-3-1 Power Mixer S and Power Mixer L <PN 4401/4402>

Install between the mixing unit and the spray gun, in the same position as with the Static Mixer with mixing hose.



⚠ WARNING

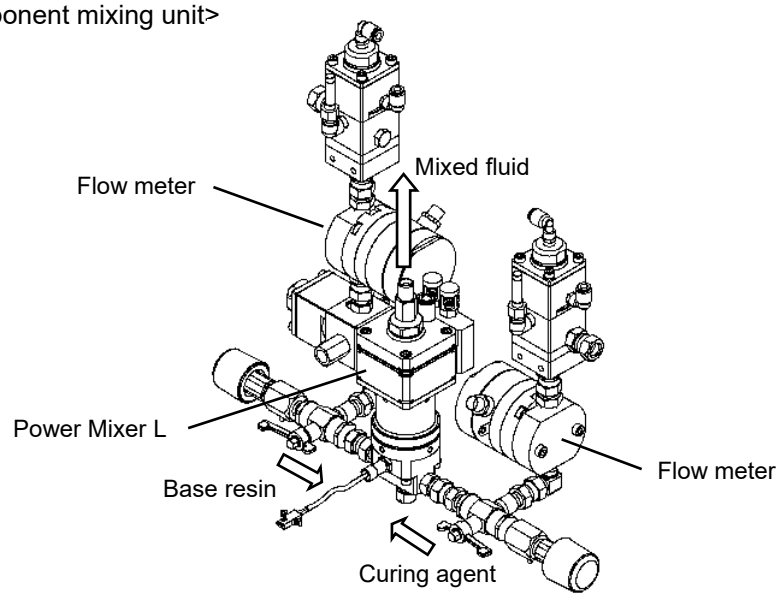
There is a possibility of fire or electric shock.

- **Do not wet the tacho sensor connector with any liquid (e.g. water, alcohol or solvent).**
  When connecting the extension cable, protect the connector from contact with solvent vapors.
- **Firmly connect the body of the Power Mixer to a class D grounding object using the attached grounding wire.**

2-3-2 Power Mixer L <PN 4402-2>

For mixing a soluble or another special paint, install it at the point where the base resin and curing agent are mixed together.

Figure below is an example of installation of a CNC two-component coating machine, <ACW4200 standard two-component mixing unit>



2-4 As-Installed Condition and Angle

The rotor set built in the Power Mixer is hollow and rotates around the central axis when receiving a rotational force. The Power Mixer shall be installed in the vertical position with the central axis at 90° with horizontal as shown in Figure 1 (vertical installation). The maximum permissible inclination angle is 45°. (See Figure 4.)

Installing the equipment in upside down as shown in Figure 2 leads to insufficient agitation effect, due to unstable rotation and deteriorate agitation performance.

Installing the Power Mixer in the horizontal position as shown in Figure 3 (horizontal installation) may lead to unstable rotation during the cleaning process with air/thinner purge. When inevitably installing the Power Mixer in the horizontal position, a control shall be provided for turbine rotation speed feedback.

See 4-2-3 “Recommendation for Rotation Speed Feedback.”

Especially when the Power Mixer is not filled with fluid, the rotor set does not stably rotate and may stop due to internal interference with its blades. Do not use the Power Mixer with air included or as empty.

In addition, if it is installed in the horizontal position, internal cleaning fluid cannot be fully drained and will flow into the turbine, resulting in an operation failure, when removing the rotor set during the overhauling work. In this case, remove the Power Mixer from the place of installation before overhauling.

See 7-2 “Rotor Set Removal Procedure.”

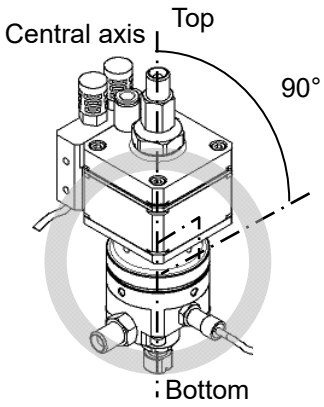
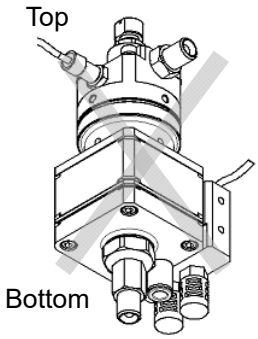
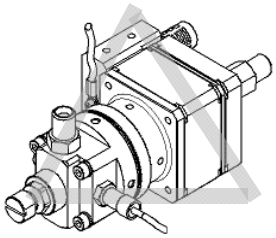


Figure 1: Vertical Installation



Not acceptable

Figure 2: Upside down



- Caution is required when overhauling.
- The rotating speed changes significantly.
- The rotation stops under certain conditions.

Figure 3: Horizontal Installation

When installed on a robot arm, the Power Mixer may be inclined within 45° from vertical as shown in Figure 4 to allow for range of the robot motion.

See 4-2-4 “Installing the Power Mixer on a Movable Machine (Robot).”

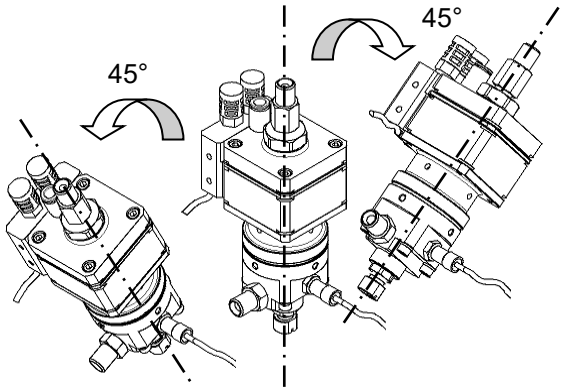


Figure 4: Within 45° of motion range

3 Specifications

3-1 Model Coding Format

Model: PWM- □ □ **B**

Number of inlet ports; 1 for a single port or 2 for double ports (check

Internal volume; S for 20 ml or L for 28 ml

3-2 Models and Specifications

Name	Power Mixer S	Power Mixer L	
Model	PWM-S1B	PWM-L1B	PWM-L2B
Parts No.	4401	4402	4402-2
Internal volume	20 ml	28 ml	
Number of inlet ports	1 (For installation between mixing unit and gun)		2 (check valve type)
Acceptable viscosity range	25 to 300 mPa•s		
Rotating speed	1000 to 3000 rpm		
Fluid pressure	0.7 MPa max.		
Operating air pressure	See Figure 1 in 3-6 “Relationship Among the Rotating Speed, Air Pressure (Flow Rate) and Paint Viscosity.”		
Air consumption	See Figure 3 in 3-6 “Relationship Among the Rotating Speed, Air Pressure (Flow Rate) and Paint Viscosity.”		
Fluid inlet diameter	G1/4 (PF1/4)		
Fluid outlet diameter	G1/4 (PF1/4)		
Operating air port diameter	Outside diameter φ8		
Outside dimensions	H201 × W83 × D121 mm	H223 × W83 × D121 mm	H223 × W96 × D121 mm
Mass	1.65 kg	1.75 kg	
Operating conditions	0°C to +40°C, 10 to 80%RH		

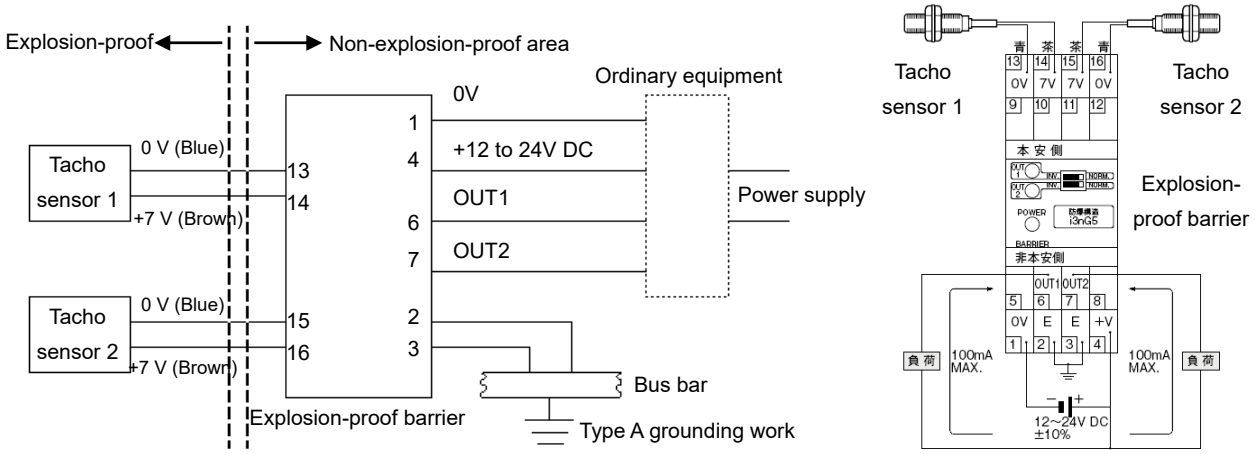
3-3 Explosion-proof barrier (Separately offered) The explosion-proof barrier is not included to the Power Mixer. It is separately required.

Name	Explosion-proof barrier <PN 467-0018>
Intrinsic safety construction:	i3nG5
Place of installation:	Non-explosion-proof area
Supply voltage:	12 to 24V DC+/-10%
Consumption current:	30 mA
Power supply for sensor:	7V DC, 4 mA
Mass:	130 g
Operating conditions:	-20°C to +50°C (no condensation or freezing allowed), 35 to 85%RH

3-4 Explosion-proof Barrier Circuit Diagram

The explosion-proof barrier is not included to the Power Mixer. For detail, see specifications and drawings for the control panel used with the explosion-proof barrier. This section may only be used as a guide.

A single explosion-proof barrier supports two tacho sensors (explosion-proof) and, therefore, may be used for up to two Power Mixer units.



(1) The grounding terminal on each safety protector shall be connected to a bus bar independently grounded with a class A ground.

(2) The external wire between the detector and the safety protector shall be 50 m or shorter and protected from damage and induction. The inductance shall be 10 mH or lower and the capacitance 1 μF or lower.

(3) The input voltage to the ordinary equipment and the equipment internal voltage shall not exceed 250 VAC or VDC, 50/60 Hz to ground, whether in usual or unusual condition.

(4) The ambient operating temperature shall be -25°C to +60°C for detectors or -20°C to +50°C for safety protectors.

(5) Each detector installed in an explosion-proof area may be connected to one or two safety protectors.

(6) Safety protectors shall be contained in a totally enclosed instrument cluster or such.

3-5 Separately Required Part

Separately required: (1) Tacometer

(2) Sensor extension cable (installed on-site)

(3) Explosion-proof barrier <PN 467-0018>

3-6 Relationship Among the Rotating Speed, Air Pressure (Flow Rate) and Paint Viscosity

The load applied to the rotor changes with the paint viscosity to affect the relationship between the rotating speed and the operating air pressure.

The graph shows the latest data obtained at the air inlet (φ8) on the Power Mixer. Lengthening the turbine driving air hose reduces the air flow and rotating speed. This problem may be solved by increasing the hose diameter to the next upper one.

* The rotating speed is not significantly affected by the delivery rate but depends on the paint viscosity.

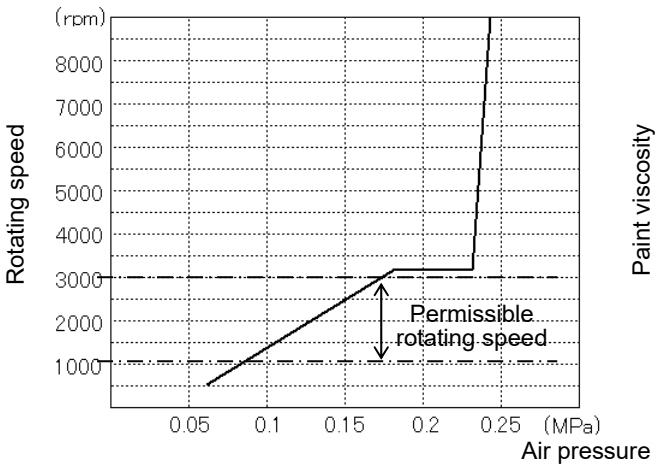


Figure 1: Operating Air Pressure vs Rotating Speed
(At paint viscosity of 20 mPa•s)

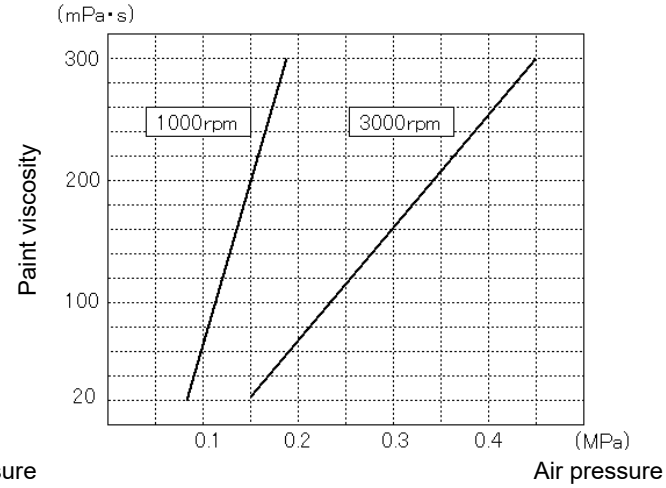


Figure 2: Operating Air Pressure vs Paint Viscosity

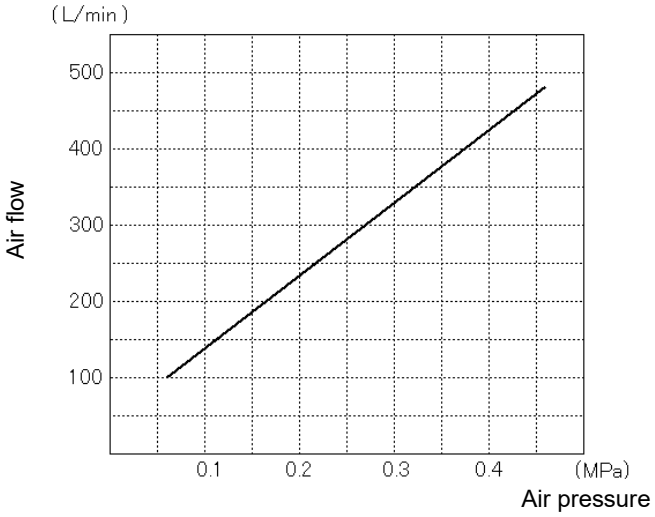


Figure 3: Operating Air Pressure vs Air Flow

⚠ CAUTION

A failure may result.

- **Rotating speeds exceeding 5,000 rpm may lead to earlier bearing wear and/or seizure. Use the Power Mixer at 3,000 rpm or lower.**
- **The rotating speed may rapidly increase when a certain pressure is reached. With the air pressure preset to 0.2 to 0.25 MPa for paint mixing, the rotating speed rises (5,000 rpm or more) during the cleaning process. Adjust the turbine driving air pressure when cleaning or filling paint thinner.**

4 Adjustment and Rotating Speed Control

4-1 Adjustment of the Power Mixer

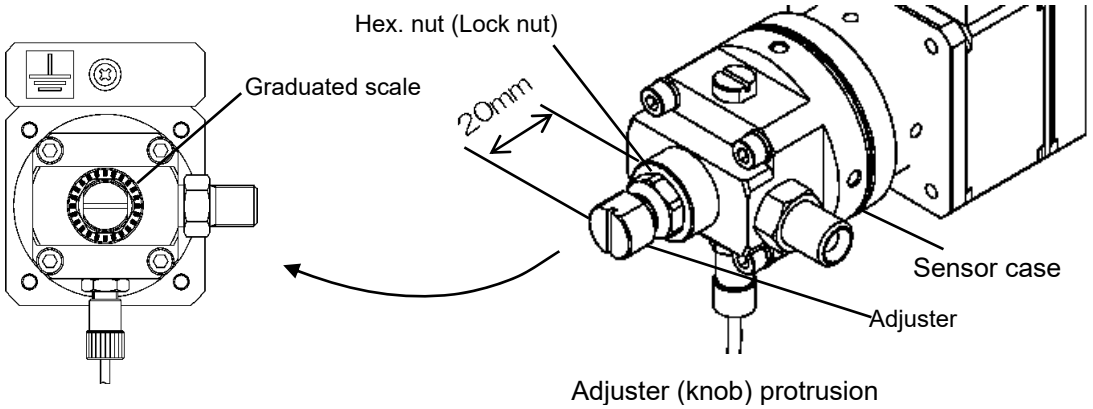
The rotational load on the Power Mixer can be adjusted with the adjuster (knob). When the rotating speed varies, turn the adjuster in the direction to loosen.

The adjuster shall be fully tightened by hand and then loosened by 180°. (Turn counterclockwise by 180°.)

(1) After extended use, the rotor head wears out to increase the gap from the adjuster, which supports the rotor. Then, the gap shall be reduced by tightening the adjuster by 15° to 45°.

(2) Remove or loosen the adjuster before disassembly. At the end of reassembly, the adjuster must be fully tightened by hand and then loosened by 180°. (Turn counterclockwise by 180°.)

(3) Never fail to firmly tighten the hexagon lock nut for (Hex 17 mm) with a wrench.



Adjuster (knob) protrusion

⚠ WARNING

Dyspnea or solvent poisoning may occur.

- **When working, wear an organic solvent mask, safety goggles and protective clothes.**

⚠ CAUTION

A malfunction (rotor not rotating) may result.

- **Tightening the adjuster so far prevents the rotor from rotating. The adjuster shall be loosened by 180° (around the above specified dimensions) after fully tightened. <The scale on the sensor case is graduated every 15°.>**
- **Loosening the adjuster so far leads to unstable rotation. Loosening so far brings the rotor head periphery (behind the end ball) into contact with the adjuster, resulting in unstable rotation.**
- **The rotor may be deformed or damaged when reassembled after disassembly. Never fail to loosen the adjuster before the overhauling work and, at the end of reassembly, tighten and adjust the adjuster.**

4-2 Rotation Speed Control

The rotating speed changes with the paint viscosity or when purging with dry air/paint thinner or filling paint thinner.

Examples of rotation speed control are given below. See 3-6 “Relationship Among the Rotating Speed, Air Pressure (Flow Rate) and Paint Viscosity.”

4-2-1 Control during the Cleaning Process or When Filling Paint Thinner

(1) During the cleaning process with air/thinner purge cycles, the Power Mixer becomes empty and the rotating speed may rapidly rise. At this time, a control is required to override the upper limit of rotating speed during the cleaning process. The lower limit of rotating speed shall be kept effective.

(2) When mixing a paint at a rotating speed between 1,000 and 1,500 rpm, filling cleaning thinner reduces the viscous drag to the rotor set to prevent it from rotating about the axis and possibly decrease the rotating speed.
In this case, raise the air pressure when filling paint thinner.

(3) When mixing a viscous paint at a rotating speed above 2,000 rpm, filling cleaning thinner significantly reduces the viscous drag to possibly increase the rotating speed.
In this case, reduce the air pressure when filling cleaning thinner.

(4) The tachometer shall be set up according to the manual provided by the manufacturer.

4-2-2 Rotation Speed Control at a Constant Air Pressure

When controlling the rotating speed with the air pressure fixed with a manual air pressure regulator or such, the rotating speed changes with the paint viscosity or when purging with dry air/paint thinner or filling paint thinner.

(1) It is difficult to control the rotating speed between 500 and 1,000 rpm with the air pressure (flow rate) fixed.
The minimum controllable speed will be 1,000 to 1,500 rpm.

(2) When cleaning or filling paint thinner, manually adjust the air pressure (flow rate) as described in 4-2-1.

See 4-2-1 “Control during the Cleaning Process or When Filling Paint Thinner.”

4-2-3 Recommendation for Rotation Speed Feedback control

A system design is recommended to perform feedback control of the rotating speed for the Power Mixer according to the situation and incorporate an air pressure or flow rate regulator (e.g. electropneumatic regulator).

Depending on the paint viscosity and coating equipment, it is possible to include the 500 to 1,000 rpm range in the controllable width with feedback control. (It may not be possible for some paint types, coating or equipment conditions.)

See 2-4 “As-Installed Condition and Angle.”

4-2-4 Installing the Power Mixer on a Movable Machine (Robot)

When installed on a robot arm, the rotating speed of the Power Mixer changes by up to 200 rpm with the inclination angle or gravitational acceleration during robot movement. In this case, a control is required to have a wider controllable rotating speed width and a longer sampling time for detection of limit rotating speeds.

See 2-4 “As-Installed Condition and Angle.”

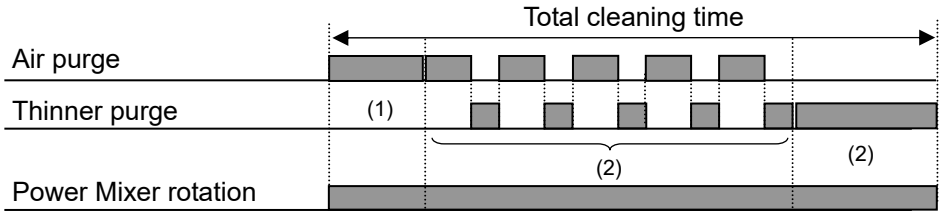
5 Cleaning Sequences

The rotor built in the Power Mixer rotates at a higher speed and, therefore, the Power Mixer can be more effectively cleaned by filling cleaning thinner for a while and causing a swirling or turbulent flow than by repeating normal air/thinner purge cycles.

5-1 Normal Cleaning Sequence

The Power Mixer is larger in inside diameter than the paint hose, which means that cleaning speed by an air purge will slow down.

It may take time to clean the inside of the Power Mixer by repeating short air/thinner purge cycles.

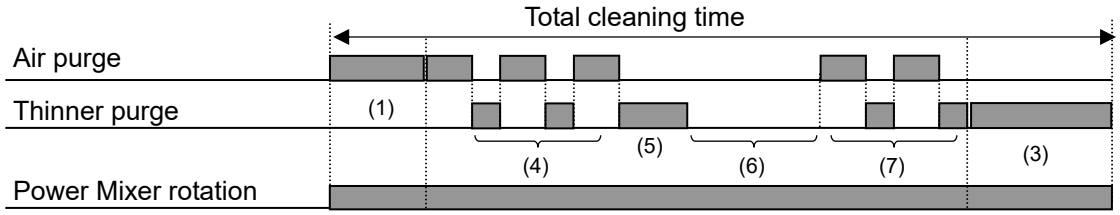


(1) Push internal mixed paint out. (Initial air purge time)

(2) Clean the paint circuit. (Air purge time, thinner purge time and number of repeats)

(3) Filling cleaning fluid. (Filling time)

5-2 Effective Cleaning Sequence for the Power Mixer



(4) Clean the paint circuit. (Air purge time, thinner purge time and number of repeats)
Repeat air/thinner purge cycles several times.

(5) Filling cleaning fluid.
Preset the time to fill-up the Power Mixer with cleaning fluid.

(6) Stop cleaning cycles (for 20 to 30 seconds).
Rotate the Power Mixer as filled with paint thinner to clean the inside of it.

(7) Clean the paint circuit. (Air purge time, thinner purge time and number of repeats)
Clean the whole circuit including the paint hose with the normal cleaning sequence.

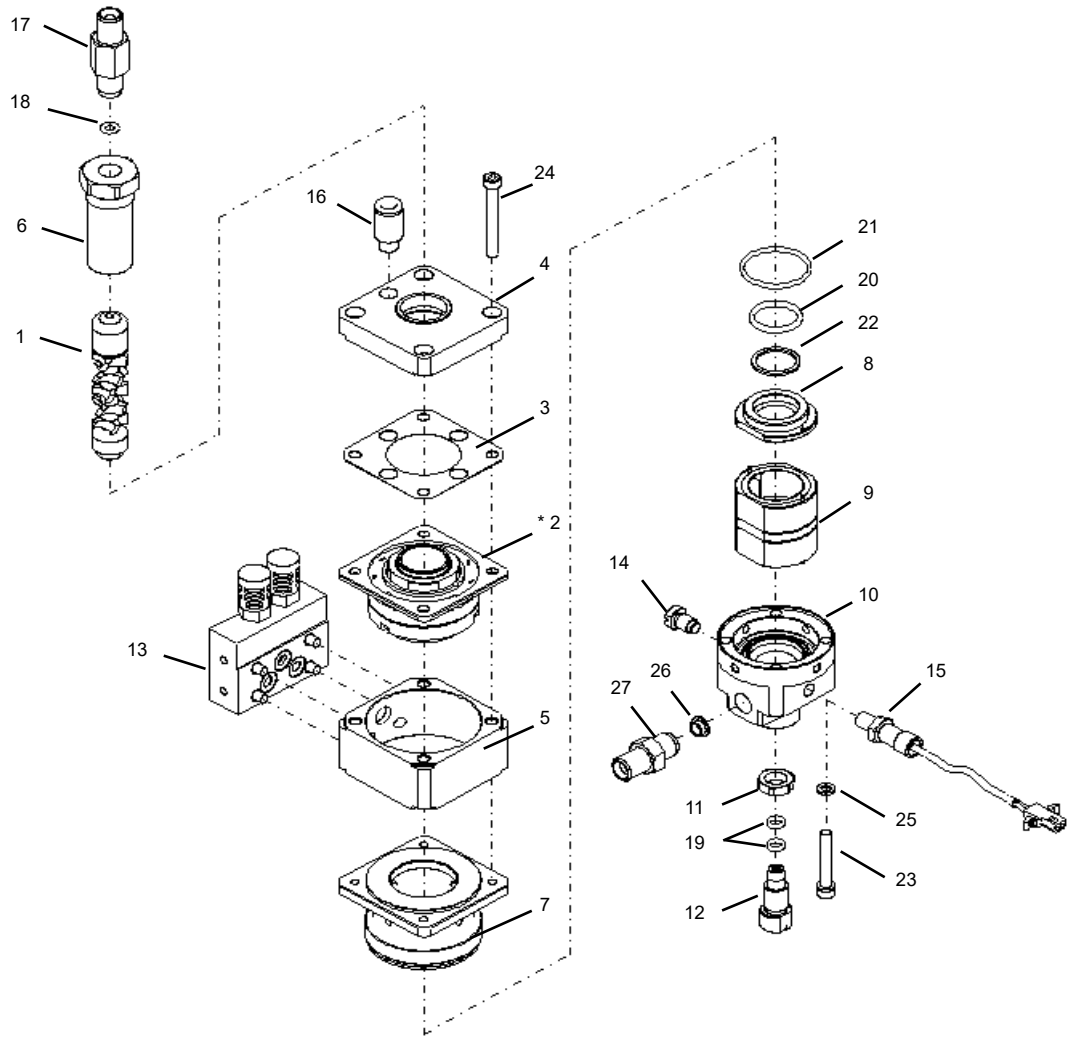
⚠ CAUTION

A rotation or operation failure may result.

- **Immersing the bearing, which is built in the turbine, in solvent removes grease, may prevent the rotation. Do not immerse the whole body or bearing of the Power Mixer in solvent.**

6 Exploded Views

6-1 Power Mixer S, Model PWM-S1B <PN 4401>

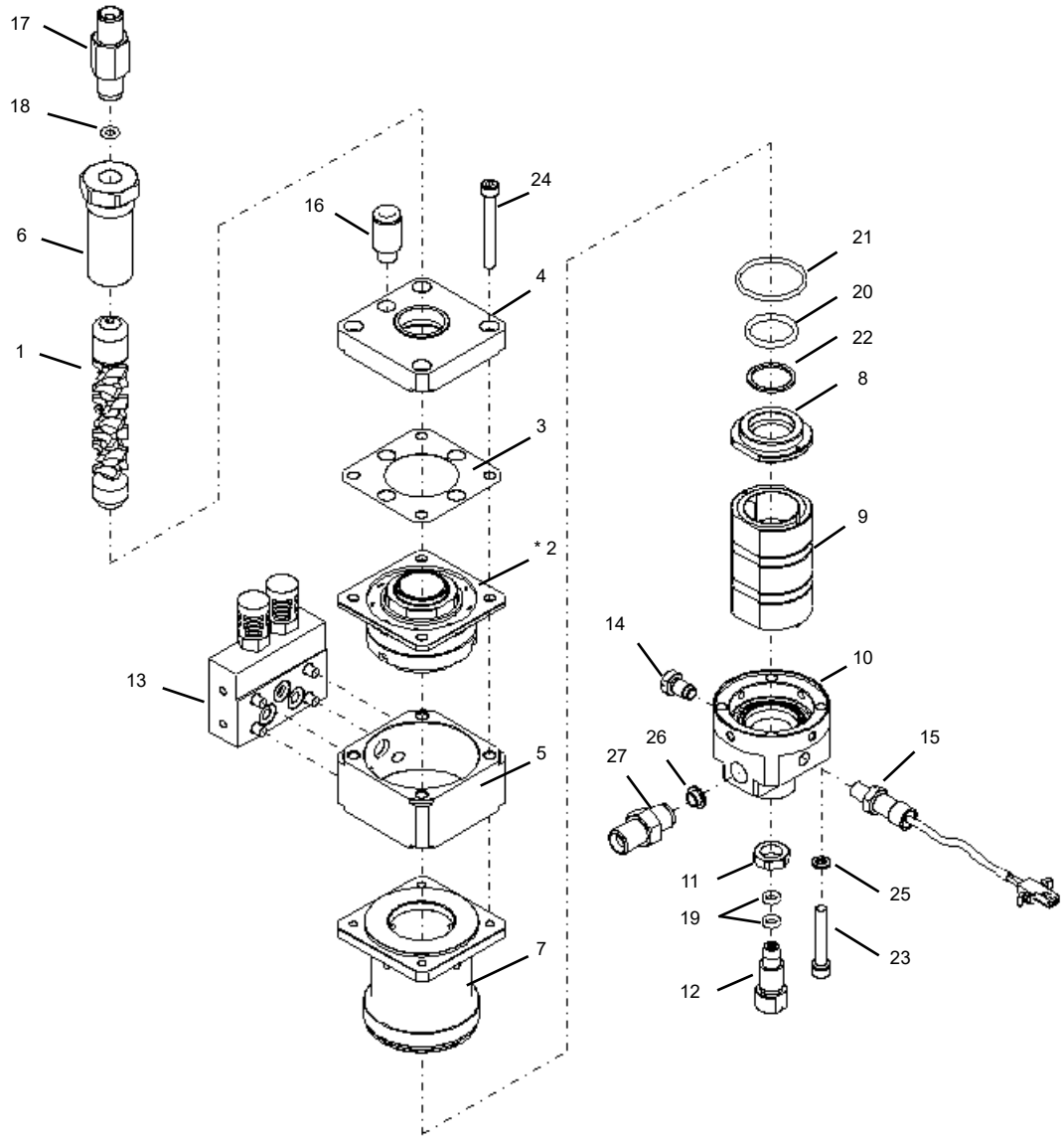


* Do not immerse item 2 in solvent.

No.	Parts No.	Part name	Qty.	Remarks
1	4903	Rotor set S	1	Exploded view 1
3	4401-008	Gasket	1	
4	4401-009	Deck plate	1	
5	4401-010	Turbine jacket	1	
6	4401-011	Rotor holder	1	
7	4401-012	Stator holder	1	
8	4401-013	Spacer	1	
9	-	-	1	Exploded view 3
10	4401-016	Sensor case	1	
11	4401-017	Hex. nut	1	
12	4401-018	Adjuster	1	
13	-	-	1	Exploded view 5
14	4401-020	Plug	1	

No.	Parts No.	Part name	Qty.	Remarks
15	9027	Tacho sensor (explosion-proof)	1	PWM-S1B
16	378-0801	Hexagon socket straight shank	1	
17	135C-117	Long nipple	1	
18	101-2006	O-ring	1	
19	101-9006	O-ring	2	
20	101-9022	O-ring	1	
21	130-6032	O-ring	1	
22	155-2020	Back-up ring	1	
23	03-80535	Hex. socket screw (plated)	4	
24	03-80545	Hex. socket screw (plated)	4	
25	41-80500	Spring washer (plated)	4	
26	4425-007	Gasket	1	
27	134E-025	Hose nipple	1	

6-2 Power Mixer L, Model PWM-L1B <PN 4402>

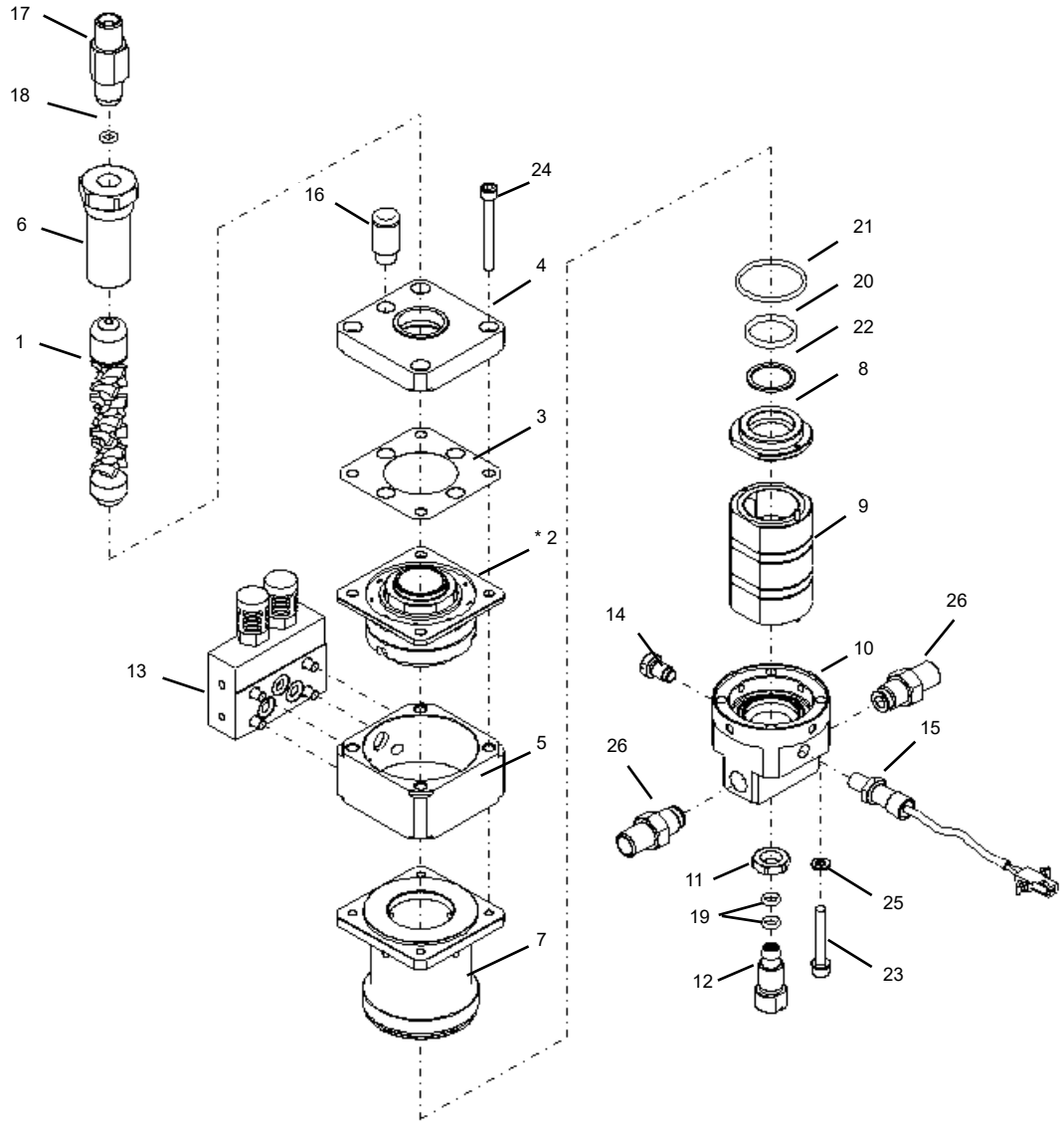


* Do not immerse item 2 in solvent.

No.	Parts No.	Part name	Qty.	Remarks
1	4904	Rotor set L	1	Exploded view 1
3	4401-008	Gasket	1	
4	4401-009	Deck plate	1	
5	4401-010	Turbine jacket	1	
6	4401-011	Rotor holder	1	
7	4402-012	Stator holder	1	
8	4401-013	Spacer	1	
9	-	-	1	Exploded view 4
10	4401-016	Sensor case	1	
11	4401-017	Hex. nut	1	
12	4401-018	Adjuster	1	
13	-	-	1	Exploded view 5
14	4401-020	Plug	1	

No.	Parts No.	Part name	Qty.	Remarks
15	9027	Tacho sensor (explosion-proof)	1	PWM-L1B
16	378-0801	Hexagon socket straight shank	1	
17	135C-117	Long nipple	1	
18	101-2006	O-ring	1	
19	101-9006	O-ring	2	
20	101-9022	O-ring	1	
21	130-6032	O-ring	1	
22	155-2020	Back-up ring	1	
23	03-80535	Hex. socket screw (plated)	4	
24	03-80545	Hex. socket screw (plated)	4	
25	41-80500	Spring washer (plated)	4	
26	4425-007	Gasket	1	
27	134E-025	Hose nipple	1	

6-3 Power Mixer L, Model PWM-L2B <PN 4402-2>

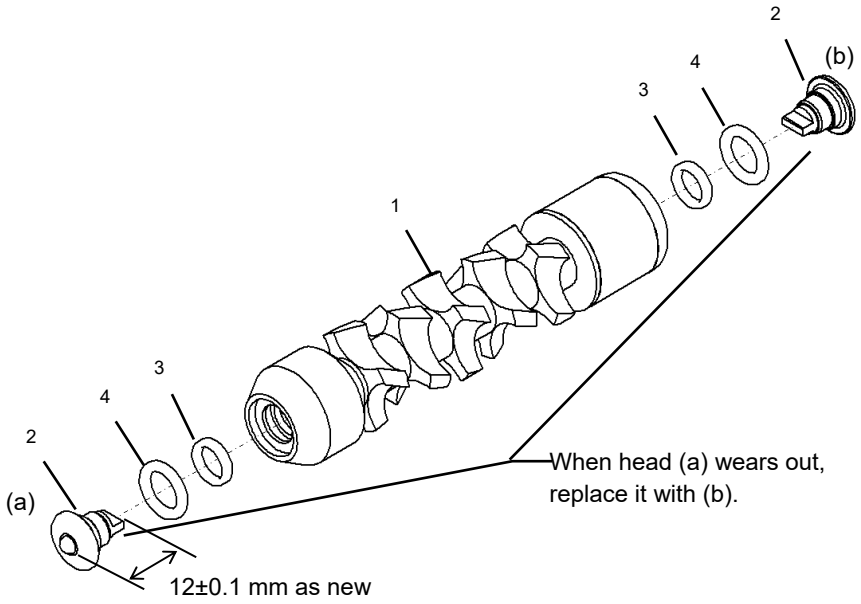


* Do not immerse item 2 in solvent.

No.	Parts No.	Part name	Qty.	Remarks
1	4904	Rotor set L	1	Exploded view 1
3	4401-008	Gasket	1	
4	4401-009	Deck plate	1	
5	4401-010	Turbine jacket	1	
6	4401-011	Rotor holder	1	
7	4402-012	Stator holder	1	
8	4401-013	Spacer	1	
9	-	-	1	Exploded view 4
10	4402-016	Sensor case	1	
11	4401-017	Hex. nut	1	
12	4401-018	Adjuster	1	
13	-	-	1	Exploded view 5
14	4401-020	Plug	1	

No.	Parts No.	Part name	Qty.	Remarks
15	9027	Tacho sensor (explosion-proof)	1	PWM-L2B
16	378-0801	Hexagon socket straight shank	1	
17	135C-117	Long nipple	1	
18	101-2006	O-ring	1	
19	101-9006	O-ring	2	
20	101-9022	O-ring	1	
21	130-6032	O-ring	1	
22	155-2020	Back-up ring	1	
23	03-80535	Hex. socket screw (plated)	4	
24	03-80545	Hex. socket screw (plated)	4	
25	41-80500	Spring washer (plated)	4	
26	3620	Check valve	2	

6-4 Rotor Set S and Rotor Set L <PN 4903/4904> (Exploded View 1)

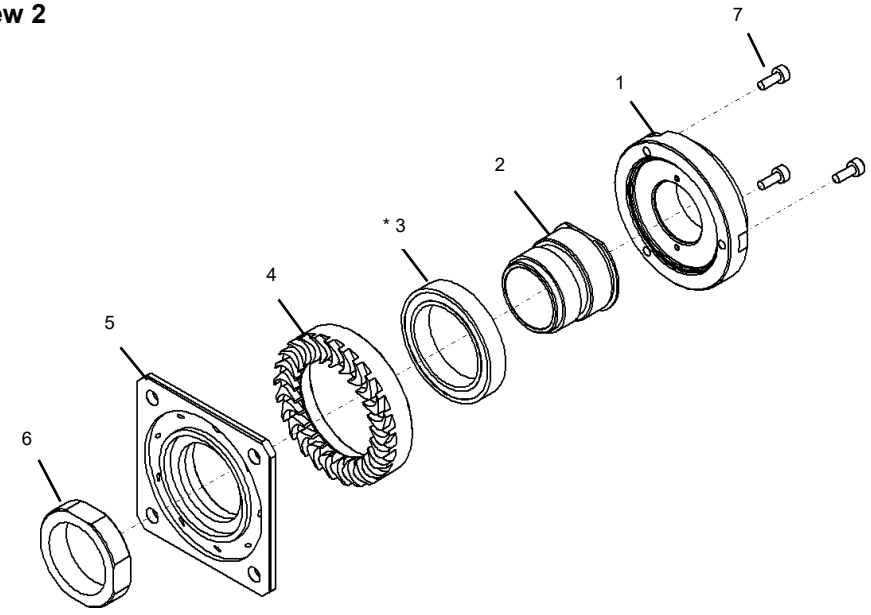


See 9-2 “Quarterly Inspection.”

No.	Parts No.	Part name	Qty.	Remarks
1	4903-001	Main blade S	1	Rotor set S
	4904-001	Main blade L	1	Rotor set L
2	4903-002	Head	2	

No.	Parts No.	Part name	Qty.	Remarks
3	130-9006	O-ring	2	
4	130-9008	O-ring	2	

6-5 Exploded View 2



* Immersing the ball bearing, item 3, removes grease, resulting in rotation failure.

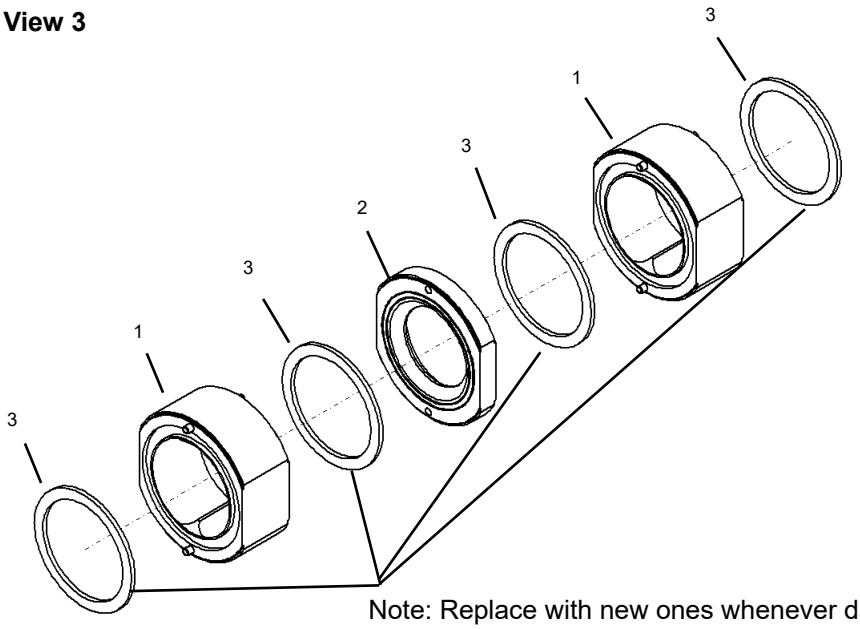
  Do not immerse the ball bearing in solvent.

See 7-3 “Turbine Disassembly Procedure.”

No.	Parts No.	Part name	Qty.	Remarks
1	4401-002	Magnet driver	1	
2	4401-003	Bearing retainer	1	
3	312-0158	Ball bearing	1	
4	4401-005	Turbine	1	

No.	Parts No.	Part name	Qty.	Remarks
5	4401-006	Nozzle plate	1	
6	4401-007	Rubber hose joint	1	
7	03-80308	Hex. socket screw (plated)	3	

6-6 Exploded View 3



Note: Replace with new ones whenever damaged.

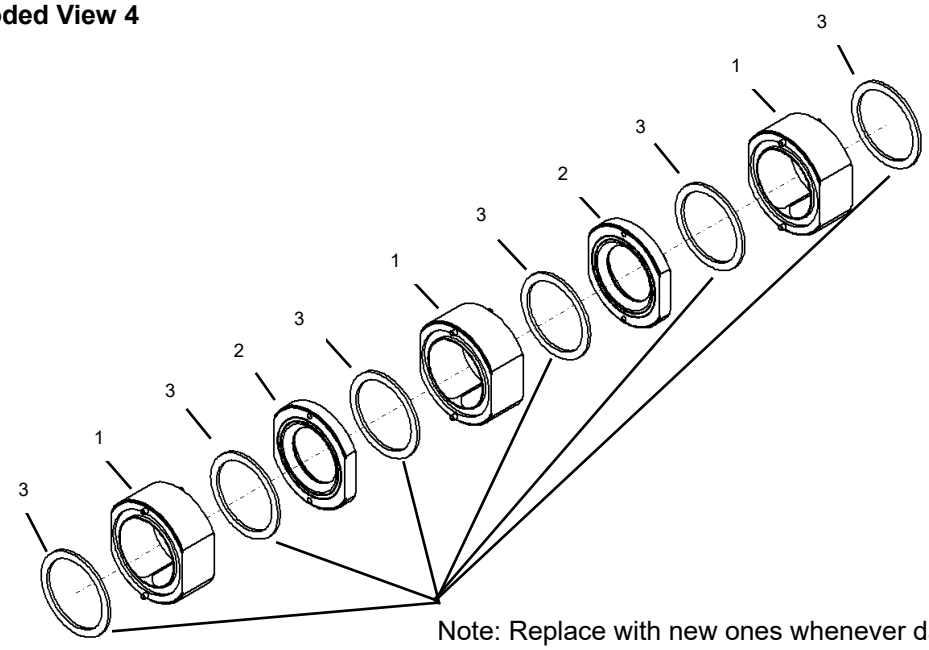
Note: The back-up ring may be damaged if pried out with a sharp edge. Replace the back-up ring with a new one whenever damaged.

See 7-4 “Stator Holder Disassembly Procedure.”

No.	Parts No.	Part name	Qty.	Remarks
1	4401-014	Agitator	2	
2	4401-015	Squeezer	1	

No.	Parts No.	Part name	Qty.	Remarks
3	155-2028	Back-up ring	4	

6-7 Exploded View 4



Note: Replace with new ones whenever damaged.

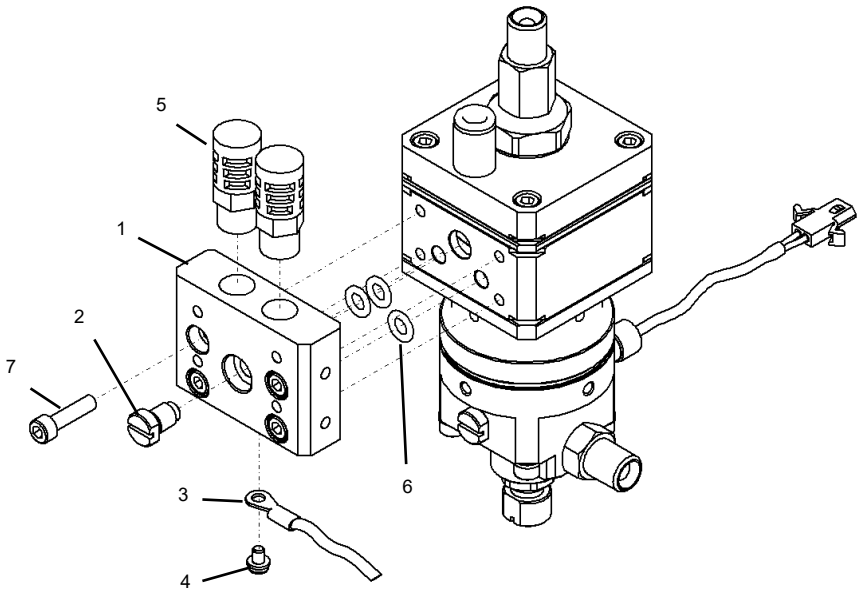
Note: The back-up ring may be damaged if pried out with a sharp edge. Replace the back-up ring with a new one whenever damaged.

See 7-4 “Stator Holder Disassembly Procedure.”

No.	Parts No.	Part name	Qty.	Remarks
1	4401-014	Agitator	3	
2	4401-015	Squeezer	2	

No.	Parts No.	Part name	Qty.	Remarks
3	155-2028	Back-up ring	6	

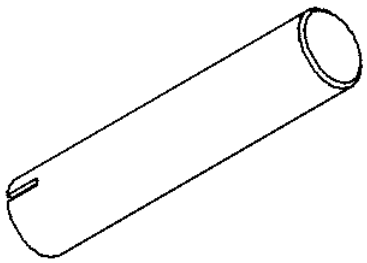
6-8 Exploded View 5



No.	Parts No.	Part name	Qty.	Remarks
1	4401-019	Manifold	1	
2	4401-020	Plug	1	
3	40338-024	Grounding wire	1	5 m
4	13-10406	3-point screw w/washer	1	

No.	Parts No.	Part name	Qty.	Remarks
5	326-0013	Muffler	2	
6	130-6009	O-ring	3	
7	03-80520	Hex. socket screw (plated)	4	

6-9 Rotor Remover <PN 4401-022>



For how to use, see 7-2 “Rotor Set Removal Procedure.”

7 Overhauling Procedures

Before starting the overhauling work, never fail to clean the inside of the Power Mixer and purge internal solvent out with dry air. Before starting the overhauling work, never fail to reduce the air and paint pressures supplied to the Power Mixer to zero.

⚠ WARNING

Hazards arising from misuse of the Power Mixer

- **Before starting the overhauling work, never fail to reduce the air and paint pressures supplied to the Power Mixer to zero.**

Otherwise, dyspnea or solvent poisoning may occur.

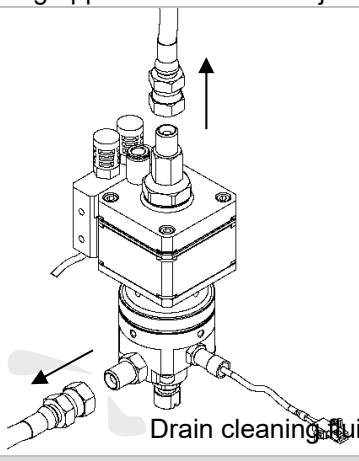
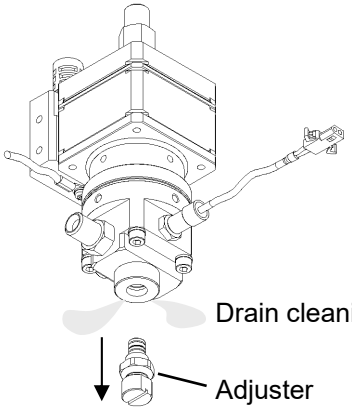
- **When working, wear an organic solvent mask, safety goggles and protective clothes. Isocyanate, which is used as hardener, may inflame nasal and throat mucus. When working, wear an organic solvent mask. Special protective devices may be required depending on the paint type or ventilation. Please consult the paint manufacturer.**
- **Thoroughly ventilate the work area to avoid accumulating combustible atmospheres (solvent vapors).**

There is a possibility of fire or explosion.

- **Ensure that all components of the equipment will be correctly grounded.**
- **Thoroughly ventilate the work area to avoid accumulating combustible atmospheres (solvent vapors).**

7-1 Draining Internal Solvent from the Power Mixer

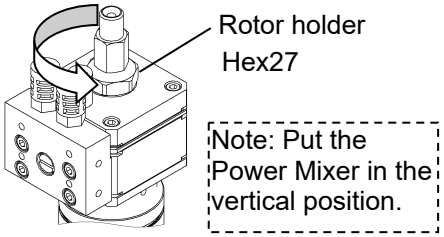
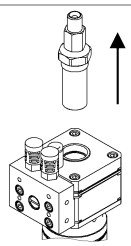
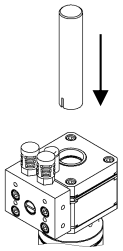
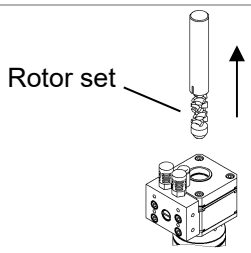
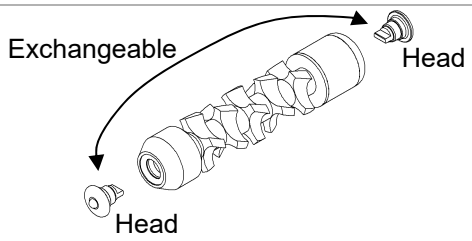
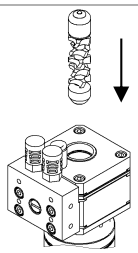
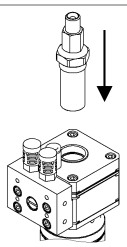
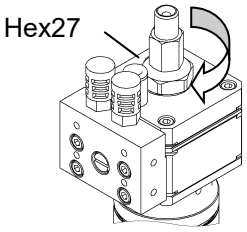
If internal solvent cannot be purged out with dry air, use any of the following methods:

(1) Removing upper and lower hose joints	(2) Removing the adjuster
	
Never fail to reduce the fluid (paint/solvent) pressures to zero before removing upper and lower hoses. Remove them while receiving the solvent coming out of hoses and mouthpieces with a waste cloth or such.	Never fail to reduce the fluid (paint/solvent) pressures to zero before removing the adjuster. Remove it while receiving the outcoming solvent with a waste cloth or such. Install and adjust the adjuster according to 4-1 “Adjustment of the Power Mixer.”

7-2 Rotor Set Removal Procedure

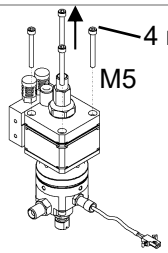
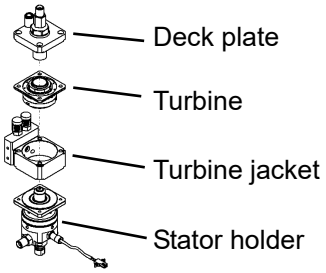
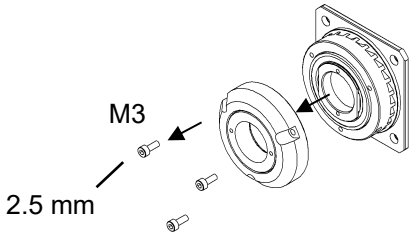
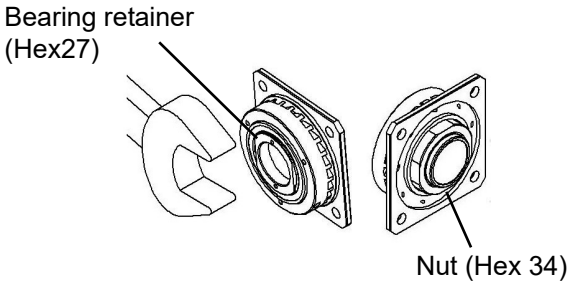
The rotor set can be removed without removing the Power Mixer from the equipment. If solvent or paint adheres to the turbine, sticky rotation may result. The rotor set shall be removed with the Power Mixer in the vertical position to prevent this.

See 2-4 “As-Installed Condition and Angle.”

<table>
<tr><td>(1)</td><td>(2)</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>Never fail to drain internal fluid before removing the rotor holder. Loosen the rotor holder with a 27 mm wrench.</td><td>Remove the rotor holder from the body with care not to allow fluid into the turbine.</td></tr>
<tr><td>(3)</td><td>(4)</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Insert the rotor remover and hold the rotor set by hand.</td><td>Remove the rotor set.</td></tr>
<tr><td>(5)</td><td>(6)</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>Clean and service the rotor set.
Exchange upper and lower heads before use if worn. Replace them with new ones as necessary.
See 6-4 “Rotor Set S and Rotor Set L.”</td><td>Insert the rotor set.
It may be stuck in the middle but shall be fully inserted.</td></tr>
<tr><td>(7)</td><td>(8)</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Install the rotor holder.</td><td>Firmly tighten the rotor holder with a 27 mm wrench.</td></tr>
</table>

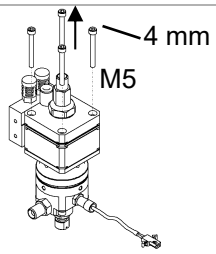
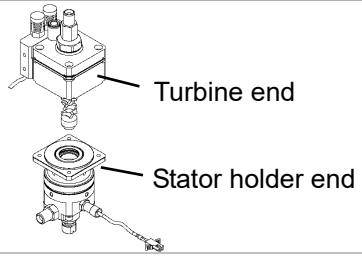
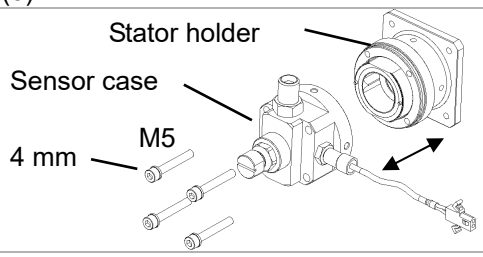
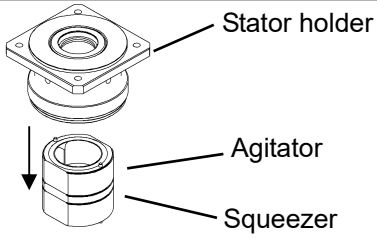
For replacement parts and timings, see 6 “Exploded Views” and 8 “List for Consumables.”

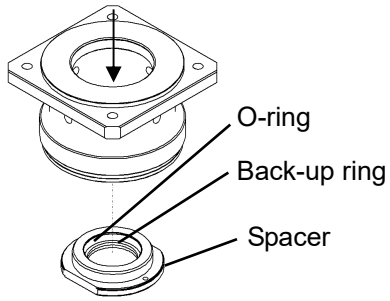
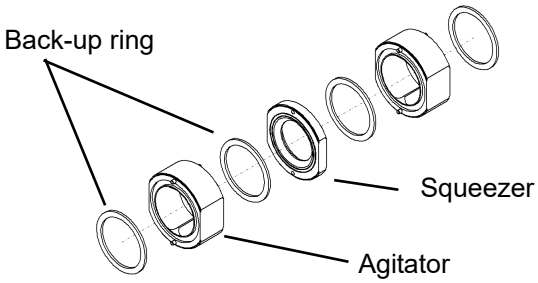
7-3 Turbine Disassembly Procedure

(1)	(2)
	
Never fail to drain internal fluid before removing the Power Mixer from the equipment. Remove four hexagonal socket screws with a 4 mm wrench.	Divide into four parts; deck plate, turbine, turbine jacket and stator holder.
(3)	(4)
	
Remove three hexagonal socket screws with a 2.5 mm wrench.	Fix the nut with wrench (34mm) and disassemble the bearing retainer by appling wrench (27mm) to width across flat.

For replacement parts and timings, see 6 “Exploded Views” and 8 “List for Consumables.”

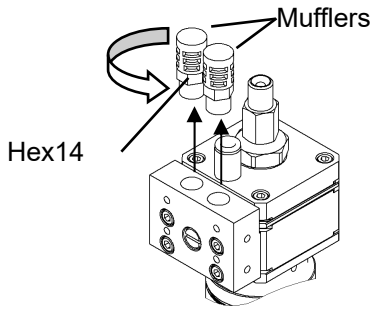
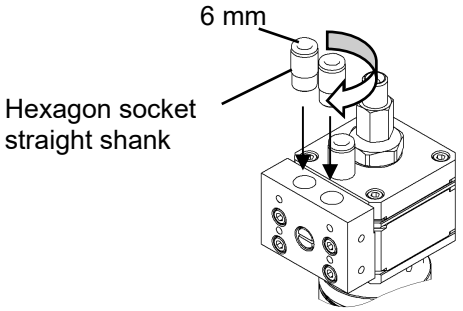
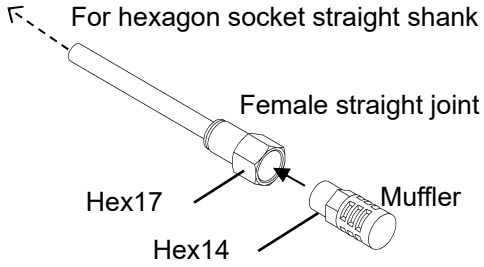
7-4 Stator Holder Disassembly Procedure

(1)	(2)
	
Never fail to drain internal fluid before removing the Power Mixer from the equipment. Remove four hexagonal socket screws with a 4 mm wrench.	Divide into the turbine and stator holder ends. Take care when handling the turbine end, which comprises discrete parts as shown in 7-3, (2).
(3)	(4)
	
Remove four hexagonal socket screws with a 4 mm wrench and remove the stator holder and sensor case.	Remove the agitator and squeezer from the stator holder. The agitator and squeezer will come apart and shall be kept from falling.

(5)	(6)
	
Remove the spacer by lightly pushing with care not to fall it. Replace the O-ring and back-up ring with new ones as necessary.	The back-up rings must be replaced with new ones if damaged by prying out with a sharp edge.

For replacement parts and timings, see 6 “Exploded Views” and 8 “List for Consumables.”

7-5 Exhaust Muffler Extension Procedure

(1)	(2)
	
Loosen and remove two mufflers with a 14 mm wrench.	Install and tighten hexagonal socket straight shanks <378-0802> (separately offered) with a 6 mm wrench.
(3)	
	
Install each muffler to a female straight joint <377-0802> (separately offered). Connect the air hose to each hexagon socket straight shank installed in step 2. (Complete two assemblies.)	

8 List for consumables

Durable lives depend on the paint type, coating conditions and equipment. Shown below are reference values assuming 20 working days per month and 6 hours' operation per day.

(1) Power Mixer body — See 6-1, 6-2 and 6-3.

Parts No.	Name	Qty.	Durable period	Remarks
4401-011	Rotor holder	1	24 months	
4401-018	Adjuster	1	12 months	
101-2006	O ring (P6)	1	Until disassembled	Replace whenever damaged.
101-9006	O ring (P6)	2	Until replaced	Replace whenever damaged.
101-9022	O ring (P22)	1	Until replaced	Replace whenever damaged.
130-6032	O ring (S32)	1	Until replaced	Replace whenever swelled.
155-2020	Back-up ring	1	Until replaced	Replace whenever damaged.

(2) Rotor set S and rotor set L — See 6-4.

Parts No.	Name	Qty.	Durable period	Remarks
4903-002	Head	2	12 months	
130-9006	O ring (S6)	2	Until replaced	Replace whenever damaged.
130-9008	O ring (S8)	2	Until replaced	Replace whenever damaged.

(3) Exploded View 2 — See 6-5.

Parts No.	Name	Qty.	Durable period	Remarks
312-0158	Ball bearing	1	12 months	

(4) Exploded Views 3 & 4 — See 6-6 and 6-7.

Parts No.	Name	Qty.	Durable period	Remarks
155-2028	Back-up ring	4	Until disassembled	Replace whenever damaged.

(5) Exploded View 5 — See 6-8.

Parts No.	Name	Qty.	Durable period	Remarks
130-6009	O ring (S9)	3	Until disassembled	Replace whenever swelled.

9 Check item

9-1 Pre-work Inspection

Check the following items at the start of each shift.

Check item	Check method	Judgment	Remedy
Fluid leak through leak check holes and paint inlet/outlet joints	Check with eyes.	No fluid leak allowed.	• Check the agitator and squeezer as assembled. Replace the back-up ring with a new one if damaged. See 7-4 "Stator Holder Disassembly Procedure." • Tighten the paint inlet/outlet joints.
Rotating speed	Read the tachometer.	Within permissible limits	• Adjust the air pressure (flow rate). • Turn the adjuster (knob). See 4-1 "Adjustment of the Power Mixer."

9-2 Quarterly Inspection

Check the following items every three months.

Check item	Check method	Judgment	Remedy
Head wear on rotor set	Check with eyes.	Overall head length is 11.6 mm or more	• Measure the overall head length (12±0.1 mm as new) with calipers and replace the head if worn more than 0.4 mm at the ball section. • It is recommended to replace the adjuster together with the head.

10 Warranty

ASAHI SUNAC CORPORATION (the “Company”) shall provide the original purchaser (the “Purchaser”) with warranty service for a period of 6months from the date of purchase of the product, as follows:

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

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

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

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

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

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

【MEMO】

●When a transfer of title of this equipment takes place, please see to it that this Operation and Maintenance Manual is handed over to the new owner.

●This equipment is manufactured in compliance with the Laws and Regulations of Japan.
In the rare eventuality of this equipment being used outside Japan, compliance with the safety standards of the relevant countries is of course mandatory.

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ASAHI SUNAC

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