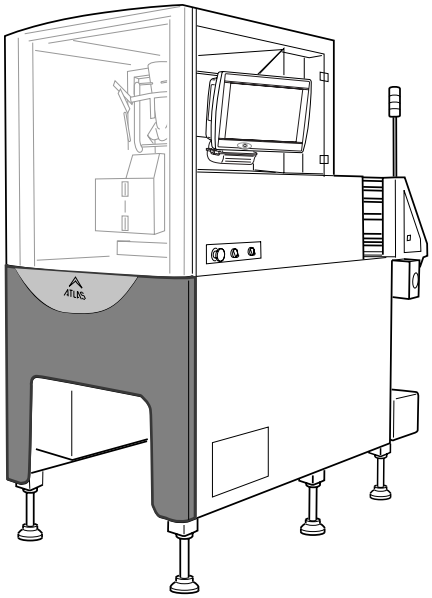
VERTICAL FORM FILL SEAL PACKAGING MACHINE

ATLAS-202

MAINTENANCE MANUAL



WARNING

- **Do not carry out installation, operation, service, or maintenance until thoroughly understanding the contents of this manual.**
- **Keep this manual available at all times for installation, operation, service, and maintenance.**

ISHIDA CO., LTD.

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You can help improve this manual by calling attention to errors and by recommending improvements.
Please convey your comments to the nearest Ishida Company regional representative.

Thank you!

PREFACE

Purpose

This service manual is designed to help service personnel maintaining ATLAS-202. Start the actual maintenance after reading through this manual.

Refer to the Operation Manual about installation, detailed setting and operations of the machine.

Related Manuals

- ATLAS-202 Operation Manual
- ATLAS-202 Parts List

Graphical Labels

The following graphical labels are used in this manual:

Graphical	LabelMeaning
WARNING	Indicates a potentially hazardous situation which, if not avoided, could possibly result in death or serious injuries. (The label is used to indicate a potentially hazardous situation which, if not observed, could possibly result in death or serious injuries.)
CAUTION	Indicates a potentially hazardous situation which, if not avoided, could possibly result in minor or moderate injuries or machine damage. (The label is used to indicate a potentially hazardous situation, if not observed, could possibly result in minor injuries.)
NOTE	Indicates special cautions or important information.
TIP	Indicates helpful information.

For Safety Service

Strictly observe the following items to perform proper maintenance and prevent accidents from occurring.

- Regarding assembly and adjustment sections, precautions are mentioned for each item. Thoroughly understand them to perform proper work.
- Always keep the surroundings of the equipment organized. In particular, extreme caution is must be taken during disassembly, because serious damage may occur if the power switch is turned ON with screws left in the equipment.
- Turn OFF the power switch before starting maintenance. According to circumstances, start maintenance after removing the power supply cable from the power receptacle.

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1 SAFETY

1.1 Summary

The information in this chapter is included to instruct persons who own, install, operate, service or inspect this equipment on warning symbols, precautions which must be observed, and explanation of warning labels attached to the machine.

WARNING

- **Before attempting to perform any operation, maintenance or inspection of this equipment, it is imperative to read and understand the instructions in this manual and to carefully observe all safety precautions and warnings contained herein.**
- **If there are any unclear points or questions concerning the information contained in this manual, please contact Ishida installation personnel or your nearest Ishida Service representative before proceeding.**

1.2 Warning Indications: Types and Definitions

The warning indications contained in this manual, as well the indications on the labels attached to the machine, are ranked into three categories according to the level of hazard involved.
It is important that these indications be fully understood and complied with.

INDICATION	EXPLANATION
DANGER	If this hazard is not avoided, death or serious injury will probably result. This indicates a clear and immediate danger, and extreme caution must be exercised to prevent a mishap.
WARNING	If this hazard is not avoided, there is a possibility of death or injury resulting.
CAUTION	If this hazard is not avoided, there is a possibility that light or moderate injury may result. It may also indicate that a possibility of damage to equipment exists.

NOTE	Used to emphasize or clarify an important point in the manual.

1.3 General Precautions to be Observed

This section describes the general safety precautions which must be observed when handling this equipment.

⚠ DANGER

- All electrical work for the installation site must be performed by licensed electrical contractors. Otherwise, electrical shock or equipment malfunction may result.
- Do not put hands through the gap at the bottom of the cover on the equipment's front. There are rotating parts inside the cover which could injure hands.
- All maintenance and inspection work involving electrical components must be performed by qualified maintenance personnel.
  Electrical shock or equipment malfunction may result if unqualified personnel are permitted to perform maintenance or inspection of electrical components.
- Before performing any maintenance or inspection work which is not specifically indicated in this manual, shut off the main power switch.
  The person performing the maintenance should lock the main power switch and keep the key in his possession while performing the work.
  Injury or electrical shock may result if the equipment is turned on by another person while maintenance work is being performed.
- Turn off the main power switch then wait at least 3 minutes before performing any maintenance or inspection work on the equipment. Residual charge may remain in the machine even after the power has been turned off.
  Also, turn off the power of any upstream/downstream units which are connected or adjacent to the equipment; otherwise there is a danger of electrical shock.

⚠ WARNING

- Persons who operate, maintain or inspect the equipment must have received appropriate training, and have attained a sufficient level of skill before they start performing such work.
- Never touch any electrical switches or buttons with wet or damp hands. Electrical shock may occur when the equipment is not properly grounded or when there is electrical leakage.
- Personnel with long hair using this equipment should tie up their hair securely and all personnel must wear a cap or hat as well as clothes and shoes suitable for the production environment. Unbound long hair or inappropriate clothing may become caught in moving parts, and injuries may result.
- Before starting operation of the equipment, make sure that all covers are securely shut and fastened. Touching the moving part during production may result injuries.
- Keep away from moving and rotating components while the equipment is in operation. They could cause injury if body parts get caught up in them.

- Before cleaning the part which is not specifically indicated in this manual, shut off the main power switch.
  The person performing the maintenance should lock the main power switch and keep the key in his possession while performing the work.
  Injury or electrical shock may result if the equipment is turned on by another person while cleaning is being performed.
- If maintenance or inspection work is to be performed with the main power switch ON, clearly indicate this situation by posting a sign in the work area. This is to prevent other personnel from accidentally starting up the equipment.
- When performing maintenance and inspection work on the upper part of the packer, use a sturdy ladder or foothold to avoid a hazardous fall.

⚠ CAUTION

- Do not run the equipment with any tools or other objects placed on top of the machine. If objects fall into moving parts, damage to the equipment may result.
- Use finger to press the operation panel of the RCU. Using a ball-point pen or other pointed object can damage the operation panel.

1.4 Special Safety Precautions

This section describes special safety precautions for this equipment which, in addition to the previously mentioned precautions, should be carefully observed.

⚠ WARNING

- Before opening the main guard and working on the parts behind it, make sure that the heater has thoroughly cooled. Otherwise the heater or its surrounding parts could cause burns when touched.

⚠ CAUTION

- Do not use the same power source for devices which may emit noise. Doing so may result in malfunction or damage.
- Do not install wiring which permits load-related power fluctuations of more than ±10%. Overload may result in malfunction or damage.
- When cleaning the equipment, be sure to rinse only the areas specifically indicated as washable. Otherwise, damage or malfunction may result.
- Do not apply insecticide or other foreign substances inside the main body, terminal boxes, motor boxes, or other enclosed packer compartments. Doing so may cause machine malfunction or damage.

1.5 Warning Labels

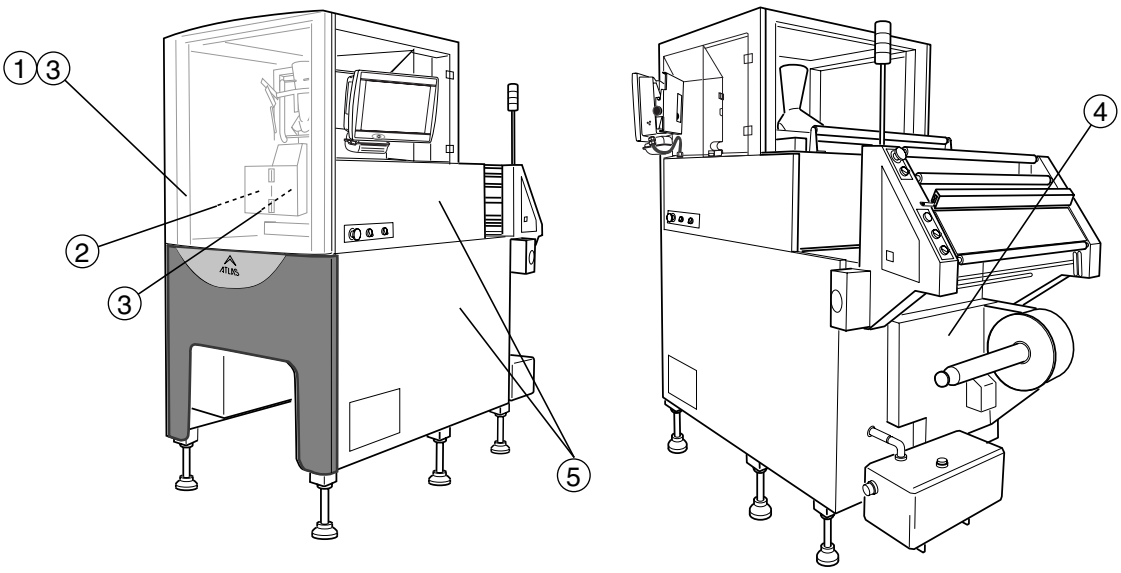
Warning labels which indicate points requiring particular caution are attached to the packer at certain locations. Please take sufficient time to familiarize yourself thoroughly with the meanings and positions of these labels.

1.5.1 Warning Label Handling

- First verify that all the warning labels are clearly legible. If the label text or graphic is difficult to read, clean or replace the label.
- Clean labels with water and neutral cleanser.
  Do not use organic solvents or gasoline.
- Labels must be replaced if they are damaged, peeled or illegible.
  For this, please contact your local Ishida Service representative.

1.5.2 Warning Label Location

The diagram below shows the location of warning labels.



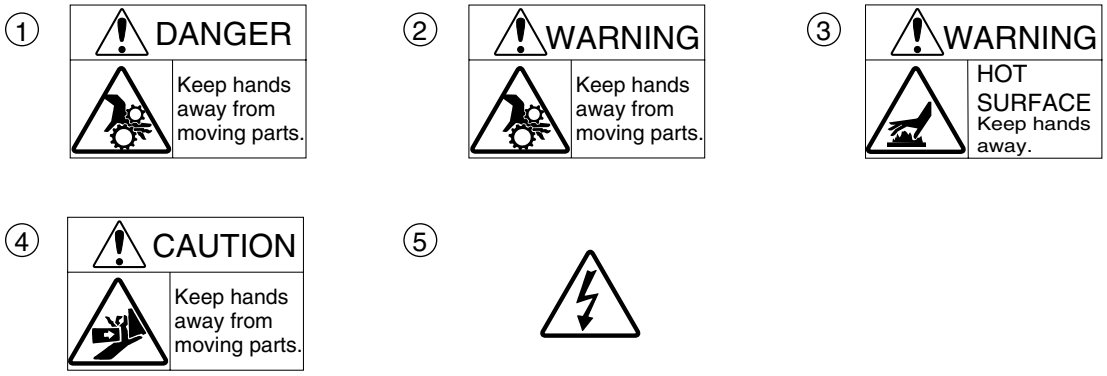


Fig. 1-1 Warning Label Location

1.6 Drive Power Shutdown and Indication

Before performing maintenance or inspection, electrical power should be shutdown to ensure the safety of personnel.
To prevent other personnel from starting operation while this work is being performed, follow the procedure described below.

- The main power switch should be shut off and locked.
- A tag clearly indicating that maintenance work is in progress should be prepared and posted on the power shutdown device.
  Lock the main power switch and attach the accident prevention tag as shown below.

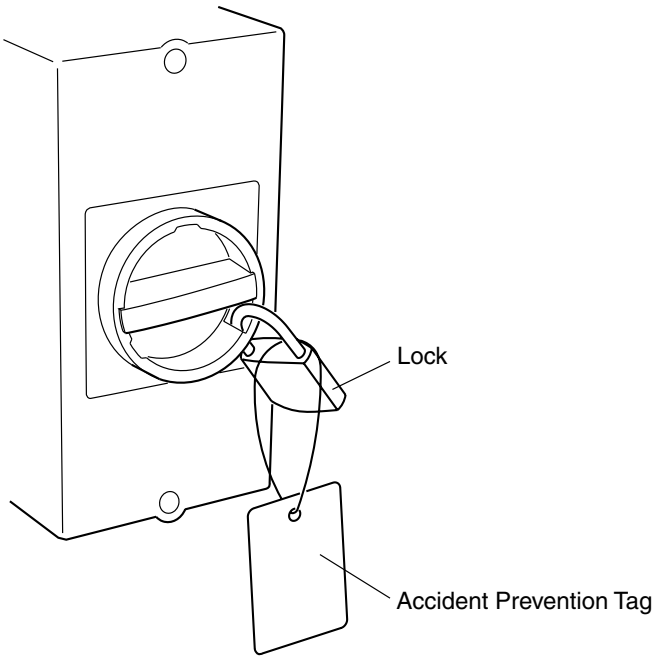


Fig. 1-2 Main Power Switch

2 DAILY INSPECTIONS

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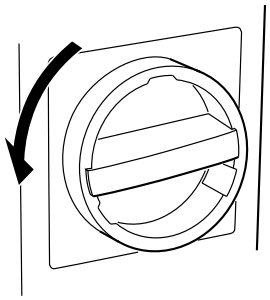
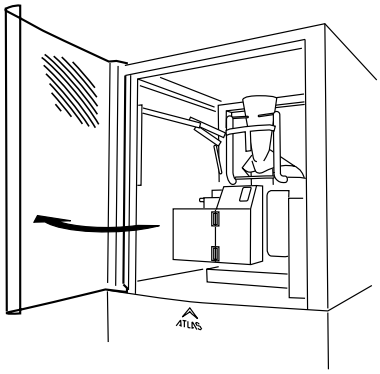
2 DAILY INSPECTIONS

2.1 End Seal Jaw Surface

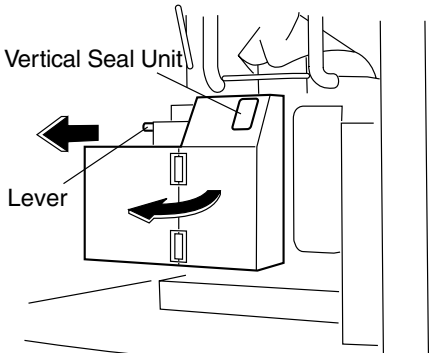
1. Turn the main power OFF.



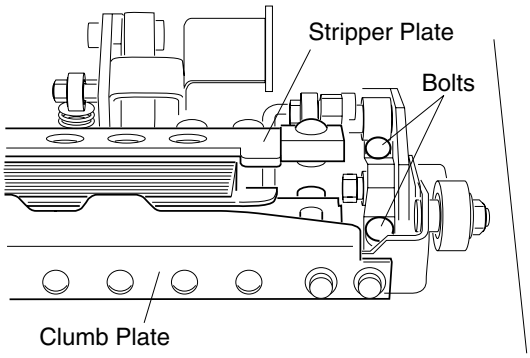
2. Open the front cover.



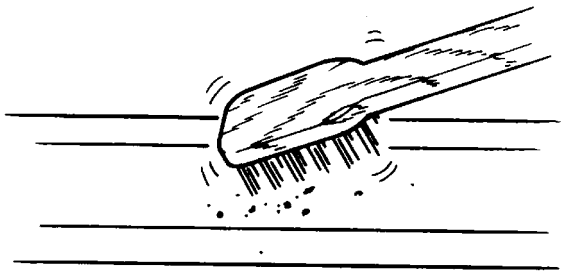
3. Pull the handle forward, and swing the back seal unit out.



4. Remove 4 bolts and remove the crumb plate and the stripper plate.
5. Make sure that no film residue or product is adhering to the surface of the jaw.



If residue or product is adhering to the surface of the jaw, use a wire brush to remove it.



CAUTION

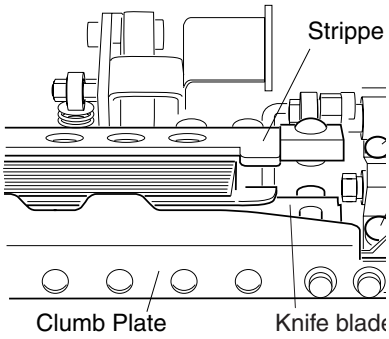
- **Do not touch the jaw with your hand. It is hot and you can get burned.**

2.2 End Seal Jaw Knife Slot

CAUTION

- **Do not touch the jaw with your hand. It is hot and you can get burned.**

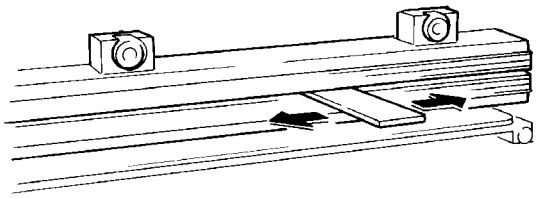
1. Proceed steps 1 to 4 of the section "2.1 End Seal Jaw Surface".
2. Remove two bolts and remove the knife blade.



WARNING

- **Be careful when removing the knife blade. It is very sharp and hot.**

3. Clean out the knife slot, both front and rear.

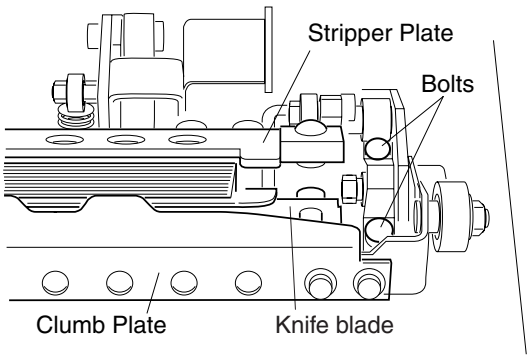


2.3 End Seal Jaw Knife Blade

CAUTION

- **After operation, the end seal jaw knife blade is extremely hot. Be careful when inspecting.**

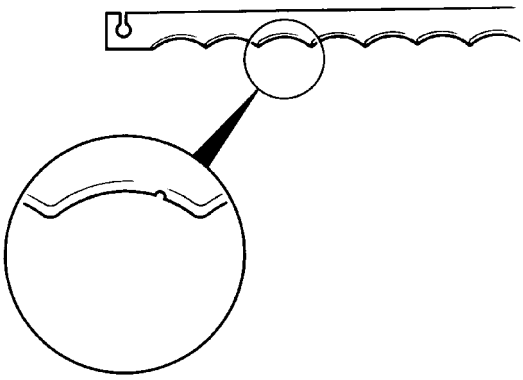
1. Proceed steps 1 to 4 of the section "2.1 End Seal Jaw Surface".
2. Remove two bolts and remove the knife blade.



WARNING

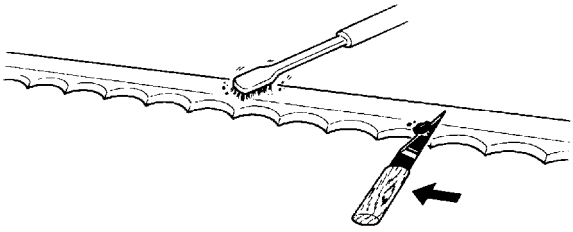
- **Be careful when removing the knife blade. It is very sharp and hot.**

3. Check the surface of the knife blade. If it is dirty, remove the grime with a brush. If strange substance is adhering to the surface, scrape it off with a knife. If the knife blade is worn or damaged, replace it with a new one.



CAUTION

- **Do not use a wire brush. The tip of the knife blade can get damaged.**



2.4 Crumb Plate

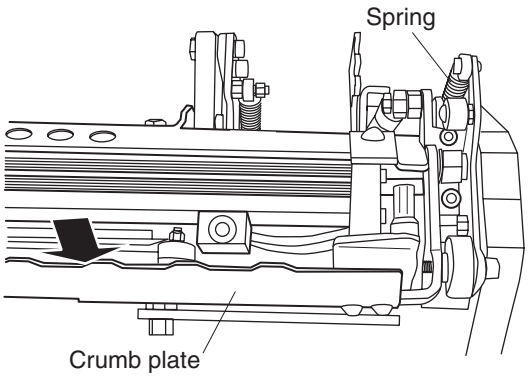
1. Proceed steps 1 to 3 of the section "2.1 End Seal Jaw Surface".
2. Compress the crumb plate and ensure the movement is free.
   If not, check for broken springs.
   If springs are broken, replace it.

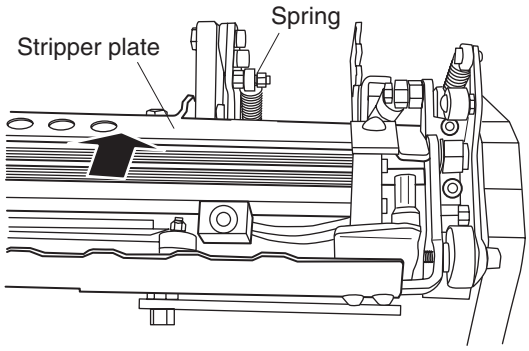
   Use following steps to replace the spring.

   (a) Loosen the fixing screws.
   (b) Replace the spring.

NOTE

- Similarly, confirm if the stripper plate moves smoothly.





2.5 Pull Belt

1. Press the [Run/Lace] key.

   ▶The pull-down belts move outward.

2. Turn the main power OFF.

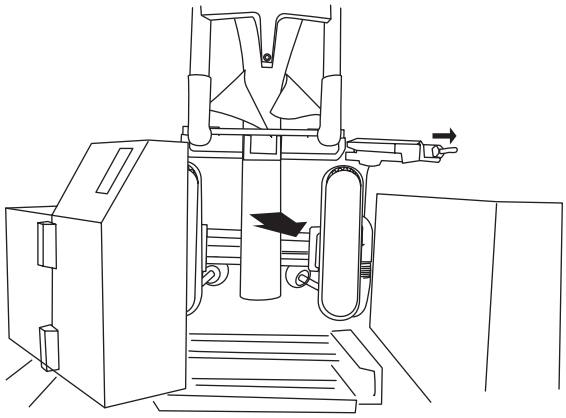
3. Open the front cover.

4. Pull the handle forward, and swing the backseal unit out.

5. Move the former lever to the rear, and remove the former.

CAUTION

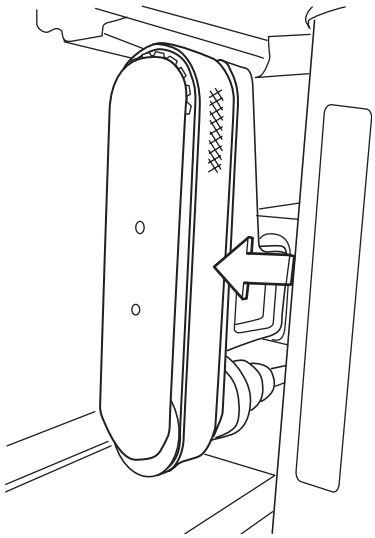
- **Be careful when handling the former. It is heavy.**



6. Check the surface of the pull belt. If it is dirty, remove the grime with a plastic brush or wet towel. If the belts are worn or split, replace them with a new ones.
   (For details on how to replace the pull belts, see"4.3.2 Replacing the Pull Belt".)

CAUTION

- **Do not use a detergent or cleanser to clean the pull belt. This can cause the pull belt to deteriorate.**



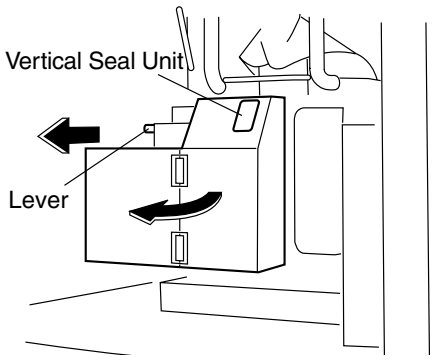
2.6 Back seal Heater Band and Heater Block

2.6.1 Back seal Heater Band

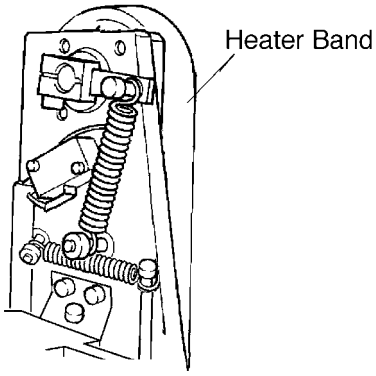
CAUTION

- **After operation, the heater band is extremely hot. Be careful when inspecting.**

1. Proceed steps 1 to 4 of the section "2.5 Pull Belt".
2. Open the back seal cover.



3. Check the surface of the heater band. If it is dirty, remove the grime with a brush. If the band is worn or damaged, replace it with a new one.
   (For details on how to replace the heater band, see "4.2.1 Replacing the Heater Band".)

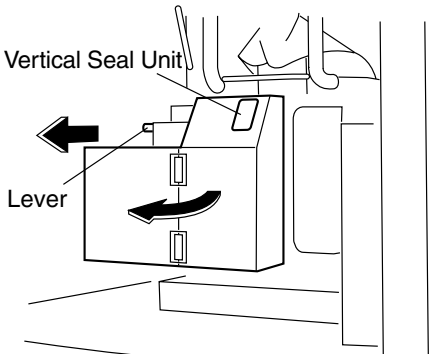


2.6.2 Back seal Heater Block

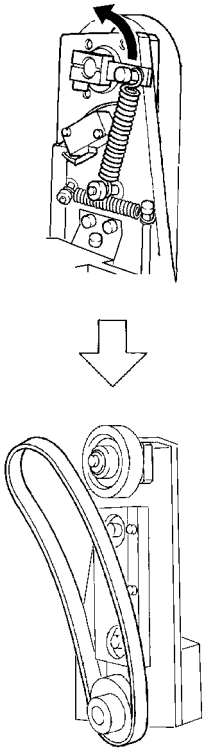
CAUTION

- **After operation, the heater block is extremely hot. Be careful when inspecting.**

1. Proceed steps 1 to 4 of the section "2.5 Pull Belt".
2. Open the back seal cover.

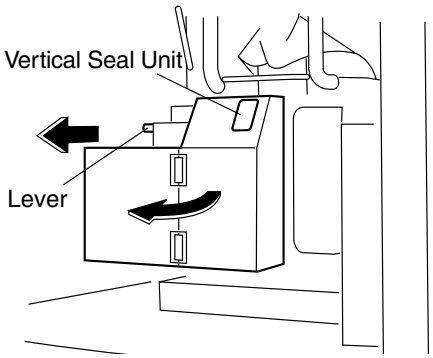


3. Lift the tension lever located on the back of the steel belt, and remove the heater belt.
4. Check the surface of the heater block. If it is dirty, scrape the grime off with a brush.

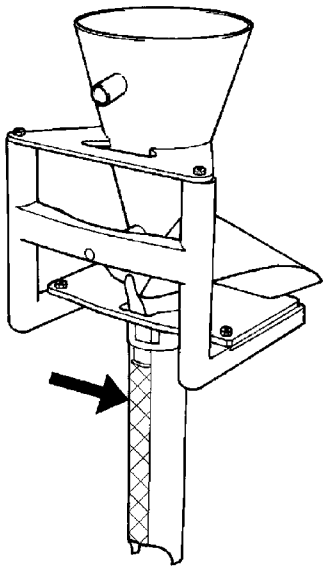


2.7 Silicon Rubber and Teflon Tape

1. Proceed steps 1 to 4 of the section "2.5 Pull Belt".
2. Open the back seal cover.



3. Check the condition of the Back Seal touching area surface.



CAUTION

- **If the silicon rubber and teflon tape are conspicuously dirty with dark grime or if its are split or otherwise damaged, replace it with new one.**

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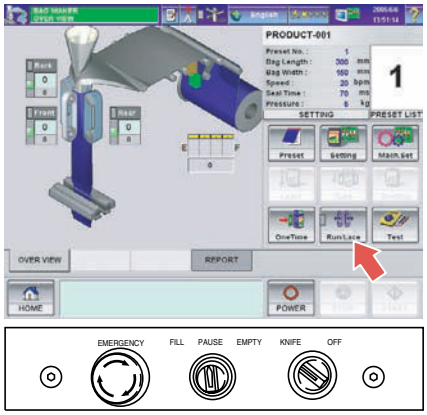
3 PERIODIC INSPECTIONS

3.1 Monthly Inspections

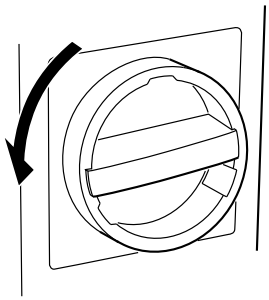
3.1.1 Pull Belt Unit

1. Press the [Run/Lace] key.

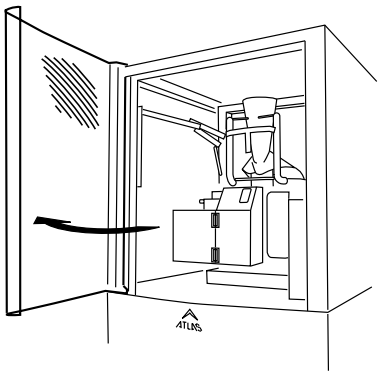
   ▶The pull-down belts move outward.



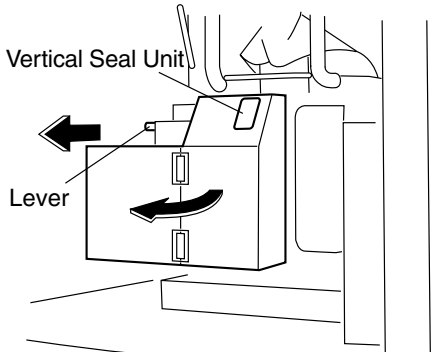
2. Turn the main power OFF.



3. Open the front cover.



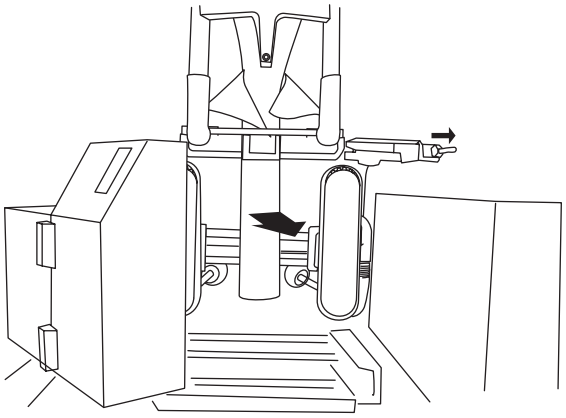
4. Pull the handle forward, and swing the back seal unit out.



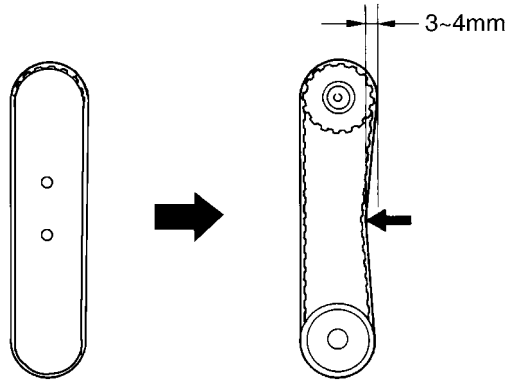
5. Remove the former, and make sure that the pull belt is free of grime, flaws, and splits.

CAUTION

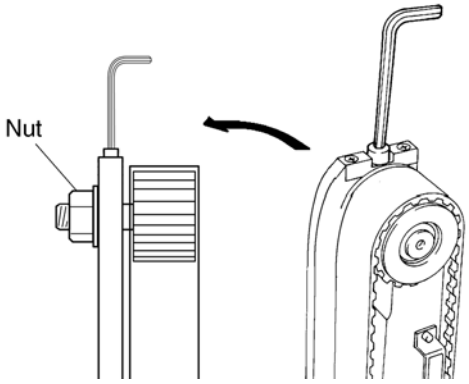
- **Be careful when handling the former. It is heavy.**



6. Press down on the center of the pull belt. Confirm that the belt deflects approximately 3 to 4 millimeters.



7. If adjustment is needed, loosen the nut at the reverse side of the pull belt unit and adjust the tension.



3.2 3-Month Inspections

3.2.1 Lubrication

CAUTION

- **Lubricate periodically.**

3.2.1.1 Jaw Unit

CAUTION

- **Make sure that the product is lubricated every three months. Use Shell Alvania.**

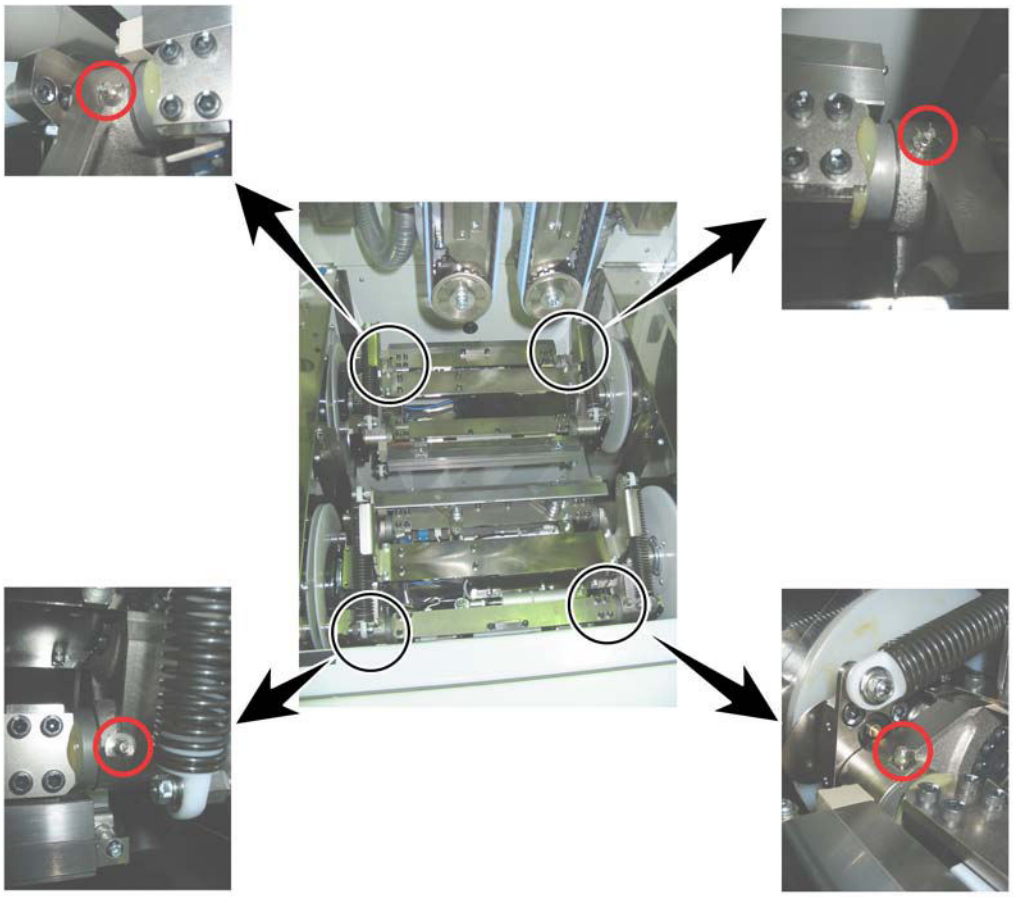


Fig. 3-1 JAW unit

1. Turn the main power OFF.

2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Lubricate the 8 locations as follows.
   - Right and left locations at the next of the reverse of the metal plate
   - One location on the jaw arm
   - Each location for 4 jaw units (Total 8 locations)

NOTE

- Apply grease to the jaw base until the old (existing) grease begins to ooze from the clearance with the shaft.

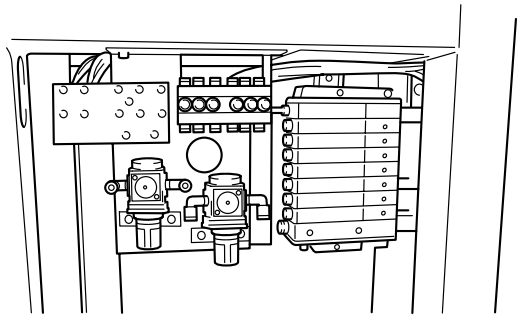
5. Using a sharp-pointed object, make sure that the grease point ball moves.

3.2.1.2 Central Lubrication (Linear Guides and Ball Screw) Gear Box

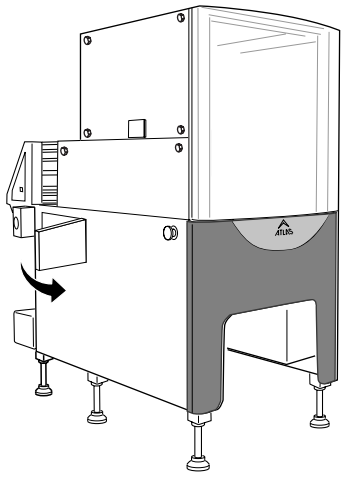
CAUTION

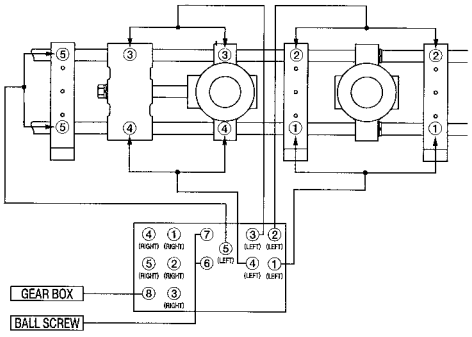
- **Make sure that the product is lubricated every three months. Use Shell Alvania.**

1. Turn the main power OFF.
2. Push and open the cover on the back of the left side.



3. The cover is unlocked. Pull and open the cover by hand.
4. Grease the ball screws and linear guides.

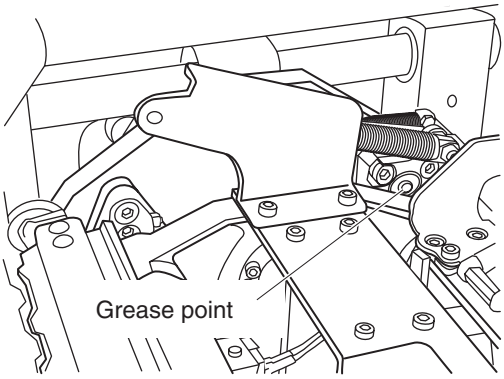




3.2.1.3 Cam Followers

This procedure describes how to lubricate the four cam followers found in the jaw area of the Atlas Bagmaker. Cam follower lubrication must be accomplished every **4,000,000 cycles** to prevent cam follower damage.

Tools Needed: Set of metric Allen wrenches and extension bar;
grease gun (96-9008-08 Hand Grease Pump) provided with Atlas Bagmaker;
use Shell Alvania Grease (64-5201-04 Grease)

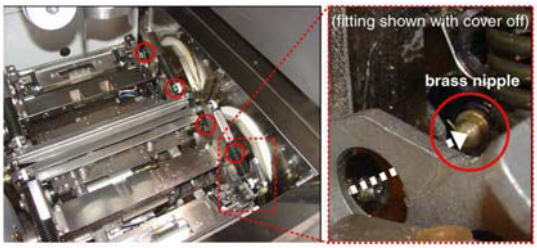


WARNING

- **Jaws of the Bagmaker may be very hot. Allow the jaws to cool before working in the jaw area.**
  Use caution when working near the knife blade.

1. Follow all Lockout / Tagout Procedures.

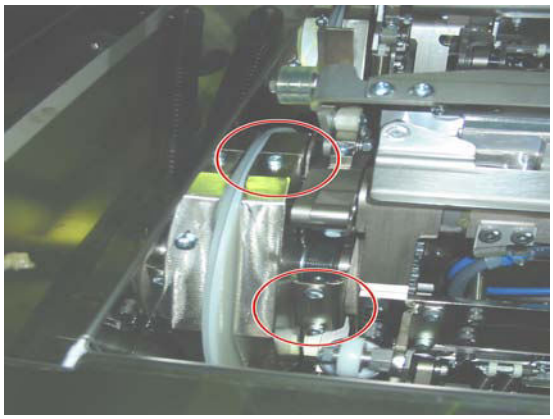
2. Open the front cover.
3. Locate the four brass cam follower lubrication nipples.



CAUTION

- **Use caution rotating jaws manually to avoid pinch points.**

4. Remove the cam follower covers (clam shell type) by removing two 3mm Allen bolts and the four 5mm Allen bolts.

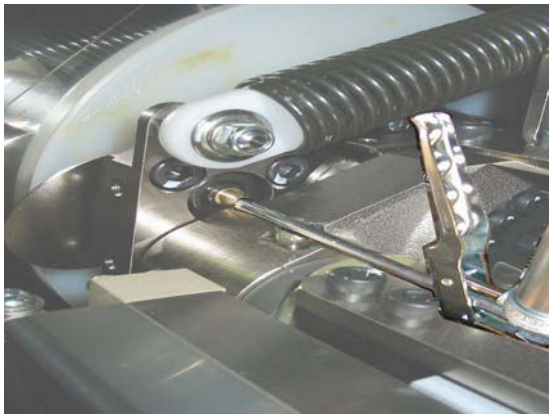


NOTE

- Rotate the jaws 180 to locate the opposite set of bolts.
  The 5mm bolts are firmly secured. Use an extension handle to loosen them.

5. After removing the Allen bolts, use your hand to remove both clam shell covers.
   Completely clean the front and real jaw clam shell covers.

6. Once the covers have been cleaned and slid into position, replace the Allen bolts.
7. Place the Ishida grease gun into position and slide the nozzle over brass nipple.
8. Pump the grease gun 5 times. **Rotate jaws 180 to lube second front nipple.**

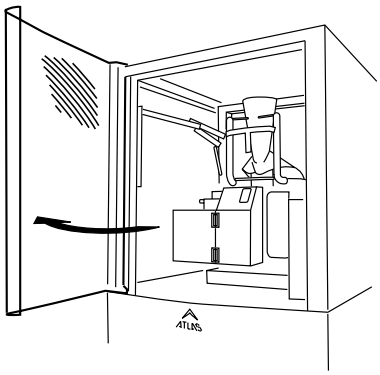


9. Repeat the procedure on the rear jaw cam followers top and bottom nipples.

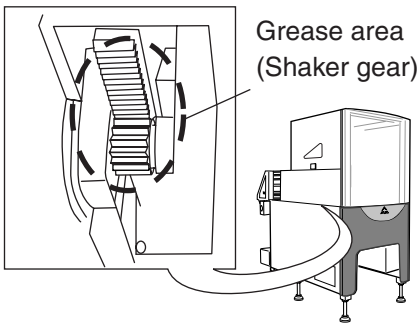
3.2.1.4 Shaker Unit Gear (Option)

1. Press the [RUN/LACE] key.

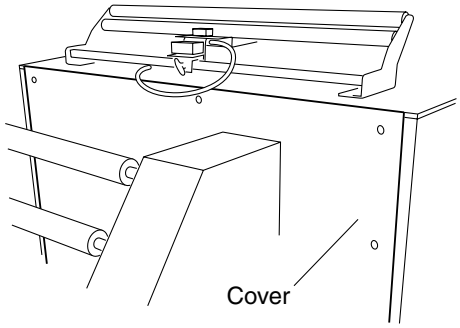
   ▶The pull-down belts move outward.
2. Turn the main power OFF.
3. Open the front cover.



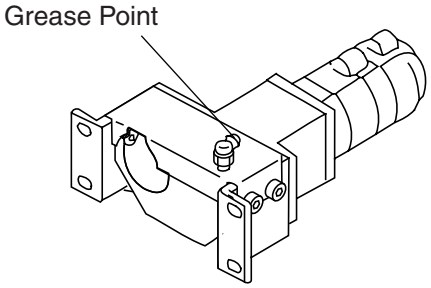
4. Grease the inner gear.



5. Open the rear upper cover by removing ten screws.



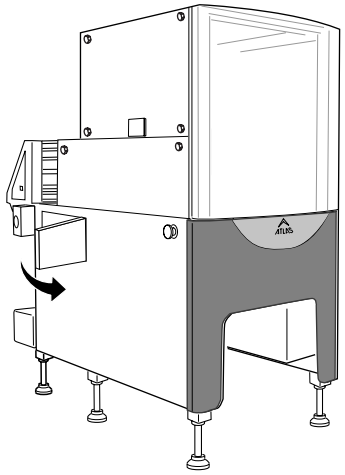
6. Grease the outer gears.



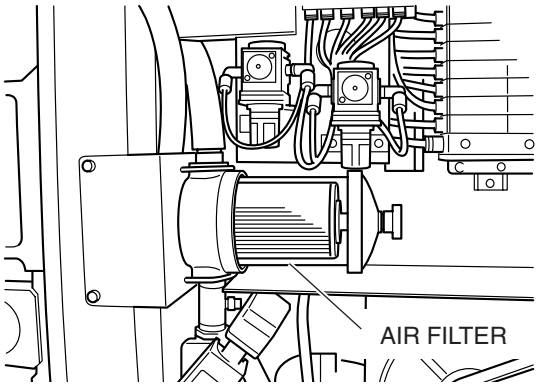
3.3 6-Month Inspections

3.3.1 Vacuum System Air Filter

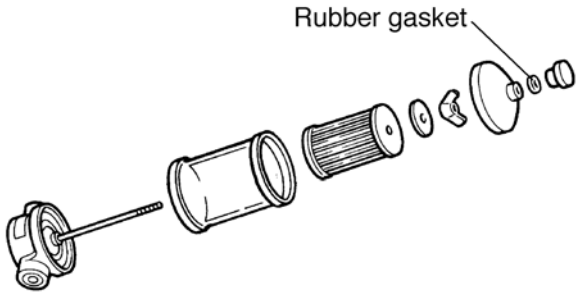
1. Turn the main power OFF.
2. Push and open the cover on the back of the left side.
3. The cover is unlocked. Pull and open the cover by hand.



4. Remove the air filter.
5. Using an air gun, blow out anything strange that may be adhering to the air filter.



6. Attach the air filter.
7. Attach the outer cover.



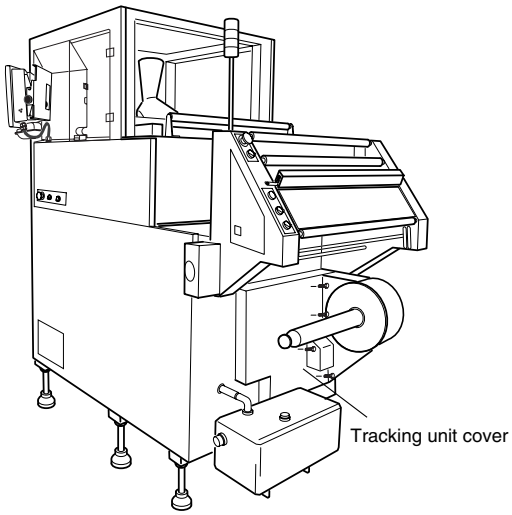
3.3.2 Lubrication

CAUTION

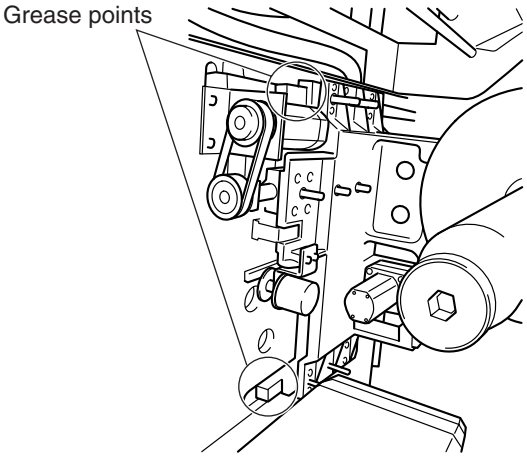
- **Lubricate periodically.**

3.3.2.1 Film Tracking Linear Guides

1. Turn the main power OFF.
2. Remove the film tracking unit cover.



3. Grease the film tracking unit linear guides.



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4 Replacement and Adjustment

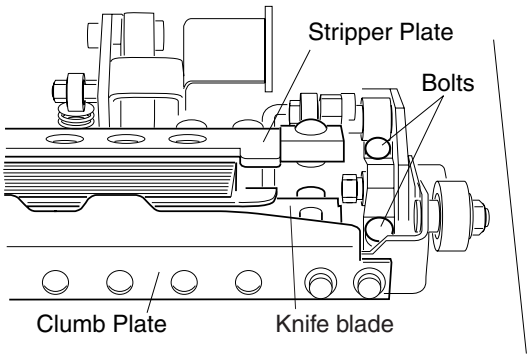
DANGER

- **Before opening the control panel cover, turn the main power OFF. Failure to do so can result in electrical shock.**

4.1 End Seal Unit

4.1.1 Replacing the Jaw Faces

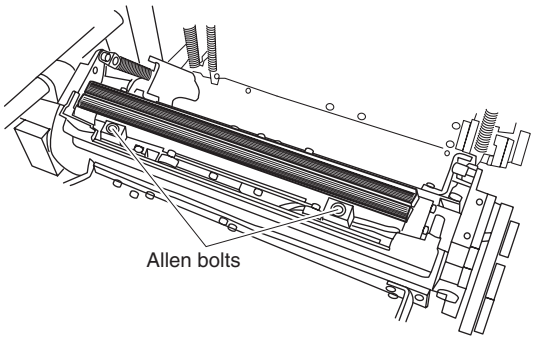
1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Remove 4 bolts and remove the crumb plate and the stripper plate.
5. Remove the allen bolts and remove the knife blade.



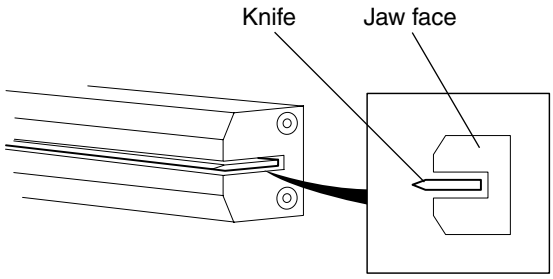
WARNING

- **Be careful when removing the knife blade. It is very sharp and hot.**

6. Replace the front and rear jaw faces with new ones.



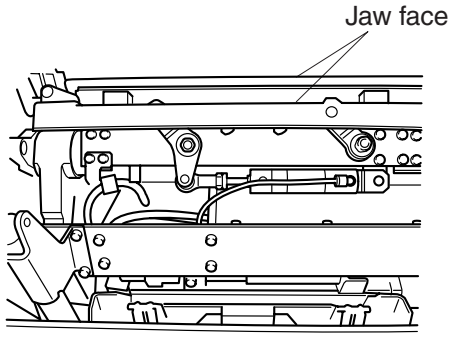
- Install the front jaw face so that the knife blade is in the middle of its knife slot.
- Install the rear jaw face temporary.



7. Make sure that the front and rear jaw faces are properly aligned.

   If the alignment is improper, adjust the position of the jaw. (For details on how to adjust the jaw, see "4.1.2 Jaw Alignment")

8. Tighten the allen bolts of the rear jaw.



4.1.2 Jaw Alignment

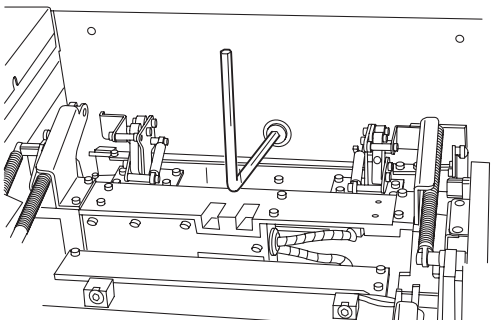
WARNING

- **It is sometimes necessary to have the main power ON when making adjustments. At such times, when the main power is ON, make sure that the motor power supply is turned OFF. If the motor power supply is left ON, the motor could start up, injuring someone. In addition, wear protective gloves when adjusting electrical equipment.**

1. Jog the jaw until the front and rear jaws engage.
2. If the following cases appear, jaw adjustment will be needed.
   a. Jaw alignment has upward or downward deviation.
   b. Jaw alignment has play.
   c. Jaw alignment has horizontal deviation.

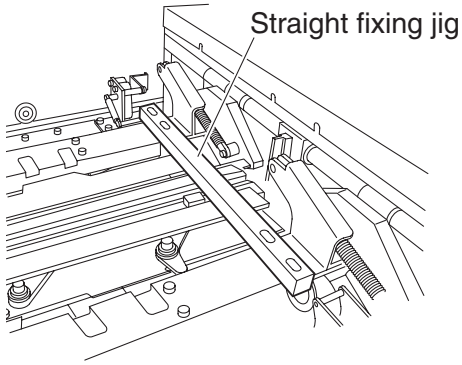
   To adjust the Jaw alignment, follow the below steps.

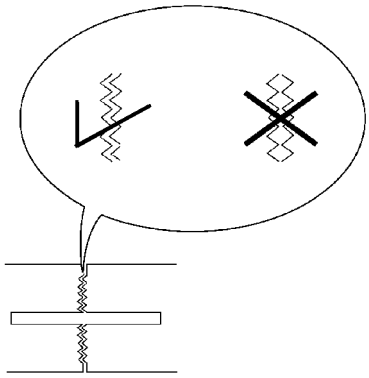
1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Remove 4 bolts and remove the crumb plate and the stripper plate.
5. Turn the pivot point screw to close jaw.



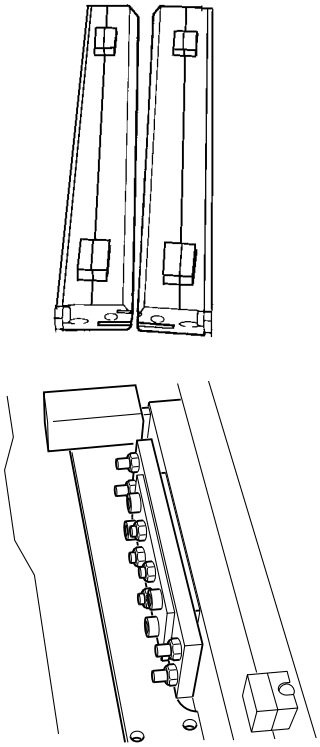
6. Adjust the front and rear jaw to match the knife.
7. Attach a straight fixing jig to keep jaw horizontal.
8. Check alignment with mirror.

   If the jaw alignment is loose, adjust as follows.

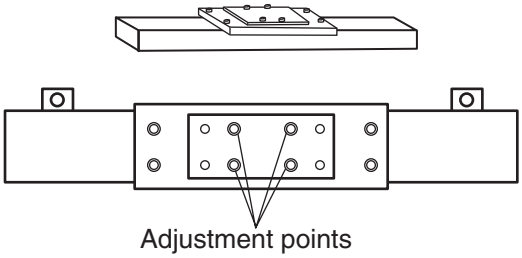




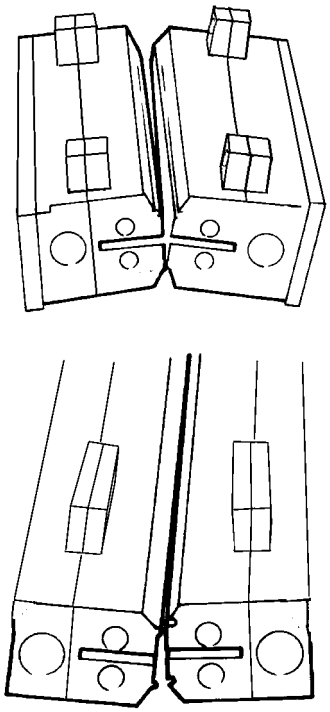
Right or Left adjustment



If the right and left are not aligned, adjust by turning adjustment screws on the metal plate attached to rear jaw.

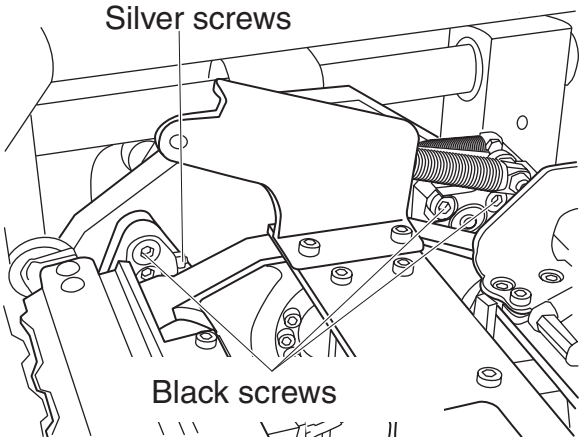


Top and Bottom adjustment



If top and bottom are not aligned, adjust the screw on the arm.

1. Loosen the 3 black screws.
2. Tighten or loosen the silver screw to adjust jaw face.



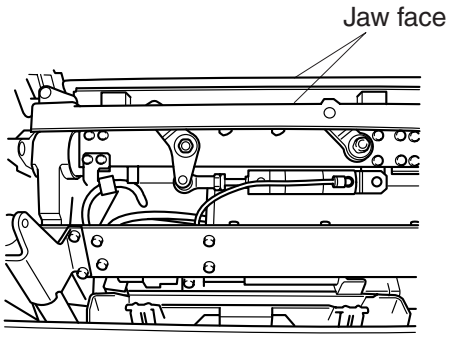
NOTE

There are two sets of jaw, so check both of jaw alignment.

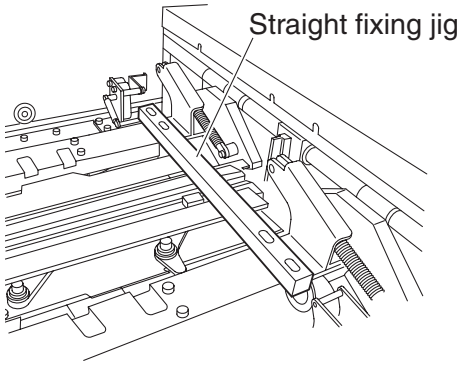
4.1.3 M2 Motor

4.1.3.1 Timing Belt of M2 Motor

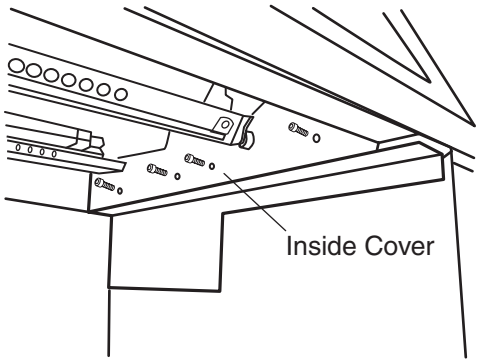
1. Proceed steps 1 to 4 of the section "4.1.1 Replacing the Jaw Faces".
2. Using your hand, rotate the jaw arm and engage the front and rear jaws.



3. Attach a straight fixing jig to the jaw arm.



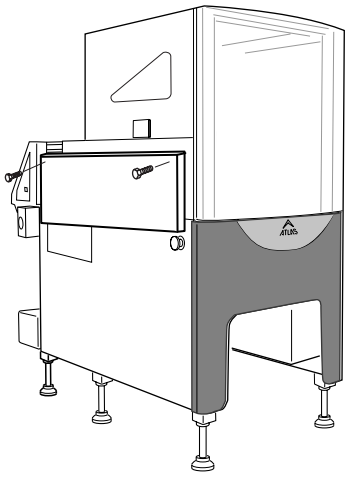
4. Remove 4 screws, remove the inside cover.



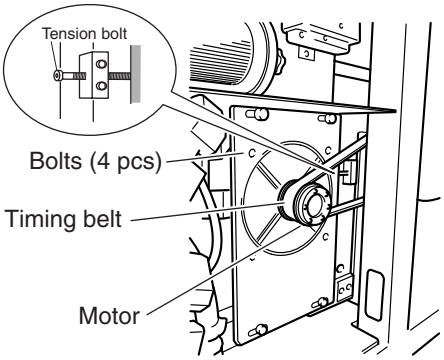
5. Remove the LEFT side cover.

CAUTION

- **Two people should remove the cover, since it is heavy.**

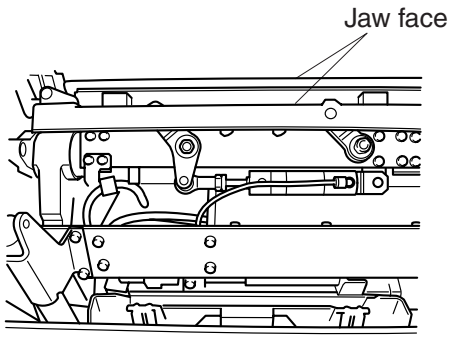


6. Loosen 4 bolts tightening the motor bracket.
7. Loosen the tension bolt.
8. Remove the timing belt.
9. Install the new timing belt.
10. Using your finger, press down on the center of the belt between pulleys. Adjust until the deflection is approximately 2 millimeters then tighten the tension bolt and tighten the motor bracket screws.
11. Attach the inside cover.

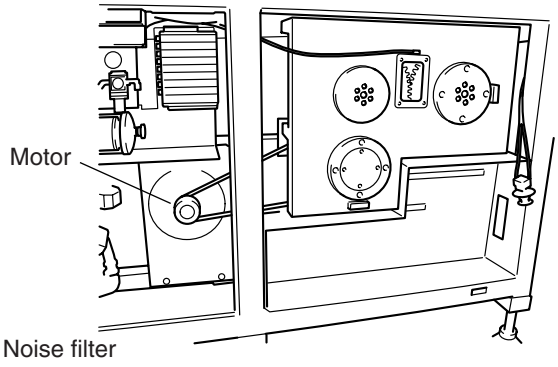


4.1.3.2 Replacing the M2 Motor

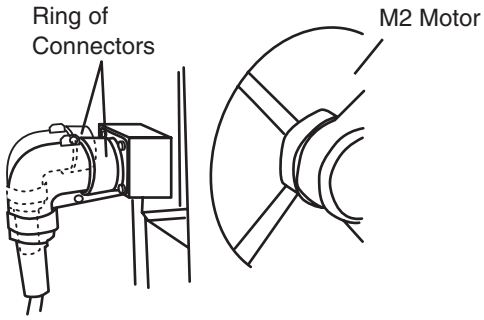
1. Proceed steps 1 to 4 of the section "4.1.1 Replacing the Jaw Faces".
2. Using your hand, rotate the jaw arm and engage the front and rear jaws.
3. Attach a straight fixing jig to the jaw arm.



4. Remove 4 screws and remove the noise filter unit so that you can access the M2 motor.



5. Loosen the ring, remove two connectors at the right of M2 motor.
6. Loosen 4 bolts tightened the motor bracket.
7. Loosen the tension bolt.
8. Remove 4 screws, remove the inside cover.
9. Remove the timing belt.
10. Loosen the mechanical lock, and remove the pulley from the M2 motor.
11. Remove the allen bolts, and remove the M2 motor.



CAUTION

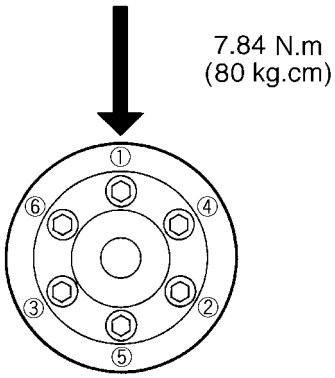
- **The motor is heavy and should be lifted by two people.**

12. Remove the motor from the motor base.
13. Attach the motor to the new motor base.

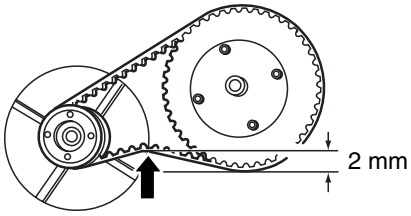
CAUTION

- **Do not cause any shock to the motor, or the motor's encoder can be damaged.**

14. Attach and fasten the gear and mechanical lock to the motor shaft. Tighten the bolts for the mechanical lock at 7.84 N.m (80 kgf.cm) in a crisscross (star) pattern.

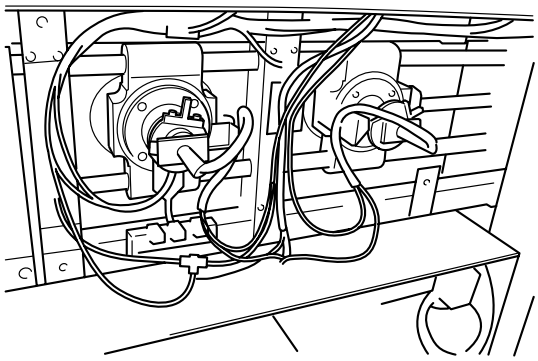


15. Install the motor with motor base.
16. Install the electrical box of the PS-0 unit.
17. Attach the timing belt.
18. Using your finger, press down on the center of the belt between gears. Adjust until the deflection is approximately 2 millimeters; then fasten the M2 motor.



19. Tighten the tension bolt.
20. Attach the inside cover.

4.1.3.3 Home Position of Jaw Rotation

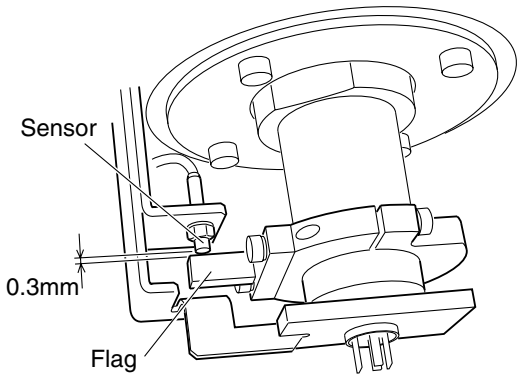


Home Position is the position where the jaw stops after the motor is turned on.
Then, either knife 1 or knife 2 comes upper side.

- When the rear sensor turned on, knife 1 comes to upper side.
- When the front sensor turned on, knife 2 comes to upper side.
- When Home position, the plate of the jaw should be angled 90 degree against the horizontal frame of main unit.

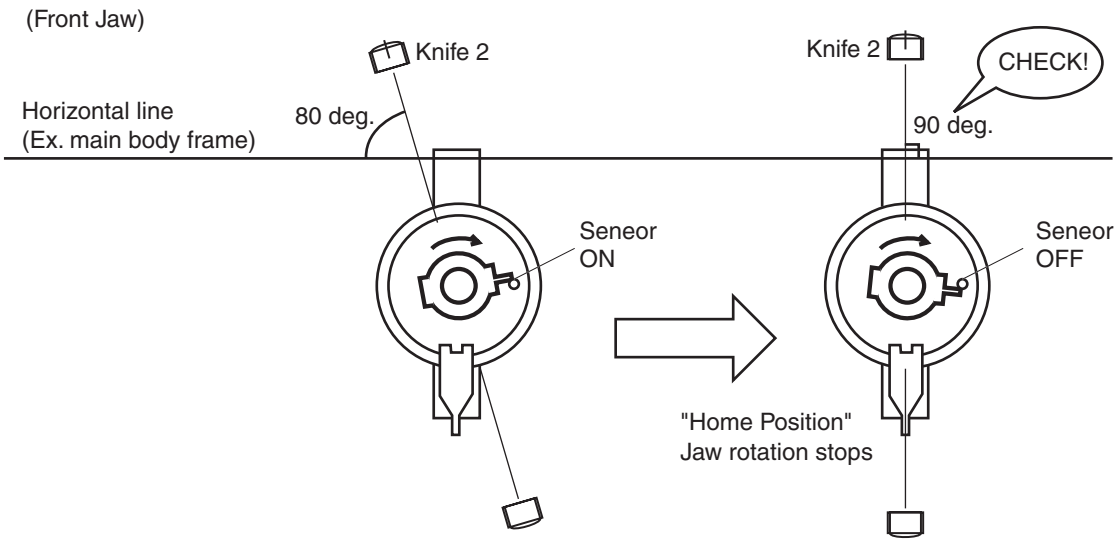
1. Turn the motor power supply OFF.
2. Turn the main power supply OFF.

3. Open the left lower cover.
4. Set gap to 0.3mm between sensor and flag.



5. Set the angle of the jaw plate to 80 degree against the horizontal frame of main unit when the sensor turns on.
6. Turns the motor power on.

   Jaw rotates until the sensor switches on, then the jaw stops.
7. Confirm if the angle of the jaw plate is 90 degree against horizontal frame.



8. If the angle is not 90 degree, adjust the flag, then restart the motor power on, and confirm the angle when the jaw stops at home position.

NOTE

- Repeat the above step until the angle to be correct.

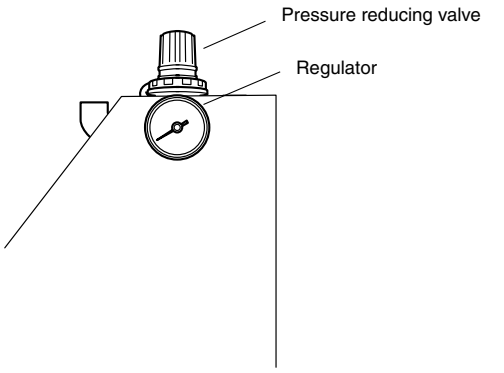
9. Adjust both of the Knife 1 and Knife 2 jaw sensor.

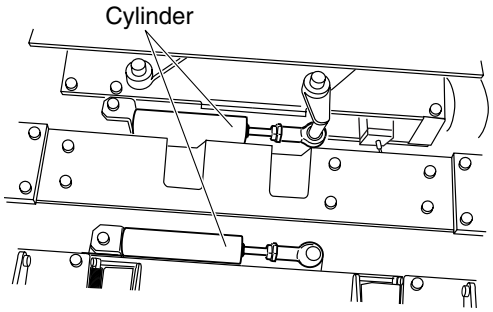
<How to adjust the flag>

1. Loosen the screws tightening the flag, and rotate the flag to appropriate angle.
2. Tighten the screws.

4.1.4 Replacing the Air Cylinder for Knife

1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Remove 4 bolts and remove the crumb plate and the stripper plate.
5. Pull the knob for the pressure reducing valve and adjust until the pressure is 0.0 MPa.
6. Remove the rod end ; then replace the cylinder for knife with a new one.

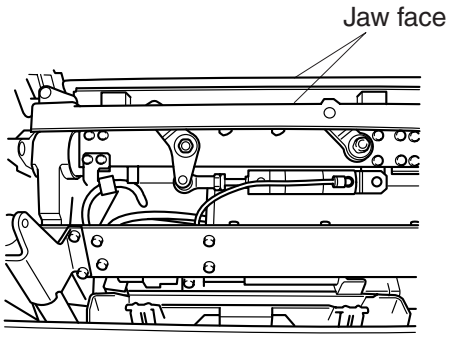




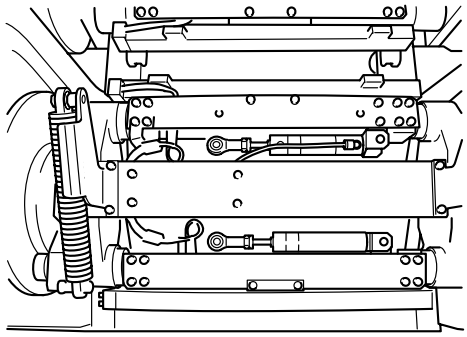
4.1.5 Jaw Heater

4.1.5.1 Replacing the Jaw Heater

1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Remove 4 bolts and remove the crumb plate and the stripper plate.



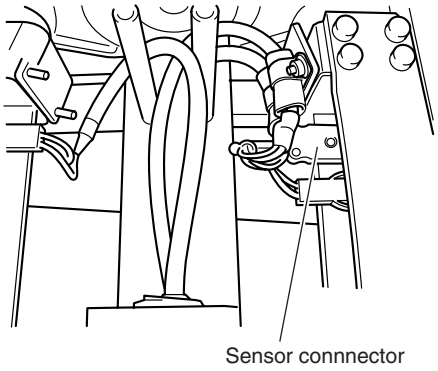
5. Remove the sensor connector of the end seal heater from the plate.



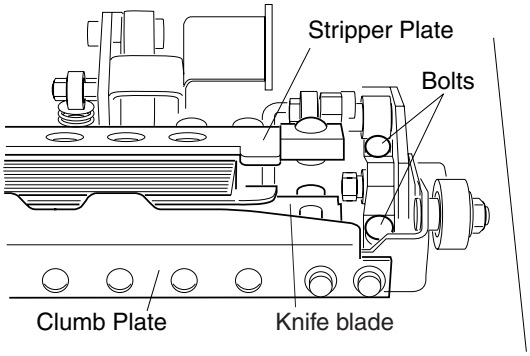
6. Disconnect the cable that runs from the terminal connector for the heater.

CAUTION

- **The thermocouple has polarity and is identified by the color of the cable (red or white).**
  If a connection is made with the wrong polarity, the temperature control can fail or unit can be damage.



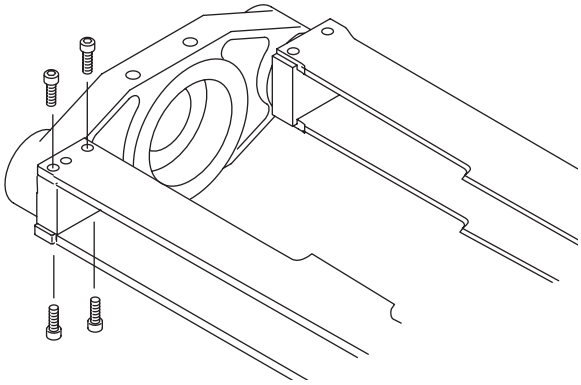
7. Remove the allen bolt and remove the knife blade.



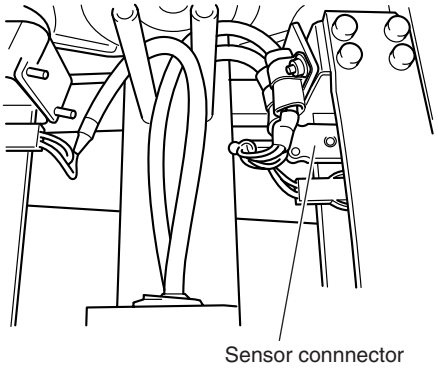
WARNING

Be careful when removing the knife blade. It is very sharp and hot.

8. Remove 8 screws, remove the heater unit from the arm unit.



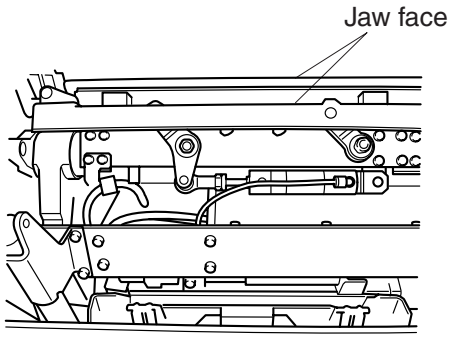
9. Remove 4 screws, remove the heater cover.
10. Remove 3 screws, remove the heater cap then pull the heater.



TIP

- In case of replacing thermocouple, remove the fixing screw then pull the thermocouple.

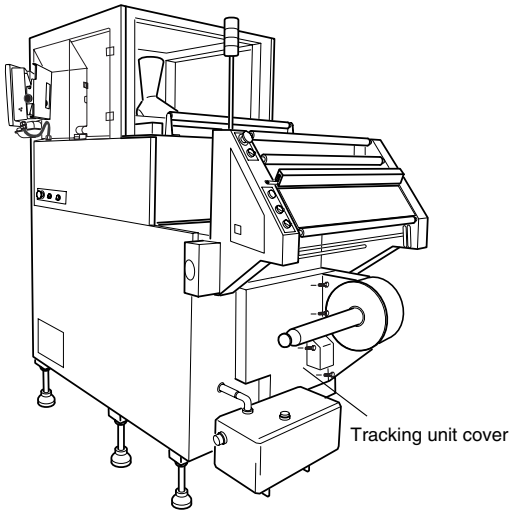
11. Attach the new heater or thermocouple.
12. Install in the reverse order of removal.
13. Check the engagement of the jaws. If the engagement is not proper, adjustment is needed. (To adjust the position of the jaws, see "4.1.2 Jaw Alignment")



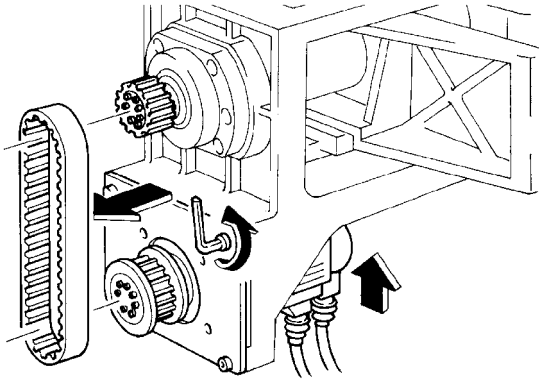
4.1.6 M3 Motor

4.1.6.1 Timing Belt of M3 Motor

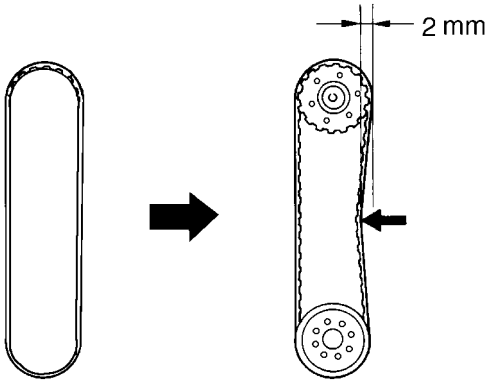
1. Turn the main power OFF.
2. Remove the tracking unit cover.
3. Move the tracking unit to the right edge. (Rotate the tracking motor by hand to move the unit.)
4. Perform the operation from the back side of the main unit.



5. Loosen the allen bolts that fasten the M3 motor.
6. Lift the M3 motor, and temporarily fasten the allen bolts.
7. Replace the belt with a new one.
8. Life the motor down and tighten the bolt.

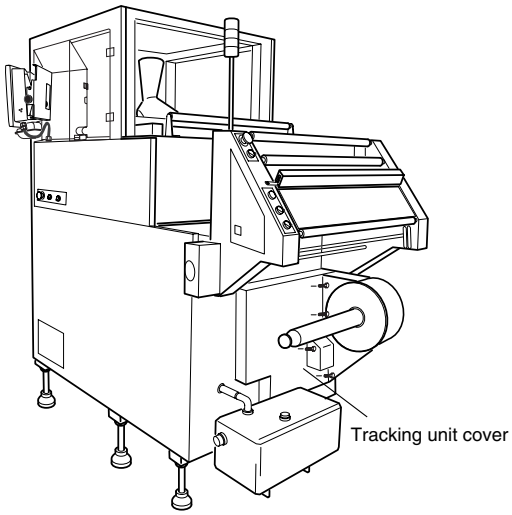


9. Using your finger, press down on the center of the belt between pulleys. Adjust until the deflection is approximately 2 millimeters; then tighten the M3 motor fixing bolts.

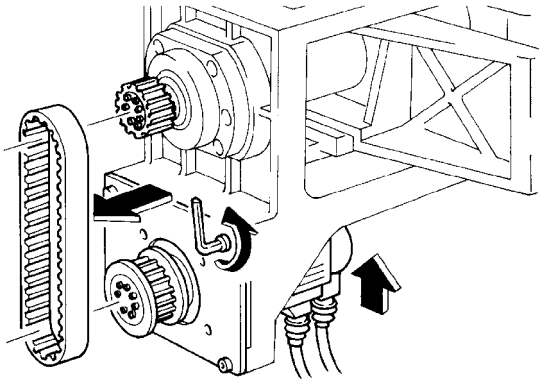


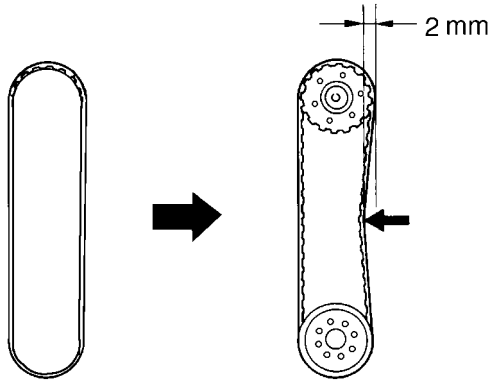
4.1.6.2 Replacing the M3 Pivot Point Motor

1. Turn the main power OFF.
2. Remove the tracking unit cover.
3. Remove the main unit lower cover on the right side.
4. Move the tracking unit to the right edge. (Rotate the tracking motor by hand to move the unit.)



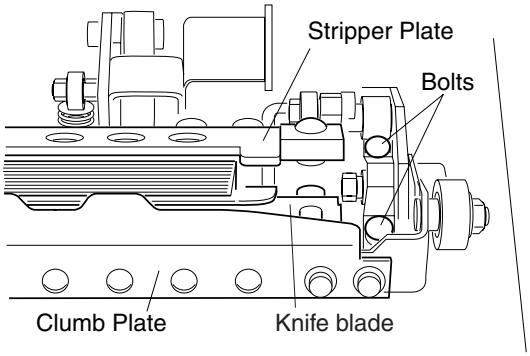
5. Loosen the allen bolts that fasten the M3 motor.
6. Lift the M3 motor, and temporarily fasten the allen bolts.
7. Remove the timing belt.
8. Remove the two cables connected to motor.
9. Remove the 4 screws, and replace the motor with a new one.
10. Move the electrical control panel with the front side of the panel centered and remove the motor through the panel for installation.
11. Temporarily fasten the motor.
12. Attach the belt.
13. Lift the motor down.
14. Using your finger, press down on the center of the belt between gears. Adjust until the deflection is approximately 2 millimeters; then tighten the M3 motor fixing bolts.





4.1.6.3 Home Position of Pivot

1. Turn the motor power supply OFF.
2. Turn the main power supply OFF.
3. Remove the main unit lower cover on the right side.
4. Open the front cover.
5. Pull the handle forward, and swing the back seal unit out.
6. Remove 4 bolts and remove the crumb plate and the stripper plate.



CAUTION

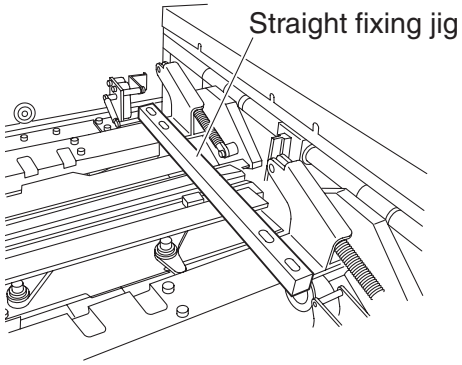
- **After operation, the jaws are extremely hot. Do not touch directly. You can get burned.**

7. Jog arms around until jaw faces mesh together and arm are perfectly horizontal.

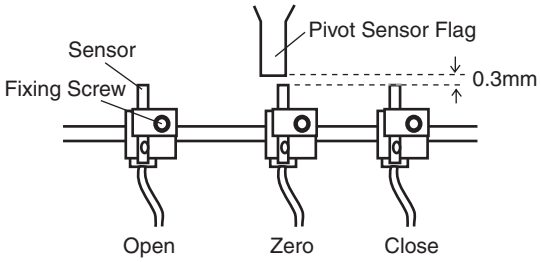
NOTE

- Arms must be perfectly horizontal.

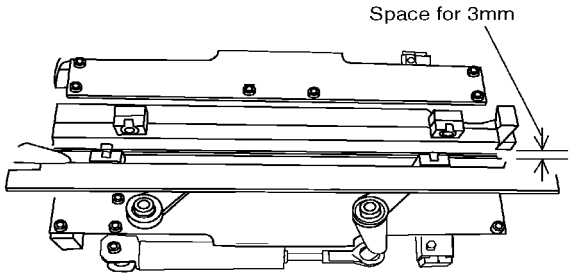
8. Attach a straight fixing jig to the jaw arm.



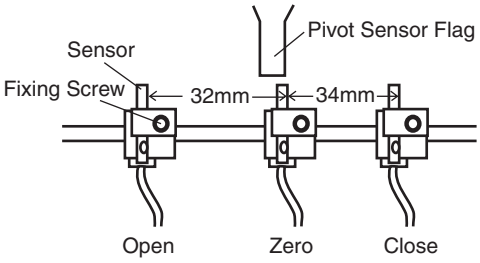
9. Set gap to 0.3mm between flag and sensor.



10. Make a space for 3mm between jaw faces.



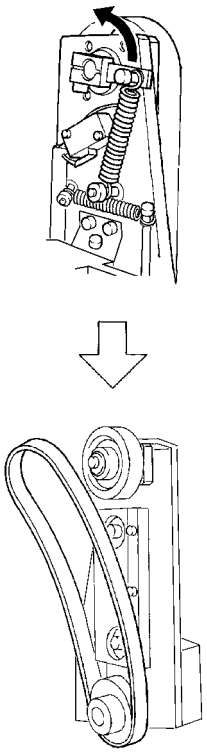
11. Adjust the middle(zero) sensor position to the right edge of the flag.
12. Remove the fixing jig.
13. Set the distance to 34mm between middle block and right(close) block.
14. Set the distance to 32mm between middle block and left(open) block.



4.2 Back Seal Unit

4.2.1 Replacing the Heater Band

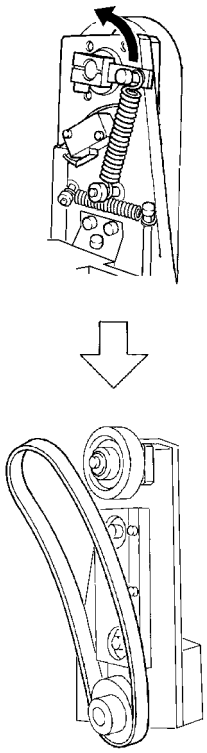
1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Open the back seal cover.
5. Lift the tension lever located on the side of the back seal unit.
6. Replace the heater band with a new one.



4.2.2 Back Seal Heater

4.2.2.1 Replacing the Heater Sensor

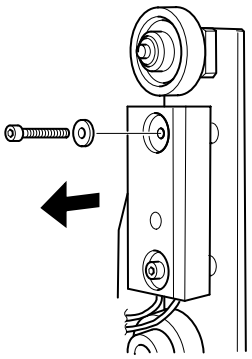
1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Open the back seal cover.
5. Lift the tension lever located on the back of the steel belt, and remove the heater belt.



6. Remove the heater block.

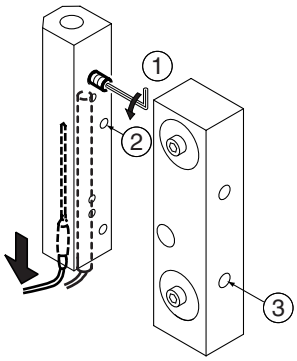
NOTE

- The lengths of the bolts that fasten the heater block are different.



7. Loosen the two allen screws ③ from the side of the heater block and remove the heater shoe.

8. Loosen the screws ① and/or ② from the side of the heater block, and pull out the heater and/or thermocouple.



CAUTION

- **If the thermal joint is sticking, making it difficult to pull out the heater, press with a rod-shaped tool from the opposite side; then pull out.**

9. Replace the heater and/or thermocouple with new ones.

10. Reinstall all parts in the reverse order of removal.

4.2.2.2 Replacing the Heat Pipe

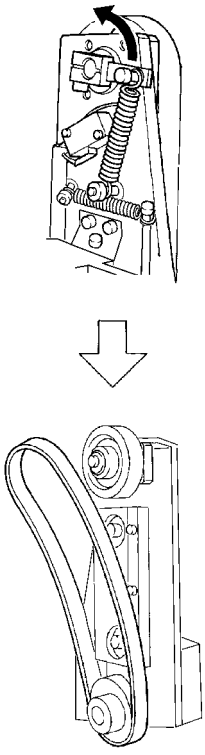
1. Turn the main power OFF.

2. Open the front cover.

3. Pull the handle forward, and swing the back seal unit out.

4. Open the back seal cover.

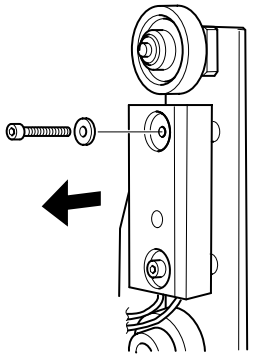
5. Lift the tension lever located on the back of the steel belt, and remove the heater belt.



6. Remove the heater block.

NOTE

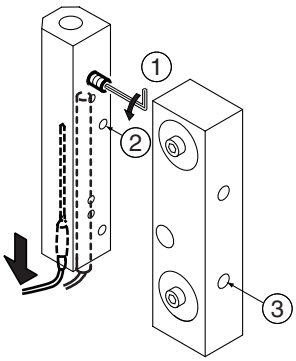
- The lengths of the bolts that fasten the heater block are different.



7. Remove the two bolts that fasten the heater shoe to the heater block.

8. Loosen the two allen screws ③ from the side of the heater block and remove the heater shoe.

9. Loosen the screws ① and/or ② from the side of the heater block, and pull out the heater and/or thermocouple.



10. Install the new heat pipe.

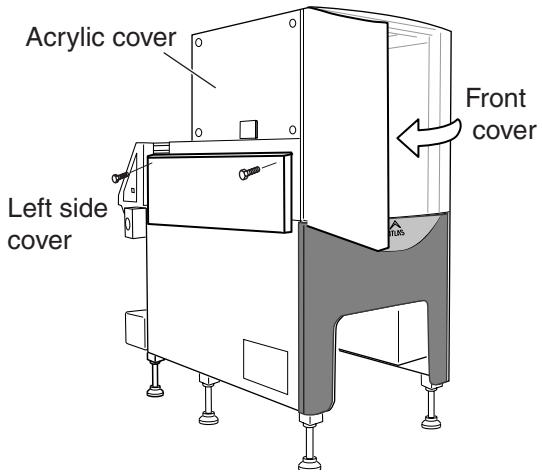
11. Reinstall all parts in the reverse order of removal.

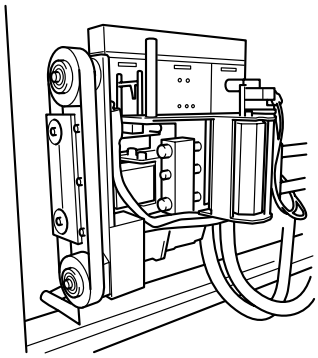
4.2.3 Replacing the Back Seal Air Cylinder

NOTE

- You must remove the back seal unit to access the back seal cylinder.

1. Turn the main power OFF.
2. Lift the pressure reducing valve knob; then turn the knob counterclockwise until the pressure is at 0.
3. Open the front cover, left upper cover and acrylic cover.
4. Pull the handle forward, and swing the back seal unit out.

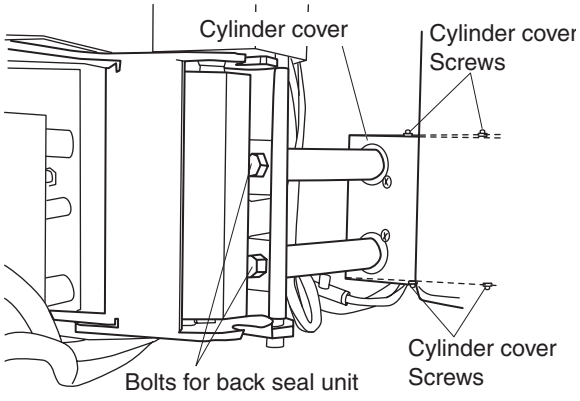




5. Remove the two bolts fixing the back seal unit, remove the back seal unit.

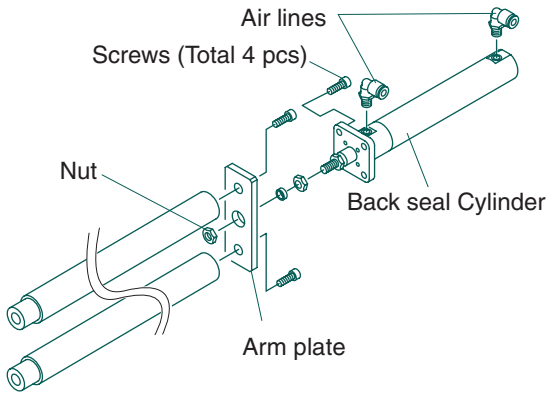
NOTE

- The back seal unit is heavy so put on the space carefuly not causing any shock.
- The back seal unit removal is just to access to the back seal cylinder. Back seal unit is out of replacing items.



6. Remove each two screws on the top and bottom sides of cylinder cover and remove the cylinder cover.

7. Remove a nut fastened arm plate and remove the cylinder.
8. Remove the two air lines from the fitting.
9. Remove 4 screws and remove the cylinder from the main body.
10. Install the new air cylinder.
11. Reinstall all parts in the reverse order of removal.



4.2.4 Replacing the Back Seal Unit M5 Motor

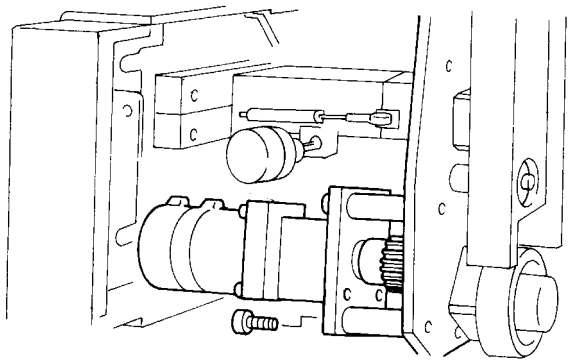
1. Turn the main power OFF.
2. Open the front cover.
3. Open the back seal unit.
4. Remove the arm cover.
5. Remove the CN sig cable from the M5 connector.

CAUTION

- **Pull the cable out straight while holding the connector. Failure to do so can damage the cable.**

6. Remove the M5 servo motor horizontally. The M5 motor is fastened by four allen bolts.

   Tool: 5-mm hex wrench

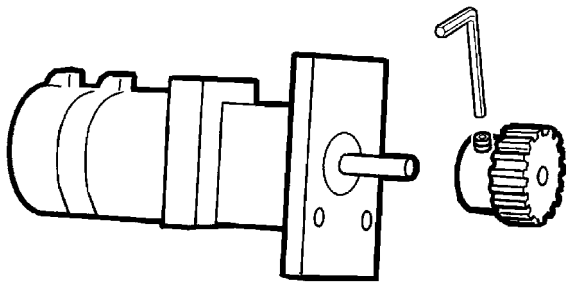


NOTE

- Removing the guard plate will make the replacement work easier.

7. Remove the gear from the M5 servo motor.

   Tool: 2.5-mm hex wrench



NOTE

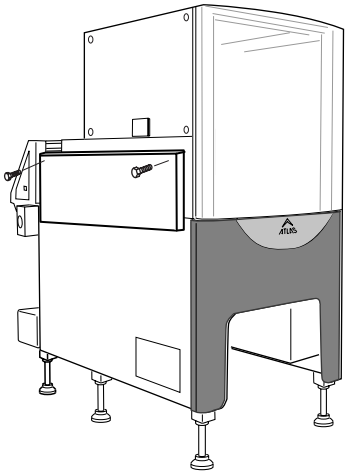
- Replace the motor only. The gears are not included.

8. Attach the original gear to the new M5 servo motor.
9. Attach the M5 servo motor to the back seal unit.
10. Reinstall all parts in the reverse order of removal.

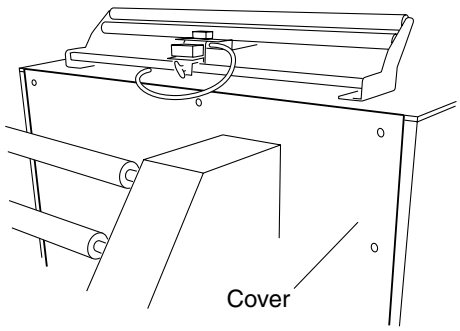
4.3 Pull Belt Unit

4.3.1 Replacing M1 Motor of the Pull Belt

1. Turn the main power OFF.
2. Open the left side upper cover.
3. Remove the 2 back side screws fixing the left side upper cover, then remove the front side 2 screws to remove the cover.



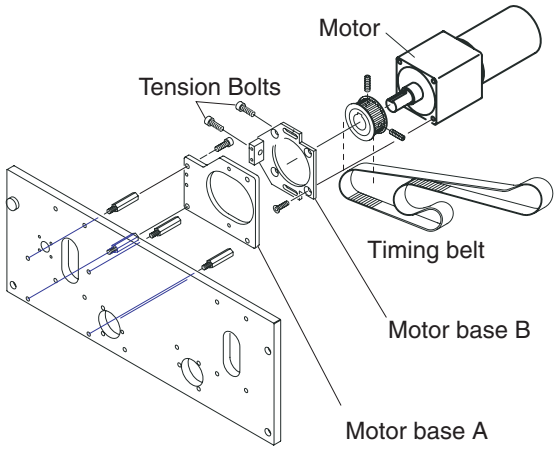
4. Remove the ten screws, remove the rear upper cover.



5. Loosen two tension bolts.
6. Remove 2 screws and remove the motor base A from the M1 motor with motor base B.
7. Remove 4 screws, remove the M1 motor from the motor base B.
8. Remove the timing belt if necessary.

NOTE

- You cannot remove timing belt without removing the motor.



9. Reinstall all parts in the reverse order of removal.
10. Check for proper tension on pull belts.

    Deflection : 3-4mm

4.3.2 Replacing the Pull Belt

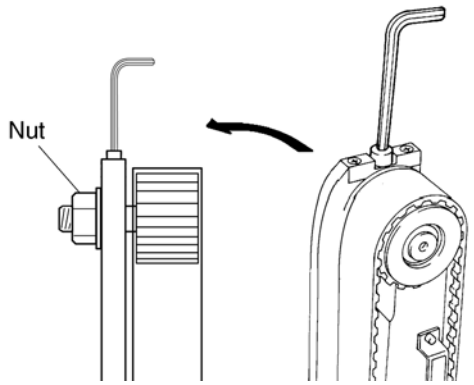
1. Press the [Run/Lace] key.

   ▶The pull-down belts move outward.
2. Turn the main power OFF.
3. Open the front cover.
4. Pull the handle forward, and swing the back seal unit out.
5. Remove the former, and make sure that the pull belt is free of grime, flaws, and splits.

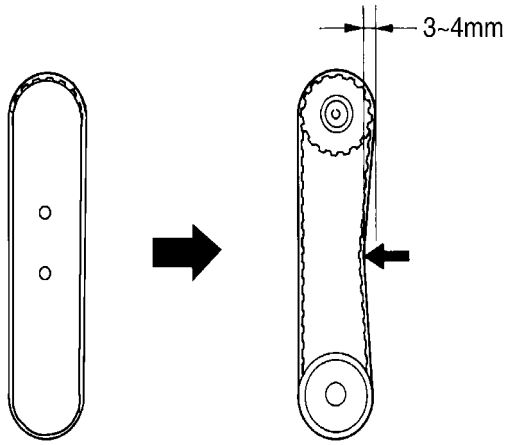
⚠ CAUTION

- **Be careful when handling the former. It is heavy.**

6. Loosen the nut at the reverse side of the pull belt unit and loosen the tension.
7. Remove the pull belt.
8. install the new pull belt.



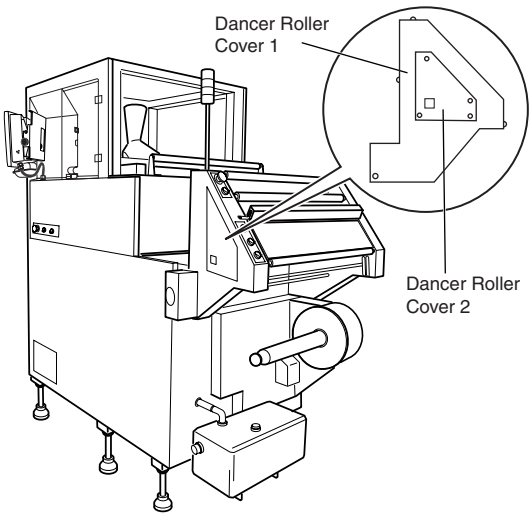
9. Press down on the center of the pull belt and adjust the tension that the belt deflects approximately 3 to 4 millimeters, then tighten the nut.



4.4 Dancer Roller

4.4.1 Replacing the Load Cell

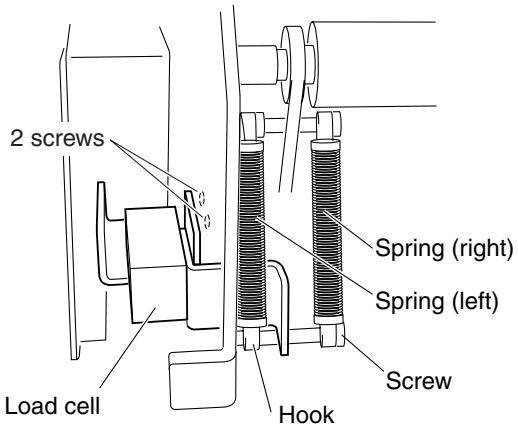
1. Turn the main power OFF.
2. Remove the main unit lower cover on the right side.
3. Move the electrical control panel to remove the load cell connector in the back.
4. Loosen 4 screws, remove the Dancer Roller Unit cover 2.



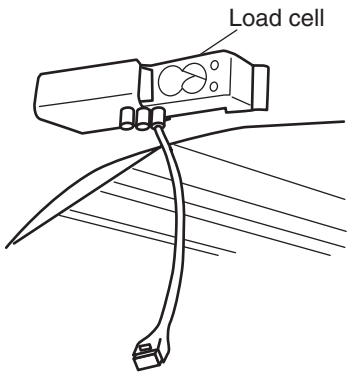
5. Remove the Dancer Roller cover.
6. Remove the dancer roller spring.

   Right: Remove the nut attaching the bottom of the spring.

   Left: Remove the 4 screws of the load cell move the load cell and detach the spring from the hook.
7. Remove the 2 bolts fixing the load cell fitting outside the frame.

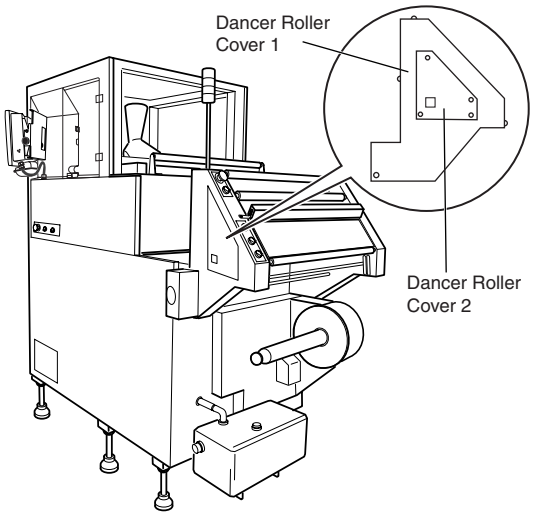


8. Remove the load cell.



4.4.2 Dancer roller adjustment

1. Turn the main power supply ON.
2. Loosen 4 screws, remove the Dancer Roller Unit cover 2.



3. Press the operation level key  on a screen.

   ▶The screen to select the operation level will appear.

4. Select the Maintenance level.

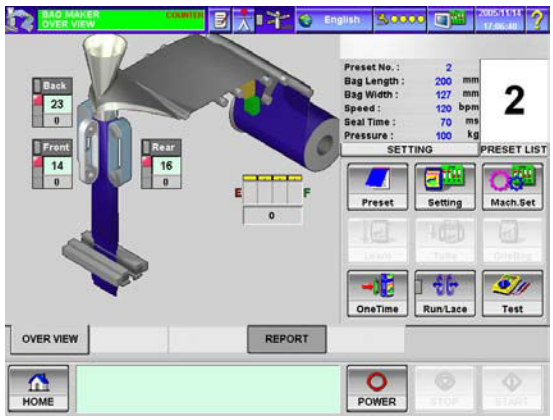
   ▶The keyboard to enter the password will appear.

5. Enter the password for the Maintenance level.

   ▶The Operation Standby screen for the Maintenance level will appear.

6. Press the  key.

   ▶The MACHINE SETTING screen will apper.

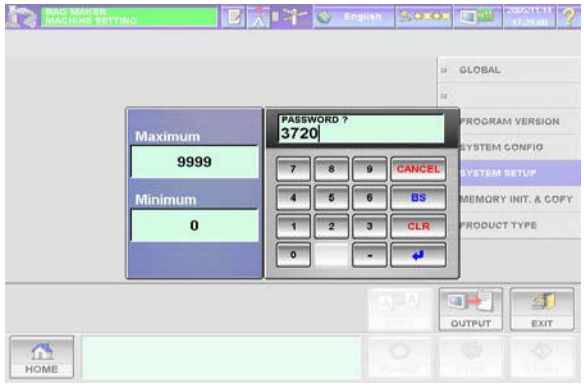


7. Press the [SYSTEM SETUP] index.

   ▶The keyboard to enter the password will apper.

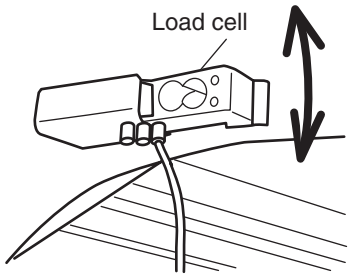
8. Enter the password "3720".

   ▶The SYSTEM SETUP screen will apper.



9. Confirm that the following values have been displayed for the load cell data on the screen:

   If dancer roller is at lower limit: 520 (±10)
   If dancer roller is at upper limit: 4000-4400



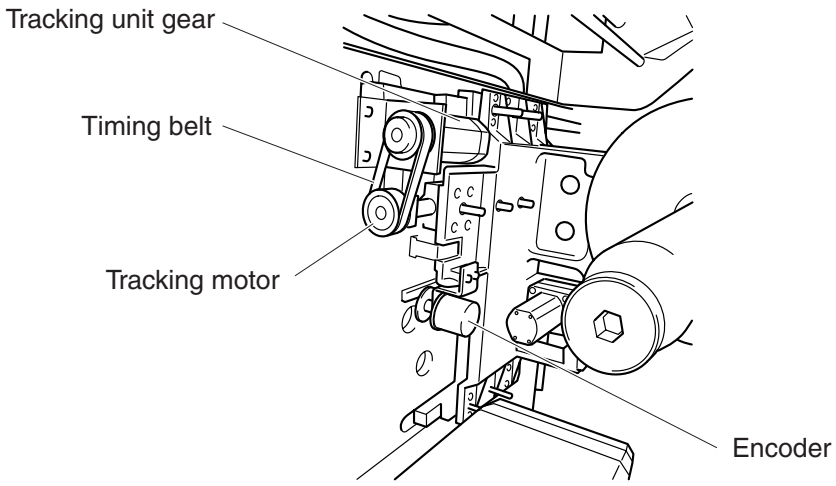
NOTE

- If the specified values are not given, change the angle of the load cell for adjustment.

10. Loosen the fixing screws, then loosen the bolts from the inside to adjust the position.

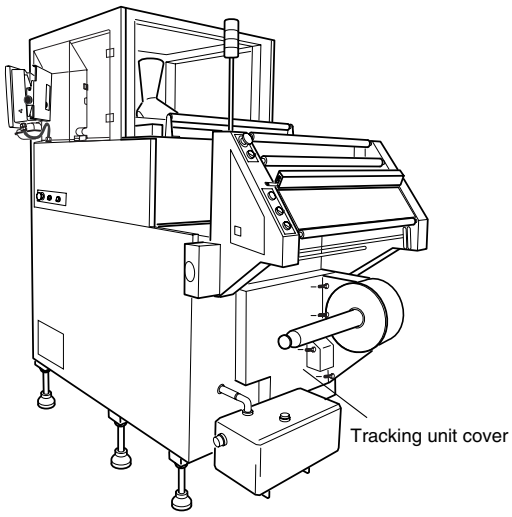
11. Attach the dancer roller cover.

4.5 Tracking Unit

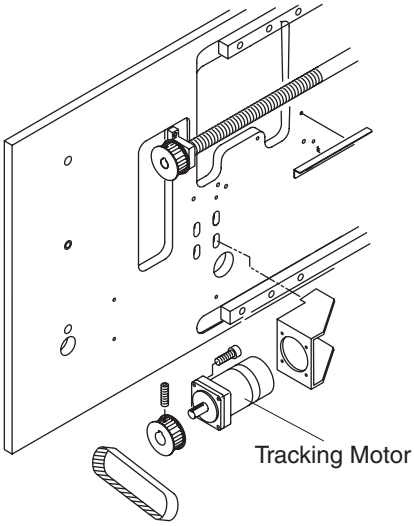


4.5.1 M7 Tracking Motor

1. Turn the main power OFF.
2. Remove the back side cover.
3. Loosen 4 bolts of the motor bracket.
4. Loosen the tension of the tracking motor.

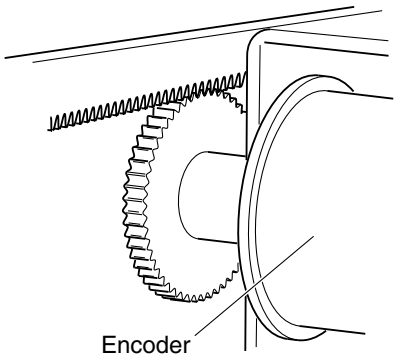


5. Remove the timing belt.
6. Remove the motor bracket by removing 4 bolts.
7. Remove the head gear from the motor.
8. Remove 4 bolts and remove M7 motor from the bracket.
9. Attach the head gear to the new motor.
10. Install the motor with attached head gear.
11. Reinstall all parts in the reverse order of removal.



4.5.2 Replacing the Encoder

1. Turn the main power OFF.
2. Remove the back side cover.
3. Remove the two screws and remove the encorder with bracket.
4. Remove the encorder gear.
5. Remove the 4 screws and remove the encorder from the bracket.



4.5.3 Tracking unit Adjustment

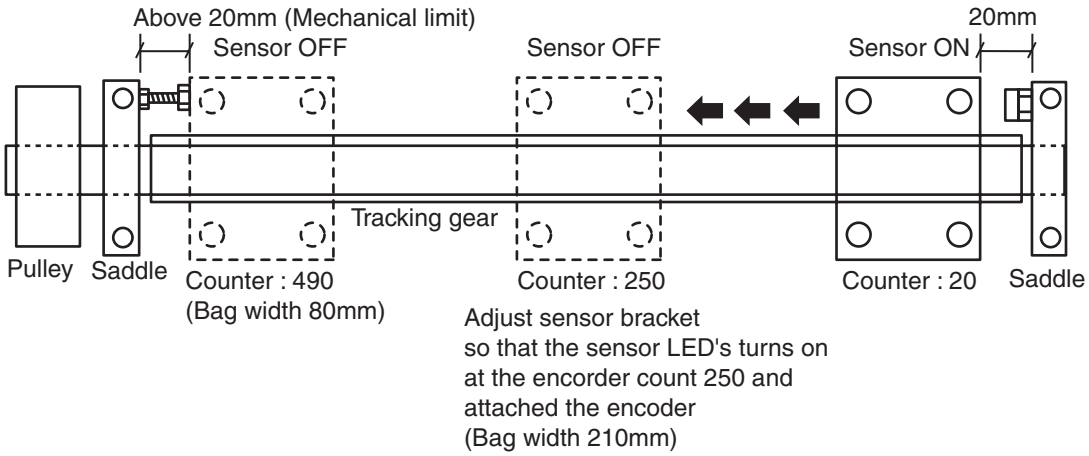
NOTE

- If you need replacement, replace the parts according to the parts list.

Tracking unit Adjustment

1. Turn the main power supply ON.
2. Remove the Tracking unit cover.

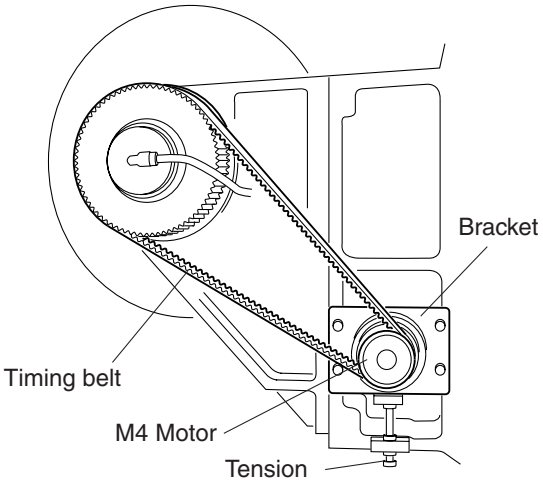
3. Switch to the remote control screen's tracking adjustment.
4. Set the encorder to count "20" at 20mm from the saddle without pulley.
5. Move the tracking unit with rotating the pulley till the encorder counts 250.
6. Adjust L plate so that the tracking sensor turns off at this position.
7. Additionally, check if the encorder counts 490 at the position of above 20mm from the saddle which is the next of pulley).



4.6 Replacing the Film Unwind Unit

4.6.1 Replacing the M4 Motor

1. Turn the main power OFF.
2. Remove the film spindle unit cover.
3. Loosen 4 bolts of the motor bracket, and loosen the tension bolt.
4. Detatch the timing belt.
5. Remove 4 screws and remove the motor with bracket.
6. Remove the belt gear.
7. Remove the M4 motor from the bracket.
8. Attach the original gear to the new motor; then apply a small amount of graphite grease.



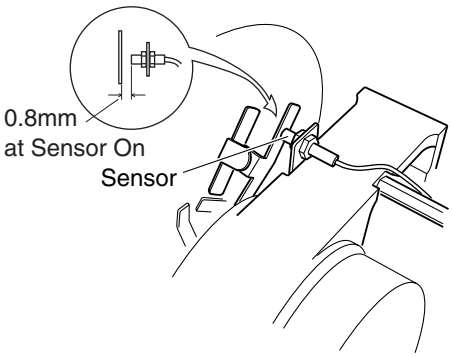
NOTE

- Replace the motor only. The gears are not included.

9. Install the new motor.
10. Reinstall all parts in the reverse order of removal.

4.6.2 Film roll Sensor

1. Check if the gap between sensor and lever is 0.8mm when the sensor turns on.



CAUTION

Also check if the lever does not touch with the sensor when sensor is on. Otherwise the sensor and the lever may be broken.

4.7 Electrical System

WARNING

- **Before replacing electrical components, make sure that the main power supply and motor power supply are turned OFF. Failure to do so can result in electrical shock.**

4.7.1 Remote Control System Board

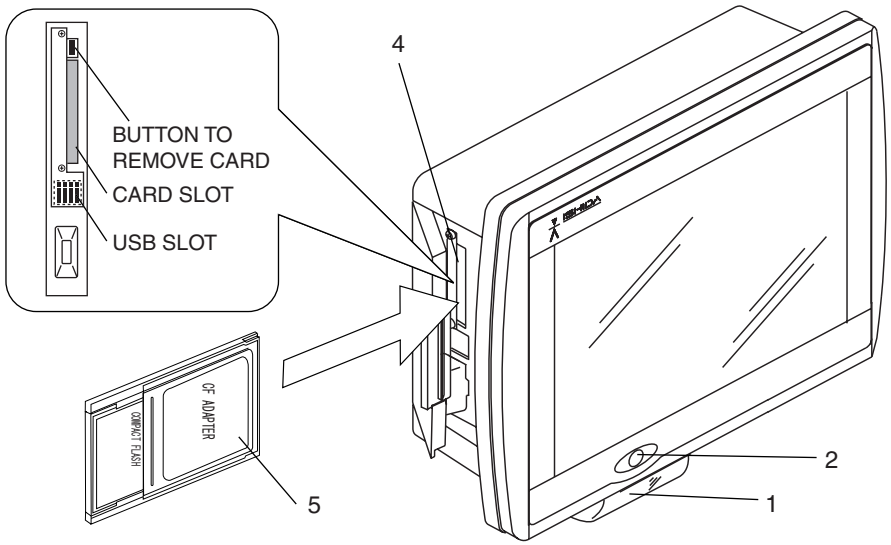
CAUTION

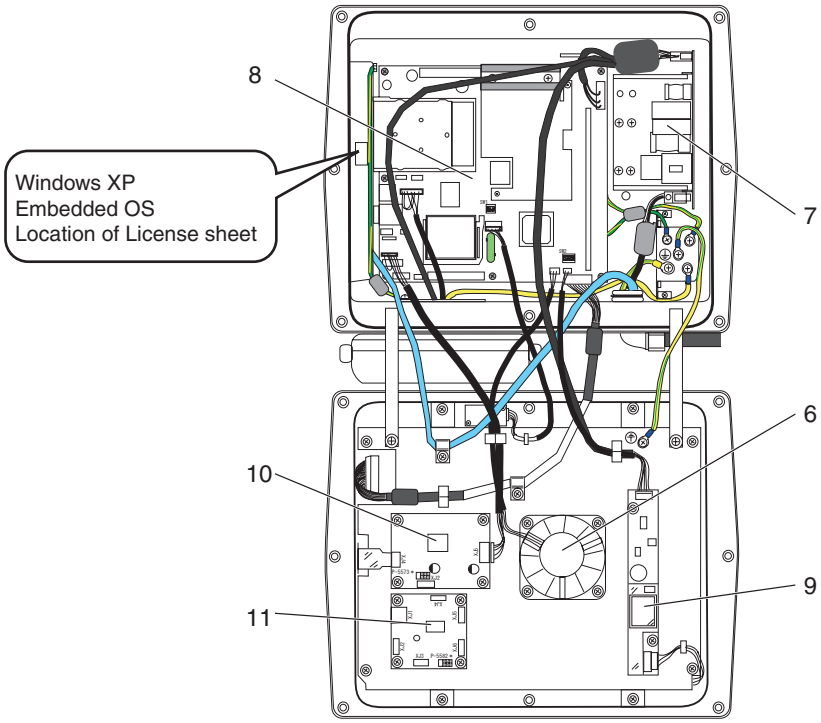
- **Do not drop or damage the board. Doing so can cause it to fail.**

NOTE

- The * symbol used with the serial number shown on the board represents the board version number.

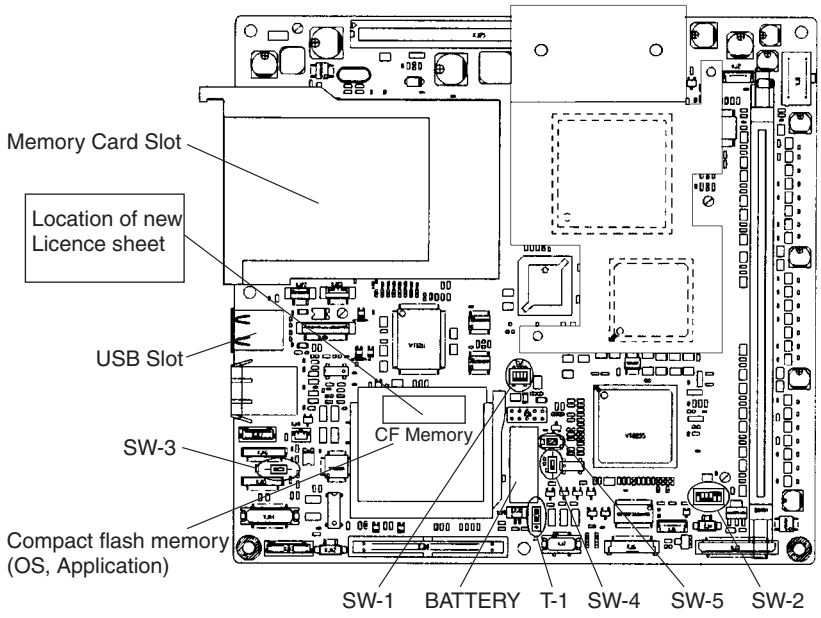
4.7.1.1 Remote Control Unit





No.	Name
1	PRINTER UNIT
2	USB CAMERA
3	TOUCH PANEL, COLOR LIQUID CRYSTAL DISPLAY
4	MEMORY CARD INSERTION PORT
5	MEMORY CARD (CF CARD) (Optional)
6	FAN MOTOR
7	DC/DC converter
8	RCU BOARD (P-970*)
9	BACKLIGHT INVERTER BOARD
10	TP-I/F BOARD (P-5578*)
11	USB camera selection board (P-5582 *) [Option]

4.7.1.2 RCU Board (P-970*)



Function of board

1. Input control by touch panel
2. Display control on color LCD
3. Communication [Ethernet] with CAL [DMU board (P-5562 *)]
4. Communication with compact flash slot unit
5. Printer control

Battery

1. Battery in use: Lithium primary battery (accumulator battery) Model: RE2477A/VA
2. Replacement time: 15 years (It depends on the environment.)

⚠ CAUTION

- **The battery replacement with a wrong one may cause malfunction in the board. Replace with the same type or equivalent.**
  Discard the used battery.

Function of DIP-SW

(1) SW1: Setting the multiple DIP-SW

SW1	Functional description	Initial setting mode
1	ON: Debug mode	OFF
2	Not used (As of October 2004)	
3		
4		

(2) SW2: DIP-SW for LCD panel type setting

SW2	Functional description					Initial setting mode
1	1	2	3	4		ON
2	ON	OFF	OFF	OFF	: 800 x 600	OFF
3	OFF	OFF	OFF	OFF	: 1024 x 768	
4						
5	Reverse display-2 (XJ3-41pin) OFF: High level ON: Low level					ON
6	Reverse display-1 (XJ3-38pin, XJ6-3pin) OFF: High level ON: Low level					OFF

(3) SW3: DIP-SW for COM2 port setting

SW3	Functional description	Initial setting mode
OFF	COM2 port has been set to RS-232C level (Using XJ16)	ON
ON	COM2 port has been set to C-MOS level (Using XJ21)	

(4) SW4: DIP-SW for Power supply setting

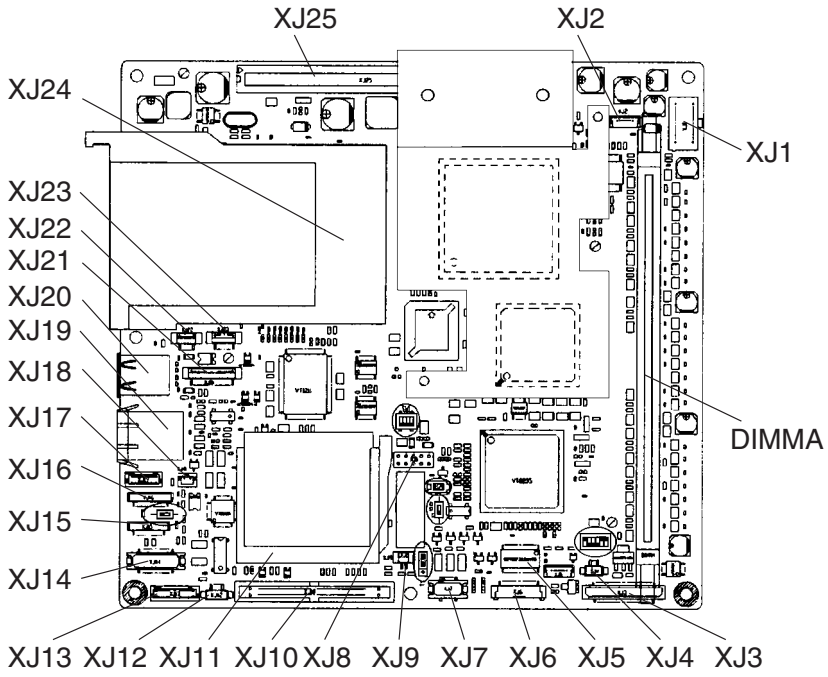
SW4	Functional description	Initial setting mode
OFF	Uses ATX type power supply and starts up by power supply SW.	ON
ON	Uses AT type power supply and starts up by turning ON the power supply.	

(5) SW5: Power supply DIP-SW on board
This is power supply SW and connected with XJ19 (external power supply SW) line.

(6) T1: CMOS clear plug

T1	Functional description	Initial setting mode
1-2	Normal operation	1-2 side
2-3	CMOS, RTC clear	

Connector layout



Connector classification

Connector No.		Item
XJ1	(8P)	Power supply input (+ 12V DC/ + 5V DC)
XJ2	(3P)	FAN1
XJ3	(41P)	LCD (CMOS)
XJ4	(3P)	LCD back light control
XJ5	(3P)	FAN2
XJ6	(21P)	LCD (LVDS)
XJ7	(10P)	CRT
XJ8	(10P)	USB 2/3 (For internal connection)
XJ9	(2P)	Power supply switch
XJ10	(44P)	Primary IDE
XJ11	(50P)	CF
XJ12	(4P)	LED
XJ13	(14P)	Audio
XJ14	(20P)	DIO
XJ15	(11P)	RS-232C (COM1)
XJ16	(12P)	RS-232C (COM2)
XJ17	(10P)	KB/MOUSE
XJ18	(2P)	Buzzer

Connector No.		Item
XJ19	(8P)	LAN
XJ20	(4PX2)	USB 0/1 (For external connection)
XJ21	(10P)	COM2 (C-MOS)
XJ22	(4P)	RS485 (COM3)
XJ23	(5P)	RS485 (COM4)
XJ24	(68P)	PCMCIA
XJ25	(62PX2)	PCI
DIMMA	(184P)	DDR-DIMM

Connector function in details

(1) XJ1: Power supply input

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ1 Power supply input 1	1	+12V DC		2	GND	
	3	GND		4	GND	
	5	+5V DC		6	+5V DC	
	7	+5VS DC		8	PSON#	

(2) XJ2: FAN1 interface

Connector No.	Terminal No.	Signal	Remarks
XJ2 FAN1 interface	1	GND	
	2	+12V DC	
	3	PULSE	

(3) XJ3: LCD (C-MOS) interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ3 LCD (CMOS) interface	1	GND		2	FPCLK	
	3	GND		4	FPHSYNC	
	5	FPVSYNC		6	GND	
	7	GND		8	GND	
	9	FPR0	R <LSB>	10	FPR1	
	11	FPR2		12	GND	
	13	FPR3		14	FPR4	
	15	FPR5	R <MSB.	16	GND	
	17	GND		18	GND	
	19	FPG0	G <LSB>	20	FPG1	
	21	FPG2		22	GND	
	23	FPG3		24	FPG4	
	25	FPG5	G <MSB>	26	GND	
	27	GND		28	GND	
	29	FPB0	B <LSB>	30	FPB1	
	31	FPB2		32	GND	
	33	FPB3		34	FPB4	
	35	FPB5	B <LSB>	36	GND	
	37	FPDE		38	DPSR	H/L switch by SW
	39	LVD_VCC	+3.3 V	40	LVD_VCC	+3.3 V
	41	DPSR2	H/L switch by SW			

(4) XJ4: LCD back light control interface

Connector No.	Terminal No.	Signal	Remarks
XJ4 Back light control interface	1	BKLON#	Back light ON (C-MOS output)
	2	HALFON	Back light half ON (O.C. output)
	3	GND	

(5) XJ5: FAN2 interface

Connector No.	Terminal No.	Signal	Remarks
XJ5 FAN 2 interface	1	GND	
	2	DC +12V	
	3	PULSE	

(6) XJ6: LCD (LVDS) interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ3 LCD (LVDS) interface	1	GND		2	GND	
	3	DPSR	H/L switch by SW	4	(N.C.)	
	5	GND		6	TXC+	
	7	TXC-		8	GND	
	9	TX2+		10	TX2-	
	11	GND		12	TX1+	
	13	TX1-		14	GND	
	15	TX0+		16	TX0-	
	17	GND		18	GND	
	19	LCD_VCC	+ 3.3V	20	LCD_VCC	+ 3.3V
	21	(N.C.)				

(7) XJ7: CRT interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ7 CRT interface	1	RED		2	GND	
	3	GREEN		4	GND	
	5	BLUE		6	GND	
	7	VSYNC		8	HSYNC	
	9	GND		10	GND	

(8) XJ8: USB 2/3 interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ8 USB interface(For internal connection)	1	USB3VCC	+ 5V	2	USB2VCC	+ 5V
	3	USB3-		4	USB2-	
	5	USB3+		6	USB2+	
	7	USB3GND	+ 5V	8	USB2GND	+ 5V
	9	(N.C.)		10	(N.C.)	

(9) XJ9: Power supply switch interface

Connector No.	Terminal No.	Signal	Remarks
XJ9 Power supply switch interface	1	PWRBTN#	
	2	GND	

(10) XJ10: Primary IDE interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ10 Primary IDE interface	1	RESET#		2	GND	
	3	DD7		4	DD8	
	5	DD6		6	DD9	
	7	DD5		8	DD10	
	9	DD4		10	DD11	
	11	DD3		12	DD12	
	13	DD2		14	DD13	
	15	DD1		16	DD14	
	17	DD0		18	DD15	
	19	GND		20	(N.C.)	N.C.
	21	DMAQ		22	GND	
	23	DIOW#		24	GND	
	25	DIOR#		26	GND	
	27	IODRY		28	CSEL	
	29	DMACK#		30	GND	
	31	INTRQ		32	(IOCS16#)	N.C.
	33	DA1		34	PDIAG#	
	35	DA0		36	DA2	
	37	CS0#		38	CS1#	
	39	DASP#		40	GND	
	41	+ 5V		42	+ 5V	
	43	GND		44	(N.C.)	N.C.

(11) XJ12: LED interface

Connector No.	Terminal No.	Signal	Remarks
XJ12 LED interface	1	VCC	
	2	VCC	
	3	IDE#	
	4	GND	

(12) XJ13: Audio interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ13 Audio interface	1	SPOUT+		2	SPOUT-	
	3	(N.C.)		4	LINEOUT_L	
	5	AGND		6	LINEOUT_R	
	7	AGND		8	LINEIN_L	
	9	AGND		10	LINEIN_R	
	11	AGND		12	AGND	
	13	AGND		14	+ 5V	

(13) XJ14: DIO interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ14 DIO interface	1	OUT0		2	OUT1	
	3	OUT2		4	OUT3	
	5	OUT4		6	OUT5	
	7	OUT6		8	OUT7	
	9	+ 5V		10	GND	
	11	IN0		12	IN1	
	13	IN2		14	IN3	
	15	IN4		16	IN5	
	17	IN6		18	IN7	
	19	+ 5V		20	GND	

(14) XJ15: RS-232C (COM1) interface

Connector No.	Terminal No.	Signal	Remarks
XJ15 RS-232C(COM1)interface	1	RS1_DCD	
	2	RS1_DSR	
	3	RS1_RXD	
	4	RS1_RTS	
	5	RS1_TXD	
	6	RS1_CTS	
	7	RS1_DTR	
	8	RS1_RI	
	9	GND	
	10	+ 5V	
	11	GND	

(15) XJ16: RS-232C (COM2) interface

Connector No.	Terminal No.	Signal	Remarks
XJ16 RS-232C(COM2)interface	1	RS2_DCD	
	2	RS2_DSR	
	3	RS2_RXD	
	4	RS2_RTS	
	5	RS2_TXD	
	6	RS2_CTS	
	7	RS2_DTR	
	8	RS2_RI	
	9	GND	
	10	(N.C.)	
	11	+ 5V	
	12	GND	

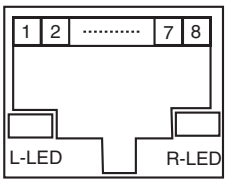
(16) XJ17: KB/ MOUSE interface

Connector No.	Terminal No.	Signal	Remarks	Terminal No.	Signal	Remarks
XJ17 KB/ MOUSE interface	1	KBDATA		2	BKVCC	+ 5V
	3	GND		4	KBCLK	
	5	MSVCC	+ 5V	6	(N.C.)	
	7	MSCLK		8	MSDATA	
	9	(N.C.)		10	GND	

(17) XJ18: Buzzer interface

Connector No.	Terminal No.	Signal	Remarks
XJ18 Buzzer interface	1	+ 5V	
	2	BZON#	

(18) XJ19: LAN interface

Connector No.	Terminal No.	Signal	Remarks
XJ19 LAN interface  	1	TX+	
	2	TX-	
	3	RX+	
	4	(Reserved)	
	5	(Reserved)	
	6	RX-	
	7	(Reserved)	
	8	(Reserved)	

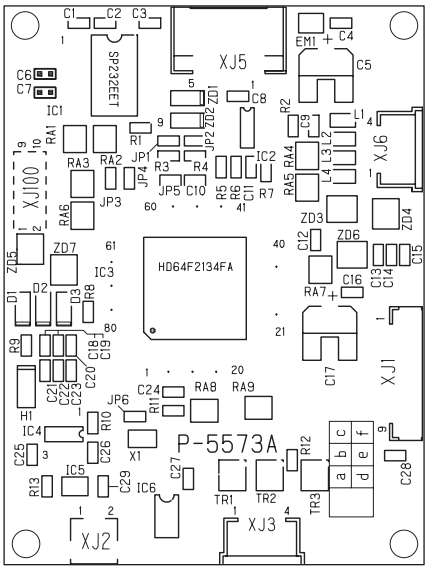
LED	Light emitting color	Functional description	Remarks
L-LED	Green	ON: Link, Blinking: Act	
R-LED	Yellow	ON: 100M, OFF: 10M	

(19) XJ20: USB interface (For external connection)

Connector No.	Terminal No.	Signal	Remarks
XJ20 USB interface(For external connection)	1	USB0VCC	
	2	USB0-	
	3	USB0+	
	4	USB0GND	
	5	USB1VCC	
	6	USB1-	
	7	USB1+	
	8	USB1GND	

4.7.1.3 TP-I/F Board (P-5573*)

Appearance of TP-I/F board (P-5573 *)

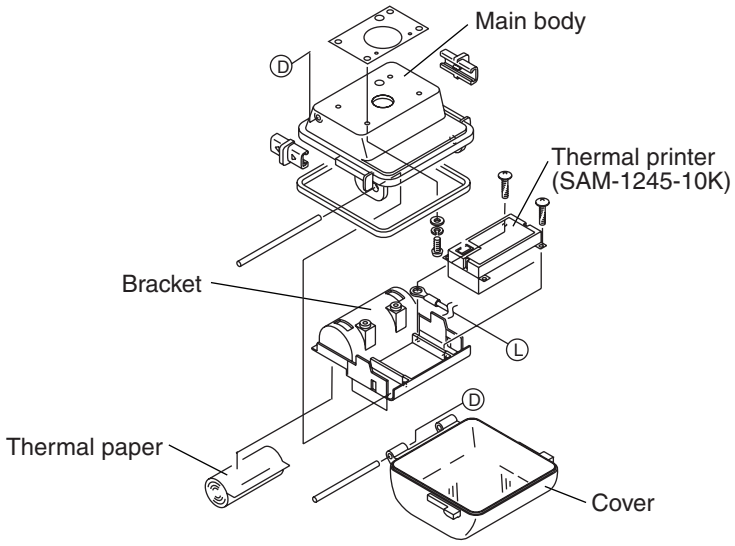


Functional description

1. Controls the signal sent from the touch panel and transmits it to RCU board.

4.7.1.4 Printer unit

Appearance of printer unit

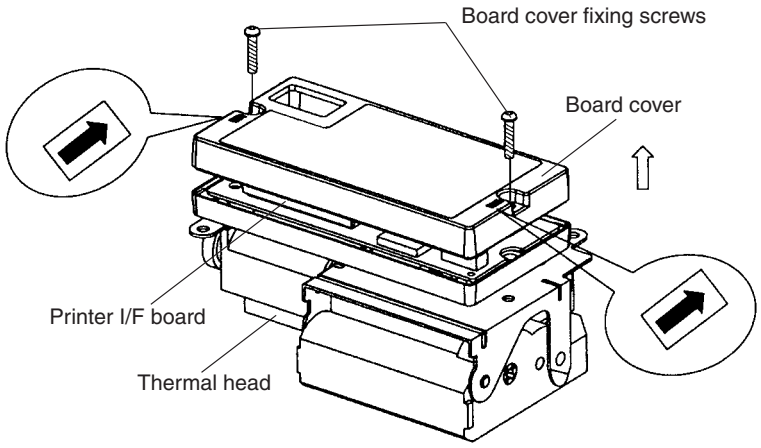


Function of unit

1. Printing statistical result totals
2. Printing presets and set values

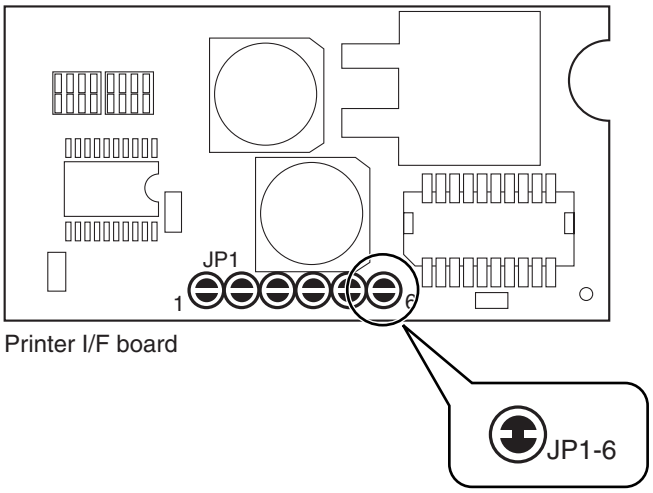
4.7.1.4.1 Thermal printer (SAM-1245-10K)

Appearance of thermal printer



Replacement of thermal printer

1. Open the door of printer main body.
2. Remove the roll paper for printing.
3. Remove two screws from the plastic bracket fixing the thermal printer and remove the bracket.
4. Reverse the bracket and remove the connector connected to the thermal printer.
5. Remove three screws fixing the thermal printer to the bracket, and remove the thermal printer.
6. Prepare a new thermal printer.
7. Remove two screws fixing the board cover, and remove the board cover.
8. Allow the function selection of the thermal printer.
9. Short-circuit the soldering jumpers for JP1-6 on the board as shown below.



10. Attach the thermal printer in the reverse steps of the above 1 to 7.

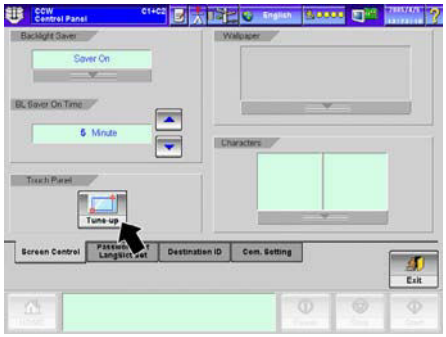
NOTE

As the soldering jumpers JP1-1 to JP1-6 of the new thermal printer are open, be sure to short circuit the soldering jumper for JP1-6. Using the thermal printer without performing soldering jumper results in malfunction.
The same type of thermal printer is used for the DACS-W-N model with the different location of soldering jumper. Refer to the Service Manual of the DACS-W-N model.

4.7.1.5 Touch Panel Coordinate Adjustment

TIP

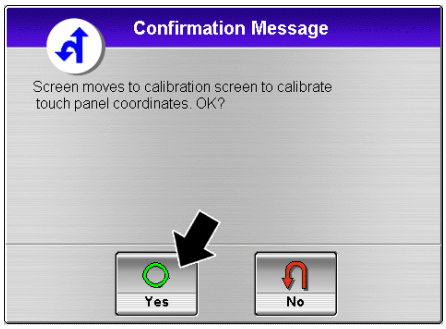
When the other page such as "password setting" is opened right before the operation, press the [Screen Control] menu.



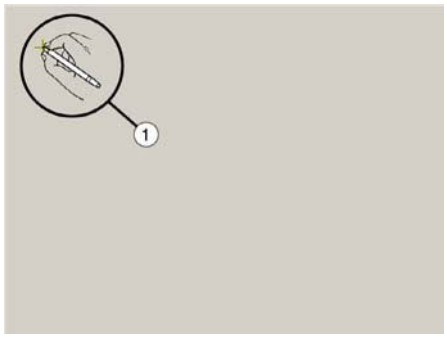
1. Press the [Tune-up] key on the [Display Control menu] screen.

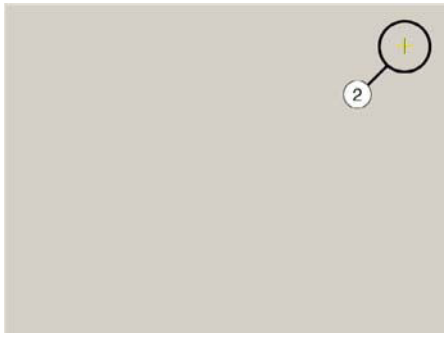
2. The [Confirmation Message] appears, and press the [Yes] key. The [Touchkit] screen appears.

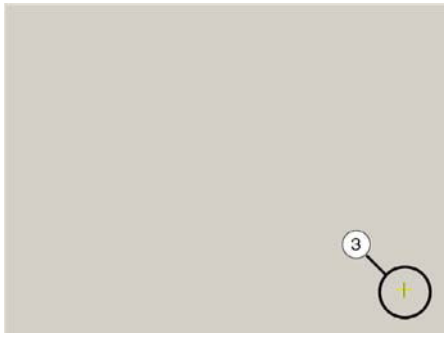
3. Press the [Cal 4 Point] key.

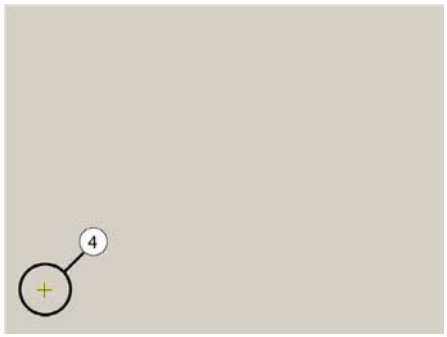


4. The following screens appear, and touch on the mark at each coordinate position with a ball point pen, etc.
5. Touch on the coordinate position mark displayed automatically in order. After 4 points are touched, the [Confirmation Message] appears automatically.





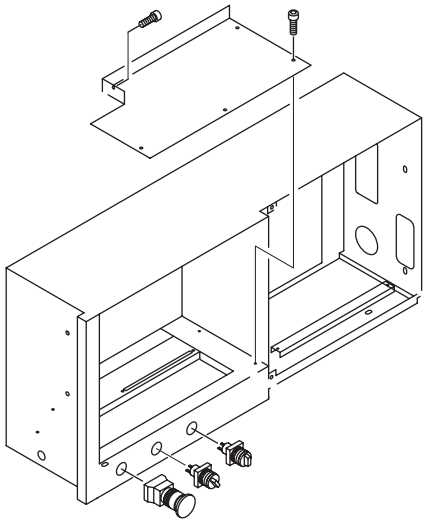




4.7.2 Relay Selector Switch Replacement

4.7.2.1 Front Switch Panel

1. Turn the main power OFF.
2. Swing the remote control unit.
3. Remove 5 screws and remove the switch plate.
4. Disconnect the cables that are connected to the switch.



NOTE

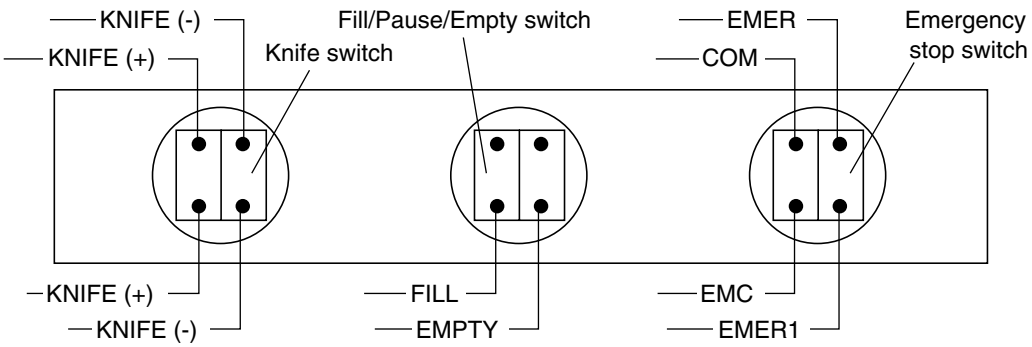
- Remove the cables in order, starting with the cable having the lowest number. (Refer to the tags attached to the cables.)
- Be sure wires are numbered.

5. Remove faulty switch.
6. Install the new switch.
7. Wire each switch.

NOTE

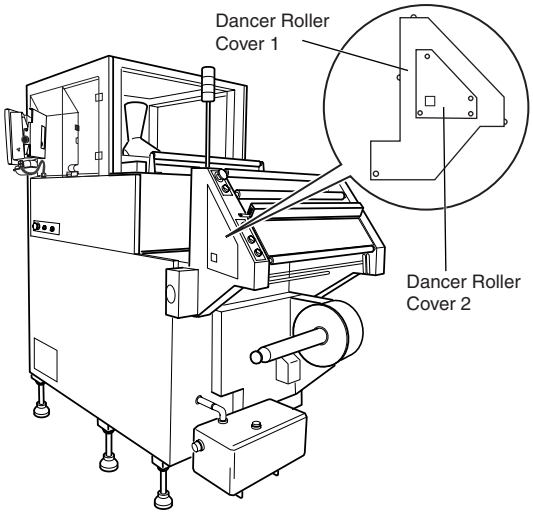
- The tags on the switch connecting cables are numbered as follows:

8. Reinstall all parts in the reverse order of removal.



4.7.2.2 Rear Switch Panel

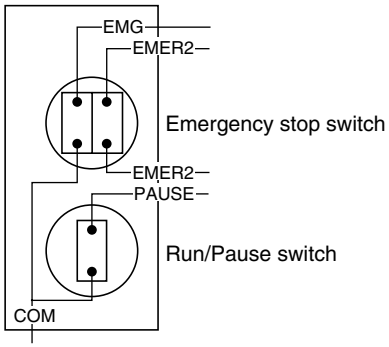
1. Turn the main power OFF.
2. Loosen the four bolts, and remove the rear switch panel from the guide arm.
3. Disconnect the cables that are connected to the faulty switch.



NOTE

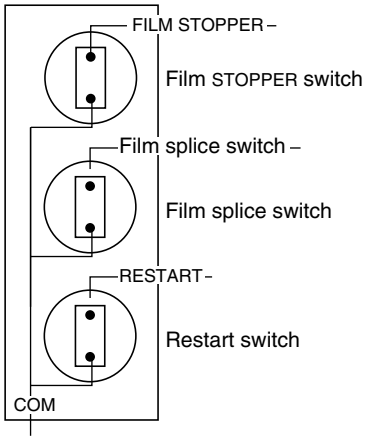
- Remove the cables in order, starting with the cable having the lowest number. (Refer to the tags attached to the cables.)
- Be sure wires are numbered.

4. Remove faulty switch.
5. Install the new switch.



NOTE

- Refer to the illustration about the tag numbers on the switch connecting cables.



6. Reinstall all parts in the reverse order of removal.

4.7.3 MCU Board

1. Turn the main power OFF.
2. Open the front cover.
3. Pull the handle forward, and swing the back seal unit out.
4. Turn the former release lever to the rear, and remove the former.

CAUTION

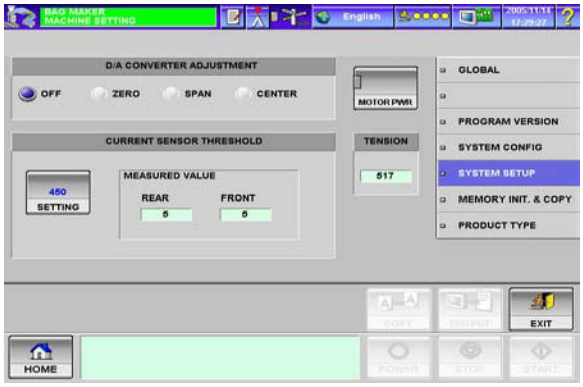
- **Be careful when handling the former. It is heavy.**

5. Remove the film roll.

NOTE

- Former and film must be removed to perform procedure!

6. Turn the main power supply ON.
7. Turn the motor power ON from Operation standby menu.
8. Enter the following password from the password screen:
   Password: 3720
   • The MACHINE SETTING screen will appear.

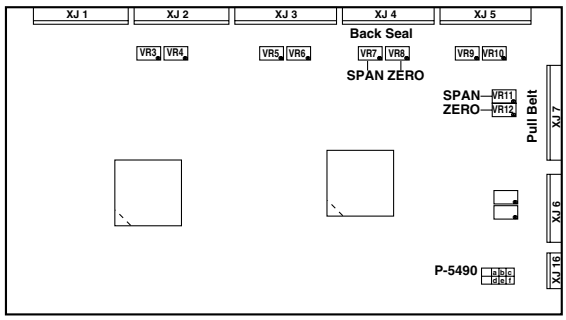


9. Press the following keys on the MACHINE SETTING screen to adjust D/A converter.
   • The left and right pull belt motor, back seal motor.
10. Press the ZERO key (ZERO adjust).
    Please check each servo driver display shows "5000". If a display shows out of "5000±2" range, please tune ZERO adjust trimmer for the servo driver on MCU Board with a small driver (Plastic point is preferable.) The display should show within "5000±2".

NOTE

- If a display dose not show "5000±2" aftertuning ZERO adjust trimmer, please refer to Appendix 2 and Appendix 3 and adjust the standard data. "500" in servo driver parameter 50. Then adjust ZERO / SPAN again.

MCU Board



11. Press the CENTER key.

12. Press the SPAN key (SPAN adjust).
    Prease chock each servo driver display shows "-5000". If a display shows out of "-5000±2" range, please turn SPAN adjust trimmer for the servo driver on MCU Board with a small driver. The display should show within "-5000±2".

13. If SPAN adjustment is performed.
    Please press the CENTER key again. Then press the ZERO key (ZERO adjust) and perform ZERO adjustment again as described in the above 11.

14. Press the STOP key after finishing each servo driver's ZERO (5000) and SPAN (-5000) adjustments.

NOTE

- If all valuos are within the standard range, press the EXIT key.

4.7.4 Replacing the Sensors

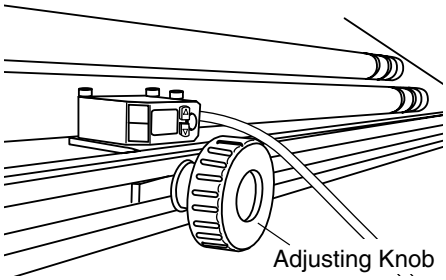
4.7.4.1 Eyemark adjustment

WARNING

- **Only authorized person can do this adjustment work.**

1. Turn the main power supply OFF.
2. The angle of the eye sensor (located at the rear of the machine) is measured when facing, and measuring upward from, the center of the sensor bar. Set the angle to the following value:

   Sensor angle: 0°



NOTE

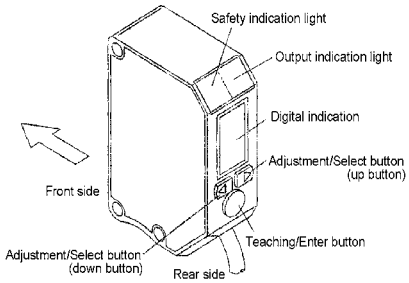
- Sensor sensitivily may need to be adjusted by slightly changing the angle of the sensor bar when the eyemark sensor amplifier, which will be mentioned later, is adjusted.

3. Turn the main power supply ON.

DANGER

- **Wear protective clothing and protective gloves to touch electrical components. Failure to do so can result in electrical shock.**

Name of Each Part



< Adusting eyemark sensor >

WARNING

- **Exercise extreme caution when handling the eyemark sensor.**

1. Press the ▲▼ button for 2 seconds or longer in the RUN mode.
2. When the display is changed, press the ▲▼ button until the mark/color switch (CI) is displayed.
3. Press the [Teaching/Enter button].
4. Press the ▲▼ button to select the mark mode (0_I).

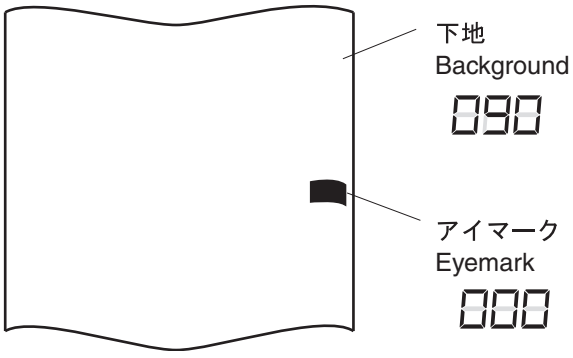
Two-point teaching in mark mode

1. Set the first point color (color for eyemark).
2. Press the [Teaching/Enter button].

   ▶"02P" is displayed in the display.

3. Set the second point color (color for film ground).
4. Press the [Teaching/enter button].

   ▶When the teaching is performed normally, it returns to the RUN mode.
   When an error occurs, "0Er" is displayed.
   Press the [Teaching/Enter button] to perform the two-point teaching.



NOTE

- For the film, the gound color is "90" or more and the eyemark color is close to "0."

Manual adjustment for threshold value

1. Press the ▲▼ button.

   ▶The threshold value is displayed, and the display blinks.

2. Press the ▲▼ button.

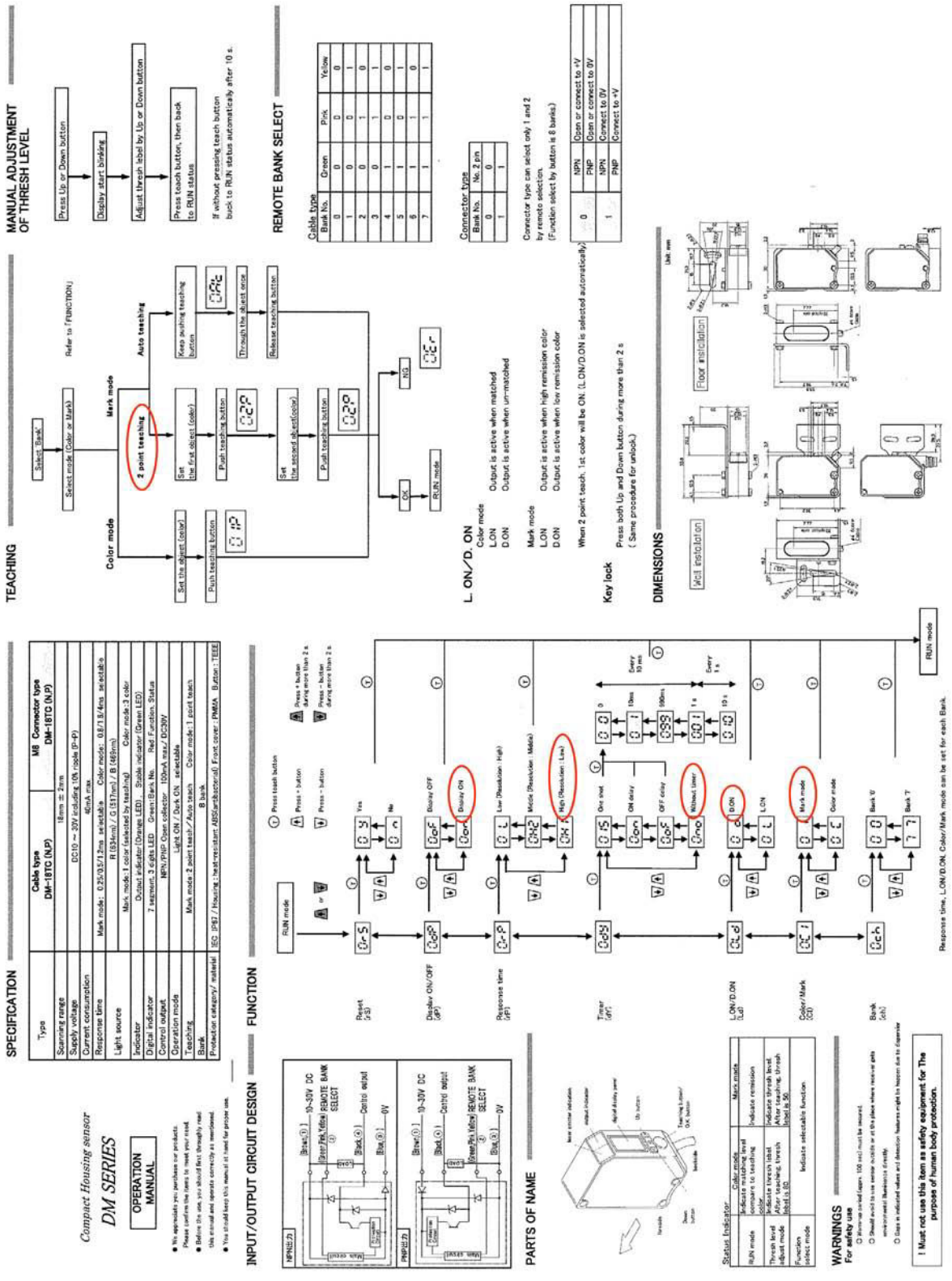
   ▶The threshold value is changed.

3. When proper threshold value is displayed, press the [Teaching/Enter button].

   ▶It returns to the RUN mode.

NOTE

- The standard threshold value is set to 50.

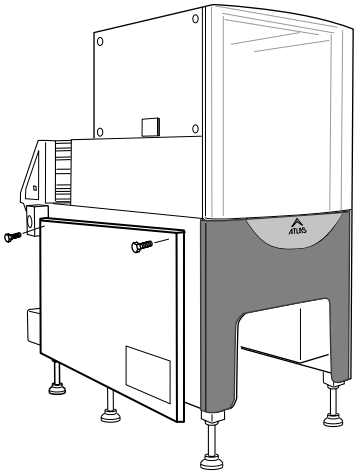

Compact Housing sensor
DM SERIES
OPERATION MANUAL
SPECIFICATION
INPUT/OUTPUT CIRCUIT DESIGN
FUNCTION
PARTS OF NAME
WARNINGS
For safety use
TEACHING
MANUAL ADJUSTMENT OF THRESH LEVEL
REMOTE BANK SELECT
L. ON/D. ON
Key lock
DIMENSIONS
Wall installation
Floor installation

4.7.4.2 Vacuum Pressure Switch Sensor

NOTE

- The * symbol used with the serial number shown on the board represents the board version number.

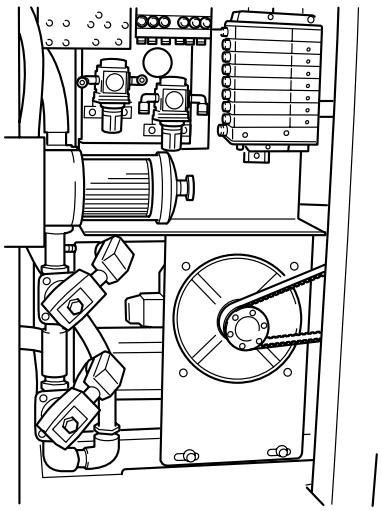
1. Turn the main power OFF.
2. Remove left lower cover.
3. Remove the XJ9 connector from the SCU2 (P-5492 *) board.



NOTE

- The connector of the vacuum pressure switch sensor cables have the following numbers:
  Connector Number (XJ9) : Color
  Pin 2 : Brown
  Pin 3 : Blue

4. Remove the vacuum pressure switch sensor.



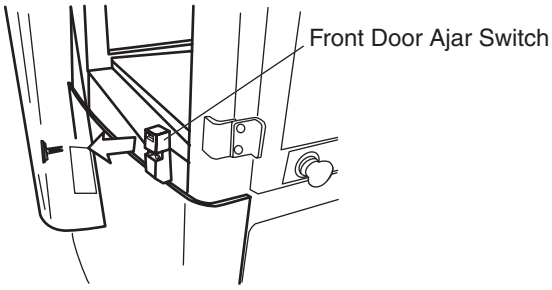
CAUTION

- **Make sure that the cable is inserted properly. If the machine is operated when the connect is substandard or the terminal is incorrect, the sensor can malfunction and / or damage can be caused.**

5. Install the vacuum pressure switch sensor.
6. Reinstall all parts in the reverse order of removal.

4.7.4.3 Front Door Ajar Switch

1. Turn the main power OFF.
2. Open the front cover.
3. Remove the front door ajar switch and bracket.
4. Loosen the screw at the bottom of the switch, and remove the cable.
5. Reattach the cable to the new switch.
6. Install the new switch into the main unit.
7. Reinstall all parts in the reverse order of removal.

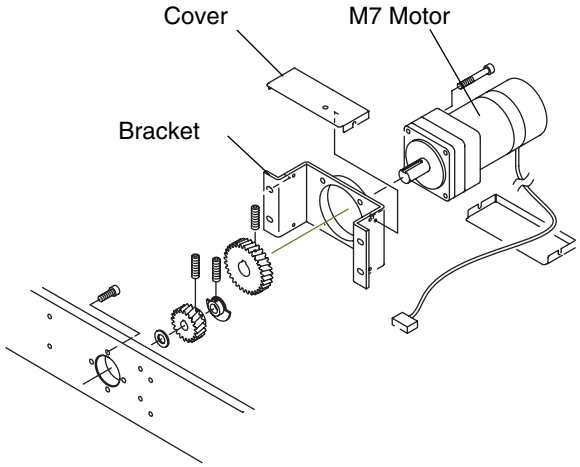


4.8 Shaker Unit (Option)

4.8.1 Replacing the M7 Motor

1. Turn the main power OFF.
2. Oopen the front cover.
3. Disconnect the two cables that are connected from the M7 servo driver to the M7 motor.
4. Remove the cover.
5. Loosen the allen screws, and remove the M7 motor from bracket.

   • M6 set bolt
   • Tool 5 mm hex wrench



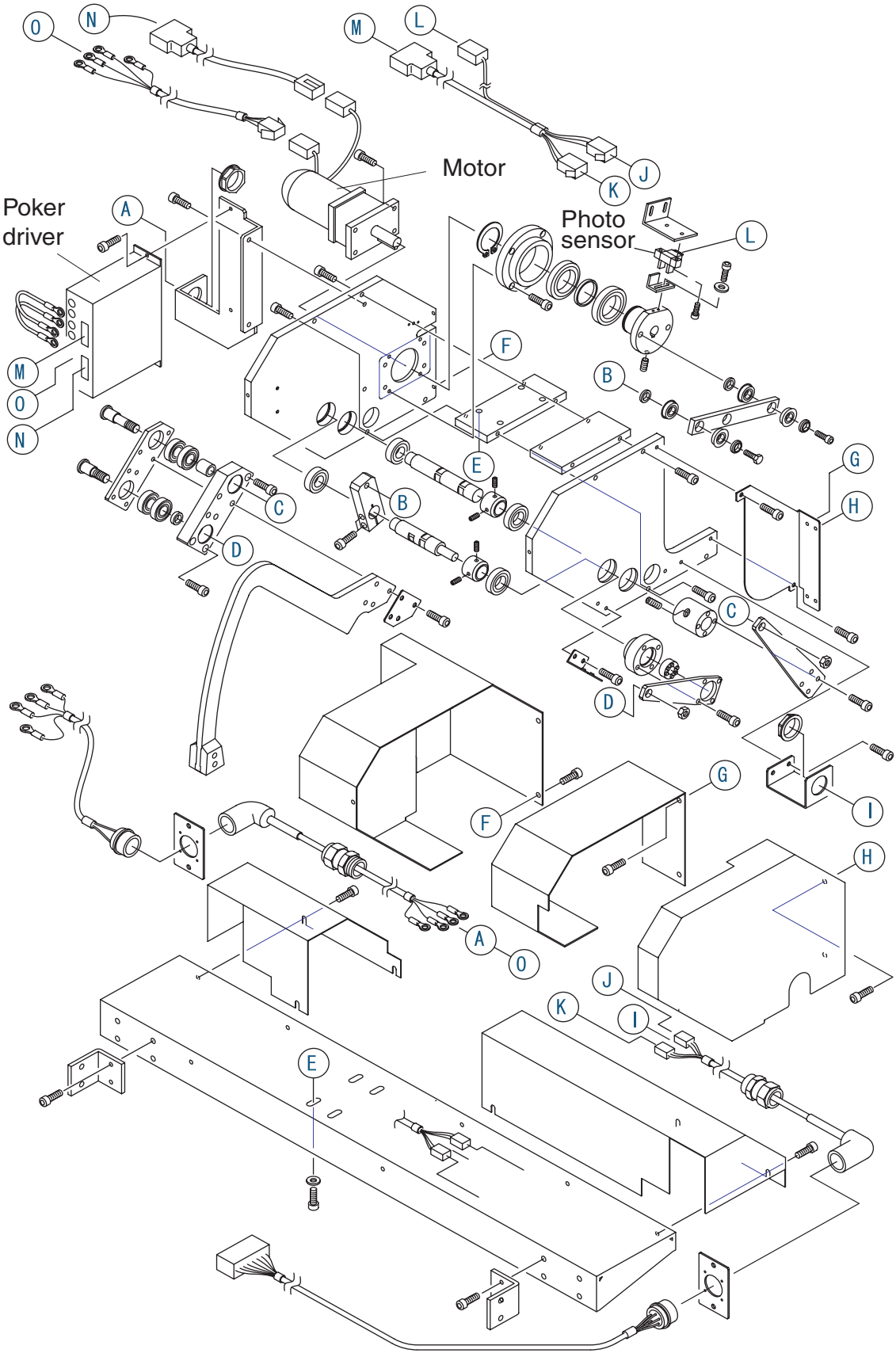
6. Attach the original gear to the new motor; then apply a small amount of graphite grease.

NOTE

- Replace the motor only. The gears are not included.

7. Install the new motor.
8. Reinstall all parts in the reverse order of removal.

4.9 Poker Unit (Option)



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5 APPENDIX

5.1 Program Installation Procedure from Web-RCU

CAUTION

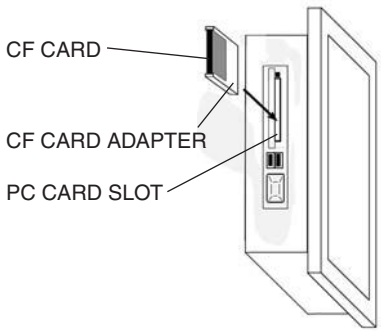
During the software installation or backup process, never turn off the power or remove the installation card.

NOTE

During installation or backup, the data is overwritten between the RCU and the main board. If the process is interrupted, the installation card may be broken, and the machine communication function may be disabled to restore. Wait while the screen in-process is displayed. Turn off the power or remove the installation card only after the process is completed.

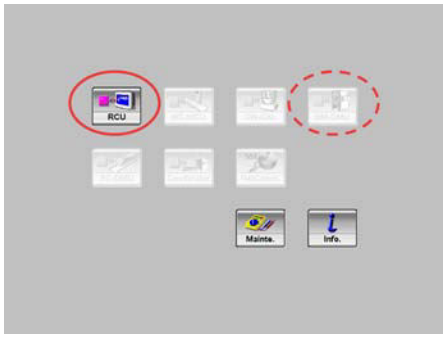
5.1.1 Installation Software Start up

1. As in the right figure, insert the compact flash card (installation card) containing the installation software in the front side of PC card slot in Web-RCU unit, and turn on the main power switch.



2. When the installation software starts up, the main menu screen shown as below appears. By pressing these buttons on the main menu, various menus appear to enable the operations. In the example in the figure below, when the 

key circled in a solid line is pressed, the main menu is switched to the menu to install or backup the RCU software. When the software to write in the installation card is not inserted, the key on the menu is faded as the area circled in a dashed line.



CAUTION

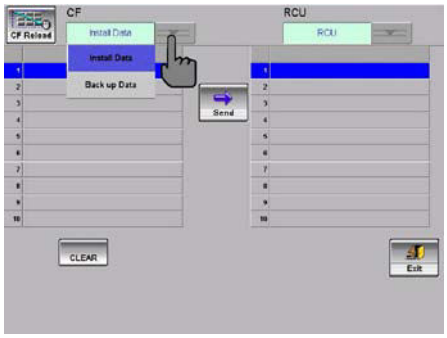
Before starting the software installation, be sure to backup the existing software to the installation card. Once the new software is written, the previous status cannot be restored without the installation card storing the previous software.

5.1.2 RCU Software Backup

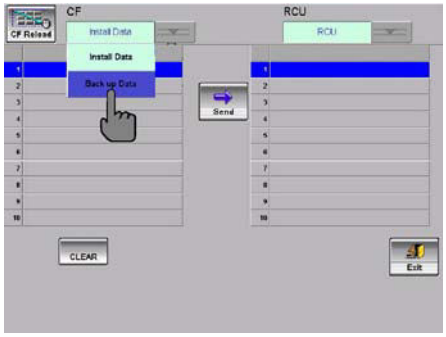
Before installing the new software, backup the written RCU software to the CF card.

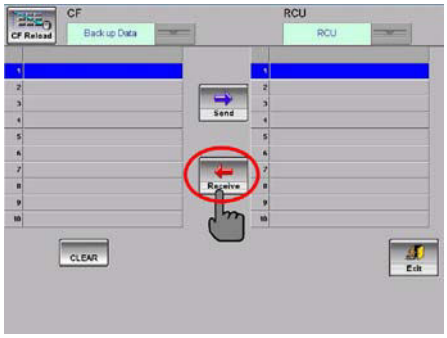
1. Press the 

key on the main menu screen.

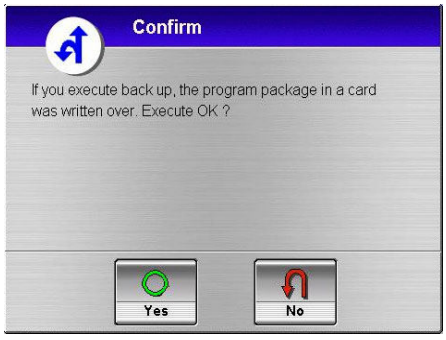


2. The installation screen appears. Press the CF drop-down key at the upper left of the screen. Select "Back up Data" from the list, and press the "Back up Data" key.

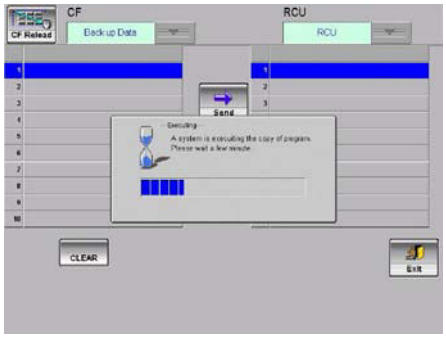




3. The Receive key as shown in the above figure appears. When the Receive key is pressed, the confirmation dialog screen appears to confirm whether or not to backup the RCU software.



4. Press the Yes key to backup.
   Press the No key to return to the previous screen.



5. Press the Yes key on the confirmation screen to start the backup process. The backup process screen appears.
   The waiting time is approximately 5 minutes, depending on the software

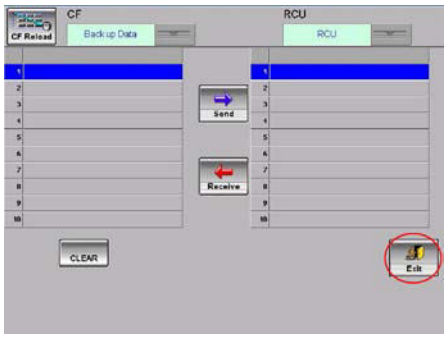
CAUTION

During the backup process, never turn off the power or remove the installation card.

6. When the backup process is completed, the Finish Message appears.

7. The RCU backup is completed. Press the OK key to return to the previous installation screen.

8. Press the Exit key on the installation screen to return to the main menu screen.



NOTE

When the error screen appears during the backup process, refer to " " for solutions.

5.1.3 RCU Software Installation

When the stored RCU software does not need the backup or when the backup process is completed, install the RCU software. The following two methods can be applied for the RCU software installation.

1. Install Program to Existing Model

   Install only the new software while keeping the existing parameter files for RCU.

2. Install Program Newly

   Install the new software and the parameter file from the card when the parameter file for RCU is not existing or deleted.

Unless otherwise indicated, install the RCU software by the method "1. Install Program to Existing Model" after the factory shipment.
Select "1. Install Program to Existing Model" after the existing parameter file for RCU is deleted.
The RCU parameter file includes the settings (displayed language, back light control time, etc.) made on the RCU control menu screen and the shot product images.

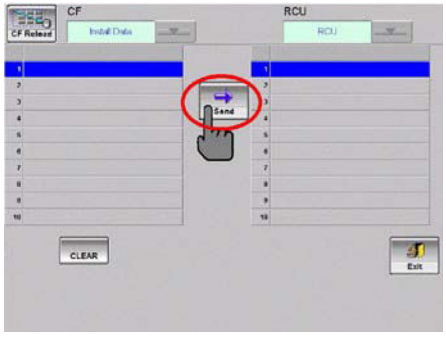
5.1.3.1 Installing the Program to Existing Model

Install only the new software while keeping the existing parameter files for RCU.

1. Press the 

key on the main menu screen.
2. The RCU installation screen appears. Press the 

key.

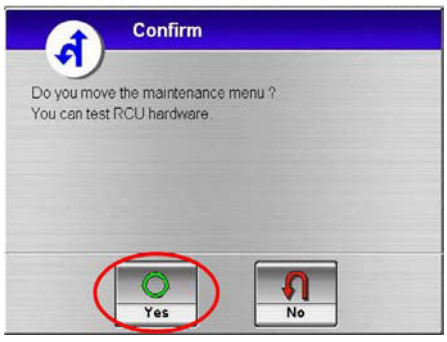


3. The confirmation dialog screen appears to confirm whether or not to install the RCU software.
4. Press the 

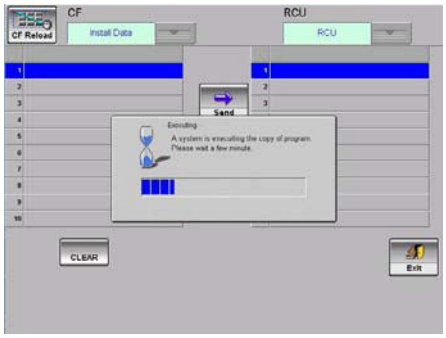
key to install.

   Press the 

key to return to the previous screen.



5. When the Yes key is pressed on the confirmation screen, the installation process starts, and the installation process screen is displayed.
   The waiting time is approximately 5 minutes, depending on the software.

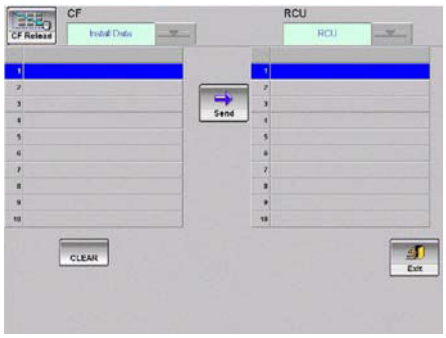


CAUTION

During the installation process, never turn off the power or remove the installation card.

6. When the backup process is completed, the Finish Message appears.
7. The RCU installation is completed. Press the OK key to return to the previous installation screen.

8. Press the Exit key on the installation screen to return to the main menu screen.
9. Toreflect the result of software installation, turn off the power, remove the installation card from the slot, and turn ON the power again.



5.1.3.2 Installing Program Newly

Install the new software and the default parameter file from the installation card after the existing parameter file for RCU is deleted.

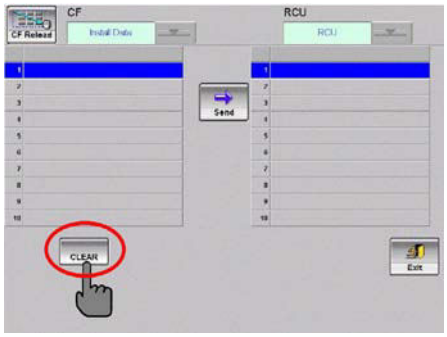
TIP

- Install the RCU software by the method "1. Install Program to Existing Model" after the factory shipment unless otherwise indicated.
- Select "1. Install Program to Existing Model" after deleting the existing parameter file for RCU.

1. Press the 

key on the main menu screen.
2. The RCU installation screen appears. Press the 

key.



3. The confirmation dialog screen appears to confirm whether or not to delete the RCU parameter file.
Press the 

key to delete the parameter file.
4. After deleting the parameter file, install the new program by referring to "5.1.3.1 Installing the Program to Existing Model". When the existing parameter file is deleted, the default parameter file is automatically copied from the installation card.

ATLAS-202 (-ITPS)
Replacement Procedure for RCU, BM-DMU, and the Main Software

1. Overview

This manual describes how to replace the software for RCU, BM-DMU, and the main unit (MCU1, MCU2, SCU1, and SCU2).

When replacing the main software, the write procedure for the main software "Industrial Machinery 05-00059_write procedure for main software.doc" is necessary, in addition to this procedure manual.

2. Compact Flash (CF) to be used and Storing File

For the stand alone machine, a CF of 32 MB or more is required. For the IITPS machine, a CF of 64 MB or more is required.

When replacing RCU or DMU Software, the Installer Program File (W0002F) must be stored in the CF, along with the file of each program.

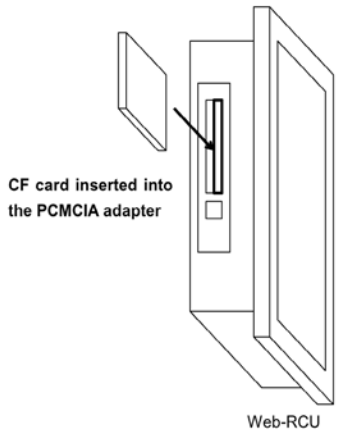
The folder for storing the program of RCU	RCU
The folder for storing the program of BM-DMU	BMDMU
The folder for storing the main unit program	BMFILE

3. Replacement Procedure for RCU and BM-DMU Software

3.1. Turning Off the Main Power

Turn off the main power before starting operation.

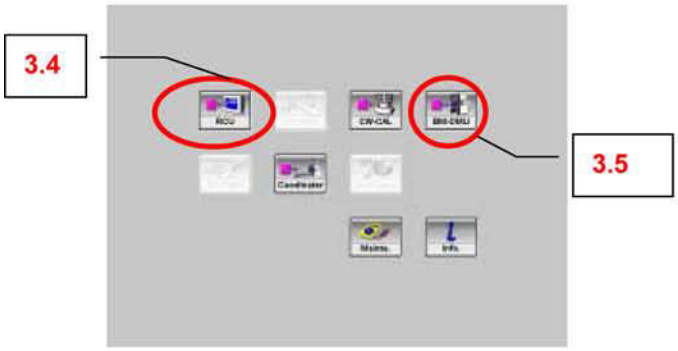
3.2. Inserting the Compact Flash into the slot of the ATLAS remote control



Web-RCU

3.3. Turning On the Main Power

Turning on the main power starts the installation screen.



3.4. Installing the RCU software

Press the [RCU] key as shown above to install the software for RCU.

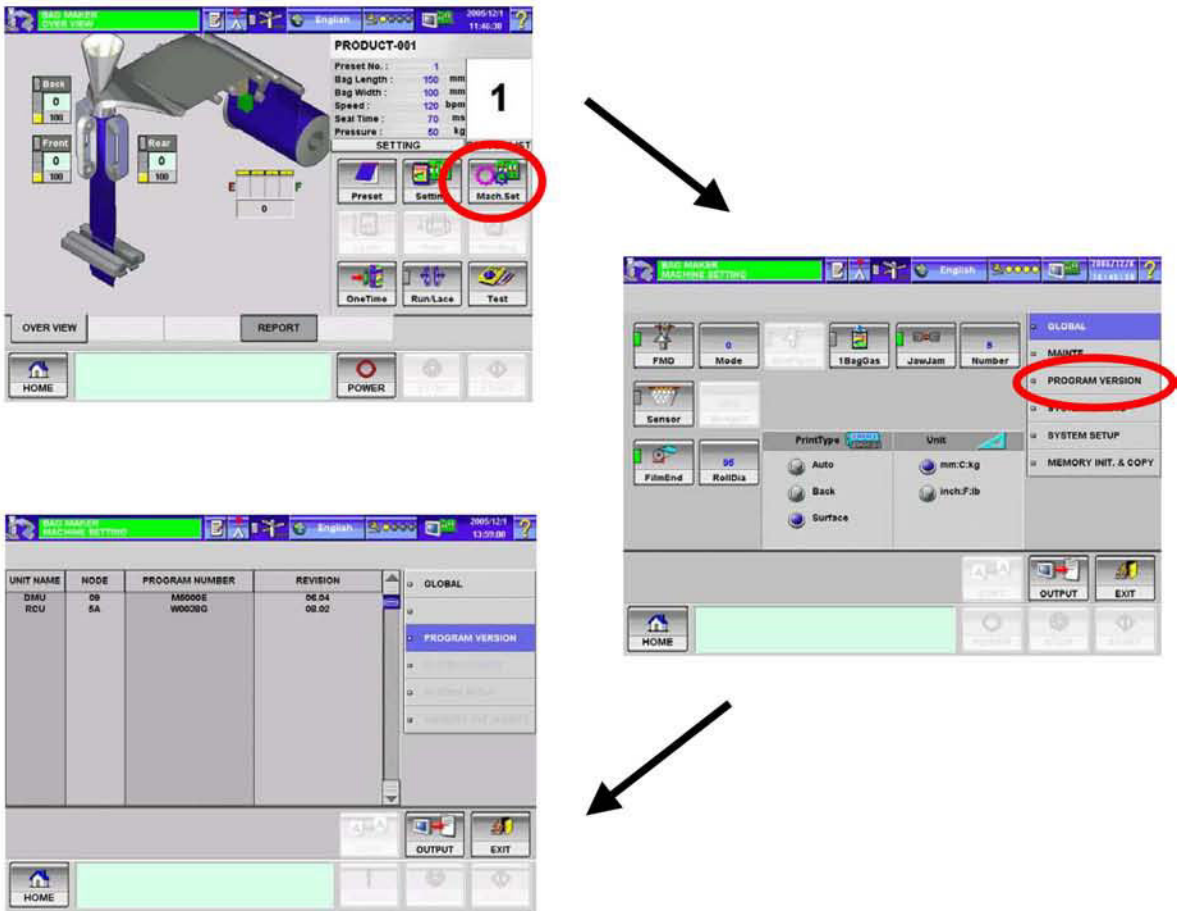
3.5. Installing the BM-DMU software

Press the [BM-DMU] key as shown above to install the software for BM-DMU.

3.6. Turning On the Power Again (Confirming the Program Number)

Remove the compact flash card from the slot and turn on the main power again.

When the remote screen is displayed, press the [Mach Set] Key on the OverView screen. Then press the [PROGRAM VERSION] key to confirm the program number.

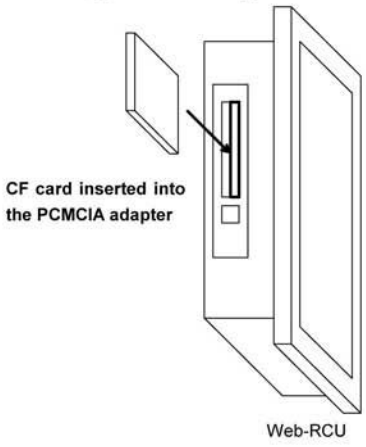


4. Replacement Procedure for the Main Software

4.1. Turning On the Main Power

Turning on the main power before starting operation to display the operation screen of the bag maker.

4.2. Inserting the Compact Flash into the slot of the ATLAS remote control

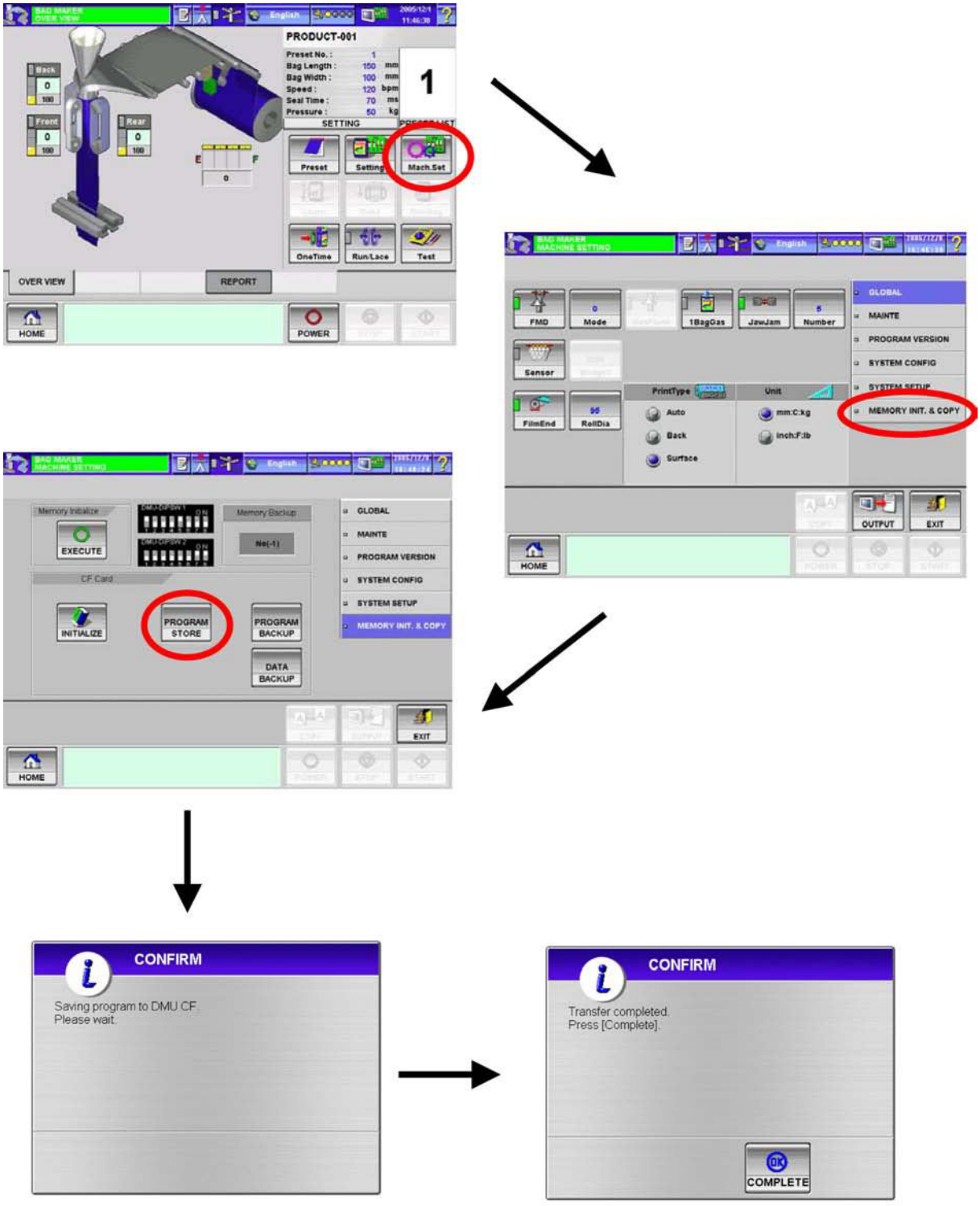


4.3. Copying the Main Software to the CF of DMU

Set the operation level to the Maintenance level.

Press the [Mach Set] key on the OverView screen and press the [MEMORY INIT & COPY] key on the next screen.

Then press the [PROGRAM STORE] key on the Memory Init & Copy screen.



When transfer is completed, refer to the write procedure for the main software “Industrial Machinery 05-00059_write procedure for main software.doc” for main software writing.

5.1.4 Maintenance level

When switching the operation level to the Maintenance level, the password for the Maintenance level is rcquired.
Follow the procedure to switch to the Maintenance level.

1. Press the operation level key  on a screen.

   ▶The screen to select the operation level will appear.

2. Select the Maintenance level.

   ▶The keyboard to enter the password will appear.

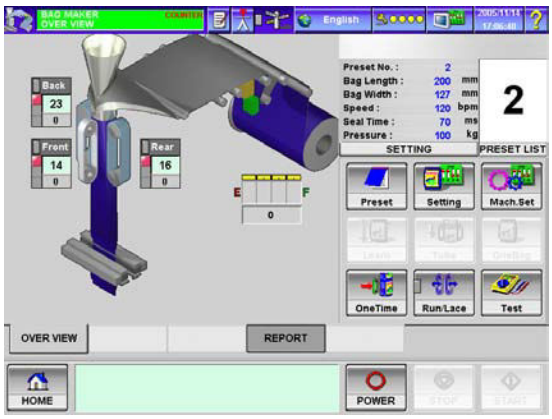
3. Enter the password for the Maintenance level.

   ▶The Operation Standby screen for the Maintenance level will appear.

4. Press the 

key.

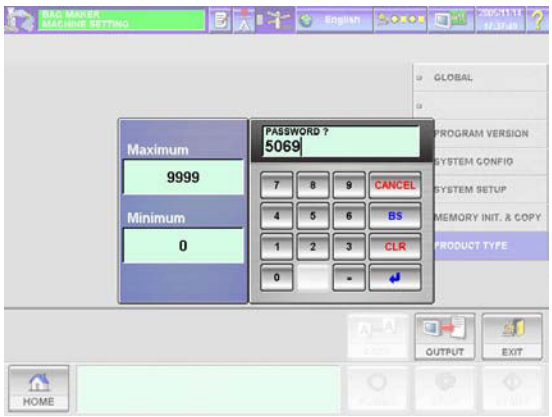
   ▶The MACHINE SETTING screen will apper.



5.1.4.1 SYSTEM CONFIG

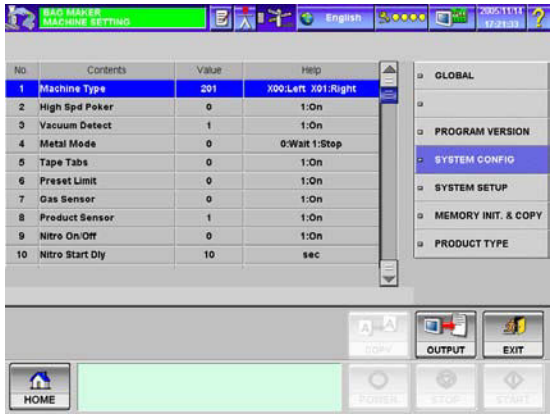
1. Press the [SYSTEM CONFIG] index.

   ▶The keyboard to enter the password will appear.



2. Enter the password "5055+(date×2)"= four figures.

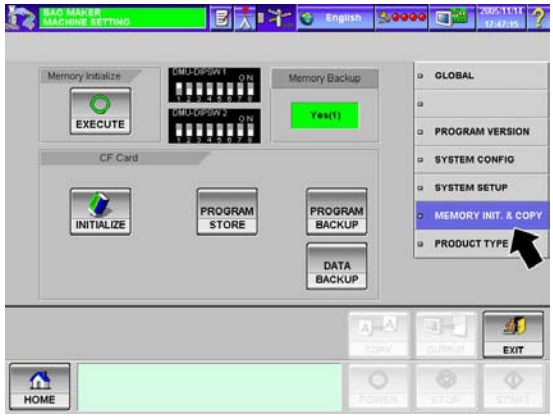
   ▶The SYSTEM CONFIG screen will appear.



5.1.4.2 MEMORY INIT. & COPY

1. Press the [MEMORY INIT. & COPY] index.

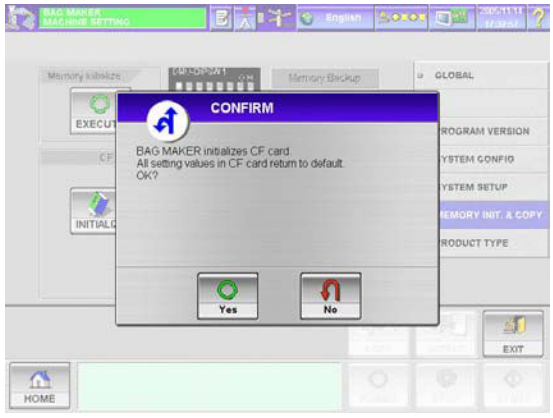
   ▶The MEMORY INIT. & COPY screen will appear.



5.1.4.2.1 Card Initialization

1. Press the [INITIALIZE] key for CF card.

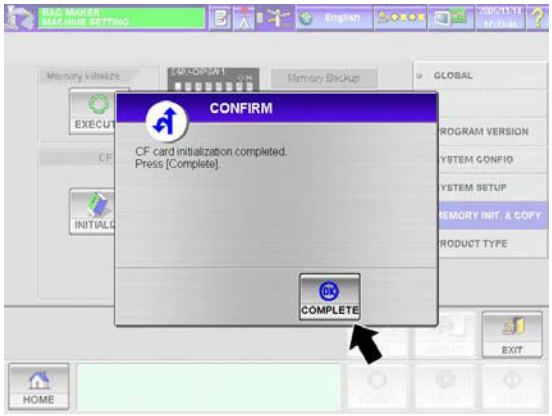
   ▶The CONFIRM screen will appear.



2. Press the [Yes] key.

   ▶The CONFIRM screen will appear.

3. Press [COMPLETE] key.

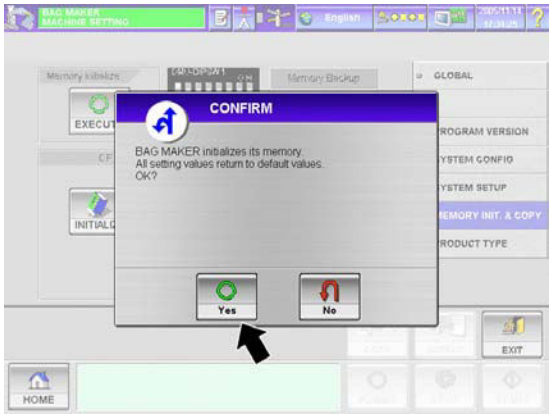


5.1.4.2.2 Memory Initialization

1. Press the [EXECUTE] key.

   ▶The CONFIRM screen will appear.

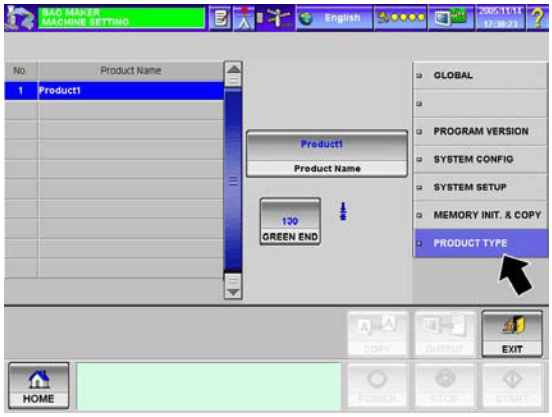
2. Press [Yes] key.



5.1.4.3 PRODUCT TYPE

1. Press the [PRODUCT TYPE] index.

   ▶The PRODUCT TYPE screen will appear.



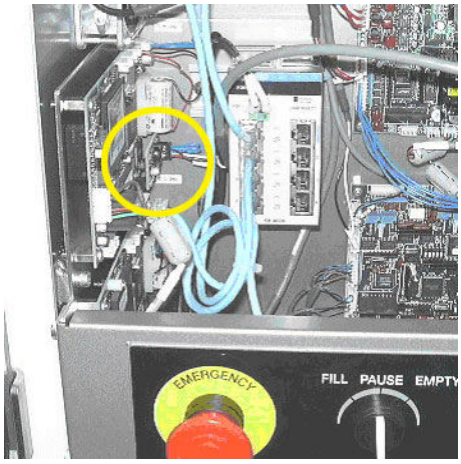
5.2 DMU Board and MCU/SCU Board Program Installation Procedure

5.2.1 INTRODUCTION

This is a procedure of program installation for ATLAS-202 main body which has flash memory type micro processing unit (MITSUBISHI M16C).
Referential program and boards are as below.

Programme	Board	Micro Processing Unit	Installation Connector
MCU1	P-5547*	IC20	XJ23
MCU2		IC23	XJ21
SCU1	P-5548*	IC19	XJ19
SCU2	P-5549*	IC10	XJ23

Mount communication board (P-5475*) to each installation connector and then connect the cable coming from BM-DMU board (P-5562-4, yellow circled in below) to the connector (J791) on this communication board.



⚠ WARNING

- **Do not connect the installation cable from BM-DMU board directly to installation connectors on each board without mountnig the communication board (P-5475*).**

When ATLAS-202 is dispatched from the victory, communication board (P-5475*) is mounted on the installation connector of SCU1 (XJ19 of P-5548*). Mount the communication board to a relevant installation connector for program to be installed.
Put back the communication board (P-5475*) to the original position (XJ19 of P-5548*) after program installation is completed.

5.2.2 Main Body Software Installation

If power supply is turned on with the corresponding harness wiring and dipswitch settings on each board, software writing starts automatically.

Software writing status is displayed with LED (H12-H15) on DMU board.

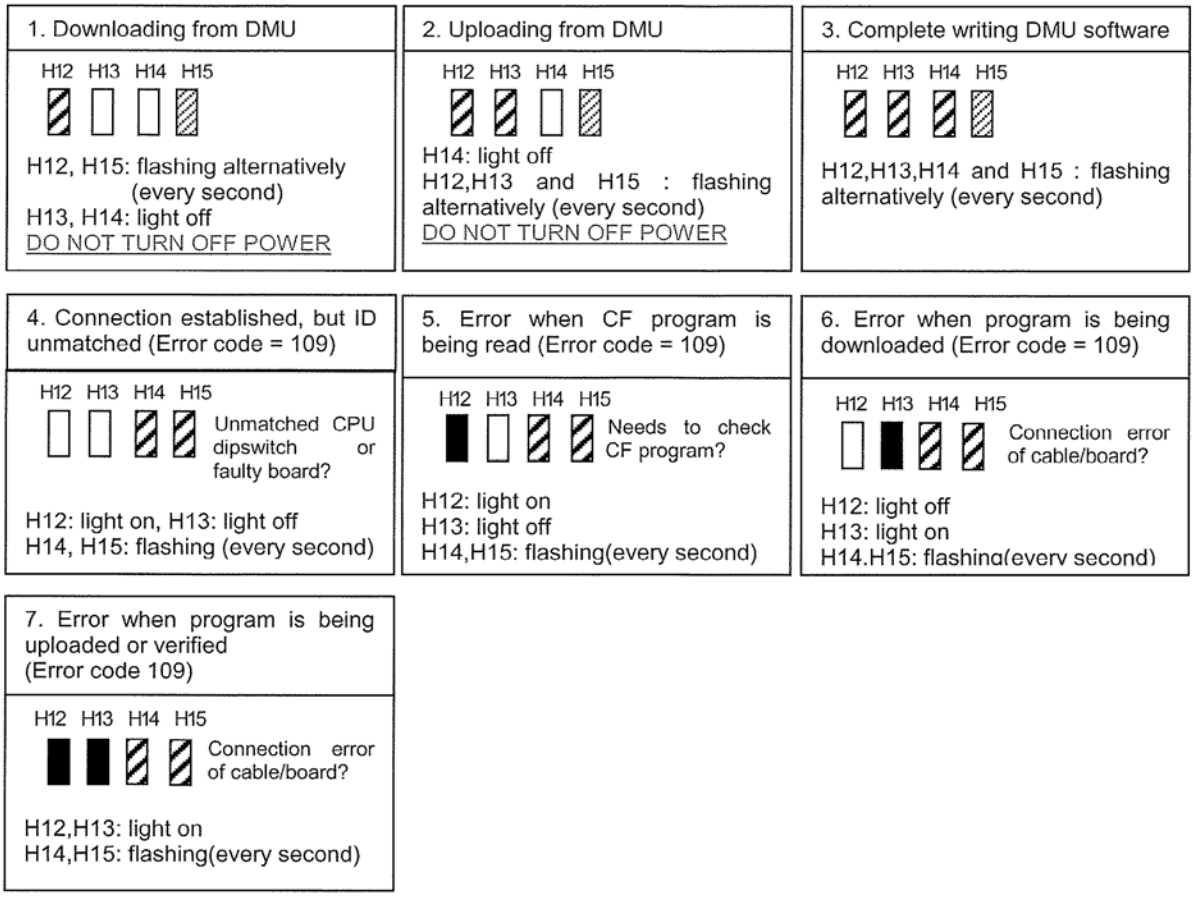


Fig. 5-1 Software writing status is displayed with LED (H12-H15) on DMU board.

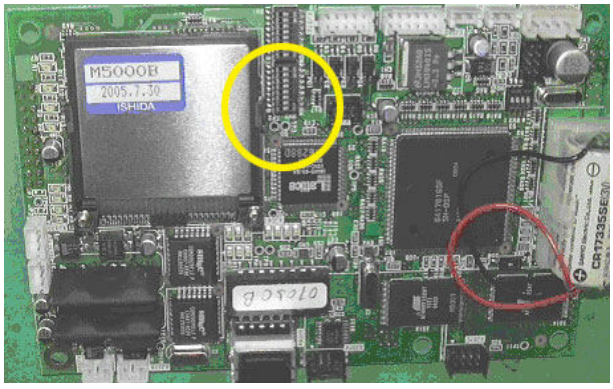
When WEB-RCU boot up is made during DMU software writing procedure, the display showing software writing process is showed up.
Press OK button at the right bottom of the message in order to turn off alarm buzzer.

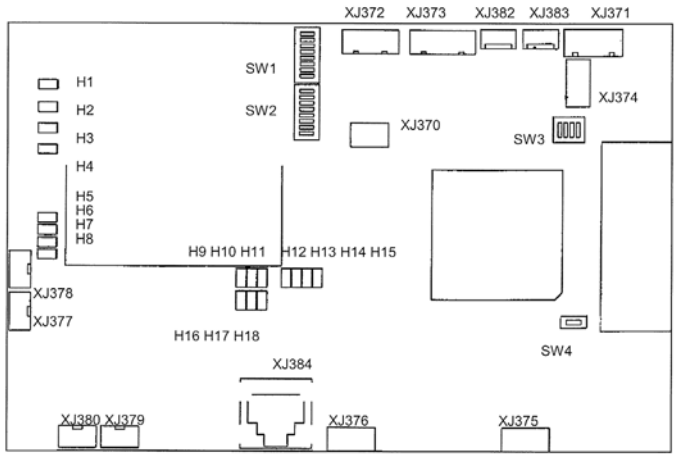
WARNING

- **Do not turn OFF machine power supply when the screen above with error code 525 - 0) is displayed.**

When software writing completes, the following display appears.

5.2.3 Dip switch setting on DMU board





The dipswitch related to the main body software installation is SW2.

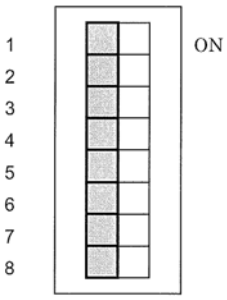
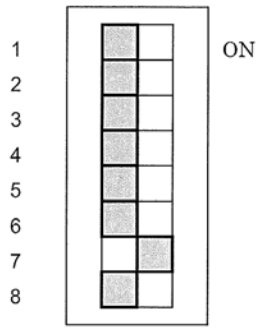
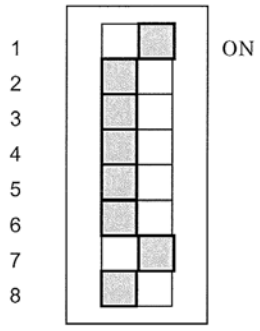


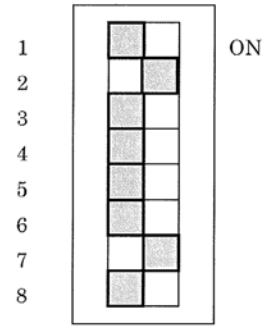
Fig. 5-2 On Ex-factory (Settings after software writing)



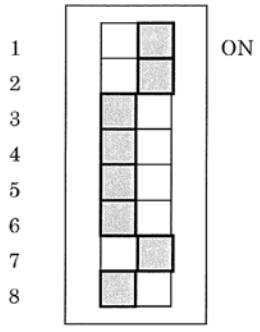
To write MCU1



To write MCU2



To write SCU1



To write SCU2

5.2.4 Setup for ATLAS

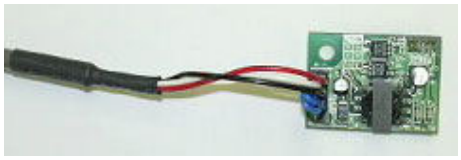
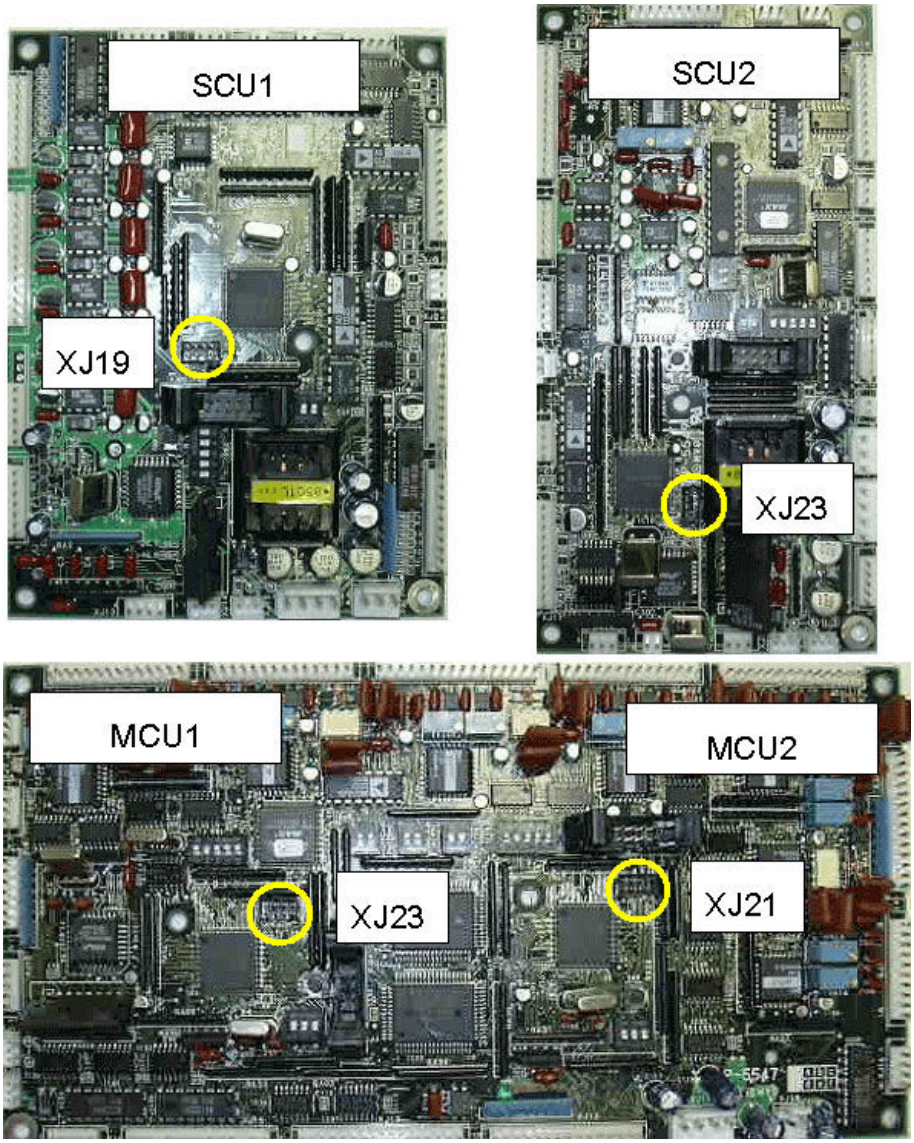


Fig. 5-3 Connection of communication board

5.2.4.1 Connection of communication board

After turning off power supply, connect the communication board with a cable (as in the photo above) to an installation connector for program to be installed.



5.2.4.2 Setting of dip switch

For program installation, setting change of dip switches is necessary. After turning off the machine power supply, set dip switches as in the next page.

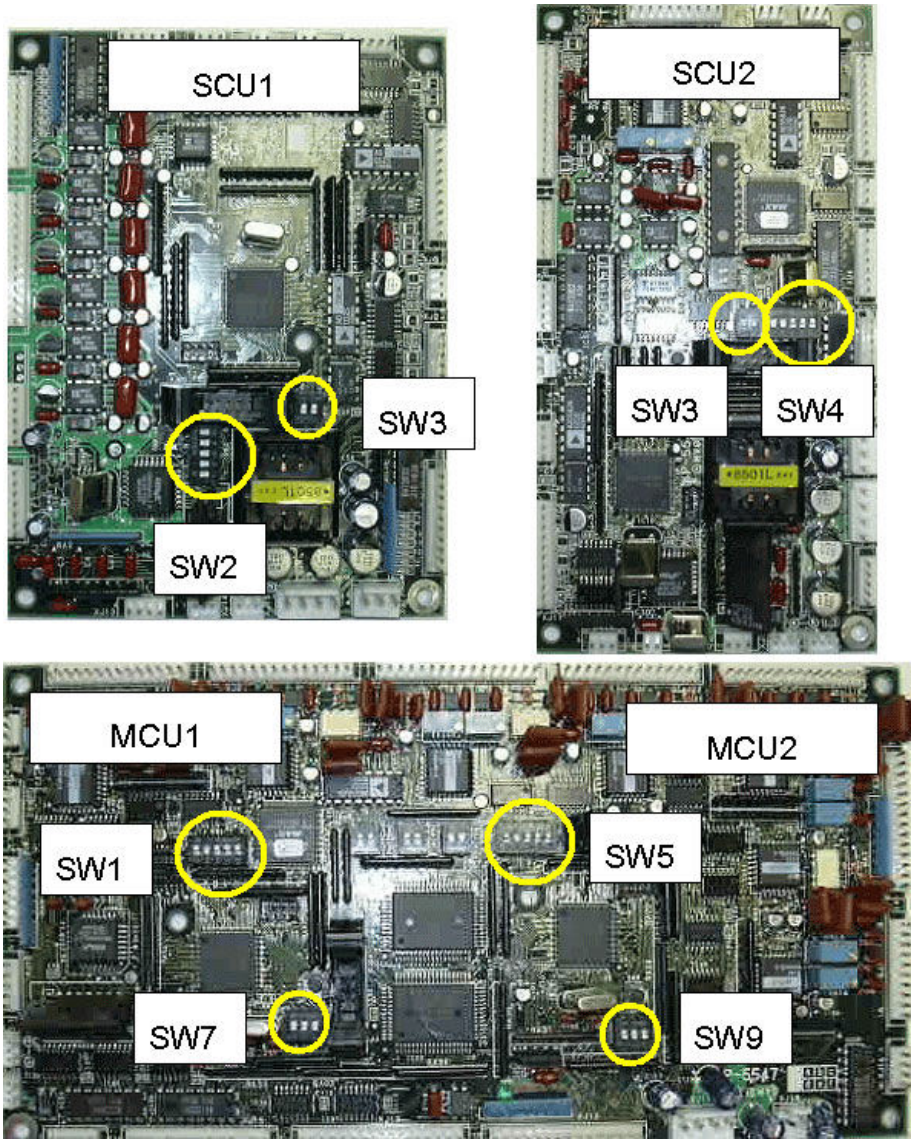


Table 5-1 Dip switch for MCU1 (P-5547*)

SW	On usual operation		On installationm
SW1	ON 1 2 3 4 5 ON, OFF,ON, ON, ON	→ ←	ON 1 2 3 4 5 OFF,ON, OFF,OFF,ON

Table 5-1 Dip switch for MCU1 (P-5547*) (Continued)

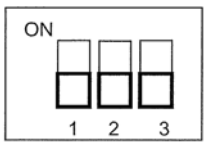
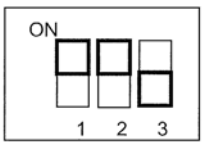
SW	On usual operation		On installationm
SW7	 OFF,OFF,OFF	→ ←	 ON, ON, OFF

Table 5-2 Dip switch for MCU2 (P-5547*)

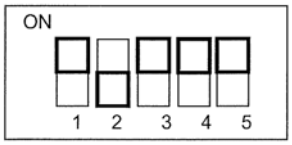
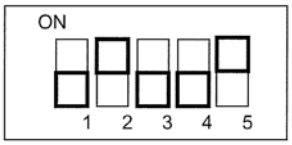
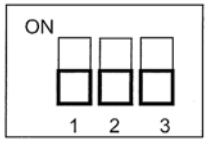
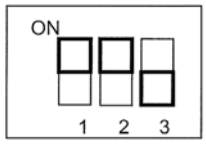
SW	On usual operation		On installationm
SW5	 ON, OFF, ON, ON, ON	→ ←	 OFF,ON, OFF,OFF,ON
SW9	 OFF,OFF,OFF	→ ←	 ON, ON, OFF

Table 5-3 Dip switch for SCU1 (P-5548*)

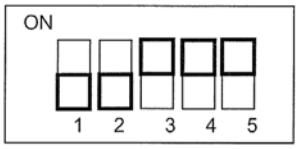
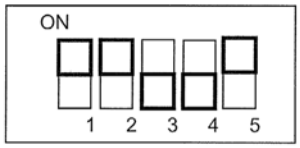
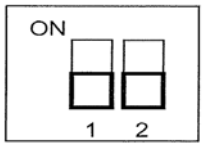
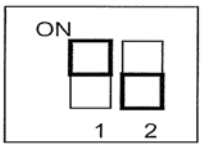
SW	On usual operation		On installationm
SW2	 OFF,OFF,ON, ON, ON	→ ←	 ON, ON, OFF,OFF,ON
SW3	 OFF,OFF	→ ←	 ON, OFF

Table 5-4 Dip switch for SCU2 (P-5549*)

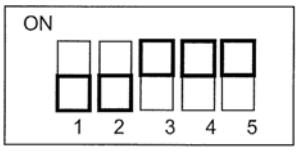
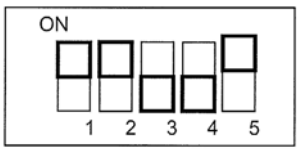
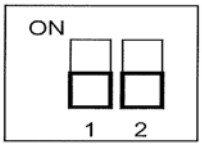
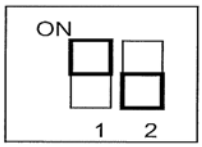
SW	On usual operation		On installationm
SW4	 OFF,OFF,ON, ON, ON	→ ←	 ON, ON, OFF,OFF,ON

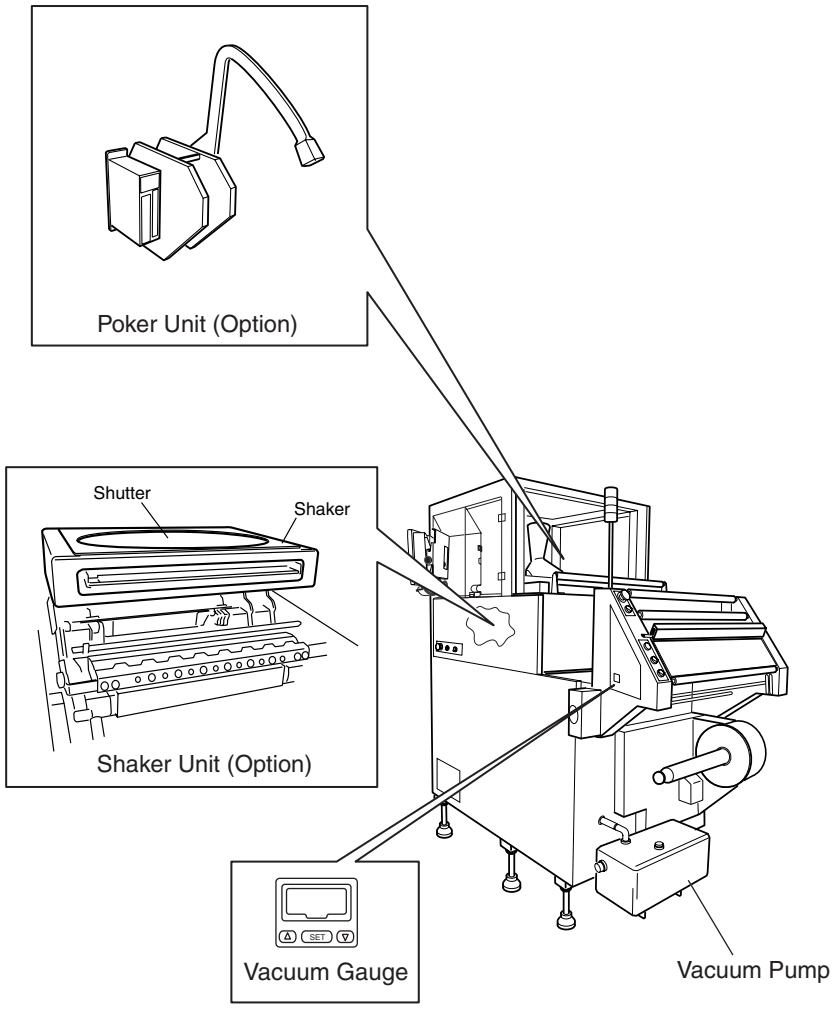
Table 5-4 Dip switch for SCU2 (P-5549*) (Continued)

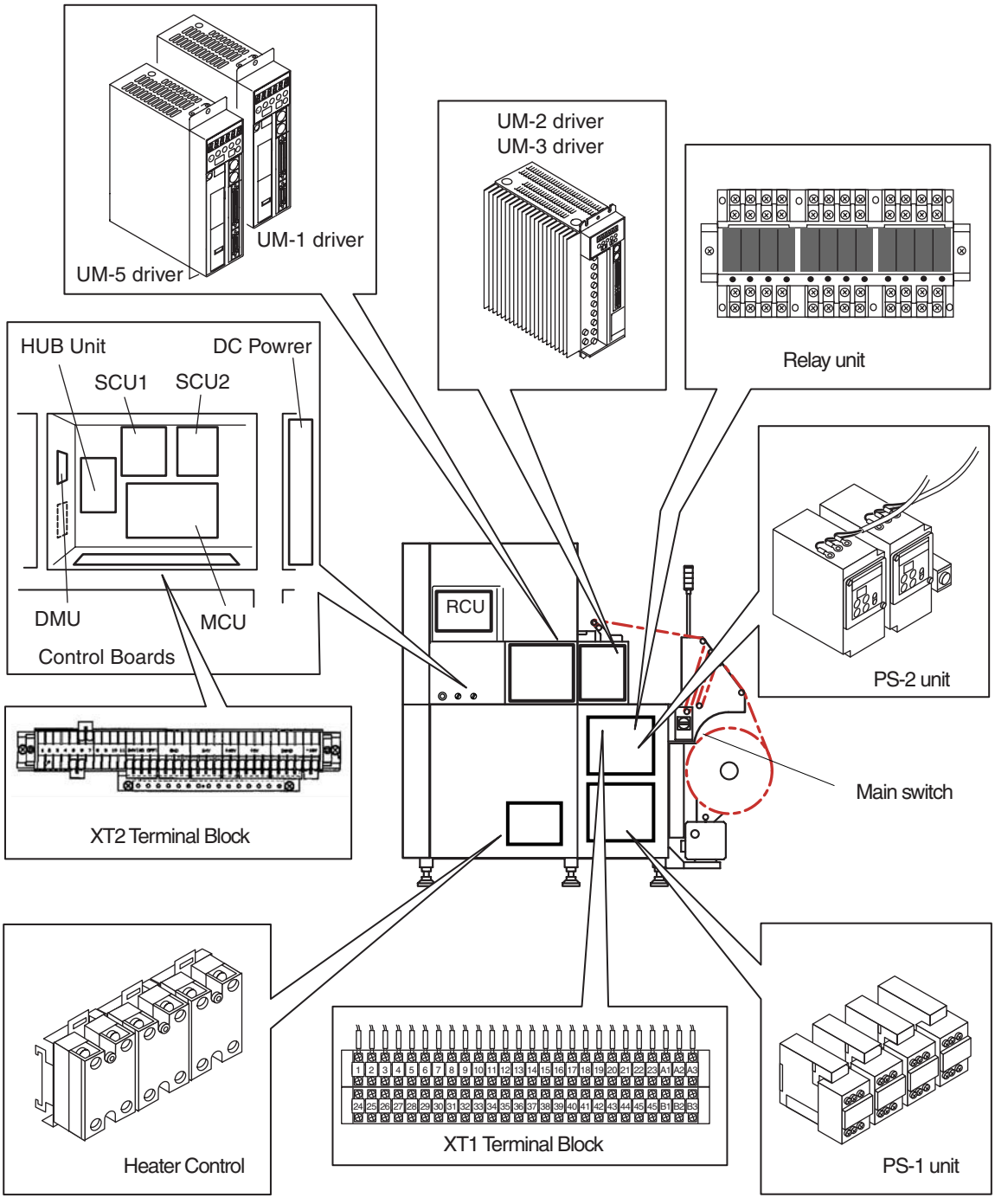
SW	On usual operation		On installationm
SW3	 OFF,OFF	→ ←	 ON, OFF

Reset of dip switches

After software installation, reset the dip switches to the original status.

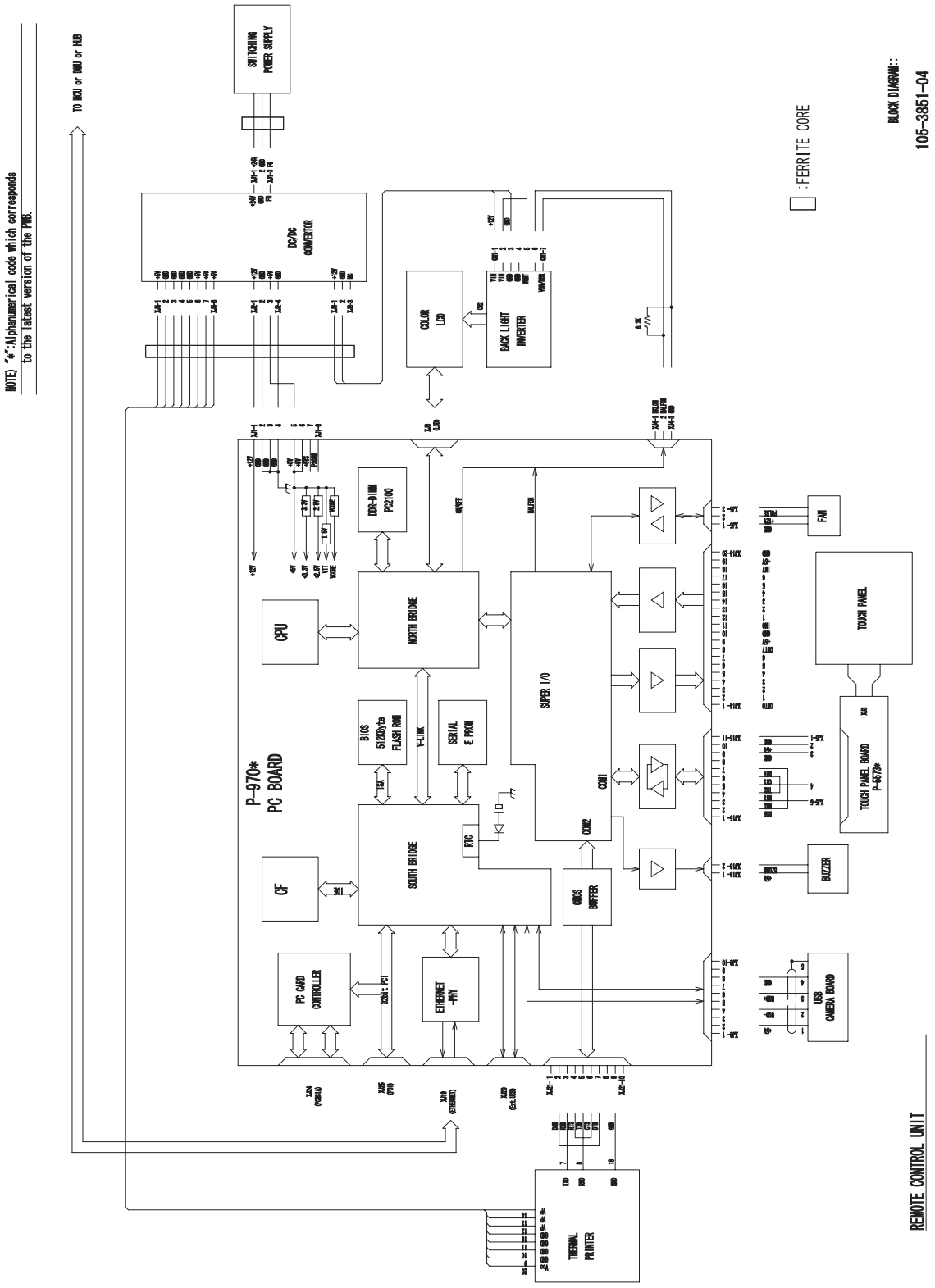
5.3 The locations of electrical boards and drivers



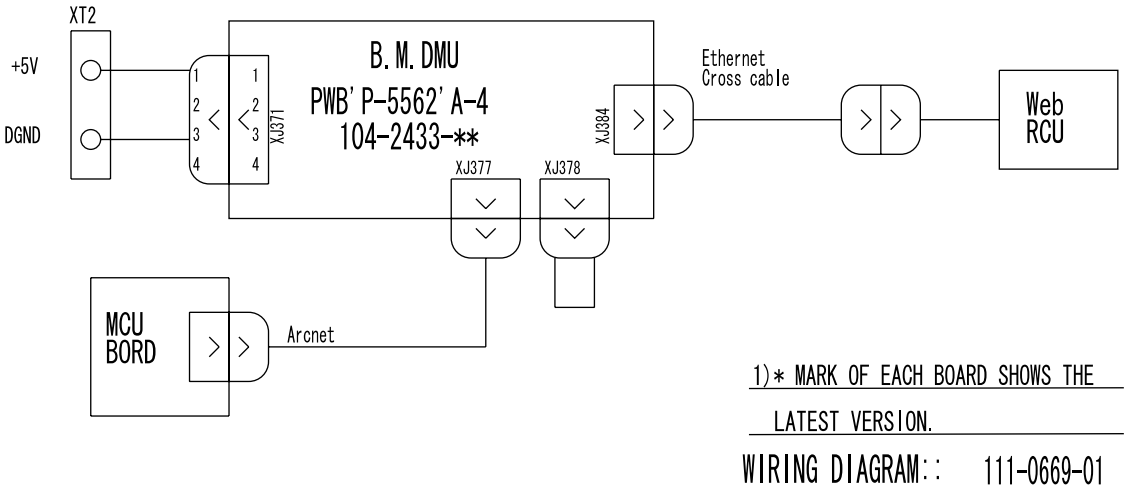

UM-5 driver
UM-1 driver
UM-2 driver
UM-3 driver
Relay unit
HUB Unit
DC Powrer
SCU1
SCU2
DMU
MCU
Control Boards
RCU
PS-2 unit
Main switch
XT2 Terminal Block
Heater Control
XT1 Terminal Block
PS-1 unit

5.4 Parts of each boards

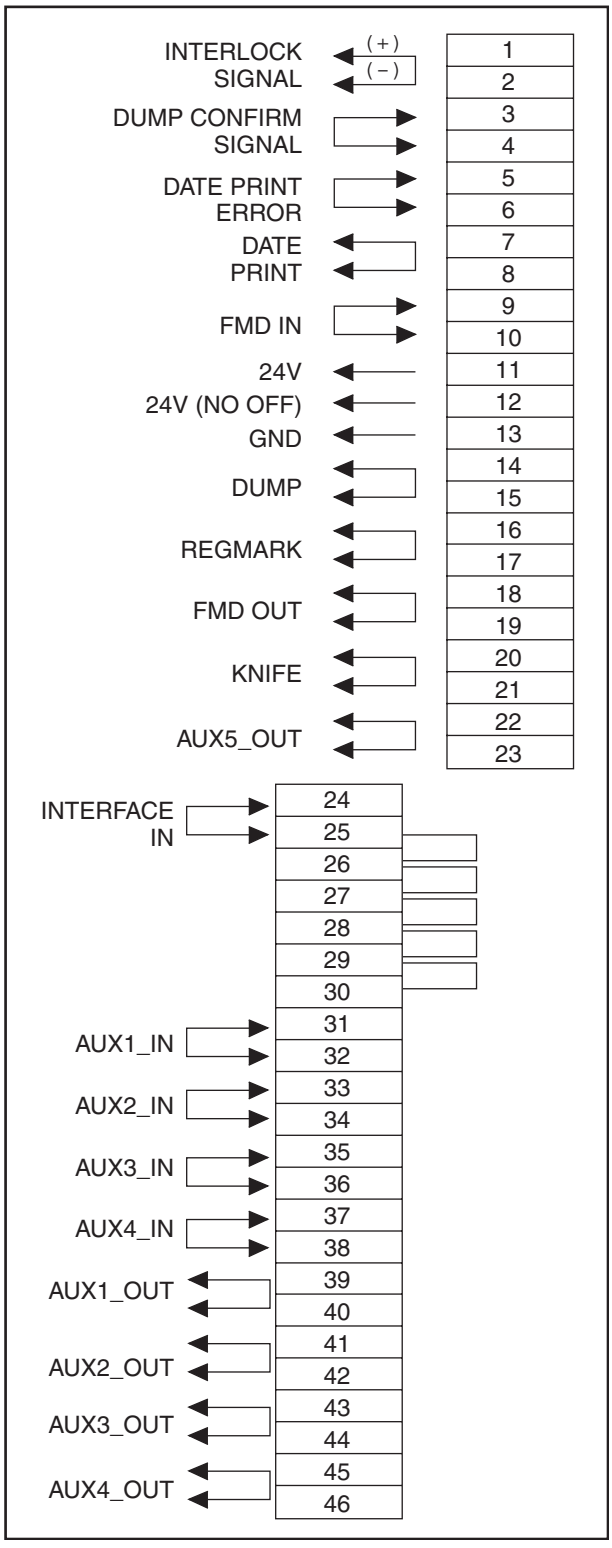
5.4.1 RCU Block diagram



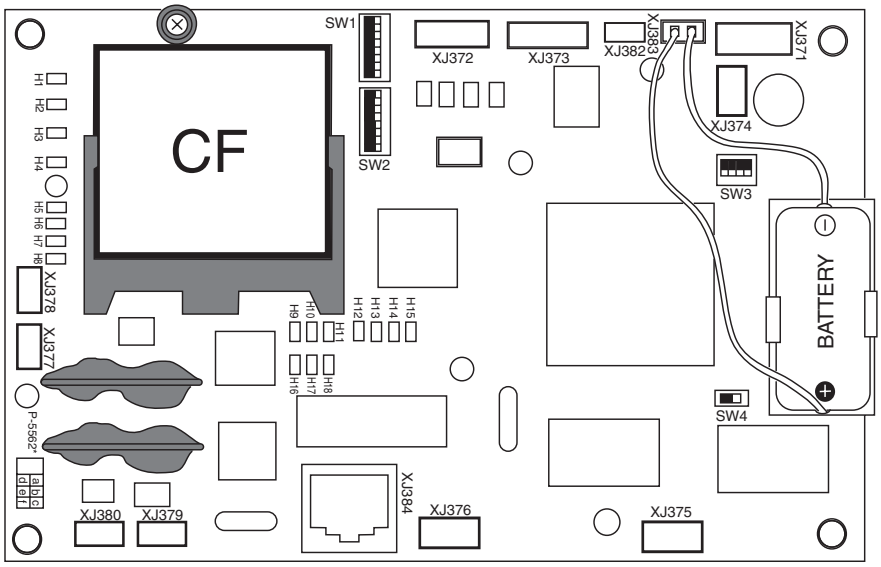
5.4.2 Block diagram



5.4.3 Wiring of XT1 Block



5.5 DMU BOARD (P-5562*)



Function of board

1. Data processing
2. Memory of Total and Parameter

Setting board DIP switches

(1) Setting off SW3

DIP SW	Function	Default at shipment
SW3-1	ON: Boot loader mode OFF: Application execution mode	OFF
SW3-2	Fix at OFF; do not turn ON.	OFF
SW3-3	ON: Flash memory write is inhibited. OFF: Flash memory write is enabled.	OFF
SW3-4	Fix at OFF; do not turn ON.	OFF

(4) Setting SW4 (Normally OFF)

Writing flash memory	OFF: Writing prohibited (available only with R23 mounted)
	ON: Writing available

Battery

Buttery in use: Lithium battery (Storage battery) CR17335SE-H SANYO
When replacing battery, connect new battery to XJ41. If an old battery is already connected, connect new battery to XJ40. Then remove old battery from another connector.

CAUTION

If the battery is replaced with an incorrect one, it may result in a board malfunction. When replacing a battery, make sure that it is the same model or an equivalent.
Dispose of used batteries after replacement.

Connector classification

Connector No.		Item
XJ370	(6P)	JTAG for CPLD (IC8)
XJ371	(4P)	DMU power supply
XJ372	(10P)	PI input CH1
XJ373	(12P)	PO output CH1
XJ374	(8P)	JTAG for CPU
XJ375	(8P)	Serial interface CH0
XJ376	(8P)	Serial interface CH1
XJ377	(3P)	Arcnet CH1
XJ378	(3P)	Arcnet CH1
XJ379	(3P)	Arcnet CH0
XJ380	(3P)	Arcnet CH0
XJ381		Compact flash
XJ382	(2P)	Battery
XJ383	(2P)	Battery
XJ384		ETHERNET connector
XJ385	(20P)	Interface for DMU
XJ386	(10P)	Power supply for stack

Connector function in details

(1) XJ370: JTAG for CPLD (IC8)

Connector No.	Terminal No.	Signal
XJ370 JTAG for CPLD (IC8)	1	+3.3V
	2	TMS
	3	TDO
	4	TDI
	5	TCK
	6	GND

(2) XJ371: MDU power supply

Connector No.	Terminal No.	Signal
XJ371 DMU power supply	1	+5V DC
	2	+5V DC
	3	GND
	4	GND

(3) XJ372: PI input CH1

Connector No.	Terminal No.	Signal
XJ372 PI input CN1	1	+ common
	2	PINT 0
	3	PINT 1
	4	PINT 2
	5	PINT 3
	6	PINT 4
	7	PINT 5
	8	PINT 6
	9	PINT 7
	10	N.C.

(4) XJ373: PO input CH1

Connector No.	Terminal No.	Signal
XJ373 PO output CH1	1	Data 0
	2	Data 1
	3	Data 2
	4	Data 3
	5	Data 4
	6	Data 5
	7	Data 6
	8	N.C.
	9	Data 7
	10	+ 5V
	11	GND
	12	N.C.

(5) XJ374: JTAG for CPU

Connector No.	Terminal No.	Signal
XJ374 JTAG for CPU	1	TCK
	2	TRST
	3	TDO
	4	GND
	5	TMS
	6	TDI
	7	RES
	8	GND

(6) XJ375: Serial interface CH0

Connector No.	Terminal No.	Signal
XJ375 Serial interface CH0	1	+5V
	2	TXD
	3	RXD
	4	GND
	5	RTS
	6	CTS
	7	DSR
	8	DTR

(7) XJ376: Serial interface CH1

Connector No.	Terminal No.	Signal
XJ376 Serial interface CH1	1	+5V
	2	TXD
	3	RXD
	4	GND
	5	RTS
	6	CTS
	7	DSR
	8	DTR

(8) XJ377/ XJ378: Arcnet CH1

Connector No.	Terminal No.	Signal
XJ377, XJ378 Arcnet CH1	1	Signal (+)
	2	Signal (-)
	3	F.G.

(9) XJ379/XJ380: Arcnet CH0

Connector No.	Terminal No.	Signal
XJ379, XJ380 Arcnet CH0	1	Signal (+)
	2	Signal (-)
	3	F.G.

(10) XJ385: Interface for DMU

Connector No.	Terminal No.	Signal
XJ385 Interface for DMU	1	Data 0
	2	Data 1
	3	Data 2
	4	Data 3
	5	Data 4
	6	Data 5
	7	Data 6
	8	Data 7
	9	Address 0
	10	Address 1
	11	Address 2
	12	Address 3
	13	R/W direction input
	14	ENB input
	15	RESET input
	16	Interruption output
	17	Serial input signal (CH0)
	18	Serial output signal (CH0)
	19	+ 5V
	20	GND

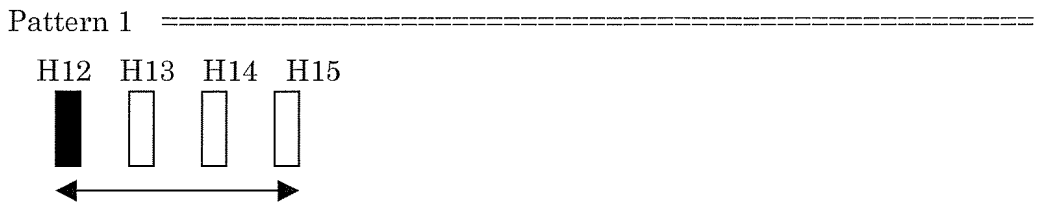
(11) XJ386: Power supply for stack

Connector No.	Terminal No.	Signal
XJ386 Power supply for stack	1	+ 5V
	2	+ 5V
	3	+ 5V
	4	+ 5V
	5	GND
	6	GND
	7	GND
	8	GND
	9	GND
	10	GND

Function of LED for monitor

LED	Functional description	LED display status
H1	PINT2	Turns off in an unconnected state.
H2	PINT3	Turns off in an unconnected state.
H3	PINT0	Turns off in an unconnected state.
H4	PINT1	Turns off in an unconnected state.
H5	Arcnet CH1 Reception signal	Lights brightly.
H6	Arcnet CH1 Transmission signal	Lights poorly.
H7	Arcnet CH0 Reception signal	Lights brightly with an instant turn off at intervals in an unconnected state.
H8	Arcnet CH0 Transmission signal	Lights poorly with an instant turn off at intervals in an unconnected state.
H12	Indicates the boot loader status by combination of 12 to 15.	(*) Flashes with normal DMU software operation.
H13		(*) Flashes with receiving operatin of main boat telegram.
H14		(*) Flashes with telegram receiving of MELSE Ethernet.
H15		(*) Flashes with receiving operation of MELSEC232 telegram.
H9	ETHER data reception	Flashes.
H10	ETHER link	Lights.
H11	ETHER all double communication	Lights.
H16	ETHER link with 100MBPS	Lights.
H17	ETHER data transmission	Flashes.
H18	ETHER collision occurred	Turns off when there is no collision.

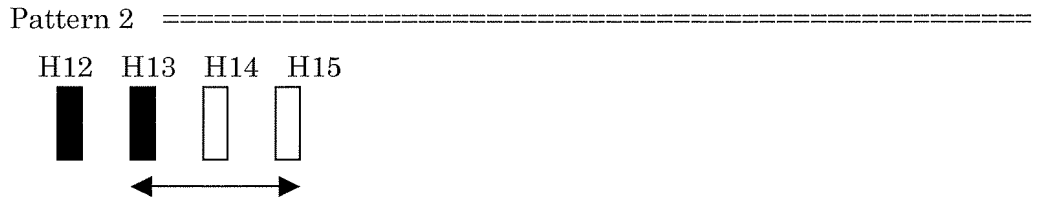
Pattern 1



H12, H13, H14, and H15 light one after another in sequence:
The bootloader starts.
When SW3-1 is ON, restarts with turning OFF SW3-1.
When SW3-1 is OFF, the flash memory has no application software and the CF card is not set. (When the CF card without INF files is set, the pattern is 5.)

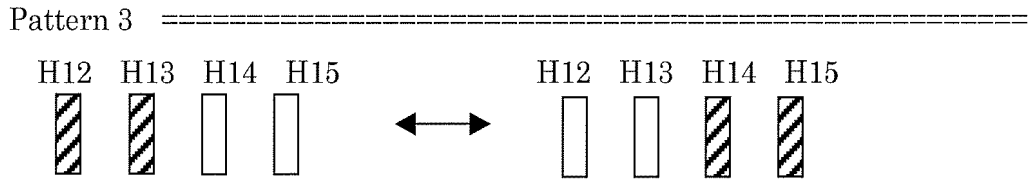
When SW3-1 is OFF and only H12 flashes as shown in pattern 4 after a few seconds, it is possible that either a DMU board for other than the packer may be installed or the board may malfunction.

Pattern 2



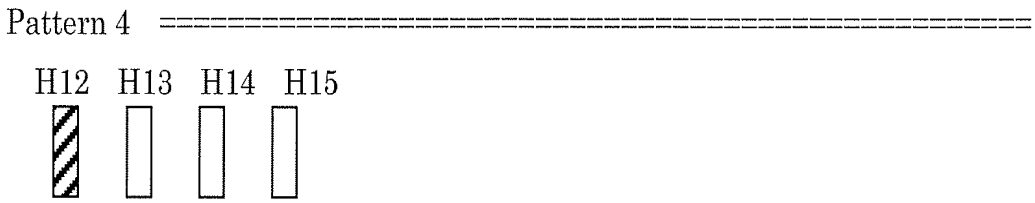
While H12 lights, H13, H14, and H15 light one after another in sequence:
In the file creation proce **(Do not turn off the main power during this process.)**

Pattern 3



H12 &H13 and H14 & H15 flash alternately:
In recovering the backup file to the root **(Do not turn off the main power during this process.)**

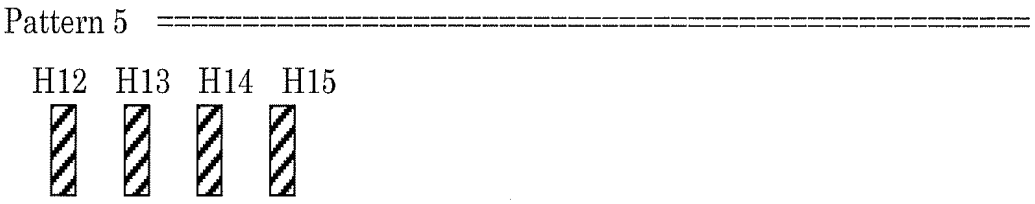
Pattern 4



Only H12 flashes:
In downloading and rewriting the DMU program **(Do not turn off the main power during this process.),**
or
in downloading the other program (after the transition from the pattern 1).

However, when this condition continues after several tens of minutes have passed, it is possible that the system was set to pattern 1 immediately after power on and transferred to this status. Turn off the main power and turn it on again, then immediately check the LED status.

Pattern 5



All of H12, H13, H14, and H15 flash together:
or
Commanding SRAM initialization (Drive Mount error: **Error code = 1019**).

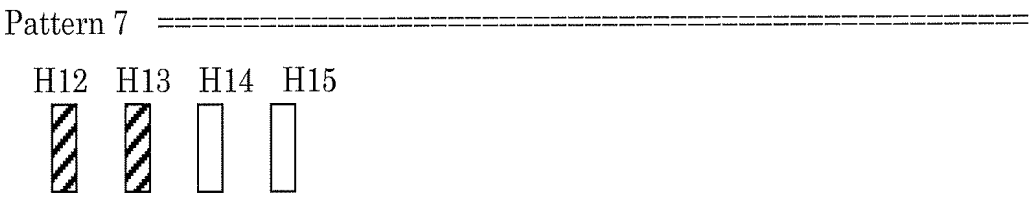
When a broken CF card or a CF card without INF file is set into the socket, the system becomes this status even SRAM operates normally. Turns off the power before turning off SW2-R, then turn on the power again with the CF card removed to confirm the status.

Pattern 6

H12, H13, and H14 flash together:
Commanding initialization of SRAM disk (Scan Disk error: **Error code = 1109**).

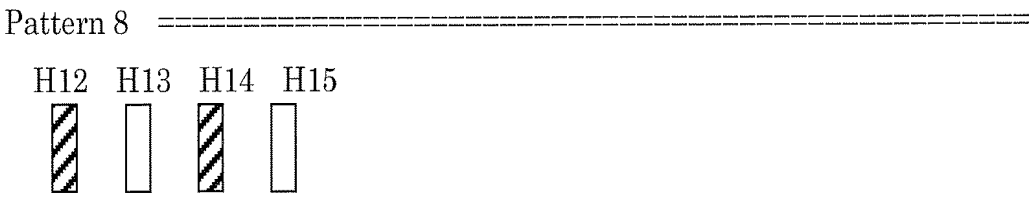
When a broken CF card or a CF card without INF file is set into the socket, the system becomes this status even SRAM operates normally. Turns off the power before turning off SW2-R, then turn on the power again with the CF card removed to confirm the status.

Pattern 7



H12 and H13 flash together:
Commanding initialization of SRAM disk (Setup file error: **Error code =1027**).

Pattern 8

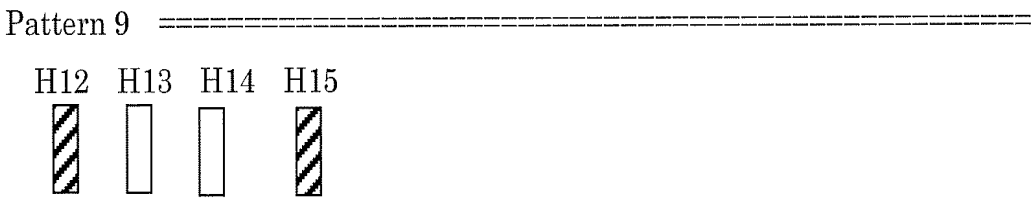


H12 and H14 flash together:
Commanding initialization of SRAM disk (Log file error: **Error code =1023**).

Turning OFF SW2-6 in the state of pattern 5 to 8 performs initialization of SRAM disk.

The error code is not set while the LED flashes. It is set when SW2-6 is OFF and after the initialization is performed.

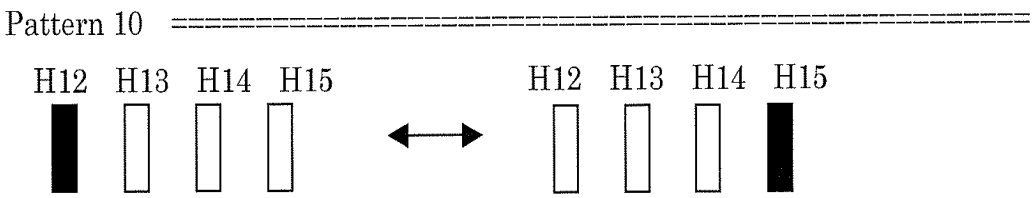
Pattern 9



H12 and H15 flash together:
Assert is generated.
Saves the file name and the number of lines that have generated in ASSERT.LOG of SRAM disk.
When the FTP connection is not possible in this state, turn on the main power again and make the FTP connection to acquire ASSERT.LOG.

ftp 192.168.0.41
user
pass
cd c:
ls
bin
get assert.log

Pattern 10

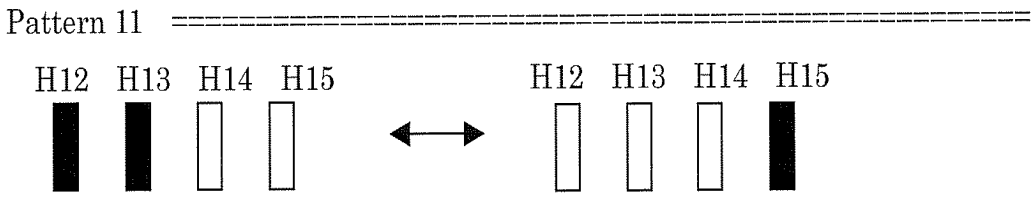


While H13 & H14 turn off, H12 & H15 light alternately (at one second cycle):
In downloading the basic software from the DMU board: (**Error code = 525**).

NOTE

- Do not turn off the main power during this process.

Pattern 11

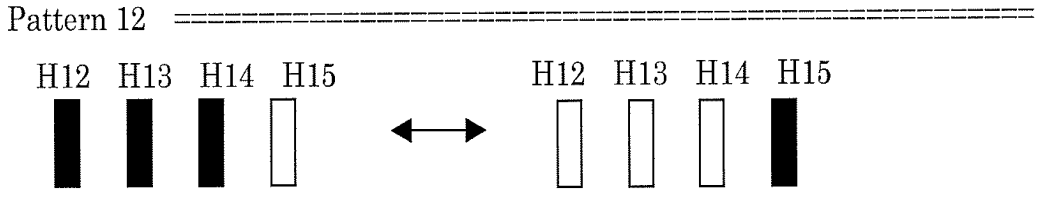


While H14 turns off, H12 & H13 and H15 light alternately (at one second cycle):
In uploading the basic software from the DMU board: (**Error code = 525**).

NOTE

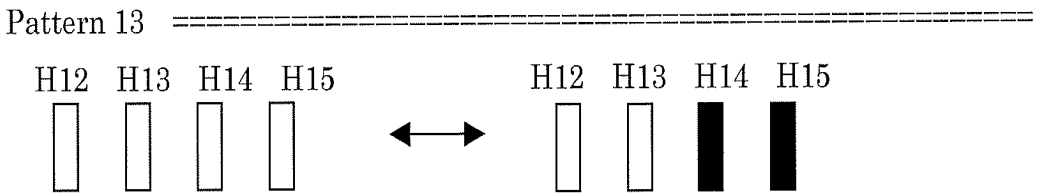
- Do not turn off the main power during this process.

Pattern 12



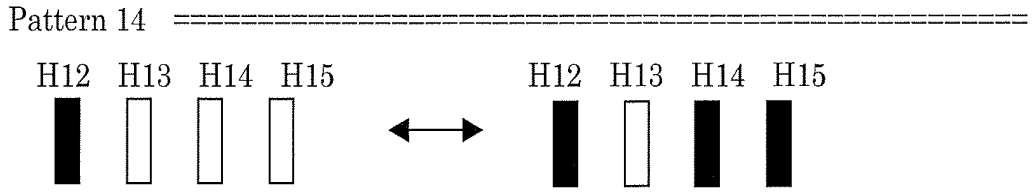
H12, H13, & H14 and H15 light alternately (at one second cycle):
Writing the basic software from the DMU board has been completed: (**Error code = 526**).

Pattern 13



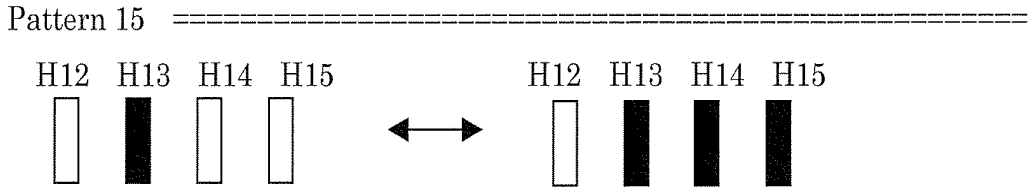
While H12 & H13 turn off, H14 and H15 flash at one second cycle:
Although writing the basic software from the DMU board has completed the connection, the IDs were not identical (**Error code = 109**).
The cause may be due to a discrepancy between the connection destination and CPU selection dip switch or a connection failure.

Pattern 14



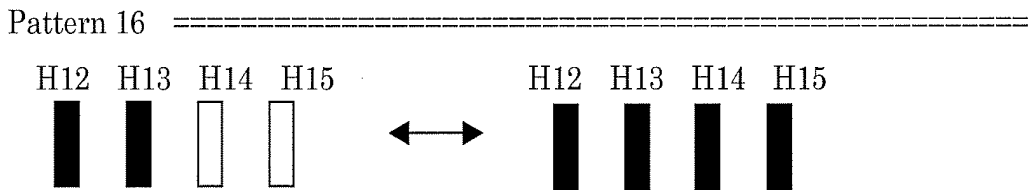
While H12 lights and H13 turns off, H14 and H15 flash at one second cycle:
In writing the basic software from DMU,an error occurs during the program reading on the CF card (**Error code = 109**).
Check the content of the CF card.

Pattern 15



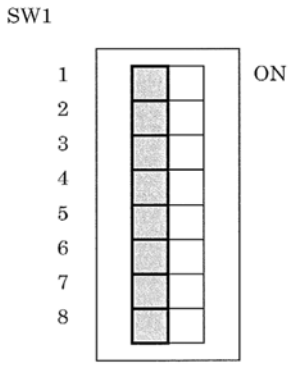
While H12 turns off and H13 lights, H14 and H15 flash at one second cycle:
In writing the basic software from the DMU board, an error occurs during the download process (**Error code = 109**).
The cause may be a poor connection of the writing cable or the board.

Pattern 16



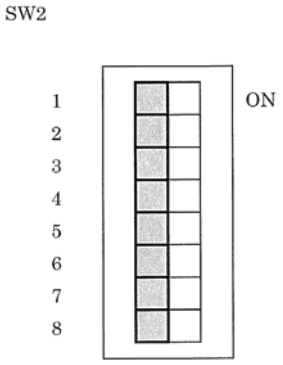
While H12 and H13 light, H14 and H15 flash at one second cycle:
In writing the basic software from the DMU board, an error occurs during the upload or verification process (**Error code = 109**).
The cause may be a poor connection of the writing cable or the board.

SW1



No.	Function	Normal
1	Reservation (F specification)	OFF
2	Reservation (model)	OFF
3	**Right machine OFF, Left machine ON**	**OFF or ON**
4	Modbus / TCP character string edian	OFF:DDE(big) / ON:OPC(little)
5	Soft stripping effective operation (specification:F)	OFF
6	Not used	OFF
7	Not used	OFF
8	Trial mode	OFF

SW2



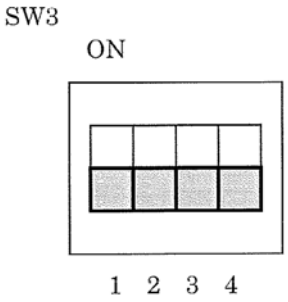
No.	Function	Normal
1	Auto-basic software writing CPU selection#1	OFF
2	Auto-basic software writing CPU selection#2	OFF
3	Auto-basic software writing CPU selection#3	**OFF or ON**
4	Not used	OFF
5	Communication monitor output permission	OFF
6	Manual initialization of SRAM, CF CARD writing permission	OFF
7	Debug	OFF
8	BIOS log message transmission	OFF (Some machines have been set to ON at the factory.)

SW2-1;OFF, SW2-2;OFF, SW2-3:OFF\xa5 \xa5 \xa5 MCU1
SW2-1;**ON**, SW2-2;OFF, SW2-3:OFF\xa5 \xa5 \xa5 MCU2
SW2-1;OFF, SW2-2;**ON**, SW2-3:OFF\xa5 \xa5 \xa5 SCU1
SW2-1;**ON**, SW2-2;**ON**, SW2-3:OFF\xa5 \xa5 \xa5 SCU2
SW2-1;OFF, SW2-2;OFF, SW2-3:**ON**\xa5 \xa5 \xa5 SCU3

When SW2-8 is ON, the transfer rate of COM #1 (XJ375) is 57600 bps. When OFF, the rate is 38400 bps. **However, when SW2-8 is OFF, SW2-7 is ON, and SW2-5 is OFF, the system is set to the auto basic software writing mode,** which establishes the connection with the main CPU at 9600 bps and writes at 19200 bps after the completion of the connection. After the connection is established, the **Error code is 109**, displaying the progress with LED of H12 to H15. (Pattern 10 to pattern 16)

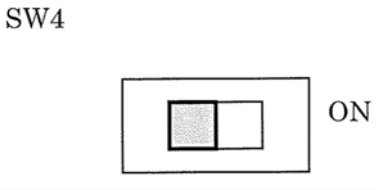
When SW2-5, SW2-7, SW2-8 are ON, the system automatically starts the scan disk of the CF card. It takes a few tens of seconds with 16 M. When the scan processing is unsuccessful including the case that the CF card is not inserted in the socket, the **Error code is 1051**. When any trouble is detected from the scan result, the **Error code is 1050**.

SW3



No.	Function	Normal
1	Starting bootloader	OFF
2	Flash writing protection	OFF
3	Starting default IP address	OFF (192.169.0.41 when it is ON)
4	Starting JTAG-ICE connection	OFF (turn ON SW1-1 as well when it is ON)

SW4



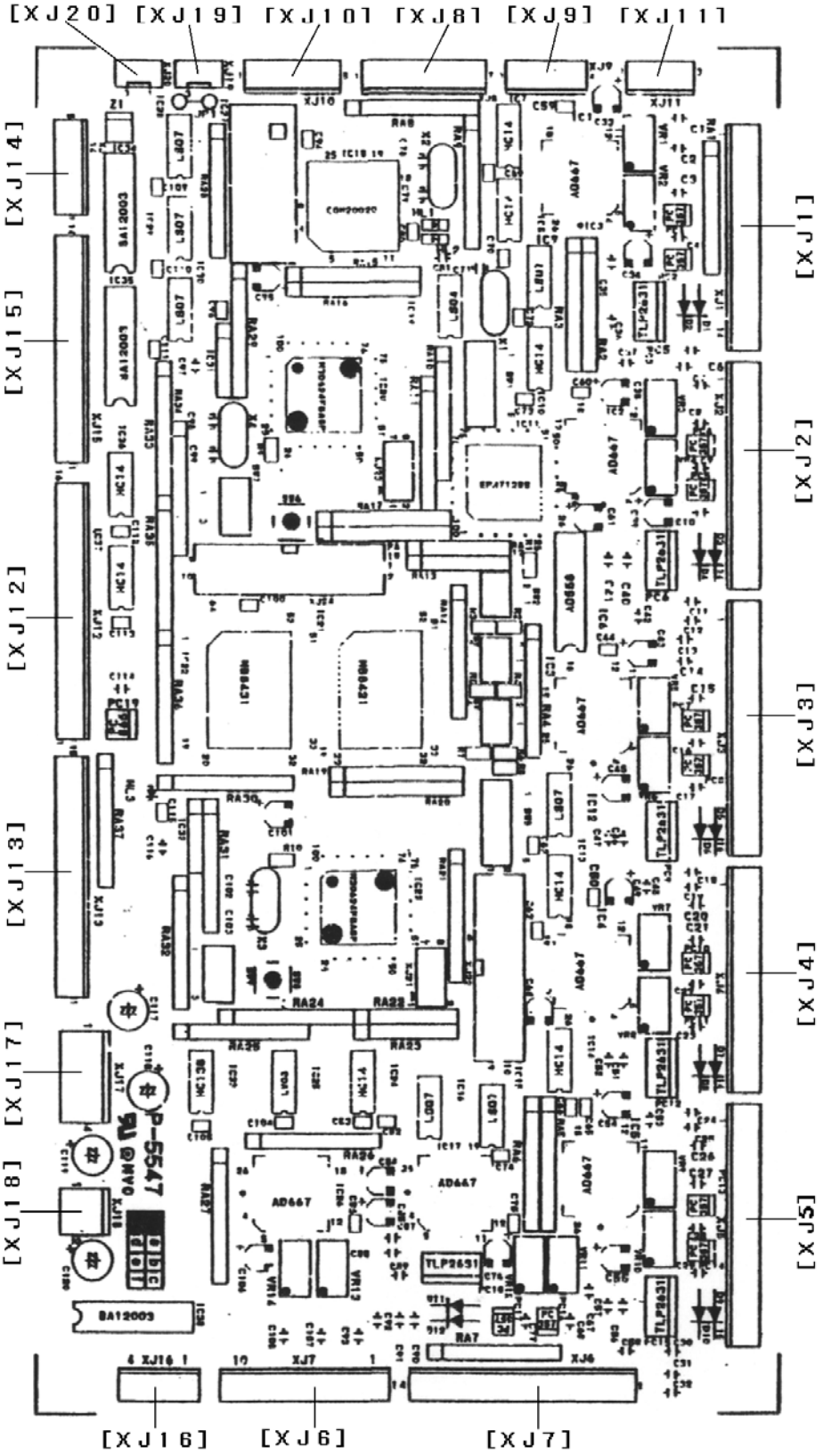
No.	Function	Normal
1	Write protection open	OFF

Connector

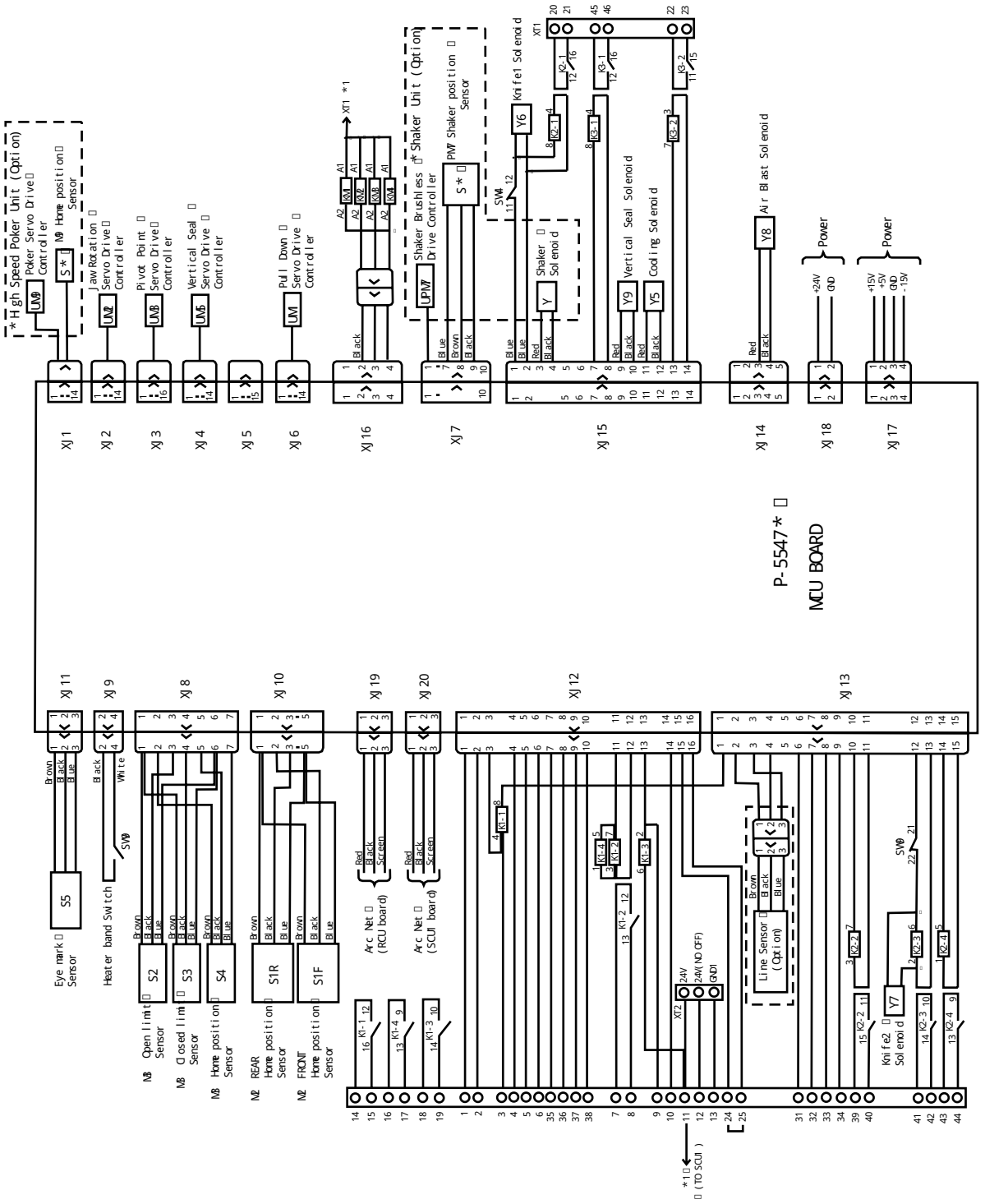
Symbol	Function
XJ370	Writing PLD
XJ372	8-IN
XJ373	8-OUT
XJ374	JTAG-ICE
XJ375	COM #1: Writing to Monitor or Main software.
XJ376	COM #2: MELSEC RS232C interface.
XJ377	ARCNET #1: Main unit (MCU, SCU1, SCU2) board communication.
XJ378	ARCNET #1: Normally terminating resistance.
XJ379	ARCNET #2: Optional board (2nd-DMU,MHIC) communication.
XJ380	ARCNET #3: Normally terminating resistance.

Symbol	Function
XJ381	CF card socket
XJ382	Battery #1
XJ383	Battery #2: Normally opened
XJ384	Ethernet
XJ385	Expansion bus

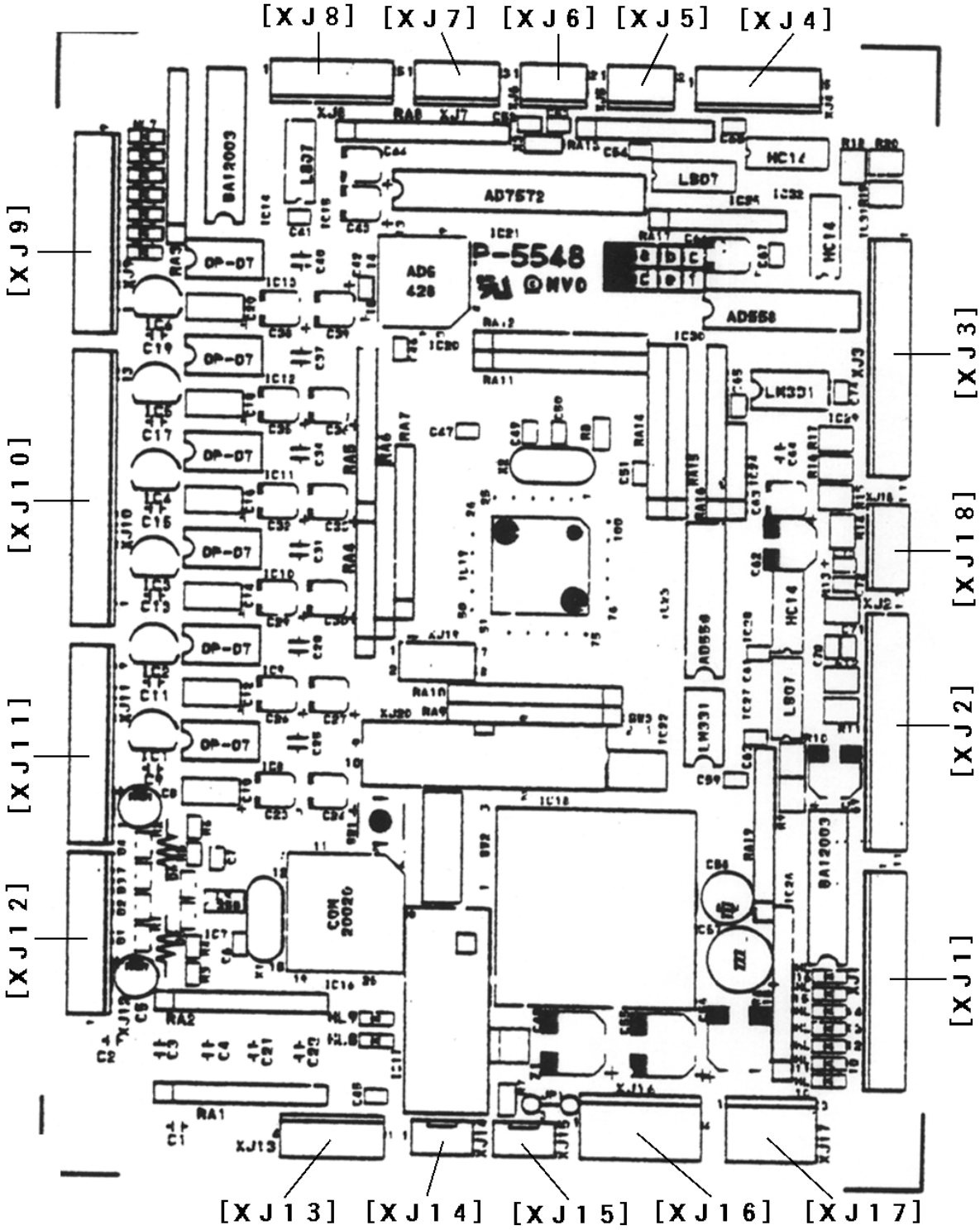
5.6 MCU board (P-5547*)



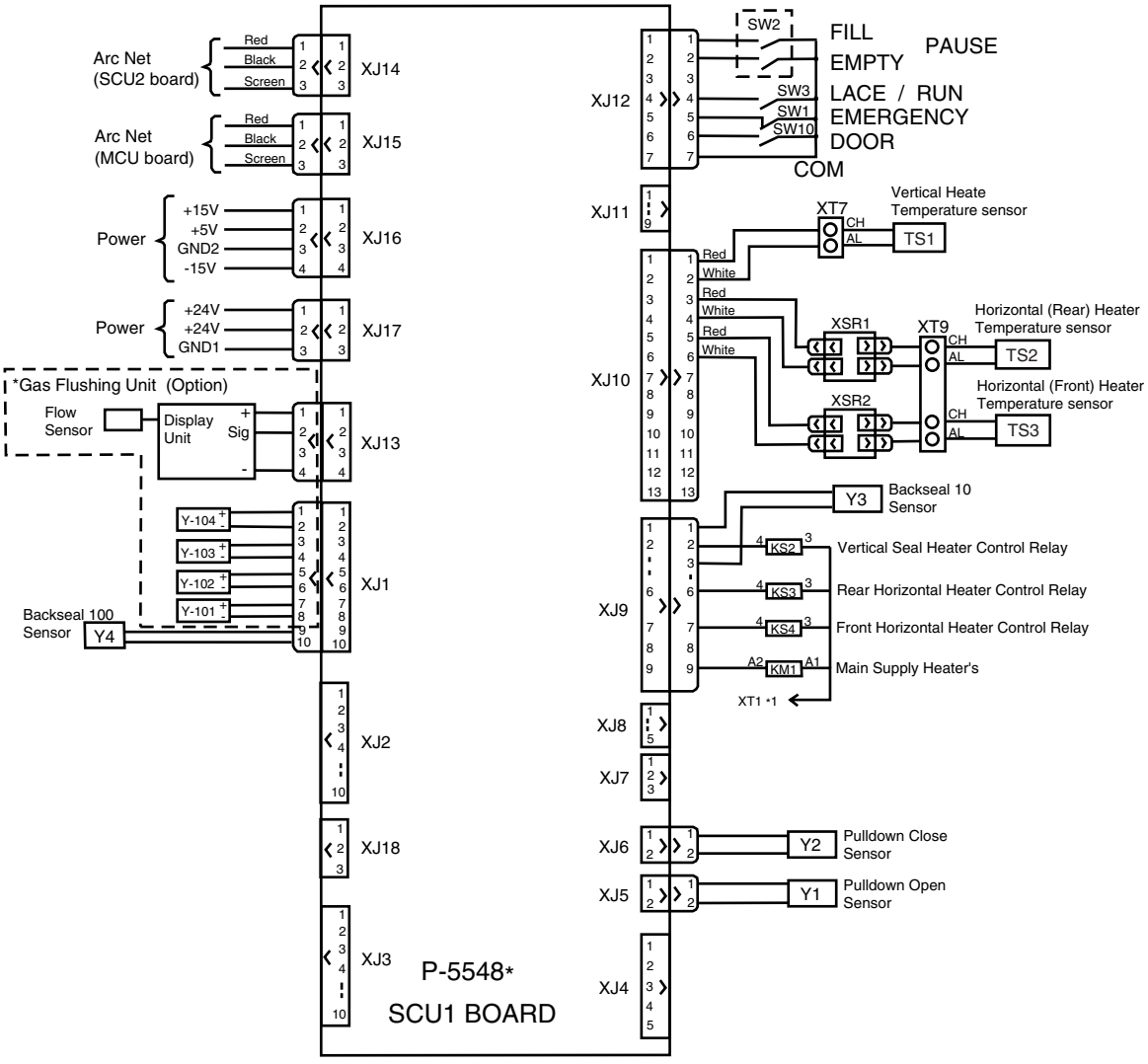
5.6.1 MCU board Block diagram



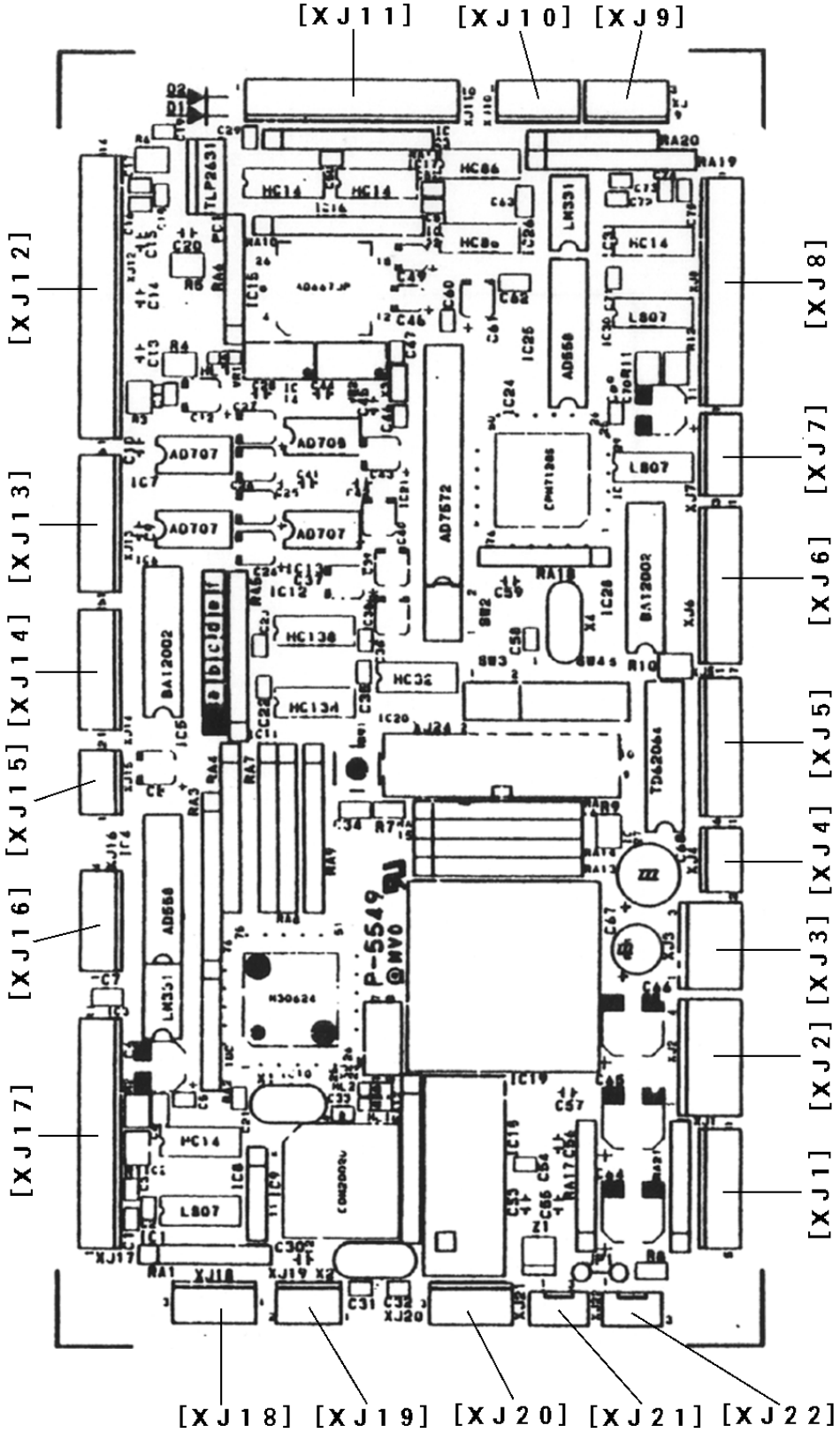
5.7 SCU1 board (P-5548*)



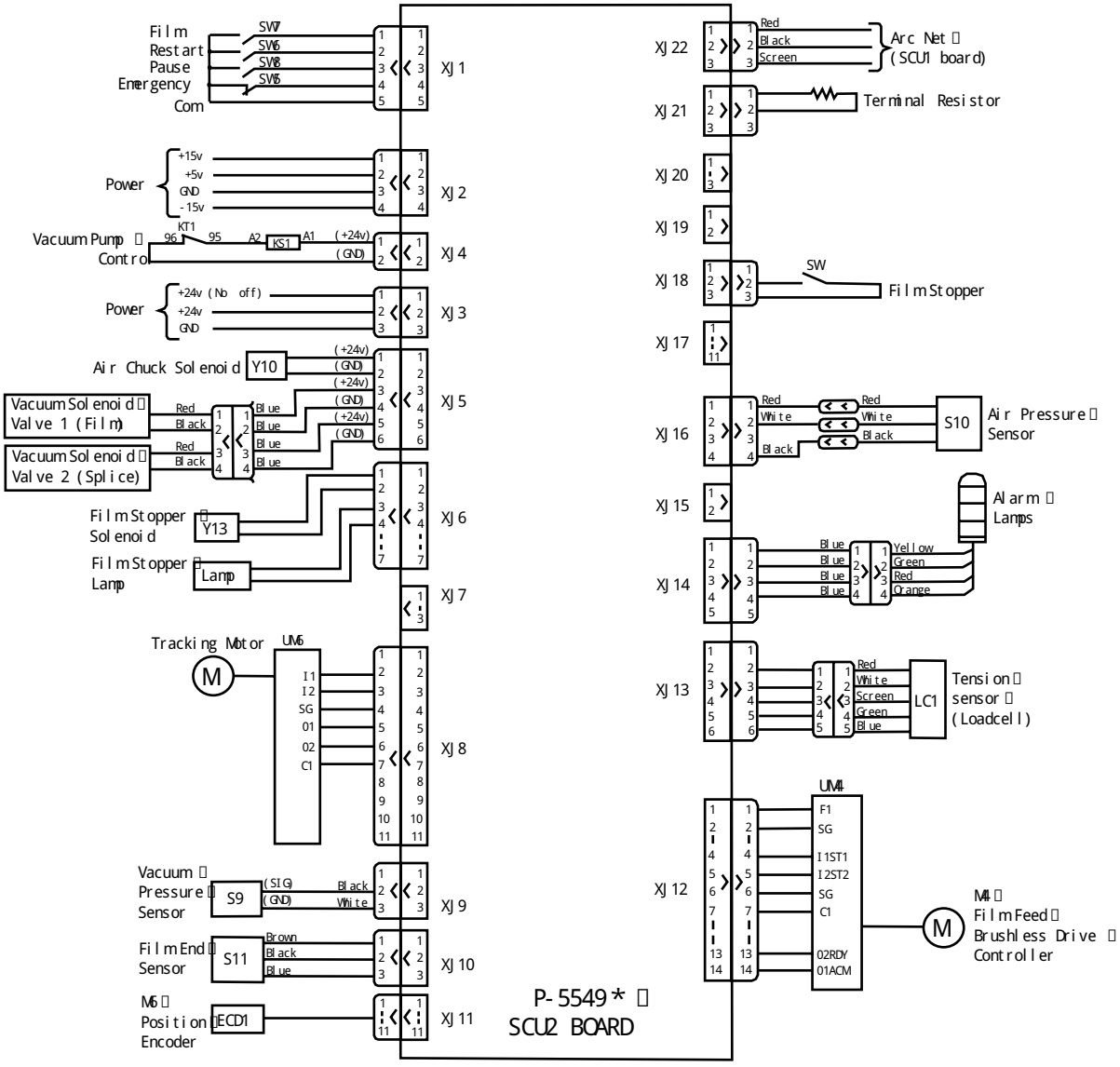
5.7.1 SCU1 board Block diagram



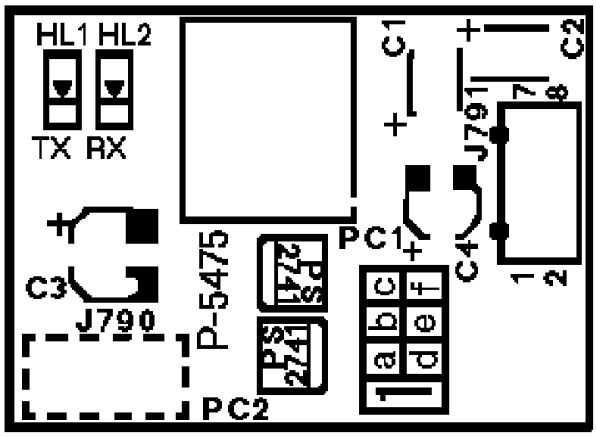
5.8 SCU2 board (P-5549*)



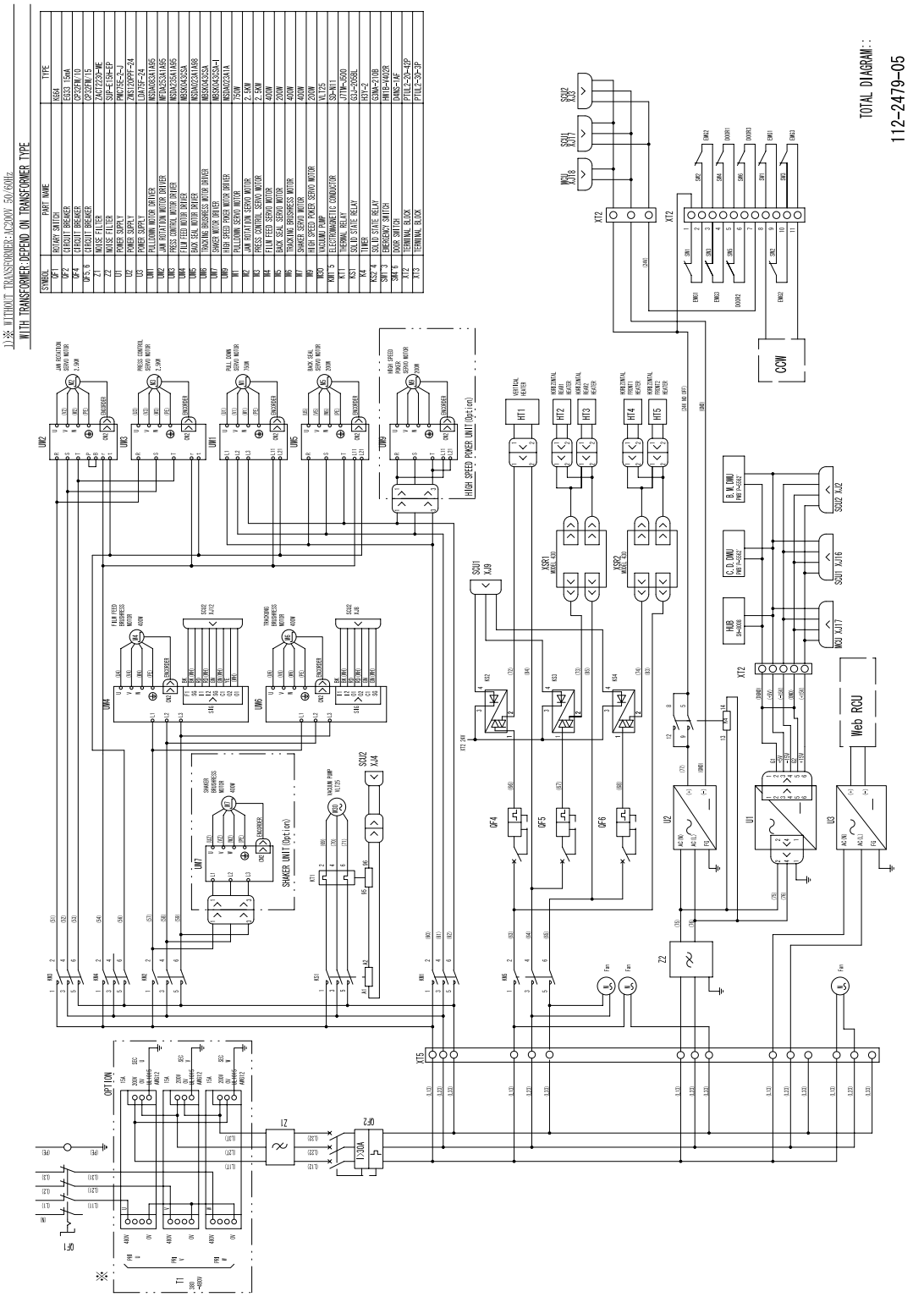
5.8.1 SCU2 board Block diagram



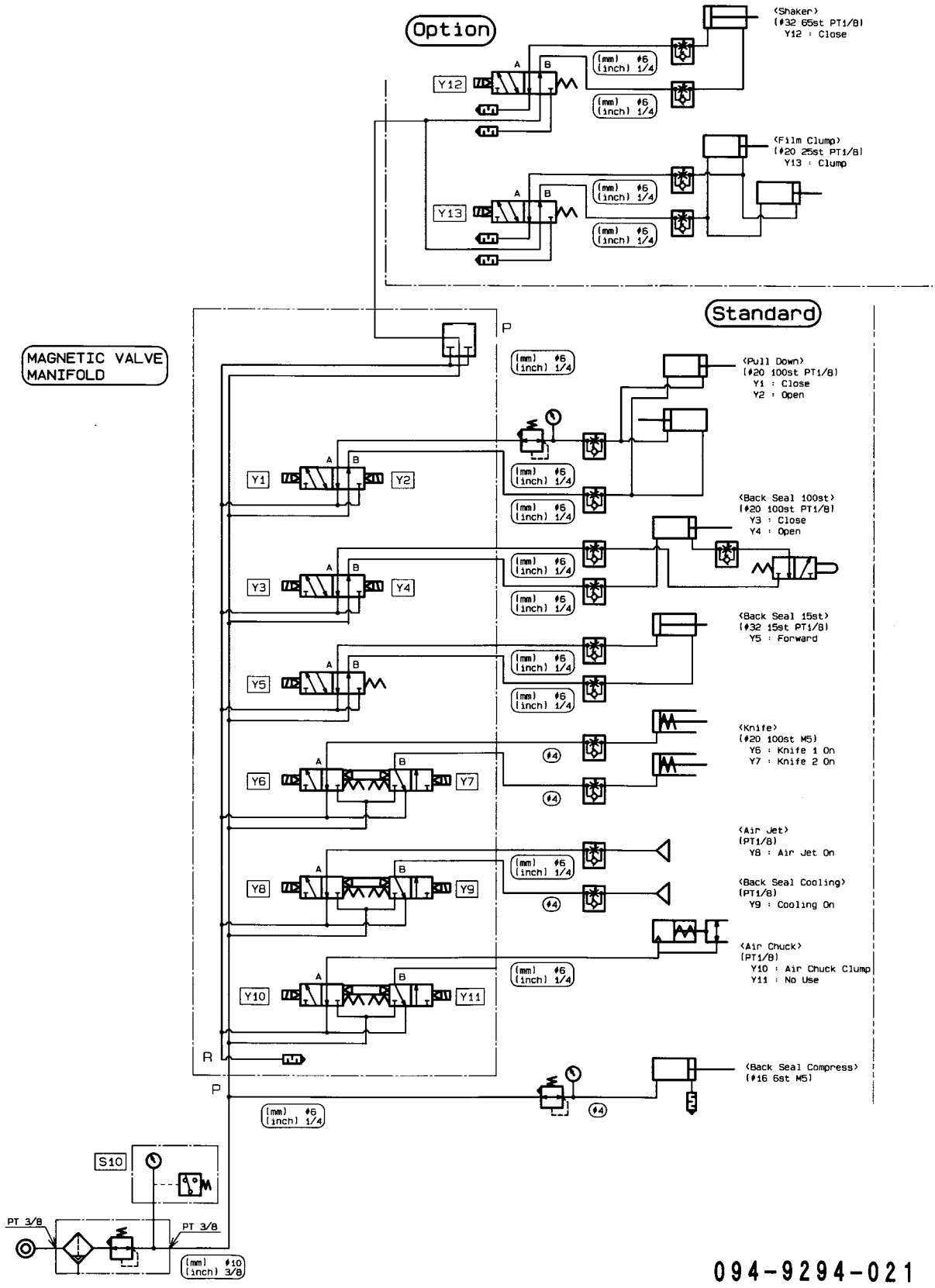
5.9 RS 232C Interface board (P-5475*)



5.9.1 Total Diagram



5.9.2 Air line Diagram



5.10 Operation of the Motor Driver

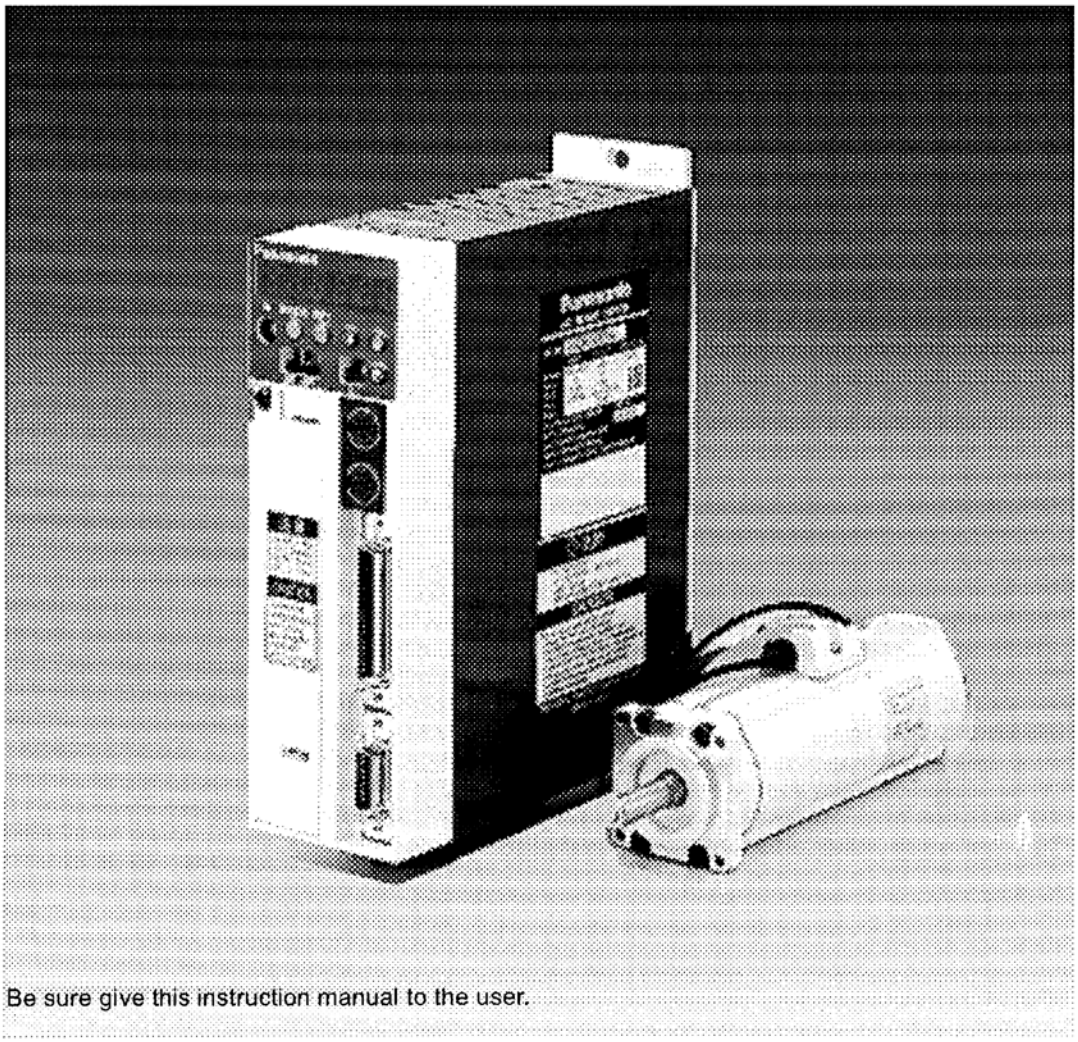
- This driver have various parameters through which you can adjust/set the performance of functions. Please use these parameters so that you can operate the driver at the most appropriate condition.
- Among various functions of this driver are;
  - n Monitoring functions of such as the number of reserved pulses of the deviation counter (position error), motor speed and generated torque.
  - n Display of the status of the control input/output signals connected to the connector, CN I/F.
  - n Display of the error factors and the record.
- There are 2 ways of operating the above functions as below;
  - n Key operation and the display of the front panel or,
  - n Computer display

5.10.1 AC Servo Driver

5.10.1.1 Key operation of the front panel and display

Panasonic

AC Servo Motor Driver
MINAS A-series
Operating Manual



Be sure give this instruction manual to the user.

- Thank you very much for your buying Panasonic AC Servo Motor Driver,A-series.
- Before use, read through this manual to ensure proper use. Keep this manual at an easily accessible place so as to be referred anytime as necessary.

Setting the Parameters

• You can set the Parameters with;

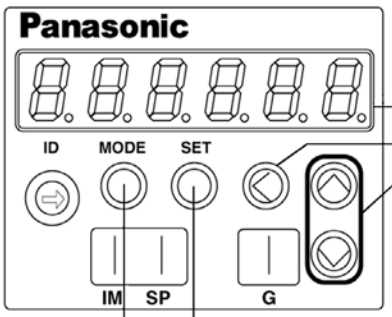
1) the front touch panel or

2) Your personal computer with the A-series communication software PANATERM.

<Note>

For the use of PANATERM for parameter handling, see the instruction manual of the software.

• Using the front panel



LED (6 digits)

Use this to change/shift the digit.

Use this to change data/execute the action of the selected parameters.

Pressing button to increase the value.

Pressing button to decrease the value.

SET button

Switches between the mode (selected with mode switching button) and the execution display.

MODE switching button

You can select five MODE options.

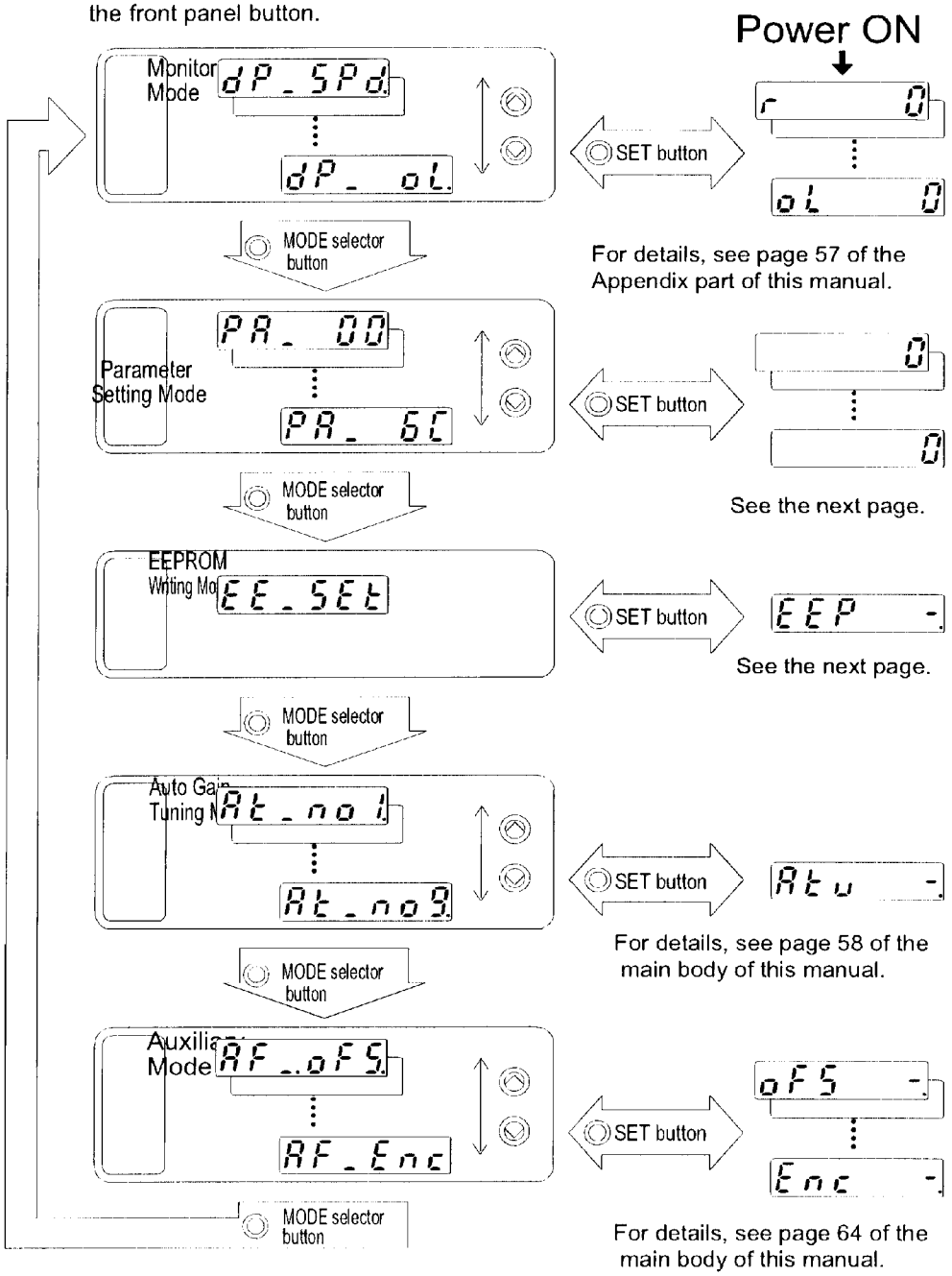
- O Monitor Mode
- O Parameter Set-up Mode
- O EEPROM Writing Mode
- O Auto Gain Tuning Mode
- O Auxiliary Mode

To set a parameter, select the Parameter Setting Mode.

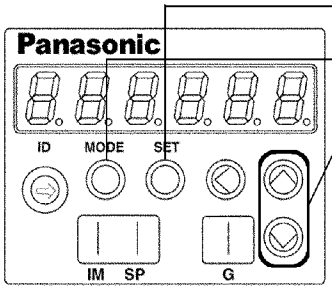
Parameter Setting

MODE's Structure

You can select a desired MODE by using the front panel button.



Using the front touch panel



1) Turn the driver (power) ON.

2) SET Press SET button. → PA_ 00

3) MODE Keep pressing MODE button. → PA_ 10

4) Select your desired Parameter No. by using UP and DOWN button. → 50

5) SET Press SET button. → 100

6) Change the value using LEFT ARROW, UP and DOWN buttons.

7) SET Press SET button.

Select EPROM Writing Mode.

8) MODE Keep pressing MODE button → EE_SEt

9) SET Press SET button. → EEP -

10) Keep pressing UP button (approx. 3 seconds). Bars in the display increases as shown in the right figure. → EEP - - → - - - - - -

Start writing (momentary message will be displayed as shown in the right figure). → StArt

→ FinISh (Writing complete) / rESEt / Error (Writing error)

- If you set a parameter that will become valid after a reset operation, "rESEt" will appear at writing complete. Turn off the power and then turn it on again to make the change valid.
- You can re-write the parameter by keeping the UP button depressed at the parameter writing complete.

<Notes>

1.If a writing error occurs, return to the first step of the writing procedure, and repeat it.

2.Do not turn off the power during EEPROM writing. Otherwise a false data may be entered. If this happens, set all parameters again, make sure that all the parameter values are correct, and then write them down to EEPROM.

Details of Operation (Monitor Mode)

Motor Mode

Operation

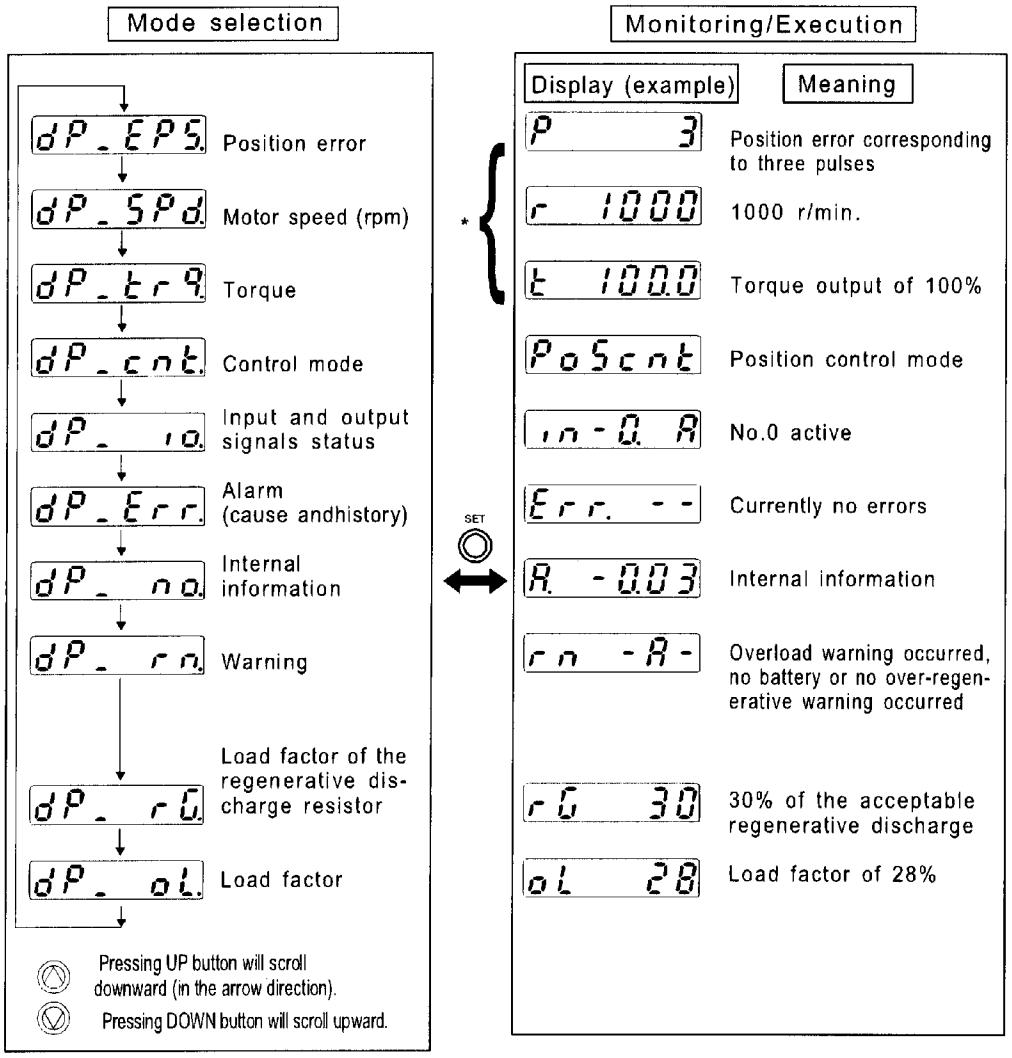
1) Turn on the mains power (driver).

→ r _ Motor speed (initial display)

2) Open the Monitor mode
(see Parameter Setting and MODE's Structure).

→ dP_□□□ Select thisdisplay.

3) Select a mode that you want to view.



Note) With power on, the indication starts with the indication items marked with *.

Appendixes

Details of Operation (Monitor Mode)

Details of Monitor Mode

Indication of position error, motor speed and torque

••••••Position error

Display the reading (pulse count) of the position error counter with an indication of polarity (unit: P).

(+): Error in CCW direction

(–): Error in CW direction

••••••Motor speed

Display the motor speed (rpm) with an indication of polarity (unit: r/min.).

(+): Revolution in CCW direction

(–): Revolution in CW direction

••••••Torque output

Display the generated torque with an indication of polarity (unit: %).

(+): Torque in CCW direction

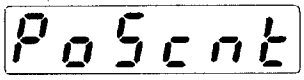
(–): Torque in CW direction

<Notes>

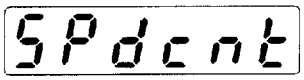
(+) symbol is not displayed.

Display of Control Mode

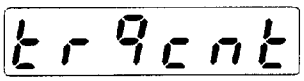
Display the current control mode.



••••••Position control mode



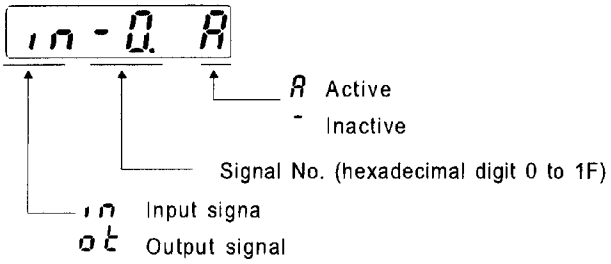
••••••Speed control mode



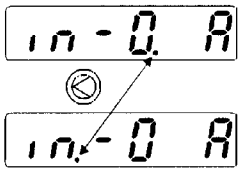
••••••Torque control mode

Display of I/O signals status

Display the status of control (input) and output signals via the CN I/F connectors. Use this information for checking the wiring connections.



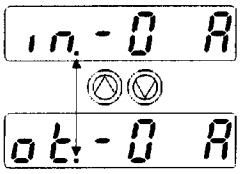
- Pressing LEFT button will move the decimal point in blinking.



(Decimal point placed on the right side: Signal selection mode)

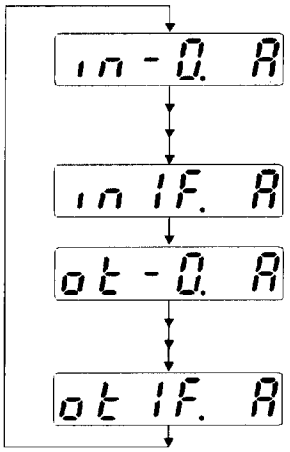
(Decimal point placed on the left side: Input/output selection mode)

1) Input/output selection mode



2) Signal selection mode

Pressing UP button will scroll downward (in the arrow direction).



The lowest No. of input signal

The highest No. of input signal

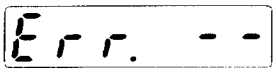
The lowest No. of output signal

The highest No. of output signal

Appendixes

Viewing the causes and history of an alarm

• You can view the latest 14 alarms including the current one.



Alarm Code No. (if no errors are occurring, -- is displayed)

Err : Current alarm
E-0 : No.0 alarm (the latest (current) alarm)
E-1 : No.1 alarm

E13 : No.13 alarm (the oldest alarm)

• ▲▼ To select any alarm event you wanted, press UP or DOWN button for access to the desired alarm No.
(▼ Pressing DOWN will move to older alarms.)

<Notes>

1. If an alarm which is stored in the history memory is occurring, the alarm is given E-0 (Error-0).
2. The alarm history cannot be deleted.

Alarm Numbers and Functions

Alarm Code No.	Function	Alarm Code No.	Function
11	Undervoltage, control power	27	Command pulse saler error
12	Overvoltage	28	External scale error
13	Undervoltage, main power	29	Error counter over flow
14	Overcurrent	35	External scale disconnection error
15	Overheat	36	EEPROM parameter error
16	Overload	37	EEPROM check code error
18	Regenerative discharge	38	Overtravel inhibit input error
20	Encoder A/B phase error	40	Absolute system down error
21	Encoder communication error	41	Absolute counter over flow error
22	Encoder connection error	42	Absolute over-speed error
23	Encoder communication data error	44	Absolute single-turn counter error
24	Position error	45	Absolute multi-turn counter error
25	Hybrid error	47	Absolute status error
26	Overspeed	Other than the above	Other errors

Details of Operation (Monitor Mode)

Alarm Display

A : FAlarm occurred
– : FNo alarms occurred

Over-regeneration alarm: over 85% of the acceptable consumption of the regenerative discharge resistor

Overload alarm: over 85% of the acceptable load level

Battery alarm: under the acceptable voltage level

<Notes>

- The battery alarm is kept active until the control power is turned off.
- Other alarms are kept displayed at least one second after the alarm event occurs.
- Alarming criteria cannot be changed.

Display of the load factor of the regenerative discharge resistor

- Display the load factor of the regenerative discharge resistor as a percentage of the protective operation level (100%).

Acceptable load factor of the regenerative discharge resistor (unit : %)

- For an external regenerative discharge resistor, Pr6C should be 0 or 1 to display the load factor.

Display of the load factor

- Display the load factor as a percentage of the rated load (100%).

Load factor (unit : %)

- See "Overload Protection: Time Limiting Characteristic" in Appendix.

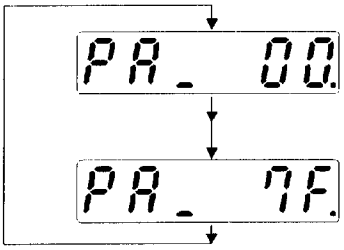
Operation in the Parameter Setting Mode

Operation in the Mode Selection mode

Parameter No. (hexadecimal digit)

<Notes>
Display of "r" in this field means that the parameter has been modified, so it must be downloaded to EEPROM. After downloading, the parameter value is not valid until the power is turned off and turned on again.

1) Press UP or DOWN button to select a parameter No. that you want to view or edit.



Press UP button to scroll down (in the arrow direction).

Press DOWN button to scroll up.

2) SET Press SET button to switch to Monitor/Execution mode.

Operation in the Monitor/Execution mode

The digit with the decimal point in blinking is the digit that you can modify the value.

Parameter value

1) Using LEFT button, move the decimal point to a digit that you want to edit

<Note>
How many digits you can move the decimal point leftward differs depending on the parameter.

2) Press UP or DOWN button to select a desired value.

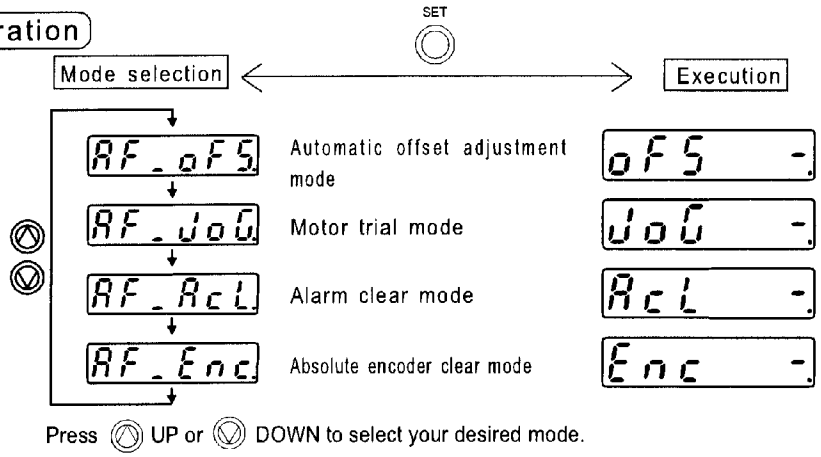
<Note>
Pressing UP will increase the value. Pressing DOWN will decrease the value. This setting (modification) of value will immediately affect the control.

Appendixes

Details of Parameters (Auxiliary Function Mode)

Auxiliary Function Mode

Operation



Press UP or DOWN to select your desired mode.

Automatic Offset Adjustment Mode

This mode is to set the voltage of analogue velocity (or torque) commands to 0V, measure the offset during Servo-OFF, and correct the offset so that small motions (rotation) can be eliminated. This automatic offset adjustment mode should be started by the following procedure.

Procedure

1) Select the automatic offset adjustment mode using the procedure mentioned above.

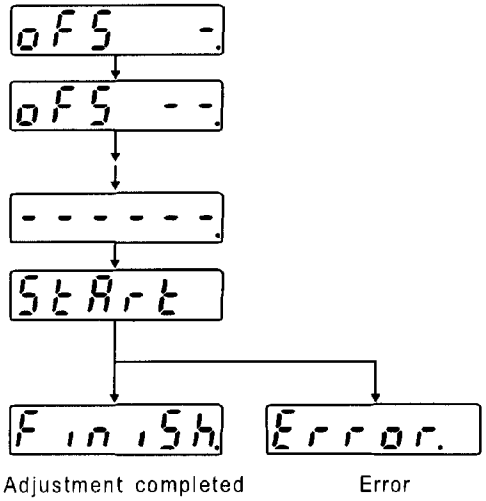
AF_oFS will appear. Press SET button to display oFS -.

2) The mode is ready for execution.

Keep pressing UP button (for about three seconds). The number of short bars (-) will increase.

The mode is started.

The adjustment will complete instantaneously.



<Notes>

1. The automatic offset adjustment mode is not effective for the position control mode.
2. If the input voltage is over the adjustment range (±25% of the maximum input voltage), the mode cannot work (an error occurs). Make sure that the input voltage is 0V.
3. If the value of Pr52 produced by the mode (i.e. the result of the offset adjustment) is not downloaded to EEPROM before turning off the power, the value will be lost (the previous value remains). If you want to continue to use the new value, download it to EEPROM before turning off the power.

Alarm Clear Mode

Clearing an alarm using the LED touch panel is the same as removing the trip status by using the alarm clear signal (A-CLR).

Procedure

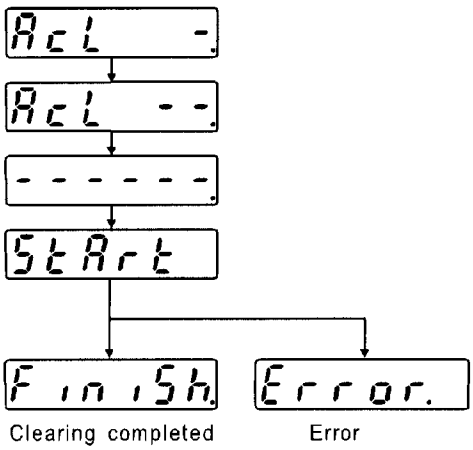
1) Select the alarm clear mode (refer to page 39 in Appendix). AF_AcL will appear.
Press SET button to display AcL -.

2) The mode is ready for execution.

Keep pressing UP button (for about three seconds). The number of short bars (-) will increase.

The mode is started.

The clearing operation will complete instantaneously.



<Notes>

If one of the errors shown below is occurring, the trip status is not removed, and Error. appears.
In this case, remove the error by turning off the power, removing the cause and turning on the power again.

Over-current, overheat, encoder A/B phase error, encoder communication error, encoder disconnection, encoder communication data error, EEPROM parameter error, EEPROM check code error, absolute single-turn counter error, absolute multi-turn counter error and Other error

Appendixes

Details of Parameters (Auxiliary Function Mode)

Absolute Encoder Clear Mode

This mode is to clear the multi-turn data of the absolute encoder, and clear the alarms regarding the encoder.

Procedure

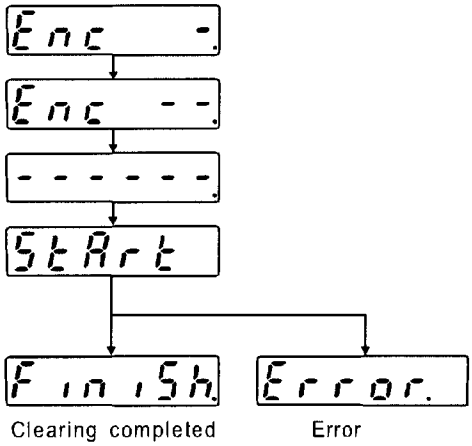
1) Select the absolute encoder clear mode (refer to page 39 in Appendix). AF_Enc. will appear. Press SET button to display Enc -.

2) The mode is ready for execution.

Keep pressing UP button (for about three seconds). The number of short bars (-) will increase.

The mode is started.

The clearing operation will complete instantaneously.



<Notes>

If you execute this mode for a driver with an incremental encoder, Error. will appear.

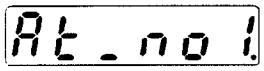
After executing the absolute encoder clear mode, turn off the power of the driver, and then turn it on again.

Adjustments

How to Use "Normal Auto Gain Tuning"

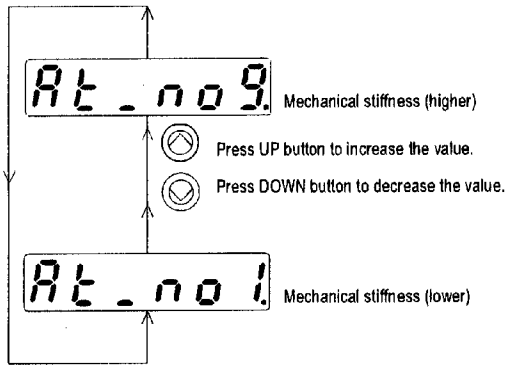
1) Select the Normal Auto Gain Tuning Mode.
Press SET button once and press MODE switching button three times.
See page 48.

Motor speed display (initial display)



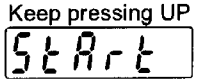
Mechanical stiffness value

2) Press UP orDOWN button to select the stiffness of the machine.



Driving method	Mechanical stiffness
Ball screw + direct coupling	4 ~ 8
Ball screw + timing belt	3 ~ 6
Timing belt	2 ~ 5
Gear, or rack & pinion	1 ~ 3
Others: lower stiffness	1 ~ 3

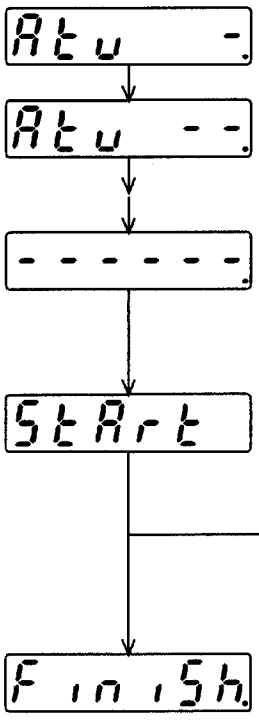
3) SET Press SET button to turn to the monitor/execution mode.

4) Operation at the monitor/execution mode:
Keep pressing UP button until 

appears.

- CN I/F pin 29: Servo-ON
- Pr10 (Notch Frequency) = 1500

Keep pressing UP button (approx. three seconds).
The horizontal bar increases as shown in the right figure.



The motor starts to run.
For approx. 15 seconds, the motor repeats the cycle 5 times(at most), which consists of two CCW revolutions
and two CW revolutions. Note that this process doesn't necessarily repeat 5 cycles and this is not abnormal.

5) Download the obtained gain values to EEPROM. Note that if you turn off the power before downloading, the gain values will be lost.

<Notes>

Symptom	Cause	Remedy
Error message displayed	Either one of Alarm, Servo-Off or Position Error Counter Clear activated.	• Avoid operation near the limit switch or home position sensor. • Turn to Servo-ON.
	The load inertia cannot be calculated	• Cancel the Position Error Counter Clear.
Values of gain affecting parameters (e.g. Pr10)doesn't change		Execute the manual adjustment.

How to Use "Real Time Auto Gain" Tuning

1) Select the Parameter Set-up Mode.
2) Set Pr1F (Disturbance torque observer) to 8 (invalid).
3) Set Pr22 (Real time auto tuning machine stiffness).
   First, set the parameter to the smallest value and then gradually increase it up to a with which no abnormal sound or vibration will occur.

Driving method	Mechanical stiffness
Ball screw + direct coupling	4 ~ 8
Ball screw + timing belt	3 ~ 6
Timing belt	2 ~ 5
Gear, or rack & pinion	1 ~ 3
Others: lower stiffness	1 ~ 3

4) Set Pr21 (Real time auto tuning mode set-up) to 1 or 2.
   • The operation may not be stable depending the operation pattern. In this case, set the parameter to 0 (to disable the auto tuning function).

Pr21 value	Real time auto tuning set-up	Fluctuation of load inertia during operation
0	Disabled	——
1	Enabled	Almost no change
2		Small change
3		Quick change

   • With a larger value, the response to the change in load inertia (acceleration) is quicker.
5) Start the motor.
6) If the fluctuation in load inertia is small, stop the motor (machine), and set Pr21 to 0 to fix the gain (in order to raise the safety).
7) Download the obtained gain values to EEPROM. Note that if you turn off the power before downloading, the gain values will be lost.

<Notes>

• Before changing Pr21 or Pr22, stop (servo-lock) the motor.
• Don't modify Pr10 through Pr15.
• Otherwise it may give a shock to the machine.

5.10.1.2 AC Servo Driver Parameter

No.	M1(PullDown)	M2(Jaw Roration)	M3(Pivot)	M5(BackSeal)	M9(Poker)
00	1	1	1	1	1
01	1	1	1	1	1
02	1	1	5	1	1
03	1	1	1	1	1
04	1	1	1	1	1
05	0	0	0	0	0
06	1	2	0	1	1
07	3	3	3	3	3
08	0	0	0	0	0
09	0	0	0	0	0
0A	1	1	1	1	1
0B	1	1	1	1	1
0C	2	2	2	2	2
0D	2	2	2	2	2
0E	0	0	0	0	0
0F	0	0	0	0	0
10	50	50	50	50	50
11	100	100	100	100	50
12	50	1000	50	50	50
13	4	4	4	4	4
14	50	100	50	50	100
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	50	50	50	50	50
19	100	100	100	100	50
1A	50	500	50	50	50
1B	4	4	4	4	4
1C	50	50	50	50	100
1D	1000	1500	1500	1500	1500
1E	2	2	2	2	2
1F	8	6	8	8	8
20	100	0	100	100	0
21	0	0	0	0	0

No.	M1(PullDown)	M2(Jaw Roration)	M3(Pivot)	M5(BackSeal)	M9(Poker)
22	2	2	2	2	2
23	100	100	100	100	100
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
2A	0	0	0	0	0
2B	0	0	0	0	0
2C	0	0	0	0	0
2D	0	0	0	0	0
2E	0	0	0	0	0
2F	0	0	0	0	0
30	0	1	0	0	0
31	0	0	0	0	0
32	0	0	0	0	0
33	0	0	0	0	0
34	0	0	0	0	0
35	0	0	0	0	0
36	0	5	0	0	0
37	0	0	0	0	0
38	0	5	0	0	0
39	0	0	0	0	0
3A	0	0	0	0	0
3B	0	0	0	0	0
3C	0	0	0	0	0
3D	0	0	0	0	0
3E	0	0	0	0	0
3F	0	0	0	0	0
40	4	4	4	4	4
41	0	0	0	0	0
42	1	1	1	1	1
43	1	1	1	1	1
44	1000	2500	1000	2500	250
45	0	0	0	0	0

No.	M1(PullDown)	M2(Jaw Roration)	M3(Pivot)	M5(BackSeal)	M9(Poker)
46	10000	10000	10000	10000	10000
47	10000	10000	10000	10000	10000
48	10000	10000	10000	10000	10000
49	10000	10000	10000	10000	10000
4A	0	0	0	0	0
4B	10000	10000	10000	10000	10000
4C	1	1	1	1	1
4D	0	0	0	0	0
4E	0	0	0	0	0
4F	0	0	0	0	0
50	500	200	400	500	500
51	1	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	1200	0	0
57	300	100	300	300	100
58	0	0	0	0	0
59	0	0	0	0	0
5A	0	0	0	0	0
5B	0	0	0	0	0
5C	30	30	30	30	30
5D	0	0	1	0	0
5E	300	300	300	300	300
5F	0	0	0	0	0
60	10	10	10	10	10
61	50	50	50	50	50
62	1000	1000	1000	1000	1000
63	1875	1875	1875	1875	1875
64	0	0	0	0	0
65	1	1	1	1	1
66	0	0	0	0	0
67	3	0	0	0	3
68	3	0	0	0	3
69	3	0	0	0	3

No.	M1(PullDown)	M2(Jaw Roration)	M3(Pivot)	M5(BackSeal)	M9(Poker)
6A	0	0	0	0	0
6B	0	0	0	0	0
6C	0	0	0	0	0
6D	0	0	0	0	0
6E	0	0	0	0	0
6F	0	0	0	0	0
70	10	10	10	10	10
71	0	0	0	0	0
72	10	10	10	10	10
73	10	10	10	10	10
74	10000	10000	10000	10000	10000
75	0	0	0	0	0
76	10000	10000	10000	10000	10000
77	1	1	1	1	1
78	0	0	0	0	0
79	10000	10000	10000	10000	10000
7A	10000	10000	10000	10000	10000
7B	0	0	0	0	0
7C	0	0	0	0	0
7D	30	30	30	30	30
7E	625	625	625	625	625
7F	0	0	0	0	0

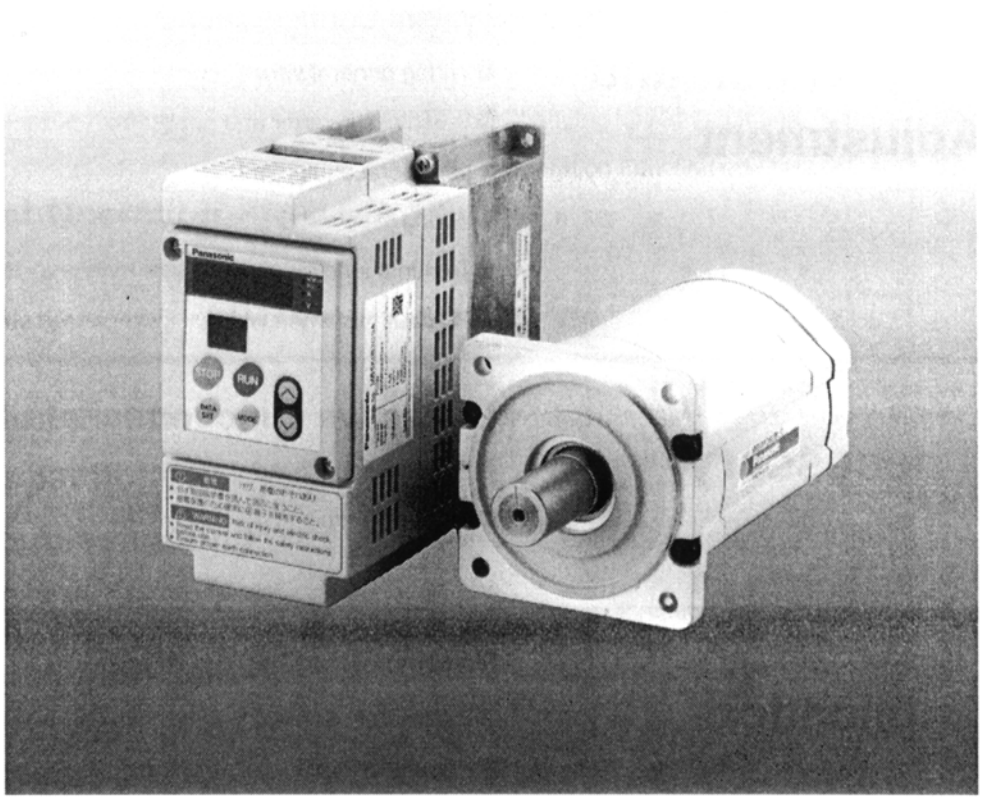
5.10.2 DC Brushless Motor Driver

5.10.2.1 Parameter Setting

Panasonic

Brushless Inverter MBS Series
Brushless Motor MBM Series

Operating Instructions



Be sure to provide the customer with a copy of this manual.

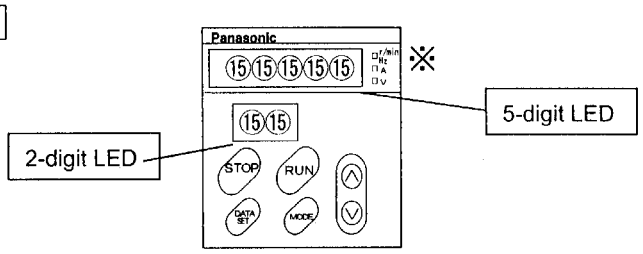
- Thank you for purchasing a Panasonic Brushless Inverter • Brushless motor.
- Be sure to read the instruction thoroughly before attempting to operate the Inverter. After reading, be sure to keep in a safe place for future reference.

Industrial and Appliance Motor Division, Motor Company
Matsushita Electric Industrial Co., Ltd.

Parameter Setting

Setting

Operation Panel



* The panel reads rpm instead of frequency in the monitoring mode.
* The readings are just for reference and cannot be an alternative to that on an instrument. Parameter [6 1 Display scale factor] can be applied to the values to be displayed.

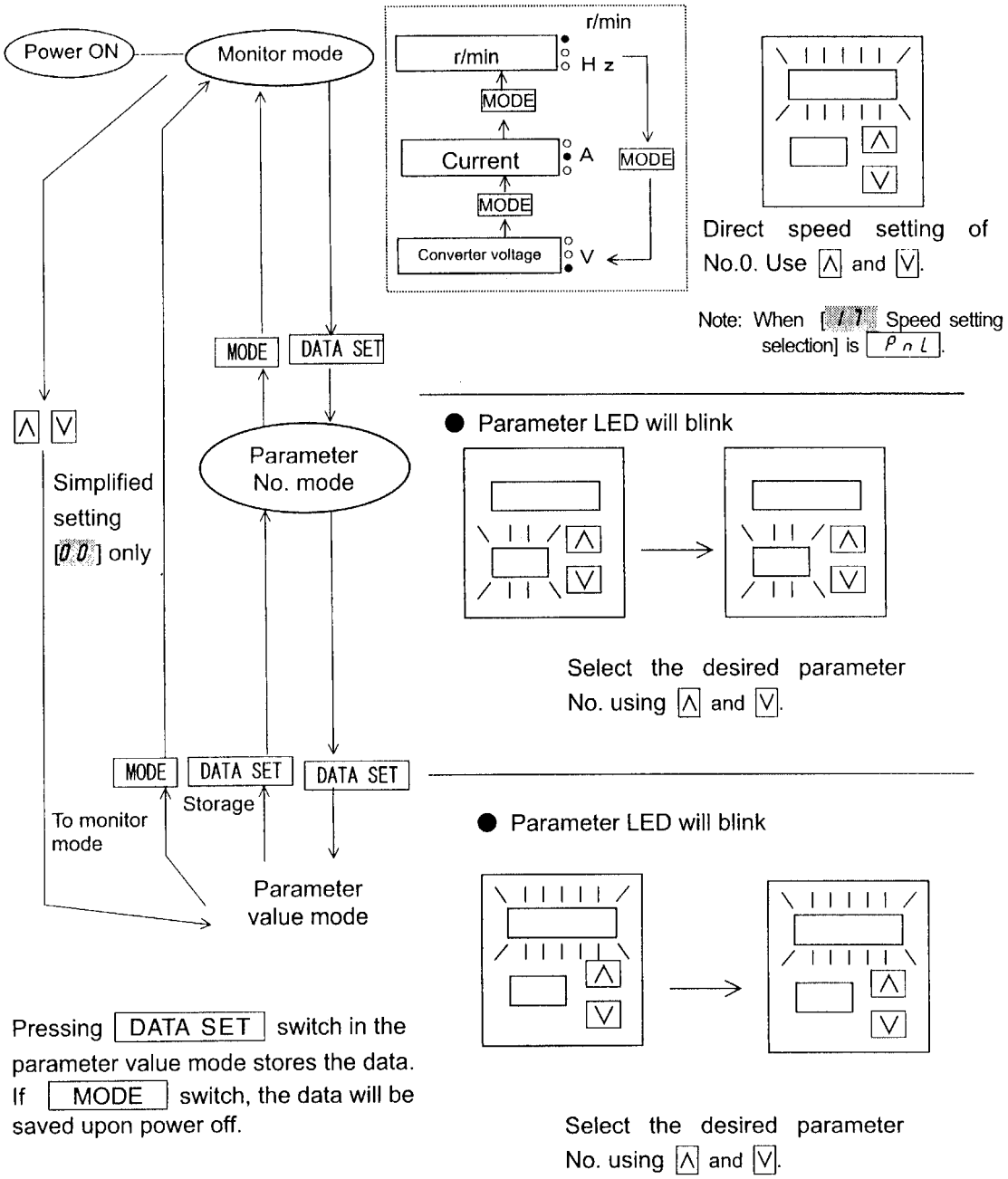
5-digit LED	Reads rpm, set speed, cause of problem or parameter.
2-digit LED	Indicates parameter number. Shows the direction of rotation viewed from the motor shaft during operation. [F] ... CCW; [r] ... CW.
[MODE] switch	Selects the target of monitoring. When repeatedly pressed, cycles from "r/min", "converter voltage" to "output current" and then back to "r/min".
[DATA SET] switch	Switch for selecting parameter No. mode and parameter value mode, setting parameter value.
[△] [▽] switch	Use to select, set and modify a parameter. Can be held down for continuous changing.
[RUN] switch	Commands the inverter to run. If [1 6 Run command selection] is PnL, bOTH.
[STOP] switch	Commands the inverter to stop. If [1 6 Run command selection] is PnL, bOTH.

● Mode description

Monitor mode	**Default mode.** Displays revolutions, converter DC voltage, output current on the 5-digit LED. Displays the set speed with parameter [6 0 Monitor mode selection]. Pressing [MODE] button while in the parameter number mode or parameter value setting mode returns to this mode.
Parameter number mode	**Flashes** a parameter number (0 0 - 9 9). Pressing [DATA SET] switch in the monitor mode enters this mode.
Parameter value setting mode	**Flashes** content (settings) of a parameter. Use [△] and [▽] buttons to change the setting and then press [DATA SET] switch to save the changes. [MODE] switch has no memory storage function.

Preparation and Adjustment

Parameter Setting



Pressing DATA SET switch in the parameter value mode stores the data. If MODE switch, the data will be saved upon power off.

Simplified setting

● Pressing ∧ and ∨ in the monitor mode blinks the settings of [00 Set speed (No.0 speed)], which can be changed using ∧ and ∨.

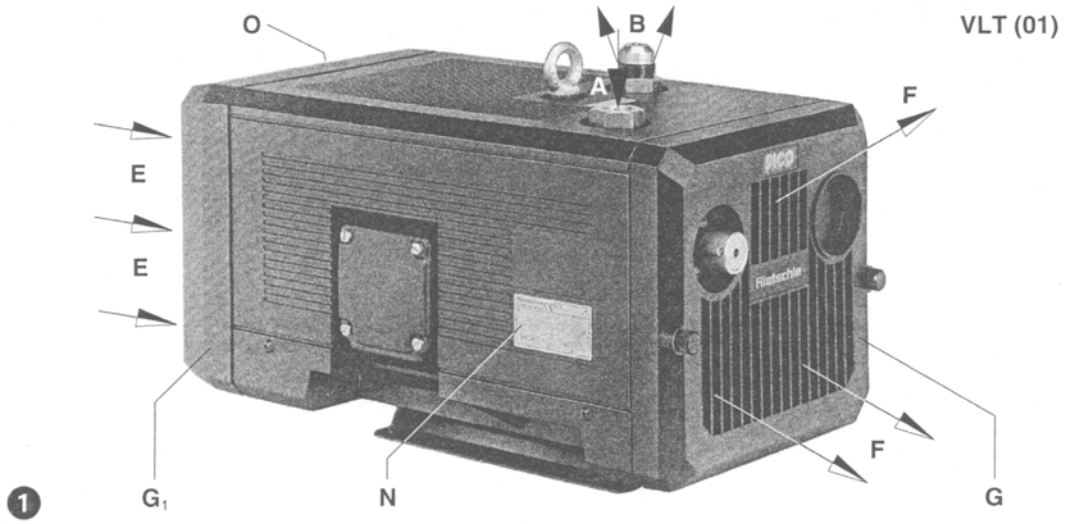
5.10.2.2 DC Brushless Motor Driver Parameter

No	Default	M6(Tracking)	M4(FilmRoll)	M7(Shaker)
0	0	60	3000	0
1	1800	1800	1800	1800
2	1200	1200	1200	1200
3	600	600	600	600
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	BOTH	BOTH	TEr	BOTH
17	PnL	PnL	0-5	0-5
18	4	4	4	4
19				
20				
21	1	0	0	0
22	1	0	0	0
23	1	0	0	0
24	1	0	0	0
25				
26	1	1	1	1
27				
28				
29	300	300	300	300
30	4	4	4	4
31	1	0	0	0
32	1	0	0	0
33	1	0	0	0
34	1	0	0	0

No	Default	M6(Tracking)	M4(FilmRoll)	M7(Shaker)
35				
36				
37				
38				
39				
40				
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	F-r	rS.Fr	rS.Fr	rS.Fr
47	FrEE	FrEE	FrEE	FrEE
48	rST	rST	rST	rST
49	bIn	bIn	bIn	bIn
50				
51	TriP	CAUS	TriP	CAUS
52	STbL	STbL	TriP	STbL
53				
54				
55	nOr	rEV	rEV	rEV
56				
57				
58	Lin.	Lin.	S.-2	Lin.
59	Lin.	Lin.	S.-2	Lin.
60	0.-r	0.-r	0.-r	0.-r
61	1	1	1	1
62				
63				
64				
65	0	0	0	0
66	0	0	0	0
67	50	50	50	50
68				
69	1	1	1	1
70	yES	yES	yES	yES

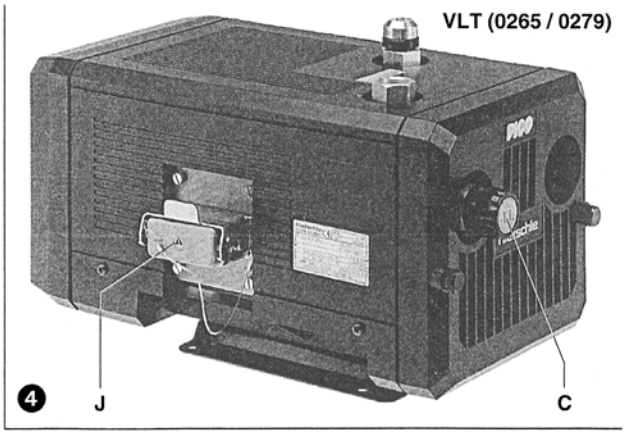
No	Default	M6(Tracking)	M4(FilmRoll)	M7(Shaker)
71	nO	nO	nO	nO
72	4	4	4	4
73	0	0	0	0
74	0	0	0	0
75	3000	3000	3600	3000
76	1	1	1	1
77				
78	0	0	0	0
79	100	100	100	100
80	nO	nO	nO	nO
81	-	-	-	-
82	-	-	-	-
83	-	-	-	-
84	-	-	-	-
85	-	-	-	-
86	nO	nO	nO	nO
d0	150	150	150	150
d1	200	20	20	20
d2	yES	yES	nO	yES
d3	dEC	dEC	dEC	dEC
d4	0	0	0	0
bb	nO	nO	nO	nO
AA	nO	nO	nO	nO
99	-	-	-	-

5.11 Vacuum Pump Parameter



Pump ranges
These operating instructions concern the following dry running rotary vane vacuum pumps: Models VLT 6 to VLT 60.
The vacuum capacities at atmosphere are 6, 10, 15, 25, 40 and 60 m³/hr operating on 50 cycles. The pumping curves which show capacity against pressure, can be found in data sheet D 280.

Description
All models are complete with a vacuum connection and an exhaust silencer on the outlet. All the air handled is filtered by a built-in micro-fine filter.
Both the motor and pump have a common shaft.
The VLT (01) to (11) are partially enclosed in a rugged black plastic sound enclosure. The cooling fan is located inside the sound enclosure (pictures ❶ and ❹).
The VLT (13) to (50) are located in a sheet metal cover. The motor fan provides the cooling (pictures ❷ and ❸).
The VLT (14) has on the pressure side a vent valve (D) (picture ❸).
The VLT (02) and (13) have as standard a vacuum regulating valve (C), which can be adjusted to the level required, however it is limited to a maximum point (pictures ❷ and ❹).



Optional extras (as required): Vacuum regulating valve (ZRV), non return valve (ZRK), motor starter (ZMS) and pipe connection (ZSA).

Directed Suitability
The units VLT are suitable for use in the industrial field i.e. the protection equipment corresponds to EN DIN 294 table 4.
The VLT can be used for the evacuation of a closed system or for permanent vacuum from: 150 to 1000 mbar (abs.).
These dry running vacuum pumps are suitable for use with air of a relative humidity of 30 to 90%.

Warning – Suction of explosive gases
Any non compliance may lead to severe injury to persons and damage to the pump may occur!
Dangerous mixtures (i.e. inflammable or explosive gases or vapours), extremely humid air, water vapour, aggressive gases or traces of oil and grease must not be handled.
The standard versions may not be used in hazardous areas.

! Caution – Do not exceed the temperature
At non compliance severe damage may occur on the pump.
The ambient and suction temperatures must be between 5 and 40°C.

! Caution – Noise Emission
Potential risks for operating personnel.
When working permanently in the vicinity of an operating pump, we recommend wearing ear protection to avoid any damage to hearing.

Setting up

Warning – hot surfaces

Pumps that have reached operating temperature may have a surface temperature at position (Q) of more than 70 °C.
Do not touch these hot surfaces (see also warning signs)!

There must be a minimum space of 30 cm in front of the exhaust grid (G), suction grid (G_1) and housing cover (b) for servicing. The cooling air entries (E) and the cooling air exits (F) must have a minimum distance of 10 cm from any obstruction. The discharged cooling air must not be re-circulated.

▶ Note

The VLT pumps can only be operated reliably if they are installed horizontally.
For installations that are higher than 1000 m above sea level there will be a loss in capacity.

When the pumps are installed on a solid base, they do not need to be fixed down. If the pumps are installed on a base plate we would recommend fitting anti-vibration mounts. This range of vacuum pumps are almost vibration free in operation.

Installation

For operating and installation follow any relevant national standards that are in operation.

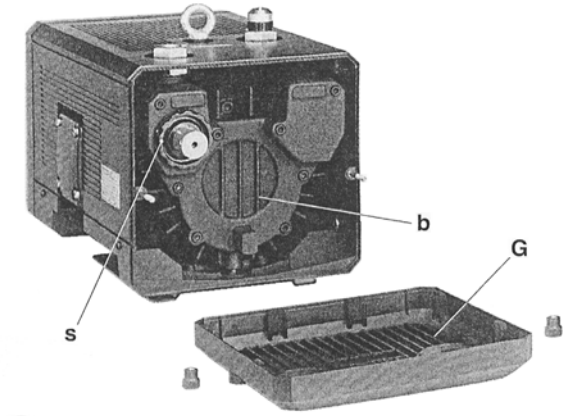
1. Vacuum connection at (A).
   The air handled can be exhausted into the atmosphere through the exhaust port (B) or by utilising a pipe connection and pipeline.

   ▶ Note

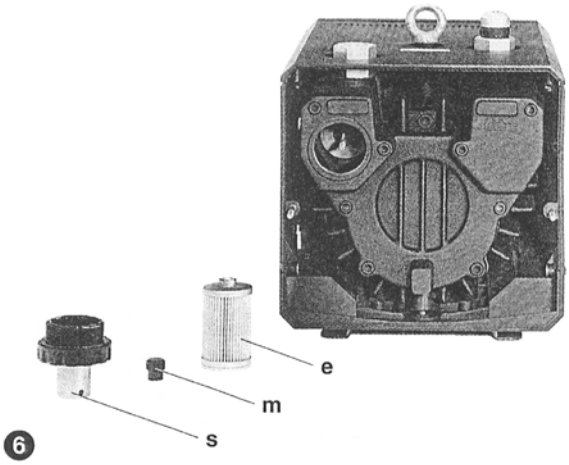
   Long and/or small bore pipework should be avoided, as this tends to reduce the capacity of the pump.
2. The electrical data can be found on the data plate (N) or the motor data plate (P). The motors correspond to DIN/VDE 0530 and have IP 55 protection and insulation class F. The connection diagram can be found in the terminal box on the motor (unless a special plug connection is fitted). Check the electrical data of the motor for compatibility with your available supply (voltage, frequency, permissible current etc.).
3. Connect the motor via a plug-connector (J → pict. ❹) if fitted or via a relevant direct on-line motor starter. It is advisable to use thermal overload motor starters to protect the motor and wiring. All cabling used on starters should be secured with good quality cable clamps.
   We recommend that motor starters should be used that are fitted with a time delayed trip resulting from running beyond the amperage setting. When the unit is started cold overamperage may occur for a short time.

Warning – electrical installation

Danger to life through unprofessional electrical installation!
The electrical installation should only be made by a qualified electrician under the observance of EN 60204. The main switch must be provided by the operator.



5



6

Initial Operation (pictures ❶ to ❹)

1. Initially switch the pump on and off for a few seconds to check the direction of rotation against the direction arrow (O).

! Caution – Suction pipework should not be connected

On the initial start the suction pipework should not be connected. If the pump runs backwards with the pipework connected pressure could build up within the housing which could result in damaged rotor blades.

2. Connect the suction pipe at (A).

▶ Note

For pipework longer than 3 m we recommend using non-return valves (ZRK), to avoid reverse rotation when the units are switched off.

3. Vacuum regulating valve:
The vacuum can be adjusted by turning the regulating valve (C) according to the symbols on the top of the regulating valve.

Maintenance and Servicing

When maintaining these units and where the situation exits where personnel could be hurt by moving parts or by live electrical parts, the pump must be isolated by totally disconnecting the electrical supply. It is imperative that the unit cannot be re-started during the maintenance operation.

Do not maintain a pump that is at it's normal operating temperature as there is danger from hot parts.

1. Lubrication

The VLT pumps have bearings that are greased for life. They do not need to be serviced.

2. Air filtration (pictures ❺ and ❻)

! Caution – Pollution in the suction air

The capacity of the pump could be reduced if the air inlet filters are not maintained correctly.

The filter cartridge (e) for vacuum air has to be cleaned depending on the amount of contamination. This is achieved by blowing compressed air from the inside of the cartridge outwards. Even if the cartridges are cleaned their separating efficiency deteriorates. We would therefore recommend exchanging the cartridges every six months.

Changing the filter:

VLT (01) - (11) → remove exhaust grid (G). Take off screw cap (s) and milled knob (m). Pull filter cartridge (e) off and clean or exchange. Re-assemble in reverse order.

3. Blades (pictures ❺ and ❼)

Checking blades: VLT 6 - 25 have 6 blades whilst the VLT 40 / 60 have 7 blades. The blades have a low but permanent wear factor.

VLT 6, VLT 10 and VLT 15: first check after 7,000 operating hours (approx. 22 months in 2-shift operation), thereafter every 1,000 operating hours (approx. 3 months in 2-shift operation).

VLT 25, VLT 40 and VLT 60: first check after 5,000 operating hours (approx. 16 months in 2-shift operation), thereafter every 1,000 operating hours (approx. 3 months in 2-shift operation).

VLT (01) - (11) → remove exhaust grid (G). Take off housing cover (b) from housing. Remove blades (d) for inspection. All blades must have a minimum height (X):

Type	X (minimum height)
VLT 6	20 mm
VLT 10	20 mm
VLT 15	24 mm
VLT 25	24 mm
VLT 40	35 mm
VLT 60	35 mm

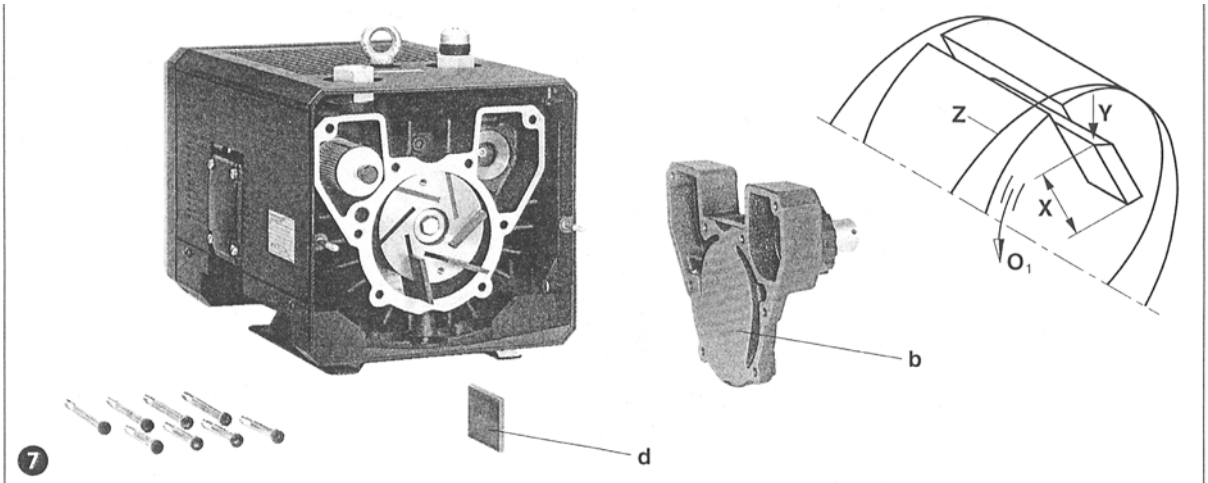
▶ Note

Blades must be changed in a complete set.

Changing blades: if the minimum height is reached, then the whole set of rotor blades should be changed.

Before fitting new blades clean the housing and rotor slots with compressed air. Place the blades with the radius outwards (Y) such that the bevel is in the direction of rotation (O_1) and corresponds with the radius of the housing (Z).

Fix end cover (b) and exhaust grid (G). Before restarting the pump check free movement of the blades by turning the motor cooling fan before refitting the cooling grid (G_1) or fan cover (G_2).



Trouble Shooting:

1. Motor starter cuts out vacuum pump:

1.1 The incoming voltage and frequency does not corresponds with the motor data plate. Solution: Adjustment of the mains voltage.
1.2 The connections on the motor terminal block or the plug (J) is incorrect.
Solution: Check connections on the motor terminal block or the plug.
1.3 Incorrect setting on the motor starter. Solution: Check the setting of the motor starter.
1.4 Motor starter trips too fast.
Solution: Use a motor starter with a time delay trip (version as per IEC 947-4).
1.5 Back pressure on the exhaust pipework is excessive.
Solution: Check the exhaust pipework if necessary remove.

2. Insufficient suction capacity:

2.1 Inlet filter is blocked. Solution: Clean the inlet filter if necessary exchange.
2.2 Suction pipework is too long or too small. Solution: Use bigger pipe diameter, avoid restriction.
2.3 Leak on the pump or on the system.
Solution: Check the pump and the pipework for pressure losses.
2.4 Blades are damaged. Solution: replace blades.

3. Vacuum pump does not reach ultimate vacuum:

3.1 Check for leaks on the suction side of the pump or on the system.
Solution: Check the suction side and the pipework for pressure losses.
3.2 Blades are worn or damaged. Solution: replace blades.

4. Vacuum pump operates at an abnormally high temperature:

4.1 Ambient or suction temperature too high.
Solution: The ambient and suction temperatures must be between 5 and 40°C.
4.2 Cooling air flow is restricted.
Solution: The cooling air entries (E) and the cooling air exits (F) must have a minimum distance of 10 cm from any obstruction
4.3 Problem as per 1.5.

5. Unit emits abnormal noise:

5.1 The pump cylinder is worn.
Solution: send your complete unit off for repair to the supplier or approved service agent.
5.2 The regulating valve (if existing) is noisy. Solution: replace valve.
5.3 Blades are damaged. Solution: replace blades.

Appendix:

Repair on Site: For all repairs on site an electrician must disconnect the motor so that an accidental start of the unit cannot happen.
All engineers are recommended to consult the original manufacturer or one of the subsidiaries, agents or service agents. The address of the nearest repair workshop can be obtained from the manufacturer on application.
After a repair or before re-installation follow the instructions as shown under the headings "Installation and Initial Operation".

Lifting and Transport: To lift and transport the VLT 15 - VLT 60 the eye bolt on the pump must be used.
The weight of the pumps are shown in the accompanying table.

Storage: VLT units must be stored in dry ambient conditions with normal humidity. We recommend for a relative humidity of over 80% that the pump should be stored in a closed container with the appropriate "drying" chemicals.

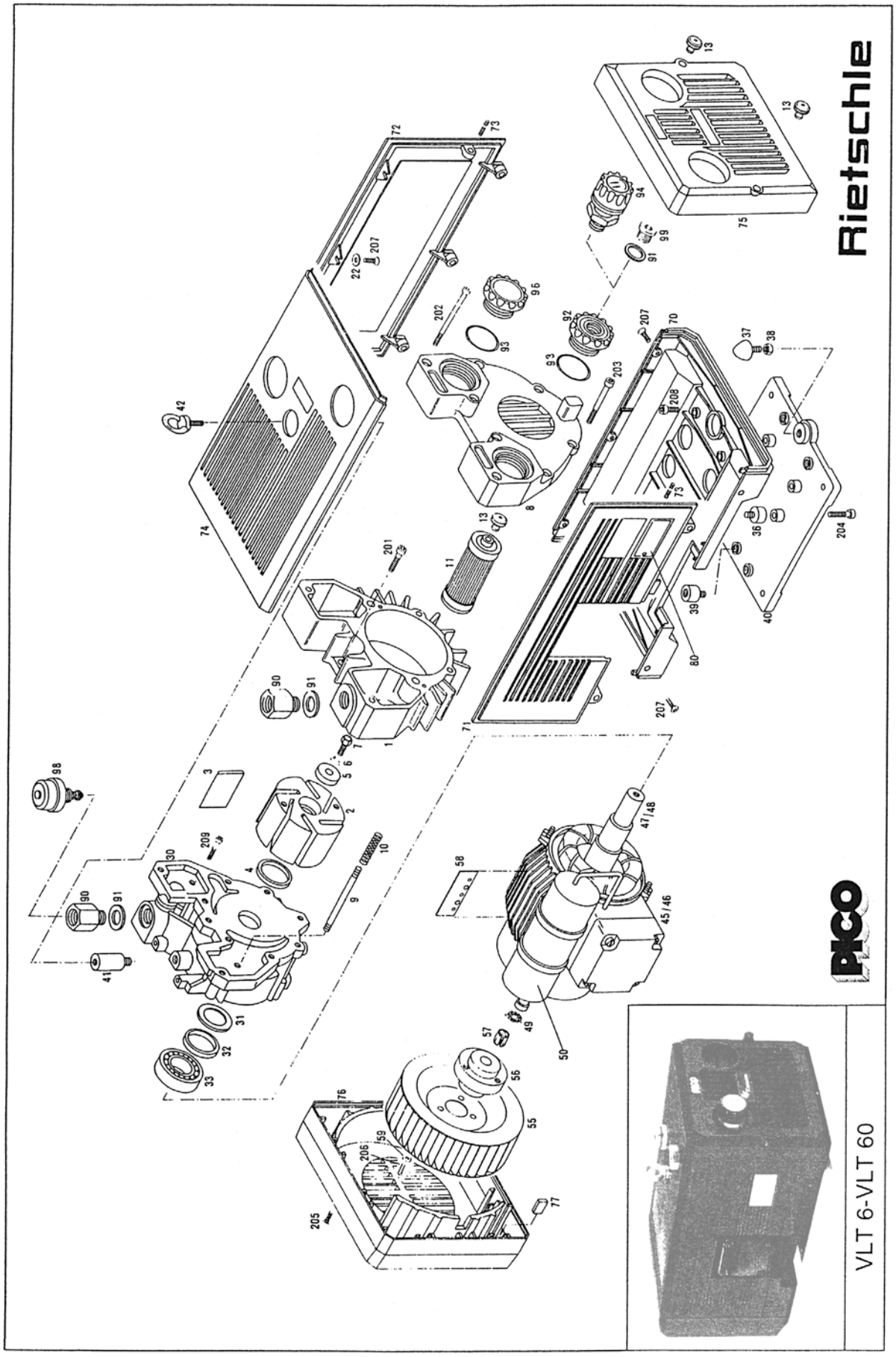
Disposal: The wearing parts (as listed in the spare parts lists) should be disposed of with due regard to health and safety regulations.

Spare parts lists:
E 280 → VLT 6 - VLT 60 (01) - (11)
E 280/13 → VLT 15 (13)
E 280/14 → VLT 15 (14)
E 280/20 → VLT 10 / 15 (20)

VLT			6	10	15	25	40	60
Noise level (max.)	dB(A)	50 Hz	62	64	65	68	72	75
		60 Hz	63	65	66	70	74	77
Weight (max.)	kg	3 ~	16	18	26	30	46	47
		1 ~	17	20	27	33	49	-

VLT (01) - (11)		6	10	15	25	40	60
Length	mm	370	390	442	473	545	545
Length + ZRV	mm	402	422	476	507	593	593
Width	mm	209	209	241	241	269	269
Height	mm	208	208	246	246	272	272

VLT		15 (13)	15 (14)	15 (15)	10 (20)	15 (20)	10 (50)
Length	mm	427	382	413	339	404	318
Width	mm	248	248	248	204	231	204
Height	mm	230	215	194	180	195	195


Rietschle
PICO
VLT 6-VLT 60

		Basic parts
1		Housing
2		Rotor
3	V	Blade
4		Disc
5		Disc
6		Spring shim
7		Hexagon head screw
8		End cover
9		Threaded pin
10		Spring
11	V	Filter cartridge Complete
13		Milled knob
22		Disc
		Connection cover
30		Connection cover
31	D	Sealing ring
32		Supporting ring
33	V	Deep groove ball bearing
36		Rubber foot
37		Rubber foot
38		Hexhead screw
39		Rubber foot
40		Foot
41		Mounting
42		Lifting eye
		Drive
45		Motor (3~)
46		Motor (1~)
47		Drive shaft(3~)
48		Drive shaft (1~)
49	V	Deep groove ball bearing
50		Condenser

		Cooling
55		Fan
56		Fan hub
57	V	Tolerance ring
58		Air guiding plate
59		Disc
		Box
70		Lower part
71		Side part
72		Side part
73		Threaded pin
74		Upper part
75		Exhaust grid
76		Suction grid
77		Buffer
		Labels
80		Data plate
		Assembly parts
90		Connection nipple
91	D	Sealing ring
92		Screwed cover
93	D	Sealing ring
94		Vacuum regulating valve
		Variant(02)
96		Screwed cover
98		Exhaust silencer
99		Plug
201 ↓ 209		Screws

V : Consumption parts
D : Sealing parts

5.12 Digital Pressure Switch

This saction describes the default value of the vacuum pump parameter.

NOTE

- Set the vacuum pressure in operation to 40 kPa.

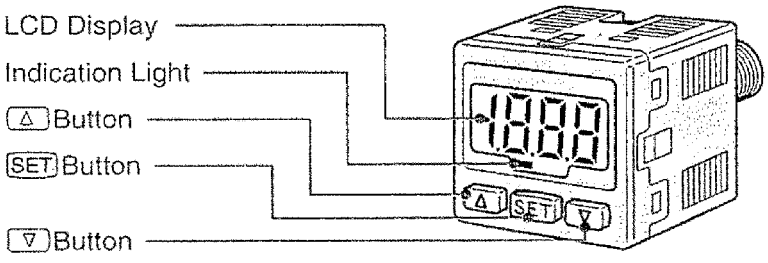
Setting item		Setting value
Default setting	Setting Display Color	SoG (ON : green)
	Setting Operation Mode	HYS (Hysteresis mode)
	Setting Output Form	nC (normal close)
	Setting Response Time	640 (640ms)
	Setting Auto Preset	mAn (manual)
Setting Pressure Setting (n-1)		-10kPa

Setting pressure unit: kPa (Europe)
psi (North America)

Names and Functions of Individual Parts

Main Unit

Indication Light : Displays switch operation condition.
(Green Light)
LCD Display : Displays the current status of pressure, setting mode, selected indication unit and error code. Four display modes can be selected: display always in red or green only, or changing from green to red linked to output.
△ Button : Alters the mode or increases ON/OFF set value. Press this button to change to the peak display mode.
▽ Button : Alters the mode or decreases ON/OFF set value. Press this button to change to the bottom display mode.
SET Button : Press this button to change to either mode and to set a set value.



Setting

Setting Procedures

Measurement Mode

↓

Initialize
Set output mode, response time and display color change.

↓

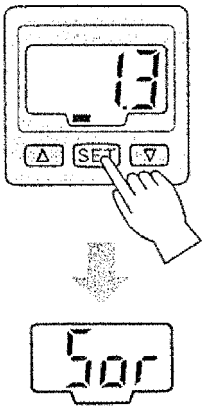
Pressure Setting
Input a set value for pressure to perform switch output.

↓

Measurement Mode
Detects pressure, displays values and performs switching.
Other functions such as zero clear can also be set if necessary.

Initialize

Press the SET button continuously for more than two seconds. The display shown at the lower right will pop up to allow setting of a display color.
In the case that the unit specification of model indication is M, the SI units will be fixed. If no symbol is supplied, see "Selecting Indication Unit".



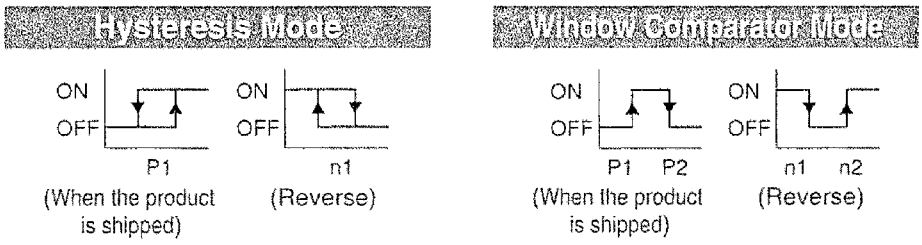
1.Display Color Setting

Select a color for the LCD display.
When changing the display color, press the △ or ▽ button to select a display color.
Sor (Red/ON) ⇔ SoG (Green/ON) ⇔ rEd (Red) ⇔ Grn (Green)
Press the SET button to set the desired display color and to move on to setting a desired operation mode.
If the mode is set to analog output, press the △ or ▽ button, to select a desired display color from
"Grn" (Green) ⇔ "rEd" (Red), then press the SET button. Setting of a desired operation mode will become available.

2.Operation Mode Setting

A desired switch operation mode can be selected.
The operation mode currently selected will be displayed. Select a desired operation mode by pressing the △ or ▽ button.

HyS ⇔ wnd
(Hysteresis) (Window Comparator)



Press the SET button to move on to setting an output mode.

Setting (continue)

3.Output Mode Setting

A desired output mode can be set freely for switch output.
The output mode currently selected will be displayed.
Press the △ or ▽ button to switch to normal output "no" or reverse output "nC".

no ⇔ nC
(Normally open) (Normally closed)

Press the SET button to move on to setting a desired response time.

4.Response Time Setting

A response time for switch output can be set as user desires.
Setting of a response time prevents chattering output.
The response time currently set will be displayed. Select a desired response time by pressing the △ or ▽ button.

2.5 ⇔ 20 ⇔ 160 ⇔ 640 ⇔ 1280

If the operating mode is set to Hysteresis, press SET button to set and move on to setting Auto Preset mode.
If the operating mode is set to Window comparator, press SET button to set and return to Measurement mode.

5.Auto Preset Setting

This function is for memory of a measurement pressure as a reference value when Auto Preset input is set. The settings currently set will be displayed. Press the △ or ▽ button to set to Auto Preset.

mAn ⇔ AUt
(Manual Setting) (Auto Preset)

Press the SET button to return to the set Measurement mode.

Selecting Indication Unit

If the unit specification of the model indication is without "M"

The indication unit can be selected freely.
Pressing the △ or ▽ button will change the unit and will automatically convert set values.
The units will change in the following order :
PA ⇔ GF ⇔ bAr ⇔ PSi ⇔ inH ⇔ mmH

For Vacuum and Low Pressure

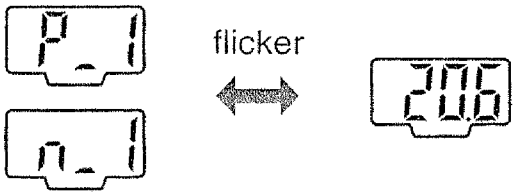
Pa ⇔ kgf/cm² ⇔ bar ⇔ psi ⇔ inchHg ⇔ mmHg

For Positive Pressure

MPa ⇔ kgf/cm² ⇔ bar ⇔ psi

Press the SET button to set and to move on to setting a display color.

If set to Manual Setting

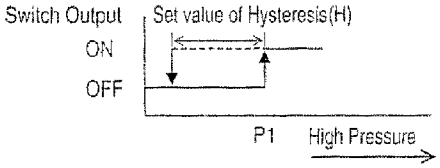


Press the SET button in the Measurement mode to display set values. "P_1" or "n_1" and the current set value will flicker alternately. Press the SET button to display the next set value. Press the △ or ▽ button to enter into the Value Change mode. (See "Value Setting")

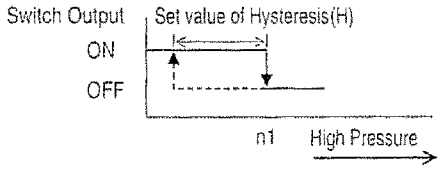
If Hysteresis mode is set

If the Hysteresis mode is set, "H" and the set value of Hysteresis will be displayed alternately after the setting for "P1" or "n1". Press the SET button to return to the normal Measurement mode. Press the △ or ▽ button to enter into the Value Change mode. (See "Value Setting")

If set to Normally Open Mode

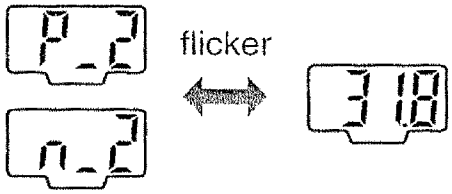


If set to Normally Closed Mode



In case Hysteresis is set at less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.

If window comparator mode is set

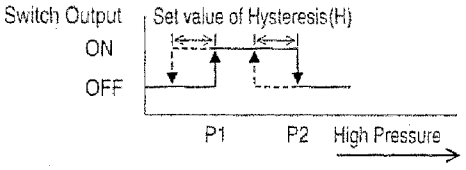


If the Window comparator mode is set, "P2" or "n2" and the current set value will be displayed alternately after the setting for "P1" or "n1". Press the [SET] button to display the next set value.
(Hysteresis : H)

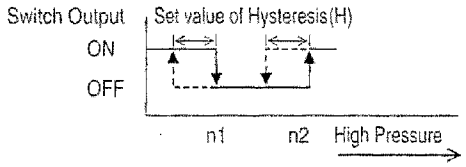
Press the [△] or [▽] button to enter into the Value Change mode. (See "Value Setting")
Next, "H" and the set value of Hysteresis will be displayed alternately. Press the [SET] button to return to the normal Measurement mode. Press the [△] or [▽] button to enter into the Value Change mode. (See "Value Setting")

If the initialize value is the Normally Open mode, "P_1" will be displayed. "n_1" will be displayed if it is Normally Closed mode. The set pressure value can be checked without holding or stopping switch output operation.

If set to Normally Open Mode



If set to Normally Closed Mode



Pressure Setting (continue)

Fine Adjustment Mode
(Fine Adjustment Function of Display Value)

Press the SET button and ▽ buttons simultaneously for longer than two seconds in the Measurement mode. "FSt" and current pressure Measurement value will be displayed. Press the △ or ▽ button to change the set value. If no operation is made for longer than two seconds or press the SET button, the pressure switch will display the current pressure Measurement value which will then flicker alternately with "FSt".
Press the SET button to display an adjusted amount (percentage), which will then flicker alternately with "FSC".
Press the SET button to return to the normal Measurement mode.

If set to Auto Preset Mode

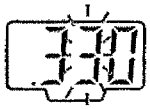
Press the SET button during the Measurement mode to ready the Auto Preset mode. "AP1" will be displayed. Setting pressure in this condition will ready the equipment. Press the △ and ▽ buttons simultaneously while "AP1" is displayed to return to the Measurement mode.

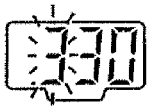
To execute Auto Preset, press the SET button and "A1L" will be displayed. Perform adsorption and desorption operations. Detection will be made and a set value will be stored in the memory automatically. Press the SET button while "A1L" is displayed to finish setting and to return to the normal Measurement mode.

Value Setting

To input a value for pressure setting or other purposes:

1. Press the △ or ▽ button to enter the Set Value Change mode. The first row will flicker.
2. Press the △ or ▽ button to set a desired value. (No operation within ten seconds after the Set Value Change mode was selected results in automatic setting of the value appearing in the display window and in charging of the mode from Set Value Change mode to Set Value Indication mode.)
3. Press the SET button to make the value one digit higher flicker. (If the highest place is zero, " ˈ " or " ˌ " will flicker. " ˈ " means "+zero", " ˌ " means "–zero".) (In the case that the SET button is pressed in the highest place, the first digit will flicker.)
4. Press the SET button continuously for longer than one second to return to displaying set values.

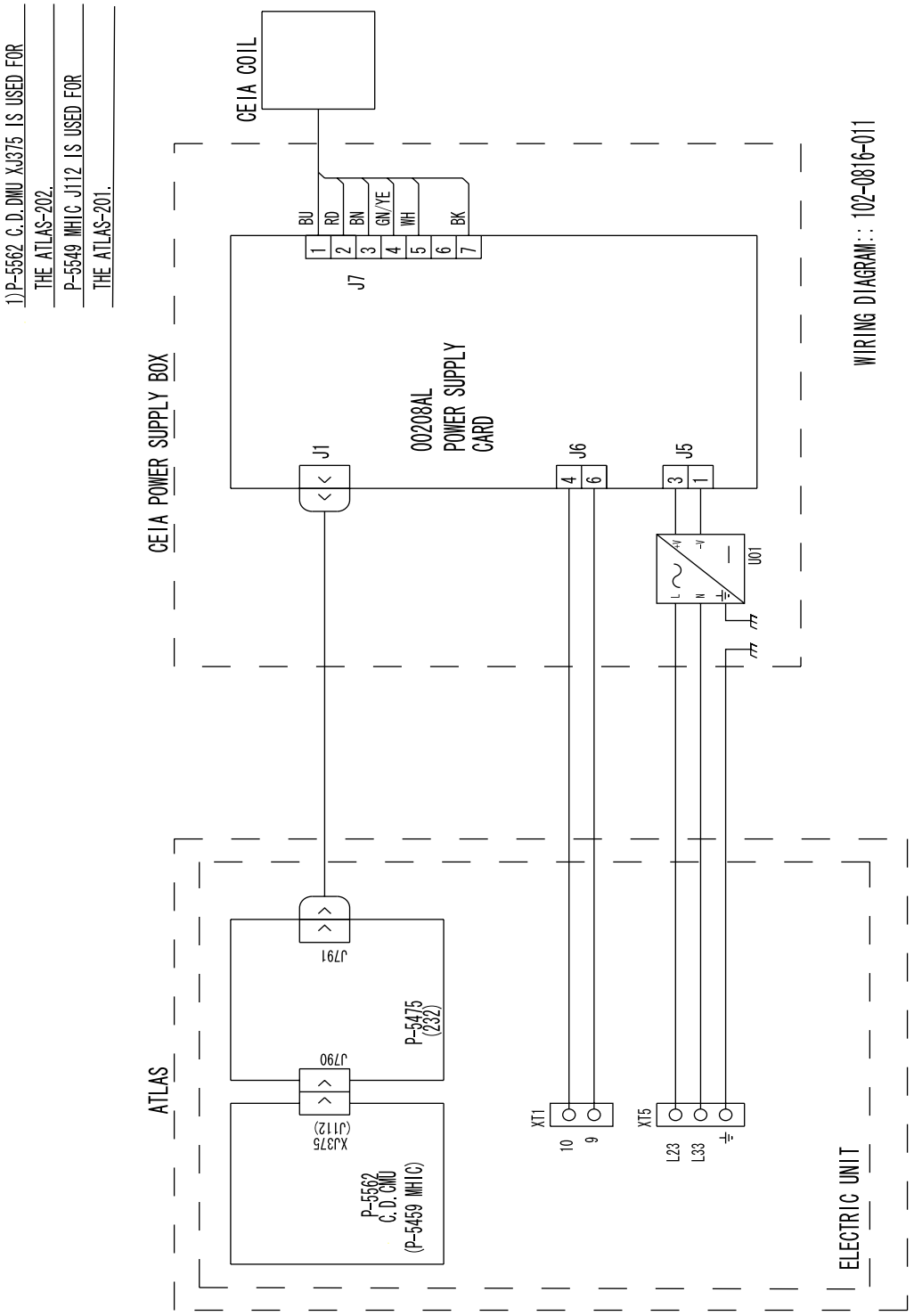




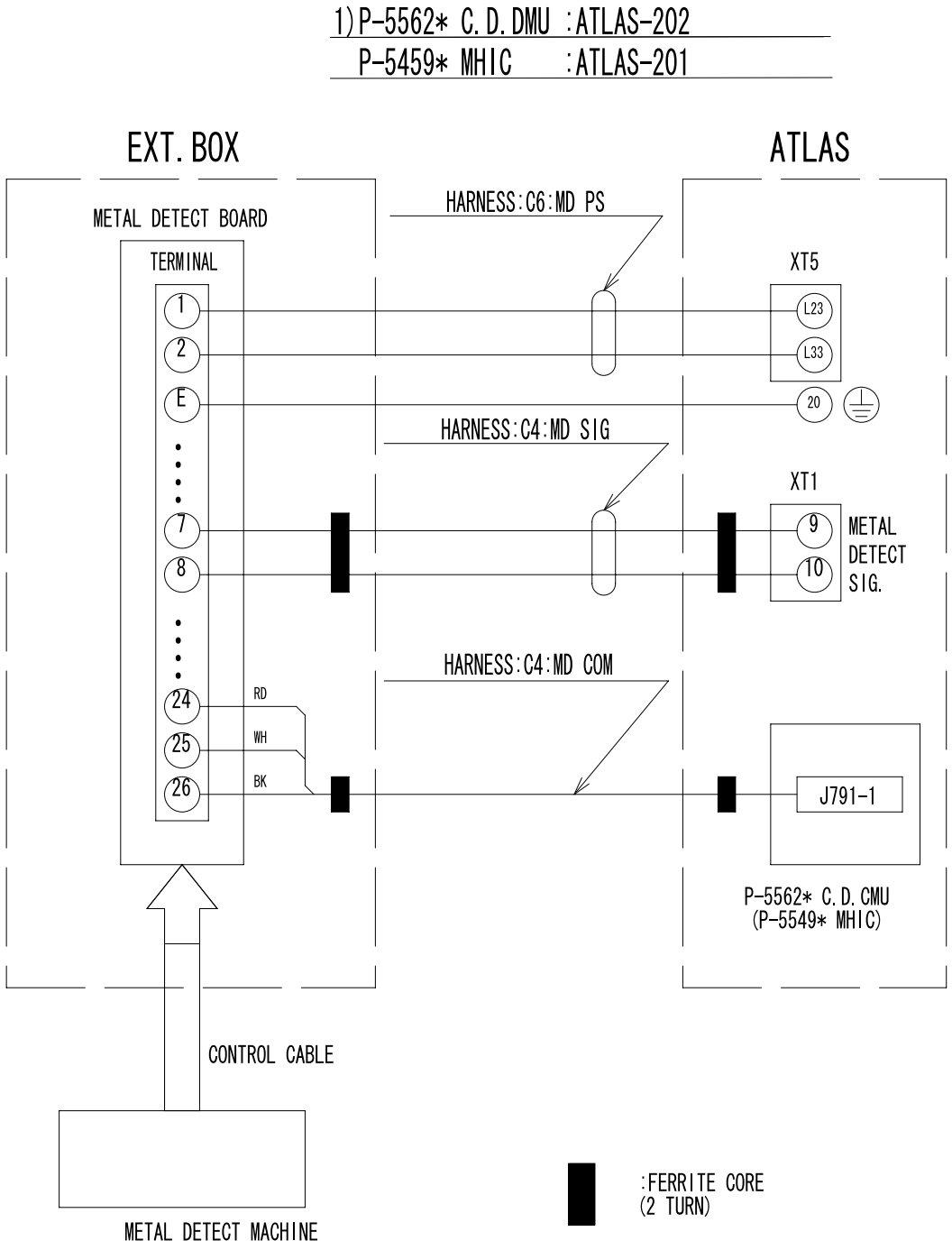
5.13 ITPS (OPTION)

5.13.1 Block diagram

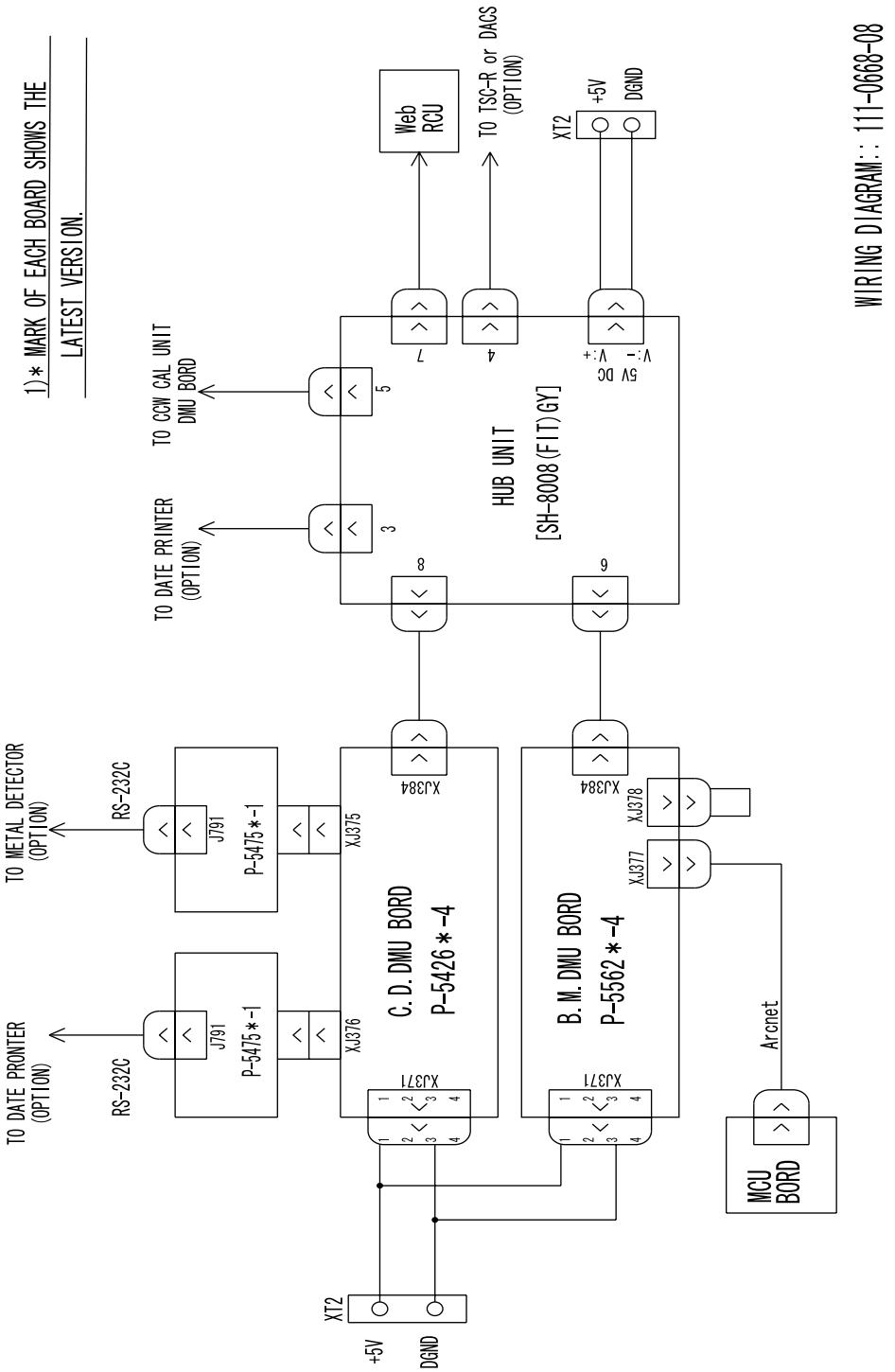
5.13.2 Block diagram



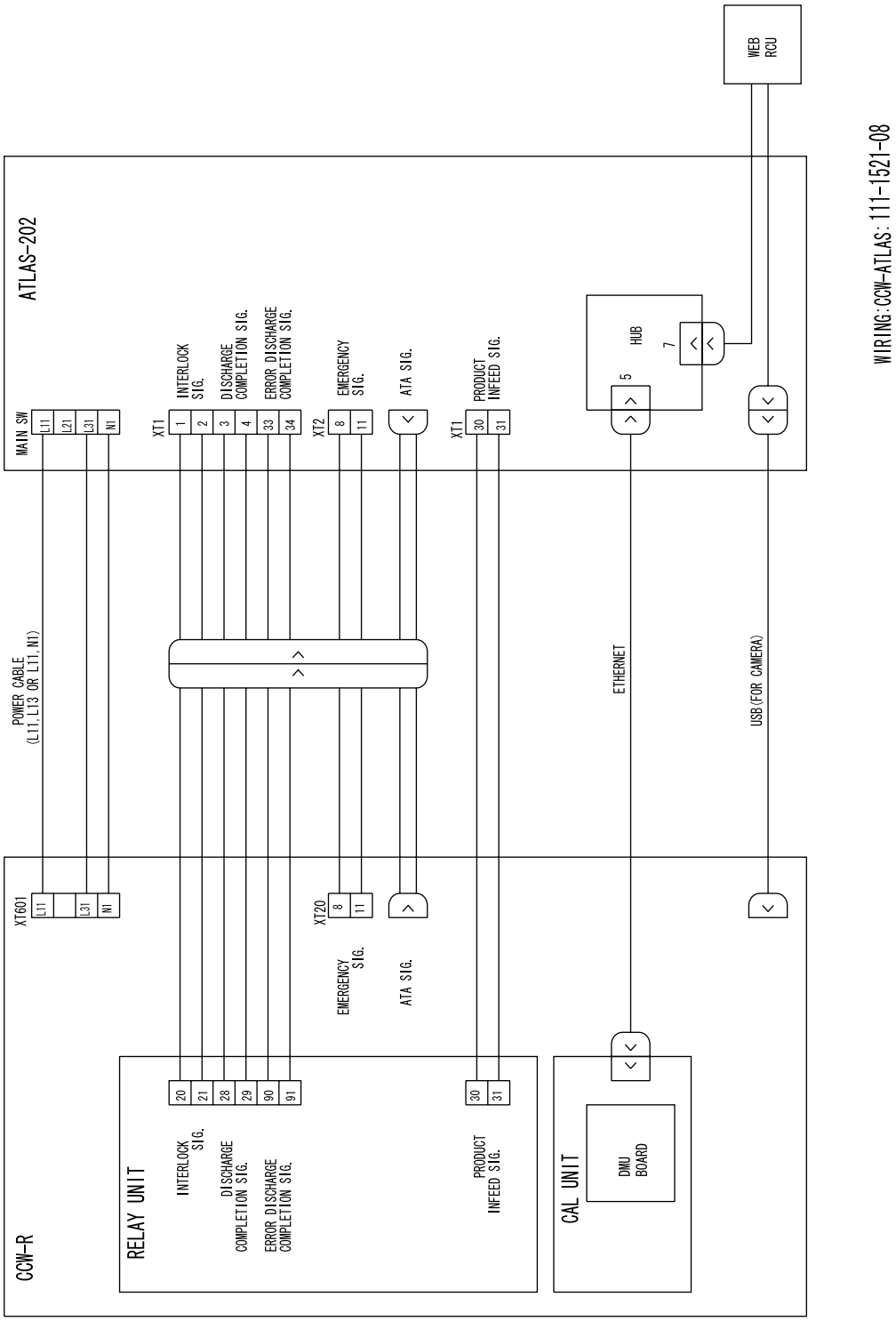
5.13.3 Metal Detect / ATLAS 202 integrated operation



5.13.4 Block diagram (option) [ITPS]



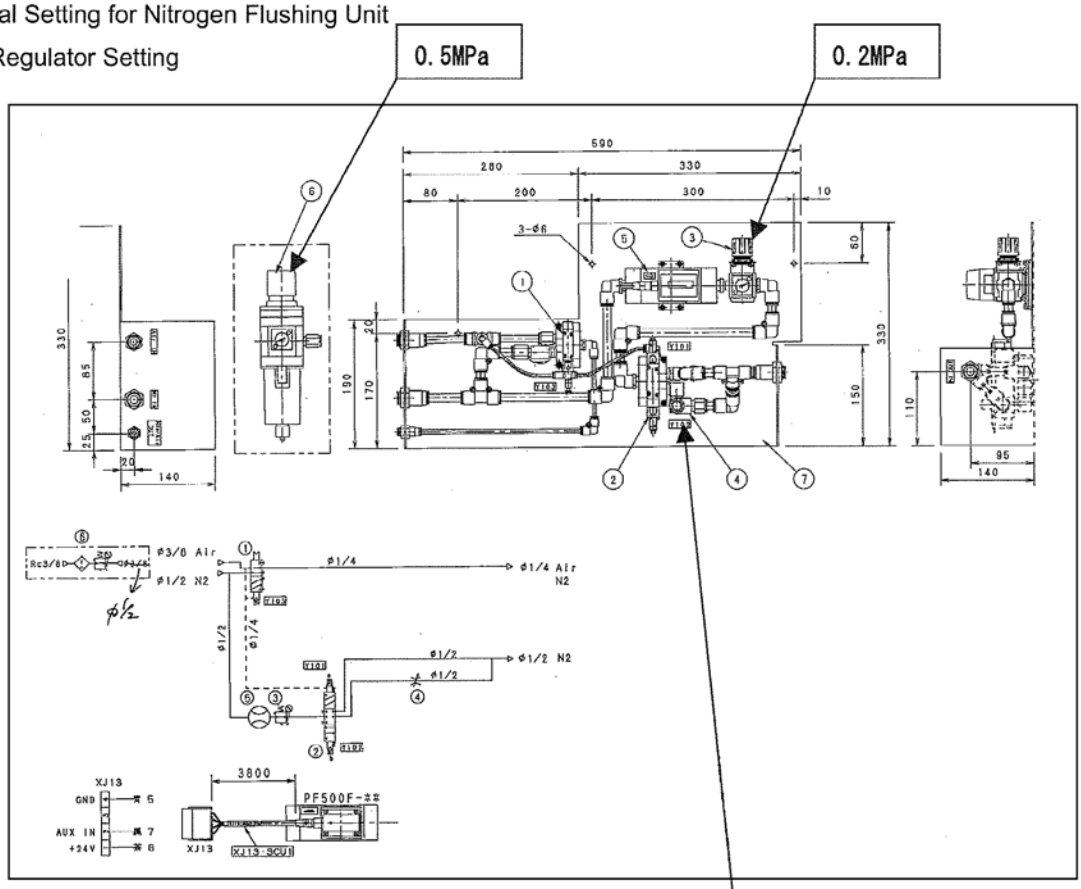
5.13.5 Block diagram : CCW-R - ATLAS 202

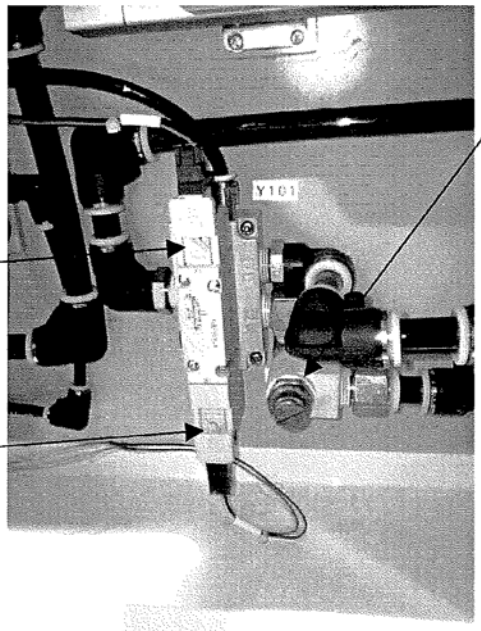


5.14 ATLAS 202 Nitrogen Flushing Setting (Option)

Initial Setting for Nitrogen Flushing Unit

1) Regulator Setting





Low Pressure Flow is set to 30[N liter/min] (110 [× 10^{-2}CFM]) with Speed Control.

High Pressure ON

Low Pressure ON

1)-2. Flow Meter Setting

How to set the alarm

After power is turned on, monitor is in Flow rate measurement status (Measurement mode) as fig. right. Description is given below to change the below settings in measurement mode.

P(Parameter):0, H(High):50, L(Low):20, h(Hysteresis):0

(All LEDs light up for 3 seconds for a hardware check, followed by flow range for 2 seconds, right after the power is turned on.)

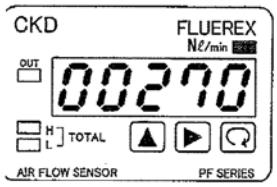
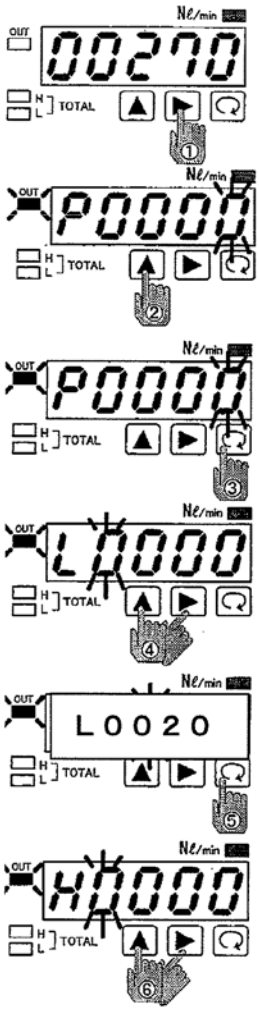


図5-5

1) Changing from the measurement mode to the write mode
   *Press the shift key ▶ for 2 seconds.
   OUT LED blinks and "P" is shown at first place of the 7segment LED from the left, and the fifth place blinks.
2) Setting the parameter
   *Press the up key ▶
   If parameter is "0", press the change key ↻
3) Shifting to the low setting
   *Press the change key ↻
   "L" is shown at the first place of 7segment LED from the left and the second place blinks.
4) Low setting
   *Press the shift key ▶ and the up key ▲ to set the low value.
   In case of LOW=20, press the shift key twice, and the up key twice.
5) Shifting to the High setting
   *Press the change key ↻
   "H" is shown at the first place of 7segment LED from the left and the second place blinks.
6) High setting
   *Press the shift key ▶ and the up key ▲ to set the high value.
   In case of HIGH=50, press the shift key twice, and the up key 5 times.



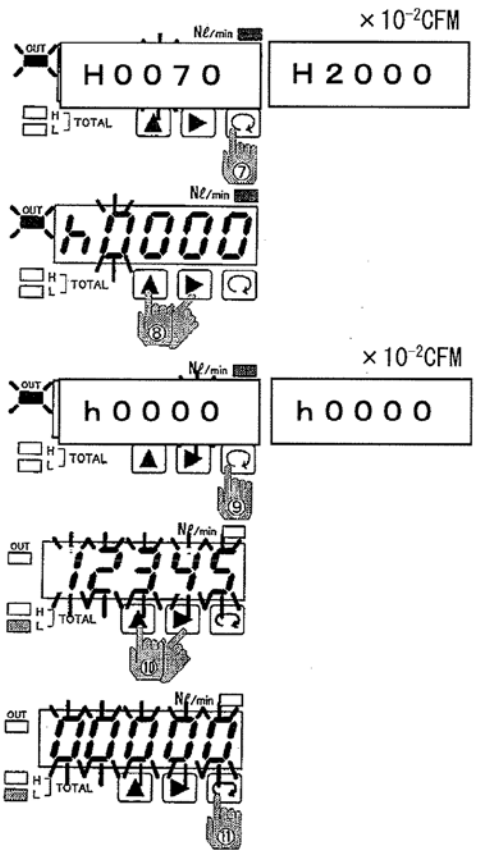
7) Shifting to the hysteresis setting
*Press the change key
"H" is shown at the first place of 7segment LED from the left and the second place blinks.

8) Hysteresis Setting
*Press the shift key and the up key to set the hysteresis value. h(hysteresis) keeps "0".

9) Shifting to the cumulative value clear mode
*Press the change key
Cumulative Flow is shown at 7segment LED and all place blink. Then, Unit display lump is "L-TOTAL".

10) Clearing the cumulative value
*Press the shift key and the up key simultaneously for 5 seconds to clear the cumulative value.
[Notes]
If you do not clear the cumulative value, go to 11)Completion process.

11) *Press the change key to complete the setting and return the measurement mode (the menu right after power on).



2) Flow Meter

Initial setting for Gas Flow Meter is as follows. Please set properly at your site.
(Measure to be used depends on used area.)

	Other area	North America
Measure	N liter/min	×10⁻² CFM
P(Parameter)	0	0
L(Low)	20	71
H(High)	70	2000
h(Hysteresis)	0	0
(Low Pressure Flow)	(30)	(110)

Conversion Formula: 1CFM=28.317N liter/min

ISHIDA CO.,LTD.

44 SANNO-CHO, SHOGOIN, SAKYO-KU,
KYOTO, 606-8392 JAPAN
PHONE: (075)771-4141
FACSIMILE: (075)751-1634
URL: http://www.ishidajapan.com