

COMPUTER SCALE
CCW-R-2XXX series
SERVICE MANUAL
(1st Edition)



 **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.

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PREFACE

Purpose

This manual contains instructions on installation and service maintenance procedure for CCW-R-2XXX Computer Aided Scale.

Please read through the manual once before attempting actual installation/maintenance.

For details of the machine settings and operation, refer to the operation manual..

Related Manuals

- CCW-R-214W Instruction Manual
- CCW-R-216B Instruction Manual
- CCW-R-214W Parts Manual
- CCW-R-216B Parts Manual
- Computer Scale CCW-R series Technical Manual Report (No.085-6009-04)

Precaution Notations

Precaution notations are used in this manual:

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.
TIP	Gives information which helps understanding.

For Safety Service

In order to carry out the appropriate maintenance procedures and prevent accidents, strictly observe the following precautions:

- Precautions are described on each item for assembly or adjustment. Read and fully understand them to make an appropriate work. Turn OFF all power switches before performing any maintenance service.
- Make sure that the area around the equipment is kept clean and tidy. Especially at the time of disassembling, be careful not to leave screws and other small parts in the equipment. Turning ON the power switch in this state may cause serious damages to the equipment.
- Turn OFF all power switches before performing any maintenance service.

Table of Contents**GENERAL TABLE OF CONTENTS****1 Overview**

1.1 Main Components	1-1
1.1.1 Appearance	1-1
1.2 Configuration	1-5
1.3 Menu Configuration	1-6

2 Maintenance, Adjustment and Replacement

2.1 Mechanical Unit Configuration	2-1
2.2 Replacing Feeder Cover (Rubber Packing)	2-2
2.2.1 Removing Feeder Cover	2-2
2.2.2 Replacing Cover (Rubber Packing)	2-3
2.2.3 Setting Feeder Cover	2-3
2.3 Replacing and Adjusting Radiation Feeder Parts	2-6
2.3.1 Appearance of Radiation Feeder	2-6
2.3.2 Replacing Leaf Springs of Radial Feeder	2-7
2.3.3 Replacing Magnetic Coil of Radial Feeder	2-8
2.3.4 Adjusting Amplitude of Radial Feeder	2-9
2.4 Replacing and Adjusting Dispersion Feeder Parts	2-11
2.4.1 Appearance of Dispersion Feeder	2-11
2.4.2 Replacing Leaf Springs of Dispersion Feeder	2-12
2.4.3 Replacing Magnetic Coil of Dispersion Feeder	2-13
2.4.4 Adjusting Amplitude of Dispersion Feeder	2-15
2.5 Weigh/Drive Unit	2-16
2.5.1 Appearance of Weigh/Drive Unit	2-16
2.5.2 Exploded View of Weigh/Drive Unit for Model R-214W-S/20.30	2-17
2.5.2.1 Replacing DUC Board (P-5428*)	2-18
2.5.2.2 Replacing WH (Stepping) Motor	2-19
2.5.2.3 Replacing PH (Stepping) Motor	2-20
2.5.2.4 Replacing Load Cell	2-21
2.5.3 Exploded View of Weigh/Drive Unit for Model R-216B-D/20.30	2-24
2.5.3.1 Replacing DUC Board (P-5428*)	2-25
2.5.3.2 Replacing WH (Stepping) Motor	2-26
2.5.3.3 Replacing PH (Stepping) Motor	2-27
2.5.3.4 Replacing Load Cell	2-28
2.5.4 Exploded view for weigh/drive unit of model R-214W-S/70	2-31
2.5.4.1 Replacing DUC board (P-5428*)	2-32

2.5.4.2 Replacing WH (Stepping) Motor	2-33
2.5.4.3 Replacing PH (Stepping) Motor	2-34
2.5.4.4 Replacing Load Cell	2-35
2.6 BH Drive Unit	2-39
2.6.1 Appearance of BH Drive Unit	2-39
2.6.2 Exploded View of BH Drive Unit for Model R-216B-D/20.30	2-40
2.6.3 Replacing BH (Stepping) Motor	2-41
2.7 TH Drive Unit (Optional)	2-42
2.7.1 Appearance of TH Drive Unit	2-42
2.7.2 Exploded View of TH Drive Unit	2-43
2.7.3 Replacing TH (Stepping) Motor	2-44
3 Electrical Components	
3.1 Electrical Unit Configuration	3-1
3.1.1 CCW-R-214W-S/20.30	3-1
3.1.2 CCW-R-216B-D/20.30	3-2
3.1.3 CCW-R-214W-S/70	3-3
3.1.4 Hardware Block Diagram for model CCW-R-2XXX	3-4
3.2 BLOCK DIAGRAM	3-5
3.2.1 CCW-R-214W-S	3-5
3.2.2 CCW-R-216B-D	3-6
3.3 Remote Control Unit Block Diagram	3-7
3.4 Remote Control Unit	3-8
3.4.1 RCU Board (P-970*)	3-9
3.4.2 TP-I/F Board (P-5573*)	3-20
3.4.3 Printer unit	3-20
3.4.3.1 Thermal printer (SAM-4245-10K)	3-21
3.4.4 Camera selection board (P-5582 *) [Option]	3-22
3.5 CAL UNIT	3-24
3.5.1 WCU BOARD (P-5561*)	3-25
3.5.2 ADC BOARD (P-5576*)	3-35
3.5.3 DMU BOARD (P-5562*)	3-37
3.6 Main Electrical Unit	3-44
3.6.1 FDRV Board (P-5578*)	3-45
3.6.2 FDC Board (P-5532*)	3-46
3.6.3 Cautions for FDRV board (P-5578 *) replacement	3-47
3.7 Relay unit	3-48
3.7.1 EXC Board (P-5426*)	3-49
3.7.2 Relay Board (P-5506*)	3-50
3.8 PS-0 Unit	3-53
3.8.1 AC FUSE BOARD (P-5507 *)	3-54
3.9 PS-2 Unit	3-55
3.9.1 DC FUSE BOARD (P-5508*)	3-56

3.10 Feeder PS unit	3-57
3.10.1 Feeder power supply board (P-5580 *) (P-5581 *)	3-59
3.11 Weigh/Drive Unit	3-60
3.11.1 DUC Board (P-5428*)	3-60
3.11.2 DDU Board (P-5439*)	3-60
3.12 AFV Unit	3-61
3.12.1 AFV Preamp Board (P-5488*)	3-61
3.13 Other Boards / Optional Unit	3-62
3.13.1 Preamp Board (P-5435*) [for the dispersion feeder load cell]	3-62
3.13.2 DU Board (P-5429*)	3-62
3.13.3 Photosensor board (P-5207*)	3-63
3.13.4 Diagram of dispersion camera relay unit (Option)	3-64

4 MAINTENANCE SERVICE (MAINT SERVICE) LEVEL FUNCTION

4.1 Remote Control Display	4-1
4.1.1 Remote Control Display	4-1
4.2 Maintenance Service Level Menu	4-2
4.2.1 Maintenance Service Level Display	4-2
4.2.2 Main Menu Screens for Maintenance Service	4-4
4.3 Control Panel Items (Maintenance Service)	4-4
4.3.1 Display Control Menu Screens	4-4
4.3.1.1 Touch Panel Coordinate Adjustment	4-4
4.3.2 Password Set/Language Select Set Menu Screen.	4-7
4.3.2.1 Language Select Setting	4-7
4.3.2.2 Password Setting	4-8
4.3.3 Destination ID Menu Screen.	4-9
4.3.3.1 Destination ID	4-9
4.3.3.2 Browser Setting	4-9
4.3.3.3 E-mail Setting	4-9
4.3.4 Communication Set Menu Screen	4-10
4.3.4.1 [RCU] Communication Setting	4-10
4.3.4.2 [Main Body] Communication Setting	4-10
4.3.4.3 [Server IP Address] Setting	4-11
4.4 Maintenance Service Items in Machine Set	4-12
4.4.1 Weigher Information	4-12
4.4.2 Display and Data Manager.	4-14
4.4.2.1 Layout Setting	4-14
4.4.2.2 Machine Set Manager.	4-15
4.4.2.3 All Setting Manager.	4-15
4.4.2.3.1Memory Initialization.	4-15
4.4.2.3.2Card Initialization	4-16
4.4.2.4 Hopper Name Setting	4-17
4.4.3 Various Parameter Setting	4-18
4.4.3.1 Feeder Drive Specifications	4-19
4.4.3.2 Hopper Drive Specification Setting	4-26
4.4.3.2.1Hopper Drive Specification Setting (PH/WH/BH)	4-26

4.4.3.2.2 Hopper Open/Close Drive Pattern (PH/WH/BH)	4-31
4.4.3.2.3 Hopper Drive Specification Setting (D.TH/TH/RS)	4-35
4.4.3.2.4 Hopper Open/Close Drive Pattern (DTH/TH/RS)	4-36
4.4.4 Weigher Setting	4-38
4.4.4.1 Automatic Timing Setting	4-39
4.4.4.2 Network Setting	4-40
4.4.4.3 AFD Setting	4-40
5 APPENDIX	
5.1 Program Installation Procedure from Web-RCU	5-1
5.1.1 Installation Software Start up	5-1
5.1.2 RCU Software Backup	5-2
5.1.3 RCU Software Installation	5-4
5.1.3.1 Installing the Program to Existing Model	5-4
5.1.3.2 Installing Program Newly	5-5
5.1.4 CCW CAL Software Backup	5-6
5.1.5 CCW CAL Software Installation	5-9
5.1.5.1 Backup Software Reinstallation	5-10
5.1.6 Errors during Installation and Backup	5-11
5.1.6.1 Error Display Screen	5-11
5.2 Direct Program Installation to Main Unit (DMU).	5-13
5.2.1 Attaching CF to DMU Board	5-13
5.2.2 Status for Installation Start and Installation Process	5-14
5.2.3 Installation Completion	5-14
5.3 AFV (Anti Floor Vibration)	5-15
5.3.1 AFV Compensation System	5-15
5.3.2 AFV for CCW-R (CCW-NZ or later)	5-15
5.3.3 AFV Effect for CCW-R (CCW-NZ or later)	5-19
5.3.4 Relationship between the AFV and Filter	5-19
5.4 Frequency Adjustment(PWM Control Feeder)	5-21
5.4.1 Adjustment of Frequency	5-21
5.4.2 Memory and Display of Frequency	5-21
5.4.2.1 Natural frequency	5-21
5.4.2.2 Drive Frequency Display	5-21
5.4.2.3 Frequency Initialization	5-21
5.4.3 Natural Frequency Check for Feeder and RCU	5-21
5.4.3.1 When no response for natural frequency comes from FDRV	5-22
5.4.3.2 When the natural frequencies memorized in FDRV and in RCU differ from each other	5-22
5.4.4 Automatic Adjustment of Frequency	5-24
5.4.4.1 Adjustment of Natural Frequency	5-24
5.4.4.2 Drive Frequency Check	5-26
5.4.4.3 Adjusting Feeder Amplitude by Drive Frequency	5-27
5.4.4.4 Procedure of Amplitude Adjustment by Changing the Drive Frequency ..	5-28
5.5 Procedure for Replacing FDRV Board and DMU Board	5-30
5.5.1 Replacing the boards	5-30
5.5.1.1 Overview	5-30
5.5.1.2 Procedure of Board Replacement	5-30

6 CIRCUIT DIAGRAM

6.1 TOTAL DIAGRAM	6-1
6.1.1 CCW-R-210W-S TOTAL DIAGRAM.....	6-2
6.1.2 CCW-R-210W-S DIAGRAM	6-3
6.1.3 CCW-R-214W-S TOTAL DIAGRAM.....	6-4
6.1.4 CCW-R-214W-S DIAGRAM	6-5
6.1.5 CCW-R-216B-D TOTAL DIAGRAM	6-6
6.1.6 CCW-R-216B-D DIAGRAM	6-7
6.2 BLOCK DIAGRAM	6-8
6.2.1 REMOTE CONTROL UNIT	6-8
6.2.2 CAL UNIT 2/1	6-9
6.2.3 CAL UNIT 2/2	6-10
6.2.4 RELAY UNIT.....	6-11
6.2.5 ELECTRICAL UNIT MAIN	6-12
6.2.5.1 CCW-R-214W-S ELECTRICAL UNIT MAIN.....	6-12
6.2.5.2 CCW-R-216B-D ELECTRICAL UNIT MAIN	6-13
6.2.6 WEIGH DRIVE UNIT	6-14
6.2.6.1 CCW-R-2XXW-S WEIGH DRIVE UNIT 1/2	6-14
6.2.6.2 CCW-R-2XXW-S WEIGH DRIVE UNIT 2/2	6-15
6.2.6.3 CCW-R-216B-D WEIGH DRIVE UNIT 1/2	6-16
6.2.6.4 CCW-R-216B-D WEIGH DRIVE UNIT 2/2	6-17
6.2.7 PS UNIT [POWER SUPPLY UNIT]	6-18
6.2.7.1 CCW-R-214W-S	6-18
6.2.7.2 CCW-R-216B-D	6-19
6.2.8 AFV UNIT	6-20

1 OVERVIEW

1.1 Main Components.....	1-1
1.1.1 Appearance	1-1
1.2 Configuration	1-5
1.3 Menu Configuration	1-6

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1 Overview

1.1 Main Components

1.1.1 Appearance

For model CCW-R-2XXW-S

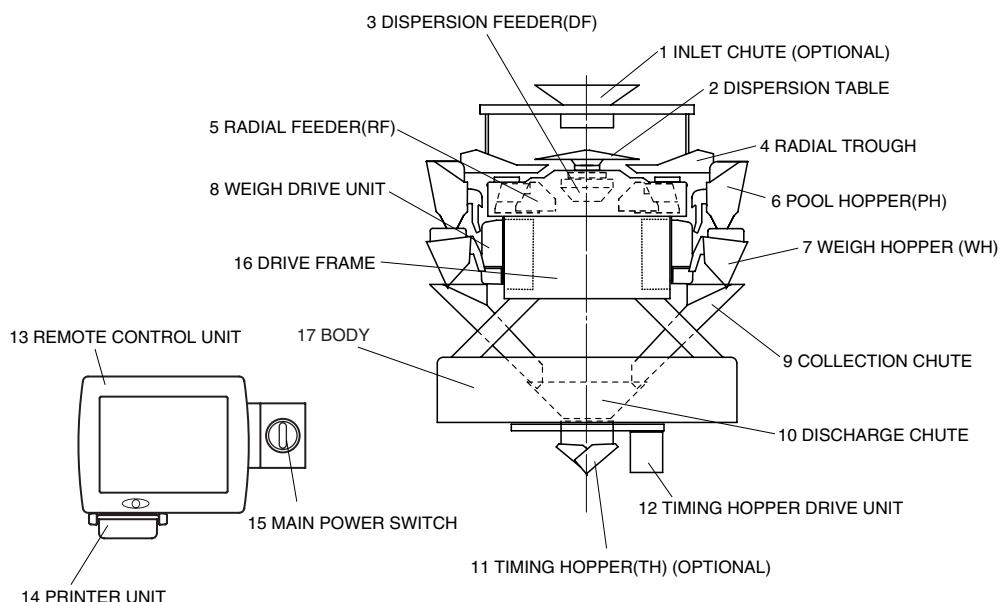


Table 1-1 Unit Descriptions

No.	Name	Functional description
1	Inlet chute (Optional)	Product inlet The funnel-shaped inlet chute guides product fed from the infeed equipment onto the center of the dispersion table.
2	Dispersion table	The dispersion table receives the vibration from the dispersion feeder and conveys product from the inlet chute to the radial troughs.
3	Dispersion feeder (DF)	The magnetic coil incorporated in the feeder vibrates the dispersion table. Product flow amount is controlled by means of the weigh sensor which measures the amount of product on the dispersion table.
4	Radial trough	The radial troughs receive vibration from the radial feeders and convey product to the pool hoppers.
5	Radial feeder (RF)	The magnetic coil incorporated in the feeder vibrates the radial trough.
6	Pool hopper (PH)	Each pool hopper receives product fed from the radial troughs above it and holds it temporarily in synchronization with product weighing. The pool hoppers open or close according to the weighing operation to feed product into the weigh hoppers.

Table 1-1 Unit Descriptions (Continued)

No.	Name	Functional description
7	Weigh hopper (WH)	The weigh hoppers measure the weight of product received from the pool hoppers. These hoppers open or close as a result of combination weighing to feed product into the collection chutes.
8	Weigh/drive unit (WDU)	The weigh/drive unit powers the open/close action of the weigh and pool hoppers. It also contains a load cell which measures the weight of product in the weigh hoppers.
9	Collection chute	The collection chute receives and collects product discharged from the weigh hoppers and guide the product down into the discharge chute.
10	Discharge chute	The discharge chute collects product discharged from the collection chute and guide the product down into the timing hopper or the packer.
11	Timing hopper (TH) (Optional)	The timing hopper temporally pools the product from the discharge chute and controls the timing of discharge to the packer.
12	Timing hopper drive unit (Optional)	The timing hopper drive unit powers the open/close action of the timing hopper.
13	Remote control unit (RCU)	Enables the operation required for weighing such as production operation or condition setting.
14	Printer	Prints out setting data, weighing results, and statistical data.
15	Main power switch	Turns on and off the power to the weigher.
16	Drive frame	Incorporates the main electrical unit, drive unit, and AFV unit.
17	Body	Incorporates PS-0, PS-2, PS feeder, CAL, and/or relay unit.

For model CCW-R-2XXB-D

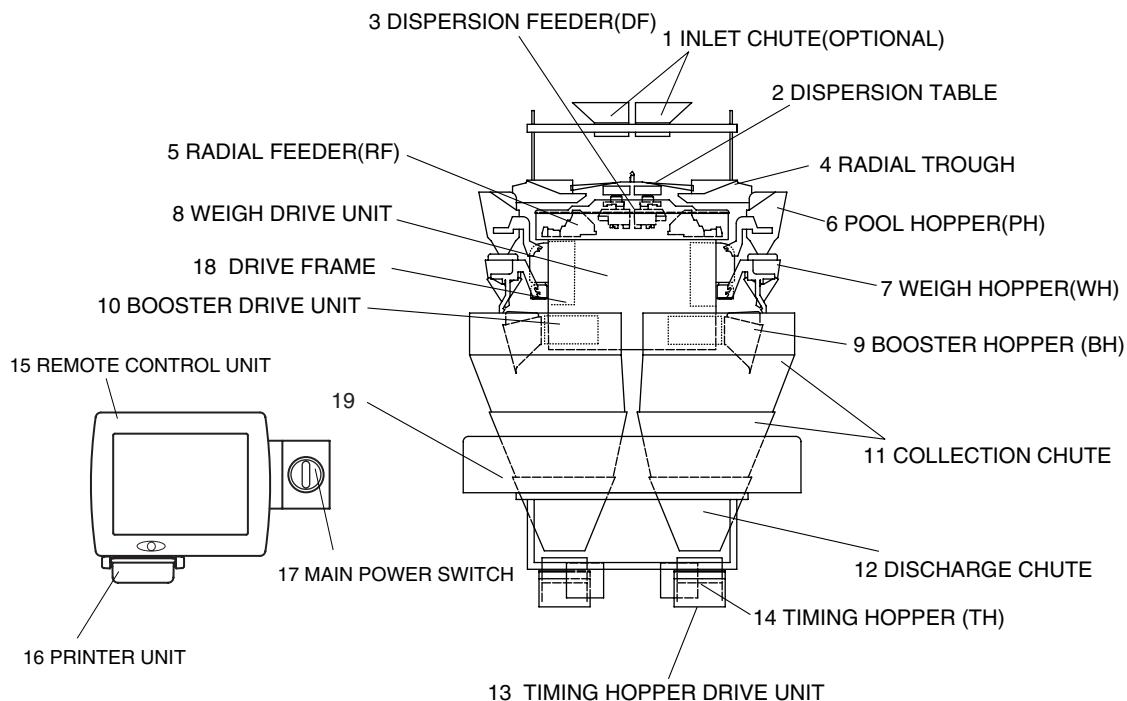


Table 1-2 Unit Descriptions

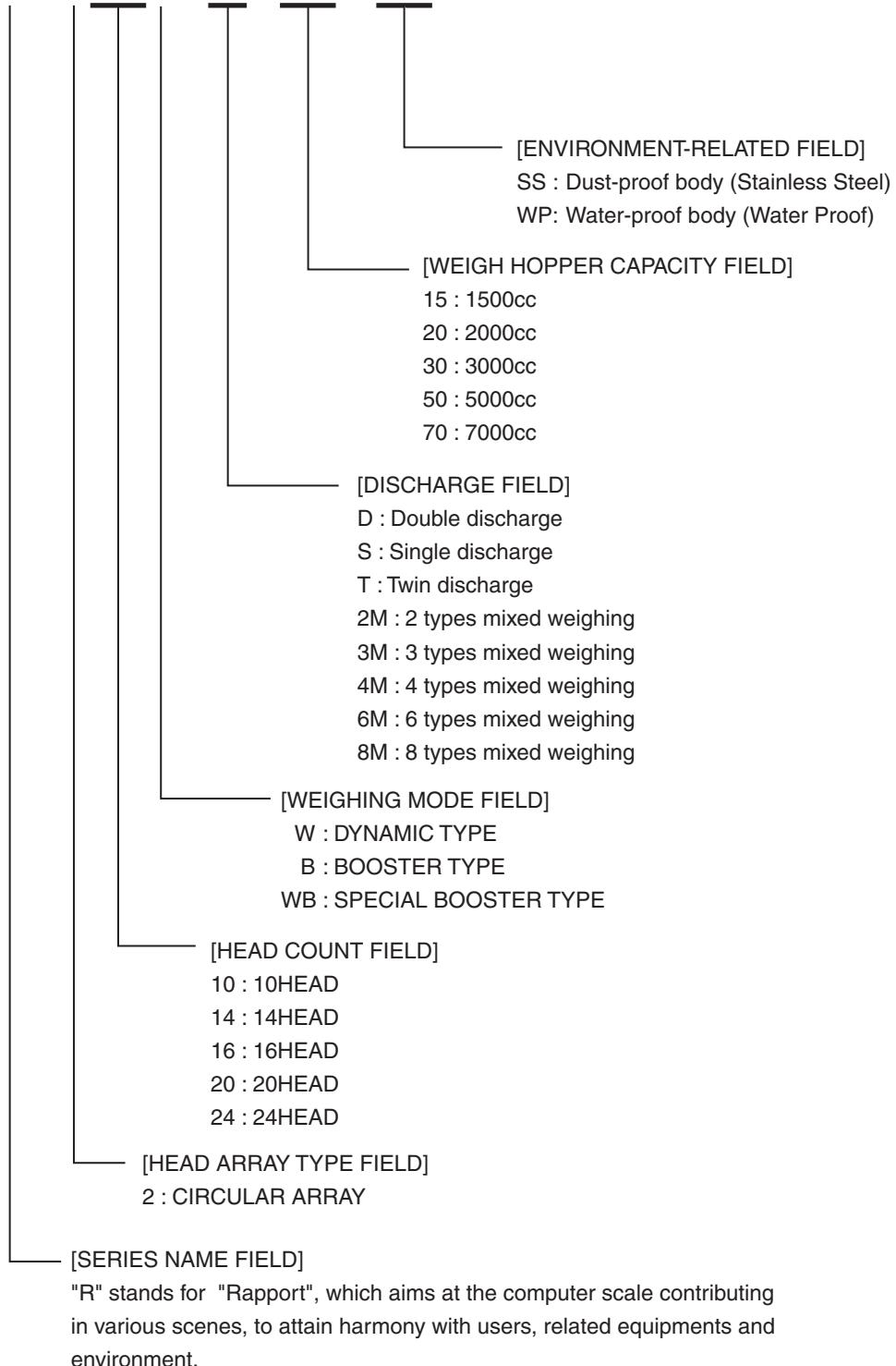
No.	Name	Functional description
1	Inlet chute (Optional)	Product inlet The funnel-shaped inlet chute guides product fed from the infeed equipment onto the center of the dispersion table.
2	Dispersion table	The dispersion table receives the vibration from the dispersion feeder and conveys product from the inlet chute to the radial troughs.
3	Dispersion feeder (DF)	The magnetic coil incorporated in the feeder vibrates the dispersion table. Product flow amount is controlled by means of the weigh sensor which measures the amount of product on the dispersion table.
4	Radial trough	The radial troughs receive vibration from the radial feeders and convey product to the pool hoppers.
5	Radial feeder (RF)	The magnetic coil incorporated in the feeder vibrates the radial trough.
6	Pool hopper (PH)	Each pool hopper receives product fed from the radial troughs above it and holds it temporarily in synchronization with product weighing. The pool hoppers open or close according to the weighing operation to feed product into the weigh hoppers.
7	Weigh hopper (WH)	The weigh hoppers are used to hold and measure, by means of a load cell, the weight of product received from the pool hoppers. These hoppers open or close as a result of combination weighing to feed product into the collection chutes or booster hoppers.

Table 1-2 Unit Descriptions (Continued)

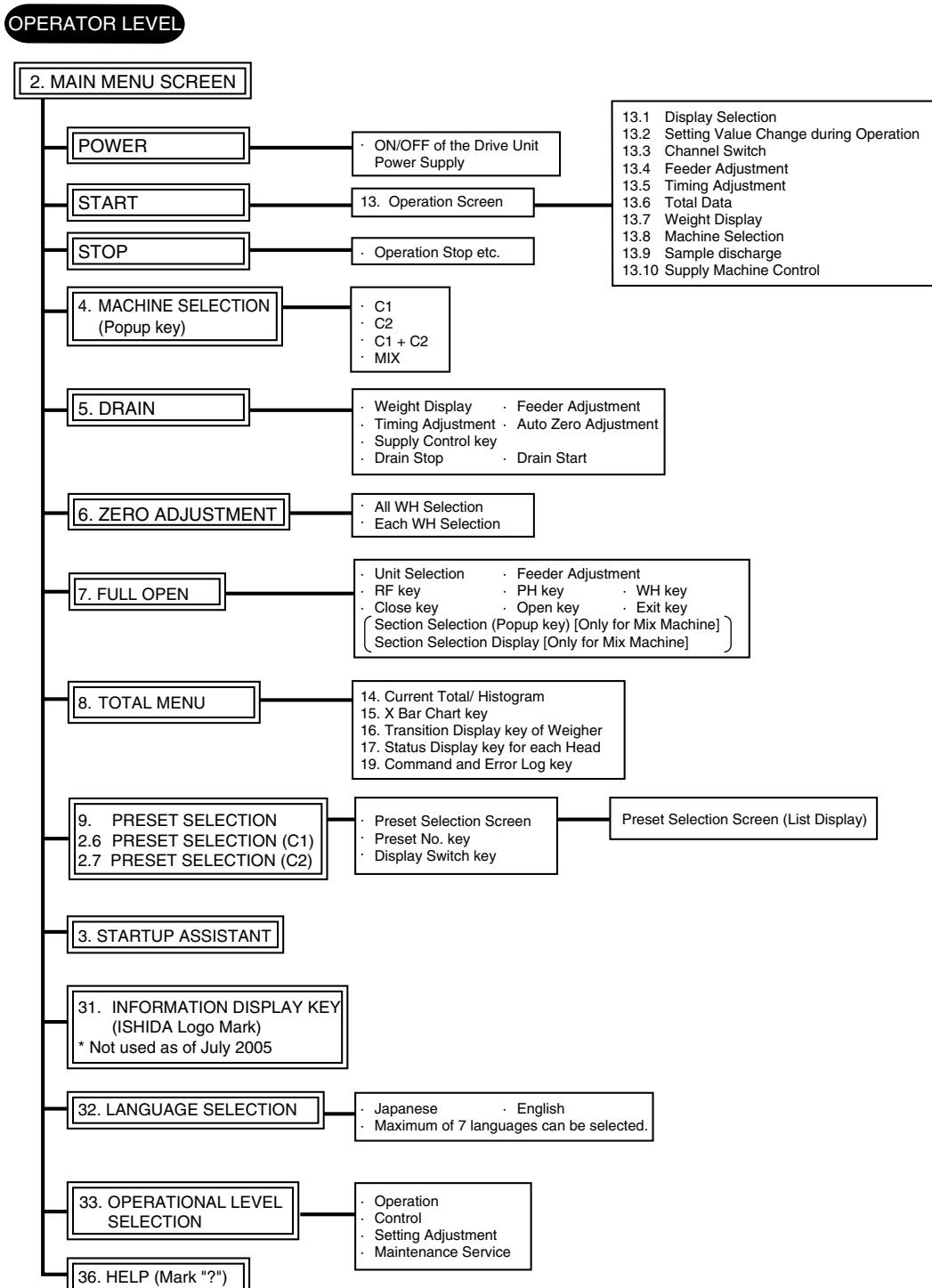
No.	Name	Functional description
8	Weigh/drive unit (WDU)	The weigh/drive unit powers the open/close action of the weigh and pool hoppers. It also contains a load cell which measures the weight of product in the weigh hoppers.
9	Booster hopper (BH)	Product which has been discharged from the weigh hoppers and is not immediately included in a combination is temporarily pooled in the booster hoppers.
10	Booster hopper drive unit (BDU)	The booster hopper drive unit powers the open/close action of the booster hopper.
11	Collection chute	The collection chute receives and collects product discharged from the weigh or booster hoppers and guide the product down into the discharge chute.
12	Discharge chute	The discharge chute collects product discharged from the collection chute and guide the product down into the timing hopper or the packer.
13	Timing hopper (TH) (Optional)	The timing hopper temporally pools the product from the weigh or booster hoppers and controls the timing of discharge to the packer.
14	Timing hopper drive unit	The timing hopper drive unit powers the open/close action of the timing hopper.
15	Remote control unit (RCU)	Enables the operation required for weighing such as production operation or condition setting.
16	Printer	Prints out setting data, weighing results, and statistical data.
17	Main power switch	Turns on and off the power to the weigher.
18	Drive frame	Incorporates the main electrical unit, main drive unit and AFV unit.
19	Main body	Incorporates PS-0, PS-2, PS Feeder, CAL, and relay unit.

1.2 Configuration

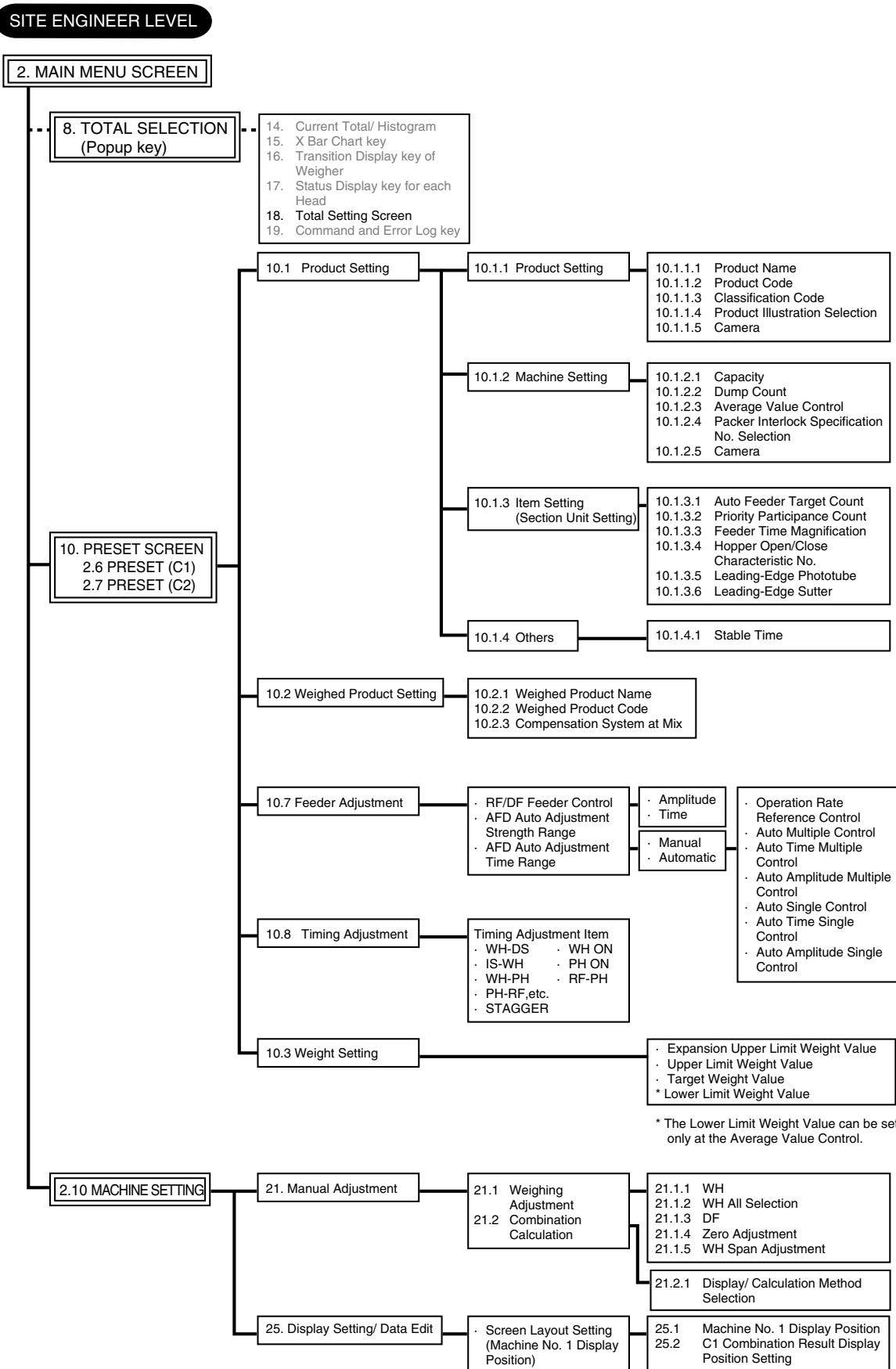
CCW - R - 2XXX - X / XX - XX

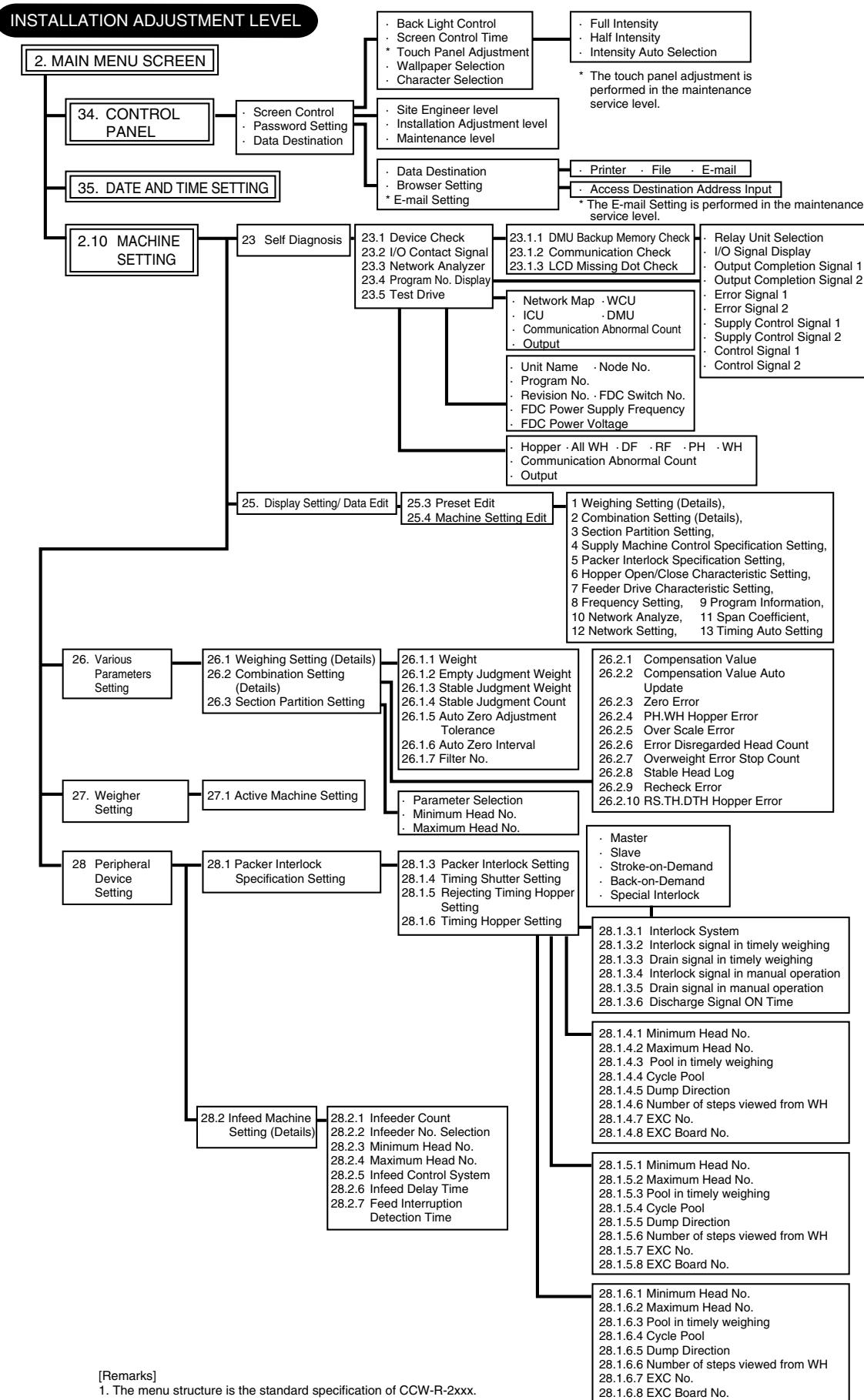


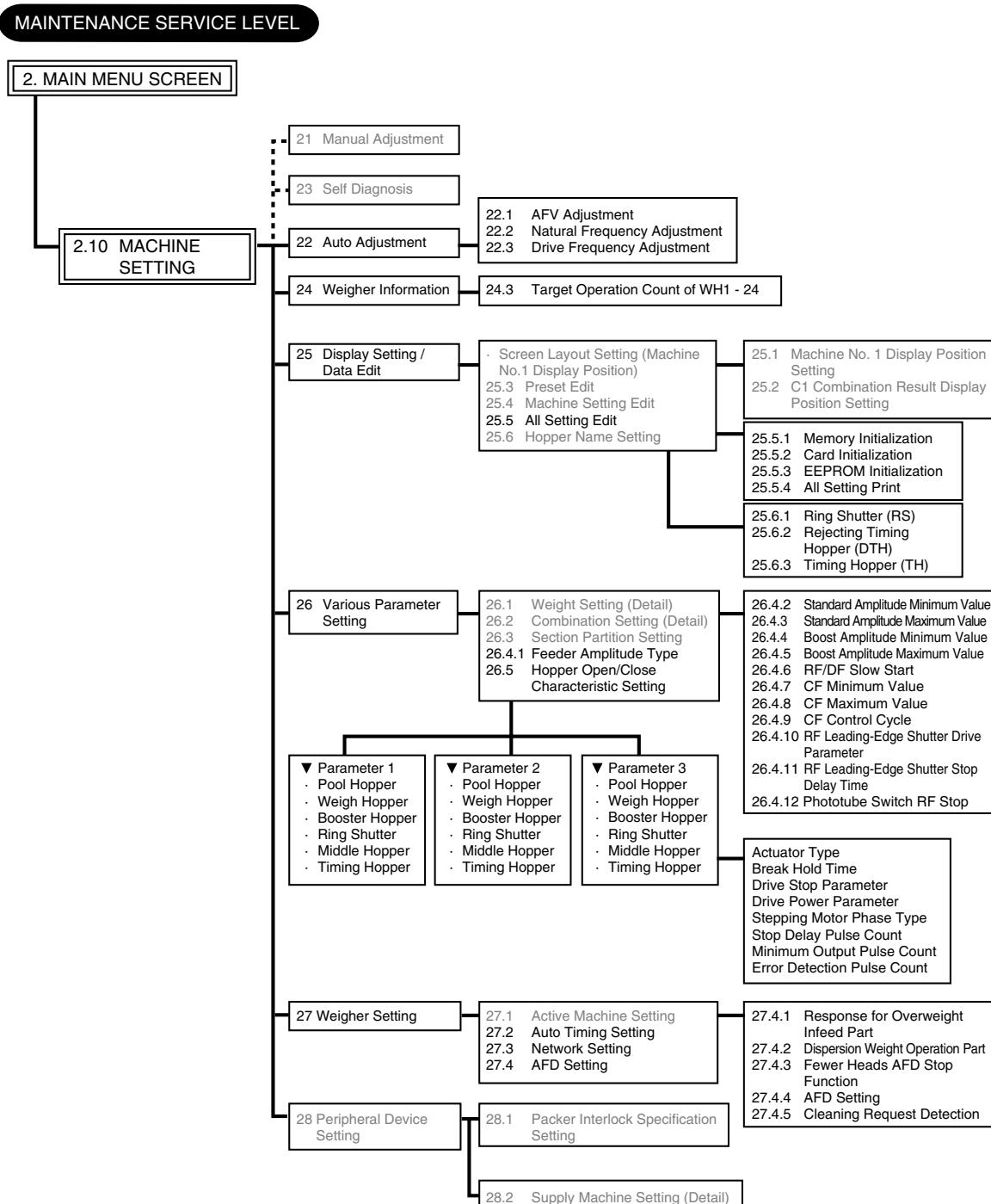
1.3 Menu Configuration



[Remark]
1. The menu structure is the standard specification of CCW-R-2xxx.







(Remarks)

1. The menu structure is the standard specification of CCW-R-2xxx.
2. The Menu accessible to the operation level is displayed in light letters.

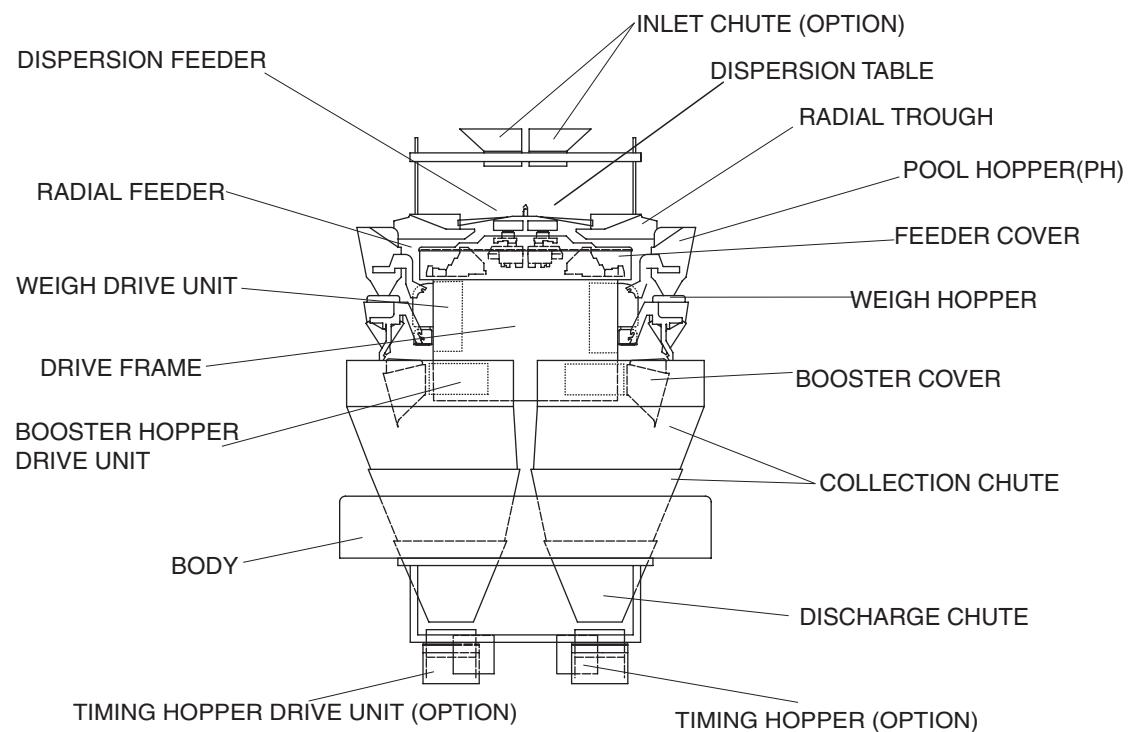
2 MAINTENANCE, ADJUSTMENT AND REPLACEMENT

2.1 Mechanical Unit Configuration	2-1
2.2 Replacing Feeder Cover (Rubber Packing)	2-2
2.2.1 Removing Feeder Cover	2-2
2.2.2 Replacing Cover (Rubber Packing)	2-3
2.2.3 Setting Feeder Cover	2-3
2.3 Replacing and Adjusting Radiation Feeder Parts	2-6
2.3.1 Appearance of Radiation Feeder	2-6
2.3.2 Replacing Leaf Springs of Radial Feeder	2-7
2.3.3 Replacing Magnetic Coil of Radial Feeder	2-8
2.3.4 Adjusting Amplitude of Radial Feeder	2-9
2.4 Replacing and Adjusting Dispersion Feeder Parts	2-11
2.4.1 Appearance of Dispersion Feeder	2-11
2.4.2 Replacing Leaf Springs of Dispersion Feeder	2-12
2.4.3 Replacing Magnetic Coil of Dispersion Feeder	2-13
2.4.4 Adjusting Amplitude of Dispersion Feeder	2-15
2.5 Weigh/Drive Unit	2-16
2.5.1 Appearance of Weigh/Drive Unit	2-16
2.5.2 Exploded View of Weigh/Drive Unit for Model R-214W-S/20.30	2-17
2.5.2.1 Replacing DUC Board (P-5428*)	2-18
2.5.2.2 Replacing WH (Stepping) Motor	2-19
2.5.2.3 Replacing PH (Stepping) Motor	2-20
2.5.2.4 Replacing Load Cell	2-21
2.5.3 Exploded View of Weigh/Drive Unit for Model R-216B-D/20.30	2-24
2.5.3.1 Replacing DUC Board (P-5428*)	2-25
2.5.3.2 Replacing WH (Stepping) Motor	2-26
2.5.3.3 Replacing PH (Stepping) Motor	2-27
2.5.3.4 Replacing Load Cell	2-28
2.5.4 Exploded view for weigh/drive unit of model R-214W-S/70 ..	2-31
2.5.4.1 Replacing DUC board (P-5428*)	2-32
2.5.4.2 Replacing WH (Stepping) Motor	2-33
2.5.4.3 Replacing PH (Stepping) Motor	2-34
2.5.4.4 Replacing Load Cell	2-35

2.6 BH Drive Unit	2-39
2.6.1 Appearance of BH Drive Unit.....	2-39
2.6.2 Exploded View of BH Drive Unit for Model R-216B-D/20.30 ..	2-40
2.6.3 Replacing BH (Stepping) Motor	2-41
2.7 TH Drive Unit (Optional).....	2-42
2.7.1 Appearance of TH Drive Unit.....	2-42
2.7.2 Exploded View of TH Drive Unit.....	2-43
2.7.3 Replacing TH (Stepping) Motor	2-44

2 Maintenance, Adjustment and Replacement

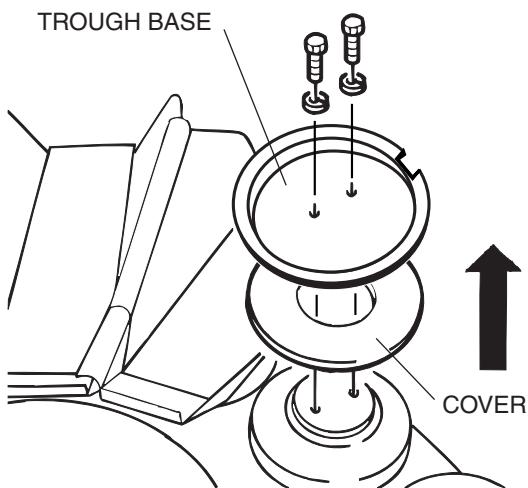
2.1 Mechanical Unit Configuration



2.2 Replacing Feeder Cover (Rubber Packing)

2.2.1 Removing Feeder Cover

1. Remove the pool hoppers, weigh hoppers, dispersion table and radial troughs.
2. Remove the trough base and cover from each feeder.



3. Loosen the four bolts, and detach the feeder cover.

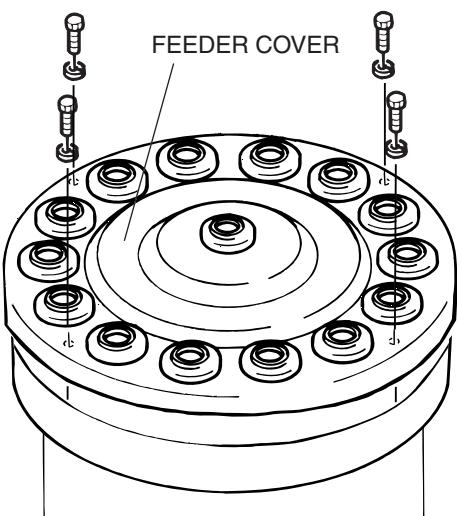
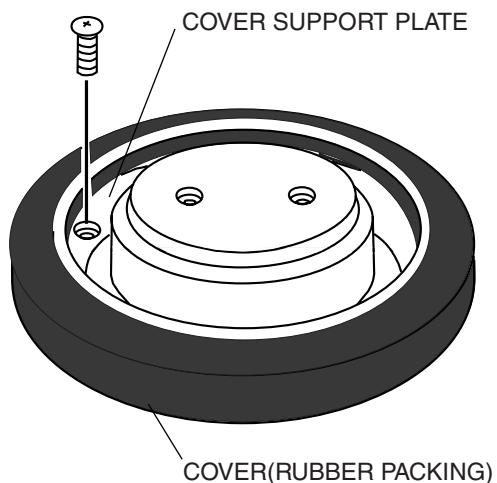


Figure 2-1 For Model CCW-R-214W-S

2.2.2 Replacing Cover (Rubber Packing)

1. Remove four screws on the cover support plate fixed to the feeder cover, and remove the cover support plate and the cover (rubber packing).
2. Insert a new cover (rubber packing) between the feeder cover and the cover support plate and fix it by four screws.



NOTE

Incorrect setting of rubber packing can cause a breakage due to a foreign matter and/or moisture coming from the gap.

2.2.3 Setting Feeder Cover

1. Attach the feeder cover and tighten it by four bolts.

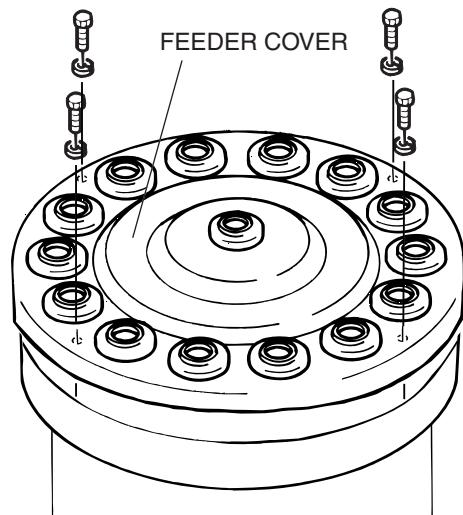
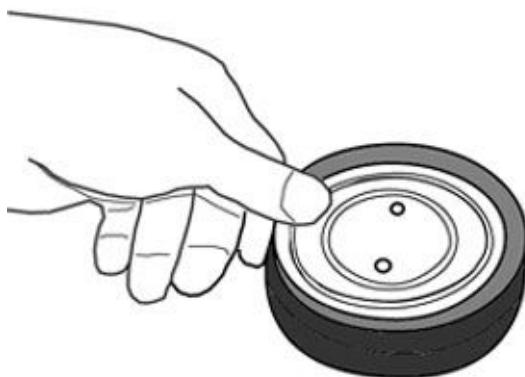


Figure 2-2 For Model CCW-R-214W-S

2. Insert the cover between the rubber packings.



3. Insert the cover between the black rubber packings and confirm that the cover is in the center of rubber packing and not shifted to the either end.
When the cover is not positioned in the center of rubber packing, it is regarded as "Incorrect way" in the figure.

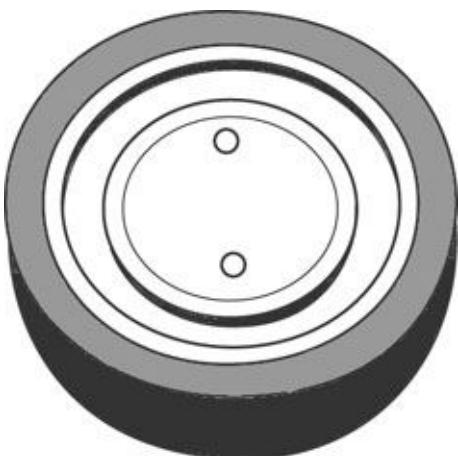


Figure 2-3 Correct way

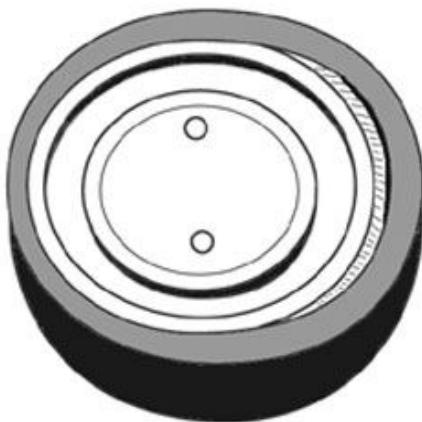
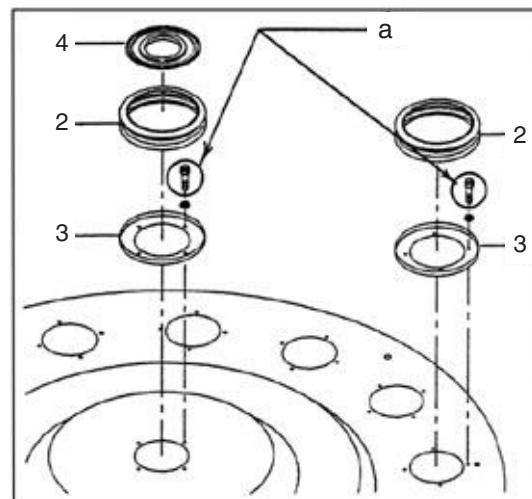
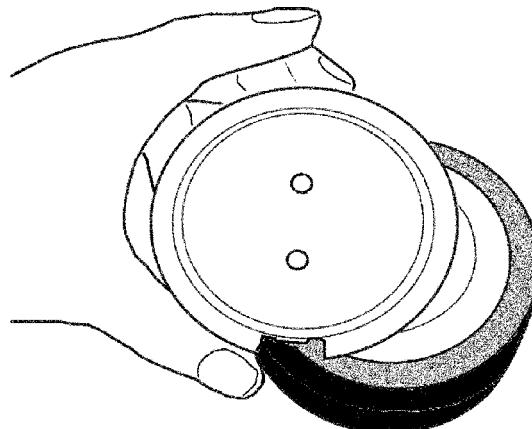


Figure 2-4 Incorrect way (Part of peripheral rubber packing frame is strained)

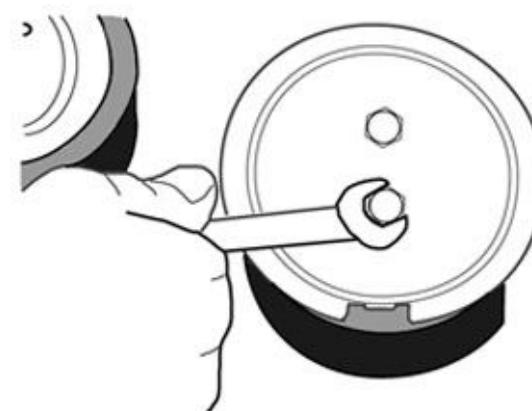
4. To align the cover position to the center of rubber packing, follow the procedure below.
 - Loosen the bolts a.
 - Shift the holder 3 so that the cover is aligned to the center of rubber packing.
 - When the cover is in the center of rubber packing, tighten the bolts a.



5. Put the trough base (a hollow part should be the front).

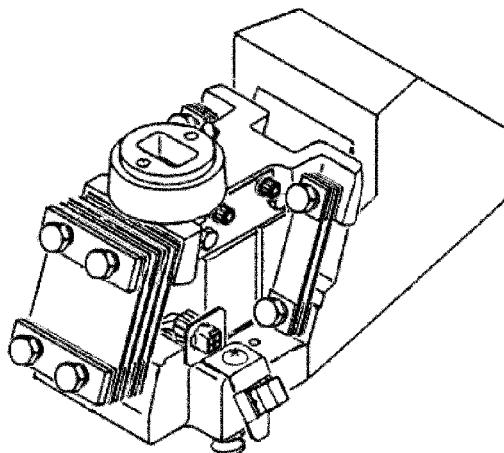


6. Tighten the bolts.
 - Tightening torque: 90 kgf • cm
(8.8N • m SI unit)

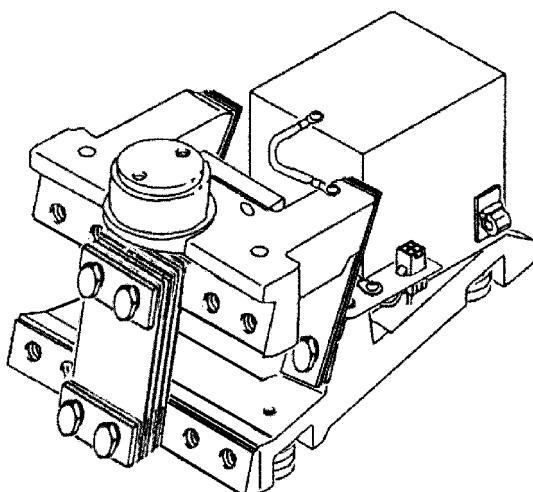


2.3 Replacing and Adjusting Radiation Feeder Parts

2.3.1 Appearance of Radiation Feeder



R-210.214W-S/20.30(R-216-S.D/20.30)

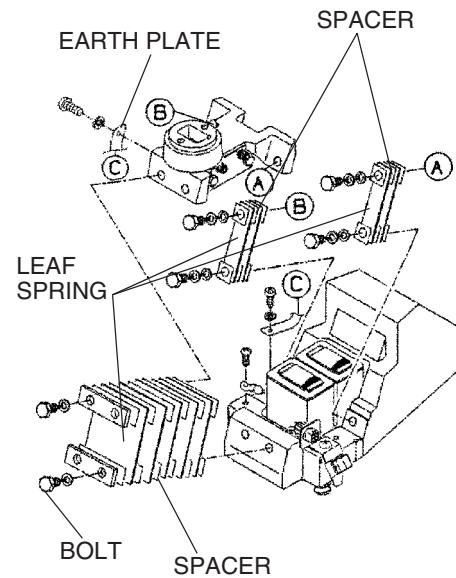


R-214W-S/50.70

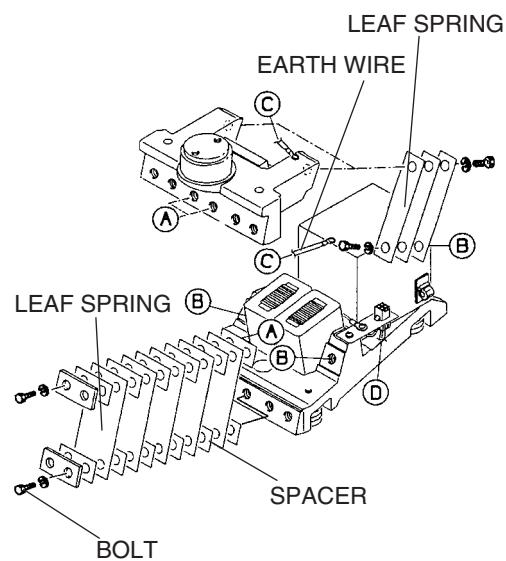
2.3.2 Replacing Leaf Springs of Radial Feeder

1. Upper part of the feeder and feeder base are connected by earth wire; remove the screws connecting the earth wire.
2. Remove the leaf spring attaching bolts.
3. Remove the leaf springs and spacers.
4. Attach the new leaf springs (with the same sheets and thickness). When any spacer is included, do not forget to attach the spacer.
5. Connect the upper part of feeder and the feeder base using the earth wire connecting screws.

R-210.214W-S/20.30



R-214W-S/50.70



TIP

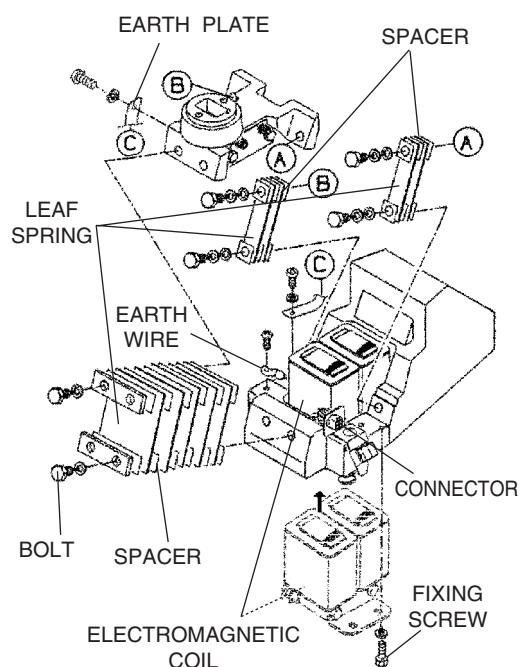
- The standard gap between the magnet coil and the moving iron-core is:
 - The model R-210.214W-S/20.30 : 2.0mm
 - The model R-216B-D/20.30 : 2.0mm
 - The model R-214W-S/50.70 : 2.3mm

NOTE

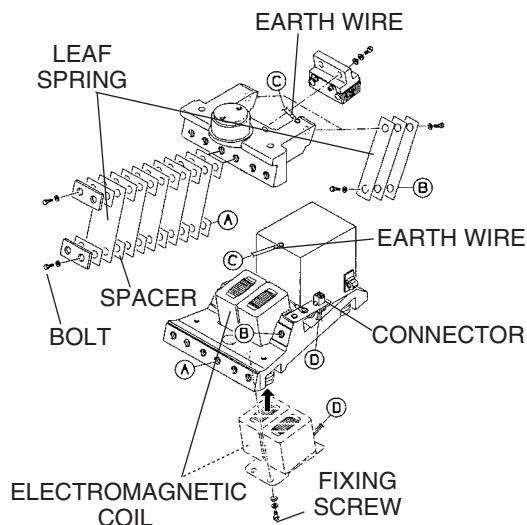
- The upper part of the feeder and the feeder base are assured in security by earth wire. When the earth wire is damaged or cut in replacing the leaf springs, reconnect the wire. Leaving the damaged wire may cause malfunction of the machine due to electrostatics.

2.3.3 Replacing Magnetic Coil of Radial Feeder

- Upper part of the feeder and feeder base are connected by earth wire; remove the screws connecting the earth wire.
- Remove the leaf spring attachment bolts, and remove leaf springs and spacers.
- Remove the connector, and earth wire fixing screws.
- Loosen four magnetic coil fixing screws and remove the magnetic coil.
- Attach the new magnetic coil. Attach the other parts in the reverse step from above.
- Confirm the clearance between the magnetic coil and the movable steel core.
 - The model R-210.214W-S/20.30 : 2.0mm
 - The model R-216B-D/20.30 : 2.0mm
 - The model R-214W-S/50.70 : 2.3mm

R-210.214W-S/20.30

R-214-W-S/50.70

**NOTE**

- The upper part of the feeder and the feeder base are assured in security by earth wire. When the earth wire is damaged or cut in replacing the leaf springs, reconnect the wire. Leaving the damaged wire may cause malfunction of the machine due to electrostatics.

2.3.4 Adjusting Amplitude of Radial Feeder

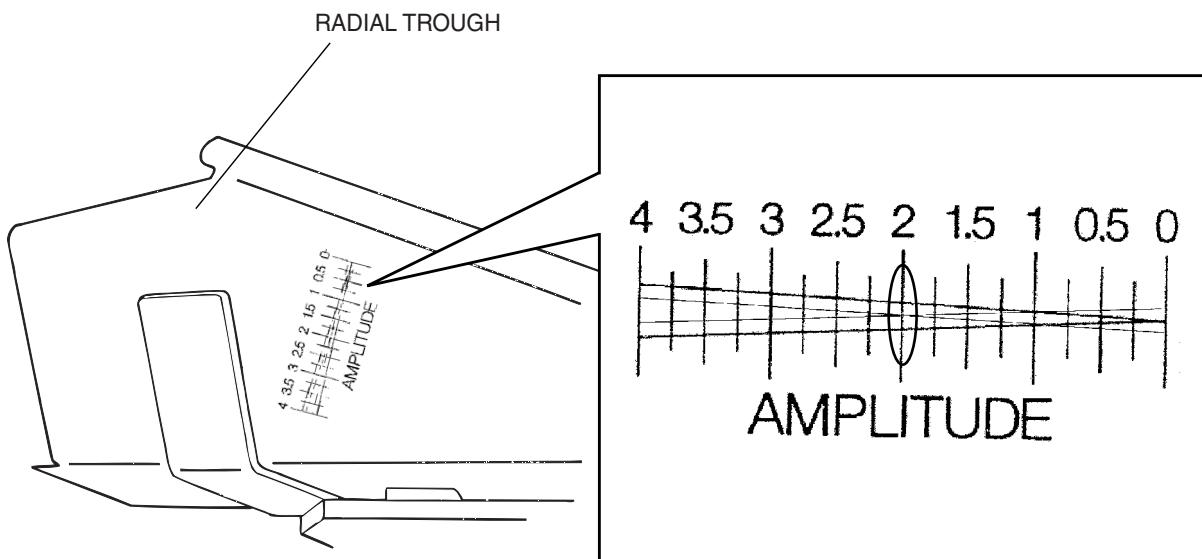
Adjust the amplitude of the radial feeder by referring to Chapter 5 Appendix, 5.4.4.3 Feeder Amplitude Adjustment by Drive Frequency and 5.4.4.4 Amplitude Adjustment Procedure by Drive Frequency Change.

NOTE

- This equipment, which is the PWM control type, does not need to adjust the amplitude by leaf springs.
- Be sure to mount the trough base, trough and feeder cover in adjusting.
- Be sure that the adjacent trough or supply chute does not contact with the feeder trough to be adjusted.

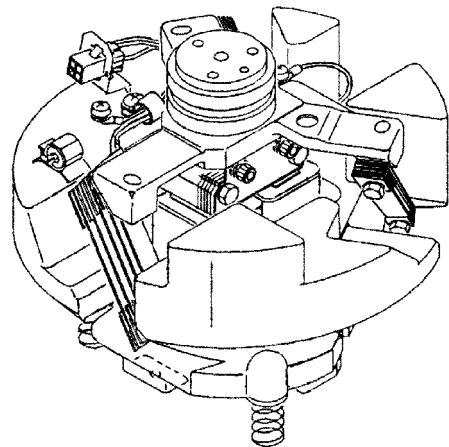
Amplitude Indication Plate

Apply the amplitude indication plate at the side of all the radiation troughs, and amplitude of radial feeder can show the lines on the indication board crossed. The value for the crossed points shows the feeder amplitude value. The standard amplitude value is approximately 2.0 mm at maximum (for strong amplitude width, approximately 3.0 mm at maximum). After the amplitude adjustment, remove the amplitude indication plate.

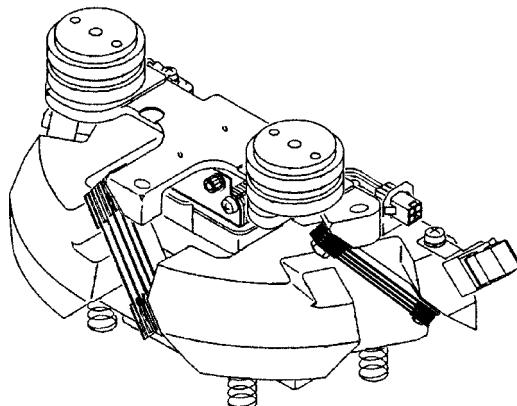


2.4 Replacing and Adjusting Dispersion Feeder Parts

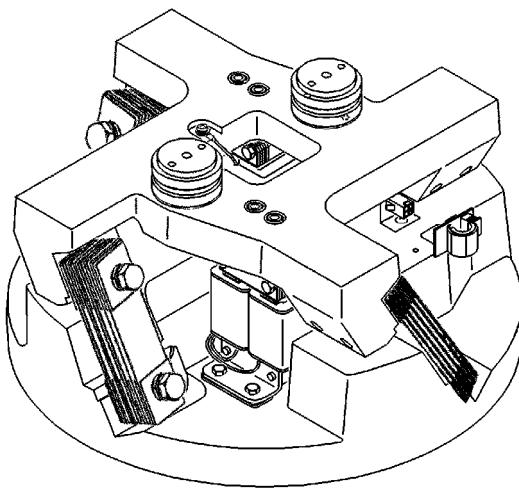
2.4.1 Appearance of Dispersion Feeder



R-210.214W-S/20.30



R-216B-D/20.30

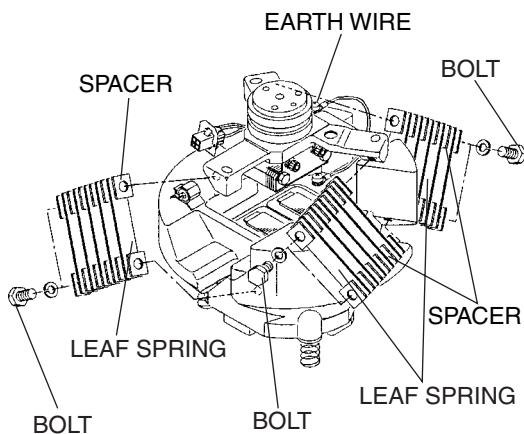


R-214W-S/50.70

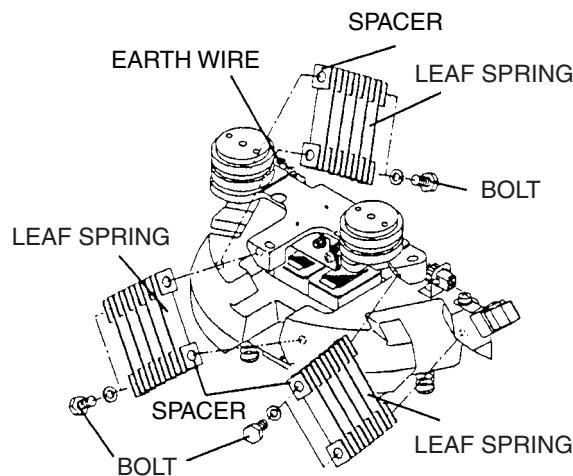
2.4.2 Replacing Leaf Springs of Dispersion Feeder

1. Upper part of the feeder and feeder base are connected by earth wire; remove the screws connecting the earth wire.
2. Remove the leaf springs attaching bolt.
3. Remove the leaf springs and the spacer.
4. Attach the new leaf springs (with the same sheets and thickness). When any spacer is included, do not forget to attach the spacer.
5. Connect the upper part of the feeder and the feeder base with the earth wire connecting screws.

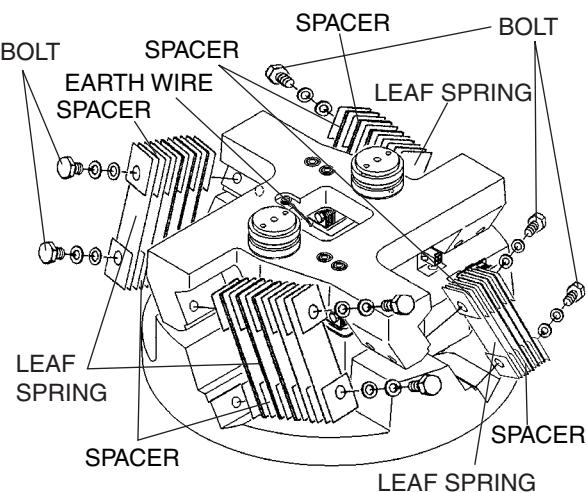
R-210.214W-S/20.30



R-216B-D/15.20.30



R-214W-S/50.70



TIP

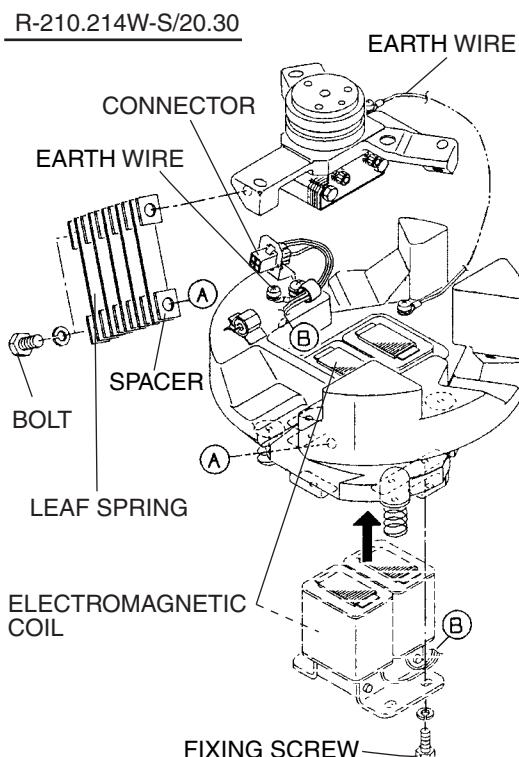
- The standard gap between the magnet coil and the moving iron-core is:
 - The model R-214W-S/20.30 : 2.0mm
 - The model R-216B-D/20.30 : 2.0mm
 - The model R-214W-S/50.70 : 2.3mm

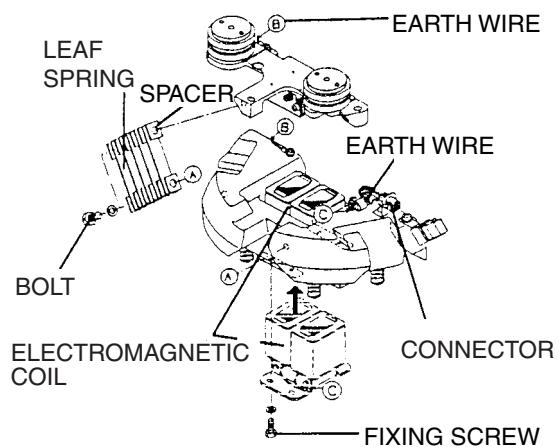
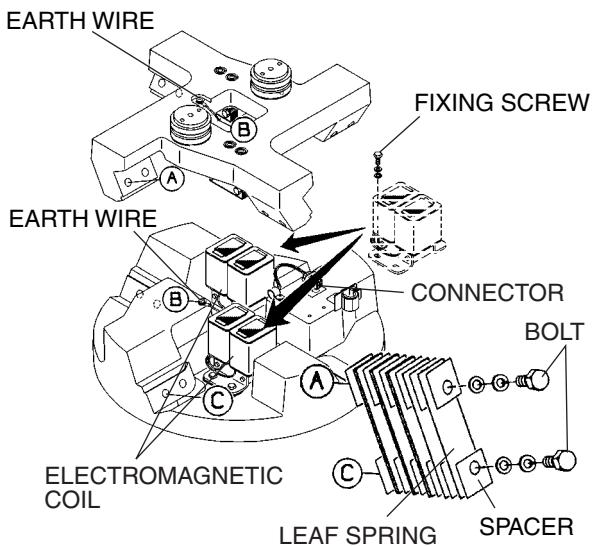
NOTE

- The upper part of the feeder and the feeder base are assured in security by earth wire. When the earth wire is damaged or cut in replacing the leaf springs, reconnect the wire. Leaving the damaged wire may cause malfunction of the machine due to electrostatics.

2.4.3 Replacing Magnetic Coil of Dispersion Feeder

- Upper part of the feeder and feeder base are connected by earth wire; remove the screws connecting the earth wire.
- Remove the leaf spring attaching bolts, and remove the leaf springs and the spacers.
- Disconnect the connector and remove the earth wire fixing screws.
- Remove four screws fixing the magnetic coil, and remove the magnetic coil.
- Attach the new magnetic coil. Attach the other parts in the reverse step from above. (Model R-214W-S/50.70 contains two magnetic coils connected in parallel.)
- The standard gap between the magnet coil and the moving iron-core is:
 - The model R-214W-S/20.30 : 2.0mm
 - The model R-216B-D/20.30 : 2.0mm
 - The model R-214W-S/50.70 : 2.3mm



R-216B-D/20.30R-214W-S/50.70
NOTE

- The upper part of the feeder and the feeder base are assured in security by earth wire. When the earth wire is damaged or cut in replacing the magnetic coil, reconnect the wire. Leaving the damaged wire may cause malfunction of the machine due to electrostatics.

2.4.4 Adjusting Amplitude of Dispersion Feeder

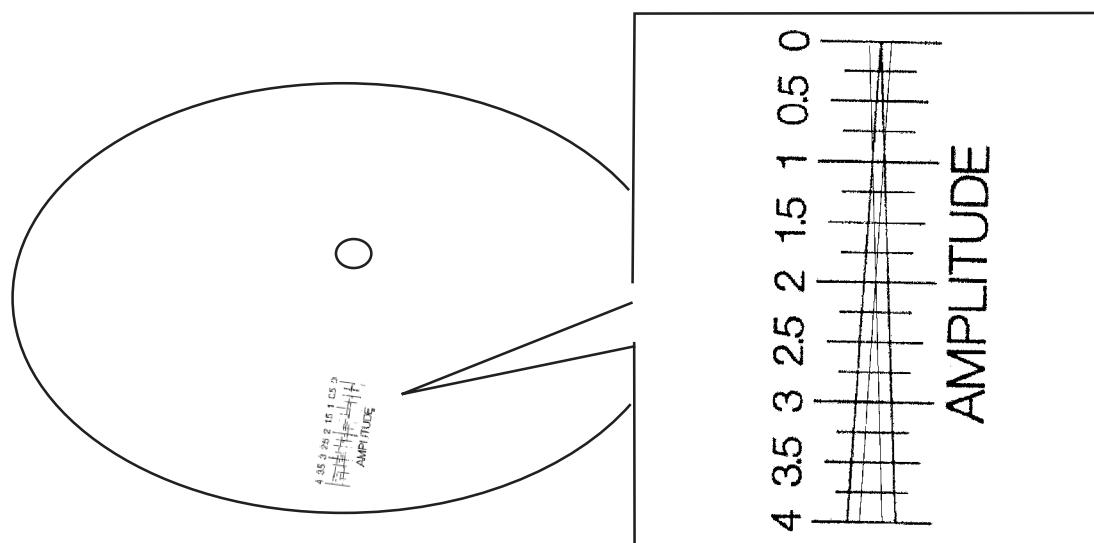
Adjust the amplitude of dispersion feeder by referring to Chapter 5 Appendix, 5.4.4.3 Feeder Amplitude Adjustment by Drive Frequency and 5.4.4.4 Amplitude Adjustment Procedure by Drive Frequency Change.

NOTE

- This equipment, which is the PWM control type, does not need to adjust the amplitude by leaf springs.
- Be sure to mount the trough base, trough and feeder cover in adjusting.
- Be sure that the adjacent trough or supply chute does not contact with the feeder trough to be adjusted.

Amplitude Indication Plate

Apply the amplitude indication plate on the surface of the dispersion table. Amplitude of dispersion feeder can show the lines on the indication board crossed. The value for the crossed points shows the feeder amplitude value. The standard amplitude value is approximately 2.0 mm at maximum (for strong amplitude width, approximately 3.0 mm at maximum). After the amplitude adjustment, remove the amplitude indication plate.

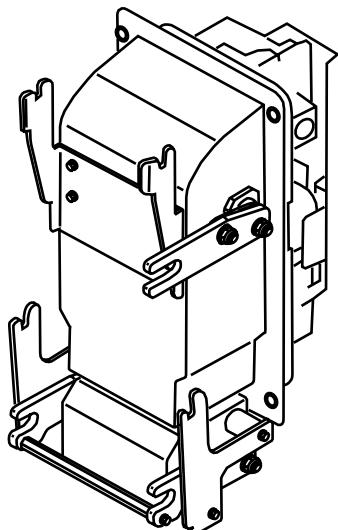


2.5 Weigh/Drive Unit

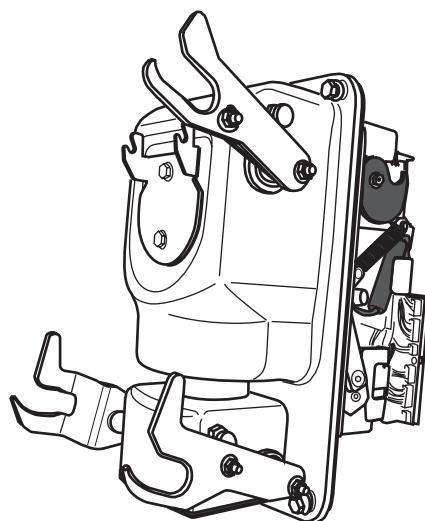
2.5.1 Appearance of Weigh/Drive Unit



R-210.214W-S/20.30

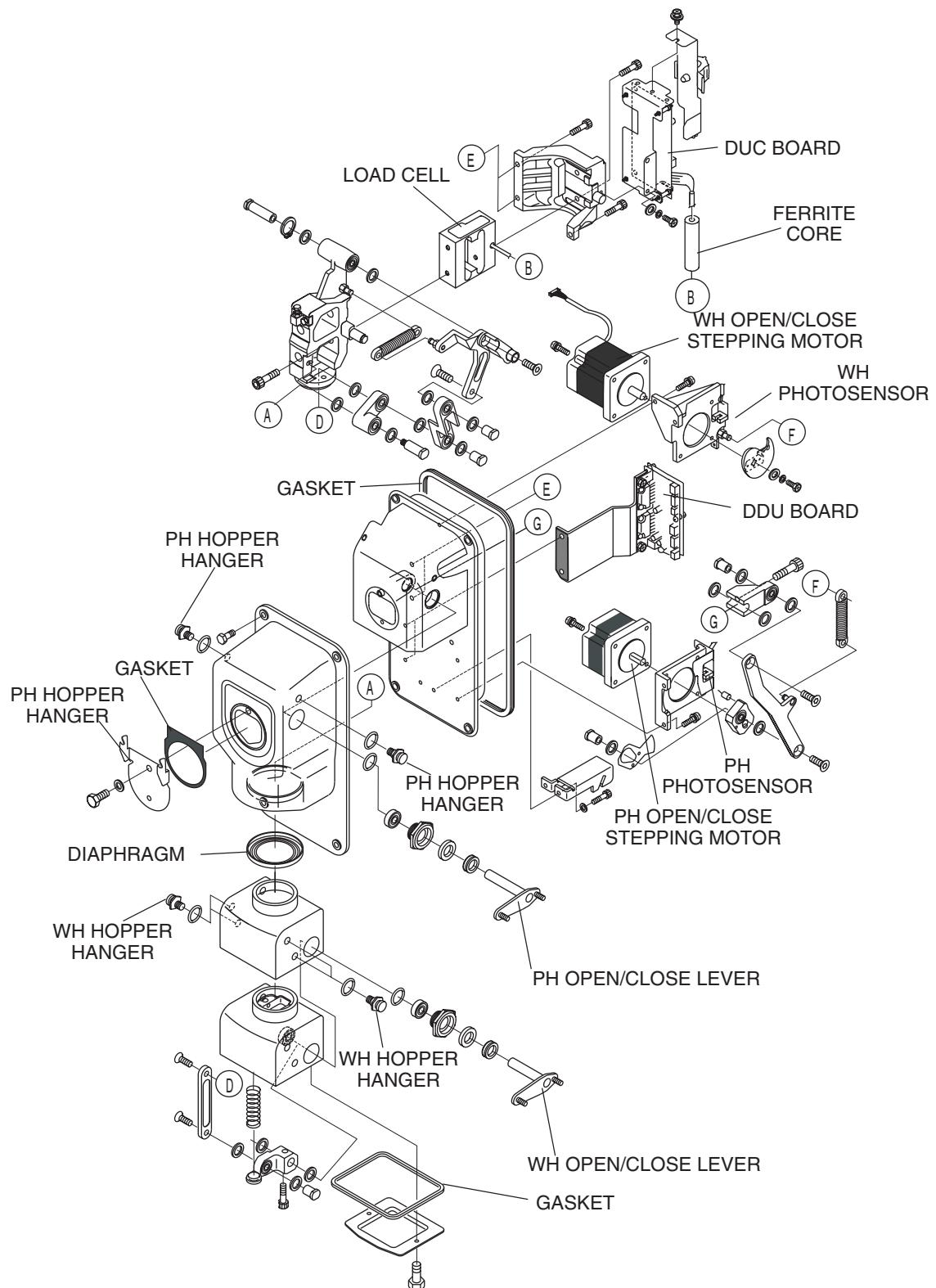


R-214W-S/50.70



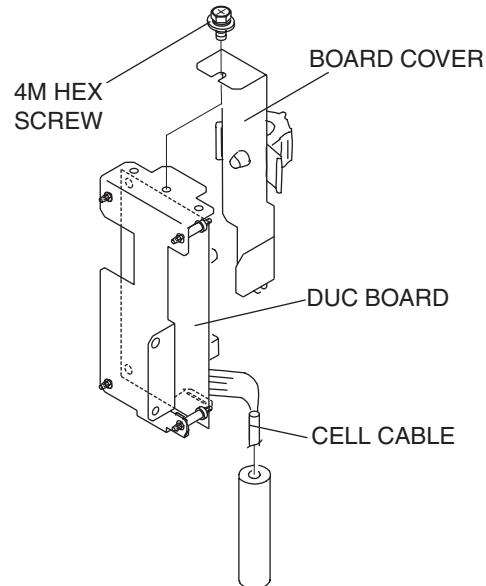
R-216B-D/20.30

2.5.2 Exploded View of Weigh/Drive Unit for Model R-214W-S/20.30



2.5.2.1 Replacing DUC Board (P-5428*)

1. Remove the 4M hexagonal screw, and remove the board cover.
2. Disconnect the cable connector (J202PH/J203WH) on the DUC board.
3. Remove the soldering of the terminal J208 for the cell cable on DUC board.



4. Remove DUC board from four positions of the card spacer.
5. Attach the new DCU board to the card spacers, and assemble them by the reverse step of the above 1 to 3.
6. Set SW1(Dip SW) on DUC board to the original head No. by binary number. (The following is the setting example.)

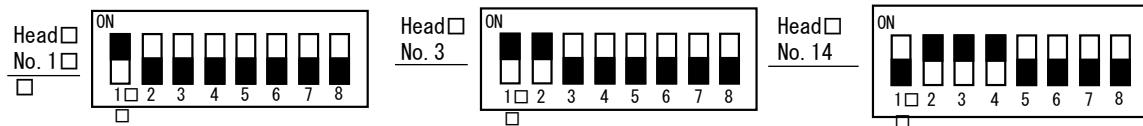
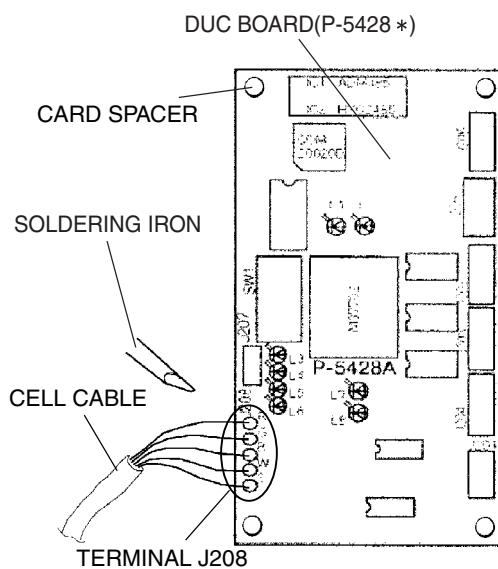


Figure 2-5 Setting Example

NOTE

In soldering the cell cable to the terminal J208, securely connect them by soldering iron. Poor connection may prevent the weight indication from being stabilized.

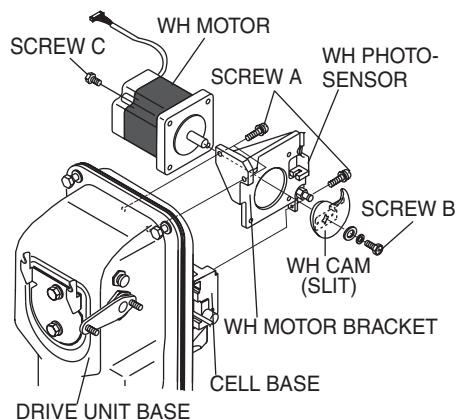
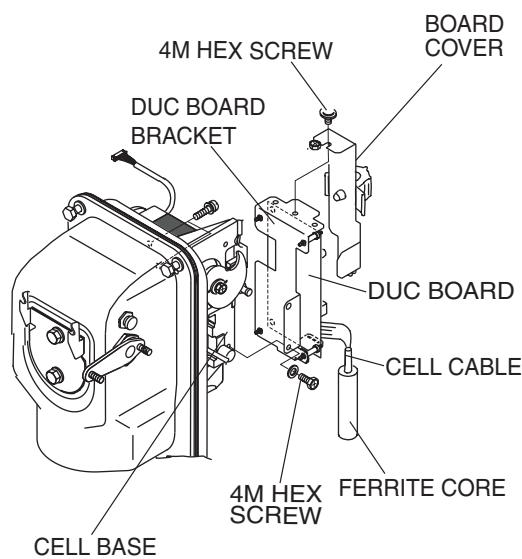
2.5.2.2 Replacing WH (Stepping) Motor

1. Remove the 4M hexagonal screw, and remove the board cover.
2. Remove the 4M hexagonal screw, and remove the DUC board cover.

NOTE

Remove the DUC board bracket from the cell base carefully not to cut the cell cable.

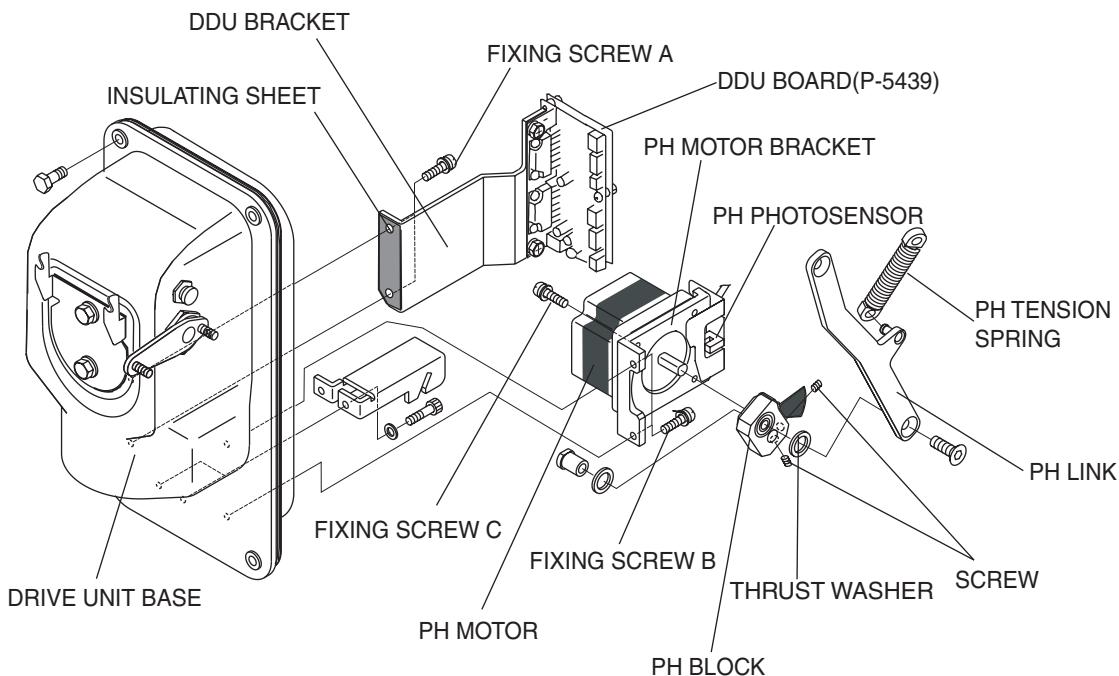
3. Disconnect WH photosensor cable connector and WH motor cable connector from DDU board.
4. Remove two screws A fixed to the drive unit base and a screw fixed to the cell base, and remove WH motor bracket.
5. Loosen one screw B fixed to WH motor axis, and remove WH cam (with slit).
6. Remove four screws C fixing WH motor, and remove WH (stepping) motor from WH motor bracket.
7. Attach the new WH (stepping) motor in the reverse step from the above 1 to 6.



NOTE

In fixing the WH cam (with slit) to the WH motor axis, adjust it so that the slit comes to the center of WH photosensor. Check that there is approximately 1mm gap between WH cam and WH open/close cam follower.

2.5.2.3 Replacing PH (Stepping) Motor



1. Remove the 4M hexagonal screw and remove the board cover.
2. Remove the PH tension spring.
3. Disconnect PH photosensor cable connector and PH motor cable connector from DDU board (P-5439*).
4. Remove two fixing screws A fixing DDU bracket, and remove DDU bracket. (Other cables need not to be disconnected; when disconnected, put them into the same position.)
5. Loosen two screws of PH block fixed to PH motor axis (with the slit and the PH link attached).

TIP

Since the screws are applied with coatings to prevent loosening, sometimes it is hard to remove them. In that case, heat the screws.

6. Loosen two fixing screws B for bracket that support PH motor bracket to the drive unit base, and remove PH motor bracket.

7. Remove four screws C fixing PH motor, and remove PH (stepping) motor from PH motor bracket.
8. Attach the new PH (stepping) motor in the reverse step from the above 1 to 7.

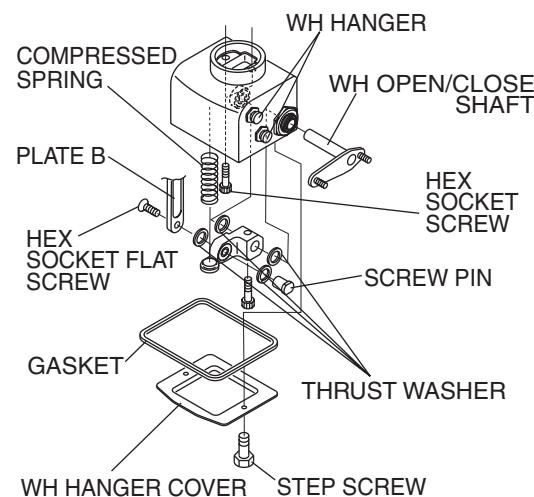
NOTE

In fixing PH block to PH motor axis, adjust it so that the screws come to the "necked" part of the axis. Also fix the slit so that it comes to the center of PH photosensor.

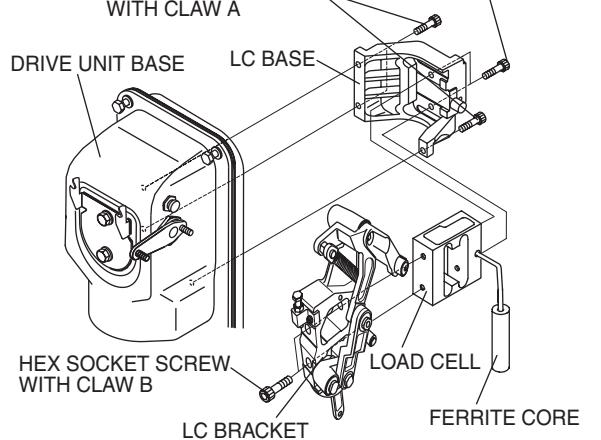
2.5.2.4 Replacing Load Cell

1. Remove DUC board by the same step as 2.5.2.1 Replacing DUC Board (P-5428*)
2. Remove WH motor bracket (with WH motor) by the same step as 2.5.2.2 Replacing WH (Stepping) Motor
3. Loosen two step screws shown in the right figure, and remove WH hanger cover.
4. Remove the compressed spring.
5. Fix the screw pin with a spanner (No. 10), and remove one hexagon socket flat screw.
6. Remove two hexagon socket screws on the head fixing the WH hunger and open/close lever unit to the LC bracket. Then remove the WH hunger and open/close lever unit.
7. Take out the whole assembly of LC bracket, load cell, and LC base by removing three hex socket screws with claw A fixing LC base to the drive unit base.
8. Remove two hexagon socket screws with claw B fixing LC bracket, and remove the LC bracket..
9. Remove two hexagon socket screws with claw C fixing the load cell, and remove the load cell from LC base. Also remove the ferrite core.

WH HANGER/OPEN/CLOSE LEVER UNIT



DRIVE UNIT BASE

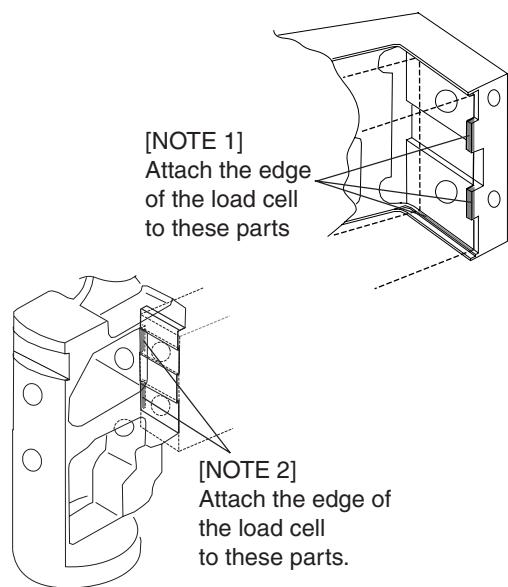
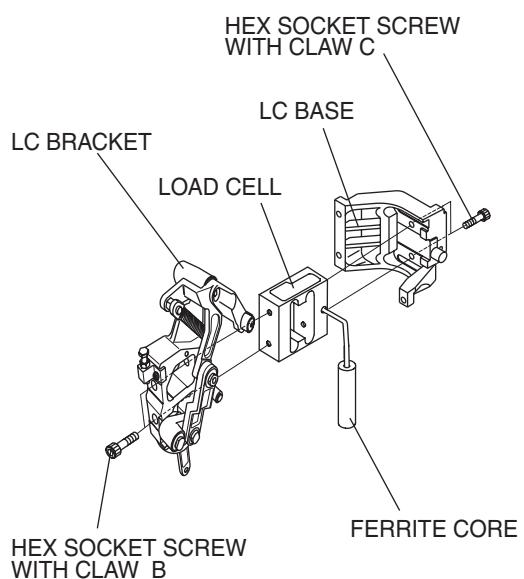


10. Fix the new load cell to LC base by two hexagon socket screws with claw C as in the right figure. (*Follow the instruction in Note 1.)

11. Fix LC bracket to the load cell by two hexagon socket screws with claw B as in the right figure. (Follow the instruction in Note 2.)

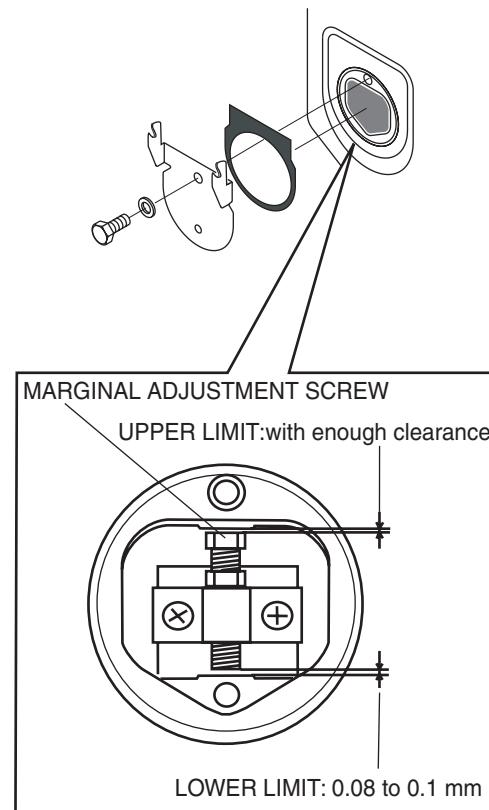
NOTE

In tightening the hexagon socket screw with claw, note that no force more than 6kg is applied on the load cell.

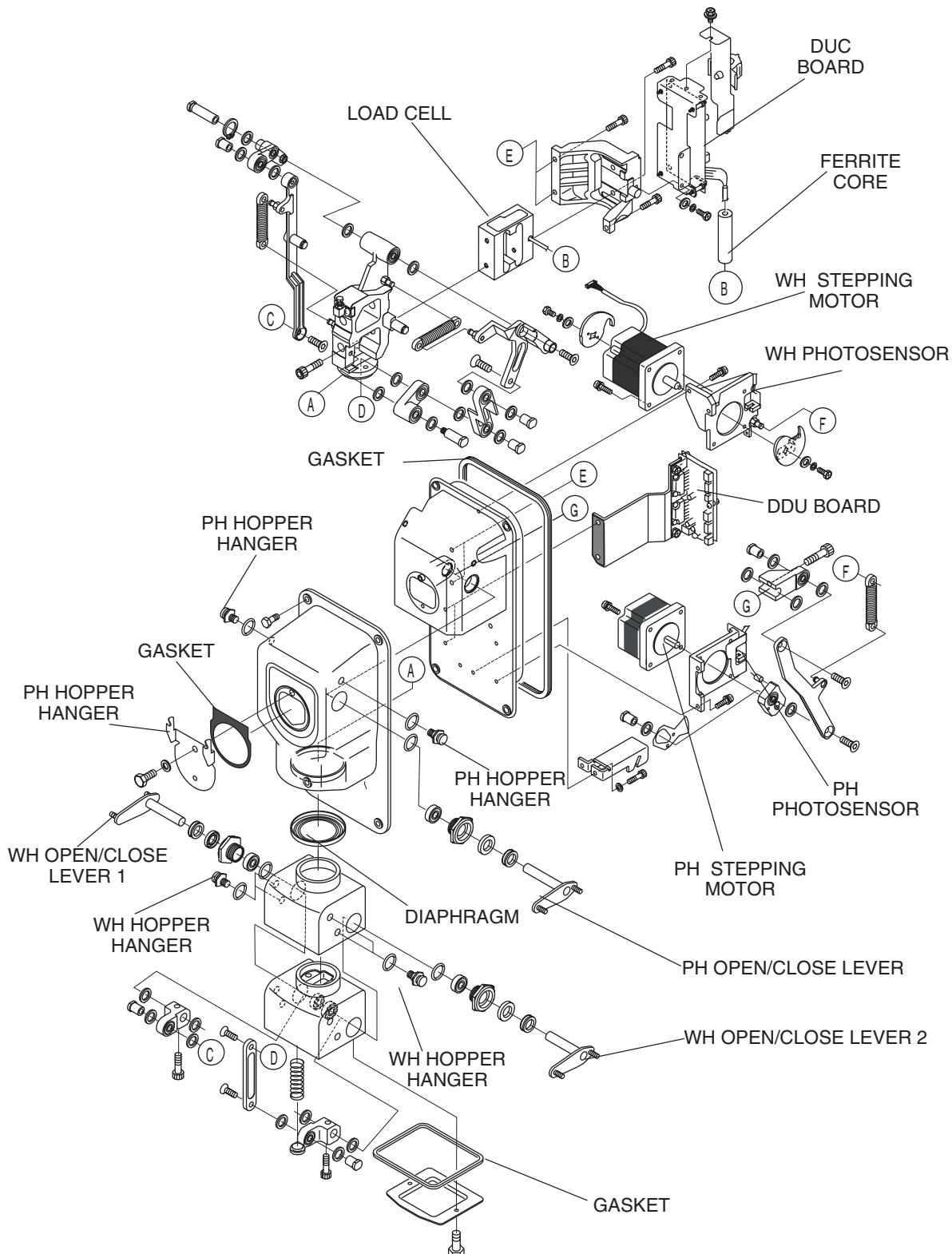


12. Assemble each part in the reverse step from the above 1 to 7.

13. Finally, as in the right figure, by thickness gauge, adjust the marginal adjustment screw;
Upper limit: with enough clearance
Lower limit: 0.08 to 0.1mm

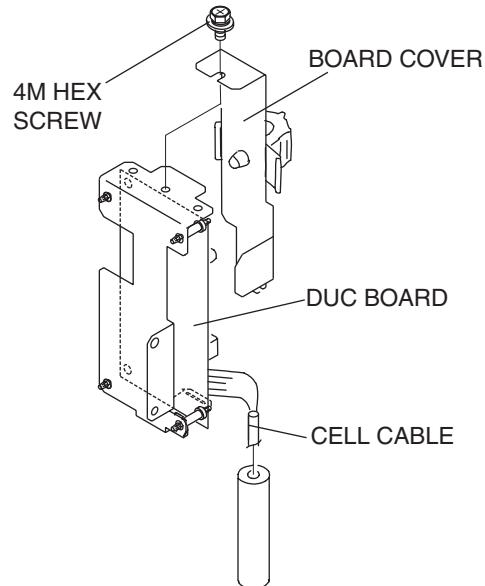


2.5.3 Exploded View of Weigh/Drive Unit for Model R-216B-D/20.30

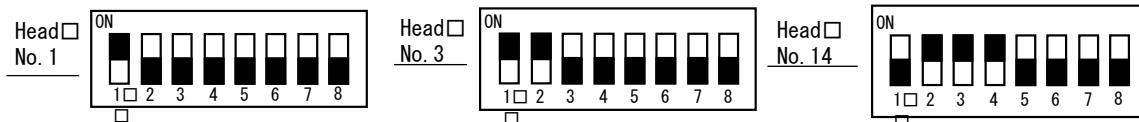
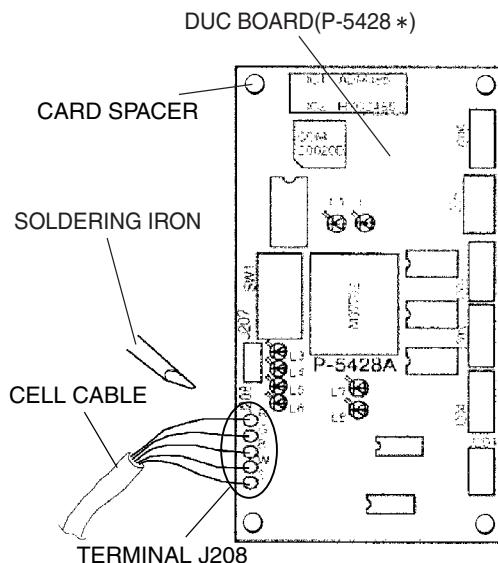


2.5.3.1 Replacing DUC Board (P-5428*)

1. Remove the 4M hexagonal screw, and remove the board cover.
2. Remove the cable connector (J202PH/J203WH) on DUC board.
3. Remove the soldering of the terminal J208 for the cell cable on DUC board.



4. Remove DUC board from four card spacers.
5. Attach the new DUC board to the card spacers and assemble it by the reverse step from the above 1 to 3.
6. Set SW1(Dip SW) on DUC board to the original head No. by binary number. (The following is the setting example.)



NOTE

In soldering the cell cable to the terminal J208, securely connect them by soldering iron. Poor connection may prevent the weight indication from being stabilized.

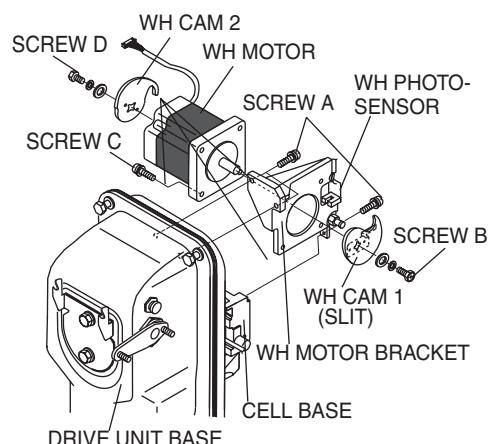
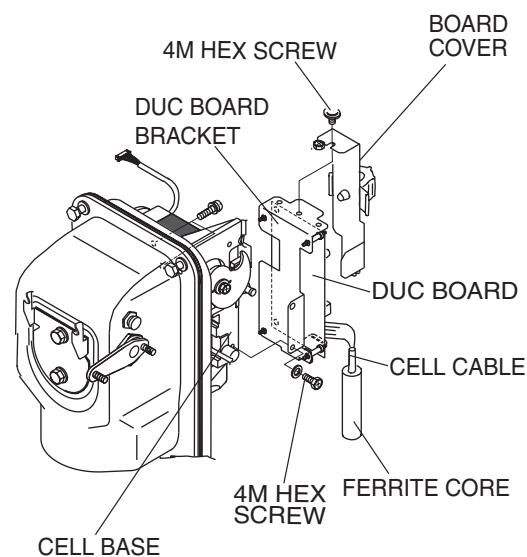
2.5.3.2 Replacing WH (Stepping) Motor

1. Remove the 4M hexagonal screw, and remove the board cover.
2. Remove the 4M hexagonal screw, and remove DUC board bracket (The step screw attaches PH extension spring).

NOTE

Remove the DUC board bracket from the cell base carefully not to cut the cell cable.

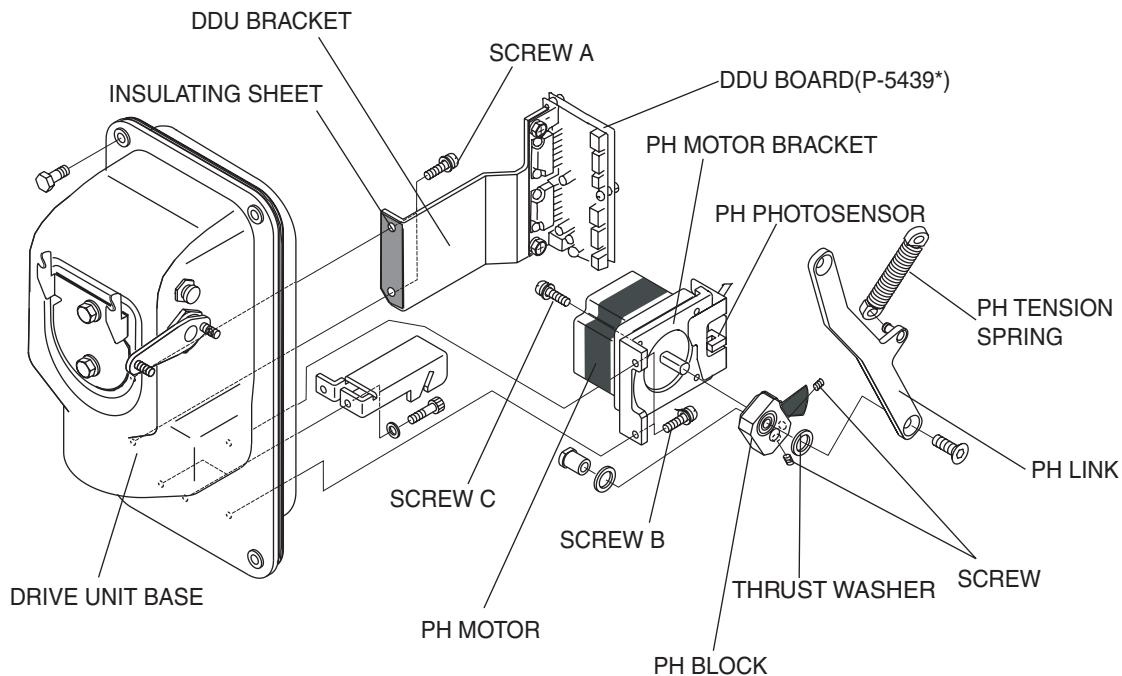
3. Disconnect WH photosensor cable connector and WH motor cable connector from DDU board.
4. Remove two screws A fixed to the drive unit base and the screw A fixed to the cell base, and remove WH motor bracket.
5. Remove the screw B fixed to the WH motor axis, and remove the WH cam 1 (with slit).
6. Remove the screw D fixed to the WH motor axis which is the opposite side of (5), and remove the WH cam 2.
7. Remove four screws C fixing WH motor, and remove WH (stepping) motor from WH motor bracket.
8. Attach the new WH (stepping) motor by the reverse step from the above 1 to 7.



NOTE

In fixing the WH cam 1 (with slit) to the WH motor axis, adjust the position so that the slit comes to the center of WH photosensor. Check that there is approximately 1mm gap between WH cam 1 and WH 1 open/close cam follower. Attach the WH cam 2 in correct orientation. Check that there is approximately 1mm gap between WH cam 2 and WH 2 open/close cam follower.

2.5.3.3 Replacing PH (Stepping) Motor



1. Remove the 4M hexagonal screw, and remove the board cover.
2. Remove PH tension spring.
3. Disconnect PH photosensor cable connector and PH motor cable connector from DDU board (P-5439*).
4. Remove two screws A fixing DDU bracket, and remove DDU bracket. (Other cables need not to be disconnected; when disconnected, put them into the same position.)
5. Loosen two screws of PH block fixed to PH motor axis (with the slit and the PH link attached).

TIP

Since the screws are applied with coatings to prevent loosening, sometimes it is hard to remove them. In that case, heat the screws.

6. Remove two screws B fixing PH motor bracket to the drive unit base, and remove PH motor bracket.

7. Remove four screws C fixing PH motor, and remove PH (stepping) motor from PH motor bracket.
8. Attach the new PH (stepping) motor by the reverse step from the above 1 to 7.

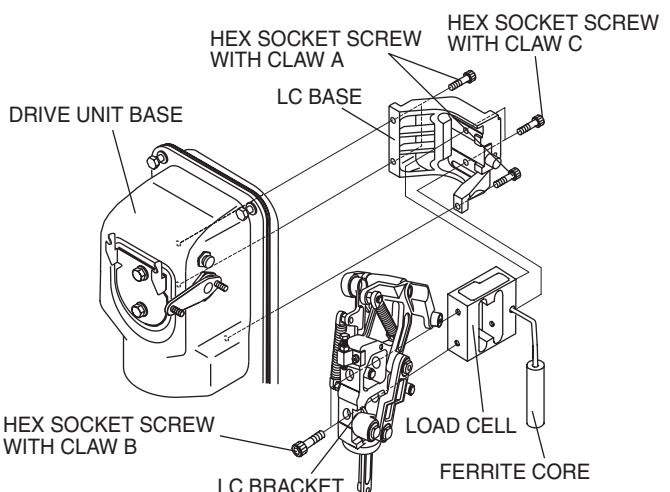
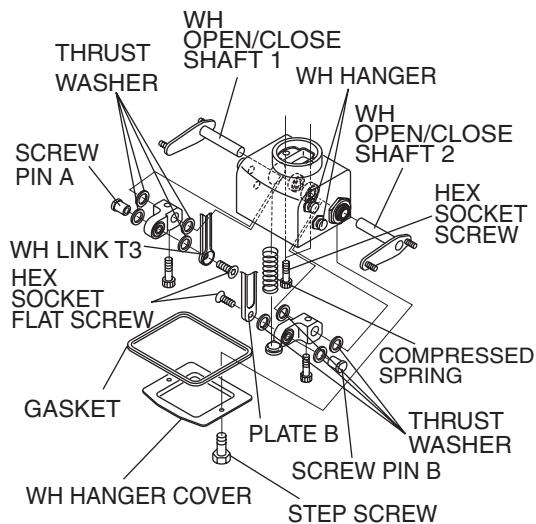
NOTE

In fixing PH block to PH motor axis, adjust it so that the screws come to the "necked" part of the axis. Also fix the slit so that it comes to the center of PH photosensor.

2.5.3.4 Replacing Load Cell

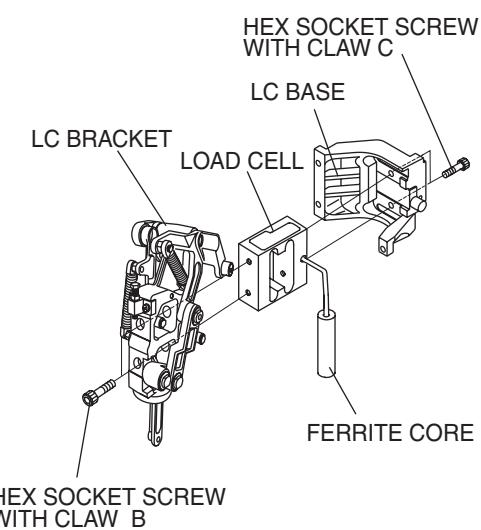
1. Remove DUC board by the same step with 2.5.3.1 Replacing DUC Board (P-5428*)
2. Remove WH motor bracket (with WH motor) by the same step with 2.5.3.2 Replacing WH (Stepping) Motor
3. Loosen two step screws and remove WH hanger cover.
4. Remove the compressed spring.
5. Fix the screw pin A and B with a spanner (No. 10), and remove two hexagon socket flat screws.
6. Remove two cap screws fixing WH hanger and open/close lever unit to the LC bracket, and remove WH hanger and open/close lever unit.
7. Take out the whole assembly of LC bracket, load cell, and LC base by removing three hex socket screws with claw A fixing LC base to the drive unit base.
8. Remove two hexagon socket screws with claw B fixing LC bracket, and remove LC bracket.
9. Remove two hexagon socket screws with claw C fixing the load cell, and remove the load cell from LC base. Also remove the ferrite core.

WH HANGER/OPEN/CLOSE LEVER UNIT

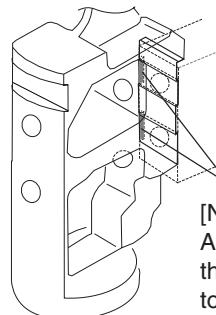


10. Fix the new load cell to LC base by two hexagon socket screw C with claw as in the right figure. (*Follow the instruction in Note 1.)

11. Fix LC bracket to the load cell by two hexagon socket screw B with claw as in the right figure. (Follow the instruction in Note 2.)



[NOTE 1]
Attach the edge
of the load cell
to these parts



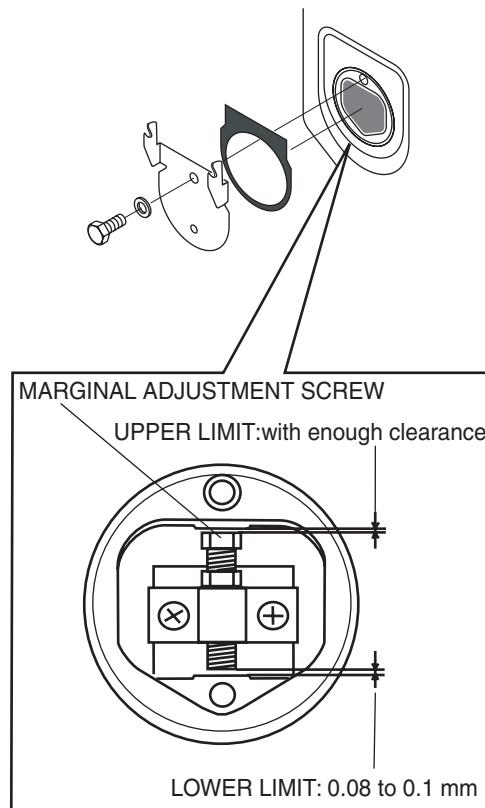
[NOTE 2]
Attach the edge of
the load cell
to these parts.

NOTE

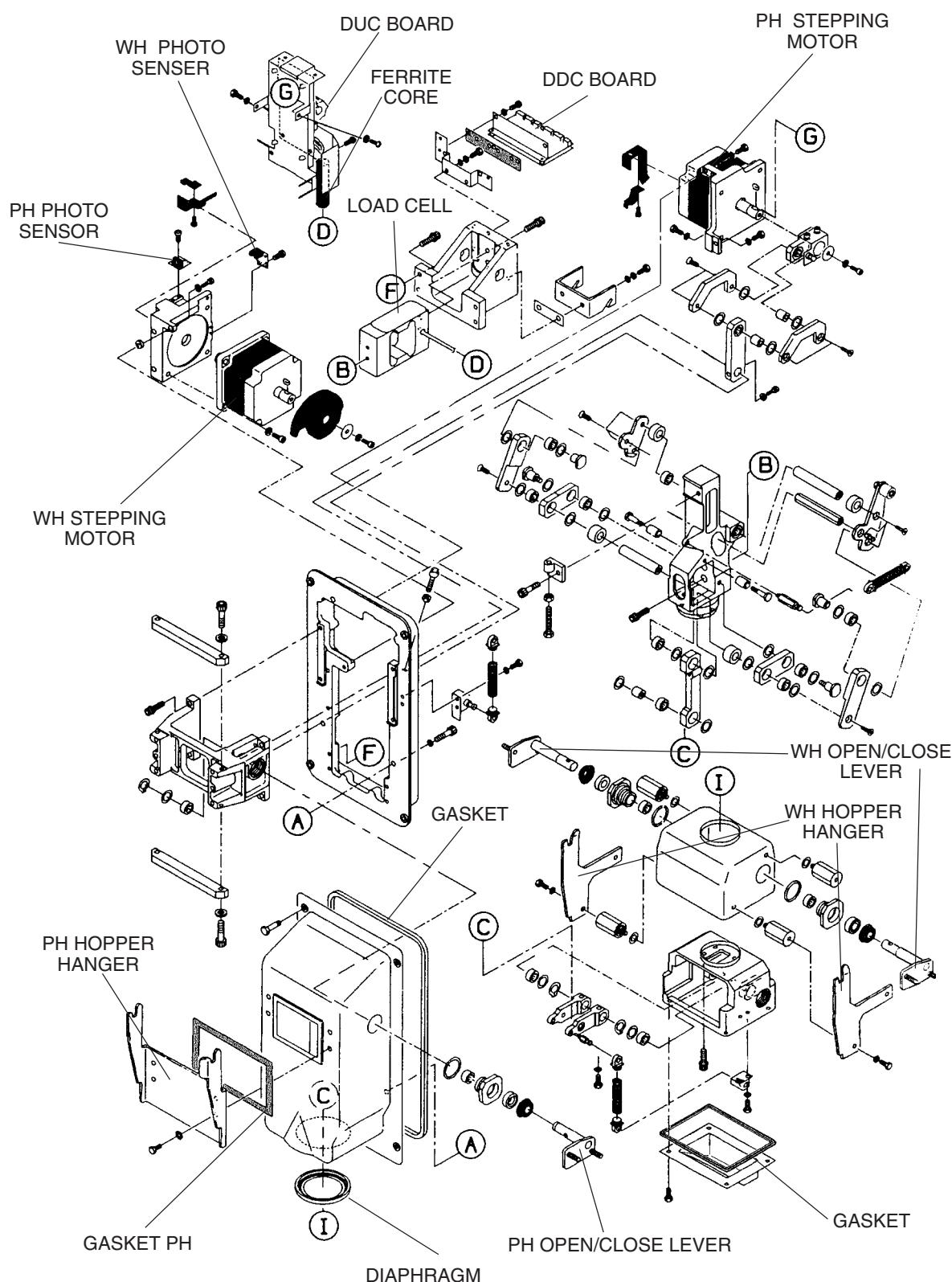
In tightening the hexagon socket screw with claw, note that no force more than 6kg is applied on the load cell.

12. Attach each part by the same step shown in the above 1 to 7.

13. Finally, as in the right figure, by thickness gauge, adjust the marginal adjustment screw;
Upper limit: with enough clearance
Lower limit: 0.08 to 0.1mm

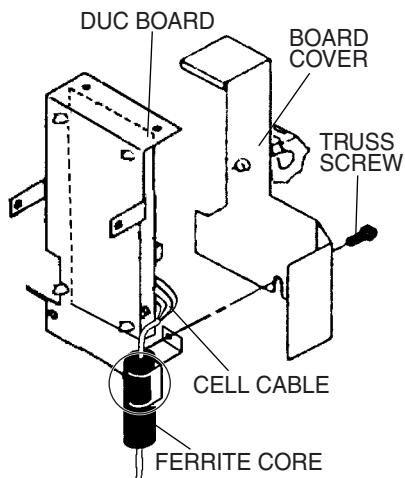


2.5.4 Exploded view for weigh/drive unit of model R-214W-S/70



2.5.4.1 Replacing DUC board (P-5428*)

1. Remove the truss screw, and remove the board cover.
2. Disconnect the cable connector (J202PH/J203WH) on DUC board.
3. Remove the soldering of the terminal J208 for the cell cable on DUC board.



4. Remove DUC board from four card spacers.
5. Attach the new DUC board to the card spacers, and assemble by the same step shown in the above 1 to 3.
6. Set SW1 (Dip SW) on DUC board to the original head No. by binary number. (The following is the setting example.)

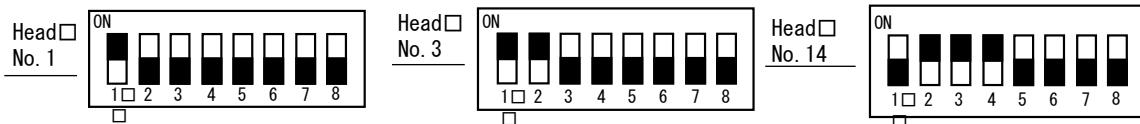
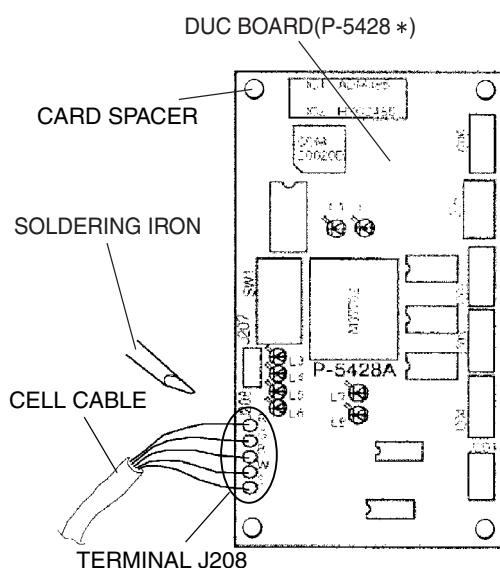


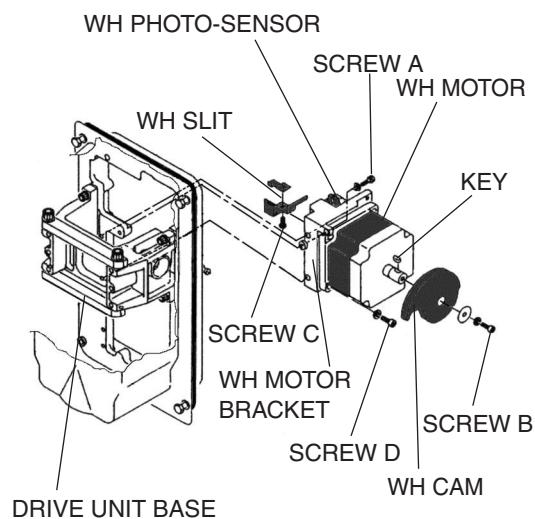
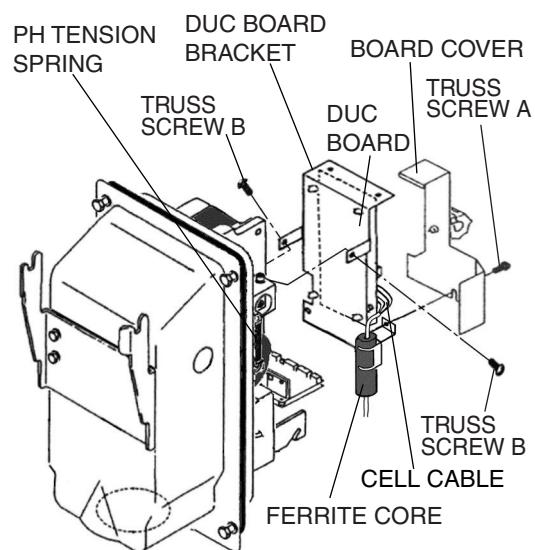
Figure 2-6 Setting example

NOTE

In soldering the cell cable to the terminal J208, securely connect them by soldering iron. Poor connection may prevent the weight indication from being stabilized.

2.5.4.2 Replacing WH (Stepping) Motor

1. Remove the truss screw A, and remove the board cover.
2. Remove two truss screws B and remove DUC board bracket.
3. Remove the PH tension spring.
4. Disconnect the PH photosensor, WH photosensor, and WH motor cable connector from the DDU board (P-5439 *).
5. Remove three bracket fixing screws A of the WH motor bracket fixed to the drive unit base and remove the motor bracket. (The WH cam and slit must be kept attached.)
6. Remove the screw B fixed to the WH motor axis, and remove the WH cam.
7. Remove the screw C fixed to the WH motor axis which is the opposite side of (6), and remove the WH slit.
8. Remove four screws D fixing WH motor, and remove WH (stepping) motor from WH motor bracket.

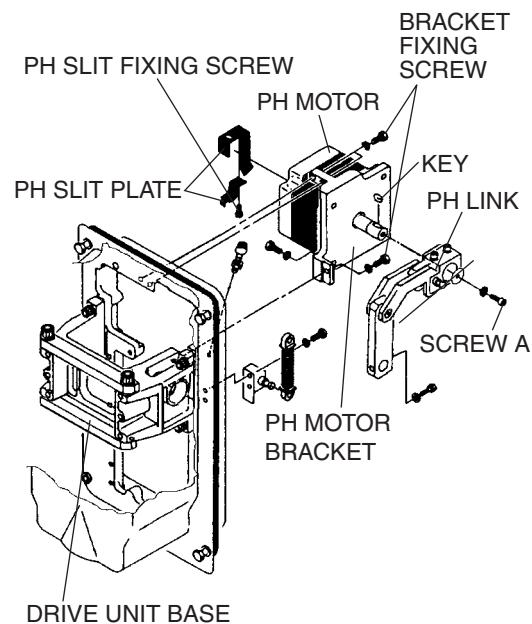
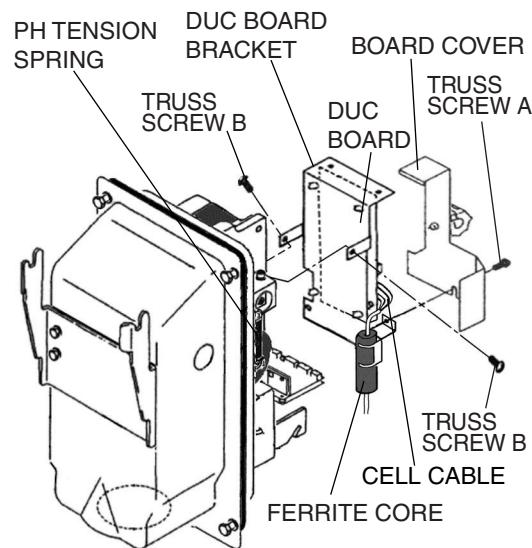


NOTE

In fixing the WH cam to the WH motor axis, adjust it so that the WH cam concave part comes to the key part of axis. Also adjust the convex part of slit to the concave part of axis and fix it so that the slit comes to the center of WH photosensor.

2.5.4.3 Replacing PH (Stepping) Motor

1. Remove the truss screw A, and remove the board cover.
2. Remove two truss screws B, and remove the DUC board bracket.
3. Remove the PH tension spring.
4. Disconnect the PH motor cable connector from the DDU board (P-5439 *).
5. Remove the PH link fixing screw A, and remove the PH link from the PH motor axis.
6. Remove three bracket fixing screws of PH motor bracket fixed to the drive unit base, and remove the motor bracket. (The slit must be kept attached.)
7. Remove the PH slit fixing screw and remove the PH slit plate from the PH motor axis.
8. Remove four screws B fixing PH motor, and remove PH (stepping) motor from PH motor bracket.
9. Attach the new PH (stepping) motor by the reverse step from the above 1 to 8

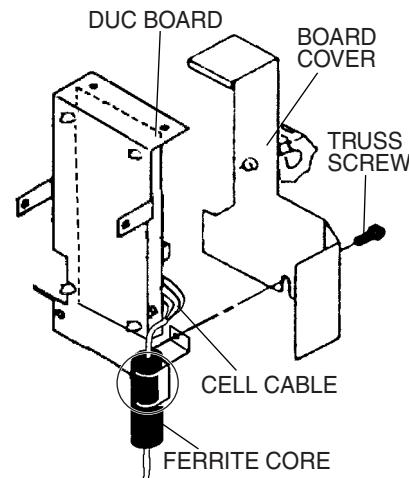


NOTE

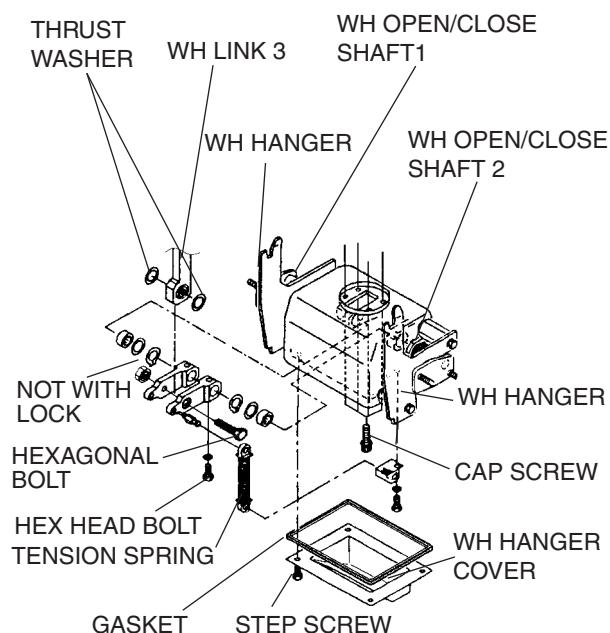
In fixing the PH link to the PH motor axis, adjust the position so that the concave part of the PH link comes to the key part of axis. Also adjust the convex part of slit to the concave part of axis, and fix it so that the slit comes to the center of PH photosensor.

2.5.4.4 Replacing Load Cell

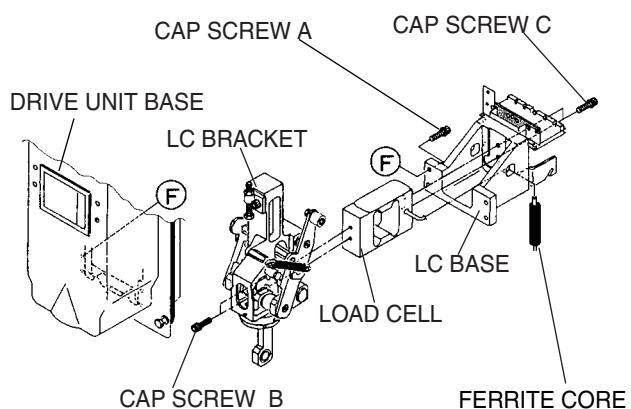
1. Remove DUC board by the same step shown in 2.5.4.1 Replacing DUC board (P-5428*). Open two claws that fix the ferrite core with the mark "O" in the right figure, so that the load cell can be easily taken out.
2. Remove WH motor bracket (with WH motor) by the same step shown in 2.5.4.2 Replacing WH (Stepping) Motor
3. Remove the PH motor bracket (with PH motor) in the same step shown in 2.5.4.3 Replacing PH (Stepping) Motor.



4. Loosen four step screws in the right figure, and remove WH hanger cover.
5. Remove the tension spring.
6. Fixing the hexagonal bolt with a spanner, remove the nut with lock, and remove WH link 3.
7. Remove four cap screws fixing WH hanger and open/close lever unit to the LC bracket, and remove WH hanger and open/close lever unit.



8. Take out the whole assembly of LC bracket, load cell, and LC base by removing four cap screws A fixing LC base to the drive unit base.
9. Loosen two cap screws B fixing LC bracket, and remove LC bracket.
10. Remove two cap screws C fixing the load cell, and remove the load cell from LC base. Also remove the ferrite core.

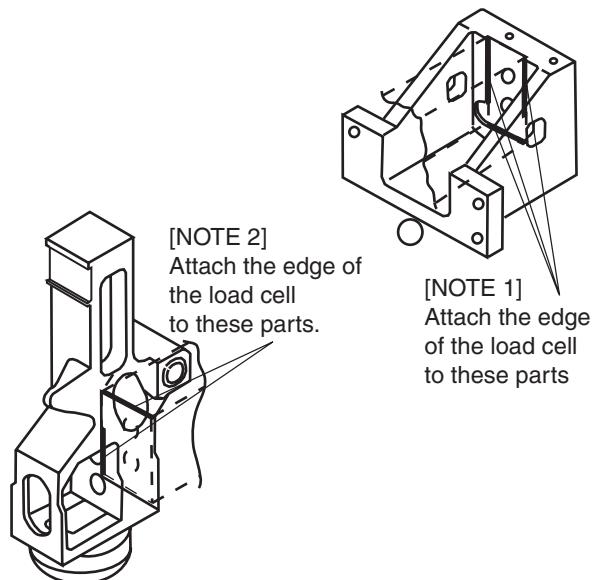
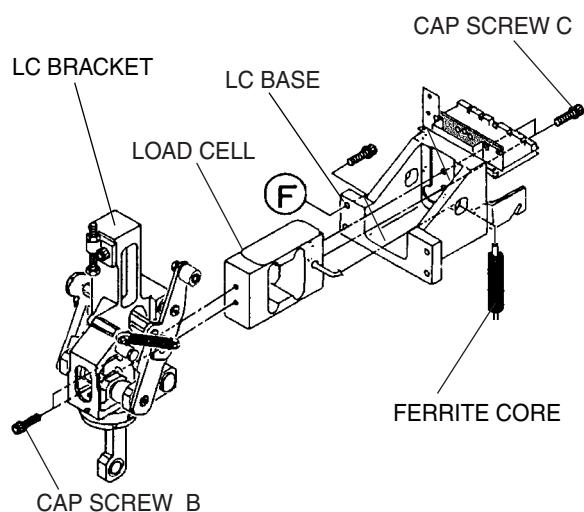


11. Fix the new load cell to LC base by two cap screws C as in the right figure. (*Follow the instruction in Note 1.)

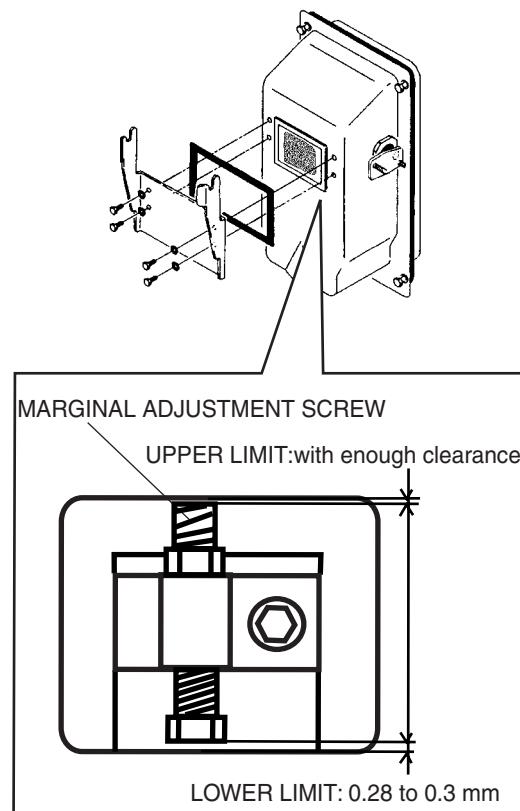
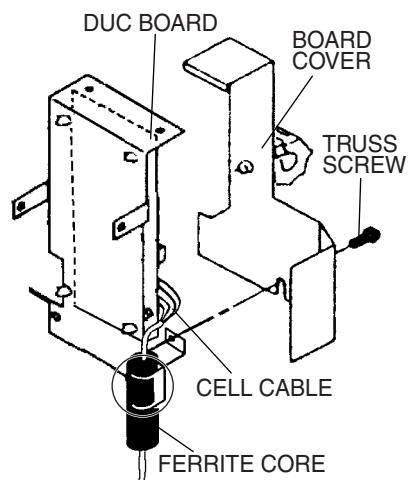
12. Fix LC bracket to the load cell by two cap screws B as in the right figure. (Follow the instruction in Note 2.)

NOTE

In tightening the cap screws, note that no force more than 24kg is applied on the load cell.

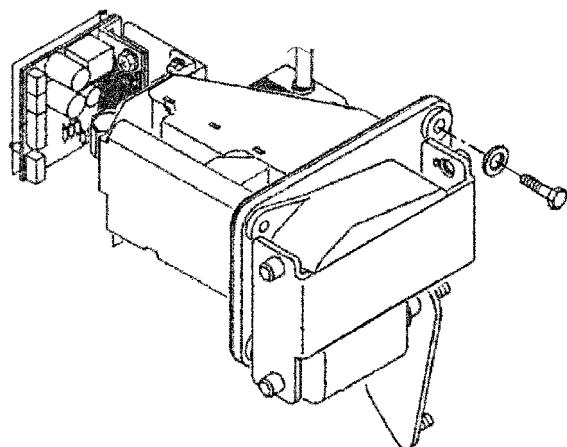


13. Hold two claws marked "O" as shown in the right figure to fix the ferrite core; by this, the cell cable is fixed.
14. Attach each part by the same step shown in the above 1 to 8
15. Finally, as in the right figure, by thickness gauge, adjust the marginal adjustment screw;
Upper limit: with enough clearance
Lower limit: 0.28 to 0.3mm

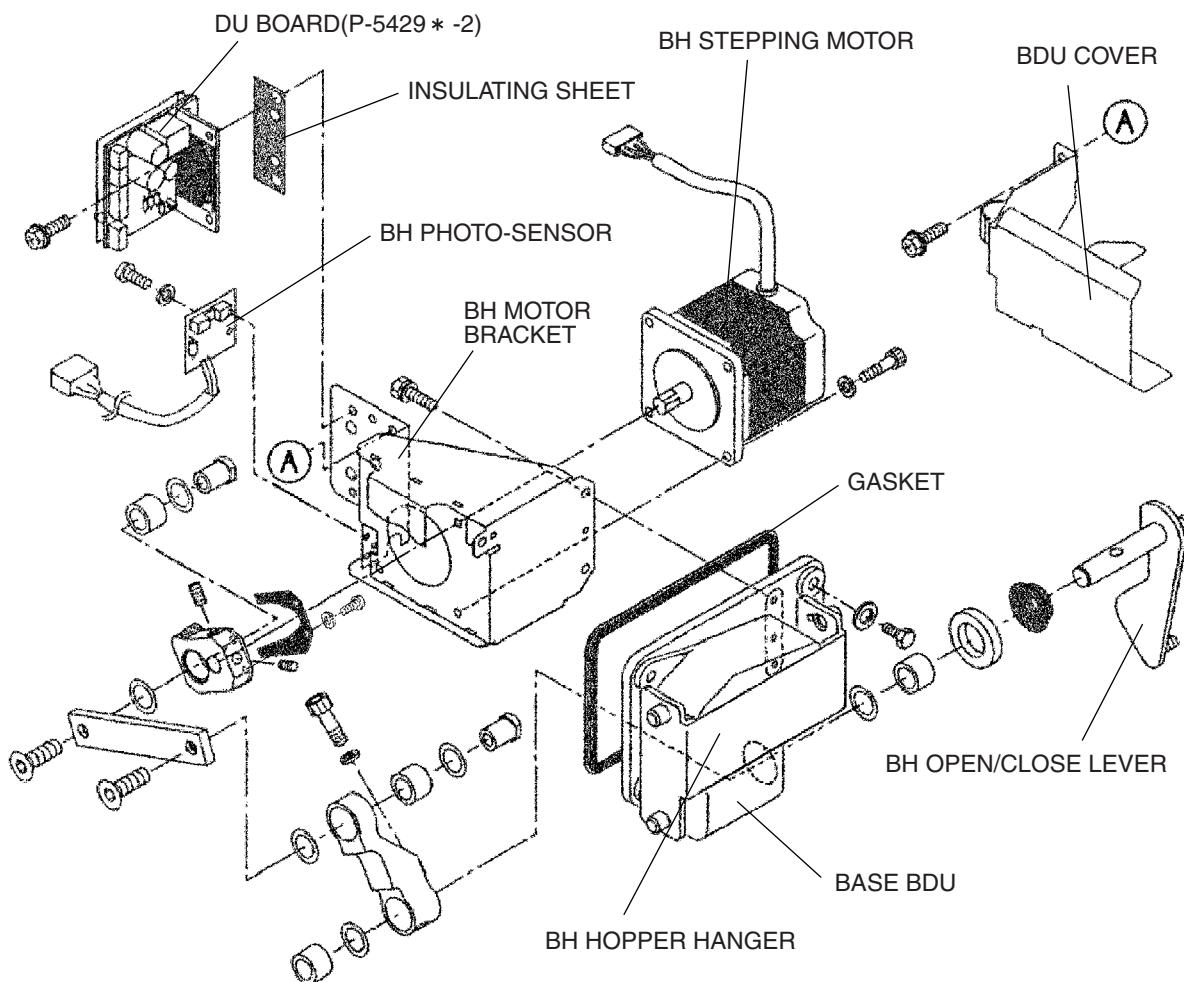


2.6 BH Drive Unit

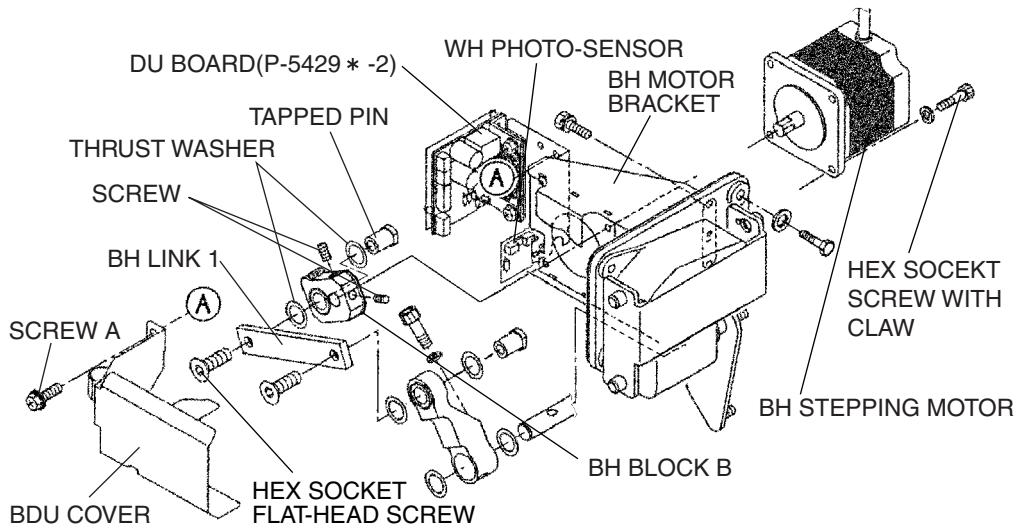
2.6.1 Appearance of BH Drive Unit



2.6.2 Exploded View of BH Drive Unit for Model R-216B-D/20.30



2.6.3 Replacing BH (Stepping) Motor



1. Loosen the screw A, and remove BDU cover.
2. Fix the screw pin fixing BH link 1 to BH block, loosen the hexagonal socket flat-head screw at the reverse side, to remove BH link 1.

TIP

Since the screws are applied with coatings to prevent loosening, sometimes it is hard to remove them. In that case, heat the screws.

3. Loosen two screws of BH block B, and remove BH block B.

NOTE

BH block is attached with the slit for BH photosensor; remove it carefully not to damage BH photosensor.

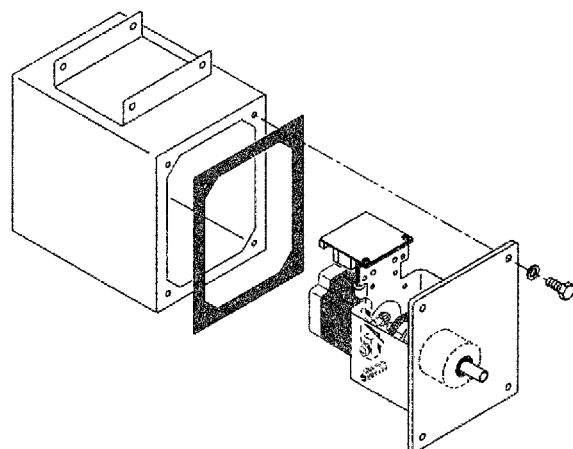
4. Disconnect BH motor cable connector from DU board (P-5429*-2).
5. Remove four hexagon socket screws with claw fixing BH stepping motor to BH motor bracket, and remove BH stepping motor.
6. Prepare a new BH stepping motor, and attach each part in the reverse step from the above 1 to 5.

NOTE

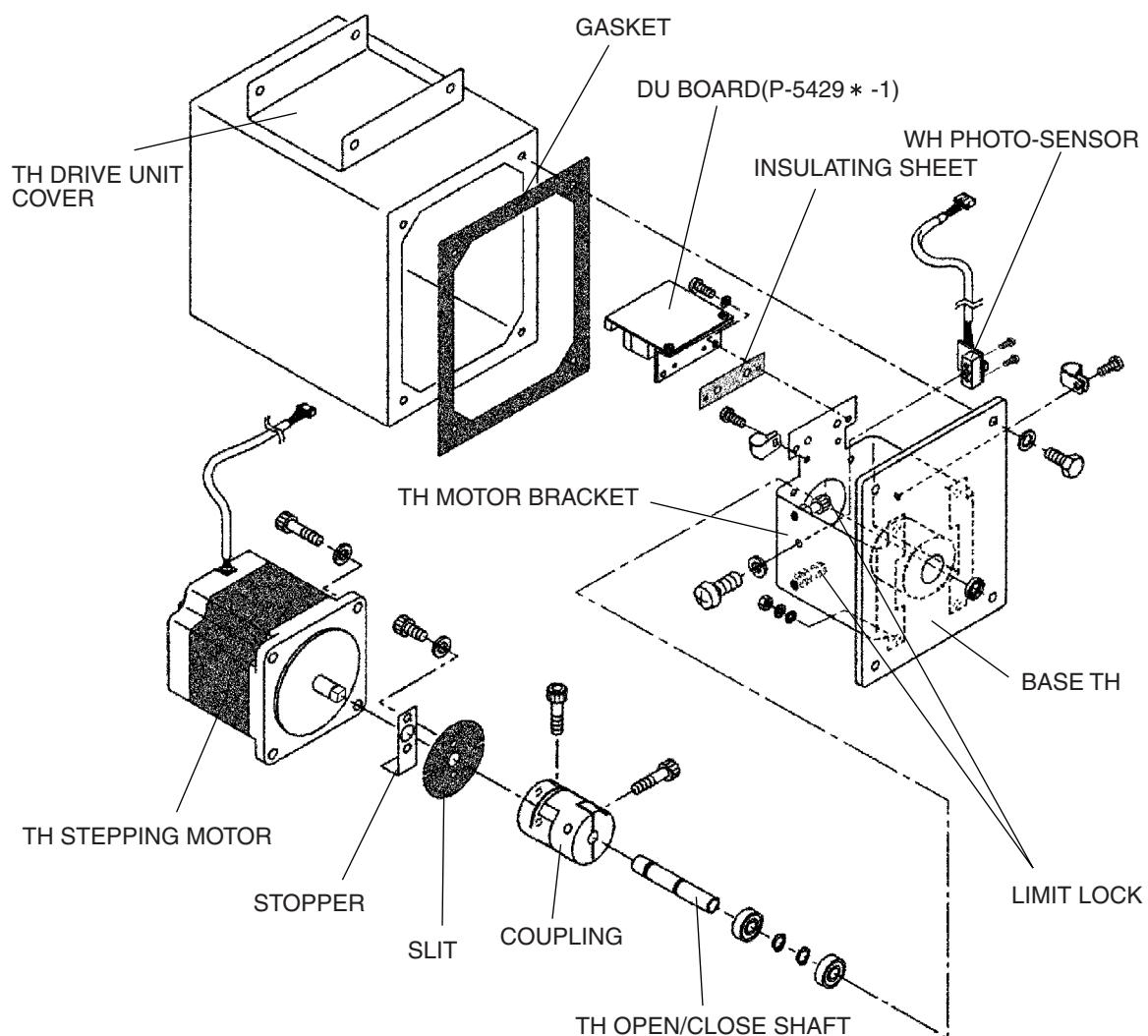
In fixing BH block to BH motor axis, adjust it so that the screws come to the "necked" part of the axis. Also fix the slit so that it comes to the center of BH photosensor.

2.7 TH Drive Unit (Optional)

2.7.1 Appearance of TH Drive Unit



2.7.2 Exploded View of TH Drive Unit



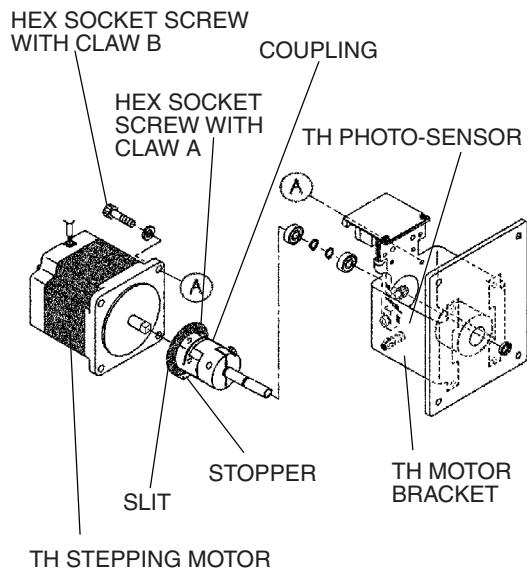
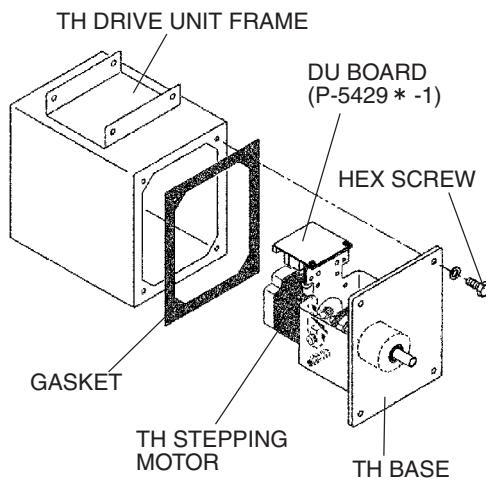
2.7.3 Replacing TH (Stepping) Motor

1. Remove four hexagon screws fixing TH base to the TH drive unit frame, and remove the TH drive unit.

NOTE

The interlock cable from the main body is connected to DU board; carefully take out TH drive unit to avoid any damage.

2. Loosen the hexagon socket screw with claw A.
3. Disconnect TH motor cable connector from DU board (P-5429*-1).
4. Loosen four hexagonal socket screws with claw B, and remove TH stepping motor from TH motor bracket.
5. Prepare a new TH stepping motor, and attach it by the reverse step of the above step 1 to 4.



NOTE

In fixing the coupling to TH motor axis, adjust it so that the positions of the part "necked squarely," the stopper, and the slid are the same with that in the condition before the replacement. Fix the coupling so that the slit is at the center of TH photosensor.

3 ELECTRICAL COMPONENTS

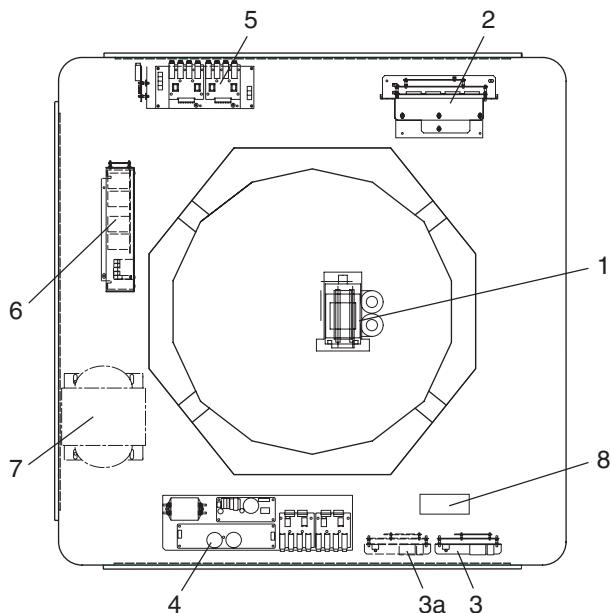
3.1 Electrical Unit Configuration	3-1
3.1.1 CCW-R-214W-S/20.30	3-1
3.1.2 CCW-R-216B-D/20.30	3-2
3.1.3 CCW-R-214W-S/70	3-3
3.1.4 Hardware Block Diagram for model CCW-R-2XXX	3-4
3.2 BLOCK DIAGRAM.....	3-5
3.2.1 CCW-R-214W-S.....	3-5
3.2.2 CCW-R-216B-D	3-6
3.3 Remote Control Unit Block Diagram.....	3-7
3.4 Remote Control Unit.....	3-8
3.4.1 RCU Board (P-970*).....	3-9
3.4.2 TP-I/F Board (P-5573*).....	3-20
3.4.3 Printer unit	3-20
3.4.3.1 Thermal printer (SAM-4245-10K)	3-21
3.4.4 Camera selection board (P-5582 *) [Option]	3-22
3.5 CAL UNIT.....	3-24
3.5.1 WCU BOARD (P-5561*).....	3-25
3.5.2 ADC BOARD (P-5576*).....	3-35
3.5.3 DMU BOARD (P-5562*).....	3-37
3.6 Main Electrical Unit.....	3-44
3.6.1 FDRV Board (P-5578*).....	3-45
3.6.2 FDC Board (P-5532*)	3-46
3.6.3 Cautions for FDRV board (P-5578 *) replacement	3-47
3.7 Relay unit.....	3-48
3.7.1 EXC Board (P-5426*)	3-49
3.7.2 Relay Board (P-5506*)	3-50
3.8 PS-0 Unit	3-53
3.8.1 AC FUSE BOARD (P-5507 *)	3-54
3.9 PS-2 Unit	3-55
3.9.1 DC FUSE BOARD (P-5508*)	3-56
3.10 Feeder PS unit.....	3-57
3.10.1 Feeder power supply board (P-5580 *) (P-5581 *)	3-59
3.11 Weigh/Drive Unit.....	3-60

3.11.1 DUC Board (P-5428*).....	3-60
3.11.2 DDU Board (P-5439*).....	3-60
3.12 AFV Unit	3-61
3.12.1 AFV Preamp Board (P-5488*)	3-61
3.13 Other Boards / Optional Unit.....	3-62
3.13.1 Preamp Board (P-5435*) [for the dispersion feeder load cell] ..	3-62
3.13.2 DU Board (P-5429*)	3-62
3.13.3 Photosensor board (P-5207*).....	3-63
3.13.4 Diagram of dispersion camera relay unit (Option)	3-64

3 Electrical Components

3.1 Electrical Unit Configuration

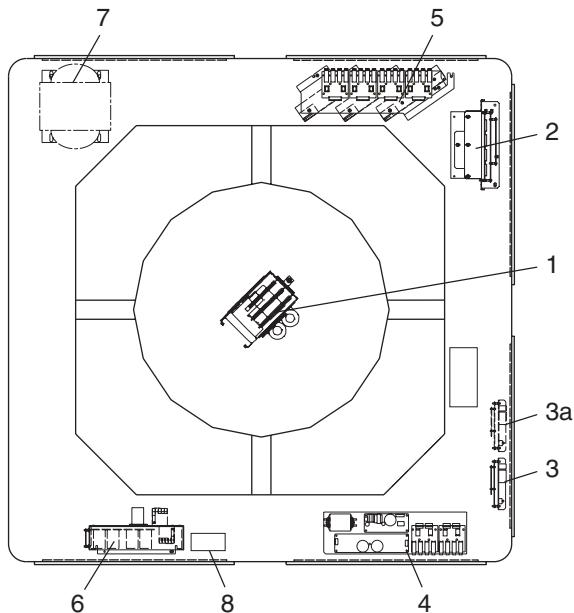
3.1.1 CCW-R-214W-S/20.30



No.	Name
1	MAIN ELECTRICAL UNIT (HUB BOARD(P-5535*), MPS BOARD(P-5436*), FDC BOARD(P-5532*), FDRV BOARD(P-5578*))
2	CAL UNIT (WCU BOARD(P-5561*), ADC BOARD(P-5576*), DMU BOARD(P-5562*))
3	RELAY UNIT (EXC BOARD(P-5426*), RELAY BOARD(P-5506*))
3a	RELAY UNIT (option) (EXC BOARD(P-5426*), RELAY BOARD(P-5506*))
4	PS-0 UNIT (AC FUSE BOARD(P-5507*), Switching Power Supply Unit(24V DC), 2 units for RCU, Relay unit)
5	PS-2 UNIT (DC FUSE BOARD(P-5508*)), Switching Power Supply Unit(39V DC)
6	PS feeder UNIT (FPS BOARD(P-5580*)), Switching Power Supply Unit(12V DC)
7	Transformer Unit (Optional)
8	DISPERSION CAMERA RELAY UNIT (OPTION)

*The number of board in use may differ according to the specifications.

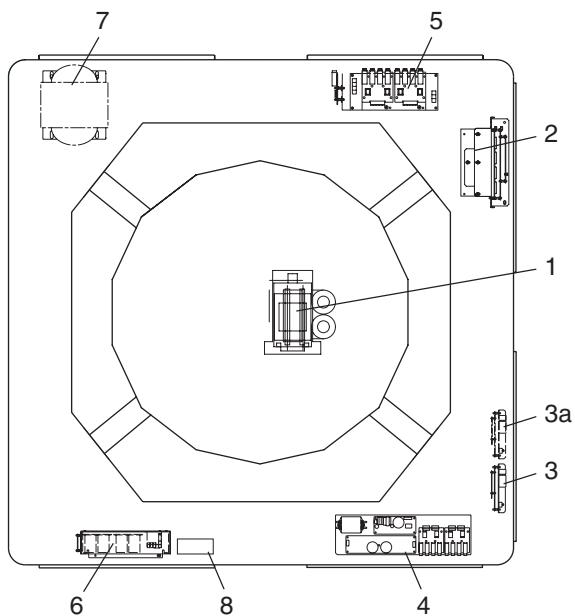
3.1.2 CCW-R-216B-D/20.30



No.	Name
1	MAIN ELECTRICAL UNIT (HUB BOARD(P-5535*), MPS BOARD(P-5436*), FDC BOARD(P-5532*), FDRV BOARD(P-5578*))
2	CAL UNIT (WCU BOARD(P-5561*), ADC BOARD(P-5576*), DMU BOARD(P-5562*))
3	RELAY UNIT (EXC BOARD(P-5426*), RELAY BOARD(P-5506*))
3a	RELAY UNIT (option) (EXC BOARD(P-5426*), RELAY BOARD(P-5506*))
4	PS-0 UNIT (AC FUSE BOARD(P-5507*), Switching Power Supply Unit(24V DC), 2 units for RCU, Relay unit)
5	PS-2 UNIT (DC FUSE BOARD(P-5508*)), Switching Power Supply Unit(39V DC)
6	PS feeder UNIT (FPS BOARD(P-5580*, P-5581*)), Switching Power Supply Unit(12V DC)
7	Transformer Unit (Optional)
8	DISPERSION CAMERA RELAY UNIT (OPTION)

*The number of board in use may differ according to the specifications.

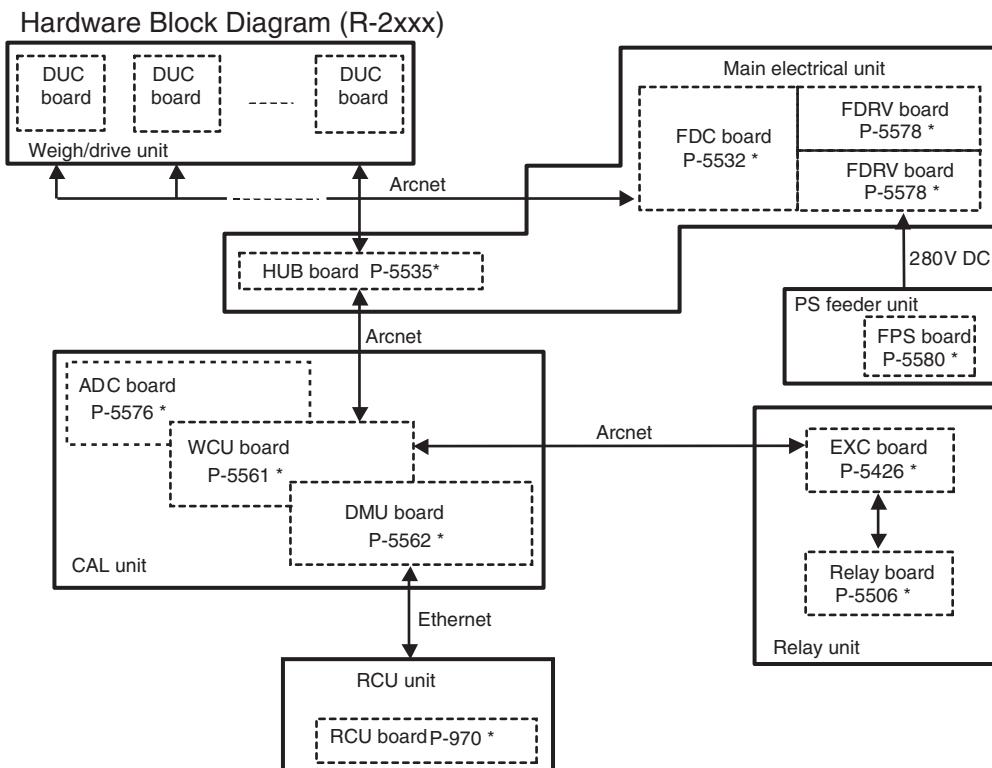
3.1.3 CCW-R-214W-S/70



No.	Name
1	MAIN ELECTRICAL UNIT (HUB BOARD(P-5535*), MPS BOARD(P-5436*), FDC BOARD(P-5532*), FDRV BOARD(P-5578*))
2	CAL UNIT (WCU BOARD(P-5561*), ADC BOARD(P-5576*), DMU BOARD(P-5562*))
3	RELAY UNIT (EXC BOARD(P-5426*), RELAY BOARD(P-5506*))
3a	RELAY UNIT (option) (EXC BOARD(P-5426*), RELAY BOARD(P-5506*))
4	PS-0 UNIT (AC FUSE BOARD(P-5507*), Switching Power Supply Unit(24V DC), 2 units for RCU, Relay unit)
5	PS-2 UNIT (DC FUSE BOARD(P-5508*)), Switching Power Supply Unit(39V DC)
6	PS feeder UNIT (FPS BOARD(P-5580*)), Switching Power Supply Unit(12V DC)
7	Transformer Unit (Optional)
8	DISPERSION CAMERA RELAY UNIT (OPTION)

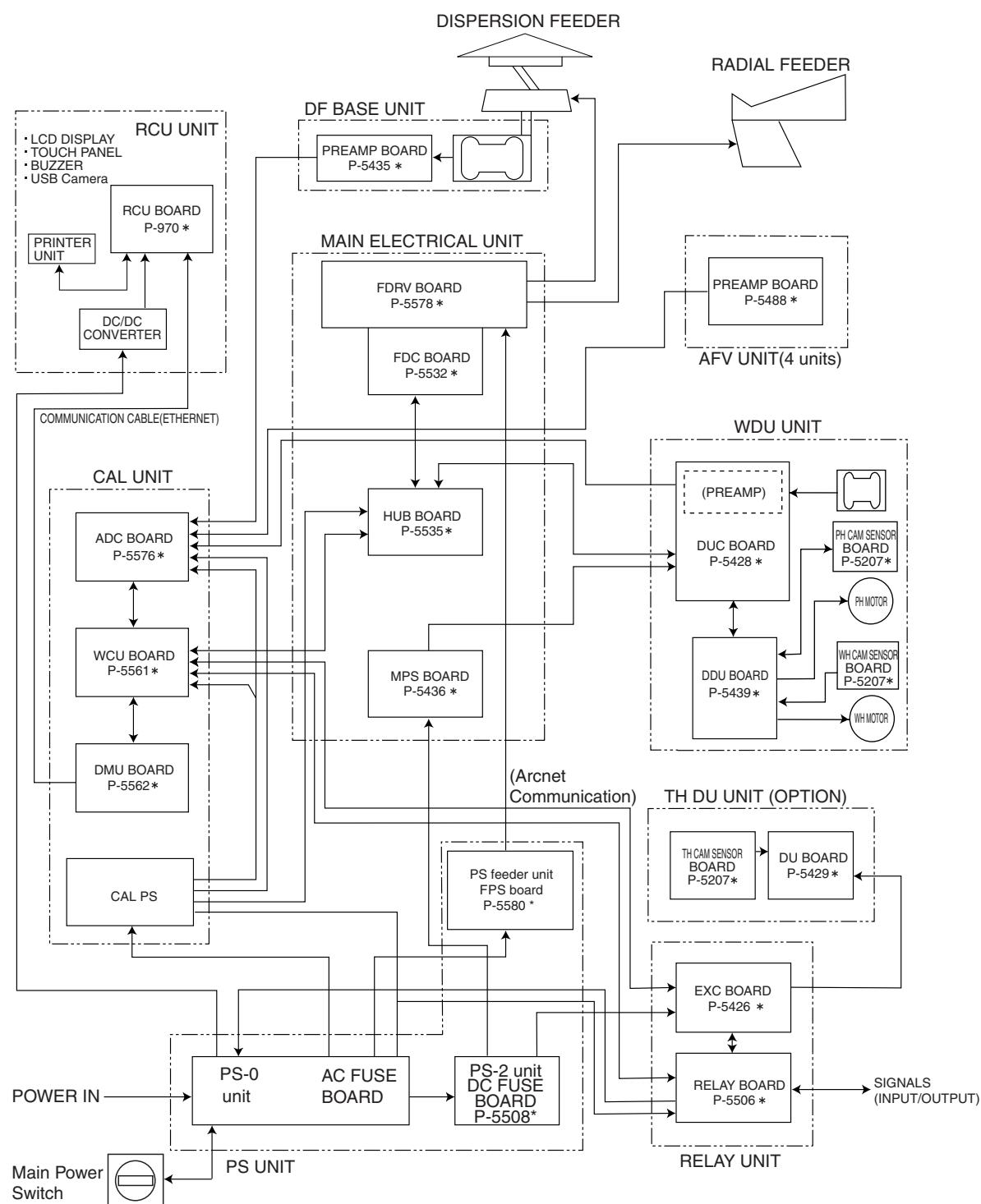
*The number of board in use may differ according to the specifications.

3.1.4 Hardware Block Diagram for model CCW-R-2XXX

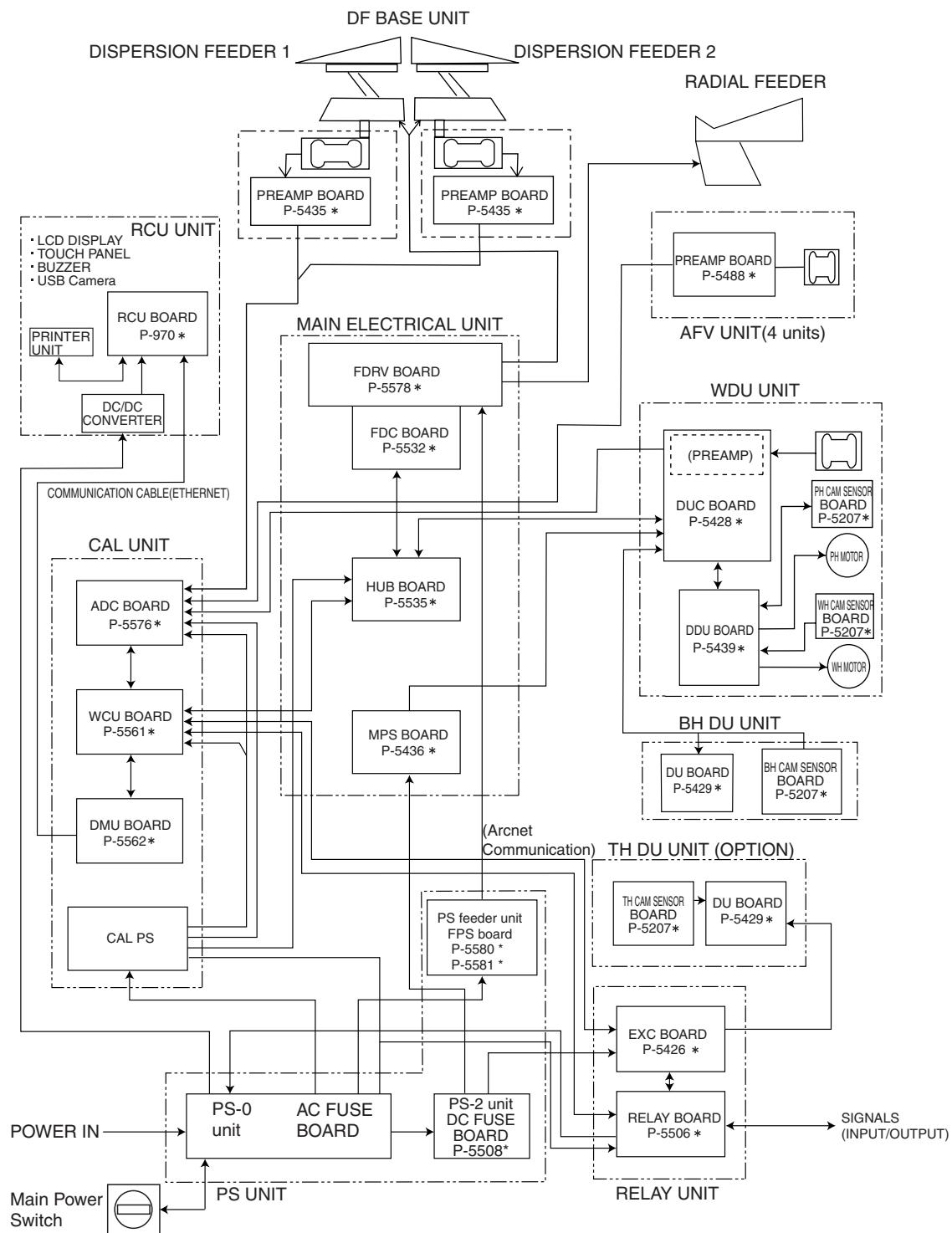


3.2 BLOCK DIAGRAM

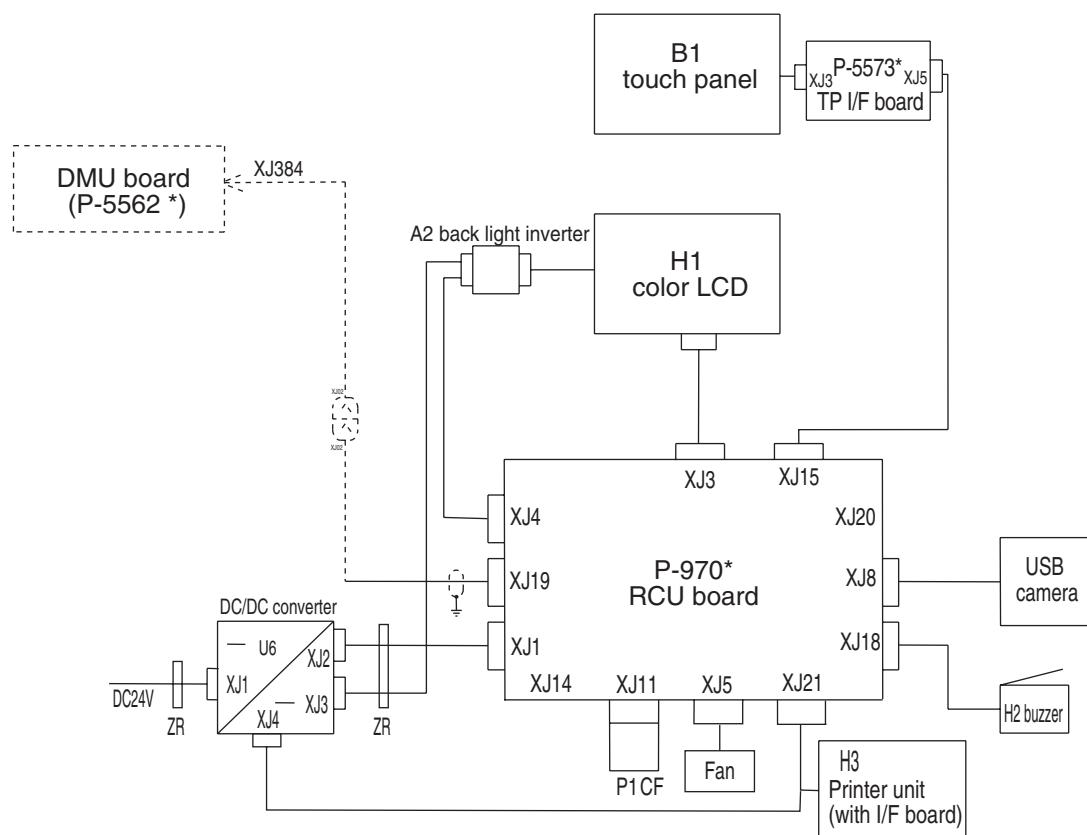
3.2.1 CCW-R-214W-S



3.2.2 CCW-R-216B-D

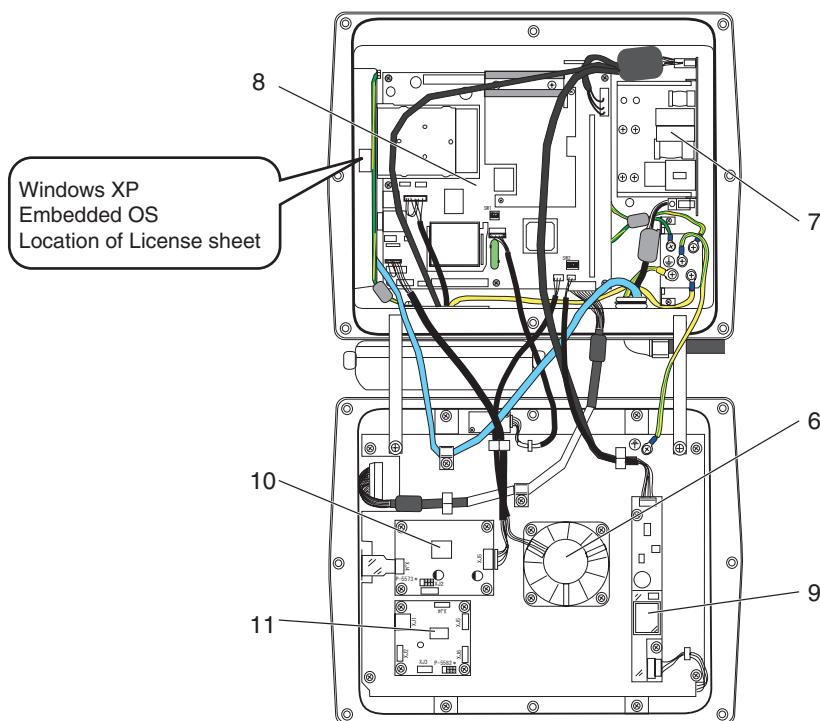
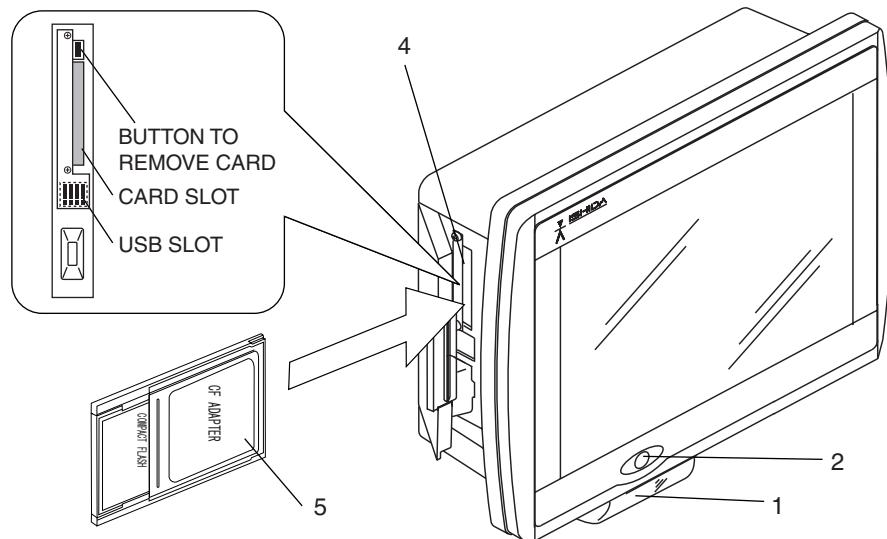


3.3 Remote Control Unit Block Diagram



Symbol	Name	Model No. / remarks	Manufacturer
A2	Back light inverter	CXA-P1212A-WJL	TDK
B1	Touch panel	KBT-12.1C2R-FM	KB electron
H1	Color LCD	AA121SL01	Mitsubishi Electric
P1	CF (Compact Flash)		
U6	DC/DC converter	YA4056-11049G1	
ZR	Ferrite	E04SR200932	Hagiwara Sys-com
H2	Buzzer		
H3	Printer unit	SAM-1245-10K	SEIKO

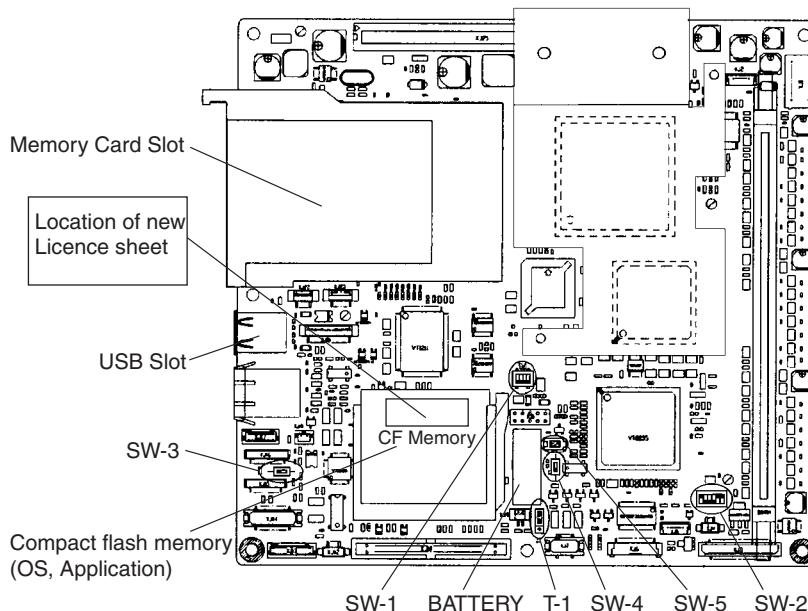
3.4 Remote Control Unit



No.	Name
1	PRINTER UNIT
2	USB CAMERA
3	TOUCH PANEL, COLOR LIQUID CRYSTAL DISPLAY
4	MEMORY CARD INSERTION PORT

No.	Name
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]

3.4.1 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		
3	Not used (As of October 2004)	
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.	

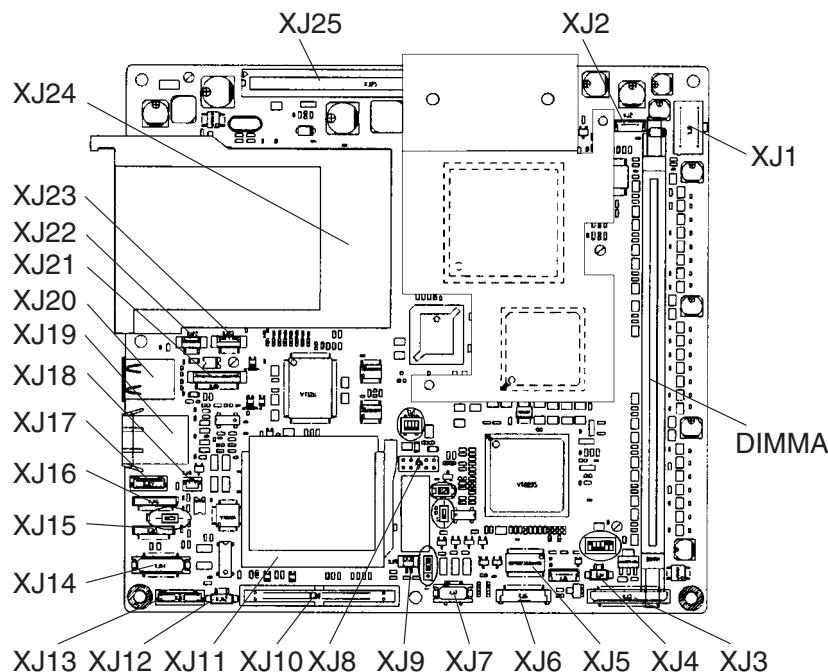
(5) SW5: Power supply DIP-SW on board

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

Connector No.		Item
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
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	

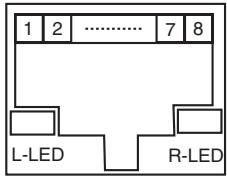
(16) XJ17: KB/ MOUSE interface

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)	

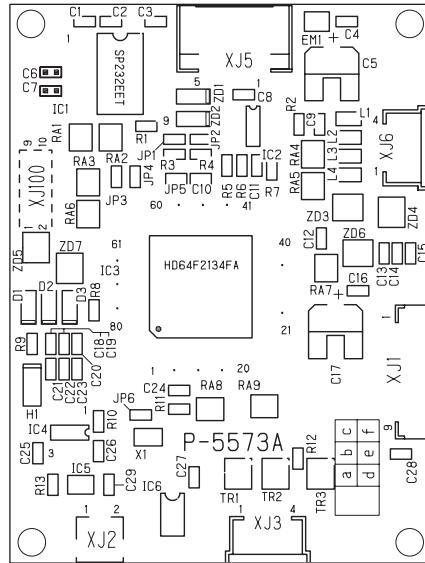
LED	Light emitting color	Functional description	Remarks
L-LED	Green	ON: Link, Blinking: Act	
R-LED	Yellow	ON: 100M, OFF: 10M	

(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	

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

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

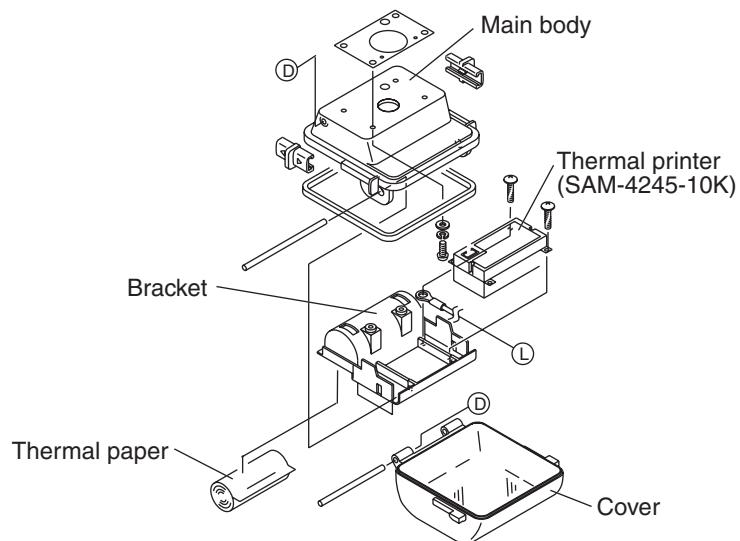


Functional description

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

3.4.3 Printer unit

Appearance of printer unit

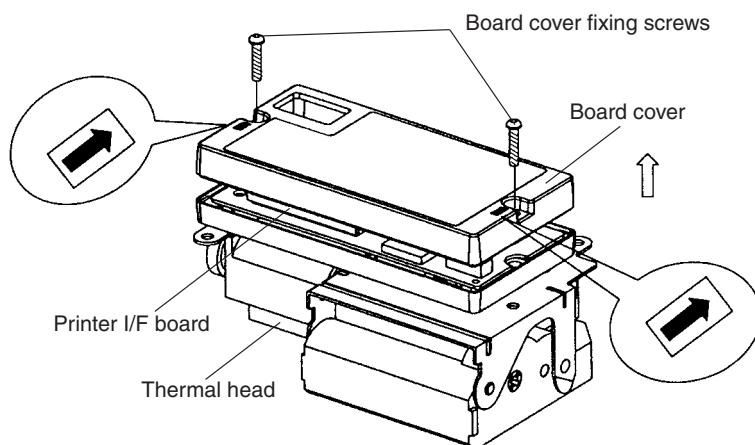


Function of unit

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

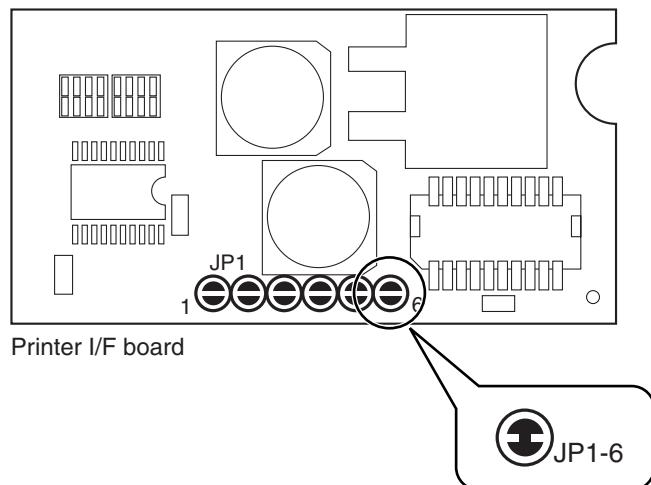
3.4.3.1 Thermal printer (SAM-4245-10K)

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.

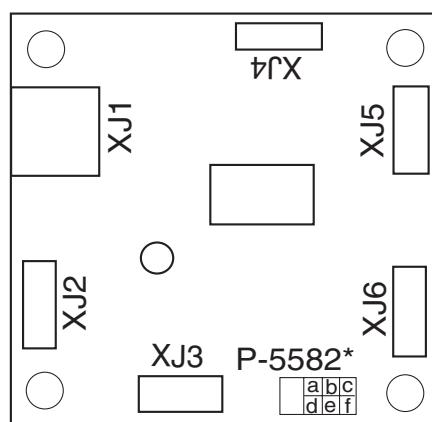
NOTE

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.

3.4.4 Camera selection board (P-5582 *) [Option]

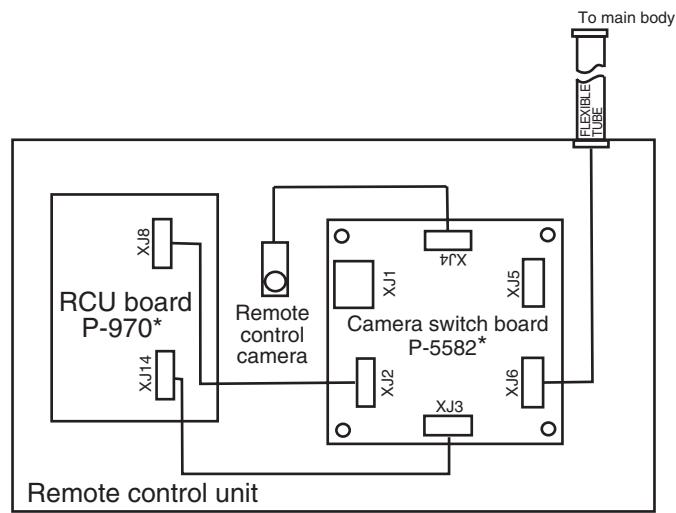
Appearance of camera switch board (P-5582 *)



Function of board

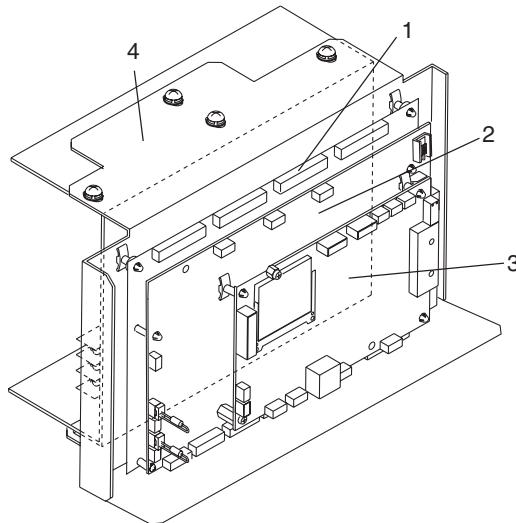
1. This board is used to switch between the dispersion camera signal and the RCU camera signal.

Block diagram



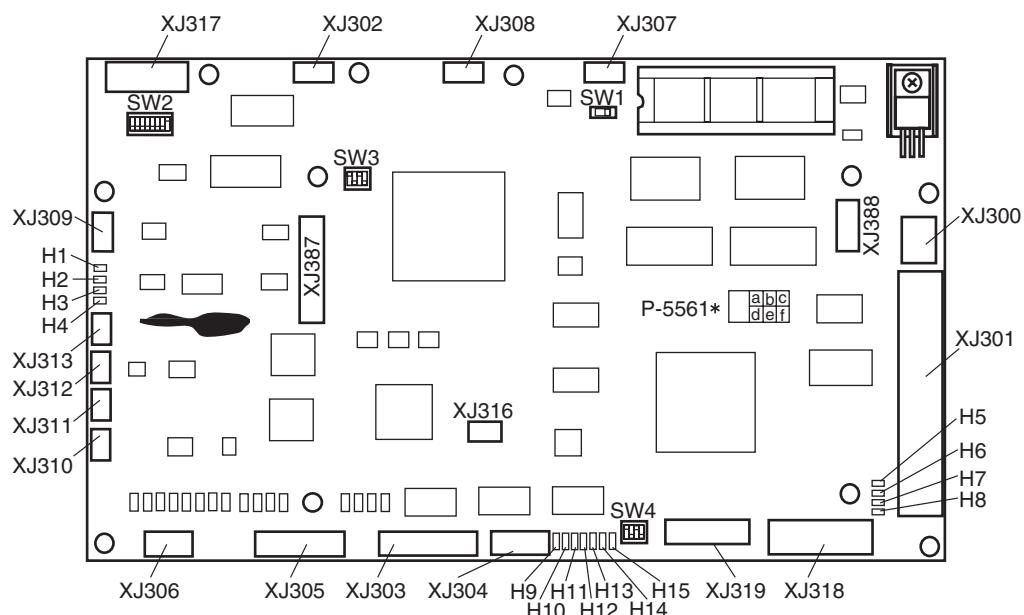
3.5 CAL UNIT

Appearance



No.	Name
1	ADC BOARD (P-5576*)
2	WCU BOARD (P-5561*)
3	DMU BOARD (P-5562*)
4	CAL.PS UNIT

3.5.1 WCU BOARD (P-5561*)



Function of board

1. Controlling the weigher main body.
2. High speed calculation by the combination calculation (FPGA).

Setting board DIP switches

(1) SW1 setting

SW1	Functional description	Initial setting mode
1	Writing the flash memory OFF: Writing prohibited (available only with JP3 mounted) ON: Writing available	OFF

(2) SW2 setting

SW2	Functional description		Initial setting mode
1	Normally unused	Used depending on the application software	OFF
2			
3			
4			
5			
6			
7			
8			

(3) SW3 setting (for FPGA)

SW3	Functional description	Initial setting mode
1	Operation mode M0 (Always ON)	ON
2	Operation mode M1 (Normally OFF, At debug: ON)	OFF
3	Terminal pull-up valid (Always ON)	ON
4	Writing in the flash memory prohibited (Normal: OFF With software sealed : ON)	OFF

(4) SW4 setting (for SH3)

SW4	Functional description	Initial setting mode
1	CPU operation mode (Always ON) (At operation in combination with DMU: OFF) (With WCU individual ROM operation: ON)	OFF
2	JTAG (Normally OFF, At debug: ON)	OFF
3	Memory and endian system (Always ON) (ON: big-endian, OFF: little-endian)	ON
4	N.C. (Always OFF)	OFF

Function of LED for monitor

LED	Functional description	LED display status
H1	Arcnet CH1 Reception signal	Normally, always ON. Abnormal when blinking in approx. every second.
H2	Arcnet CH1 Transmission signal	
H3	Arcnet CH0 Reception signal	
H4	Arcnet CH0 Transmission signal	

LED	Functional description	LED display status
H5	ADC1 interruption occurred	Abnormal when holding ON. (Communication error between ADC and WCU)
H6	ADC2 interruption occurred	
H7	ADC3 interruption occurred	
H8	ADC4 interruption occurred	
H9	FIFO in DMU side interruption (With received data + transmitting FIFO is empty in transmitting.)	Normally blinking.
H10	DMU receiving available	Normally ON.
H11	DMU transmitting	Normally blinking.
H12	Combination calculating	Abnormal in holding ON.
H13	FIFO interruption at the WCU side (With received data + transmitting FIFO is empty in transmitting.)	Normally blinking.
H14	WCU receiving available	Normally ON.
H15	WCU transmitting	Normally blinking.

Connector classification

Connector No.		Item
XJ300	(4P)	Power supply (DC + 5V)
XJ301	(40P)	ADC interface
XJ302	(8P)	Serial interface CH3
XJ303	(11P)	PO output CH1
XJ304	(12P)	PO output CH2
XJ305	(10P)	PI input CH1
XJ306	(10P)	PI input CH2
XJ307	(8P)	Serial interface CH0
XJ308	(8P)	Serial interface CH1
XJ309	(8P)	Serial interface CH2
XJ310	(3P)	Arcnet CH0
XJ311	(3P)	Arcnet CH0
XJ312	(3P)	Arcnet CH1
XJ313	(3P)	Arcnet CH1
XJ316	(6P)	JTAG for CPLD (IC32, IC34)
XJ317	(6P)	JTAG for FPGA
XJ318		JTAG for CPU
XJ319		JTAG-ICE for CPU
XJ387	(20P)	Interface for DMU
XJ388	(10P)	Power supply for DMU

Connector function in details

(1) XJ300: WCU power input

Connector No.	Terminal No.	Signal name
XJ300 Power supply for WCU	1	DC+5V
	2	DC+5V
	3	GND
	4	GND

(2) XJ301: ADC interface

Connector No.	Terminal No.	Signal	Terminal No.	Signal
XJ301 ADC interface	1	DC+5V	21	A10
	2	GND	22	A11
	3	D0 (Data I/O)	23	A12
	4	D1	24	A13
	5	D2	25	A14
	6	D3	26	Reserved input (ADC4_INT)
	7	D4	27	Reserved output (ADC4_CS)
	8	D5	28	Reserved output (ADC4_RES)
	9	D6	29	WE (Writing control output)
	10	D7	30	OE (Reading control output)
	11	A0 (Address output)	31	READY (Access ready input)
	12	A1	32	ADC3_INT (Interrupt input)
	13	A2	33	ADC3_CS (ADC board selection output)
	14	A3	34	ADC3_RES (ADC board reset output)
	15	A4	35	ADC1_INT (Interrupt input)
	16	A5	36	ADC1_CS (ADC board selection output)
	17	A6	37	ADC1_RES (ADC board reset output)
	18	A7	38	ADC2_INT (Interrupt input)
	19	A8	39	ADC2_CS (ADC board selection output)
	20	A9	40	ADC2_RES (ADC board reset output)

(3) XJ302: Serial interface CH3

Connector No.	Terminal No.	Signal
XJ302 Serial interface CH3	1	+5V
	2	TXD
	3	RXD
	4	GND
	5	RTS
	6	CTS
	7	DSR
	8	DTR

(4) XJ303: PO output CH1

Connector No.	Terminal No.	Signal
XJ303 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	Data 7
	9	Power ON control signal
	10	+5V
	11	GND

(5) XJ304: PO output CH2

Connector No.	Terminal No.	Signal
XJ304 PO output CH2	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	Power ON control signal
	10	+5V
	11	GND
	12	N.C.

(6) XJ305: PI input CH1

Connector No.	Terminal No.	Signal
XJ305 PI input CH1	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.

(7) XJ306: PI input CH2

Connector No.	Terminal No.	Signal
XJ306 PI input CH2	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.

(8) XJ307: Serial Interface CH0

Connector No.	Terminal No.	Signal	Remarks
XJ307 Serial interface CH0	1	+5V	
	2	TXD	
	3	RXD	
	4	GND	
	5	RTS	
	6	CTS	
	7	DSR	
	8	DTR	

(9) XJ308: Serial interface CH1

Connector No.	Terminal No.	Signal	Remarks
XJ308 Serial interface CH1	1	+5V	
	2	TXD	
	3	RXD	
	4	GND	
	5	RTS	
	6	CTS	
	7	DSR	
	8	DTR	

(10) XJ309: Serial interface CH2

Connector No.	Terminal No.	Signal	Remarks
XJ309 Serial interface CH2	1	+5V	
	2	TXD	
	3	RXD	
	4	GND	
	5	RTS	
	6	CTS	
	7	DSR	
	8	DTR	

(11) XJ310/XJ311: Arcnet CH0

Connector No.	Terminal No.	Signal
XJ310/XJ311 Arcnet CH0	1	Signal (+)
	2	Signal (-)
	3	F.G.

(12) XJ312/XJ313: Arcnet CH1

Connector No.	Terminal No.	Signal
XJ312/XJ313 Arcnet CH1	1	Signal (+)
	2	Signal (-)
	3	F.G.

(13) XJ316: JTAG for CPLD (IC32, IC34)

Connector No.	Terminal No.	Signal
XJ316 JTAG for CPLD (IC32, IC34)	1	+3.3V
	2	TMS
	3	TDO
	4	TDI
	5	TCK
	6	GND

(14) XJ317: JTAG for FPGA

Connector No.	Terminal No.	Signal
XJ317 JTAG for FPGA	1	+3.3V
	2	TCK
	3	TDO
	4	TDI
	5	TMS
	6	GND

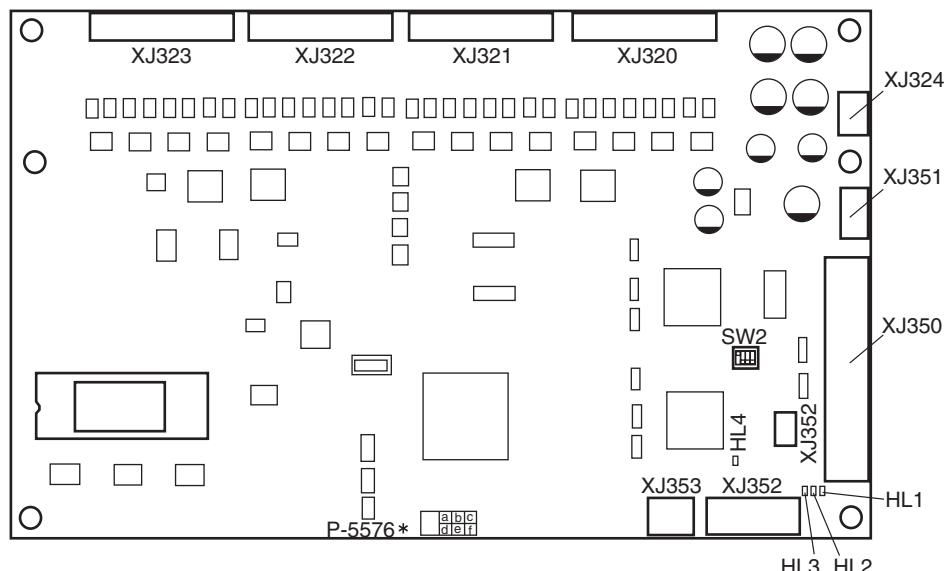
(15) XJ387: Interface for DMU

Connector No.	Terminal No.	Signal
XJ387 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 (CHO)
	18	Serial output signal (CHO)
	19	+ 5V
	20	GND

(16) XJ388: Power supply for DMU

Connector No.	Terminal No.	Signal
XJ388 Power supply for DMU	1	+ 5V
	2	+ 5V
	3	+ 5V
	4	+ 5V
	5	GND
	6	GND
	7	GND
	8	GND
	9	GND
	10	GND

3.5.2 ADC BOARD (P-5576*)



Function of board

1. Loading weigh data.
2. Zero adjustment and span adjustment.
3. Digital and high speed filter processing by DSP.

NOTE

- Check the branch number for board replacement.

Setting board DIP switches (SW2)

SW2	Functional description	Default at shipment
1	ON (Start up DSP from PROM) OFF (Start up DSP from FLASH)	ON
2	For debug	OFF
3	For debug	OFF
4	For debug	OFF

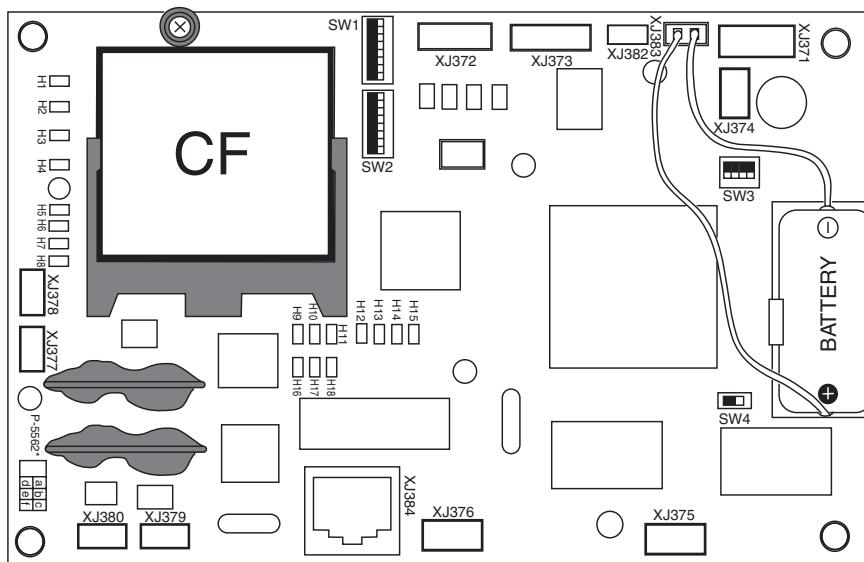
Functions of monitor LED

LED	Functional description
HL1	ADC reset signal (Lights ON at startup temporarily, and soon lights OFF) (The light-ON state, if lasts, disables startup due to I/F error with WCU.)
HL2	WCU interface ready signal (Lights ON when WCU is waiting)
HL3	WCU interface interrupt signal (Lights ON when WCU is interrupted)
HL4	Debug monitor output busy signal (Normally lights ON, lights OFF during monitor output)
HL5	AD converter hold signal (Lights ON softly when the initialization completes)
HL6	DSP life LED (Lights ON at startup, Flashes in every 0.5 sec when the initialization completes)

Connector classification

Connector No.		Item
XJ320	(32P)	For weight signal input (WH1 to WH8)
XJ321	(32P)	For weight signal input (WH9 to WH16)
XJ322	(32P)	For weight signal input (DF1 to DF4, AFV1 to AFV4)
XJ323	(32P)	For weight signal input (WH17 to WH20, DF5 to DF8 or WH21 to WH24)
XJ324	(3P)	For analog power (1:+15v. 2:-15v. 3:AGMD)
XJ351	(4P)	For digital power (1,2:+5v. 3,4:DGMD)
XJ352	(20P)	For debug DSP parallel monitor output
XJ353	(8P)	For debug DSP serial I/F
XJ354	(14P)	For debug DSP-JTAG-ICE connection (not mounted yet)
XJ355	(6P)	For debug (connector for CPLD writing)

3.5.3 DMU BOARD (P-5562*)



Function of board

1. Data processing
2. Memory of Total and Parameter

Setting board DIP switches

(1) Setting SW1 / SW2 / SW3

DIP SW	Function	Default at shipment
SW 1 - 1 to SW 1 - 8	Not used	OFF
SW 2-1 to SW 2 - 5	Not used	OFF
SW2-6	ON: Clear SRAM on memory initialization OFF: Does not clear SRM on memory initialization	OFF
SW2-7	ON: Does not output FIF 0 at DMU application OFF: Outputs FIF 0 at DMU application	OFF
SW2-8	ON: Does not output message of boot loader OFF: Outputs message of boot loader	OFF
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

Butterly 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.



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.

Function of LED for monitor

LED	Functional description	LED display status
H1	PINT2	
H2	PINT3	
H3	PINT0	
H4	PINT1	
H5	Arcnet CH1 Reception signal	Normally, always ON. Abnormal when blinking in approx. every second.
H6	Arcnet CH1 Transmission signal	
H7	Arcnet CH0 Reception signal	
H8	Arcnet CH0 Transmission signal	
H12	Indicates the boot loader status by combination of 12 to 15.	LED lights ON/OFF in the order from 12 to 15. The boot loader causes error when all of four LEDs are blinking. Turning ON of all four LEDs starts the application.
H13		
H14		
H15		
H9	ETHER data reception	Normally blinking.
H10	ETHER link	Normally ON.
H11	ETHER all double communication	Normally OFF.
H16	ETHER link with 100MBPS	
H17	ETHER data transmission	Normally blinking.
H18	ETHER collision occurred	Normally OFF.

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 output 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

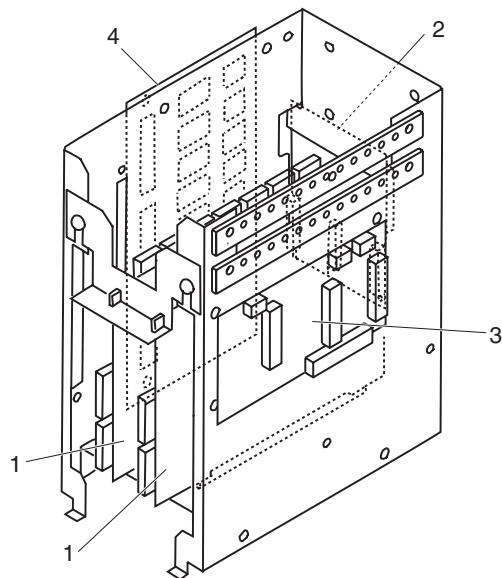
Connector No.	Terminal No.	Signal
XJ385 Interface for DMU	1	Data 0
	2	Data 1
	3	Data 2
	4	Data 3
	5	Data 4
	6	Data 5
	7	Data 6
	8	Data 7
	9	Address 0
	10	Address 1
	11	Address 2
	12	Address 3
	13	R/W direction input
	14	ENB input
	15	RESET input
	16	Interruption output
	17	Serial input signal (CH0)
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

3.6 Main Electrical Unit

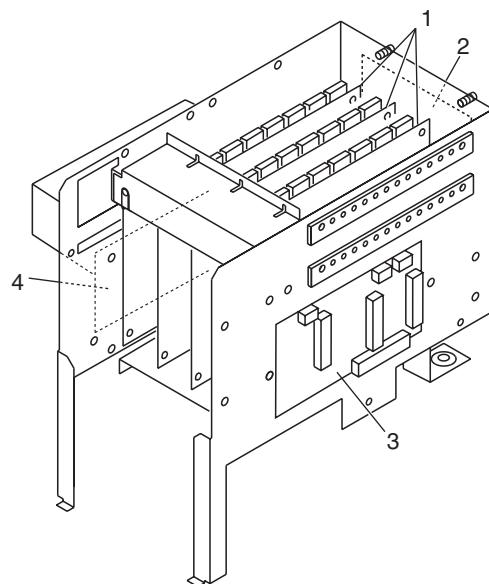
Appearance of CCW-R-214W-S



No.	Name
1	FDRV BOARD (P-5578*)
2	FDC BOARD (P-5532*)
3	HUB BOARD (P-5535*)
4	MPS BOARD (P-5436*)

*The number of board in use may differ according to the specifications.

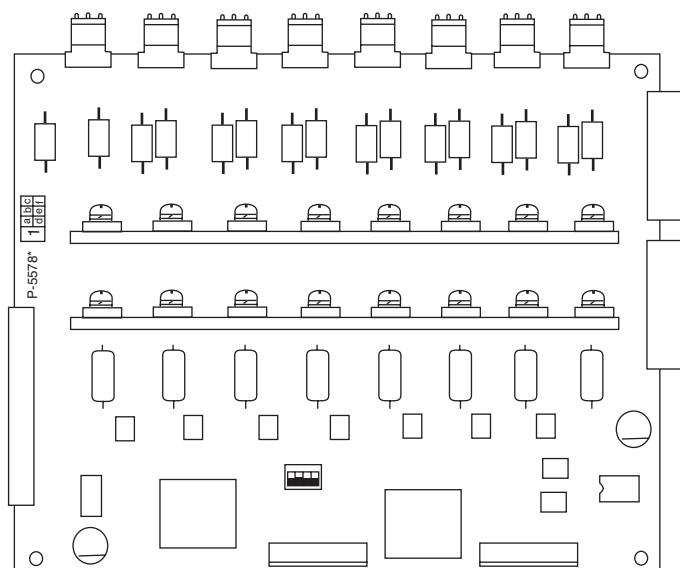
Appearance of CCW-R-216B-D



No.	Name
1	FDRV BOARD (P-5578*)
2	FDC BOARD (P-5532*)
3	HUB BOARD (P-5535*)
4	MPS BOARD (P-5436*)

*The number of sheets of FDRV board and HFDRV board varies with the machine types.

3.6.1 FDRV Board (P-5578*)



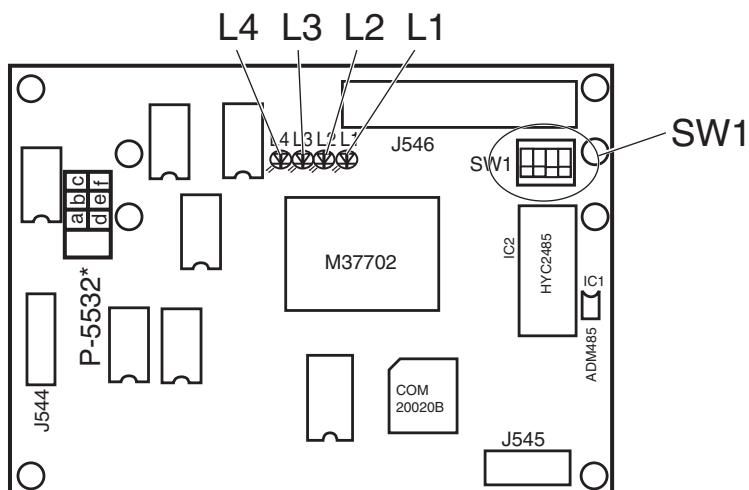
Function of board

1. Driving control of the radial feeder and the dispersion feeder
2. Detecting feeder power voltage
3. Relaying and distributing the power supply of radial feeder and dispersion feeder from the PS feeder unit.

NOTE

- Before replacing the board, confirm the suffix number.
- The board count varies with the number of weigh heads.

3.6.2 FDC Board (P-5532*)



Function of board

1. Drive control of radial feeder and dispersion feeder

Description of LED for monitor

LED	Functional description	LED display status
L1	Arcnet signal	Normally, always ON. Abnormal when blinking in approx. every second.
L2		
L3	Life LED	Normal when blinking in approx. every second.
L4	Error LED	Blinking in error

Setting the dip switch on the board

SW1	Functional description
SW 1-1	Mode selection (ON: CF, OFF: RF/DF)
SW 1-2	Not used (Normally OFF)
SW 1-3	Not used (Normally OFF)
SW 1-4	Not used (Normally OFF)

(As of 20.01.2005, SW1-2 to SW1-4 in SW1 are not used.)

NOTE

- At board replacement, return the switches as they were before the replacement.

3.6.3 Cautions for FDRV board (P-5578 *) replacement

- Make sure to keep as follows without fail: Turn OFF the main power supply switch. For safety, do not touch the FDRV board (P-5578 *) for 5 minutes after turning OFF the switch. The DC voltage (280V DC) is used for the feeder drive. Thus, the electrolysis capacitors on the feeder power supply board (P-5580 *) and the FDRV board (P-5578 *) have stored the voltage of 280 V DC. It takes approximately 3 to 5 minutes to release the voltage stored after turning off the power supply. Perform the replacement of FDRV board (P-5578 *) after 5 minutes.

CAUTION

Be sure not to touch the FDRV board (P-5578 *) and the feeder power supply board (P-5580 *, P-5580 *) within 5 minutes after turning off the power supply. Otherwise it may cause electric shock.

- Replace the FDRV board (P-5578 *) of the main electrical unit.

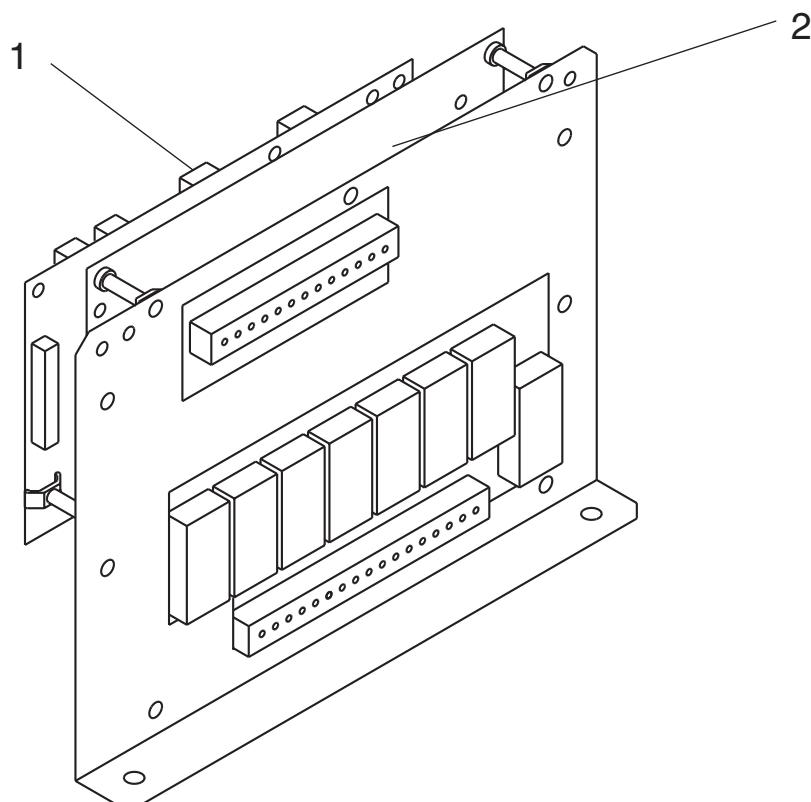
- Remove all harnesses attaching to the FDRV board (P-5578 *) which is to be replaced.
- Remove the guide FDRV fixing the FDRV board (P-5578 *).
(Loosen two screws fixing the guide FDRV, and remove the guide FDRV.)
- Pull out the FDRV board (P-5578 *) along with the guide.
- Attach a new FDRV board (P-5578 *) along with the guide.
- Attach the guide FDRV.
- Adjust the harness number and the connector number of the FDRV board (P-5578 *), and attach the harness to the FDRV board (P-5578 *).

- Initialize the FDRV board (P-5578 *).

Write the frequency data from the DMU board onto the FDRV board. Referring to Chapter 5 Appendix, 5.5 Procedure for replacing FDRV board and DMU board.

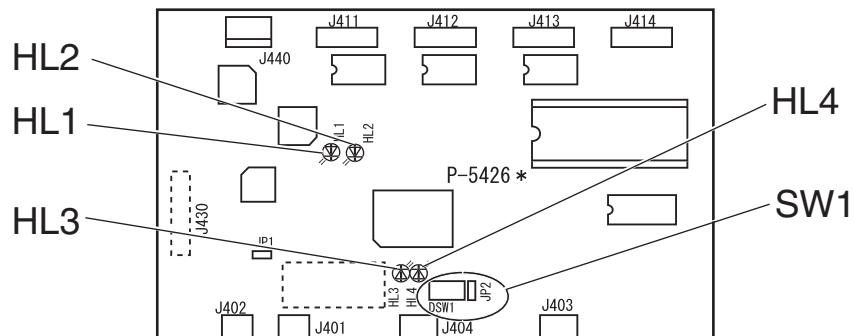
3.7 Relay unit

Appearance



No.	Name
1	EXC BOARD (P-5426*)
2	RELAY BOARD (P-5506*)

3.7.1 EXC Board (P-5426*)



*In most instances, set all DSW1 switches to OFF.

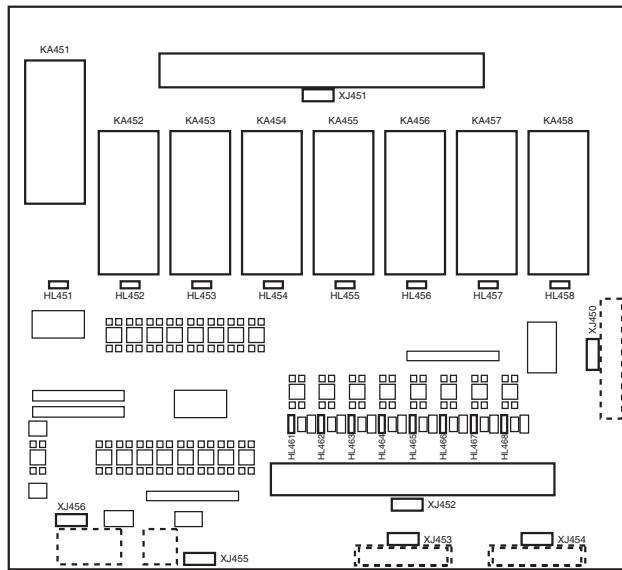
Function of board

1. Communication with the CAL unit
2. Timing hopper (optional) control

Description of LED for monitor

LED	Functional description	LED display status
HL1	Arcnet signal	Normally, always ON. Abnormal when blinking in approx. every second.
HL2		
HL3	Life LED	Normal when blinking in approx. every second.
HL4		Normal when turning OFF.

3.7.2 Relay Board (P-5506*)



Function of board

1. Input of interlock signal from packer, and input monitor
2. Output of discharge completion signal to packer, and output monitor
3. Error signal output, and output monitor
4. Output of infeed control signal to the infeeder, and output monitor
5. Input of option signal, and input monitor
6. Output of option signal, and output monitor

Function of LED for monitor

LED	Functional description	LED	Functional description
HL 451	Discharge completion signal 1	HL 461	Interlock signal 1
HL 452	Discharge completion signal 2	HL 462	Interlock signal 2
HL 453	Error signal 1	HL 463	Input signal 5
HL 454	Error signal 2	HL 464	Input signal 6
HL 455	Infeed control signal 1	HL 465	Input signal 1
HL 456	Infeed control signal 2	HL 466	Input signal 2
HL 457	Control 1	HL 467	Input signal 3
HL 458	Control 2	HL 468	Input signal 4

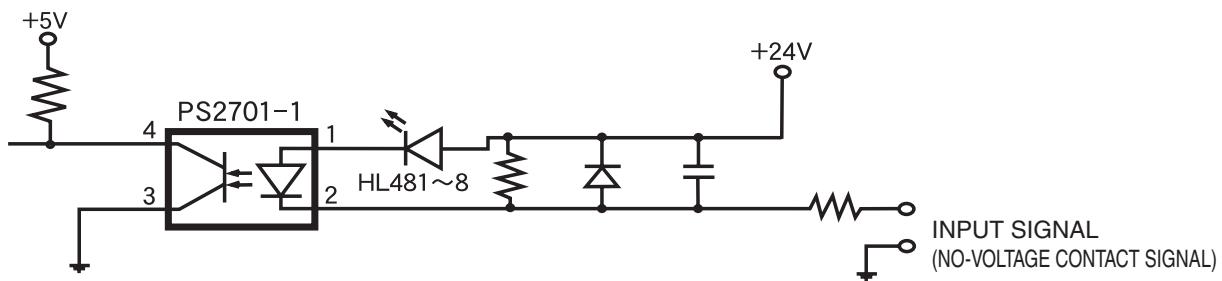


Figure 3-1 Input signal circuit diagram in the board

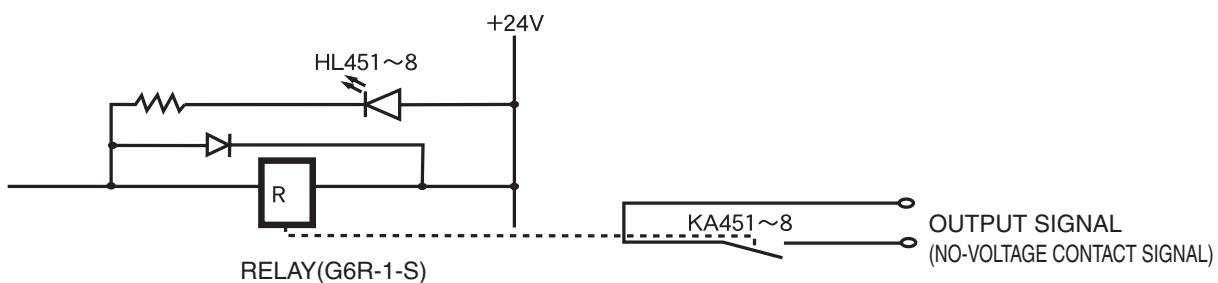


Figure 3-2 Output signal circuit diagram in the board

TIP

- The following figure shows an I/O signal circuit in the relay board. Use it for reference when connecting with interlocked equipment. Rated voltage for relay contact used: 250V.AC5A Use the unit with the load under this voltage.

Table 3-1 External Connector Terminals in the Relay Unit

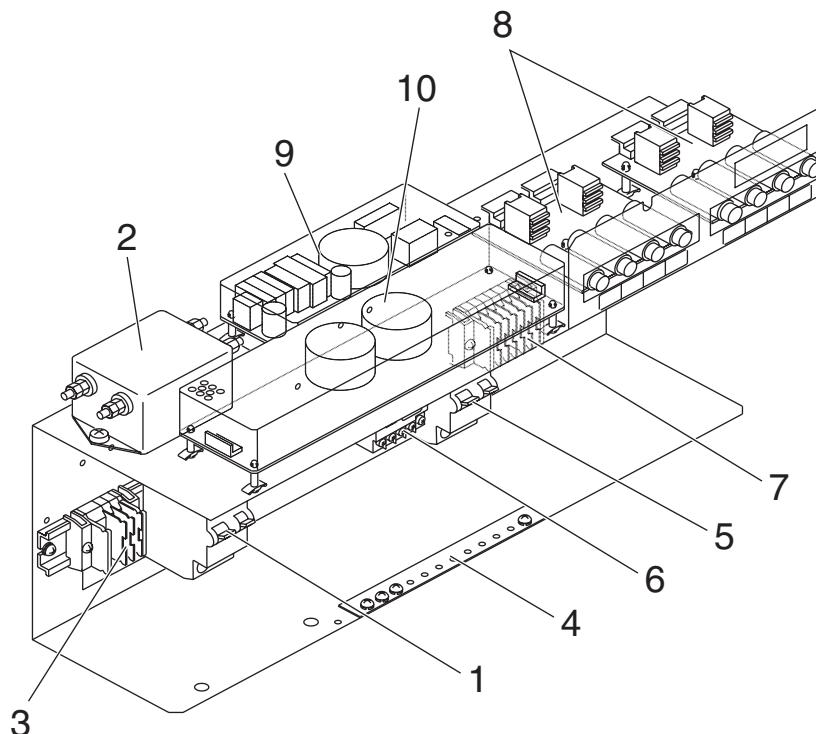
Terminal block No.	Terminal No.	Signal name	Destination
XJ451/1-2	28-29	Discharge completion signal 1	To the packer
XJ451/3-4	78-79	Discharge completion signal 2	To the packer
XJ451/5-6	82-83	Error signal 1	
XJ451/7-8	90-91	Error signal 2	
XJ451/9-10	30-31	Infeed control signal 1	To the infeeder
XJ451/11-12	88-89	Infeed control signal 2	To the infeeder
XJ451/13-14	84-85	Control 1	*Optional
XJ451/15-16	86-87	Control 2	*Optional
XJ452/1-2	20-21	Interlock signal 1	To the packer
XJ452/2-3	21-72	Interlock signal 2	To the packer
XJ452/4-5	22-21	Auxiliary signal 5	*Optional
XJ452/5-6	21-73	Auxiliary signal 6	*Optional
XJ452/7-8	25-26	Auxiliary signal 1	*Optional
XJ452/8-9	26-102	Auxiliary signal 2	*Optional

Table 3-1 External Connector Terminals in the Relay Unit (Continued)

Terminal block No.	Terminal No.	Signal name	Destination
XJ452/10-11	104-105	Auxiliary signal 3	*Optional
XJ452/11-12	105-106	Auxiliary signal 4	*Optional
XJ452/13-14	53-54	DC+24V	DC POWER

3.8 PS-0 Unit

Appearance



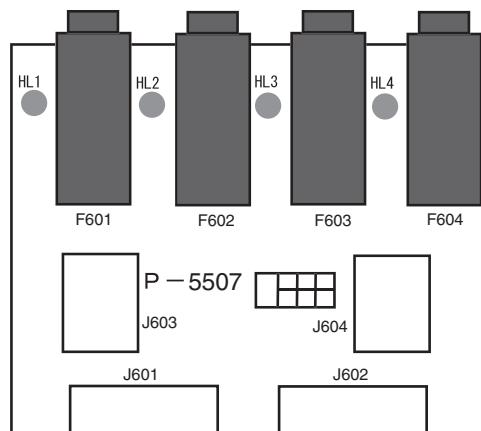
No.	Name
1	Power supply breaker QF02
2	Noise filter Z01
3	Terminal block XT601
4	Earth bar
5	Breaker QF03
6	Electromagnetic contactor KM01
7	Terminal block XT602
8	AC fuse board (P-5507 *)
9	Power supply unit [For relay unit] U2 (24V DC)
10	Power supply unit [For remote control] U01 (24V DC)

Function of unit

1. Detecting the overcurrent and shuts down the power supply.

2. Reducing the noise from the power supply line.
3. Power supply I/O terminal.
4. DC power supply unit (+ 24V) for the remote control unit and relay unit.

3.8.1 AC FUSE BOARD (P-5507 *)



Function of board

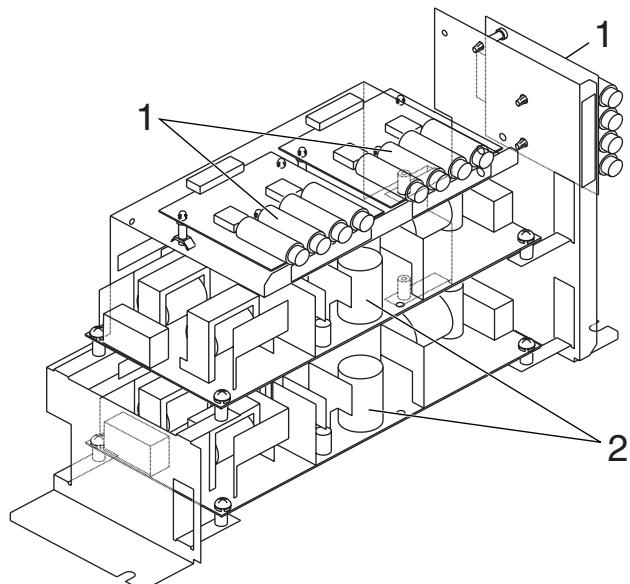
1. Radial Feeder and Dispersion Feeder AC Power Protective Fuse Board

TIP

- For the standard model, 250V AC.3.15A fuse is used. Check the part number in the parts list for the replacement.

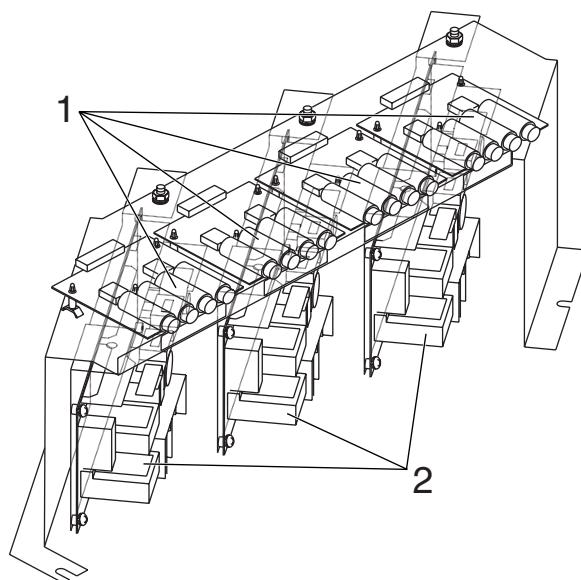
3.9 PS-2 Unit

Appearance (CCW-R-214W-S)



No.	Name
1	DC fuse board (P-5508 *)
2	Power supply unit U03, U04 (39V DC)

Appearance (CCW-R-216B-D)



No.	Name
1	DC fuse board (P-5508 *)
2	Power supply unit U03, U04, U05 (39V DC)

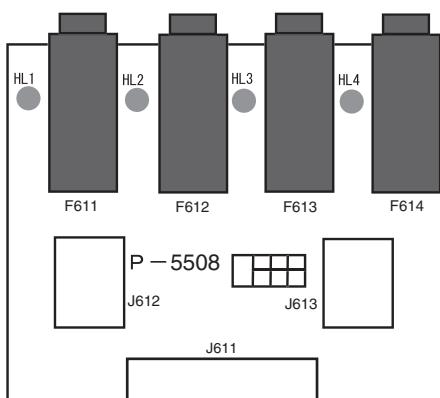
Function of unit

1. Power Supply DC+39V for the stepping motor
2. Fuse board (P-5508*) for the stepping motor

NOTE

- The board and the power supply unit (39V DC) counts vary on the head counts of the machine.

3.9.1 DC FUSE BOARD (P-5508*)



Function of board

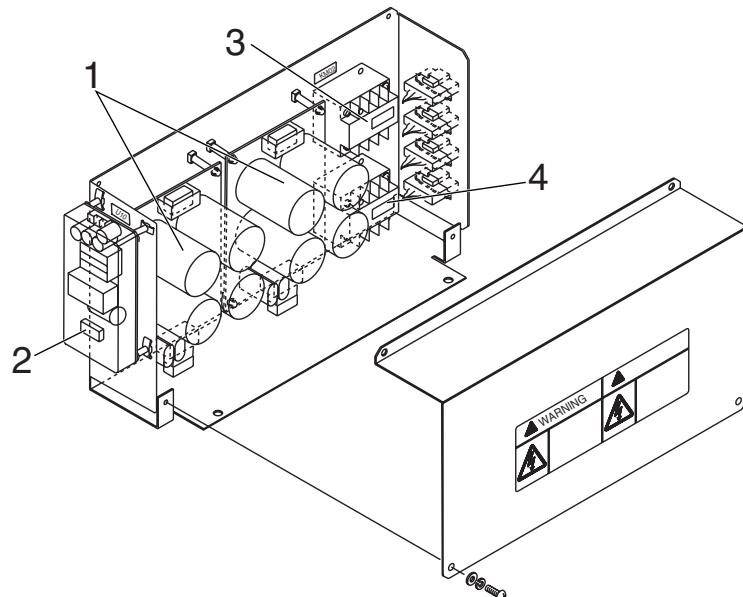
1. DC power protective fuse board for the stepping motor

TIP

- For the standard model, AC250V.5A fuse is used. Check the part number with the parts at the replacement.

3.10 Feeder PS unit

Appearance of model CCW-R-214W-S

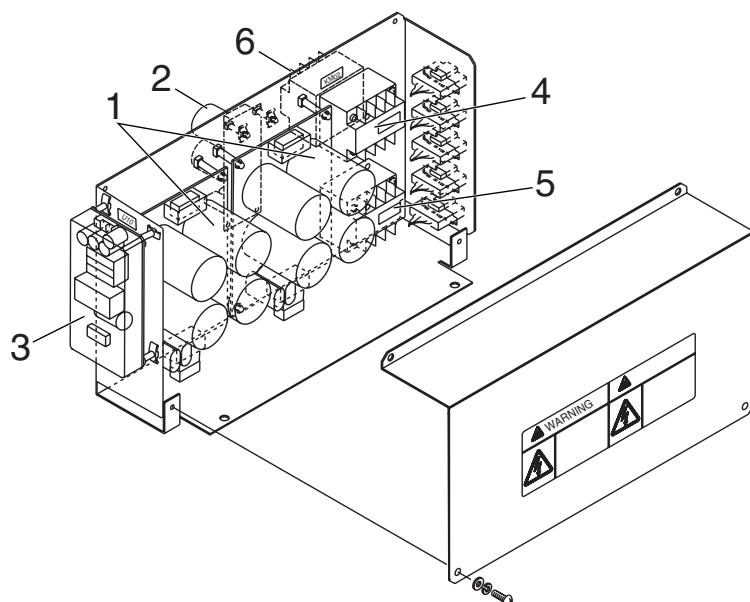


No.	Name
1	Feeder power supply board (P-5580 *)
2	Power supply unit U10 (12 V DC)
3	Electromagnetic contactor (KM02)
4	Electromagnetic contactor (KM03)

CAUTION

- Be sure not to touch the feeder PS Unit or the feeder supply unit (P-5580 *) even after turning off the power supply, to avoid the electric shock. When required, wait for 5 minutes or more to touch the feeder PS unit.

Appearance of model CCW-R-216B-D

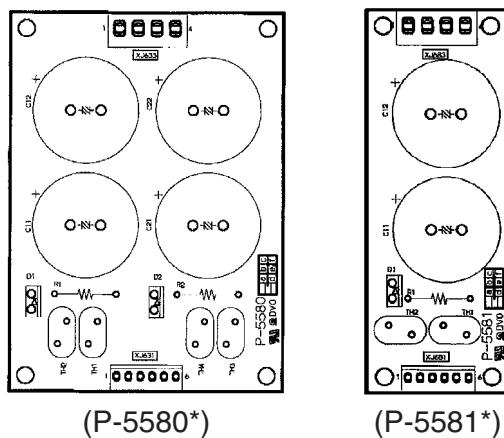


No.	Name
1	Feeder power supply board (P-5580 *)
2	Feeder power supply board (P-5581 *)
3	Power supply unit U10 (12 V DC)
4	Electromagnetic contactor (KM02)
5	Electromagnetic contactor (KM03)
6	Electromagnetic contactor (KM04)

Function of unit

1. ON/OFF control of the drive power supply of radial feeder and dispersion feeder.
2. Supplies the DC power to [Linear Feeder and Main Supply Feeder Drive] on the FDRV board (P-5578 *).
3. Supplies the DC power to the FDRV board (P-5578 *).

3.10.1 Feeder power supply board (P-5580 *) (P-5581 *)



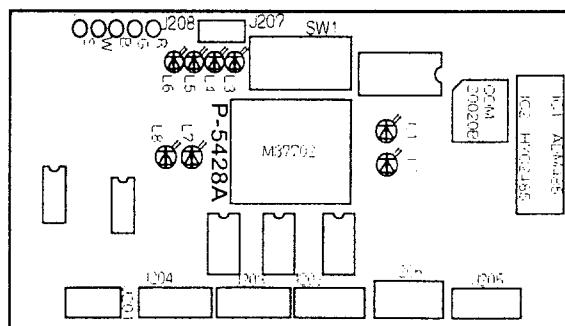
*The number of boards in use may differ according to the specifications.

Function of the boards

1. Converting the AC power supply into the DC power supply. (Power supply for the feeder)

3.11 Weigh/Drive Unit

3.11.1 DUC Board (P-5428*)



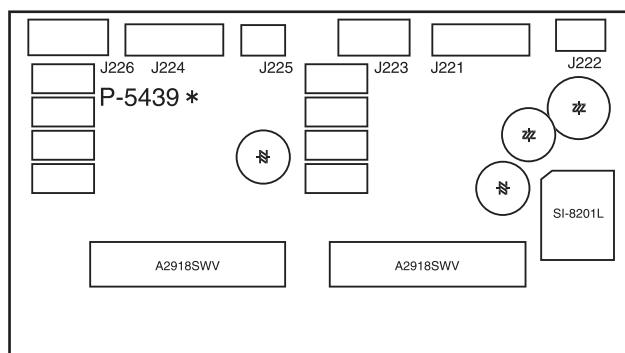
NOTE

- When the weigh/drive unit or the DUC board is replaced, set the weigher model using the DIP switch.

Function of board

- Communication with the WCU board through the HUB board via a high speed communication line
- Open/close control of PH and WH
- Load cell output amplification via a preamp circuit

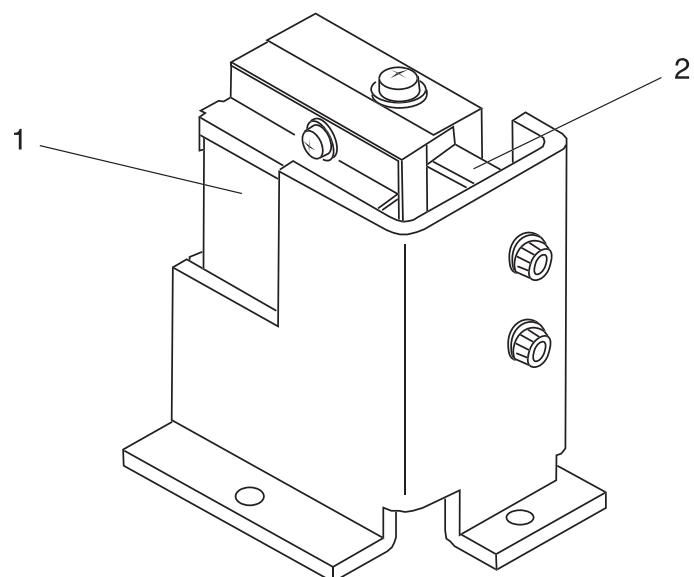
3.11.2 DDU Board (P-5439*)



Function of board

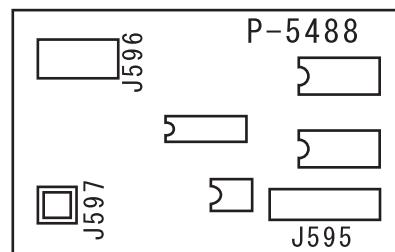
- Driving stepping motor for pool hopper and weighing hopper open/close

3.12 AFV Unit



No.	Name
1	PREAMP BOARD (P-5488*)
2	LOAD CELL (BAS-0.25L/HAS-0.5L)

3.12.1 AFV Preamp Board (P-5488*)

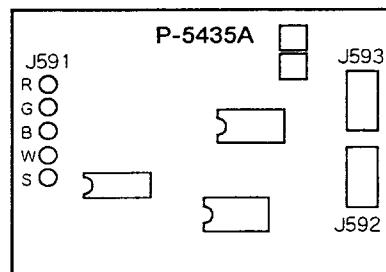


Function of board

1. Amplification of the AFV load cell output

3.13 Other Boards / Optional Unit

3.13.1 Preamp Board (P-5435*) [for the dispersion feeder load cell]



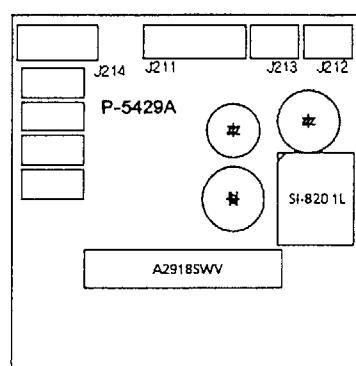
Function of board

1. Amplification of the dispersion feeder load cell output

NOTE

- Before replacing the board, confirm the suffix number.

3.13.2 DU Board (P-5429*)

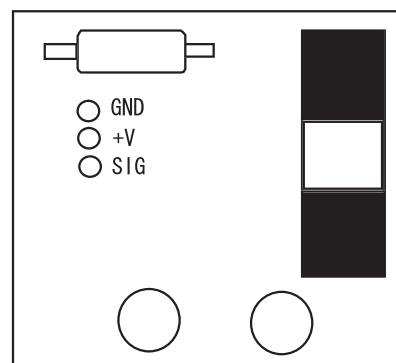
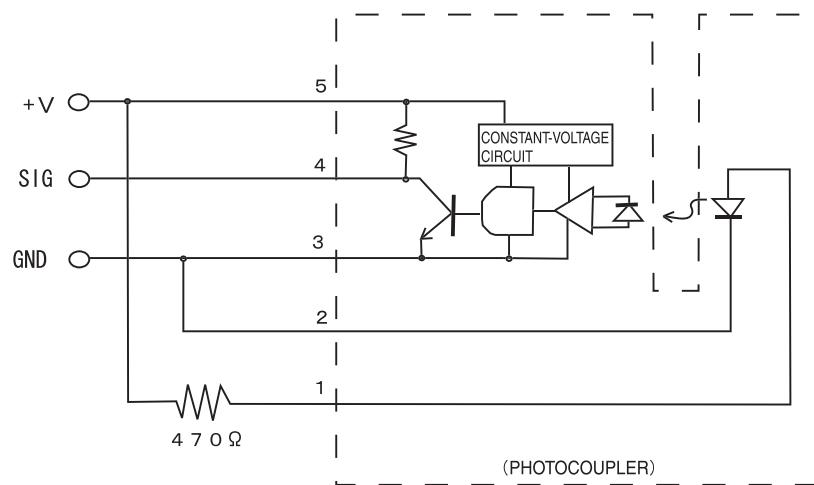


Function of board

1. Driving stepping motor for booster hopper and timing hopper open/close

NOTE

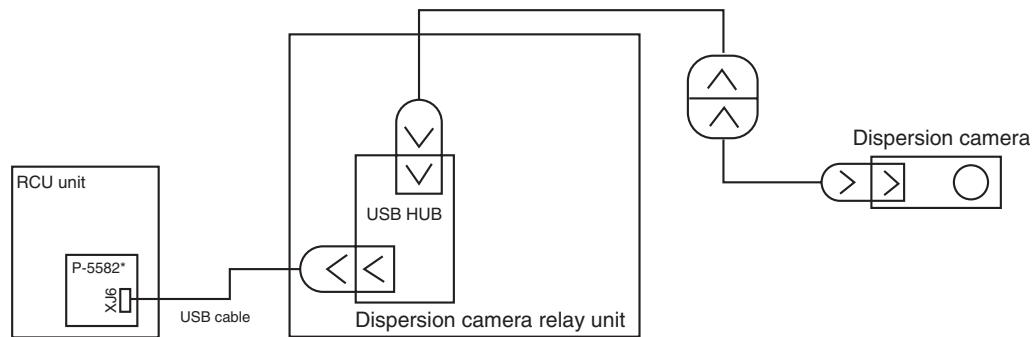
- Board suffix number depends on BH/TH. Before replacing the board, confirm the suffix number.

3.13.3 Photosensor board (P-5207*)**[External view]****[Circuit Diagram]****Function of board**

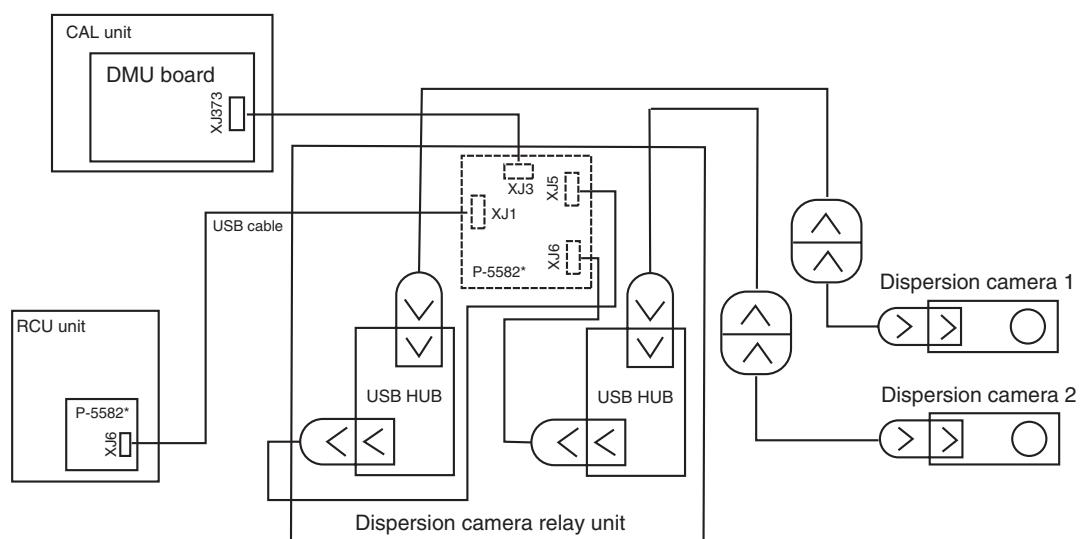
1. Stop position detection for the stepping motor to open/close pool hopper and weighing hopper
2. Stop position detection for the stepping motor to open/close booster hopper and timing hopper

3.13.4 Diagram of dispersion camera relay unit (Option)

For single dispersion camera



For double dispersion cameras



4 MAINTENANCE SERVICE (MAINT SERVICE) LEVEL FUNCTION

4.1 Remote Control Display	4-1
4.1.1 Remote Control Display	4-1
4.2 Maintenance Service Level Menu	4-2
4.2.1 Maintenance Service Level Display	4-2
4.2.2 Main Menu Screens for Maintenance Service	4-4
4.3 Control Panel Items (Maintenance Service)	4-4
4.3.1 Display Control Menu Screens	4-4
4.3.1.1 Touch Panel Coordinate Adjustment	4-4
4.3.2 Password Set/Language Select Set Menu Screen	4-7
4.3.2.1 Language Select Setting	4-7
4.3.2.2 Password Setting	4-8
4.3.3 Destination ID Menu Screen	4-9
4.3.3.1 Destination ID	4-9
4.3.3.2 Browser Setting	4-9
4.3.3.3 E-mail Setting	4-9
4.3.4 Communication Set Menu Screen	4-10
4.3.4.1 [RCU] Communication Setting	4-10
4.3.4.2 [Main Body] Communication Setting	4-10
4.3.4.3 [Server IP Address] Setting	4-11
4.4 Maintenance Service Items in Machine Set	4-12
4.4.1 Weigher Information	4-12
4.4.2 Display and Data Manager	4-14
4.4.2.1 Layout Setting	4-14
4.4.2.2 Machine Set Manager	4-15
4.4.2.3 All Setting Manager	4-15
4.4.2.3.1 Memory Initialization	4-15
4.4.2.3.2 Card Initialization	4-16
4.4.2.4 Hopper Name Setting	4-17
4.4.3 Various Parameter Setting	4-18
4.4.3.1 Feeder Drive Specifications	4-19
4.4.3.2 Hopper Drive Specification Setting	4-26
4.4.3.2.1 Hopper Drive Specification Setting (PH/WH/BH)	4-26
4.4.3.2.2 Hopper Open/Close Drive Pattern (PH/WH/BH)	4-31
4.4.3.2.3 Hopper Drive Specification Setting (D.TH/TH/RS)	4-35
4.4.3.2.4 Hopper Open/Close Drive Pattern (DTH/TH/RS)	4-36
4.4.4 Weigher Setting	4-38

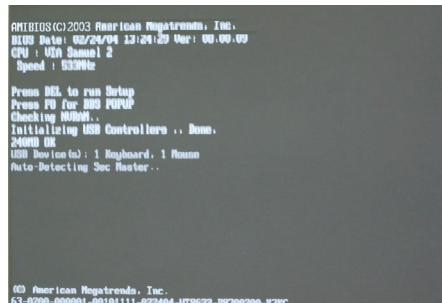
4.4.4.1	Automatic Timing Setting	4-39
4.4.4.2	Network Setting.	4-40
4.4.4.3	AFD Setting.	4-40

4 MAINTENANCE SERVICE (MAINT SERVICE) LEVEL FUNCTION

4.1 Remote Control Display

4.1.1 Remote Control Display

1. Turn on the main power switch, and the initial screen (shown right) appears.



2. The [Windows XP] screen (shown right) appears.



3. The screen (shown right) appears.



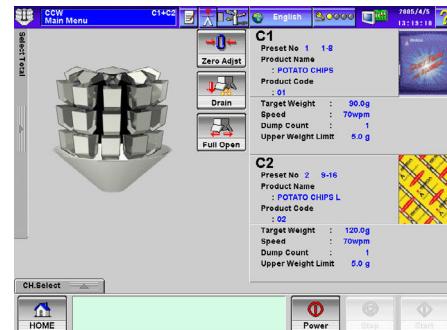
4. The [ISHIDA logo] screen (shown right) appears.



5. The [Main Menu] (shown right) appears.

TIP

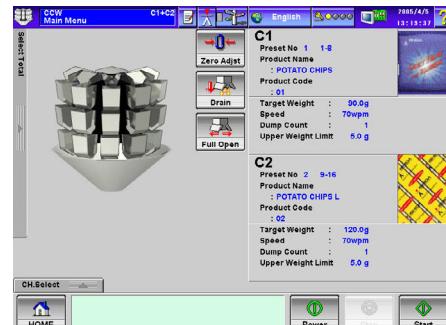
The [Main Menu] appears 30 to 40 seconds after the main power switch is turned on.



4.2 Maintenance Service Level Menu

4.2.1 Maintenance Service Level Display

1. Turn on the main power switch and Main Menu (shown right) appears.



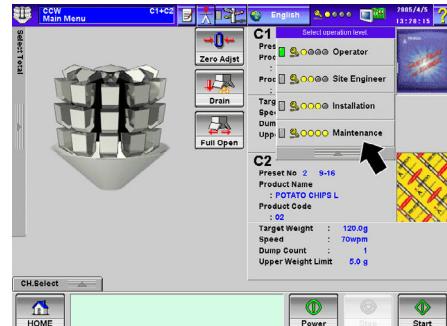
2. Press the [Select operation level] key.



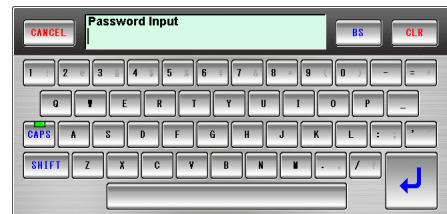
3. The [Select operation level] menu appears.



4. Press the Maintenance key.



5. The menu to enter the password for the Maintenance service level appears.

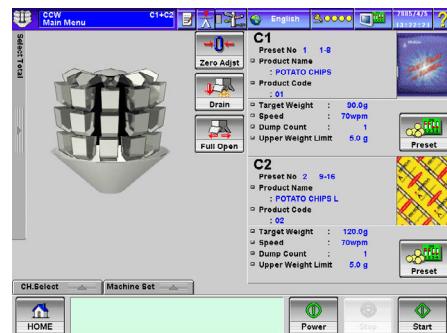


6. Press the ten key, enter the password, and press the [Return] key.

TIP

- The password set at the factory for the Maintenance Service level is "123."
- When entering the password, the numbers are displayed as "###" on keypad.

7. The Main Menu for Maintenance Service appears.



4.2.2 Main Menu Screens for Maintenance Service

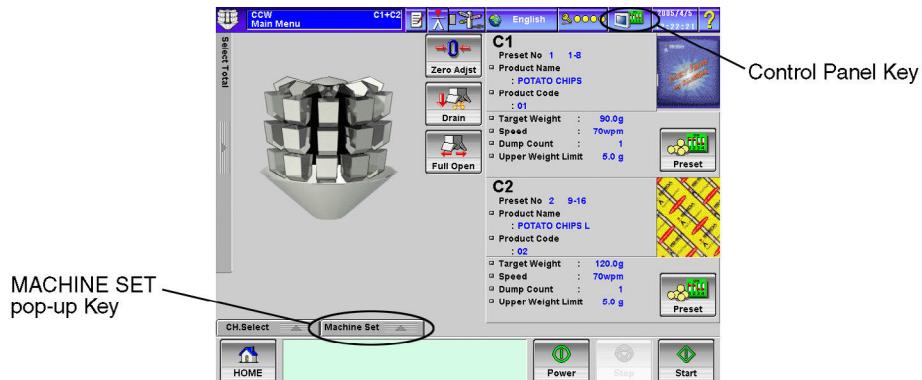


Figure 4-1 [Main Menu Screen]

4.3 Control Panel Items (Maintenance Service)

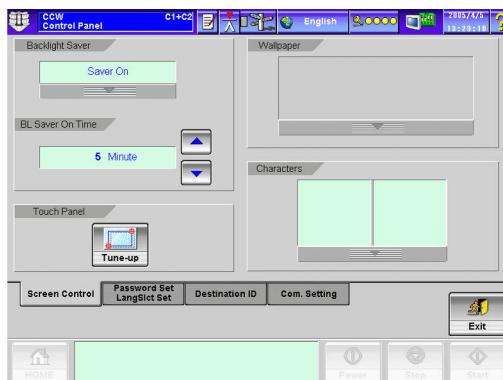


Figure 4-2 [Main Menu Screen with Control Panel Opened]

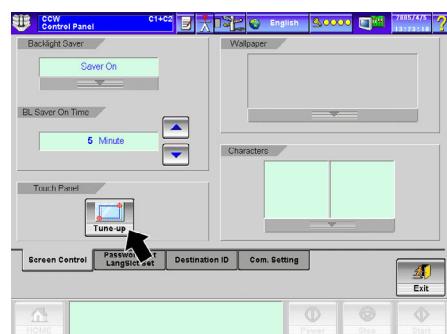
4.3.1 Display Control Menu Screens

4.3.1.1 Touch Panel Coordinate Adjustment

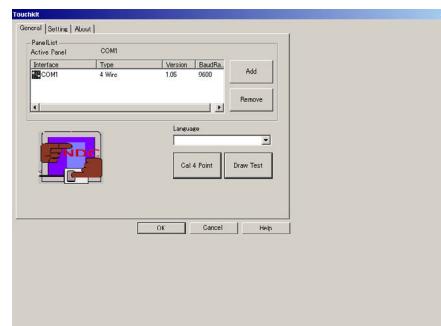
TIP

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

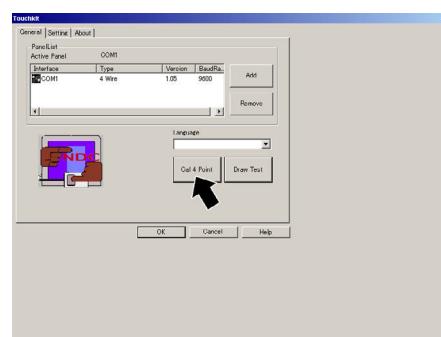
1. Press the [Tune-up] key on the [Display Control menu] screen.



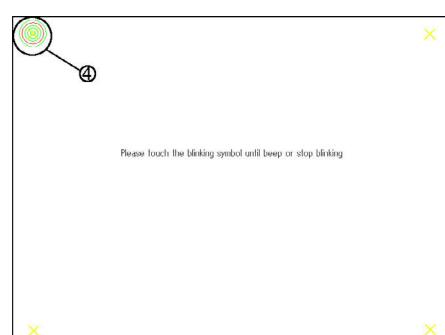
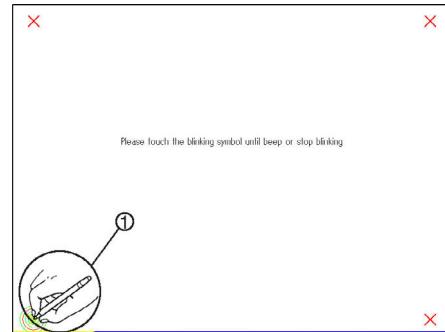
2. The [Confirmation Message] appears, and press the [Yes] key. The [Touchkit] screen appears.



3. Press the [Cal 4 Point] key.



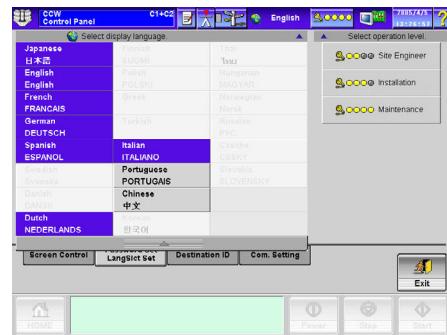
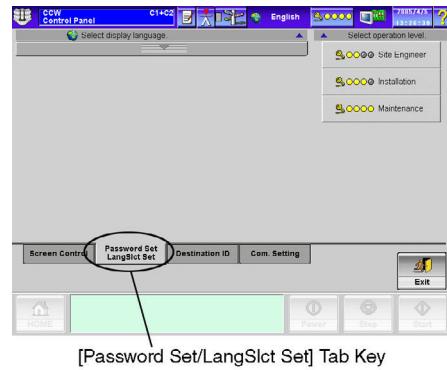
4. The following screens appear, and touch on the mark at each coordinate position with a ball point pen, etc.
5. Touch on the coordinate position mark displayed automatically in order. After 4 points are touched, the [Confirmation Message] appears automatically.



4.3.2 Password Set/Language Select Set Menu Screen

4.3.2.1 Language Select Setting

1. Press the [Password Set/LangSlct Set] tab key.
The Password Set/Language Select Set menu screen appears. Press the [Select display language] pop-up key.
2. Select a display language.



4.3.2.2 Password Setting

- Press the key to change the password on the [Select operation level].

After entering password for change, press the [Return] key.

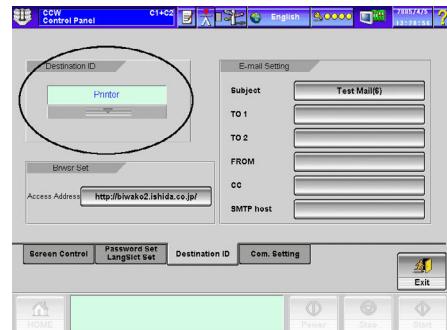


Figure 4-3 [Example]

4.3.3 Destination ID Menu Screen

4.3.3.1 Destination ID

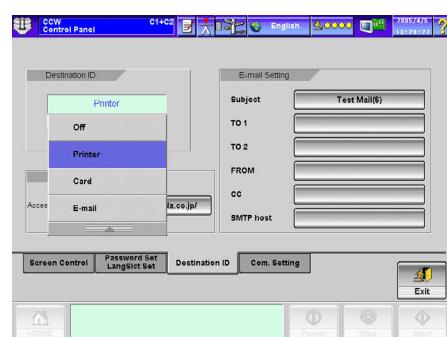
- Press the [Destination ID] tab key. The Destination ID menu screen appears.



- Press the [Destination ID] pop-up key, and select one from [Off, Printer, Card or E-mail].

TIP

Usually, select the [Printer].



4.3.3.2 Browser Setting

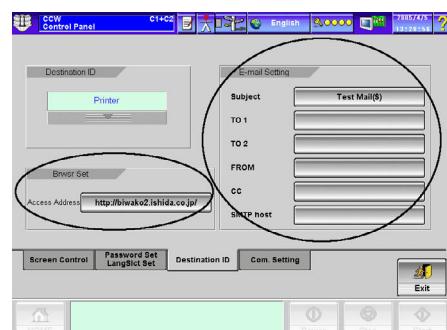
- Set the [Access Address] accordingly.

4.3.3.3 E-mail Setting

- Set each item of [Subject, TO 1...etc.] accordingly.

TIP

This equipment should be connected to the network before setting.

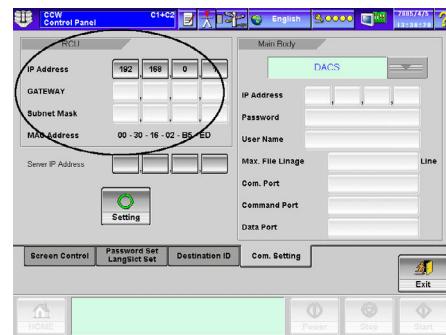


4.3.4 Communication Set Menu Screen

- Touch on the [Com. Setting] tab key. The [Communication Setting] menu screen appears.

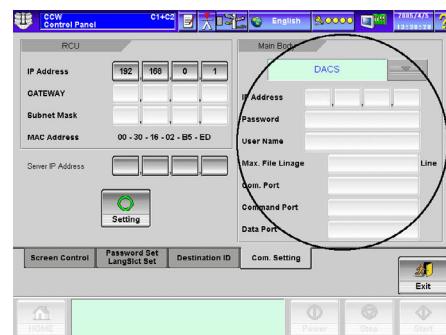
4.3.4.1 [RCU] Communication Setting

- Set the [IP Address, GATEWAY, Subnet Mask] in RCU.



4.3.4.2 [Main Body] Communication Setting

- Set the [IP Address, Password, User Name, etc.] in CCM selected in the Main Body.

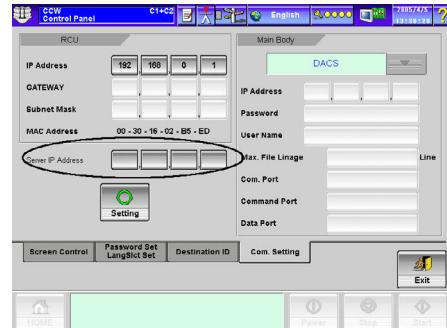


4.3.4.3 [Server IP Address] Setting

- Set the Server IP Address.

NOTE

Be sure not to make an incorrect change.
Otherwise, it may cause the communication failure.



TIP

- The standard values are set at the factory; use them as they are.
- Change these values when interlocking with the computer after receiving the equipment.

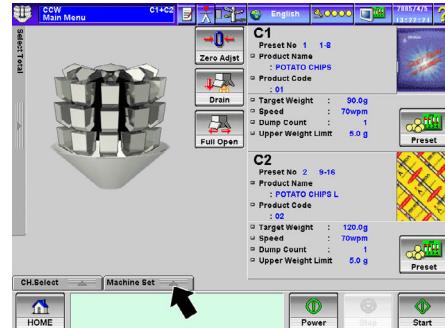
4.4 Maintenance Service Items in Machine Set



Figure 4-4 [Menu Screen with the Machine Set Items Opened]

4.4.1 Weigher Information

1. Press the [Machine Set] pop-up key. The [Machine Set] menu screen appears.



2. Press the [Weigher Information] key. The [Drive Count] screen appears.



3. The Drive Counts for PH and WH are displayed in the [Drive Count] screen. (BH is also displayed in the booster type.)

No.	Detail	Target Count	Counter
1	PH 1 DrvCnt	2000000	00000193590
2	PH 2 DrvCnt	2000000	00000179359
3	PH 3 DrvCnt	2000000	00000193590
4	PH 4 DrvCnt	2000000	00000180190
5	PH 5 DrvCnt	2000000	00000193590
6	PH 6 DrvCnt	2000000	00000179359
7	PH 7 DrvCnt	2000000	00000179359
8	PH 8 DrvCnt	2000000	00000179359
9	PH 9 DrvCnt	2000000	00000193590
10	PH 10 DrvCnt	2000000	00000193590

No.	Detail	Target Count	Counter
11	PH 11 DrvCnt	2000000	00000179359
12	PH 12 DrvCnt	2000000	00000179359
13	PH 13 DrvCnt	2000000	00000179359
14	PH 14 DrvCnt	2000000	00000179359
15	PH 15 DrvCnt	2000000	00000179359
16	PH 16 DrvCnt	2000000	00000193590
17	WH 1 DrvCnt	2000000	00000193297
18	WH 2 DrvCnt	2000000	00000193297
19	WH 3 DrvCnt	2000000	00000193297
20	WH 4 DrvCnt	2000000	00000193297

No.	Detail	Target Count	Counter
21	WH 5 DrvCnt	2000000	00000193297
22	WH 6 DrvCnt	2000000	00000193297
23	WH 7 DrvCnt	2000000	00000193297
24	WH 8 DrvCnt	2000000	00000193297
25	WH 9 DrvCnt	2000000	00000193297
26	WH 10 DrvCnt	2000000	00000193297
27	WH 11 DrvCnt	2000000	00000193297
28	WH 12 DrvCnt	2000000	00000193297
29	WH 13 DrvCnt	2000000	00000193297

No.	Detail	Target Count	Counter
30	WH 14 DrvCnt	2000000	00000193297
31	WH 15 DrvCnt	2000000	00000193297
32	WH 16 DrvCnt	2000000	00000193297
33	BH 1 DrvCnt	2000000	00000200000
34	BH 2 DrvCnt	2000000	00000200000
35	BH 3 DrvCnt	2000000	00000200000
36	BH 4 DrvCnt	2000000	00000200000
37	BH 5 DrvCnt	2000000	00000200000
38	BH 6 DrvCnt	2000000	00000200000
39	BH 7 DrvCnt	2000000	00000200000

4. Using the reset button enables to reset the Drive Counter of each PH, WH, and (BH).

- Press the reset button.

No.	Detail	Target Count	Counter
1	PH 1 DrvCnt	2000000	00000193590

- The Reset Confirmation screen appears.
Press [Yes] to proceed the reset operation.



- The Counter will be reset to [0].

No.	Detail	Target Count	Counter
1	PH 1 DrvCnt	2000000	000000000000

4.4.2 Display and Data Manager

- Press the [Display & Data Manager] key. The [Display & Data Manager] menu screen appears.



4.4.2.1 Layout Setting

- Press the [Layout Setting] tab key. The [Layout Setting] screen appears.
- Displaying position of the Machine No. 1 can be set in any position. (As for the Machine No.2 and later are displayed in the counterclockwise direction.

TIP

The position does not change physically.



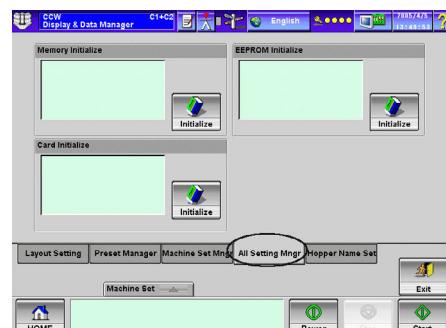
4.4.2.2 Machine Set Manager

- Press the [Machine Set Mngr] tab key. The [Machine Set Manager] screen appears.
- Pressing the keys in the [Machine Set Manager] screen initializes all parameters in the memory card (RCU, DMU), writes all parameter numbers to memory card, and reads all parameter numbers from memory card.



4.4.2.3 All Setting Manager

- Press the [All Setting Mngr] tab key. The [Memory Initialize] and [Card Initialize] screens appear.

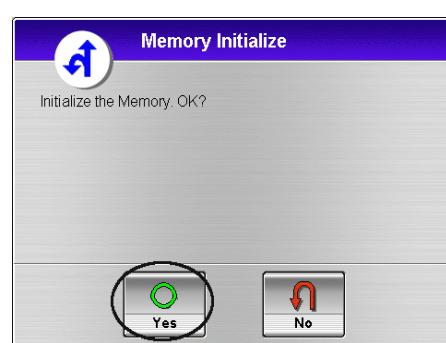


4.4.2.3.1 Memory Initialization

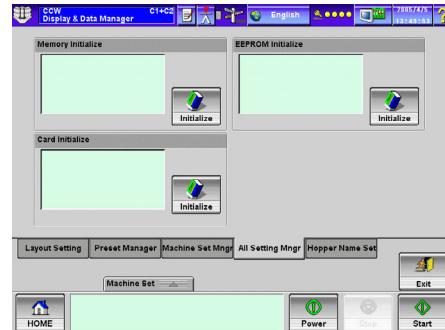
- Press the [Initialize] key of [Memory Initialize].



- The confirmation screen appears. Press the [Yes] key to initialize the memory.

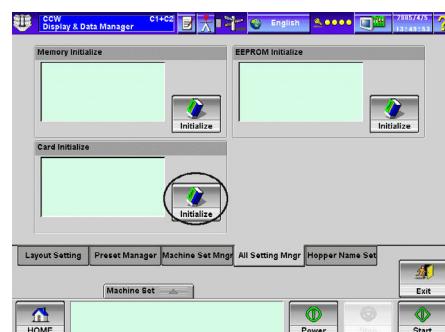


3. When the memory is initialized, the screen returns to the [Memory initialize.] and [Card initialize] screens. Then reboot the main power by following the instruction on the screen.



4.4.2.3.2 Card Initialization

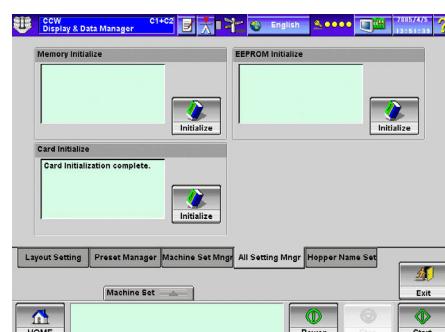
1. Insert the memory card into the card slot of the remote control, and press the [Initialize] key of the [Card Initialize].



2. The confirmation screen appears. When initializing the memory card, press the [Yes] key.

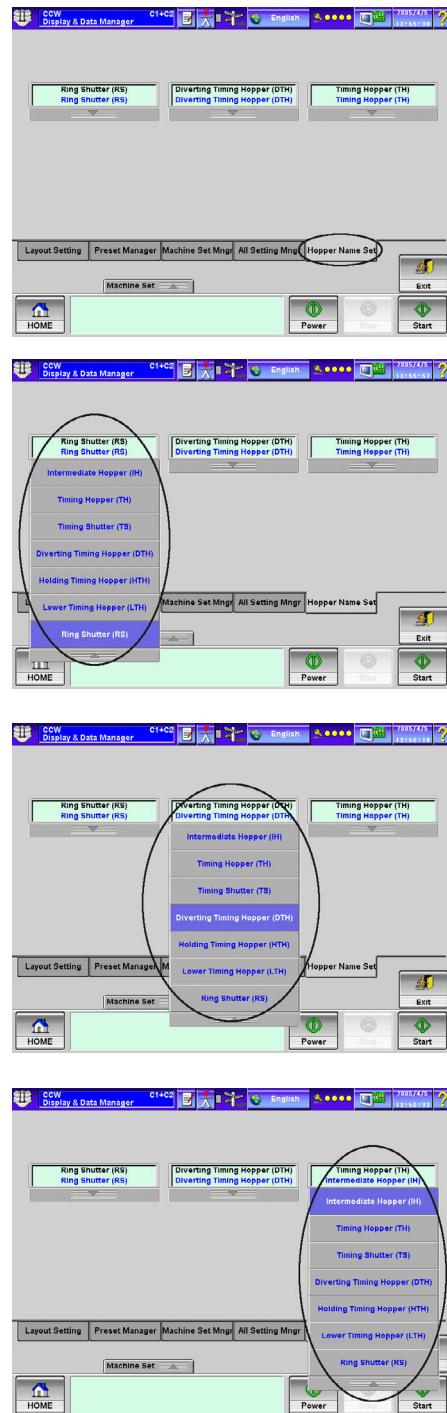


3. When the card is initialized, the screen returns to the [All Setting Manager] screen. Then, remove the memory card from the card slot.



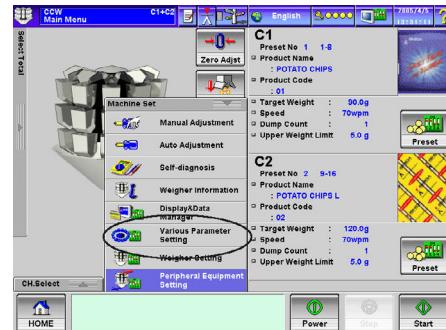
4.4.2.4 Hopper Name Setting

- Press the [Hopper Name Set] tab key. The [Hopper Name Set] screen appears.



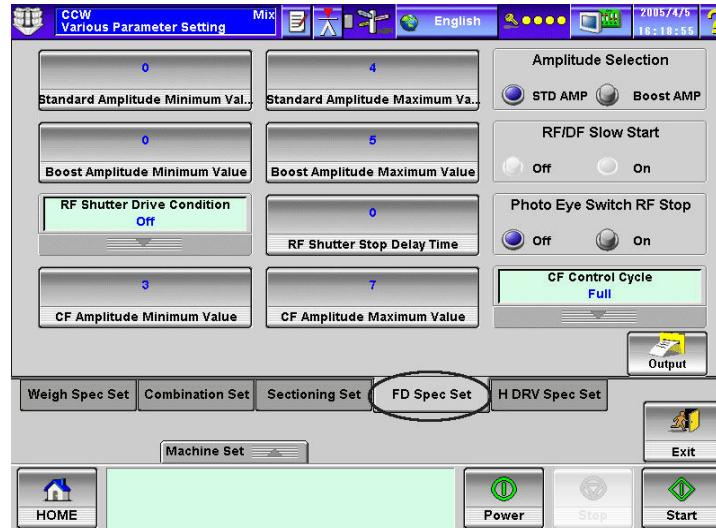
4.4.3 Various Parameter Setting

- Press the [Various Parameter Setting] key. The [Various Parameter Setting] menu screen appears.



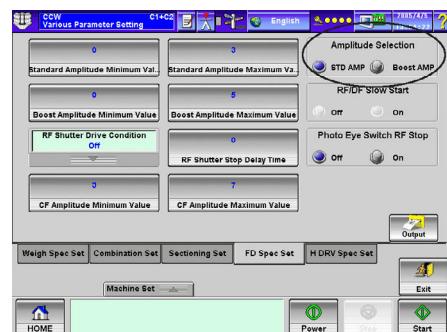
4.4.3.1 Feeder Drive Specifications

- Press the [FD Spec Set] tab key. The [Feeder Specification Set] menu screen appears.
- This menu is used to set and print the parameters for Feeder Drive Specifications.



1. Amplitude Selection

- Pressing the [STD AMP] and [Boost AMP] buttons switches the maximum amplitude values for the Feeder (DF) and the Radial Feeder (RF).
- When set to [STD AMP], the maximum amplitude is 2 mm. [STD AMP] yields higher resolution for the feeder amplitude setting steps [0 - 99] in comparison with the [Boost AMP]. The amplitude setting of 2 mm is considered sufficient for snacks and/or general food, which are easy to flow.
- When set to [Boost AMP], the maximum amplitude is 3 mm. Compared to [STD AMP], the step resolution is lower. [Boost AMP] should be selected for salad and/or sticky products, which are hard to flow. Initialization value is [STD AMP].

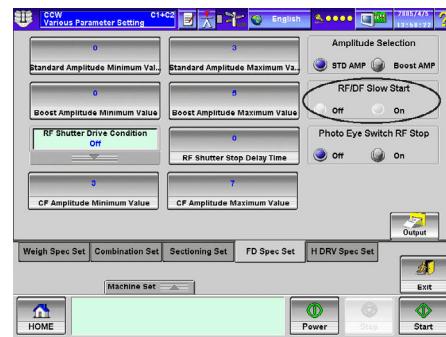


2. RF/DF Slow Start

- Touching this key can set either [On] or [Off] the over-chute preventive action at the amplitude start of RF (radial feeder) and DF (dispersion feeder). In feeder drive characteristic setting, when the setting is given that [STD AMP/Boost AMP] switch is turned to [Boost AMP] and the feeder maximum amplitude is set to 3 mm, the key selection [Off] causes over-chute at the startup and exceeds the breakage limit of leaf spring. To prevent this, set the key selection to [On] to smoothen the amplitude waveform at the startup. The initial value is set to [ON].

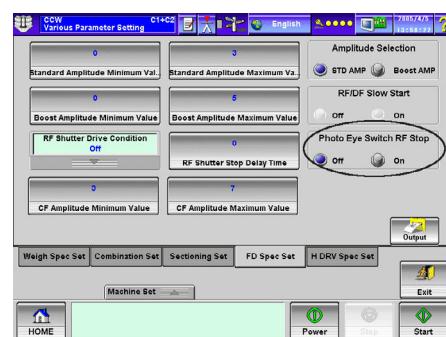
TIP

- (For details, refer to 10. Pattern Drive at Start (Smooth start) function in Chapter 1 PWM Control Feeder Drive Technique of CCW-R series [Technical report 1st edition].)
- In feeder drive characteristic setting, when the setting is given that [STD AMP/Boost AMP] switch is turned to [STD AMP] and the feeder maximum amplitude is set to 2 mm, sometimes the key selection [Off] gives easy control of the weighed product depending on its property.



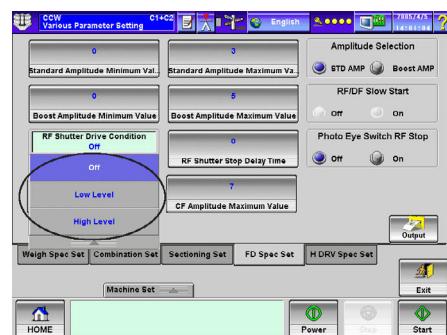
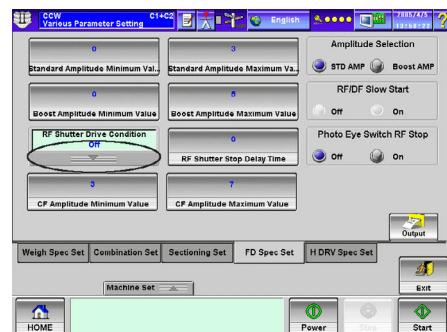
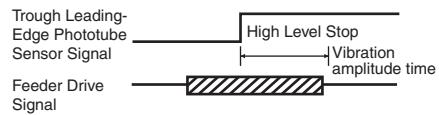
3. Phototube switch RF stop

- Select and press the [On] or [Off] button of Photo Eye Switch RF Stop, and this enables to set how to stop the radial feeder by the radial trough leading-edge phototube. The initialization value is set to [Off].



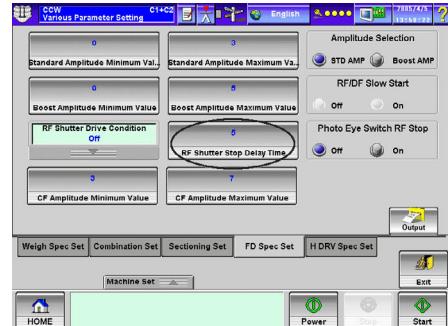
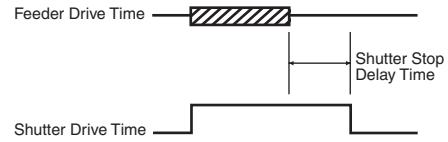
4. RF Shutter Drive Condition

- Press the [RF Shutter Drive Condition] pop-up key. The RF Shutter Drive (Option) can be set in this screen. The initialization value is set to [Off].



5. RF Shutter Stop Delay Time

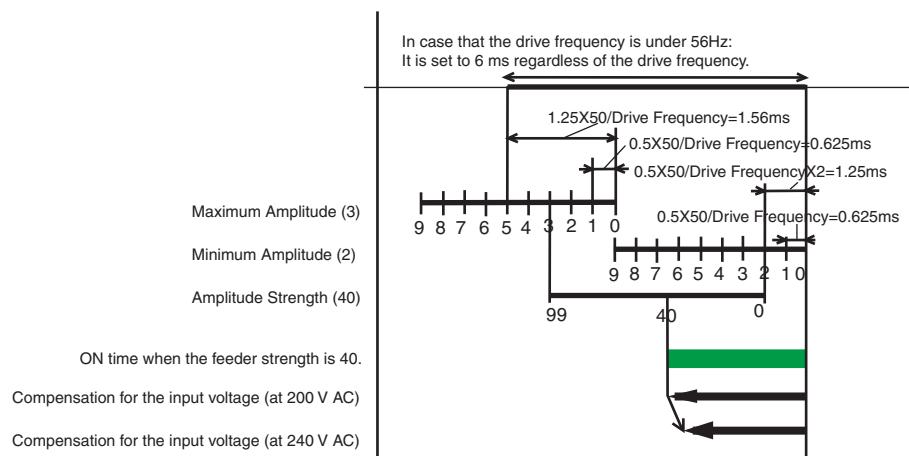
- Pressing the [RF Shutter Stop Delay Time] key displays the ten key and sets the delay time [0 - 2550] ms starting from the time radial feeders stops until shutter stops (Option).



6. [PWM Feeder Control]

The desired drive frequency can be set for all feeders in the PWM control, and the leaf spring adjustment for each power supply frequency is not required. In the PWM control, the FDC sends the feeder strength and the drive frequency data to the FDRV first. The FDC controls the feeder by sending the signals of timing, when the feeder starts and completes driving to FDRV in real time. The example to calculate the feeder strength in the PWM feeder control is shown.

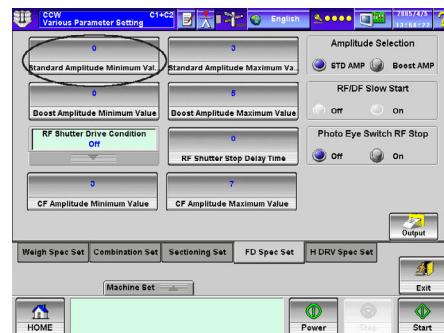
[Example] When the settings are 40Hz Drive, Maximum Amplitude 3, Minimum Amplitude 2, Feeder strength 40, 240V AC

**TIP**

For details of the PWM feeder control, refer to Chapter 1 PWM Control Feeder Drive Technique of CCW-R series [Technical report 1st edition].

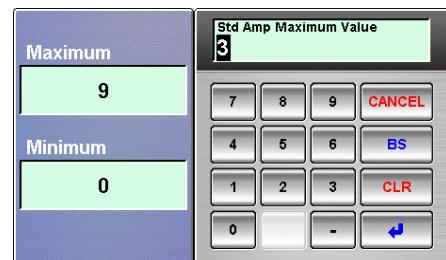
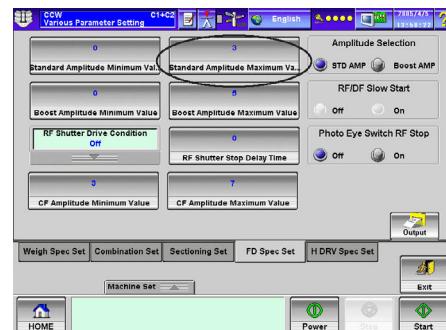
7. Standard Amplitude Minimum Value

- Pressing this key displays the ten key and enables setting the [Standard Amplitude Minimum Value] for when the dispersion feeders (DF) and the radial feeders (RF) are set to maximum amplitude of 2 mm. Setting value is [0 - 9]. The initialization value is [0].



8. Standard Amplitude Maximum Value

- Pressing this key displays the ten key and enables switching to maximum amplitude when dispersion feeders (DF) and the radial feeders (RF) are set to maximum amplitude of 2 mm. This setting value is [0 - 9]. The initialization value is [3].



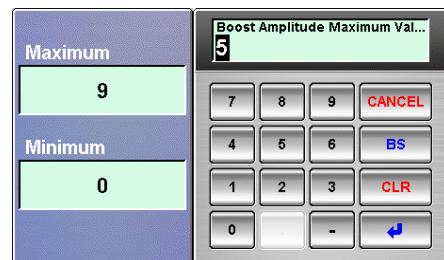
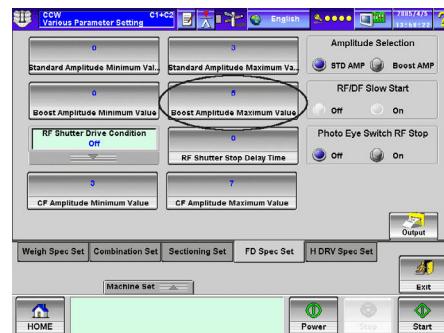
9. Boost Amplitude Minimum Value

- Pressing this key displays the ten key and enables switching to minimum amplitude when dispersion feeders (DF) and the radial feeders (RF) are set to minimum amplitude of 3 mm. This setting value is [0 - 9]. The initialization value is [0].



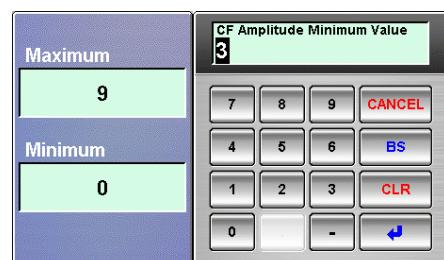
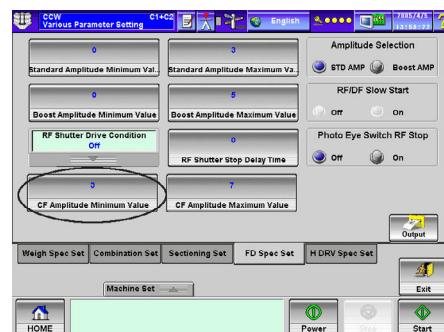
10. Boost Amplitude Maximum Value

- Pressing this key displays the ten key and enables switching to maximum amplitude when dispersion feeders (DF) and the radial feeders (RF) are set to maximum amplitude of 3 mm. This setting value is [0 - 9]. The initialization value is [5].



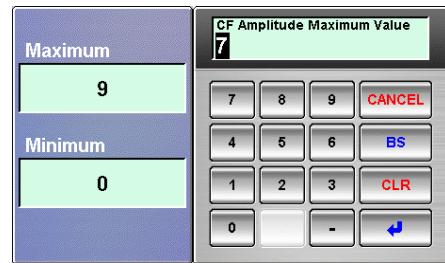
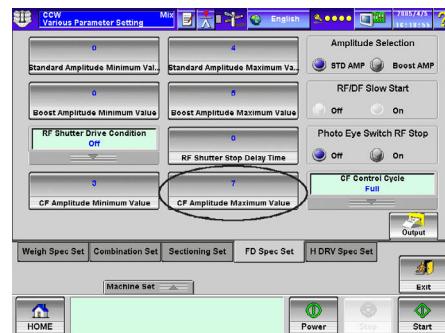
11. CF Amplitude Minimum Value

- Pressing this key displays the ten key and enables setting [CF Amplitude Minimum Value] of the Cross Feeder (CF) (Option). This setting value is [0 - 9]. The initialization value is [3].



12. CF Amplitude Maximum Value

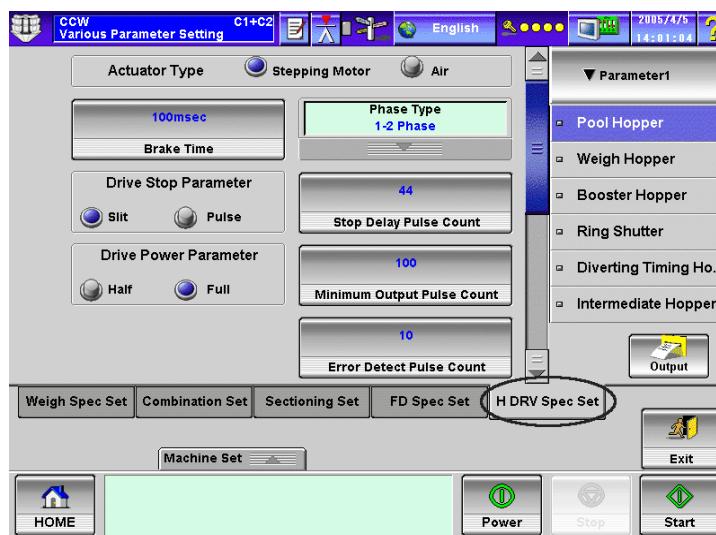
- Pressing this key displays the ten key and enables setting [CF Amplitude Minimum Value] of the Cross Feeder (CF) (Option). This setting value is [0 - 9]. The initialization value is [7].



4.4.3.2 Hopper Drive Specification Setting

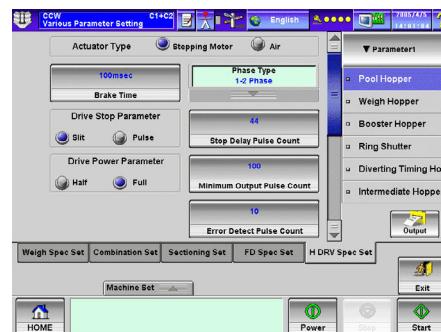
- Pressing the [H DRV Spec Set] key displays the Hopper Drive Specification Setting menu.
- This menu is used to set and print the parameters for Feeder Drive Specifications.

4.4.3.2.1 Hopper Drive Specification Setting (PH/WH/BH)



1. Parameter 1, 2, 3

- Pressing the [Parameter 1] key displays the parameter selection keys.
- Three types of the parameters (1, 2, 3) can be set. Pressing the [Parameter 1, 2, 3] keys selects the number.
- Select these numbers in "Product setting," "Item setting," "Hopper Drive Specification Setting" of "Preset." There are three types of the parameters [1, 2, 3] for each preset.
- Usually, the Standard Hopper Drive Specification Pattern is set for the [Parameter 1]. The Drive Pattern set in [Parameter 2] is shorter in its open/close time than the standard one. The Drive Pattern set in [Parameter 3] pauses when the hopper is at full open, and its hopper open/close time is longer than that of [Parameter 1]. The setting value for each Hopper Drive Spec Setting varies according to the models.

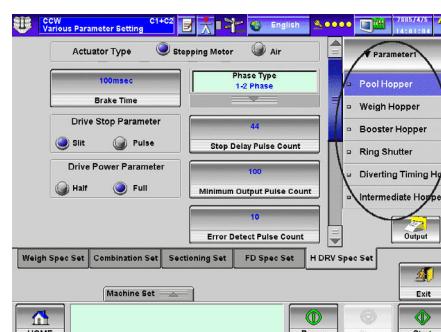


Section No.	Range	Speed (mm)	Hold Time (msec)	Drive Start	Drive Stop
1	100	160	0	20	0
2	15	160	0	20	0
3	0	89	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0

Hopper Drive Specification Pattern

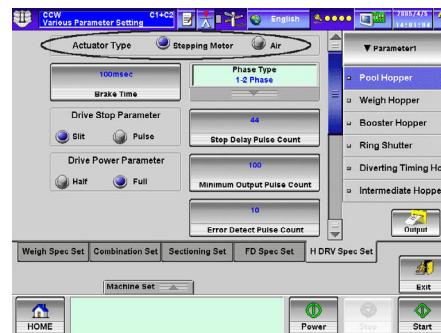
2. Each Hopper Selection

- Select the [Pool Hopper to Timing Hopper] key under the [Parameter 1] key, and perform the Hopper Drive Specification Setting.



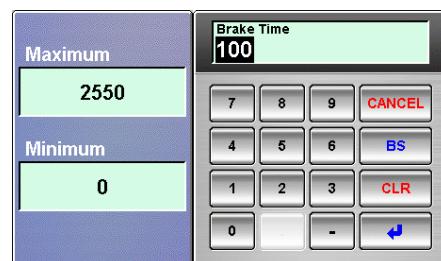
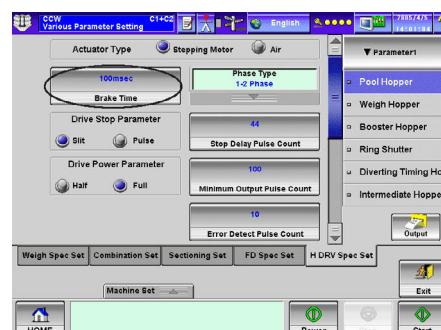
3. Actuator Type

- Pressing this button sets the hopper open/close actuator. Initialization values are set to [Stepping Motor]; however, set to [Air] for hopper open/close specifications using the air cylinder.
- When setting to the [Air], the other Hopper Drive Specification Settings except for this item become inoperative.



4. Brake Time

- Pressing this key displays the ten key used to maintain stepping motor phase. Set the time [0 - 2550] ms in which the brake is applied after drive stop parameters are enacted and motor stops.
- While brake is being applied, the motor is restarted and returns to normal operation without an operation overlap error sounding.
- Usually, set the value to [100] ms.



5. Stepping Motor Phase Type

- Pressing this pop-up key sets the stepping motor phase type.
- Step angle and torque can be changed by changing phase type.
- There are 3 types of phase: [1 phase], [2 phase], [1-2 phase]. The phase type can be changed by pressing the key.
- To open and close hopper requires the appropriate phase setting. For this reason, always set to 1-2 phase type. In 1-2 phase, characteristic is set.

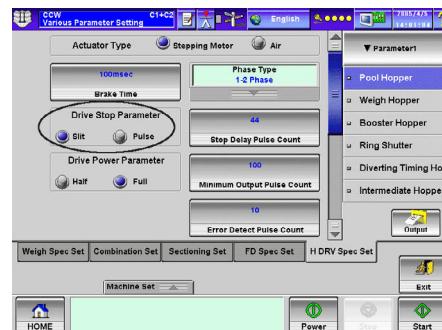
NOTE

After initialization, the stepping motor phase type will be set as [1-2 Phase].



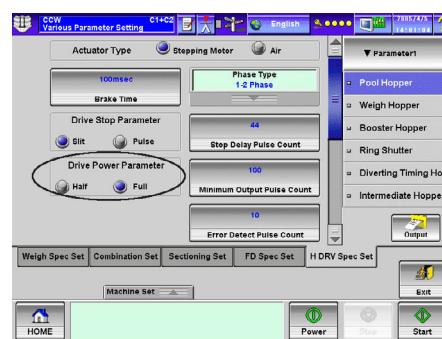
6. Drive Stop Parameter

- For PH, WH, and BH, pressing this button sets the drive stop parameter of the motor. Two types of settings, [Slit] and [Pulse] are available. Since this machine mode is designed to detect the drive stop position by slit signal, always set to [Slit].



7. Drive Power Parameter

- For PH, WH, and BH, touching on this button enables to set the drive power parameter of the motor.
- It is possible to lower power consumption and torque for all intervals by changing power setting. However, this function is not intended to save energy and should always be set to Full.



8. Stop Delay Pulse Count

- Pressing this key displays the ten key used to enter the step number for setting the duration from when the drive stop parameters are enacted by slit signals until the motor stops. Step value is [0-255].
- The initialization values depend on the hoppers.

[Initialization value]

PH: [44]

WH: [2]

BH: [2]

DTH: [4]

TH: [4]

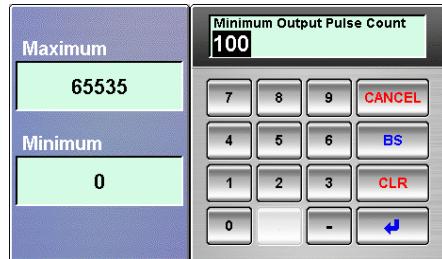
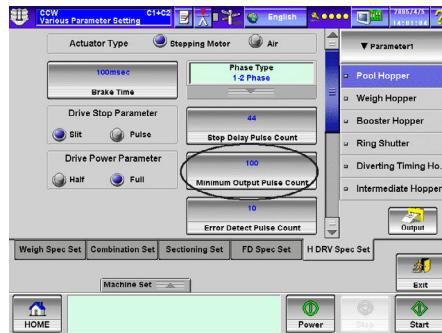
If other values are entered, the initial position will be unstable and the open/close sound will get stronger. (Do not make a change.)



Maximum	Stop Delay Pulse Count 44			
255	7	8	9	CANCEL
Minimum	4	5	6	BS
0	1	2	3	CLR
	0	-		←

9. Minimum Output Pulse Count

- Pressing this key displays the ten key used to enter step number for setting the interval from when the motor is started until slit signals are not detected. Usually, this value is set to [100].

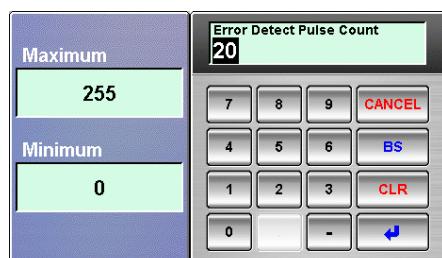
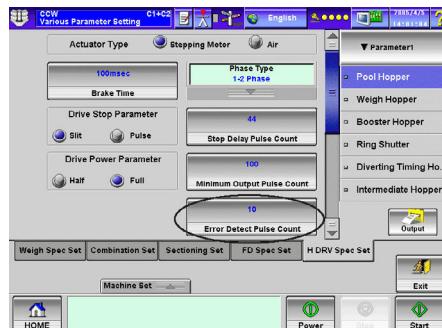


10. Error Detection Pulse Count

- Pressing this key displays the ten key used to set the number of steps [0 - 225] to consider the error message when motor rotation is not performed accurately.
- The motor cannot operate normally and returns an error when the difference in absolute value between the step count of normal rotation and reverse rotation exceeds the Error Detection Pulse Count for hopper open/close by motor normal/reverse operation.

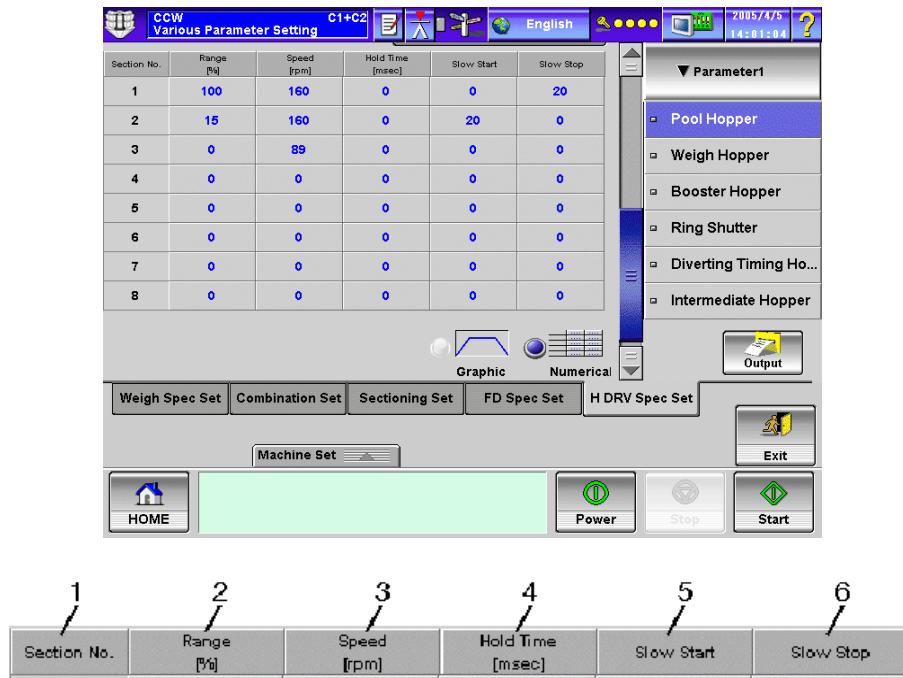
NOTE

Setting this value to 0 disables Error Detection Pulse Count. However, if a request for the next hopper open/close occurs while hoppers are driving, it causes an overlap error to occur. Usually set to [20].



4.4.3.2.2 Hopper Open/Close Drive Pattern (PH/WH/BH)

- Move the cursor downward in the H DRV Spec Set screen. The Hopper Open/Close Drive Pattern appears.



1. Section

- Motor rotation is partitioned into several sections for [Drive Pattern]. These sections set [Range], [Speed], [Hold Time], [Slow Start], and [Slow Stop] as one set and are given numbers corresponding to the sequence in which they occur.
- A maximum of 8 sections can be partitioned for motor rotation.

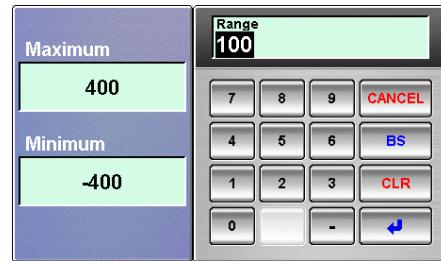
Section No.	Range [%]
1	100
2	15
3	0
4	0
5	0
6	0
7	0
8	0

2. Range

- [Range] expresses by percentage the carry-over position of a completed section in relation to the maximum carry-over position of that section. When range setting is larger than the range setting of the previous section. When range setting is larger than the range setting of the previous section, it means that the motor operates normally. When the range setting is smaller than the range setting of the previous section, it means that the motor operates reversely.
- Maximum carry-over position is controlled by the full step number (Standard: 200 pulse) and varies according to machine type and hopper size.
- Pressing the number in the [Range] column for each section displays the ten key.
- Currently, [100]% is set to the [Range] column of [Section1].

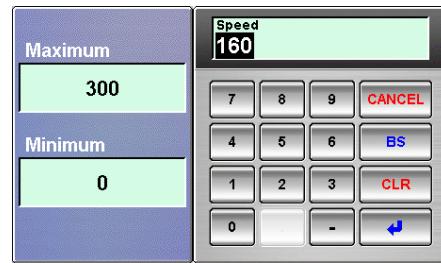
TIP

[Example] A hopper with a full step count of 200 set to a range of 100% is completed at a carry-over position of approximately 200 steps (200×1.00) at a rotated position of 180 degrees (200×0.9) from the initial position.



3. Speed

- [Speed] expresses the rotation speed at constant speed (not adjustable speed) for a section motor operation.
- When sent to [0 rpm], the section set to 0 becomes inoperative and drive patterns are in effect for the previous sections.



NOTE

Although the software supports higher speed settings than [300 rpm], do not set to this value, for operation cannot be guaranteed when speed exceeds [300 rpm]. When set under [120 rpm], pay attention to the slow start and slow stop settings.

4. Hold Time

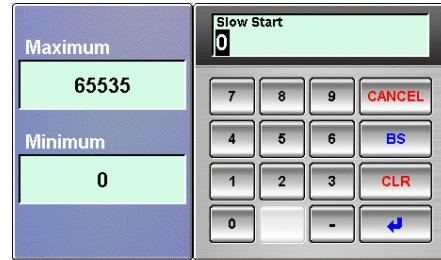
- [Hold Time] expresses the delay between the completion of a section operation and the beginning of the next section operation.
- Usually, this value is set to [0].
- Since the simplest way to increase hopper open/close time is to extend the stop time at full open position, [Hold Time] is usually set for a section with a [100%] Range setting.



Figure 4-5 [Set between 0 and 3000 (ms)]

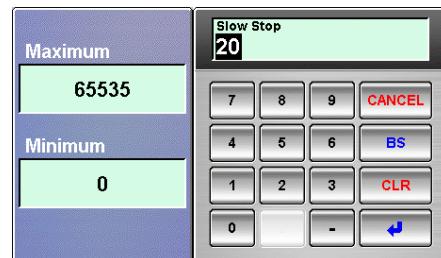
5. Slow Start

- [Slow start] expresses the interval in steps used to accelerate motor rotation along an acceleration curve (automatically calculated) from the speed at completion of the previous section to the speed set for the present section.
- When the speed difference is large, set slow start to a large value for smooth motor rotation. Note that the sum of steps set in [Slow Start] and [Slow Stop] cannot exceed the number of steps set for that section. When starting from reverse rotation or full step, the acceleration curve is automatically calculated from a speed of 120 rpm. For this reason, set [Slow Start] to [0] when section speed is below [120 rpm] for startup or starting reverse.

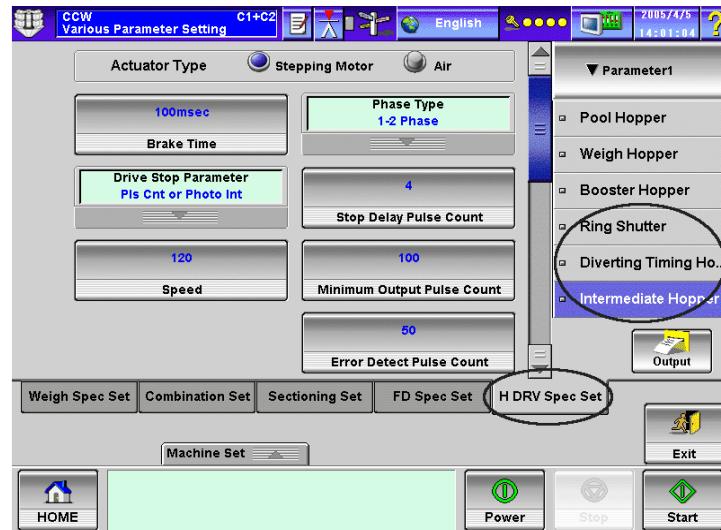


6. Slow Stop

- Slow stop expresses the interval in steps used to decelerate along an deceleration curve (automatically calculated) and stop the rotating motor.
- When decelerating from a high speed, set the slow stop to a large value for smooth stopping of motor. Note that the sum of steps set in [Slow Start] and [Slow Stop] cannot exceed the number of steps set for that section. When the drive stop parameters are set by slit for the last section, the motor is not stopped and speed is slowed to 120 rpm along an automatically calculated deceleration curve. For this reason, set [Slow Stop] to [0] when speed is below [120 rpm].

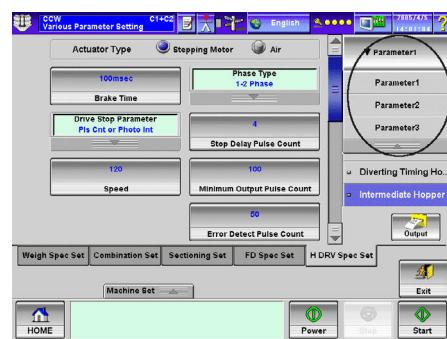


4.4.3.2.3 Hopper Drive Specification Setting (D.TH/TH/RS)



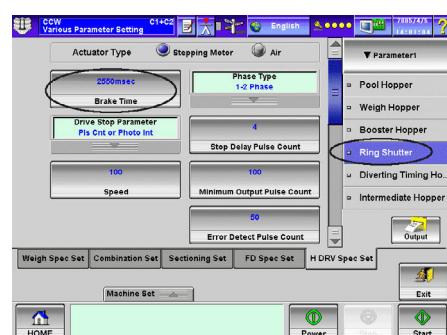
1. Parameter 1, 2, 3

- Pressing the [Parameter 1] key displays the parameter selection keys.
- Three types of parameters (1,2,3) can be set. Pressing the [Parameter 1, 2, 3] keys selects the number.
- Select these numbers in "Product setting," "Item setting," "Hopper Drive Specification Setting" of "Preset." There are three types of the parameters [1,2,3] for each preset.



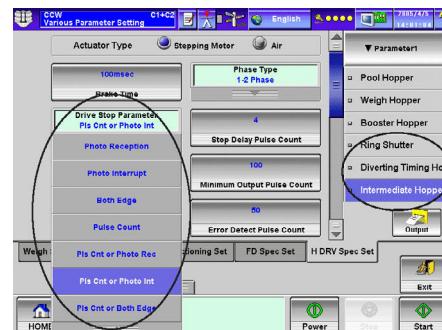
2. Brake Time

- Pressing this key displays the ten key used to maintain stepping motor phase. Set the time [0 - 2550] ms in which the brake is applied after drive stop parameters are enacted and motor stops.
- While brake is being applied, the motor is restarted and returns to normal operation without an operation overlap error sounding.
- Usually, the value is set to [100]. (RS is [2550]ms.)



3. Drive Stop Parameter

- For DTH, TH, and RS, touching this pop-up key sets the drive stop parameter of the motor. The position of the drive stop is normally set to be detected by circular (or strip) slit cam detection. For this reason, always set to [Pls Cnt or Photo Rec + Pls Cnt or Photo Int].

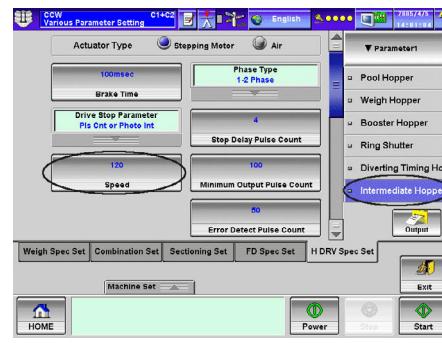


4. Rotation Count

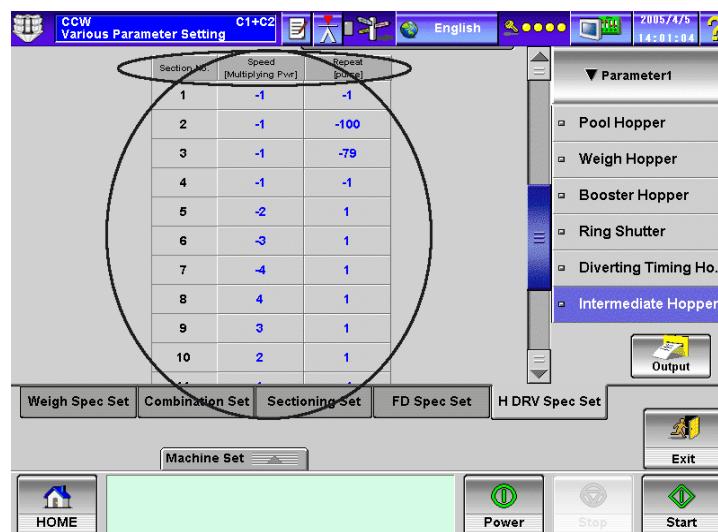
- Touching this key displays the ten key used to set the motor standard speed by the Rotation Count per minute.

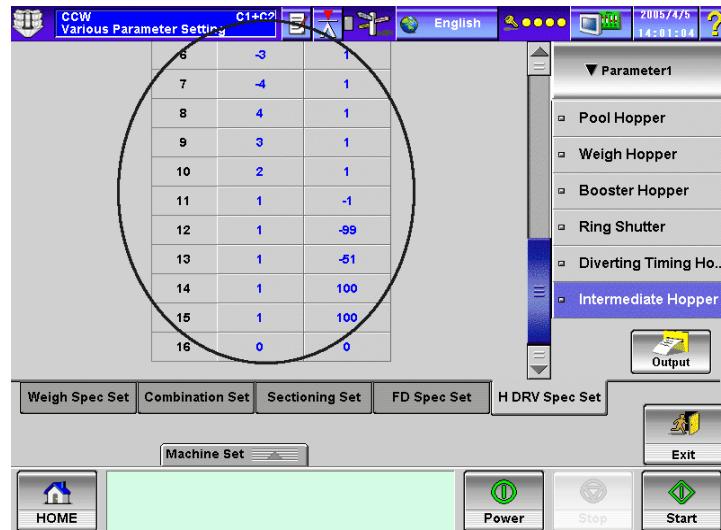
NOTE

Although the present software allows to set values greater than [200 rpm] and less than [50 rpm]; do not set these values, for operation cannot be guaranteed outside of [50 to 200 rpm].



4.4.3.2.4 Hopper Open/Close Drive Pattern (DTH/TH/RS)





■ [Drive Pattern] of DTH, TH and RS can be set in this menu.

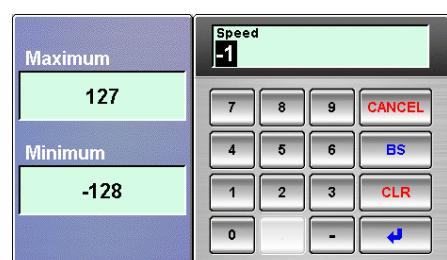
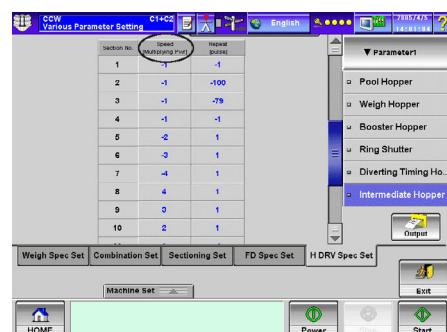
- Motor rotation is partitioned into several sections for [Drive Pattern]. These sections set [Speed] and [Repeat] as one set.
- A maximum of 16 sections can be partitioned for motor rotation.

TIP

When the Drive Stop Parameter is set to [Pulse], set the operation step number equal for the normal rotation and the reverse rotation. When it is set to other than [Pulse], set larger step count for the reverse rotation than that for the normal rotation. In this case, be sure to set the larger step number than [Error Detection Pulse Number].

1. Speed

- This expresses the value used for how fast the machine operates with the motor rotation speed set by 4.4.3.2.3/4. rotation count as a standard.
- When set to 1, the speed is one-first. When set to 3, the speed is one-third. When a minus value is set, it rotates in reverse at the same speed.
- When set to [0 rpm], the section set to 0 becomes inoperative and drive patterns are in effect for the previous sections.

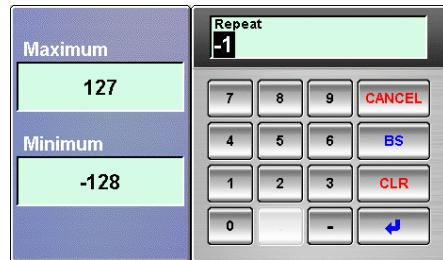
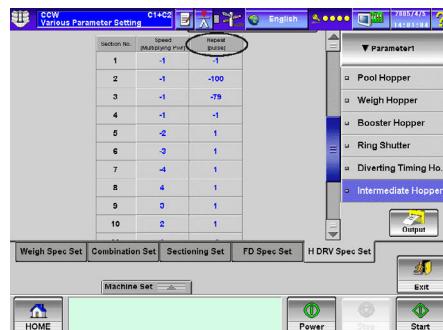


2. Repeat

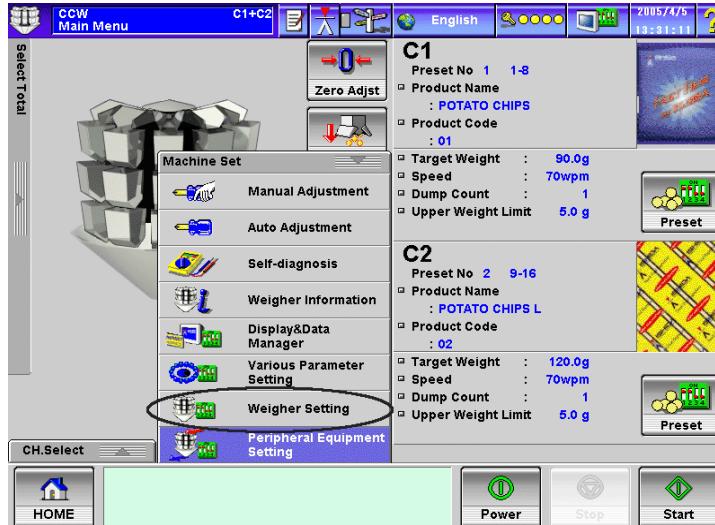
- This expresses the value used to indicate how many operation steps are repeated; one step operates at the speed set in [Speed].
- It operates at low torque and low electrical consumption when a minus value is set.
- When set to [0 rpm], the section set to 0 becomes inoperative and drive patterns are in effect for the previous sections.

NOTE

The position of the drive stop is normally set to be detected by strip (or circular) slit cam detection. For this reason, set all the reverse [repeat] step counts [100] steps larger than all the normal one.



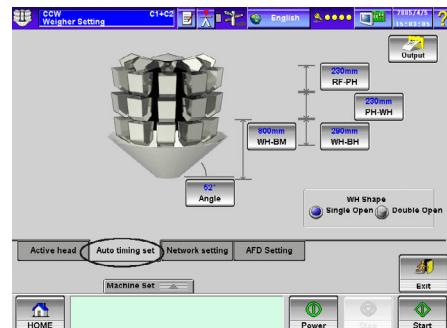
4.4.4 Weigher Setting



■ Pressing the [Weigher Setting] displays the [Weigher Setting] menu screen.

4.4.4.1 Automatic Timing Setting

- Pressing the [Auto timing set] tab key displays the Automatic Timing Setting screen.
- This menu is used to set the parameters for Automatic Timing Setting and print them.



1. WH Shape

- Input the WH Shape in use. Press either of [Single Open] or [Double Open].



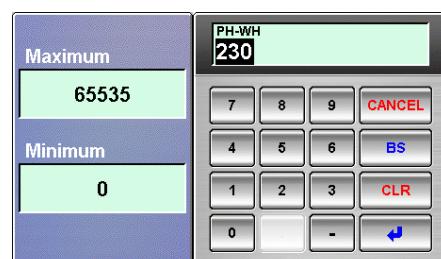
2. RF-PH

- Pressing the **290mm RF-PH** key displays the ten key. Input the distance between the RF edge to PH bottom.
- The PH-RF Delay Time is automatically changed when the PH Open Time of the timing adjustment in the Preset is changed.



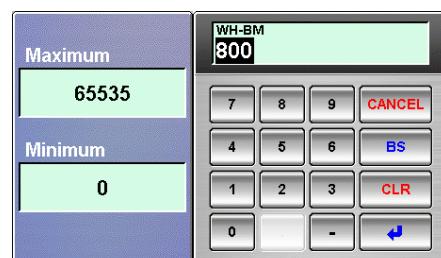
3. PH-WH

- Pressing the **290mm PH-WH** key displays the ten key. Input the distance between the PH edge to WH bottom.
- The WH-PH Delay Time is automatically changed when the PH Open Time of the timing adjustment in the Preset is changed.



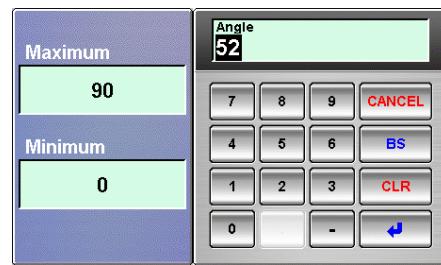
4. WH - Packing (TH)

- Pressing the **290mm WH-BH** key displays the ten key. Input the distance between the WH edge to the packer in mm. (In case of TH, input the distance between the WH edge to TH bottom in mm.)
- The IS-TH Delay Time is automatically changed when the TH Open Time of the timing adjustment in the Preset is changed.



5. Angle

- Pressing the **Angle** key displays the ten key. Input the Collection Chute Angle in degrees.

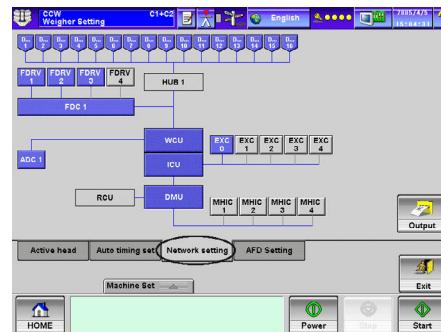


4.4.4.2 Network Setting

- Touching on the [Network Setting] tab key displays the Network Setting screen.

NOTE

The standard is initialized at the factory and the required network setting is ready. No setting of this screen is required again at the site.



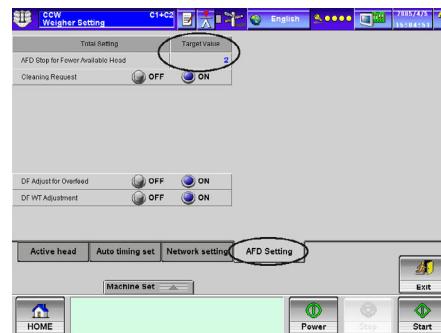
- When adding the option unit after delivering, perform the network setting of the unit in this screen.

4.4.4.3 AFD Setting

- Touching on the [AFD Setting] tab key displays the AFD Setting screen.

TIP

The flow is affected depending on the products and the wrong flow may cause the AFD function not to work sufficiently. Turn OFF the AFD Setting when the accuracy and speed drop.



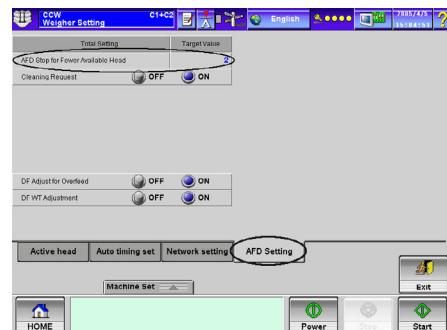
1. AFD Stop Function for Fewer Available Head Number

- Touching on the [Target Value] column of the AFD Stop Function for Fewer Available Head Number, displays the ten key. Input the number. Usually, the value is set to [2].

TIP

AFD Stop Function for Fewer Available Head Number operates like mentioned below when the Head Number, which cannot participate in the combination inside the all WH (Unstable Head Full Scale etc.), exceeds the Target Value.

- Stops the operation of the dispersion feeder control.
- The RCU screen displays the message indicating that the AFD is in pause due to the Head Number decreasing.



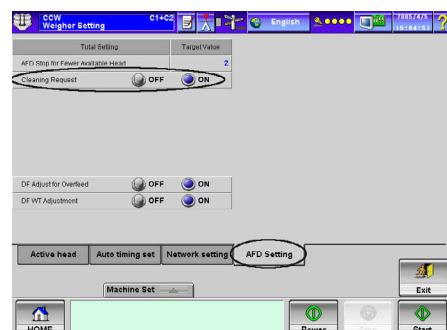
2. Cleaning Request Detection

- Touching either on the [Off] or [On] buttons of the Cleaning Request Detection of the AFD Setting screen, and input [Off] or [On]. Usually, [Off] is set.

TIP

The Cleaning Request Detection operates as mentioned below considering the targeted head as insufficient supply status when the counters for each WH are prepared, increasing the count with WH empty occurrence, decreasing the count with participate/selection, and the counter is 10 or more (saturated with 12) within the dispersion weigh control cycle (25 times).

- Stops the operation of the DF control parts and the dispersion weigh control parts.
- Displays to mention that the AFD is in stop considering the targeted head as insufficient supply status on the RCU screen.

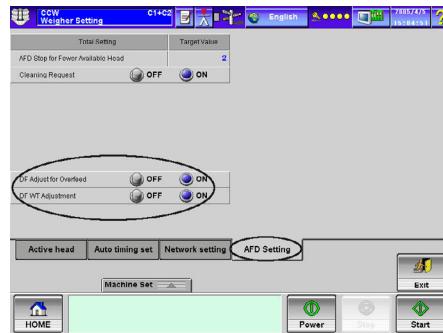


3. DF Adjust for Overfeed/DF WT Adjustment

- Pressing either the [Off] or [On] buttons of these functions, and input [Off] or [On]. Usually, [Off] is set.

TIP

- DF Adjust for Overfeed stabilizes the discharge volume from the disperse feeder by calculating and changing the actual dispersion time for each weigh cycle.
- DF WT Adjustment operates the dispersion weigh according to each status by classifying the weigh status of the machine into 5 types based on the average selection head number, empty head number and áýþ/Overfeed (Over Scale) occurrence number calculated during 25 times of weighing.
- For details on the CCW-R AFD Control, refer to CCW-R series [Technical report 1st edition](Part number: 085-6009-04).



5 APPENDIX

5.1 Program Installation Procedure from Web-RCU	5-1
5.1.1 Installation Software Start up	5-1
5.1.2 RCU Software Backup	5-2
5.1.3 RCU Software Installation	5-4
5.1.3.1 Installing the Program to Existing Model.....	5-4
5.1.3.2 Installing Program Newly	5-5
5.1.4 CCW CAL Software Backup.....	5-6
5.1.5 CCW CAL Software Installation	5-9
5.1.5.1 Backup Software Reinstallation	5-10
5.1.6 Errors during Installation and Backup.....	5-11
5.1.6.1 Error Display Screen.....	5-11
5.2 Direct Program Installation to Main Unit (DMU).....	5-13
5.2.1 Attaching CF to DMU Board.....	5-13
5.2.2 Status for Installation Start and Installation Process	5-14
5.2.3 Installation Completion.....	5-14
5.3 AFV (Anti Floor Vibration)	5-15
5.3.1 AFV Compensation System	5-15
5.3.2 AFV for CCW-R (CCW-NZ or later)	5-15
5.3.3 AFV Effect for CCW-R (CCW-NZ or later)	5-19
5.3.4 Relationship between the AFV and Filter.....	5-19
5.4 Frequency Adjustment(PWM Control Feeder).....	5-21
5.4.1 Adjustment of Frequency	5-21
5.4.2 Memory and Display of Frequency.....	5-21
5.4.2.1 Natural frequency	5-21
5.4.2.2 Drive Frequency Display.....	5-21
5.4.2.3 Frequency Initialization.....	5-21
5.4.3 Natural Frequency Check for Feeder and RCU	5-21
5.4.3.1 When no response for natural frequency comes from FDRV	5-22
5.4.3.2 When the natural frequencies memorized in FDRV and in RCU differ from each other	5-22
5.4.4 Automatic Adjustment of Frequency.....	5-24
5.4.4.1 Adjustment of Natural Frequency	5-24
5.4.4.2 Drive Frequency Check.....	5-26
5.4.4.3 Adjusting Feeder Amplitude by Drive Frequency.....	5-27
5.4.4.4 Procedure of Amplitude Adjustment by Changing the Drive Frequency.....	5-28
5.5 Procedure for Replacing FDRV Board and DMU Board ..	5-30
5.5.1 Replacing the boards	5-30

5.5.1.1	Overview.....	5-30
5.5.1.2	Procedure of Board Replacement.....	5-30

5 APPENDIX

5.1 Program Installation Procedure from Web-RCU

CAUTION

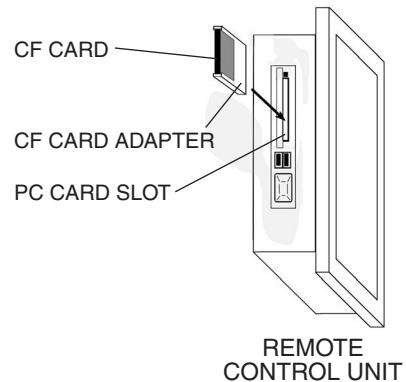
During the software installation or backup process, never turn off the power or remove the installation card.

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.

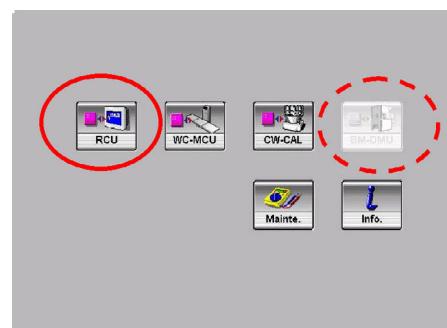
5.1.1 Installation Software Start up

- 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.



- 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.



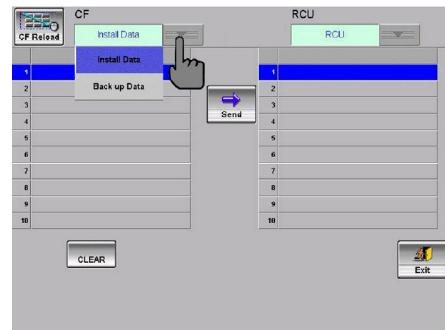
CAUTION

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.

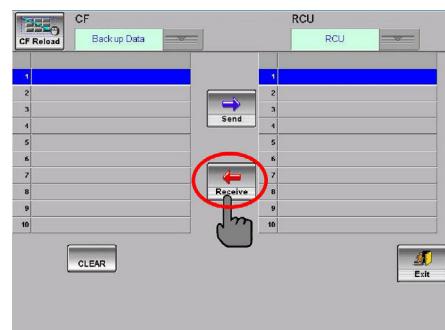
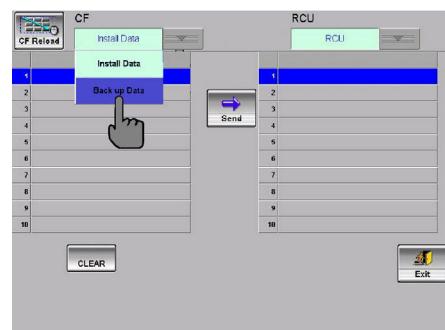
5.1.2 RCU Software Backup

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.



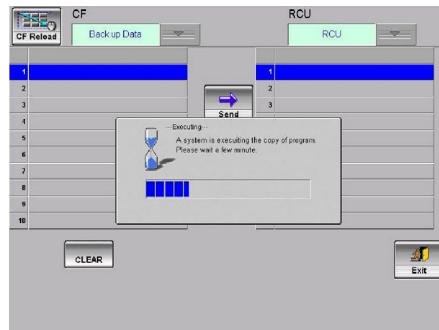
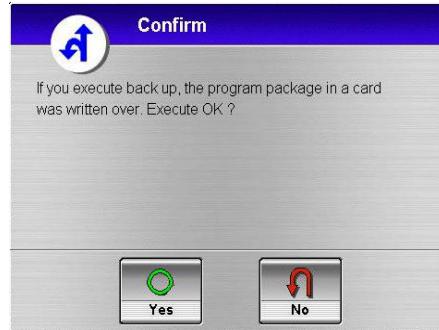
3. The  key as shown in the above figure

appears. When the  key is pressed, the confirmation dialog screen appears to confirm whether or not to backup the RCU software.

4. Press the  key to backup.

Press the  key to return to the previous screen.

5. Press the  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.

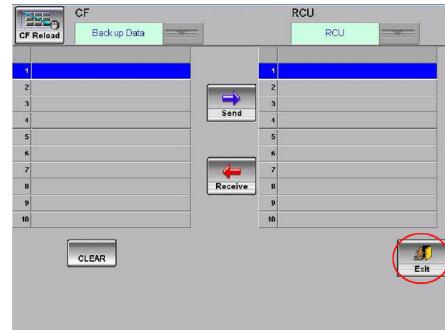
7. The RCU backup is completed. Press the  key to return to the previous installation screen.



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

NOTE

When the error screen appears during the backup process, refer to "5.1.6 Errors during Installation and Backup" 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.

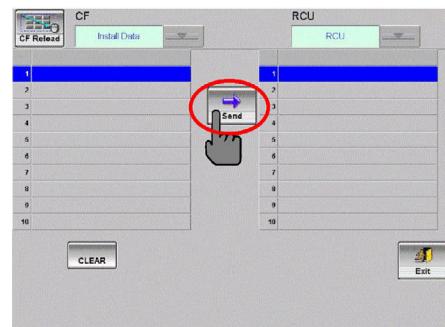
Unless otherwise indicated, install the RCU software by the method "1. Install Program to Existing Model" after the factory shipment.

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  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.

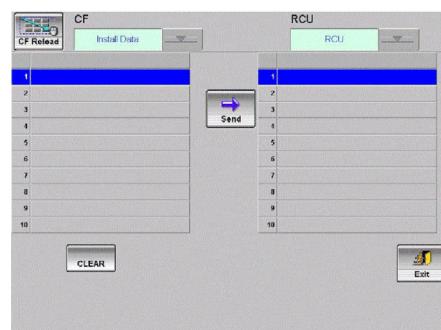
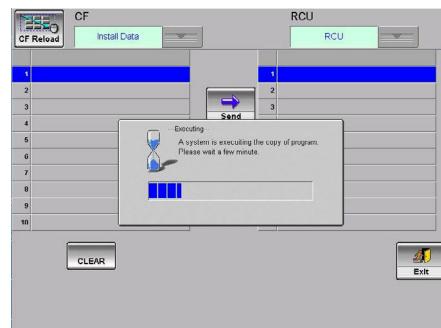
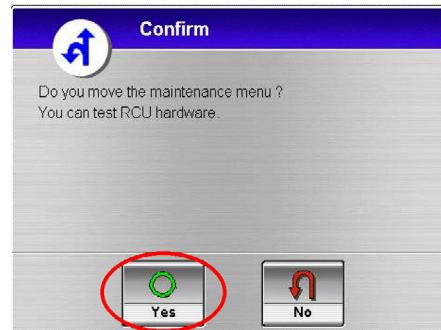
CAUTION

**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  key to return to the previous installation screen.

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



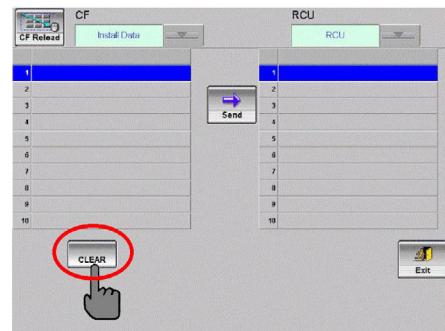
5.1.3.2 Installing Program Newly

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.



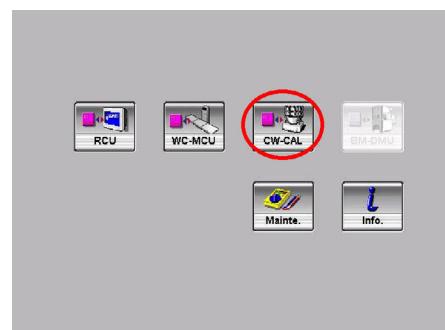
3. The confirmation dialog screen appears to confirm whether or not to delete the RCU parameter file.
- Press the  key to delete the parameter file.
4. After deleting the parameter file, install the new program by referring to "5.1.3.1 Installing the Program to Existing Model". When the existing parameter file is deleted, the default parameter file is automatically copied from the installation card.



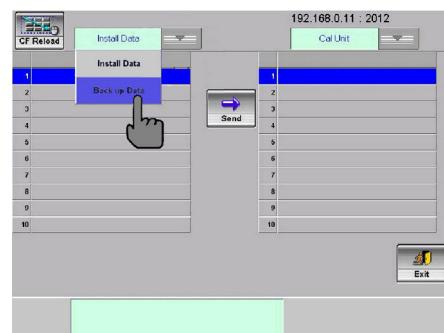
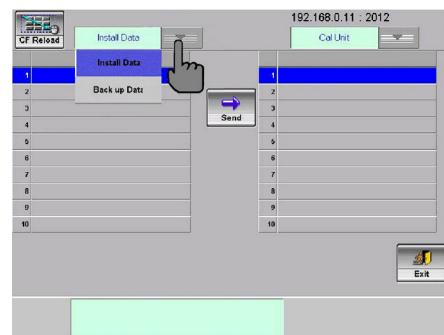
5.1.4 CCW CAL Software Backup

Before installing the new software, backup the written CCW CAL software to the CF card. When the backup is not necessary for such a case as board replacement, proceed to "5.1.5 CCW CAL Software Installation".

1. Press the  key on the main menu screen.

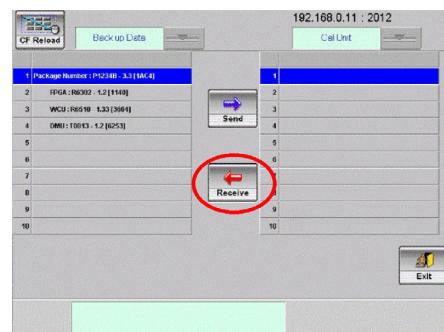


2. The CCW CAL installation screen appears. Press the drop-down key at the upper left of the screen. Select "Back up Data" from the list, and press the "Back up Data" key.



3. The  key as shown in the figure above

appears. When the  key is pressed, the confirmation dialog screen appears to confirm whether or not to backup the CCW CAL software.



4. Press the  key to backup.

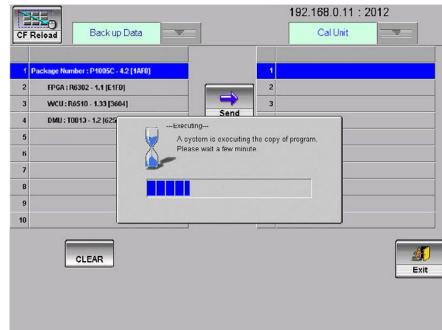
Press the  key to return to the previous screen.



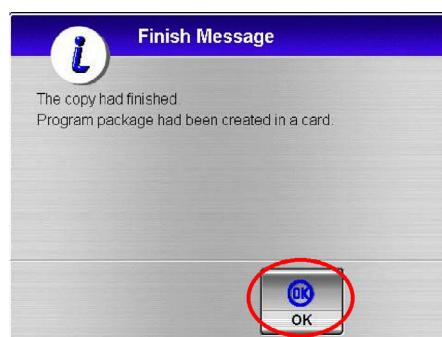
5. When the  key is pressed on the confirmation screen, the backup process starts, and the backup process screen is displayed. The waiting time is approximately 5 minutes, depending on the software.

NOTE

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



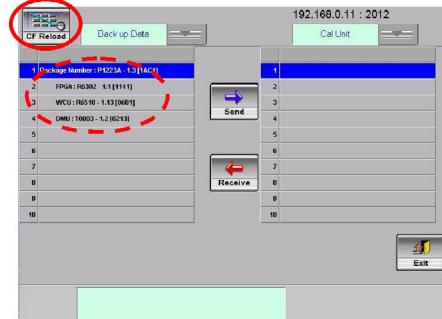
6. When the backup process is completed, the Finish Message appears. The CCW CAL backup is completed. Press the  key to return to the previous installation screen.



7. Press the  key on the installation screen to return to the main menu screen. When the backup is completed, press the "CF Reload" key circled in a solid line at the upper left of the reloaded screen in the right figure. The software package (circled in a dashed line) read in the backup is displayed. Confirm that the software package stored in the machine is displayed.

TIP

When the error screen is displayed during backup process, refer to "5.1.6 Errors during Installation and Backup" to handle the error.

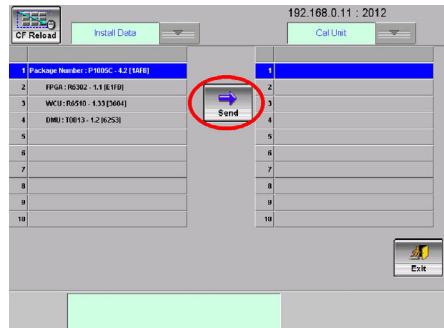


5.1.5 CCW CAL Software Installation

When the stored CCW CAL software does not need the backup or when the backup process is completed, install the CCW CAL software.

1. Press the  key on the main menu screen.
2. The CCW CAL installation screen appears.

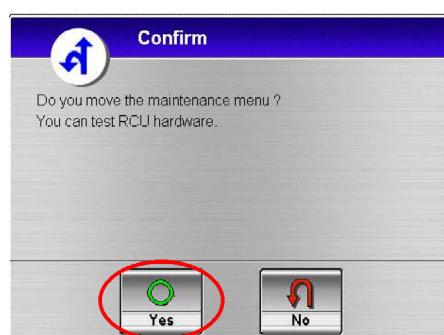
Press the  key.



3. The confirmation dialog screen appears to confirm whether or not to install the CCW CAL software.

4. Press the  key to install.

Press the  key to return to the previous screen.



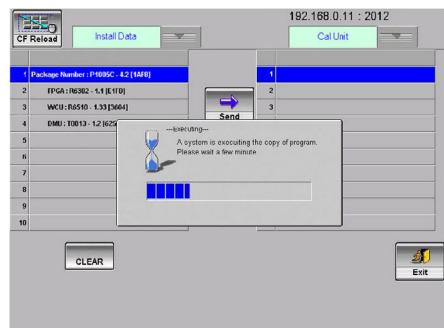
5. When the  key is pressed on the confirmation screen, the installation process starts, and the installation process screen appears.

The waiting time is approximately 5 minutes, depending on the software.

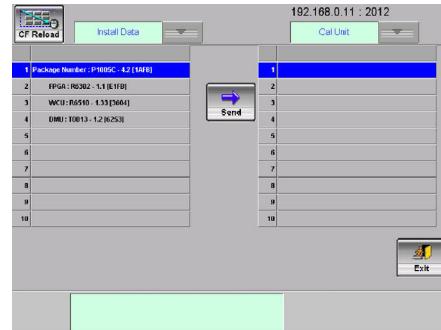


During the installation process, never turn off the power or remove the installation card.

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



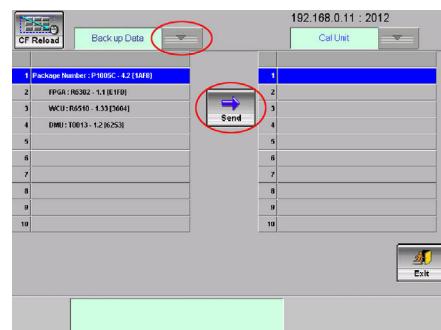
8. Press the  key on the installation screen to return to the main menu screen.
9. To reflect the result of software installation, turn off the power, remove the installation card from the slot, and turn ON the power again.



5.1.5.1 Backup Software Reinstallation

1. When the backup CCW CAL software package exists in the installation card, press the drop down key at the upper left of the screen. Select

 the "Back up Data," and press the  key. For the other operations, refer to "5.1.5 CCW CAL Software Installation".

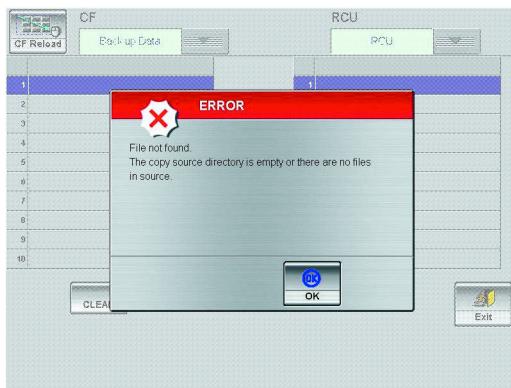


5.1.6 Errors during Installation and Backup

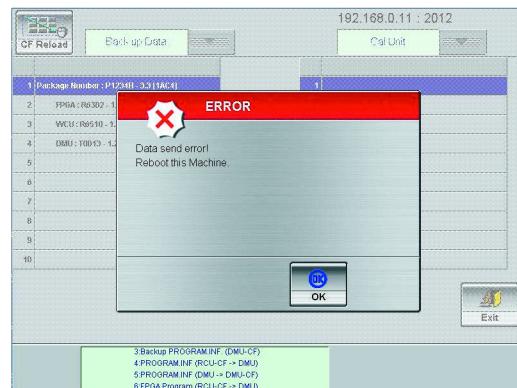
5.1.6.1 Error Display Screen

During the installation or the backup process for the RCU software, the error messages as shown below may appear.

- When an error occurs during the installation or the backup process for the RCU software, press the  key to return to the previous screen and handle the error by referring to the "5.1.6.1 Error Display Screen".
- When an error occurs during the installation or the backup process for the CCW CAL software, handle the error by referring to the message box (circled in a solid line) for the "Action on Error during Installation or Backup of CCW CAL Software" and "5.1.6.1 Error Display Screen".



Error during installation or backup of RCU software



Error during installation or backup of CCW CAL software

Table 5-1 Countermeasures for Error during Installation or Backup of CCW CAL Software

Trouble	Cause	Countermeasure
Necessary screen buttons are not displayed at the installation or backup.	<ol style="list-style-type: none"> The "program.inf" and program name are not matched. The sum value of "program.inf" is incorrect. The program for the installation is not included in the installation card. 	Use the installation card including the correct programs.
The operation is paused after the following messages appear in the error dialog screen. - File not found. - The copy source directory is empty or there are no files in source.	<ol style="list-style-type: none"> There is no data to be correctly installed in the installation card. The backup process is performed for the RCU program while the program does not exist in the RCU. 	Use the installation card including the correct programs. The backup process cannot be performed without the existing program.

Table 5-1 Countermeasures for Error during Installation or Backup of CCW CAL Software

Trouble	Cause	Countermeasure
The operation is paused after the following messages appear in the error dialog screen. - Network connection error. - Can not connect to main board. - Reboot this Machine.	The Ethernet is not connected or improperly connected between the RCU and the main unit.	Pause the installation operation, and check if the machine starts up correctly. Without establishing the network, installation or backup of the main program cannot be performed.
The operation is paused after the following messages appear in the error dialog screen. - Data send error! - Reboot this Machine. Refer to the message box circled in a solid line on the "Error during installation or backup of CCW CAL software" screen.	"40 PCCard access error." Since the CF card does not exist on the main board, the error occurs during the installation and backup. "*** download name check error." or "*** download version check error." or "*** download sum check error." The program name or sum value defined in the *** program does not match "program.inf". The program with an incorrect version may be tried to be installed.	Insert the CF with the appropriate program to the main board. Check the installation data.
The operation is paused after the following messages appear in the error dialog screen. - Data send error! - Reboot this Machine. Refer to the message box circled in a solid line on the "Error during installation or backup of CCW CAL software" screen.	"*** start address error." or "***program download error." The contents in the *** program cannot be read. The installation data may be broken, or a different program type is operated. "73 *** DIPSW error." The DIP switch setting is incorrect.	Check the installation data. Check the DIP switch on the *** board.
The error messages other than those above appear in the message box.	• Errors occur during the internal process.	After rechecking the installation data and no error is found, inform the recorded error message to the manufacture.

5.2 Direct Program Installation to Main Unit (DMU)

⚠ CAUTION

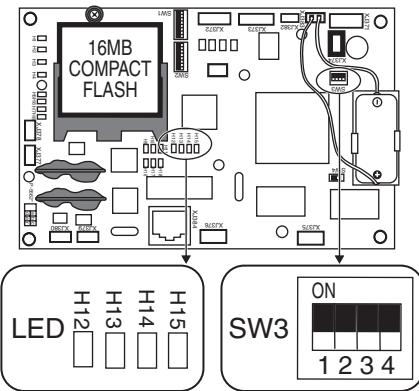
During the installation process, never turn off the power or remove the CF card.

The socket for CF is attached on the DMU board. When the software is written to the CF, the software written in the CF is automatically transferred to the internal flash ROM. This CF requires software for WCU, FPGA, and DMU.

In this installation procedure, it is assumed that the software for WCU, FPGA, and DMU is correctly installed to the CF card (16 MB) at the factory.

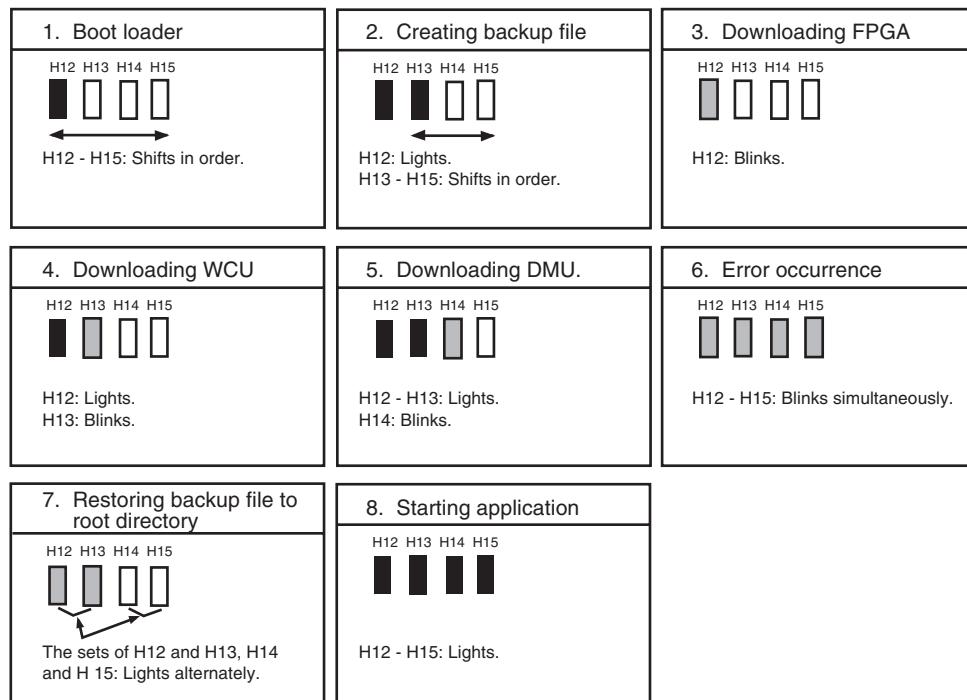
5.2.1 Attaching CF to DMU Board

1. Turn off the power.
Attach the CF card to the DMU board with a fixing screw.
2. Check that the DIP switch, SW3-1 on the DMU board is OFF.



5.2.2 Status for Installation Start and Installation Process

1. Attach the DMU board to the CAL unit, and connect wirings including connectors.
2. The installation automatically starts by turning on the main power.
3. The installation status can be checked with LEDs H12 to H15 on the DMU board.



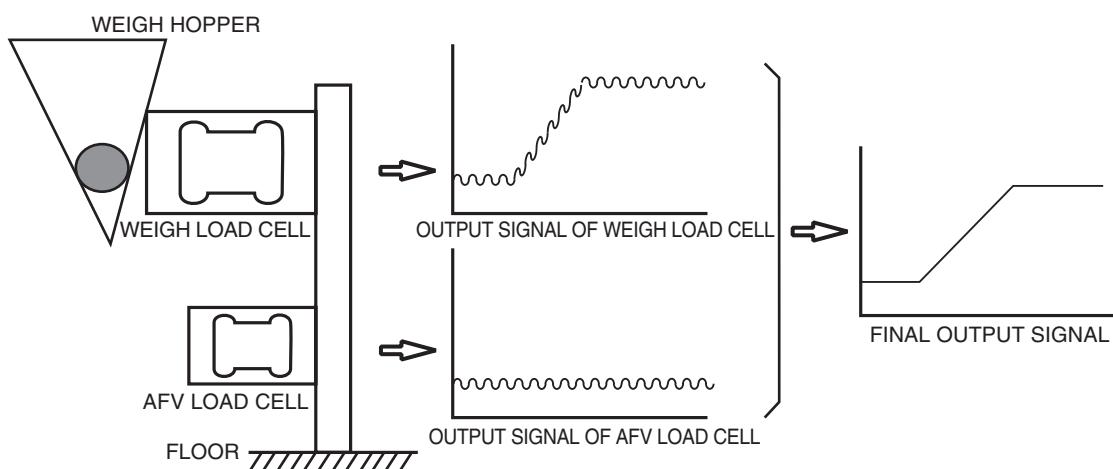
5.2.3 Installation Completion

When the installation is completed, the LEDs are displayed as the table "8. Starting application." Turn OFF the main power, and restart the machine.

5.3 AFV (Anti Floor Vibration)

5.3.1 AFV Compensation System

Principle of AFV Compensation System



The AFV compensation system is the function to remove the influence of floor vibration transmitting from the attaching part of weigh load cell.

The weigh signal is obtained by deducting the vibrational component detected by the load cell for floor vibration detection (AFV load cell) from the weigh signal containing the floor vibration output.

Since the filter was conventionally the only way to remove the disturbance, the filter with low cutoff frequency and long filter time had to be used to reduce the low-frequency floor vibration of 10 Hz or less. By incorporating the AFV compensation system, the filter with high cutoff frequency and short filter time is now available to achieve high performance.

$$\text{Weigh load cell output signal} = \text{Weigh signal} + \text{Output from floor vibration}$$

$$-) \text{ AFV load cell output signal} = \text{Output from floor vibration}$$

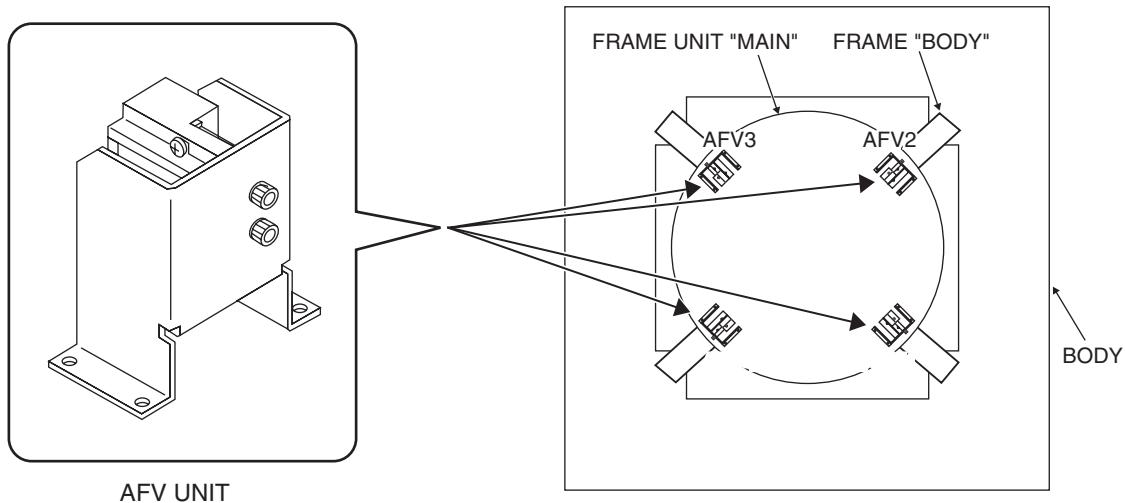
$$\text{Final output signal} = \text{Weigh signal}$$

5.3.2 AFV for CCW-R (CCW-NZ or later)

In the AFV system incorporated on the DACS-V W series, each weigh load cell equips a vibration detection load cell.

For the CCW-R series (CCW-NZ or later), the number of weigh load cell (weigh head) is 10 to 24. It is difficult to prepare a vibration detection load cell (hereinafter referred to as AFV load cell) per each cell in terms of the cost and space. For the CCW-R series (CCW-NZ or later), 4 AFV load cells are equipped for a machine, regardless of the number of the weigh heads.

AFV Unit and Layout



1. Surface calculation

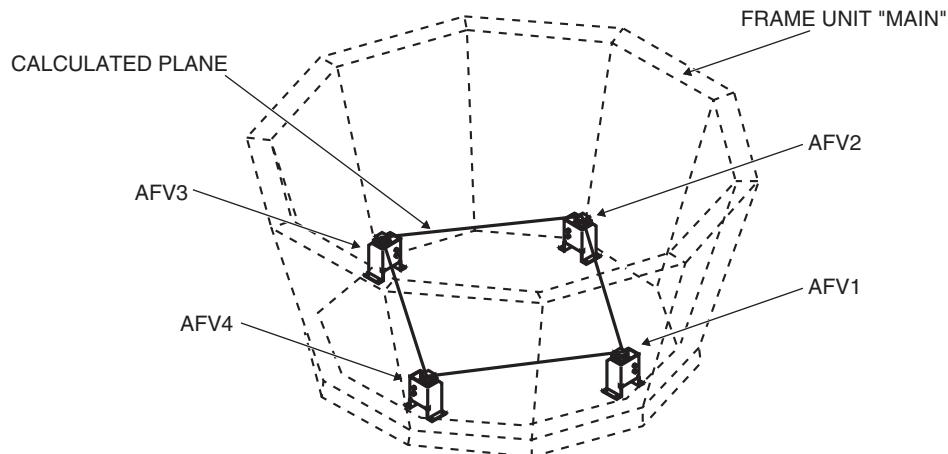
When the frame unit "main" equipping the weigh head and AFV load cell has an adequate rigid body, the mounting positions of the weigh load cell and AFV load cell are on the same plane. The load cell signal is output in proportion to the displacement magnitude of the mounting positions from the plane in resting state.

When three positions on the plane are determined, the plane can be determined. With three AFV load cells, the plane including the weigh head is determined by the outputs. The output by vibration can be calculated by determining the weigh head position with optional time.

The error is reduced by determining the plane using the minimum square method.

In order to reduce errors, the plane is determined by the outputs from four AFV load cells by using the minimum square method.

Plane Calculated from Four AFV Load Cells



2. AFV coefficient (---- sensibility rate)

Although the weigh load cell and the AFV load cell suffer the same vibration in the same plane, the compensation may be necessary since the output may differ depending on the load cell sensibility (rated output) and the tare load rate. The compensation coefficient is the AFV coefficient.

The AFV coefficient is calculated per each head.

To cancel the actual vibrational component, the following formula is applied.

(Weigh signal) - (AFV coefficient) x (Vibrational component of weigh load cell calculated by AFV load cell)

For the CCW-R (CCW-NZ or later) series, the AFV coefficient values are between approximately 40000 and 80000, depending on the machine and WH weight.

The values vary in the same machine depending on the variation and vibration condition of the weigh load cell sensibility.

(AFV coefficient) x 28000/8192/65536

From the internal calculation processing, the following is the actual sensibility rate (weigh load cell/ AFV load cell), which is approximately 2 to 4.

3. AFV adjustment

The AFV adjustment is performed to obtain the AFV coefficient. When the machine is placed on the soft rubber for adjustment and adjustment is started, the machine opens and closes each PH of half of heads (the machines with even number and the machines with odd number open and close alternately). The sensibility is automatically calculated by driving the feeder and applying the vibration. The errors are reduced by obtaining the trend from the repeated calculations. When the calculation count reaches 400 for all heads, the adjustment is automatically completed.

When the vibration output is increased to some extent, the calculation errors cannot be ignored. The adjustment is not performed unless the vibration is the specified strength or more.

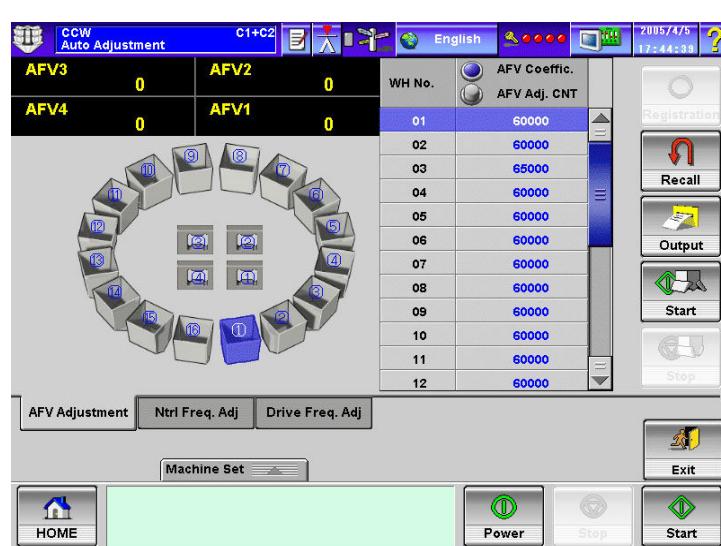


Figure 5-1 AFV Adjustment Screen



Figure 5-2 AFV Adjustment Count Screen

NOTE

The AFV adjustment is performed before factory shipment, and it is not necessary after receiving.

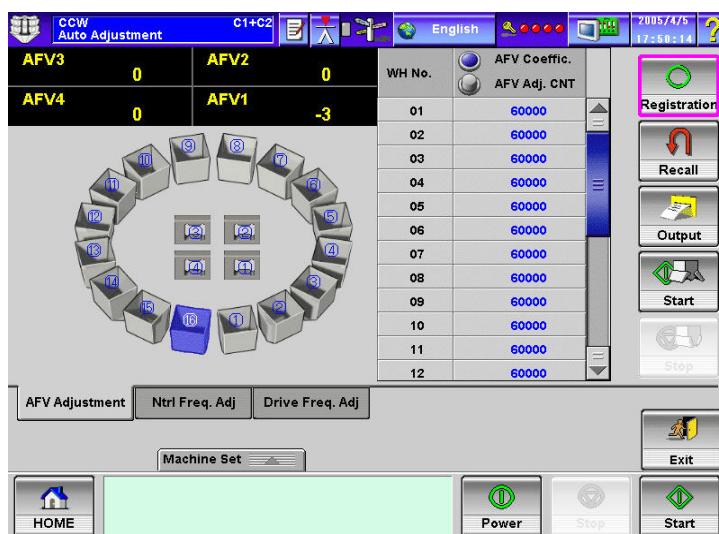


Figure 5-3 AFV Coefficient Registration Screen

NOTE

- When replacing the ADC board at the site, register the AFV coefficient once again for each head recorded in the delivered reference material.
- When recalling the AFV coefficient, the AFV coefficient for each head becomes "60000."

4. Weight compensation

The AFV coefficient is determined while the WH is empty. For the normal production status, the weighed product is applied to the weigh load cell in addition to the tare weight. The output by vibration is stronger compared with the empty one. On the other hand, since any load except for the vibration is not applied to the AFV load cell, the AFV coefficient needs to be compensated by the loaded weight as follows.

When the tare weight of initial weigh load cell is M and the weighed product weight is m, the formula is as follows:

$$((M+m)/M) \times (\text{Initial AFV coefficient})$$

Since the weighed product weight, m is the value to be calculated finally, the value is not determined when the AFV compensation is performed. Therefore, the weighed product weight is calculated by performing AFV compensation without performing the weight compensation, and the calculated weight is applied for the weight compensation. By repeating these steps three times, the correct AFV compensation can be performed even when the weighed product is added.

5.3.3 AFV Effect for CCW-R (CCW-NZ or later)

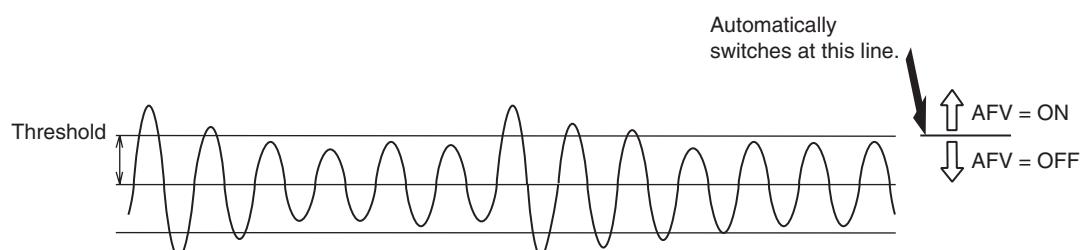
When the vibration applied to the machine is weak, the weighing errors are accumulated. The stability may not be obtained by performing the AFV compensation in the opposite result. In this case, turn the AFV setting to "OFF."

To prevent these cases, the AFV system has the "auto" setting. When the calculated vibrational component is the threshold or less, the AFV compensation is canceled (OFF). When it exceeds the threshold, the AFV compensation is operated (ON). This judgment is performed per the sampling data and the weigh head. The AFV setting is used in "auto." The threshold is as follows:

Standard capacity (2L/3L) 0.2g

Standard capacity (1.5L) 0.15g

Large capacity (5L/7L) 0.5g



* With the AFV setting in "auto" the AFV is turned OFF when it is the threshold or less, and the AFV is turned ON when it exceeds the threshold. This switchover is automatically repeated.

5.3.4 Relationship between the AFV and Filter

- In using the filter No. 0 and 1, the AFV is used since they are weak to the low frequency vibration.
- In using the filter No. 2, the AFV can be set either "OFF" or "auto." Judge it by the used condition.

- In using the filter No. 3 and 4, the AFV does not work since they are strong to low frequency vibration.

5.4 Frequency Adjustment(PWM Control Feeder)

5.4.1 Adjustment of Frequency

An automatic adjustment is now available for each feeder frequency (the natural frequency) from the remote controll unit.

The feeder drive can use a corrected frequency value (drive frequency), because amplifying the feeder by the natural frequency should make the amplitude quite large due to the resonance.

In this manual the corrected value is called as "corrected drive frequency," and can be set from the remote controll unit.

The remote controll unit indicates the drive frequency actually applied to the feeder (sum of the natural frequency and the corrected drive frequency).

5.4.2 Memory and Display of Frequency

5.4.2.1 Natural frequency

Both feeder drive unit (FDRV) and remote controll unit (RCU) memorize the frequency.

This is to avoid possibility that the feeder can be driven by a wrong frequency in replacing FDRV and/or DMU.

The natural frequency is memorized by both FDRV and DMU, and is checked automatically by "5.4.3 Natural Frequency Check for Feeder and RCU".

5.4.2.2 Drive Frequency Display

On the remote controller, the display and setting are available by the unit of 0.1 Hz.

5.4.2.3 Frequency Initialization

Note that the frequency is deleted when the data on RAM are deleted in initializing the memory on RCU with DIP SW 2-6 on the DMU board "ON" using the install software (for a software changing purpose). If, therefore, you need to delete the data on RAM, save the frequency to the memory card (CF) beforehand to backup the data.

5.4.3 Natural Frequency Check for Feeder and RCU

- The data check is automatically performed to confirm if the natural frequencies memorized in FDRV and RCU are the same. The system checks the data at the following occasions:
 - After the main power on (only once)
 - Opening Frequency Adjustment Window
 - Closing Frequency Adjustment Window
 - In editing/changing the frequencies

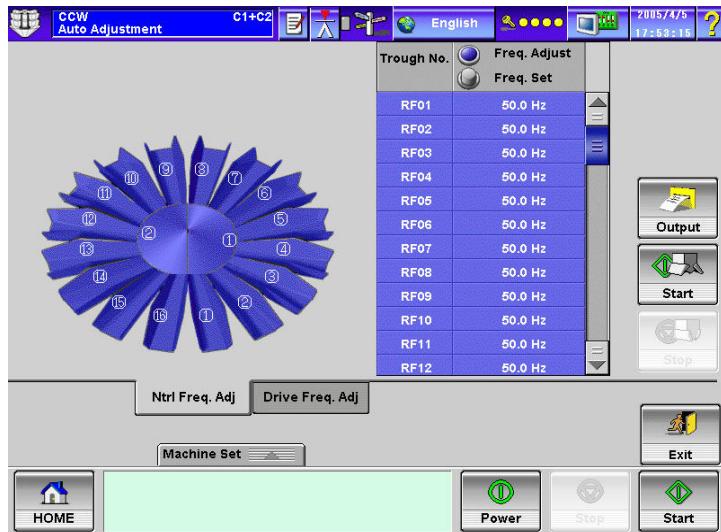


Figure 5-4 Typical display of acquiring natural frequency in Frequency Adjustment Window

5.4.3.1 When no response for natural frequency comes from FDRV

The window indicates the warning message below to notice the situation. This warning message is indicated every 3 seconds repeatedly until any response comes from FDRV.

No response from FDRV for Natural Frequency.

< Cause >

FDC or FDRV is possibly defective or damaged.

< Counteraction >

If the program No. for WCU or FDC is indicated in Program Number Information Window, FDRV is suspected to be defective or damaged. Check boards FDC or FDRV, or communication wirings between WCU and FDC.

5.4.3.2 When the natural frequencies memorized in FDRV and in RCU differ from each other

The window indicates the warning message below to notice the situation. This warning message is indicated every 3 seconds repeatedly until each data becomes consistent.

**FDRV and RCU have different value of Natural Frequency.
RF:1,2,3,4,5,6,7,8,9,10,11,12,13,14 DF:1**

- The feeder failed in data check needs another detection of natural frequency: select the feeder (the button turns to red) to start the detection in Natural Freq. Display Window so that the natural frequency is preferably detected.



< Cause >

1. Replacement of RCU board or FDRV board is suspected.
2. Backup memory on RCU board or FDRV board is possibly defective or damaged.

< Counteraction 1 >

- In replacing RCU board, read the frequency from FDRV or the memory card to RCU by referring to "5.4.1 Adjustment of Frequency".
- In replacing FDRV board, write the frequency from RCU to FDRV by referring to "5.4.1 Adjustment of Frequency".

< Counteraction 2 >

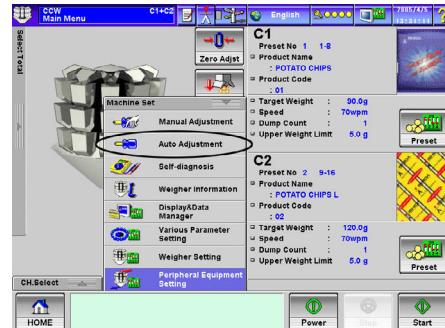
- Perform automatic adjustment by referring to "5.4.4 Automatic Adjustment of Frequency".
- When the natural frequency indicated on RCU differs from the one of your note, RCU backup memory is suspected to be defective or damaged. Either read the frequency again from FDRV, or perform automatic adjustment of the frequency.
- If the RCU indicates the same natural frequency with the one of your note, FDRV board is suspected to be defective or damaged. Replace FDRV board, and write the frequency from RCU to FDRV again.

5.4.4 Automatic Adjustment of Frequency

5.4.4.1 Adjustment of Natural Frequency

1. Press the [Machine Set] popup key on the main menu and press the [Auto Adjustment] key.
2. Press the [Ntral Freq.Adj] tab key to display the Natural Frequency Adjustment screen.

3. When making the Natural Frequency Adjustment of all feeders, press Freq. Adjust button and then press all trough buttons to change all trough figures to blue. Then press the  key.



4. All trough displays change from blue to gray. The frequency table displays [Adjusting] to

 start an automatic adjustment. The  key is also displayed.

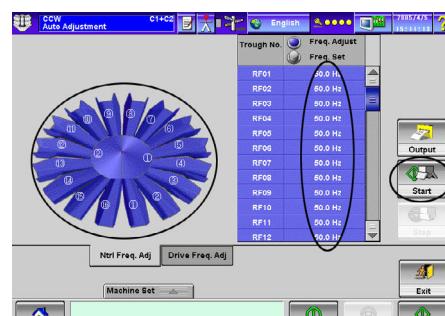
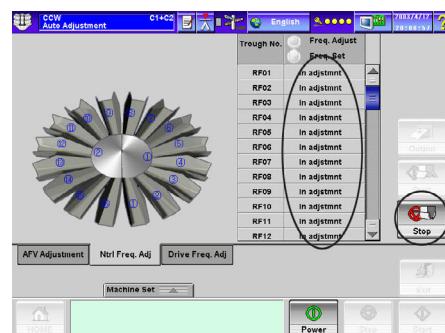
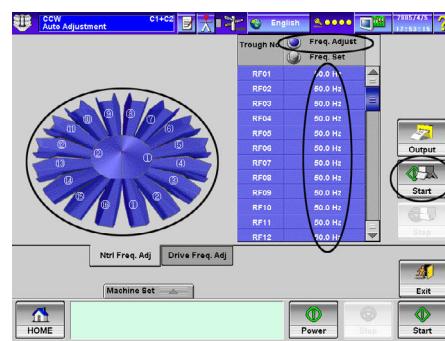
To cancel the automatic adjustment during

 operation, press the  key to return to the start screen.

5. When the automatic adjustment is completed successfully, all troughs are displayed in blue, the value of each frequency is displayed on the frequency table, and the figure returns to the blue display.

TIP

For the model CCW-R-216B-D, it normally takes approx. 30 minutes to complete the Natural Frequency Adjustment of all feeders in the automatic mode.



6. When the automatic adjustment is not completed successfully in all machines, all troughs are displayed in gray, Error is displayed on the frequency table, and the figure is also

displayed in gray with the  key displayed

on the screen. Press the  key to return to the start screen.

When an error occurs at a single head, only the relative machine is displayed in gray and the normal machines are displayed with the blue frequency, then the screen returns to the adjustment screen.

TIP

When the error occurs at all the machines, there are possibilities of failures at the feeder board (FDRV) or the feeder power unit. Take necessary countermeasures such as board replacement or voltage check.

7. When adjusting the natural frequency of radial feeder for only the machine No.1, press the machine No. 1 to change the figure of trough to

 blue. Then press the  key.

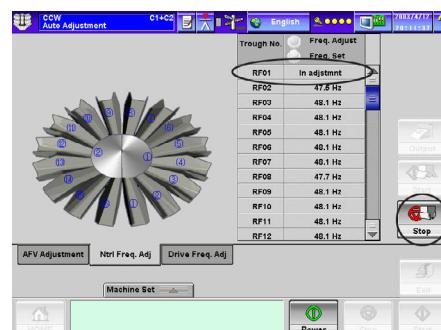
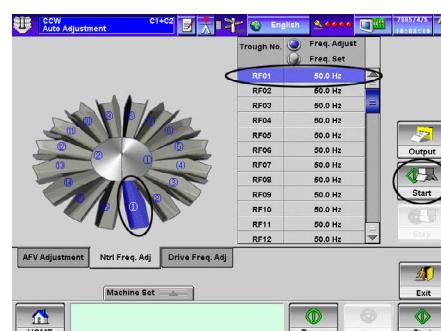
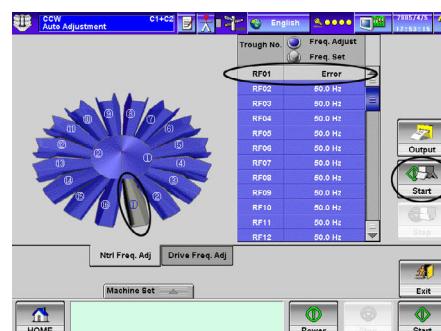
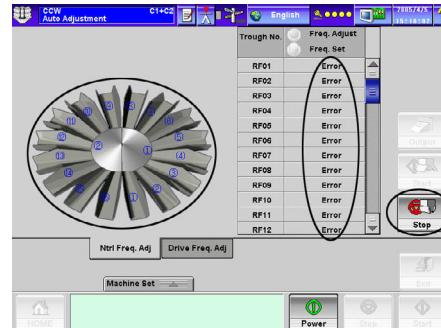
8. The display of trough figure of the machine No.1 changes from blue to gray and the frequency table displays Adjusting to start the

 automatic adjustment. The  key is also displayed.

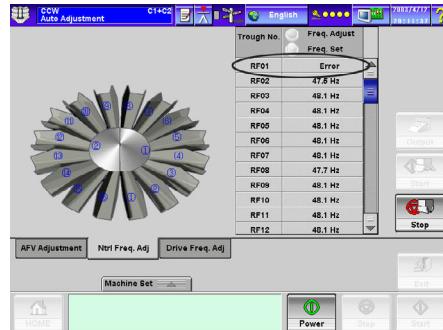
To cancel the automatic adjustment during

 operation, press the  key to return to the start screen.

9. When the automatic adjustment is completed successfully, the trough is displayed in blue, the value of each frequency is displayed on the frequency table, and the table returns to the blue display.



10. When the automatic adjustment is not completed successfully, Error is displayed on the frequency table. The table and the trough figure are also displayed in blue and the screen returns to the adjustment screen.



11. After completion of adjustment, press the



key to print the natural frequency to store.

(Be sure to make a copy on the plain paper for storage as the printer paper is thermal paper, which is not suitable for the long-term storage.)

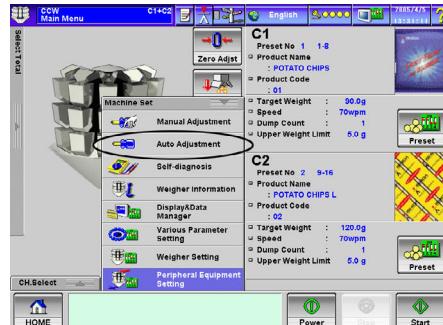


TIP

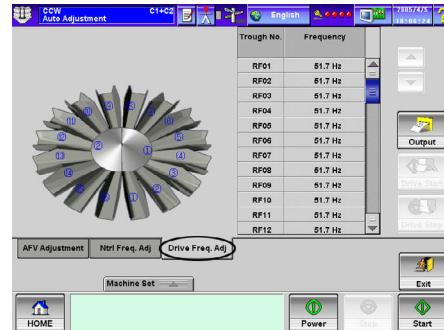
- For the machine CCW-R-216B-D, it normally takes approx. 15 minutes to complete the Natural Frequency Adjustment of a single feeder in the automatic mode.
- When an error occurs at a single machine, check if the supply chute or the adjacent trough contacts to the relative radial trough. In that case, solve the problem and try the Natural Frequency Adjustment again.

5.4.4.2 Drive Frequency Check

1. Press the Set Machine popup key on the main menu and the Auto Adjustment key.



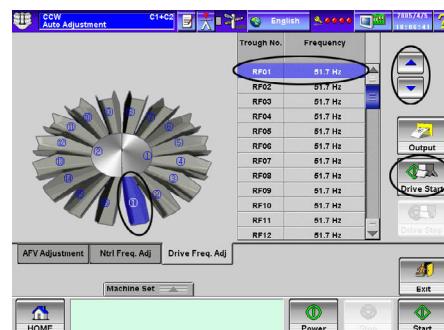
- Press the Drive Freq. Adj tab key to display the Drive Frequency Adjustment screen.



- Press the trough number of radial feeder for adjustment to change the trough figure and table to blue. Then, press the / keys to enable the drive frequency setting by 0.1 Hz.

NOTE

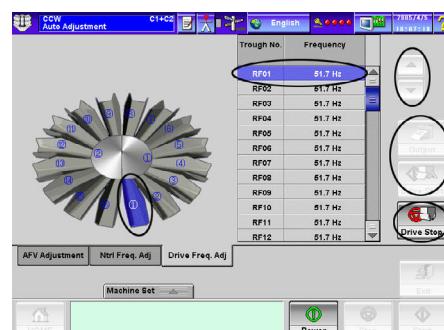
The setting range of drive frequency is from 35.0 to 130.0 Hz. For safety reason, the same value cannot be set for the natural frequency and for the drive frequency. Be sure to set the drive frequency to the value, which is not the same as that of the natural frequency.



- For adjusting the machine No.1, set the drive frequency in the step (3) and press the Drive key. This hides the / / / keys from the screen and allows the set radial feeder to start vibrating.
- Attach the amplitude indicator board to the trough of radial feeder for adjusting to check amplitude.

TIP

Amplitude for feeder drive is: capacity: 20 rpm, Strength: 99, Time: 99, Boost amplitude / Time rate (Time magnification): 1.



5.4.4.3 Adjusting Feeder Amplitude by Drive Frequency

Modify the drive frequency of the head when the appropriate amplitude is not obtained at each feeder. The amplitude changes according to the change of drive frequency.

NOTE

From this version, the standard specification is set to the PWM feeder control. Be sure not to make amplitude adjustment using a leaf spring. To make amplitude adjustment, follow the steps to change the drive frequency.

- Adjust the maximum amplitude of feeder to 3.0 mm.
- Adjust the drive frequency smaller than the current value when the amplitude of feeder is small. Adjusting the drive frequency smaller increases the feeder amplitude.
1. Converting formula of feeder amplitude: $+ 0.1 \text{ mm} = - 0.1 \text{ Hz}$
- Adjust the drive frequency larger than the current value when the amplitude of feeder is large. Adjusting the drive frequency larger decreases the feeder amplitude.
1. Converting formula of feeder amplitude: $- 0.1 \text{ mm} = + 0.1 \text{ Hz}$

NOTE

The converting formulas of feeder amplitude are provided just as a rough guide. Be sure to drive to check the appropriate amplitude.

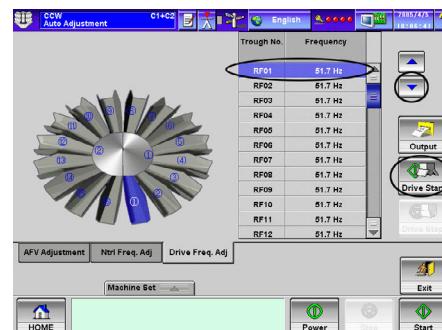
Specified examples of change

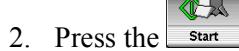
1. In case that the amplitude is 1.2 mm in the head No.1, if the appropriate amplitude is 3.0 mm, $3.0 - 1.2 = 1.8 \text{ mm}$ is to be increased to reach the appropriate one.
Applying the above-mentioned conversion formula $+0.1 \text{ mm} = -0.1 \text{ Hz}$, the result $-0.6 \text{ mm} = +0.6 \text{ Hz}$ is obtained. Thus, decrease the drive frequency of current head No.1 by 1.8 Hz.
2. In case that the amplitude is 3.6 mm in the head No.1, if the appropriate amplitude is 3.0 mm, $3.6 - 3.0 = 0.6 \text{ mm}$ is to be decreased to reach the appropriate one.
Applying the above-mentioned conversion formula $-0.1 \text{ mm} = +0.1 \text{ Hz}$, the result $-0.6 \text{ mm} = +0.6 \text{ Hz}$ is obtained. Thus, increase the drive frequency of current head No.1 by 0.6 Hz.

5.4.4.4 Procedure of Amplitude Adjustment by Changing the Drive Frequency

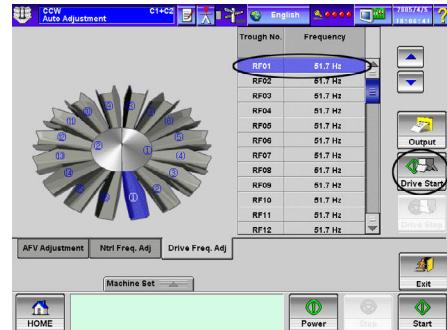
1. Press the number of head for changing to change it to blue. For the example (1) above mentioned, decrease the drive frequency of the head No.1 by 1.9 Hz.

Firstly press the  key to change the frequency to "49.6" Hz.





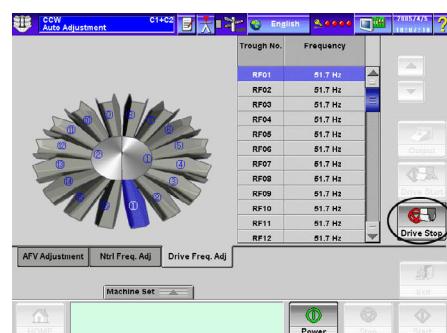
2. Press the **Start** key to vibrate the feeder and check the current amplitude value.



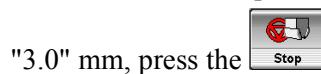
3. When the current amplitude value is "3.0" mm,



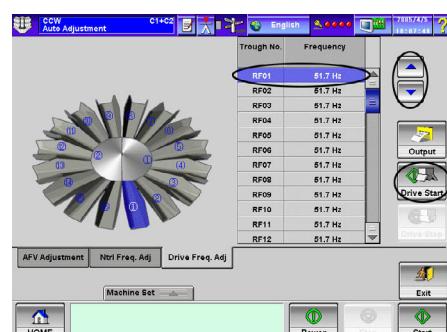
press the **Stop** key to complete the amplitude adjustment.



4. When the current amplitude value is other than



"3.0" mm, press the **Stop** key to return to the drive frequency adjustment screen to change the frequency. Then start from the step (1) for the adjustment.



5.5 Procedure for Replacing FDRV Board and DMU Board

5.5.1 Replacing the boards

5.5.1.1 Overview

The drive frequency to be most suitable for every each feeder is different. The feeder will be damaged when you drive it by improper drive frequency value. In order to avoid this disastrous event, the value of natural frequency data that is it in the cause of most suitable drive frequency is saved to both RCU and FDRV boards to not to drive a feeders with improper frequencies. As of this, for precaution measures to protect the feeder breakdown, both RCU and FDRV boards will confront each other to check the value of saved natural frequency data are same (feeder will not drive if the two values are not match). When you replace either RCU or FDRV board by failure of contingent event, newly replaced board need to be restored with the value of natural frequency from other board. Please see below for the procedure of data dump (data reload) from one to another board.

5.5.1.2 Procedure of Board Replacement

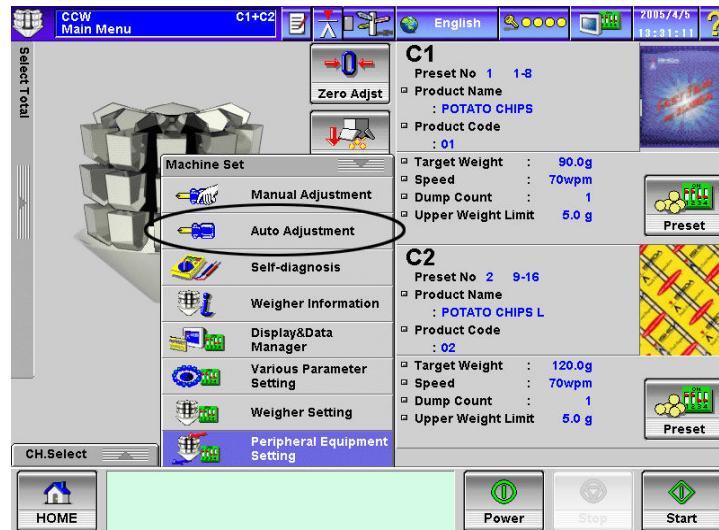
The procedure is different by a board need be to replace.

- a) Replace FDRV board only and remain the RCU board.
- b) Replace RCU board only and FDRV board remains same.
- c) Replace both FDRV and RCU board.

a) Replace FDRV board only and remain the RCU board

Turn on the main power after you replaced FDRV board. Please follow below procedure.

1. Turn on the power key on RCU screen.
2. Touch [Operator] key and display the [Operation Environment Selection] menu.
3. Touch [Maintenance Service] key and enter the password for the [Maintenance Service level]. The [Maintenance Service Level Menu] appears.
4. Press the [Machine Set] popup key, then press the Auto Adjustment key.
5. The [Auto Adjustment] screen is displayed.

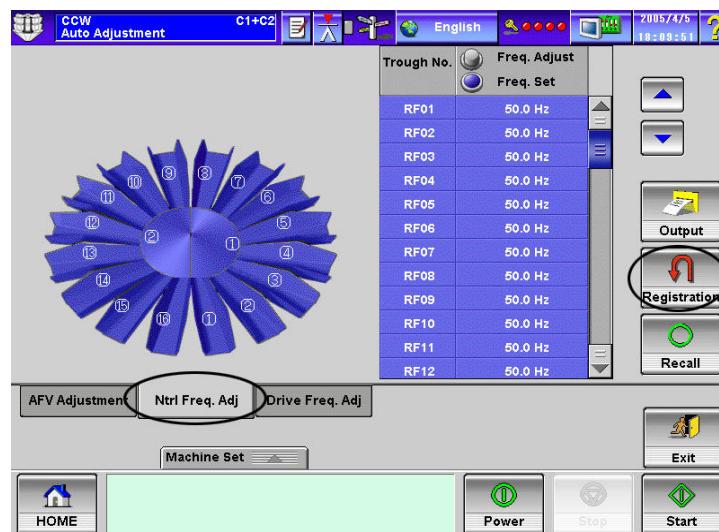


6. Press the [Ntrl Freq. Adj] tab key to display the Natural Frequency Adjustment screen.

7. Press the [Freq. Set] button.



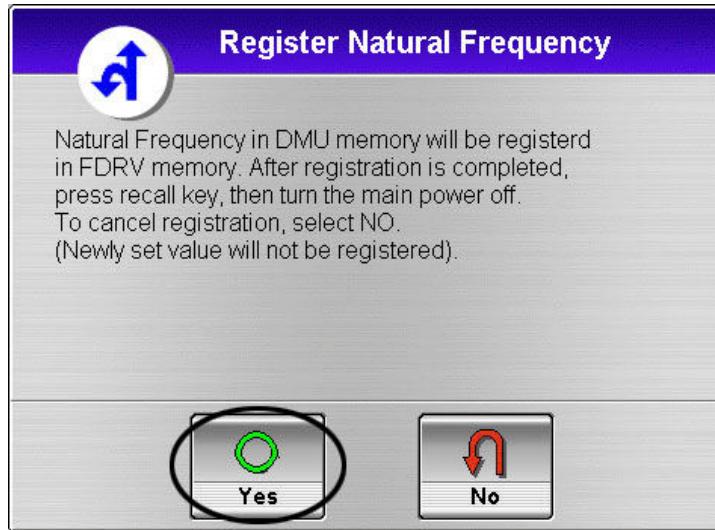
8. Press the key to display the dialog box to confirm that the Natural Frequency Data in the DMU board to be copied to the FDRV board.



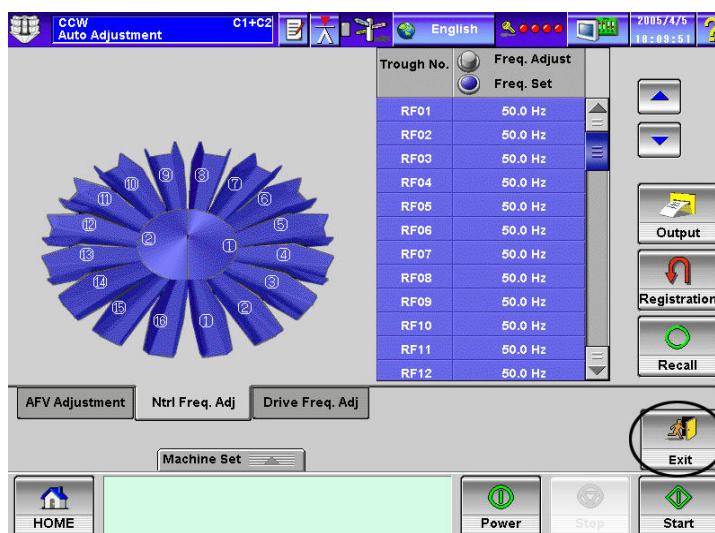
9. To copy, press the key on the dialog box.



To cancel copying, press the key. Selecting either of both keys returns to the Natural Frequency Adjustment screen.



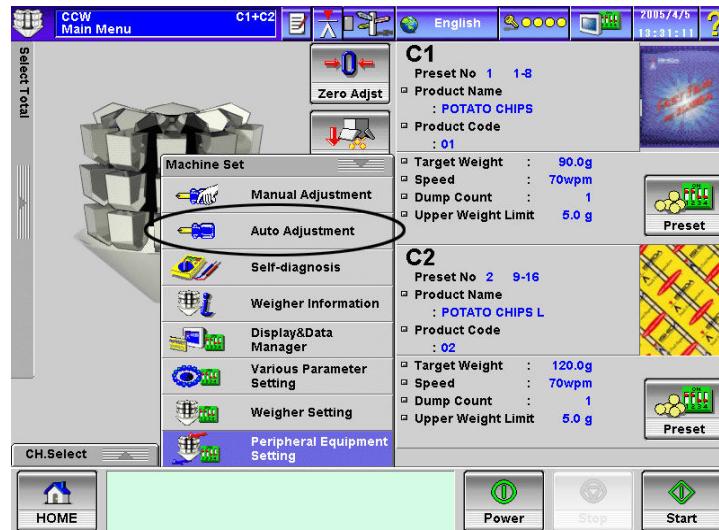
10. After setting, check that the appropriate amplitude appears on the Drive Frequency Adjustment screen. After checking, press the key to return to the main menu.



b) Replace RCU board only and FDRV board remains same

Turn on the main power after you replaced RCU board. Complete the normal initialization ,turn off the main power switch and turn it on again. Please follow below procedure.

1. Turn on the power key on RCU screen.
2. Touch [Operator] key and display the [Operation Environment Selection] menu.
3. Touch [Maintenance Service] key and enter the password for the [Maintenance Service level]. The [Maintenance Service Level Menu] appears.
4. Press the [Machine Set] popup key and the [Auto Adjustment] key.
5. The [Auto Adjustment] screen is displayed.

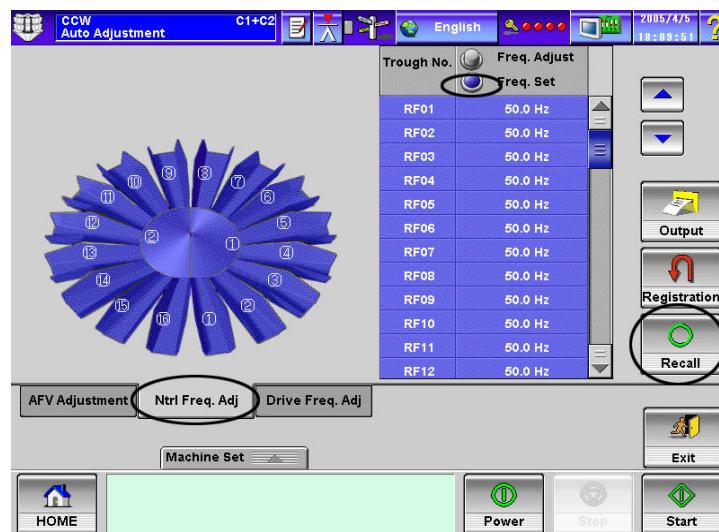


6. Press the [Ntrl Freq. Adj] tab key to display the Natural Frequency Adjustment screen.

7. Press the [Registration] button.



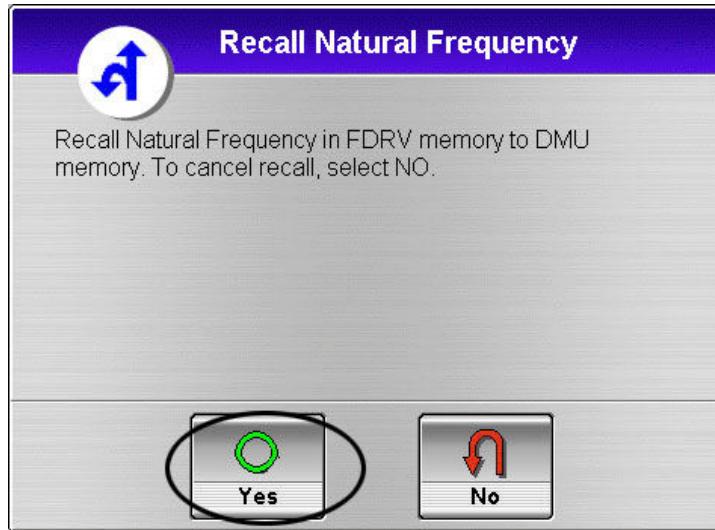
8. Press the  key to display the dialog box to confirm that the Natural Frequency Data in the FDRV board copies to the DMU board.



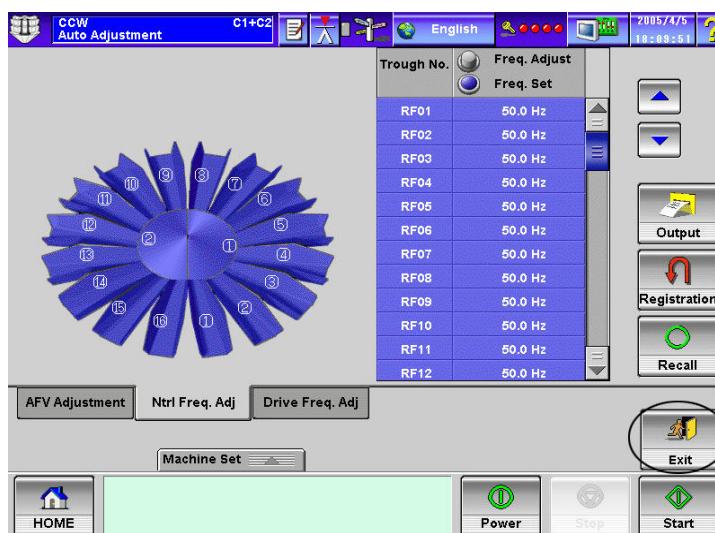
9. To copy, press the  key on the dialog box.



To cancel copying, press the  key. Selecting either of both keys returns to the Natural Frequency Adjustment screen.



10. After setting, check that the appropriate amplitude appears on the Drive Frequency Adjustment screen. After checking, press the key to return to the main menu.



c) Replace both FDRV and RCU board

Do not replace these boards at the same time, but do it alternatively and perform a) and b) respectively.

After the replacement, press the [Machine Set] popup key on the main menu screen. Then press the [Auto Adjustment] key to check for the amplitude on the Drive Frequency Adjustment screen.

6 CIRCUIT DIAGRAM

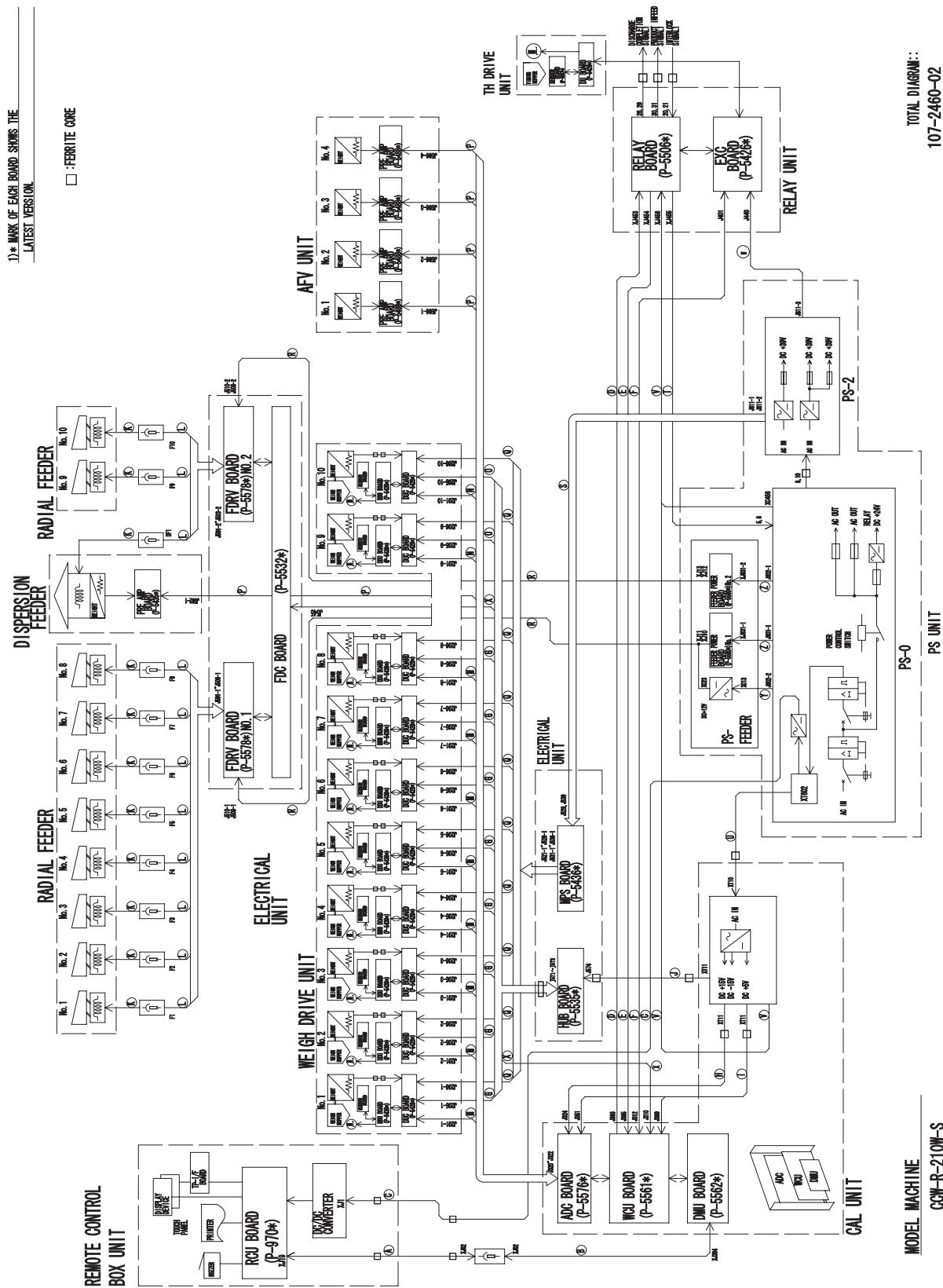
6.1 TOTAL DIAGRAM	6-1
6.1.1 CCW-R-210W-S TOTAL DIAGRAM.....	6-2
6.1.2 CCW-R-210W-S DIAGRAM.....	6-3
6.1.3 CCW-R-214W-S TOTAL DIAGRAM.....	6-4
6.1.4 CCW-R-214W-S DIAGRAM.....	6-5
6.1.5 CCW-R-216B-D TOTAL DIAGRAM.....	6-6
6.1.6 CCW-R-216B-D DIAGRAM	6-7
6.2 BLOCK DIAGRAM	6-8
6.2.1 REMOTE CONTROL UNIT	6-8
6.2.2 CAL UNIT 2/1	6-9
6.2.3 CAL UNIT 2/2	6-10
6.2.4 RELAY UNIT	6-11
6.2.5 ELECTRICAL UNIT MAIN	6-12
6.2.5.1 CCW-R-214W-S ELECTRICAL UNIT MAIN.....	6-12
6.2.5.2 CCW-R-216B-D ELECTRICAL UNIT MAIN	6-13
6.2.6 WEIGH DRIVE UNIT	6-14
6.2.6.1 CCW-R-2XXW-S WEIGH DRIVE UNIT 1/2	6-14
6.2.6.2 CCW-R-2XXW-S WEIGH DRIVE UNIT 2/2	6-15
6.2.6.3 CCW-R-216B-D WEIGH DRIVE UNIT 1/2	6-16
6.2.6.4 CCW-R-216B-D WEIGH DRIVE UNIT 2/2	6-17
6.2.7 PS UNIT [POWER SUPPLY UNIT]	6-18
6.2.7.1 CCW-R-214W-S	6-18
6.2.7.2 CCW-R-216B-D	6-19
6.2.8 AFV UNIT	6-20

<MEMO>

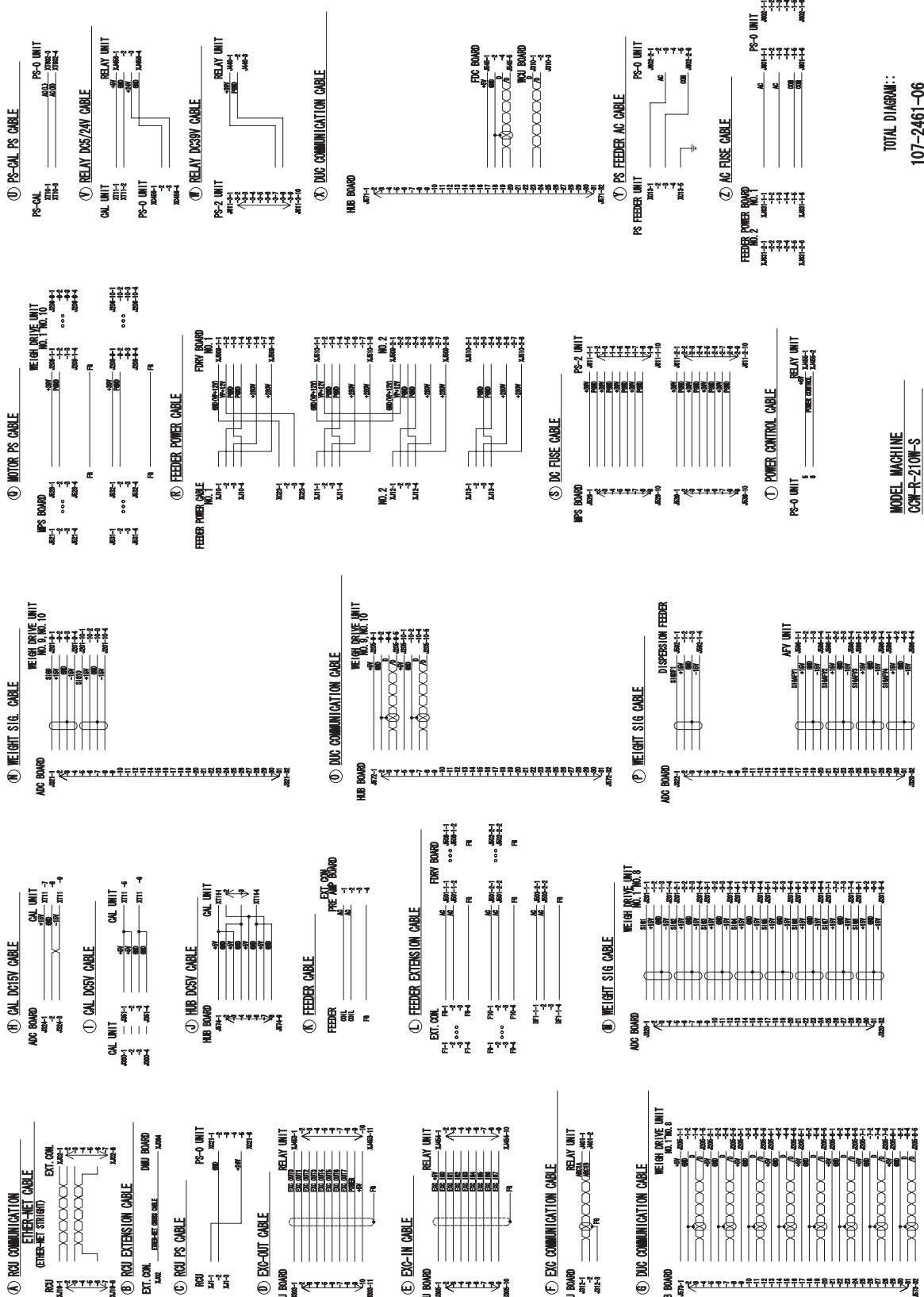
6 CIRCUIT DIAGRAM

6.1 TOTAL DIAGRAM

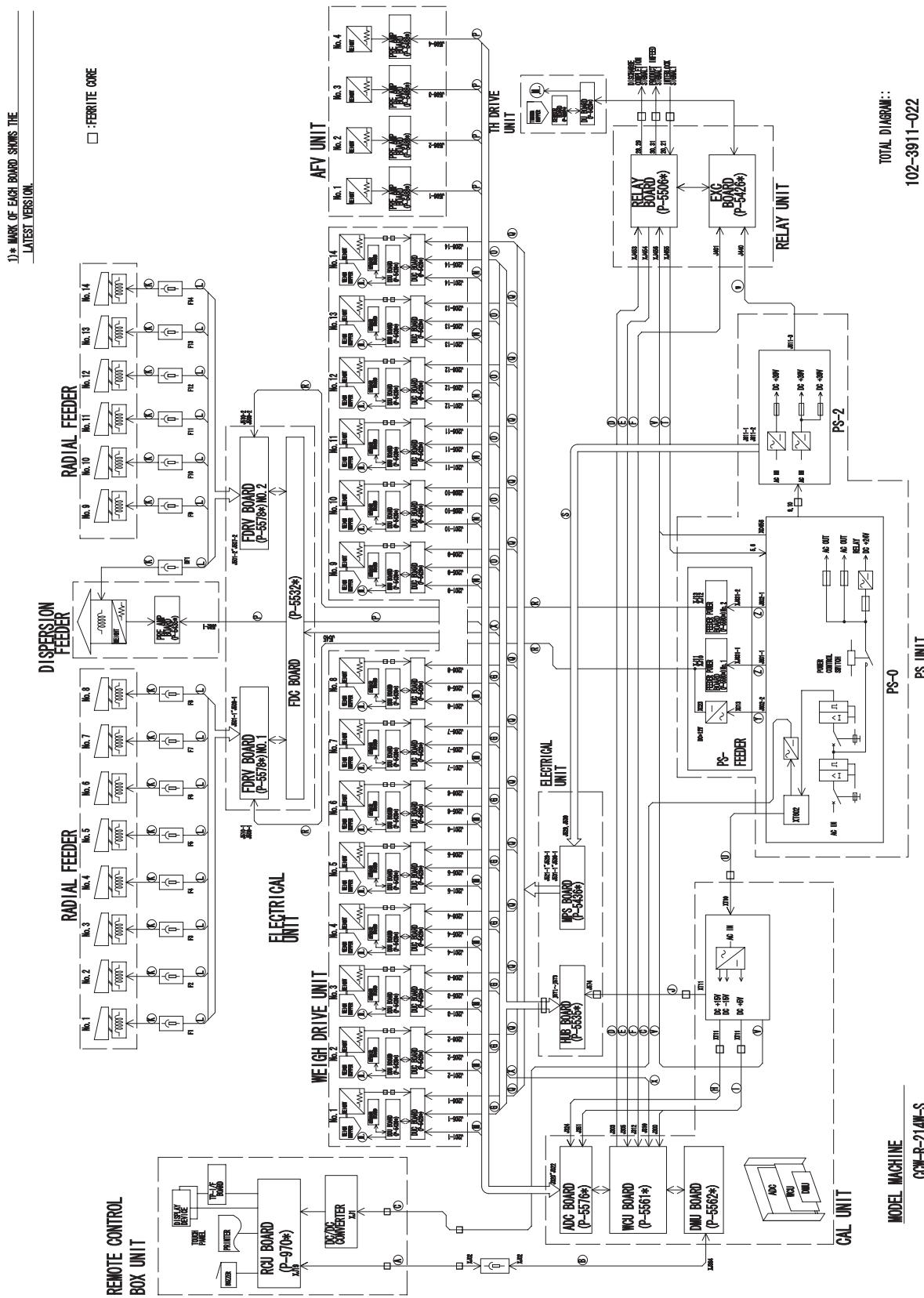
6.1.1 CCW-R-210W-S TOTAL DIAGRAM



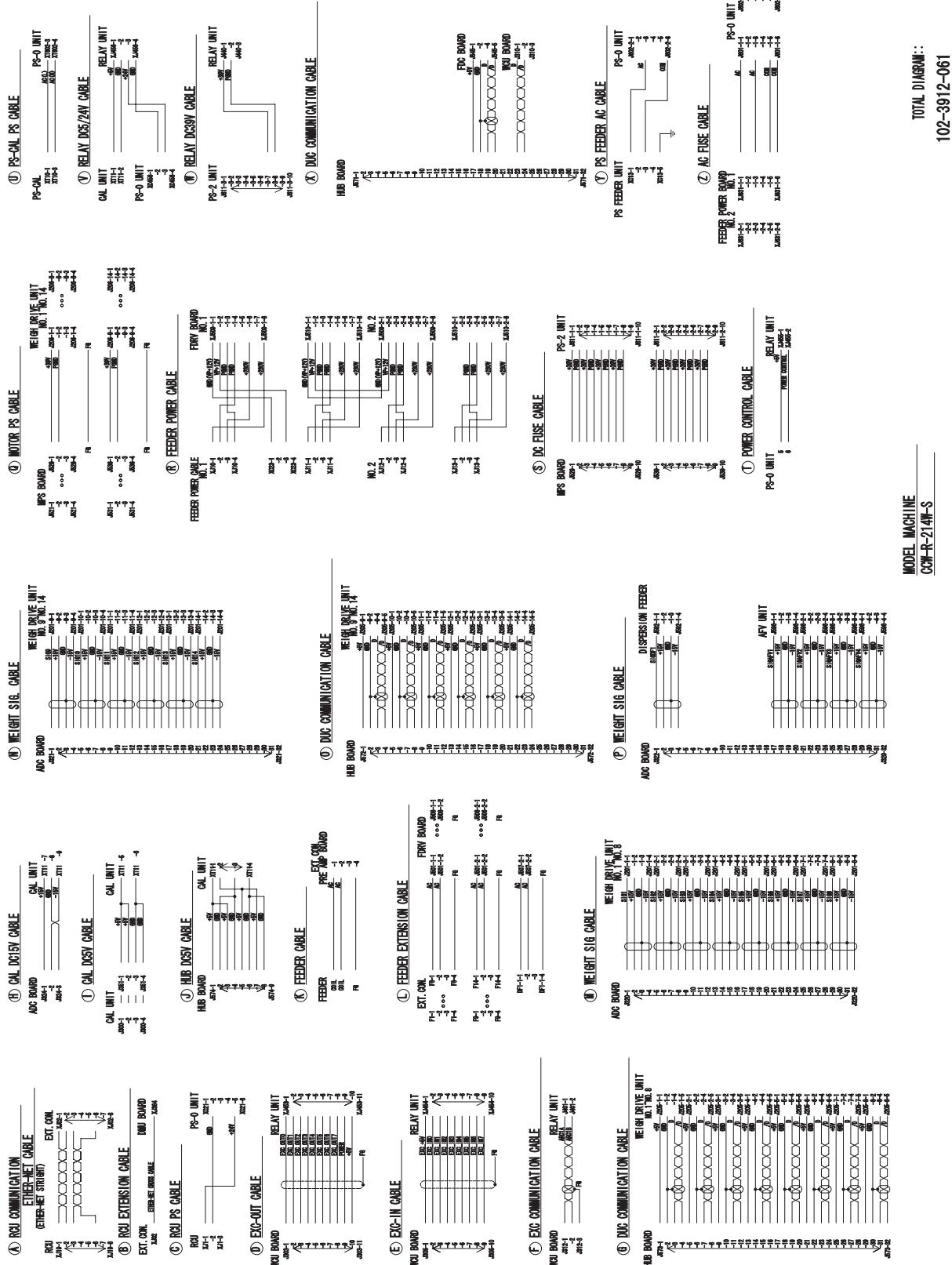
6.1.2 CCW-R-210W-S DIAGRAM



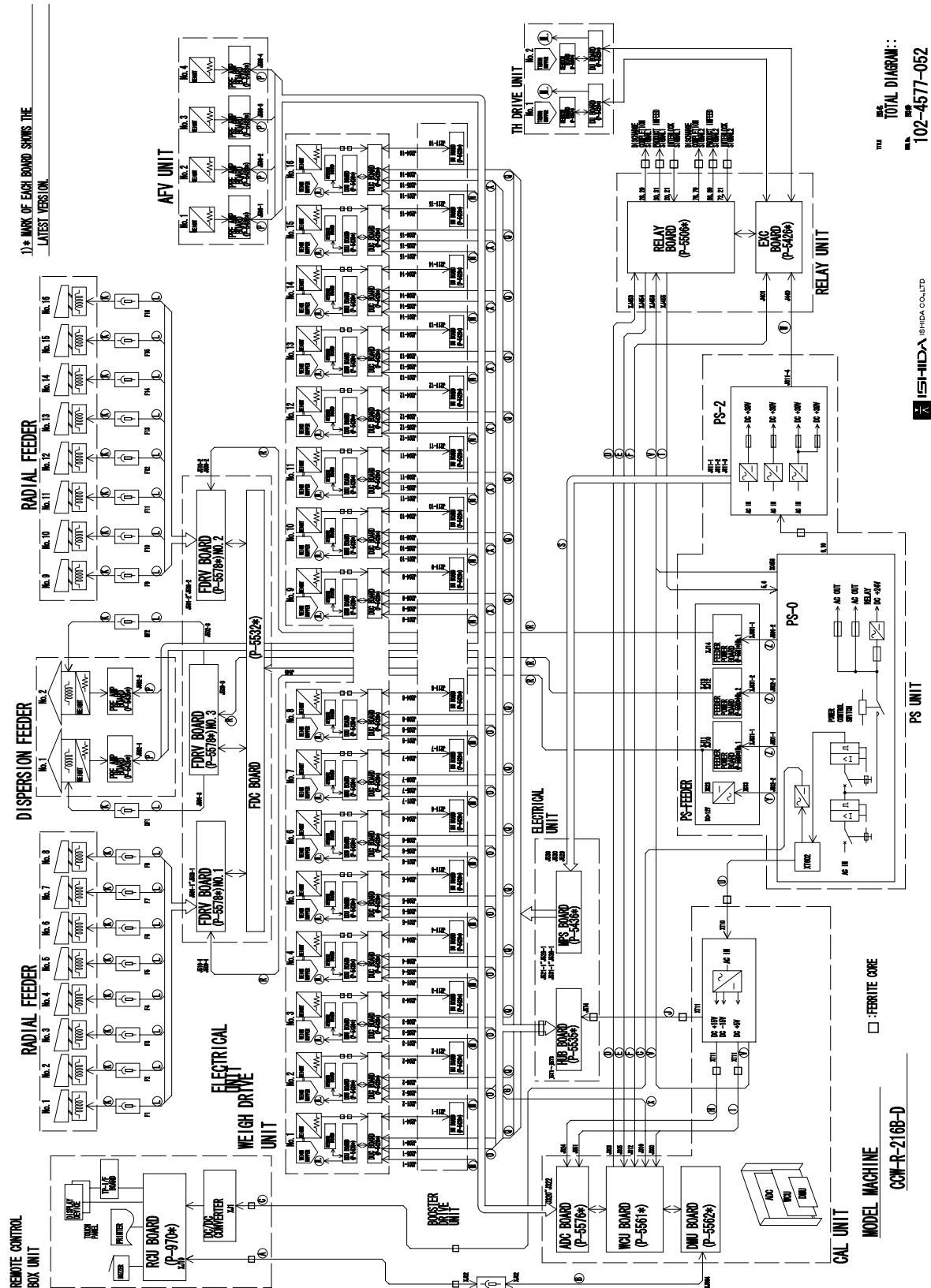
6.1.3 CCW-R-214W-S TOTAL DIAGRAM



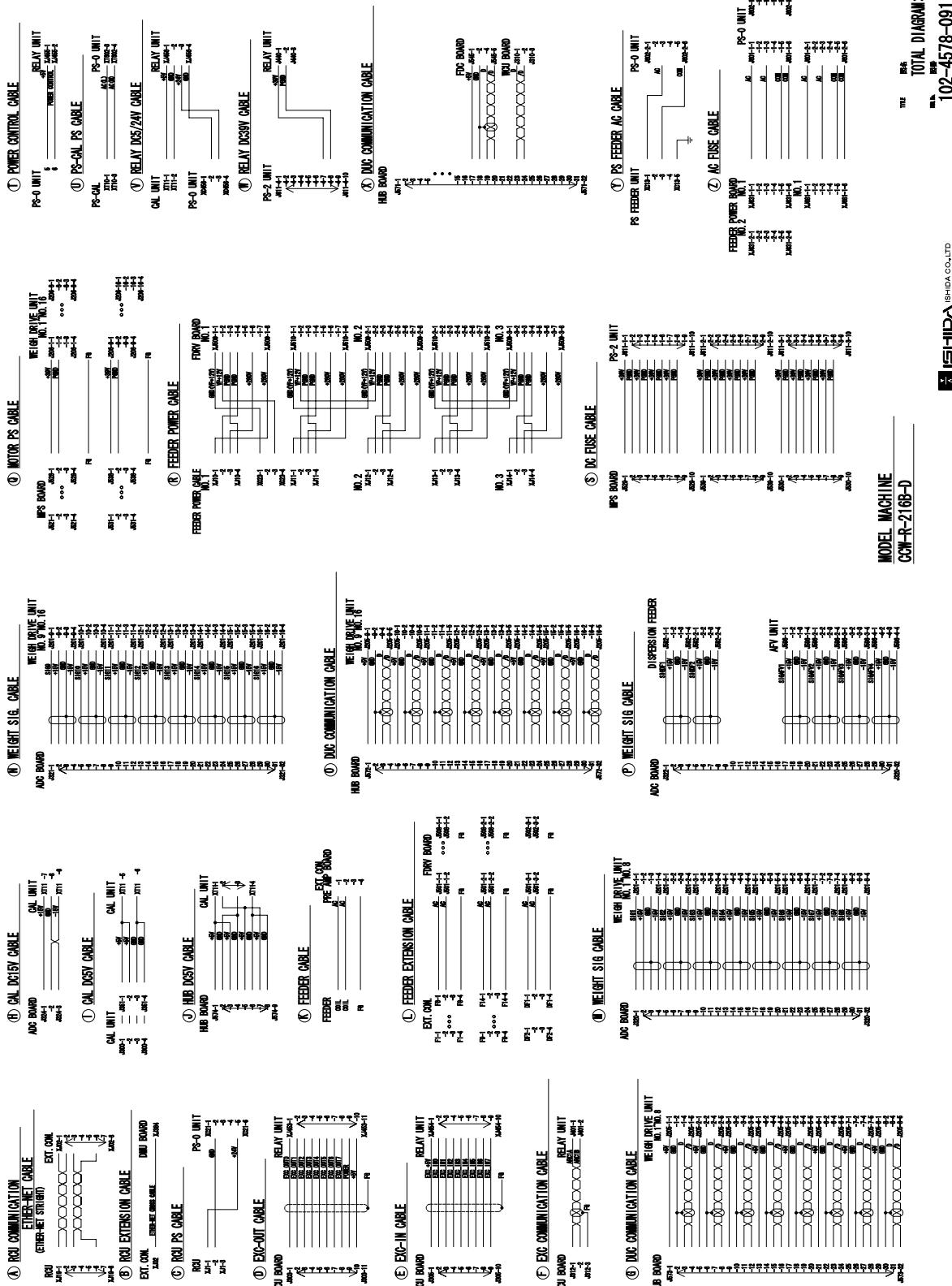
6.1.4 CCW-R-214W-S DIAGRAM



6.1.5 CCW-R-216B-D TOTAL DIAGRAM

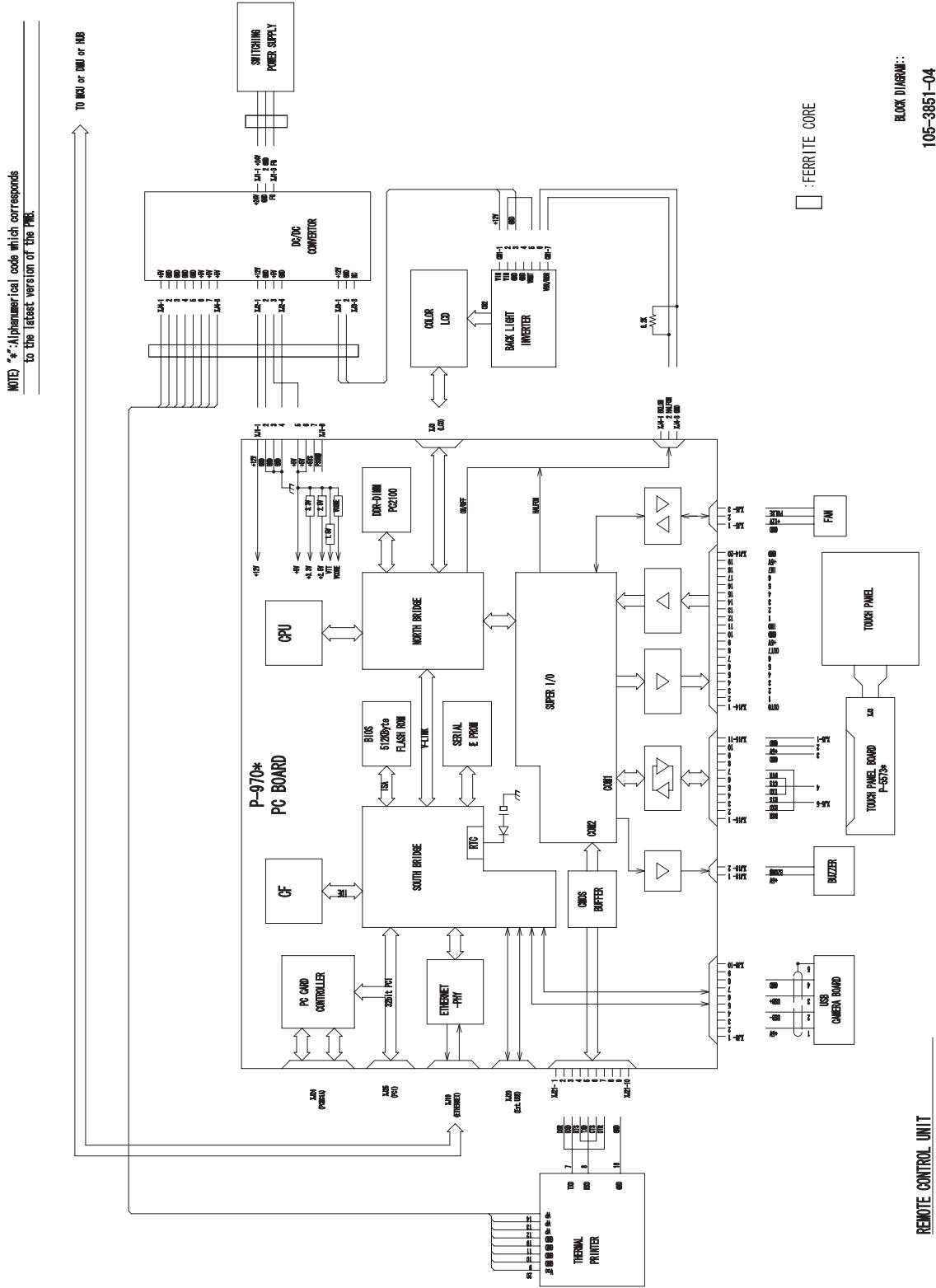


6.1.6 CCW-R-216B-D DIAGRAM

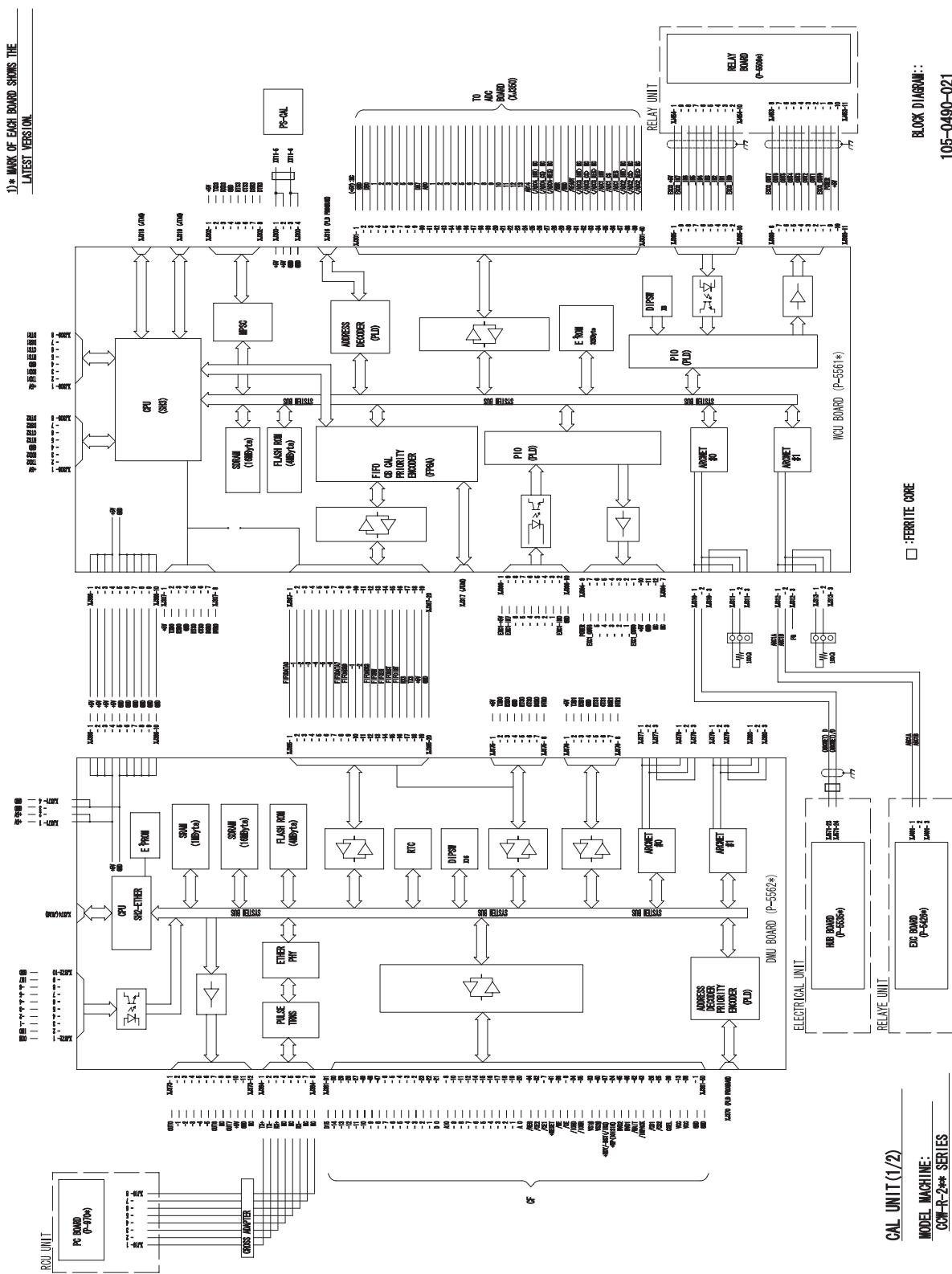


6.2 BLOCK DIAGRAM

6.2.1 REMOTE CONTROL UNIT

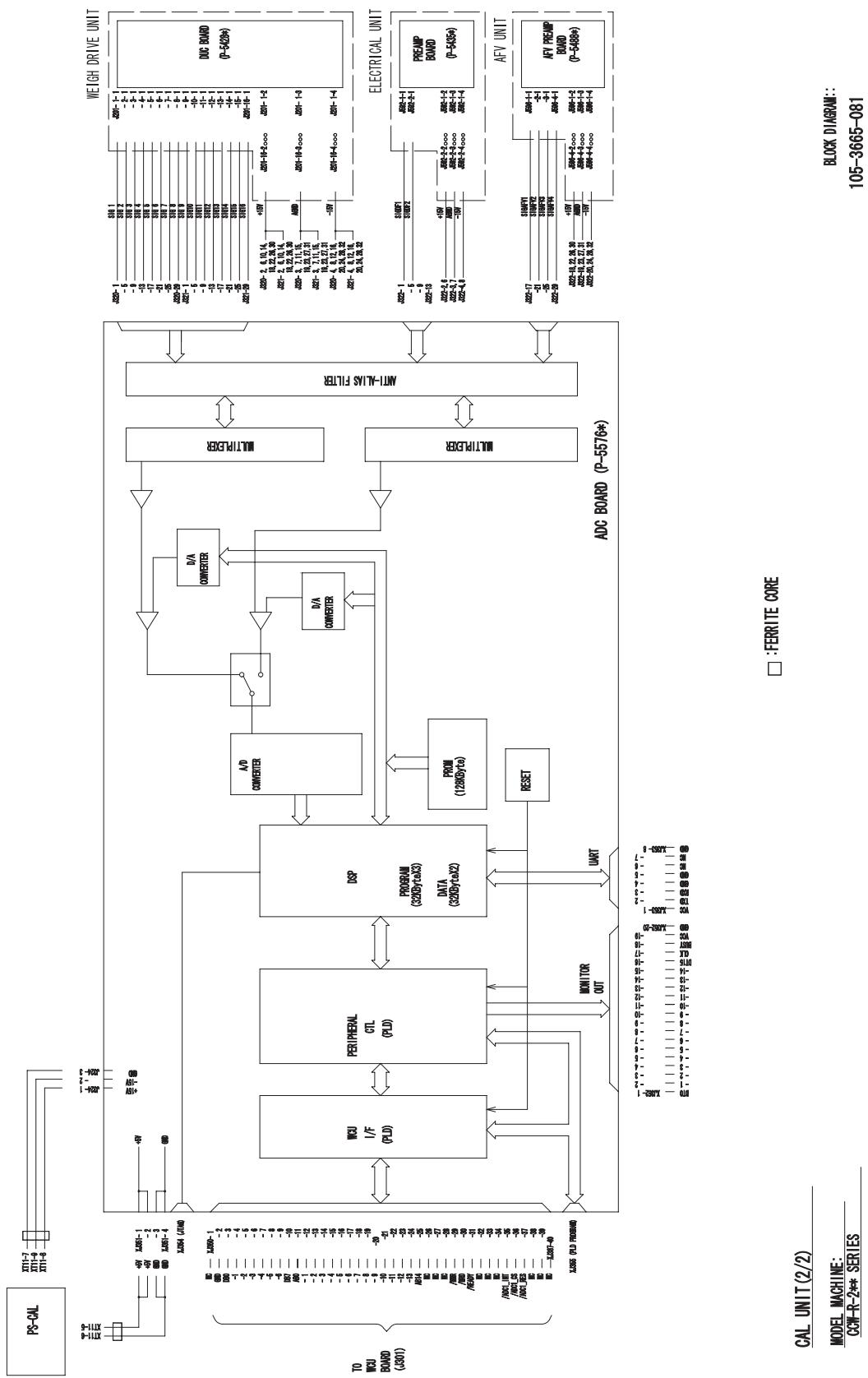


6.2.2 CAL UNIT 2/1

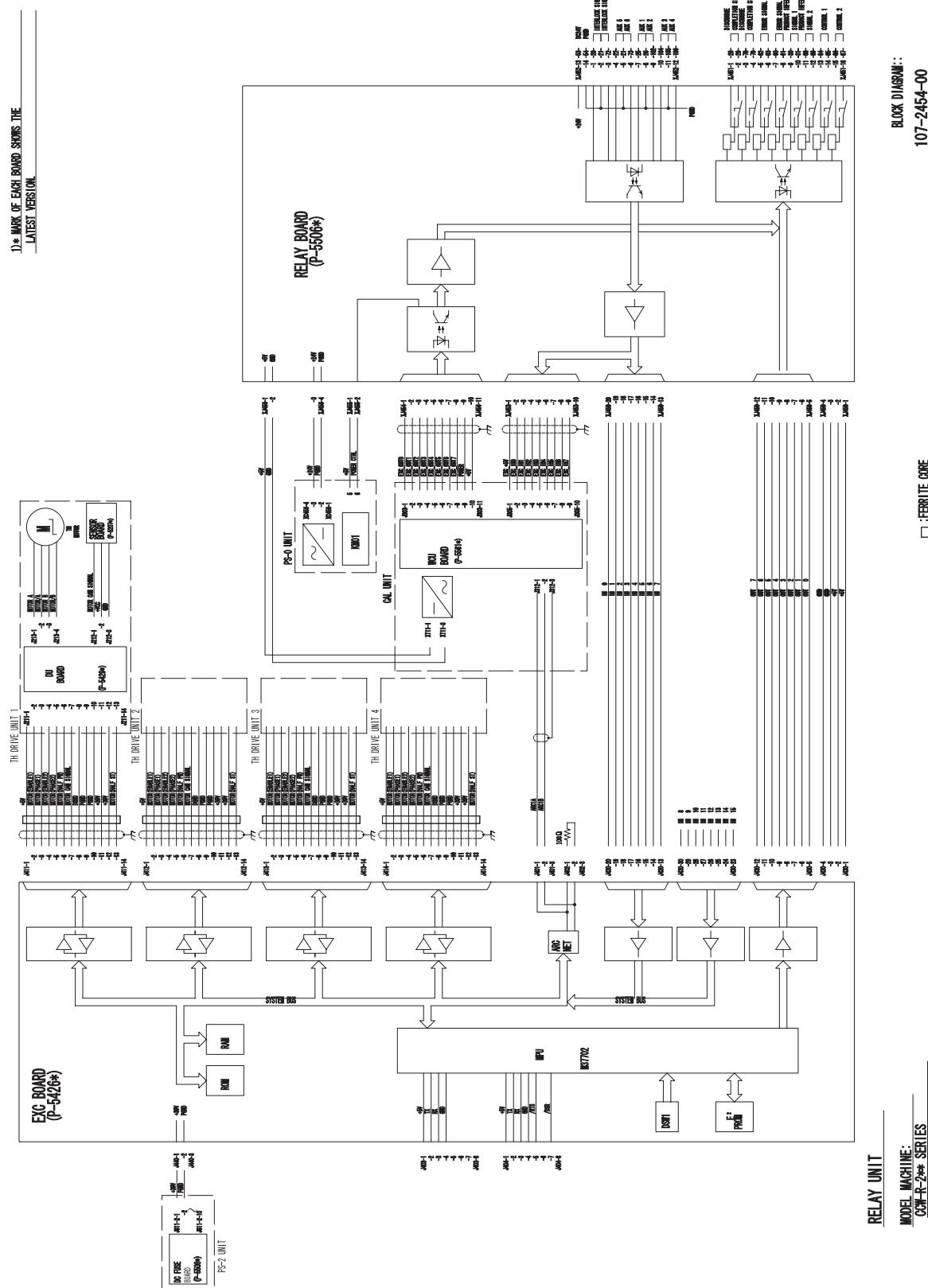


6.2.3 CAL UNIT 2/2

1)* MARK OF EACH BOARD SHOWS THE
LATEST VERSION.

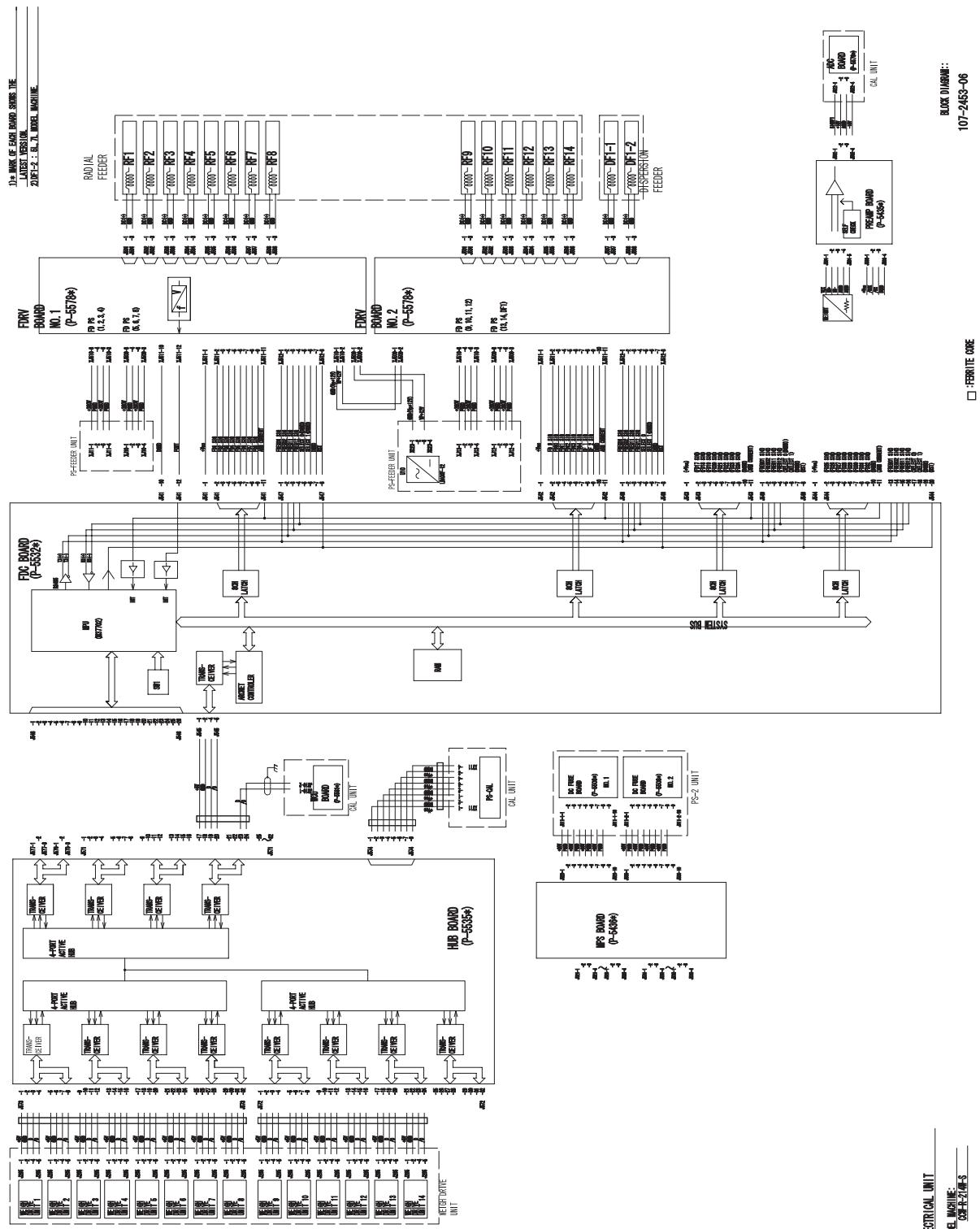


6.2.4 RELAY UNIT

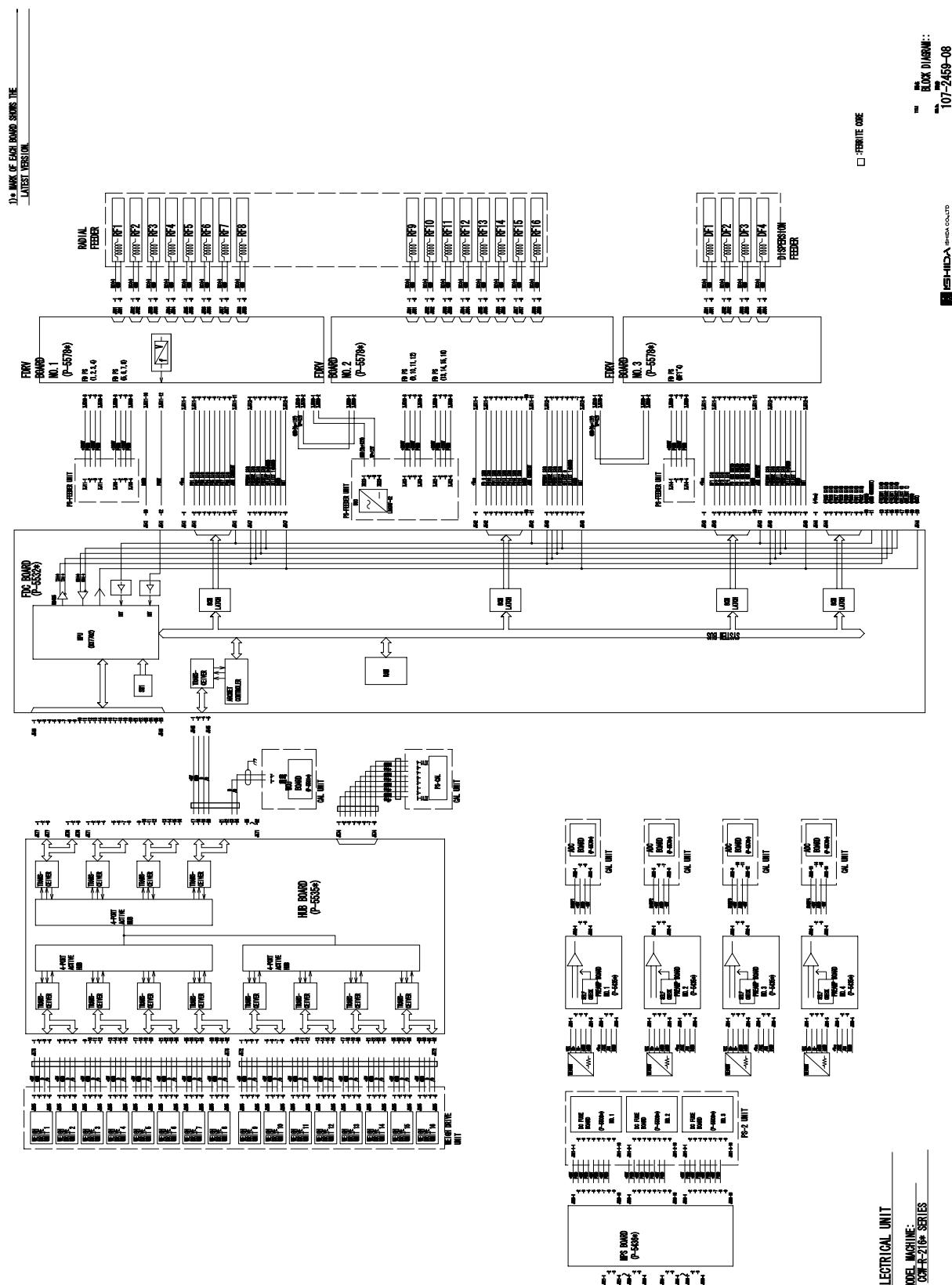


6.2.5 ELECTRICAL UNIT MAIN

6.2.5.1 CCW-R-214W-S ELECTRICAL UNIT MAIN

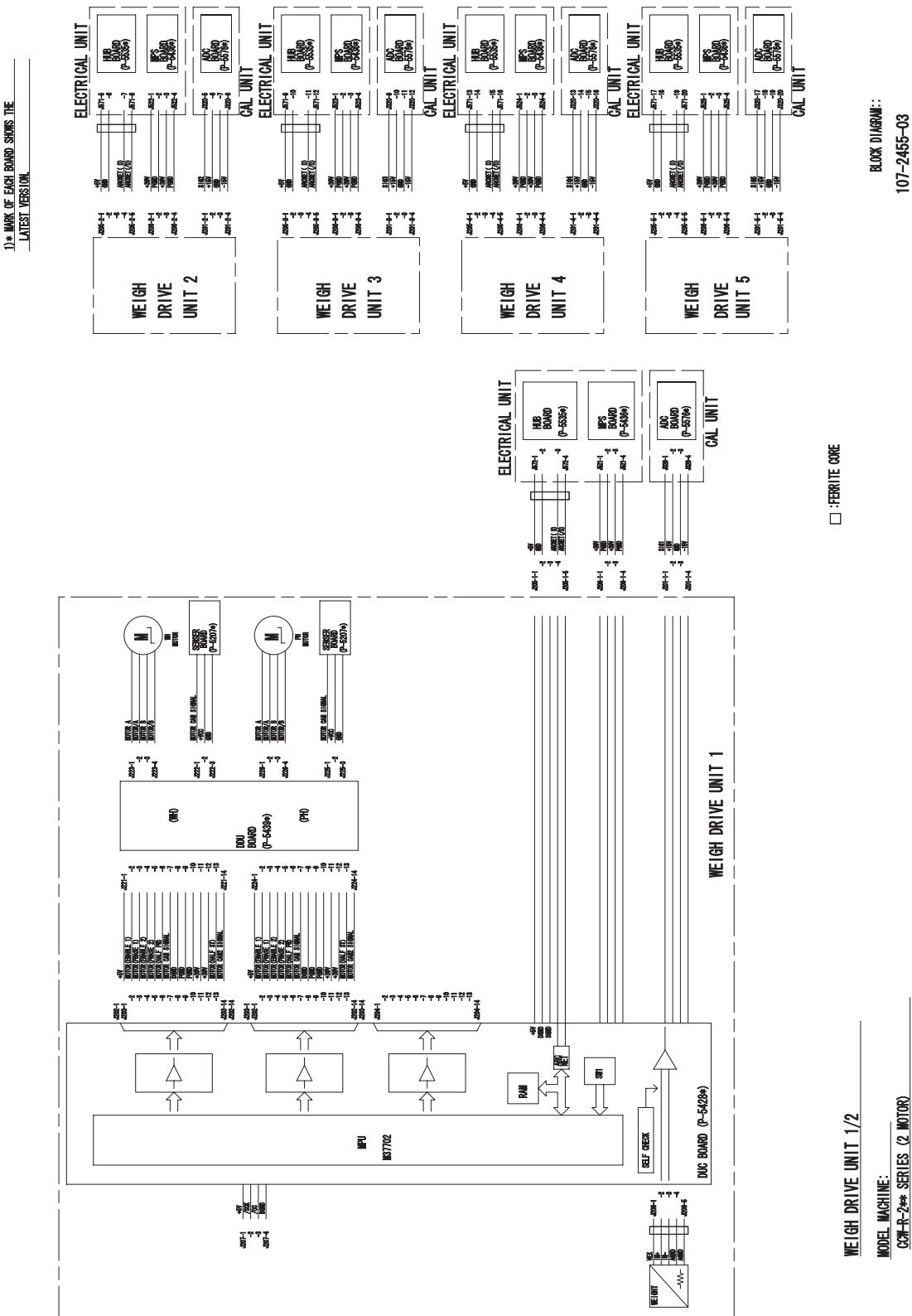


6.2.5.2 CCW-R-216B-D ELECTRICAL UNIT MAIN



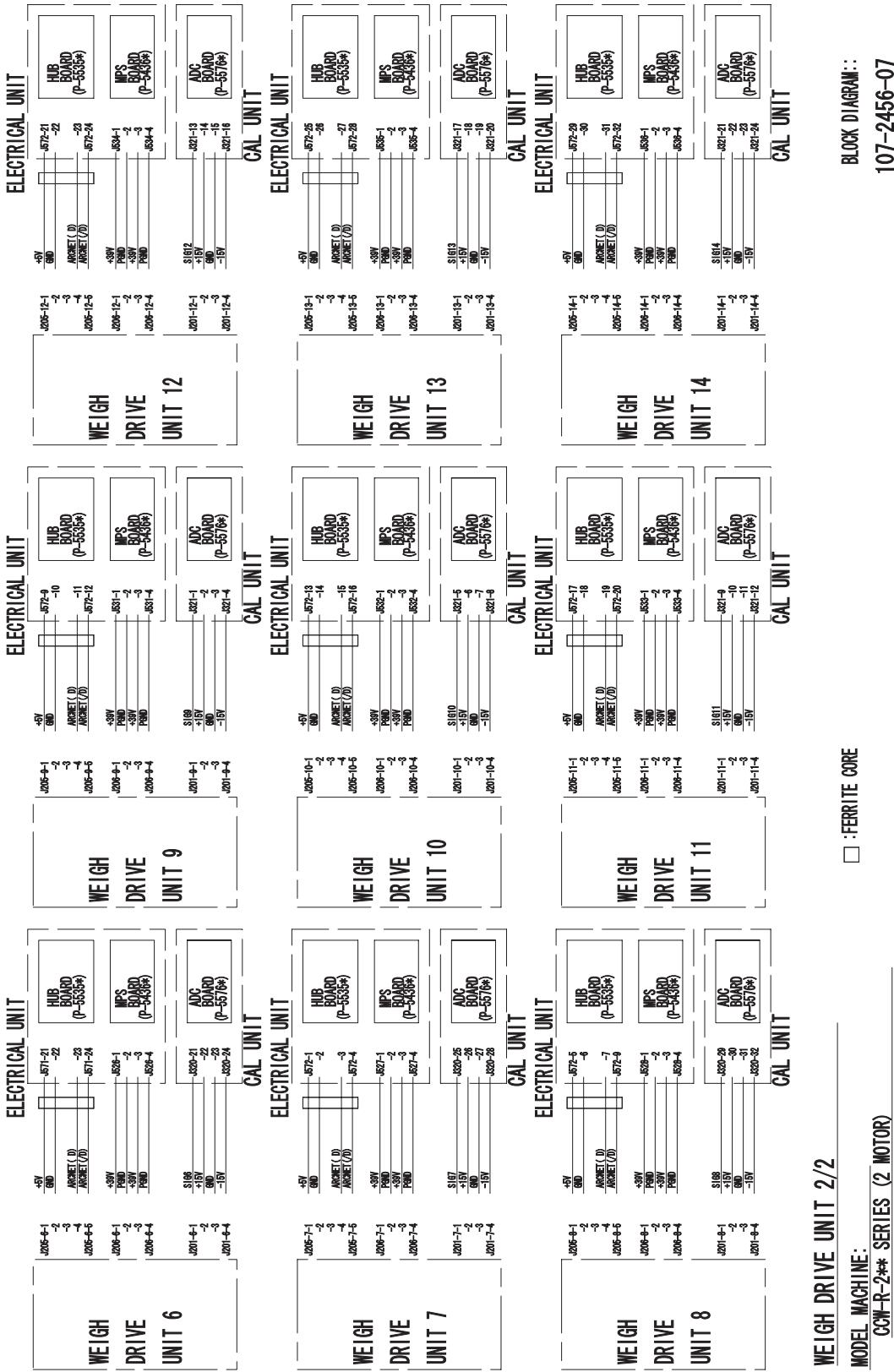
6.2.6 WEIGH DRIVE UNIT

6.2.6.1 CCW-R-2XXW-S WEIGH DRIVE UNIT 1/2

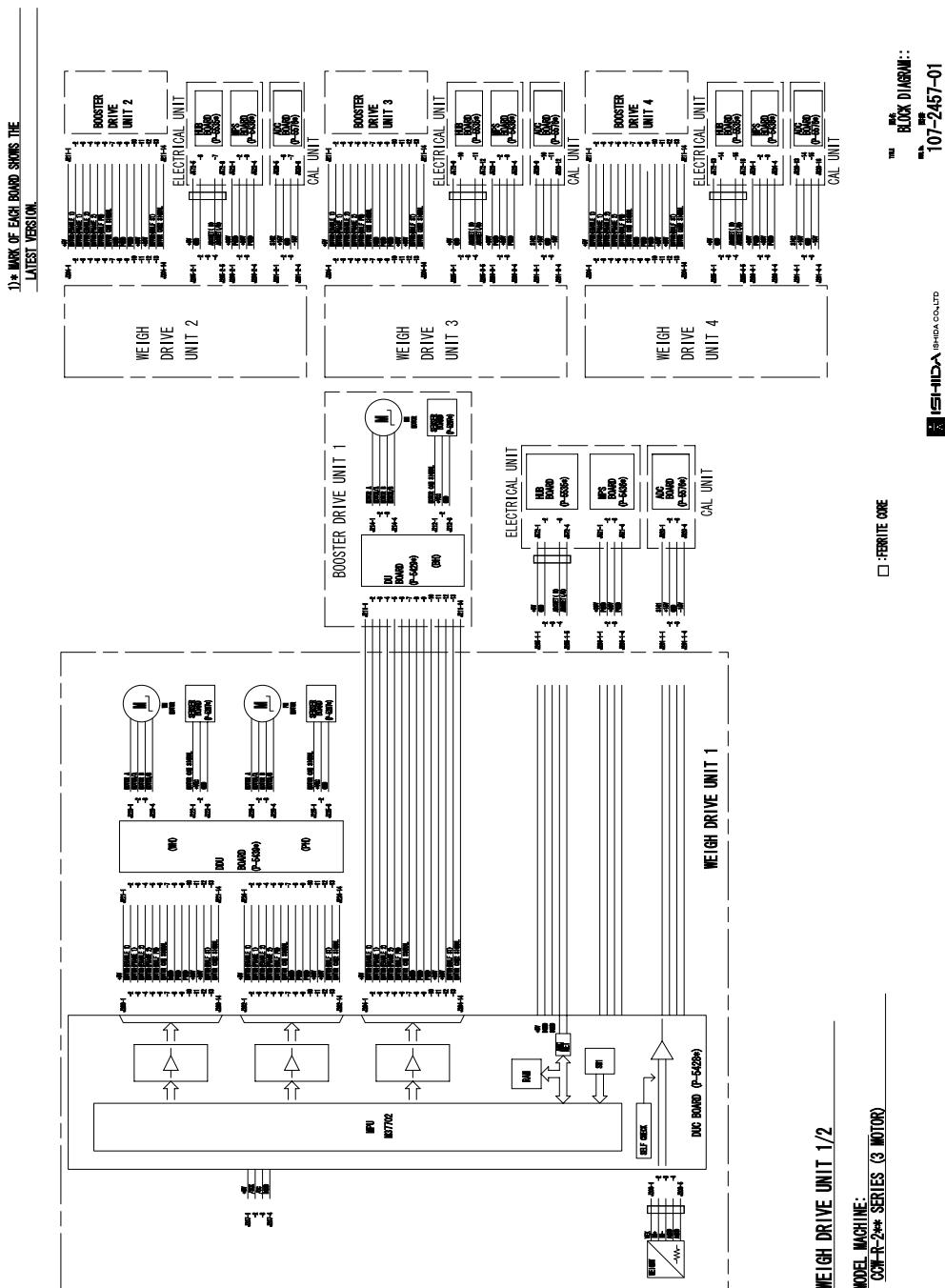


6.2.6.2 CCW-R-2XXW-S WEIGH DRIVE UNIT 2/2

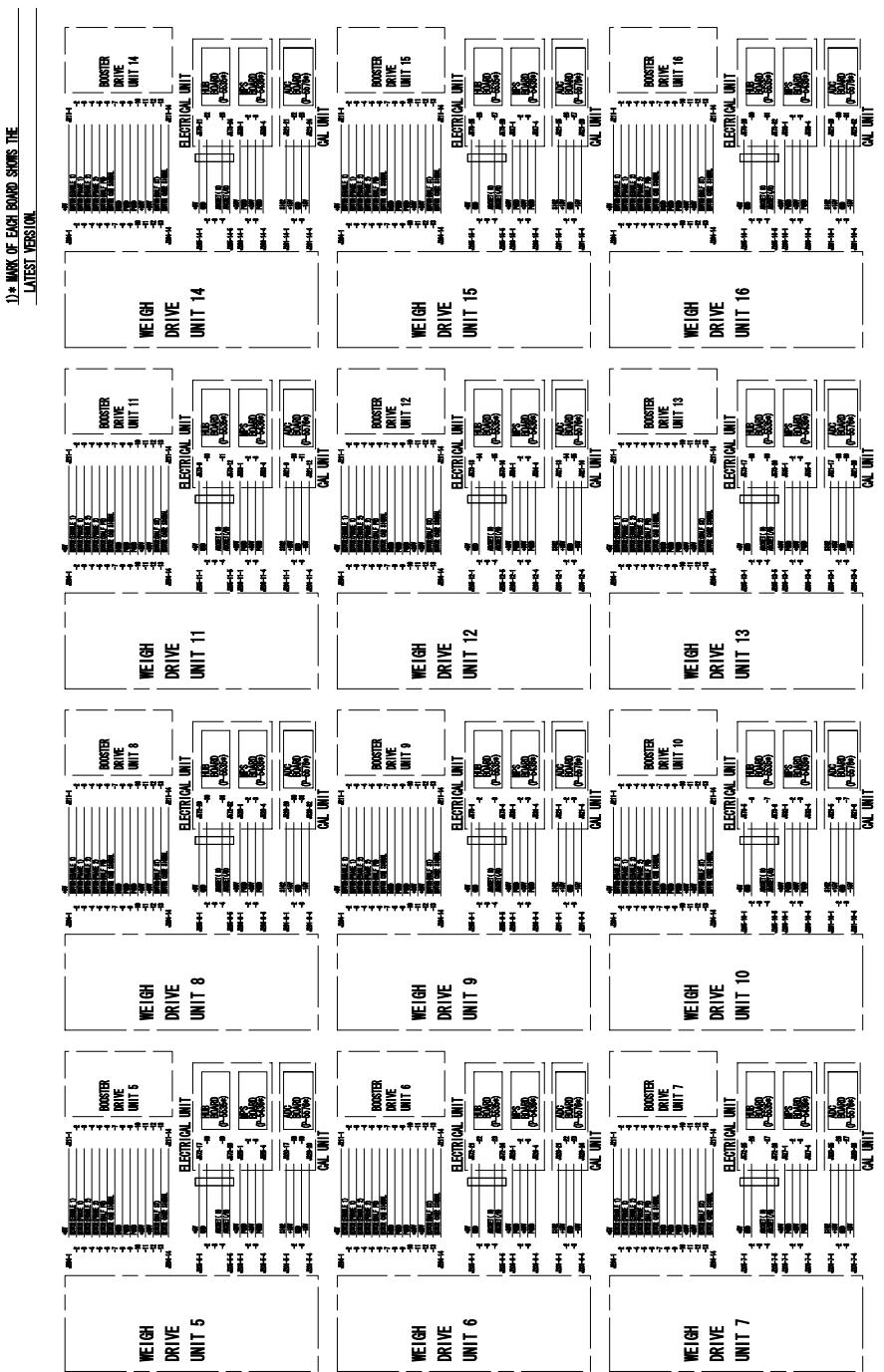
1)* MARK OF EACH BOARD SHOWS THE LATEST VERSION.



6.2.6.3 CCW-R-216B-D WEIGH DRIVE UNIT 1/2



6.2.6.4 CCW-R-216B-D WEIGH DRIVE UNIT 2/2

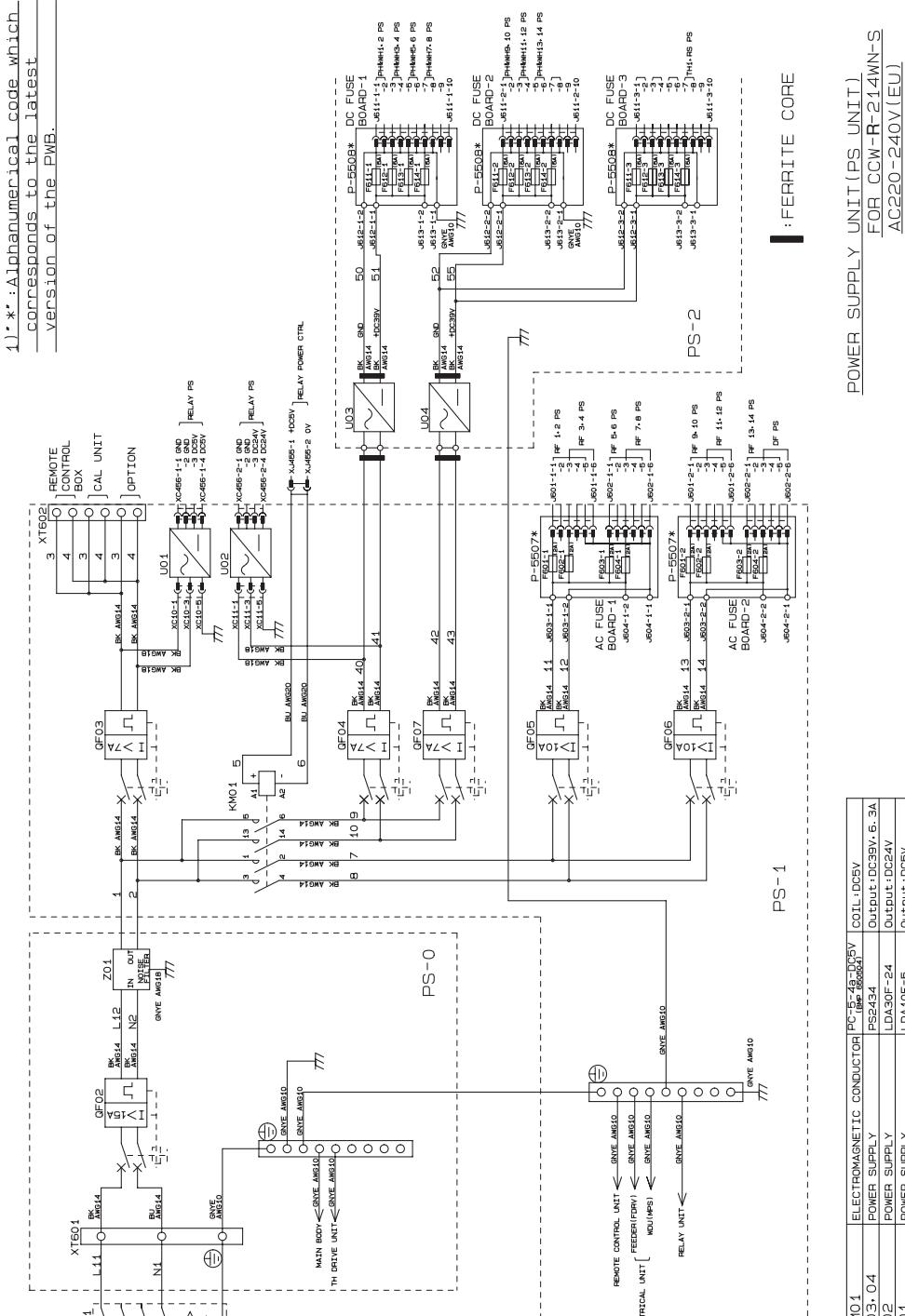
 :FERRITE CORE

...
BLOCK DIAGRAM:
107-2458-04

WEIGH DRIVE UNIT 2/2
MODEL MACHINE:
CCW-R-216B-D (3 MOTOR)

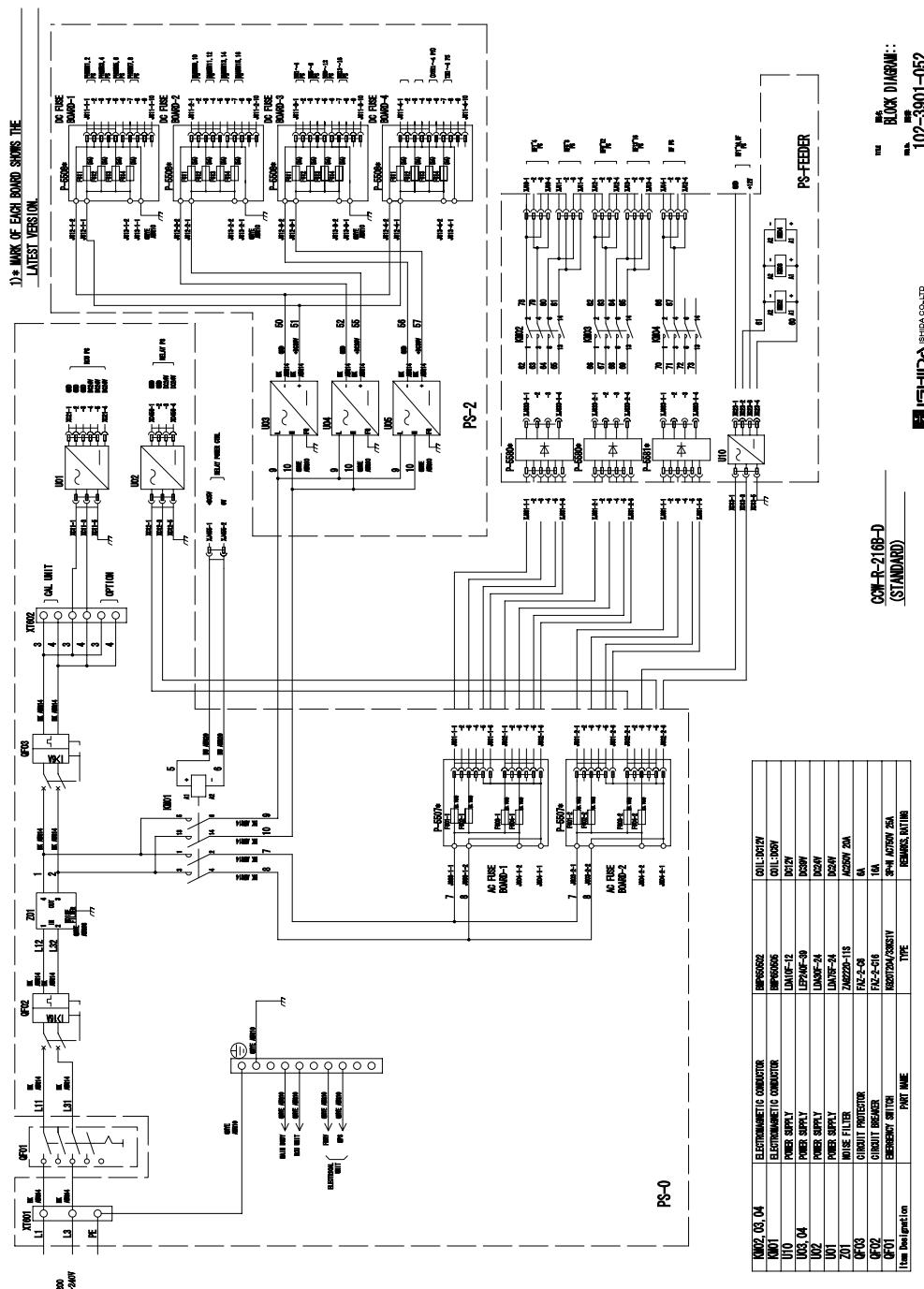
6.2.7 PS UNIT [POWER SUPPLY UNIT]

6.2.7.1 CCW-R-214W-S



Item Designation	Part Name	Type	REMARKS: RATING
KM01	ELECTROMAGNETIC CONDUCTOR	PC-5-48-DC5V	COTL-DC5V
U03, 04	POWER SUPPLY	PS2-34	Output: DC5V; 6.3A
U02	POWER SUPPLY	LDA10F-24	Output: DC24V
U01	NOISE FILTER	LDA10F-5	AC250V 20A
Z01	CIRCUIT PROTECTOR	ZAG220-11S	10A
QF05, 06	CIRCUIT PROTECTOR	CP35FM/10	7A
QF03, 04, 07	CIRCUIT BREAKER	CP35FM/7	NF30-3S 2P AC500V 15A
QF02	EMERGENCY SWITCH	P1-25/1/SVB/N	3PBN AC750V 25A

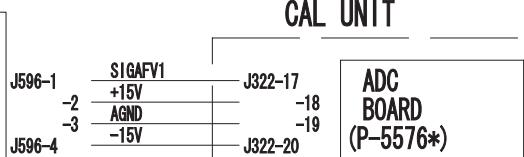
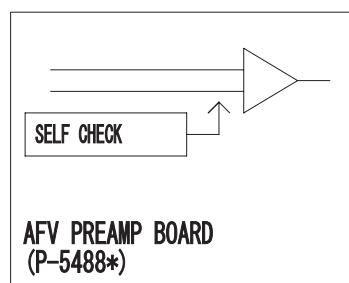
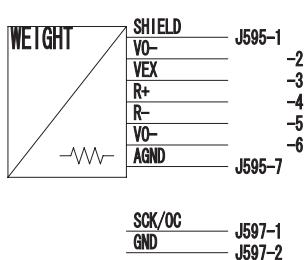
6.2.7.2 CCW-R-216B-D



6.2.8 AFV UNIT

1)* MARK OF EACH BOARD SHOWS THE LATEST VERSION.

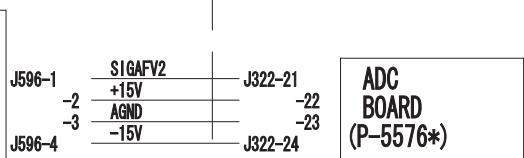
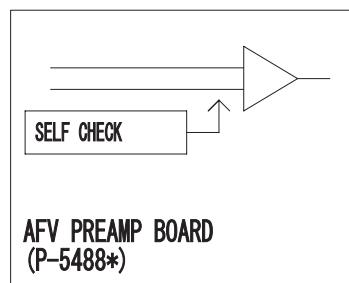
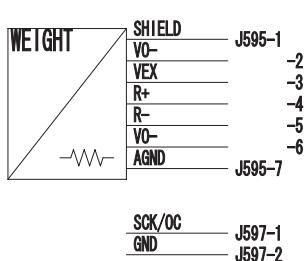
No. 1



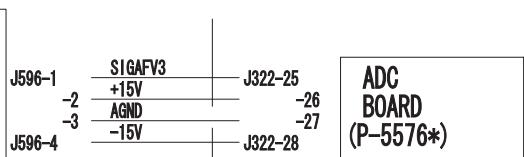
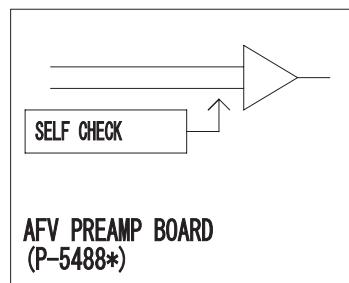
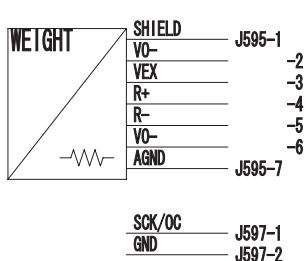
CAL UNIT

ADC
BOARD
(P-5576*)

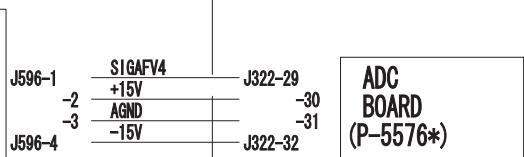
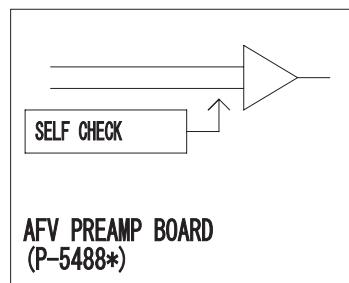
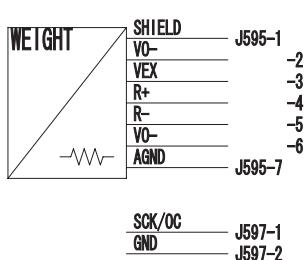
No. 2

ADC
BOARD
(P-5576*)

No. 3

ADC
BOARD
(P-5576*)

No. 4

ADC
BOARD
(P-5576*)AFV UNIT

MODEL MACHINE:
CCW-R SERIES

BLOCK DIAGRAM::
107-2452-02

INDEX

A

AC FUSE BOARD (P-5507 *) 3-54
 Actuator Type 4-28
 ADC BOARD (P-5576*) 3-35
 Adjusting Amplitude of Dispersion Feeder 2-15
 Adjusting Amplitude of Radial Feeder 2-9
 Adjusting Feeder Amplitude by Drive Frequency 5-27
 Adjustment of Frequency 5-21
 Adjustment of Natural Frequency 5-24
 AFD Setting 4-40
 AFD Stop Function for Fewer Available Head Number 4-41
 AFV (Anti Floor Vibration) 5-15
 AFV Compensation System 5-15
 AFV Effect for CCW-R (CCW-NZ or later) 5-19
 AFV for CCW-R (CCW-NZ or later) 5-15
 AFV Preamp Board (P-5488*) 3-61
 AFV UNIT 6-20
 AFV Unit 3-61
 All Setting Manager 4-15
 Amplitude Selection 4-19
 Angle 4-40
 Appearance 1-1
 Appearance of BH Drive Unit 2-39
 Appearance of Dispersion Feeder 2-11
 Appearance of Radiation Feeder 2-6
 Appearance of TH Drive Unit 2-42
 Appearance of Weigh/Drive Unit 2-16
 APPENDIX 5-1
 Attaching CF to DMU Board 5-13
 Automatic Adjustment of Frequency 5-24
 Automatic Timing Setting 4-39

B

Backup Software Reinstallation 5-10
 BH 1-4
 BH Drive Unit 2-39
 BLOCK DIAGRAM 3-5, 6-8
 Body 1-2
 Boost Amplitude Maximum Value 4-25
 Boost Amplitude Minimum Value 4-24
 Booster Hopper 1-4

Booster hopper drive unit(BDU) 1-4
 Brake Time 4-28, 4-35
 Browser Setting 4-9

C

CAL UNIT 3-24
 CAL UNIT 2/1 6-9
 CAL UNIT 2/2 6-10
 Card Initialization 4-16
 Cautions for FDRV board (P-5578 *) replacement 3-47
 CCW CAL Software Backup 5-6
 CCW CAL Software Installation 5-9
 CCW-R-210W-S DIAGRAM 6-3
 CCW-R-210W-S TOTAL DIAGRAM 6-2
 CCW-R-214W-S 3-5, 6-18
 CCW-R-214W-S DIAGRAM 6-5
 CCW-R-214W-S ELECTRICAL UNIT MAIN 6-12
 CCW-R-214W-S TOTAL DIAGRAM 6-4
 CCW-R-214W-S/20.30 3-1
 CCW-R-214W-S/70 3-3
 CCW-R-216B-D 3-6, 6-19
 CCW-R-216B-D DIAGRAM 6-7
 CCW-R-216B-D ELECTRICAL UNIT MAIN 6-13
 CCW-R-216B-D TOTAL DIAGRAM 6-6
 CCW-R-216B-D WEIGH DRIVE UNIT 1/2 6-16
 CCW-R-216B-D WEIGH DRIVE UNIT 2/2 6-17
 CCW-R-216B-D/20.30 3-2
 CCW-R-2XXW-S WEIGH DRIVE UNIT 1/2 6-14
 CCW-R-2XXW-S WEIGH DRIVE UNIT 2/2 6-15
 CF Amplitude Maximum Value 4-26
 CF Amplitude Minimum Value 4-25
 CIRCUIT DIAGRAM 6-1
 Cleaning Request Detection 4-41
 Collection Chute 1-2, 1-4
 Communication Set Menu Screen 4-10
 Communication Setting 4-10
 Configuration 1-5
 Control Panel Items (Maintenance Service) 4-4

D

DC FUSE BOARD (P-5508*) 3-56

DDU Board (P-5439*) 3-60
 Destination ID 4-9
 Destination ID Menu Screen 4-9
 DF 1-1, 1-3
 DF Adjust for Overfeed/DF WT Adjustment 4-42
 Diagram of dispersion camera relay unit (Option) 3-64
 Direct Program Installation to Main Unit (DMU) 5-13
 Discharge Chute 1-2, 1-4
 Dispersion Feeder 1-1, 1-3
 Dispersion Table 1-1, 1-3
 Display and Data Manager 4-14
 Display Control Menu Screens 4-4
 DMU BOARD (P-5562*) 3-37
 Drive frame 1-2, 1-4
 Drive Frequency Check 5-26
 Drive Frequency Display 5-21
 Drive Power Parameter 4-29
 Drive Stop Parameter 4-29, 4-36
 DU Board (P-5429*) 3-62
 DUC Board (P-5428*) 3-60

E

E-mail Setting 4-9
 Each Hopper Selection 4-27
 Electrical Components 3-1
 Electrical Unit Configuration 3-1
 ELECTRICAL UNIT MAIN 6-12
 Error Detection Pulse Count 4-30
 Error Display Screen 5-11
 Errors during Installation and Backup 5-11
 EXC Board (P-5426*) 3-49
 Exploded view for weigh/drive unit of model R-214W-S/70 2-31
 Exploded View of BH Drive Unit for Model R-216B-D/20.30 2-40
 Exploded View of TH Drive Unit 2-43
 Exploded View of Weigh/Drive Unit for Model R-214W-S/20.30 2-17
 Exploded View of Weigh/Drive Unit for Model R-216B-D/20.30 2-24

F

FDC Board (P-5532*) 3-46
 FDRV Board (P-5578*) 3-45
 Feeder Drive Specifications 4-19

Feeder power supply board (P-5580 *) (P-5581 *) 3-59
 Feeder PS unit 3-57
 Preamp Board (P-5435*) 3-62
 Frequency Adjustment(PWM Control Feeder) 5-21
 Frequency Initialization 5-21

H

Hardware Block Diagram for model CCW-R-2XXX 3-4
 Hold Time 4-33
 Hopper Drive Specification Setting (D.TH/TH/RS) 4-35
 Hopper Name Setting 4-17
 Hopper Open/Close Drive Pattern (DTH/TH/RS) 4-36
 Hopper Open/Close Drive Pattern (PH/WH/BH) 4-31

I

Inlet Chute 1-1, 1-3
 Installation Completion 5-14
 Installation Software Start up 5-1
 Installing Program Newly 5-5
 Installing the Program to Existing Model 5-4

L

Language Select Setting 4-7
 Layout Setting 4-14

M

Machine Set Manager 4-15
 Main Body 4-10
 Main body 1-4
 Main Components 1-1
 Main Electrical Unit 3-44
 Main Power Switch 1-2, 1-4
 MAINTENANCE SERVICE (MAINT SERVICE)
 LEVEL FUNCTION 4-1
 Maintenance Service Items in Machine Set 4-12
 Maintenance Service Level Menu 4-2
 Maintenance, Adjustment and Replacement 2-1
 Mechanical Unit Configuration 2-1
 Memory and Display of Frequency 5-21

Memory Initialization 4-15
 Menu Configuration 1-6
 Minimum Output Pulse Count 4-30

N

Natural frequency 5-21
 Natural Frequency Check for Feeder and RCU 5-21
 Network Setting 4-40

O

Camera selection board (P-5582 *) 3-22
 Other Boards / Optional Unit 3-62
 Overview 1-1

P

Parameter 1, 2, 3 4-27, 4-35
 Password Set/Language Select Set Menu Screen 4-7
 Password Setting 4-8
 PH 1-1, 1-3
 PH-WH 4-39
 Photosensor board (P-5207*) 3-63
 Phototube switch RF stop 4-20
 Pool Hopper 1-1, 1-3
 PS UNIT 6-18
 Printer 1-2, 1-4
 Printer unit 3-20
 Procedure for Replacing FDRV Board and DMU Board 5-30
 Procedure of Amplitude Adjustment by Changing the Drive Frequency 5-28
 Procedure of Board Replacement 5-30
 Program Installation Procedure from Web-RCU 5-1
 PS-0 Unit 3-53
 PS-2 Unit 3-55
 PWM Feeder Control 4-22

R

Radial Feeder 1-1, 1-3
 Radial Trough 1-1, 1-3
 Range 4-32
 RCU 4-10
 RCU 1-2, 1-4
 RCU Board (P-970*) 3-9
 RCU Software Backup 5-2

RCU Software Installation 5-4
 Relationship between the AFV and Filter 5-19
 Relay Board (P-5506*) 3-50
 RELAY UNIT 6-11
 Relay unit 3-48
 Remote Control Display 4-1
 REMOTE CONTROL UNIT 6-8
 Remote Control Unit 1-2, 1-4, 3-8
 Remote Control Unit Block Diagram 3-7
 Removing Feeder Cover 2-2
 Repeat 4-38
 Replacing and Adjusting Dispersion Feeder Parts 2-11
 Replacing and Adjusting Radiation Feeder Parts 2-6
 Replacing BH (Stepping) Motor 2-41
 Replacing Cover (Rubber Packing) 2-3
 Replacing DUC Board (P-5428*) 2-18, 2-25
 Replacing DUC board (P-5428*) 2-32
 Replacing Feeder Cover (Rubber Packing) 2-2
 Replacing Leaf Springs of Dispersion Feeder 2-12
 Replacing Leaf Springs of Radial Feeder 2-7
 Replacing Load Cell 2-21, 2-28, 2-35
 Replacing Magnetic Coil of Dispersion Feeder 2-13
 Replacing Magnetic Coil of Radial Feeder 2-8
 Replacing PH (Stepping) Motor 2-20, 2-27, 2-34
 Replacing TH (Stepping) Motor 2-44
 Replacing the boards 5-30
 Replacing WH (Stepping) Motor 2-19, 2-26, 2-33
 RF 1-1, 1-3
 RF Shutter Drive Condition 4-21
 RF Shutter Stop Delay Time 4-22
 RF-PH 4-39
 RF/DF Slow Start 4-20
 Rotation Count 4-36

S

Section 4-31
 Setting 4-11
 Server IP Address 4-11
 Setting Feeder Cover 2-3
 Slow Start 4-34
 Slow Stop 4-34
 Speed 4-33, 4-37
 Standard Amplitude Maximum Value 4-24
 Standard Amplitude Minimum Value 4-23
 Status for Installation Start and Installation Process 5-14

Stepping Motor Phase Type 4-28

Stop Delay Pulse Count 4-29

T

TH 1-2, 1-4

TH Drive Unit 2-42

Thermal printer (SAM-4245-10K) 3-21

Timing Hopper 1-2, 1-4

Timing Hopper Drive Unit 1-2, 1-4

TOTAL DIAGRAM 6-1

Touch Panel Coordinate Adjustment 4-4

TP-I/F Board (P-5573*) 3-20

V

Various Parameter Setting 4-18

W

WCU BOARD (P-5561*) 3-25

WDU 1-2, 1-4

WEIGH DRIVE UNIT 6-14

Weigh Hopper 1-2, 1-3

Weigh/Drive Unit 2-16, 3-60

Weigh/drive unit 1-2, 1-4

Weigher Information 4-12

Weigher Setting 4-38

WH 1-2, 1-3

WH - Packing (TH) 4-39

WH Shape 4-39

When no response for natural frequency comes from
FDRV 5-22

When the natural frequencies memorized in FDRV
and in RCU differ from each other 5-22



ISHIDA

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>
