Dm 201

NORITSU MANUAL

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NORITSU
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TS

Noritsu Densitometer

MODEL : D M - 2 0 1

Operator's Manual

9004

CONTENTS

1. Specifications

Density : Totally diffused light density
- Visual density
- Three primary color density (B, G, R)

Measuring mode : Transmission and reflection

Area measured : 3mm in dia. for both transmission and reflection modes.

Range measured : 0 to 4.0D for transmission mode
0 to 2.5D for reflection mode

Accuracy :
Transmission: 0 ~ 3.0D ± 0.02
2.0D ~ 4.0D ± 0.03

Reflection --- 0 ~ 2.5D ± 0.02

Repeatability : ±0.01

Maximum size of subject measurable : 11×14 inches
DISC film can also be measured.

Filters : Status M for transmission mode

Light receiving element : Photo-diode

Measuring head : Vertical stroke of 12mm

Display : Four digits show B, G, R and V density separately. B, G, R and V density values appear simultaneously.
Dot matrix display, 20 characters on each of 2 lines.
Liquid crystal display elements are used.

Calibration : The enclosed reference film and reflection check plaque is used when calibrating the densitometer.
When zero setting is carried out using a subject with a certain density, the difference in density between that subject and another can be measured.

Interface : With Noritsu printer (compatible with DM-1)
With Technet (RS232C)

Printing out data : By built-in dot printer

Other features :

1. After measuring control strips, the data is calculated automatically.
2. The device can be used to set up various kinds of printers.
3. Only one print is enough to carry out morning set up.
4. It is possible to print out measured data, etc.

External dimensions : 280 (width) × 351 (length) × 201 (height) mm

Weight : 9kg (approx.)

Power requirements : (50Hz/60Hz)

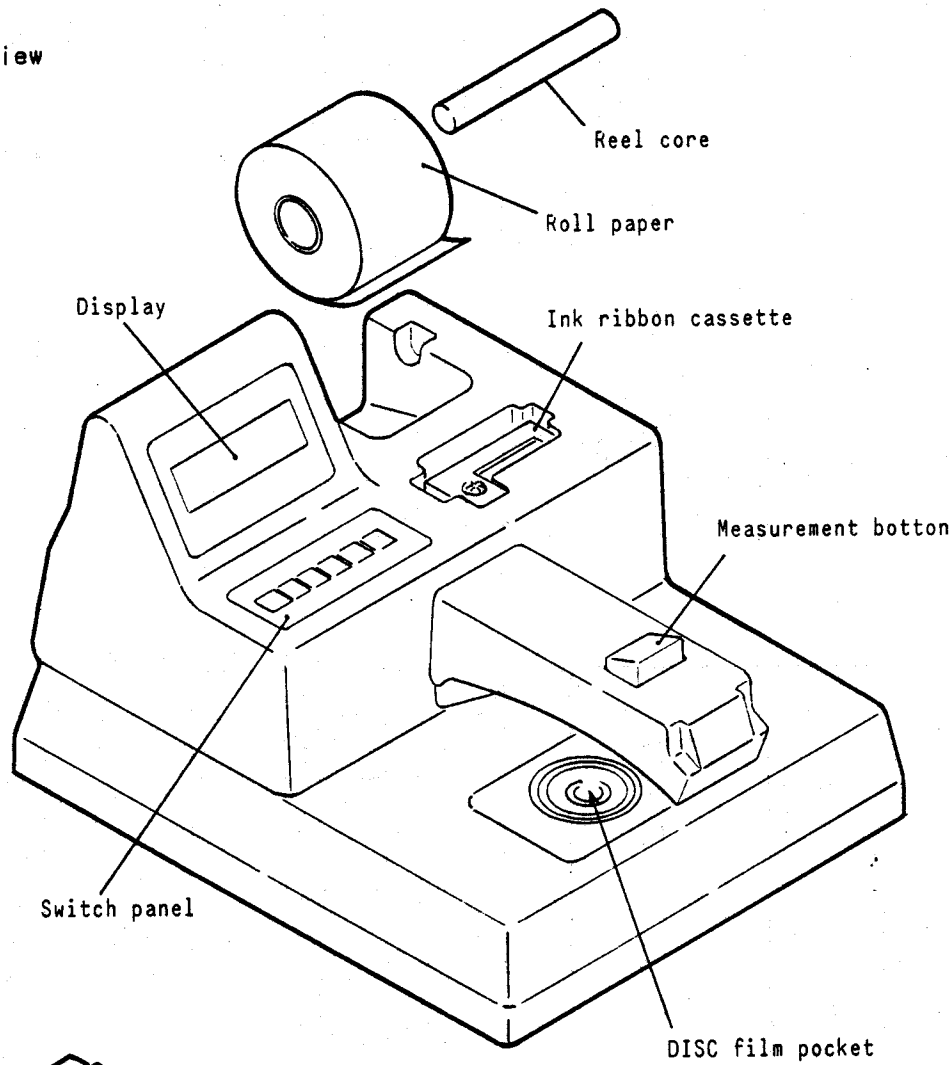
Voltage AC(V) ± 10%	100V	110V	120V	220V	230V	240V
Capacity	0.4A	0.4A	0.4A	0.2A	0.2A	0.2A

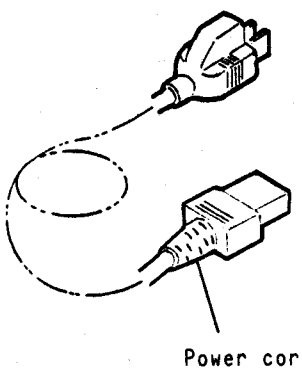
Accessory :

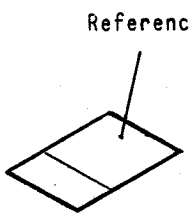
·Black-white reflection check plaque	1
·Calibration film	1
·Roll paper	1
·Main body cover	1
·Check plaque cover	1
·Printer roller	1
·Fuse (250V 6/10A)	1
·Halogen lamp	1

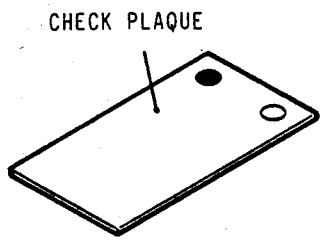
2. Name and explanation of each part

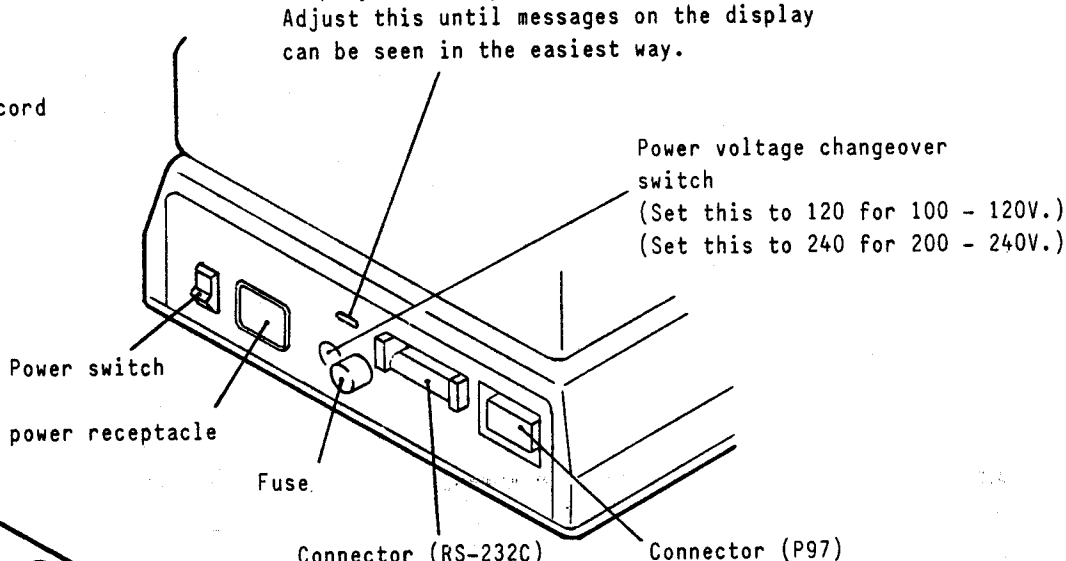
1. Overall view



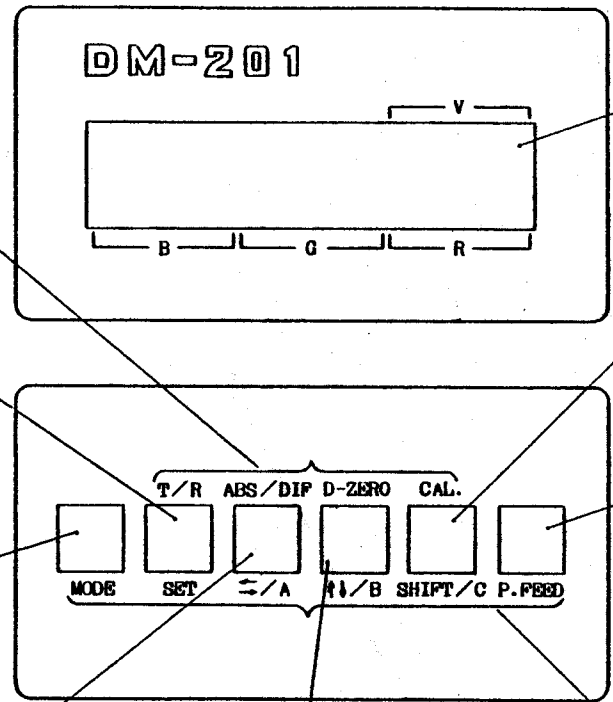








2. Key board



These keys are used when setting the densitometer functions in the normal mode.

[T/R · SET] key
[T/R] is used when changing from transmission mode to reflection mode and vice versa.
[SET] is used when selecting processing items.

[MODE] key
This key is used when selecting modes.

[ABS/DIF · ⇆/A] key
[ABS/DIF] is used when changing from the absolute value measurement mode to difference measurement mode and vice versa.
[⇆] is used when moving the cursor.
[A] is used when selecting modes.

[D-ZERO · ↑↓/B] key
[D-ZERO] is used when carrying out zero adjustment for density. (To be carried out before each measurement.)
[↑↓] is used when changing data.
[B] is used when selecting modes.

Display (20 characters for each of 2 lines)

[CAL. · SHIFT/C] key
[CAL.] is used when calibrating the measuring scale. [SHIFT] is used, in conjunction with [⇆/A] or [↑↓/B] key, to move the cursor or numbers in the reverse direction.
[C] is used when selecting modes.

[P.FEED] key
This key is used to advance the roll paper without any data being printed out on it.

These are used as the operation keys in all modes except the normal measuring mode.

3. Preparations for operations

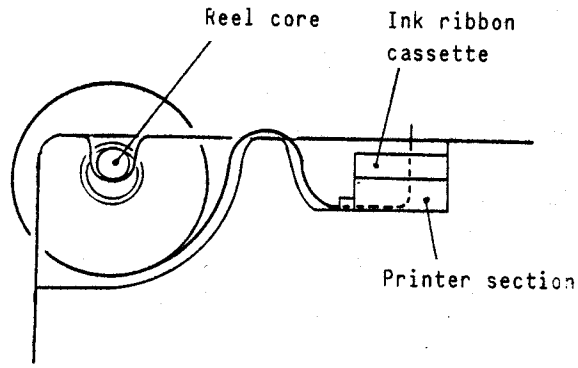
1. Turn ON the power switch located on the rear of the machine.

2. Set the roll paper in position in the following way :

   (1) Put the reel core into the roll paper and set it in the machine.

   (2) Pass the front end of the paper through the gap in the printer.

   (3) Press the [P-FEED] key until the front end of the paper comes out of the ink ribbon cassette.



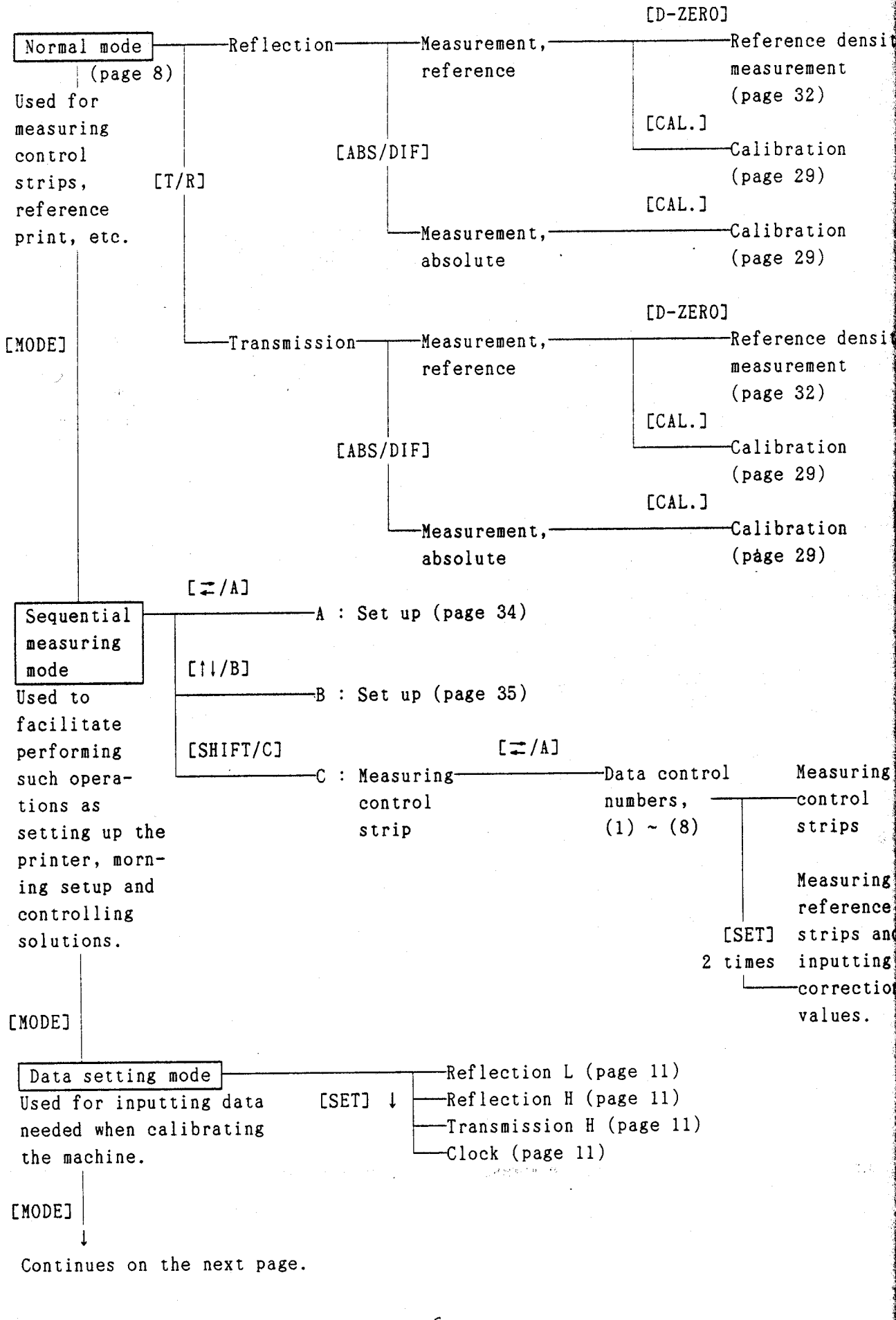
4. Explanation of each mode

1. As the [MODE] key is pressed, the 4 principal modes come up in succession. See the next page.

2. As [T/R・SET] key is pressed, items in each mode come up in succession.

3. When it is desired to change the mode to another one or to redo the operation, press the [MODE] key.

4. The chart showing the modes in DM-201



Continues from the previous page.

Control strip data presetting mode

Used for inputting data needed when calculating automatically the control strip measurement data.

[SET] ↓

- Process (page 13)
- Names of the sections to be measured (page 15)
- Colors to be measured (page 16)
- Correction / No-correction (page 17)
- Names of the calculation results you want to obtain. (page 18)
- Colors to be measured (page 20)
- Calculation expression (page 20)
- Limit value / No-limit value (page 22)
- Limit value (page 23)

[MODE]

Switch mode

Used for changing items listed on the right.

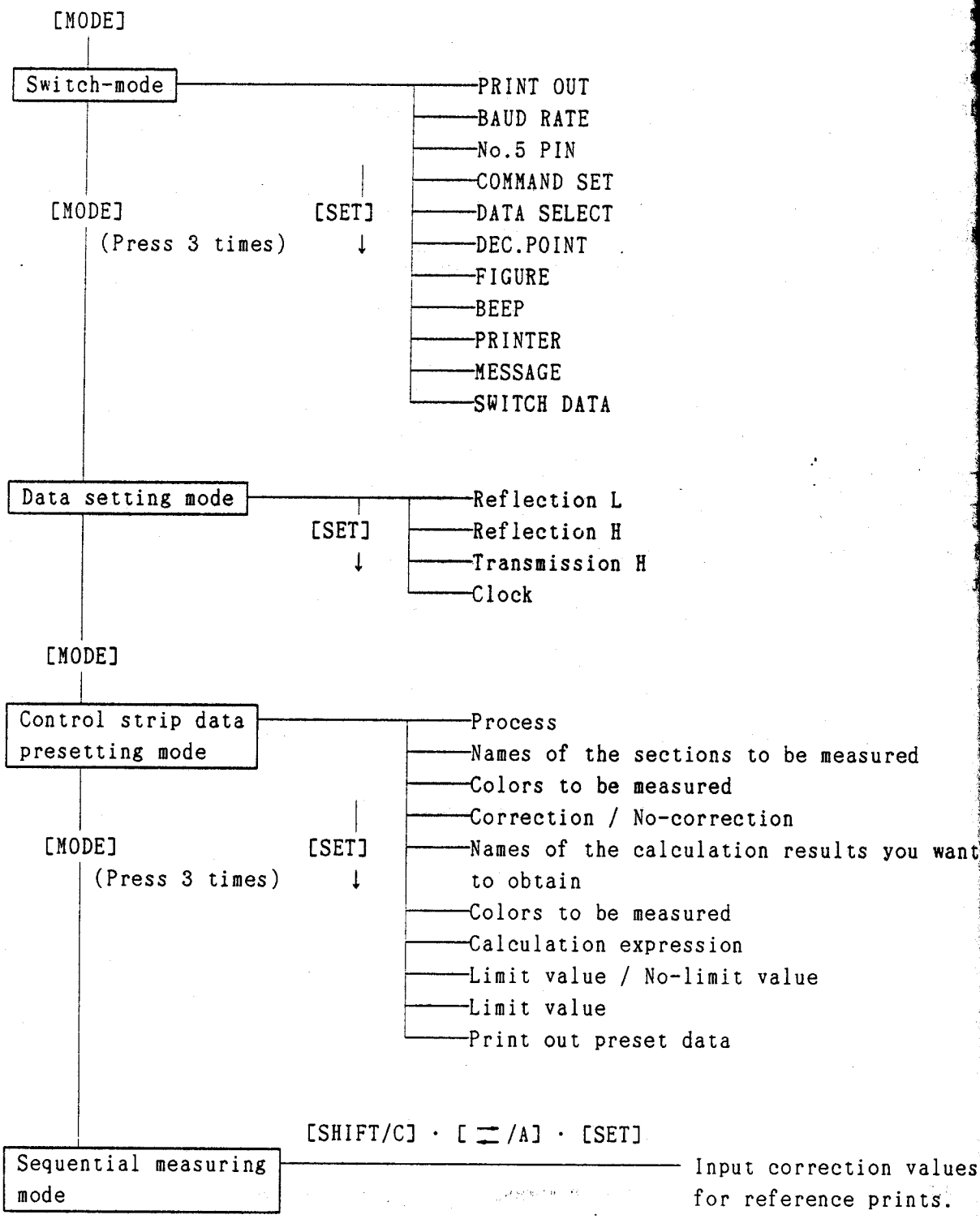
[SET] ↓

- PRINT OUT (page 9)
- BAUD RATE (page 9)
- No.5 PIN (page 9)
- COMMAND SET (page 9)
- DATA SELECT (page 9)
- DEC. POINT (page 9)
- FIGURE (page 9)
- BEEP (page 9)
- PRINTER (page 10)
- MESSAGE (page 10)
- SWITCH DATA (page 10)

5. Initial settings of the machine

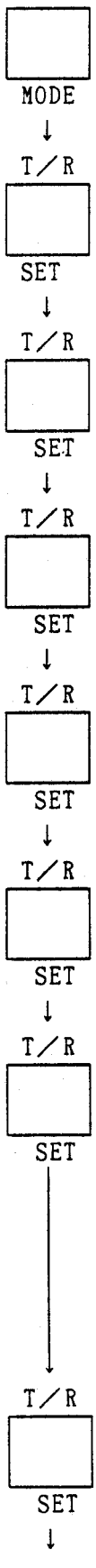
In this mode, you input all the necessary data into the machine before starting use the machine. Once the data has been input, it is preserved even when the po switch is turned OFF.

Flowchart



1. Switch setting mode

This mode is used for setting communication, meassages, etc.



Press this key until the message appears on the display.

Be sure to set items 2) ~ 6) to OFF when data is not to be communicated.

1) SWITCH (PRINTER)
PRINT OUT (ON)

Printing/No printing
(ON : Printing, OFF : No printing)
Data will be printed out after each measuring.

2) SWITCH (RS-232C)
BAUD RATE (1200)
↑
300,600,1200,2400,4800,9600(Baud rate)

3) SWITCH (RS-232C)
NO. 5 PIN (CTS)
↑
CTS,BUSY,OFF

4) SWITCH (RS-232C)
COMMAND SET (ON)
↑
ON,OFF

5) SWTICH (RS-232C)
DATA SELECT (ON)
↑
ON,OFF

6) SWITCH (RS-232C)
DEC. POINT (OFF)
↑
ON,OFF

7) SWITCH (RS-232C)
FLGURE (OFF)
↑
ON,OFF

·Set this to OFF when displaying measured data down to hundredths.
·Set this to ON when displaying measured data down to thousandths.

8) SWITCH (RS-232C)
BEEP (ON)
↑
Alarm/No-alarm
(ON:Alarm, OFF:No-alarm) ON,OFF

↓
T/R
[ ]
SET
↓
T/R
[ ]
SET
↓
T/R
[ ]
SET
↓
T/R
[ ]
SET

9) SWITCH	(SET UP)
PRINTER	(OFF)

↑
ON,OFF

10) SWITCH	(MESSAGE)
MESSAGE	(ENG.)

Japanese/English

PRINT OUT
SWITCH DATA ? A:YES

Press the [ABS/DIF· ⇄/A] key to print out data.

1. How to change the switches

T/R
[ ]
SET
Select the desired mode.

↓

ABS/DIF
[ ]
⇄/A
Bring up the cursor.

↓

D-ZERO
[ ]
↑↓/B
Each time this key is pressed, ON/OFF changes over.

↓

T/R
[ ]
SET

Example)

8) SWITCH	(RS-232C)
BEEP	(ON)

8) SWITCH	(RS-232C)
BEEP	(ON)

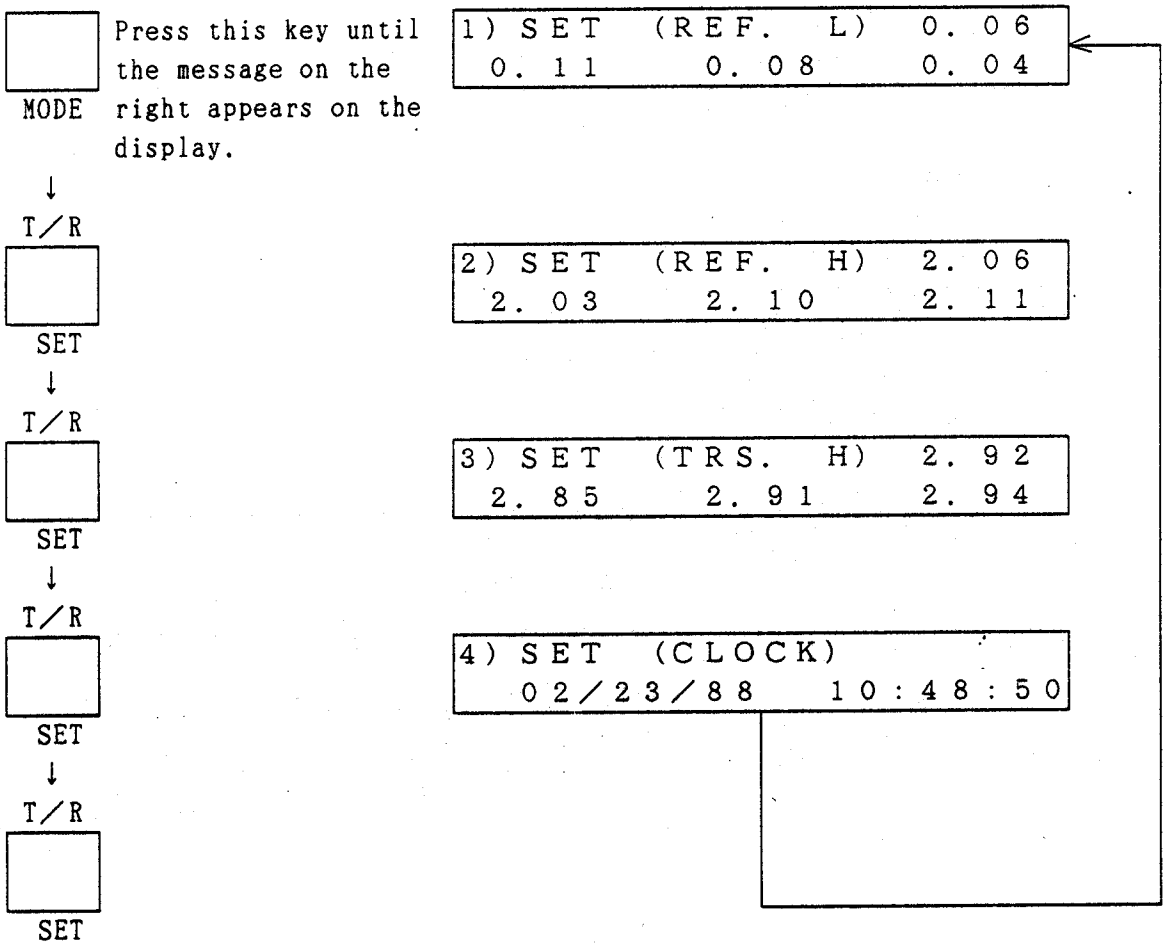
8) SWTICH	(RS-232C)
BEEP	(OFF)

9) SWITCH	(SETUP)
PRINTER	(ON)

When [D-ZERO · ↑↓/B] key is pressed while [CAL · SHIFT/C] key is being pressed, the switches change in the reverse order.

2. Data setting mode

Input the data marked on the enclosed reference film and reflection check plaque. The data becomes the reference value when calibrating the machine. When reference film and check plaque are replaced, be sure to input new data.

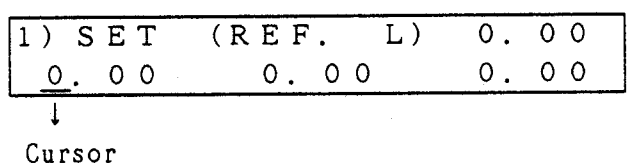


1. How to change the numbers on the display.

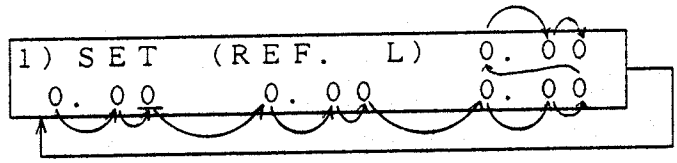
(1) Bring up the desired message on the display.

(2) Press [ABS/DIF・⇄/A] key to bring up the cursor on the display.

Note:
When the cursor is brought up on the display in the [CLOCK] mode, the clock display stops.

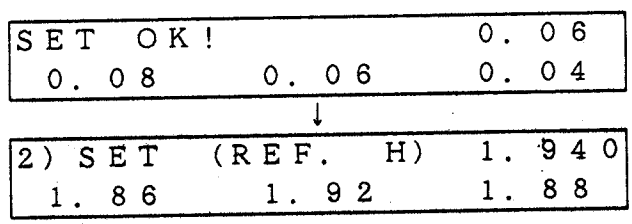


(3) Press [ABS/DIF · ⇄/A] key to move the cursor. The cursor moves as shown on the right. To move it in the reverse direction, press [ABS/DIF · ⇄/A] key while pressing [CAL · SHIFT/C] key.



(4) To change the numbers on the display, press [D-ZERO · ↑↓/B] key. To change the numbers in the reverse direction, press [D-ZERO · ↑↓/B] key while pressing [CAL · SHIFT/C] key.

(5) Press [T/R · SET] key.



3. Presetting control strip correction values

It is necessary to input the correction values before measuring control strips because the values are used when calculating the measured values.
To input the values, first input the process for the control strip to be measured. Next, input the correction values for the control strip, the values marked on the box for the control strips. After all of the control strips in one box have been used up and a new box is opened, it is necessary to input the correction values marked on the new box before using new batch of control strips.
Do as follows :

1. Inputting a process

MODE — Press this key repeatedly until the message appears on the display.

```
*
PRE-SET CONST DATA
```

(* CONST = control strip)

↓

T/R

SET

```
PROCESS ( FILM )
  1  C-41
```

Each time [ABS/DIF · ⇄/A] key is pressed, FILM and PAPER appear alternatively.

ABS/DIF

⇄/A — Film/paper changeover

```
PROCESS (PAPER)
  1  EP-2
```

CAL

SHIFT/C — Changing data control numbers : (Pressing this key twice increases the number by one.)

```
PROCESS (PAPER)
  2  EP-2
```

↑ Data control number

D-ZERO

↑↓/B — Process setting (refer to the table on the next page). (Messages change continuously while this key is being pressed.)

```
PROCESS (PAPER)
  2  EP-2NR
```

Set the message to FILM or PAPER for the processes not in the table.

To move messages backwards, press [D-ZERO · ↑↓/B] key while pressing [CAL · SHIFT/C] key.

Note : There are 8 data control numbers. So, up to 8 processes can b input into the machine. But when you are using less than 8 process, input FILM or PAPER for the data control numbers whic are not in use.

When a process has been set, standard initial settings suited for the process is automatically brought up. When you want to use the standa initial settings as they are, skip to item 11. In this case, the ite from 2 to 10 are not needed to be carried out. When you want to chan the initial settings, proceed to the following step, 2.

T/R

SET

Advance to the next setting (item 2).

Name of process (film processor)		Name of process (paper processor)	
C-41		E-2	
C-41NP		EP-2NR	
C-41B		EP-2NP	
C-41BNP		RA-4	
CN-16		RA-4NP	
CN-16(FLR)		CP-20	
CN-16(AD)		CP-20(FLR)	
CN-16Q		CP-20(LR)	
FILM		CP-21	
		CP-25Q	
		PAPER	

2. Selecting names of the sections to be measured (See part (a) in the table on page 38.)

Read the chemical control directions published by the emulsion manufacturer before selecting names. After the names have been selected, write them in the table on page 38.

You can select the appropriate name for each number, 1) to 5). When a process has been set in item 1, the standard names are automatically selected. When they are satisfactory, it is not necessary to carry out the subsequent operations.

```
CONST (MEAS. NAME)
1)   HD
```

1) to 5) Appropriate name

ABS/DIF
[ ]
⇄/A
Changing numbers, 1) to 5).

D-ZERO
[ ]
↑↓/B
Selecting the appropriate name. (Messages change continuously while this key is being pressed.)

→Ymax→Black→Dmax→Dmin→HD→Hi-Den→
→High→LD→Low→Low-Den→MD→Min-Den→
→No Use→STAIN→STEP1→STEP2→STEP3→
→STEP4→White→Yellow →

To move messages backwards, press D-ZERO [ ] ↑↓/B key while pressing CAL. [ ] SHIFT/C key.

T/R
[ ]
SET
Advances to the next setting (item 3).

3. Selecting colors in control strips to be measured (see part (b) in the table on page 38).

You can select colors to be measured for each name decided in item 2 above.

○ : Measurement
(large circle) : Simultaneous measurement
(small circle) : Single color measurement
× : No measurement

```
CONST (MEAS. COLOR)
HD          B : ○  G : ×  R : ○
```

↑
The name decided in item 2 appear here.

ABS／DIF
[ ]
⇄／A
Moving the cursor.

```
CONST (MEAS. COLOR)
HD          B : ○  G : ○  R : ○
```

D-ZERO
[ ]
↑↓／B
Selecting colors (◯, ○, ×).

```
CONST (MEAS. COLOR)
HD          B : ×  G : ○  R : ○
```

CAL.
[ ]
SHIFT／C
Bringing up the names decided in item 2.

```
CONST (MEAS. COLOR)
LD          B : ○  G : ○  R : ○
```

If No Use was selected in item 2, the name will not appear.

T／R
[ ]
SET
Advances to the next setting (item 4).

4. Correction / No-correction setting (see part (c) in the table on page 38).

Determine whether correction values are to be input or not. Correction values are marked on a box for control strips.

```
CONST (CORRECT)
HD              B : O  G : O  R : O
```

↑ Names decided in item 2 appear here.

O : Correction
× : No-correction

ABS／DIF
[ ] Moving the cursor.
=／A

```
CONST (CORRECT)
HD              B : O  G : O  R : O
```

D-ZERO
[ ] Selecting O or ×.
↑↓／B

```
CONST (CORRECT)
HD              B : ×  G : O  R : O
```

CAL.
[ ] Bringing up names decided in item 2.
SHIFT／C

```
CONST (CORRECT)
LD              B : ×  G : O  R : O
```

When No Use was selected, the name will not appear.

T／R
[ ] Advances to the next setting (item 5).
SET

5. Selecting names of the calculation results you want to obtain.
(See part (d) in the table on page 38).

You can select the appropriate name for each number, 1) to 5).
When a process has been set in item 1, the standard names are automatically selected. When they are satisfactory, it is not necessary to carry out the subsequent operations.

```
CAL. (ANS. NAME)
 1)  HD-LD
```

1) to 5) — Name of the result

ABS/DIF
⇄/A

Changing numbers, 1) to 5).

```
CAL. (ANS. NAME)
 2)  HD-LD
```

D-ZERO
↑↓/B

Selecting the appropriate names. Refer to the table on the next page.
(Messages change continuously while this key is being pressed.)

```
CAL. (ANS. NAME)
 2)  LD
```

To move messages backwards, press D-ZERO (↑↓/B) key while pressing CAL. (SHIFT/C)

T/R
SET

Advances to the next setting (item 6).

Table showing names of calculation results

No.	Name	No.	Name
1	B-HDC	21	SPEED
2	Black	22	STAIN
3	BR-HDCR	23	STEP1
4	COLOR	24	STEP2
5	Dmax	25	STEP3
6	DmaxB-YB	26	STEP4
7	DmaxR-DmaxG	27	White
8	Dmin	28	XB-YB
9	HD	29	XR-XG
10	HD-LD	30	Yellow
11	Hi-Den	31	Ymax
12	High	32	YR-SR
13	LD	33	
14	Low	34	
15	Low-Den	35	
16	MaxB-YelB	36	
17	MaxR-MaxG	37	
18	MD	38	
19	Min-Den	39	
20	No use	40	

6. Selecting colors for calculation results. (See part (e) in the table on page 38.)

You can select colors for each calculation result decided in item 5.

```
CAL. (COL) HD-LD
             B:O  G:O  R:O
```

O : Calculation
× : No calculation

ABS/DIF
[ ] Moving the cursor.
⇄/A

```
CAL. (COL) HD-LD
             B:O  G:O  R:O
```

D-ZERO
[ ] Selecting color(s). (O or ×)
↑↓/B

```
CAL. (COL) HD-LD
             B:×  G:O  R:O
```

CAL.
[ ] Bringing up names of calculation result, 1) to 5).
SHIFT/C
When No Use was selected, the name will not appear.

```
CAL. (COL) Hi-Den
             B:O  G:O  R:O
```

T/R
[ ] Advances to the next setting (item 7).
SET

7. Inputting calculation expressions. (See part (f) in the table on page 38.)

You can input the appropriate expression for each name of the calculation result selected in item 5.

```
CAL. (EXP) HD-LD
(C2-C1) - (RV2-RV1)
```

ABS/DIF
[ ] Moving the cursor.
⇄/A

```
CAL. (EXP) HD-LD
(C2-C1) - (RV2-RV1)
```

D-ZERO
[ ] Changing and inputing expression.
↑↓/B

```
CAL. (EXP) HD-LD
(C3-C1) - (RV2-RV1)
```

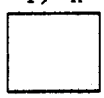
CAL.

SHIFT/C

Bringing up names of calculation results, 1) to 5).

When No Use was selected, the name will not appear.

T/R



SET

Advances to the next setting (item 8).

Marks used in equations

No.	Mark	No.	Mark	No.	Mark
1	R1	34	C4B	67	RV2G
2	R1B	35	C4G	68	RV2R
3	R1G	36	C4R	69	RV3
4	R1R	37	C5	70	RV3B
5	R2	38	C5B	71	RV3G
6	R2B	39	C5G	72	RV3R
7	R2G	40	C5R	73	RV4
8	R2R	41	H1	74	RV4B
9	R3	42	H1B	75	RV4G
10	R3B	43	H1G	76	RV4R
11	R3G	44	H1R	77	RV5
12	R3R	45	H2	78	RV5B
13	R4	46	H2B	79	RV5G
14	R4B	47	H2G	80	RV5R
15	R4G	48	H2R	81	+
16	R4R	49	H3	82	-
17	R5	50	H3B	83	(
18	R5B	51	H3G	84	)
19	R5G	52	H3R	85	{
20	R5R	53	H4	86	}
21	C1	54	H4B	87	□ (space)
22	C1B	55	H4G	88	
23	C1G	56	H4R	89	
24	C1R	57	H5	90	
25	C2	58	H5B	91	
26	C2B	59	H5G	92	
27	C2G	60	H5R	93	
28	C2R	61	RV1	94	
29	C3	62	RV1B	95	
30	C3B	63	RV1G	96	
31	C3G	64	RV1R	87	
32	C3R	65	RV2	98	
33	C4	66	RV2B	99	

8. Limit / No-limit setting (See part (g) in the table on page 38.)

You can decide whether there should be limit values or not for each calculation result selected in item 5.

LIMIT	HD－LD	
AL	＋：○	－：○

AL : Action Limit　　○ : Limit values
CL : Control Limit　　× : No limit values

ABS／DIF
[ ]
Moving the cursor.
＝／A

LIMIT	HD－LD	
AL	＋：<u>○</u>	－：○

D-ZERO
[ ]
Limit / No limit setting (○ or ×).
↑↓／B

LIMIT	HD－LD	
AL	＋：<u>×</u>	－：○

CAL.
[ ]
Bringing up names, 1) to 5).
SHIFT／C

→ 1 → 2 → 3 → 4 → 5 → 1 → 2 → 3 → 4 → 5
AL　　CL

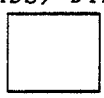
T／R
[ ]
Advances to the next setting (item 9).
SET

9. Setting limit values (See part (h) in the table on page 38.)

You can set limit values for each calculation result selected in item 5.

LIMIT	HD－LD	
AL	+0.00	－0.00

ABS／DIF

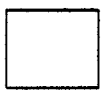


⇄／A

Moving the cursor.

LIMIT	HD－LD	
AL	+0.00	－0.00

D-ZERO



↑↓／B

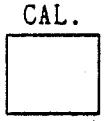
Changing values to the appropriate one.

LIMIT	HD－LD	
AL	+9.00	－0.00

(Numbers change by one each time this key is pressed.)

To move message backwards, press D-ZERO ↑↓／B key while pressing CAL. SHIFT／C key.

CAL.



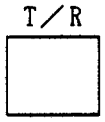
SHIFT／C

Bringing up names, 1) to 5).

→ 1 → 2 → 3 → 4 → 5 → 1 → 2 → 3 → 4 → 5

AL　　CL

T／R



SET

Advances to the next setting (item 10).

10. Printing out preset data

When [ABS/DIF · ⥂/A] key is pressed, the preset data is printed out.
Press the [MODE] key to stop printing.

```
PRINT OUT
PRE-SET DATA A:YES
```

Example)

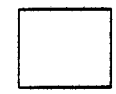
```
$$$$$$$$$$$$$$$$$$$$$$$$
Preset data

1) Film
Process :C-41

Correction value
Yellow  -9.99  -9.99  -9.99
Dmax    -9.99  -9.99  -9.99
HD      -9.99  -9.99  -9.99
LD      -9.99  -9.99  -9.99
Dmin    -9.99  -9.99  -9.99

Action Limit
DmaxB-YB
DmaxR-DmaxG
HD-LD
LD
Dmin

Control Limit
DmaxB-YB
DmaxR-DmaxG
HD-LD
LD
Dmin


2) Paper
Process :EP-2
   |        |
   |        |  (The same as for film)
   |        |
$$$$$$$$$$$$$$$$$$$$$$$$
```

T/R
SET

Returns to the initial setting.

11. Inputting correction values for reference strips

Each time a new box for control strips is opened, input the correction values marked on the new box before using the new batch of control strips.



MODE

Press this key repeatedly until the message appears.

```
SEQUENCE MEASURE
A/B:SETUP      C:CONST
```

↓

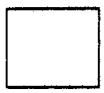
CAL.

SHIFT/C

```
MEAS. CONST ( FILM )
PROCESS:1) C-41
```

↓

ABS/DIF

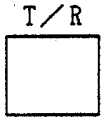


⇄/A

Set to the appropriate control number.

↓

T/R



SET

Press twice.

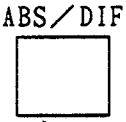
Name of the section to be measured of the selected control number, 1 ~ 5.

```
          ↓        ↓
COR. (PAPER ) HD
-3.20 +0.00 +0.20
```

↓

Input correction values.

ABS/DIF



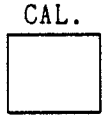
⇄/A

Displaying and moving a cursor.

```
COR. (PAPER ) HD
-3.20 +0.00 +0.20
↑
```

When the key is pressed once, a cursor appears. The cursor starts to move to the right when the same key is pressed.

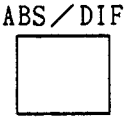
CAL.



SHIFT/C

While pressing

ABS/DIF



⇄/A

The cursor moves to the left.

↓

D-ZERO

[ ] Changing marks (+ or -) and numbers.

↑↓/B

```
COR. (PAPER )  HD
+3.20  +0.00  +0.20
```

↑

Each time the key is pressed, "+" changes to "-" and vice versa. Numbers increase from 0 to 9 by one. After 9, it returns to 0.

CAL.

[ ]

SHIFT/C

While pressing

D-ZERO

[ ]

↑↓/B

Numbers decrease from 9 to 0 by one. After 0, it returns to 9.

↓

Change the message.

CAL.

[ ] Press twice.

SHIFT/C

↓

T/R

[ ] Input correction values.

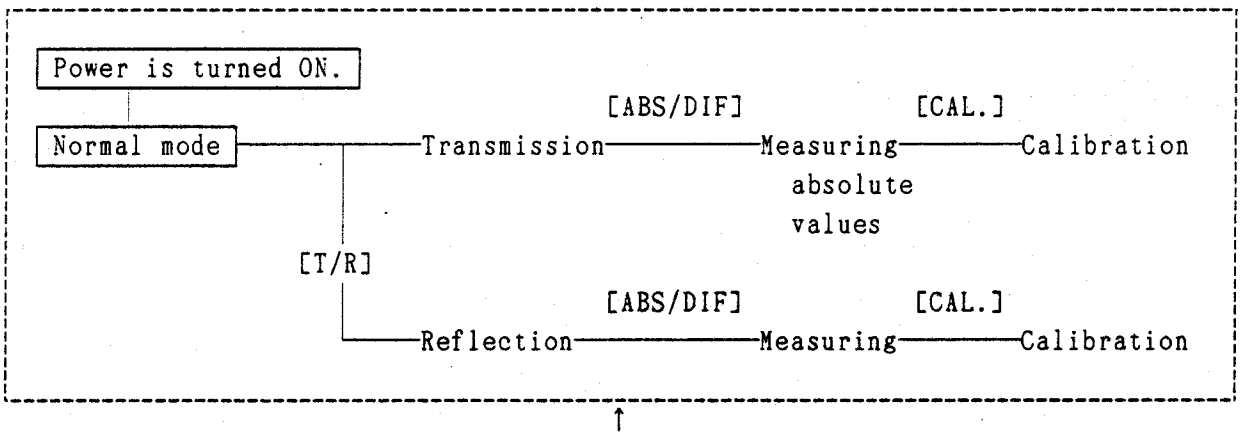
SET

The densitometer has now been setup.
Change the mode to another with the [MODE] key.

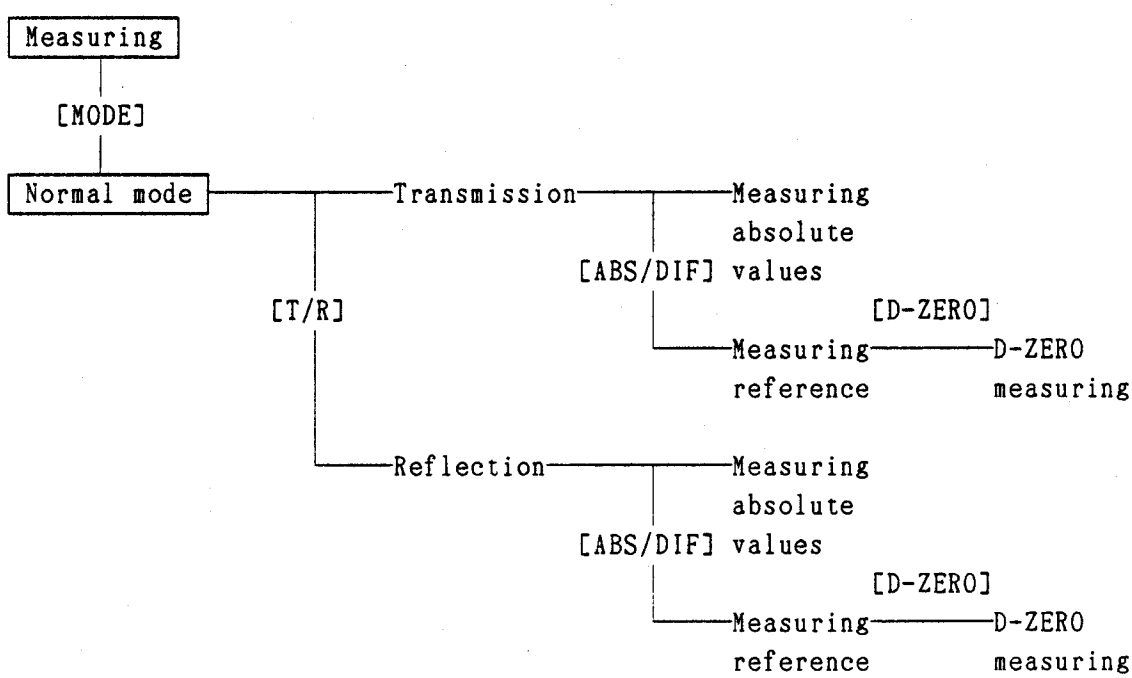
6. Operation

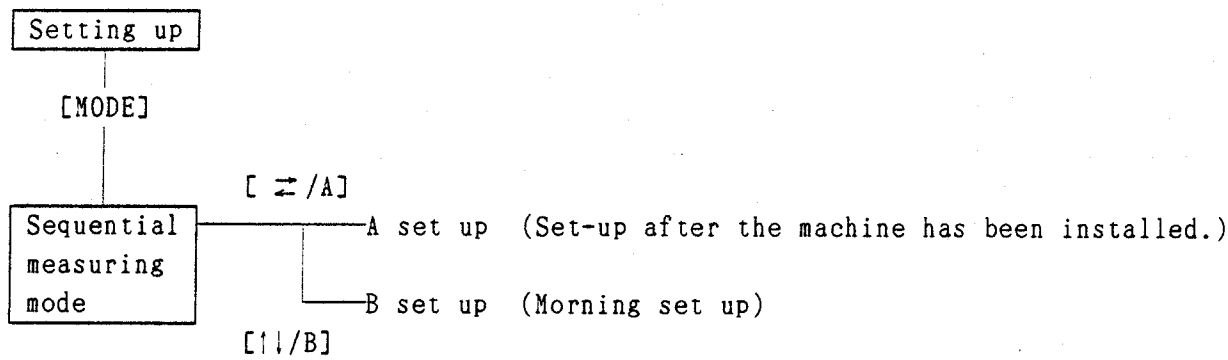
The densitometer, besides being able to measure reflection and transmission density of objects, also has such a capability as that facilitating printer setting up and morning set up. It has a capability measuring control strips, calculating the values and displaying the calculation results on the display, too.

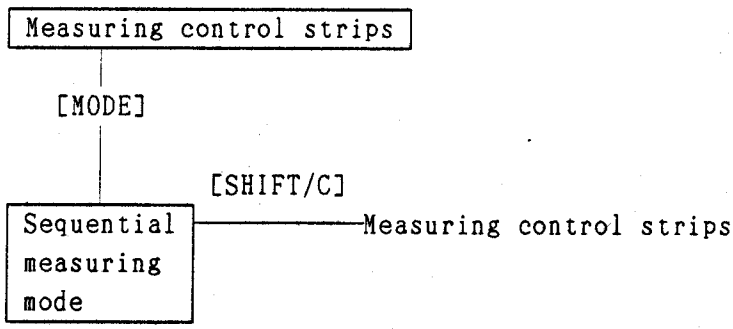
Operation flowchart



The operations needed to be performed after the power switch is tuned ON.



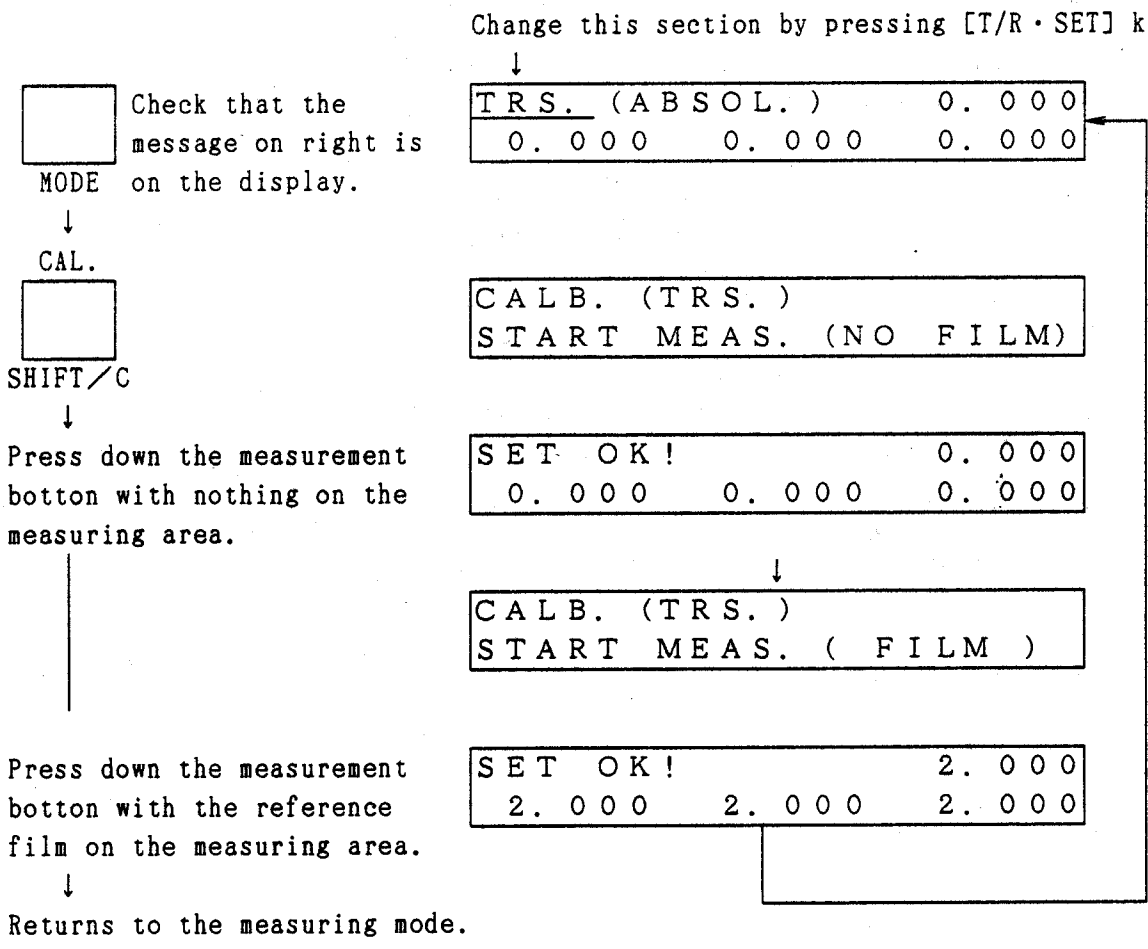

Setting up
[MODE]
[⇄ /A]
Sequential measuring mode
A set up (Set-up after the machine has been installed.)
B set up (Morning set up)
[↑↓/B]


Measuring control strips
[MODE]
[SHIFT/C]
Sequential measuring mode
Measuring control strips

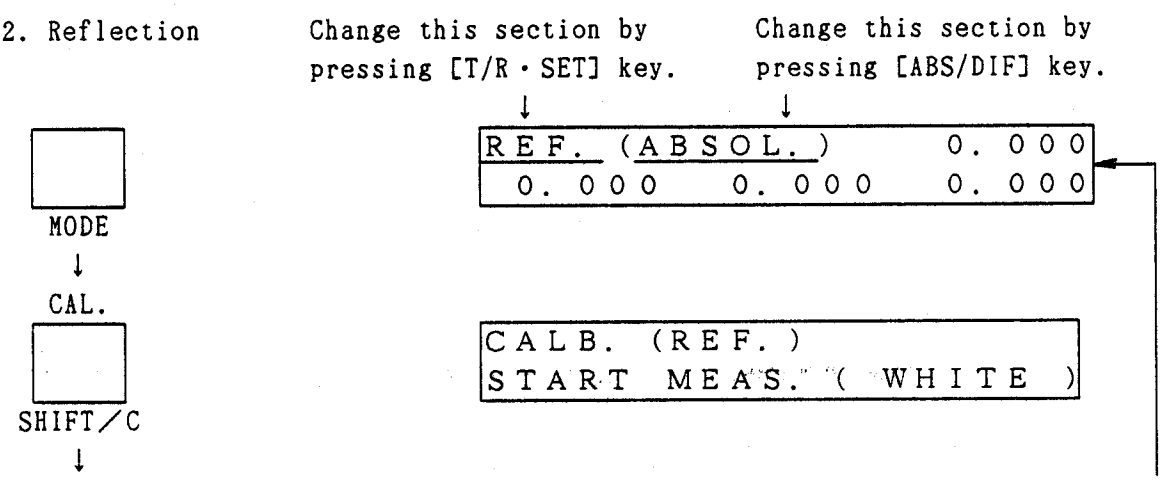
1. Setting calibration mode

This operation is to input the zero point which is to be used when measuring the absolute valve and reference values. Be sure to perform this operation each time the power switch is turned ON. Check that the lamp is lit. If it is not, press the measurement button to light up the lamp. When the lamp is kept ON without measuring anything for 2 minutes, it will go OFF. In this case, press the button again.

1. Transmission

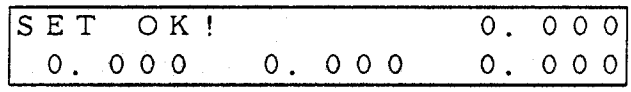


2. Reflection

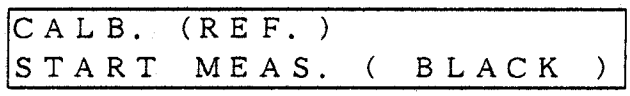


↓

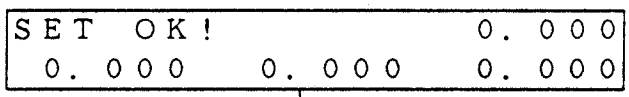
Measure the white spot on the check plaque.



↓



Measure the black spot on the check plaque.



↓

Returns to the measuring mode.

2. Measuring absolute values

In this mode, the density of an object is measured using the density of the calibration film or that of the black and white check plague as the standard.

Note: The lamp will automatically go OFF 2 minutes after the measuring. Be sure to check that the lamp is ON before measuring again. If it is OFF, press the measurement button to turn it ON.

1. Transmission

Use the [T/R·SET] key to change "REF."to "TRS." and vice versa.

Use the [ABS/DIF] key to change "DIFFE." to "ABSOL." and vice versa.

↓ ↓

TRS. (ABSOL.)		0. 000
0. 000	0. 000	0. 000

MODE

↓

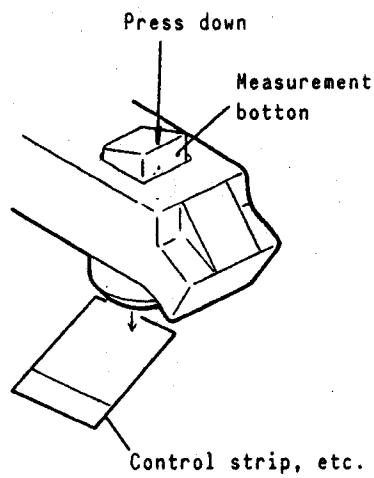
Place an object on the measuring area and press down the button.

↓

Record the meaured values.

Press the button until a high pitch sound is heared.

When PRINT is set to "ON" in the switch mode, the measured values are printed out.



2. Reflection

Use the [T/R·SET] key to change "TRS." to "REF." and vice versa.

Use the [ABS/DIF] key to change "DIFFE." to "ABSOL." and vice versa.

↓ ↓

REF. (ABSOL.)		0. 000
0. 000	0. 000	0. 000

MODE

↓

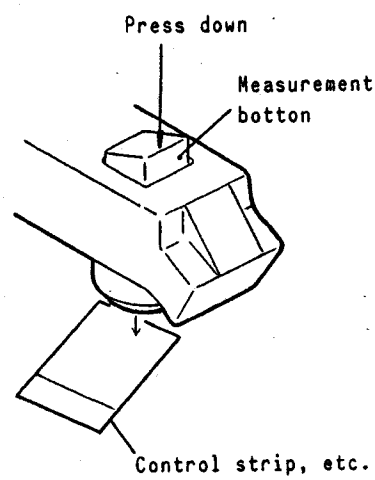
Place an object on the measuring area and press down the button.

↓

Record the meaured values.

Press the button until a high pitch sound is heared.

When PRINT is set to "ON" in the switch mode, the measured values are printed out.

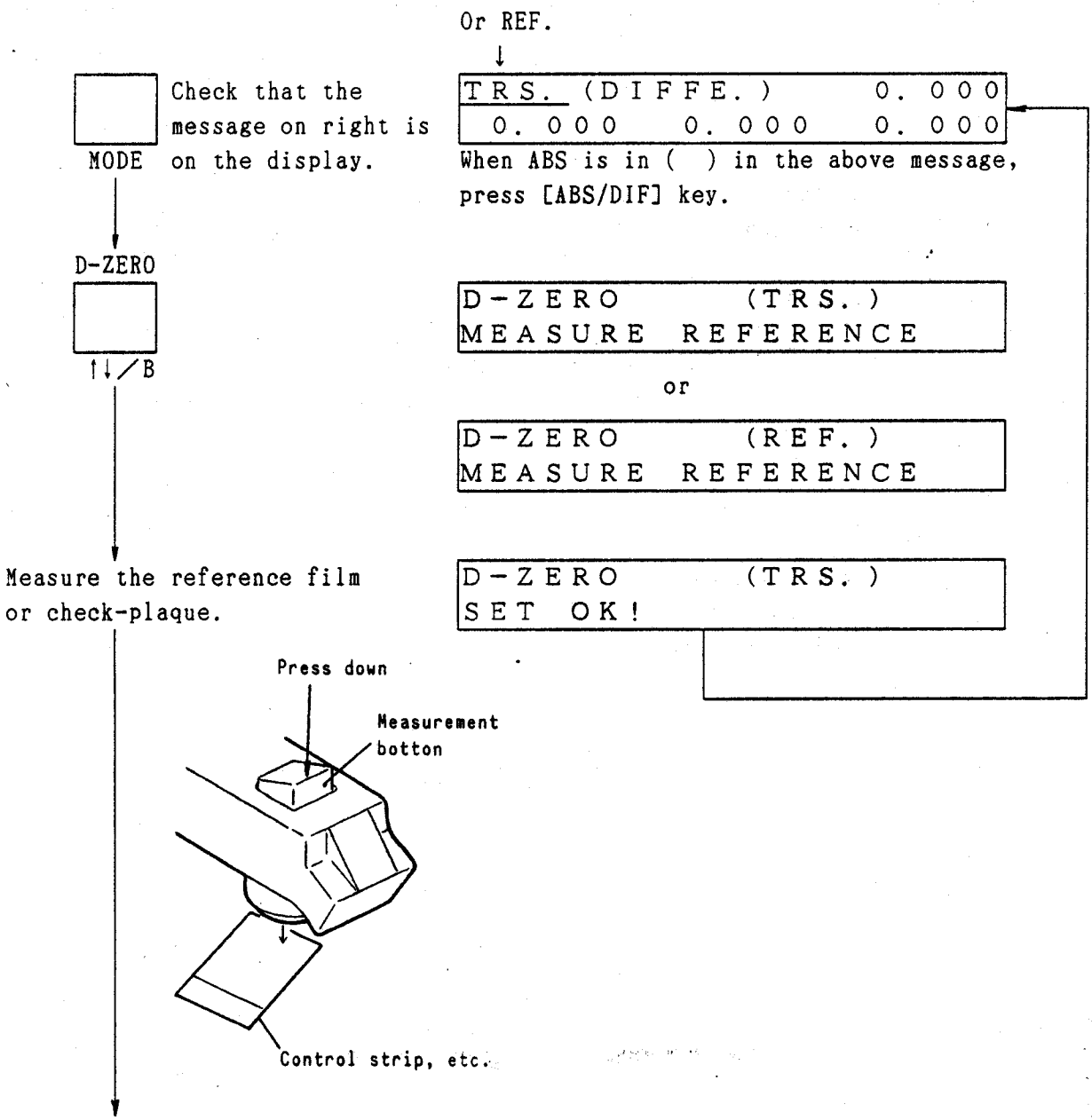


3. Reference measurement

In this mode, you measure the density of an object using the density of another object as a reference. Input the reference density in the D-ZERO mode.

1. D-ZERO setting

When you want to use film and paper of certain density as reference strips, input the value of the material in this mode.
Check that the lamp is lit. If it is not, press the measurement button to light up the lamp. When the lamp is kept ON for 2 minutes without measuring anything, it will go OFF. In this case, press the button again.



Returns to the measurement mode.

2. Transmission

Use the [T/R·SET] key to change "REF." to "TRS." and vice versa.

Use the [ABS/DIF] key to change "ABSOL." to "DIFFE." and vice versa.

↓ ↓

TRS. (DIFFE.)		0. 000
0. 000	0. 000	0. 000

MODE

↓

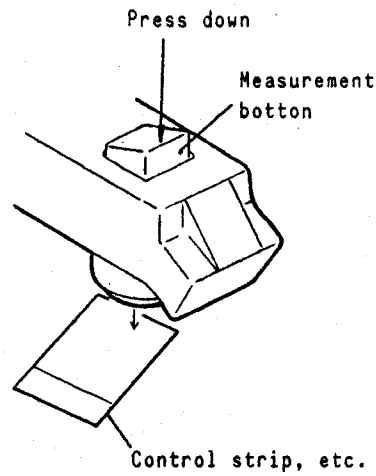
Place an object on the measuring area and press down the button.

↓

Record the meaured values.

Press the button until a high pitch sound is heared.

When PRINT is set to "ON" in the switch mode, the measured values are printed out.



3. Reflection

Use the [T/R·SET] key to change "TRS." to "REF." and vice versa.

Use the [ABS/DIF] key to change "ABSOL." to "DIFFIE." and vice versa.

↓ ↓

REF. (DIFFE.)		0. 000
0. 000	0. 000	0. 000

MODE

↓

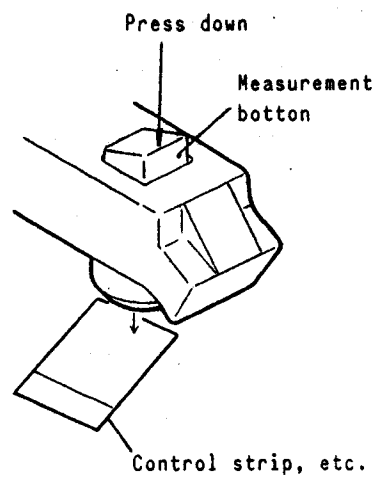
Place an object on the measuring area and press down the button.

↓

Record the meaured values.

Press the button until a high pitch sound is heared.

When PRINT is set to "ON" in the switch mode, the measured values are printed out.

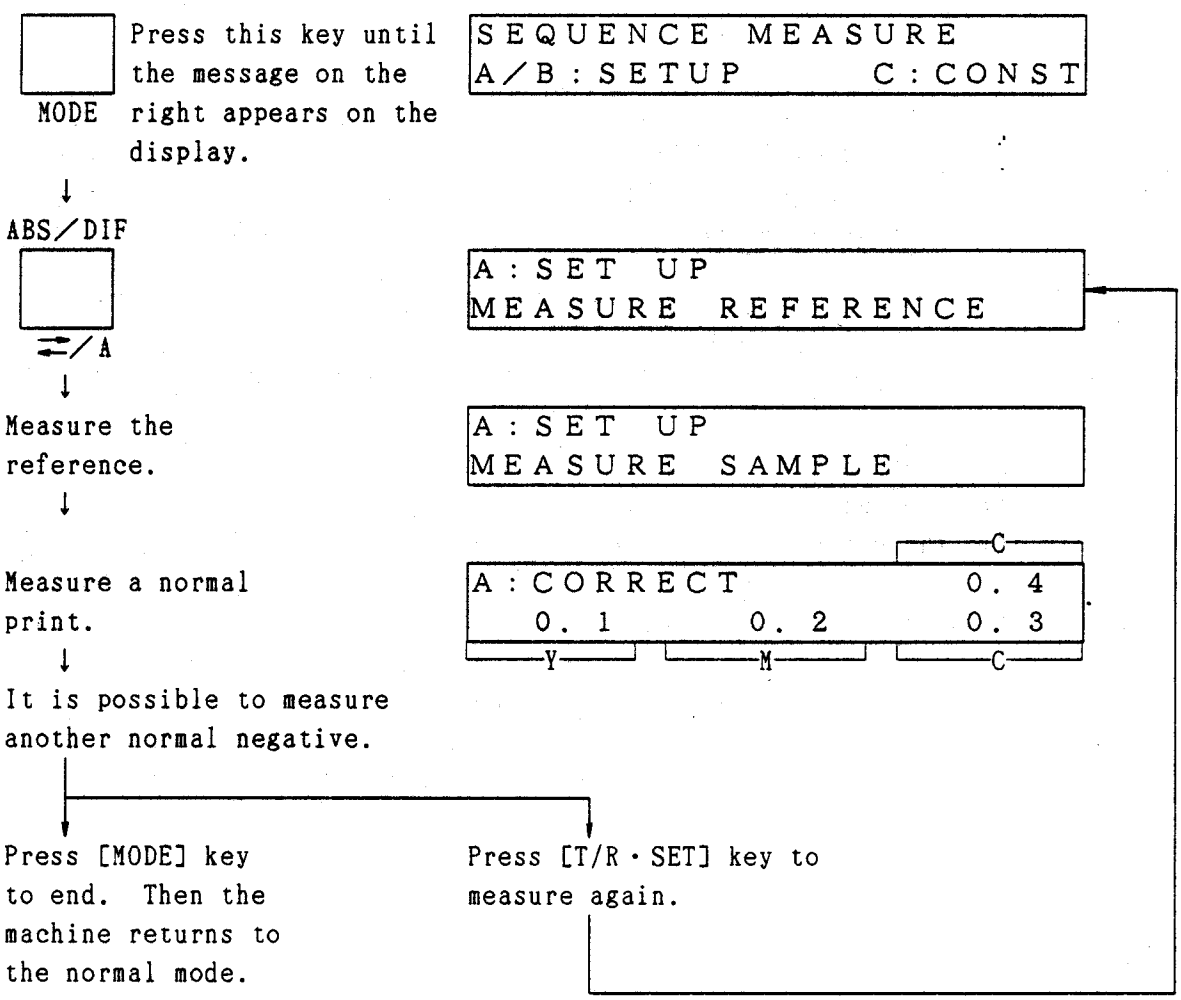


4. Setting up the printer

This mode is used to measure the difference between the color condition of the prints just made and that of the reference print and to show the results in terms of the key values. Use this mode when setting up the printer or when carrying out the daily checks. There are two setting up modes, that is, A and B. The A mode is used for daily checks (morning setup) and B mode is for setting up the printer when it is installed. When C is selected, the machine enters the controlstrip measuring mode.

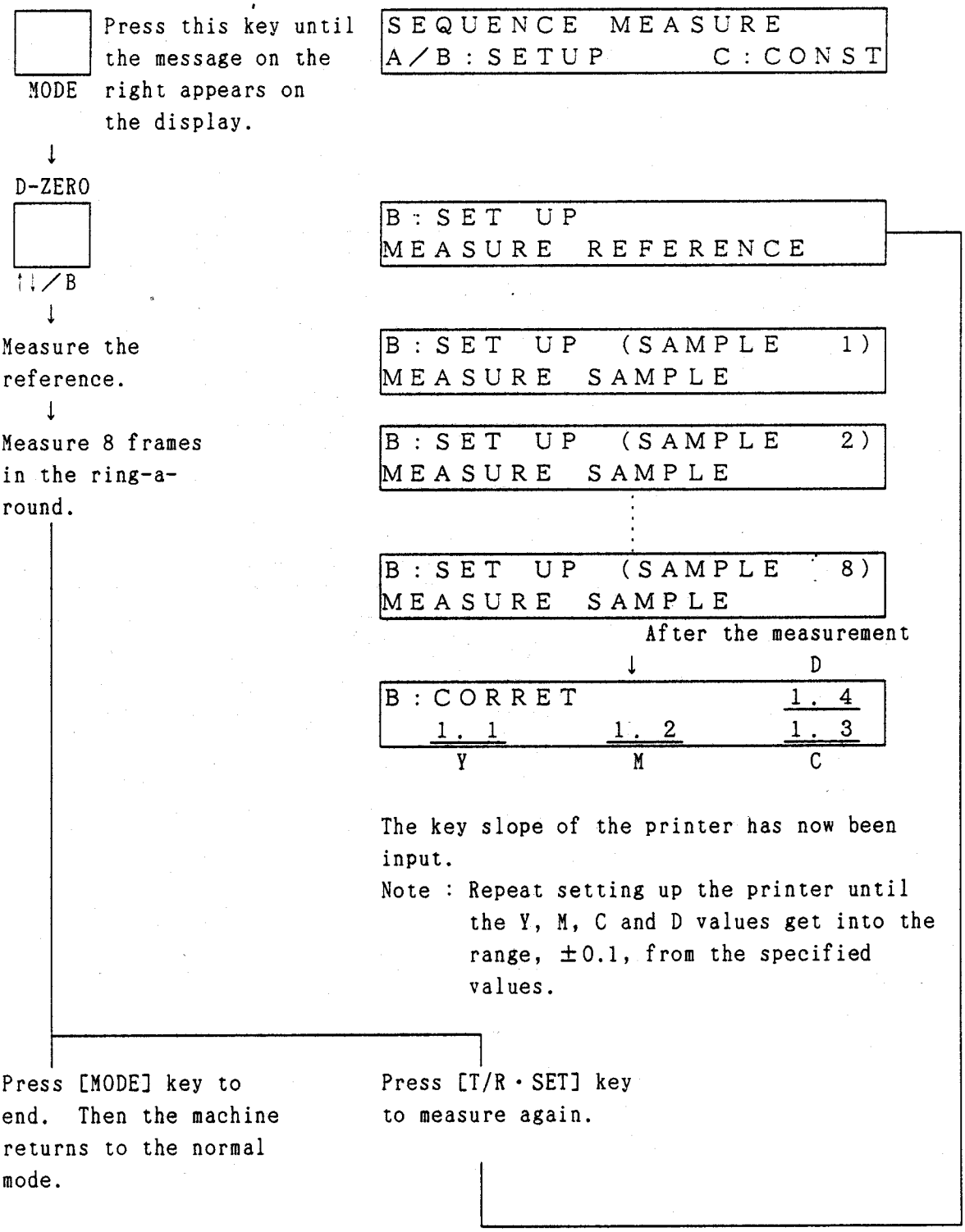
1. Setting up, mode A (for morning setup)

Before carrying out this setting, it is necessary to carry out setting up, mode B. First the reference print is measured and next a normal print is measured. Then the difference is shown on the display in terms of key values.
Use this, for example, when carrying out morning set up for the printer.



2. Setting up, mode B (after the printer has been installed)

The reference print and eight frames in a ring-a-round are measured.
Then the correction values are calculated and are shown on the display.

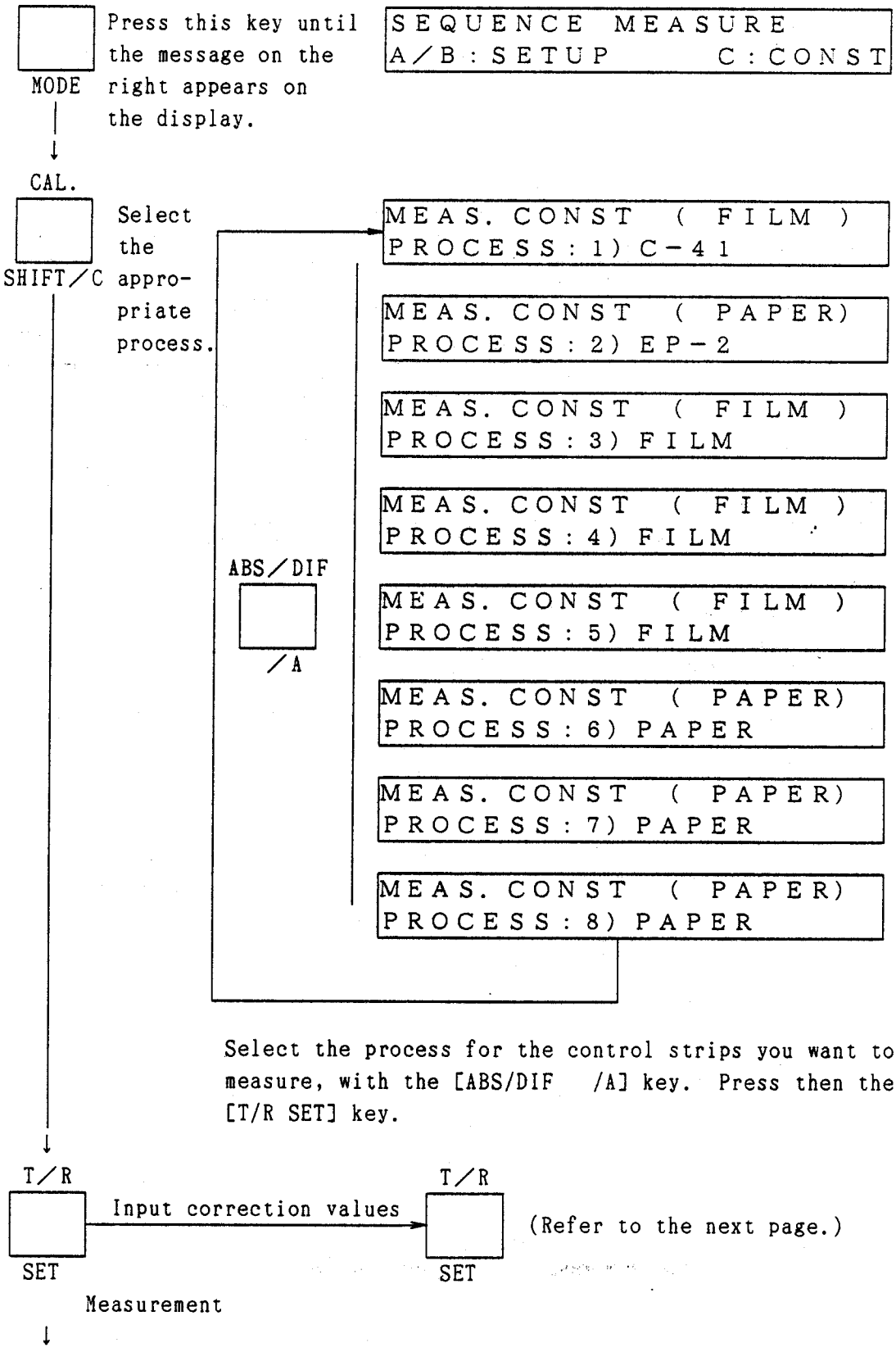


◎The relationship between the prints in a ring-a-round and sample numbers.

Sample number→ 1	2	3	4	5	6	7	8
-1Y	+1Y	-1M	+1M	-1C	+1C	-1D	+1D

5. Measurement of control strips

In this mode, the machine calculates automatically the measured data and shows the results on the display.



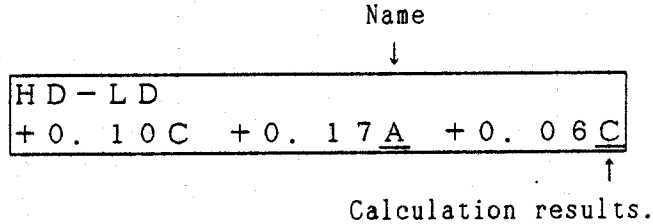
↓

Following the directions shown on the display,
measure the reference strip and corol strip.
(First the message for reference strips appears.
After measurement, that for control strips takes over.)

Example)

↓

After the measurement, the machine automatically calculates the data and shows the results on the display.
(When the "PRINTER" in the switch mode is set to ON, the data after measurement is printed out.)



Example)

```
++++++++++++++++++++++++++
CONTROL VALUE
  12/26/88   16:19:14
PROCESS:  RA-4
            (B)      (G)      (R)

 Black
          -1.32    -0.30    -1.31
             CL                CL ← Exceeding the
                                    CL area.
 HD-LD
          -0.15    -0.67    -0.74
                      CL       AL ← Exceeding the
                                    AL area.
 LD
          -0.21    -0.19    -0.17


 STAIN
          +2.03    +0.99    +1.98
             AL                CL
++++++++++++++++++++++++++
```

Each time the [CAL./SHIFT/C] key is pressed, calculation results, 1) to 5), appear in order. If any value exceeds either AL or CL, alarm is heared.

AL : Action limit (Corrective actions are needed.)
CL : Control limint (Solution are to be replaced with new ones.)

Information No.1

Preset-data for control strips

Process :

1. Measured data

No.	Name	Color on control strip			Correction/ No-correction		
		B	G	R	B	G	R
1	a	b	b	b	c	c	c
2	a	b	b	b	c	c	c
3	a	b	b	b	c	c	c
4	a	b	b	b	c	c	c
5	a	b	b	b	c	c	c

Select from the chart on page 14.

○ : Correction values
× : No correction values

○ : Measurement (Simultaneous measurement)
: Measurement (Single color measurement)
× : No measurement

2. Calculation data

No.	Name	Color for calculation results			Equation	AL				CL			
						+		−		+		−	
		B	G	R		Yes/ No	Limit value	Yes/ No	Limit value	Yes/ No	Limit value	Yes/ No	Limit value
1	a	e	e	e	f	g	h	i	j	k	l	m	n
2	a	e	e	e	f	g	h	i	j	k	l	m	n
3	a	e	e	e	f	g	h	i	j	k	l	m	n
4	a	e	e	e	f	g	h	i	j	k	l	m	n
5	a	e	e	e	f	g	h	i	j	k	l	m	n

○ : Calculation
× : No-calculation

g. ○ : Yes h. Write limit value only for Yes.
× : No

Use the marks shown on page 20.
See the table below for the meaning of each mark.

3. The marks used in the calculation equation

No.	Name	Reference strip				Control strip				Correction values				Reference values			
		All colors	B	G	R	All colors	B	G	R	All colors	B	G	R	All colors	B	G	R
1		R1	R1B	R1G	R1R	C1	C1B	C1G	C1R	H1	H1B	H1G	H1R	RV1	RV1B	RV1G	RV1R
2		R2	R2B	R2G	R2R	C2	C2B	C2G	C2R	H2	H2B	H2G	H2R	RV2	RV2B	RV2G	RV2R
3		R3	R3B	R3G	R3R	C3	C3B	C3G	C3R	H3	H3B	H3G	H3R	RV3	RV3B	RV3G	RV3R
4		R4	R4B	R4G	R4R	C4	C4B	C4G	C4R	H4	H4B	H4G	H4R	RV4	RV4B	RV4G	RV4R
5		R5	R5B	R5G	R5R	C5	C5B	C5G	C5R	H5	H5B	H5G	H5R	RV5	RV5B	RV5G	RV5R

(Reference value) = (Reference strip value) + (Correction value)

RVx = Rx + Hx

Information No. 2

Preset-data for control strips

Process : _____

1. Measured data

No.	Name	Color on control strip			Correction/ No-correction		
		B	G	R	B	G	R
1							
2							
3							
4							
5							

2. Calculation data

No.	Name	Color for calculation results			Equation	AL				CL			
						+		−		+		−	
		B	G	R		Yes/ No	Limit value	Yes/ No	Limit value	Yes/ No	Limit value	Yes/ No	Limit value
1													
2													
3													
4													
5													

3. The marks used in the calculation equation

No.	Name	Reference strip				Control strip				Correction values				Reference values			
		All colors	B	G	R	All colors	B	G	R	All colors	B	G	R	All colors	B	G	R
1		R1	R1B	R1G	R1R	C1	C1B	C1G	C1R	H1	H1B	H1G	H1R	RV1	RV1B	RV1G	RV1R
2		R2	R2B	R2G	R2R	C2	C2B	C2G	C2R	H2	H2B	H2G	H2R	RV2	RV2B	RV2G	RV2R
3		R3	R3B	R3G	R3R	C3	C3B	C3G	C3R	H3	H3B	H3G	H3R	RV3	RV3B	RV3G	RV3R
4		R4	R4B	R4G	R4R	C4	C4B	C4G	C4R	H4	H4B	H4G	H4R	RV4	RV4B	RV4G	RV4R
5		R5	R5B	R5G	R5R	C5	C5B	C5G	C5R	H5	H5B	H5G	H5R	RV5	RV5B	RV5G	RV5R

(Reference value) = (Reference strip value) + (Correction value)

RVx = Rx + Hx

Information No.3
[Example]

Preset-data for control strips

Process : EP-2, EP-2NR, EP-2NP

1. Measured data

No.	Name	Color on control strip			Correction/ No-correction		
		B	G	R	B	G	R
1	HD	○	○	○	○	○	○
2	LD	○	○		○	○	○
3	Black	×	×		×	×	○
4	STAIN	○		○	○	○	○
5	No use	×	×	×	×	×	×

2. Calculation data

No.	Name	Color for calculation results			Equation	AL				CL			
						+		−		+		−	
		B	G	R		Yes/ No	Limit value	Yes/ No	Limit value	Yes/ No	Limit value	Yes/ No	Limit value
1	BR-HDCR	×	×	○	(C3-C1)-(RV3-RV1)	×		×		×		○	+0.10
2	LD	○	○	○	C2-RV2	○	+0.07	○	-0.07	○	+0.10	○	-0.10
3	HD-LD	○	○	○	(C1-C2)-(RV1-RV2)	○	+0.07	○	-0.07	○	+0.10	○	-0.10
4	STAIN	○	○	○	C4-RV4	×		×		○	+0.02	○	-0.02
5	No use	×	×	×		×		×		×		×	

3. The marks used in the calculation equation

No.	Name	Reference strip				Control strip				Correction values				Reference values			
		All colors	B	G	R	All colors	B	G	R	All colors	B	G	R	All colors	B	G	R
1		R1	R1B	R1G	R1R	C1	C1B	C1G	C1R	H1	H1B	H1G	H1R	RV1	RV1B	RV1G	RV1R
2		R2	R2B	R2G	R2R	C2	C2B	C2G	C2R	H2	H2B	H2G	H2R	RV2	RV2B	RV2G	RV2R
3		R3	R3B	R3G	R3R	C3	C3B	C3G	C3R	H3	H3B	H3G	H3R	RV3	RV3B	RV3G	RV3R
4		R4	R4B	R4G	R4R	C4	C4B	C4G	C4R	H4	H4B	H4G	H4R	RV4	RV4B	RV4G	RV4R
5		R5	R5B	R5G	R5R	C5	C5B	C5G	C5R	H5	H5B	H5G	H5R	RV5	RV5B	RV5G	RV5R

(Reference value) = (Reference strip value) + (Correction value)

RVx = Rx + Hx

1. No messages appear on the display even when the power switch is turned ON.

No.	Probable causes	Check-points	Electrical diagram
1	Brightness of the display is adjusted improperly.	1. Adjust with the DISPLAY ANGLE potentiometer at the rear of the machine.	
2	The power cord is defective.	1. Check the receptacle. 2. Check the connector of the power cord of the main body. 3. Check whether the power cord is broken or not.	
3	Fuse F1 is blown.	1. Check conduction of fuse F1 at the rear of the machine. Correct the problem and replace the fuse.	
4	Fuse F2 is blown.	1. Check conduction of fuse F2 on FUSE P.C.B. (J403369) inside the display cover. Correct the problem and replace the fuse.	
5	Connector J/P14 is loose.	1. Remove the rear cover from the machine and check.	
6	Connector J/P9 on CPU P.C.B. (J303207) is loose.	1. Check	
7	Connector J/P2 of the display unit is loose.	1. Check 2. Check connector CN2 on CPU P.C.B. (J303207)	
8	The power switch is defective.	1. Check the power voltage between Nos. 1 and 4 on J/P14.	

No.	Probable causes	Check-points	Electrical diagram
9	Transformer TR1 is defective.	1. Check the power voltage between Nos 1 and 2 on fuse board (J403269). When it is AC22V, the transformer is all right. If it is not, replace the transformer.	
10	Display unit (W401294) is defective.	Replace	
11	CPU P.C.B. (J303207) is defective.	The machine should be adjusted. So send the whole set of the machine back to the main office of the Noritsu.	

2. The lamp does not come ON even when the measurement botton is pressed.

No.	Probable causes	Check-points	Electrical diagram
1	No messages appear on the display.	See the section "No messages appear on the display even when the power switch is turned to ON".	
2	The lamp is burned out.	Remove the head cover and disconnect connector J/P13. Check conduction on J/P13. Replace the lamp.	
3	Connector J/P13 is loose.	Check	
4	Connector J/P5 is loose.	Check connector CN5 on CPU P.C.B. (J303207)	
5	CPU P.C.B. (J303207) is defective.	The machine should be adjusted. So send the whole set of the machine back to the main office of the Noritsu.	

3. The printer cannot print out.

No.	Probable causes	Check-points	Electrical diagram
1	No messages appear on the display.	See the section "No messages appear on the display even when the power switch is turned to ON".	
2	The paper roll is loaded improperly.	Refer to the operator's manual, the section for preparation, how to load roll paper.	
3	Ink in the ink ribbon cassette (i086104-00) has run out.	Replace	
4	Connector CN3 on CPU P.C.B. (J303207) is loose.	Check	
5	CPU P.C.B. (J303207) is defective.	The machine should be adjusted. So send the whole set of the machine back to the main office of the Noritsu.	

4 . The mode cannot changeover.

No.	Probable causes	Check-points	Electrical diagram
1	Connector J/P1 on the keyboard is loose.	1. Check 2. Check connector CN1 on CPU P.C.B. (J303207).	
2	Keyboard (J403267-00) is defective.	Replace	
3	CPU P.C.B. (J303207) is defective.	The machine should be adjusted. So send the whole set of the machine back to the main office of the Noritsu.	

5. Measured values fluctuate.

No.	Probable causes	Check-points	Electrical diagram
1	Values fluctuate even when the calibration film and the black and white reflection plaque are measured.	1. The film and plaque are dirty. --- Clean 2. P.C.B. is defective. --- The machine should be adjusted. So send the whole set of the machine back to the main office of the Noritsu.	
2	Values Do NOT fluctuate when the calibration film and the black and white reflection plaque are measured.	1. Read the operator's manual one more time and remeasure.	

6. The clock gets out of order.

No.	Probable causes	Check-points	Electrical diagram
1	The back up battery is defective.	Replace the back up battery. After the replacement, the datas as shown below will be cleared. It is necessary to reset up the datas. 1. Data setting mode 2. Normal mode 2-1 : D-ZERO 2-2 : CAL 3. Sequential measuring mode 3-1 : Setting up, mode A	

ILLUSTRATED PARTS LIST

PHOTO FINISHING PRODUCTS

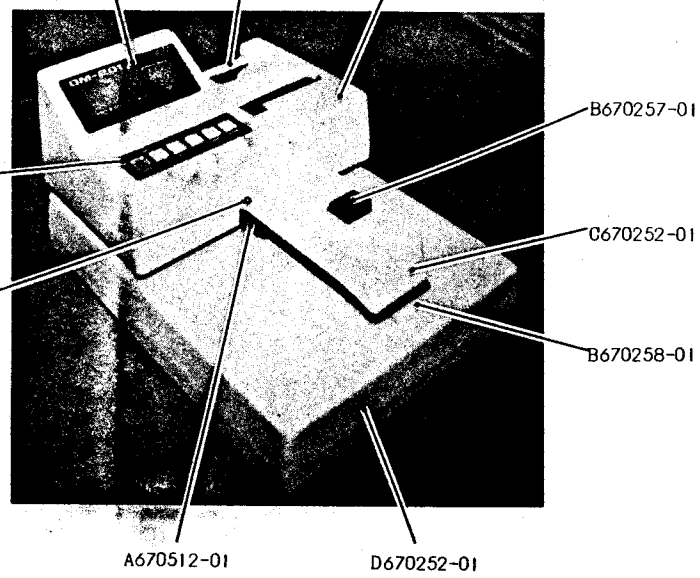
ノーリツ　濃度計

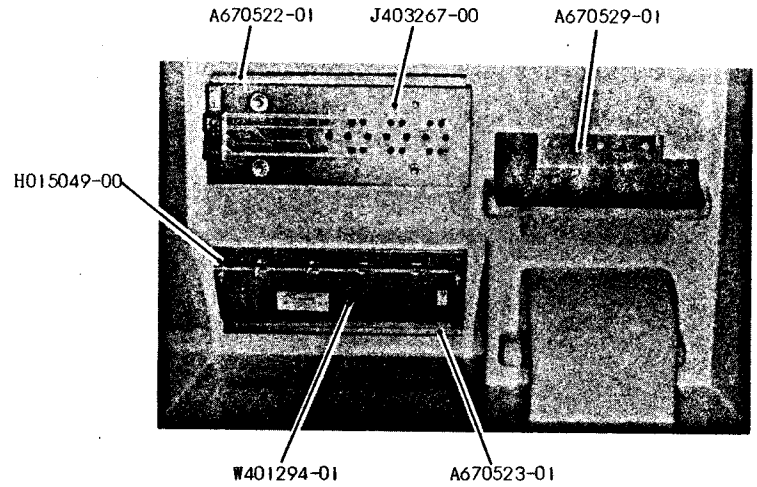
DENSITOMETER

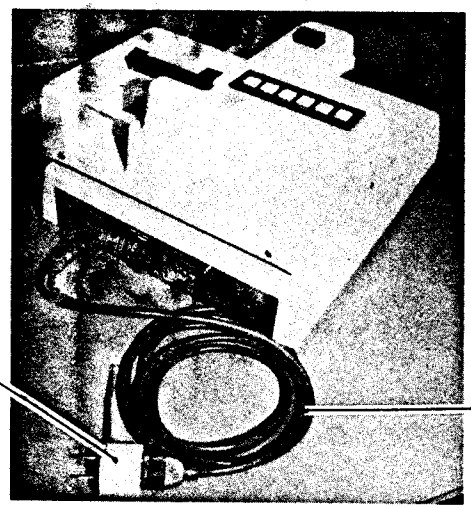
MODEL：DM－201

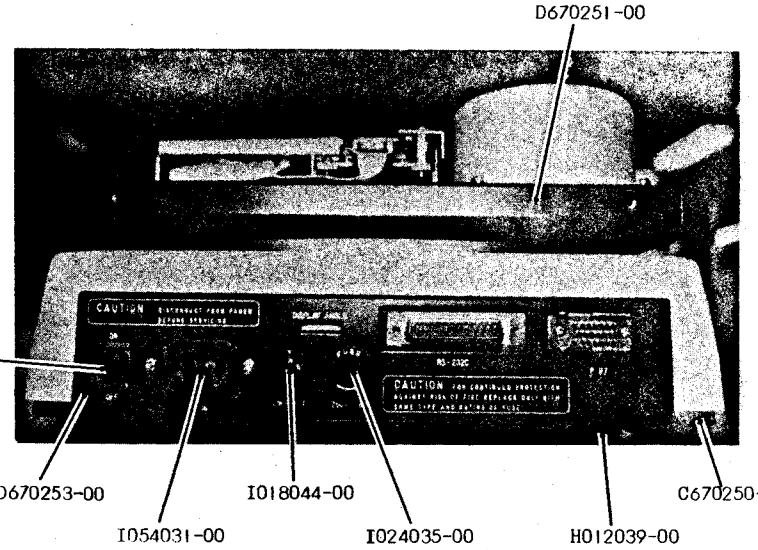
NORITSU KOKI CO., LTD.
8805

9740131	







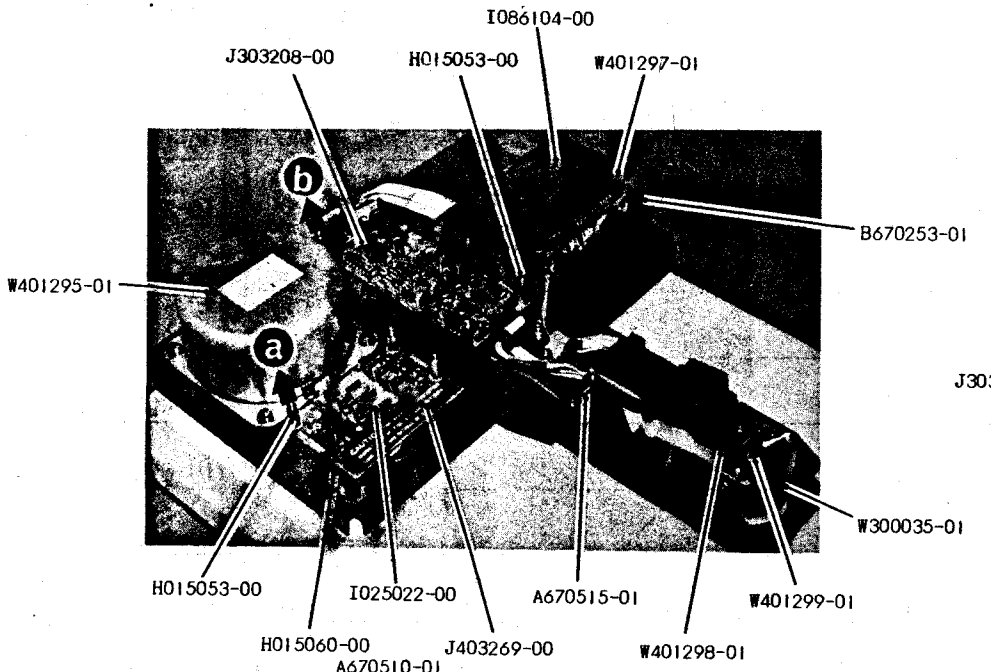


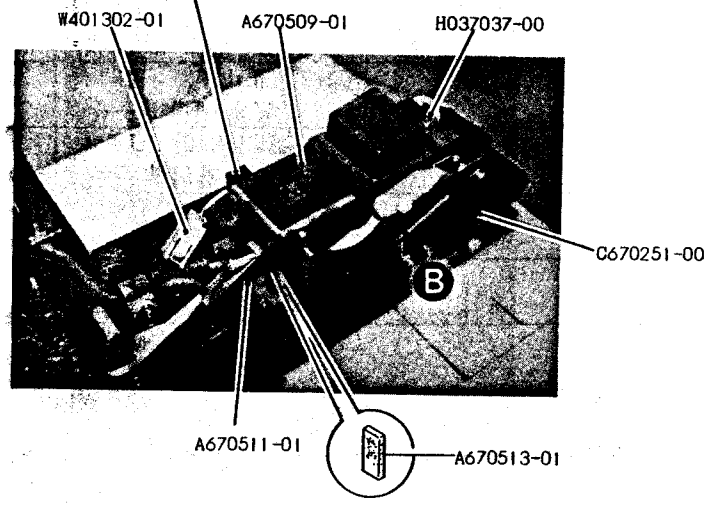
( )内はスローブローヒューズを示します。
Parts indicated in ( ) indicate slow-blow fuse.

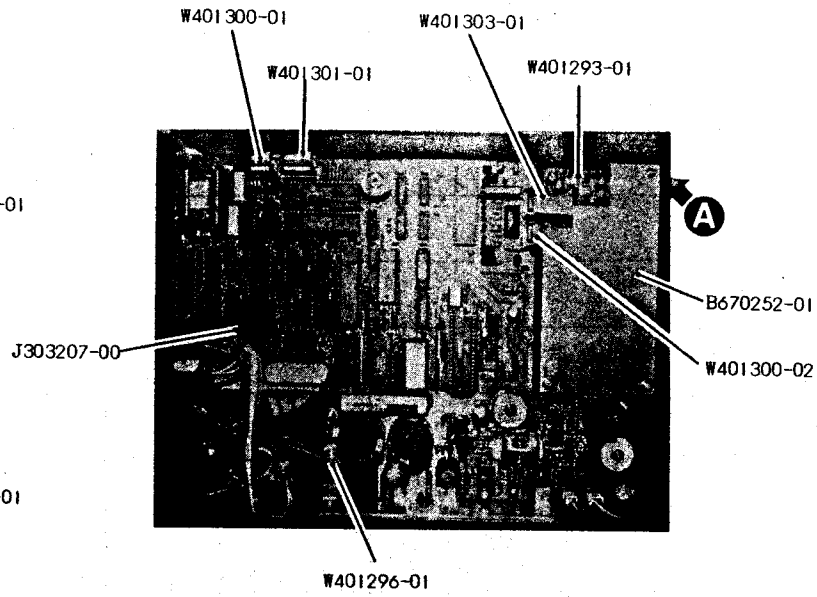
1. 外　観　部
Overall section

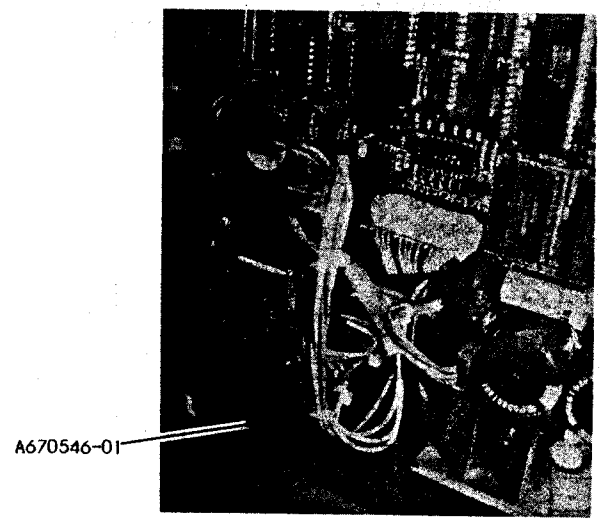
番号 NUMBER	品名 DESCRIPTION
A670512-01	アーム補強版 PLATE, REINFORCEMENT
A670520-01	プリンターローラー ROLLER, GUIDE
A670522-01	キーボード取付板 PLATE, KEY BOARD
A670523-01	液晶取付板 PLATE, DISPLAY
A670524-01	キー化粧パネル PANEL, SWITCH
A670526-01	液晶パネル PANEL
A670529-01	ペーパーカッター BLADE, CUTTER
B670257-01	押しボタン BUTTON
B670258-01	ビュアプレート PLATE, VIEWER
C670250-01	下メクラ板 FRAME, BASE
C670252-01	ヘッドカバー COVER
D670250-01	液晶取付カバー COVER
D670251-00	上部ベース板アセンブリー UPPER BASE ASSEMBLY
D670252-01	ベースカバー COVER
D670253-00	ベースアセンブリー BASE ASSEMBLY
H012039-00	バンポン RUBBER, CUSHION
H015049-00	スペーサー SPACER
H037042-00	ナイロンリベット RIVET

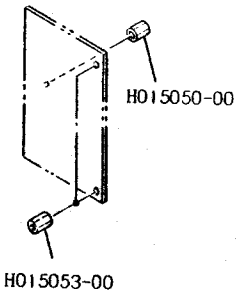
番号 NUMBER	品名 DESCRIPTION
I016151-00	ロッカースイッチ SWITCH
I018044-00	ボルテージセレクタ VOLTAGE SELECTOR
I024035-00	ヒューズホルダー HOLDER, FUSE
I025085-00	スローブローヒューズ FUSE, SLOW-BLOW
I054031-00	ノイズフィルター NOIZE FILTER
I066010-00	接地アダプタ ADAPTOR
I068101-00	電源コードセット CORD ASSEMBLY
J403267-00	キーボード KEYBOARD
W401294-01	ディスプレイユニット DISPLAY ASSEMBLY



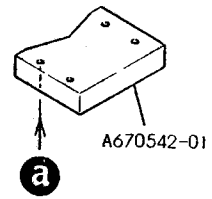


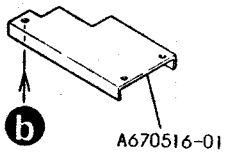


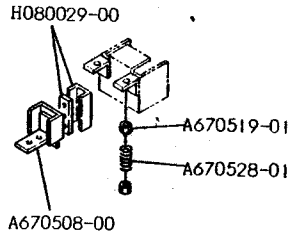




DETAIL A







DETAIL B

2. ヘッド部 & コントロール部
Head and Control assemblies

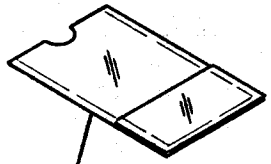
番号 NUMBER	品名 DESCRIPTION
A670508-00	ガイド支柱アセンブリー RAIL HOLDER ASSEMBLY
A670509-01	ボタンレバー LEVER
A670510-01	クランク支柱 POST
A670511-01	支柱取付板 BASE, POST
A670513-01	クッションゴム RUBBER, CUSHION
A670515-01	支点ロット棒 PIN
A670516-01	シールドケース(反射) COVER
A670519-01	バネガイド NUT
A670528-01	上下ボタンバネ SPRING
A670542-01	ヒューズ保護カバー COVER
A670546-01	メクラ板 PLATE, BLIND
B670252-01	シールドケース(透過) COVER
B670253-01	プリンター取付板 HOLDER, PRINTER
C670251-00	センサーアームアセンブリー SENSOR ARM ASSEMBLY
H015050-00	スペーサー SPACER
H015053-00	スペーサー SPACER
H015060-00	スペーサー SPACER
H037037-00	バーカーピョウ RIVET
H080029-00	レールガイド RAIL, GUIDE
I025022-00	ガラス管ヒューズ FUSE, GLASS TUBE
I086104-00	リボンカセット CASSETTE, RIBBON
J303207-00	コントロールボード P.C.B., CONTROL
J303208-00	反射ログアンプボード P.C.B.

番号 NUMBER	品名 DESCRIPTION
J403269-00	ヒューズボード P.C.B., FUSE
W300035-01	反射センサユニット SENSOR ASSEMBLY
W401293-01	透過センサユニット SENSOR ASSEMBLY(WITH P.C.B.)
W401295-01	トランスユニット TRANSFORMER ASSEMBLY
W401296-01	J9,ヒューズケーブルユニット CABLE ASSEMBLY
W401297-01	プリンターユニット PRINTER ASSEMBLY
W401298-01	測定スイッチユニット KEY SWITCH ASSEMBLY
W401299-01	ランプユニット LAMP ASSEMBLY
W401300-01	ケーブルユニット CABLE ASSEMBLY
W401300-02	ケーブルユニット CABLE ASSEMBLY
W401301-01	ディスプレイケーブルユニット CABLE ASSEMBLY
W401302-01	ランプケーブルユニット LAMP CABLE ASSEMBLY
W401303-01	J8,Tアンプケーブルユニット CABLE ASSEMBLY

番号 NUMBER	品名 DESCRIPTION

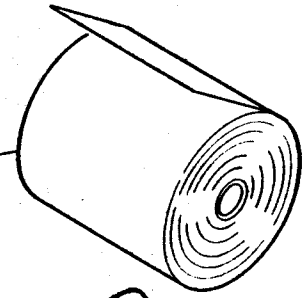
A603458-01

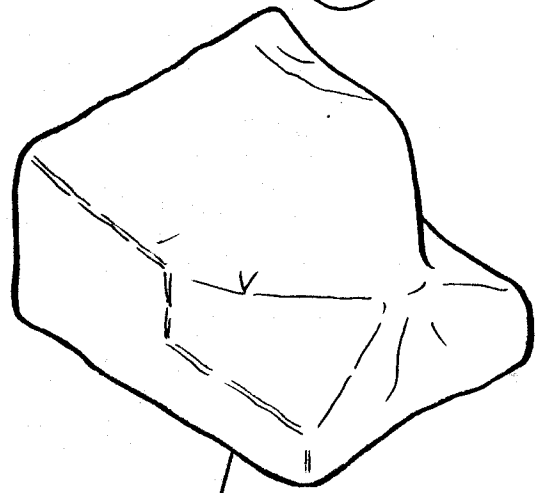
A603457-01



A670543-01

H075024-00 (5個入り / 5 pcs.)





B670259-01

番 号 NUMBER	品 名 DESCRIPTION
A603457-01	反射濃度板アセンブリー CHECK PLAQUE GAUGE ASSEMBLY
A603458-01	CAL. FILM アセンブリー CAL. FILM ASSEMBLY
A670543-01	反射濃度板カバー CASE
B670259-01	本体カバー COVER, BODY
H075024-00	ロールペーパー ROLL PAPER

番 号 NUMBER	品 名 DESCRIPTION

3. アクセサリー
ACCESSORIES