

PRESENTER UNIT

PR921-24-A

SPECIFICATION MANUAL



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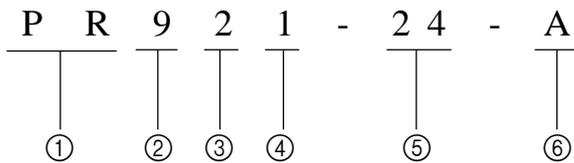
CONTENTS

1. GENERAL DESCRIPTION	1
1.1 Model Name Display Directions	1
2. PRINTER CONFIGURATION	2
3. PAPER SPECIFICATIONS (HEAT SENSITIVE PAPER)	3
4. PRESENTER SPECIFICATIONS	4
4.1 Basic Operations	4
4.2 Operating Sequence	4
4.3 Paper Detector General Specifications	8
4.4 Presenter Motor General Specifications	9
4.5 Connector	10
5. EXTERNAL SPECIFICATIONS	12
6. AMBIENT SPECIFICATIONS	15
7. RELIABILITY SPECIFICATIONS	16
8. SETTING PAPER	17
8.1 Setting Paper	17
8.2 Using the Accessories (Weight Shaft and Loop Guide)	18
9. RECOVERING FROM ERRORS (PAPER JAMS)	21
10. PRECAUTIONS REGARDING OUTER COVER DESIGNS	23
11. MAINTENANCE	25
12. OTHER PRECAUTIONS	26
12.1 Precautions in Handling	26
12.2 Precautions Relating to Safty	26

1. GENERAL DESCRIPTION

The PR921 is a paper (receipts, etc.) discharging device that uses a built-in thermal printer system employed in electronic devices such as game machines, ATM and unmanned information kiosk terminals, etc. This model carries a paper (receipts, etc.) recovery function after discharge, as a standard.

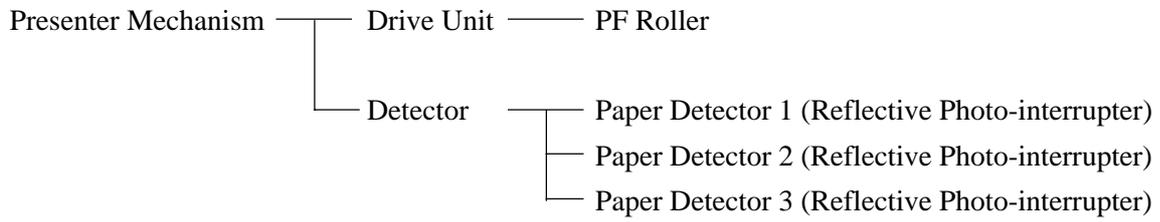
1.1 Model Name Display Directions



- ① PR : Presenter
- ② 9 : 900 Series
- ③ 2 : No cutter, horizontal discharge
- ④ 1 : Standard (Used with TMP)
- ⑤ 24 : DC 24 V Specifications
- ⑥ A : Sold Separately

2. PRINTER CONFIGURATION

The presenter mechanism is composed of the following devices.

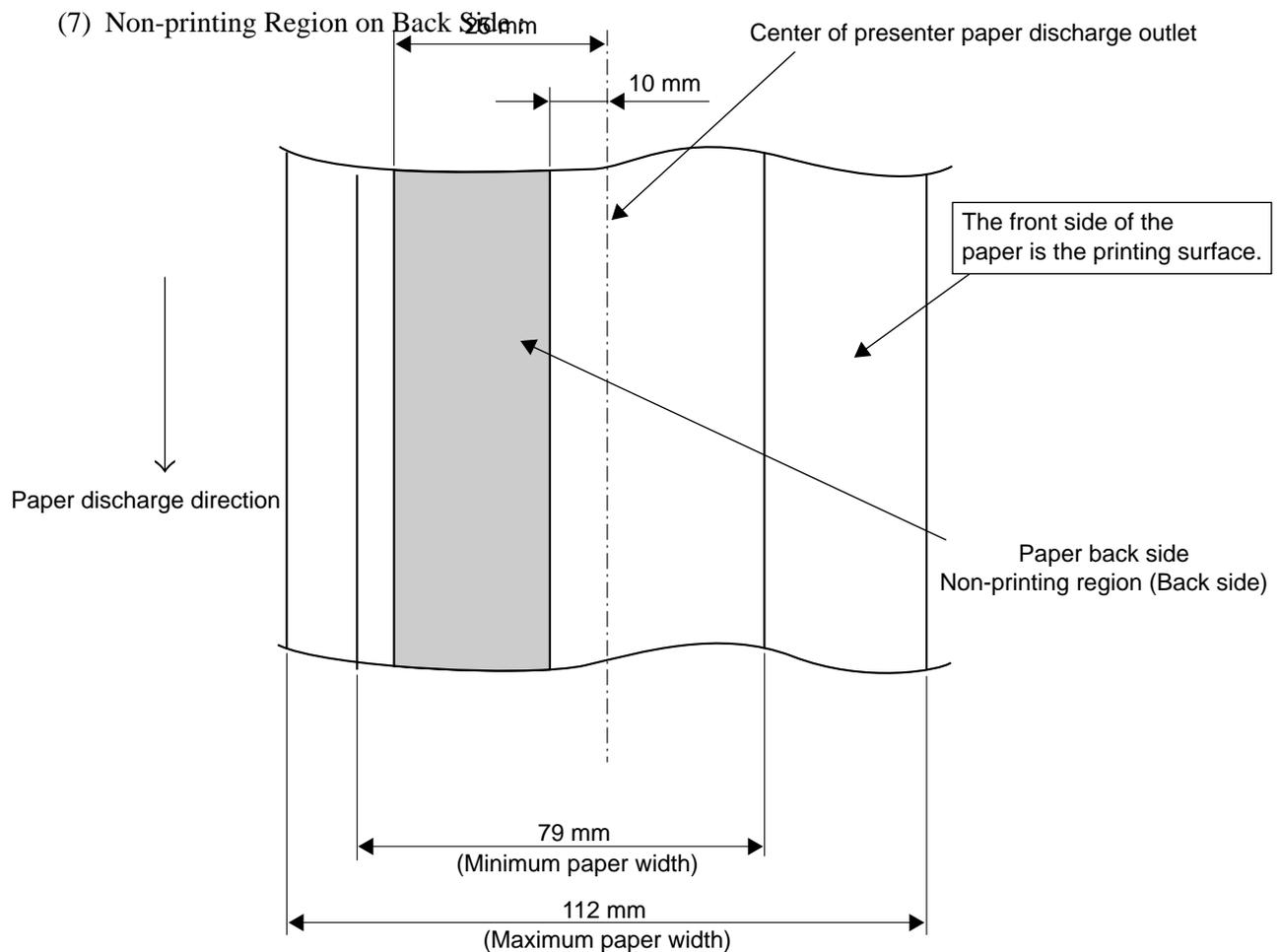


3. PAPER SPECIFICATIONS (HEAT SENSITIVE PAPER)

- (1) Paper Width : 79.5 ± 0.5 mm to 111.5 ± 0.5 mm
- (2) Allowable Sheet Length : 75 to 300 mm
- (3) Recommended Heat Sensitive Paper : According to product specifications for TMP942-24-A.
- (4) Paper Thickness : 0.065 mm to 0.150 mm
- (5) Shaft Core Diameter : When paper thickness is Min. 0.065 mm to 0.10 mm
Shaft core inner diameter: Min. 25.4 ± 1 mm;
Shaft core outer diameter: Min. 31.4 ± 1 mm

When paper thickness is Min. 0.10 mm to 0.15 mm
Shaft core inner diameter: Min. 50.8 ± 1 mm;
Shaft core outer diameter: Min. 56.8 ± 1 mm
- (6) Paper Curl Direction : Set the paper so that the printing side is facing the outside when taken up on the roll.

Note 1: Paper jams can occur if paper outside of the specifications describe above is use.



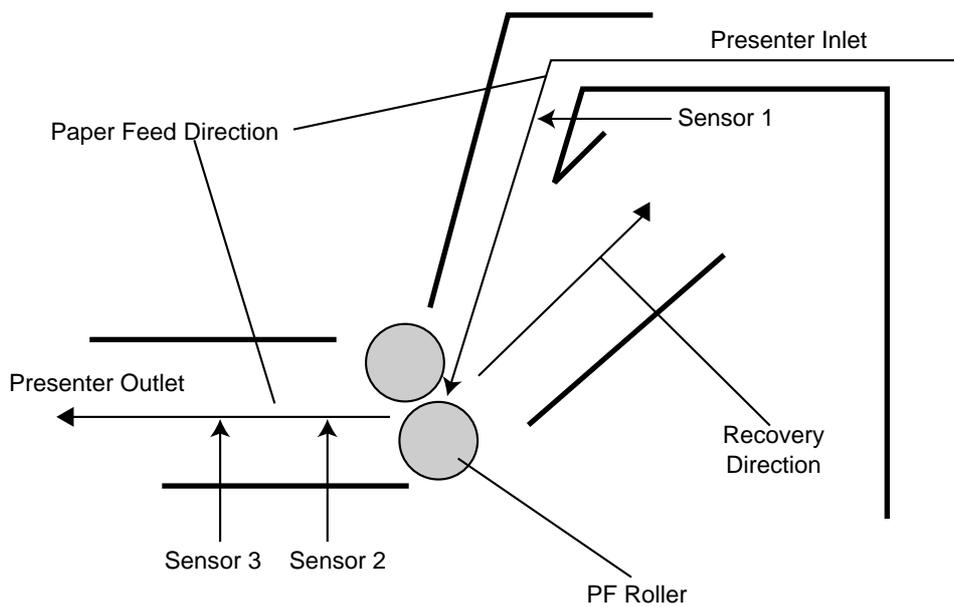
Note 2: When using paper outside of the specifications describe above, the paper detector(sensor) may mis-detect the paper or may not detect the paper at all.

4. PRESENTER SPECIFICATIONS

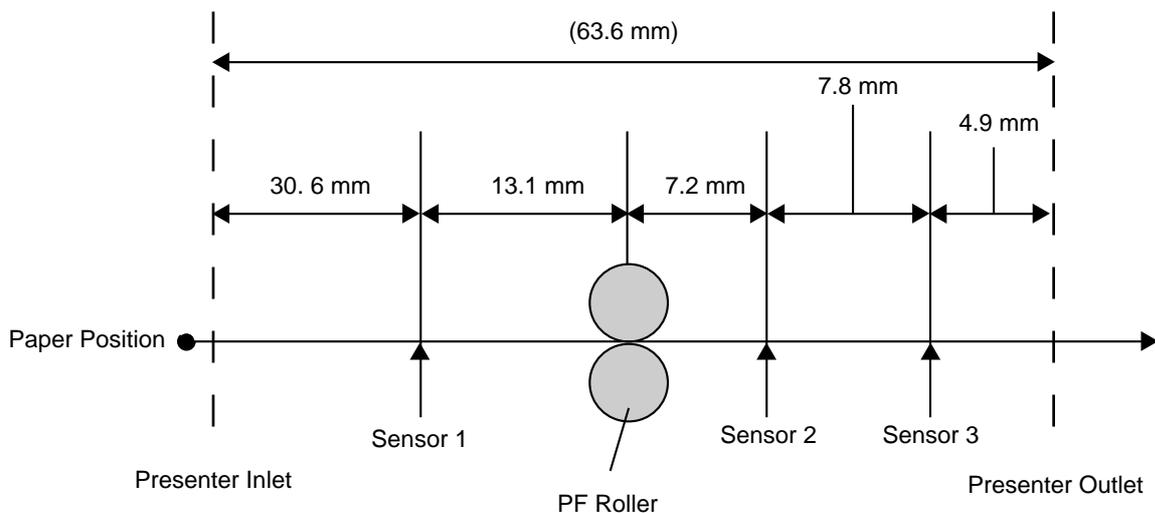
4.1 Basic Operations

- Paper is not discharged from the printer while printing.
- After printing is completed, the presenter roller rotates to discharge the paper.
- The roller stops when the detector has detected the trailing edge of the paper.
(Paper discharge completed)
- The next print job can be started by the user removing the paper from the printer.
- The recovery command or a timer can be used to recover the paper if it is not removed.

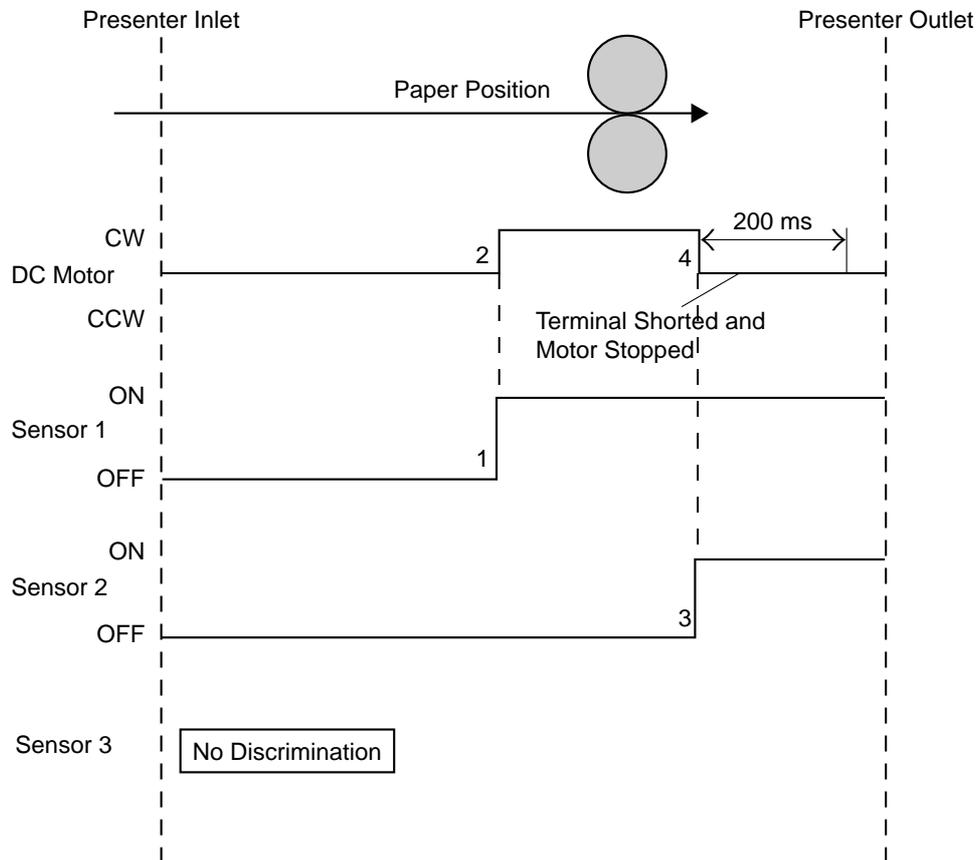
4.2 Operating Sequence



Sensor 1: Sensor for detecting leading edge and trailing edge of paper.
 Sensor 2: Sensor for detecting leading edge of paper.
 Sensor 3: Sensor for determining recovery

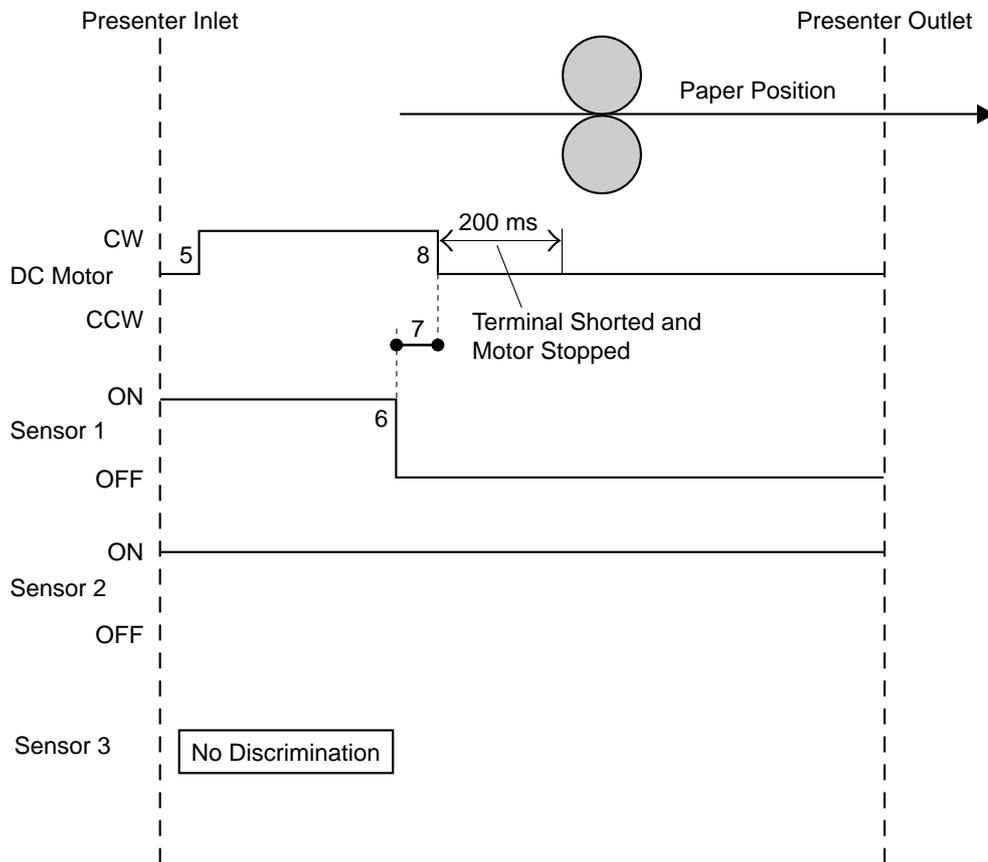


(1) Paper is discharged and the trailing edge of the paper is stopped in front of the PF roller.



- ① Sensor 1 detects leading edge of paper and sensor 1 turns ON.
- ② Sensor 1 turns ON, DC motor starts rotating clockwise.
- ③ Sensor 2 detects leading edge of paper and sensor 2 turns ON.
- ④ Sensor 2 turns ON, DC motor is braked for 200 ms and stopped.

(2) Paper Discharge Until Paper Trailing Edge is Stopped Before PF Roller

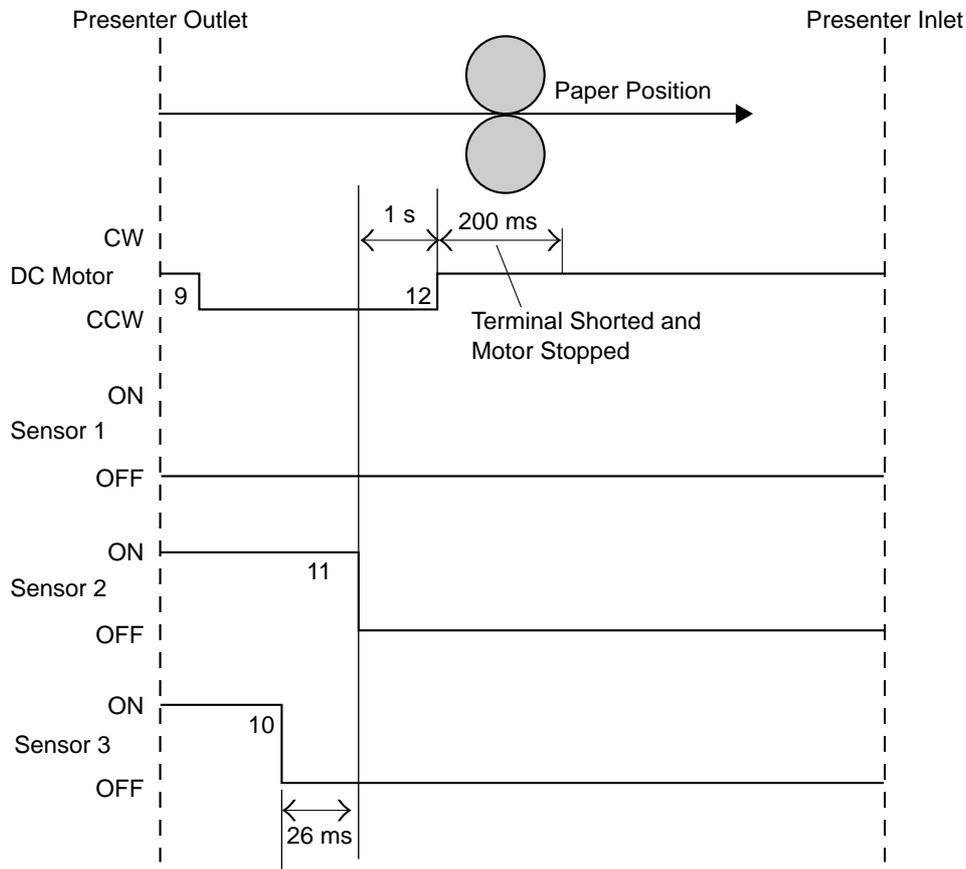


- ⑤ DC motor rotates clockwise by the paper discharge instruction.
- ⑥ Sensor 1 detects trailing edge of paper and sensor 1 turns OFF.
- ⑦ Sensor 1 turns OFF, paper is fed 1.2 mm.
- ⑧ After feeding paper 1.2 mm, DC motor is braked for 200 ms and stopped.

Note: The amount of time required for feeding paper 1.2 mm in step 7, above, is logically 4 ms with a paper discharge speed of 300 m/s.

(3) Paper Recovery Operation

If the sensor 2 and sensor 3 detection signals are ON after a determined amount of time has passed, the paper recovery operation is performed.



Sensor 3 turns OFF, then, if sensor 2 turns OFF, it is determined that the paper has been recovered. Under all other conditions, it is considered that paper has been pulled out.

- ⑨ DC motor rotates counterclockwise by the paper recovery instruction.
- ⑩ Sensor 3 detects trailing edge of paper and sensor 3 turns OFF.
- ⑪ Sensor 2 detects trailing edge of paper and sensor 3 turns OFF.
- ⑫ 1 second after sensor 2 turns OFF, DC motor is braked for 200 ms and stopped.

Note: The distance between sensor 2 and sensor 3 is 7.8 mm. Therefore, the amount of time required for sensor 2 to turn OFF after sensor 3 turns OFF is 26 ms. It is necessary to enable detection in that amount of time.

4.3 Paper Detector General Specifications

The paper detector is composed of a reflective sensor and generates a set/reset signal.

Absolute Maximum Rating (at 25°C)

	Items	Symbol	Rating	Units
Light Emitting Side	Reverse Voltage	VR	6	V
	Forward Current	IF	50	mA
	Tolerance Loss	PD	75	mW
Light Reception Side	Voltage Between Collector - Emulator	VCE0	35	V
	Collector Current	IC	20	mA
	Collector Loss	PC	75	mW
	Total Tolerance Loss	Ptot	100	mW
	Operating Temperature	Topt	-25 to +85	°C
	Storage Temperature	Tstg	-40 to +100	°C
	* Soldering Temperature	Tsol	260	°C

* Soldering Time: Within 5 seconds

Electrical Characteristics (at 25°C)

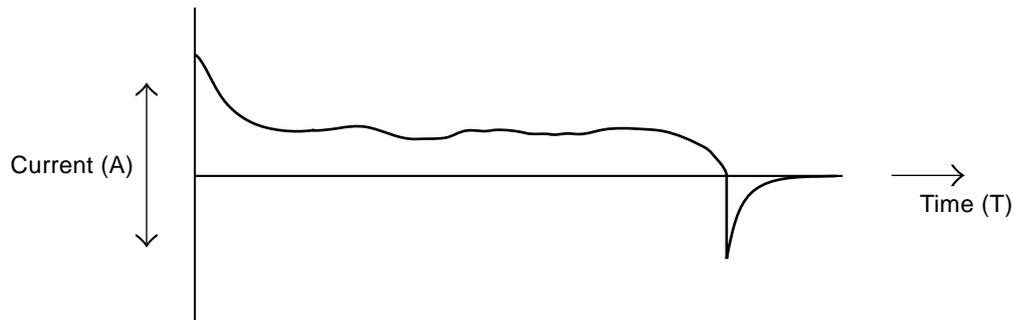
	Item	Symbol	Conditions	MIN	TYP	MAX	Units
Input Characteristics	Forward Voltage	VF	IF = 20 mA		1.2	1.4	V
	Reverse Current	IR	VR = 3 V			10	μm
Output Characteristics	Dark Current	ICEO	VCE = 20 V		1	100	nA
Joining Characteristics	Optical Current	IC	IF = 20 mA, VCE = 5V	1.0		3.0	mA
	* 1 Leaked Current	Ileak	IF = 20 mA, VCE = 5V			500	nA
	Response Time (Rise)	tr	VCE = 2V, IC = 100 μA RL = 1000Ω, D = 4mm		50	150	μs
	Response Time (Fall)	tf	(*2)		50	150	μs

*1: No reflective material.

*2: D is the thickness of the reflective mirror glass.

4.4 Presenter Motor General Specifications

Model:	Mabuchi Motor FK-180SH
Rated Voltage:	24.0 V
Voltage Range for Use:	21.6 V to 26.4 V (24.0 V \pm 10%)
Peak Current:	Approximately 1.0 A (24 VDC, 25°C)
Average Current:	Approximately 0.2 A (24 VDC, 25°C, including at startup.)



Usage Temperature Range:	-15°C to +60°C
No Load Current:	Max. 30 mA
No Load Revolutions:	6600 \pm 850 rpm
Rated Load Current:	Max. 110 mA
Rated Load Revolutions:	5000 \pm 650 rpm
Direction of Rotation:	At Discharge: CW (Clockwise direction when looking from the motor output shaft.) At Recovery: CCW (Counterclockwise when looking from the motor outputshaft.)

DC Motor Drive

Speed Control:	None
Drive and Control:	Voltage (24.0 V) is applied to the DC motor when stopped to start it.
Brake Control:	Stops by shorting terminals. Shorting time is 200 ms.

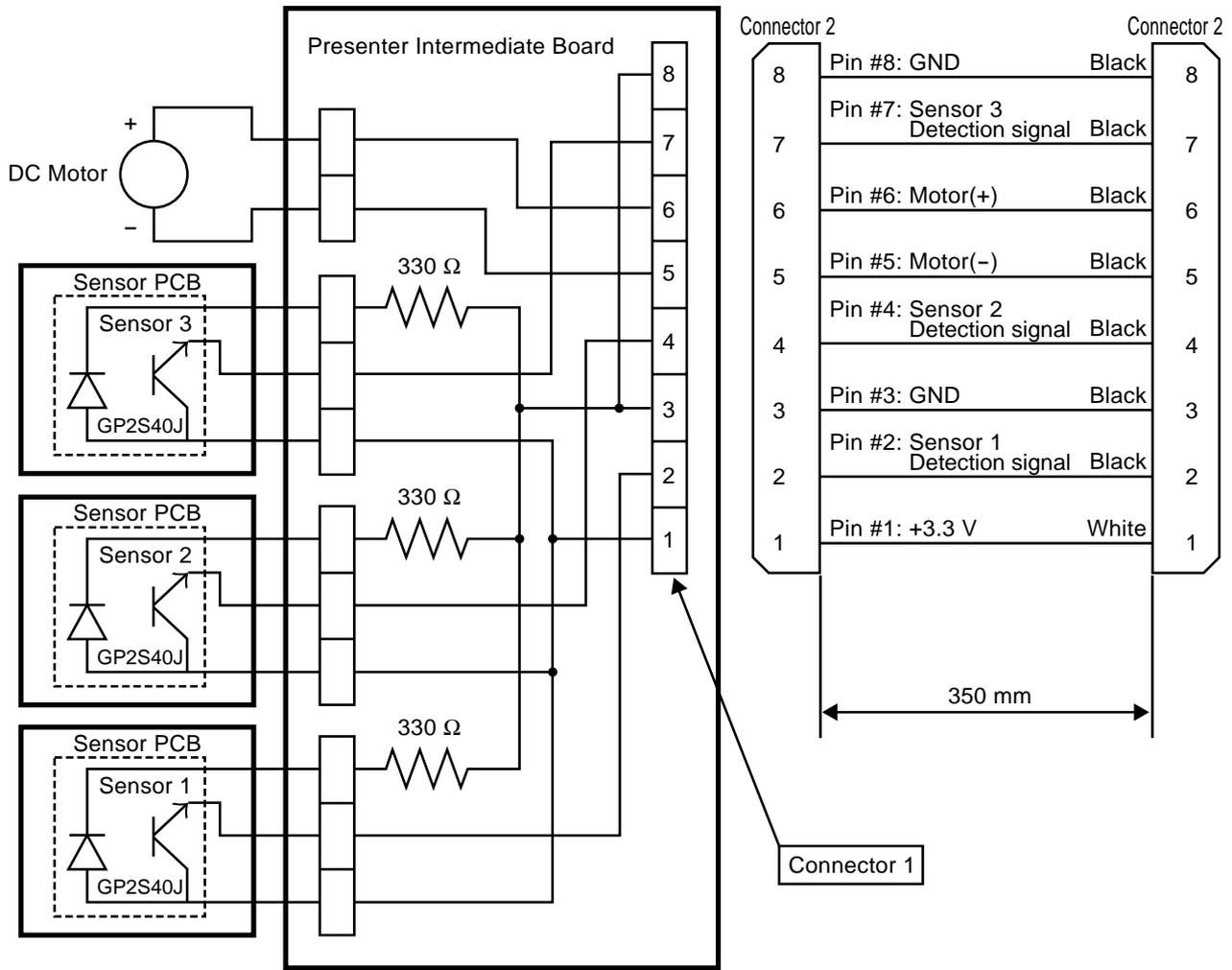
Paper Discharge Speed: 300 mm/sec

Note 1: The above paper discharge speed reflects the value for recommended paper (thickness of 65 mm) and a receipt length of 75 mm.

Note 2: The above paper discharge speed varies according to the environment of use (temperature, humidity, power voltage fluctuations, etc.).

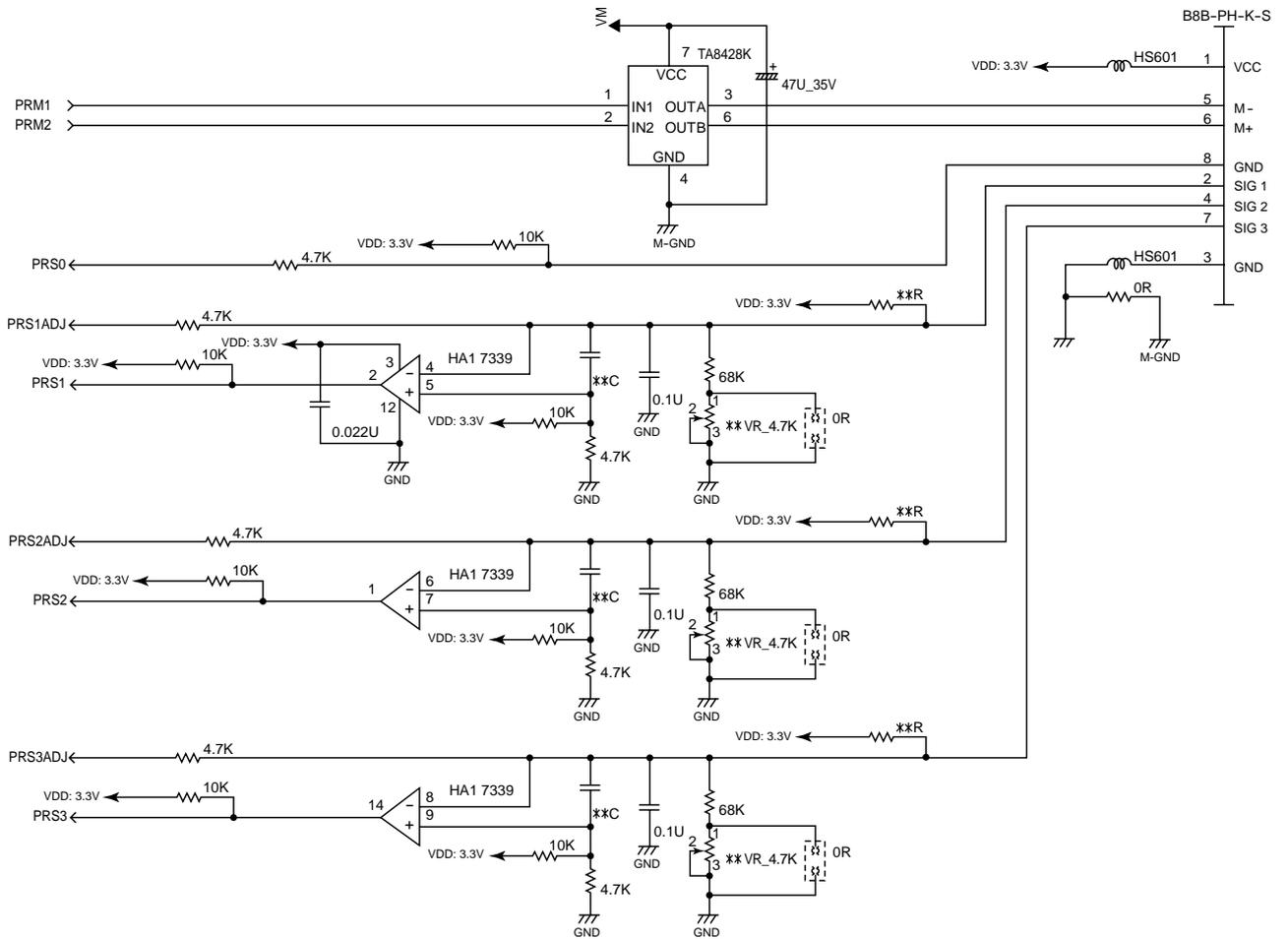
4.5 Connector

4.5.1 Paper Detector and Motor



Connector No.	Manufacturer and Model No.	Corresponding Connectors
Connector 1	JST S 8B-PH-K-S (Side Type)	JST PHR-8 (Housing)
Connector 2	JST PHR-8 (Housing)	JST S 8B - PH - K - S (Side Type) (Post standard with base)
		JST B 8B - PH - K - S (Top Type) (Post standard with base)
		JST S 8B - PH - KL (Side Type) (Post low check type with base)
		JST B 8B - PH - KL (Top Type) (Post low check type with base)
		JST S 8B - PH - SM2 - TB (Side Type) (Post with surface mount type base:with support bracket)
		JST B 8B - PH - SM2 - TB (Top Type) (Post with surface mount type base: withsupport bracket)

4.5.2 Example Circuit



Note: Parts marked with an asterisk are not mounted.

5. EXTERNAL SPECIFICATIONS

(1) External Dimensions

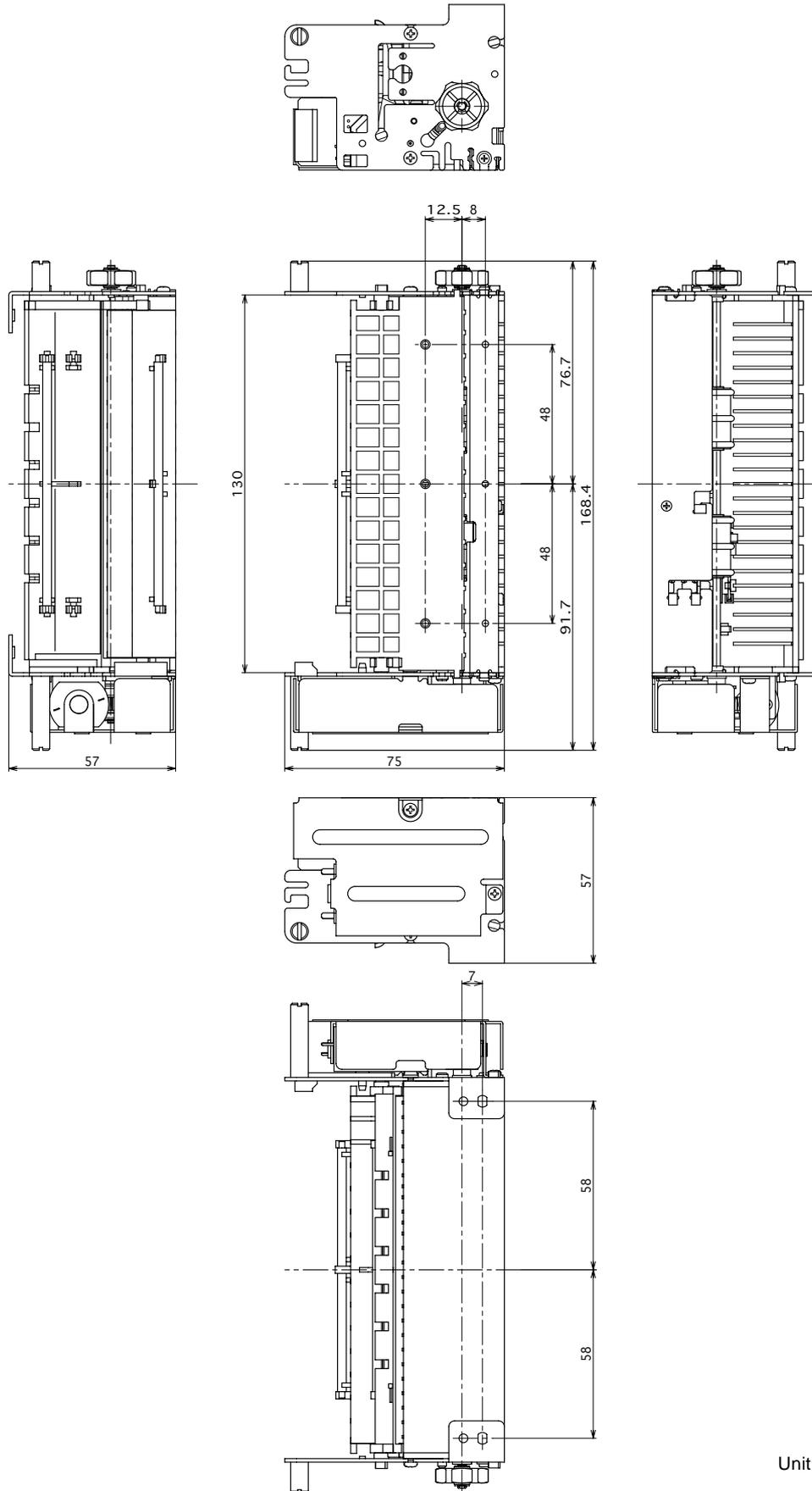
See Figure 5-1

(2) Weight:

285 ±10g (Excluding peripheral devices)

(3) External View

See Figure 5-2



Unit: mm

Figure 5-1

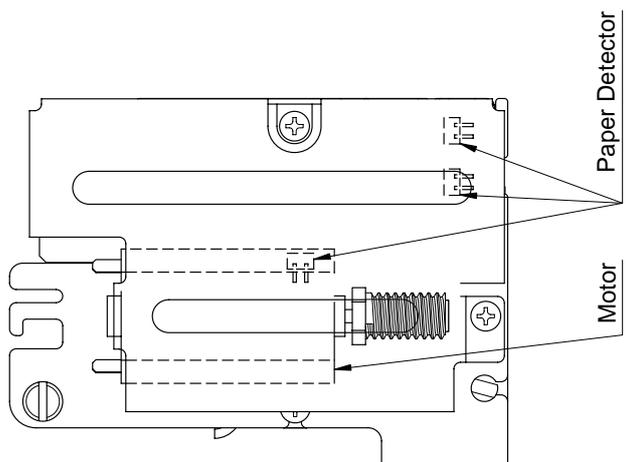
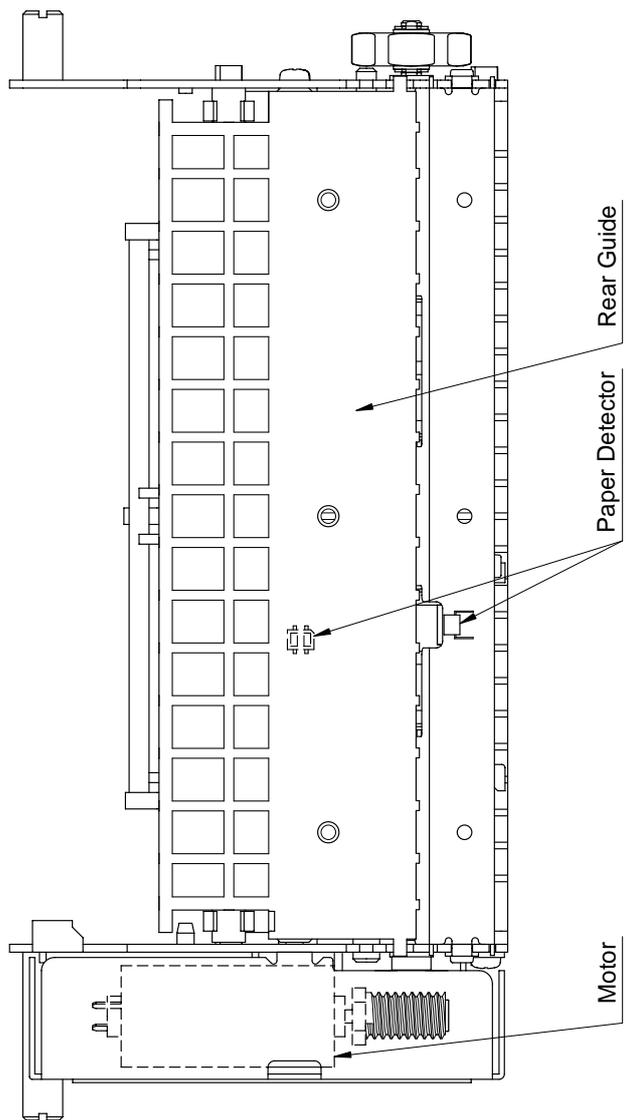
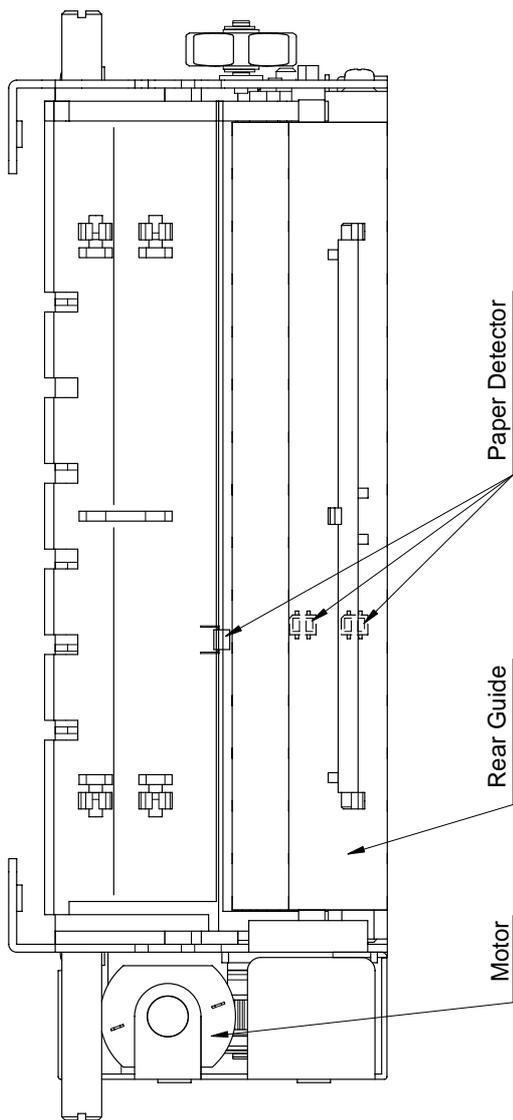


Figure 5-2

6. AMBIENT SPECIFICATIONS

(1) During Operation

Ambient Test (For Evaluation)

Room Temperature :	23°C at 50% RH
High Temperature :	50°C
High Temperature/High Humidity :	37°C at 85% RH
Low Temperature :	0°C

Specifications

Temperature :	0°C to 50°C
Humidity :	10% to 80% RH (No condensation) However, 80% RH assumes 34°C.

(2) At Storage

Storage Test (At Evaluation)

High Temperature Storage :	60°C at 96 Hr
Low Temperature Storage :	-20°C at 96 Hr
Humidity at Storage :	40°C at 90% RH

Specifications

Temperature :	-20°C to 60°C
Humidity :	10% to 90% (No condensation) However, high temperature/high humidity of 40°C at 90% (with no condensation) is considered the worst values.

7. RELIABILITY SPECIFICATIONS

(1) Life

Presentation System: 1 million times

Note 1: If not using our recommended paper type, reliability cannot be guaranteed. Therefore, you should always use the recommended paper type.

Note 2: This reliability is guaranteed for receipt lengths of 100 mm or less.

(2) Vibrations/Shocks from Drops (In the order of drop, vibrations)

① Drop Shock Test

Height of Drop :	1 angle, 3 corners: 85 cm 6 surfaces: 100 cm
Direction of Drop :	1 angle; 3 corners; 6 surfaces
Number of Drops :	Once each time (total of 10 drops)
Packing Status :	Minimum Packing Status

② Vibration Test

Direction of Vibration :	XYZ
Vibration Frequency :	10 Hz to 55 Hz to 10 Hz
Sweep Time :	1 minute
Vibration Acceleration Speed :	0.3 to 9.3 G
Charging Time :	One Direction Two Hours (Total Six Hours)
Packing Status :	Minimum Packing Status
Total Vibrations :	Constant at 1.54 mm

8. SETTING PAPER AND USING THE ACCESSORIES

8.1 Setting Paper (See Figure 8-1)

- 1) Cut the leading edge of paper to be set straight across the end.
- 2) Insert the paper straight along the paper mounted thermal mechanism and between the presenter paper guide and paper holder.

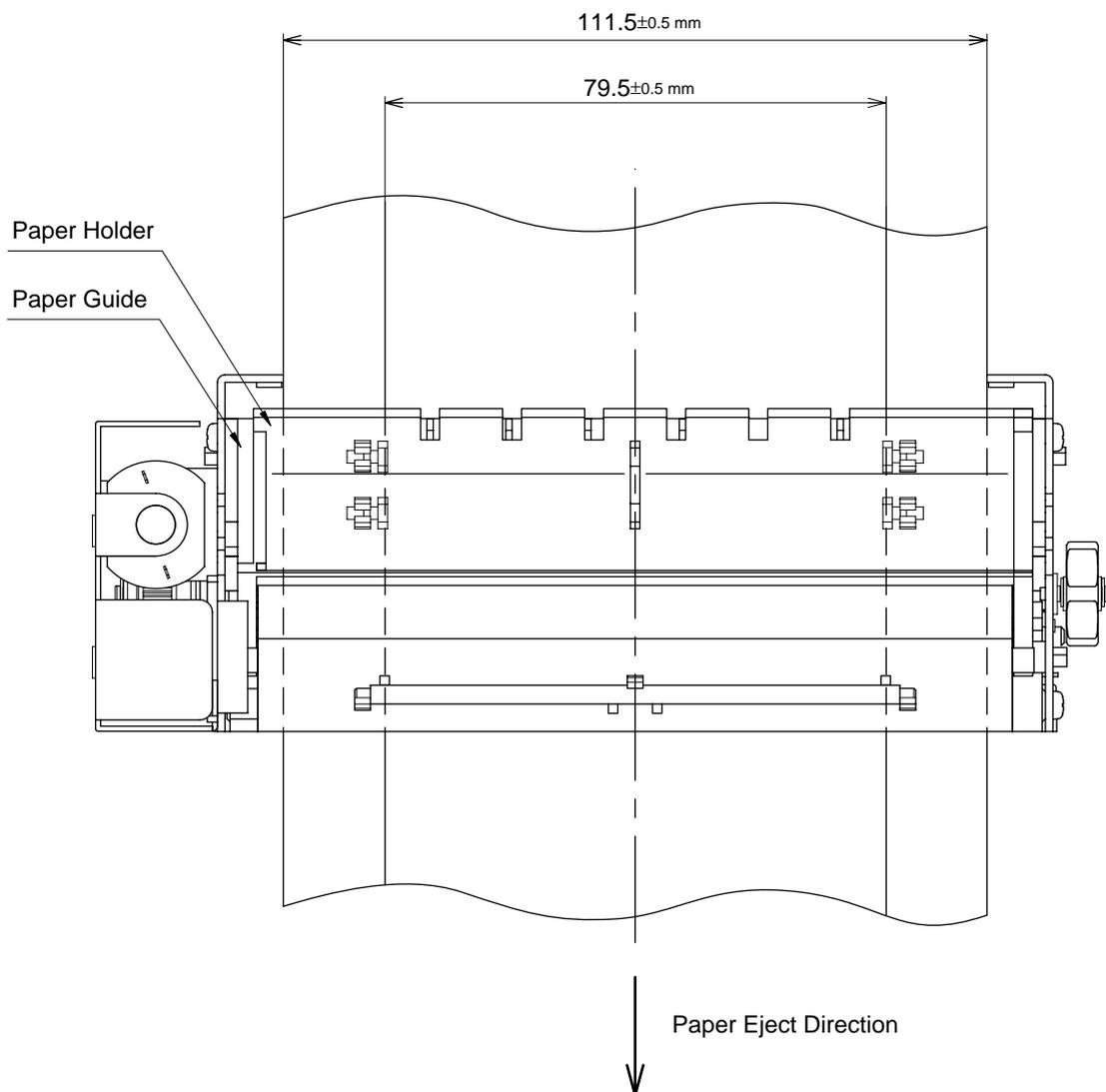


Figure 8-1

8.2 Using the Accessories (Weight Shaft and Loop Guide)

- **Paper thickness: Min. 0.065 to Max. 0.10 mm. (See Figure 8-2)**

- 1) No shaft is used so fasten the 3 hooks in the 3 positions on the rear guide so that they do not get lost.
- 2) Fasten the loop cutter to the cutter with the 2 accessory screws.
 1. Position the loop guide and cutter in positioners ① and ②.
 2. Tighten the screw next to the positioner ①.
 3. While pulling the next loop guide in the direction of the arrow, tighten the screw next to the positioner ② so that it does not flow therebetween the cutter (see Fig. 8-3)

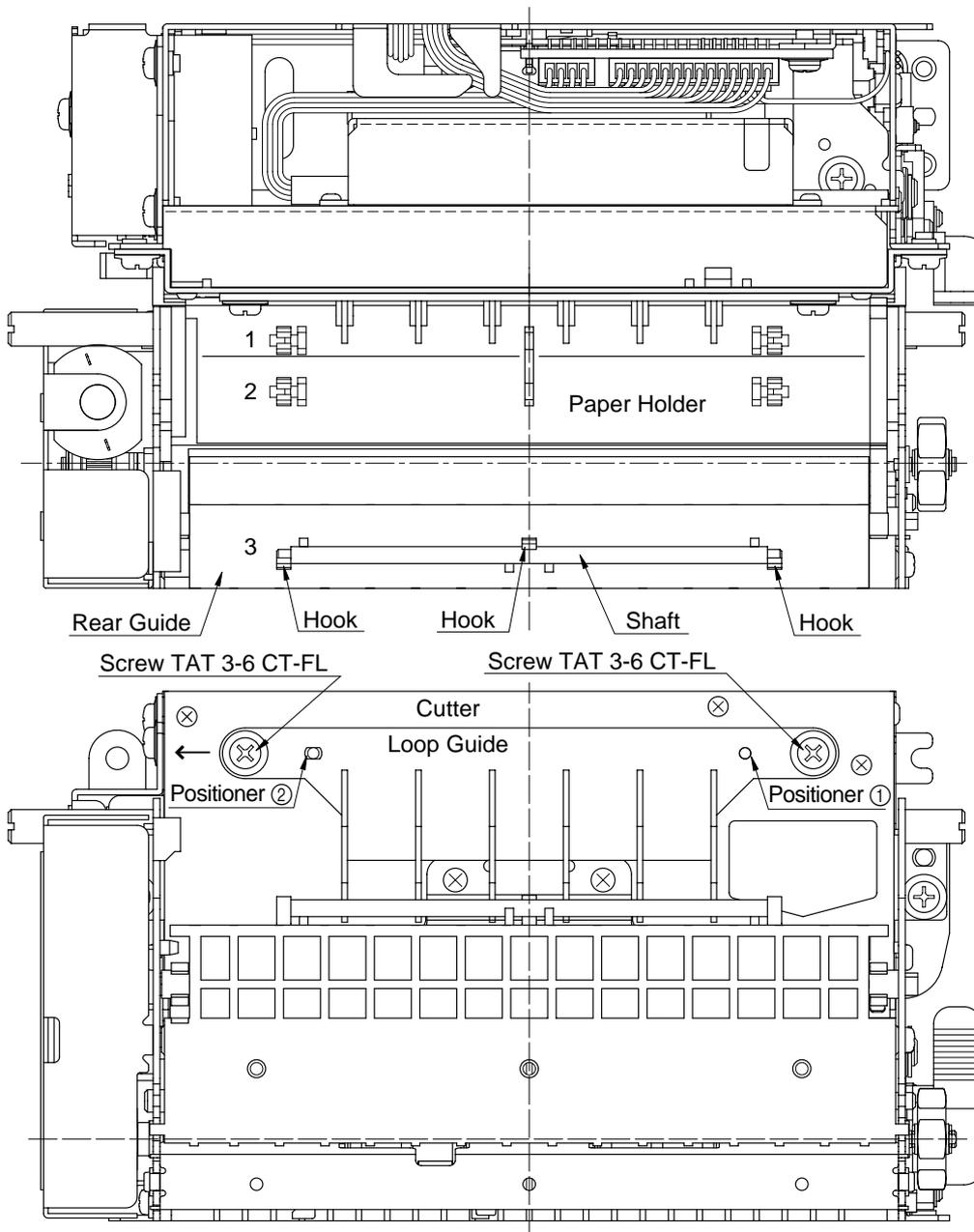


Figure 8-2

3) Rotate the paper holder and set after checking that it does not interfere with the loop guide.

Note: Floating therebetween the cutter can occur because of deformation in the loop guide caused by sudden environmental changes. (See fig. 8-3) If that should occur, follow the directions above for the mounting of the loop guide and remount it so that it does not float.

[If Floating Occurs Between the Loop Guide and Cutter]

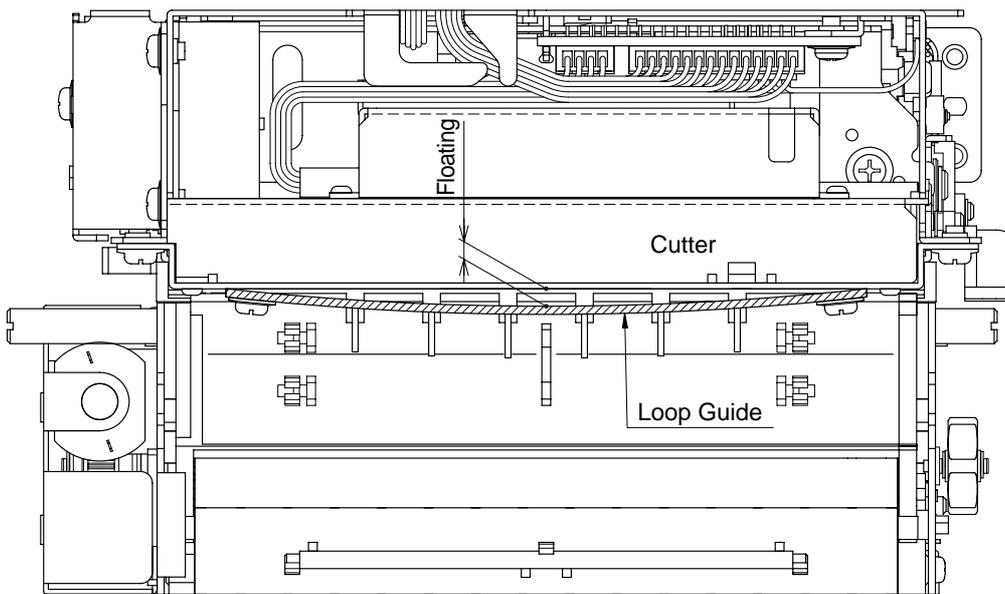


Figure 8-3

- **Paper thickness: Min. 0.10 to Max. 0.15 mm. (See Figure 8-4)**

- 1) Fasten the shaft with the left and right hooks positioned on the Paper Holder.
- 2) Check that the shaft is securely fastened to the Paper Holder hooks to set it.

Note 1: The 2 positions of the Paper Holder should be adjusted for the thickness of the recording paper, the length thereof and the environment of use.

Note 2: The loop guide is not used, so store it so that it will not get lost.

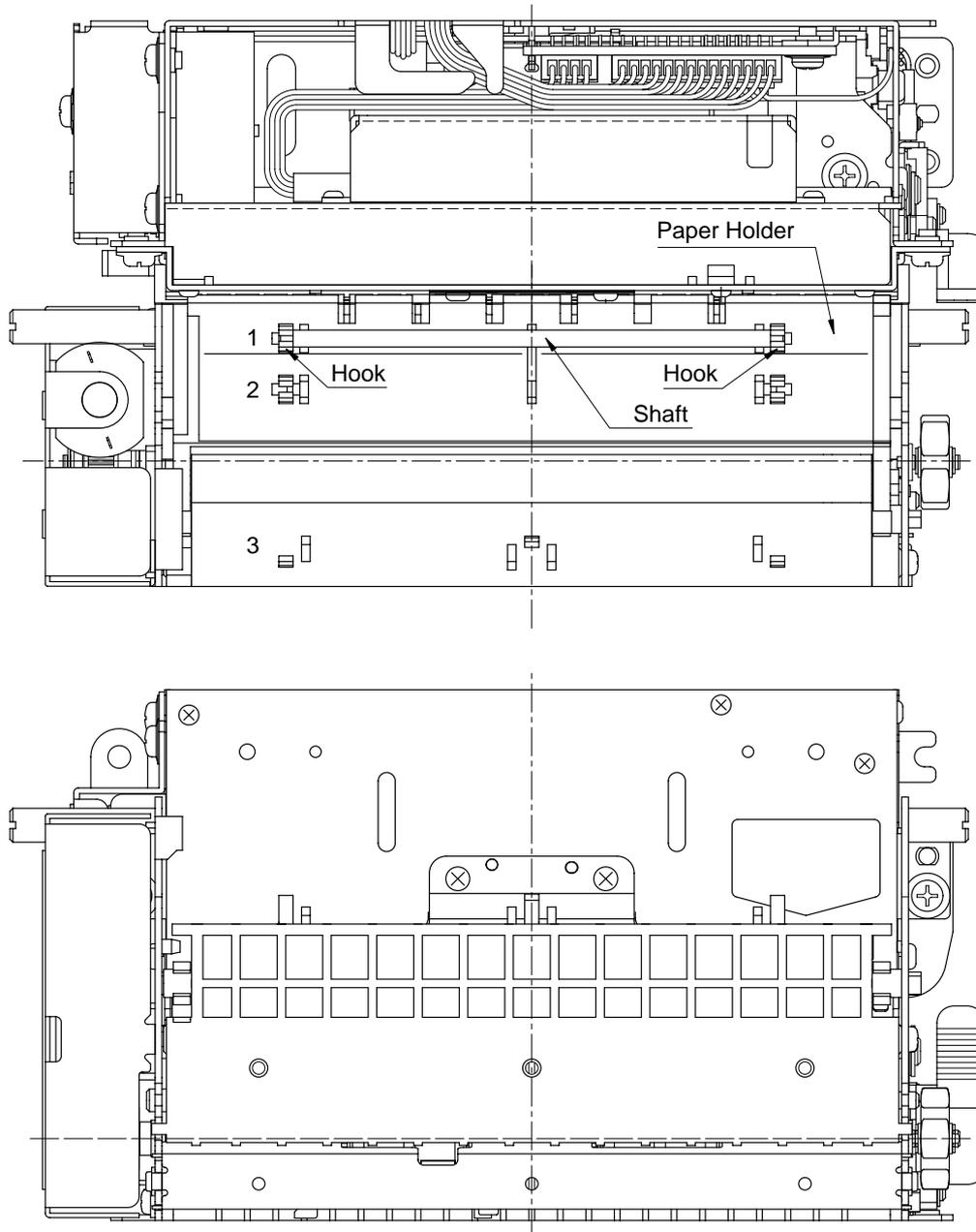


Figure 8-4

9. RECOVERING FROM ERRORS (PAPER JAMS)

Remove jammed paper according to the directions shown in Figure 9-1 and 9-2 to recover from non-recoverable paper jams. When doing so, always verify that the power has been turned OFF.

(Procedure 1)

- 1) Rotate the knob in the clockwise or counterclockwise direction.
- 2) Remove the jammed sheet from where it is easiest to remove.
(Paper inlet, discharge outlet, of the lower recovery space)

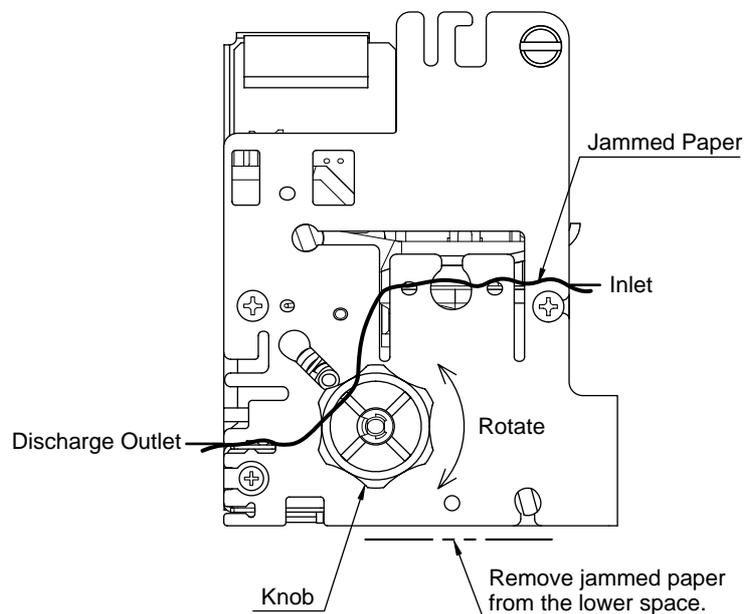


Figure 9-1

(Procedure 2: When Paper Cannot be Removed with Procedure 1)

- 1) Remove the screws on both sides of the presenter, shown in the figure below.
- 2) Rotate the rear guide and remove the jammed paper.
- 3) After removing the jammed paper, reverse the procedure 2), then fasten the screws in their original positions.

Note: When fastening the screws in procedure 3), be careful not to pinch the wires shown in the figure below.

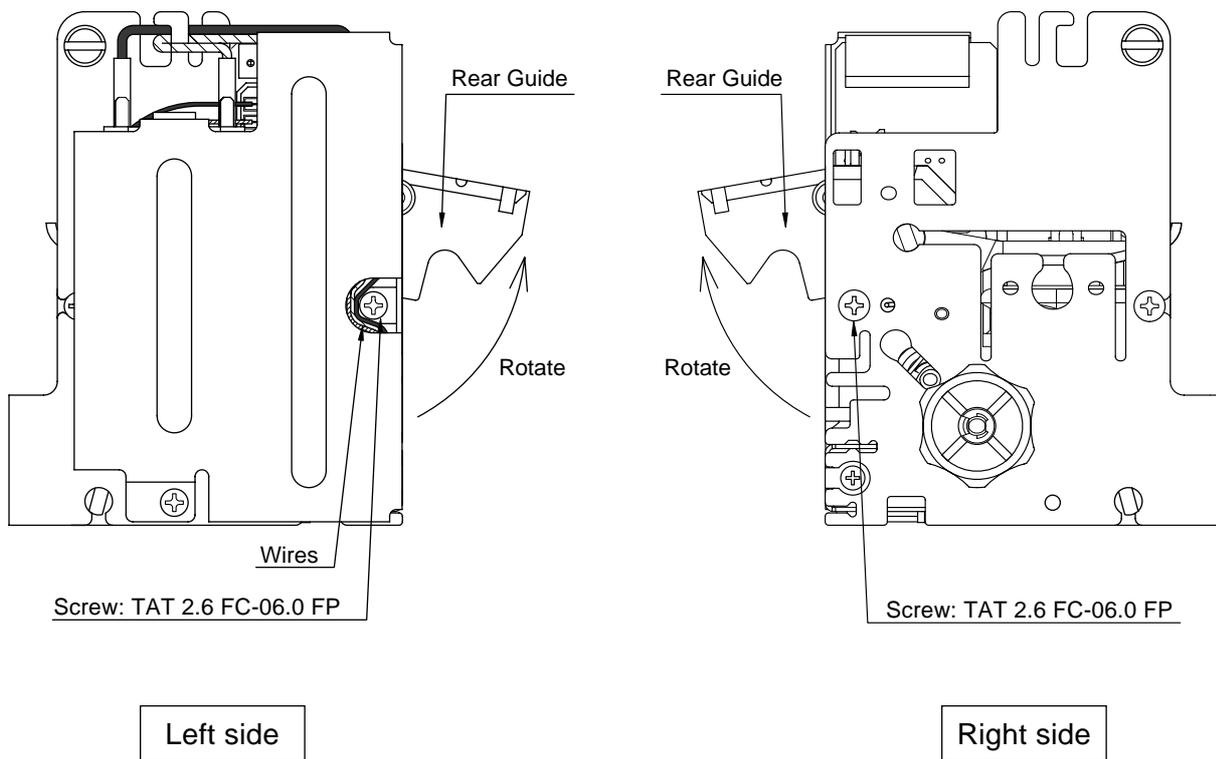


Figure 9-2

10. PRECAUTIONS REGARDING OUTER COVER DESIGNS

To prevent jams at the presenter discharge outlet, consider designing the casing so that recording paper does not enter between the presenter unit and the case.

- ① Gap of *1 must be a maximum of 1 mm. (See Figure 10-1)
 - ② The dimensions of *2 must be larger than the presenter discharge outlet (2 mm), but it should be small enough that it does not block the paper discharge outlet. (See Figure 10-1) If it is too large, interfering light (from the sun, etc.) will enter from outside of the apparatus from the recording paper outlet causing the paper detectors (sensors) to mis-operate, so do not make them too large.
- 1) The casing for the recording paper discharge outlet should have an outlet portion established such as *3 so that coins and clips do not fall into the casing. (See Figure 10-1)
 - 2) Storage space for the recovery of recording paper should consider the length of the recording paper and degree of curling to all plenty of space. It is recommended to ensure approximately 100 mm or more space for storage depth. (See Figure 10-2)

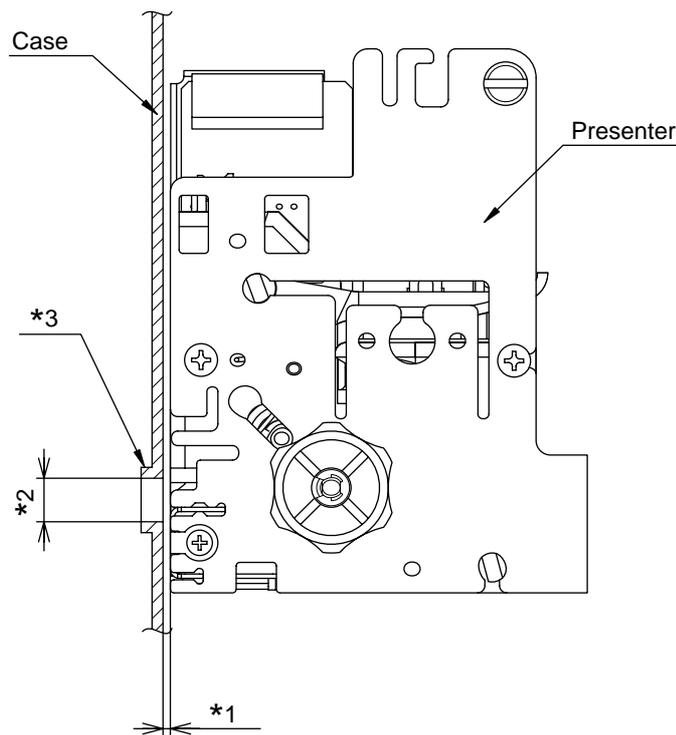


Figure 10-1

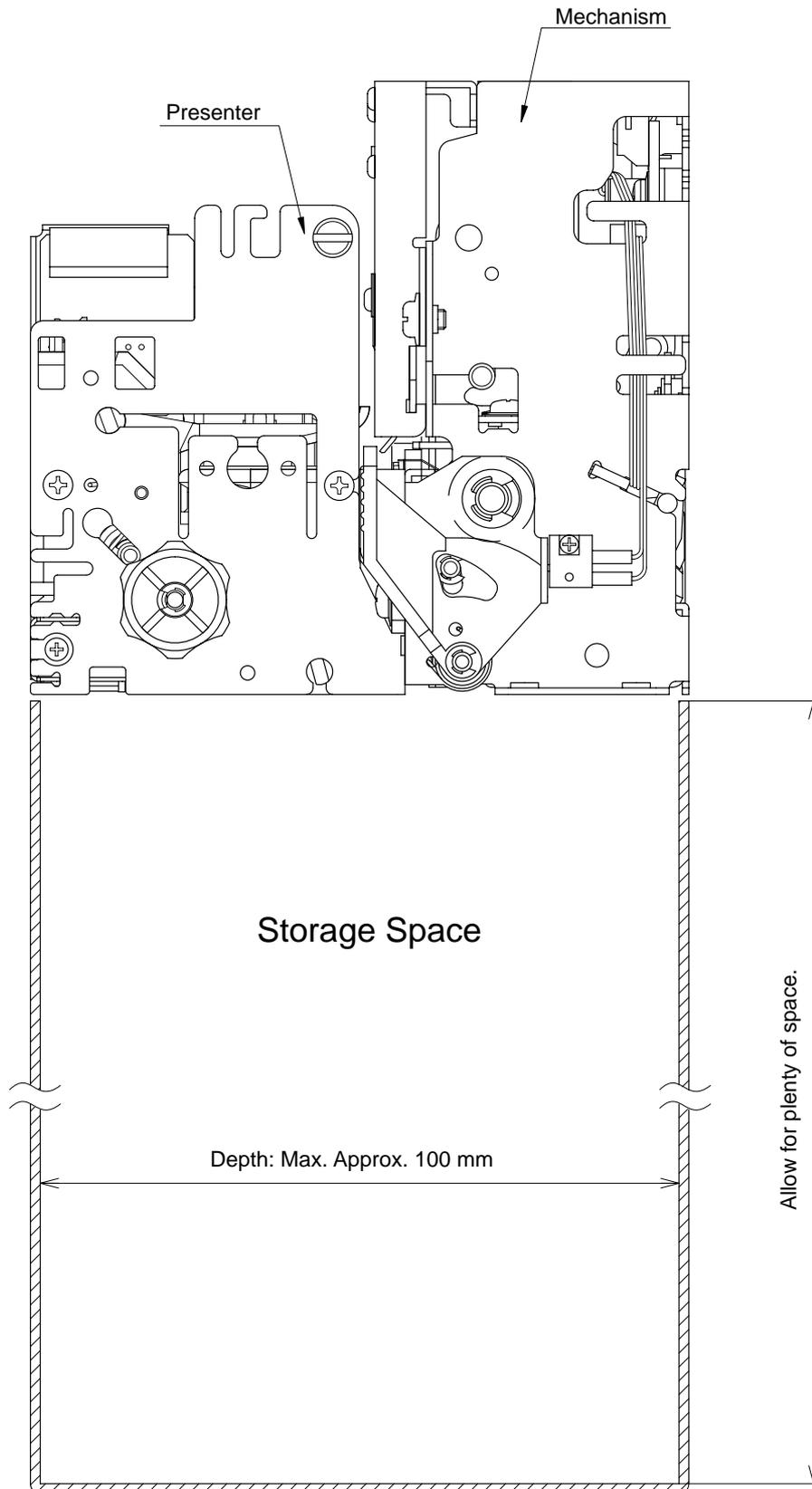


Figure 10-2

11. MAINTENANCE

Perform the following maintenance periodically.

Maintenance Periods: Every six months or after a million lines of printing.

Location of Maintenance: Each detector and the vicinity

Content of Maintenance: Clean away any paper dust or dirt and dust adhering to the detectors in the presenter.

Note 1: Always verify that the power supply has been turned OFF when performing maintenance on the presenter.

Note 2: Remove the two screws on both sides of the presenter, as shown in Figure 11, and rotate the rear guide upward to remove any dust and dirt on the paper detector in the presenter. After performing maintenance, return the rear guide to its original status and tighten the screws. When doing so, do not allow the screws to catch on the wires in the Figure 11.

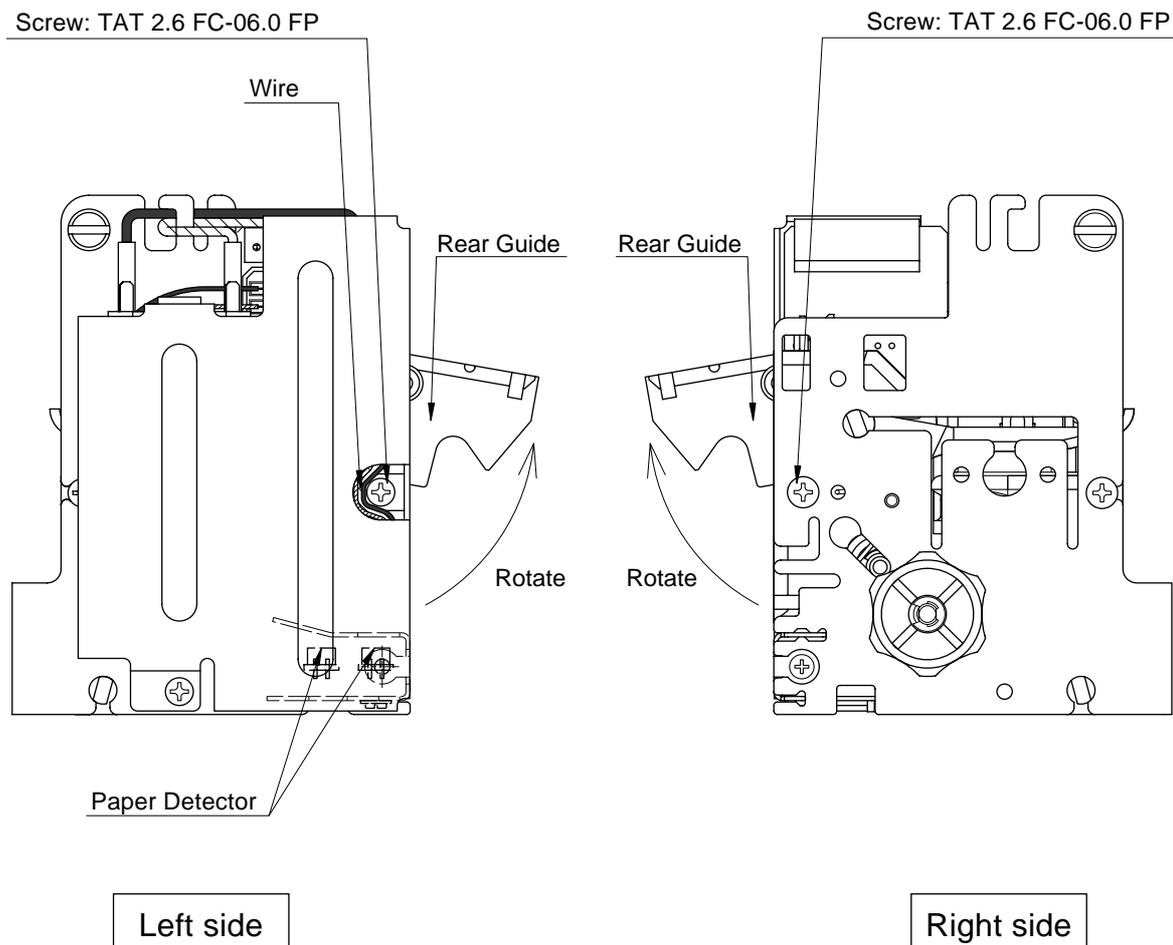


Figure 11-1

12. HANDLING THE PRESENTER

12.1 Precautions in Handling

- 1) Do not store or use the printer in locations that are dusty, oily or exposed to metallic dust.
- 2) Do not apply an unreasonable amount of force on the body.
(This can disfigure the frame and lead to the printer not functioning properly.)
- 3) Avoid sudden changes even if the ambient temperature and humidity are within standard conditions. Allow the printer to sit in its new environment for at least 30 minutes before use in the event there has been a sudden change.
- 4) Do not use the printer in an environment where condensation has formed. If condensation should form, absolutely never turn ON the power until the condensation has dried.
- 5) The setup angle for the presenter should be a maximum of $\pm 5^\circ$, as shown in Figure 12.
- 6) Paper transport and life cannot be guaranteed when using recording paper other than what is recommended.
- 7) Be careful not to allow foreign matter to adhere to the recording paper.
- 8) Be careful not to apply an excess amount of force on the cable connectors.
- 9) When closing the presenter from an open state, verify that the presenter is securely locked before operating.

12.2 Precautions Relating to Safety

- 1) After operation is completed, the surface of the motor can be very hot, so be careful never to touch it directly with your bare hands.
- 2) When the presenter is operating, never touch the rotating members, such as the gears.
- 3) Handle the presenter engine (the metallic portions) carefully because they can cause serious injury.
- 4) To perform maintenance on the presenter, always verify that the power supply has been turned OFF.

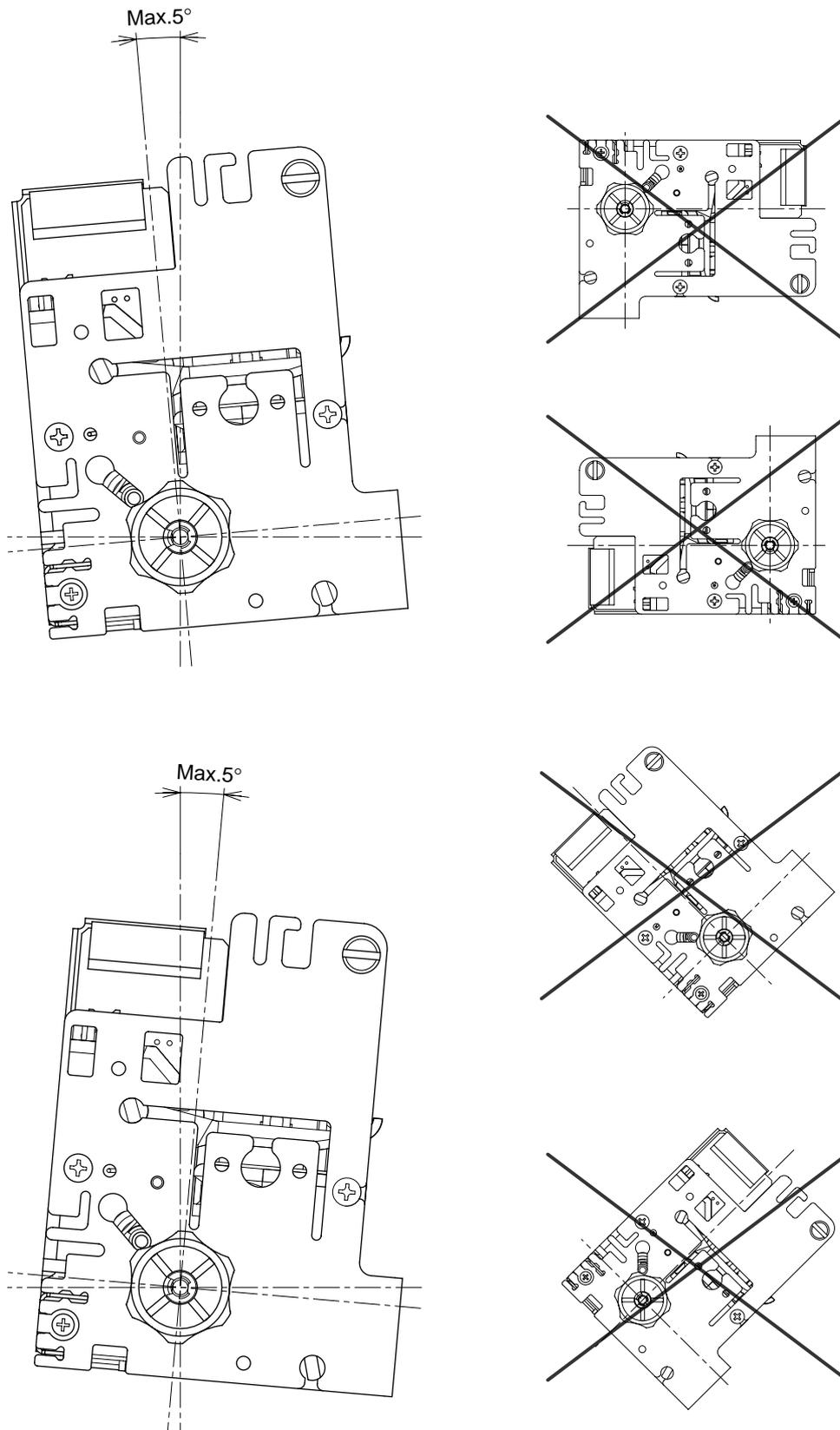


Figure 12



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