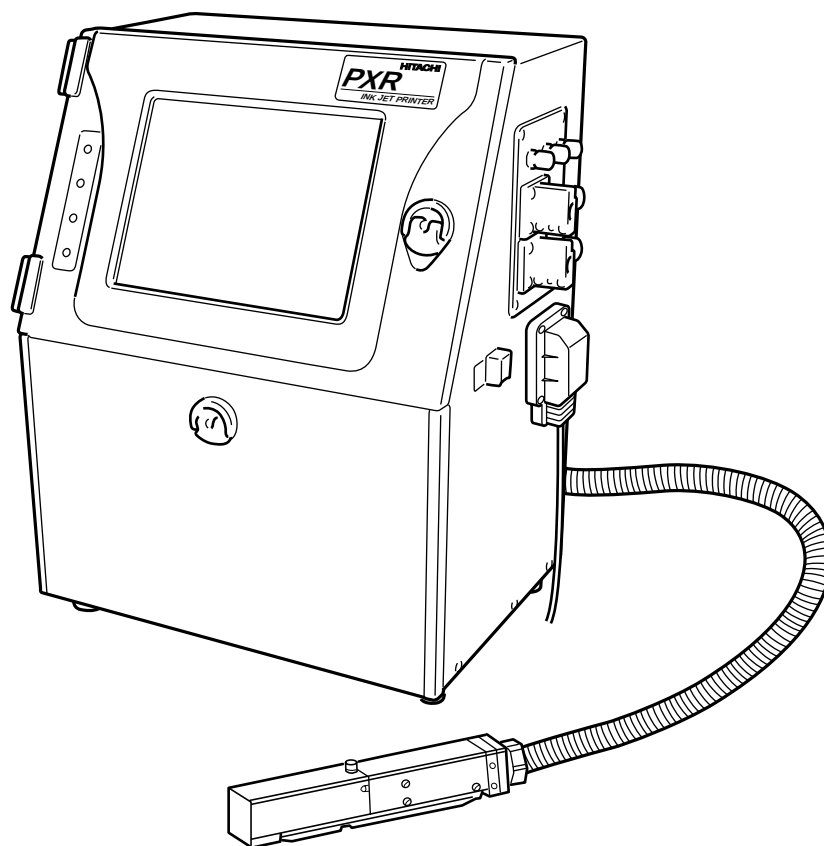


Instruction Manual

INK JET PRINTER FOR INDUSTRIAL MARKING

HITACHI Printer

Model PXR-D



Thank you for purchasing the Hitachi IJ Printer Model PXR-D.

This printer employs a noncontact, ink-jet method to print onto a print target.

This instruction manual describes the basic operating procedures, maintenance procedures, and other detailed handling procedures of the Hitachi IJ Printer Model PXR-D.

If the printer is improperly handled or maintained, it may not operate smoothly and may become defective or cause an accident. It is therefore essential that you read this manual to gain a complete understanding of the printer and use it correctly.

After thoroughly reading the manual, properly store it for future reference.

IF you changed the language of screen by mistake,
see the chapter 5.5 "Selecting Languages".

HITACHI



Safety Precautions

- Before using the printer, thoroughly read the following safety precautions for optimum printer use.
- You should observe the precautions set forth below in order to use the product properly and avoid endangering or causing damage to you or other persons. For the purpose of clarifying the severity of injury or damage and likelihood of occurrence, the precautions are classified into two categories, WARNING and CAUTION, which both describe the hazardous situations that may arise if you ignore the precautions and perform an incorrect handling or operating procedure. The precautions in these two categories are both important and must therefore be observed without fail.

 WARNING	WARNING is used to indicate the presence of a hazard which may cause severe personal injury or death if the warning against performing an incorrect handling procedure is ignored.
 CAUTION	CAUTION is used to indicate the presence of a hazard which may cause personal injury or property damage if the warning against performing an incorrect handling procedure is ignored.

- If the warning in the CAUTION category is ignored, serious results may occur depending on the situation.
- After the manual has been read, it must be stored in such a location that all printer operation personnel can refer to it at all times.
- All the instructions set forth in this manual are important and must therefore be observed without fail.

Pictograph Examples

	The △ symbols are used to indicate precautions (including those related to potential hazards and warnings) to be observed. Detailed information is furnished by a picture within the symbol outline (a shock hazard is indicated by the example shown at left).
	The ⊘ symbols are used to describe prohibited actions. The details of a prohibited action are given by a picture within or near the symbol outline (the example shown at left dictates that you must keep flames away).
	The ● symbols are used to describe required actions. Detailed instructions are given by a picture within the symbol outline (the example shown at left dictates that a ground connection must be made).

Restrictions on Export

User hereby agrees not to export or re-export this product to any end-user who the user has reason to suspect may utilize the product for the design, development or reproduction of nuclear, chemical or biochemical weapons.

File management is carried out using eParts made from eSOL.



Safety Precautions (Continued)

WARNING

- Ensure that there is no flame- or arc-generating device within 5 m of the printer.

The ink and makeup ink are both flammable and may cause fire.

Fire can be generated by matches, lighters, cigarettes, heaters, stoves, gas burners, welders, grinders and static electricity. Arcs may be generated from open-type relays, switches, and brush motors. Before handling the ink and makeup ink, remove electricity from your body, peripheral equipment, and so on. In the interest of safety, position a dry-chemical fire extinguisher near the printer.



- Since the ink and makeup ink contain organic solvents, install the printer at an adequately ventilated location.

- ① Never install the printer in an enclosed space.
- ② Connect exhaust equipment to the printer in order to prevent it from filling with organic solvent vapor.

- Do not insert tweezers, a screwdriver, or any other metal article into the ink ejection hole in the end of the print head.

When the printer is ready to print, a high voltage (approximately 6 kV) is applied to the deflection electrode section in the print head.

Exercise caution to avoid electric shock, injury, and fire.



- Do not remove the outer covering.

A high voltage is applied to some sections of the printer.

Exercise caution to avoid electric shock and injury.



- Use an AC voltage of 100 to 120 V or 200 to 240 V $\pm 10\%$ only and a power frequency of 50 or 60 Hz only.

If the above requirements are not met, the electric parts may overheat and burn, creating a risk of fire or electric shock.

- Never drain the ink or makeup ink waste solution into a public sewer system.

Waste disposal must comply with all appropriate regulations. Consult the appropriate regulatory agency for further information.

- Exercise caution to avoid inadvertently disconnecting, forcibly pulling, or bending piping tubes.

Since the ink and makeup ink in some portions of piping tubes are pressurized, they may splash into your eyes or mouth or onto your hands or clothing.

If any ink or makeup ink enters your eyes or mouth, immediately flush with warm or cold water and consult a physician.



Safety Precautions (Continued)

WARNING

- While the printer is operating, do not look into the ink ejection hole in the end of the print head.

Ink or makeup ink may enter your eyes or mouth or soil your hands or clothing. If any ink or makeup ink enters your eyes or mouth, immediately flush with warm or cold water and consult a physician.



- Ensure that no welding operations are performed within 5 m of the printer.

The welding current may flow to the control section in the printer and cause a circuit board or printer malfunction. Also, the flame generated by welding may cause a fire.

- Before servicing the printer, be sure to stop the ink ejection.

Because ink or makeup ink may splash into your eyes or mouth or onto your hands or clothing. If any ink or makeup ink enters your eyes or mouth, immediately flush with warm or cold water and consult a physician.



- If an earthquake, fire, or other emergency occurs while the printer is engaged in printing or just turned on, press the ON/OFF power switch to turn off the power.

- The printer must be managed in compliance with all appropriate regulations.

Read and understand the appropriate Material Safety Data Sheet (MSDS) before using any ink or makeup ink.

- Only use Hitachi-approved consumables and periodic replacement parts.

Using products that are not designated by Hitachi may lead to malfunction or failure. Such malfunction or failure will not be covered by the warranty.

- Warning for Mercury

 -- THE LAMP IN THIS PRODUCT CONTAINS MERCURY. RECYCLE OR DISPOSE OF ACCORDING TO APPLICABLE ENVIRONMENTAL LAWS.

For Recycling and Disposal information, contact your government agency, the Electronic Industries Alliance at www.eiae.org, and/or www.lamprecycle.org (in the US), or the Electronic Product Stewardship Canada at www.epsc.ca (in Canada). For more information, call 1-800-HITACHI (1-800-448-2244) (in the US).



Safety Precautions (Continued)

WARNING

- When charging a refill of ink or makeup ink, exchanging ink, or otherwise handling ink or makeup ink, take enough care not to spill ink or makeup ink. If you spill any ink or makeup ink by mistake, wipe it off neatly and promptly with wiping paper or something similar. Do not close the maintenance cover until you make sure that the portion you have just wiped is completely dry.

You must pay particular attention when you have spilled ink or makeup ink inside the printer and it is not completely dry. Why? Because vapors of ink or makeup ink will stay inside the printer and may catch on or cause a fire.

If you find it hard to wipe the printer when energized, stop it with the maintenance cover open. Power it down, then wipe it off again.

- If you wish to clean the casing of the printer with wiping paper impregnated with makeup ink, be sure to do so with the power down.



Attempting to clean it when energized will cause makeup ink or vapors of makeup ink to enter the printer, possibly catching on or causing a fire.

When the cleaning is over, open the maintenance cover and make sure that no makeup ink has entered and no vapors stay inside.

- Should you find a leak of ink or makeup ink inside the printer while the printer is running or being maintained, wipe it off promptly with wiping paper or something similar. Then, with the maintenance cover open, stop the printer, power it down, and repair the leak.

A continued run with a leak of ink or makeup ink will cause an anomaly, resulting in abnormal printing.

Ink and makeup ink are flammable. They may therefore catch on or cause a fire.

- If you wish to receive ink particles in a beaker, for a printing test for example, use an electrically conductive beaker and connect the beaker securely to the ground.

Do not let the tip of the printing head enter the beaker.

Ink particles used for printing are electrically charged. An ungrounded beaker has a gradually rising charge, possibly catching on or causing a fire.

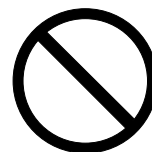


Safety Precautions (Continued)

CAUTION

- Only persons who have completed an operator training course for Hitachi IJP can operate and service the printer.

If the printer is operated or serviced incorrectly, it may malfunction or break down.



- Do not attempt to make repairs for any purpose other than operation or maintenance.



- Since the ink and makeup ink contain organic solvents, observe the following handling precautions.

① Secure adequate space for the ink/makeup ink handling area and printer installation site. At least 200 m³ must be provided per print head.

Ensure that adequate ventilation is provided.

② When handling the ink or makeup ink, wear protective gloves and safety goggles to avoid direct skin contact. If the ink or makeup ink comes into contact with skin, wash thoroughly with soap and warm or cold water.

③ When transferring the ink or makeup ink to or from a bottle, exercise caution to prevent it coming into contact with the printer or surrounding articles.

If there is any spillage, immediately wipe it clean using a cloth moistened with ethyl alcohol.

④ Notice that there is a possibility that a cap and a content may fly with inner pressure when opening the container of ink and a solvent.

⑤ Please open a cap of container an even place.





Safety Precautions (Continued)



CAUTION

- Ensure that all electrical wiring, connections and grounding comply with applicable codes. Properly connect the printer to its dedicated ground.

Complete the above procedure to avoid electrical shock hazards.



- Ink and makeup ink must be stored as flammable liquids. Storage must comply with local regulatory requirements. Consult the appropriate regulatory agency for further information.



- If extraneous noise enters the printer, it may malfunction or break down.

For maximum noise immunity, observe the following installation and wiring precautions.

- ① Ensure that 100 to 120 VAC or 200 to 240 VAC power cables are not bundled with other power supply cables.
- ② Insulate the printer main body and print head so that they do not come into direct contact with the conveyor or other devices.
- ③ If the employed print target detector is housed in a metal case, use a plastic mounting brace for the purpose of insulating the detector from the conveyor and other devices.
- ④ Be sure that the print target detector wiring is not bundled together with other power supply cables.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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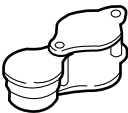
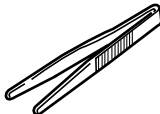
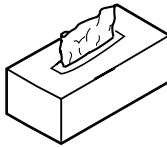
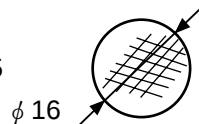
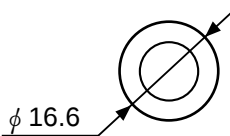
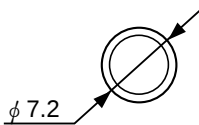
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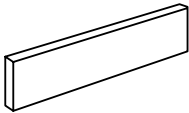
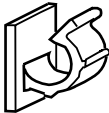
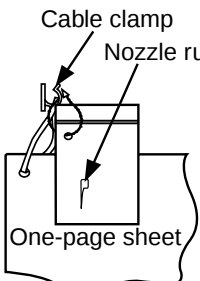
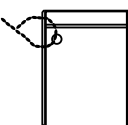


1. Overview

1.1 Items Delivered

- Unpack the order you received, and check that the following items are supplied.

No.	Item name	Quantity	Parts No.	Remarks
1	IJ printer main body	1	—	
2	Instruction manual	1	—	
3	One-page sheet	1	—	
4	Magnifying glass 	1	451274	Used for ink particle shape confirmation, ink beam position confirmation, and other purposes.
5	Tweezers 	1	451412	Used for orifice plate removal and other purposes.
6	Cleaning bottle 	1	451058	Filled with the makeup ink and used for print head cleaning.
7	Beaker (with handle) 	1	451410	Used for print head cleaning, ink replacement, and other purposes.
8	Wide-mouthed bottle 	1	451126	To be used as a waste solution tank.
9	Wiping paper 	1	—	Used to wipe the print head after cleaning.
10	Nozzle flat filter 75 	1	451037	Spare part. Recovery system filter.
11	O-ring P12 	1	450214	Spare part. For recovery system filter sealing.
12	O-ring SF7000-5.6 	1	451589	An O ring for the orifice plate seal (spare part).

No.	Item name	Quantity	Parts No.	Remarks
13	Cable seal 	3	—	For external communication cable sealing.
14	Cable clamp 	1	—	 Cable clamp Nozzle rubber seal One-page sheet
15	Vinyl bag with fastener 	1	—	
16	Drainage tube 	1	451676	Used for ink replacement and filter replacement.

If you order items that attached with the main body, tell up their item name and parts No..

- What is makeup ink?
The makeup ink serves as the replenisher that makes up for a constituent loss due to ink evaporation during ink ejection. It is also used as a cleaning solution.

1.2 Usage Precautions

1.2.1 Notes on ink and makeup ink

(1) Ink and makeup ink replenishment

The printer employs an automatic ink/makeup ink replenishment system. While the printer is operated, the ink reservoir automatically supplies the ink and the makeup ink reservoir automatically supplies the makeup ink to the ink main tank at regular intervals. If the ink or makeup ink replenisher level is too low, an alarm is issued. In such an instance, effect replenishment without delay. (For the replenishment procedures, see Section 7.3, Ink Replenishment , and Section 7.4, Makeup ink Replenishment.)

(2) Ink periodic replacement

For the replacement procedure, see Section 7.5, Ink Replacement.

- While the IJ printer ink circulates for operations, it reacts with atmospheric air elements and deteriorates with time. Therefore, it needs periodic replacement. The table below furnishes a guide for determining the proper replacement intervals. However, since the proper replacement intervals vary with the printer operating environmental conditions (temperature, humidity, dust, etc.), determine the best replacement intervals in accordance with the obtained printings, and replace all ink within the printer with new ink.

Ink type	Replacement intervals (operating hours or elapsed days whichever comes earlier)	
	Approximate operating hours	Approximate elapsed days
JP-K26	600 to 1200 hours	6 months
JP-K27	600 to 1200 hours	6 months
JP-R27	600 to 1200 hours	6 months
JP-B27	600 to 1200 hours	6 months
JP-G27	600 to 1200 hours	6 months
JP-K28	600 to 1200 hours	6 months
JP-K31A	600 to 1200 hours	6 months
JP-K33	600 to 1200 hours	6 months
JP-Y37	600 to 1200 hours	6 months
JP-K60	300 to 600 hours	3 months
JP-K61	300 to 600 hours	3 months
JP-K62	600 to 1200 hours	6 months
JP-F63	300 to 600 hours	3 months
JP-T64	300 to 600 hours	3 months
JP-K65	200 hours	1 months
JP-R65	200 hours	1 months
JP-K67	600 to 1200 hours	6 months
JP-K68	300 to 600 hours	3 months
JP-K69	600 to 1200 hours	6 months
JP-K70	600 to 1200 hours	6 months
JP-T71	600 to 1200 hours	6 months
JP-K72	600 to 1200 hours	6 months
JP-T75	600 to 1200 hours	6 months
JP-R76	600 to 1200 hours	6 months
JP-K84	600 to 1200 hours	6 months
JP-K77	300 to 600 hours	3 months
JP-E78	300 to 600 hours	3 months
JP-F80	600 to 1200 hours	6 months
JP-K81	600 to 1200 hours	6 months
JP-B82	600 to 1200 hours	6 months
JP-K86	600 to 1200 hours	6 months
JP-K87	600 to 1200 hours	6 months

Notice

The ink which you can use differs with areas.
Please confirm ink which you can use to each area's distributors.

(3) Storage precautions

- ① Store the ink and makeup ink in a cold dark place (0 to 20°C). (Observe this rule no matter whether tanks are unsealed or not.)
- ② The storage validity period is predefined for the ink and makeup ink. Begin to use the ink/makeup ink before the "Expiration date" (「開封期限」) date arrives.
- ③ Once an ink bottle is opened, even if it is stored, the bottled ink begins to deteriorate in the same manner as the ink in the printer. If the above-indicated "approximate elapsed days" limit is exceeded, discard the bottle of ink. (When an ink bottle is opened, indicate the date of opening on the bottle's label for proper management purposes.)
- ④ The makeup ink must be added to the printer within one year after opening the tank. Note that the makeup ink added to the printer needs no replacement.

WARNING

- Do not drain the ink or makeup ink waste solution into public sewer systems or elsewhere. Waste disposal must comply with all appropriate regulations. Consult the appropriate regulatory agency for further information.

(4) Ink differences and handling precautions

Notice

The ink which you can use differs with areas.
Please confirm ink which you can use to each area's distributors.

① Differences

Ink type	Applicable makeup ink	Operating temperature range		
		65 μ m	40 μ m	100 μ m
JP-K26	TH-TYPE B	0 to 35℃	Inapplicable	0 to 35℃
JP-K27	TH-TYPE A	0 to 45℃	0 to 35℃	Inapplicable
JP-R27	TH-TYPE A	0 to 35℃	Inapplicable	0 to 35℃
JP-B27	TH-TYPE C			
JP-G27	TH-TYPE A			
JP-K28	TH-TYPE A			
JP-K31A	TH-TYPE E		Inapplicable	
JP-K33	TH-18			
JP-Y37	TH-TYPE E		0 to 35℃	0 to 35℃
JP-K60	TH-60		Inapplicable	Inapplicable
JP-K61	TH-23		0 to 35℃	
JP-K62	TH-18		Inapplicable	
JP-F63	TH-63		Inapplicable	
JP-T64	TH-18		0 to 35℃	
JP-K65	TH-65		Inapplicable	
JP-R65	TH-65			
JP-K67	TH-TYPE A	0 to 45℃	0 to 35℃	0 to 35℃
JP-K68	TH-TYPE F	0 to 35℃		
JP-K69	TH-69	0 to 45℃		
JP-K70	TH-70	0 to 35℃	Inapplicable	Inapplicable
JP-T71	TH-71			
JP-K72	TH-18	0 to 40℃	0 to 35℃	0 to 35℃
JP-T75	TH-75	0 to 35℃	Inapplicable	Inapplicable
JP-R76	TH-76		0 to 35℃	
JP-K84	TH-84			
JP-K77	TH-77	0 to 35℃	Inapplicable	
JP-E78	TH-78			
JP-F80	TH-80			
JP-K81	TH-81			
JP-B82	TH-82			
JP-K86	TH-86			
JP-K87	TH-18			

For the part code numbers for the above inks and makeup ink, see Section 12, "Maintenance".

② Handling precautions

- a. When you use the JP-K31A, JP-K60, JP-F63, JP-K68, JP-K70, JP-T71, JP-K77, JP-E78 or JP-K84 ink, you must complete the print head air-purge procedure without regard to the humidity predominating in the employed environment.

(See Section 1.2.6, "Print head air purge".)

- b. (1) The JP-K31A, JP-K60, JP-K69 and JP-K84 inks employ carbon black as the pigment.

If an excess electrostatic charge alarm is issued when no ink or makeup ink is on the print head surface and ink drops are properly generated, it is conceivable that carbon black may be deposited on the print head surface.

This may have been incurred by creeping leakage on the deflection electrode mounting surface. In such an instance, remove the deflection electrode from the printer head and wipe the entire mounting surface clean.

- (2) The JP-K31A, JP-K60, JP-K69 and JP-K84 inks employ carbon black as the pigment.

Shake the ink bottle well before use.

- c. The carbon black pigment of the JP-K31A may cohere depending on the employed environment. For enhanced pigment stability, you should perform the following maintenance programs.

- Replace the main ink tank on a periodic basis (at intervals of about 2400 operating hours). When it needs replacement, contact your local service personnel.
- Replace the stainless filter within the shutoff valve (MV9, mounted on the print head) on a periodic basis (at intervals of about 2400 operating hours). When it needs replacement, contact your local service personnel.

- d. If the dye of the JP-K60 comes into contact with the human body, it cannot easily be removed. Exercise utmost caution to avoid skin contact with it.

- e. The JP-K65, JP-R65 hardens if it is exposed to ultraviolet rays after printing. Its hardenability varies with the printed matter material and surface condition (roughness and presence of deposits), printed matter temperature, time interval between printing completion and ultraviolet radiation, employed ultraviolet radiation device, and other factors. You should confirm the ink hardenability under the employed operating conditions.

Typical hardening conditions

Lamp type	Metal halide lamp (2kW)
Lamp light emission length	250mm (80W/cm)
Radiation distance	150mm
Radiation time	15seconds

If ink sticks to the end of the nozzle, the ink stream will be bent, the nozzle may be clogged, or printing disorder may be caused. Before ejection, apply the makeup ink to the orifice plate to wash it.

- f. If JP-F63 has been deteriorated by light (corresponding to the irradiation of sunlight for one month or more), light emission by ultra violet rays becomes difficult. However, this condition can be improved into a light emission enable status by applying a regenerating liquid (type: RF-B1, code No.: 451520).
- g. The JP-B27 require to replace the stainless filter within the shutoff valve (MV9, mounted on the print head) on a periodic basis (at intervals of about 2400 operating hours). When it needs replacement, contact your local service personnel.

h. Differences in JP-Y37 and cautions on use

The JP-Y37 ink uses organic color whose specific gravity is low for pigment. It can be used in the same way as dye ink when periodical maintenance is performed.

(1) Cautions during normal operation

Item	Maintenance period	Caution during maintenance
Ink	When ink is charged, replenished or replaced	Shake the ink bottle well until all precipitated pigment is dispersed. (See "7.3 Ink replenishment" and "7.5 Ink replacement".)
Ink reservoir	When ink is replaced (or 6 months after ink is charged)	(See "1.3 Component names and functions") ① Referring to "7.5 Ink replacement", drain the ink from ink reservoir, and check to see if there is any sediment at the bottom of ink reservoir. ② If there is any sediment, pour the makeup ink on the sediment in ink reservoir to wash it out. (Also wash the inside of ink reservoir with the makeup ink.) Drain the makeup ink after washing, and charge new ink.
Main ink tank	When ink is replaced (or 6 months after ink is charged)	(See "1.3 Component names and functions") ① Check to see if there is any sediment at the bottom of ink reservoir. (A dark yellow substance at the bottom of tank can be judged as sediment.) ② If sediment is found and "7.16 Draining the Ink from the Main Ink Tank" is not possible (the flow from drain tube cannot be confirmed), execute the long-term shutdown process, referring to "7.15 Long-term Shutdown", and remove the sediment. ③ If the sediment cannot be removed, replace the main ink tank. When replacing the main ink tank, contact your local distributor.

(2) Caution when continuously injecting ink:

When ink is continuously injected, it even once a day for more than a month, perform the circulation of ink without interruption at least once a month, referring to "7. Circulation System Operating and Adjustment Procedures", in order to prevent sediment of ink accumulating in print head cable tube. (No printing can be performed while "Ink Circulation" is being executed.)

(3) Other cautions

- ① If the nozzle or gutter is dried by mistake and ink is stuck to it, and it cannot be recovered by solvent washing with makeup ink, immerse nozzle or gutter in household detergent of approx. 0.5% and wash in an ultrasonic washer for approx. 10 minutes. The stuck ink will be loosened and can then be removed.
- ② When using the printer in an environment where the humidity is more than 85%, the amount of sediment may increase. Perform air purge (see "1.2.6 Print head air purge").

- i. JP-T71 and JP-T75 will change color if retorting processing (heating with hot water or steam) is done after printing. Since water is necessary for change of color, the change will not occur if heating is done with hot air. Be sure to perform ex ante evaluation for color changeability. Degree of change will vary depending on the conditions of printing matter, retorting device or retort processing. Confirm the change in the condition being used.

(1) Items to be checked before using:

CAUTION	
Change of color	(1) Change of color is caused by element seeping as a result of boiling or use of condensed steam.
	(2) Water is necessary for change of color. No change of color will occur if heating is done with hot air.
	(3) Reference condition for change of color by heating with steam is 120°C for 20 minutes. However, if stream of steam in retorting device is not sufficient, change of color may not occur, or color may change unevenly. And the degree of change may vary depending on the position inside the device, retort food, canned content or contents of printed matter.
	(4) Reference condition for change of color by heating with boiled water is 100 °C for 20 minutes. However, seeped dye may stain, color blur may occur or poor change of color may occur, due to uneven temperature inside retorting device, flow or retention of hot water on printed surface. And the degree of change may vary depending on the position inside the device, retort food, canned content, surface temperature of can or contents of printed matter.
	(5) Change of color does not guarantee that sterilization has been perfectly performed, nor does the case when color does not change always indicate that heating has not been performed.
	(6) Change of color tone will vary depending on material of printed matter, shape, surface condition and hue. Especially, when printing is done with dark color, change may not be clearly indicated.
Boiling, condensed water	(1) Change of color is caused by seeping of dye. So, in case before change of color, the elution test standard for appliance and container specified by food hygiene law will not be satisfied. However, the standard will be satisfied after change of color: If used for food container, be sure to confirm change of color. (JP-T71)

j. Caution of JP-K77, JP-K81 and JP-K86

- (1) When handling ink or makeup, take enough care not to spill ink or makeup. If you spill any ink or makeup by accident, wipe it off completely and promptly with wiping paper or something similar. Be sure to close the maintenance cover after the portion where you wiped is completely dry, because vapors of ink or makeup staying inside the printer may catch on or cause a fire.
- (2) Never remodel the printer.
- (3) Never let the printer run in case the cooling fan is not working.
- (4) Acetone is used as solvent for JP-K77, JP-K81 and JP-K86. Acetone has characteristics of high vapor pressure (evaporable) compared with MEK, so take care to with the following:
 - Reference period for long-term shutdown will be shorter. Operate printer within the reference period periodically, or perform maintenance work for long-term shutdown if shut-down time exceeds reference period.
 - If the printer is shut down longer than reference time, re-start may not be possible due to settling of remaining ink component.

K. Caution of JP-E78

- (1) If printed mark is boiled or soaked in water, printed characters may fade.
- (2) Do not charge JP-E78 to a printer in which any other type of ink has been used: Ink components may mix before printing.

1.2.2 IJ printer long-term shutdown

In the case where the operation of the IJ printer is irregular (the IJ printer is shut down for a few weeks in a row, for instance) in conjunction with production and so on, there is a possibility of occurrence of a problem such as no ink ejecting when operating the printer or no recovery possible due to accretion of the ink inside the printer.

The period of possible shutdown is different according to the temperature of the storage as described in the table below. When you are to use the printer in such a manner, it is necessary to operate it (eject the ink) regularly within an estimated period of possible shutdown or perform storage work for the long-term shutdown.

(The storage work for the long-term shutdown is to drain the ink in the ink circulation system and refill it with the makeup ink, which requires a specific operation on a restart. See "7.15 Long-term shutdown" for details.)

Moreover, in the case of operating it regularly, note that the time necessary for operating it once is different according to the ink to be used and ambient temperature of the place for the operation. (It is different depending on major components of a solvent of the ink.)

Storage temperature	Estimated term of possible shutdown ^{*1}	^{*3}	Operating time per operation ^{*2}
$0 \leq T \leq 35^{\circ}\text{C}$	3 weeks	10 days	1 to 4 hours
$35 < T \leq 40^{\circ}\text{C}$	2 weeks	7 days	1 hour
$40 < T \leq 45^{\circ}\text{C}$	1 week	5 days	1 hour

^{*1}: Maximum period possible to be continuously shut down without operation.

It is necessary to operate it at least once during this period.

^{*2}: The values in the table indicate the case of an MEK-based ink.

See "1.2.5 Cautions on operating time when printer is in service" for the case of an ethanol-based ink.

^{*3}: JP-K77, JP-K81 and JP-K86 ink. See "1.2.1(4) j Caution of JP-K77, JP-K81 and JP-K86".

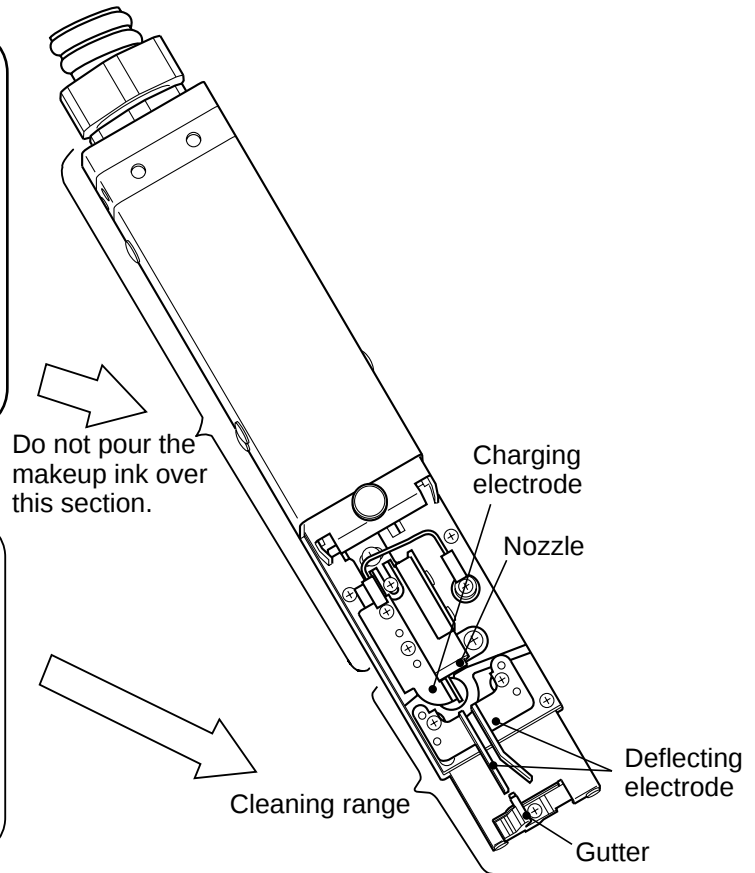
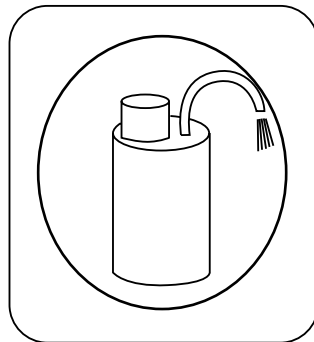
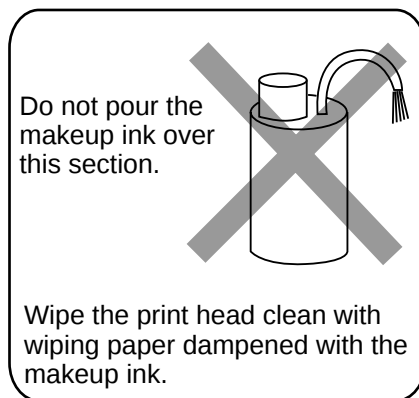
CAUTION

Even if the treatment for long-term shutdown has been performed, restart may not succeed due to accretion of ink components. Ask your serviceman for restart whenever possible.

(In cases where temperature in the storage place is high [30°C or higher], or shutdown period has exceeded six months, be sure to ask your serviceman for restart.)

1.2.3 Print head cleaning

- ① Cleaning with the makeup ink should be limited to the end of the print head. To clean the end of the print head with the makeup ink, orient the end of the print head downward.



- ② Never immerse the print head in the makeup ink.
- ③ After cleaning, thoroughly wipe the print head with wiping paper and allow it to dry.
- It is necessary to wipe and dry the nozzle, charging electrode, deflecting electrode, mounting base and fringe of the gutter.
 - While the print head is wet, do not orient its end upward.
 - If you use the JP-K60, JP-F63, JP-K68, JP-E78 ink, you must allow the printhead to dry firmly before running because the ink is not easy to dry.

When a print error or emergency stop occurs, refer to 8. "If a Warning Condition/ Fault Occurs".

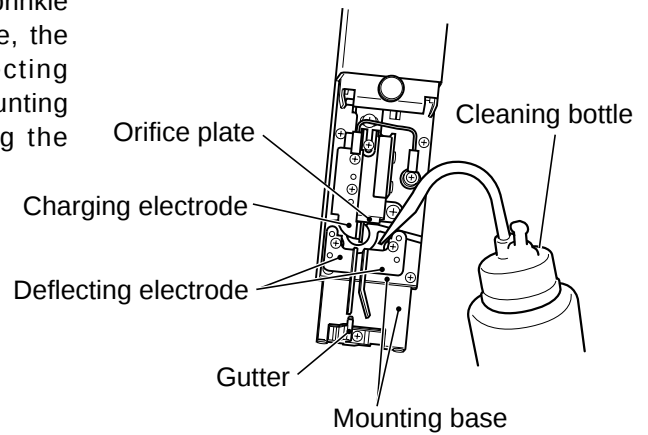
Regarding cleaning at a shutdown, refer to 2.2 "Shutdown".

The stain due to ink splashes can be removed effectively by performing air purge for the print head. Refer to 1.2.6 "Print head air purge".

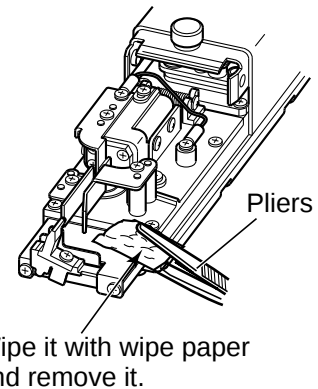
- ④ When using JP-K31A, JP-K60, JP-K69 and JP-K84 ink, the following precautions must be observed.

Since charging and deflecting electrodes and a gutter are provided inside the print head, if highly conductive carbon black settles on the print head mounting base (made of insulating material), leakage can occur between these electrodes resulting in frequent recurrence of errors. It is, therefore, important to clean inside the print head whenever stains are detected.

After the operation is completed, sprinkle the makeup ink on the orifice plate, the charging electrode, the deflecting electrodes, the gutter and the mounting base, and then clean them using the cleaning pin.

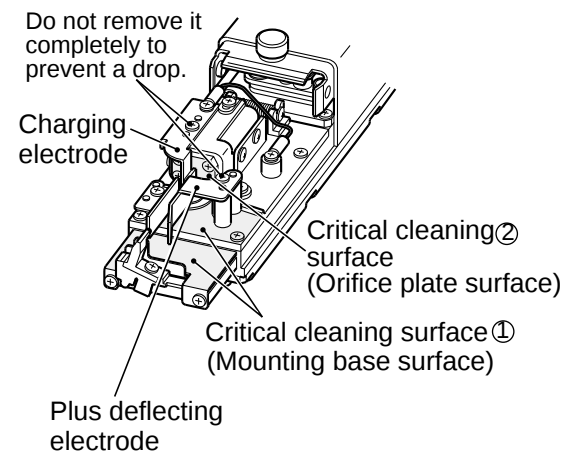


Clean carbon black and makeup ink off the parts (including the mounting base) using paper wipers and let the parts dry themselves in the ambient temperature.



In the case where an abnormality arises in the operation after the above work, there is a possibility that carbon black still remains on the surface of the mounting base and creepage is caused. In this case, remove the plus deflecting electrode, and wipe the mounting surface clean with wipe paper to which a makeup ink is applied.

In addition, remove the charging electrode, and wipe the orifice plate surface clean likewise.



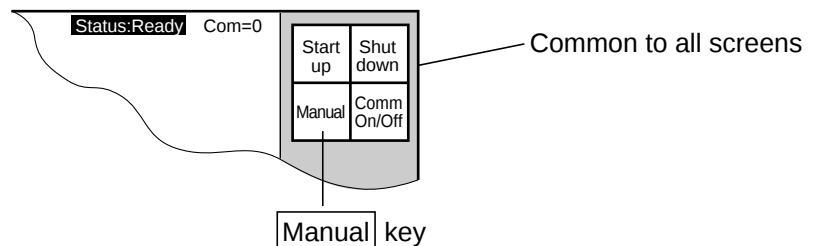
- ⑤ When printing is frequently performed or an space between the print material and the print head is small, ink splashes may stain the end of the print head and the print head cover. If this condition is left as it is, the stained status will be made worse, resulting in a print error or emergency stop. If a print error or emergency stop frequently occurs because of stain due to ink splashes, stop the operation that is in progress and clean the end of the print head and the print head cover. Do this in addition to the cleaning to be performed at the end of each daily work.

1.2.4 Shutdown (no-cleaning stop)

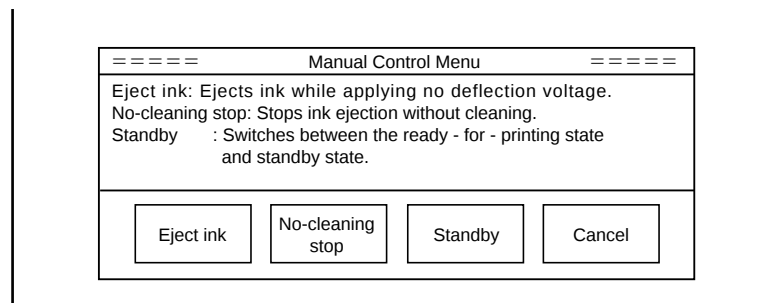
When you press the **Shut down** key on the upper right-hand corner of a screen, the printer stops after completing its automatic nozzle cleaning sequence. If you repeatedly activate the **Shut down** key to stop an operation, excessive makeup ink enters the printer, thereby thinning the ink or producing an unduly high ink main tank solution level. If it is absolutely necessary to repeatedly stop a printer operation, use the following procedure.

The procedure below works even while the startup sequence is being executed (the **Shut down** key is inoperative during the startup sequence).

- 1 Press the **Manual** key (the **Manual** key is displayed commonly on all screens).

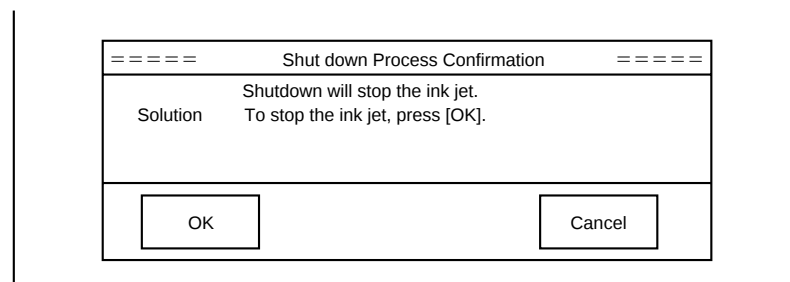


- 2 Press the **No-cleaning stop** key within the control menu.



The ink stop confirmation message appears.

- 3 Press **OK**.



*1: Do not use the **Shut down** key to stop an operation more than two successive times.

*2: If you stop an operation with the **No-cleaning stop** key, immediately initiate ink ejection. If such a condition is allowed to continue, the nozzle may become stuck with the ink, causing the ink beam to be bent or the nozzle to be clogged.

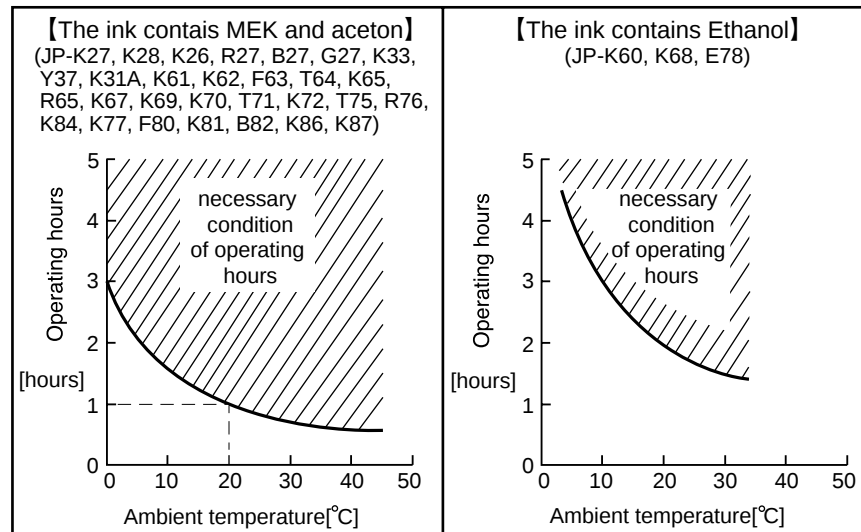
Accordingly, apply the makeup ink to the orifice plate to wash it within 30 minutes after a stop, and then cause ink to eject once again.

1.2.5 Cautions on operating time when printer is in service

① Caution when daily operating time is relatively short:

If you frequently perform the shutdown procedure,excessive makeup ink enters the printer,therby thinning the ink.

For the stable using,you must keep terms of the graphs.



*1. Example.

If you use JP-K67 ink at 20°C,the IJ printer must eject the ink for one hour or more.

*2. The makeup ink which enter in the IJ printer by automatic cleaning is evaporating naturally, and then the ink becomes initial state.

② Caution when daily operating time is relatively long:

Since the IJ printer jets ink to the work for printing, the outside and inside of print head cover will get dirty with accumulated ink spillage from the work, etc.

To prevent fault in printing due to dirt, periodically check the head cover, and claeen as required.

1.2.6 Print head air purge

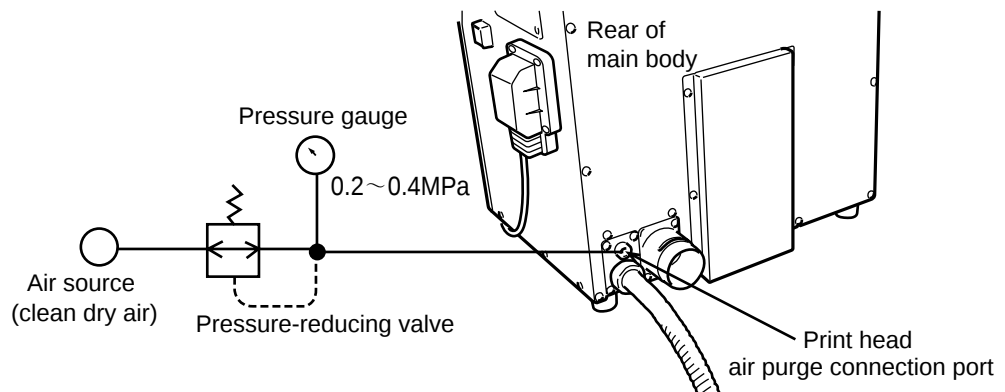
If the makeup ink remains in the electrode section after cleaning or if you use the IJ printer at a high humidity, moisture condensation may occur within the print head, causing leakage from the deflection electrode section. It is also important to remember that dust or splashed ink accumulation on the deflection electrode section may cause leakage. Performing the following air purge procedure for the print head interior is effective in preventing such leakage.

(1) Situations requiring an air purge

- ① When the printer is used in a highly humid place such as a beer or other beverage can line (If you use the printer in an environment in which the relative humidity is 85% or higher, complete the print head air-purge procedure).
- ② When a water drainage blow sequence is performed before printing.
- ③ When the printer is used in a place where a considerable amount of paper powder or other dust exists.
- ④ When the printing distance is short so that the end of the print head is splashed with ink.
- ⑤ When you use the JP-K31A, JP-K60, JP-F63, JP-K68, JP-K70, JP-T71, JP-K77, JP-E78, JP-K84 ink.

(2) Air-purging procedure

Introduce clean dry air into the print head air purge connection port (Rc 1/8 (PT 1/8) × screw) in the rear of the printer main body at a pressure of about 0.2 to 0.4 MPa. If it is possible that the employed air tanks oil or water, turn it into clean dry air with an air filter, micro-mist separator, or the like before introducing it into the printer main body.



Since this is a plastic type, use care to avoid overtightening when using a metal joint to establish a connection.

The maximum tightening torque value is 1.47 N · m.

NOTICE

If the air-purge amount is excessive, print irregularities may occur. After air-purge pressure adjustment, be sure to perform a printing test to verify the printing results.

1.2.7 Heating of ink

- (1) If ambient temperature is under approximately 20°C, the ink is heated by heating unit which established in print head.

If the heating carried out, the time of startup process is prolonged.

Non-heating : approximately 1.5 minutes

Heating : maximum approximately 10 minutes. (changed by ambient temperature)

- (2) If fault of heating unit happens, take care of the following items.

- ① If fault of heating unit happens, the message of "Ink Heating too High" , "Heating Unit Sensor Fault" and "Ink Heating Current Fault" are displayed, and then the IJ printer becomes to stop.

If you pushed **Clear** key, the IJ printer can be operated. However, the IJ printer don't heat the ink since reset.

- ② If "ink non-heating" state is established, the following message allways indicates.

Push the **Close** key, and then contact your local distributor.

===== Ink Temperature Correction Notice =====	
The selected setup does not allow ink temperature corrections to be made.	
Solution	Call your nearest distributor.
Close	

- ③ If the ink is not heated at low temerature, the IJ printer may not be able to print satisfactorily.

When this failure happened, you must establish the excitation voltage again according to "7.13 Excitation Setting Adjustment".

1.2.8 Ink concentration control

- (1) Ink is automatically controlled to maintain optimum concentration for print.

- (2) If fault occurs in the viscosity meter which is used to control ink concentration, take care of the following points:

- ① There are three types of faults for viscometer:

"Viscometer Temperature Sensor Fault", "Viscosity Reading Instability", and "Viscosity Readings Out of Range".

- ② When "Viscometer Temperature Sensor Fault" occurs, the unit will enter fault stop.

Re-start is possible by pressing **Clear** key, but the setting will be changed to status in which the ink concentration control based on the measuring result using viscometer is not performed thereafter.

Once the setting of automatic concentration control is released, every time the power is turned on, the following message will appear. Cancel the message by pressing **Close** key, and be sure to inform nearest your local distributor.

===== No Ink Concentration Control =====	
The current setting have made ink concentration control unavailable.	
Solution	Press [Close].
Close	

- ③ When "Viscosity Reading Instability" or "Viscosity Readings Out of Range" occurs, the unit will not enter fault stop, and print can be continued. However, you should contact nearest your local distributor for inspection.

1.2.9 Gutter cleaning

The IJ printer collects ink not used for printing, from the gutter. At the same time, it sucks in atmospheric gas, dust and other matter from the air. If these substances are mixed with ink in the gutter, undissolved components by the ink or makeup ink may stick to the gutter. If the system is run for 24 consecutive hours without automatic cleaning, these components get accumulated gradually in the gutter. This, together with the ink beam coming into contact with it, may cause such errors as "an error stemming from a dirty head."

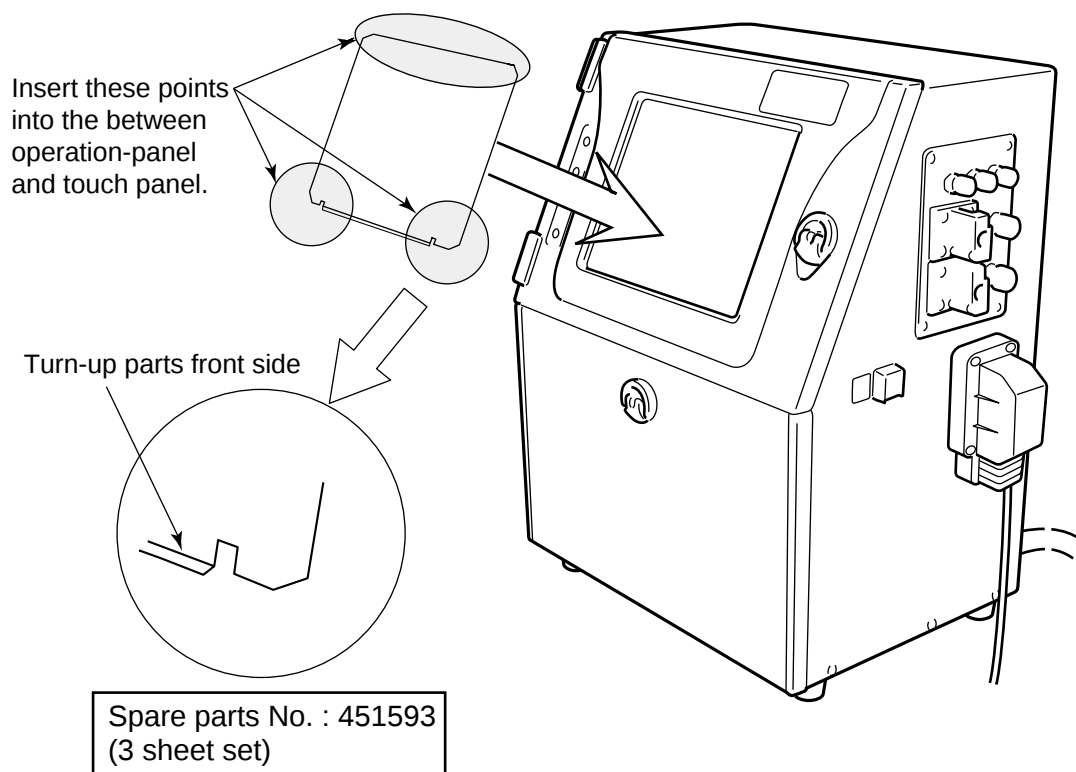
If any such component sticks to the gutter, immerse it in a solution of about 0.5% household dish detergent and clean it for about 10 minutes with an ultrasonic cleaner. The dirt can then be removed.

1.2.10 Protection Sheet for touch panel

(1) Installation of Protection Sheet

- ① Clean up stains, dirt, ink spots on the surface of the touch panel.
Sweep the touch panel using wiping paper steeped by water or make-up ink.
*Make sure the surface of the touch panel dry.
- ② Tear off the back-coat film of the Protection Sheet.
*Keep the back of sheet clean.
- ③ As in the drawing, insert the touch panel protection sheet by two points on the underside into the IJ printer proper, and affix it to the touch panel with the fold facing up.

(See figure)

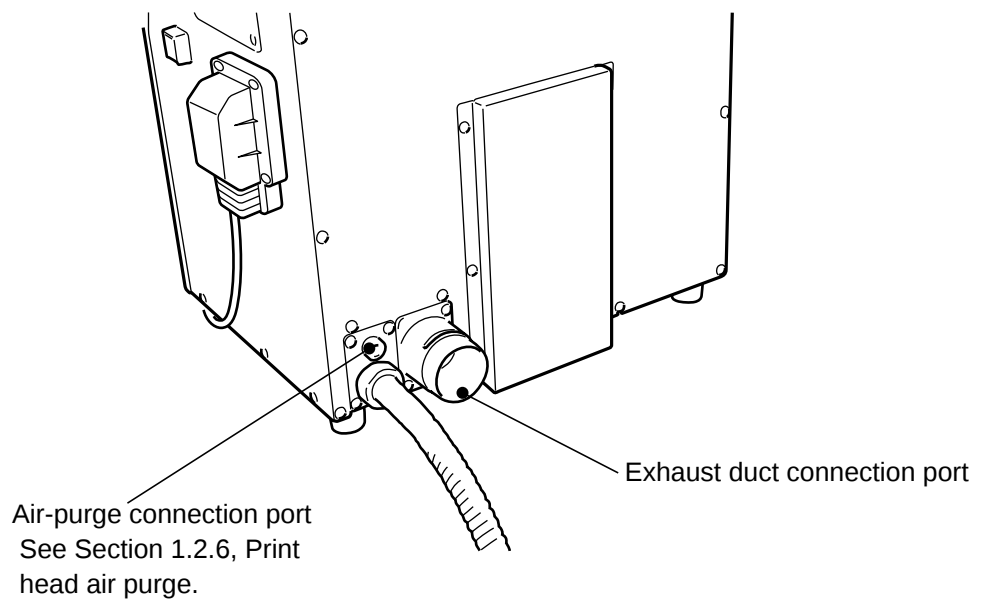
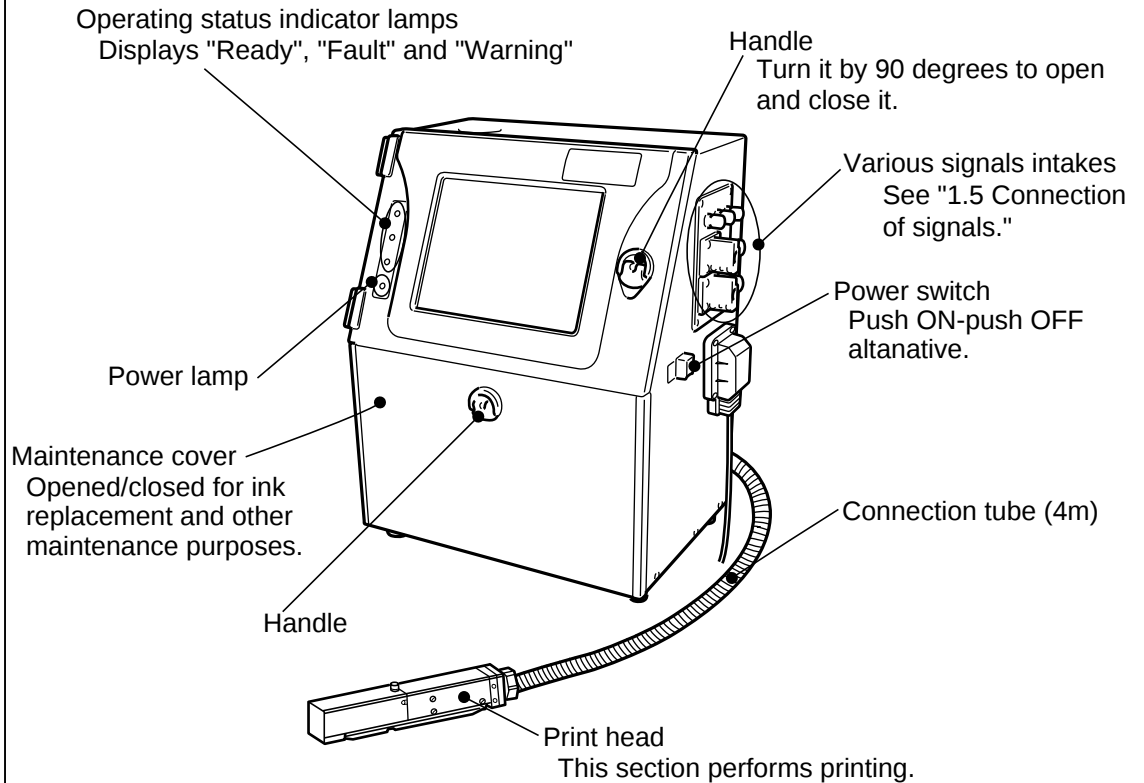


(2) Suggestion for good use

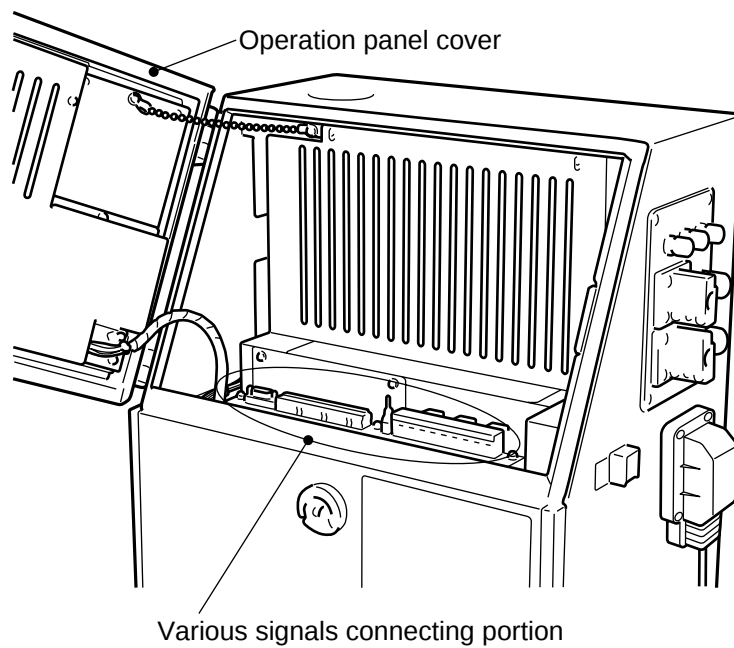
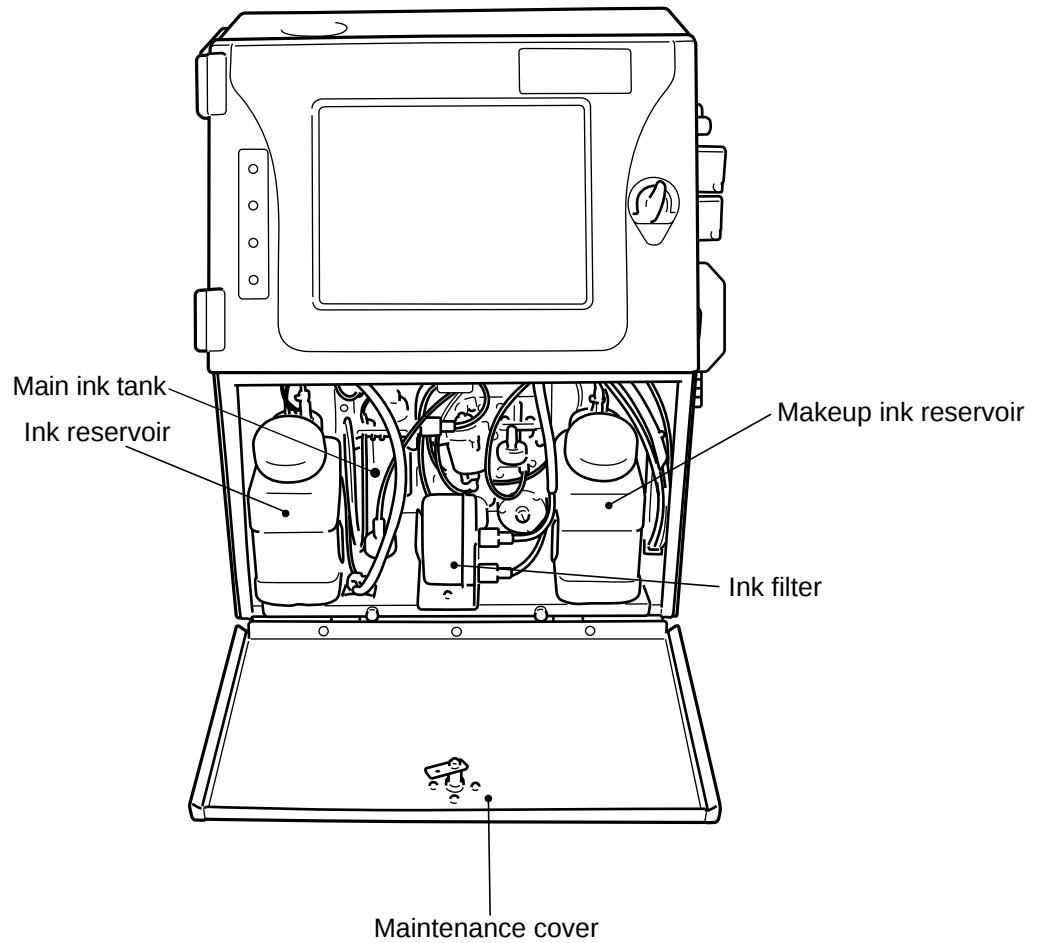
- Do not splash ink and make-up ink on the touch panel.
Sweep immediately when sticking.
- If touch panel protection sheet is not attached correctly, key operation may not be possible.

1.3 Component Names and Functions

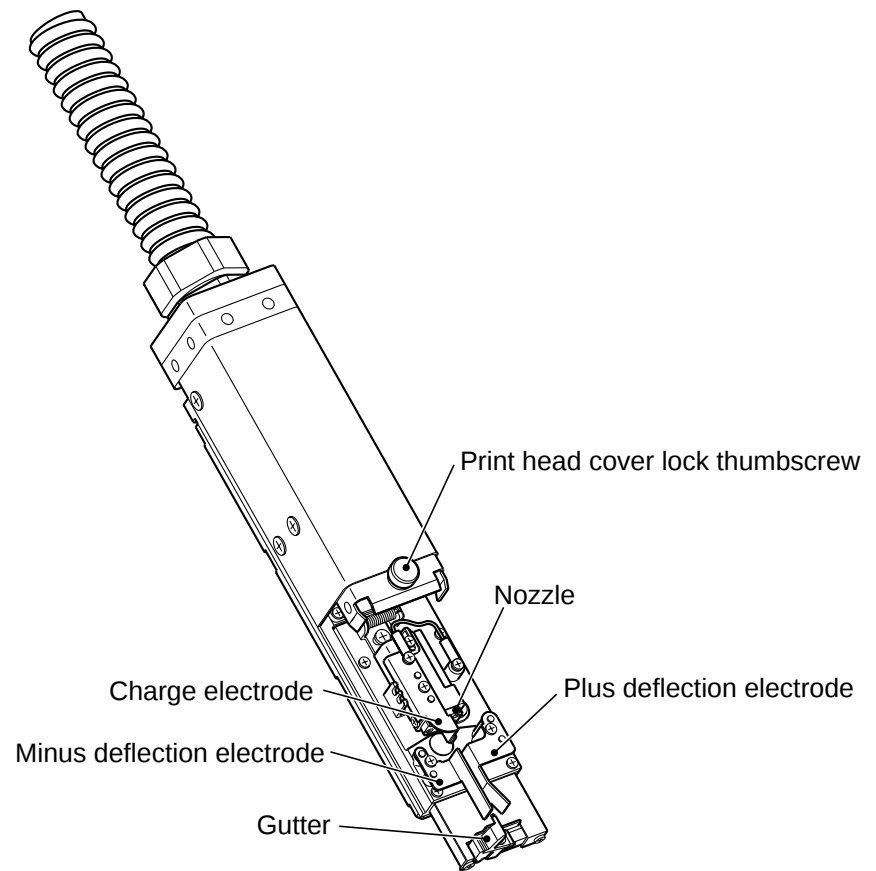
1.3.1 External views



1.3.2 Main body internal parts arrangement



1.3.3 Print head



1.4 Installing Precautions

⚠ WARNING

- Ensure that there is no flame- or arc-generating device within 5 m of the printer.

The ink and makeup ink are both flammable and may cause ignition or fire. Flames can be generated by matches, lighters, cigarettes, heaters, stoves, gas burners, welders, grinders, and static electricity. Arcs may be generated from open-type relays, switches, and brush motors. Before handling the ink and makeup ink, remove electricity from human body, the peripheral equipment, and so on. In the interests of safety, furnish a dry-chemical fire extinguisher near the printer.



- Since the ink and makeup ink contain organic solvents, install the printer at a location where adequate ventilation (air exhaust) is provided.

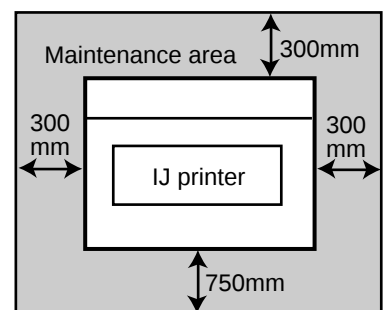
- ① Never install the printer in an enclosed space.
- ② Connect the printer to exhaust equipment in order to prevent the organic solvent vapor from being retained.

⚠ CAUTION

- The employed ink and makeup ink contain organic solvents. Furnish an adequate space for the ink/makeup ink handling area and printer installation site. A space of at least 200 m³ must be provided per print head. Ensure that adequate ventilation is provided. Follow all regulation in your country.



- (1) Provide a clearance around the IJ printer for daily operation, handling, and maintenance access (see the figure at right).
- (2) The print head needs to be cleaned with the makeup ink while the printer is operated and stopped (daily maintenance). Adopt a fixed structure in consideration of print head cover and print head removal.
- (3) Installation must be completed so that no vibration will be applied to the IJ printer main body, print head, or print head cable.
If they are vibrated, print quality deterioration and print irregularity may be incurred (the maximum permissible vibration value is 1.96m/s²).
- (4) The IJ printer main body must be installed with a levelness error of not over $\pm 1^\circ$.
- (5) The IJ printer main body must be electrically insulated from the other equipment (conveyors, packing machines, etc.), photoelectric switches, and the rotary encoder.
- (6) The standard distance between the printing head and the object to be printed on is as indicated in the right-hand table. The smaller the clearance between the print head and print target, the smaller the character height.
- (7) The IJ printer proper requires maintenance as the occasion may demand including replenishment of ink and makeup ink and replacement of filter.



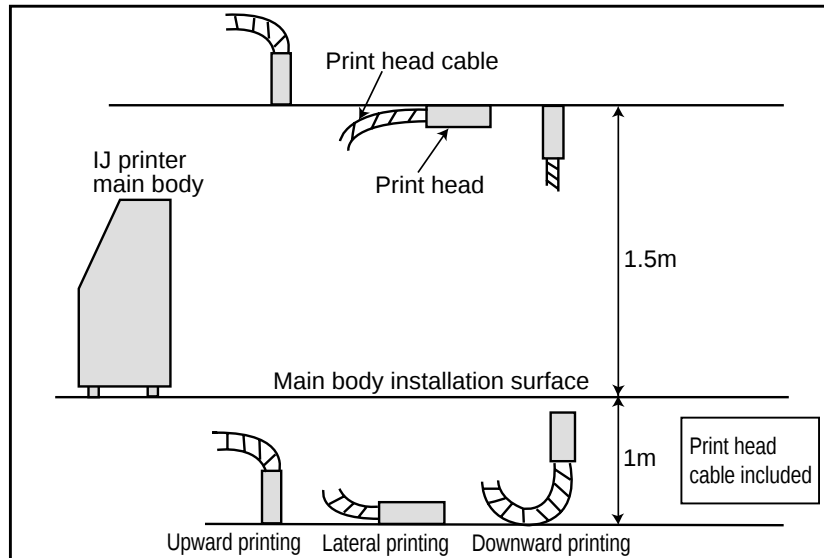
Top view

※ Leave a maintenance area of at least 20 cm for the upside of printer.

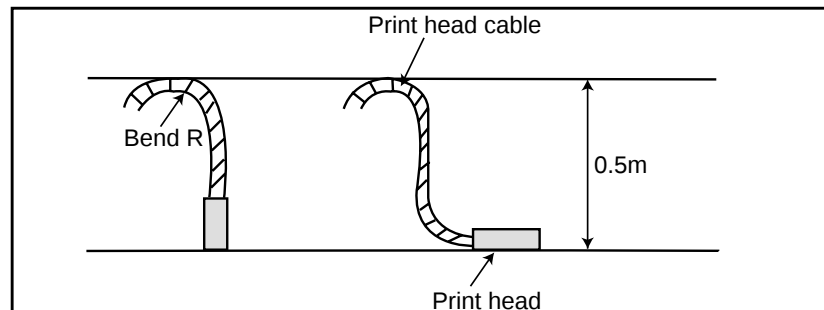
Distance between the printing head and the object to be printed on

Nozzle diameter	Distance
65 μ m	10 to 30mm
40 μ m	5mm
100 μ m	30 to 50mm

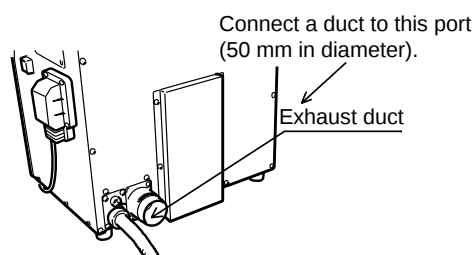
- (8) If ambient humidity is 85 to 90%RH, you must purge inside of print head by air.
It is necessary for dry-clean air, regulator for pressure of air and air filter.
(Quantities of the air are 1L / minutes.)
- (9) When installing the print head and print head cable, comply with the following conditions.
- ① When positioning the end of the print head above the printer main body installation surface, ensure that the distance between the end of the print head and the installation surface does not exceed 1.5 m.
 - ② When positioning the end of the print head below the printer main body installation surface, ensure that the distance between the end of the print head and the installation surface does not exceed 1 m.



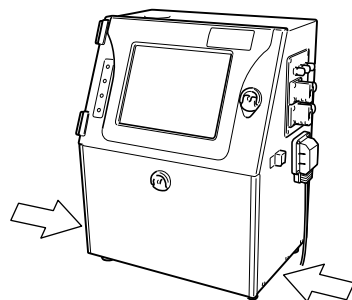
- (10) When using the printer for upward or lateral printing, ensure that the rising print head cable upper end is positioned not more than 0.5 m above the print head.



- (11) If you fixed the print head, ensure that the minimum bend radius of the print head cable is at least 150 mm.
- (12) The ink stream may bend for some reason or other (due, for instance, to dirt).
The facilities positioned in the direction of ink ejection should be partially covered as needed to avoid ink accumulation.
- (13) When connecting an exhaust duct to the printer, install a damper and adjust the wind velocity at the intake port to 0.3 to 0.5 m/s.
(Use an anemometer for verification. If the wind velocity is too high, the makeup ink consumption increases.)



- (14) If you try to fix the print head with a magnetic substance (such as iron), the cover switch will malfunction resulting in an "Cover Open" error.
This, you must only use nonmagnetic resins or metals for fixing the print head.
- (15) In the case of carrying the printer proper, put in your hands from the direction of the arrow in the drawing below.



1.5 Connection of signals

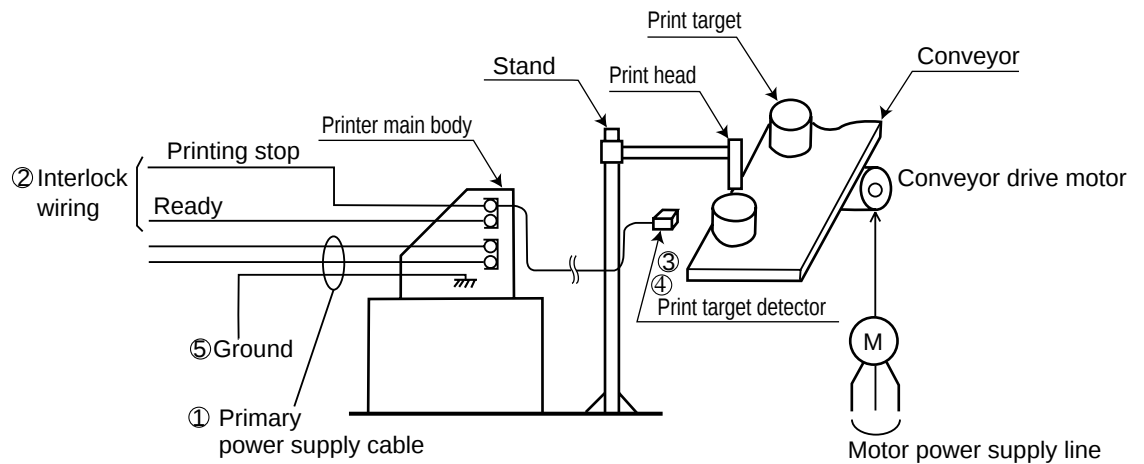
1.5.1 Wiring Precautions

(1) If extraneous noise enters the printer, it may abnormally operate or become defective. For increased noise immunity, observe the following precautions when making wiring connections.

- ① Ensure that the power supply cable connected to the printer is positioned away from the other motive power supply lines (particularly the speed control inverter power supply line).

For best results, they should be routed within respective ducts.

- ② Do not bundle the interlock wiring together with the other motive power lines. Be sure that they are routed separately.
- ③ Electrically insulate the print target detector, print head, stand, and printer main body from the other mechanical devices (conveyors, etc.).
- ④ Ensure that the print target detector wiring is positioned away from the other motive power supply lines.
- ⑤ Ensure that all electrical wiring, connections and grounding comply with applicable codes. (A dedicated ground should be provided if erratic operations are caused by noise or the like.)

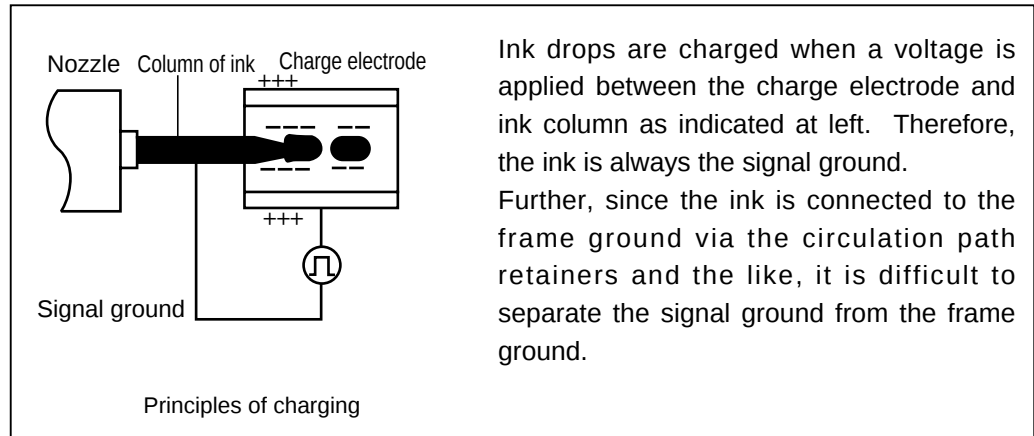


(2) Connection to the power supply

The printer should be connected using a suitable plug and socket outlet which is accessible and close to the equipment, so that power can be quickly disconnected.

(3) Notes on welder welding current

The IJ printer operates with its ink particles electrically charged. Therefore, a signal (weak current) ground and frame ground are connected to it.



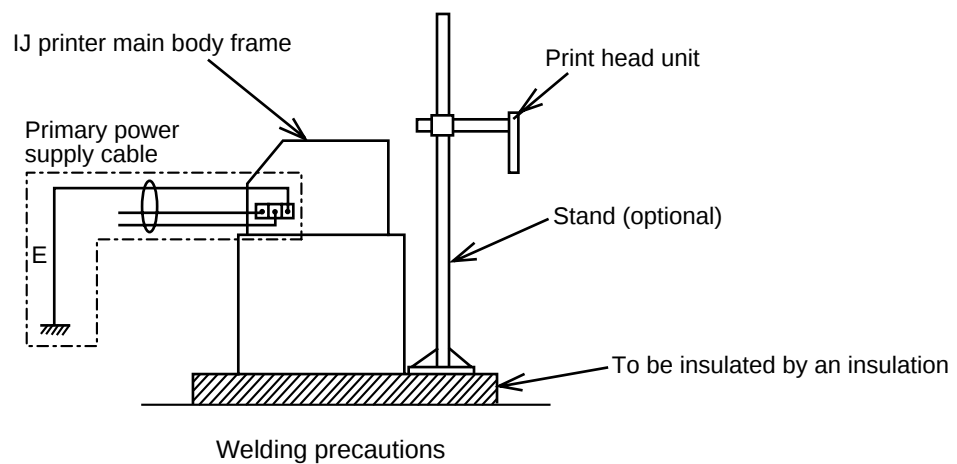
Consequently, when a large current (e.g., welder welding current) flows in from the outside via the frame ground, it also flows to the signal ground and may damage the printed circuit boards.

Therefore, when conducting welding operations near the IJ printer (there must be no flame or arc within 5m of the printer), use the following method.

Method

Insulate the main frame of the IJ printer, print head unit, and print target detector body from the conveyor and earth ground, and provide one-point grounding for the IJ printer ground terminal only.

When this method is employed, welding operations can be conducted even while the IJ printer is running.



⚠ WARNING

- Keep flames at least 5m away from the machine.
The ink and makeup ink are both flammable. Flames generated by welders may cause ignition or fire. Ensure adequate ventilation in order to not be in the fire within 5m of the printer in printing or no-printing.
In the interest of safety, furnish a dry-chemical fire extinguisher near the printer.

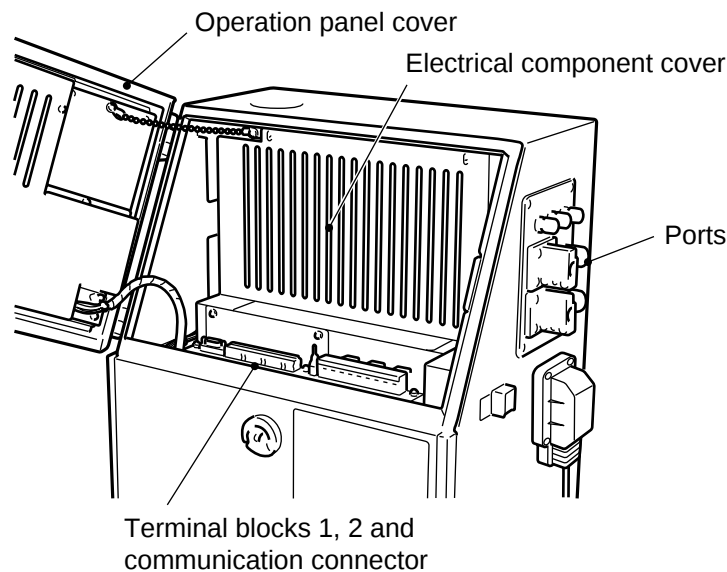


1.5.2 Overview

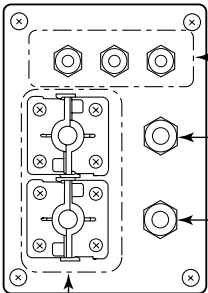
As for wiring of the input-output lines, open the operation panel cover and draw the lines from the ports on the side, and connect them to the external connection terminal blocks 1, 2 and the external communication connector inside.

⚠ Caution

Be sure to turn off the power when performing the wiring.
Keep the operation panel cover closed for normal use.



● Ports



Name	Cable outer diameter range
For print target detector/encoder	φ 3.5 to 7 (M12)
For reciprocative print, printing / print completed, stop printing, online and remote signals	φ 4.5 to 10 (M16)
For ready, fault, warning	φ 4.5 to 10 (M16)
For external communication	φ 3.5 to 10

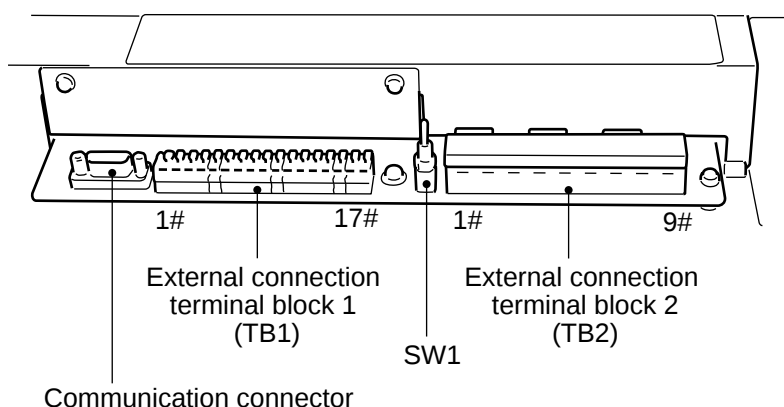
() indicates a tightening nut.

Power switch

⚠ Caution

Use the cables of the outer diameter range specified above. Securely tighten the tightening nuts of the ports.
In addition, do not bundle weak-current and heavy-current signals together inside and outside the equipment so that a weak-current signals (terminal block 1, a connection signal to the external communication connector) will be least influenced by noise from a heavy-current signals (a connection signal to the power supply and the terminal block 2). In particular, the cables for the print target detector, stop printing signals, power supply and printable signals should never be bundled together or wired in the same duct.

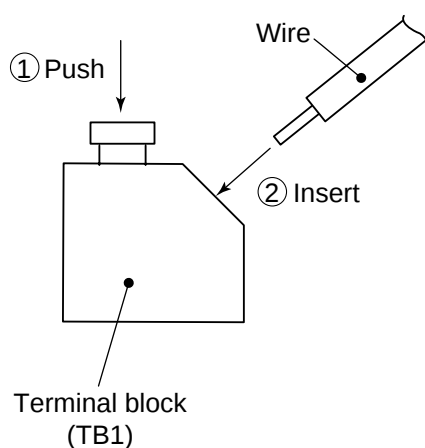
● Layout of connectors for connection



● Connection to the external connection terminal block (TB1)

Pin number	Name	Input/output	Remarks
1	Print target detector power supply	Output	12 VDC; maximum: 80 mA
2	Print target detector	Input	
3	Print target detector ground	—	—
4	Printing stop	Input	
5	Signal ground	—	—
6	Encoder power supply	Output	12 VDC; maximum: 80 mA
7	Encoder signal (totem pole)	Input	Use either one.
8	Encoder signal (open collector)	Input	
9	Encoder ground	—	—
10	Deflection voltage ON/OFF	Input	
11	Reverse direction printing signal	Input	
12	Printing-in-progress/ printing-complete signal	Output	Make a choice with an operating key.
13	Signal ground	—	—
14	Run	Input	
15	Reset (Clear)	Input	
16	Stop	Input	
17	Online	Output	

- Applicable cable size : AWG26 to 14 (ϕ 0.4 to 1.6)
- Wire covering to be stripped : 9mm



UL Notice

Use UL Listed wire with 30V rating or more, 60°C rating or more and VW-1 or FT-1 notation. The length must be 3m or less. When length is 3m or more, use the wire of CL2 or CM grade of the NEC standard. But the power supply line from IJP to the exterior (No. 1 and No. 6 pin of TB1) and connection lines with equipment of a factory (conveyer etc.) can use only the wire of CL2 grade.

● Connection to the external connection terminal block (TB2)

Pin number	Name		Remarks
1	Ready	NC	
2		NO	
3		COM	
4	Fault	NC	
5		NO	
6		COM	
7	Warning	NC	
8		NO	
9		COM	

(NOTE)

NC : Normally closed

NO : Normally open

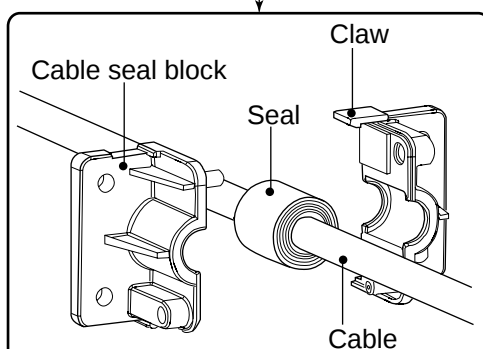
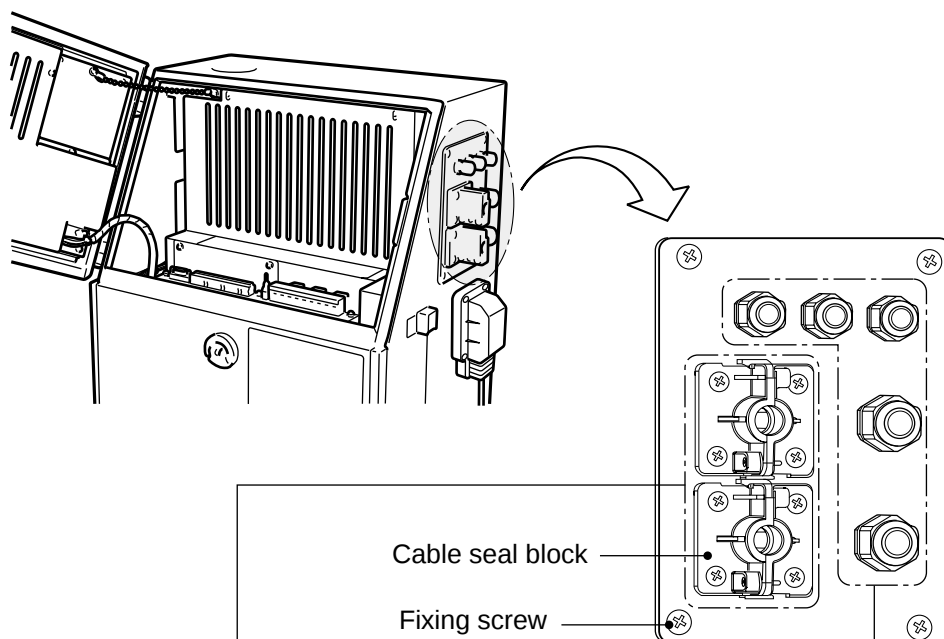
COM : Common

- Terminal specification : M4

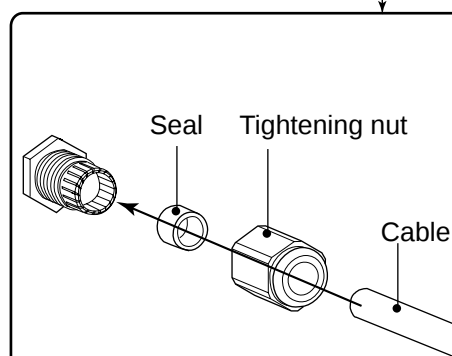
● Connection to the external communication (RS-232C) connector

Pin number	Name	Input/Output	Remarks
1	(NC)	—	Unconnected
2	RD	Input	
3	SD	Output	
4	(NC)	—	Unconnected
5	SG	—	Ground
6	(NC)	—	Unconnected
7	(NC)	—	Unconnected
8	(NC)	—	Unconnected
9	(NC)	—	Unconnected

Notices on connecting the cable



- ① Remove the fixing screw and take the cable seal block off the printer proper.
- ② Remove the claw and divide it.
- ③ Tie the seal around the outside of the cable as in the drawing.
(Tie the seal so that there will be no clearance between it and the cable seal block.)
- ④ Mount it on the printer proper by using a reversed procedure.



- ① Remove the tightening nut.
- ② Put the cable through as in the drawing.
- ③ Tighten the tightening nut.
(Tighten the tightening nut securely by using a tool.)

1.5.3 Connection of various signal

When handling an external signal, be sure to comply with the voltage, current and time described herein.

We cannot guarantee the operation unless it is handled correctly.

1.5.3-1 Ready output signal

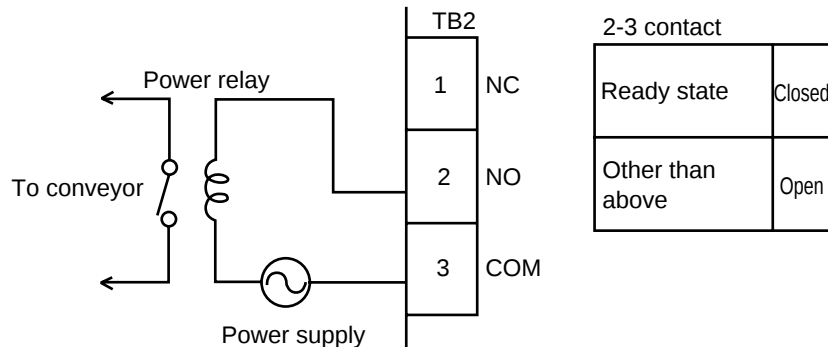
The following describes the wiring of the signal that is outputted to the outside for the purpose of indicating that the IJ printer is ready state.

(To prevent a print target from traveling without being printed, this signal is used, for instance, to stop the conveyor when the IJ printer cannot perform printing.)

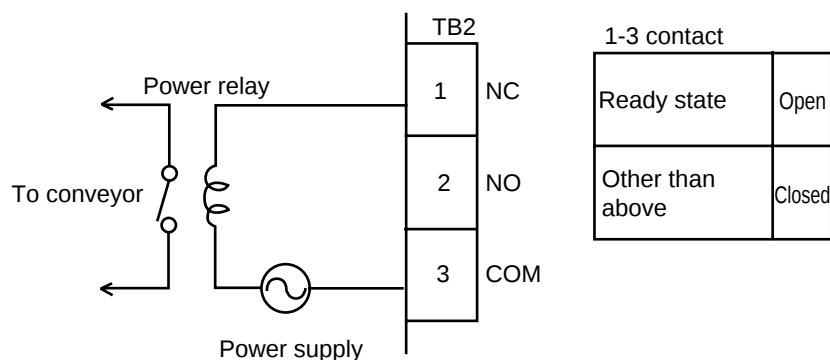
When this signal is connected, set the ready output switch to 3.

(See Section 1.5.4, Using the Ready Output Selector Switch).

(a) When using the NO contact (make contact)



(b) When using the NC contact (break contact)

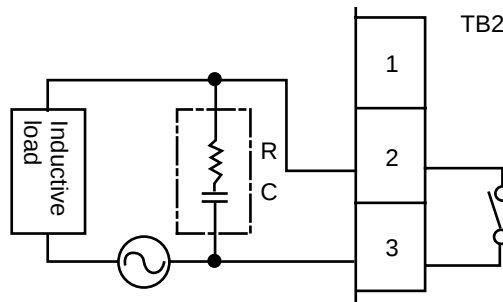


For both the NO and NC contacts, the maximum capacity is 30 VAC/0.5 A or 30 VDC / 1 A. If any load having a greater capacity is used, furnish a separate relay in between.

Further, if a motor, relay, or other inductive load is employed, a counter-electromotive force may be generated to reduce the useful contact life. Therefore, be sure to provide contact protection.

Typical contact protection methods are indicated below.

① Applicable to CR system (AC, DC)



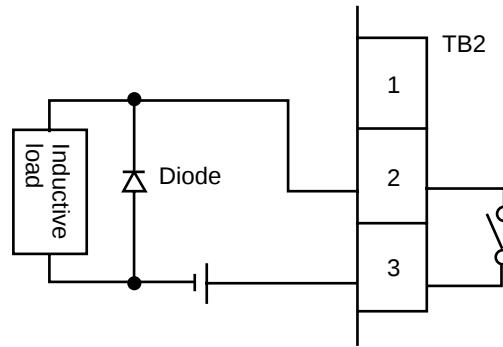
The suggested values for capacitor C and resistor R are as follows.

C: 0.5 to 1 μ F, no polarity

R: 0.5 to 1 Ω per 1 V

The withstanding voltages of the capacitor and resistor must be at least two times as high as the employed voltage.

② Diode system (applicable to DC, inapplicable to AC)

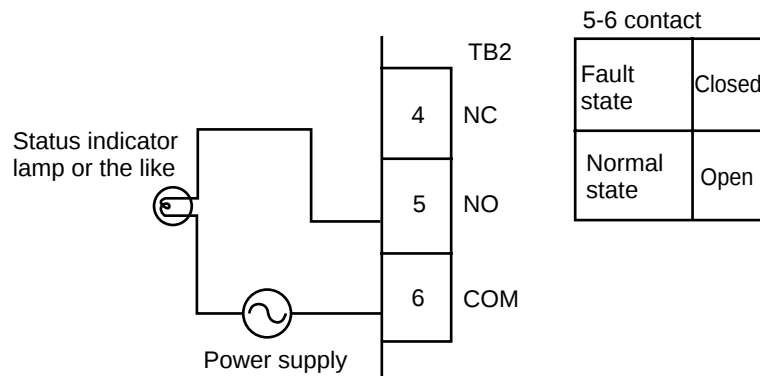


The peak inverse voltage of the employed diode must be at least 10 times as high as the employed voltage, and its forward current must be larger than the load current.

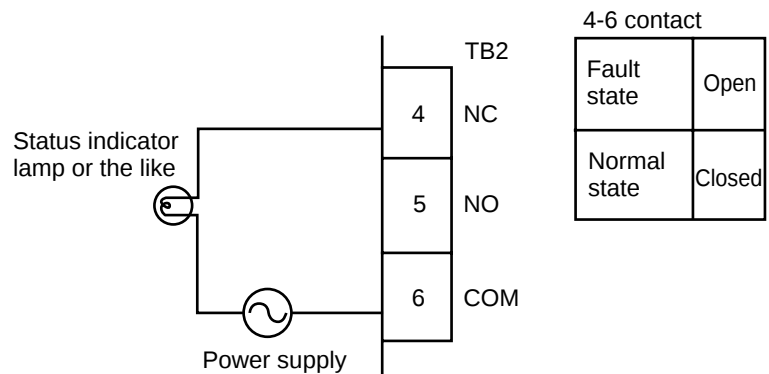
1.5.3-2 Fault signal output

The following describes the wiring of the signal that is outputted to the outside for the purpose of indicating that the IJ printer is in the fault mode.

(a) When using the NO contact (make contact)



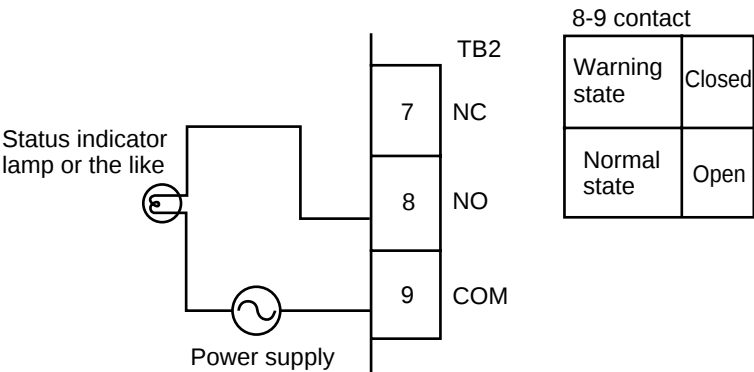
(b) When using the NC contact (break contact)



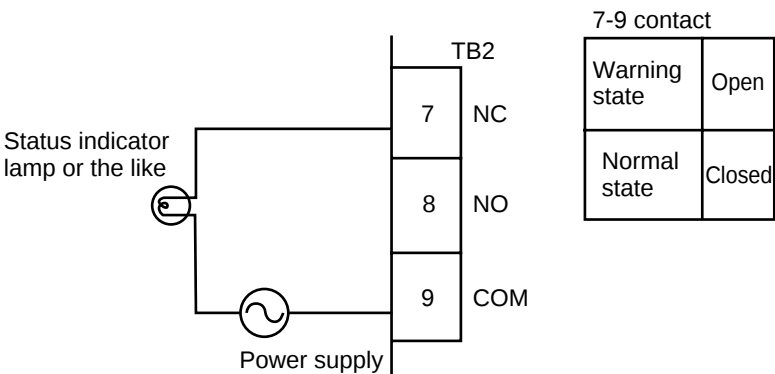
1.5.3-3 Warning signal output

The following describes the wiring of the signal that is outputted to the outside for the purpose of indicating that the IJ printer is in the warning mode.

(a) When using the NO contact (make contact)



(b) When using the NC contact (break contact)



For both the NO and NC contacts, the maximum capacities of the fault and warning condition outputs are 30 VAC/0.5A, or 30 VDC/1 A. If any load having a greater capacity is used, furnish a separate relay in between.

Further, if a motor, relay, or other inductive load is employed, a counter-electromotive force may be generated to reduce the useful contact life. Therefore, be sure to provide contact protection as suggested for the ready output signal wiring.

1.5.3-4 Print target detector

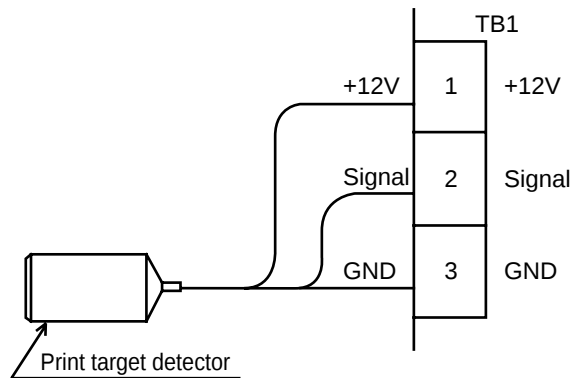
(a) When a dedicated power supply is not used

If the print target detector current consumption is not more than 80 mA, no dedicated power supply is required because adequate power can be supplied from the IJ printer built-in power supply. In such a situation, make wiring connections and perform setup as indicated below.

(i) Print target detector wiring method

Use a print target detector whose output is of a noncontact (transistor) type.

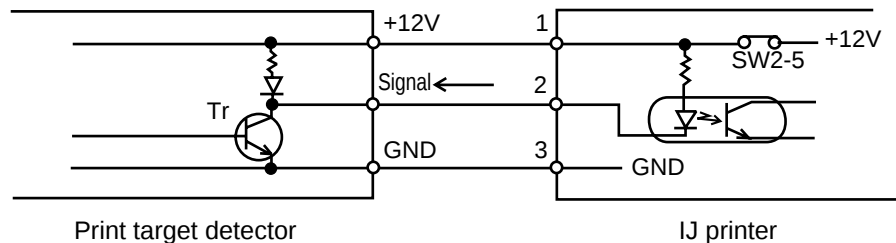
The best suited detector would be an amplifier-incorporated photoelectric sensor that uses an optical beam for print target detection.



When a transmission type is employed, both the light emitter and receptor must be connected in the same manner.

(ii) Print target detector specifications

① Output circuit



The IJ printer input circuit serves as a current-steered load for the print target detector output circuit so that the printing start signal is entered when the print target detector output transistor (Tr) turns ON. Ensure that the employed output transistor (Tr) complies with the following specifications.

- Withstanding voltage : 12 VDC or more
- Maximum drive current : 12 mA or more ($I_L \div 10\text{mA}$)
- Residual voltage : 2 V or less
- Leak current : 0.1 mA or less

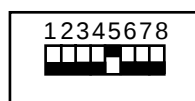
② Power supply specifications

- Supply voltage : DC12V
- Current consumption : 80 mA or less

(iii) Setup procedure

Turn ON switch SW2-5 on the EZJ95 board (terminal).

(Switch 2 is inside the cover. Do not operate it unless you have finished the service education.)

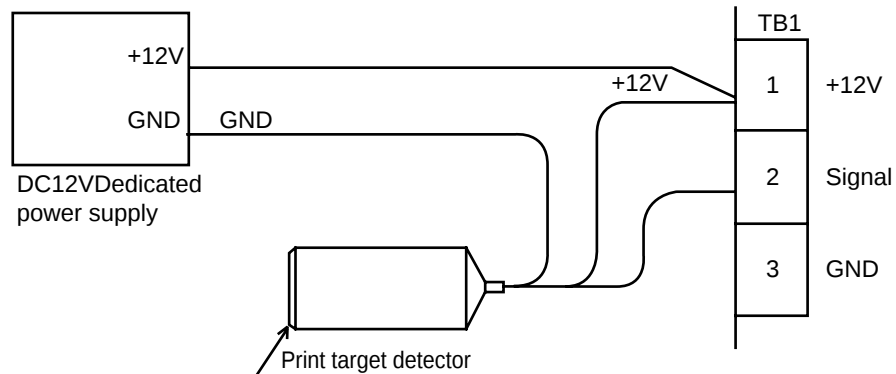


ON
(Switch is black.)
OFF

(b) When a dedicated power supply is used

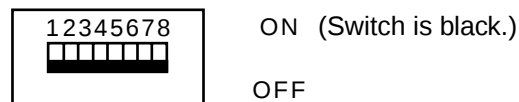
If the print target detector current consumption is more than 80 mA, furnish a dedicated power supply. In this instance, make wiring connections and perform setup as indicated below.

(i) Print target detector wiring method

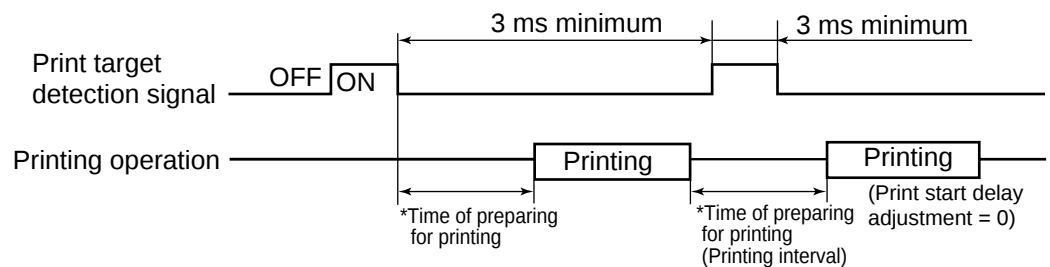


(ii) Setup procedure

Turn OFF switch SW2-5 on the EZJ95 board (terminal).
(Switch 2 is inside the cover. Do not operate it unless you have finished the service education.)



(c) Relationship between print target detection signal and printing operation



* The minimum value for the time of preparing for printing varies with the print dot matrix, calendar setup, and count setup. Approximate time values are indicated in the table below.

Nozzle Size	Approximate Time
65 μ m or 40 μ m	10ms
100 μ m	13ms

The required time is precisely calculated using the following formula. It varies with the pre-selected vertical dot count, character width, and ink drop use percentage.

Time required for preparing for printing = (One-scan time x (N+1)) + K (ms)

One-scan time = $\frac{(\text{vertical dot count} + \text{character width}) \times \text{ink drop use percentage}}{\text{excitation frequency (kHz)}}$ (ms)

N: (Integer that satisfies the equation one-scan time x N) $\geq$ a

K: 3 (ms)

Excitation frequency : 68.9 (In the case of 65 μ m nozzle, JP-K67)

: 90.9 (In the case of 40 μ m nozzle, JP-K67)

: 28.1 (In the case of 100 μ m nozzle, JP-K67)

Nozzle size	a
65 μ m	7
40 μ m	7
100 μ m	10

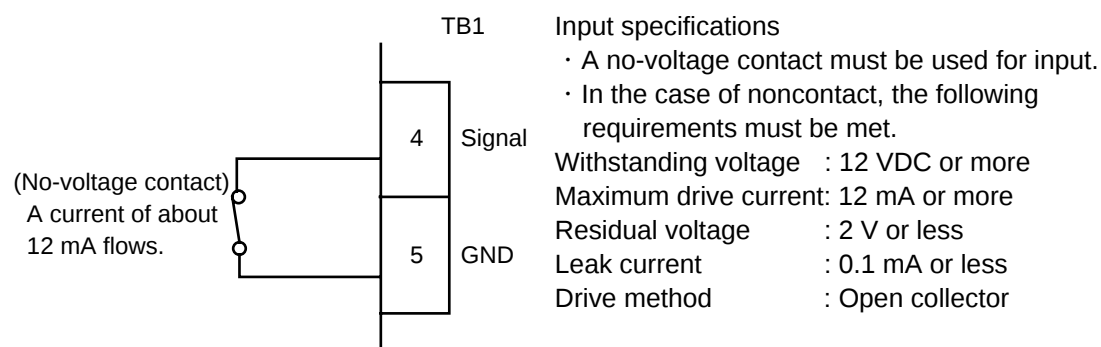
In the case of following speed, **the number of encoder pulses** indicated below is a standard minimum value of a printing space.

$$\text{Minimum time of 1 pulse} = \frac{(\text{vertical dot count} + \text{character width}) \times \text{ink drop use percentage}}{\text{excitation frequency (kHz)}} \text{ (ms)}$$

$$\text{Necessary number of encoder pulses} = \frac{K+a}{\text{Minimum time of 1 pulse}} \times \text{Pulse rate division factor (pulse)}$$

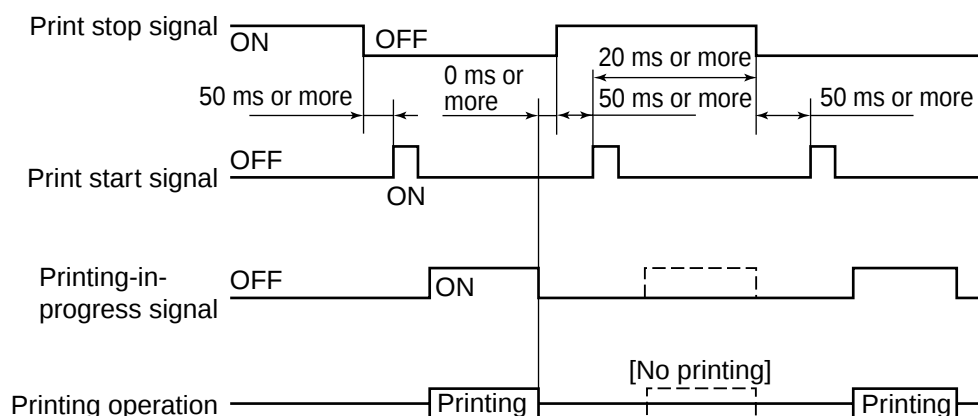
1.5.3-5 Printing stop signal

The following describes the wiring of the signal that is entered from the outside to inhibit printing. (Note that the ready output signal remains unchanged even if this signal is entered from the outside.)



When the input is ON - While the IJ printer is in the ready state, it does not make prints even if the print target detector turns ON. However, if any printing operation is being performed, it does not come to a halt.

When the input is OFF - While the IJ printer is in the ready state, it starts making prints upon print target detector ON.



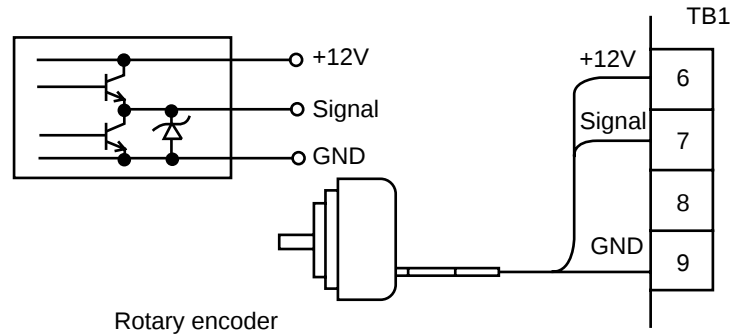
- The signal level is Low in the ON state or High in the OFF state.
- The tracking function cannot be used.
In the tracking mode, the printing stop time cannot be generated by the print stop signal.
- In the continuous print mode, the operation is performed in accordance with the print start signal that is generated inside the IJ printer.

1.5.3-6 Rotary encoder signal

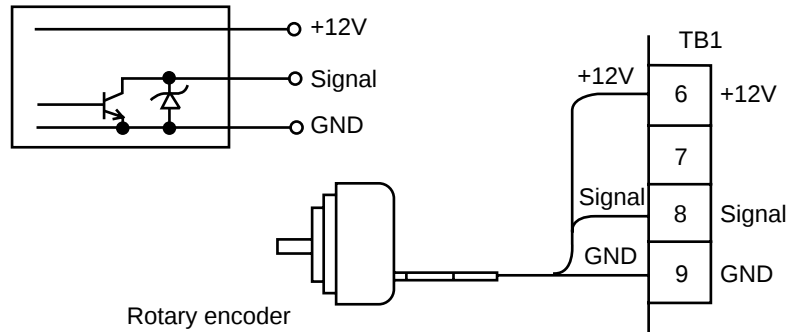
The following shows how to wire the rotary encoder and set up its switch in cases where the product speed matching feature is used.

(a) Wiring

(i) Totem pole output



(ii) Open collector output



- The connectable rotary encoder specifications are as stated below.

Output waveform	: Square wave (duty: within $50 \pm 25\%$)
Output withstanding voltage	: 12 VDC or more
Load current	: 12 mA or more
Leak current	: 0.1 mA or less
Supply voltage	: 12 VDC
Current consumption	: 80 mA or less

(b) Setup

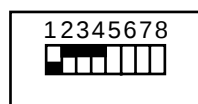
- From the print specifications screen, specify whether or not to enable the product speed matching feature.

(See Section 3.4, Setting Character Height and Character Orientation).

- See the table below and set up switch SW2 on the EZJ95 board (I/O) in accordance with the rotary encoder output type.

(Switch 2 is inside the cover. Do not operate it unless you have finished the service education.)

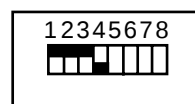
SW2	1	2	3	4
Output type				
Totem pole	OFF	ON	ON	ON
Open collector	ON	ON	ON	OFF



(Totem pole)

ON

OFF



(Open collector)

ON

OFF

(Switch is black.)

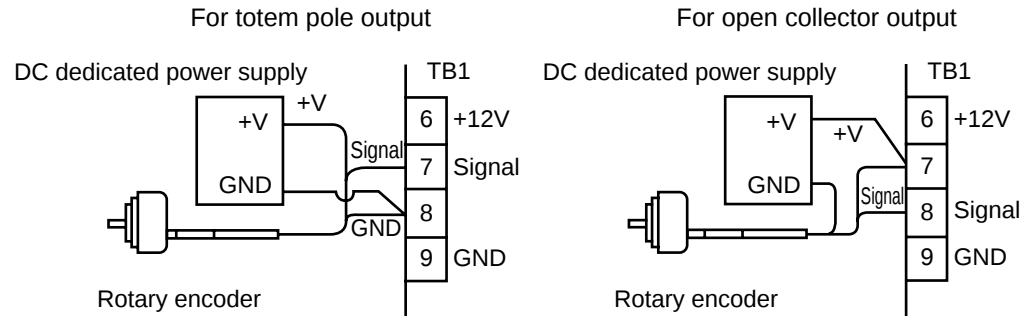
- (iii) From the print specifications screen, set the character width as shown in the following table (the setting varies with the ink drop use percentage).

Ink drop use percentage setting	Character width setting
1/1	002
1/2	001
1/3 ~ 1/16	000

NOTE: For the 40 μ m nozzle version, an ink drop use percentage of 1/1 cannot set.
(See Section 3.4 Setting Character Height and Character Orientation.)

(c) Wiring for dedicated power supply use

If the rotary encoder current consumption exceeds 80 mA or a 24 VDC type rotary encoder is used, furnish a dedicated power supply and make wiring connections as indicated below.



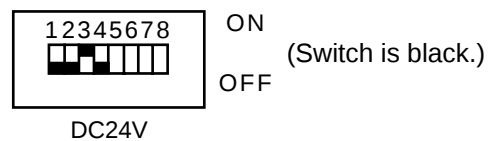
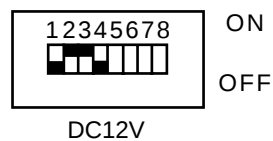
(d) Setup for dedicated power supply use

In the same manner as in cases where no dedicated power supply is used, refer to step (b)-(i) above and specify whether or not to enable the product speed matching feature.

See the table below and set switch SW2 on the EZJ95 board (I/O board) in accordance with the supply voltage (12 VDC or 24 VDC). In this instance, the same setup applies to the totem pole output and open collector output.

(Switch 2 is inside the cover. Do not operate it unless you have finished the service education.)

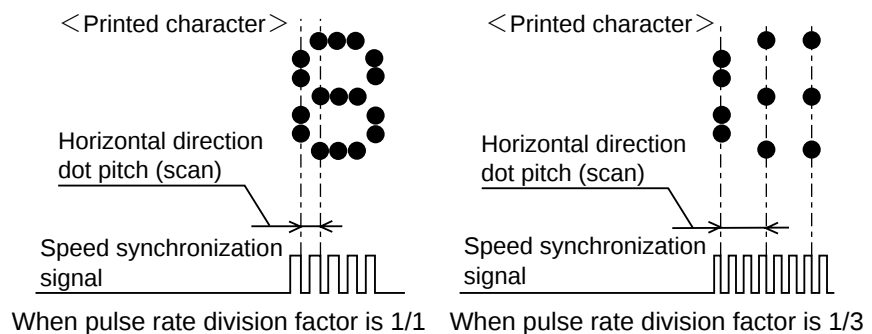
SW2	1	2	3	4
Supply voltage				
DC12V	OFF	ON	ON	OFF
DC24V	OFF	OFF	ON	OFF



(e) Setting the rotary encoder pulse count and pulse rate division factor

When the rotary encoder is used, prints are made by conducting one scan after another in accordance with the speed synchronization signal from the rotary encoder and the pulse rate division factor (see the figure below).

To assure fixed character width, it is necessary to install the rotary encoder in such a manner that the speed synchronization signal varies in proportion to the print target transport speed.



- The printing scan count maximum value is dependent on the printed character width and conveyor maximum speed and calculated using the following equation. Substitute the nozzle diameter suited for the model you are using for item d.

$$\text{Printing scan count maximum value[kHz]} = \text{conveyor maximum speed[m/min]} \times \frac{1}{60} \times \frac{\text{horizontal dot count} - 1}{\text{character width[mm]} - d[\text{mm}]} \dots\dots(\text{Equation 1})$$

nozzle diameter	d
65 μ m	0.3
40 μ m	0.2
100 μ m	0.5

- Using Equation 2, check whether the printing scan count maximum value determined by Equation 1 can be followed by the IJ printer printing speed.

$$\frac{\text{Excitation frequency(f)}}{(\text{Vertical dot count} + \text{character width setting} + 1) \times (\text{ink drop use percentage})} [\text{kHz}] > \text{printing scan count maximum value[kHz]} \dots\dots(\text{Equation 2})$$

- The excitation frequency (f) value varies with the ink type employed.

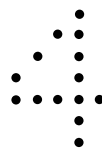
Ink Type	Excitation frequency		
	65 μ m Nozzle Machine	40 μ m Nozzle Machine	100 μ m Nozzle Machine
JP-K26	68.9kHz	—	28.1kHz
JP-K27	68.9kHz	90.9kHz	—
JP-R27	68.9kHz	—	28.1kHz
JP-B27	68.9kHz		
JP-G27	68.9kHz		
JP-K28	68.9kHz		
JP-K31A	68.9kHz		
JP-K33	74.0kHz	90.9kHz	—
JP-Y37	68.9kHz		28.1kHz
JP-K60	68.9kHz	—	—
JP-K61	68.9kHz	90.9kHz	
JP-K62	68.9kHz		
JP-F63	68.9kHz	—	
JP-T64	68.9kHz		
JP-K65	68.9kHz	80.0kHz	
JP-R65	68.9kHz	—	
JP-K67	68.9kHz	90.9kHz	
JP-K68	68.9kHz		
JP-K69	68.9kHz		
JP-K70	68.9kHz	—	—
JP-T71	68.9kHz		
JP-K72	68.9kHz	90.9kHz	28.1kHz
JP-T75	68.9kHz	—	—
JP-R76	68.9kHz		
JP-K84	68.9kHz	90.9kHz	
JP-K77	68.9kHz	—	—
JP-E78	68.9kHz		
JP-F80	68.9kHz		
JP-K81	68.9kHz		
JP-B82	68.9kHz		
JP-K86	68.9kHz		
JP-K87	68.9kHz		

- Ink drop use percentage: This must be set up from the print specifications screen (see Section 3.4, Setting Character Height and Character Orientation).
- The number of speed synchronization signal pulses from the rotary encoder is dependent on the printing scan count and pulse rate division factor and calculated using the following equation.

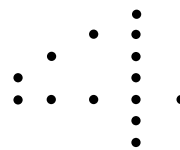
$$\text{Number of speed synchronization signal pulses[kHz]} = \frac{\text{printing scan count[kHz]}}{\text{pulse rate division factor (1/n)}} \dots\dots(\text{Equation 3})$$

The pulse rate division factor (1/n) must be set up from the print specifications screen. (See Section 3.4, Setting Character Height and Character Orientation).

- If the calculation result derived from Equation 2 is smaller than the printing scan count maximum value (Equation 1), the product speed matching feature does not work normally so that the character width is increased. In such an instance, lower the conveyor maximum speed as needed so that the printing scan count maximum value is smaller than the calculation result of Equation 2.



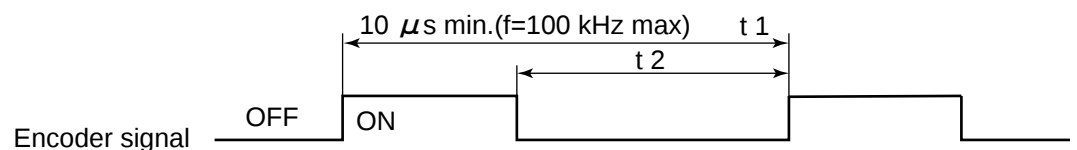
Normal



Character width increased

- When the rotary encoder is used, you cannot change the IJ printer character width. If it is necessary to change the character width, you have to install an appropriate device that will permit you to vary the ratio between the conveyor speed and rotary encoder speed synchronization signal pulse count.

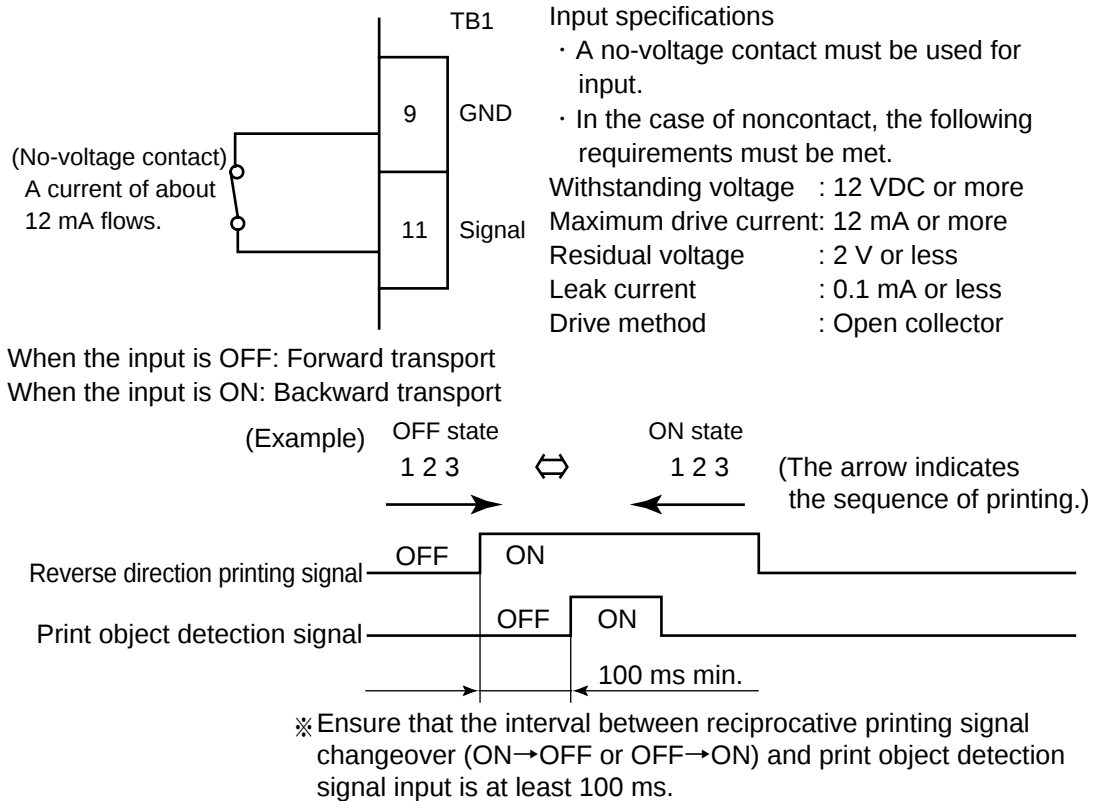
(f) Encoder signal limitation



See that the duty is between 30% and 70%. $\text{Duty} = \frac{t_2}{t_1} \times 100\%$

1.5.3-7 Reciprocative printing signal (input)

The following shows the connection terminal for the signal that delivers instructions for a change in the order of characters to be printed.

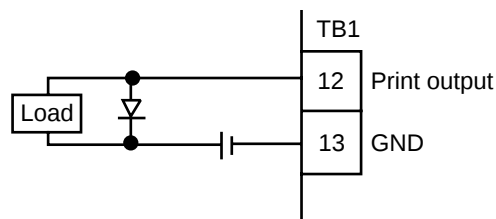


Operation when changing the correspondence between signal ON/OFF and printing direction:
 (See "4.2 Setting up User Environment")

1.5.3-8 Print output signal (output)

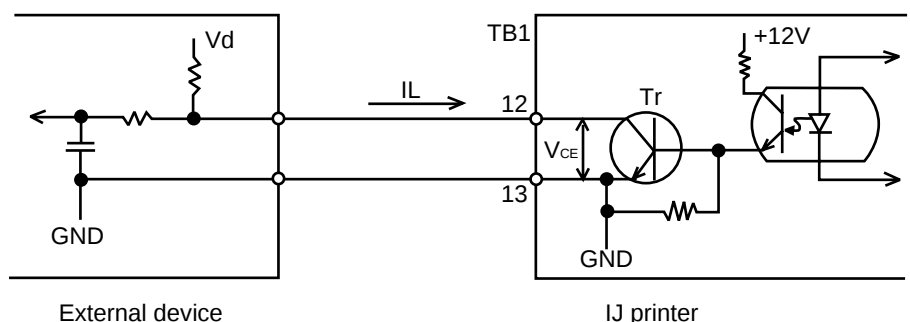
The following shows the wiring of the signal that is outputted when a printing operation is being conducted or completed by the IJ printer.

(a) Wiring



- If a relay, solenoid, or other inductive load is employed, connect a counter-electromotive force generation prevention diode in parallel with the load.
- The load circuit is for DC only. It cannot be used with an AC load.

Output specifications



- The output transistor (Tr) is of an open collector type. It operates as indicated below.
 While printing is performed (printing-completed signal ON) : Tr ON
 While no printing is performed (printing-completed signal OFF) : Tr OFF

- The voltage and current used by the external device must meet the following specifications.

$$I_L \leq 20\text{mA} \quad (V_{CE} : \text{TYP}0.6\text{V}, \text{MAX}2\text{V})$$

The I_L maximum permissible current is 50 mA.

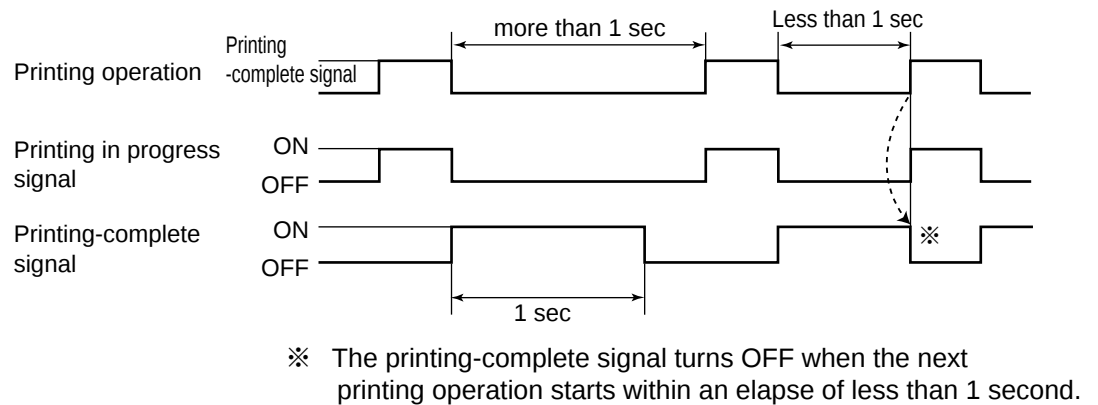
$$V_d \leq \text{DC}30\text{V}$$

(b) Changeover between printing-in-progress and printing-complete

Perform printing-in-progress/printing-complete signal changeover setup from the user environment setup screen.

(See Section 4.2, Setting the User Environment).

(c) Signal timing

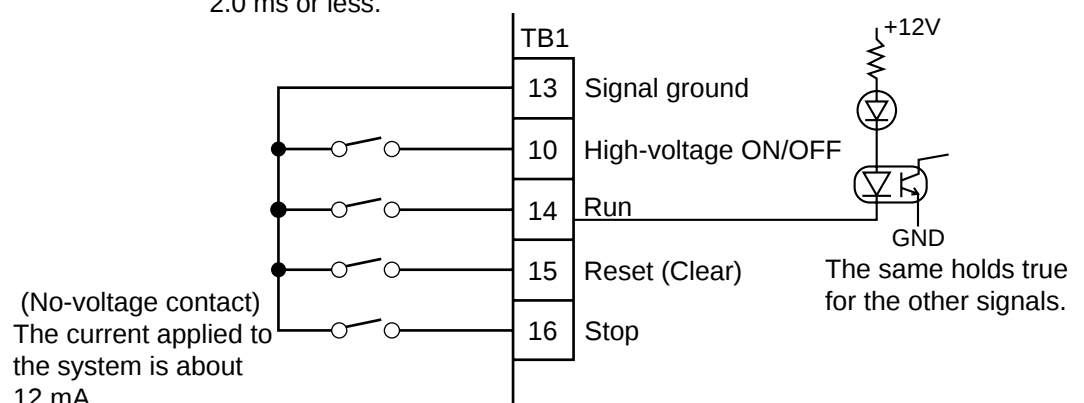


1.5.3-9 Input for remote control signals

These connection terminals enter actions corresponding to the run-state operation keys of the IJ printer (Run, Stop, fault Clear, and Deflection Voltage Control (switchover between a standby state and a ready state), by means of external switches, contact signals, or something similar.

(a) Input specifications

- Make inputs by no-voltage contacts.
- In the case of no-contact, use terminals that satisfy the following requirements:
 - Withstanding voltage: 12 VDC or more
 - Maximum driving current: 12 mA or more
 - Residual voltage: 2 V or less
 - Leak current: 0.1 mA or less
 - Driving method: Open collector
- In the case of contact signal
 - In the case of the chattering when contact is ON or OFF, use terminals of 2.0 ms or less.

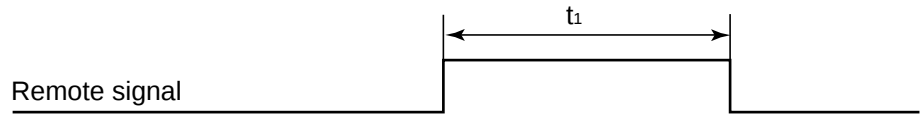


- When all input contacts are ON, the system runs in the same manner as when the Run, Clear, Stop, or Deflection Voltage Control key is pressed.

(b) Judgement conditions

(b-1) Remote signals in general

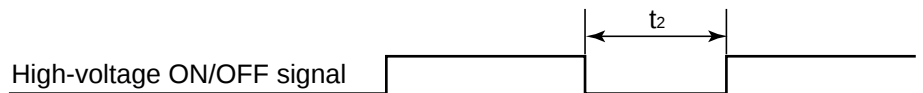
- ① The ON duration of the remote signal is 100 ms or more.



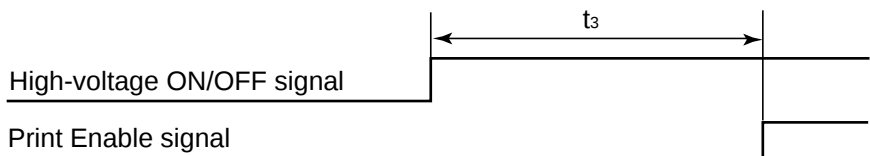
- ② Don't turn on multiple remote signals at a time.
If multiple signals are turned on, they cannot be accepted.
- ③ In the following cases, no signal is accepted.
- ① The confirmation window is open.
 - ② The circulation control screen is opened by the maintenance function.
 - ③ The touch screen setup screen is opened by the auxiliary function.

(b-2) "High-voltage ON/OFF signal"

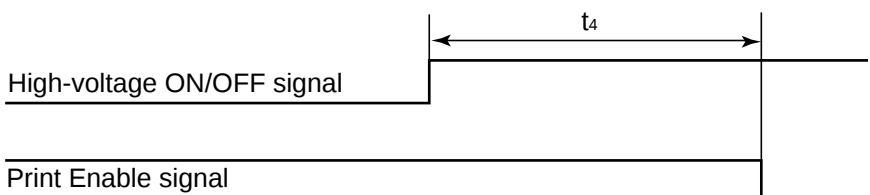
- ① For inputting the "high-voltage ON/OFF signal" in succession, a certain OFF duration is required. When t_2 is 10 ms or less, the OFF status is not detected and the signal cannot be accepted.



- ② The time t_3 from an input of "high-voltage ON/OFF signal" till a change of statue is 3 seconds or less. (Standby -> Print Enable)



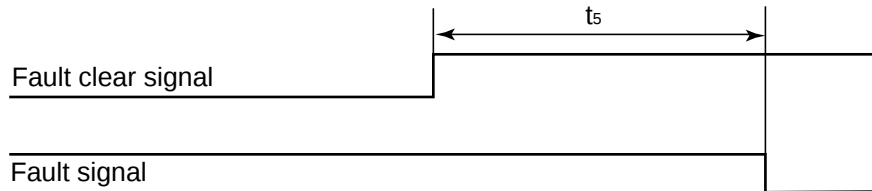
t_4 is 100ms or less. (Print Enable -> Standby)



- ③ For turning on the "high-voltage ON/OFF signal", the status must be confirmed beforehand. If the "high-voltage ON/OFF signal" is turned on by mistake during printing, this printing, which may be in progress, is aborted and the print enable status is switched over to the standby status.
For prevention against a print error, input a signal in the status where printing is not in progress.
- ④ If you want to change the contents of print when the product speed matching function is used and the transfer is stopped during printing, this signal permits switching the status over to the standby status to allow you to change the contents of print.

(b-3) "Fault clear signal"

- ① Input this signal when the fault signal is ON.
After inputting the signal, make sure that "Fault" has been cleared.
- ② Turn on the "fault clear signal" after the lapse of 30 seconds or more after turning on the power supply of the IJ printer.
- ③ The time t_s from an input of "fault clear signal" till clearing the error is 100 ms or less.

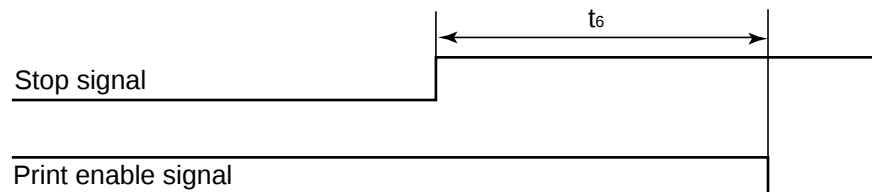


(b-4) "Operation signal"

- ① The "operation signal" is an instruction signal that automatically causes operations to be performed up to an ink jet.
- ② If the "operation signal" is turned on during ink stop processing, it will be ignored.
- ③ Turn on the "operation signal" after the lapse of 30 seconds or more after turning on the power supply of the IJ printer.
After making sure that "Fault" has been cleared, input the signal.
The time from turning on the "operation signal" till a print enable status is about 2 minutes.

(b-5) "Stop signal"

- ① After making sure that the IJ printer is put into a pause by turning on the "stop signal", turn off the power supply.
The time from turning on the "stop signal" till a pause status is about 3 minutes.
- ② The time t_s from an input of "stop signal" till a change of status is 100 ms or less.



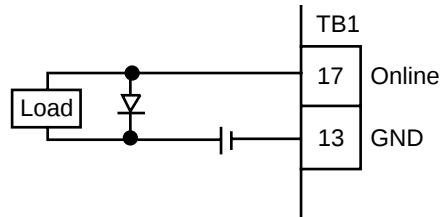
(Cautions)

- (1) When using key inputs, you must check each input. However, when inputting external signals, the equipment executes processing in accordance with instructions of these signals. In particular, the "operation" (operation signal) instructs an ink jet. So take extreme care in handling this signal.
- (2) When the confirmation window appears, every remote signal input is invalidated. After closing the confirmation window, input each signal once again.
When Line monitor is displayed, all remote operation signals will be disabled.
- (3) When each of the touch screen setup screen and the circulation control screens appears, every remote operation signal input is invalidated. After displaying a different screen, input each signal once again.
- (4) When the conveyor is stopped during printing by using the rotary encoder, the remote operation signal is valid.
- (5) In the case of inputting a stop signal while the fault window is open, the ink stops with the window remaining open.

1.5.3-10 Online signal output

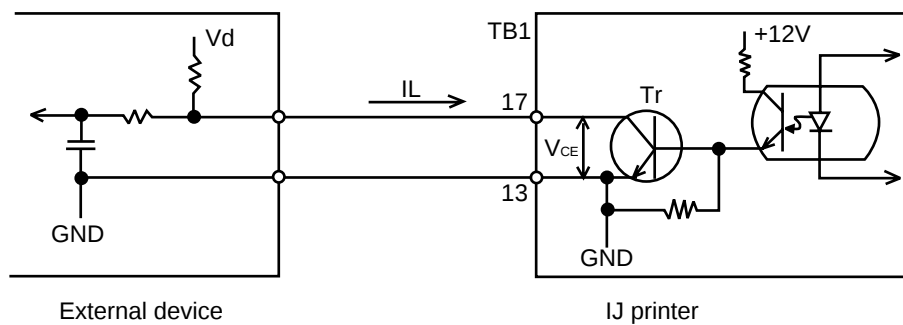
Connection of signals outputted to the outside when the IJ printer is online

(a) Wiring



- If a relay, solenoid, or other inductive load is employed, connect a counter-electromotive force generation prevention diode in parallel with the load.
- The load circuit is for DC only. It cannot be used with an AC load.

Output specifications



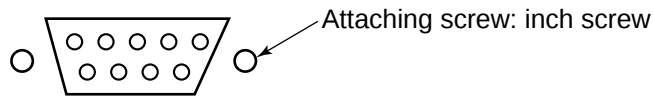
- The output transistor (Tr) is of an open collector type. It operates as indicated below.
 Online : Tr ON
 Offline : Tr OFF
- The voltage and current used by the external device must meet the following specifications.
 $IL \leq 20\text{mA}$ (V_{CE} : TYP0.6V, MAX2V)
 The IL maximum permissible current is 50 mA.
 $V_d \leq \text{DC}30\text{V}$

1.5.3-11 External communication (RS-232C)

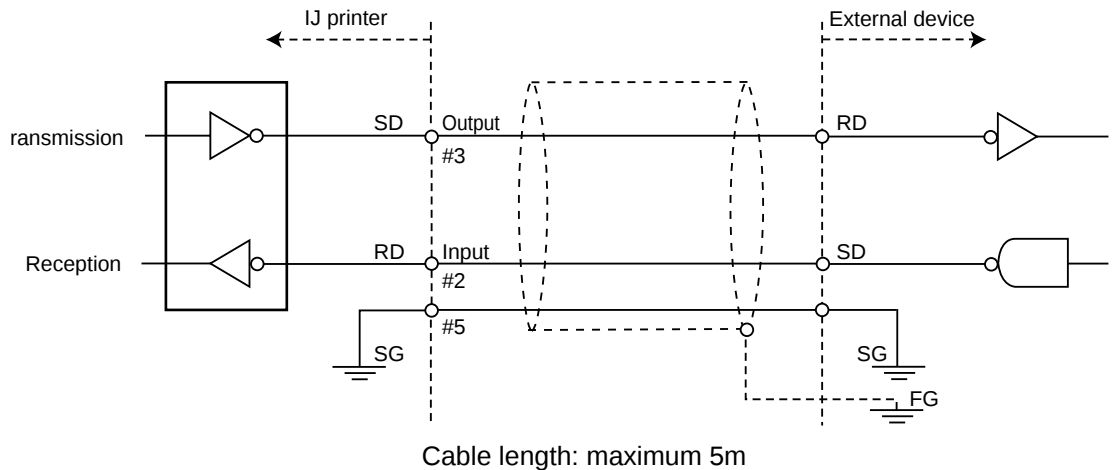
External equipment is connected to the IJ printer by serial communication of RS-232C.

(a) Wiring

Pin number	Name	Input/Output	Remarks
1	(NC)	—	Unconnected
2	RD	Input	
3	SD	Output	
4	(NC)	—	Unconnected
5	SG	—	Ground
6	(NC)	—	Unconnected
7	(NC)	—	Unconnected
8	(NC)	—	Unconnected
9	(NC)	—	Unconnected



Substrate side connector: 9-pin D sub-connector (plug)

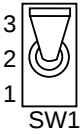
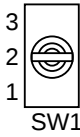


⚠ Caution

- Do not connect any signal other than #2, #3 and #5 since it is not used.
- Do not bundle it together with heavy-current signals inside and outside the equipment so that it will not be influenced by noise from a heavy-current signals (a connection signal to the power supply and the terminal block 2).
- Use a cable which is as short as possible.

1.5.4 Using the Ready Output Selector Switch

The ready output selector switch (SW1) is used to enable or disable the ready signal output (see under "1.5.3-1 Ready output signal").

Switch setting	Ready output status																	
 SW1	When this setting is employed, the ready output signal is enabled. The path between the TB2 terminals opens or closes depending on whether the IJ printer is ready.																	
	<table border="1"> <tr> <th></th><th colspan="2">Ready state</th><th colspan="2">Not-ready state</th></tr> <tr> <td>TB 1-3 contact</td><td>Open</td><td>1-3 contact</td><td>Closed</td><td></td></tr> <tr> <td>TB 2-3 contact</td><td>Closed</td><td>2-3 contact</td><td>Open</td><td></td></tr> </table>		Ready state		Not-ready state		TB 1-3 contact	Open	1-3 contact	Closed		TB 2-3 contact	Closed	2-3 contact	Open			
	Ready state		Not-ready state															
TB 1-3 contact	Open	1-3 contact	Closed															
TB 2-3 contact	Closed	2-3 contact	Open															
 SW1	When the NC contact (break contact) is used, the ready output signal is disabled. The path between the TB2 terminals opens as shown in the table at right no matter whether the IJ printer is ready.																	
	<table border="1"> <tr> <th></th><th colspan="2">Ready state</th><th colspan="2">Not-ready state</th></tr> <tr> <td>TB 1-3 contact</td><td>Open</td><td>1-3 contact</td><td>Open</td><td></td></tr> </table>		Ready state		Not-ready state		TB 1-3 contact	Open	1-3 contact	Open								
	Ready state		Not-ready state															
TB 1-3 contact	Open	1-3 contact	Open															
 SW1	When the NO contact (make contact) is used, the ready output signal is disabled. The path between TB2 terminals 1 and 3 opens and the path between TB2 terminals 2 and 3 closes as shown in the table at right regardless of whether the IJ printer is ready.																	
	<table border="1"> <tr> <th></th><th colspan="2">Ready state</th><th colspan="2">Not-ready state</th></tr> <tr> <td>TB 2-3 contact</td><td>Closed</td><td>2-3 contact</td><td>Closed</td><td></td></tr> </table>		Ready state		Not-ready state		TB 2-3 contact	Closed	2-3 contact	Closed								
	Ready state		Not-ready state															
TB 2-3 contact	Closed	2-3 contact	Closed															



2. Basic Operating Procedures

2.1 Startup

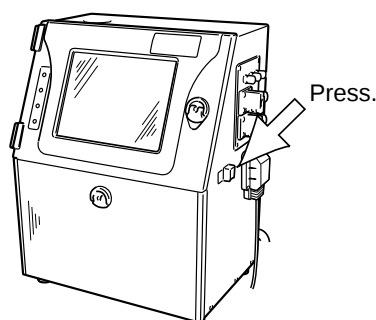
2.1.1 Starting an operation

⚠ CAUTION

- The ink and makeup ink employed contains organic solvents. When handling them, wear protective gloves and safety goggles to avoid direct skin contact.
- A touch key incorporated LCD is employed. When manipulating the keys, do not apply excessive force to them.
- If the system becomes inoperative, press the power switch to OFF. When turning the power switch back ON to use the printer, see Section 10, Emergency Procedures.



- 1 Press the power ON/OFF switch to turn ON the power.



The following print description screen opens.

The current operating status is indicated (see Section 2.3.2, Status, for details).

Print description 2011.07.07 12:45 Status:Stop Com=0

Message name [AAAAAAAAAAAA]

Column 1	Column 2	Column 3
[USE BY]	[YY. MM. DD]	[.]
[YY. MM. DD]	[MFG DATE]	[.]
[ABC]	[CCCC]	[.]
[.]	[.]	[.]

The printings are described.

Print layout

USE BY	11.07.07
11.07.07	MFG DATE
ABC	0001

The print layout is indicated.

Start up	Shut down
Manual	Comm On/Off
Prev. col.	Next col.

Print line setup	Edit message	Print format	Print spec.	Select message	Save message	Menu
------------------	--------------	--------------	-------------	----------------	--------------	------

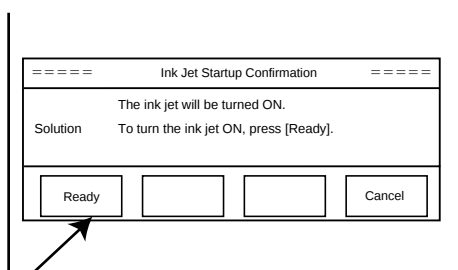
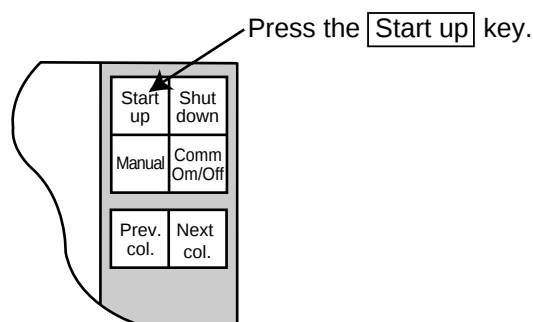
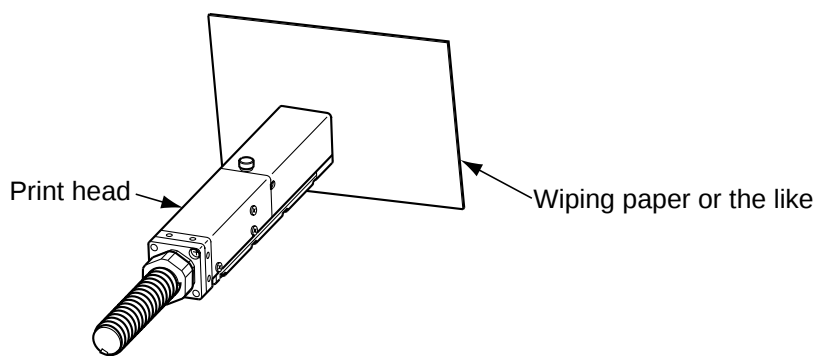
For print description input, see Section 3, Editing Print Data and Printing.

- It takes about 50 seconds for the above screen to open.
- Verify that the print descriptions are entered.

Entering a run signal executes the same action.
(See Section 1.5.3-9, Input for remote control signals.)

2 Hold wiping paper or the like against the ink ejection port in the end of the print head. Press the **Start up** and **Ready** keys in sequence.

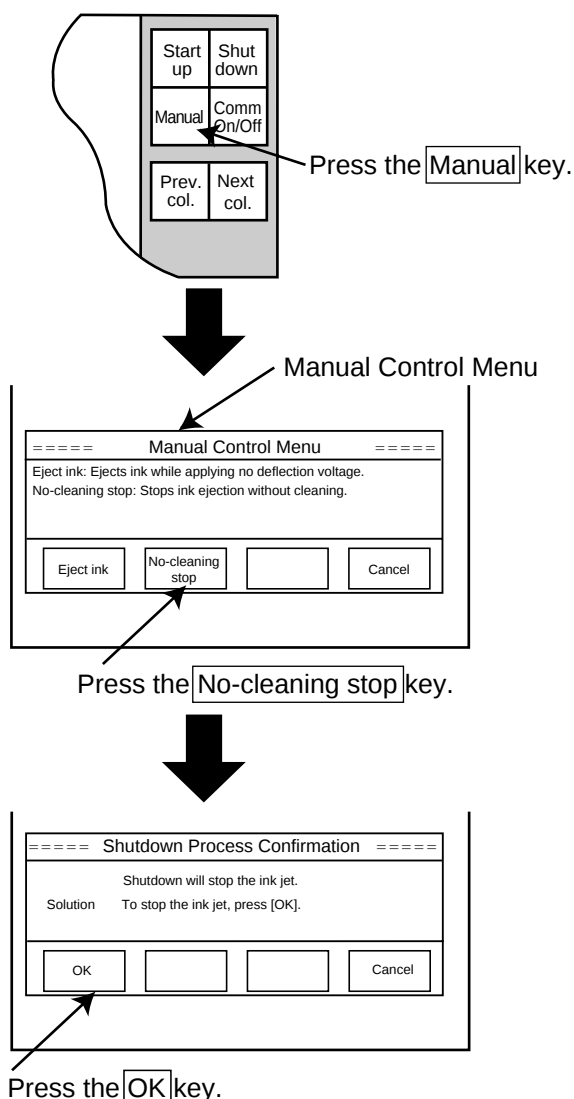
- The ink jets out of the nozzle within the print head.
- Properly position wiping paper or the like to prevent the ejected ink from scattering.
- Before starting an operation after 24-hour or longer printer inactivity (e.g., starting a day's operation after a holiday), complete the print head cleaning procedure in the same manner as for shutdown (see Section 2.2, Shutdown, and Section 1.2, Usage Precautions).



See Section 1.2.4,
Shutdown (no-cleaning
stop).

- If the ink jets out continuously, a fault exists.

Press the **Manual** key to display the control menu. Press the **No-cleaning stop** and **OK** keys in sequence to stop the ink ejection operation.

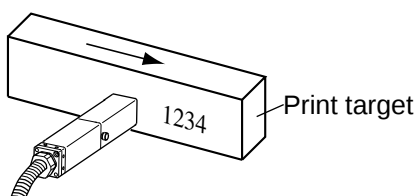


- For the subsequent operations, see Section 2.1.2, If a fault occurs at the beginning of an operation.
- When the ink jets out, it may momentarily scatter and stain paper. However, this does not indicate any abnormality at all.

3 Wait until the status changes from "Starting" to "Ready."

- If any startup fault occurs, see Section 2.1.2, If a fault occurs at the beginning of an operation.
- When the temperature is low (below 20°C or so), it takes slightly longer for the printer to become "Ready for printing" than at a normal temperature.

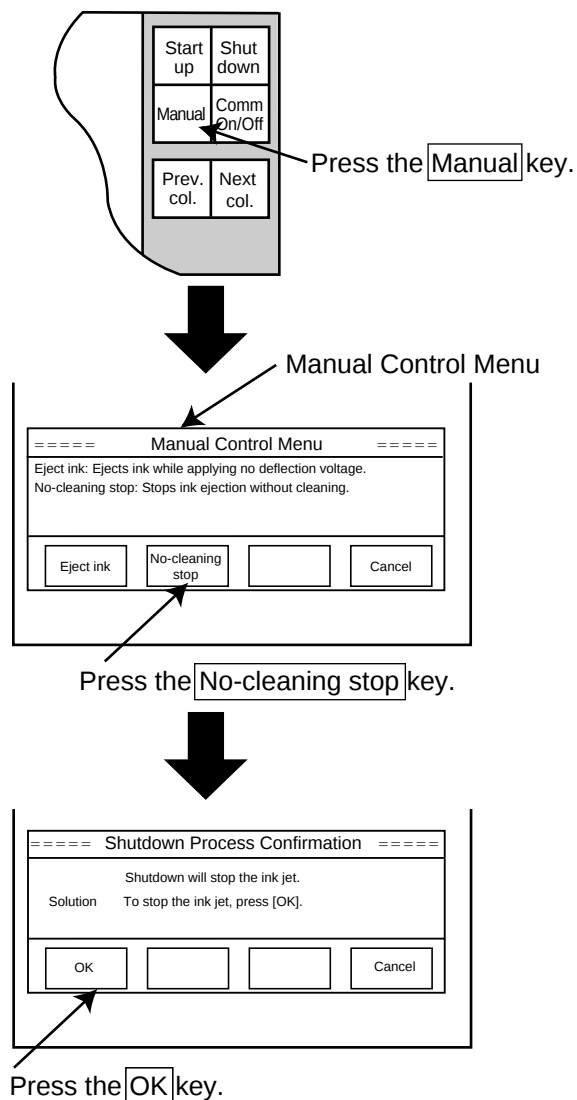
4 Enter the print target detection signal and verify the printing results.



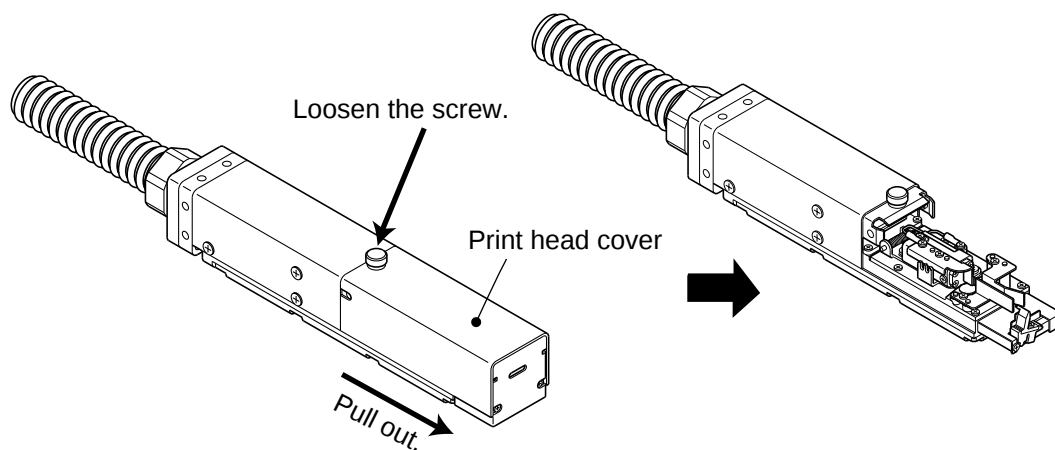
- When the print target detection signal is entered while the printer is "Ready," the preselected print is made.

2.1.2 If a fault occurs at the beginning of an operation

- 1 Press the **Manual** key to display the control menu. Press the **No-cleaning stop** and **OK** keys in sequence to stop the ink ejection operation.



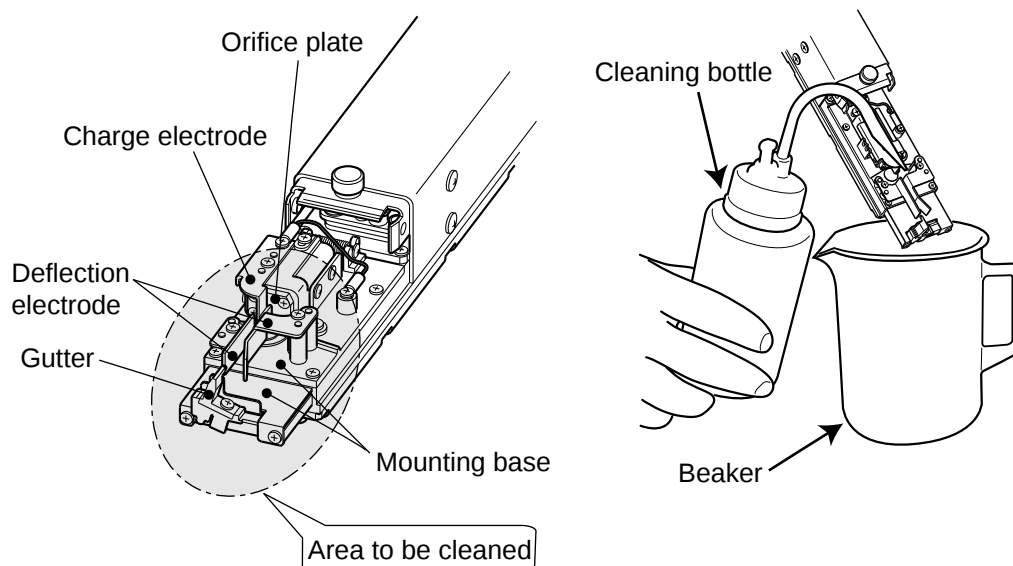
- 2 Remove the print head cover. This requires loosening its retaining screw.



Entering a run signal
executes the same
action.
(See Section 1.5.3-9,
Input for remote
control signals.)

3 Perform cleaning by pouring the intensifier over the area to be cleaned.

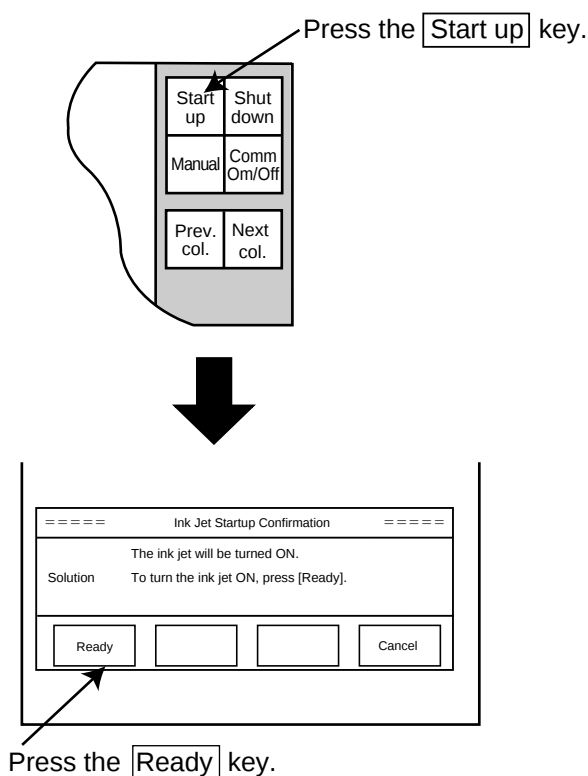
Pour the makeup ink over the orifice plate, charge electrode, deflection electrodes, gutter, and mounting base to clean them (you should also refer to Section 1.2.3, Print head cleaning).



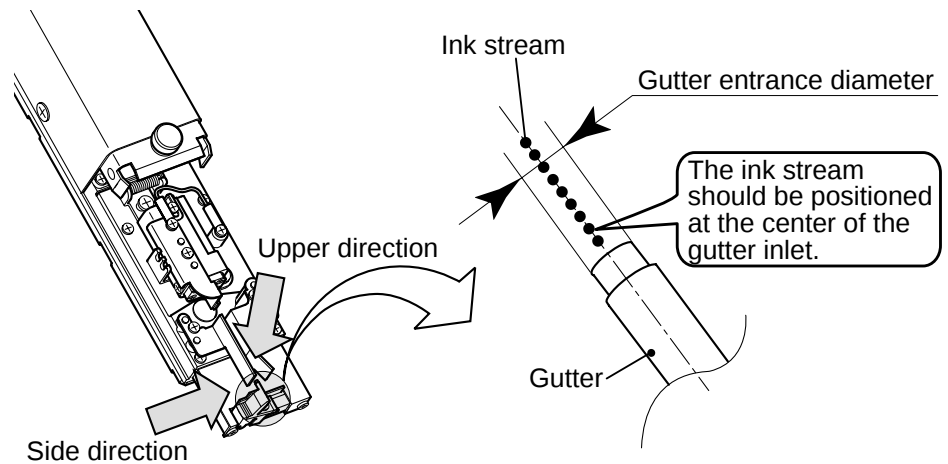
* With wiping paper, thoroughly wipe the makeup ink away from the parts (mounting base included) surfaces, and then allow them to dry.

4 With the print head cover left removed, press the **Start up** and **Ready** keys in sequence.

- The ink jets out of the nozzle. (The status changes from "Stop" to "Starting.")
- Perform an operation while the end of the print head is placed in a beaker.



- 5** Make sure that the ink stream is positioned at the center of the gutter from the side and upper direction as shown in the following figure.



If the ink stream is not positioned at the center of the gutter, perform step **1** to stop the ink ejection operation, and then proceed as directed in Section 7.6, Correcting a Bent Ink Stream and Clogged Nozzle.

⚠ WARNING

- When checking the ink stream position, wear protectors (goggles and mask).
- If the ink or makeup ink should enter your eyes or mouth, immediately flush with warm or cold water and see a physician.
- Before ejecting the ink, ensure that there is no person in the direction of ejection. (The end of the print head must be placed in a beaker or the like.)

- 6** Install the print head cover.

- If the "Cover open" fault is indicated, press the **Close** key.

- 7** Wait until the status changes to "Ready."

- 8** Enter the print target detection signal and verify the printing results (See Section 2.1.1, Strating an operation).

2.1.3 Operations for Modifying the Setting Contents

- You can modify the setting contents (print description, character height, excitation voltage, etc.) in any of the states "Ready," "Standby" and "Stop."

State in which setting contents are modifiable

Classification	Screen name	State in which setting contents are modifiable
Data editing	Print line setup, Edit message, Calendar condition, substitution rule setup, Count condition, Print format, Printing specifications, Select message, Save message	Ready, Standby, Stop
Maintenance work	User environment setup, Operation management, Date/time setup, Communication environment setup, Excitation V update, Password setup/update, Password protection	
Auxiliary function	Copy data (Printer → Memory card)	
Maintenance work	Touch screen setup	Standby, Stop
Auxiliary function	Manage messages, Create user pattern, Copy data (Memory card → Printer)	

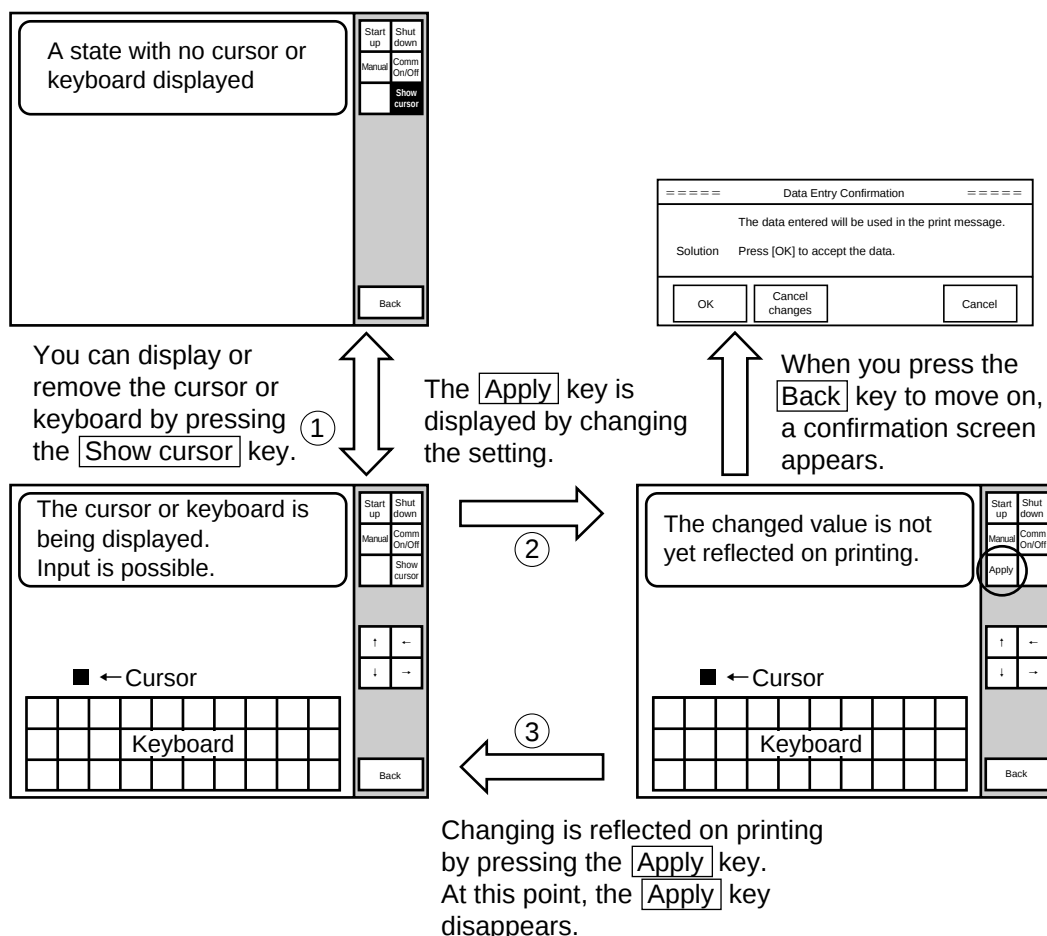
- As the **Apply** key appears if you modify the setting contents, be sure to press the **Apply** key after you have completed modification.

(1) Operation in the "Ready" state

Procedure: ① **Display the cursor and keyboard** ⇒ ② **Enter a value** ⇒ ③ **Reflect the value in printing**

The **Apply** key appears on the following screens.

Character input, Calendar condition, substitution rule setup, Count condition, Print format, Printing specifications, User environment setup, Operation management, Communication environment setup.



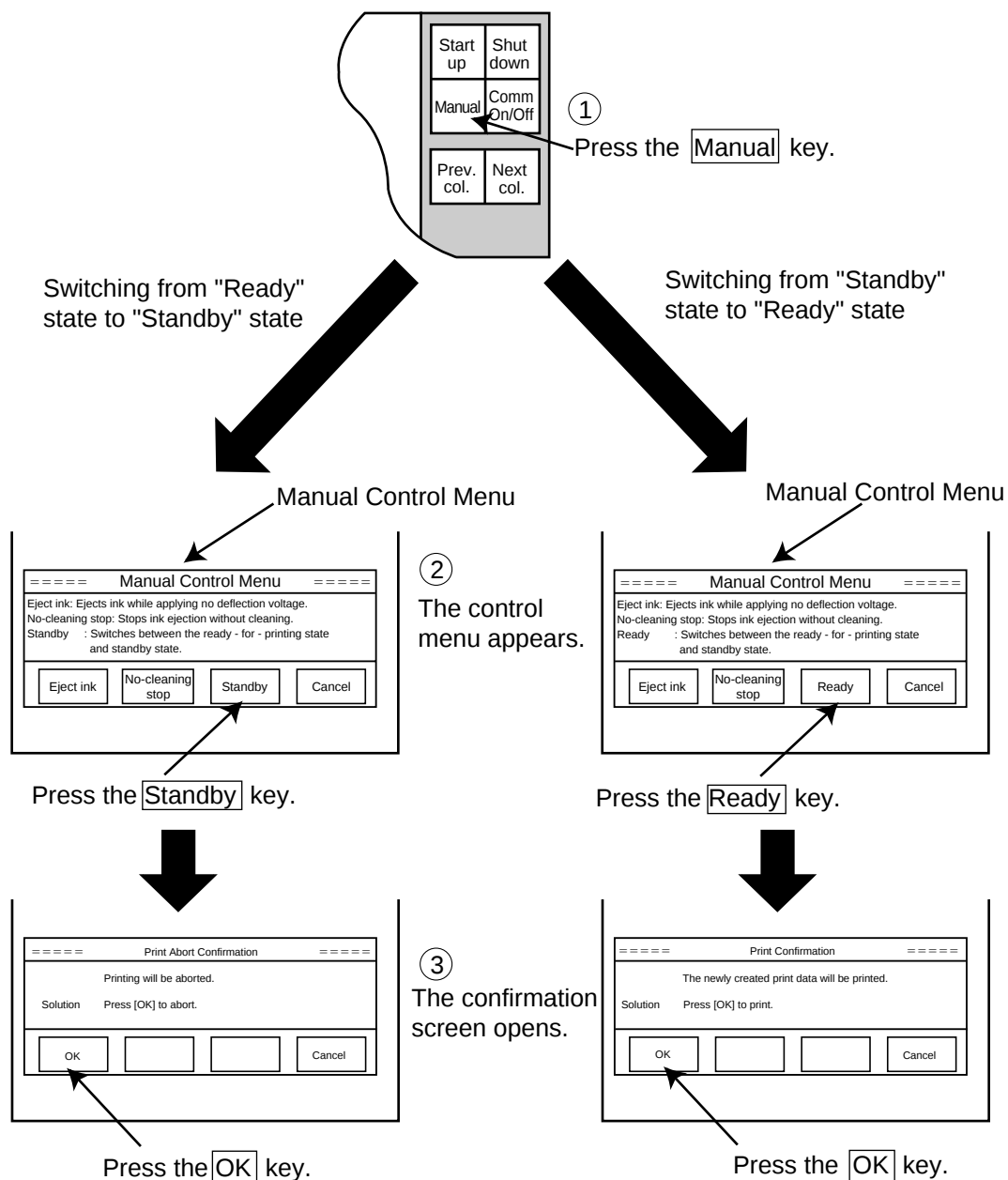
- Until you enter the **Apply** key, the setting contents on the display will not be reflected. When you have modified the contents, check that the **Apply** key is not on display and then restart printing.
- In case you enter a print target signal the instant the **Apply** key is pressed, fault "Print Data Changeover in Progress M" occurs.

See Section 1.5.3-1,
"Ready output signal".

(2) Switching between "Ready" state and "Standby" state

- When the conveyer interlock is put in operation by the Ready output signal, be careful not to switch to "Standby" state since it will stop the conveyer.

Entering a deflection voltage ON/OFF signal executes the same action.
(See Section 1.5.3-9, Input for remote control signals.)



- You can abort the operation by pressing the [Cancel] key from either the "Manual Control Menu" screen or the confirmation screen.

Precautions to be observed when changing the printings, print format, or print line setup data

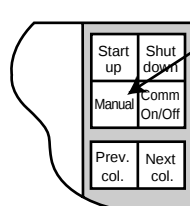
- When the following setup (① - ③) is employed, the printing method is automatically switched to the single scan control. You should bear in mind that the print quality varies with the employed printing method particularly when the ink drop use percentage is 1/1 or 1/2. To determine which printing method is currently selected, view the printing specifications screen.
 - ① When differing print formats are designated for some or all setup items
 - ② When differing line count settings are employed for some or all columns
 - ③ The ink drop use percentage is changed to 1/5 to 1/16.
- Perform the following setup to make prints by the printing method of line spacing control (interlaced).
 - ① Ensure that the same print format is employed for all items.
 - ② Ensure that the same line count setting is employed for all columns.
 - ③ The ink drop use percentage is 1/1 to 1/4.

Perform overall column setup. The format for the first item is then applied to all the other items so as to provide line spacing control setup. When making a 1-line print, the single scan control predominates even if you perform steps ① through ③.

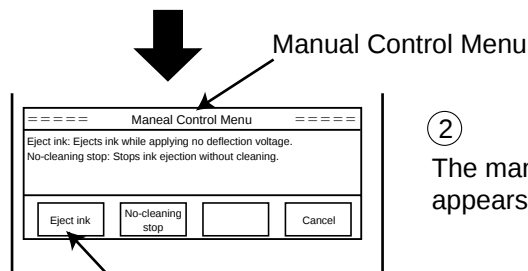
Ejecting the ink using the control menu

This feature is used to eject the ink from the nozzle with no intention of printing (for maintenance purposes only).

Press the **Manual** key to make prints on paper.

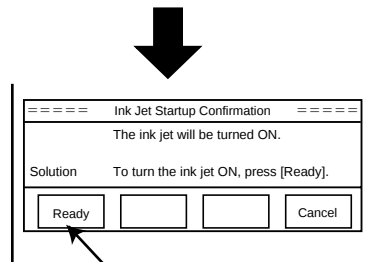


① Press the **Manual** key.



② The manual control menu appears.

Press the **Eject ink** key.



③ The confirmation screen opens.

Press the **Ready** key.

- You can abort the operation by pressing the **Cancel** key from either the "Manual Control Menu" screen or the confirmation screen.
- Even if you perform the above ink ejection procedure with the print head cover installed, the printer does become ready for printing (but goes into the standby state).

Entering a stop signal will execute the same action.
(See Section 1.5.3-5, "Printing stop signal.")

While the stop process is being performed, the IJ printer internally performs the following operations.

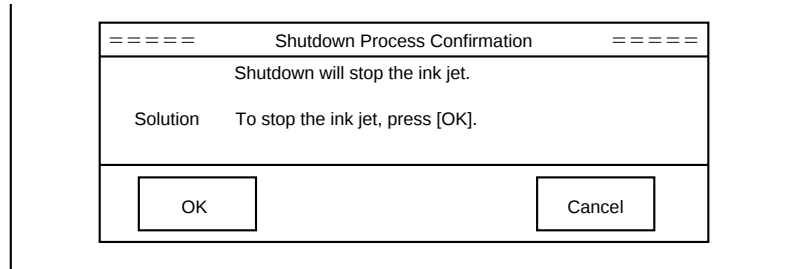
- ① Shuts off the high-voltage supply.
- ② Stops ink ejection and switches to makeup ink ejection.
- ③ Cleans the nozzle, gutter, and recovery path.
- ④ Stops makeup ink ejection and relieves the circulation path internal pressure.

2.2 Shutdown

- Complete the ink stop process by performing the following steps. If you turn OFF the power without performing the ink stop process, the operation management information (ink operating time and print count) and count update will not be stored into memory. When the count function is in use, it is necessary to set the count update (initial value) again at the time of power ON.

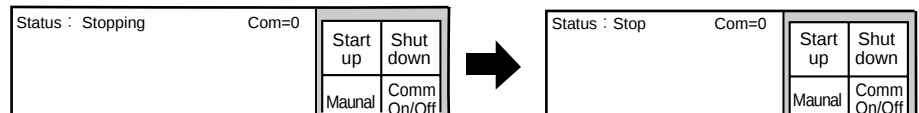
1 Press the **Shut down** key.

The confirmation screen then opens.



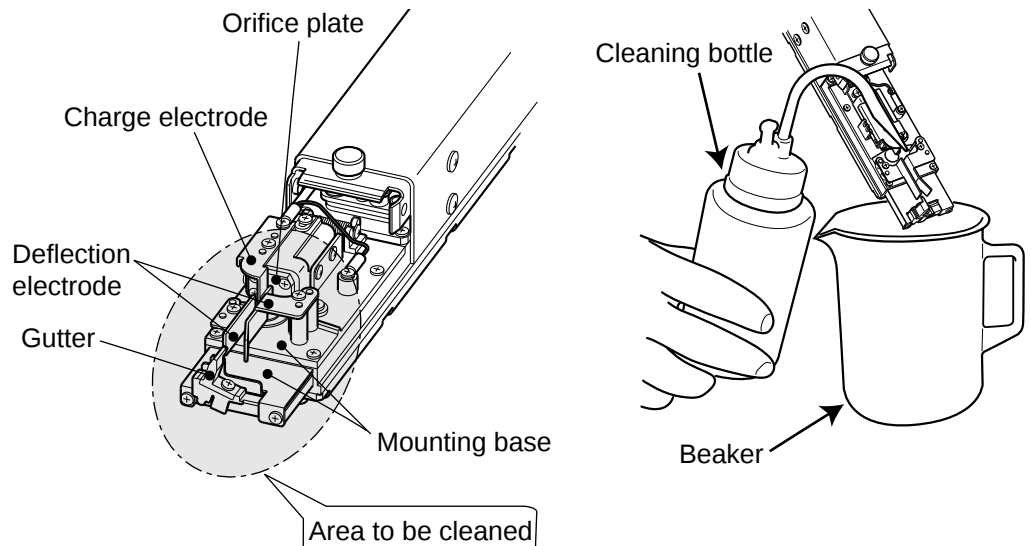
2 Press the **OK** key.

- Wait until the status changes from "Stopping" to "Stop."



3 Remove the print head cover and clean the print head.

- Perform cleaning by pouring the makeup ink over the area to be cleaned. Pour the makeup ink over the orifice plate, charge electrode, deflection electrodes, gutter, and mounting base to clean them (you should also refer to Section 1.2.3, Print head cleaning).

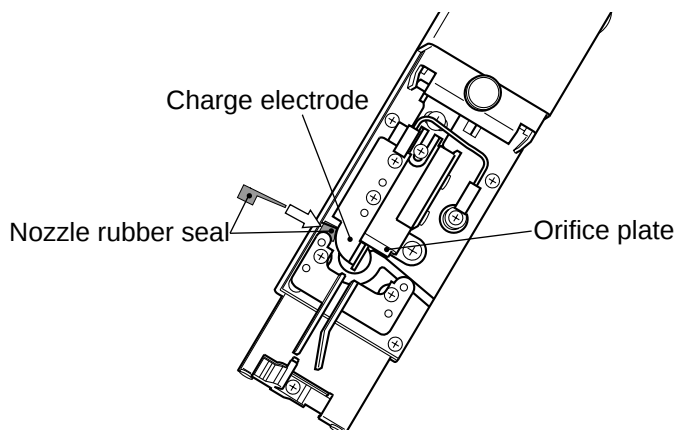


- *1. With wiping paper, thoroughly wipe the makeup ink away from the parts (mounting base included) surfaces and allow them to dry.
- *2. The "nozzle rubber seal" is effective in assuring orifice plate dryness and preventing dust buildup. For increased smoothness in later printer startup, it is recommended that you install the "nozzle rubber seal" between the orifice plate and charge electrode while the printer is inactive. (Refer to the next page.)

- 4** If the print head cover is dirty, apply the makeup ink and clean it.
 - * 1 Clean the portion which became dirty with a splatter on printing or a splash on ejecting the ink.
 - * 2 After cleaning, wipe away the makeup ink by using wiping paper. When wiping the inside of the cover, wipe it by holding the wiping paper with tweezers.
- 5** Install the print head cover.
- 6** Press the power ON/OFF switch to turn OFF the power.

Using the nozzle rubber seal

1. To prevent nozzle orifice plate drying and dust accumulation during printer transit and storage, a "nozzle rubber seal" has been incorporated at the factory prior to shipment. Remove the "nozzle rubber seal" at the time of printer installation/test run/adjustment.



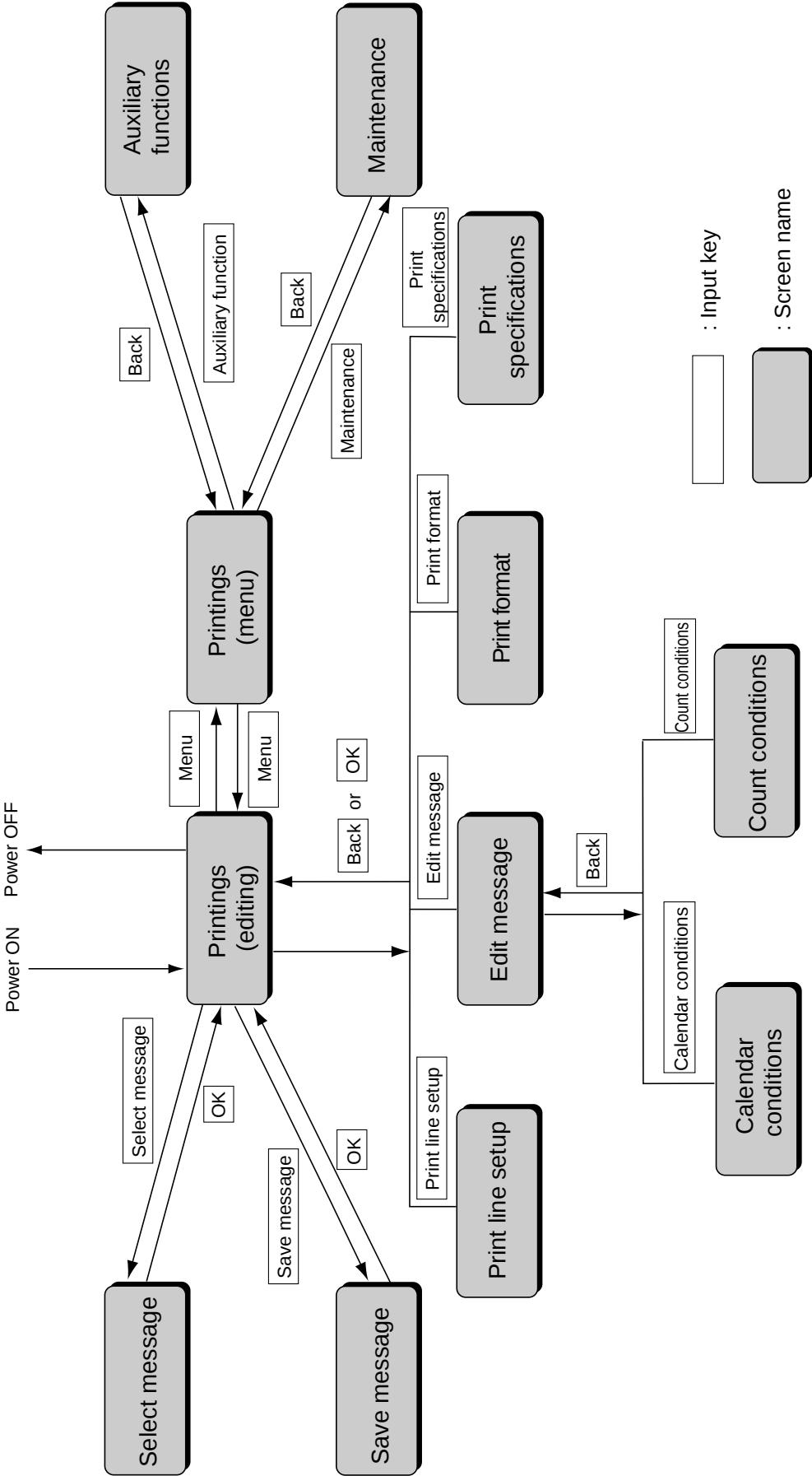
2. The "nozzle rubber seal" is effective in preventing orifice plate drying and dust accumulation. When shutting down the printer, it is recommended that you set the nozzle rubber seal between the orifice plate and charge electrode to assure smoothness in the next printer startup.

Usage precautions

- ① When storing the nozzle rubber seal, place it in a vinyl bag or the like to prevent it from collecting dirt and dust.
- ② Before setting the nozzle rubber seal in position, be sure to clean it with the makeup ink.
- ③ When installing the nozzle rubber seal, exercise care not to deform the charge electrode.

2.3 Operating Scheme

2.3.1 Operating Scheme



2.3.2 Status

(1) The printer is in one of the following states.

No.	State	Description
1	Stop	The ink is stopped. No deflection voltage is applied.
2	Standby	The ink is ejected. No deflection voltage is applied.
3	Ready	The ink is ejected. The deflection voltage is applied (printing is permitted by the sensor signal).
4	Starting	State in which the printer changes from the inactive state to the standby state.
5	Ink heating	Start up in process, with the ink being heated.
6	Drop adjust	Period during which ink particles are not properly charged in the standby state.
7	Cover open	Period during which the nozzle head cover is open in the standby state.
8	Service	Circulation control process for maintenance task execution.
9	Fault	State in which a fault exists.

(2) The current status including the on-line/off-line (communication) state is constantly displayed at the top of the screen.

Status: Stop		Com=0	Start up	Shut down
			Manual	Comm On/Off

(3) When a warning condition occurs, its description appears on the screen.

Status: Stop		Com=0	Start up	Shut down
Warning : Ink Low Warning			Manual	Comm On/Off



- Input the contents to be printed from the "Print description" screen.
- Select the **Print line setup**, **Print format**, **Edit message** or **Print spec.** screen from the menu and set the contents to be printed.
- The print image can be checked in the print layout area after input.

Print description
setting area

Print description	2011.07.07 12:45	Status: Stop	Com=0
Message name []			
Column 1	Column 2	Column 3	
[.]	[.]	[.]	
[.]	[.]	[.]	
[.]	[.]	[.]	
Print layout < >			

Print line setup	Edit message	Print format	Print spec.	Select message	Save message	Menu
------------------	--------------	--------------	-------------	----------------	--------------	------

- Typical print description screen at the system startup

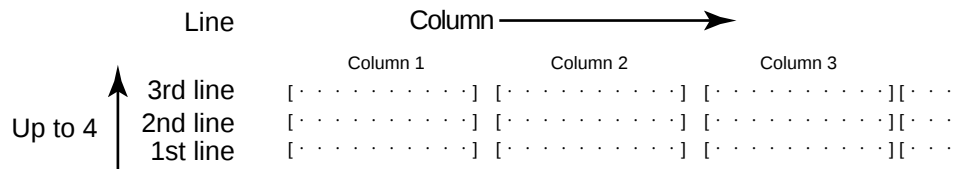
Print line setup	Edit message	Print format	Print spec.	Select message	Save message
---------------------	-----------------	-----------------	----------------	-------------------	-----------------

- The print description can be set up to 24 items (1 item = up to 10 characters).

The function, printable lines, and character sizes are different depending on the model type. For more details, see "11.1 Printer Specifications."

- Allocate each item into appropriate lines and columns to match the print descriptions.

The lines can be set up to 4.



- Depending on the print description, set the "Print lines", "Character size", "Print description" for each print item with up to 10 characters.
- "Print spec." is common for all print items.
- Select the **Print line setup**, **Print format**, **Edit message**, and **Print spec.** screens from the menu and set them step by step.

The available functions and printable line count and character size vary from one model to another. See Section 11.1, Printer Specifications.

Interlaced prints:
See Section 3.4 (1) ④

Character size conditions: See Section 3.2, Setting Print Format.

3.1 Setting Print Lines

(1) Overview

- Set the number of lines to print in each column.
- The number of lines that can be printed in each column is up to 4.
But the line for more than 24 items cannot be set.
- The number of lines for each column can be set in two ways; one is to set it for all columns at a time and the other is to set it by each column.

① Performing overall setup

- The entered number of lines will be set for all the columns.
- The selectable number of lines ranges from 1 to 4.
- The print format is used as the print item for the first column and applied uniformly.
- To set "interlaced", set it collectively for convenience sake.
- Printing quality is better with "interlaced" than with "single scan".
- If the number of vertical dots within a column exceeds the maximum number of dots, the following print format applies.

Line spacing	0 dot
Character size	5×8
Inter-character space	1 dot
Increased width	1x
Bar code	None

NOTICE

- Characters nonconforming to the character size conditions will be printed as spaces.

② Performing setup on an individual column basis

- The entered number of lines is set for designated columns.
- When the number of lines is increased, new lines are added to the lowermost line position.
- When the number of lines is decreased, the lowermost lines are deleted accordingly.
- No changes are acceptable if the number of print items exceeds 24.
- The format for the lower most line prevailing before line addition applies to newly added lines.
- It becomes "single scan" if set up column by column.
- If the number of vertical dots within a column exceeds the maximum number of dots, the following print format applies.

Line spacing	0 dot
Character size	5×8
Inter-character space	1 dot
Increased width	1x
Bar code	None

- Print lines can be deleted or inserted.

NOTICE

- Characters nonconforming to the character size conditions will be printed as spaces.

If the cursor is not displayed, press **Show cursor**.

① Selecting a Print line setting of 4 for all columns

						Menu
Print line setup	Edit message	Print format	Print spec.	Select message	Save message	

Print line setup	2011.07.07 12:45	Status: Ready	Com=0
Message name []			
Column 1	Column 2	Column 3	
[.]	[.]	[.]	
[.]	[.]	[.]	
[.]	[.]	[.]	

Overall column setup : Sets same number of lines for all columns.

Individual column setup : Sets number of lines for each column, or deletes column.

Overall column setup	Individual column setup
-----------------------------	--------------------------------

1 line	2 lines	3 lines	4 lines	Insert column	Delete column
--------	---------	---------	---------	---------------	---------------

Print line setup		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[.]	[.]	[.]	[.]	[.]	[.]		
[.]	[.]	[.]	[.]	[.]	[.]		
[.]	[.]	[.]	[.]	[.]	[.]		

Overall column setup : Sets same number of lines for all columns.

Individual column setup : Sets number of lines for each column, or deletes column.

Print line setup type	Overall column setup Individual column setup
--------------------------	---

1 line	2 lines	3 lines	4 lines		
--------	---------	---------	---------	--	--

Start up	Shut down
Manual	Comm On/Off

Prev. col.	Next col.
------------	-----------

Cancel
OK

- Setting Print Lines 3-4

4 Press **OK**.

You are then returned to the "Print description" screen. For printings creation purposes, the number of line is set to 4 for columns 1 to 3.

Print description		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[.]		[.]		[.]			
[.]		[.]		[.]			
[.]		[.]		[.]			
[.]		[.]		[.]			
Print layout							
← →							
Print line setup		Edit message		Print format		Print spec.	
Select message		Save message		Menu			

② Selecting a line count setting of 2 for the first column

1 From the "Print description" screen, press **Print line setup**.

Print line setup						Menu	
------------------	--	--	--	--	--	------	--

The "Print line setup" screen then opens.

If the cursor is not displayed, press **Show cursor**.

Print line setup		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[.]		[.]		[.]			
[.]		[.]		[.]			
[.]		[.]		[.]			
Overall column setup : Sets same number of lines for all columns.							
Individual column setup : Sets number of lines for each column, or deletes column.							
Print line setup type		Overall column setup Individual column setup					
1 line		2 lines		3 lines		4 lines	
Insert column		Delete column		Cancel			
				OK			

2 Press **2 lines**.

3 Press **OK**.

The first column is then set to 2 lines.

- To change the setting for another column, press **Previous column** or **Next column** and then repeat step 2.

3.2 Setting Print Format

(1) Overview

- The procedure for setting the line spacing, character size, inter-character space, increased width, and bar code.

Print format		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[.]		[.]		[.]			
[.]		[.]		[.]			
[.]		[.]		[.]			
Line spacing		[0] (dots 0-2)					
Character size		[2] (1:5x5 2:5x8 3:7x10 4:12x16 5:18x24 6:24x32)					
Inter-char. space		[1] (dots 0-3)					
Increased width		[1] (times 1-9)					
Bar code		[0] (0:none 1:C39 2:ITF 3:NW-7 4:EAN-13 5:DM 6:C128)					
1	2	3	4	5	6	7	8
							Decre- ment
							Incre- ment
							Back

① Line spacing

- The clearance to the upper line can be adjusted.
- Setup can be performed variously for all columns.
- The setting ranges are as indicated below.

Number of lines	Setting range
1	0
2	0 to 2
3	0 to 2
4	0 to 2

② Character size

- The character size can be set.
- The following character sizes are selectable.

Character font (in dots) (width×height in dots)	2 lines machine	4 lines machine
5×5	1 to 2 lines	1 to 4lines
5×8 or 5×7	1 to 2 lines	1 to 4lines
7×10	1 to 2 lines	1 to 3 lines
9×8 or 9×7	1 to 2 lines	1 to 4 lines
12×16	1 line	1 to 2 lines
18×24	—	1 line
24×32	—	1 line

NOTICE

- If no associated character is available after a character size change, a space is used as a substitute.

Type	Applicable character size
Dedicated character	5×8, 7×10
Katakana	5×8(5×7)、7×10、12×16、18×24
User pattern	5×5、5×8(5×7)、9×8(9×7)、7×10、12×16、18×24、24×32
Special character	5×8、9×8、7×10、12×16、18×24、24×32
Arabic character	5×8、12×16、18×24、24×32

The available functions and printable line count and character sizes vary from one model to another. See Section 11.1, Printer Specifications.

For size changeover between 7 × 10 and 9 × 8, see Section 4.2, Setting the User Environment.

For dedicated character varieties, see Section 3.3.2, Printing dedicated characters.

If the user pattern for a newly selected character size is not saved, a space is used as a substitute.

The "Arabic input" be unable to do in "Simple Chinese".

If the setting range is exceeded by a character size change, the closest acceptable value will be employed.

For a Inter-line method, see "Precautions to be observed when changing the printings, print format, or line count setup data" (See section 2.1.3, Operation for Modifying the Setting Contents.)

The available functions and printable line count and character sizes vary from one model to another. See Section 11.1, Printer Specifications.

③ Inter-character space

- The space between characters can be set.
- The following settings are selectable.

Character size	Inter-character space
5×5	0 to 3
5×8 or 5×7	0 to 3
9×8 or 9×7	0 to 7
7×10	0 to 3
12×16	0 to 4
18×24	0 to 6
24×32	0 to 8

- To perform "interlaced" printing in the case of using dedicated characters, the inter-character space of all the printing items should be 1 dot.
- The inter-character space of the printing items having dedicated characters should be 1 dot.
(See Section "3.3.2 Printing dedicated characters".)

④ Increased width

- The width of characters can be magnified.
- The selectable magnifications are from 1 to 9.

⑤ Bar code

- The bar code type can be specified.
- One bar code type can be selected.
- The following types are selectable.

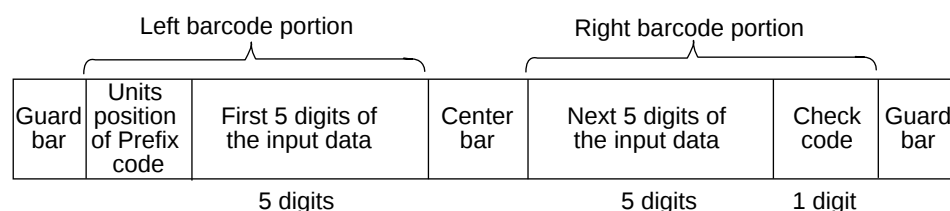
Type	Available characters
Code 39 (C39)	0 to 9, A to Z, space, +, -, /, . (period), \$, %
ITF	00 to 99
NW-7	0 to 9, +, -, /, .(period), :, \$
EAN-13	0 to 9
Data matrix (DM)	All Alphabets, numerals and symbols
Code128 (C128)	(Code set B) All Alphabets, numerals and symbols, FNC1 (Code set C) 0 to 9, FNC1

- Bar code type changes are simultaneously applied to all items for which bar code setup has been completed.
- For DM and Code 128, number of barcodes which can be set is four. When multiple barcodes are to be set, insert print item to which no barcode has been set between them.
- For Code 39, ITF, NW-7, EAN-13, DM and Code 128 barcode can be set to print items to which calendar or count has been set. However, barcode cannot be set if replacement of calendar, zero suppression or characters which cannot be used have been set. In these cases, the characters will be replaced with invalid characters.

- When alphabet character has been set to the upper limit value, if Code set C of Code 128 is set, all characters in the item will be replaced with invalid characters.
- The start and stop codes are automatically added.

Notice of inserting an EAN-13 bar code

- When inserting an EAN-13 bar code, you must enter a two-digit code in the EAN prefix area.
- The input data must be 10 digits. If the input data is less than 10 digits, the "No print contents" fault will happen.
- The guard bar, center bar and check code are automatically added.



Notice of DM code is used

- Set as shown below for print item to which DM is to be set:
 - (i) Number of lines: 1 line
 - (ii) Character size: 5x8, 12x16, 18x24
- Set barcode type to "DM" on the print format screen, and select the size.

Data matrix: Type of size and maximum character number

Character size		5X8		12X16		18X24			
DM size		8X32	16X16	16X36	16X48	18X18	20X20	22X22	24X24
Maximum character number	Numeral only	20	24	64	98	36	44	60	72
	Alphabet only	10	12	32	49	18	22	30	36
	Alpha-numeral	10-19	12-23	32-63	49-97	18-35	22-43	30-59	36-71

- Input characters within the specified digit number for print item to which barcode has been set. If characters exceed ten digits, input across multiple items.
- When alphabet letters and numerals occur together, the number of characters which can be coded will vary depending on character array.
- When "DM8x32" is used, set item "character size 1" on the user environment setup screen to "5x8".

Notice of Code 128 is used

- With multiple line printing, only one "Code 128" can be set to the same line. If two or more "Code 128"s are set to the same line, "Barcode incorrect 2" error will occur.

If the cursor is not displayed, press **Show cursor**.

Selected item on the
cursor-positioned line
can be changed
by touching.

(3) Printing barcode

- After setting barcode using "Print format" screen, input contents to be printed.
- Character spacing has already been specified by the type of barcode:
It cannot be changed.
- Setting the line spacing to 0, character size to 12×16, character width increase to 1 and barcode to code 39.
- Set contents to be printed to "1234567890".

1 From the "Print description" screen, press **Print format**.

2 Press **Previous item** or **Next item** to select an item whose print format is to be changed.

3 Press **↓** or **↑** to move the cursor to the setup item to be edited.

4 Change the value as desired with a numeric key, **Decrement** key, or **Increment** key.

5 Press **Apply**.

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

Print format		2011.07.07 12:45		Status: Ready		Com=0																					
Message name []																											
Column 1		Column 2		Column 3																							
[.....] [.....] [.....]																											
Line spacing		[0] (dots 0-2)																									
Character size		[4] (1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)																									
Inter-char. space		[0] (dots 0-3)																									
Increased width		[1] (times 1-9)																									
Bar code		[1] (0:none 1:C39 2:ITF 3:NW-7 4:EAN-13 5:DM 6:C128)																									
1	2	3	4	5	6	7	8	9	0																		
								Decre- ment	Incre- ment																		
<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td></td> <td>Show cursor</td> </tr> <tr> <td>Prev. item</td> <td>Next item</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> <tr> <td colspan="2"></td> </tr> <tr> <td colspan="2"></td> </tr> <tr> <td colspan="2">Back</td> </tr> </table>										Start up	Shut down	Manual	Comm On/Off		Show cursor	Prev. item	Next item	↑	←	↓	→					Back	
Start up	Shut down																										
Manual	Comm On/Off																										
	Show cursor																										
Prev. item	Next item																										
↑	←																										
↓	→																										
Back																											

6 Press **Back**.

You are then returned to the "Print description" screen.

- 7** From the "Print description" screen, press **Edit message**.

The "Edit message" screen then opens. Keyboard for inputting Code 39 will be displayed.

Edit message		2011.07.07 12:45		Status: Ready		Com=0	
Message name [						]	
Column 1		Column 2		Column 3			
[.]		[.]		[.]			
		ABC • 123 •					Insert Delete
1	2	3	4	5	6	7	8 9 0
A	B	C	D	E	F	G	H I J
K	L	M	N	O	P	Q	R S T
U	V	W	X	Y	Z	+	- /
		\$	%	.		Space	Blank Back-space

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. col.	Next col.
↑	←
↓	→
Calendar conditions	
Count conditions	
Back	

- 8** Press **1 2 3 4 5 6 7 8 9 0**.

- 9** Press **Apply**.

- 10** Press **Back**.

You are then returned to the "Print description" screen.

- Input numeric characters will be displayed in red on print layout screen.

Calendar character input→See Section 3.3.3, Printing calendar characters.

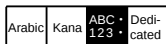
Count character input →See Section 3.3.8, Printing count characters.

Dedicated character input →See Section 3.3.2, Printing dedicated characters.

Operations for modifying the setting contents.
(See Section 2.1.3, Operations for modifying the setting contents.)

If the cursor is not displayed, press **Show cursor**.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."



Operation when changing the alphanumeric keyboard to that of QWERTY key allocations:
(See "4.7 Touch Screen Setup")

3.3 Printing Characters

In addition to normal characters, calendar characters, count characters, and dedicated characters are available.

3.3.1 Printing fixed characters

(1) Operating procedure

- Entering "ABC" in the first line of the first column. The number of lines is set to 3.

1 Press **Edit message**.

The Edit message screen then opens.

2 Touch first column and first line.

The cursor then moves to the first line of the first column.

Type of alphameric character (standard character):
Refer to "6.4.6 Code tables".

- 3** Sequentially press **A**, **B**, and **C** on the keyboard.
The display then reads ABC.

Edit message		2011.07.07 12:45	Status: Ready	Com=0
Message name []				
Column 1	Column 2	Column 3	Start up	Shut down
[.]	[.]	[.]	Manual	Comm On/Off
[.]	[.]	[.]	Apply	
[A B C]	[.]	[.]		

Notice

Part of [. . .] shows no input status (blank): Any blank part and characters after the blank part in the item will not be printed.
<Example> In case of "ABC . . DEF . . ", only ABC will be printed.

- 4** Press **Apply**.

- 5** Press **Back**.

The system then returns you to the "Print description" screen.

Print description		2011.07.07 12:45	Status: Ready	Com=0
Message name []				
Column 1	Column 2	Column 3	Start up	Shut down
[.]	[.]	[.]	Manual	Comm On/Off
[.]	[.]	[.]		
[A B C]	[.]	[.]	Prev. col.	Next col.
Print layout				
< ABC >				
Print line setup	Edit message	Print format	Print spec.	Select message
Save message	Menu			

Dedicated characters are specially predefined characters.

Character size setup
(See Section 3.2,
Setting Print Format)

It is presumed that the internal calendar date is July 7, 2011.

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

If the cursor is not displayed, press **Show cursor**.

The "Arabic input" be unable to do in "Simple Chinese".

3.3.2 Printing dedicated characters (when KANA and dedicated characters can be input)

*This chapter is only for the user of chinese characters. If you don't use chinese characters, please skip this chapter.

(1) Overview

- Dedicated characters are to be entered from the dedicated character keyboard.
- The following dedicated characters can be set.

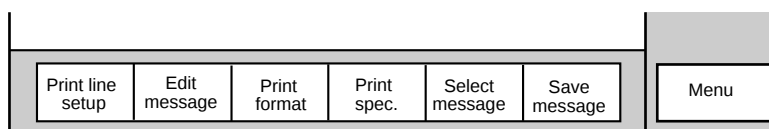
製造	賞味	消費	年	迄	円
出荷	使用	品質	月	期限	g
出庫	有効	保持	日	期間	番号
包装	保証	平成	以内	¥	個

- Before entering dedicated characters, select a character size of 5×8 or 7×10. No other character size can be used to enter dedicated characters.
- The inter-character space of the printing items having dedicated characters should be 1 dot.
- Characters are handled on an individual word basis. The whole associated word is erased when **Backspace** or **Delete** is pressed.
[Example] If you press **Delete** with the cursor positioned over the first character of "賞味期限", the resulting remaining character string is "期限".
- Since the character string "製造" has a 3-character width, the display reads "製 造".

(2) Operating procedure

- Entering "保証期限" in the third line of the first column

1 From the "Print description" screen, press **Edit message**.



2 The "Edit message" screen then opens.

Edit message		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[.]	[.]	[.]					
[.]	[.]	[.]					
[.]	[.]	[.]					
Arabic	Kana	ABC • 123 •	Dedicated	User pattern	Calendar /count	Punct.	Delete

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. col.	Next col.

3 Press **Dedicated**.

The dedicated character input keyboard then appears.

Arabic	Kana	ABC • 123 •	Dedicated	User pattern	Calendar /count	Punct.	Insert	Delete
製造	出荷	出庫	包装		平成	年	月	日
					以内	迄		
賞味	使用	有効	保証		期限	期間		
消費	品質	保持			¥	円	g	番号
							Space	Blank
								Back-space

4 Press **保証**.

The display then reads "保証" and the cursor moves to the next digit position.

Edit message		2011.07.07 12:45		Status: Ready		Com=0	
Message name [							
Column 1		Column 2		Column 3			
[保証]		[]		[]			
[]		[]		[]			

Start up	Shut down
Manual	Comm On/Off

5 Press **Space**.

A space is then displayed, and the cursor moves to the next digit position.

6 Press **期間**.

The third line of the first row then reads "保証 期間".

7 Press **Apply**.

8 Press **Back**.

The system then returns you to the "Print description" screen.

3.3.2 Printing special characters

(when special characters can be input)

(1) Overview

- Enter them from the special character keyboard.
- The characters which can be set up as special characters are as follows.

Arabic	Special	ABC 123	Special2	User pattern	Calendar /count	Punct.	Insert	Delete
À	Á	Â	Ã	Ä	È	É	Ê	Ë
Ì	Í	Î		Ï	Ò	Ó	Ô	Õ
Ù	Ú	Û		Ü				
Æ	Ç	Ñ	Œ		Å	Ø	£	€
Shift ^	Shift V						Space	Blank

Arabic	Special	ABC 123	Special2	User pattern	Calendar /count	Punct.	Insert	Delete
à	á	â	ã	ä	è	é	ê	ë
ì	í	î		ï	ò	ó	ô	õ
ù	ú	û		ü				
æ	ç	ñ	œ	ß	å	ø		
Shift ^	Shift V						Space	Blank

Arabic	Special	ABC 123	Special2	User pattern	Calendar /count	Punct.	Insert	Delete
İ	I	Ğ	Ş	Ü	Ý	Ł	Ŕ	
Č	Ď	Ě	Ň	Ř	Š	Ť	Ž	
Ą	Ć	Ę	Ł	Ń	Ś	Ż	Ž	
Đ	Ō	Ŭ						
Shift ^	Shift V						Space	Blank

Arabic	Special	ABC· 123·	Special2	User pat- tern	Calendar /count		Punct.	Insert	Delete
ı	ı	ğ	ş	û	ý	í	ı	ı	
č	d'	ě	ň	ř	š	ť	ž		
ą	ć	ę	ł	ń	ś	ź	ż		
đ	ó	ú							
Shift ^	Shift v						Space	Blank	Back- space

Arabic	Special	ABC· 123·	Special2	User pat- tern	Calendar /count		Punct.	Insert	Delete
A	B	Г	Δ	E	Z	H	Θ	I	K
Λ	M	N	Ξ	O	Π	P	Σ	T	Y
Φ	X	Ψ	Ω						
Shift ^	Shift v						Space	Blank	Back- space

Arabic	Special	ABC· 123·	Special2	User pat- tern	Calendar /count		Punct.	Insert	Delete
α	β	γ	δ	ε	ζ	η	θ	ι	κ
λ	μ	ν	ξ	ο	π	ρ	σ	τ	υ
φ	χ	ψ	ω				ς		
Shift ^	Shift v						Space	Blank	Back- space

Arabic	Special	ABC· 123·	Special2	User pat- tern	Calendar /count		Punct.	Insert	Delete
А	Б	В	Г	Д	Е	Ё	Ж		
З	И	Й	К	Л	М	Н	О		
П	Р	С	Т	У	Ф	Х	Ц		
Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я	Ѡ
Shift ^	Shift v	Ј	Љ	Њ	Ћ	Ќ	Space	Blank	Back- space

Arabic	Special	ABC· 123·	Special2	User pat- tern	Calendar /count		Punct.	Insert	Delete
а	б	в	г	д	е	ё	ж		
з	и	й	к	л	м	н	о		
п	р	с	т	у	ф	х	ц		
ч	ш	щ	ъ	ы	ь	э	ю	я	ђ
Shift ^	Shift v	j	љ	њ	ћ	ќ	Space	Blank	Back- space

- The special characters cannot be entered in character size 5 x 5.

The calendar time is the time indicated by the internal clock of the IJ printer.

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

If the cursor is not displayed, press **Show cursor**.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	------------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	------------	----------

3.3.3 Printing calendar characters

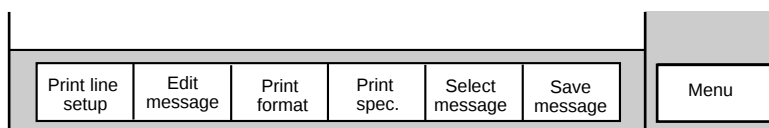
(1) Overview

- The following procedure is used to set the year, month, day, hour, minute and second.
- Entries are to be made from the calendar/count keyboard.
- When entries are set up as calendar characters, the year, month, day, hour, minute and second values will be printed in accordance with calendar time changes.
- Calendar characters cannot be printed in the same print item with shift code characters or time count characters.

(2) Operating procedure

- Making "year," "month," and "day" entries in the third line of the second column.

1 From the "Print description" screen, press **Edit message**.



2 The "Edit message" screen then opens.

Edit message		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[USE BY]		[.]		[.]			
[YY. MM. DD . .]		[MFG DATE . . .]		[.]			
[ABC]		[.]		[.]			
Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count	Punct.	Delete

3 Press **Next column**.

The cursor then moves to the beginning of the second column.

4 Press **Calendar/count**.

The calendar input keyboard then appears.

Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /Count	Punct.	Insert	Delete
Year	Month	Day	Hour	Minute	Second	Total days	JAN FEB	Week number
Shift code	Time count							Day of week
Count								
						+	-	×
		(	)	.	:	,	Space	Blank
								Back- space

5 Press **Year** .

The first press of **Year** prints the last digit of the year (AD) (the "y" indication is given).

The second press of the **Year** prints the last two digits of the year (AD) (the "yy" indication is given).

The fourth press of the **Year** prints all four digits of the year (AD) (the "yyyy" indication is given).

The subsequent explanation applies to cases where **Year** is pressed twice.

Edit message		2011.07.07 12:45	Status: Ready	Com=0
Message name []				
Column 1	Column 2	Column 3	Start up	Shut down
[USE BY]	[YY]	[.]	Manual	Comm On/Off
[YY . MM . DD . . .]	[MFG DATE]	[.]	Apply	
[ABC]	[.]	[.]		

6 Press **.** .

The "." mark then appears.

[YY. ■]

7 Press **Month** twice.

The display then reads [YY. MM]

If you press **Month** only once, only the last digit of the month will be printed.

8 Press **.** .

The display then reads [YY. MM].

9 Press **Day** twice.

The display then reads [YY. MM. DD].

If you press **Day** only once, only the one last digit of the day will be printed.

10 Press **Apply** .

11 Press **Back** .

You are then returned to the "Print description" screen. The print image area reads "USE BY 11.07.07".

Print layout		
USE BY	11.07.07	
11.07.07	MFG DATE	
ABC		

3.3.4 Printing the characters indicating the number of elapsed days

(1) Overview

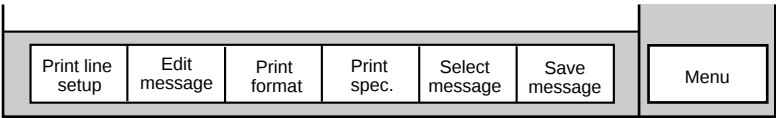
- The following procedure is used to print the number of days that has elapsed since January 1.
- Entries are to be made from the calendar/count keyboard.
- When entries are set up as characters indicating the number of elapsed days, the contents of the resulting printing will be changed in accordance with the calendar time and the current number of elapsed days.
- The table below shows the difference between a common year and leap year.

	1/1	1/2	...	2/28	2/29	3/1	...	12/31
Common year	1	2	...	59	—	60	...	365
Leap year	1	2	...	59	60	61	...	366

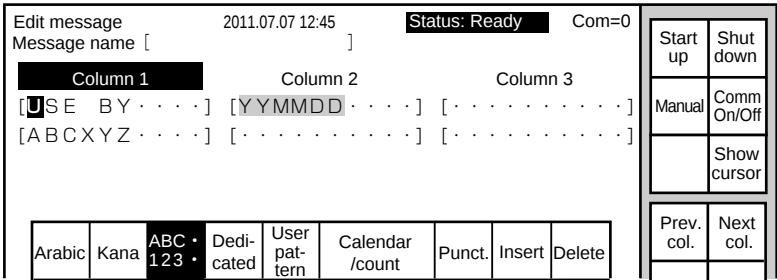
(2) Operating procedure

- Making a 3-digit entry in the second line of the second column to set the elapsed number of days

1 From the "Print description" screen, press **Edit message**.



2 The "Edit message" screen opens.



3 Press **Next column**.

The cursor moves to the beginning of the second column.

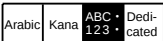
4 Press **↓**.

The cursor moves to the beginning of the second line in the second column.

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

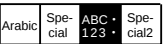
If the cursor is not displayed, press **Show cursor**.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."



Cursor will move to the line you touched.

Keyboard display has been set to one of the following settings:
 "When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	------------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	------------	----------

5 Press **Calendar/count**.

The calendar-input keyboard appears.

Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count	Punct.	Insert	Delete
Year	Month	Day	Hour	Minute	Second	Total days	JAN FEB	Week number
Shift code	Time count							Day of week
Count								
						+	-	×
						.	Space	Blank
		()	.	:	.			Back- space

6 Press **Total days**.

Pressing once **Total days** prints the lowest digit of the number of elapsed days (T appears on the display).

Pressing twice **Total days** prints the second lowest digit of the number of elapsed days (TT appears on the display).

Pressing three times **Total days** prints the third lowest digit of the number of elapsed days (TTT appears on the display).

7 Press **Apply**.

8 Press **Back**.

You are returned to the "Print description" screen. The print image area reads "188".

USE BY	1 3 0 2 0 4
ABCXYZ	1 8 8

3.3.5 Printing month with 3 alphabet characters

(1) Overview

- Used when month is printed, indicating use of 3 alphabet characters.
- Entries are to be made from the calendar/count keyboard.
- Linked with calendar considering offset.
- If month is to be printed in languages other than English, it will be defined on the "Substitution rule setup" screen for month with 3 alphabet characters.

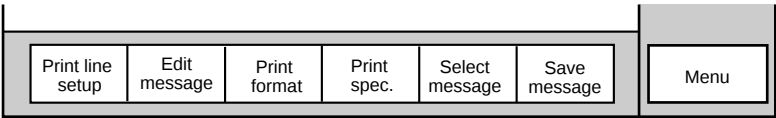
Indication with English

Month (numerical)	01	02	03	04	05	06	07	08	09	10	11	12
3 alphabet character	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

(2) Operating procedure

- Setting month with 3 characters in Italian

1 From the "Print description" screen, press **Edit message**.



The "Edit message" screen opens.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	---------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)
"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	---------	----------

Edit message2011.07.07 12:45Status: ReadyCom=0

Message name []

Column 1Column 2Column 3

[DMMMYYYY] [.] [.]

[ABCDE-XXXX] [.] [.]

	Special	ABC 123	Special2	User pattern	Calendar /count	Punct.	Insert	Delete	
1	2	3	4	5	6	7	8	9	0
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	+	-	x	/
Shift ^	Shift V	(	)	.	:	,	Space	Blank	Back-space

Start upShut down

ManualComm On/Off

Show cursor

Prev. col.Next col.

Calendar conditions

Count conditions

Back

2 Press **Calendar conditions**.

The "Calendar conditions" screen then opens.

Assume that 3-digit month code has been input.

Calendar conditions		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[DDMMYY YYYY]		[.....]		[.....]			
[ABCDE-XXXX]		[.....]		[.....]			
<Offset>		<Substitution rules>		<Zero-suppression>			
Year	[0000]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Month	[0000]						
Day	[0000]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Hour	[0000]						
Minute	[0000]						
Substitution rules No. [0 1]							
1	2	3	4	5	6	7	8
—							
							Decrement
							Increment
Start up							
Shut down							
Manual							
Comm On/Off							
Show cursor							
Prev. item							
Next item							
↑							
↓							
→							
←							
JAN, FEB, --							
Substitution rules							
Back							

3 Press **JAN, FEB, --**.

"Subst. rule setup" screen for month with 3 characters will appear.

Subst. rule setup		2011.07.07 12:45		Status: Ready		Com=0	
<JAN,FEB,-->							
01	[JAN]	02	[FEB]	03	[MAR]	04	[APR]
05	[MAY]	06	[JUN]	07	[JUL]	08	[AUG]
09	[SEP]	10	[OCT]	11	[NOV]	12	[DEC]
Start up							
Shut down							
Manual							
Comm On/Off							
Decision							

4 Press **G E N**.

Subst. rule setup		2011.07.07 12:45		Status: Ready		Com=0	
<JAN,FEB,-->							
01	[GEN]	02	[FEB]	03	[MAR]	04	[APR]
05	[MAY]	06	[JUN]	07	[JUL]	08	[AUG]
09	[SEP]	10	[OCT]	11	[NOV]	12	[DEC]
Start up							
Shut down							
Manual							
Comm On/Off							
Apply							

5 After this, input months up to December in Italian in the same way.

Subst. rule setup		2011.07.07 12:45		Status: Ready		Com=0	
<JAN,FEB,-->							
01	[GEN]	02	[FEB]	03	[MAR]	04	[APR]
05	[MAG]	06	[GIU]	07	[LUG]	08	[AGO]
09	[SET]	10	[OTT]	11	[NOV]	12	[DIC]
Start up							
Shut down							
Manual							
Comm On/Off							
Apply							

6 Press **Apply**.

7 Press **Back** three times.

You are returned to the "Print description" screen. The print image area reads "07LUG 2011".

Print description		2011.07.07 12:45	Status: Ready	Com=0	
Message name []					
Column 1		Column 2		Column 3	
[DDMMM YYYY]		[.....]		[.....]	
[ABCDE-XXXX]		[.....]		[.....]	
Print layout					
< 07LUG 2011 ABCDE-XXXX >					
Print line setup Edit message Print format Print spec. Select message Save message					
					Menu

3.3.6 Printing week number

(1) Overview

- Use this function when you want to print which week of the year the current week is.
- Use the calendar/count keyboard to input data.
- This function is interlocked with the calendar time that takes offset into consideration.
- A week is defined as starting on Monday and ending on Sunday.
- The week that includes January 4 in the year is counted as the first week.
Or: the week that includes the first Thursday in the year is counted as the first week.
- Days at the beginning of year that are not included in the first week will be counted as the last week of the preceding year.

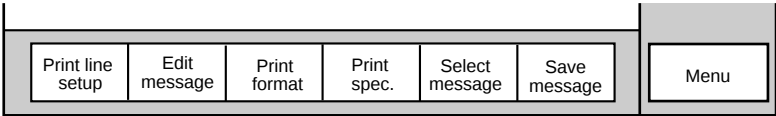
Example of counting week numbers at the end and beginning of year:

	Mon	Tue	Wen	Thu	Fri	Sat	Sun	Week number
December	21	22	23	24	25	26	27	52
	28	29	30	31	1	2	3	53
January	4	5	6	7	8	9	10	01
	11	12	13	14	15	16	17	02

(2) Operating procedure

- To set a 2-digit week number.

1 From the "Print description" screen, press **Edit message**.



The "Edit message" screen opens.

Edit message
2011.07.07 12:45
Status: Ready
Com=0

Message name []

Column 1

Column 2

Column 3

[USE BY . . .]

[YY. MM. DD . .]

[.]

[WEEK . . .]

[.]

[.]

Arabic

Kana

ABC 123

Dedicated

User pattern

Calendar /count

Punct.

Insert

Delete

Start up

Shut down

Manual

Comm On/Off

Show cursor

Prev. col.

Next col.

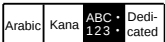
2 Press **Next column**.

The cursor moves to the beginning of the second column.

3 Press **↓**.

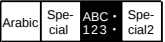
The cursor moves to the beginning of the second line in the second column.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."



Keyboard display has been set to one of the following settings:
 "When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	------------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	------------	----------

4 Press **Calendar/count**.

The calendar-input keyboard appears.

Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count		Punct.	Insert	Delete
Year	Month	Day	Hour	Minute	Second	Total days	JAN FEB	Week number	Day of week
Shift code	Time count								
Count									
						+	-	×	/
		(	)	.	:	,	Space	Blank	Back- space

5 Press **Week number** twice.

6 Press **Apply**.

7 Press **Back**.

You are returned to the "Print description" screen. The print image area reads "27".

Print description
2011.07.07 12:45
Status: Ready
Com=0

Message name [
]

Column 1

Column 2

Column 3

[USE BY . . .] [YY. MM. DD . .] [.]

[WEEK . . .] [WW] [.]

Print layout

USE BY 13. 02. 04

WEEK 27

Print line setup

Edit message

Print format

Print spec.

Select message

Save message

Menu

Start up

Shut down

Manual

Comm On/Off

Prev. col.

Next col.

3.3.7 Printing day of the week

(1) Overview

- Use this function when expressing the day of the week as a one-digit character and printing it.
- Use the calendar/count keyboard to input data.
- This function is interlocked with the calendar time that takes offset into consideration.
- A week is defined to starting on Monday and ending on Sunday.
- Use the "User environment setup" screen to choose the type of character for printing calendar "day of the week".

Type of character for printing calendar "day of the week":

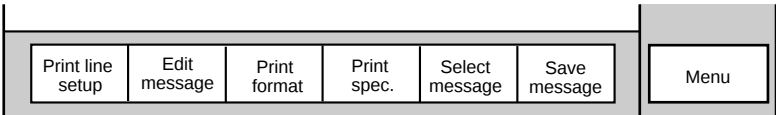
	Mon	Tue	Wen	Thu	Fri	Sat	Sun
1 to 7	1	2	3	4	5	6	7
A to G	A	B	C	D	E	F	G
Registered character	C1	C2	C3	C4	C5	C6	C7

The last 7 characters are used for registered characters.

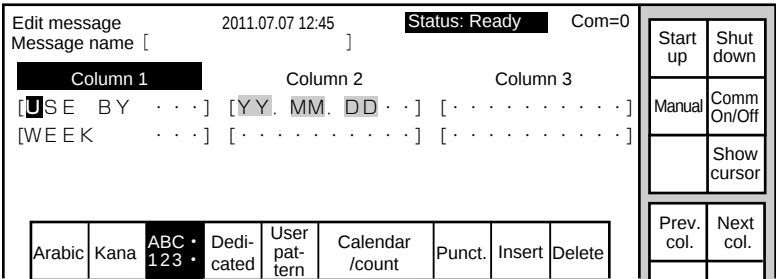
(2) Operating procedure

- To set 1-digit day of the week.

1 From the "Print description" screen, press **Edit message**.



The "Edit message" screen opens.



2 Press **Next column**.

The cursor moves to the beginning of the second column.

3 Press **↓**.

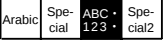
The cursor moves to the beginning of the second line in the second column.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."



Keyboard display has been set to one of the following settings:
 "When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	------------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	------------	----------

4 Press **Calendar/count**.

The calendar-input keyboard appears.

Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count		Punct.	Insert	Delete
Year	Month	Day	Hour	Minute	Second	Total days	JAN FEB	Week number	Day of week
Shift code	Time count								
Count									
						+	-	×	/
		(	)	.	:	,	Space	Blank	Back- space

5 Press **Day of week**.

6 Press **Apply**.

7 Press **Back**.

You are returned to the "Print description" screen. The print image area reads "4".

Print description
2011.07.07 12:45
Status: Ready
Com=0

Message name [
]

Column 1

Column 2

Column 3

[USE BY . . .] [YY. MM. DD. . .] [.]

[WEEK . . .] [7] [.]

Print layout

USE BY 13. 02. 04

WEEK 4

Print line setup

Edit message

Print format

Print spec.

Select message

Save message

Menu

Start up

Shut down

Manual

Comm On/Off

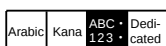
Prev. col.

Next col.

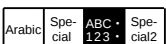
Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

If the cursor is not displayed, press **Show cursor**.

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)
"When special characters can be input."



Cursor will move to the line you touched.

3.3.8 Printing count characters

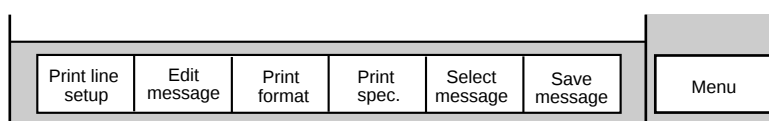
(1) Overview

- The numerical value of a predefined item is incremented or decremented each time it is printed.
- Count character entries are to be made from the calendar/count keyboard.
- By key input, count value will be reset to preset value.

(2) Operating examples

- ① Procedure for printing numbers between AA0001 and ZZ9999 in the first line of the second column by incrementing the printed number by one after each printing

- 1** From the "Print description" screen, press **Edit message**.



The "Edit message" screen then opens.

Edit message
2011.07.07 12:45
Status: Ready
Com=0

Message name [
]

Column 1
Column 2
Column 3

[USE BY] [YY. MM. DD. . .] [.]
[YY. MM. DD. . .] [MFG DATE . . .] [.]
[ABC] [.] [.]

Arabic	Kana	ABC 123	Dedicated	User pattern	Calendar /count	Punct.	Insert	Delete
1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I
K	L	M	N	O	P	Q	R	S
U	V	W	X	Y	Z	+	-	x
Shift ^	Shift V	(	)	.	:	.	Space	Blank
								Back-space

Start up
Shut down
Manual
Comm On/Off
Show cursor

Prev. col.
Next col.

Calendar conditions
Count conditions
Back

- 2** Press **Next column**.

The cursor then moves to the third line of the second column.

- 3** Press **↓** twice.

This causes the cursor to move to the first line of the second column.

- 4** Press **Calendar/count**.

- 5** Press **Count** six times.

The display then reads [CCCCCC].

- 6** Press **Apply**.

If the cursor is not displayed, press **Show cursor**.

7 Press **Count conditions**.

The "Count conditions" screen then opens.

Count conditions		2011.07.07 12:45	Status: Ready	Com=0																														
Message name []																																		
Column 1	Column 2	Column 3																																
[U]SE BY	[YY. MM. DD]	[.]																																
[YY. MM. DD]	[MFG DATE]	[.]																																
[ABC]	[CCCCC]	[.]																																
Value	[0 0 0 0 0]																																	
Range	[0 0 0 0 0]	Increment [0 1]																																
	[9 9 9 9 9]	Direction [1] (1:up 2:down)																																
Update	[0 0 0 0 0] (in progress)	Jump from:[.]																																
	[0 0 0 0 1] (unit)	to:[.]																																
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>123</td><td>ABC</td><td>abc</td><td>User pat-tern</td><td></td><td></td><td></td><td>Blank</td><td>Decre-ment</td><td>Incre-ment</td> </tr> </table>					1	2	3	4	5	6	7	8	9	0											123	ABC	abc	User pat-tern				Blank	Decre-ment	Incre-ment
1	2	3	4	5	6	7	8	9	0																									
123	ABC	abc	User pat-tern				Blank	Decre-ment	Incre-ment																									
			Start up	Shut down																														
			Manual	Comm On/Off																														
			Show cursor																															
			Prev. item	Next item																														
			↑	←																														
			↓	→																														
			Next conditions																															
			Back																															

8 Change the following settings. The input executes ① ② ③ in sequence.

Value [A A 0 0 0 1] ②
 Range [A A 0 0 0 0] ③ increment [0 1]
 [Z Z 9 9 9 9] ① Direction [1]
 Update [0 0 0 0 0 0] Jump from: [Z Z 9 9 9 9]
 [0 0 0 0 0 1] to: [A A 0 0 0 1]

Note: Input minimum and maximum obtainable values in whole digits for count range.

[Example] In case when value is to be updated in the following sequence:

001 -> 002 -> ... -> 998 -> 999 -> 001

Correct setting

Value [0 0 1]

Range [0 0 0]

[9 9 9]

Jump from: [9 9 9]

to: [0 0 1]

Wrong setting

Value [0 0 1]

Range [0 0 1]

[9 9 9]

Jump from: [9 9 9]

to: [0 0 1]

Keying procedures

Key	Function
	Moves the cursor one position up. When this key is pressed while the cursor is positioned at the uppermost line, the cursor moves to the lowermost line.
	Moves the cursor one position down. When this key is pressed while the cursor is positioned at the lowermost line, the cursor moves to the uppermost line.
Increment	Increments a numerical setting.
Decrement	Decrements a numerical setting.

9 Press **Apply**.

10 Press **Back**.

You are then returned to the "Edit message" screen.

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

- ② Procedure for printing numbers from AA0001-AA1000 through AB0001 to ZZ1000 in the first line of the second row by incrementing the printed number by one after each printing

1 Perform steps **1** through **7** of procedure ① .

2 Change the following settings.

This causes the cursor to move to the first line of the second row.

Initial value	[A A 0 0 0 1	]	
Range	[A A 0 0 0 0	]	increment [0 1]
	[Z Z 1 9 9 9	]	Direction [1]
Update	[0 0 0 0 0 0]		Jump from: [· · 1 0 0 0]
	[0 0 0 0 0 1]		to: [· · 0 0 0 1]

The following counting results are obtained. (Only the digits for which count setup has been performed are shown.)



3 Press **Apply**.

4 Press **Back**.

You are then returned to the "Edit message" screen.

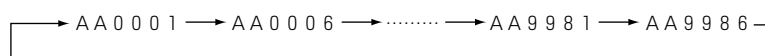
- ③ Procedure for printing numbers in increments of 5 from AA0001 through AA9986 in the first line of the second row

1 Perform steps **1** through **7** in operating example ①.

2 Change the settings as indicated below.

Value	[A A 0 0 0 1	]	
Range	[A A 0 0 0 0	]	Increment [0 5]
	[A A 9 9 9 9	]	Direction [1]
Update	[0 0 0 0 0 0]		Jump from: [A A 9 9 8 6]
	[0 0 0 0 0 1]		to: [A A 0 0 0 1]

The following counting results are obtained. (Only the digits for which count setup has been performed are shown.)



(NOTE) Ensure that the jump source setting is the count value for the increment setting.

④ Procedure for setting up registered characters as count values.

1 Change the values of the setup items on the "Count conditions" screen as follows.

Value	[00	]	
Range	[00	]	Increment [0 1]
	[07	]	Direction [1]
Update	[0 0 0 0 0 0]		Jump from: [·
	[0 0 0 0 0 1]		to: [·

[ex.] Define the registered characters as follows.

Registered character code	<u>00</u>	<u>01</u>	<u>02</u>	<u>03</u>	<u>04</u>	<u>05</u>	<u>06</u>	<u>07</u>
Defined pattern	①	②	③	④	④	③	②	①

When printing outward and homeward four times respectively in reciprocating printing, the same lines can be printed by the same numbers (① to ④).

The counts results will be as follows.

Outward ① → ② → ③ → ④ —

Homeward ① ← ② ← ③ ← ④ ←

- The registered characters usable for the count are 48 types up to the code 47.

Be sure to start with the lead 00.

- The registered characters can be combined with numbers.

```
[ex.] Range [ 0 0 0 0
              [ 9 9 0 9 0 9
```

⑤ Operation procedure for resetting count value to the preset value

- 1 Press **Next conditions** on "Count conditions" screen.
The 2nd page of "Count conditions" screen will appear.

Count conditions		2011.07.07 12:45		Status: Ready		Com=0			
Message name []									
Column 1		Column 2		Column 3					
[C C C C C C]		[.]		[.]					
[A B C D]		[.]		[.]					
Reset [.]									
1	2	3	4	5	6	7	8	9	0
123	ABC	abc	User pattern				Blank	Decrement	Increment
Start up Shut down Manual Comm On/Off Show cursor Prev. item Next item ↑ ← ↓ → Previous conditions Back									

- 2 Press **0 0 0 1**.
Reset character string is thus defined.

Count conditions		2011.07.07 12:45		Status: Ready		Com=0			
Message name []									
Column 1		Column 2		Column 3					
[C C C C C C]		[.]		[.]					
[A B C D]		[.]		[.]					
Reset [0 0 0 1]									
1	2	3	4	5	6	7	8	9	0
123	ABC	abc	User pattern				Blank	Decrement	Increment
Start up Shut down Manual Comm On/Off Apply Prev. item Next item ↑ ← ↓ → Previous conditions Back									

- 3 Press **Apply**.

4 Press **Back** twice.

You are returned to the "Print description" screen. **Count reset** will be displayed.

Print description		2011.07.07 12:45	Status: Ready	Com=0
Message name []				
Column 1	Column 2	Column 3		
[CCCC]	[]	[]		
[ABCD]	[]	[]		
Print layout				
< 0 1 2 3 ABCD >				
Print line setup Edit message Print format Print spec. Select message Save message				
Menu				

5 From the "Print description" screen, press **Count reset**.

"Count Reset Confirmation" message will be displayed.

====				Count Reset Confirmation		====	
The count value will be reset.							
OK						Cancel	

6 Press **OK**.

Count characters will change from "0123" to "0001".

Print description		2011.07.07 12:45	Status: Ready	Com=0
Message name []				
Column 1	Column 2	Column 3		
[CCCC]	[]	[]		
[ABCD]	[]	[]		
Print layout				
< 0 0 0 1 ABCD >				
Print line setup Edit message Print format Print spec. Select message Save message				
Menu				

(The "Arabic input" be
unable to do in "Simple
Chinese".)

3.3.9 Printing Arabic characters

(1) Overview

- Enter from the Arabic character keyboard.
- The Arabic characters cannot be entered in character size 5×5 , 9×8 and 7×10 .
- Entering an Arabic character will move the cursor to the left.

3.4 Setting Character Height and Character Orientation

(1) Overview

- The procedure for setting the character height, character width, character orientation and print start delay is described below.

The "Print specifications" first screen.

Print specifications		2011.07.07 12:45	Status: Ready	Com=0
Message name []				
Character height	[85]	(0-99)		
Character width	[000]	(0-199)		
Character orientation	[0]	(0:ABC 1:ABC 2:CBV 3:CBV)		
(Arrow: Printing direction) → ← ← →				
Printing method	2	(1: single scan 2: Interlaced)		
Repeat intervals	[0000]	(scanning unit SC 0-9999)		
Repeat count	[0000]	(0: none, 1-9998, 9999: continuous)		
Print start delay	[0050]	(scanning unit SC 0-9999)		
Target sensor timer	[000]	(1/10 sec 0: none, 1-999)		
Target sensor filter	[1]	(1: time setup 2: until end of print.)		
Setup value	[0000]	(msec 0-9999)		

1	2	3	4	5	6	7	8	9	0
								Decrement	Increment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. settings	Next settings
↑	←
↓	→
Character unit CH	
Scanning unit SC	
Back	

① Character height

- The character height can be specified.
- The character height setting range is from 0 to 99.

② Character width

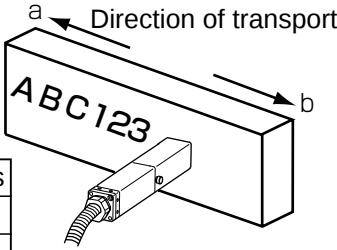
- The character width can be specified.
- The character width setting range is from 0 to 199.
- When the product speed matching feature is incorporated (when the rotary encoder is connected), set the character width as indicated below.

Ink drop use percentage setting	Character width setting
1/1	002
1/2	001
1/3 to 1/16	000

③ Character orientation

- Printing direction of characters can be set.
- Settings and print results are as shown below.

Setting	Direction of transport	Printing results
0 : ABC →	a←	ABC123
	→b	εSIBCBA
1 : ABC ←	a←	εSIBCBA
	→b	ABC123
2 : CBV ←	a←	VBC153
	→b	ε2ICBA
3 : CBV →	a←	ε2ICBA
	→b	VBC153



For rotary encoder wiring and setup, see Section 1.5.3-6, Rotary encoder signal.

For the 40 μ m nozzle machine, a ink drop use percentage setting of 1/1 is not available.

- The difference between "Blank" and "Space" is as follows.

	Printings	Printing results	
		Character orientation 0 "ABC→" (left-justified)	Character orientation 1 "ABC←" (right-justified)
1	[· · AB · · CD · ·]	AB	AB
	[· · · 1 2 3 4 · · ·]	1 2 3 4	1 2 3 4
2	[· · AB△△CD · ·]	AB CD	AB CD
	[· · · 1 2 3 4 · · ·]	1 2 3 4	1 2 3 4

- (Blank): Characters positioned after this mark will not be printed.
- △(Space) : A space will be handled as a character.

④ Printing method

- Two printing methods are selectable: "single scan" and "interlaced"
- A printing method will be automatically selected in accordance with the print format setup.
- When making interlaced prints, perform the following setup.
 - Ensure that the same print format is employed for all items.
 - Ensure that the same line count setting is employed for all columns.
 - The ink drop use percentage is 1/1 to 1/4.

Perform overall column setup. The format for the first item is then applied to all the other items so as to provide interlaced setup. When making a 1-line print, the single scan predominates even if you perform steps (i) through (iii) .

⑤ Print start delay

- The printing start position can be specified.
- The print start delay can be specified either on an individual character basis or on an individual scan basis.
- You should set the print start delay on an individual character basis and then make fine adjustments on an individual scan basis.
- The positional relationship between the sensor and nozzle is as indicated below.

When the nozzle is positioned before the sensor	When the nozzle is positioned after the sensor
Print start delay = $a - b$ (mm)	Print start delay = $a + b$ (mm)

- Specify the print start delay (printing start position) as suggested below.
 - Measure the length of the print start delay.
 - Measure the inter-character distance (C).
 - Divide the value obtained in (i) by the value obtained in (ii). Enter the resulting value.

$$\frac{a \pm b}{C} : \text{Setting value}$$

- When product speed matching function is not provided, if the ink drop use percentage, character width, character size or number of lines is changed, the set value of the print start delay can be adjusted so that the time until printing starts will not change.
- When product speed matching function is provided, if the pulse rate division factor is changed, the set value of the print start delay can be adjusted so that the time until printing starts will not change.

The term "chattering" refers to a state where signal voltage instability occurs when the sensor signal starts or ends.

⑥ Target sensor timer

- You can specify the time for displaying a fault message when the sensor light is continuously blocked.
- When the time of shielding the sensor from light exceeds a set value, the message "Target Sensor Fault" is displayed.
- If the "Target sensor timer" feature is not needed, select a setting of 0.
- The selectable setting is from 0.0 to 99.9 seconds.

⑦ Target sensor filter

- Perform this setup when you intend to maintain operation normality even in the event of chattering.
- In the case that a sensor signal chatters when a printed matter shields the sensor from light, the time to ignore the chattering is set.
- When a fault occurs due to chattering, the message "Print Overlap Fault" is displayed.
- If the target sensor filter feature is not needed, select a setting of 0.
- The selectable setting ranges from 0 to 9999 milliseconds.
- This allows not only "time setup" but "until end of print." as well.
- "Until end of print" can not be used in case of continuous printing.

The "Print specifications" second screen.

Print specifications	2011.07.07 12:45	Status: Ready	Com=0
Message name [	]		
Product speed matching	[0] (0: Time-based 1: Encoder based)	Start up	Shut down
Pulse rate div. Factor	[0 0 1] (1/1 ~ 1/999 Enter denominator.)	Manual	Comm On/Off
Ink drop use	[0 1] (1/1 ~ 1/16 Enter denominator.)		Show cursor
High-speed print	[0] (0: HM 1: NM 2: QM)	Prev. settings	Next settings
Calendar offset	[1] (1: offset from yesterday 2: from today)		
Day of week char.	[1] (1: 1-7 2: A-G 3: User pattern)		

⑧ Product speed matching

- When printing is conducted with this feature activated, the character width is maintained irrespective of print target transport speed changes.

⑨ Pulse rate division Factor

- Specifies the pulse rate division Factor that determines the intervals at which the encoder signal is to be recognized.
- The selectable setting ranges from 1/1 to 1/999.
- When a setting of 1/1 is selected, no pulse rate division Factor is effected.
- This feature cannot be activated if the product speed matching feature is disabled.

⑩ Ink drop use percentage

- A setting between 1/1 and 1/16 can be selected.

⑪ High-speed printing

- Set the high-speed printing format. See "3.10 Setting high-speed printing" for details.

⑫ Calendar offset

- Specifies whether the "from today" or "offset from yesterday" option is to be selected for calendar month/year offset determination.

⑬ Day of week character

- Set the type of character to be printed for calendar (day of the week).

	Mon	Tue	Wen	Thu	Fri	Sat	Sun
1 to 7	1	2	3	4	5	6	7
A to G	A	B	C	D	E	F	G
Registered character	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>	<u>C7</u>

The last 7 chracters are used for user pattern characters.

For the 40 μ m nozzle machine, an ink drop use percentage setting of 1/1 is not available.

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

If the cursor is not displayed, press **Show cursor**.

(2) Operating procedure

- Setting the character height to 90, character width to 10, character orientation to 1.

1 From the "Print description" screen, press **Print spec**.

The "Print specifications" screen then opens. (The maximum value for the print start delay varies with the character size.)

Print specifications		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Character height		[8]5 (0-99)					
Character width		[000] (0-199)					
Character orientation		[0] (0:ABC 1:ABC 2:CBV 3:CBV)					
(Arrow: Printing direction) → ← ← →							
Printing method		2 (1: single scan 2: Interlaced)					
Repeat intervals		[0000] (scanning unit SC 0-9999)					
Repeat count		[0000] (0: none, 1-9998, 9999: continuous)					
Print start delay		[0050] (scanning unit SC 0-9999)					
Target sensor timer		[000] (1/10 sec 0: none, 1-999)					
Target sensor filter		[1] (1: time setup, 2: until end of print.)					
Setup value		[0000] (msec 0-9999)					
1	2	3	4	5	6	7	8
							Decrement
							Increment
Character unit CH							
Scanning unit SC							
Back							

2 Press **9** and **0** in sequence.

The character height is then set to 90.

Print specifications		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Character height		[90] (0-99)					
Character width		[000] (0-199)					
Manual		Comm On/Off					
Start up		Shut down					

3 Press **↓**.

The cursor then moves to the character width input field.

4 Press **0**, **1**, and **0** in sequence.

The character width is then set to 10.

Print specifications		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Character height		[90] (0-99)					
Character width		[010] (0-199)					
Manual		Comm On/Off					
Start up		Shut down					

5 Press **↓**.

The cursor then moves to the character orientation input field.

6 Press **1**.

Character orientation option 1 (ABC) is then selected.

- The same result is produced if you press **Increment**.

Print specifications		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Character height		[90] (0-99)					
Character width		[010] (0-199)					
Character orientation		[1] (0:ABC 1:ABC 2:CBV 3:CBV)					
(Arrow: Printing direction) → ← ← →							
Manual		Comm On/Off					
Start up		Shut down					
Apply							

7 Press **↓**.

This places the cursor in the repeat intervals input field.

Cursor will move to the line you touched.

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

3.5 Setting Repeat Printing

(1) Overview

- This is set to print the same print description continuously.
- Set the "Repeat intervals" and "Repeat count" for repeat printing.

① Repeat intervals

- The print target size can be specified.
- This setup is to be performed when the print target is transported while it is in close contact.
- Perform the following calculations for repeat intervals setup purposes.

(i) On an individual scan basis

$(1\text{-digit character width} \times \text{number of digits} - \text{trailing character correction value}) \times (\text{print target size/all-digit print width})$

(ii) On an individual character basis

$\text{Number of digits} \times (\text{print target size/all-digit print width})$

(Example) Print target size: 64 mm; all-digit print width: 25 mm;
number of digits: 6; character size: 5 × 7 dots; inter-character space: 2 dots

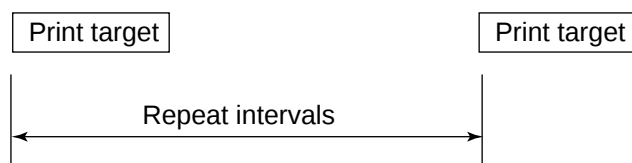
- On an individual scan basis

$((5 + 2) \times 1 \times 6 - (2 \times 1 + 1)) \times (64 / 25) = 99.84 \rightarrow 100$

- On an individual character basis

$6 \times (64 / 25) = 15.36 \rightarrow 15$

- Round off the calculation results to the nearest whole number.



② Repeat count

- You can preset the number of repeat printing sequences to be performed while the sensor light is blocked.
- If repeat printing is not needed, select the number "0".
- Printing is performed in accordance with the repeat printing mode setup.
- The relationship between repeat printing mode and count is as stated below.

Mode	Setting	
	2 ~ 9998	9999
Signal ON period	Printing is repeated a preselected number of times at predefined intervals while the print target is detected.	Repeat printing is performed while the print target is detected.
OFF - ON transition	Printing is repeated a preselected number of times at predefined intervals once the print target is detected.	Once the print target is detected, repeat printing is performed until it is aborted.

1-digit character width =
(horizontal character size
+ inter-character space) x
character width increase
setting

Trailing character
correction value = inter-
character space x
character width
increase setting + 1

(2) Operating procedure

Set the repeat intervals and repeat count.

1 Set the repeat intervals.

- The unit of repeat intervals can be changed by pressing

Character unit CH and **Scanning unit SC**.

Character unit CH is to set the character width unit and

Scanning unit SC is to set the interval by one dot width.

2 Press **0 3 0 0** for **Scanning unit SC**.

A repeat intervals setting of 300 is then selected.

Print specifications	2011.07.07 12:45	Status: Ready	Com=0
Message name [	]		
Character height	[9 0] (0-9 9)		
Character width	[0 1 0] (0-1 9 9)		
Character orientation	[1] (0:ABC 1:ABC 2:CB A 3:CB A)		
(Arrow: Printing direction)	→ ← ← →		
Printing method	2 (1: single scan 2: Interlaced)		
Repeat intervals	[0 3 0 0] (scanning unit SC 0-9999)		

Start up	Shut down
Manual	Comm On/Off
Apply	
Prev. set-	Next set-

Cursor will move to the line you touched.

3 Press **↓**.

The cursor then moves to the repeat count input field.

4 Press **9** four times consecutively.

The repeat count is then set to 9999.

Print specifications	2011.07.07 12:45	Status: Ready	Com=0
Message name [	]		
Character height	[9 0] (0-9 9)		
Character width	[0 1 0] (0-1 9 9)		
Character orientation	[1] (0:ABC 1:ABC 2:CB A 3:CB A)		
(Arrow: Printing direction)	→ ← ← →		
Printing method	2 (1: single scan 2: Interlaced)		
Repeat intervals	[0 3 0 0] (scanning unit SC 0-9999)		
Repeat count	[9 9 9 9] (0:none, 1-9998, 9999:continuous)		

Start up	Shut down
Manual	Comm On/Off
Apply	
Prev. set-tings	Next set-tings

5 Press **Apply**.

6 Press **Back**.

You are then returned to the "Printing description" screen.

Offset values: Values to be added to the current date and time values

3.6 Printing Future Date and Time

(1) Overview

- Date/time setup can be performed by adding the internal clock date/time and offset values together.
- The following offset values are selectable.

Year	0 ~ 99
Month	0 ~ 99
Day	0 ~ 1999
Hour	-23 ~ 99
Minute	-59 ~ 99

- Monthly offset example

Print spec. calendar offset	Offset from yesterday		From today	
	1 month	1 month + 1 day	1 month	1 month + 1 day
07.01.28	07.02.27	07.02.28	07.02.28	07.03.01
07.01.29	07.02.28	07.02.28	07.02.28	07.03.01
07.01.30	07.02.28	07.02.28	07.02.28	07.03.01
07.01.31	07.02.28	07.02.28	07.02.28	07.03.01
07.02.01	07.02.28	07.03.01	07.03.01	07.03.02
07.02.02	07.03.01	07.03.02	07.03.02	07.03.03
07.02.27	07.03.26	07.03.27	07.03.27	07.03.28
07.02.28	07.03.27	07.03.28	07.03.28	07.03.29
07.03.01	07.03.31	07.04.01	07.04.01	07.04.02
08.01.28	08.02.27	08.02.28	08.02.28	08.02.29
08.01.29	08.02.28	08.02.29	08.02.29	08.03.01
08.01.30	08.02.29	08.02.29	08.02.29	08.03.01
08.01.31	08.02.29	08.02.29	08.02.29	08.03.01
08.02.01	08.02.29	08.03.01	08.03.01	08.03.02
08.02.02	08.03.01	08.03.02	08.03.02	08.03.03
08.02.27	08.03.26	08.03.27	08.03.27	08.03.28
08.02.28	08.03.27	08.03.28	08.03.28	08.03.29
08.02.29	08.03.28	08.03.29	08.03.29	08.03.30
08.03.01	08.03.31	08.04.01	08.04.01	08.04.02

- Yearly offset example

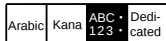
Calendar clock date	Offset from yesterday		From today	
	1 year	4 years	1 year	4 years
08.02.29	09.02.28	12.02.28	09.02.28	12.02.29

- For changeover between "Offset from yesterday" and "From today," see Section 3.4, Setting Character Height and Character Orientation.

It is presumed that the present date is July 7, 2011.

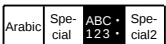
Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."



If the cursor is not displayed, press **Show cursor**.

(2) Operating procedure

- Setting the "USE BY" date entry to August 6, 2011, which is one month later

1 From the "Print description" screen, press **Edit message**.

Print line setup	Edit message	Print format	Print spec.	Select message	Save message	Menu
------------------	--------------	--------------	-------------	----------------	--------------	------

The "Edit message" screen then opens.

Edit message										2011.07.07 12:45		Status: Ready		Com=0	
Message name []															
Column 1				Column 2				Column 3							
[USE BY]				[YY. MM. DD . . .]				[.]							
[YY. MM. DD . . .]				[MFG DATE . . .]				[.]							
[ABC]				[CCCC]				[.]							
Arabic	Kana	ABC 123	Dedicated	User pattern	Calendar /count	Punct.	Insert	Delete							
1	2	3	4	5	6	7	8	9	0						
A	B	C	D	E	F	G	H	I	J						
K	L	M	N	O	P	Q	R	S	T						
U	V	W	X	Y	Z	+	-	x	/						
Shift ^	Shift V	(	)	.	:	.	Space	Blank	Back-space						
										Start up	Shut down				
										Manual	Comm On/Off				
											Show cursor				
										Prev. col.	Next col.				
										↑	←				
										↓	→				
										Calendar conditions					
										Count conditions					
										Back					

2 Press **Calendar conditions**.

The "Calendar conditions" screen then opens with the cursor positioned in the year input field.

3 Press **Next item**.

The third line of the second column is then highlighted.

Calendar conditions										2011.07.07 12:45		Status: Ready		Com=0	
Message name []															
Column 1				Column 2				Column 3							
[USE BY]				[YY. MM. DD . . .]				[.]							
[YY. MM. DD . . .]				[MFG DATE . . .]				[.]							
[ABC]				[CCCC]				[.]							
										Start up	Shut down				
										Manual	Comm On/Off				
											Show cursor				
										Prev. item	Next item				
										↑	←				
										↓	→				
										Substitution rules					
										Back					

<Offset>										<Substitution rules>										<Zero-suppression>									
Year		[0 0 0 0]		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)							
Month		[0 0 0 0]		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)							
Day		[0 0 0 0]		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)		[0]		(0:Disable 1:Enable)							
Hour		[0 0 0 0]																											
Minute		[0 0 0 0]																											
Substitution rules No. [0 1]																													
1	2	3	4	5	6	7	8	9	0																				
—																		Decrement	Increment										

Cursor will move to the line you touched.

4 Press **↓**.

The cursor then moves to the "Month" field.

	<Offset>	<Substitution rules>	<Zero-suppression>
Year	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)
Month	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)
Day	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)
Hour	[0 0 0 0]		
Minute	[0 0 0 0]		

Substitution rules No. [0 1]

Prev. item	Next item
↑	←
↓	→

5 Press **0**, **0**, **0**, and **1** in sequence.

6 Press **Apply**.

- To continue to perform offset setup for another item, press **Next item** or **Previous item** and repeat steps **4** and **5**.

7 Press **Back**.

You are then returned to the "Edit message" screen.

8 Press **Back**.

You are then returned to the "Print description" screen.

3.7 Printing with Date/ Time Changed to Other Characters

(1) Overview

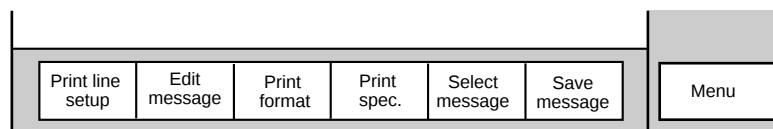
- Printing can be performed with date/time entries changed to designated characters.
- The characters to be used for this substitution must be set from the "Substitution rule setup" screen.
- You can make up to 99 substitution rules.
- You are to specify one substitution rule number for the print items.
- Katakana, alphanumeric, user pattern characters, and Arabic numeral can be designated as substitute characters.
- The available year substitution characters are adequate for a period of 25 years beginning with the year indicated by the calendar clock.

(NOTE) Regarding replacement characters for years, the setting is automatically justified forward (justified backward when the calendar is turned back) each time the calendar is updated.
In particular, when "year" of the calendar is turned back, the replacement characters of this year will be replaced with spaces.

(2) Operating procedure

- Performing setup so that the time values between 00 and 11 are printed as "AM" and that the time values between 12 and 23 are printed as "PM"

1 From the "Print description" screen, press **Edit message**.



The "Edit message" screen then opens.

Edit message
2011.07.07 12:45
Status: Ready
Com=0

Message name []

Column 1

Column 2

Column 3

[USE BY]

[YY. MM. DD . . .]

[.]

[YY. MM. DDhh]

[MFG DATE . . .]

[.]

[ABC]

[CCCC]

[.]

Arabic	Kana	ABC 123	Dedicated	User pattern	Calendar /count	Punct.	Insert	Delete
1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I
K	L	M	N	O	P	Q	R	S
U	V	W	X	Y	Z	+	-	x
Shift ^	Shift V	(	)	.	:	.	Space	Blank
								Back-space

Start up

Shut down

Manual

Comm On/Off

Show cursor

Prev. col.

Next col.

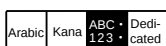
Calendar conditions

Count conditions

Back

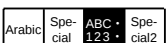
Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

Keyboard display has been set to one of the following settings:
"When KANA and dedicated characters can be input."



(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."



If the cursor is not displayed, press **Show cursor**.

2 Press **Calendar conditions**.

The "Calendar conditions" screen then opens with the cursor positioned in the year input field.

Calendar conditions		2011.07.07 12:45		Status: Ready		Com=0																					
Message name []																											
Column 1		Column 2		Column 3																							
[USE BY]		[YY. MM. DD . . .]		[.]																							
[YY. MM. DDhh]		[MFG DATE . . .]		[.]																							
[ABC]		[CCCC]		[.]																							
< Offset > < Substitution rules > < Zero-suppression >																											
Year	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)																								
Month	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)																								
Day	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)																								
Hour	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)																								
Minute	[0 0 0 0]																										
Substitution rules No. [0 1]																											
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Decre-ment</td><td>Incre-ment</td> </tr> </table>								1	2	3	4	5	6	7	8	9	0									Decre-ment	Incre-ment
1	2	3	4	5	6	7	8	9	0																		
								Decre-ment	Incre-ment																		
<table border="1"> <tr> <td>Start up</td><td>Shut down</td> </tr> <tr> <td>Manual</td><td>Comm On/Off</td> </tr> <tr> <td></td><td>Show cursor</td> </tr> <tr> <td>Prev. item</td><td>Next item</td> </tr> <tr> <td>↑</td><td>←</td> </tr> <tr> <td>↓</td><td>→</td> </tr> <tr> <td colspan="2">Substitution rules</td> </tr> <tr> <td colspan="2">Back</td> </tr> </table>								Start up	Shut down	Manual	Comm On/Off		Show cursor	Prev. item	Next item	↑	←	↓	→	Substitution rules		Back					
Start up	Shut down																										
Manual	Comm On/Off																										
	Show cursor																										
Prev. item	Next item																										
↑	←																										
↓	→																										
Substitution rules																											
Back																											

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

3 Press **↓** three times consecutively.

The cursor is then positioned in the "Hour" field.

4 Press **→** four times consecutively.

The cursor then moves to the <Substitution rules> row.

5 Press **1**.

A substitution rule setting of 1 is then selected for "Hour".

To change substitution rule numbers, move the cursor to the "Substitution rules No." field.

6 Press **Apply**.

7 Press **Substitution rules**.

The "Substitution rule setup" screen for "hour" then opens.

Subst. rule setup		2011.07.07 12:45		Status: Ready		Com=0							
No.[0 1] Type [Hour]													
0 0[]	0 1[]	0 2[]	0 3[]	0 4[]	0 5[]								
0 6[]	0 7[]	0 8[]	0 9[]	1 0[]	1 1[]								
1 2[]	1 3[]	1 4[]	1 5[]	1 6[]	1 7[]								
1 8[]	1 9[]	2 0[]	2 1[]	2 2[]	2 3[]								
<table border="1"> <tr> <td>Start up</td><td>Shut down</td> </tr> <tr> <td>Manual</td><td>Comm On/Off</td> </tr> <tr> <td></td><td>Show cursor</td> </tr> </table>								Start up	Shut down	Manual	Comm On/Off		Show cursor
Start up	Shut down												
Manual	Comm On/Off												
	Show cursor												

- If the "year", "month", or "day" substitution setup is displayed, you can switch to the "hour" substitution setup by pressing **Previous display** or **Next display**.

If the cursor is not displayed, press **Show cursor**.

- 8** Press **A** and **M** in sequence.

The cursor then moves to the next field.

- 9** Press **Duplicate**.

The "01" field then reads "AM".

- The same result is obtained by pressing **A** and **M** in sequence.

Subst. rule setup		2011.07.07 12:45		Status: Ready		Com=0	
No.[0 1]	Type	[Hour]					
0 0 [A M]	0 1 [A M]	0 2 []	0 3 []	0 4 []	0 5 []		
0 6 []	0 7 []	0 8 []	0 9 []	1 0 []	1 1 []		
1 2 []	1 3 []	1 4 []	1 5 []	1 6 []	1 7 []		
1 8 []	1 9 []	2 0 []	2 1 []	2 2 []	2 3 []		

Start up	Shut down
Manual	Comm On/Off
Apply	

- 10** Repeat step **9** until the "11" field is covered.

Subst. rule setup		2011.07.07 12:45		Status: Ready		Com=0	
No.[0 1]	Type	[Hour]					
0 0 [A M]	0 1 [A M]	0 2 [A M]	0 3 [A M]	0 4 [A M]	0 5 [A M]		
0 6 [A M]	0 7 [A M]	0 8 [A M]	0 9 [A M]	1 0 [A M]	1 1 [A M]		
1 2 []	1 3 []	1 4 []	1 5 []	1 6 []	1 7 []		
1 8 []	1 9 []	2 0 []	2 1 []	2 2 []	2 3 []		

Start up	Shut down
Manual	Comm On/Off
Apply	

- 11** Press **P** and **M** in sequence.

- 12** Repeat step **9** until the "23" field is covered.

- The same result is obtained by pressing **P** and **M** in sequence instead of Duplicate .
- To continue to perform substitution setup for year, month, day, or minute, switch to the target screen by pressing **Next display** or **Previous display**.
At each press of **Previous display**, the screen changes in the day, month, year, minute, and hour order.
At each press of **Next display**, the screen changes in the day, hour, minute, year, and month order.

- 13** Press **Apply**.

- 14** Press **Back**.

The system then returns you to the "Calendar conditions" screen.

- 15** Press **Back**.

You are then returned to the "Edit message" screen.

- 16** Press **Back**.

The "Print description" then appears again.

Replacing 0 with space for printing

Using the zero suppression function allows you to replace zeros (0) in the upper digits of calendar characters with spaces for printing.

<Example> Input as **[YYYY.MM.DD]** and print on April 8, 2011:

Calendar conditions	Print result
No zero suppression for any calendar characters	2011.04.08
No zero suppression for year ; zero suppression for month and day	2011. 4. 8

(1) Overview

- ## (2) Operating procedure

- 1** From the "Print description" screen, press **Save message**.

The system then returns you to the "Save message" screen.

2 Press **A**, **B**, and **C** in sequence.

3 Press **OK**.

Save message	2011.07.07 12:45	Status: Ready	Com=0
Message name [	]		
Save message as (name) : [ABC	]		
Message number : 01			

Start up	Shut down
Manual	Comm On/Off

Arabic	Spe- cial	ABC • 123 •	Spe- cial2
--------	--------------	----------------	---------------

3.9 Recalling Saved Data

(1) Overview

- You can recall Saved print data.

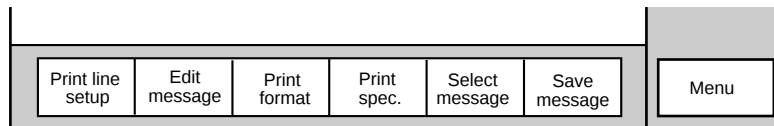
(2) Operating procedure

- Recalling the "FFFFFFFFFFFF" data

1 From the "Print description" screen, press **Select message**.

Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

If the cursor is not
displayed, press
Show cursor.



The system then returns you to the "Select message" screen.

Select message		2011.07.07 12:45		Status: Ready		Com=0																	
Message name [A A A A A A A A A A A]																							
No	Message name	No	Message name	<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2">Prev. list</td> </tr> <tr> <td colspan="2">Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> <tr> <td colspan="2">Cancel</td> </tr> <tr> <td colspan="2">OK</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off	Prev. list		Next list		↑	←	↓	→	Cancel		OK	
Start up	Shut down																						
Manual	Comm On/Off																						
Prev. list																							
Next list																							
↑	←																						
↓	→																						
Cancel																							
OK																							
1	A A A A A A A A A A A	16																					
2	B B B B B B B B B B B	17																					
3	C C C C C C C C C C C	18																					
4	D D D D D D D D D D D	19																					
5	E E E E E E E E E E E	20																					
6	F F F F F F F F F F F	21																					
7	G G G G G G G G G G G	22																					
8		23																					
9		24																					
10		25																					
11		26																					
12		27																					
13		28																					
14		29																					
15		30																					

2 Press down on "FFFFFFFFFFFF".

The cursor then moves to the No. 6 position.

Select message		2011.07.07 12:45		Status: Ready		Com=0											
Message name [A A A A A A A A A A A]																	
No	Message name	No	Message name	<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2">Prev. list</td> </tr> <tr> <td colspan="2">Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off	Prev. list		Next list		↑	←
Start up	Shut down																
Manual	Comm On/Off																
Prev. list																	
Next list																	
↑	←																
1	A A A A A A A A A A A	16															
2	B B B B B B B B B B B	17															
3	C C C C C C C C C C C	18															
4	D D D D D D D D D D D	19															
5	E E E E E E E E E E E	20															
6	F F F F F F F F F F F	21															

3 Press **OK**.

The Select Message Confirmation message then appears.

4 Press **Execute**.

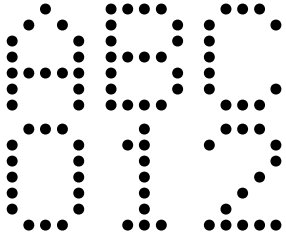
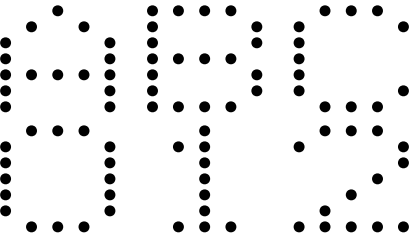
The system then recalls "FFFFFFFFFFFF" and returns you to the "Print description" screen.

- If called up during printing, the on-screen contents change to the called printing data, but the printing of the previous contents continues. Printing results change from the next printing.

3.10 Setting high-speed printing

(1) Overview

- When nozzle diameter 65 μ m, with the character size setting is 5x7 dots, and print line is set to 2 or 3 lines, three modes of HM, NM or QM can be selected with the setting of particle use percentage: 1/1.
By selecting the mode, high quality printing result can be ensured according to the linespeed.

HM mode	NM mode	Remarks
		HM mode is equivalent to particle use percentage of 1/1. In the 2-line print setting, NM mode is equivalent to ink drop use percentage of 1/1.5. If the line speed remains the same, print width in the NM mode will widen by 1.5 times with respect to HM mode.

- When nozzle diameter is 40 μ m, with character size of 5x5, 5x7 or 5x8 dots, HM mode can be selected for 1-line print, QM mode can be selected for 2-line or 3-line mode print.

① Necessary conditions to perform high-speed printing

- When all necessary conditions from Nos. 1 to 7 are satisfied, high-speed printing HM, NM or QM mode can be selected.

No.	Item	Conditions with 65 μ m	Conditions with 40 μ m
1	Character size	Character size of all print items is 5x7.	Character size of all print items is the same. Character size is any one of 5x5, 5x7 or 5x8.
2	Print line	Number of lines in all columns is 2 lines or 3 lines.	Number of lines for all columns is the same. Number of lines is any one of 1 line, 2 lines or 3 lines.
3	Line spacing	line spaces in all columns are the same.	
4	Barcode	Bar code is not set for any print items.	
5	Character orientation	Set value of character orientation is "0" or "1".	
6	Ink drop use percentage	Ink drop use percentage: 1/1	

② Type of high-speed print and number of vertical dots used

- Number of vertical dots used in high-speed printing is shown in Table below.
- When calculating printing preparation time, etc., pay attention to number of vertical dots.

Number of vertical dots used when nozzle diameter is 65 μ m

Ink drop use rate	Type	No. of vertical dots used in 2-line printing	No. of vertical dots used 3-line printing
1/1	HM	14	21
	NM	21 *	28
	QM	21 *	35
1/2	—	28	42

(Note) * When 2-line printing is set, settings of NM and QM will be the same.

calculating printing preparation time
(See Section "1.5.3-4, Print target detector")

Number of vertical dots used when nozzle diameter is 40 μ m

Ink drop use rate	Type	Vertical dots used in 1-line printing			Vertical dots used in 2-line printing			Vertical dots used in 3-line printing		
		5X5	5X7	5X8	5X5	5X7	5X8	5X5	5X7	5X8
1/1	HM	5	7	8	—	—	—	—	—	—
	NM	—	—	—	—	—	—	—	—	—
	QM	—	—	—	15	21	24	25	35	40
1/2	—	10	14	16	20	28	32	30	42	48

(2) Operating procedure

- When nozzle diameter 65 μ m, Set to high-speed printing NM mode with 3-line print setting.

1 Display "User environment setup" screen.

User environment setup
(See Section 4.2, "Setting the user environment ")

User environment setup 2011.07.07 12:45
Status: Ready Com=0

Repeat print sensor mode [1] (1: signal ON 2: ON-Off transition)
Reverse direction printing [0] (0: Disable 1: OFF=ABC 2: OFF=CBA)
Reverse print [1] (1: method1 2: method2)
Speed compensation [0] (0: Disable 1: Enable)
Print signal type [1] (1: print. complete 2: print.-in-progress)
Method to apply print data [1] (1: method1 2: method2)
Create messages [0] (0: access 1: protect)
Char. Size menu 1 [1] (1: 5×8 2: 5×7)
Char. Size menu 2 [1] (1: 7×10 2: 9×8 3: 9×7)
Excitation V-ref. warning [1] (0: Disable 1: Enable)

1	2	3	4	5	6	7	8	9	0
								Decre-ment	Incre-ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. set-tings	Next set-tings
↑	←
↓	→
Back	

2 Set "Char. size 1" to "2: 5 x 7".

User environment setup 2011.07.07 12:45
Status: Ready Com=0

Repeat print sensor mode [1] (1: signal ON 2: ON-Off transition)
Reverse direction printing [0] (0: Disable 1: OFF=ABC 2: OFF=CBA)
Reverse print [1] (1: method1 2: method2)
Speed compensation [0] (0: Disable 1: Enable)
Print signal type [1] (1: print. complete 2: print.-in-progress)
Method to apply print data [1] (1: method1 2: method2)
Create messages [0] (0: access 1: protect)
Char. Size menu 1 [2] (1: 5×8 2: 5×7)
Char. Size menu 2 [1] (1: 7×10 2: 9×8 3: 9×7)
Excitation V-ref. warning [1] (0: Disable 1: Enable)

1	2	3	4	5	6	7	8	9	0
								Decre-ment	Incre-ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. set-tings	Next set-tings
↑	←
↓	→
Back	

- 3** Set "Character size" to "2: 5 x 7", "Barcode" to "0: none" on the "Print format" screen.

Print format		2011.07.07 12:45		Status: Ready		Com=0																					
Message name [SAMPLE 1]																											
Column 1		Column 2		Column 3																							
[0 1 2 3 4 5 6 7 8 9]		[0 1 2 3 4 5 6 7 8 9]		[0 1 2 3 4 5 6 7 8 9]																							
Line spacing		[0] (dots 0-2)																									
Character size		[2] (1:5x5 2:5x7 3:7x10 4:12x16 5:18x24 6:24x32)																									
Inter-char. space		[1] (dots 0-3)																									
Increased width		[1] (times 1-9)																									
Bar code		[0] (0:none 1:C39 2:ITF 3:NW-7 4:EAN-13 5:DM 6:C128)																									
1	2	3	4	5	6	7	8	9	0																		
								Decre- ment	Incre- ment																		
<table border="1"> <tr> <td>Start up</td><td>Shut down</td> </tr> <tr> <td>Manual</td><td>Comm On/Off</td> </tr> <tr> <td></td><td>Show cursor</td> </tr> <tr> <td>Prev. item</td><td>Next item</td> </tr> <tr> <td>↑</td><td>←</td> </tr> <tr> <td>↓</td><td>→</td> </tr> <tr> <td colspan="2"></td> </tr> <tr> <td colspan="2"></td> </tr> <tr> <td colspan="2">Back</td> </tr> </table>										Start up	Shut down	Manual	Comm On/Off		Show cursor	Prev. item	Next item	↑	←	↓	→					Back	
Start up	Shut down																										
Manual	Comm On/Off																										
	Show cursor																										
Prev. item	Next item																										
↑	←																										
↓	→																										
Back																											

- 4** Set to "Overall column setup" and then set to "3 lines" on the "Print line setup" screen.

Print line setup		2011.07.07 12:45		Status: Ready		Com=0															
Message name [SAMPLE 1]																					
Column 1		Column 2		Column 3																	
[1 2 3 4 5 6 7 8 9 0]		[1 2 3 4 5 6 7 8 9 0]		[1 2 3 4 5 6 7 8 9 0]																	
Overall column setup : Sets same number of lines for all columns. Individual column setup : Sets number of lines for each column, or deletes column.																					
Print line setup type		Overall column setup Individual column setup																			
1 line	2 lines	3 lines	4 lines																		
<table border="1"> <tr> <td>Start up</td><td>Shut down</td> </tr> <tr> <td>Manual</td><td>Comm On/Off</td> </tr> <tr> <td>Prev. col.</td><td>Next col.</td> </tr> <tr> <td colspan="2"></td> </tr> <tr> <td colspan="2">Cancel</td> </tr> <tr> <td colspan="2"></td> </tr> <tr> <td colspan="2">OK</td> </tr> </table>								Start up	Shut down	Manual	Comm On/Off	Prev. col.	Next col.			Cancel				OK	
Start up	Shut down																				
Manual	Comm On/Off																				
Prev. col.	Next col.																				
Cancel																					
OK																					

- 5 Set "Character orientation" to "0: ABC" or "1: ABC" on the "Print specifications" screen.

Print specifications		2011.07.07 12:45		Status: Ready		Com=0			
Message name [SAMPLE 1]									
Character height		[5 0] (0-9 9)							
Character width		[0 0 2] (0-1 9 9)							
Character orientation		[0] (0: ABC 1: A B C 2: C B A 3: C B A)							
(Arrow: Printing direction) → ← ← →									
Printing method		2 (1: single scan 2: Interlaced)							
Repeat intervals		[0 0 0 0] (scanning unit SC 0-9999)							
Repeat count		[0 0 0 0] (0: none, 1-9998, 9999: continuous)							
Print start delay		[0 0 5 0] (scanning unit SC 0-1234)							
Target sensor timer		[0 0 0] (1/10 sec 0: none, 1-999)							
Target sensor filter		[1] (1: time setup 2: until end of print.)							
Setup value		[0 0 5 0] (msec 0-9999)							
1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment
Character unit CH									
Scanning unit SC									
Back									

- 6 Press **Next settings**.

- The second page of "Print specifications" screen will appear.

Print specifications		2011.07.07 12:45		Status: Ready		Com=0			
Message name [SAMPLE 1]									
Product speed matching		[0] (0: Time-based 1: Encoder based)							
Pulse rate div. Factor		[0 0 1] (1/1~1/999 Enter denominator.)							
Ink drop use		[0 3] (1/1~1/16 Enter denominator.)							
High-speed print		[0] (0: HM 1: NM 2: QM)							
Calendar offset		[1] (1: offset from yesterday 2: from today)							
Day of week char.		[1] (1: 1-7 2: A-G 3: User pattern)							
1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment
Back									

7 Set "Ink drop use" to "01" on the "Print specifications" screen.

Print specifications		2011.07.07 12:45		Status: Ready		Com=0	
Message name [SAMPLE 1]							
Product speed matching		[0] (0 : Time-based 1 : Encoder based)					
Pulse rate div. Factor		[0 0 1] (1/1~1/999 Enter denominator.)					
Ink drop use		[0 1] (1/1~1/16 Enter denominator.)					
High-speed print		[0] (0: HM 1: NM 2 : QM)					
Calendar offset		[1] (1: offset from yesterday 2: from today)					
Day of week char.		[1] (1: 1-7 2: A-G 3: User pattern)					

1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. set- tings	Next set- tings
↑	←
↓	→
Back	

8 Set "High-speed print" to "NM".

Print specifications		2011.07.07 12:45		Status: Ready		Com=0	
Message name [SAMPLE 1]							
Product speed matching		[0] (0 : Time-based 1 : Encoder based)					
Pulse rate div. Factor		[0 0 1] (1/1~1/999 Enter denominator.)					
Ink drop use		[0 1] (1/1~1/16 Enter denominator.)					
High-speed print		[1] (0: HM 1: NM 2 : QM)					
Calendar offset		[1] (1: offset from yesterday 2: from today)					
Day of week char.		[1] (1: 1-7 2: A-G 3: User pattern)					

1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. set- tings	Next set- tings
↑	←
↓	→
Back	

9 Press the **Back** key and display the "Print description" screen.

With above settings, high speed and high quality printing can be performed.

3.11 Printing shift code

(1) Overview

- The working day is divided into multiple work shifts, and a different code can be printed for each work shift.

(Example) One day is divided into 3 working shifts

No.	Range	Print result
1	0:30 - 8:14	A1
2	8:15 - 16:44	A2
3	16:45 - 0:29	A3

- Shift code characters can be set to only one position for one item of print data. A maximum of 10 characters can be input.
- Shift code rule is set using "Shift code setup" screen.
- For a work shift, start time is specified by hour and minute units. A maximum of 10 divisions can be specified.
- The rule of shift code is commonly used with each item of print data which has been saved.
- This is linked with Calendar time considering offset.
- Shift code characters cannot be input in the same print item of any other calendar.

(2) Operating procedure

- Setting contents shown above (example)

1 Press **Edit message** on the "print description" screen.

Print line setup	Edit message	Print format	Print spec.	Select message	Save message	Menu
------------------	--------------	--------------	-------------	----------------	--------------	------

"Edit message" screen will appear.

Edit message			2011.07.07 12:45	Status: Ready	Com=0
Message name []					
Column 1		Column 2		Column 3	
[.]		[.]		[.]	
Prev. col.		Next col.			

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. col.	Next col.

2 Press **Calendar/count**.

Keyboard for calendar input will appear.

Arabic	Spe- cial	ABC 123	Spe- cial2	User pat- tern	Calendar /count		Punct.	Insert	Delete
Year	Month	Day	Hour	Minute	Second	Total days	JAN FEB	Week number	Day of week
Shift code	Time count								
Count									
						+	-	×	/
		(	)	.	:	.	Space	Blank	Back- space

3 Press **Shift code** twice.

Shift code character "E" will be input.

4 Press **Apply**.

5 Press **calendar conditions**.

"Calendar conditions" screen will appear.

Calendar conditions
2011.07.07 12:45
Status: Ready
Com=0

Message name [

Column 1

Column 2

Column 3

[E E] [.] [.]

< Offset >

Year [0 0 0 0]

Month [0 0 0 0]

Day [0 0 0 0]

Hour [0 0 0 0]

Minute [0 0 0 0]

1	2	3	4	5	6	7	8	9	0
-								Decre- ment	Incre- ment

Start up

Shut down

Manual

Comm On/Off

Show cursor

Prev. item

Next item

↑

←

↓

→

Shift code

Back

6 Press **Shift** code.

"Shift code setup" screen will appear.

- If a work shift exceeds 5 divisions, switch the screen using "Prev. display" or "Next display".
- Input the times in ascending order.
- Setting can be inserted or deleted by one line units.

Shift code setup		2011.07.07 12:45		Status: Ready		Com=0	
Input time in ascending order.							
00 : 00 ~ 23 : 59 []							
[00] : [00] ~ 00 : 00 [. .]							

	Spe- cial	ABC 123	Spe- cial2	User pat- tern				Insert	Delete
1	2	3	4	5	6	7	8	9	0
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	+	-	x	/
Shift ^	Shift v	(	)	.	:	,	Space		Back- space

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. dis- play	Next dis- play
↑	←
↓	→
Delete line	
Insert line	
Back	

7 Press **A** and **3**.

"A3" will be displayed in the shift code column on the 1st line.

Shift code setup		2011.07.07 12:45		Status: Ready		Com=0	
Input time in ascending order.							
00 : 00 ~ 23 : 59 [A3]							
[00] : [00] ~ 00 : 00 [. .]							

Start up	Shut down
Manual	Comm On/Off
Apply	

8 Press **↓**.

Cursor will move to the time input area.

9 Press **0 0 3 0** → **A 1**.

The time "00:30 - 23:59" and shift code "A1" will be displayed.

Shift code setup		2011.07.07 12:45		Status: Ready		Com=0	
Input time in ascending order.							
00 : 00 ~ 00 : 29 [A3]							
[00] : [30] ~ 23 : 59 [A1]							
[00] : [00] ~ 00 : 00 [. .]							

Start up	Shut down
Manual	Comm On/Off
Apply	

10 In the same way, repeat the input.

Shift code setup	2011.07.07 12:45	Status: Ready	Com=0
Input time in ascending order.			
0 0 : 0 0 ~ 0 0 : 2 9 [A 3]			
[0 0] : [3 0] ~ 0 8 : 1 4 [A 1]			
[0 8] : [1 5] ~ 1 6 : 4 4 [A 2]			
[1 6] : [4 5] ~ 2 3 : 5 9 [A 3]			
[0 0] : [0 0] ~ 0 0 : 0 0 [· ·]			

Start up	Shut down
Manual	Comm On/Off
Apply	

- If the shift division straddles 00:00, divide into 2 at 00:00.

11 Press **Apply**.

12 Press **Back**.

"Calendar conditions" screen will return.

13 Press **Back**.

"Edit message" screen will return.

14 Press **Back**.

"Print description" screen will return, with "A2" displayed in the print layout area.

3.12 Renewing print contents at a fixed period

(1) Overview

- Print contents can be renewed by the timing of the preset renewal period (minutes).
- One base point time can be specified in a day: When that time is reached, the print contents will be renewed to the preset value.
- The time count character can be set at one position for one item of print data. A maximum of 3 characters can be input.
- Conditions for time count character can be set by the "time count setup" screen.
- For the time count conditions, range, reset character, reset time and renewal period can be set.
- Renewal print contents will be always in increments of +1.
- Time count conditions are commonly used with all items of print data which have been saved.
- This is linked with Calendar time considering offset.
- Time count characters cannot be input in the same print item of any other calendar.

(Example) Range: AA - GG, renewal period: 30 minutes,
reset time: 00:00, reset value: [AA]

Time and count value

Time	Value	Time	Value	Time	Value	Time	Value	Time	Value	Time	Value
00:00	FD	04:00	GE	08:00	AG	12:00	CA	16:00	DB	20:00	EC
00:30	FE	04:30	GF	08:30	BA	12:30	CB	16:30	DC	20:30	ED
01:00	FF	05:00	AA	09:00	BB	13:00	CC	17:00	DD	21:00	EE
01:30	FG	05:30	AB	09:30	BC	13:30	CD	17:30	DE	21:30	EF
02:00	GA	06:00	AC	10:00	BD	14:00	CE	18:00	DF	22:00	EG
02:30	GB	06:30	AD	10:30	BE	14:30	CF	18:30	DG	22:30	FA
03:00	GC	07:00	AE	11:00	BF	15:00	CG	19:00	EA	23:00	FB
03:30	GD	07:30	AF	11:30	BG	15:30	DA	19:30	EB	23:30	FC

(2) Operating procedure

- Setting contents shown above (example)

1 Press **Edit message** on the "Print description" screen.

Print line setup	Edit message	Print format	Print spec.	Select message	Save message	Menu	

"Edit message" screen will appear.

Edit message	2011.07.07 12:45	Status: Ready	Com=0
Message name []			
Column 1	Column 2	Column 3	
[.]	[.]	[.]	
			Start up
			Shut down
			Manual
			Comm On/Off
			Show cursor
			Prev. col.
			Next col.

2 Press **Calendar/count**.

Keyboard for calendar input will appear.

Arabic	Spe- cial	ABC 123	Spe- cial2	User pat- tern	Calendar /count		Punct.	Insert	Delete
Year	Month	Day	Hour	Minute	Second	Total days	JAN FEB	Week number	Day of week
Shift code	Time count								
Count									
						+	-	×	/
		(	)	.	:	.	Space	Blank	Back- space

3 Press **Time count** twice.

Time count character "F" will be input.

4 Press **Apply**.

5 Press **calendar conditions**.

"Calendar conditions" screen will appear.

Calendar conditions
2011.07.07 12:45
Status: Ready
Com=0

Message name [
]

Column 1

Column 2

Column 3

[F F] [.] [.]

< Offset >

Year [0 0 0 0]

Month [0 0 0 0]

Day [0 0 0 0]

Hour [0 0 0 0]

Minute [0 0 0 0]

1	2	3	4	5	6	7	8	9	0
-								Decre- ment	Incre- ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. item	Next item
↑	←
↓	→
Time count	
Back	

6 Press **Time count**.

"Time count" screen will appear.

- Input range, Reset (character), Reset time and Renewal period (minute).

Time count conditions		2011.07.07 12:45		Status: Ready		Com=0			
Message name []									
Column 1		Column 2		Column 3					
[F F]		[.]		[.]					
Range [0 0] [9 9] Reset [0 0] Reset time [0 0] hour 0 0minute Renewal period (minute) [4] (1 : 5 2 : 6 3 : 10 4 : 15 5 : 20 6 : 30)									
1	2	3	4	5	6	7	8	9	0
123 ·	ABC ·	abc ·	User pat-tern					Decre-ment	Incre-ment
Start up Shut down Manual Comm On/Off Show cursor ↑ ← ↓ → Back									

7 Input range, Reset (character), Reset time and Renewal period (minute).

Time count conditions		2011.07.07 12:45		Status: Ready		Com=0			
Message name []									
Column 1		Column 2		Column 3					
[F F]		[.]		[.]					
Range [A A] [G G] Reset [A A] Reset time [0 5] hour 0 0minute Renewal period (minute) [4] (1 : 5 2 : 6 3 : 10 4 : 15 5 : 20 6 : 30)									
1	2	3	4	5	6	7	8	9	0
123 ·	ABC ·	abc ·	User pat-tern					Decre-ment	Incre-ment
Start up Shut down Manual Comm On/Off Apply ↑ ← ↓ → Back									

8 Press **Apply**.

9 Press **Back**.

"Calendar conditions" screen will return.

10 Press **Back**.

"Edit message" screen will return.

11 Press **Back**.

"Print description" screen will return, with "CB" displayed in the print layout area.



4. Setting the Operating Environment

4.1 Managing the Operations

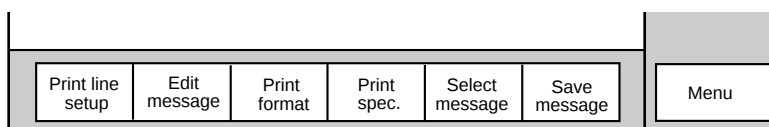
(1) Overview

- You can predefine the operating conditions.
- The operating time and print count are stored in memory every hour (at 00 minute).
If power failure occur, the previously stored status will be restored.

Item	Description
Ink operating time	• The operating time elapsed since last ink replacement is displayed. This value can be changed. • The value "0" is to be set upon ink replacement. A value between 0 and 9999 hours appears on the display. • If the preselected ink alarm time is exceeded, a warning message appears to prompt for ink replacement.
Ink alarm time	• The suggested ink replacement time is displayed. • The standard value is constantly displayed.
Cumulative operating time	• The cumulative operating time is displayed. This value cannot be changed. • The displayed value is incremented up to 999,999 hours.
Print count	• The total number of prints made is displayed. This value can be changed. • A setting between 0 and 999,999,999 can be selected.
Ink name	• The employed ink type is displayed.
Makeup ink name	• The employed makeup ink type is displayed.
Ink viscosity	• The ink viscosity is displayed. • The standard value is 100.
Ink pressure	• The ink pressure is displayed. • The standard value is constantly displayed.
Ambient temperature	• The ambient temperature and permissible ambient temperature range are displayed.
Deflection voltage	• The deflection voltage in "ready " state is displayed.
Excitation V-ref.	• The excitation V-ref. setting is displayed.
Excitation frequency	• The nozzle excitation frequency is displayed.

(2) Operating procedure

- Setting the operating time to 0 and print count to 0



If the cursor is not displayed, press **Show cursor**.

- The maintenance selection menu then appears.

					Menu
Maintenance	Auxiliary function	Operation management	Show fault	Environment setup menu	

- The "Operation management" screen then opens.

Operation management	2011.07.07 12:45	Status: Ready	Com=0																				
Ink operating time [0] 1 0 0] (hours) Ink alarm time [1 2 0 0] (hours : standard value:1200) Cumulative op. time 0 0 0 1 0 0 (hours) Print count [0 0 0 0 0 1 0 0 0] (prints) Ink, makeup ink JP-K67, TH-TYPE A Ink viscosity 100 (standard value:100) Ink pressure 0.255 (MPa ; standard value:0.255) Ambient temperature 21 (°C; range: 0~45) Deflection voltage 5.6 (k V) Excitation V-ref. 10 (0~19) Excitation frequency 68.9 (kHz)																							
<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="width: 12.5%;">1</td> <td style="width: 12.5%;">2</td> <td style="width: 12.5%;">3</td> <td style="width: 12.5%;">4</td> <td style="width: 12.5%;">5</td> <td style="width: 12.5%;">6</td> <td style="width: 12.5%;">7</td> <td style="width: 12.5%;">8</td> <td style="width: 12.5%;">9</td> <td style="width: 12.5%;">0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Decre- ment</td> <td>Incre- ment</td> </tr> </table>				1	2	3	4	5	6	7	8	9	0									Decre- ment	Incre- ment
1	2	3	4	5	6	7	8	9	0														
								Decre- ment	Incre- ment														

Start up
Manual

Shut down
Comm On/Off
Show cursor

↑
↓

←
→

Cancel changes
Reset
Back

- The operating time field then reads [0000] hours.

Operation management	2011.07.07 12:45	Status: Ready	Com=0	Strat up	Shut down
Ink operating time	[0 0 0 0] (hours)				

- The cursor then moves to the print count field.

- The print count field then indicates a print count of [000000000].

Operation management		2011.07.07 12:45	Status: Ready	Com=0	Start up	Shut down
Ink operating time	[0 0 0 0]	(hours)			Manual	Comm On/Off
Ink alarm time	[1 2 0 0]	(hours : standard value:1200)				
Cumulative op. time	0 0 0 1 0 0	(hours)				
Print count	[0 0 0 0 0 0 0 0]	(prints)			Apply	

- 7** Press **Back**.

4-2 ● Managing the Operations

Keying procedures

Key	Function
Reset	Selects a setting of 0 while the cursor is placed in the ink operating time, ink alarm time, print count, or cumulative operating time field.
Cancel changes	Causes the setting in the current cursor position to revert to the value prevailing before the change.
Back	Returns you to the "Maintenance menu" screen.

4.2 Setting the User Environment

(1) Overview

Setup item	Description	Default				
Repeat print sensor mode	Sets the conditions under which printing is performed a preselected number of times at predefined intervals.	Signal ON period				
	<table><tr><td>Signal ON period</td><td>While the print target detection signal is ON</td></tr></table>		Signal ON period	While the print target detection signal is ON		
	Signal ON period		While the print target detection signal is ON			
<table><tr><td>OFF - ON transition</td><td>When the print target detection signal turns ON</td></tr></table>	OFF - ON transition	When the print target detection signal turns ON				
OFF - ON transition	When the print target detection signal turns ON					
	Invalid if the repeat count is 0.					
Reverse direction printing	Set whether reverse direction printing is to be performed or not.	Disable				
	When character orientation is normal (0, 1): <table><tr><td>OFF=ABC</td><td>Prints in forward direction when the reverse direction printing signal is OFF; and in reverse when it is ON.</td></tr><tr><td>OFF=CBA</td><td>Prints in reverse direction when the reverse direction printing signal is OFF; and forward when it is ON.</td></tr></table>		OFF=ABC	Prints in forward direction when the reverse direction printing signal is OFF; and in reverse when it is ON.	OFF=CBA	Prints in reverse direction when the reverse direction printing signal is OFF; and forward when it is ON.
	OFF=ABC		Prints in forward direction when the reverse direction printing signal is OFF; and in reverse when it is ON.			
OFF=CBA	Prints in reverse direction when the reverse direction printing signal is OFF; and forward when it is ON.					
When character orientation in the print specifications screen is inverted (2, 3), print direction (forward, reverse) will also be inverted by the above specifications. <u>OFF=ABC</u> When OFF 123 → When ON 123 ← (The arrow shows the order of printing) Reverse direction printing signal OFF ON Print target detector signal ON ON <u>OFF=CBA</u> When OFF 123 ← When ON 123 → (The arrow shows the order of printing) Reverse direction printing signal OFF ON Print target detector signal ON ON						

For details about print output signals, see Section 1.5.3-8, Print output signal.

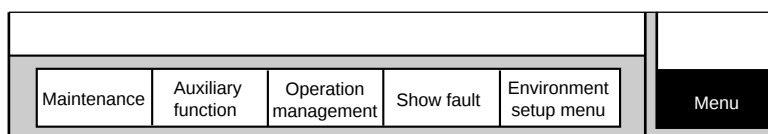
Setup item	Description	Default		
Reverse print	Set the print start position when character position 1 or 3 is set.	Method 1		
	<table><tr><td>Method 1</td><td>In case of multiple line printing, print start position will be aligned to the end of line. (Print start position will be different when character position 0 or 2 is set.)</td></tr></table>		Method 1	In case of multiple line printing, print start position will be aligned to the end of line. (Print start position will be different when character position 0 or 2 is set.)
	Method 1		In case of multiple line printing, print start position will be aligned to the end of line. (Print start position will be different when character position 0 or 2 is set.)	
	<table><tr><td>Method 2</td><td>In case of multiple line printing, print start position will be aligned to the head of line. (Print start position will be the same when character position 0 or 2 is set.)</td></tr></table>		Method 2	In case of multiple line printing, print start position will be aligned to the head of line. (Print start position will be the same when character position 0 or 2 is set.)
	Method 2		In case of multiple line printing, print start position will be aligned to the head of line. (Print start position will be the same when character position 0 or 2 is set.)	
(Example) Printed result when print contents of [1 2 3 4 5 6 7 8 9 0] [ABC] are printed with character position 1.				
<table><tr><td>Method 1</td><td>1 2 3 4 5 6 7 8 9 0 A B C</td></tr><tr><td>Method 2</td><td>1 2 3 4 5 6 7 8 9 0 A B C</td></tr></table>	Method 1	1 2 3 4 5 6 7 8 9 0 A B C	Method 2	1 2 3 4 5 6 7 8 9 0 A B C
Method 1	1 2 3 4 5 6 7 8 9 0 A B C			
Method 2	1 2 3 4 5 6 7 8 9 0 A B C			
Speed compensation	- Line where barcode has been set will always be printed with method 1. - Line where the increased width has been set to 5 to 9 will always be printed with method 1. - This setting will also function in backward printing of reverse direction printing mode.	Disable		
	- This feature can be enabled to prevent print start delay variations. - This feature cannot be activated if the product speed matching feature is disabled. - It cannot be used in the case where the repeat print mode is specified on the Print description screen. - When the setting of Speed Compensation is set to "Enable" from "Disable", and print interval is extremely short, "Print Overlap Fault" error may occur: Take care.			
Print signal type	Performs timing setup for IJ printer status signal output.	Printing complete		
	<table><tr><td>Printing complete</td><td>Generates an output for a fixed period of time upon completion of printing.</td></tr></table>		Printing complete	Generates an output for a fixed period of time upon completion of printing.
	Printing complete		Generates an output for a fixed period of time upon completion of printing.	
<table><tr><td>Printing in progress</td><td>Generates an output during printing.</td></tr></table>	Printing in progress	Generates an output during printing.		
Printing in progress	Generates an output during printing.			

Setup item	Description		Default				
Method to apply print data	● Set the action when print contents are changed and determined during printing.		Method 1				
	Method 1	When print contents are changed and determined during printing, "Print data changeover in progress M" error will occur.					
	Method 2	When print contents are changed and determined during printing, changed contents will be reflected in printing about one second later. ("Print data changeover in progress M" error does not occur.)					
	● When character is input to an item in which all print contents are invalid characters, action of method 1 will be applied even if method 2 is selected. ● When print content in an item including calendar character, count character or barcode item is changed, action of method 1 will be applied even if method 2 is selected.						
Create messages	● Sets whether or not to display Create Messages key in the auxiliary menu.		Usable				
Character size menu	● Specifies the character size to be employed. ● The following sizes can be selected. <table><tr><td>Character size 1</td><td>5×8、5×7</td></tr><tr><td>Character size 2</td><td>7×10、9×8、9×7</td></tr></table>		Character size 1	5×8、5×7	Character size 2	7×10、9×8、9×7	Character size 1:5×8 Character size 2:7×10
Character size 1	5×8、5×7						
Character size 2	7×10、9×8、9×7						
Excitation V-ref. warning	● When the difference between the current ambient temperature and the standard one (the ambient temperature when the excitation V-ref. setting is updated) exceeds a certain level, the alarm "Excitation V-ref. Review" occurs. This enables/disables the function.		Depends on the ink type.				

Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

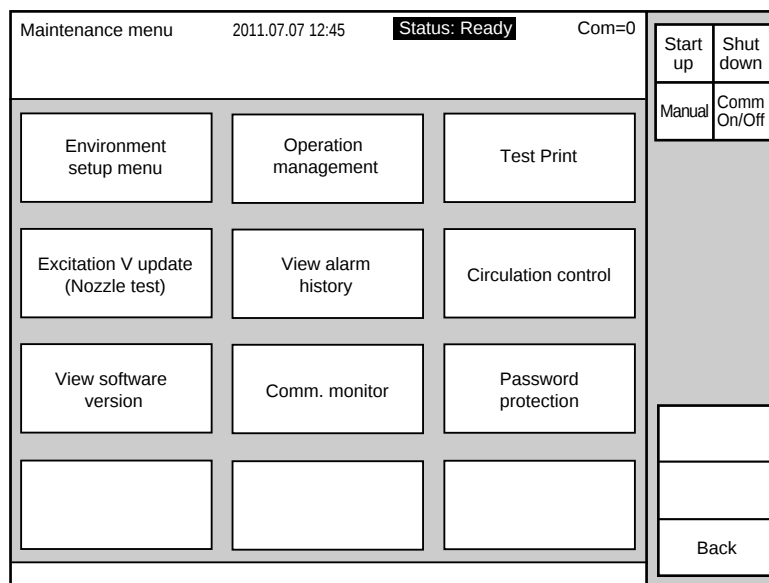
(2) Operating procedure

- Setting the output signal to "Print. in progress".



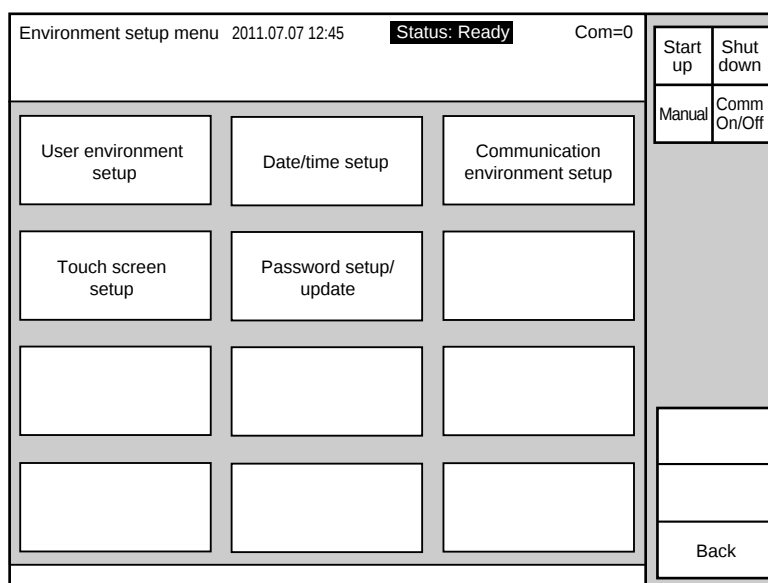
1 Choose **Maintenance** from the menu.

The "Maintenance menu" screen then appears.



2 Press **Environment setup menu** .

The "Environment setup menu" screen then opens.



If the cursor is not displayed, press **Show cursor**.

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

3 Press **User environment setup**.

The "User environment setup" screen then opens.

User environment setup 2011.07.07 12:45										Status: Ready		Com=0																					
Repeat print sensor mode [1] (1: signal ON 2: OFF-ON transition)										Start up		Shut down																					
Reverse direction printing [0] (0: Disable 1: OFF=ABC 2: OFF=CBA)										Manual		Comm On/Off																					
Reverse print [1] (1: method1 2: method2)												Show cursor																					
Speed compensation [0] (0: Disable 1: Enable)										Prev. settings		Next settings																					
Print signal type [1] (1: print. complete 2: print.-in-progress)										↑		←																					
Method to apply print data [1] (1: method1 2: method2)										↓		→																					
Create messages [0] (0: access 1: protect)																																	
Char. Size menu 1 [1] (1: 5×8 2: 5×7)																																	
Char. Size menu 2 [1] (1: 7×10 2: 9×8 3: 9×7)																																	
Excitation V-ref. warning [1] (0: Disable 1: Enable)																																	
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Decre-ment</td><td>Incre-ment</td> </tr> </table>										1	2	3	4	5	6	7	8	9	0									Decre-ment	Incre-ment				
1	2	3	4	5	6	7	8	9	0																								
								Decre-ment	Incre-ment																								
												Back																					

4 Press **↓** three times consecutively.

The cursor then moves to the output signal field.

5 Press **2**.

The output signal field then reads "print. in progress".

6 Press **Apply**.

7 Press **Back**.

The system then returns you to the "Environment setup menu" screen.

4.3 Setting the Date and Time

(1) Overview

- The time values to be printed can be set in accordance with the calendar time.
Either of the following two setup methods can be used.

Same as current time	• The current time is used as the calendar time.
Clock stop	• A predefined time is used as the calendar time. • You cannot set a time later than the current time.

- You can change the current time.
- The year, month, day, hour, minute, and second values can be set.
- You can choose between the 24-hour clock and 12-hour clock for setup purposes.
- The current time can be set until the year 2079 comes.

(NOTE) If substitution rules are defined for year, do not select "Clock stop" to set a year earlier than the current year. Even if you set such an earlier year, it is replaced by a space.

(2) Operating procedure

- Performing date/time setup so that "23:00, July 7, 2011" will be constantly printed.

1 Choose **Environment setup menu** from the maintenance menu.

The "Environment setup menu" screen then appears.

Environment setup menu 2011.07.07 23:45			Status: Ready	Com=0	Start up	Shut down
					Manual	Comm On/Off
User environment setup	Date/time setup	Communication environment setup				
Touch screen setup	Password setup/update					
					Back	

When the password is set up, the current time cannot be changed.

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

If the cursor is not displayed, press **Show cursor**.

2 Press **Date/time setup**.

The "Date/time setup" screen then opens.

Date/time setup		2011.07.07 23:45		Status: Ready		Com=0					
Current time		[2 0 1 1] (year)		[0 7] (month)		[0 7] (day)					
		[2 3] (hour)		[4 5] (minute)		[1 2] (second)					
Calendar time control		[1] (1: same as current time		2: clock stop)							
Calendar time		[2 0 1 1] (year)		[0 7] (month)		[0 7] (day)					
		[2 3] (hour)		[4 5] (minute)		[1 2] (second)					
Clock system		[1] (1: 24-hour clock		2: 12-hour clock)							
Press OK to apply the date/time setup. The current time takes into account the display elapsed time if no changes are made. The calendar time affects actual calendar character printing operations.											
1	2	3	4	5	6	7	8	9	0		
								Decre-	Incre-		
										Cancel	
										OK	

Cursor will move to the line you touched.

3 Press **↓** two times consecutively.

The cursor then moves to the calendar time control field.

4 Press **2**.

The calendar time control field then reads "clock stop" to permit calendar time input.

Calendar time control	[2] (1: same as current time	2: clock stop)
Calendar time	[2 0 1 1] (year)	[0 7] (month) [0 7] (day)
	[2 3] (hour)	[4 5] (minute) [1 2] (second)

Cursor will move to the line you touched.

5 Press **↓** two times.

The cursor moves to the "hour" input field.

6 Press **2** and **3** in sequence.

The display reads [23] (hour) [45] (minute) [12] (second), with the cursor positioned in the "minute" input field.

7 Press **0** and **0** in sequence.

The display reads [23] (hour) [00] (minute) [12] (second), with the cursor positioned in the "second" input field.

8 Press **0** and **0** in sequence.

The calendar time is set as indicated below, with the cursor positioned in the "year" input field.

[2011] (year) [07] (month) [07] (day)
[23] (hour) [00] (minute) [00] (second)

9 Press **OK**.

You are returned to the "Environment setup menu" screen.

4.4 Setting the Password

(1) Overview

- You can set the password for the purpose of imposing restrictions on the executable functions.
- A string of 1 to 12 characters can be accepted as the password.
- The acceptable password characters are 0-9 and A-Z.
- The current password cannot be changed until you type and enter it.
- The alphabetical characters used in the password are case-insensitive.

(2) Operating procedure

- Changing the password from AYZ02 to CZB05

1 Choose **Environment setup menu** from the maintenance menu.

The "Environment setup menu" screen then opens.

Environment setup menu 2011.07.07 12:45			Status: Stop	Com=0	Start up	Shut down
					Manual	Comm On/Off
User environment setup	Date/time setup	Communication environment setup				
Touch screen setup	Password setup/update					
					Back	

2 Press **Password setup/update**.

The "Password setup/update" screen then opens.

Password setup/update 2011.07.07 12:45		Status: Stop	Com=0																														
Old password [] New password [] New password reentry []																																	
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>123</td><td>ABC</td><td>abc</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Back-space</td> </tr> </table>				1	2	3	4	5	6	7	8	9	0											123	ABC	abc							Back-space
1	2	3	4	5	6	7	8	9	0																								
123	ABC	abc							Back-space																								
<table border="1"> <tr> <td>↑</td><td>←</td> </tr> <tr> <td>↓</td><td>→</td> </tr> </table>				↑	←	↓	→																										
↑	←																																
↓	→																																
Cancel																																	
OK																																	

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

- If no password has been entered, you cannot make an old password entry. In such an instance, the cursor is placed in the new password input field.
- Pressing displays an upper-case alphabetical keyboard. Pressing displays a lower-case alphabetical keyboard.

3 With the cursor positioned in the old password input field, press , , , , and .

A string of * marks is then displayed in place of the entered password.

Password setup/update	2011.07.07 12:45	Status: Stop	Com=0	
Old password	[* * * * *]			
New password	[			
New password reentry	[			

Cursor will move to the line you touched.

4 Press .

The cursor then moves to the new password input field.

5 Press , , , , and in sequence.

Password setup/update	2011.07.07 12:45	Status: Stop	Com=0	
Old password	[* * * * *]			
New password	[* * * * *]			
New password reentry	[			

Cursor will move to the line you touched.

6 Press .

The cursor is then placed in the new password reentry field.

7 Press , , , , and in sequence.

Password setup/update	2011.07.07 12:45	Status: Stop	Com=0	
Old password	[* * * * *]			
New password	[* * * * *]			
New password reentry	[* * * * *]			

8 Press .

The password is then updated, and you are returned to the "Environment setup menu" screen.

- If either of the following conditions occurs, an error message appears.

① The entry in the old password input field does not agree with the current password. However, the error does not occur if you type in "NOCHECK" as the password.

Use this word if you forget your password.

- Old password mismatch

② The entries in the new password field and new password reentry field do not match.

- New password mismatch

Password setup →
See Section 4.4,
Setting the Password.

4.5 Controlling the Executable Functions

(1) Overview

- You can disable the each functions.
- When the above functions are disabled, the keys assigned to them will not be displayed.
- No functional limitations can be imposed unless the password entry agrees with the defined one.
- Limitations can be imposed on the following functions.
 - ① When "Edit message/Select message" is restricted
 - Edit message
 - Calendar conditions
 - Substitution rule setup
 - Count conditions
 - Select message
 - ② When "Save message" is restricted
 - Save message
 - ③ When "Print specifications" are restricted
 - Print specifications
 - ④ When "Print format" is restricted
 - Print line setup
 - Print format
 - ⑤ When "Maintenance" is restricted
 - User environment setup
 - Date/time setup
 - Communication environment setup
 - Touch screen setup
 - Operation management
 - Excitation V update
 - Circulation control
 - Manage message
 - Create user pattern
 - Touch screen setup
 - Copy data
 - Edit standard pattern
- If executable functions are restricted, the names of screen will be shaded.
- Even when "Print specifications" or "Print format" is restricted, the print specifications or print format can be changed by recalling print data.

Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

- Performing setup so as to restrict the print data change function

- 1** Choose **Maintenance** from the menu.

The "Maintenance menu" screen then opens.

The "Password protection" screen then opens.

4-14 ● Controlling the Executable Functions

3 Press **C**, **Z**, **B**, **0**, and **5** in sequence.

The password is then entered. The entered password is indicated by a string of * marks.

Password protection	2011.07.07 12:45	Status: Stop	Com=0
When the password entry is accepted, you can change the password protection setup.			
Password	[* * * *]		

4 Press **Enter password**.

The cursor will move to the "Edit message/Select message" field.

The "Edit message/Select message", "Save message", "Print specifications", "Print format" and "Maintenance" can be input.

Password protection	2011.07.07 12:45	Status: Stop	Com=0
When the password entry is accepted, you can change the password protection setup.			
Password	[	]	
Edit message/Select message	[0]	(0 : access	1 : protect)
Save message	[0]	(0 : access	1 : protect)
Print specifications	[0]	(0 : access	1 : protect)
Print format	[0]	(0 : access	1 : protect)
Maintenance	[0]	(0 : access	1 : protect)

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

5 Press **1**.

The use of "Edit message/Select message" will be restricted.

6 Press **Back**.

You are then returned to the "Maintenance menu" screen. The function you restricted is now unexecutable.

- To restrict other items, press **↓** as needed to place the cursor in the target field and then press **1**.

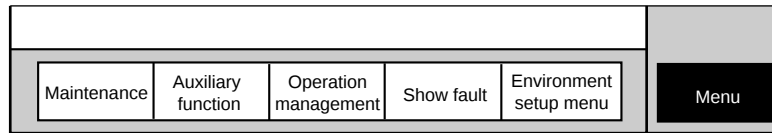
4.6 Confirming the Registered Software

(1) Overview

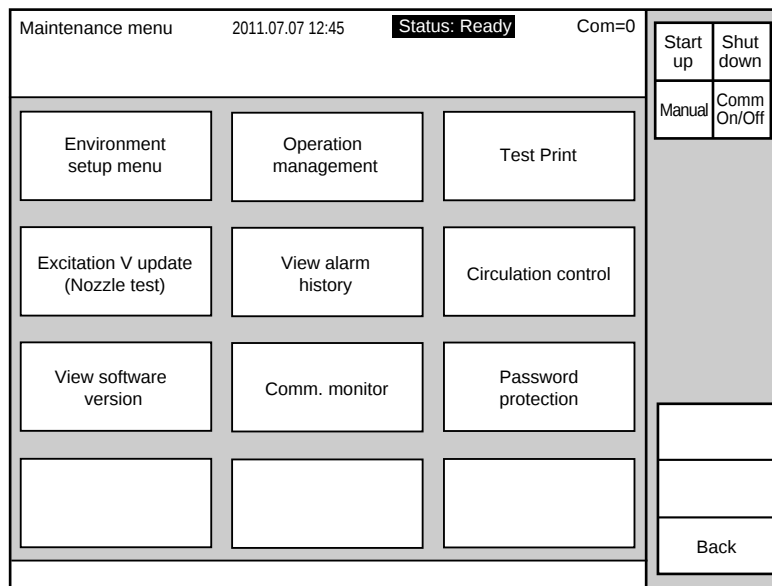
- The names of registered software programs and their versions can be displayed.

(2) Operating procedure

- 1 Choose **Maintenance** from the menu.

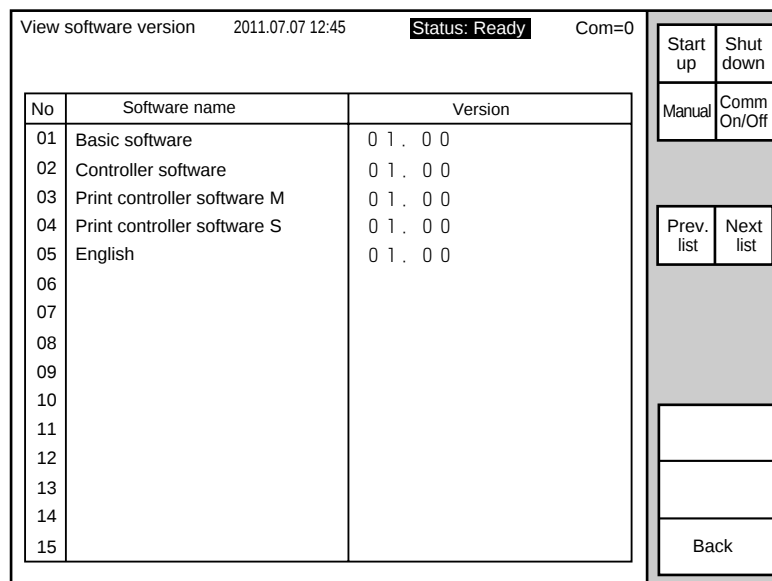


The "Maintenance menu" screen then opens.



- 2 Press **View software version**.

A list of registered software programs then appears.



- If there are 16 or more registered software programs, you can view hidden ones by pressing **Next list** or **Previous list**.

- 3 Press **Back**.

You are then returned to the "Maintenance menu" screen.

4.7 Touch Screen Setup

(1) Overview

Function	Description																																																										
Display	Specifies the lighting time of the screen. [Caution] If you set "Off in 30 min" or "Illuminated", cumulative lighting time reduces illuminance.																																																										
Keyboard layout	Changes the key allocations of alphanumeric keyboard.																																																										
	<table><tr><td>ABC</td><td>Alphabetical order allocations (default)</td></tr><tr><td>QWERTY</td><td>Allocations generally used for PC, etc.</td></tr></table>	ABC	Alphabetical order allocations (default)	QWERTY	Allocations generally used for PC, etc.																																																						
	ABC	Alphabetical order allocations (default)																																																									
	QWERTY	Allocations generally used for PC, etc.																																																									
	<table><tr><td>Arabic</td><td>Kana</td><td>ABC 123</td><td>Dedicated</td><td>User pat- tern</td><td>Calendar /count</td><td>Punct.</td><td>Insert</td><td>Delete</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td></tr><tr><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td><td>I</td><td>J</td></tr><tr><td>K</td><td>L</td><td>M</td><td>N</td><td>O</td><td>P</td><td>Q</td><td>R</td><td>S</td><td>T</td></tr><tr><td>U</td><td>V</td><td>W</td><td>X</td><td>Y</td><td>Z</td><td>+</td><td>-</td><td>x</td><td>/</td></tr><tr><td>Shift ^</td><td>Shift V</td><td>(</td><td>)</td><td>.</td><td>:</td><td>.</td><td>Space</td><td>Blank</td><td>Back- space</td></tr></table> ABC allocations	Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count	Punct.	Insert	Delete	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	+	-	x	/	Shift ^	Shift V	(	)	.	:	.	Space	Blank
Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count	Punct.	Insert	Delete																																																			
1	2	3	4	5	6	7	8	9	0																																																		
A	B	C	D	E	F	G	H	I	J																																																		
K	L	M	N	O	P	Q	R	S	T																																																		
U	V	W	X	Y	Z	+	-	x	/																																																		
Shift ^	Shift V	(	)	.	:	.	Space	Blank	Back- space																																																		
<table><tr><td>Arabic</td><td>Kana</td><td>ABC 123</td><td>Dedicated</td><td>User pat- tern</td><td>Calendar /count</td><td>Punct.</td><td>Insert</td><td>Delete</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td></tr><tr><td>Q</td><td>W</td><td>E</td><td>R</td><td>T</td><td>Y</td><td>U</td><td>I</td><td>O</td><td>P</td></tr><tr><td>A</td><td>S</td><td>D</td><td>F</td><td>G</td><td>H</td><td>J</td><td>K</td><td>L</td><td>+</td></tr><tr><td>Z</td><td>X</td><td>C</td><td>V</td><td>B</td><td>N</td><td>M</td><td>,</td><td>.</td><td>/</td></tr><tr><td>Shift ^</td><td>Shift V</td><td>(</td><td>)</td><td>-</td><td>:</td><td>x</td><td>Space</td><td>Blank</td><td>Back- space</td></tr></table> QWERTY allocations	Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count	Punct.	Insert	Delete	1	2	3	4	5	6	7	8	9	0	Q	W	E	R	T	Y	U	I	O	P	A	S	D	F	G	H	J	K	L	+	Z	X	C	V	B	N	M	,	.	/	Shift ^	Shift V	(	)	-	:	x	Space	Blank	Back- space
Arabic	Kana	ABC 123	Dedicated	User pat- tern	Calendar /count	Punct.	Insert	Delete																																																			
1	2	3	4	5	6	7	8	9	0																																																		
Q	W	E	R	T	Y	U	I	O	P																																																		
A	S	D	F	G	H	J	K	L	+																																																		
Z	X	C	V	B	N	M	,	.	/																																																		
Shift ^	Shift V	(	)	-	:	x	Space	Blank	Back- space																																																		

Keyboard display has been set to one of the following settings:

"When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	------------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	------------	----------

(2) Operating procedure

- 1 Verify that the printer is in "Stop," or "Standby" state. Choose **Environment setup menu** from the Maintenance menu.

The "Environment setup menu" screen appears.

Environment setup menu 2011.07.07 12:45 Status: Stop Cm=0			Start up	Shut down
			Manual	Comm On/Off
User environment setup	Date/time setup	Communication environment setup		
Touch screen setup	Password setup/update			
			Back	

- 2 Press **Touch screen setup**.

The "Touch screen setup" screen appears.

Touch screen setup 2011.07.07 12:45 Status: Stop Com=0												
Display [1] (1: Off in 3 min 2: Off in 30 min 3: Always ON)												
Keyboard layout [0] (0: ABC 1: QWERTY)												
		↑ ← ↓ →										
1	2	3	4	5	6	7	8	9	0	Decre- ment	Incre- ment	Back

- 3 Press **Increment** and **Decrement** to adjust the system.

Cursor will move to the line you touched.

Selected item on the cursor-positioned line can be changed by touching.

4.8 Printing Without Entering Sensor Signals

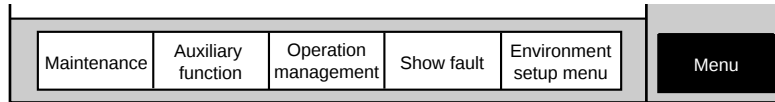
(1) Overview

- With this function, you can print by key operation without entering a printout startup signal.

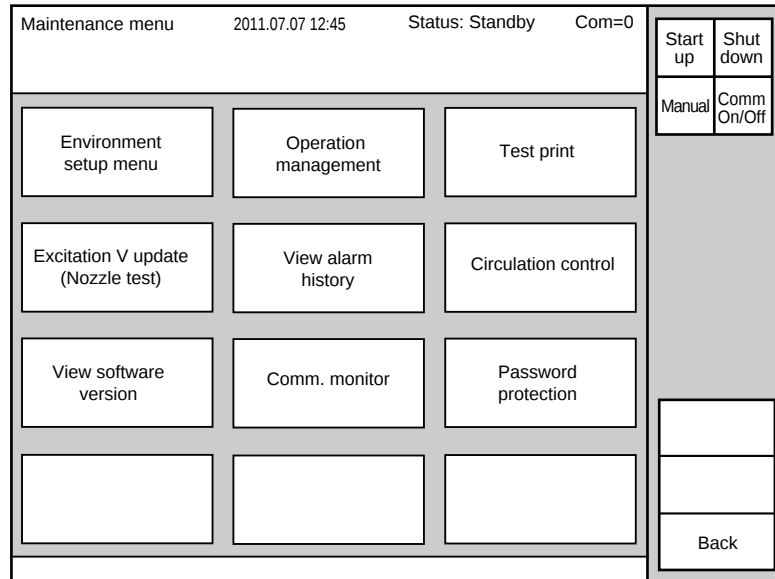
(2) Operating procedure

1 Verify that the printer is in "Standby" state.

Choose **Maintenance** from the menu.

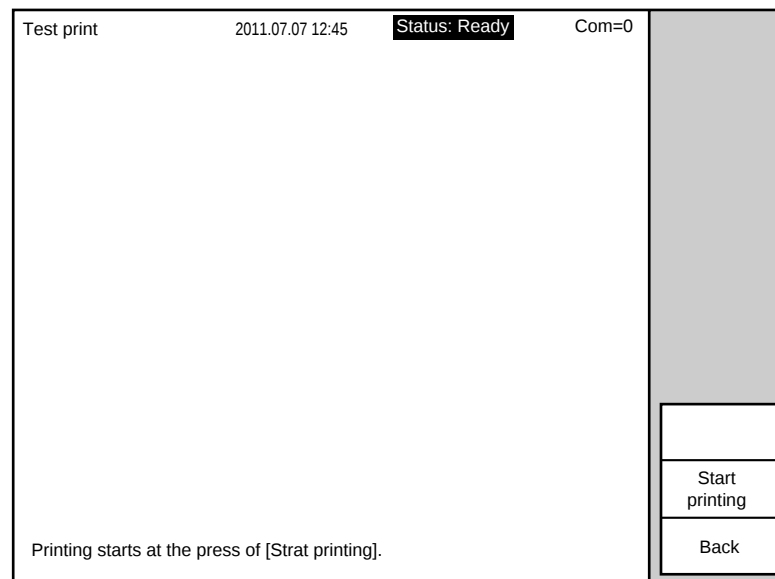


The "Maintenance menu" screen then opens.



2 Press **Test print**.

The "Test print" screen appears.



3 Press **Start printing**.

The system will print.

[Caution] When the repeat print sensor mode of the user environment setup screen is "OFF-ON transition" and the system is set to repeat print, the system will print continuously. To abort printing while the system is continuously printing, press the **Abort** key.



5. Auxiliary Function

You can manage created print data and create or update user patterns. The associated functions can be selected from the auxiliary function menu screen.

5.1 Managing Created Print Data

5.1.1 Changing the message number

(1) Overview

- Two print data can be interchanged for registration number change purposes.

(2) Operating procedure

- Exchanging the No. 3 print data for the No. 7 print data

- 1** Verify that the printer is in "Stop," or "Standby" state. Choose **Auxiliary function** from the menu.

The "Auxiliary function menu" screen then opens.

Aux. function menu 2011.07.07 12:45 Status: Stop Com=0

Manage messages	Create user pattern
Calibrate touch screen coordinates	Copy data
Select Languages	Edit Standard pattern
Create Messages	

Start up Shut down
Manual Comm On/Off

Back

- 2** Press **Manage message**.

The "Message management menu" screen then opens.

Message mgmt. menu 2011.07.07 12:45 Status: Stop Com=0

Change message number	Delete Stored message
Change message name	

Start up Shut down
Manual Comm On/Off

Back

Operations for modifying the setting contents
(See Section 2.1.3, Operations for modifying the setting contents.)

3 Press **Change message number**.

The "Change message number" screen then opens.

Change message num.		2011.07.07 12:45		Status: Stop		Com=0																
Select the message name for the message number change.																						
No	Message name	No	Message name																			
1	AAAAAAAAAAAAA	16		<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2">Prev. list</td> <td>Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> <tr> <td colspan="2">Cancel</td> </tr> <tr> <td colspan="2">Select/deselect</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off	Prev. list		Next list	↑	←	↓	→	Cancel		Select/deselect	
Start up	Shut down																					
Manual	Comm On/Off																					
Prev. list		Next list																				
↑	←																					
↓	→																					
Cancel																						
Select/deselect																						
2	BBBBBBBBBBBBB	17																				
3	CCCCCCCCCCCCC	18																				
4	DDDDDDDDDDDDD	19																				
5	EEEEEEEEEEEEEE	20																				
6	FFFFFFFFFFFFFFF	21																				
7	GGGGGGGGGGGGG	22																				
8	HHHHHHHHHHHHH	23																				
9		24																				
10		25																				
11		26																				
12		27																				
13		28																				
14		29																				
15		30																				

Cursor will move to the line you touched.

4 Press **↓** two times consecutively.

The cursor then moves to the No. 3 line.

Change message num.		2011.07.07 12:45		Status: Stop		Com=0					
Select the message name for the message number change.											
No	Message name	No	Message name								
1	AAAAAAAAAAAAA	16		<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off
Start up	Shut down										
Manual	Comm On/Off										
2	BBBBBBBBBBBBB	17									
3	CCCCCCCCCCCCC	18									

5 Press **Select/deselect**.

The No. 3 line is then shaded with the cursor positioned over the No. 4 line.

Change message num.		2011.07.07 12:45		Status: Stop		Com=0												
Select the move destination.																		
No	Message name	No	Message name															
1	AAAAAAAAAAAAA	16		<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2">Prev. list</td> <td>Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off	Prev. list		Next list	↑	←	↓	→
Start up	Shut down																	
Manual	Comm On/Off																	
Prev. list		Next list																
↑	←																	
↓	→																	
2	BBBBBBBBBBBBB	17																
3	CCCCCCCCCCCCC	18																
4	DDDDDDDDDDDDD	19																
5	EEEEEEEEEEEEEE	20																
6	FFFFFFFFFFFFFFF	21																
7	GGGGGGGGGGGGG	22																
8	HHHHHHHHHHHHH	23																
9		24																
10		25																

(NOTE) When recalling print data or changing or deleting a registration number with the communication function, it is necessary to change the external device communication software.

Cursor will move to the line you touched.

6 Press  three times consecutively.

The cursor then moves to the No. 7 line.

Change message num.		2011.07.07 12:45		Status: Stop		Com=0													
Select the move destination.																			
No	Message name	No	Message name	<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>Prev. list</td> <td>Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off			Prev. list	Next list	↑	←	↓	→
Start up	Shut down																		
Manual	Comm On/Off																		
Prev. list	Next list																		
↑	←																		
↓	→																		
1	AAAAAAAAAAAAAA																		
2	BBBBBBBBBBBBBB																		
3	CCCCCCCCCCCCCC																		
4	DDDDDDDDDDDDDD																		
5	EEEEEEEEEEEEEE																		
6	FFFFFFFFFFFFFF																		
7	GGGGGGGGGGGGGG																		
8	HHHHHHHHHHHHHH																		
9																			
10																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			
24																			
25																			

7 Press .

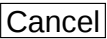
The No. 7 line is then shaded with no cursor displayed.

Change message num.		2011.07.07 12:45		Status: Stop		Com=0																			
Two message numbers will be swapped.																									
No	Message name	No	Message name	<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>Prev. list</td> <td>Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> <tr> <td colspan="2">Cancel</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td colspan="2">OK</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off			Prev. list	Next list	↑	←	↓	→	Cancel				OK	
Start up	Shut down																								
Manual	Comm On/Off																								
Prev. list	Next list																								
↑	←																								
↓	→																								
Cancel																									
OK																									
1	AAAAAAAAAAAAAA																								
2	BBBBBBBBBBBBBB																								
3	CCCCCCCCCCCCCC																								
4	DDDDDDDDDDDDDD																								
5	EEEEEEEEEEEEEE																								
6	FFFFFFFFFFFFFF																								
7	GGGGGGGGGGGGGG																								
8	HHHHHHHHHHHHHH																								
9																									
10																									
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23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									

8 Press .

The registration numbers for print data "CCCCCCCCCC" and "GGGGGGGGGG" are then interchanged.

Change message num.		2011.07.07 12:45		Status: Stop		Com=0													
Two message numbers will be swapped.																			
No	Message name	No	Message name	<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>Prev. list</td> <td>Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off			Prev. list	Next list	↑	←		
Start up	Shut down																		
Manual	Comm On/Off																		
Prev. list	Next list																		
↑	←																		
1	AAAAAAAAAAAAAA																		
2	BBBBBBBBBBBBBB																		
3	GGGGGGGGGGGGGG																		
4	DDDDDDDDDDDDDD																		
5	EEEEEEEEEEEEEE																		
6	FFFFFFFFFFFFFF																		
7	CCCCCCCCCCCCCC																		
8	HHHHHHHHHHHHHH																		
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			

9 Press .

You are then returned to the "Message management menu" screen.

The on-screen indication changes from "green" to "yellow."

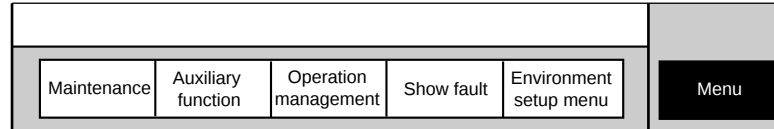
5.1.2 Deleting stored data

(1) Overview

- You can delete saved print data.

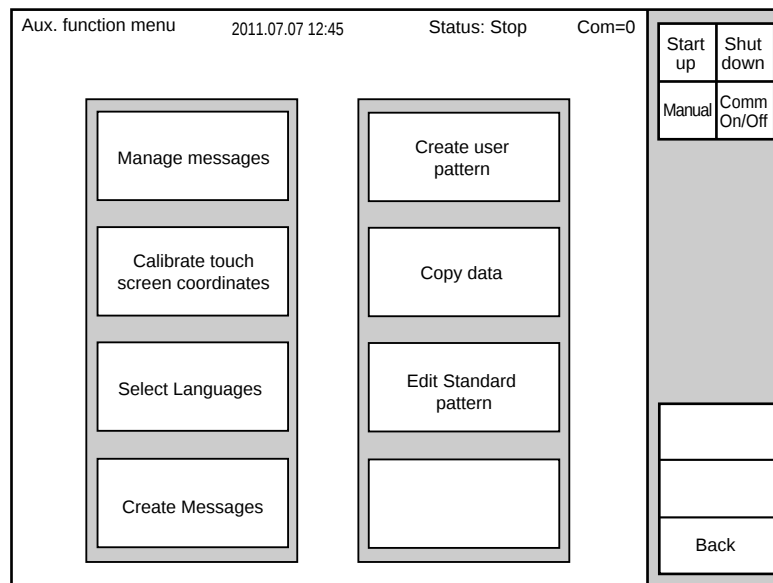
(2) Operating procedure

- Deleting the data stored in the No. 2 position



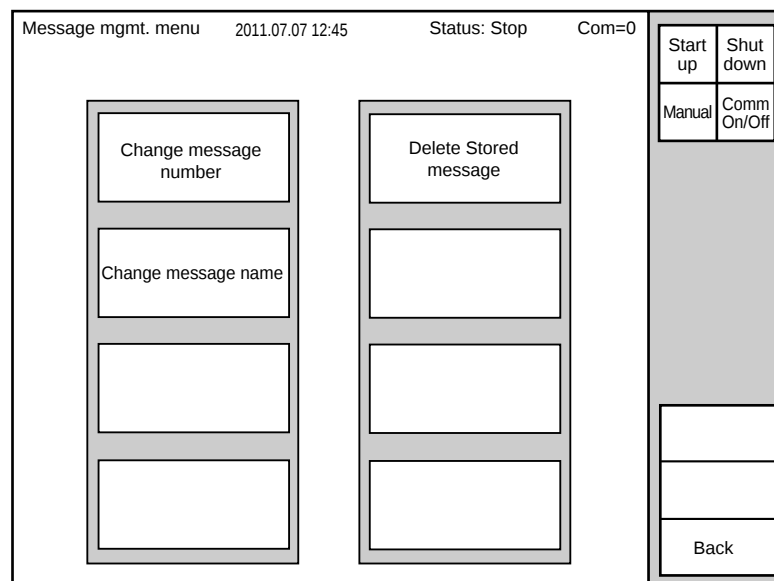
- 1 Verify that the printer is in "Stop," or "Standby" state. Choose **Auxiliary function** from the menu.

The "Auxiliary function menu" screen then opens.



- 2 Press **Manage message**.

The "Message management menu" screen then opens.



Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

3 Press **Delete stored message**.

The "Delete stored message" screen then opens.

Delete stored message		2011.07.07 12:45		Status: Stop		Com=0																			
Select the message to be deleted.																									
No	Message name	No	Message name																						
1	AAAAAAAAAAAAAA	16		<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>Prev. list</td> <td>Next list</td> </tr> <tr> <td>↑</td> <td>←</td> </tr> <tr> <td>↓</td> <td>→</td> </tr> <tr> <td colspan="2">Cancel</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td colspan="2">Select</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off			Prev. list	Next list	↑	←	↓	→	Cancel				Select	
Start up	Shut down																								
Manual	Comm On/Off																								
Prev. list	Next list																								
↑	←																								
↓	→																								
Cancel																									
Select																									
2	BBBBBBBBBBBBBB	17																							
3	CCCCCCCCCCCCCC	18																							
4		19																							
5		20																							
6		21																							
7		22																							
8		23																							
9		24																							
10		25																							
11		26																							
12		27																							
13		28																							
14		29																							
15		30																							

Cursor will move to the line you touched.

4 Press **↓**.

The cursor then moves to the No. 2 line.

Delete stored message		2011.07.07 12:45		Status: Stop		Com=0					
Select the message to be deleted.											
No	Message name	No	Message name								
1	AAAAAAAAAAAAAA	16		<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off
Start up	Shut down										
Manual	Comm On/Off										
2	BBBBBBBBBBBBBB	17									

5 Press **Select**.

The Delete Stored Message Confirmation message then appears.

Delete Stored Message Confirmation			
Print data "BBBBBBBBBBBBBB" will be deleted.			
OK			Cancel

- If there are 31 or more registrations, press **Next list** or **Previous list** to switch to a desired list screen.

6 Press **OK**.

The "BBBBBBBBBBBBBB" print data is then deleted.

Delete stored message		2011.07.07 12:45		Status: Stop		Com=0					
Select the message to be deleted.											
No	Message name	No	Message name								
1	AAAAAAAAAAAAAA	16		<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> </table>				Start up	Shut down	Manual	Comm On/Off
Start up	Shut down										
Manual	Comm On/Off										
2		17									
3	CCCCCCCCCCCCCC	18									

7 Press **Cancel**.

You are then returned to the "Message management menu" screen.

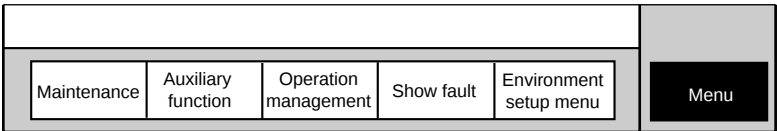
5.1.3 Changing a message name

(1) Overview

- You can change the message name of saved print data.

(2) Operating procedure

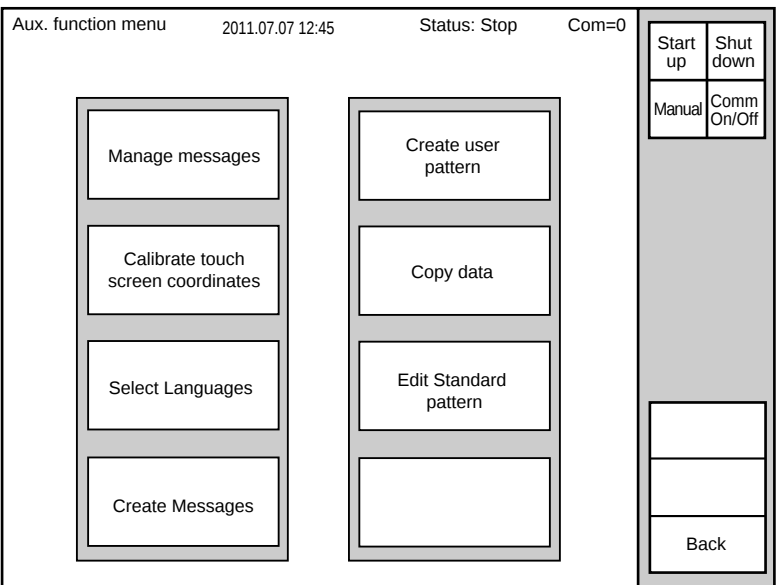
- Changing the message name of saved data from "AAAAAAAAAAAA" to "ABC9701"



Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

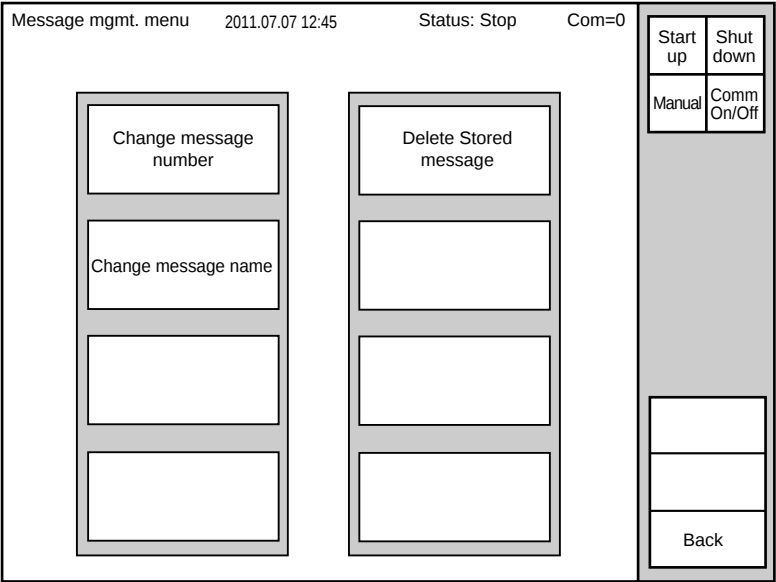
- 1** Verify that the printer is in "Stop," or "Standby" state. Choose **Auxiliary function** from the menu.

The "Auxiliary function menu" screen then opens.



- 2** Press **Manage message**.

The "Manage message menu" screen then opens.



3 Press **Change message name**.

The data selection screen for a Change message name then opens.

Change message name 2011.07.07 12:45 Status: Stop Com=0	
Select the message name to be changed.	
No	Message name
1	AAAAAAAAAAAA
2	BBBBBBBBBBBB
3	CCCCCCCCCCCC
4	DDDDDDDDDDDD
5	EEEEEEEEEEEE
6	FFFFFFFFFFFF
7	GGGGGGGGGGGG
8	HHHHHHHHHHHH
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

Start up	Shut down
Manual	Comm On/Off

Prev. list	Next list
↑	←
↓	→

Cancel
Select

- If there are 31 or more registrations, press **Next list** or **Previous list** as needed to switch to a desired listing screen.

4 Press **Select**.

The input screen for a message name change then opens.

Change message name 2011.07.07 12:45 Status: Stop Com=0																																																													
Current message name AAAAAAAAAAAAA																																																													
New message name [A AAAAAAAAAAAAA]																																																													
<table border="1" style="width: 100%;"> <tr> <td></td> <td>Kana</td> <td>ABC 123</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Insert</td> <td>Delete</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>0</td> </tr> <tr> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> <td>F</td> <td>G</td> <td>H</td> <td>I</td> <td>J</td> </tr> <tr> <td>K</td> <td>L</td> <td>M</td> <td>N</td> <td>O</td> <td>P</td> <td>Q</td> <td>R</td> <td>S</td> <td>T</td> </tr> <tr> <td>U</td> <td>V</td> <td>W</td> <td>X</td> <td>Y</td> <td>Z</td> <td>+</td> <td>-</td> <td>x</td> <td>/</td> </tr> <tr> <td>Shift ^</td> <td>Shift V</td> <td>(</td> <td>)</td> <td>.</td> <td>:</td> <td>.</td> <td>Space</td> <td></td> <td>Back-space</td> </tr> </table>			Kana	ABC 123						Insert	Delete	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	+	-	x	/	Shift ^	Shift V	(	)	.	:	.	Space		Back-space
	Kana	ABC 123						Insert	Delete																																																				
1	2	3	4	5	6	7	8	9	0																																																				
A	B	C	D	E	F	G	H	I	J																																																				
K	L	M	N	O	P	Q	R	S	T																																																				
U	V	W	X	Y	Z	+	-	x	/																																																				
Shift ^	Shift V	(	)	.	:	.	Space		Back-space																																																				

Start up	Shut down
Manual	Comm On/Off

↑	←
↓	→

Cancel
OK

5 Press **A**, **B**, **C**, **9**, **7**, **0**, and **1** in sequence.

The new message name field then reads "ABC9701AAAAA".

Change message name 2011.07.07 12:45 Status: Stop Com=0	
Current message name AAAAAAAAAAAAA	
New message name [ABC9701A AAAAA]	

Start up	Shut down
Manual	Comm On/Off

6 Press **Delete** five times consecutively.

Keyboard display has been set to one of the following settings:
 "When KANA and dedicated characters can be input."

Arabic	Kana	ABC 123	Dedicated
--------	------	---------	-----------

(The "Arabic input" be unable to do in "Simple Chinese".)

"When special characters can be input."

Arabic	Special	ABC 123	Special2
--------	---------	---------	----------

7 Press **OK**.

The data selection screen for a Change message name then opens.

Change message name		2011.07.07 12:45	Status: Stop	Com=0
Select the message name to be changed.				
No	Message name	No	Message name	
1	ABC 9 7 0 1	16		
2	BBBBBBBBBBBBBB	17		

Start up	Shut down
Manual	Comm On/Off

If the message name you entered is already saved, the "Duplicate message name" message appears.

===== Duplicate Message Name =====

Print data having the same message name has already been stored.

Close

Press **Close** to return to the message name input sequence.

- You cannot perform an overwrite for registration purposes.

8 Press **Cancel**.

You are then returned to the "Print data reduction menu" screen.

5.2 Creating a User Pattern

5.2.1 Saving a user pattern

(1) Overview

- You can create and save a user pattern drawing.
- Up to 128 characters can be saved (for each character size).
- 7 different character sizes can be generated: 5×5, 5×8(5×7), 7×10, 9×8(9×7), 12×16, 18×24, and 24×32.
- An inter-character space setting between 0 and 8 can be selected. However, the acceptable setting range varies with the character size.
- The relationship between character sizes and acceptable inter-character space setting ranges is as indicated below.

	Character size	5×5	5×7	5×8	7×10	9×7	9×8	12×16	18×24	24×32
Inter-character space	Range	0 to 3			0 to 1	0 to 7		0 to 4	0 to 6	0 to 8
	Default value	2			1	4		4	6	8

- While the inter-character space of character size 7 × 10 can be set up to 3 dots at the maximum on the print format screen, it is 1 dot at the maximum on the "Create user pattern" screen.

(2) Operating procedure

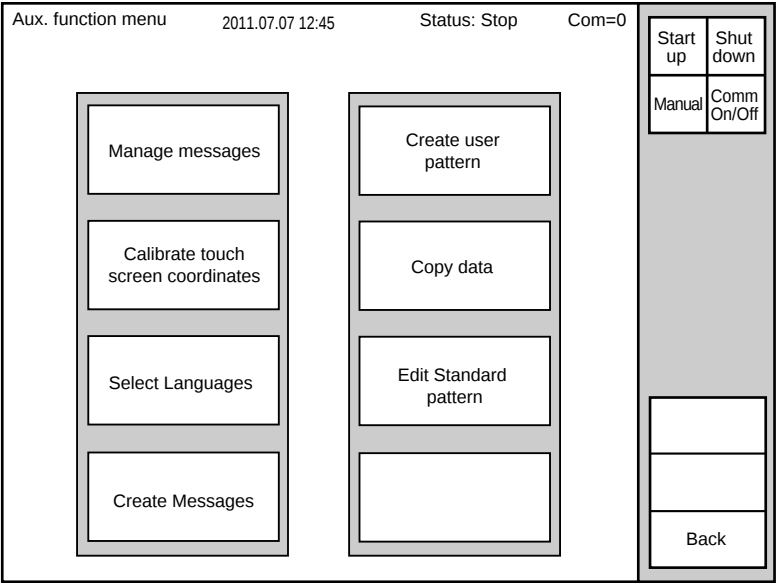
- Creating "  " with the character size set to 5×5 and inter-character space set to 0

					Menu
Maintenance	Auxiliary function	Operation management	Show fault	Environment setup menu	

Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

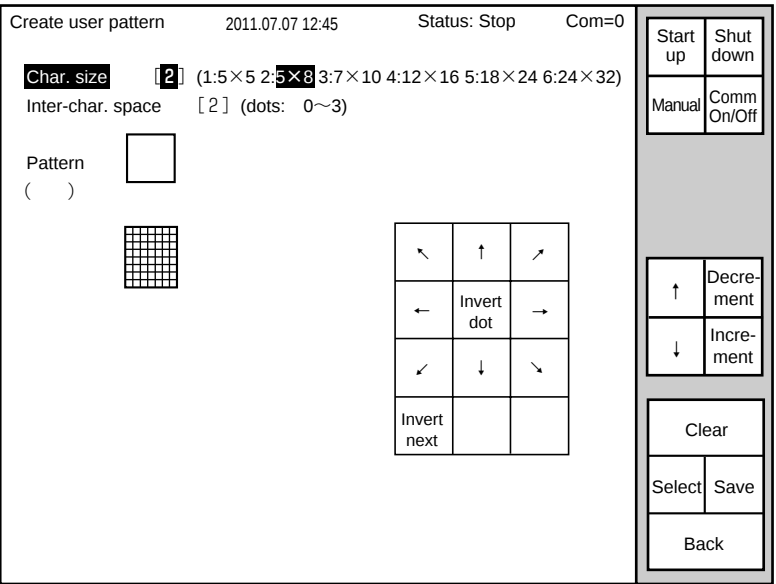
- 1** Verify that the printer is in "Stop," or "Standby" state. Choose **Auxiliary function** from the menu.

The "Auxiliary function menu" screen then opens.



- 2** Press **Create user pattern**.

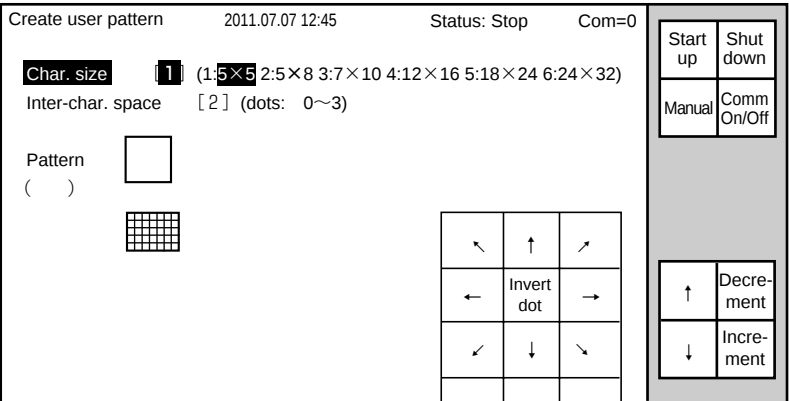
The "Create user pattern" screen then opens.



- 3** Press **Decrement**.

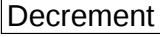
The character size is set to 5 x 5.

The matrix size is set to 5 x 5.



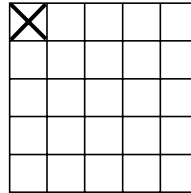
- 4** Press  on the right-hand side.

The cursor then moves to the inter-character space input field.

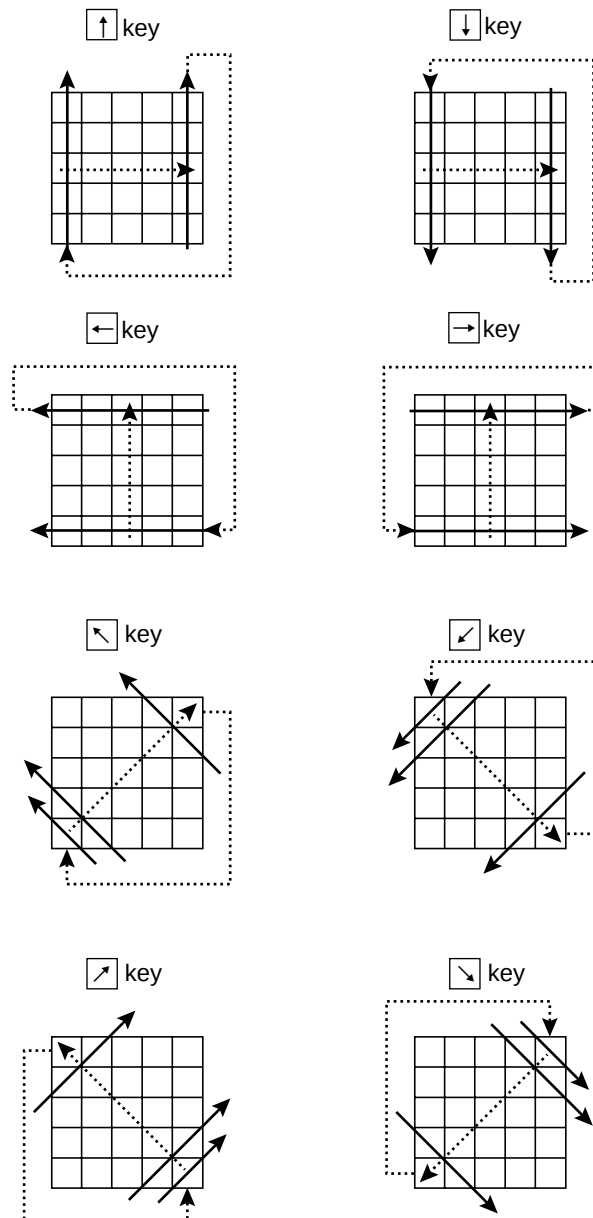
- 5** Press  two times consecutively.

The inter-character space is then set to 0.

- The cursor is set at the upper left-hand corner of the pattern creation area.



- To move the cursor, press down on the matrix that is located beside the dot pattern creation area.
- The procedures for moving the cursor are indicated below.



- The following two different cursors are used.

Move mode

Displayed: 

The cursor is moved to a dot setup position.

Reversal mode

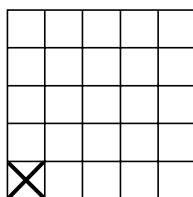
Displayed: 

The dots at positions where the cursor has passed are reversed.

- To change the cursor type, press **Invert next**.

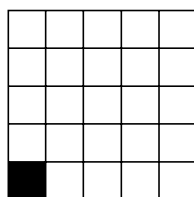
- 5** Locate  within the matrix which is displayed beside the pattern creation area. Press this  key four times consecutively.

The cursor then moves toward the lower left-hand corner of the matrix.



- 6** Press **Invert next**.

The cursor then enters the reversal mode.



- The following indications are given.

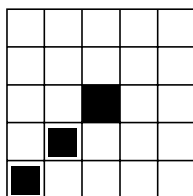
Dot present: 

Dot not present: 

- When you press **Clear**, the pattern generated in the creation area is erased.

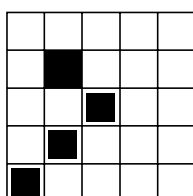
- 7** Press  two times consecutively.

The cursor then moves toward the upper right-hand corner.



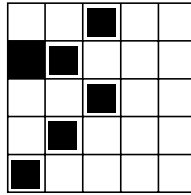
- 8** Press .

This causes the cursor to move toward the upper left-hand corner and reverse.



9 Press  two times consecutively.

The cursor then moves toward the upper right-hand corner and reverses.



10 Press .

The "Save pattern" screen then opens.

11 Press the position at which the pattern is to be saved.

Save pattern
2011.07.07 12:45
Status: Stop
Com=0

Char. size [1] (1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)
Inter-char. space [0] (dots: 0~3)

Pattern  Stored destination pattern 
(00) (05)

—	—	—	—	User pat-tern	—	—	—	—	—
■	■	■	■	■	■	■	■	■	■
Shift ^	Shift v								

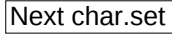
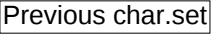
Start up Shut down

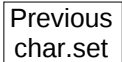
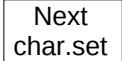
Manual Comm On/Off

Prev. char. set Next char. set

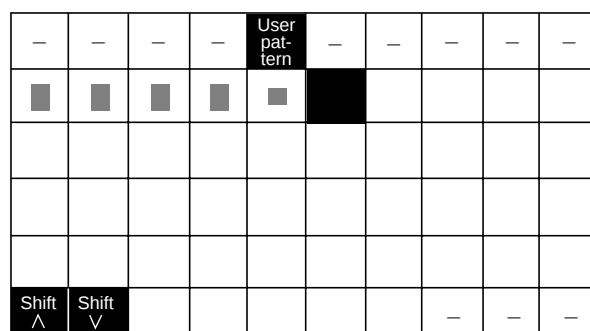
Cancel

OK

- Up to 128 save destinations (on-screen indications: 00-C7) can be designated (for each character size).
- To switch to a different screen, press  or .

	Displays the previous screen. When you press the key from the first screen, the last screen appears.
	Displays the next screen. When you press the key from the last screen, the first screen appears.

- On pages other than the first one, the Shift keys' background color changes from blue to yellow.



12 Press **OK**.

The system then registers the created pattern and returns you to the "Create user pattern" screen.

The saved pattern appears on the display.

- If you press **Cancel**, the system brings you back to the "Create user pattern" screen without saving the created pattern.

13 Press **Back**.

You are then returned to the "Auxiliary function menu" screen.

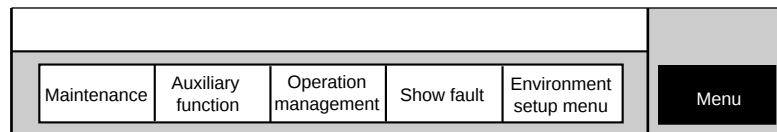
5.2.2 Recalling a user pattern

(1) Overview

- A registered user pattern can be recalled and displayed on the "Create user pattern" screen.

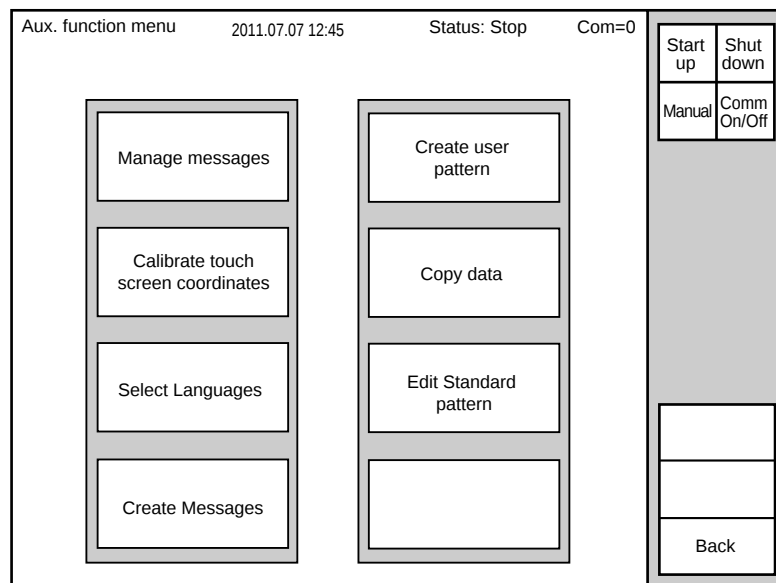
(2) Operating procedure

- Recalling a pattern that has a character size of 5×5 and is registered in the No. 3 position



1 Verify that the printer is in "Stop," or "Standby" state. Choose **Auxiliary function** from the menu.

The "Auxiliary function menu" screen then opens.



Operations for
modifying the setting
contents
(See Section 2.1.3,
Operations for
modifying the setting
contents.)

2 Press **Create user pattern**.

The "Create user pattern" screen then opens.

Create user pattern

2011.07.07 12:45

Status: Stop

Com=0

Char. size

2

(1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)

Inter-char. space

[2] (dots: 0~3)

Pattern

()




↖	↑	↗
←	Invert dot	→
↙	↓	↘
Invert next		

Start up	Shut down
Manual	Comm On/Off

↑	Decrement
↓	Increment

Clear	
Select	Save
Back	

3 Press **Decrement**.

The character size is then set to "1: 5× 5".

4 Press **Select**.

The "Select pattern" screen then opens.

Select pattern 2011.07.07 12:45 Status: Stop Com=0

Char. size [1] (1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)

Inter-char. space [0] (dots: 0~3)

Pattern ☐

(00)

—	—	ABC 123	—	User pat- tern	—	—	—	—	—
■	■	■	■	■					
Shift ^	Shift v						—	—	—

Start up	Shut down
Manual	Comm On/Off

Prev. char. set	Next char. set
-----------------------	----------------------

Cancel
OK

5 Press the third pattern display position from the left.

The third pattern is then displayed in reverse video (white on black).

Select pattern	2011.07.07 12:45	Status: Stop	Com=0	Start up	Shut down
Char. size	[1]	(1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)		Manual	Comm On/Off
Inter-char. space	[2]	(dots: 0~3)			
Pattern					
(02)					
—	—	ABC · 123 ·	—	User pat-tern	—
					

- To switch to a different screen, press **Next char.set** or **Prev. char.set**.
- Press **ABC · 123 ·** when selecting standard characters (alphabetical characters, numbers and symbols).

6 Press **OK**.

The system then returns you to the "Create user pattern" screen and displays the designated pattern in the editing area.

- If you press **Cancel**, the system brings you back to the "Create user pattern" screen without recalling the designated pattern.
- The procedure for modifying and saving a recalled pattern is the same as for creating and saving a pattern.

5.3 Copying User Data on a Memory Card

(1) Overview

- Copy print data and user pattern on a Memory card.
- Backup data can be copied on an IJ printer.
- A data type can be selected when copying it on an IJ printer.

User pattern	User pattern, Print data
--------------	-----------------------------

- (i) User patterns include registered characters of all character sizes.
- (ii) Print data includes print contents, line/column structure, print format, and print specifications. The registered print data will be backed up, Print data be edited will not be backed up.

- Copying method can be selected when copying data to IJ printer.

Overwrite copy	Copy to open space
----------------	--------------------

- (i) "Overwrite copy" will copy the backup data as is. User data which have been registered will be deleted.

- (ii) "Copy to open space" will copy data to any free space in IJ printer from the memory card. User data which have been registered will be held.

- (iii) With "Copy to open space", substitution rules can not be copied. The data which used substitution rules will be changed to a setting with no substitution rules, and copied.

Message "Substitution rules are not used" will be displayed until re-registration when this print data is recalled.

- Multiple IJ printer data can be copied to a memory card for backup.
- A folder depending on the serial number will be created on memory card.
- When copying backup data from memory card to IJ printer, select the folder to be copied.
- Data of up to 100 IJ printer units can usually be stored on one memory card. However, data exceeding the capacity of memory card cannot be stored.
- Use PC card (flash ATA card TYPE II (8 MB or higher)) as a memory card.
- Insert or remove the Memory card with the backup screen displayed.
- Do not repeat insertion and removal of Memory card any more often than necessary.
- If the standard character patterns has been changed, start the backup function while in "Stop" state.

(2) Operating procedure

- ① Copy user data from an IJ printer onto a Memory card.

- 1** Choose **Auxiliary function** from the menu.

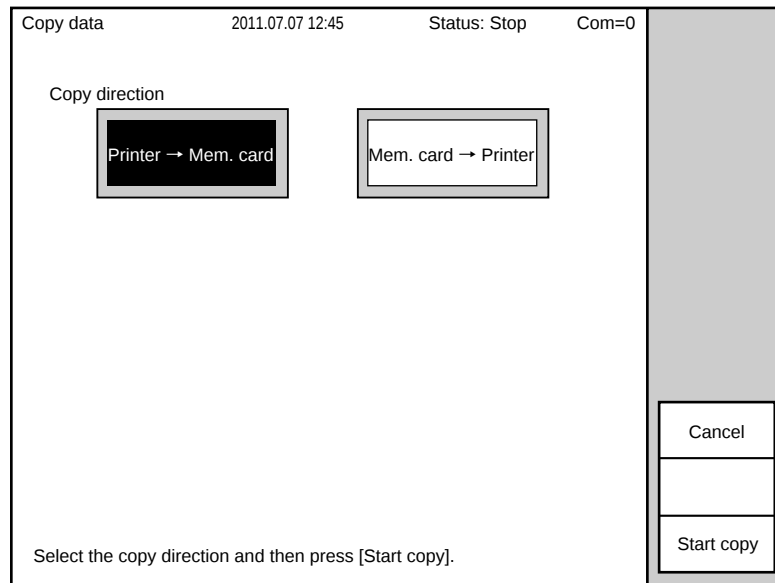
Maintenance	Auxiliary function	Operation management	Show fault	Environment setup menu	Menu
-------------	--------------------	----------------------	------------	------------------------	------

The "Auxiliary function menu" screen then opens.

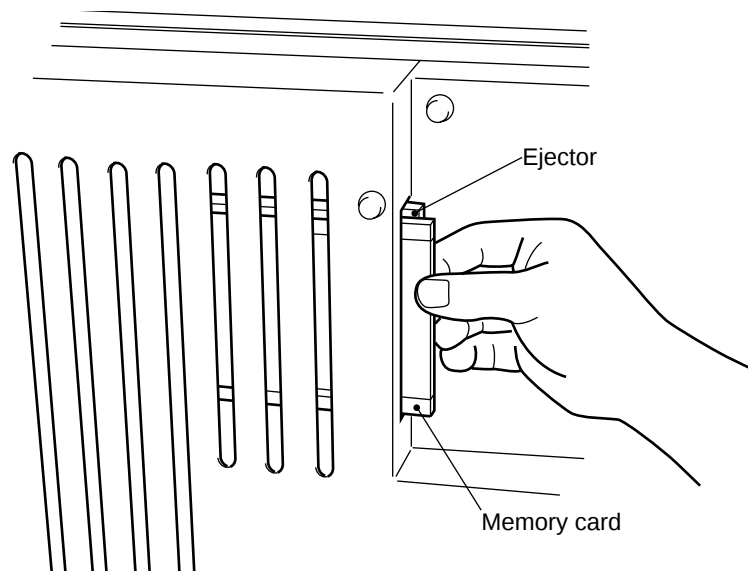
Aux. function menu		2011.07.07 12:45	Status: Stop	Com=0	Start up	Shut down
					Manual	Comm On/Off
Manage messages		Create user pattern				
Calibrate touch screen coordinates		Copy data				
Select Languages		Edit Standard pattern				
Create Messages						
				Back		

2 Press **Copy data**.

The "Copy data" screen then opens.



3 Insert a Memory card into a slot.



[Caution] Make the back of the Memory card face the board. In inserting it into a slot, do not overstrain it.

4 Press **Printer → Memory card** and specify a direction of copy.

5 Press **Start copy**.

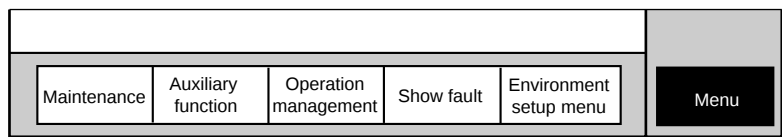
The copying is executed.

6 After the copying is over, press the ejector (button) and take the Memory card out of the slot.

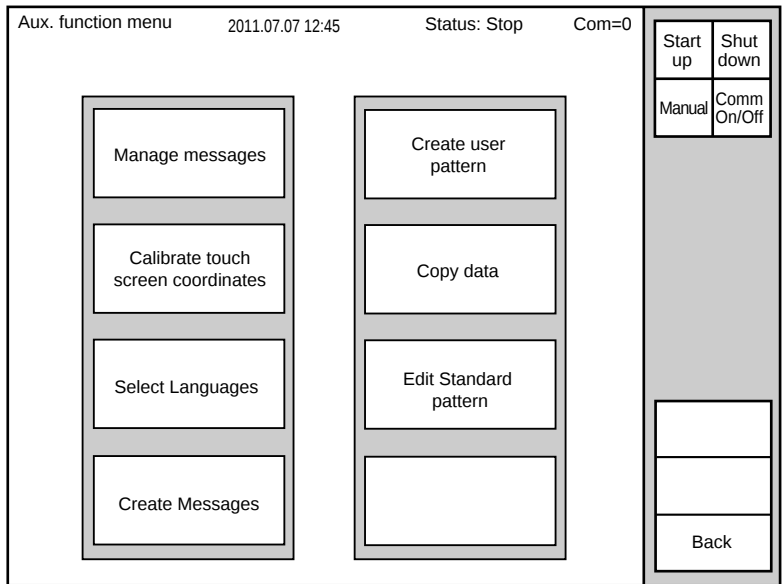
To copy data stored on a Memory card on an IJ printer, press the **Memory card → Printer** key.

② Copy user pattern from a Memory card onto an IJ printer .

- 1** Verify that the printer is in "Stop," or "Standby" state. Choose **Auxiliary function** from the menu.

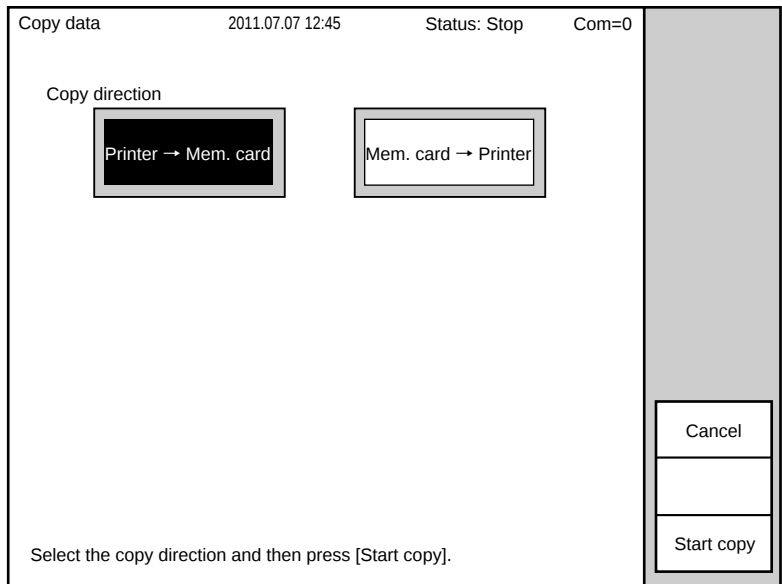


The "Auxiliary function menu" screen then opens.



- 2** Press **Copy data**.

The "Copy data" screen then opens.



- 3** Insert a Memory card into a slot.

- 4** Press **Memory card → Printer** and specify a direction of copy.

The screenshot shows a 'Copy data' screen with the following elements:

- Top status bar: 'Copy data', '2011.07.07 12:45', 'Status: Stop', 'Com=0'.
- 'Copy direction' section: Two buttons. The left button is 'Printer → Mem. card' (white background). The right button is 'Mem. card → Printer' (black background with white text).
- 'Folder to be copied' section: A label '[9 9 9 9 9 9 9]' and a 'Serial number' label '9 9 9 9 9 9 9'. To the right are two arrow buttons (up and down).
- 'Data type' section: Two buttons. The left button is 'User pattern' (white background). The right button is 'User pattern Print data' (black background with white text).
- 'Copy method' section: Two buttons. The left button is 'Overwrite copy' (white background). The right button is 'Copy to open space' (black background with white text).
- Right sidebar: A vertical stack of buttons: 'Cancel', an empty button, and 'Start copy'.

- 5** Press **↑** or **↓** to select the folder to be copied.

- 6** Press **User pattern** .

- 7** Press **Start copy** .

The copying is executed.

- 8** After the copying is over, press the ejector (button) and take the Memory card out of the slot.

5.4 Calibrating the Touch Screen Coordinates

- The procedure for adjusting the difference between the touch panel and on-screen coordinate positions.

Print description		2011.07.07 12:45		Status : Stop		Com=0							
Message name[]													
Column 1		Column 2		Column 3									
[USE BY]		[YY. MM. DD . .]		[.]									
[YY. MM. DD . .]		[MFG DATE . .]		[.]									
[ABC]		[CCCC]		[.]									
Print layout													
< <table border="1"> <tr><td>USE BY</td><td>11. 07. 07</td></tr> <tr><td>11. 07. 07</td><td>MFG DATE</td></tr> <tr><td>ABC</td><td>0001</td></tr> </table> >								USE BY	11. 07. 07	11. 07. 07	MFG DATE	ABC	0001
USE BY	11. 07. 07												
11. 07. 07	MFG DATE												
ABC	0001												
Print line setup Edit message Print format Print spec. Select message Save message													
							Menu						

- From the print description screen, press **Menu**.
The menu then opens.

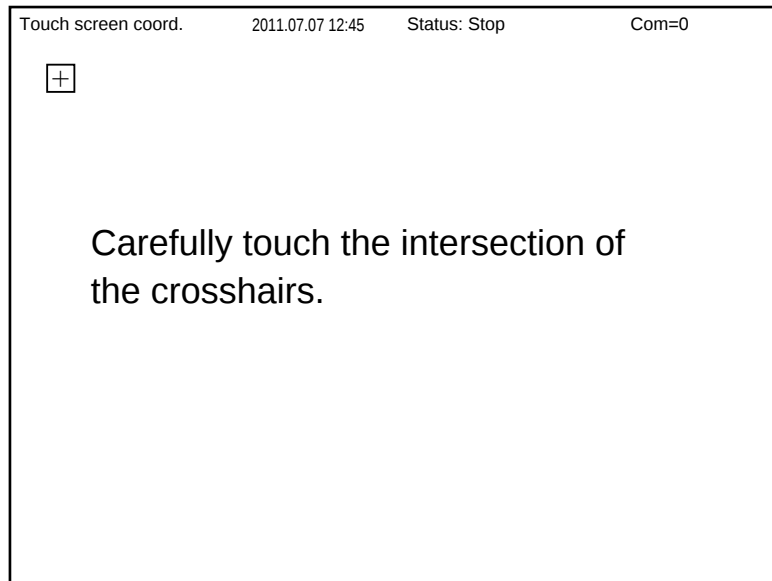
					Menu
Maintenance	Auxiliary function	Operation management	Show fault	Environment setup menu	

- While the menu is displayed, press **Auxiliary function**.
The auxiliary function menu then appears.

Aux. function menu		2011.07.07 12:45		Status: Stop		Com=0	
Manage messages Calibrate touch screen coordinates Select Languages Create Messages Create user pattern Copy data Edit Standard pattern							
							Back

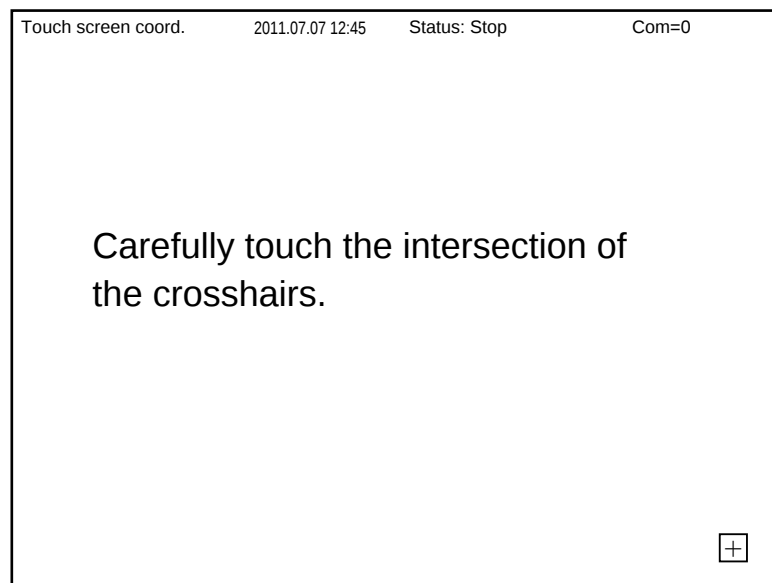
3 Press **Calibrate touch screen coordinates**.

The touch screen coordinates screen then opens.



4 Press the **+** mark at the upper left-hand corner.

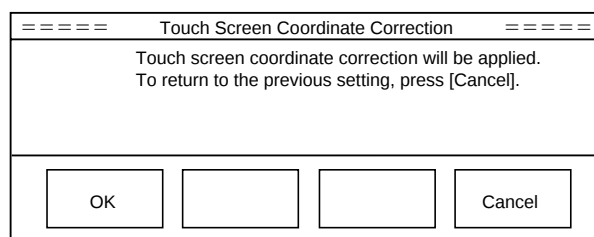
The **+** mark appears at the bottom right.



5 Press the **+** mark at the bottom right.

6 Hold down the **+** mark at the top left and bottom right until the system displays a confirmation message for Touch Screen Coordinate Correction.

The touch screen coordinate correction confirmation message then appears.



7 Press **OK**.

The system then corrects the coordinates and returns you to the auxiliary function menu.

5.5 Selecting Languages

(1) Overview

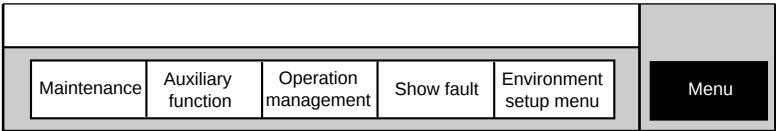
- You can change the language of screen from English to another language.

(2) Operating procedure

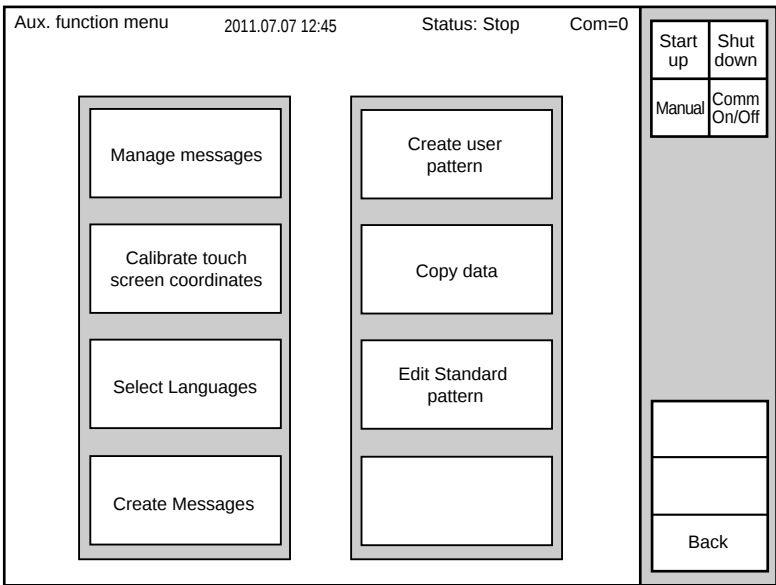
- Changing the language of screen from English to another language.

1 Verify that the printer is in "Stop" state.

Choose **Auxiliary function** from the menu.

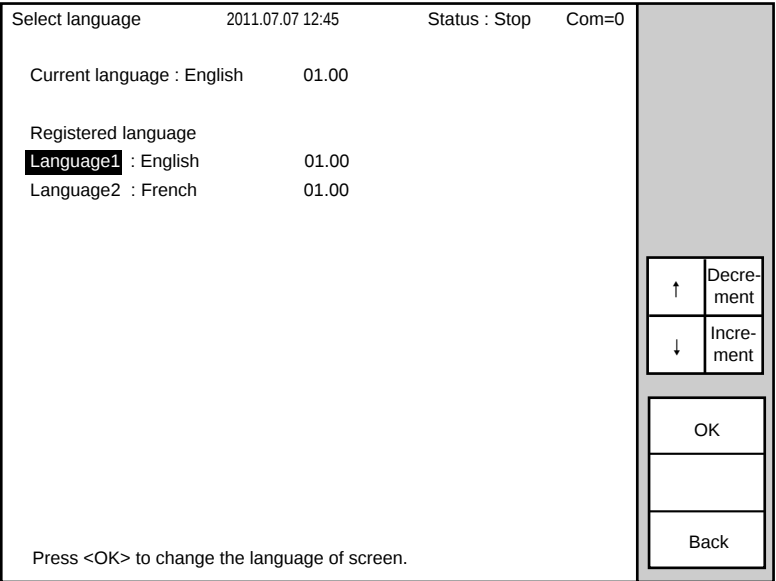


The "Auxiliary function menu" screen then opens.



2 Press **Select Languages**.

The "Select language menu" screen then opens.

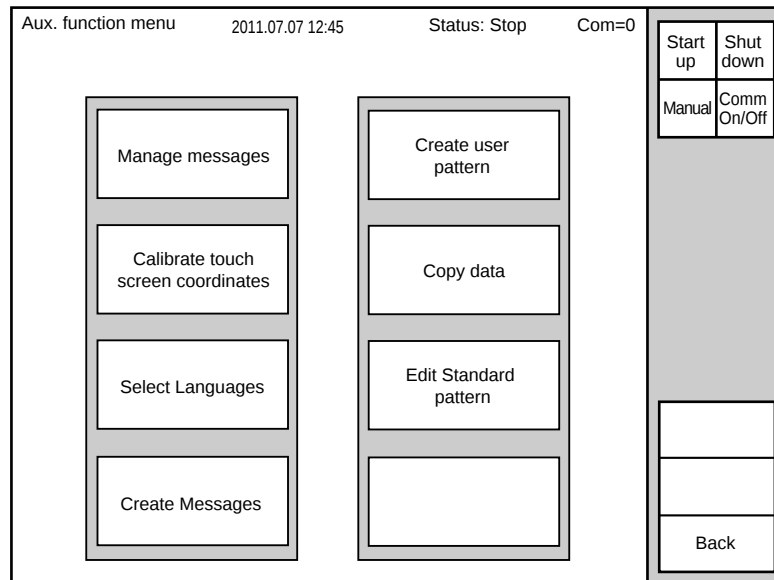


3 Press **Language1** or **Language2** to select the language.

4 Press **OK**.

The language of screen is changed from English to another language.

5 Press **Back**.



6 Press **Back**.

The "Print description screen" then opens.

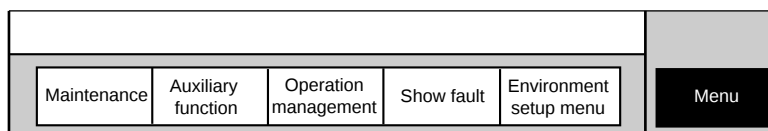
5.6 Editing Standard Character Patterns

(1) Overview

- Character patterns of printing are edited by the dot.
- Subject standard characters are 90 characters of alphabetical characters, numbers and symbols.
- Operations of pattern editing are the same as the "Create user pattern" function.
- The characters whose patterns have been changed will be displayed in blue on keyboard.
- Create the character patterns while printing with the user pattern: Once the pattern design has been established, use the "Edit standard pattern" function.

(2) Operating procedure

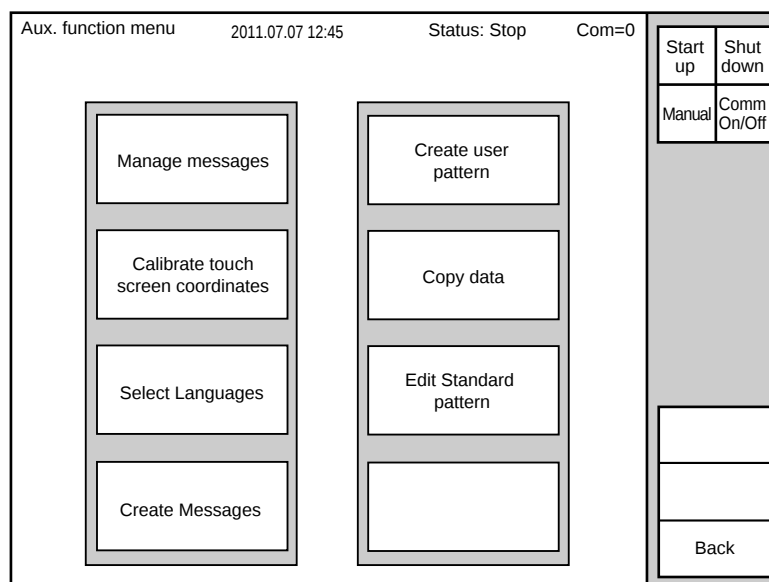
- A pattern of character size 7 x 10, character "7" is edited.



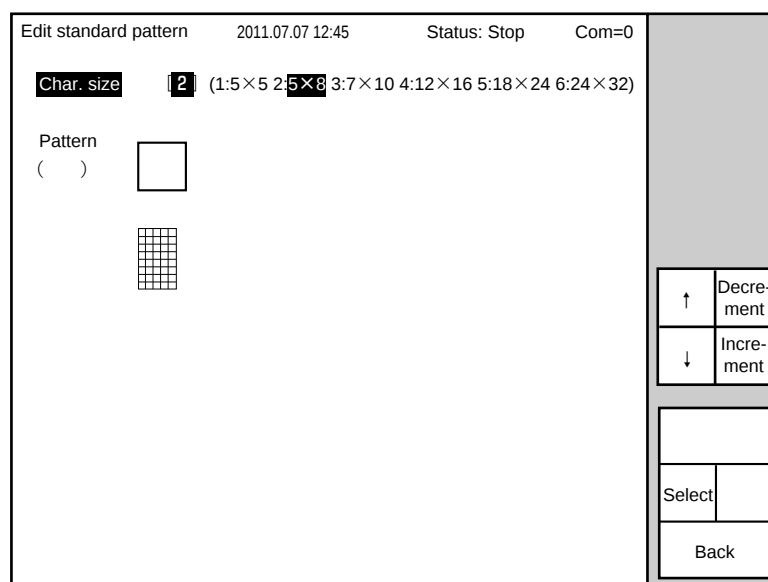
1 Verify that the printer is in "Stop" state.

Choose **Auxiliary function** from the menu.

The "Auxiliary function menu" screen then opens.



2 Press **Edit Standard pattern**.



3 Press **Increment**.

The character size becomes "3: 7 x 10."

4 Press **Select**.

The "Select pattern" screen then opens.

Select pattern		2011.07.07 12:45		Status: Stop		Com=0			
Char. size		[1] (1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)							
Pattern		□							
()									
—	—	ABC 123	—	—	—	—	—	—	—
1	2	3	4	5	6	7	8	9	0
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	+	—	×	/
Shift Λ	Shift V	(	)	.	:	,	—	—	—

Prev.
char.
set

Next
char.
set

Cancel

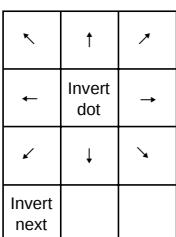
OK

5 Press **7**.

The "7" is highlighted in black and white.

6 Press **OK**.

It returns to the "Edit Standard pattern" screen, and the specified pattern appears in the editing area.

Edit standard pattern		2011.07.07 12:45		Status: Stop		Com=0			
Char. size		[3] (1:5×5 2:5×8 3:7×10 4:12×16 5:18×24 6:24×32)							
Pattern		7							
(7)									
									

↑ Decre-
ment

↓ Incre-
ment

Select

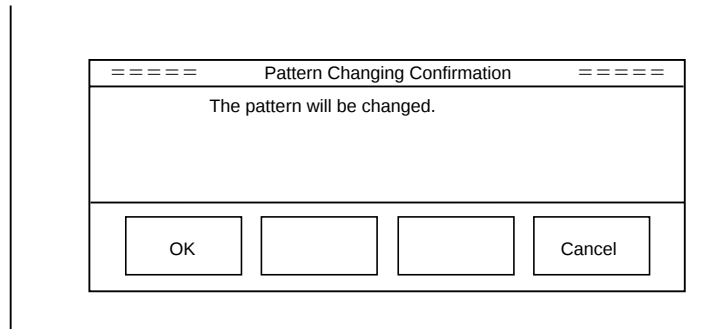
Save

Back

7 Edit the pattern.

8 Press **Save**.

The pattern changing confirmation message appears.



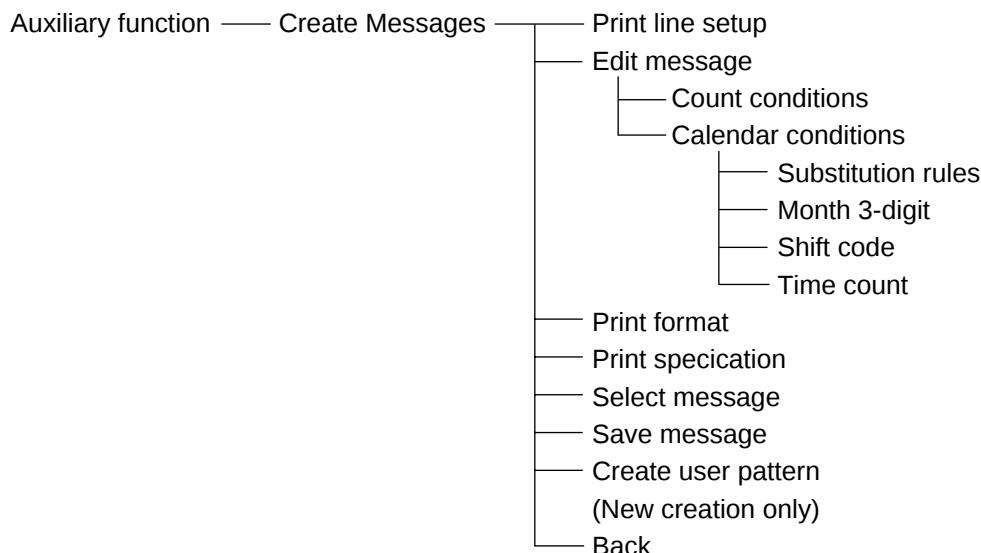
9 Press **OK**.

The pattern of the character selected earlier is updated.

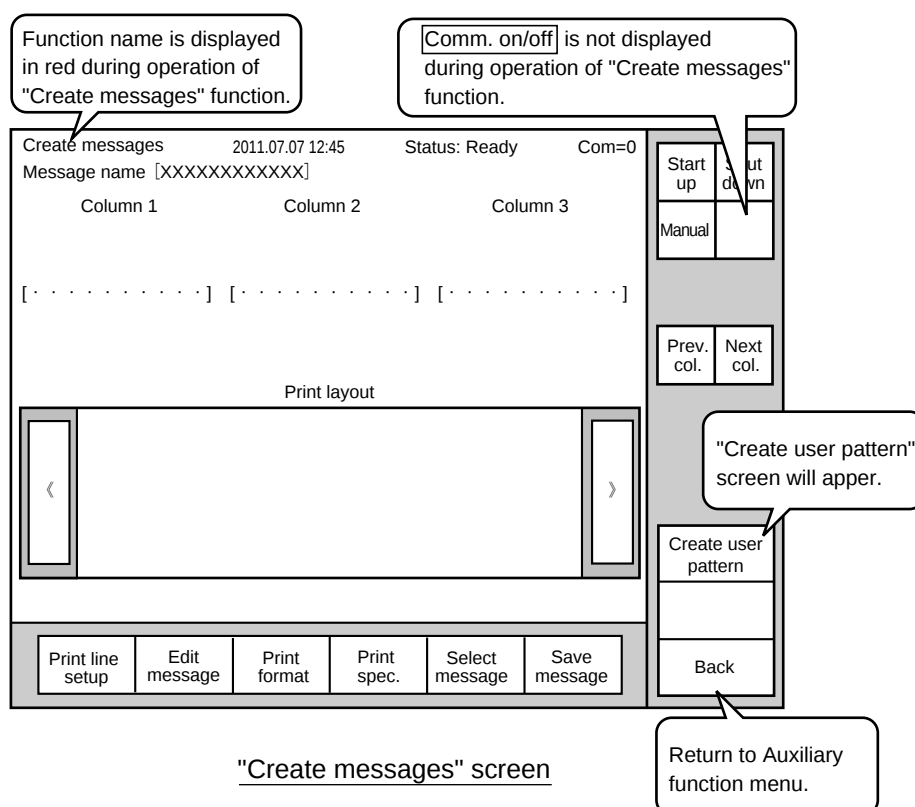
5.7 Editing/registering data that is different from that being printed

(1) Overview

- Edit different data from that being printed.
- If print data is edited or registered using "Create messages" function, there is no effect on print contents being printed.



Configuration of "Create messages" function



"Create messages" screen

- Before starting "Create messages" function, set the following setting.
 - >> Environment setup menu >> Create messages >> "0: access"
 - >> Password protection >> Save message >> "0: access"
 - >> Password protection >> Maintenance >> "0: access"
- In on-line status, "Create messages" function cannot be started. Use after setting to off-line status.

- Be sure to register all print data which is created using "Create messages" function. After that, the data can be printed by selecting it on print description screen.
- Normally, print data created by "Create messages" function is controlled and stored separately from data created by print description screen. To apply the same control of data created by print description screen, re-store data in the timing shown in table below. At this time, it will take about 3 seconds for each 1 print data.

No.	Re-storing timing to apply the same control of data made by print contents screen
1	Timing when ink is stopped. (When ink is stopped from the circulation control screen, and also when ink is stopped while Apply key is being displayed, the data cannot be stored in registration area.)
2	Timing when "Manage messages" function is started.
3	Timing when "Copy data" function is started.
4	Timing when status shifts from off-line to on-line.
5	Timing when power is turned on.

- With the "Create messages" function, a maximum of 30 types of print data can be handled separately from normal control. (In the Select message screen, message name of these data will be displayed in blue.) However, if the data is restored so that the same control of print data created by print description screen is applied, the above limitation is released.
- When the "Create messages" function is finished by pressing **Back** key without registering print data edited using "Create messages" function, the message "Unstored Print Data" will be displayed. Press **OK** key to register data. If **Close** key is pressed, screen will return to Auxiliary function menu without registration of data.

===== Unstored Print Data =====	
Print data are not yet stored.	
Solution	Press [OK] to store print data.
OK	Close
	Cancel

- Once "Create messages" function is set, print data will not be the contents edited last, which will be new message. Be sure to register the data before finishing the "Create messages" function.
- On-line transmission cannot be done even if there is only 1 print data item separated from normal control. Perform transmission after changing to on-line status by manual operation.
- When "Create user pattern" is started from "Create messages" screen, overwrite to already registered pattern cannot be performed: Register in an undefined area.

(2) Operation

- Editing data different from that being printed during printing.

1 Status is assumed as "Ready" and "Off-line".

2 Press **maintenance** in "Print description" screen.

					Menu
Maintenance	Auxiliary function	Operation management	Show fault	Environment setup menu	

"Maintenance menu" screen will appear.

Maintenance menu		2011.07.07 12:45	Status: Ready	Com=0												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 10px; text-align: center;">Environment setup menu</td> <td style="width: 33%; padding: 10px; text-align: center;">Operation management</td> <td style="width: 33%; padding: 10px; text-align: center;">Test Print</td> </tr> <tr> <td style="padding: 10px; text-align: center;">Excitation V update (Nozzle test)</td> <td style="padding: 10px; text-align: center;">View alarm history</td> <td style="padding: 10px; text-align: center;">Circulation control</td> </tr> <tr> <td style="padding: 10px; text-align: center;">View software version</td> <td style="padding: 10px; text-align: center;">Comm. monitor</td> <td style="padding: 10px; text-align: center;">Password protection</td> </tr> <tr> <td style="height: 50px;"></td> <td style="height: 50px;"></td> <td style="height: 50px;"></td> </tr> </table>					Environment setup menu	Operation management	Test Print	Excitation V update (Nozzle test)	View alarm history	Circulation control	View software version	Comm. monitor	Password protection			
Environment setup menu	Operation management	Test Print														
Excitation V update (Nozzle test)	View alarm history	Circulation control														
View software version	Comm. monitor	Password protection														
			Start up	Shut down												
			Manual	Comm On/Off												
			Back													

3 Press **Password protection**.

"Password protection" screen will appear.

Password protection	2011.07.07 12:45	Status: Ready	Com=0
When the password entry is accepted, you can change the password protection setup.			
Password	[]		
Edit message>Select message	[0]	(0 : access	1 : protect)
Save message	[0]	(0 : access	1 : protect)
Print specifications	[0]	(0 : access	1 : protect)
Print format	[0]	(0 : access	1 : protect)
Maintenance	[0]	(0 : access	1 : protect)

1	2	3	4	5	6	7	8	9	0
123 ·	ABC ·	abc ·							Back-space

↑	←
↓	→

Enter password
Back

Operations modifying
Password protection.
(See Section 4.5,
Controlling the
Executable Functions.)

- 4 Confirm that "save message" and "Maintenance" columns are set to "0: access".
If it is not set, change the setting.
- 5 Press **Back**.
"Maintenance menu" screen will appear.
- 6 Press **Environment setup menu** screen.
"Environment setup" screen will appear.

Environment setup menu 2011.07.07 12:45			Status: Ready	Com=0	Start up	Shut down
					Manual	Comm On/Off
User environment setup	Date/time setup	Communication environment setup				
Touch screen setup	Password setup/update					
					Back	

- 7 Press **User environment setup**.
"User environment setup" screen will appear.

User environment setup 2011.07.07 12:45			Status: Ready	Com=0	Start up	Shut down			
					Manual	Comm On/Off			
Repeat print sensor mode [1] (1: signal ON 2: OFF-ON transition)									
Reverse direction printing [0] (0: Disable 1: OFF=ABC 2: OFF=CBA)									
Reverse print [1] (1: method1 2: method2)									
Speed compensation [0] (0: Disable 1: Enable)									
Print signal type [1] (1: print. complete 2: print-in-progress)									
Method to apply print data [1] (1: method1 2: method2)									
Create message [0] (0: access 1: protect)									
Char. Size menu 1 [1] (1: 5×8 2: 5×7)									
Char. Size menu 2 [1] (1: 7×10 2: 9×8 3: 9×7)									
Excitation V-ref. warning [1] (0: Disable 1: Enable)									
Product speed matching error [1] (0: Disable 1: Enable)									
1	2	3	4	5	6	7	8	9	0
								Decre-ment	Incre-ment
Back									

- 8 Confirm that "Create messages" is set to "0: access".
If it is not set, change the setting.

Operations for
modifying User
environment.
(See Section 4.2,
Setting the User
Environment.)

9 Press **Back**.

"Environment setup" screen will be displayed.

10 Press **Back**.

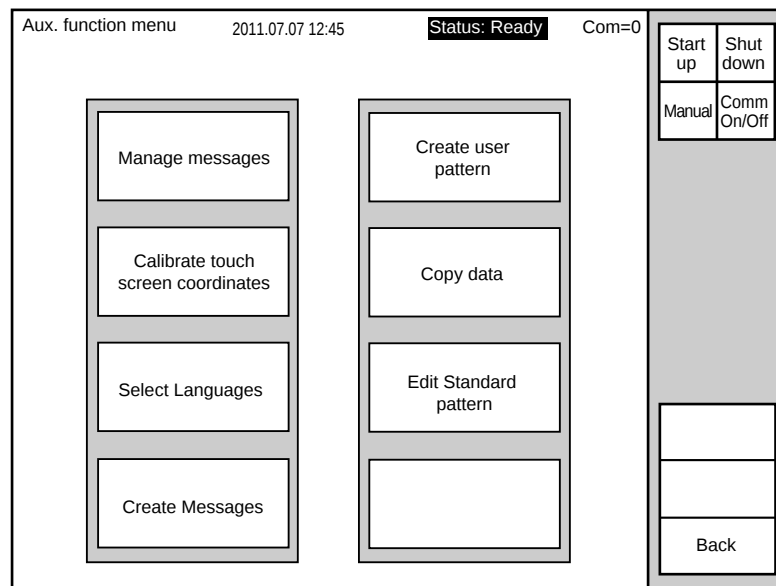
"Maintenance menu" screen will be displayed.

11 Press **Back**.

"Print description" screen will be displayed.

12 Press **Auxiliary function**.

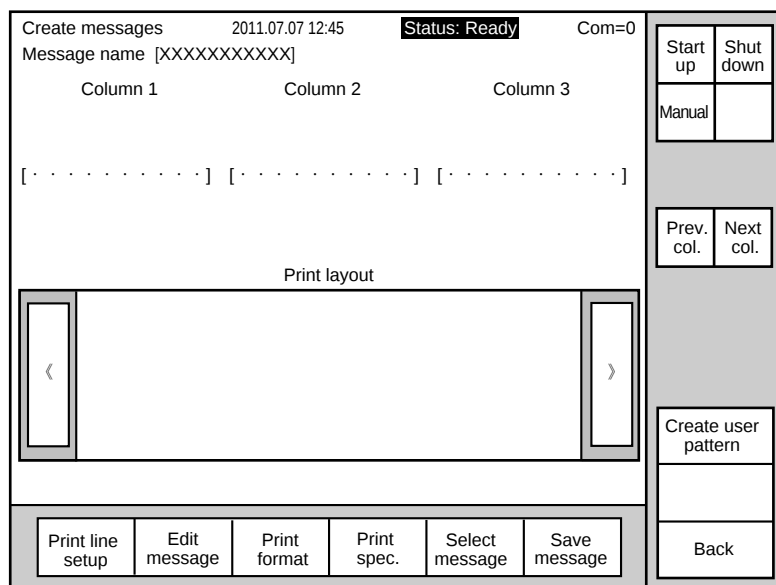
"Auxiliary function menu" screen will be displayed.



The screen displays the 'Aux. function menu' with a timestamp of 2011.07.07 12:45, 'Status: Ready', and 'Com=0'. It features two columns of buttons: the left column contains 'Manage messages', 'Calibrate touch screen coordinates', 'Select Languages', and 'Create Messages'; the right column contains 'Create user pattern', 'Copy data', 'Edit Standard pattern', and an empty button. A vertical sidebar on the right includes 'Start up', 'Shut down', 'Manual', 'Comm On/Off', three empty buttons, and a 'Back' button at the bottom.

13 Press **Create messages**.

"Create messages" screen will appear.



The screen displays the 'Create messages' interface with a timestamp of 2011.07.07 12:45, 'Status: Ready', and 'Com=0'. It includes a 'Message name' field with placeholder text '[XXXXXXXXXX]' and three columns labeled 'Column 1', 'Column 2', and 'Column 3', each with a dotted line for input. Below these is a 'Print layout' section with a large empty box and left/right navigation arrows. A bottom toolbar contains buttons for 'Print line setup', 'Edit message', 'Print format', 'Print spec.', 'Select message', and 'Save message'. A vertical sidebar on the right includes 'Start up', 'Shut down', 'Manual', 'Prev. col.', 'Next col.', 'Create user pattern', and a 'Back' button at the bottom.

Operations modifying
select message.
(See Section 3.9,
Recalling Saved Data.)

14 Press **Select message**.

"Select message " screen will appear.

Select message		2011.07.07 12:45		Status: Ready		Com=0	
Message name [A A A A A A A A A A A A]							
No	Message name	No	Message name				
1	A A A A A A A A A A A A	16					
2	B B B B B B B B B B B B	17					
3	C C C C C C C C C C C C	18					
4	D D D D D D D D D D D D	19					
5	E E E E E E E E E E E E	20					
6	F F F F F F F F F F F F	21					
7	G G G G G G G G G G G G	22					
8		23					
9		24					
10		25					
11		26					
12		27					
13		28					
14		29					
15		30					

Start up	Shut down
Manual	
	Show cursor
Prev. list	Next list
↑	←
↓	→
Cancel	
OK	

15 Select print data and press **OK**.

"Select message " confirmation message will appear.

16 Press **Enter**.

Selected print data will be recalled and "Create messages" screen will return.

Create messages		2011.07.07 12:45		Status: Ready		Com=0	
Message name [A A A A A A A A A A A A]							
Column 1		Column 2		Column 3			
[YY/MM/DD . . .] [A B C D E] [.]							
Print layout							
{ YY/MM/DD A B C D E }							
Print line setup Edit message Print format Print spec. Select message Save message							

Start up	Shut down
Manual	
Prev. col.	Next col.
Create user pattern	
Back	

The calendar/Conut characters are indicated by a mark at the Print layout area.

Operations modifying
edit message.
(See Section 3.3,
Printing Characters.)

17 Press **Edit message**.

"Edit message"screen will appear.

Edit message		2011.07.07 12:45		Status: Ready		Com=0			
Message name [AAAAAAAAAAAA]									
Column 1		Column 2		Column 3					
[YY/MM/DD . . .]		[ABCDE]		[.]					
Arabic	Kana	ABC 123	Dedi- cated	User pat- tern	Calendar /count	Punct.	Insert	Delete	
1	2	3	4	5	6	7	8	9	0
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	+	-	x	/
Shift ^	Shift V	(	)	.	:	.	Space	Blank	Back- space

Start up	Shut down
Manual	
	Show cursor
Prev. col.	Next col.
↑	←
↓	→
Calendar conditions	
Count conditions	
Back	

18 Press character key on keyboard.

19 Press **Apply**.

20 Press **Back**.

"Create messages" screen will return.

Create messages		2011.07.07 12:45		Status: Ready		Com=0					
Message name [AAAAAAAAAAAA]											
Column 1		Column 2		Column 3							
[YY/MM/DD . . .]		[FGHJK]		[.]							
Print layout											
◀		YY/MM/DD		FGHJK		▶					
Print line setup		Edit message		Print format		Print spec.		Select message		Save message	
Create user pattern										Back	

Operations modifying
registration print data.
(See Section 3.8,
Saving Edited Print
Data.)

- 21** Press **Save message** .
"Save message" screen will appear.

Save message										2011.07.07 12:45		Status: Ready		Com=0	
Message name [AAAAAAAAAAAA]															
Save message as (name) : [AAAAAAAAAAAA]															
	Spe- cial	ABC 123	Spe- cial2						Insert	Delete					
1	2	3	4	5	6	7	8	9	0						
A	B	C	D	E	F	G	H	I	J						
K	L	M	N	O	P	Q	R	S	T						
U	V	W	X	Y	Z	+	-	x	/						
Shift ^	Shift V	(	)	.	:	.	Space		Back- space						

Start up	Shut down
Manual	
	Show cursor
↑ ←	
↓ →	
Cancel	
OK	

- 22** Confirm message name and press **OK** .
Confirmation message "Same print data found" will be displayed.

- 23** Press **Enter** .
Print data is temporarily stored and "Create messages" screen will return.

Create messages										2011.07.07 12:45		Status: Ready		Com=0					
Message name [AAAAAAAAAAAA]																			
Column 1				Column 2				Column 3											
[YY/MM/DD . . .] [FGHJK] [.]																			
Print layout																			
<table border="1"><tr><td>YY/MM/DD</td><td>FGHJK</td></tr></table>														YY/MM/DD	FGHJK				
YY/MM/DD	FGHJK																		
Print line setup										Edit message		Print format		Print spec.		Select message		Save message	
Create user pattern																			
Back																			

- 24** Press **Back** .
"Auxiliary function menu" screen will be displayed.

25

Back

"Print description" screen will be displayed.

Print description		2011.07.07 12:45		Status: Ready		Com=0					
Message name [BBBBBBBBBBBBBB]											
Column 1		Column 2		Column 3							
[USE BY · ·] [YY/MM/DD · ·] [· · · · · · · ·] [MFG DATE · ·] [YY/MM/DD · ·] [· · · · · · · ·]											
Print layout											
< <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20%;">USE BY</td> <td style="width: 20%;">11 / 10 / 06</td> </tr> <tr> <td>MFG DATE</td> <td>11 / 07 / 07</td> </tr> </table> >								USE BY	11 / 10 / 06	MFG DATE	11 / 07 / 07
USE BY	11 / 10 / 06										
MFG DATE	11 / 07 / 07										
Print line setup Edit message Print format Print spec. Select message Save message											

Prev. col.

Next col.

Count reset

Back



6. Communication

6.1 Overview

The functions described in this document are used to transmit printings and their registration numbers and enter them into the IJ printer with an external device connected to the IJ printer via an RS-232C serial communication line.

(1) Printings transmission

- An "item number" and "character string" are transmitted from the external device to the IJ printer.
- The IJ printer receives the "item number" and "character string" and then makes preparations for making designated prints.
- The printings of print item for which bar codes or increased-width printings can also be transmitted by the communication functions.
- When a number (alphabetical character) is transmitted via a communications link to a count setting digit, the default value can be set.

(2) Print data recall/transmission

- A print data "message number" is transmitted from the external device to the IJ Printer.
- The IJ printer recalls print data designated by a "message number" and makes preparations for making prints.

(3) Print condition transmission

- The external device transmits "printing specifications", "print format", and "overall column setup" to the IJ printer.
- The IJ printer receives the "printing specifications", "print format", and "overall column setup" and prepares for making prints under the specified conditions.

(4) User registration character transmission

- This function is used to transmit a user pattern and enter it into the IJ printer.
- A transmitted user pattern can be edited using the "Create user pattern" function, which is provided as an auxiliary function.

(5) Comparison of "printings transmission", "print data recall transmission", "print condition transmission", and "user pattern character transmission".

No.	Function	Data received from external device	Data updated within IJ printer
1	Printings transmission	① Item number ② Printings (character string data)	Printings for specified print items only
2	Print data recall transmission	Print data message number	Printing, print format, line/column structure, and all print specifications (because saved print data will be recalled for substitution)
3	Print condition transmission	① Print specifications ② Print format ③ Overall column count setup	Print specifications, print format, and line/column structure
4	User pattern character transmission	① Character size ② Character code ③ Pattern data	Only the user pattern characters having the specified number

6.2 Setting Communication Environment

6.2.1 Setting Communication Environment

(1) Overview

Function	Description	Default
State at power-up	• Comm. port is OFF : Offline mode when the power is turned on. • Comm. port is ON : Online mode when the power is turned on. • OFF fixed : Always offline mode and you cannot change to the online mode.	Comm. port is OFF
Baud rate	• Sets the baud rate at which communication is established with the outside. • Eight different settings are selectable: 150, 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, or 38,400 bps.	4,800bps
Data format	• Sets the data length, parity bit, and stop bits for communication with the outside. • The following settings are available. ① Data length: 7 or 8 bits ② Parity bit: none, odd, or even ③ Stop bits: 1 bit or 2 bits	Data length: 8 bit Parity bit: none Stop bits: 1 bit
Number of comm. bytes	• Sets the number of character code bytes for communication with the outside. • A setting of 1 byte or 2 bytes can be selected.	1 byte
BCC code handling	• Setup can be performed so that no communication error occurs even if BCC code attached data is received.	Disable
Communication mode	• Overwrite-protected: No new data will be received until the previously received data is printed. • Overwrite-enabled: New data is received even if the previously received data has not been printed. The newly received data overwrites the old data.	Overwrite-protected
Print message transfer ACK	• t=fixed : The time from receiving the print description from an external device to sending ACK becomes nearly fixed regardless of the transmission volume. • t=async. : The system will be ready to print immediately after returning ACK.	t=async.
Print spec. transfer char. height	• 2 digits: Uses 2-digit data for character height setting ([00] to [99]) transmission. • 3 digits: Uses 3-digit data for transmission.	2 digits
Communication and signal error	• Warning : An external communication error and external signal error are considered to be "Warning." • Fault : An external communication error and external signal error are considered to be "Fault."	Warning

(2) Operating procedure

- 1 Press **Communication environment setup** from the Environment setup menu.

The "Communication environment setup" screen appears.

Comm. env. setup

2011.07.07 12:45

Status: Ready

Com=0

State at power-up

[0] (0: Comm. port is OFF

1: Comm. port is ON 2: OFF fixed)

Baud rate (bps)

[6] (4800)

Data format

Data length

[2] (1: 7 bits 2: 8 bits)

Parity bit

[0] (0: Disable 1: odd 2: even)

Stop bits

[1] (1: 1 bit 2: 2 bits)

Number of comm. bytes

[1] (1: 1 byte 2: 2 bytes)

BCC code handling

[0] (0: Disable 1: Enable)

Communication mode

[1] (1: overwrite-protected

2: overwrite-enabled)

1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor
Prev. set- tings	Next set- tings
↑	←
↓	→

Back

- 2** Press **Next settings**.

The second screen appears.

Comm. env. setup

2011.07.07 12:45

Status: Ready

Com=0

Print message transfer ACK

2 (1: t=fixed 2: t=async.)

Print spec. transfer char. height

0 (0: 2 digits 1: 3 digits)

Communication and signal error

0 (0: Warning 1: Fault)

1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment

Start up

Shut down

Manual

Comm On/Off

Show cursor

Prev. settings

Next settings

↑

←

↓

→

Back

6.2.2 Transmission Specifications

- (1) Communication method: Half duplex
- (2) Startup method: Started up by host
- (3) Synchronization method: Asynchronous
- (4) Transmission method: Bit serial transmission
- (5) Baud rate: 150、300、600、1,200、2,400、4,800、9,600、19,200、38,400(bps)
- (6) Codes transmitted: Alphanumerical characters, symbols, dedicated characters, user pattern characters, and punctuation characters
- (7) Data format: Formats A through H are selectable (see the table below).
No other formats can be chosen.

Data format table

Format \ Item	Start bit (bits)	Data length (bits)	Parity bit (bits)	Stop bits (bits)
A	1	7	1 (even)	2
B	1	7	1 (odd)	2
C	1	7	1 (even)	1
D	1	7	1 (odd)	1
E	1	8	None	2
F (default)	1	8	None	1
G	1	8	1 (even)	1
H	1	8	1 (odd)	1

Selecting a data length of 7 bits allows you to transmit alphanumerical characters and symbols but inhibits you from transmitting punctuation characters and using 2-byte codes to send dedicated characters and user pattern characters.

(8) Bit configuration

Formats A and B

Start	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	Parity	Stop	Stop
-------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	--------	------	------

Formats C and D

Start	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	Parity	Stop
-------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	--------	------

Format E

Start	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	b ₇	Stop	Stop
-------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	------	------

Format F

Start	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	b ₇	Stop
-------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	------

Formats G and H

Start	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	b ₇	Parity	Stop
-------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	--------	------

Order of code transmission: Transmission occurs beginning with the least significant bit (b₀).

(9) Error control

- Vertical parity error (detection on an individual character basis)
- Overrun error
- Framing error

6.3 Standard Communication Functions

6.3.1 Printings Transmission

- In the example below, the manufacturing equipment symbol is changed from "XXXXX" to "ABCDE".

- 1 Let us suppose that the printer is ready for printing.
- 2 The "USE BY" date and "Manufacturing Equipment Symbol" are already entered.

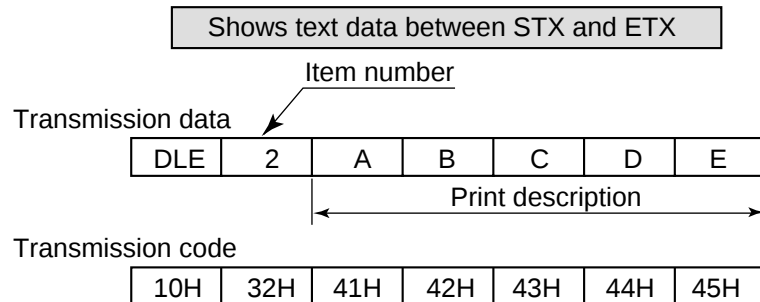
Print description		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column1		Column 2		Column 3			
[YY. MM. DD . .]		[.]		[.]			
[x x x x]		[.]		[.]			
Print layout							
< 11. 07. 10 XXXXX >							
Maintenance		Auxiliary function		Operation management		Show fault	
		Environment setup menu		Menu			

<Printings setup>
Item 1: Calendar character
Item 2: Fixed character

- 3 Press the **Comm On/Off** key.

The status then changes from "off-line (Com=0)" to "on-line (Com=1)".

- 4 The external device transmits an "item number" and "printings" to the IJ printer.



- 5 The printings change.

Print description		2011.07.07 12:45		Status: Ready		Com=1	
Message name []							
Column1		Column 2		Column 3			
[YY. MM. DD . .]		[.]		[.]			
[ABCDE]		[.]		[.]			
Print layout							
< 11. 07. 10 ABCDE >							
Maintenance		Auxiliary function		Operation management		Show fault	
		Environment setup menu		Menu			

6.3.2 Print Data Recall/Transmission

- In the example below, saved print data "VVVVVVVV" is recalled.

1 Let us suppose that the printer is ready.

Print description	2011.07.07 12:45	Status: Ready	Com=0
Message name [	]		
Column 1	Column 2	Column 3	
[0 1 2 3 4 5 6 7 8 9]	[.]	[.]	
[0 1 2 3 4 5 6 7 8 9]	[.]	[.]	
Print layout			
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9			

<Printings setup>
Item 1: Fixed character
Item 2: Fixed character

2 Press the **Comm On/Off** key.

The status then changes from "off-line" to "on-line".

- 3 The external device transmits the "message number" of print data to the IJ printer.

Shows text data between STX and ETX

Transmission data

ESC	Header	0	1	2
		Message number		

Transmission code

1BH	56H	30H	31H	32H
-----	-----	-----	-----	-----

4 The printings change.

Print description	2011.07.07 12:45	Status:Ready	Com=1
Message name [VVVVVVVVVVVV]			
Column1	Column 2	Column 3	
[YY. MM. DD ..]	[.....]	[.....]	
[ABCDE.....]	[.....]	[.....]	
Print layout			
< > 11. 07. 10 ABCDE			
Maintenance	Auxiliary function	Operation management	Show fault
Environment setup menu		Menu	

<Printings setup>
Item 1: Calendar character
Item 2: Fixed character

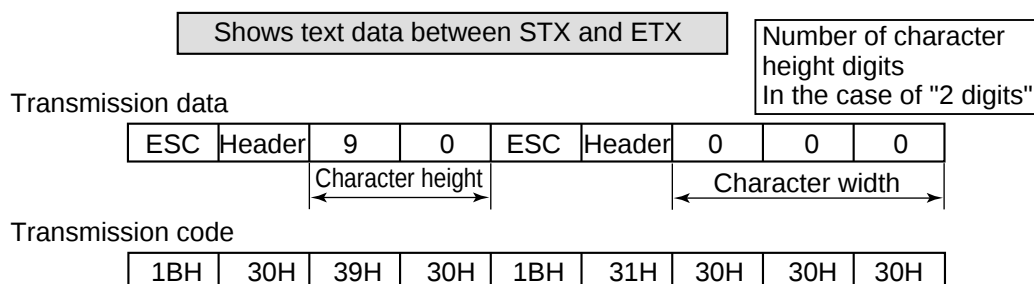
6.3.3 Print Condition Transmission

- The procedure for changing the character height from "99" to "90" and change the character width from "050" to "000." is shown in the example below.

- 1 Assume that the printer is ready for printing.
- 2 From the "Print description" screen, press **Print spec**.
- 3 You can see a character height setting of 99 and character width of "050" entered.

Print specifications	2011.07.07 12:45	Status: Ready	Com=0
Message name [AAAAAAAAAAAA]			
Character height	[99] (0-99)		
Character width	[050] (0-199)		
Character orientation	[0] (0:ABC 1:ABC 2:CBV 3:CBV)		
(Arrow: Printing direction) → ← ← →			
Printing method	2 (1: signal scan 2: Interlaced)		
Repeat intervals	[0000] (scanning unit SC 0-9999)		
Repeat count	[0000] (0:none, 1-9998, 9999:continuous)		
Print start delay	[0000] (character unit CH 1-1234)		
Target sensor timer	[000] (1/10sec 0: none, 1-999)		
Target sensor filter	[1] (1: time setup, 2: until end of print.)		
Setup value	[0000] (msec 0-9999)		
Start up Shut down Manual Comm On/Off Show cursor Prev. settings Next settings Character unit CH Scanning unit SC Back			

- 4 Press the **Comm On/Off** key.
The status then changes from "off-line" to "on-line".
- 5 Transmit character height data and character width data from the external device to the IJ printer.



- 6** The character height setting then changes to "90".
The character width setting then changes to "000."

Print specifications		2011.07.07 12:45	Status: Ready	Com=1														
Message name [AAAAAAAAAAAA]																		
Character height	[90]	(0-99)																
Character width	[000]	(0-199)																
Character orientation	[0]	(0:ABC 1:ABC 2:QBV 3:QBV)																
(Arrow: Printing direction) → ← ← →																		
Printing method	2	(1: signal scan 2: Interlaced)																
Repeat intervals	[0000]	(scanning unit SC 0-9999)																
Repeat count	[0000]	(0: none, 1-9998, 9999: continuous)																
Print start delay	[0000]	(scanning unit SC 0-9999)																
Target sensor timer	[000]	(1/10sec 0: none, 1-999)																
Target sensor filter	[1]	(1: time setup 2: until end of print.)																
Setup value	[0000]	(msec 0-9999)																
<table border="1"> <tr> <td>Start up</td> <td>Shut down</td> </tr> <tr> <td>Manual</td> <td>Comm On/Off</td> </tr> <tr> <td colspan="2">Prev. settings</td> </tr> <tr> <td colspan="2">Next settings</td> </tr> <tr> <td colspan="2">Character unit CH</td> </tr> <tr> <td colspan="2">Scanning unit SC</td> </tr> <tr> <td colspan="2">Back</td> </tr> </table>					Start up	Shut down	Manual	Comm On/Off	Prev. settings		Next settings		Character unit CH		Scanning unit SC		Back	
Start up	Shut down																	
Manual	Comm On/Off																	
Prev. settings																		
Next settings																		
Character unit CH																		
Scanning unit SC																		
Back																		

6.3.4 User Pattern Character Transmission

- The procedure for saving a user pattern as No. "00" for a character size of 5 x 5 is shown in the example below.

- 1 Assume that the printer is ready for printing.
- 2 You can see that a registration No. "00" user pattern for a character size of 5 x 5 (spaces only) is entered in the first digit position of the first row.

Print description		2011.07.07 12:45		Status: Ready		Com=0	
Message name [							
Column 1		Column 2		Column 3			
[00]		[.]		[.]			
Print layout							
< >							
Maintenance		Auxiliary function		Operation management		Show fault	
		Environment setup menu				Menu	

- 3 Press the Comm On/Off key.

The status then changes from "off-line" to "on-line".

- 4 Transmit "character size", "registration number", and "user pattern data" from the external device to the IJ printer.

Shows text data between STX and ETX

Communication byte count
For "1 byte"

Transmission data

ESC	Header	Size	Registration	Data1	Data2	Data3	Data4	Data5	Data6	Data7	Data8
		Character size	Registration No.	User pattern data							
1BH	20H	30H	D0H	00H	01H	0CH	14H	00H	00H	00H	00H

Transmission code

- 5 The transmitted user pattern appears on the display.

Print description		2011.07.07 12:45		Status: Ready		Com=1	
Message name [							
Column 1		Column 2		Column 3			
[00]		[.]		[.]			
Print layout							
<  >							
Maintenance		Auxiliary function		Operation management		Show fault	
		Environment setup menu				Menu	

6.3.5 Calendar Character Transmission

- The following shows an example of changing "XXXXXX" to "year/month/day" on the Print description screen:

1 Assume that the printer is ready for printing.

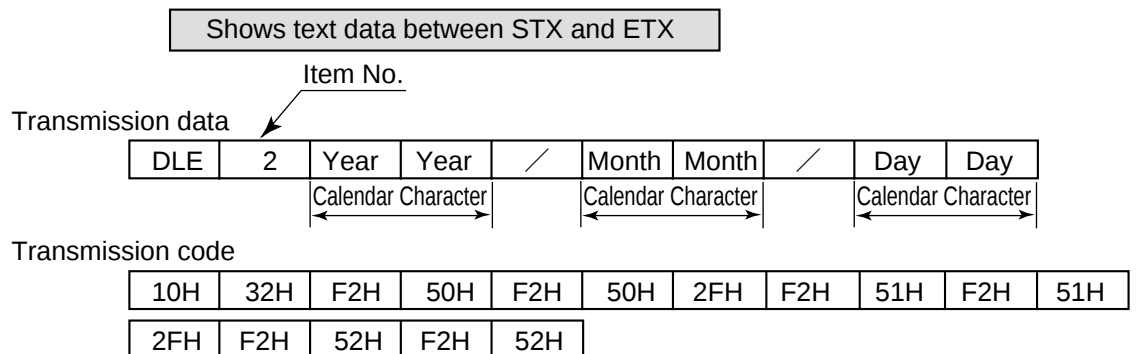
2 You can see that the "ABCDE" and "XXXXXX" are entered.

Print description	2011.07.07 12:45	Status:Ready	Com=0
Message name []			
Column 1	Column 2	Column 3	
[A B C D E]	[.]	[.]	
[x x x x x]	[.]	[.]	
Print layout			
<	ABCDE XXXXXX		>
Maintenance	Auxiliary function	Operation management	Show fault
		Environment setup menu	Menu

3 Press the **Comm On/Off** key.

The status then changes from "off-line" to "on-line".

4 Transmit "item No." and "calendar character" from the external device to the IJ printer.



* With the above transmission code, the setting on the number of transfer bytes will be described in the 2-byte mode.

5 The print description will change to calendar characters.

Print description		2011.07.07 12:45		Status: Ready		Com=1	
Message name []							
Column 1		Column 2		Column 3			
[ABCDE]		[.]		[.]			
[YY/MM/DD . . .]		[.]		[.]			
Print layout							
< ABCDE 11/07/07 >							
Maintenance		Auxiliary function		Operation management		Show fault	
		Environment setup menu		Menu			

6.3.6 Calendar Conditions Transmission

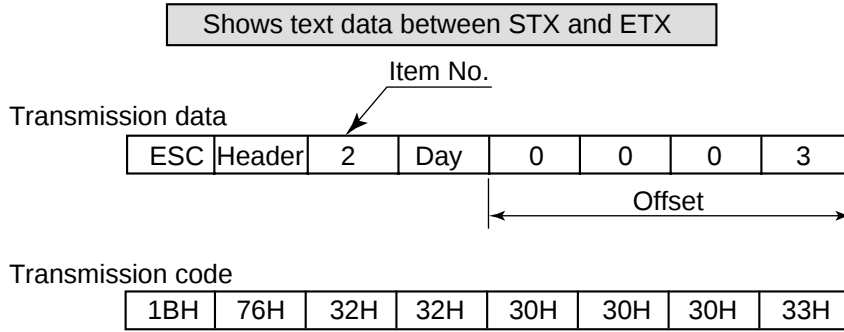
- The following shows an example of changing the offset of day from "0000" to "0003":

- 1 Assume that the printer is ready for printing.
- 2 Press the **Calendar conditions** in the "Edit message" screen.
- 3 The offset of day "0000" has already been entered.

Calendar conditions		2011.07.07 12:45		Status: Ready		Com=0	
Message name []							
Column 1		Column 2		Column 3			
[USE BY]		[YY. MM. DD . . .]		[.]			
[YY. MM. DD h h]		[MFG DATE . . .]		[.]			
[ABC]		[CCCC]		[.]			
<Offset>		<Substitution rules>		<Zero-suppression>			
Year	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Month	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Day	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Hour	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Minute	[0 0 0 0]						
Substitution rules No. [0 1]							
1	2	3	4	5	6	7	8
						Decre-	Incre-
						ment	ment
Substitution rules							
Back							

- 4 Press the **Comm On/Off** key.
The status then changes from "off-line" to "on-line".

5 Transmit "day offset" from the external device to the IJ printer.



6 The offset of the day will change.

Calendar conditions		2011.07.12 12:45		Status: Ready		Com=1	
Message name []							
Column 1		Column 2		Column 3			
[USE BY]		[YY. MM. DD . . .]		[.]			
[YY. MM. DDhh]		[MFG DATE . . .]		[.]			
[ABC]		[CCCC]		[.]			
<Offset>		<Substitution rules>		<Zero-suppression>			
Year	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Month	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Day	[0 0 0 3]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Hour	[0 0 0 0]	[0] (0:Disable 1:Enable)	[0] (0:Disable 1:Enable)				
Minute	[0 0 0 0]						
Substitution rules No. [0 1]							

* The calendar conditions can be transmitted only for items in which the calendar characters have been previously set. To transmit items without calendar characters, transmit the calendar characters first.

6.3.7 On-line/Off-line Transmission

- The following shows how to change the setting online/offline:

- 1 Assume that the printer is ready for printing.
- 2 Assume the printer is off-line.

Print description	2011.07.07 12:45	Status:Ready	Com=0	Start up	Shut down
Message name [	]				
Column 1	Column 2	Column 3		Manual	Comm On/Off

- 3 Transmit "on-line" from the external device to the IJ printer.

Transmission data

ESC	Header
-----	--------

Transmission code

1BH	79H
-----	-----

- 4 The online status will be set.

Print description	2011.07.07 12:45	Status:Ready	Com=1	Start up	Shut down
Message name [	]			Manual	Comm On/Off
Column 1	Column 2	Column 3			

6.3.8 Current Time Output Transmission

- The current time on IJ printer internal calendar will be output.

- 1 Assume that the printer is ready for printing.
- 2 Assume the printer is on-line.

Print description	2011.07.07 12:45	Status:Ready	Com=1	Start up	Shut down
Message name [	]			Manual	Comm On/Off
Column 1	Column 2	Column 3			

- 3 An external device requests the IJ printer to output the current time.

Transmission data

ESC	Header
-----	--------

Transmission code

1BH	7BH
-----	-----

Output data

Shows text data between STX and ETX

ESC	Header	2	0	1	1	0	7	0	7
		Year				Month		Day	
1	2	4	5	3	8				
Hour		Minute		Second					

- 4 The current time will be output.

6.3.9 Count Character Transmission

- The following shows an example of changing "XXXX" to 4-digit count characters.

- Assume that the printer is ready for printing.
- Fixed characters "XXXX" have been input.

Print description		2011.07.07 12:45		Status: Ready		Com=0					
Message name [XXXXXXXXXXXX]											
Column 1		Column 2		Column 3							
[USE BY]		[YY/MM/DD . .]		[.]							
[ABCDEF]		[XXXX]		[.]							
Print layout											
< <table border="1" style="margin: auto;"> <tr> <td>USE BY</td> <td>11/08/06</td> </tr> <tr> <td>ABCDEF</td> <td>XXXX</td> </tr> </table> >								USE BY	11/08/06	ABCDEF	XXXX
USE BY	11/08/06										
ABCDEF	XXXX										
Print line setup Edit message Print format Print spec. Select message Save message Start up Shut down Manual Comm On/Off Prev. col. Next col. Back											

- Press **Comm On/Off** button.

The status then change from "offline" to "online".

- Transmit "Item No." and "count character" from the external device to the IJ printer.

Shows text data between STX and ETX

Transmission data

DLE	4	Count Character	Count Character	Count Character	Count Character
-----	---	-----------------	-----------------	-----------------	-----------------

↖ Item No.

Transmission code

10H	34H	F2H	5AH	F2H	5AH	F2H	5AH	F2H	5AH
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

- * With the above transmission code, the setting on the number of transfer bytes will be described in the 2-byte mode.

5 The print description will change to count characters.

Print description		2011.07.07 12:45		Status: Ready		Com=1	
Message name [XXXXXXXXXXXX]							
Column 1		Column 2		Column 3			
[USE BY]		[YY/MM/DD . . .]		[.]			
[ABCDEF]		[CCCC]		[.]			
Print layout							
USE BY 11/08/06 ABCDEF 0000							
Print line setup		Edit message		Print format		Print spec.	
Select message		Save message		Back			

*) If count characters are transmitted, the count condition of the transmitted count will be initialized.

6.3.10 Count Conditions Transmission

- The following shows an example of changing the range of count from "0000 to 9999" to "AAAA to FFFF":

- 1 Assume that the printer is ready for printing.
- 2 Press **Count Conditions** button in the "Edit message" screen.
- 3 The range of count "0000 to 9999" has already been entered.

Count conditions		2011.07.07 12:45	Status: Ready	Com=0																														
Message name [XXXXXXXXXX]																																		
Column 1	Column 2	Column 3																																
[USE BY]	[YY/MM/DD . . .]	[.]																																
[A B C D E F]	[C C C C]	[.]																																
Value	[0 0 0 0]																																	
Range	[0 0 0 0]	Increment [0 1]																																
	[9 9 9 9]	Direction [1] (1:up 2:down)																																
Update	[0 0 0 0 0 0] (in progress)	Jump from:[.]																																
	[0 0 0 0 0 1] (unit)	to:[.]																																
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>123 .</td><td>ABC .</td><td>abc .</td><td>User pat-tern</td><td></td><td></td><td></td><td>Blank</td><td>Decre-ment</td><td>Incre-ment</td> </tr> </table>					1	2	3	4	5	6	7	8	9	0											123 .	ABC .	abc .	User pat-tern				Blank	Decre-ment	Incre-ment
1	2	3	4	5	6	7	8	9	0																									
123 .	ABC .	abc .	User pat-tern				Blank	Decre-ment	Incre-ment																									
			Start up	Shut down																														
			Manual	Comm On/Off																														
				Show cursor																														
			Prev. item	Next item																														
			↑	←																														
			↓	→																														
			Next conditions																															
			Back																															

- 4 Press **Comm On/Off** button.
The status then change from "off-line" to "on-line".
- 5 Transmit "Range 1", "Range 2" and "Initial value" from external device to the IJ printer .

Shows text data between STX and ETX

Transmission data

Item No.

ESC	Header	4	Type	A	A	A	A
				Range 1			
ESC	Header	4	Type	F	F	F	F
				Range 2			
ESC	Header	4	Type	A	A	A	A
				Initial Value			

Transmission code

1BH	80H	34H	31H	41H	41H	41H	41H
1BH	80H	34H	32H	46H	46H	46H	46H
1BH	80H	34H	30H	41H	41H	41H	41H

* With the above transmission code, the setting on the number of transfer bytes will be described in the 2-byte mode.

6 The "Range 1", "Range2" and "Initial value" will change.

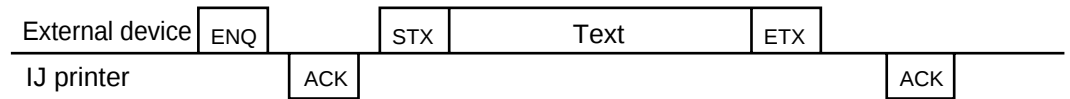
Count conditions		2011.07.07 12:45	Status: Ready	Com=1
Message name [XXXXXXXXXXXX]				
Column 1	Column 2	Column 3	Start up	Shut down
			Manual	Comm On/Off
[USE BY] [YY/MM/DD . . .] [.]				
[ABCDEF] [CCCC] [.]				
Value	[A A A A]		Prev. item	Next item
Range	[A A A A]	Increment [0 1]	↑	←
	[F F F F]	Direction [1] (1:up 2:down)		
Update	[0 0 0 0 0] (in progress)	Jump from: [. . . .]	↓	→
	[0 0 0 0 1] (unit)	to: [. . . .]		
			Next conditions	
			Back	

*) If count conditions can be transmitted only to items for which count characters have been previously set. To transmit items without count characters, transmit the count characters first.

6.4 Transmission Sequences

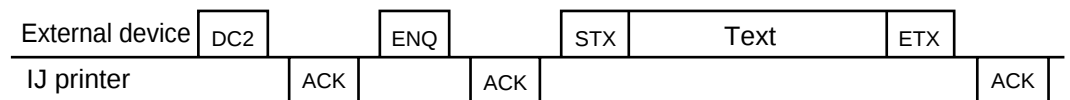
6.4.1 Common Transmission Sequences

(1) Basic transmission operation

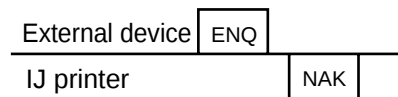


(2) When DC2 (retransmission) code is used

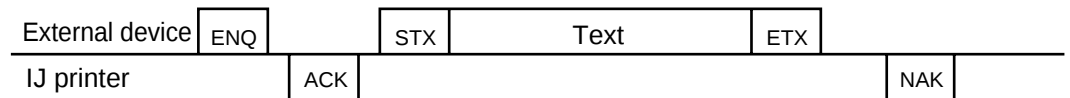
(When no response is received though ENQ has been issued and yet the contents of print are switched)



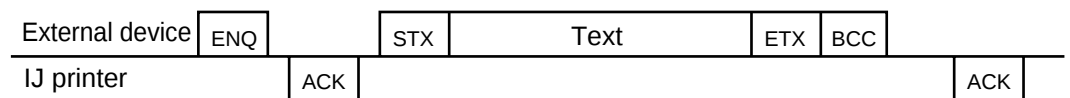
(3) When the IJ printer is incapable of receiving data or is off-line



(4) Abnormal transmission operation (when the text contains an erroneous message)



(5) When BCC code is included



6) When the IJ printer power is OFF

No response will be returned for any code transmission from the external device.

(7) The printings, print specifications, print format, and user pattern data can be consecutively transmitted in the following order in a single session.

- ① Print format
- ② Print specifications
- ③ Printings

The user pattern can be positioned anywhere within the above data chain. The overall column setup data must be transmitted independently. If an attempt is made to send it together with the other data, a communication error (NAK response) occurs.

The print data recall must also be transmitted independently. Even if it is sent together with the other data, no error occurs. However, the print data recall takes precedence, rendering the other data invalid.

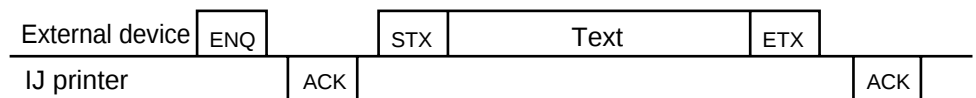
(8) Up to 1500 bytes of data can be transmitted at a time, including "STX" and "ETX". If the 1500-byte limit is exceeded, a communication error (NAK response) occurs.

(9) Any data transmitted by communication (print contents, print specifications, print format, and user pattern) is not stored except in the following cases.
[Conditions for storing the data]

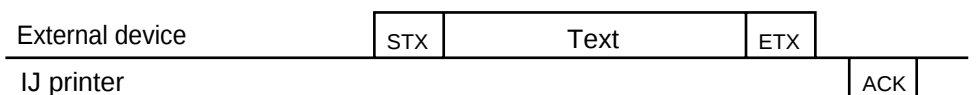
- ① When the ink is stopped after communication by the Shut down key or a stop signal.
- ② When switched from another screen to the print description screen by operating the touch panel.
- ③ At 01 minute of every hour.

(10) Communication when "ENQ" is omitted is also possible.

- ① When ENQ and ACK are present:



- ② When ENQ is omitted:



6.4.2 Printings Transmission

6.4.2-1 Text

(1) When printings are to be changed

DLE	Item number	Printings (10 digits max.)
-----	-------------	----------------------------

(2) When all 10 digits of printings are to be invalidated

DLE	Item number
-----	-------------

(3) When multiple printings are to be designated

DLE	Item number	Printings	DLE	Item number
← Printings change →			← Printings erasure →	

- Multiple print items can be consecutively transmitted within one session.
- Print items are to be designated by specifying the item numbers. The item numbers need not be sorted

6.4.2-2 Item number

Item number	1	2	...	10	...	24	25	...	100
Code	(31)H	(32)H	...	(3A)H	...	(48)H	(49)H	...	(94)H

The parenthesized value positioned to the left of H is a hexadecimal number.

 : Enabled when the print item count addition option is employed.

- The order of print items is indicated below.
(3-column example) Circled number: Item number

1st column	2nd column
[①]	[④]
[②]	[⑤]
[③]	[⑥]

6.4.2-3 Printings

- An array of "character codes" which consist of 10 or fewer digits.
- When the number of digits is less than 10, the IJ printer adds NUL to the end of the array for interpretation purposes.
- The coding system varies with the mode which is designated by the "Number of communication bytes" setting entered from the communication environment setup screen.

Number of communication bytes	Alphanumerical characters and symbols	Dedicated characters	User pattern		Punctuation mark	Katakana
			(00~47)	(48~127)		
1-byte mode	ASCII	ASCII	ASCII	2-byte code	2-byte code	2-byte code
2-byte mode	ASCII	2-byte code	2-byte code	2-byte code	2-byte code	2-byte code

6.4.2-4 Character codes

(1) 2-byte code (number of communication bytes: 1-byte mode)

- One character

SI	High-order byte	Low-order byte	SO
----	-----------------	----------------	----

- Two or more characters

SI	High-order byte	Low-order byte	High-order byte	Low-order byte	High-order byte	Low-order byte	SO
----	-----------------	----------------	-----------------	----------------	-----------------	----------------	----

(2) 2-byte code (number of communication bytes: 2-byte mode)

High-order byte	Low-order byte
-----------------	----------------

(3) Mixture of ASCII and 2-byte codes

(number of communication bytes: 1-byte mode)

ASCII	ASCII	SI	High-order byte	Low-order byte	High-order byte	Low-order byte	SO	ASCII
-------	-------	----	-----------------	----------------	-----------------	----------------	----	-------

(4) Mixture of ASCII and 2-byte codes

(number of communication bytes: 2-byte mode)

ASCII	ASCII	High-order byte	Low-order byte	High-order byte	Low-order byte	ASCII
-------	-------	-----------------	----------------	-----------------	----------------	-------

6.4.3 Print Data Recall / Transmission

(1) Text

For message numbers 001 to 150

ESC	Header	Hundreds position	Tens position	Units position

* For use only with message numbers 01 to 99, a call can be made by the following method.

In this case, the data of the hundredth digit is not required.

ESC	Header 26H	Tens position	Units position
-----	------------	---------------	----------------

(2) Print data message number

- An already saved print data number is to be designated as the print data message number.
- The message number range is from 01 to 150.
- The message number is expressed by a combination of three ASCII codes.

Message number	ASCII code	Message number	ASCII code
01	(30)H, (30)H, (31)H	100	(31)H, (30)H, (30)H
02	(30)H, (30)H, (32)H	101	(31)H, (30)H, (31)H
.....			
89	(30)H, (38)H, (39)H	149	(31)H, (34)H, (39)H
99	(30)H, (39)H, (39)H	150	(31)H, (35)H, (30)H

6.4.4 Print Condition Transmission

6.4.4-1 Text

(1) Column count setup (overall)

ESC	Header 2BH	30H
-----	------------	-----

- Overall column setup (column count and print format standardization) is performed.
- The overall column setup must be transmitted independently. It cannot be sent together with the print format, print specifications, or printings.

(2) Print specifications

- Character height

ESC	Header 30H	Tens position	Units position
-----	------------	---------------	----------------

Character height (00 to 99)

Actual data must be set using ASCII codes.

39H	30H
-----	-----

Setting 90

Number 9 Number 0

- Character width

ESC	Header 31H	Hundreds position	Tens position	Units position
-----	------------	-------------------	---------------	----------------

Character width (000 to 199)

- Character orientation

ESC	Header 32H	Units position
-----	------------	----------------

Character orientation (0 to 3)

- Repeat intervals

ESC	Header 34H	Thousands position	Hundreds position	Tens position	Units position
-----	------------	--------------------	-------------------	---------------	----------------

Repeat intervals (0000 to 9999)

- Repeat count

ESC	Header 35H	Thousands position	Hundreds position	Tens position	Units position
-----	------------	--------------------	-------------------	---------------	----------------

Repeat count (0000 to 9999)

- Print start delay

ESC	Header 33H	Thousands position	Hundreds position	Tens position	Units position
-----	------------	--------------------	-------------------	---------------	----------------

Print start delay (0000 to 9999)

- Print start delay (reverse)

ESC	Header 36H	Thousands position	Hundreds position	Tens position	Units position
-----	------------	--------------------	-------------------	---------------	----------------

Print start delay (reverse) (0000 to 9999)

- Target sensor timer

ESC	Header 37H	Hundreds position	Tens position	Units position
-----	------------	-------------------	---------------	----------------

Target sensor timer (000 to 999)

- Target sensor filter

ESC	Header 38H	Thousands position	Hundreds position	Tens position	Units position

Target sensor filter (0000 to 9999)

ESC	Header 39H	Division

Division (1: time setup, 2: until end of print.)

- High-speed printing

ESC	Header 3AH	Mode

Mode (0: HM, 1: NM, 2: QM)

- Product speed matching

ESC	Header 3BH	Based

Based (0: Time-based, 1: Encoder based)

- Pulse rate division Factor

ESC	Header 3CH	Hundreds position	Tens position	Units position

Pulse rate division Factor (001 to 999)

- Ink drop use percentage

ESC	Header 3DH	Tens position	Unit position

Ink drop use percentage (01 to 16)

• Two or more print specification items can be consecutively transmitted in a single chain.

(3) Print format

a) Print format text structure

- Specifying no print items

Print format text

- Specifying the print items

ESC	Header 24H	Item number	Print format text

Item number selection (1 to 100)

Set actual item number data as indicated in the example below.
If the software option "Print digit addition" is not used, ensure that the item number does not exceed 24.
Item number1...31H
Item number2...32H

b) Setup items

- Line count and Line spacing

ESC	Header 22H	Line count	Line spacing

Line count (1 to 4) Line spacing (0 to 2)

- Character size and inter-character space

ESC	Header 21H	Character size	Inter-character space

Character size (0 to 5) Inter-character space (0 to 8)

- Bar code type

ESC	Header 2AH	Type

Bar code type (30H to 3CH)

Character size
0 : 5×5
1 : 5×8 (5×7)
2 : 7×10 (9×8, 9×7)
3 : 12×16
4 : 18×24
5 : 24×32

Bar code types
30H : Code39
31H : ITF
32H : NW-7
33H : EAN-13
34H : DM16×16
35H : DM8×32
36H : Code128
37H : DM16×36
38H : DM16×48
39H : DM18×18
3AH : DM20×20
3BH : DM22×22
3CH : DM24×24

- Bar code "used" → "not used"

ESC	Header 29H	30H

Use (0: not used; 1: used)

- Bar code "not used" → "used"

ESC	Header 29H	31H	ESC	Header 2AH	Type

Use (0: not used; 1: used)

Bar code type (0 to 6)

- Prefix code (EAN-13)

ESC	Header 2CH	Tens position	Unit position

Prefix code (00 to 99)

- Code set (Code128)

ESC	Header 3FH	code set

0: code set B; 1: code set C

- Increased width

ESC	Header 28H	Increased width

Increased width (1 to 9)

- Two or more print format items can be consecutively transmitted in a single chain.

- (4) If you do not specify the item number, the setup data applies to all print items.

NOTE: When transmitting print format and print specification data consecutively in a single chain, ensure that the print format data precedes the print specifications data.
If this order is reversed, a communication error occurs.

6.4.4-2 Text setup rules

(1) Print format

a) Line count

- When you change the line count for a print item in a certain column, you must also set the line count for the other print items that belong to the same column.

(Example)

1	3	5	7	
2	4	6	8	

Setting items 7 and 8 to one line

1	3	5		
2	4	6	7	8

Transmit the line count consecutively to items 7 and 8. If you transmit the line count to only one of them, a communication error occurs.

- When you change the line count for a print item, you must also set the line count for the other print items that belong to the same column as the former one.

(Example)

1	3	5		
2	4	6	7	8

Setting items 7 and 8 to two lines

1	3	5	7	
2	4	6	8	

Transmit the line count consecutively to items 7 and 8. If you transmit the line count to only one of them, a communication error occurs.

b) Line spacing

- When you transmit one-line setup data for a certain print item, you have to transmit a line spacing setting of "0" as well as for the same chain as the one-line setup data.
If you do not transmit a line spacing setting of "0", a communication error occurs.
- Ensure that the same line spacing setting is selected for print items belonging to the same column. In other words, when you transmit a new line spacing setting for a print item in a certain column, you must consecutively transmit the same setting to the other print items in the same column.

c) Character size and inter-character space

- The available inter-character space varies with the character size.

Character size	Inter-character space
5×5	0 to 3 dots
5×8 (5×7)	0 to 3 dots
9×8 (9×7)	0 to 7 dots
7×10	0 to 3 dots
12×16	0 to 4 dots
18×24	0 to 6 dots
24×32	0 to 8 dots

- The total number of vertical dots cannot exceed the limit.

Machine type	Maximum number of vertical dots
Two lines machine	20 dots
Four lines machine	32 dots

- Some characters cannot be entered depending on the character size. If a print item contains an unavailable character after a character size change, its contents are changed to a space.

Input character types available for various character sizes

	5×5	5×8	9×8	7×10	12×16	18×24	24×32
Katakana (*1)	×	○	×	○	×	×	×
Katakana (*2)	×	×	×	×	○	○	×
Alphanumeric symbols	○	○	○	○	○	○	○
Dedicated characters	×	○	×	○	×	×	×
User pattern characters	○	○	○	○	○	○	○
Punctuation characters	○	○	○	○	○	○	○
Special characters	×	○	○	○	○	○	○
Arabic characters	×	○	×	×	○	○	○

(*1) No voiced-sound or p-sound characters exist. The symbols "ˆ" and "°" are used to form a two-digit character.

(*2) Voiced-sound and p-sound characters exist.

- If an inter-character space other than "0" is transmitted for a print item for which bar code setup is completed, a communication error occurs.

d) Bar code use and bar code type

- Two or more bar code types cannot coexist. When a bar code is set up for a certain print item, the same bar code is set up for the other print items for which bar code setup was completed.
- For a print item for which bar code setup is not completed, you cannot set a "bar code type" only while omitting a "bar code use" message.
- When bar code setup is completed for a print item, its inter-character space is set to "0" without regard to its actual setting. (The inter-character space value "0" need not be transmitted in this case.)

The "Arabic characters" can not be used in "Simple Chinese".

- When the bar code type is ITF or code128(code set C), you have to observe the following input rules. If you violate the rules, the contents of an illegal print item will be changed to a null character.

ITF or code128(code set C) input rules

No.	Input rule	Input example
1	The character entry must begin with an odd-numbered digit position.	(Correct) [· · 0123 · · · ·][456789 · · · ·] (Incorrect) [· · · 0123 · · ·][· 456789 · · ·]
2	Characters must be paired to make an entry.	(Correct) [· · 0123 · · · ·][456789 · · · ·] (Incorrect) [· · 012 · · · ·][45678 · · · ·]

- Some characters cannot be entered depending on the bar code type.
If any unacceptable character is included in a print item for which bar code setup is completed, the contents of the print item are changed to a null character.

Characters available for various bar code types

Type	Available character
Code 39	0 to 9 A to Z space + - / . \$ %
ITF	0 to 9
NW-7	0 to 9 + - / . : \$
EAN-13	0 to 9
DM	All Alphabets, numerals and symbols
Code 128 code set B	All Alphabets, numerals and symbols FNC1 (*1)
Code 128 code set C	0 to 9, FNC1

(*1):FNC1 is a control code used for Code128, 2-byte code of 81A6, indicated as ※ on print layout screen.

(2) Overall column setup

- The same line count and print format apply to all print items.
- The line count for the first column applies to all the other columns.
- The line spacing, character size, inter-character space, bar code use, and increased width settings for the first print item apply to all other print items.

6.4.5 User Pattern Character Transmission

6.4.5-1 Text

- When the number of communication bytes is set to "1" for communication environment setup purposes.

ESC	Header 20H	Character size	Character code	Pattern data array
-----	------------	----------------	----------------	--------------------

- When the number of communication bytes is set to "2" for communication environment setup purposes

ESC	Header 20H	Character size	High-order byte	Low-order byte	Pattern data array
			Character code		

6.4.5-2 Character size

The character size is represented by the codes shown in the following table.

Character size code table

No.	Type	Character size code	Remarks
1	5×5	30H	
2	5×8 (5×7)	31H	
3	7×10	32H	(*1)
4	9×8 (9×7)	32H	(*1)
5	12×16	33H	
6	18×24	34H	
7	24×32	35H	

(*1) Sizes No. 3 (7 x 10) and No. 4 (9 x 8) use the same character size code. However, either of them may be automatically selected in accordance with the "Character size menu 2" setting in the user environment setup screen.

6.4.5-3 Pattern data

(1) Pattern data length

The pattern data length per character varies with the character size as indicated below.

Character size	Pattern data length (bytes)
5×5	8
5×8 (5×7)	8
7×10	16
9×8 (9×7)	16
12×16	32
18×24	72
24×32	128

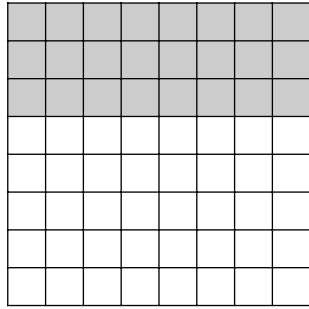
(2) Pattern data structure

The pattern data structure and data creation rules are explained below.

a) Rules

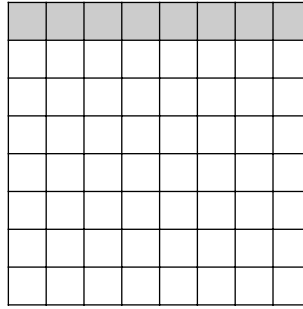
- Each pattern data unit consists of 8 bits. For each bit, dot presence is indicated by the value 1 (dot present) or 0 (dot not present).
- Vertically arrayed 8 dots correspond to 8 bits (1 byte).
- For character sizes of 5 x 5, 7 x 10, 5 x 7, and 9 x 7, some portions of 8-bit data are unavailable. Set such portions to "0".
(Even if you set them to "1", processing will be performed with their settings changed to "0".)

5×5



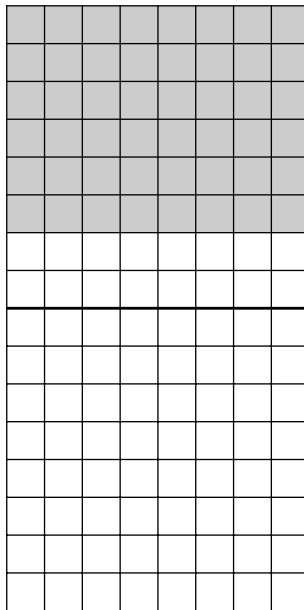
Inter-character
space data area

5×7



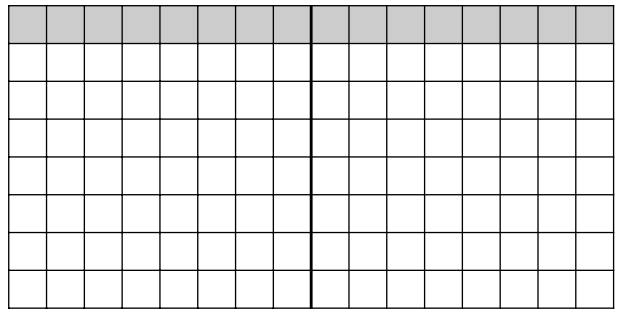
Inter-character
space data area

7×10



Inter-character
space data area

9×7



Inter-character
space data area

: Unavailable area

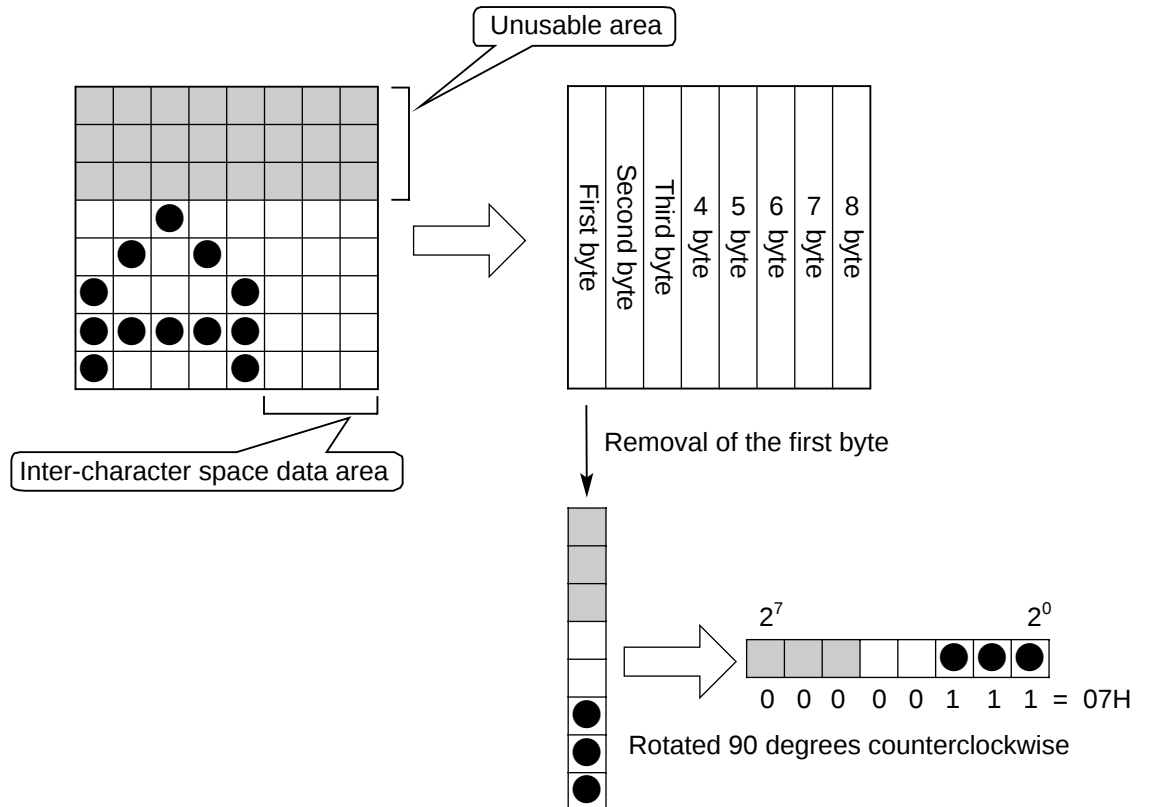
Note:

Note: While the inter-character space of character size 7 × 10 can be set up to 3 dots at the maximum on the print format screen, it is 1 dot at the maximum on the creating a user pattern screen.

- For pattern data composition purposes, the data is arranged in successive order, beginning from the bottom left, from bottom to top and from left to right.

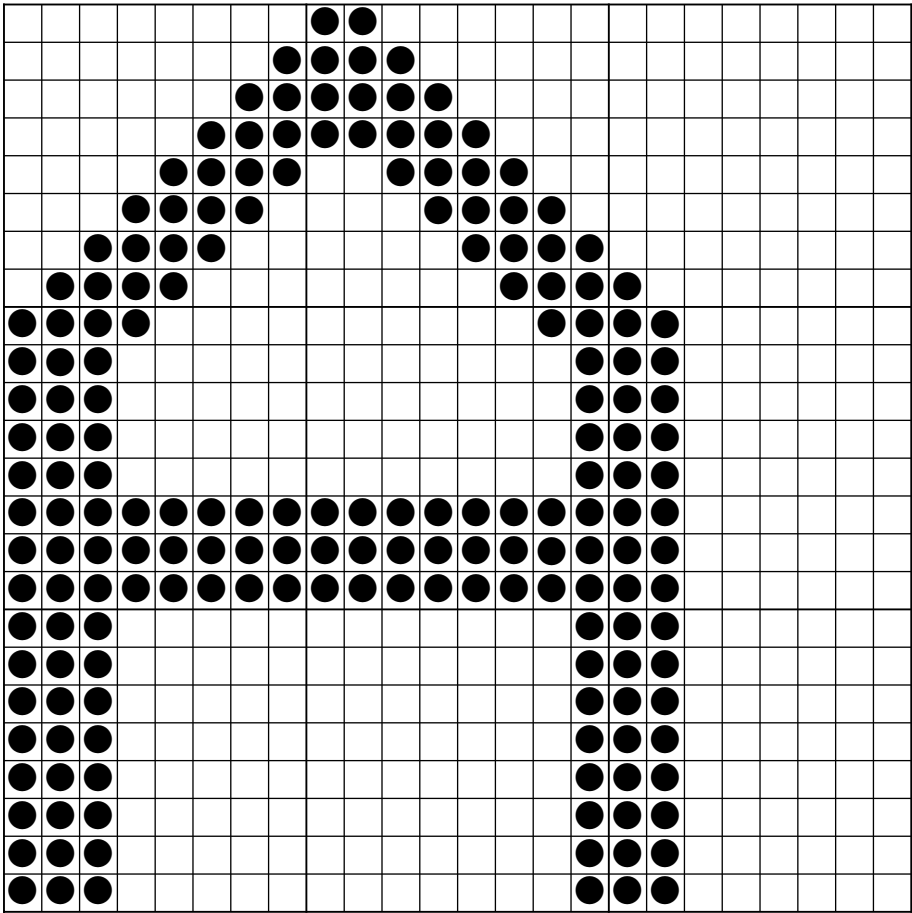
b) Pattern data example

a) For a character size of 5 x 5



Composition order	1	2	3	4	5	6	7	8
Pattern data	07H	0AH	12H	0AH	07H	00H	00H	00H

b) Example for character size 18 x 24



72 byte	71 byte	70 byte
69 byte	68 byte	67 byte
66 byte	65 byte	64 byte
63 byte	62 byte	61 byte
60 byte	59 byte	58 byte
57 byte	56 byte	55 byte
54 byte	53 byte	52 byte
51 byte	50 byte	49 byte
48 byte	47 byte	46 byte
45 byte	44 byte	43 byte
42 byte	41 byte	40 byte
39 byte	38 byte	37 byte
36 byte	35 byte	34 byte
33 byte	32 byte	31 byte
30 byte	29 byte	28 byte
27 byte	26 byte	25 byte
24 byte	23 byte	22 byte
21 byte	20 byte	19 byte
18 byte	17 byte	16 byte
15 byte	14 byte	13 byte
12 byte	11 byte	10 byte
9 byte	8 byte	7 byte
6 byte	5 byte	4 byte
3 byte	2 byte	1 byte

6.4.5-4 Character codes

For character code designation, either ASCII codes or 2-byte codes are used.

(1) ASCII codes (when the number of communication bytes is 1)

User pattern character	<u>00</u>	<u>01</u>	<u>02</u>	<u>03</u>	<u>04</u>	<u>05</u>	<u>06</u>	<u>07</u>	<u>08</u>	<u>09</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
ASCII	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
User pattern character	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>
ASCII	E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
User pattern character	<u>32</u>	<u>33</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>37</u>	<u>38</u>	<u>39</u>	<u>40</u>	<u>41</u>	<u>42</u>	<u>43</u>	<u>44</u>	<u>45</u>	<u>46</u>	<u>47</u>
ASCII	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

ASCII codes are in hexadecimal notation.

Applicable to cases where the number of user pattern characters does not exceed 48 (user pattern characters 00 through 47).

(2) 2-byte codes (when the number of communication bytes is 2)

F140 = high-order byte F1 + low-order byte 40

User pattern character	<u>00</u>	<u>01</u>	<u>02</u>	<u>03</u>	<u>04</u>	<u>05</u>	<u>06</u>	<u>07</u>	<u>08</u>	<u>09</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
2-byte code	F140	F141	F142	F143	F144	F145	F146	F147	F148	F149	F14A	F14B	F14C	F14D	F14E	F14F
User pattern character	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>
2-byte code	F150	F151	F152	F153	F154	F155	F156	F157	F158	F159	F15A	F15B	F15C	F15D	F15E	F15F
User pattern character	<u>32</u>	<u>33</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>37</u>	<u>38</u>	<u>39</u>	<u>40</u>	<u>41</u>	<u>42</u>	<u>43</u>	<u>44</u>	<u>45</u>	<u>46</u>	<u>47</u>
2-byte code	F160	F161	F162	F163	F164	F165	F166	F167	F168	F169	F16A	F16B	F16C	F16D	F16E	F16F
User pattern character	<u>48</u>	<u>49</u>	<u>50</u>	<u>51</u>	<u>52</u>	<u>53</u>	<u>54</u>	<u>55</u>	<u>56</u>	<u>57</u>	<u>58</u>	<u>59</u>	<u>60</u>	<u>61</u>	<u>62</u>	<u>63</u>
2-byte code	F170	F171	F172	F173	F174	F175	F176	F177	F178	F179	F17A	F17B	F17C	F17D	F17E	F17F
User pattern character	<u>64</u>	<u>65</u>	<u>66</u>	<u>67</u>	<u>68</u>	<u>69</u>	<u>70</u>	<u>71</u>	<u>72</u>	<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>	<u>77</u>	<u>78</u>	<u>79</u>
2-byte code	F180	F181	F182	F183	F184	F185	F186	F187	F188	F189	F18A	F18B	F18C	F18D	F18E	F18F
User pattern character	<u>80</u>	<u>81</u>	<u>82</u>	<u>83</u>	<u>84</u>	<u>85</u>	<u>86</u>	<u>87</u>	<u>88</u>	<u>89</u>	<u>90</u>	<u>91</u>	<u>92</u>	<u>93</u>	<u>94</u>	<u>95</u>
2-byte code	F190	F191	F192	F193	F194	F195	F196	F197	F198	F199	F19A	F19B	F19C	F19D	F19E	F19F
User pattern character	<u>96</u>	<u>97</u>	<u>98</u>	<u>99</u>	<u>A0</u>	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>A5</u>	<u>A6</u>	<u>A7</u>	<u>A8</u>	<u>A9</u>	<u>B0</u>	<u>B1</u>
2-byte code	F1A0	F1A1	F1A2	F1A3	F1A4	F1A5	F1A6	F1A7	F1A8	F1A9	F1AA	F1AB	F1AC	F1AD	F1AE	F1AF
User pattern character	<u>B2</u>	<u>B3</u>	<u>B4</u>	<u>B5</u>	<u>B6</u>	<u>B7</u>	<u>B8</u>	<u>B9</u>	<u>C0</u>	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>	<u>C7</u>
2-byte code	F1B0	F1B1	F1B2	F1B3	F1B4	F1B5	F1B6	F1B7	F1B8	F1B9	F1BA	F1BB	F1BC	F1BD	F1BE	F1BF

2-byte codes are in hexadecimal notation.

6.4.5-5 Supplement

- (1) If the same character code is used to transmit two or more user pattern character data in a single message, the last-transmitted data takes effect.
- (2) When two or more user pattern characters having differing character sizes or character codes are transmitted in a single message, no limitations are imposed on the order in which they are transmitted.

6.4.6 Code Tables

6.4.6-1 ASCII codes

High-order Low-order	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	Space	0	■	P		p	〒	↑	↑	保持		00	16	32
1			!	1	A	Q	a	q	円	↑	番号	↑		01	17	33
2	STX	DC2	"	2	B	R	b	r	g	保証	↑	↑		02	18	34
3	ETX	DC3	#	3	C	S	c	s	年	↑	↑	消費		03	19	35
4			\$	4	D	T	d	t	月	↑	出荷	↑		04	20	36
5	ENQ	NAK	%	5	E	U	e	u	日	期限	↑	↑		05	21	37
6	ACK		&	6	F	V	f	v	製造	↑	↑	平成		06	22	38
7			'	7	G	W	g	w	↑	↑	出庫	↑		07	23	39
8			(	8	H	X	h	x	↑	期間	↑	↑		08	24	40
9			)	9	I	Y	i	y	賞味	↑	↑			09	25	41
A			*	:	J	Z	j	z	↑	↑	包装			10	26	42
B		ESC	+	;	K	[	k		↑	以内	↑			11	27	43
C			,	<	L	〒	l		使用	↑	↑			12	28	44
D			—	=	M	]	m		↑	↑	品質			13	29	45
E	SO		.	>	N	×	n		↑	迄	↑			14	30	46
F	SI		/	?	O	_	o		有効	個	↑			15	31	47
Category	Transmission control		Standard characters						Dedicated characters					User pattern character		

NUL: Blank 「・」

■ : Unusable

↑ : Dedicated character consisting of multiple codes

nn : User pattern character number

NOTICE

- ① As regards a dedicated character (e.g., 賞味 (3-code)) consisting of two or more codes, the text must be created so that it can be contained within a single print item.
- ② As regards a print item for which a bar code is set up, the text must be created in such a manner that the employed character codes are within the range applicable to the bar code.

6.4.6-2 Transmission control

ASCII	Name	Description
(02)H	STX (start)	Code that is transmitted immediately before text.
(03)H	ETX (end)	Code that is transmitted immediately after text.
(05)H	ENQ (enquiry)	This enquiry code is used when the external device checks whether the IJ printer is ready for signal reception. This code must be transmitted before data transmission to the IJ printer. When the IJ printer is ready for reception, the "ACK" code is transmitted after ENQ code reception. If the IJ printer is not ready for reception, the "NAK" code is transmitted.
(06)H	ACK (acknowledgment)	① When the IJ printer is ready for reception, it transmits this code in response to an "ENQ" code reception from the external device. ② This code reports that text reception is normally completed.
(0E)H	SO (shift out)	When the 1-byte transmission mode prevails, this code is positioned at the end of 2-byte code for transmission purposes.
(0F)H	SI (shift in)	When the 1-byte transmission mode prevails, this code is positioned at the beginning of 2-byte code for transmission purposes.
(10)H	DLE (start of item)	This code is positioned at the beginning of printings for each print item for transmission purposes.
(12)H	DC2 (retransmission)	This code is transmitted if the printings need to be changed before the printing of the contents transmitted to the IJ printer while the overwrite-protected mode prevails. After receipt of this code, the IJ printer transmits the ACK code and becomes ready for reception. However, if the IJ printer is off-line, the "NAK" code is transmitted.
(13)H	DC3 (retransmission)	The same as DC2. However, when receiving DC3, the IJ printer terminates printing forcibly.
(15)H	NAK (negative acknowledgment)	① The IJ printer transmits this code if it is not ready for reception when it receives the "ENQ" code from the external device. ② This code reports that text reception is not normally completed (when, for instance, the received data is in transmission error or an unregistered print data number is received)
(1B)H	ESC (start of header)	This code is positioned at the beginning of a header for transmission purposes. The header is a code that recognizes the transmission data type and is transmitted next to STX.

6.4.6-3 Punctuation characters (2-byte codes)

Punctuation character	,	.	:	,	Space	;	!
2-byte code	F240	F241	F242	F243	F244	F245	F246

6.4.6-4 Dedicated characters (2-byte codes)

(When KANA and dedicated characters can be input)

Dedicated character	¥	円	g	年	月	日	製造	←	←	賞味	←	←	使用	←	←	有効
2-byte code	F040	F041	F042	F043	F044	F045	F046	F047	F048	F049	F04A	F04B	F04C	F04D	F04E	F04F
Dedicated characters	←	←	保証	←	←	期限	←	←	期間	←	←	以内	←	←	迄	個
2-byte code	F050	F051	F052	F053	F054	F055	F056	F057	F058	F059	F05A	F05B	F05C	F05D	F05E	F05F
Dedicated characters	←	番号	←	←	出荷	←	←	出庫	←	←	包装	←	←	品質	←	←
2-byte code	F060	F061	F062	F063	F064	F065	F066	F067	F068	F069	F06A	F06B	F06C	F06D	F06E	F06F
Dedicated character	保持	←	←	消費	←	←	平成	←	←							
2-byte code	F070	F071	F072	F073	F074	F075	F076	F077	F078							

← : Dedicated characters consisting of two or more codes.

"製造" consists of three characters (F046, F047, and F048).

6.4.6-4 Special characters (2-byte codes)
(when special characters can be input)

Characters	À	Á	Â	Ã	Ä	È	É	Ê	Ë	Ì	Í	Î	Ï	Ò	Ó	Ô
Communication code	F340	F341	F342	F343	F344	F345	F346	F347	F348	F349	F34A	F34B	F34C	F34D	F34E	F34F
Characters	Õ	Ö	Ù	Ú	Û	Ü	Æ	Ç	Ñ	Œ		Å	Ø		£	€
Communication code	F350	F351	F352	F353	F354	F355	F356	F357	F358	F359		F35B	F35C		F35E	F35F
Characters	à	á	â	ã	ä	è	é	ê	ë	ì	í	î	ï	ò	ó	ô
Communication code	F360	F361	F362	F363	F364	F365	F366	F367	F368	F369	F36A	F36B	F36C	F36D	F36E	F36F
Characters	õ	ö	ù	ú	û	ü	æ	ç	ñ	œ	β	å	ø			
Communication code	F370	F371	F372	F373	F374	F375	F376	F377	F378	F379	F37A	F37B	F37C			
Characters	İ	I	Ĝ	Ş	Ŭ	Ý	Č	Ď	Ě	Ň	Ř	Š	Ť	Ž	А	Ć
Communication code	F380	F381	F382	F383	F384	F385	F386	F387	F388	F389	F38A	F38B	F38C	F38D	F38E	F38F
Characters	Ė	Ł	Ń	Ś	Ż	Ž	Ł	Ł	Ŕ	Đ	Ŏ	Ű				
Communication code	F390	F391	F392	F393	F394	F395	F396	F397	F398	F399	F39A	F39B				
Characters	ı	ı	ğ	ş	ű	ý	č	ď	ě	ň	ř	š	ť	ž	ą	ć
Communication code	F3A0	F3A1	F3A2	F3A3	F3A4	F3A5	F3A6	F3A7	F3A8	F3A9	F3AA	F3AB	F3AC	F3AD	F3AE	F3AF
Characters	ę	ł	ń	ś	ż	ž	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı
Communication code	F3B0	F3B1	F3B2	F3B3	F3B4	F3B5	F3B6	F3B7	F3B8	F3B9	F3BA	F3BB				
Characters																Ş
Communication code																F29F
Characters													А			
Communication code													F2AC			
Characters	В	Г	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν	Ξ	Ο	Π	Ρ
Communication code	F3C0	F3C1	F3C2	F3C3	F3C4	F3C5	F3C6	F3C7	F3C8	F3C9	F3CA	F3CB	F3CC	F3CD	F3CE	F3CF
Characters	Σ	Τ	Υ	Φ	Χ	Ψ	Ω									α
Communication code	F3D0	F3D1	F3D2	F3D3	F3D4	F3D5	F3D6									F3DF
Characters	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	ο	π	ρ
Communication code	F3E0	F3E1	F3E2	F3E3	F3E4	F3E5	F3E6	F3E7	F3E8	F3E9	F3EA	F3EB	F3EC	F3ED	F3EE	F3EF
Characters	σ	τ	υ	φ	χ	ψ	ω									
Communication code	F3F0	F3F1	F3F2	F3F3	F3F4	F3F5	F3F6									
Characters	А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н	О
Communication code	F540	F541	F542	F543	F544	F545	F546	F547	F548	F549	F54A	F54B	F54C	F54D	F54E	F54F
Characters	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю
Communication code	F550	F551	F552	F553	F554	F555	F556	F557	F558	F559	F55A	F55B	F55C	F55D	F55E	F55F
Characters	Я	Ђ	Ј	Љ	Њ	Ћ	Џ									
Communication code	F560	F561	F562	F563	F564	F565	F566									
Characters	а	б	в	г	д	е	ё	ж	з	и	й	к	л	м	н	
Communication code	F570	F571	F572	F573	F574	F575	F576	F577	F578	F579	F57A	F57B	F57C	F57D	F57E	
Characters	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э
Communication code	F580	F581	F582	F583	F584	F585	F586	F587	F588	F589	F58A	F58B	F58C	F58D	F58E	F58F
Characters	ю	я	ђ	ј	љ	њ	ћ	џ								
Communication code	F590	F591	F592	F593	F594	F595	F596	F597								

6.4.6-5 User pattern characters (2-byte codes)

User pattern character	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
2-byte code	F140	F141	F142	F143	F144	F145	F146	F147	F148	F149	F14A	F14B	F14C	F14D	F14E	F14F
User pattern characters	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2-byte code	F150	F151	F152	F153	F154	F155	F156	F157	F158	F159	F15A	F15B	F15C	F15D	F15E	F15F
User pattern characters	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
2-byte code	F160	F161	F162	F163	F164	F165	F166	F167	F168	F169	F16A	F16B	F16C	F16D	F16E	F16F
User pattern characters	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
2-byte code	F170	F171	F172	F173	F174	F175	F176	F177	F178	F179	F17A	F17B	F17C	F17D	F17E	F17F
User pattern characters	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
2-byte code	F180	F181	F182	F183	F184	F185	F186	F187	F188	F189	F18A	F18B	F18C	F18D	F18E	F18F
User pattern characters	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
2-byte code	F190	F191	F192	F193	F194	F195	F196	F197	F198	F199	F19A	F19B	F19C	F19D	F19E	F19F
User pattern characters	96	97	98	99	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	B0	B1
2-byte code	F1A0	F1A1	F1A2	F1A3	F1A4	F1A5	F1A6	F1A7	F1A8	F1A9	F1AA	F1AB	F1AC	F1AD	F1AE	F1AF
User pattern characters	B2	B3	B4	B5	B6	B7	B8	B9	C0	C1	C2	C3	C4	C5	C6	C7
2-byte code	F1B0	F1B1	F1B2	F1B3	F1B4	F1B5	F1B6	F1B7	F1B8	F1B9	F1BA	F1BB	F1BC	F1BD	F1BE	F1BF

User pattern character display scheme

00,01.....09 (0 to 9)
10,11.....19 (10 to 19)
 :
90,91.....99 (90 to 99)
A0,A1.....A9 (100 to 109)
B0,B1.....B9 (110 to 119)
C0,C1.....C7 (120 to 127)

6.4.6-6 Katakana (when KANA and dedicated characters can be input)

① Available character sizes

	5×5	5×8	9×8	7×10	12×16	18×24	24×32
Character size	×	○	×	○	○	○	×
Inter-character space (dots)	—	1 to 3	—	1	4	6	—

② Character code table (2-byte codes)

(1) Character size 5×8、7×10

	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
834*	ア	ア	イ	イ	ウ	ウ	エ	エ	オ	オ	カ		キ		ク	
835*	ケ		コ		サ		シ		ス		セ		ソ		タ	
836*	チ		ツ	ツ	テ		ト		ナ	ニ	ヌ	ネ	ノ	ハ		
837*		ヒ			フ			ヘ			ホ			マ	ミ	
838*	ム	メ	モ	ヤ	ヤ	ユ	ユ	ヨ	ヨ	ラ	リ	ル	レ	ロ		ワ
839*			ヲ	ン										ッ	ォ	ー

(2) Character size 12×16、18×24

	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
834*	ア	ア	イ	イ	ウ	ウ	エ	エ	オ	オ	カ	ガ	キ	ギ	ク	グ
835*	ケ	ゲ	コ	ゴ	サ	ザ	シ	ジ	ス	ズ	セ	ゼ	ソ	ゾ	タ	ダ
836*	チ	ヂ	ツ	ヅ	テ	デ	ト	ド	ナ	ニ	ヌ	ネ	ノ	ハ	バ	
837*	パ	ピ	ビ	ピ	フ	ブ	プ	ヘ	ベ	ペ	ホ	ボ	ポ	マ	ミ	
838*	ム	メ	モ	ヤ	ヤ	ユ	ユ	ヨ	ヨ	ラ	リ	ル	レ	ロ		ワ
839*			ヲ	ン												

Character code of long "ー" is 815B.

6.4.6-7 Arabic characters (2-byte codes)

Characters	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث	ث
Communication code	F44D	F44C	F44B	F44A	F449	F448	F447	F446	F445	F444	F443	F442	F441			F440
Characters	د			د	د	د	د	د	د	د	د	د	د	د	د	د
Communication code	F45B			F45A	F459	F458	F457	F456	F455	F454	F453	F452	F451	F450	F44F	F44E
Characters	س	س	س	س	س			ز	ز			ر	ز			ز
Communication code	F465	F464	F463	F462	F461			F460	F45F			F45B	F45D			F45C
Characters	ط	ط	ط	ط	ض	ض	ض	ض	ض	ض	ض	ض	ش	ش	ش	ش
Communication code	F475	F474	F473	F472	F471	F470	F46F	F46E	F46D	F46C	F46B	F46A	F469	F468	F467	F466
Characters	ف	ف	ف	ف	غ	غ	غ	غ	غ	غ	غ	غ	ظ	ظ	ظ	ظ
Communication code	F485	F484	F483	F482	F481	F480	F47F	F47E	F47D	F47C	F47B	F47A	F479	F478	F477	F476
Characters	م	م	م	م	ل	ل	ل	ل	ك	ك	ك	ك	ق	ق	ق	ق
Communication code	F495	F494	F493	F492	F491	F490	F48F	F48E	F48D	F48C	F48B	F48A	F489	F488	F487	F486
Characters	ي	ي	ي	ي	و			و	و	و	و	و	ن	ن	ن	ن
Communication code F	F4A3	F4A2	F4A1	F4A0	F49F			F49E	F49D	F49C	F49B	F49A	F499	F498	F497	F496
Characters				ء	ى			ى	ة			ة	لا			لا
Communication code				F4AA	F4A9			F4A8	F4A7			F4A6	F4A5			F4A4
Characters	ؤ			ؤ	آ			آ	آ			آ	آ			آ
Communication code	F4B2			F4B1	F4B0			F4AF	F4AE			F4AD	F4AC			F4AB
Characters	ئ	ئ	ئ	ئ	لا			لا	لا			لا	لا			لا
Communication code	F4BC	F4BB	F4BA	F4B9	F4B8			F4B7	F4B6			F4B5	F4B4			F4B3
Characters								٩	٨	٧	٦	٥	٤	٣	٢	١
Communication code								F4C6	F4C5	F4C4	F4C3	F4C2	F4C1	F4C0	F4BF	F4BD

The "Arabic input" be unable to do in "Simple Chinese".

6.4.7 Header Table

	Header type	Code	Item designation		Data count	
			Supported	Not supported		
Print specifications	Print data recall/transmission	56H	—	—	3	1 to 150
		26H	—	—	2	1 to 99
	User pattern character transmission	20H	—	—	—	
	Character height	30H	×	○	2	00 to 99
	Character width	31H	×	○	3	000 to 199
	Character orientation	32H	×	○	1	0 to 3
	Repeat intervals	34H	×	○	4	0000 to 9999
	Repeat count	35H	×	○	4	0000 to 9999
	Print start delay	33H	×	○	4	0000 to 9999
	Print start delay (reverse)	36H	×	○	4	0000 to 9999
	Target sensor timer	37H	×	○	3	000 to 999
	Target sensor filter	38H	×	○	4	0000 to 9999
	Target sensor filter (Division)	39H	×	○	1	1 to 2
	High-speed printing	3AH	×	○	1	0 to 2
	Product speed matching	3BH	×	○	1	0 to 1
	Pulse rate division Factor	3CH	×	○	3	1 to 999
	Ink drop use percentage	3DH	×	○	2	1 to 16
Print format	Line count/Line spacing	22H	○	○	2	Line count : 1 to 4 Line spacing : 0 to 2
	Character size/inter-character space	21H	○	○	2	Character size : 0 to 5 Inter-character space : 0 to 8
	Bar code use	29H	○	○	1	0 to 1
	Bar code type	2AH	○	○	1	30H to 3CH
	EAN Prefix Code	2CH	○	○	2	00 to 99
	Code set	3FH	○	○	1	0 to 1
	Increased width	28H	○	○	1	1 to 9
	Item number	24H	—	—	1	1 to 100 (see the item number code table).
	Overall column setup	2BH	—	—	1	0 to 1
	Calendar offset	76H	—	—	6	Item:1 to 100 (see the item number code table). Type:0 to 4 Year,Month: 0000 to 0099 Day:0000 to 1999 Hour:-023 to 0099 Minute:-059 to 0099
	Zero-suppression	77H	—	—	3	Item:1 to 100 (see the item number code table). Type:0 to 4 Provided or not: 0 to 1
	Change to online	79H	—	—	0	—
	Change to offline	7AH	—	—	0	—
	Current time output transmission (inquiry)	7BH	—	—	0	—
	Current time output transmission (reply)	7CH	—	—	14	Year:2000 to 2099 Month:1 to 12 Day:1 to 31 Hour:00 to 23 Minute:00 to 59 Second:00 to 59

6.4.8 Character Size Code Table for User Pattern Character Transmission

Character size codes

No.	Type	Character size code	Remarks
1	5×5	30H	
2	5×8 (5×7)	31H	
3	7×10	32H	(*1)
4	9×8 (9×7)	32H	(*1)
5	12×16	33H	
6	18×24	34H	
7	24×32	35H	

(*1) Sizes No. 3 (7 x 10) and No. 4 (9 x 8) use the same character size code. However, either of them is automatically selected in accordance with the "Character size menu 2" setting in the user environment setup screen.

6.4.9 Calendar Character Transmission Procedure

Text

- (1) To specify the calendar characters for print description

DLE	Item No.	Calendar character
-----	----------	--------------------

- (2) To specify the calendar characters for multiple items

DLE	Item No.	Calendar character	DLE	Item No.	Calendar character
-----	----------	--------------------	-----	----------	--------------------

Calendar character code

Calendar character	Year	Month	Day	Hour	Minute	Second
2 byte code	F250	F251	F252	F253	F254	F255

2-byte code is hexadecimal.

Calendar character	Accumulated number of days	Month 3-digit	Weeks	Day of week
2 byte code	F256	F257	F258	F259

2-byte code is hexadecimal.

Specified number of digits for calendar characters

Calendar character	Specified number of digits
Year	1 to 4
Month	1 to 2
Day	1 to 2
Hour	1 to 2
Minute	1 to 2
Second	1 to 2
Accumulated number of days	1 to 3
Month 3-digit	3
Weeks	1 to 2
Day of week	1

6.4.10 Calendar Conditions Transmission Procedure

Text

(1) Offset

ESC	Header 76H	Item No.	Type	thousands position	hundreds position	tens position	unit position
-----	------------	----------	------	--------------------	-------------------	---------------	---------------

"-" (2DH) when setting negative offset to hour, minute.

Code of type

Offset	Year	Month	Day	Hour	Minute
ASCII	30	31	32	33	34

ASCII is hexadecimal

Offset setting range

Setting item	Offset setting range
Year	00 to 99
Month	00 to 99
Day	0000 to 1999
Hour	-23 to 99
Minute	-59 to 99

(2) Zero-suppression

ESC	Header 77H	Item No.	Type	Disable or Enable

Disable or Enable (0: Disable; 1: Enable)

Code of type

Zero-suppression	Year	Month	Day	Hour	Minute
ASCII	30	31	32	33	34

ASCII is hexadecimal

6.4.11 Online/Offline Transmission Procedure

Text

(1) Change to online

ESC	Header 79H
-----	------------

(2) Change to offline

ESC	Header 7AH
-----	------------

- In the following cases, Online/Offline transmission cannot be performed.

If it is attempted, NAK code will be the reply:

- ① "Apply" key is displayed while inputting set value.
- ② In the "Communication environment setup" screen, "Off fixed" is selected for "State at power-up" item.
- ③ During input of count conditions.
- ④ The confirmation window is open.
- ⑤ The circulation control screen is opened by the maintenance function.
- ⑥ The touch screen setup screen is opened by the auxiliary function.

6.4.12 Current Time Output Transmission Procedure

Text

- (1) Text of inquiry to IJ printer

ESC	Header 7BH
-----	------------

- (2) Text output from IJ printer

ESC	Header 7CH	Year thousands position	Year hundreds position	Year tens position	Year unit position
Month tens position	Month unit position	Day tens position	Day unit position		
Hour tens position	Hour unit position	Minute tens position	Minute unit position	Second tens position	Second unit position

6.4.13 Count Character Transmission Procedure

- (1) To specify the count characters for print description

DLE	Item No.	Count character
-----	----------	-----------------

- (2) To specify the count characters for multiple items

DLE	Item No.	Count character	DLE	Item No.	Count character
-----	----------	-----------------	-----	----------	-----------------

Count character code

Count character	C
2 byte code	F25A

*) The code of count character is a 2-byte code regardless of the mode specified with "Number of Communication bytes" in communication environment setup screen.

6.4.14 Count Conditions Transmission Procedure

- (1) Initial value, Range, Jump from, Jump to, Reset

ESC	Header 80H	Item No.	Type	Setting value
-----	------------	----------	------	---------------

Code of type

	Initial value	Range 1	Range 2	Jump from	Jump to	Reset
ASCII	30	31	32	33	34	35

ASCII is hexadecimal number.

Character code of setting value

Mode	Alphanumeric	User pattern
1-byte mode	ASCII	ASCII
2-byte mode	ASCII	2-byte code

*) When count characters has been divided (e.g., [CC CC]), transmit four-digits characters.

ESC	Header 81H	Item No.	Type	Hundred thousands position	Ten thousands position	thousands position
-----	---------------	----------	------	----------------------------------	------------------------------	-----------------------

Hundreds position	Tens position	Unit position
----------------------	------------------	------------------

Code of type

	In progress	Unit
ASCII	30	31

ASCII is hexadecimal number.

Update setting range

Set item	Update setting range
In progress	000000 to 999998
Unit	000001 to 999999

(3) Direction, External signal count, Reset signal

ESC	Header 82H	Item No.	Type	0/1
-----	------------	----------	------	-----

Direction (0: up, 1: down)

External signal count (0: Disable, 1: Enable)

Reset signal (0:Signal1, 1:Signal2)

Code of type

	Direction	External signal count	Reset signal
ASCII	30	31	32

ASCII is hexadecimal number.

(4) Increment

ESC	Header 83H	Item No.	Tens position	Unit position
-----	---------------	----------	------------------	------------------

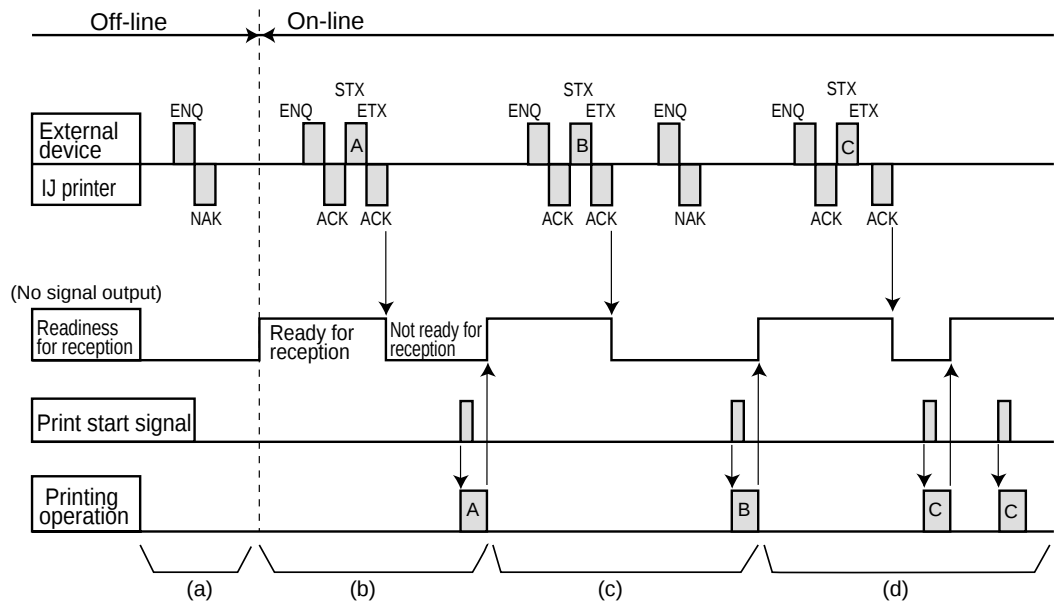
Increment setting range

Set item	Increment setting range
Increment	01 to 99

6.5 Communication Timing

6.5.1 Signal Timing

6.5.1-1 In overwrite-protected mode



(a) When the IJ printer is off-line

- The NAK code is transmitted in response to an ENQ code reception from the outside.

(b) When the IJ printer is on-line

① When transmitting printing only

- Transmission data is received from the external device. When the received data is not in error, the ACK code is transmitted and the "not ready for reception" state prevails.
- To switch from the "not ready for reception" state to the "ready for reception" state, perform one of the following procedures.
 - 1) Perform a printing operation once.
 - 2) Transmit the DC2 (retransmission) code to the IJ printer.
 - 3) Press the **Comm On/Off** key to enter the off-line mode, and then switch back to the on-line mode.
- If the data transmitted from the external device is in error, the NAK code is transmitted after receipt of the ETX code. Since the "ready for reception" state is maintained in this instance, retransmit the data beginning with the ENQ code.

② When transmitting print conditions, user pattern characters, and print data recall

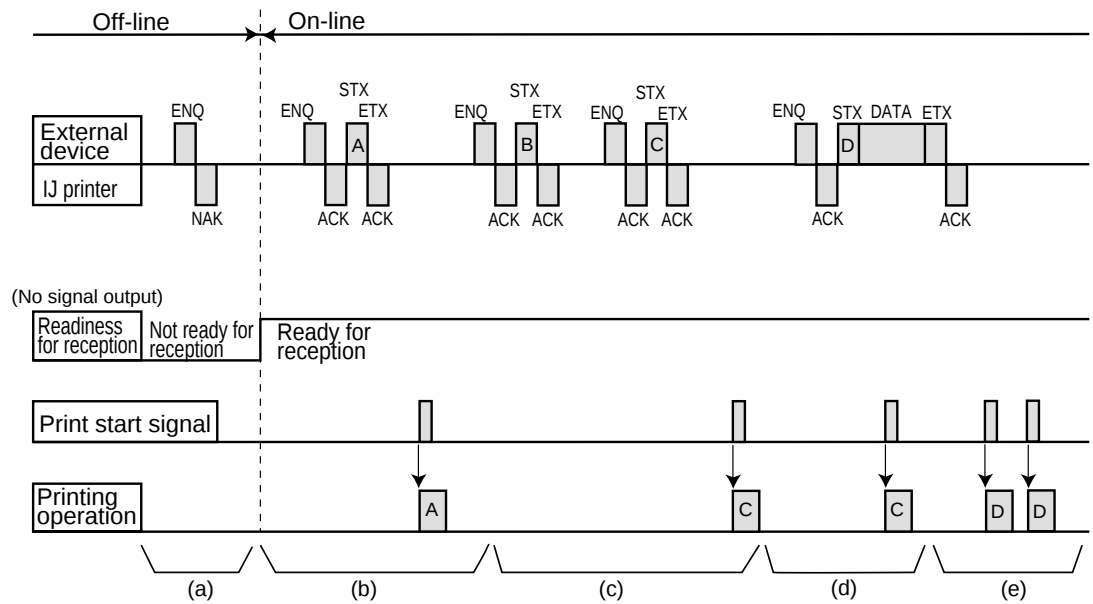
- When the data received from the external device is not in error, the ACK code is transmitted. In this instance, the "ready for reception" state is maintained.

③ When transmitting printing, print conditions, user pattern characters, and print data recall

- When transmitting printing, print conditions, user pattern characters, and print data recall, ensure that the print conditions, user pattern characters, and print data recall are transmitted prior to the printing. If the printing is transmitted earlier than the other data, the "not ready for reception" state prevails. Therefore, the subsequent transmission of the print conditions, user registration characters, and print data recall causes a communication error.

- (c) When the "not ready for reception" state prevails after transmission data reception from the external device
- The NAK code is transmitted in response to the ENQ code reception from the outside.
- (d) Transmission data received from the external device
- Error-free transmission data is stored in the IJ printer. The same contents are printed until different transmission data is transmitted to the IJ printer.
 - If the data transmitted from the external device is in error, the IJ printer printings remain unchanged. In such an instance, retransmit the data beginning with the ENQ code as explained in (b). The retransmission count setup must be determined from the device side.
- (e) When a data transmission is aborted (the transmission of up to the ETX code is not completed)
- The IJ printer printings remain unchanged. For data retransmission, perform either of the following procedures.
 - (1) Transmit the DC2 (retransmission) code to the IJ printer.
 - (2) Press the Comm On/Off key to enter the off-line mode, and then switch back to the on-line mode.

6.5.1-2 In overwrite-enabled mode



(a) When the IJ printer is off-line

- The NAK code is transmitted in response to an ENQ code reception from the outside.

(b) When the IJ printer is on-line

- Transmission data is received from the external device. When it contains no error, the ACK code is transmitted. In this instance, the "ready for reception" state is maintained.
- If the data transmitted from the external device is in error, the NAK code is transmitted after receipt of the ETX code. In this instance, retransmit the data beginning with the ENQ code.

(c) Data retransmission

- Transmission data is received from the external device, and subsequent transmission data is accepted. In this case, the received data is accepted even if the DC2 (retransmission) code is not attached.

(d) Printing during reception

- While data is being received from the external device, the previously printed contents are printed.

(e) Transmission data received from the external device

- Error-free transmission data is stored in the IJ printer. The same contents are printed until different transmission data is transmitted to the IJ printer.

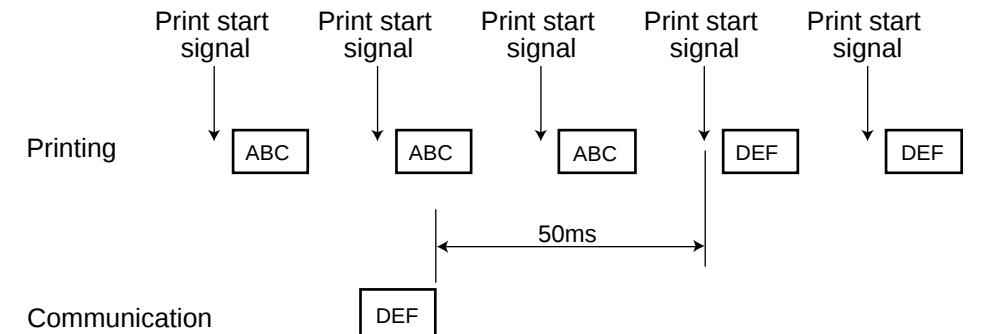
(f) When a data transmission is aborted (the transmission of up to the ETX code is not completed)

- ① Transmit the DC2 (retransmission) code to the IJ printer.
- ② Press the Comm On/Off key to enter the off-line mode, and then switch back to the on-line mode.

6.5.1-3 Switching print data with no occurrence of fault "Print data changeover in progress M"

The following shows the method of use with no occurrence of "Print data changeover in progress M" when switching the print contents during transmission:

(a) Print timing schematic diagram



- ① The IJ printer receives contents "DEF" in communication while printing contents "ABC".
- ② After approx. 50 ms, the IJ printer switches printing to the received contents: It will print the previous data during switching.

(b) Restrictions

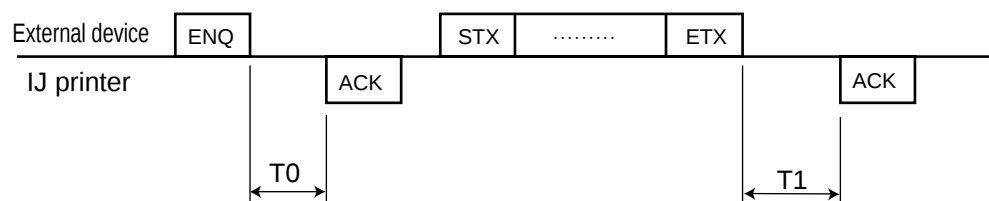
Perform communications only under the conditions shown below. If even one of these conditions is not met, any input to print start sensor while the communicated contents are being printed will cause fault "Print data changeover in progress M" to occur.

Conditions that the print start sensor input immediately after print contents are transmitted will not cause an abnormality:

No.	Condition
1	Make sure that none of the following software options are provided: • Addition of print columns (SOP-02) • External Signal Function A (SOP-05) • Communication Buffer (SOP-16-3)
2	Set the reverse-direction printing on user environment setup screen to "OFF=ABC".
3	Set the method to apply print data on user environment setup screen to "Method 2".
4	Set the print message transfer ACK on communication environment setup screen to "t=fixed".
5	Transmit print contents independently, and do not package print content transmission with print condition transmission.
6	Transmit to print items with no barcode or count.
7	Do not transmit to print items where all print contents are blank characters.
8	Do not set any print items where print contents are set to blank characters.

6.5.2 Response Time

(1) Time interval (T1) between external device communication and IJ printer response

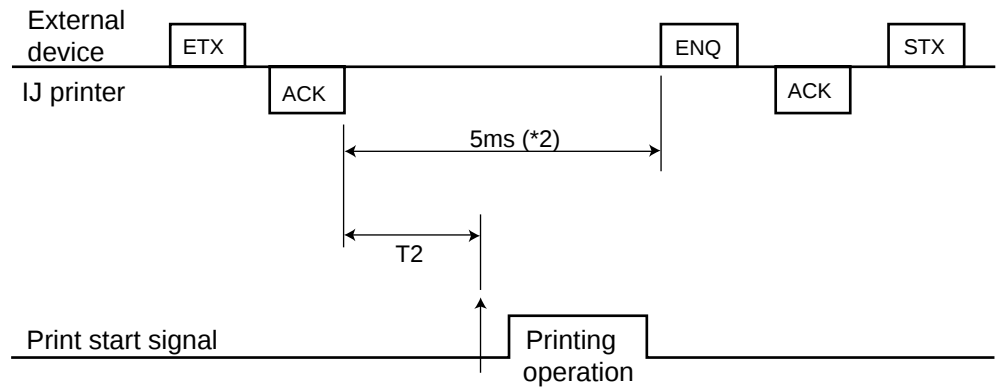


Baud rate (bps)	T0 Maximum T0 time (ms)
150 to 1200	5
2400 to 38400	1

No.	Transmission type	Conditions	T1 Maximum time (ms)	Remarks
1	Print description	The print message transfer ACK condition is t=fixed.	10	* 1
		The print message transfer ACK condition is t=async.	N + 25 (N: Number of communication items)	* 1
2	Print data recall	—	5	
3	Print conditions	Print specifications	10	
4		Print format	20	
5		Overall column setup	20	
6	User pattern character	—	M+10 (M: number of communication characters)	

*1 For "t=fixed" and "t=async.", see Section 6.2.1, "Setting Communication Environment".

(2) Time interval (T2) between IJ printer response and printing start

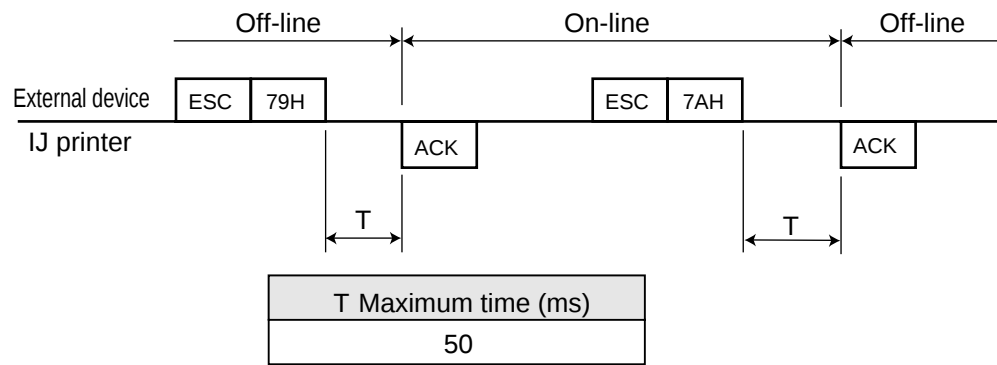


No.	Transmission type	Conditions	T2 Maximum time (ms)	Remarks
1	Print description	The print message transfer ACK condition is t=fixed.	N + 15 (N: Number of communication items)	
		The print message transfer ACK condition is t=async.	0	
2	Print data recall	When the character height, character width, character orientation, repeat count, ink drop use percentage, or print format changes before or after recall	400	
		When the character height, character width, character orientation, repeat count, ink drop use percentage, or print format does not change before or after recall	40	
3	Print conditions	Print specifications	400	
4		Print format	400	
5		Overall column setup	200	
6	User pattern character	—	25	

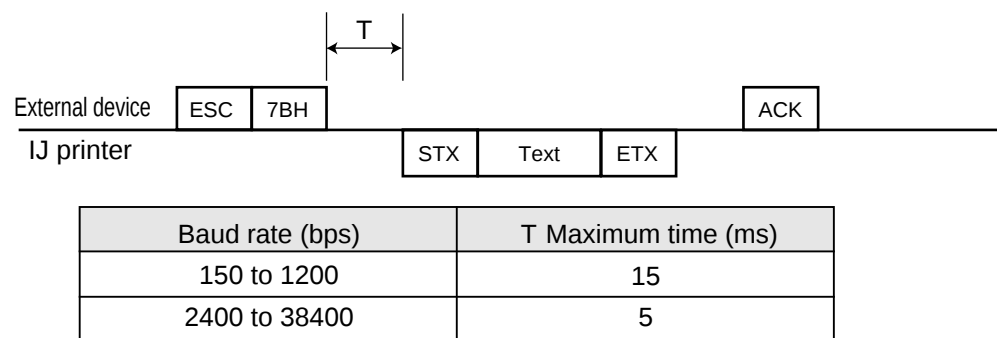
- The IJ printer executes an internal process to make printing preparations in accordance with the received print data. Do not enter the print start signal during internal process execution.
- In the overwrite-protected mode, initiate the next communication after completion of printing.
- In the overwrite-enabled mode, the next communication can be transmitted during printing, but the ACK/NAK response does not return until the ongoing printing operation is complete. (t=async.)
- When a print start signal is input with shorter timing than T2, the fault "Print data changeover in progress M" occurs.

*2 If the communication time interval is not sufficiently secured, it may not operate normally.

(3) On-line/Off-line Transmission



(4) Current time output Transmission



6.6 Communication Monitor Function

- The contents of serial communications between the external device and IJ printer are displayed.
- Up to 1500 bytes of data can be acquired at a time.
- When you press the **Start** key, the system erases monitored data and acquires new data.

Comm. monitor		2011.07.07 12:45		Status: Ready		Com=1	
Blue: DLE(10), ESC(1B) Red: Failed line.							
No	Trans.	Communication description					
1	R	05					
2	S	06					
3	R	02 10 31 41	42 43 44 45	00 00 00 00	00 10 32 31		
		32 33 34 35	00 00 00 00	00 03			
4	S	06					
5	R	05					
6	S	06					
7	R	02 10 31 41	42 43 44 45	00 00 00 00	00 AB 32 31		
		32 33 34 35	00 00 00 00	00 03			
8	S	15					

Detection [0] (0: **disable** 1: enable)
Proc. status: Halted

Start up

Shut down

Manual

Comm On/Off

Prev. list

Next list

Abort

Error detection

Start

Back

(1) Screen display

Item	Description
Trans.	External device → IJ printer: R (Receive) IJ printer → external device: S (Send)
Communication description	Sended/received data are displayed in hexadecimal notation. Sixteen bytes of data are displayed per line.
Proc. status	The current status is indicated (monitoring or interrupted).

(2) Input keys

Item	Description
Start	Starts exercising the line monitor function. Erases the monitored information.
Abort	Aborts the execution of the line monitor function.
Error detection	This switches over whether the system is to detect error-ridden locations. • Disable: The system will not detect error-ridden locations. The system will memorize up to bytes 1,500 of data transmitted and received. • Enable: The system will display error-ridden locations in ed. The system will memorize up to transmitted and received data up to the location where an error was detected.
Previous list/ Next list	Used to switch to another screen when the amount of information to be displayed is too large to fit on a single screen.
Back	Returns you to the maintenance menu.

6.7 Warning Messages

- If any communication is in error, the associated warning message appears below the status display area.
- Note the message to confirm the error and then take remedial action as appropriate for the indicated error code.

Print description		2011.07.07 12:45	Status:Ready	Com=1	Start up	Shut down
Message name []		Warning : External com. 001				
Column 1	Column 2	Column 3				
[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]				
Print layout						
< >						
Print line setup	Edit message	Print format	Print spec.	Select message	Save message	Menu

Error code table

Error code	Name	Description	Check
001	Transmission code error	• The transmitted code was not defined for communication use. • The transmitted message had an illegal structure.	Check the baud rate and transmission code.
002	Print specifications code error	The print specifications data value was illegal.	Check the print specifications communication text.
003	Print character code error	The maximum value was exceeded by the number of characters for printings that could be received as one item.	Check the printings communication text.
004	Item number error	The item number code value was illegal.	Check the printings communication text.
005	Header error	The header value was illegal.	Check the header.
006	Ready-for-reception error	• An attempt was made to establish communication while the "not ready for reception" state prevailed. • "Apply" key and message window were both displayed. • "Off-line fixed" has been set in Communication environment. • Communication monitor screen was displayed.	Check the transmission timing.
008	Print specifications code error	The maximum value was exceeded by the print specifications data.	Check the print specifications communication text.
009	ETX code error	The ETX code position was illegal.	Check the transmission procedure and ETX code.
010	DLE code error	The DLE code position was illegal.	Check the transmission procedure and DLE code.
011	STX code error	The STX code position was illegal.	Check the transmission procedure and STX code.
012	ENQ code error	The ENQ code position was illegal.	Check the transmission procedure and ENQ code.

Error code	Name	Description	Check
013	ESC code error	The ESC code position was illegal.	Check the transmission procedure and ESC code.
014	Parity error	The parity error occurred.	Check the baud rate and data format.
015	Print format code error	The print format data value was illegal.	Check the print format transmission text section.
016	Overrun error	The overrun error occurred.	Check the baud rate and data format.
017	Framing error	The framing error occurred.	Check the baud rate and data format.
019	2-byte code error	• An illegal 2-byte code (2 bytes per character) was transmitted. • Only one byte of 2-byte code was transmitted.	Check the 2-byte code transmission text.
020	Print data code error	• The print data registration number was illegal. • An unregistered number was encountered.	Check the print data recall / transmission code.
021	SI/SO code error	The SI (shift in) or SO (shift out) code position was illegal.	Check the printings communication text.
022	User pattern character size/character code error	The character size or character code values were illegal.	Check the user pattern communication text.
023	High-speed printing setup error	• When necessary conditions for high speed printing were not satisfied, NM or QM mode was transmitted. • When High speed printing NM or QM mode was set, a setting which did not satisfy necessary conditions for high speed printing was transmitted.	Check the print specifications communication text.
024	Calendar/count conditions error	• Transmitted to print item where calendar/count characters were not present. • Set value was outside specifications. • Zero suppression transmission was performed to print item for which barcode had been set.	Check calendar/count condition communication text.
026	Bar code setup error	• A character undefined for bar code use was found in the printings. • The number for ITF did not consist of an even number of numerals beginning with an odd digit position. • The input data for EAN-13 was not 10 digits.	Check the printings print format communication text.
027	Printings error	• A dedicated character or katakana was transmitted in a character size which cannot be inputted. • The three characters of a dedicated character string were not properly grouped. • A count value is out of a count range. • Count character was transmitted to calendar item.	Check the printings communication text
031	Create messages error	• While "Create messages" function was operating, on-line transmission was performed. • On-line transmission was performed when print data which was controlled separately from data created and registered by print description screen, was present.	Check the timing of on-line transmission.

6.8 Precautions

6.8.1 Notes on Product speed matching Feature Use

- (1) If the product speed matching signal cannot be entered during printing, the printing state continues to prevail so that communication may not be established (no response can be made).

If such a situation is encountered, perform procedure ① or ② below.

① Enter the standby state and then initiate the communication.

② Issue the print abort code "DC3". After the IJ printer returns an "ACK" response, perform the normal procedure to initiate the communication.

- (2) Number of pulses necessary for a rotary encoder from print signal detection until the start of printing.

Number of pulses necessary = Number of printing preparation pulses (①) + Print start delay.

① Number of printing preparation pulses = A / 1 scan time

Use an integer by rounding up the fractional portion.

nozzle diameter	Value of A
65 μ m	7
40 μ m	7
100 μ m	10

1 scan time = $\frac{(\text{Vertical dot count} + \text{character width setting}) \times \text{Ink drop use percentage}}{\text{Excitation frequency (kHz)}} \text{ (ms)}$

6.8.2 Notes on Print Condition Transmission

- (1) The number of digits for character height data is 2 by default. However, the preceding IJ printer models GX and HX use 3 digits by default for print condition transmission (optional function). If the new model of the IJ printer is used as a replacement for such a predecessor, open the following screen from the communication environment setup screen and change the number of digits for character height data to 3.

Comm.env.setup
2011.07.07 12:45
Status:Ready
Com=0

Print message transfer ACK
[2] (1: t=fixed 2: t=async.)
Print spec. transfer char. height
[1] (0: 2 digits 1: 3 digits)
Communication and signal error
[0] (0: Warning 1: Fault)

Start up
Shut down
Manual
Comm On/Off
Show cursor
Prev. set-tings
Next set-tings

- Character height (when the 3-digit data format is chosen)

ESC	Header 30H	Hundreds position	Tens position	Units position

Character height (000 to 099)

NOTE: If the value is within the range from 100 to 999, an error occurs.



7. Circulation System Operating and Adjustment Procedures

WARNING

- Never drain the ink or makeup ink waste solution into public sewer systems. Waste disposal must comply with all appropriate regulations. Consult the appropriate regulatory agency for further information.
- Exercise care not to inadvertently disconnect, forcibly pull, or bend a piping tube. Since the ink and makeup ink in some portions of piping tubes are pressurized, they may splash and enter your eyes or mouth or soil your hands or clothing. If the ink or makeup ink, enters your eyes or mouth, immediately flush with warm or cold water and see a physician.



- When charging a refill of ink or makeup ink, exchanging ink, or otherwise handling ink or makeup ink, take enough care not to spill ink or makeup ink. If you spill any ink or makeup ink by mistake, wipe it off neatly and promptly with wiping paper or something similar. Do not close the maintenance cover until you make sure that the portion you have just wiped is completely dry.

You must pay particular attention when you have spilled ink or makeup ink inside the printer and it is not completely dry. Why? Because vapors of ink or makeup ink will stay inside the printer and may catch on or cause a fire.



If you find it hard to wipe the printer when energized, stop it with the maintenance cover open. Power it down, then wipe it off again.

- Should you find a leak of ink or makeup ink inside the printer while the printer is running or being maintained, wipe it off promptly with wiping paper or something similar. Then, with the maintenance cover open, stop the printer, power it down, and repair the leak.

A continued run with a leak of ink or makeup ink will cause an anomaly, resulting in abnormal printing.

Ink and makeup ink are flammable. They may therefore catch on or cause a fire.

- If you wish to receive ink drops in a beaker, for a printing test for example, use an electrically conductive beaker and connect the beaker securely to the ground. Do not let the tip of the printing head enter the beaker.

Ink drops used for printing are electrically charged. An ungrounded beaker has a gradually rising charge, possibly catching on or causing a fire.

CAUTION

- When handling the ink or makeup ink, which contains organic solvent, observe the following precautions.
 - ① Wear protective gloves and safety goggles to avoid direct skin contact. If skin is contacted, thoroughly clean it with soap and warm or cold water.
 - ② When transferring the ink or makeup ink to or from a bottle, exercise care not to let it come into contact with the printer or surrounding articles. If anything is contacted, wipe it clean with a cloth moistened with ethyl alcohol.
 - ③ Notice that there is a possibility that a cap and a content may fly with inner pressure when opening the container of ink and a solvent.
 - ④ Please open a cap of container in an even place.



7.1 Using the Circulation Control Screen

- 1** Open the "Print description" screen as shown below

Print description	2011.07.07 12:45	Status: Stop	Com=0
Message name []			
Column 1	Column 2	Column 3	
[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	
[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	
[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	
[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	[0 1 2 3 4 5 6 7 8 9]	
Print layout			
< >			
Maintenance	Auxiliary function	Operation management	Show fault
Environment setup menu		Menu	

- 2** Press the **Maintenance** key.

The "Maintenance menu" screen then opens.

Maintenance menu		2011.07.07 12:45		Status: Stop		Com=0	
Environment setup menu		Operation management		Test Print		Start up	
Excitation V update (Nozzle test)		View alarm history		Circulation control		Manual	
View software version		Comm. monitor		Password protection		Shut down	
						Comm On/Off	
						Back	

3 Press the **Circulation control** key.

The "Circulation control" screen then opens.

Firtst menu

Circulation control 2011.07.07 12:45 Status: Stop				
Eject ink (Goes to standby)	Cleaning stop	No-cleaning stop	Prev. menu	Next menu
Nozzle backwash	Gutter cleaning			
Ink replacement	Ink filter replacement	Ink circulation		
Process prior to long-term shutdown	Process after long-term shutdown	Makeup ink refill		
Select option; press [Start/Cont.] Proc. status:			Cancel	
			Start/ Continue	

Second menu

Circulation control 2011.07.07 12:45 Status: Stop				
Ink drainage	Ink refill		Prev. menu	Next menu
Pressure relief	Ink stream alignment			
Parts usage time management	Circulation system environment setup			
Select option; press [Start/Cont.] Proc. status:			Cancel	
			Start/ Continue	

- To switch between the first menu and second menu, use the **Prev.**, **Next** keys.

4 Press the key for an execution target item and the **Start/Continue** key in sequence.

- When, for instance, executing the "Nozzle backwash" function, press the **Nozzle backwash** and **Start/Continue** keys in sequence.
- If you have pressed a wrong key, press the **Cancel** key.

5 The operating guidance, which varies with the selected function, then appears on the display.

- Perform an operation in accordance with the displayed operating guidance.
- To abort the operation, press the **Abort** key.

Circulation control	20011.07.07 12:45	Status:Service										
Function : Nozzle backwash												
Proc. time: Approx. 1 minute												
<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Proc. status: In progress.												

Abort

7.2 Details of Circulation Control

- While the "Main Ink Tank too Full" fault exists, no keys are operative. See Section 8, If a Warning Condition/Fault Occurs , and eliminate the cause of warning condition/fault and then resume operation.
- The keys are operative in differing situations. No keys are operative if they are pressed under situations other than defined below.

Circulation control name	Description	State where the key is operative
Eject ink	Used for maintenance task execution startup. (This invokes ink ejection only. It does not turn on the high-voltage supply.)	Stop
Cleaning stop	Performs the normal shutdown process (turns off the high-voltage supply and stops the ink). This invokes nozzle automatic cleaning as well.	Ready or Standby
No-cleaning stop	Performs the shutdown process at the time of maintenance (turns off the high-voltage supply and stops the ink). This does not invoke nozzle automatic cleaning.	Ready or Standby
Nozzle backwash	Sucks the makeup ink via the nozzle to clean the nozzle. This cleaning operation must be performed while the makeup ink is poured over the end of the nozzle (orifice plate surface) from a cleaning bottle.	Stop
Gutter cleaning	Sucks the makeup ink the gutter to clean the recovery path. This cleaning operation must be performed while the makeup ink is poured over the end of the gutter from a cleaning bottle.	Stop
Ink replacement	Used for replacing the ink in the printer with new ink. Performs the ink drainage and refill by one operation.	Stop
Ink filter replacement	Used for replacing the ink filter. Performs the ink drainage and refill by one operation.	Stop
Ink circulation	Used to bleed the circulation path of air and assure ink uniformity within the flow path. Upon completion of function execution, the printer goes into the ink ejection state (standby).	Standby
Process prior to long-term shutdown	Used for shutting down the printer for a long time. Performs the ink drainage to cleaning of the circulation system by one operation.	Stop
Process after long-term shutdown	Used for starting the printer after shutting it down for a long time. Performs the makeup ink drainage to ink refill within the path by one operation. After completion, the printer goes into the ink ejection state (standby).	Stop
Makeup ink refill	Used to fill the cleaning path with the makeup ink at the time of printer installation.	Stop
Ink drainage	Used for draining the ink in the printer.	Stop
Ink refill	Used when charging the printer with the ink. When this function is executed, the main ink tank ink level is initialized. After completion of function execution, the printer goes into the ink ejection state (standby).	Stop
Pressure relief	Provides pressure relief for the entire printer. (Used at the time of maintenance.)	Stop
Ink stream alignment	Used for adjusting the ink stream position. Ejects the makeup ink from the nozzle.	Stop
Parts usage time management	Used for managing operating time of the circulation system parts. Used to confirm consumption of ink and makeup ink.	All status
Circulation system environment setup	Used to choose ink density control.	Stop

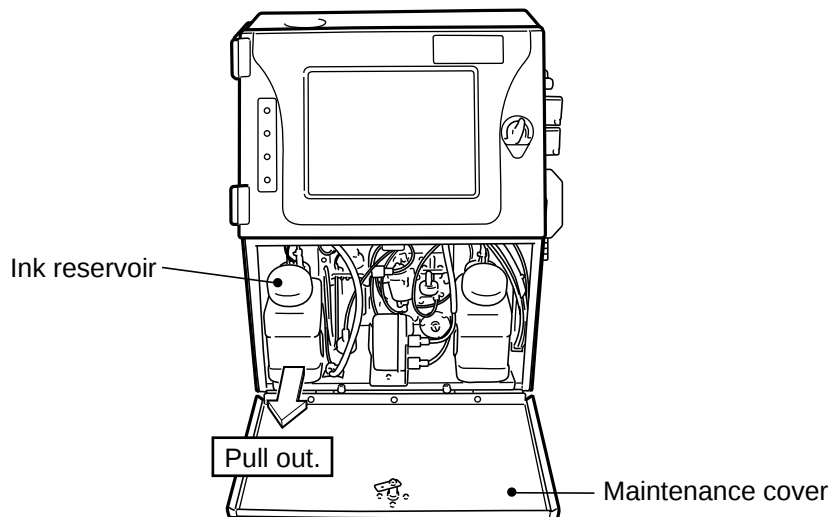
7.3 Ink Replenishment

(1) Overview

- While the printer is operated, the ink is automatically transferred at fixed intervals from the ink reservoir to the main ink tank for replenishment purposes.
- If the Ink Low Warning is issued, add ink to the ink reservoir within 60 minutes. If such a replenishment procedure is not completed within 60 minutes, the printer comes to a stop.
- Ink can be added to the ink reservoir without regard to the IJ printer power ON/OFF status or operating status.
- Upon ink replenishment, the warning is automatically cleared.
- Before replenishing the JP-Y37 ink, be sure to shake the ink bottle well until the precipitated pigment has been dispersed. Also make sure that there is no sedimentation in ink reservoir or main ink tank (see "Usage Precautions" on page 1-6).

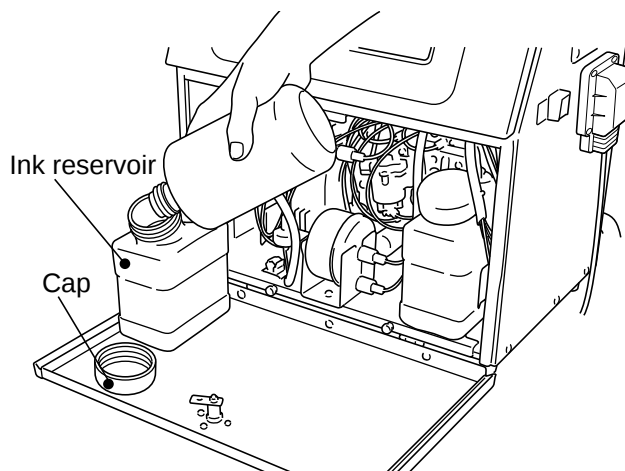
(2) Operating procedure

- 1** Open the maintenance cover and then pull out the reservoir.
Hold the reservoir and pull it forward.



- When moving the reservoir, move it gently.

- 2** Uncap the ink reservoir and then add ink.
 - Adjust the amount of replenishment in accordance with the ink consumption. Exercise care to avoid excessive replenishment.



⚠ CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar. In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

- 3** Fasten the cap of the ink reservoir.
 - Fasten it securely. Solvent components may evaporate.
- 4** Return the reservoir to its original position.
- 5** Close the maintenance cover.

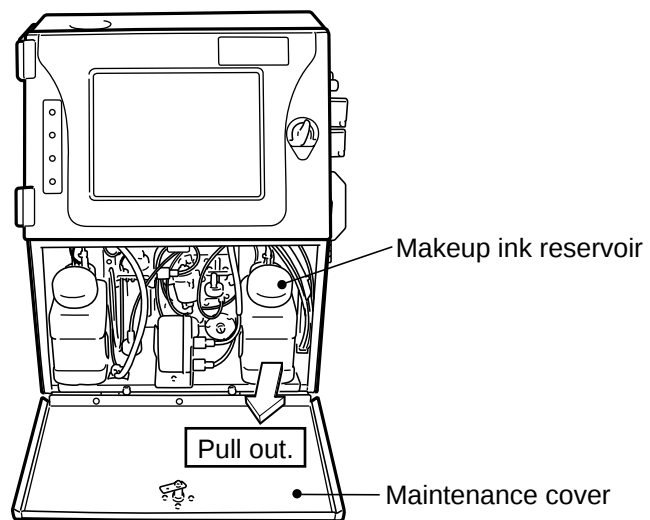
7.4 Makeup ink Replenishment

(1) Overview

- While the printer is operated, the makeup ink is automatically transferred at fixed intervals from the makeup ink reservoir to the main ink tank for replenishment purposes.
- If the makeup ink low warning is issued, add makeup ink to the makeup ink reservoir within 60 minutes. If such a replenishment procedure is not completed within 60 minutes, the printer comes to a stop.
- The makeup ink can be added to the makeup ink reservoir without regard to the IJ printer power ON/OFF status or operating status.
- Upon makeup ink replenishment, the alarm is automatically cleared.

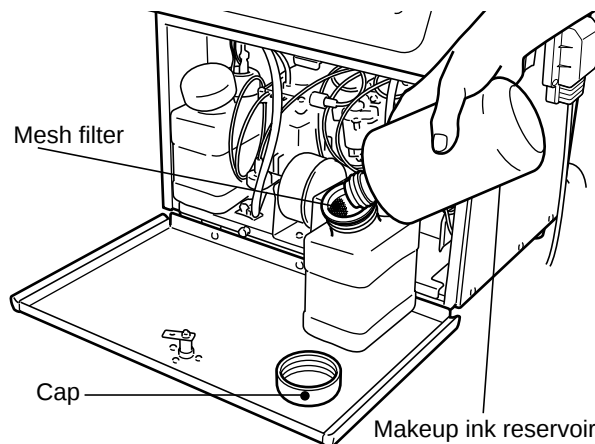
(2) Operating procedure

- 1** Open the maintenance cover and then pull out the reservoir.
Hold the reservoir and pull it forward.



- When moving the reservoir, move it gently.

- 2** Uncap the makeup ink reservoir and then add makeup ink.



⚠ CAUTION

If makeup ink is accidentally spilt, wipe it up promptly with wiping paper or something similar.
In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

- Gradually add the makeup ink to avoid spilling. Also, exercise care to avoid excessive replenishment.
 - If the mesh filter inside the cap is soiled, take it out and clean it.
- 3** Fasten the cap of the makeup ink reservoir.
 - Fasten it securely. Solvent components may evaporate.
 - 4** Push the reservoir into its original position.
 - 5** Close the maintenance cover.

7.5 Ink Replacement

(1) Overview

- This procedure is performed when replacing old ink with new one.
- The procedure cannot be performed during ink ejection.
Initiate the procedure while the printer is in the "Stop" state.
- Before charging new JP-Y37 ink, shake the ink bottle well until the precipitated pigment has been dispersed. Also make sure that there is no sedimentation in ink reservoir or main ink tank (see "Usage Precautions" on page 1-6).

* Replace the ink filter and circulation filter at the same time when replacing the ink so as not to waste the ink.

(2) Operating procedure

- 1 Open the "Circulation control" screen, and sequentially press the **Ink replacement** key and **Start/Continue** key.

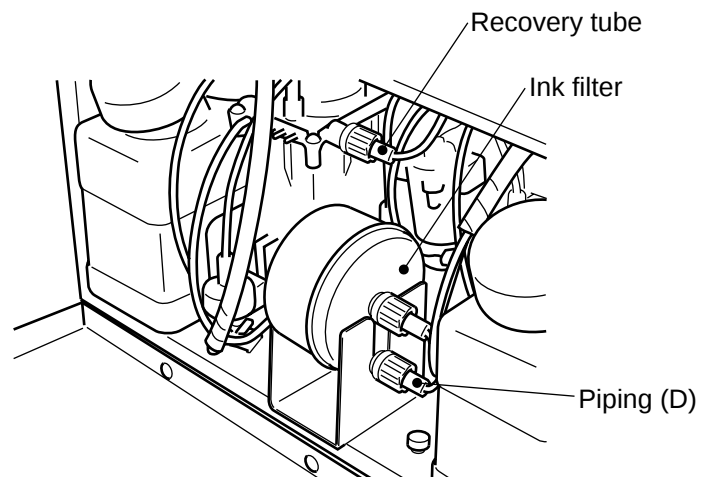
Circulation control			2011.07.07 12:45	Status: Stop
Eject ink (Goes to standby)	Cleaning stop	No-cleaning stop		
Nozzle backwash	Gutter cleaning		Prev. menu	Next menu
Ink replacement	Ink filter replacement	Ink circulation		
Process prior to long-term shutdown	Process after long-term shutdown	Makeup ink refill	Cancel	
			Start/ Continue	
Select option; press [Start/Cont.] Proc. status:				

- 2 The operating guidance on the ink replacement appears on the display.

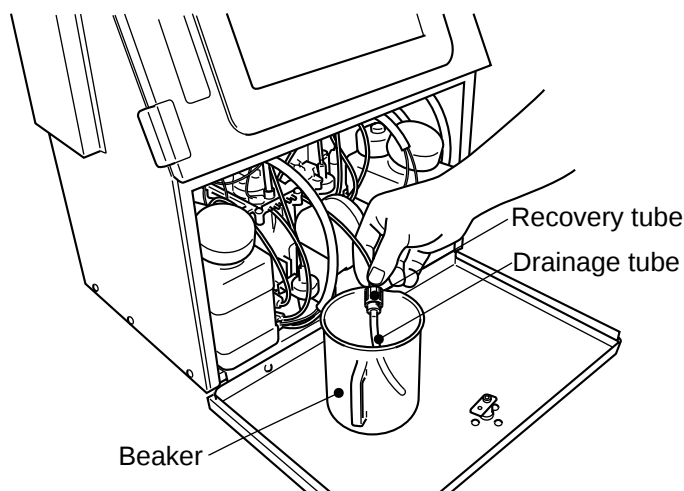
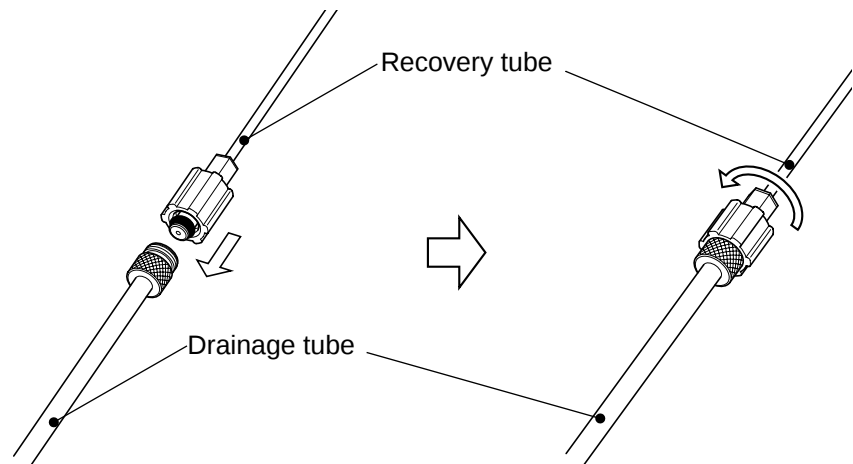
Follow the on-screen instructions.

Circulation control			2011.07.07 12:45	Status: Service
Function : Ink replacement				
Operating guide Disconnect the recovery tube and put the end in a beaker. Press [Start/Continue].				
Proc. time: Approx. 4 minutes.				
Proc. status:				
			Ink drainage	
			Ink rep.	
			Ink refill	
			Abort	
			Start/ Continue	

- 3** Open the maintenance cover, and check to see that the ink filter is set in the state shown below (piping D is the downside).



- 4** Remove the recovery tube, connect it to the accessory drainage tube and put it into the beaker.



Keep the drain tube clean with makeup ink after it is used. Otherwise, the pressure in the recovery line rises by the clogged ink, and it may cause a damage of the circulation pump.

⚠ CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar.
In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

5 Press the **Start/Continue** key.

The screen shown below then opens and the ink in the printer drains away via the drainage tube.

Circulation control 2011.07.07 12:45 Status:Service	
Function : Ink replacement	
Proc. time: Approx. 4 minutes. 	
Proc. status: In progress	
Ink drainage	
Ink rep.	
Ink refill	
Abort	

- To abort the sequence, press the **Abort** key. Then, follow the on-screen instructions to return the recovery tube to its original position and press the **Start/Continue** key. You are then returned to the "Circulation control" screen.
- When you have aborted the sequence, perform the procedure from **1** again.
 - * When aborting the operation, be sure to return the recovery tube to its original position.

6 When the predetermined period of time elapses, the following operating guidance appears on the display.

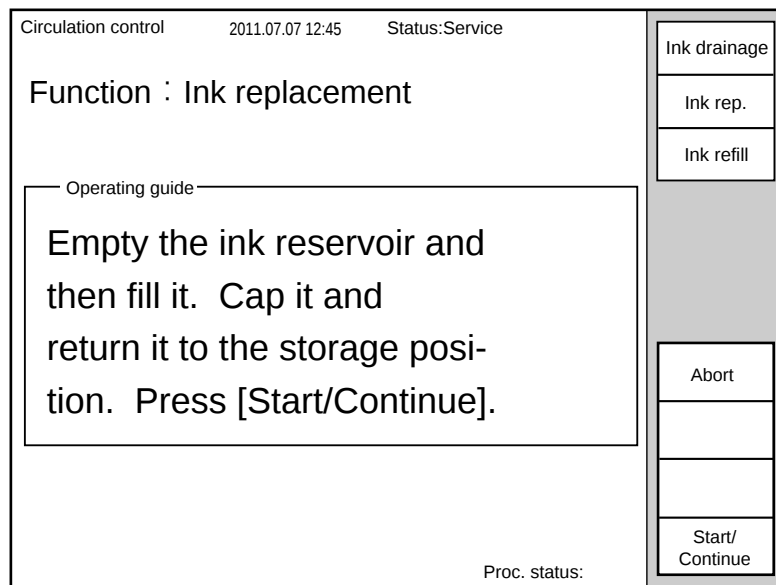
Circulation control 2011.07.07 12:45 Status:Service	
Function : Ink replacement	
— Operating guide — Connect a recovery tube to the main ink tank as before. Press [Start/Continue].	
Proc. time: Approx. 4 minutes. 	
Proc. status:	
Ink drainage	
Ink rep.	
Ink refill	
Abort	
	Start/ Continue

*1 Clean the connection at the end of the recovery tube sufficiently with the makeup ink, and then connect it as it originally was.

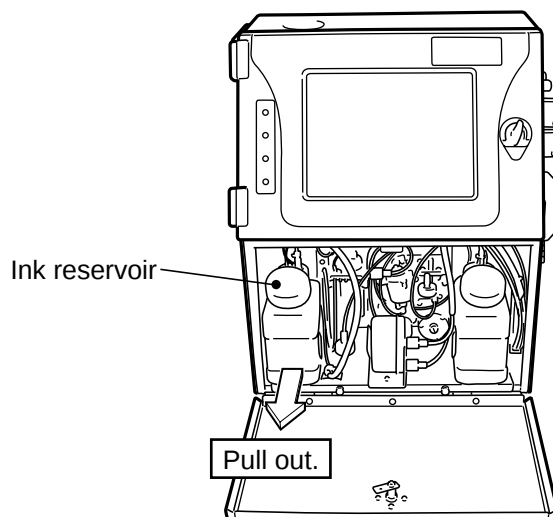
*2 To prevent the recovery tube from becoming crimped, be careful not to let it cross another tube.

7 Press the **Start/Continue** key.

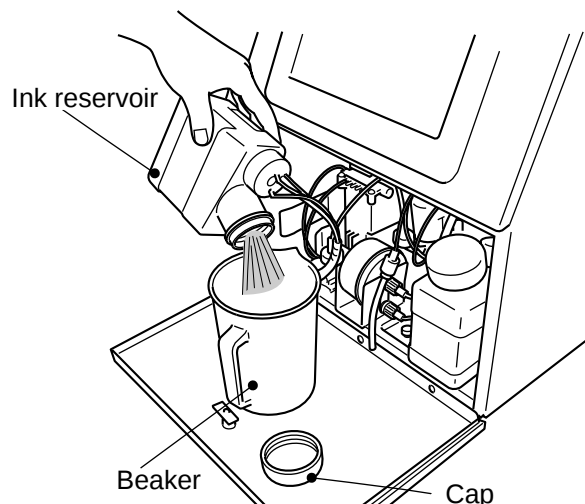
The following operating guidance appears.



8 Pull out the ink reservoir.



9 Uncap the ink reservoir, and drain the ink remaining in the reservoir.

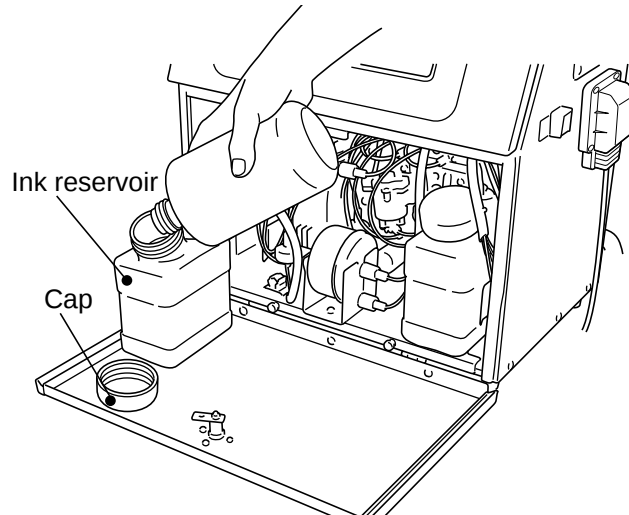


CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar. In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

10 Add the new ink to the ink reservoir.

- Fill the reservoir at least 2/3 full of the ink. Be careful of overfilling.



⚠ CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar. In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

11 Fasten the cap of the ink reservoir.

- Fasten it securely. Solvent components may evaporate.

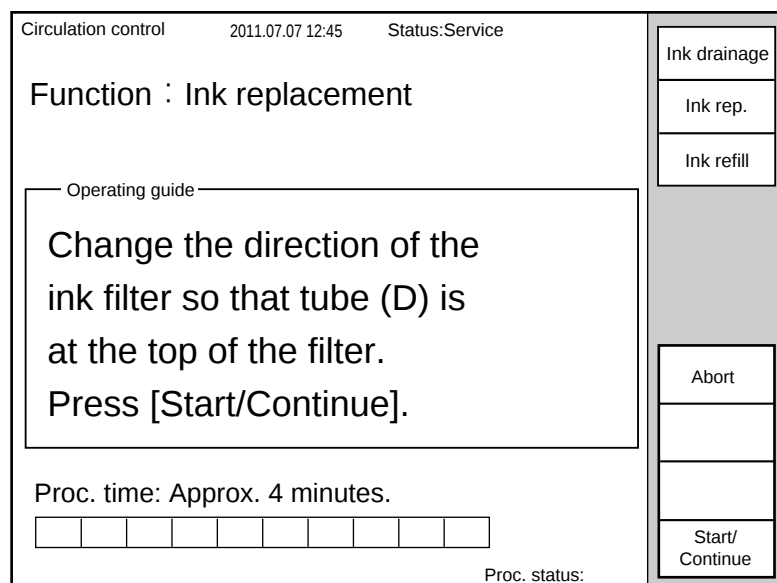
12 Push in the reservoir to return it to the original position.

13 Place the end of the print head in a beaker.

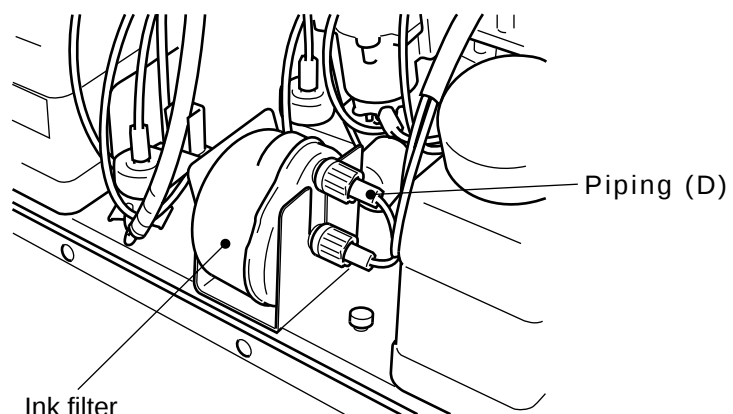
- Provide against an ink beam bend.

14 Press the **Start/Continue** key.

The following screen then opens.



15 Set the ink filter as follows (piping D is the upside).



16 Press the **Start/Continue** key.

- The screen shown below then opens, and the ink refill in the circulation path starts.
- After a while, the ink ejects from the nozzle. Check the ink stream position.

Circulation control	2011.07.07 12:45	Status:Service
Function : Ink replacement		
Proc. time: Approx. 4 minutes.		
Proc. status: In progress		
Ink drainage Ink rep. Ink refill Abort		

- To abort the sequence, press the **Abort** key, and follow the on-screen instructions. After aborting, you are returned to the "Circulation control" screen.
- When you have aborted the sequence, select the "Ink refill" from the "Circulation control" screen and perform it.
- * When aborting the operation, be sure to return the ink filter to its original state.
- If the following message is output during ink refill, the system will automatically stop.

"Failure was detected in level sensor, pump or solenoid valve.

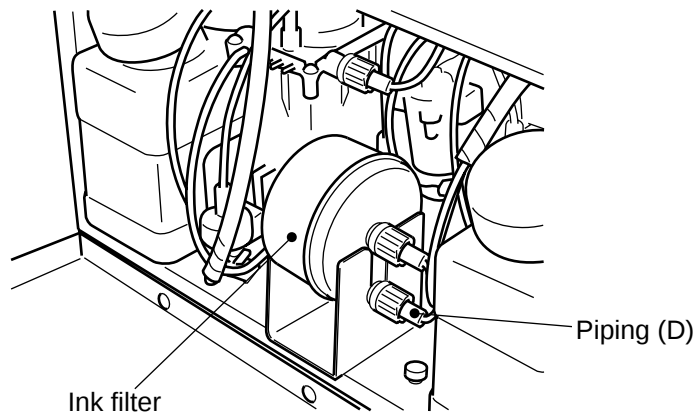
When ready, press [Start/Continue]."

Press **Start/Continue** key, select "Ink refill" on "Circulation control" screen and execute refill. If the same message appears again, contact your nearest local distributor.

17 The screen shown below opens on completion of the ink refill.

Circulation control	2011.07.07 12:45	Status:Service
Function : Ink replacement		
Operating guide Change the direction of the ink filter so that tube (D) is at the bottom of the filter. Press [Start/Continue].		
Proc. time: Approx. 4 minutes.		
Proc. status: In progress.		
Ink drainage Ink rep. Ink refill Start/Continue		

- 18** Return the ink filter to its original state (piping D is the downside).



- 19** Press the **Start/Continue** key.

- The "Circulation control" screen then opens as follows.

Circulation control			2011.07.07 12:45		Status: Standby	
Eject ink (Goes to standby)	Cleaning stop	No-cleaning stop	Prev. menu Next menu Cancel Start/ Continue			
Nozzle backwash	Gutter cleaning					
Ink replacement	Ink filter replacement	Ink circulation				
Process prior to long-term shutdown	Process after long-term shutdown	Makeup ink refill				
Select option, press [Start/Cont.].			Proc. status: ended.			

- 20** Open the "Operation management" screen, and set the operating time to 0.

For the procedure, see Section 4.1 Managing the Operations.

The ink replacement is now completed.

When you install the print head cover, the IJ printer goes into the "Standby state" (ink ejection and deflection voltage OFF).

To initiate printing, open the Manual Control menu and sequentially press the **Ready** and **OK** keys to enter the "Ready" state.

7.6 Correcting a Bent Ink Stream and Clogged Nozzle

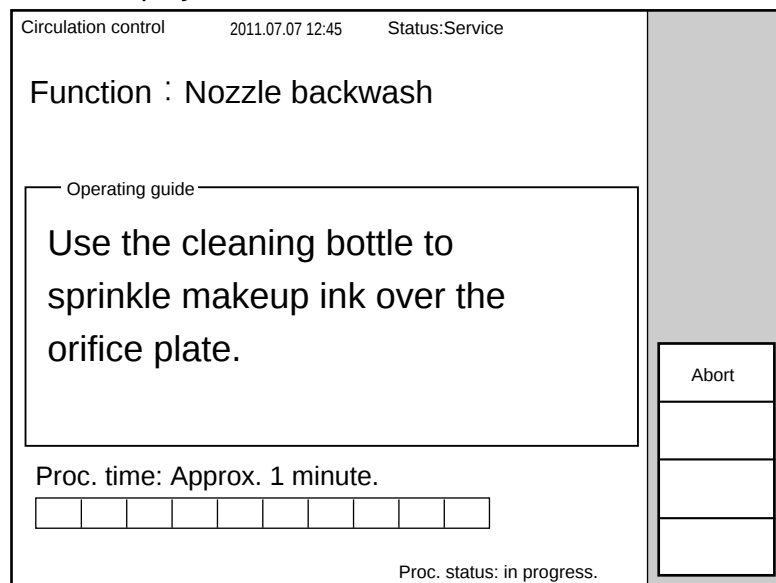
⚠ WARNING

- When checking the ink stream position, wear protectors (safety goggles and mask).
- If the ink or makeup ink should enter your eyes or mouth, immediately flush with warm or cold water and see a physician.
- Before ejecting the ink, ensure that there is no person in the direction of ejection. (The end of the print head must be placed in a beaker or the like.)

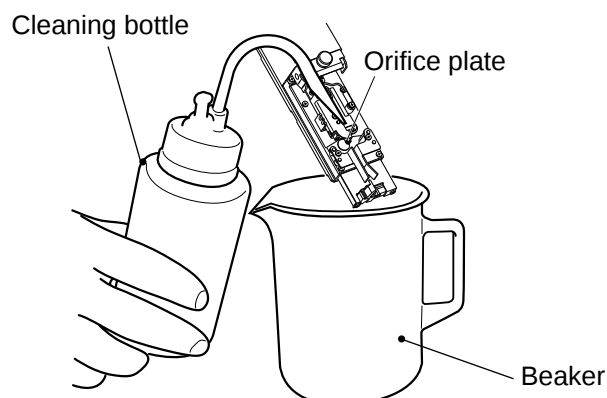
7.6.1 Nozzle backwash

- The makeup ink is sucked via the nozzle for the purpose of removing deposits and other foreign matter.
Do not repeat this nozzle backwash procedure more than three times.
- This nozzle backwash procedure cannot be performed during ink ejection. Initiate the procedure after the printer is placed in the "Stop" state.
- Have on hand a beaker and the cleaning bottle filled with the makeup ink, and then remove the print head cover.

- 1 Open the "Circulation control" screen and then sequentially press the **Nozzle backwash** key and **Start/Continue** key.
- 2 Nozzle backwash then starts with the following operating guidance displayed on the screen.

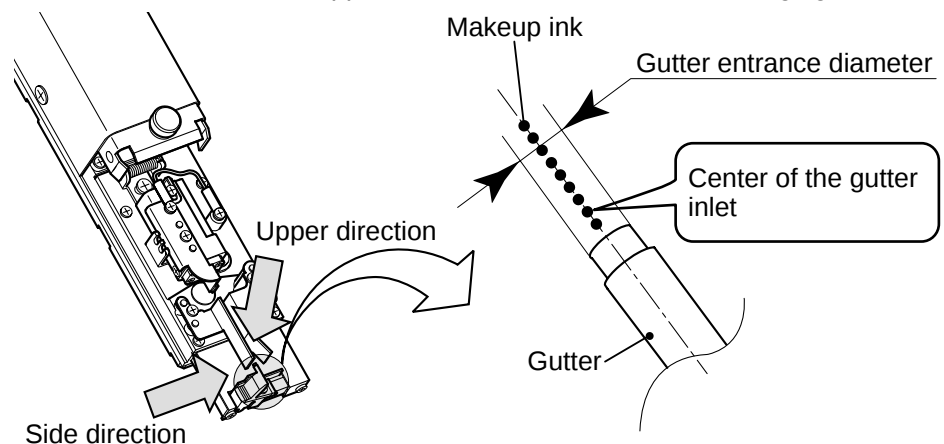


- Sprinkle the makeup ink over the orifice plate.



- To abort the nozzle backwash sequence, press **Abort**.

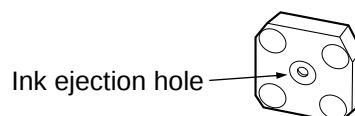
- 3 The nozzle backwash sequence ends in about a minute, returning you to the "Circulation control" screen.
- 4 Press the **Next menu** key and display the second time of the "Circulation control screen".
- 5 With the print head cover left removed, sequentially Press the **Ink stream alignment** key and then the **Start/Continue** key to eject the makeup ink.
 - Perform this step with the end of the print head placed in the beaker.
- 6 Make sure that the makeup ink is positioned at the center of the gutter.
 - Make sure that the makeup ink is positioned at the center of the gutter from the side and upper direction as shown in the following figure.



- If the ink stream is not positioned at the center of the gutter, and then repeat steps 1 and beyond.
 - If recovery cannot be achieved by repeating the nozzle backwash sequence three times, proceed as directed in Section 7.6.2, Disassembling and cleaning the orifice plate.
- 7 Press the **Abort** key to stop the ejection of the makeup ink.

7.6.2 Disassembling and cleaning the orifice plate

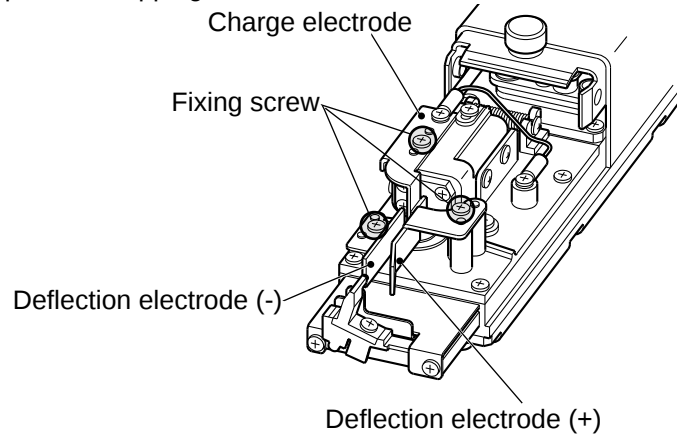
- This section describes the procedure to be performed when recovery cannot be achieved by executing the nozzle backwash procedure which is stated in Section 7.6.1.
- The procedure set forth below cannot be performed during ink ejection. Initiate the procedure after placing the printer in the "Stop" state.
- Do not handle the orifice plate directly by hand (use the accessory tweezers only).
- Scratching the ink injection hole under the orifice plate will not be able to perform the function. Take great care when removing and reattaching the orifice plate so that the ink injection hole is not damaged by screwdriver, tweezers, etc.



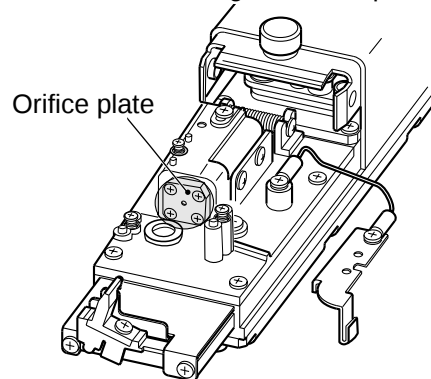
1 Remove and clean the orifice plate.

- (1) Loosen the fixing screw and remove the charge electrode and deflection electrode.

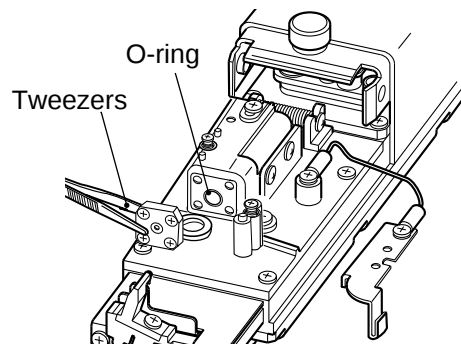
To prevent dropping, do not remove the screw.



- (2) Remove the four screws holding the orifice plate.

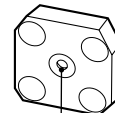


- (3) Use the tweezers to remove the orifice plate from the nozzle body.



Notice

Do not touch the ink ejection hole on orifice plate.



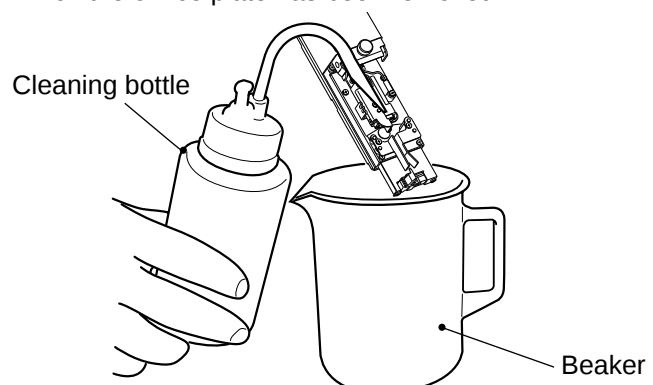
Ink ejection hole

The O-ring may detach from the orifice plate at this time. If it does, put the O-ring in a beaker with makeup ink and take care not to lose it.

- (4) Immerse the removed orifice plate in a beaker with makeup ink to clean it.

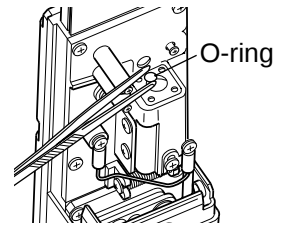
2 Clean the nozzle section.

Using the cleaning bottle, pour the makeup ink over the nozzle section to clean it, from which the orifice plate has been removed.

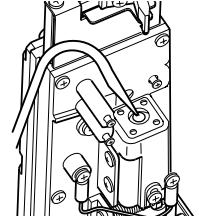


3 Reinstall the orifice plate.

- (1) Use the tweezers to hold the O-ring and put it into the nozzle body.



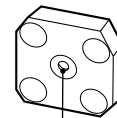
- (2) Use the cleaning bottle and splash a few droplets of makeup ink on the O-ring.



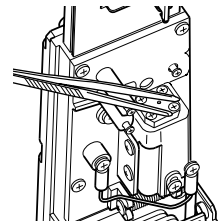
- (3) Insert the orifice plate and use tweezers to lightly depress the plate from the top.

Notice

Do not touch the ink ejection hole on orifice plate.

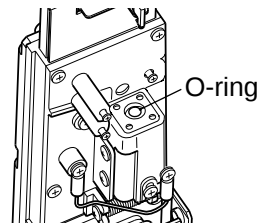


Ink ejection hole



- (4) Remove the orifice plate once and make sure that the O-ring has been installed.

Attach to the groove.



- (5) Reinsert the orifice plate, and use the four screws to secure it.

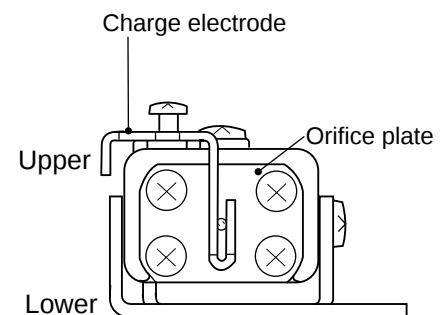
- Use the four screws to secure the orifice plate so that the characters on it face up.

Characters



Orifice parts Sxx

- Tighten the four screws little by little alternately.



Example for mounting the orifice parts xx.

xx shows diameter.

- (6) Reinstall the charge electrode and deflection electrode.

4 Eject the ink to verify that recovery is achieved.

- With the print head cover left removed, open the "Print description" or "Maintenance menu" screen and sequentially press the **Manual** key and **Eject ink** key to eject the ink.
- Perform this step with the end of the print head placed in a beaker.
- If the ink stream is not properly centered, make necessary adjustments as directed in Section 7.7, Adjusting the Ink Stream Position.
- Check the printing and update it with an optimum excitation set value.

7.7 Adjusting the Ink Stream Position

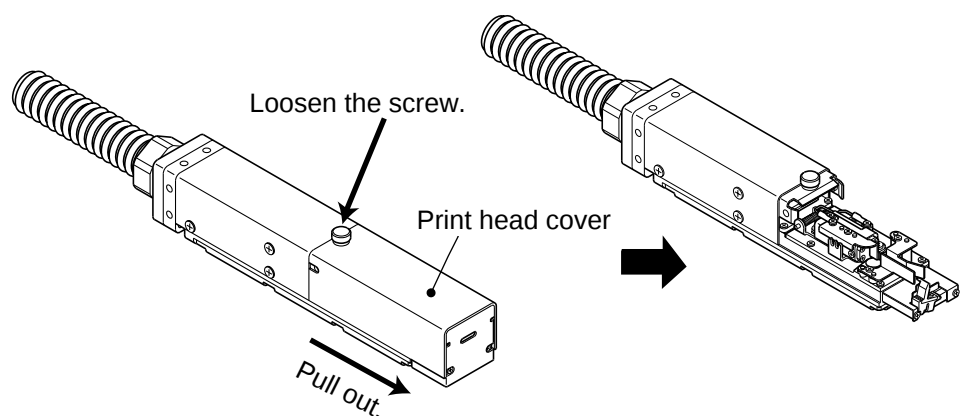
⚠ WARNING

- When checking the ink stream position, wear protectors (safety goggles and mask).
- If the ink or makeup ink should enter your eyes or mouth, immediately flush with warm or cold water and see a physician.
- Before ejecting the ink, ensure that there is no person in the direction of ejection. (The end of the print head must be placed in a beaker or the like.)

The ink stream adjustment procedure set forth below is to be performed after nozzle or orifice plate replacement. Under normal conditions, the ink stream needs no adjustment.

- The ink stream position must be adjusted so that the ink ejected from the nozzle is positioned at the center of the gutter.
- Adjustments must be made in both the horizontal direction and vertical direction.

1 Loosen the screw and then take off the print head cover.



2 Open the "Circulation Control" screen.

Sequentially press the **Ink stream alignment** key and **Start/Continue** key.

- Perform this step with the end of the print head positioned in a beaker.

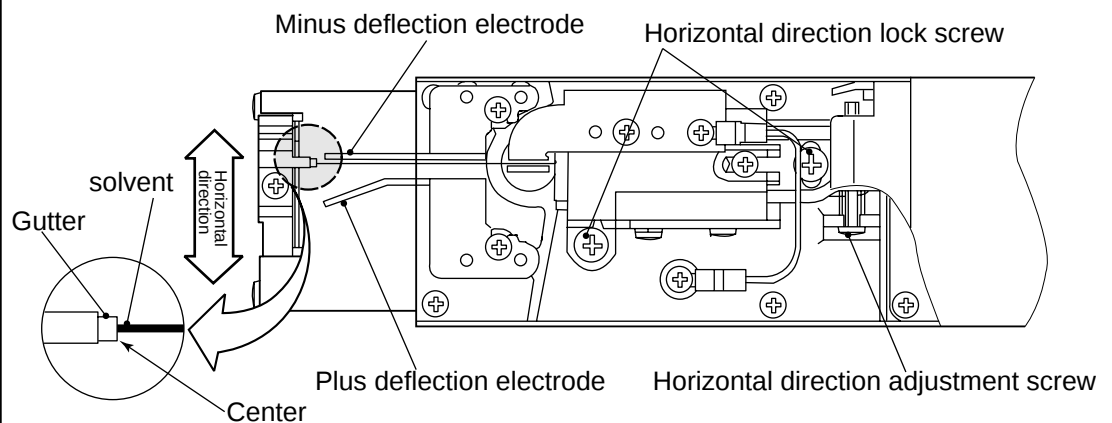
3 Make positional adjustments in both the horizontal direction and vertical direction.

(1) Horizontal direction adjustment procedure

- ① Slightly loosen the horizontal direction lock screws (2 places).
- ② Rotate the horizontal direction adjustment screw to properly position the solvent.
To shift the ink stream toward the minus deflection electrode: rotate clockwise.
To shift the ink stream toward the plus deflection electrode : rotate counterclockwise.

The adjustment must be made so that the solvent is positioned approximately at the center of the gutter.

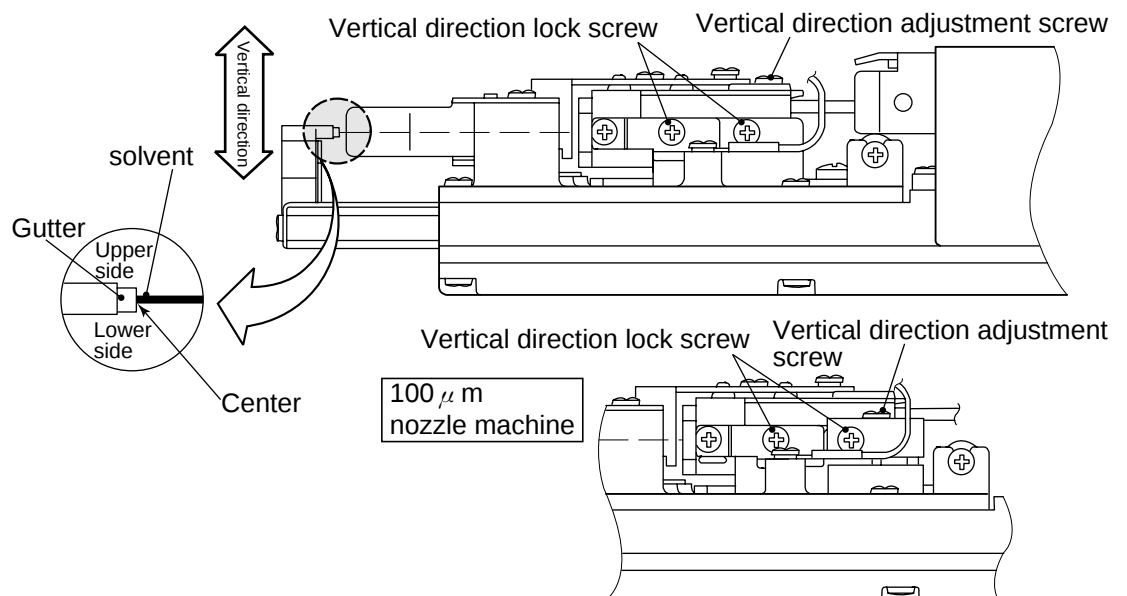
- ③ After the adjustment, tighten the horizontal lock screws (2 places).



(2) Vertical direction adjustment procedure

- ① Slightly loosen the vertical direction lock screws (2 places).
(Approximately a half turn)
- ② Rotate the vertical direction adjustment screw to properly position the solvent.
To shift the ink stream toward the lower end of the gutter: rotate counterclockwise.
To shift the ink stream toward the upper end of the gutter: rotate clockwise.

The adjustment must be made so that the solvent is positioned approximately at the center of the gutter.



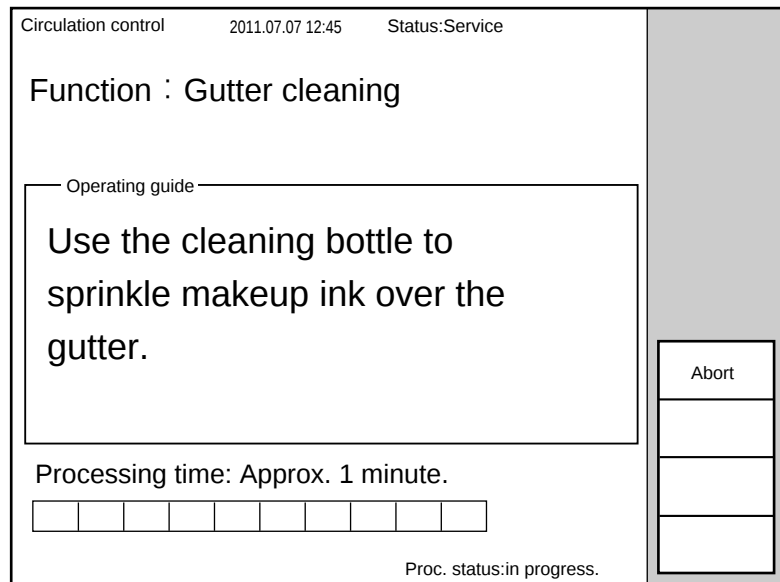
- ③ After the adjustment, tighten the vertical direction lock screws (2 places).

4 When the adjustment is completed, press the **Abort** key.

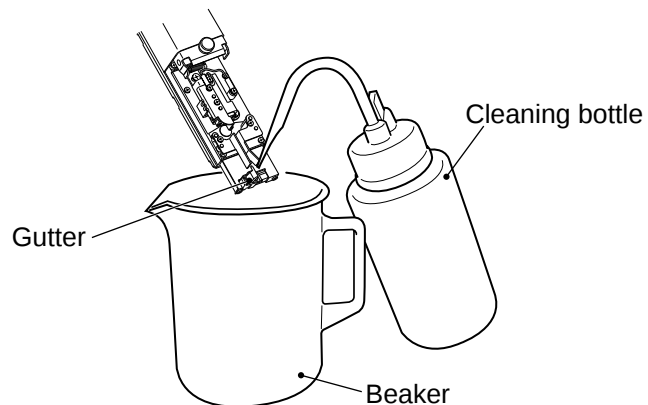
7.8 Cleaning the Gutter

- When the ink recovery system is dry or its inner ink flow is restricted, you can clean the path between the gutter and ink main tank by performing the "gutter cleaning" procedure set forth below.
- Gutter cleaning cannot be carried out during ink ejection. Initiate the gutter cleaning procedure with the printer placed in the "Stop" state.
- Have on hand a beaker and the cleaning bottle filled with the makeup ink, and then remove the print head cover.
- If you perform the gutter cleaning procedure repeatedly, the ink becomes thin, causing print irregularities. If such a situation occurs, you would be obliged to replace the ink after achieving recovery. To avoid such a problem, do not repeat the gutter cleaning procedure more than two times.

- 1** Open the "Circulation control" screen and then sequentially press the **Gutter cleaning** key and **Start/Continue** key.
- 2** Gutter cleaning then starts with the following operating guidance displayed on the screen.



- Sprinkle the makeup ink over the gutter.



- To abort the gutter cleaning sequence, press **Abort**.

- 3** The gutter cleaning sequence ends in about a minute, returning you to the "Circulation control" screen.

7.9 Ink Filter Replacement

Perform it in a state in which the ink has been drained. The ink is not wasted if performed simultaneously with the ink replacement.

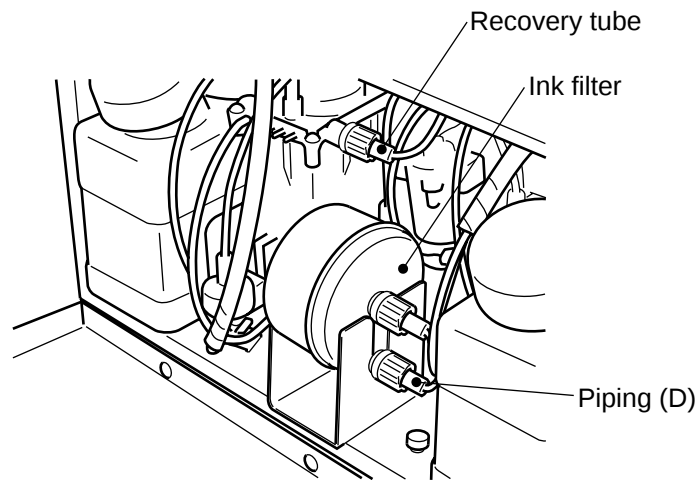
- 1 Open the "Circulation control" screen, and sequentially press the **Ink filter replacement** and **Start/Continue** keys.

Circulation control			2011.07.07 12:45		Status: Stop	
Eject ink (Goes to standby)	Cleaning stop	No-cleaning stop	Prev. menu Next menu			
Nozzle backwash	Gutter cleaning					
Ink replacement	Ink filter replacement	Ink circulation				
Process prior to long-term shutdown	Process after long-term shutdown	Makeup ink refill				
Select option; press [Start/Cont.]			Proc. status:		Cancel	
					Start/Continue	

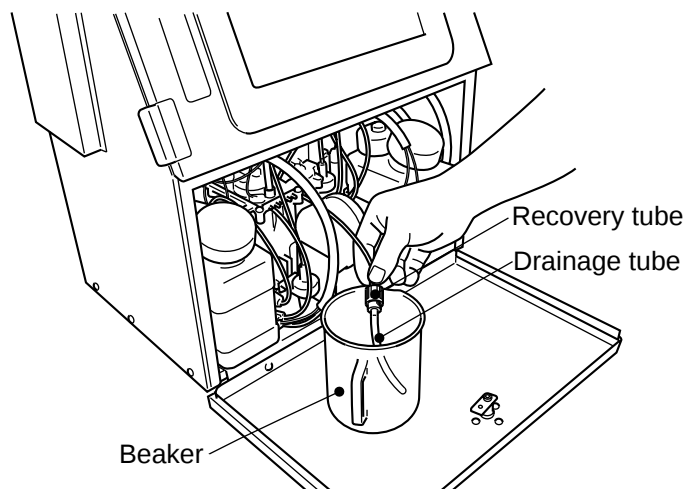
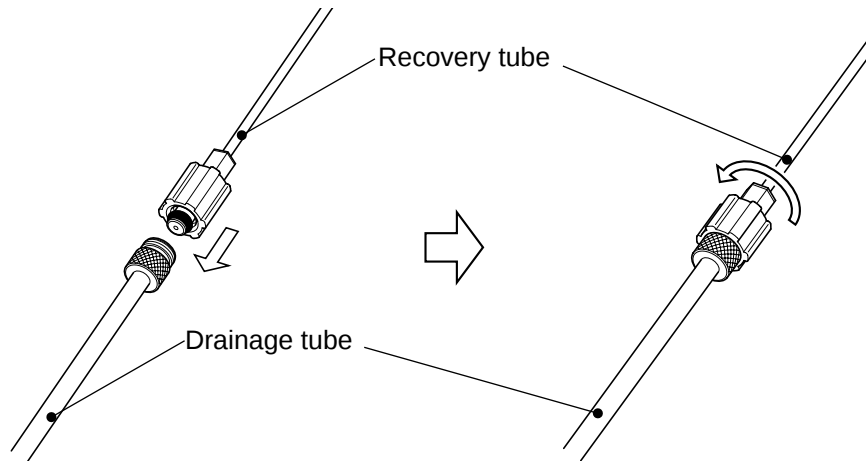
- 2 The operating guidance for the filter replacement then appears on the display.
Follow the on-screen instructions.

Circulation control			2011.07.07 12:45		Status: Service	
Function : Ink filter replacement						
Operating guide						
Disconnect the recovery tube and put the end in a beaker. Press [Start/Continue].						
Proc. time: Approx. 4 minutes.						
Proc. status:					Ink drainage	
					Filter rep.	
					Ink refill	
					Abort	
					Start/Continue	

- 3** Open the maintenance cover, and check to see that the ink filter is set in the state shown below (piping D is the downside).



- 4** Remove the recovery tube, connect it to the accessory drainage tube and put it into the beaker.



Keep the drain tube clean with makeup ink after it is used. Otherwise, the pressure in the recovery line rises by the clogged ink, and it may cause a damage of the circulation pump.

⚠ CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar.
In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

5 Press the **Start/Continue** key.

- The screen shown below then opens, and the ink in the printer is drained from the drainage tube.

Circulation control 2011.07.07 12:45 Status:Service	
Function : Ink filter replacement	
Proc. time: Approx. 4 minutes. 	
Proc. status: In progress	
Ink drainage	
Filter rep.	
Ink refill	
Abort	

- To abort the sequence, press the **Abort** key. Then, follow the on-screen instructions to return the recovery tube to its original position and press the **Start/Continue** key . You are then returned to the "Circulation control" screen.
- When you have aborted the sequence, perform the procedure from **1** again.
 - * When aborting the operation, be sure to return the recovery tube to its original position.

6 When the predetermined period of time elapses, the following operating guidance appears on the display.

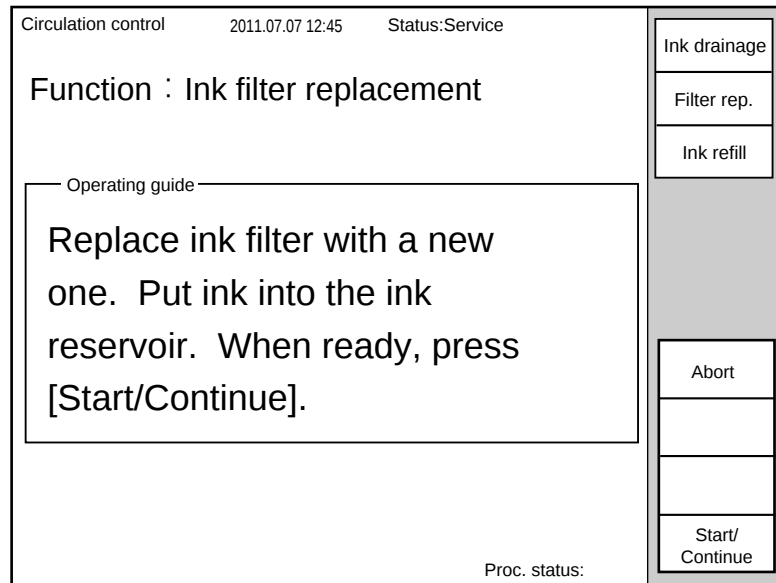
Circulation control 2011.07.07 12:45 Status:Service	
Function : Ink filter replacement	
Operating guide Connect the recovery tube to the main ink tank as before. Press [Start/Continue].	
Proc. time: Approx. 4 minutes. 	
Proc. status:	
Ink drainage	
Filter rep.	
Ink refill	
Abort	
Start/Continue	

*1 Clean the connection at the end of the recovery tube sufficiently with the makeup ink, and then connect it as it originally was.

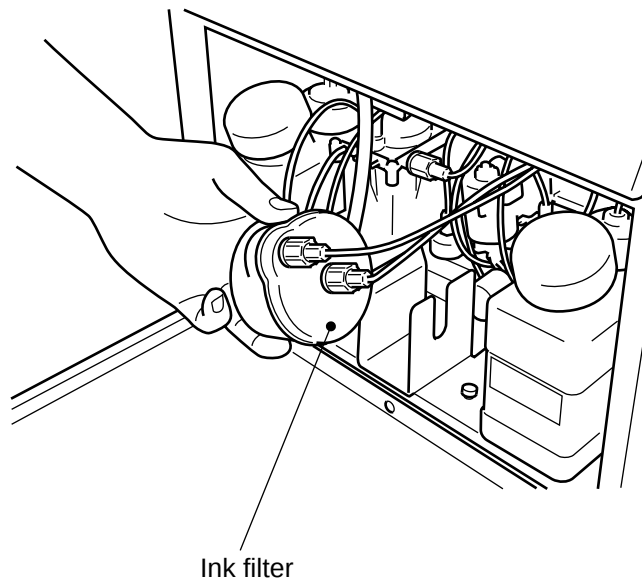
*2 To prevent the recovery tube from becoming crimped, be careful not to let it cross another tube.

7 Press the **Start/Continue** key.

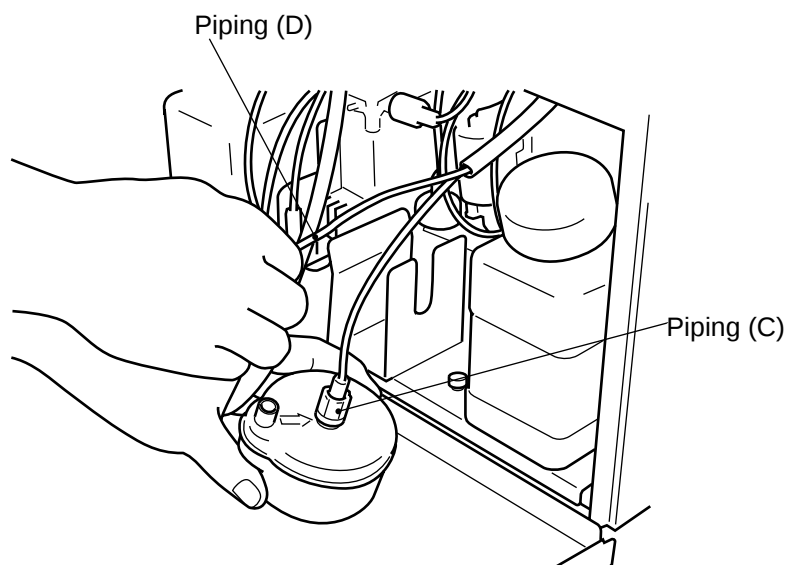
The following operating guidance appears.



8 Pull out the ink filter.



9 Remove the piping couplings (C and D), and replace it with a new ink filter.



Caution

- ① Mount and remove the piping couplings by rotating them by hand instead of using a tool.
- ② Be careful not to mistake the piping mounting positions (C is the center of the ink filter, and D is the outside).
- ③ A small amount of ink remains within the ink filter. Watch out for ink spillage when replacing it.

10 Press the **Start/Continue** key.

- The following operating guidance appears on the display.

Circulation control
2011.07.07 12:45
Status:Service

Function : Ink filter replacement

Operating guide

Change the direction of the ink filter so that tube (D) is at the top of the filter.
Press [Start/Continue].

Proc. time: Approx. 4 minutes.

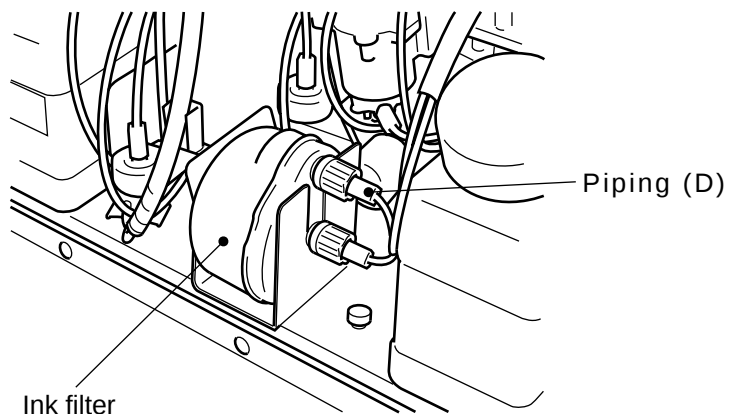
Proc. status:

Ink drainage
 Filter rep.
 Ink refill

 Abort

 Start/
Continue

11 Set the ink filter as follows (piping D is the upside).



12 Place the end of the print head in a beaker.

- Provide against an ink stream bend.

13

- The screen shown below then opens, and the ink refill in the circulation path starts.
- After a while, the ink ejects from the nozzle. Check the ink stream position.

Circulation control	2011.07.07 12:45	Status:Service	
Function : Ink filter replacement			
Proc. time: Approx. 4 minutes.			
Proc. status: In progress			Ink drainage Filter rep. Ink refill Abort

- To abort the sequence, press the **Abort** key, and follow the on-screen instructions. After aborting, you are returned to the "Circulation control" screen.
- When you have aborted the sequence, select the "Ink refill" from the "Circulation control" screen and perform it.

* When aborting the operation, be sure to return the ink filter to its original state.

- If the following message is output during ink refill, the system will automatically stop.

"Failure was detected in level sensor, pump or solenoid valve.

When ready, press [Start/Continue]."

Press **Start/Continue** key, select "Ink refill" on "Circulation control" screen and execute refill. If the same message appears again, contact your nearest local distributor.

14

Circulation control	2011.07.07 12:45	Status:Service	
Function : Ink filter replacement			
Operating guide Change the direction of the ink filter so that tube (D) is at the bottom of the filter. Press [Start/Continue].			
Proc. time: Approx. 4 minutes.			
Proc. status: In progress.			Ink drainage Filter rep. Ink refill

- 15



- 16

Parts usage time mgmt. 2011.07.07 12:45 Status:XXXXXXXXXX

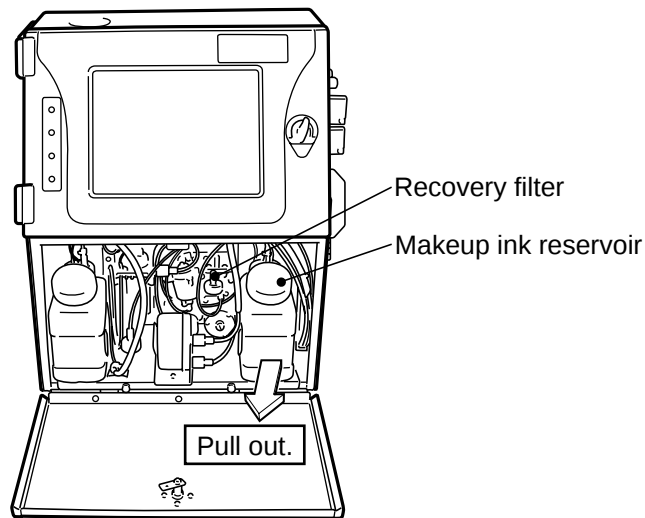
	(hours)		(hours)
Ink filter	[0 0 0 0 0]	Pump	0 0 0 0 0
Circulation f.	[0 0 0 0 0]	Heating unit	0 0 0 0 0
Makeup ink f.	[0 0 0 0 0]	MV 1	0 0 0 0 0
Air filter	[0 0 0 0 0]	MV 2	0 0 0 0 0
Recovery filter	[0 0 0 0 0]	MV 3	0 0 0 0 0
		MV 4	0 0 0 0 0
<Consumption>		MV 5	0 0 0 0 0
Ink 0 0 0 0 0 0 (ml)		MV 6	0 0 0 0 0
Makeup ink 0 0 0 0 0 0 (ml)		MV 7	0 0 0 0 0
Print count 0 0 0 0 0 0 0 0 0		MV 8	0 0 0 0 0
		MV 9	0 0 0 0 0

Update log 2011.07.07 12:45

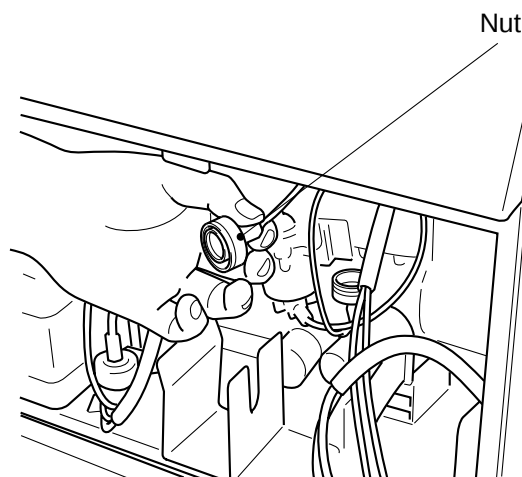
1	2	3	4	5	6	7	8	9	0
								Decre-	Incre-
								ment	ment

7.10 Recovery Filter Replacement

- 1 Pull out the makeup ink reservoir forward and out.



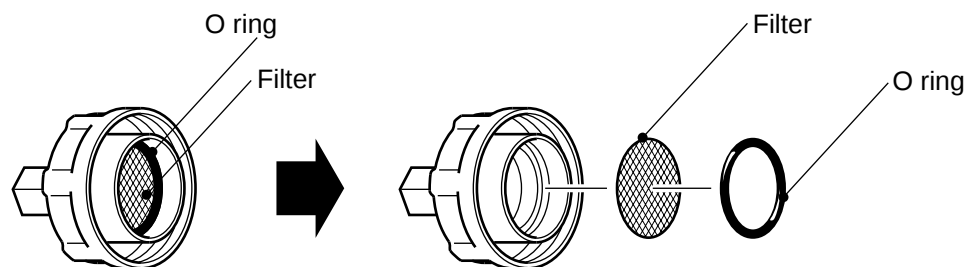
- 2 Rotate the nut of the recovery filter and pull it forward and out.



⚠ CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar. In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

- 3 Remove the O ring and filter with tweezers and mount new ones.



- 4 Return it to its original state, and check to see that there is no leak of the ink in operation.

* Tighten the nut securely by hand.

- | Parts usage time mgmt. | | 2011.07.07 12:45 | | Status:XXXXXXXXXX | |
|-----------------------------|-------------------|------------------|-----------|-------------------|--|
| | (hours) | | (hours) | | |
| Ink filter | [0 0 0 0 0] | Pump | 0 0 0 0 0 | | |
| Circulation f. | [0 0 0 0 0] | Heating unit | 0 0 0 0 0 | | |
| Makeup ink f. | [0 0 0 0 0] | MV 1 | 0 0 0 0 0 | | |
| Air filter | [0 0 0 0 0] | MV 2 | 0 0 0 0 0 | | |
| Recovery filter | [0 0 0 0 0] | MV 3 | 0 0 0 0 0 | | |
| | | MV 4 | 0 0 0 0 0 | | |
| | | MV 5 | 0 0 0 0 0 | | |
| <Consumption> | | MV 6 | 0 0 0 0 0 | | |
| Ink | 0 0 0 0 0 0 (ml) | MV 7 | 0 0 0 0 0 | | |
| Makeup ink | 0 0 0 0 0 0 (ml) | MV 8 | 0 0 0 0 0 | | |
| Print count | 0 0 0 0 0 0 0 0 0 | MV 9 | 0 0 0 0 0 | | |
| Update log 2011.07.07 12:45 | | | | | |

1	2	3	4	5	6	7	8	9	0
								Decrement	Increment

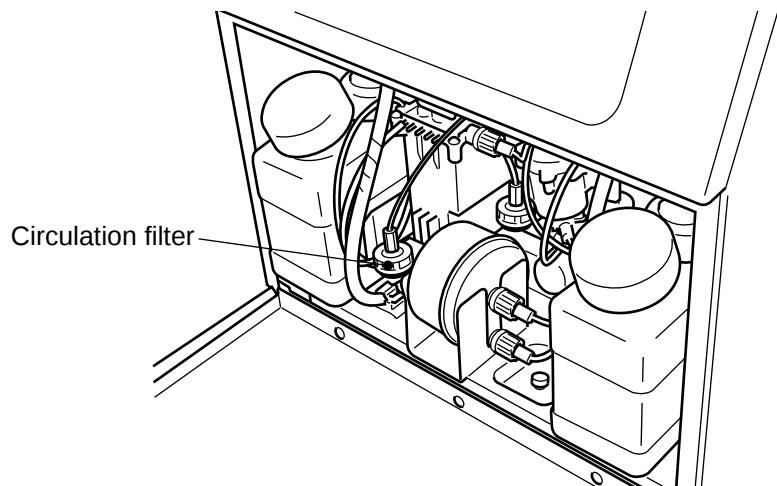
↑	←
↓	→

Cancel changes
Reset
Back

7.11 Circulation Filter Replacement

Perform it in a state in which the ink has been drained. The ink is not wasted if performed simultaneously with the ink replacement.

- 1** Perform "7.5 Ink Replacement" and put it in the state of **6** (the state in which there is no ink within the circulation path).
- 2** Replace the circulation filter at the position shown below.
See "7.10 Recovery Filter Replacement" for the replacement procedure.



- 3** Open the "Parts usage time management" screen (the page following the "Circulation control" screen), and set the used time of the circulation filter to 0.

Parts usage time mgmt.		2011.07.07 12:45		Status:XXXXXXXXXX	
Ink filter	(hours)	[0 0 0 0 0]	Pump	(hours)	0 0 0 0 0
Circulation f.		[0] 0 0 0 0	Heating unit		0 0 0 0 0
Makeup ink f.		[0 0 0 0 0]	MV 1		0 0 0 0 0
Air filter		[0 0 0 0 0]	MV 2		0 0 0 0 0
Recovery filter		[0 0 0 0 0]	MV 3		0 0 0 0 0
			MV 4		0 0 0 0 0
<Consumption>			MV 5		0 0 0 0 0
Ink	0 0 0 0 0 0 (ml)		MV 6		0 0 0 0 0
Makeup ink	0 0 0 0 0 0 (ml)		MV 7		0 0 0 0 0
Print count	0 0 0 0 0 0 0 0		MV 8		0 0 0 0 0
			MV 9		0 0 0 0 0
Update log 2011.07.07 12:45					

1	2	3	4	5	6	7	8	9	0
								Decre-	Incre-
								ment	ment

↑

←

↓

→

Cancel changes

Reset

Back

7.12 Pressure Adjustment

- Check the pressure at regular intervals of about one week.

- 1 Verify that the ink is being ejected. From the menu screen, press the **Maintenance** key.

The "Maintenance menu" screen then opens.

Maintenance menu		2011.07.07 12:45		Status: Stop		Com=0	
Environment setup menu		Operation management		Test Print			
Excitation V update (Nozzle test)		View alarm history		Circulation control			
View software version		Comm. monitor		Password protection			

Start
up

Shut
down

Manual

Comm
On/Off

- 2** Press **Operation management**.

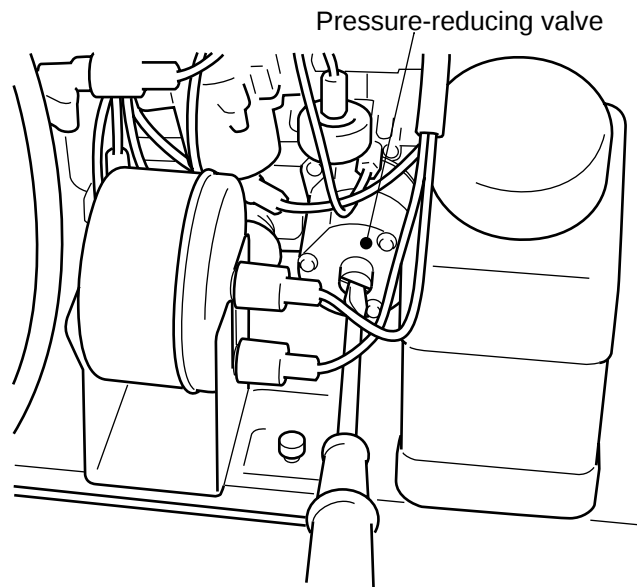
The "Operation management" screen then opens.

The standard pressure value varies with the ink type and nozzle diameter.

Operation management		2011.07.07 12:45		Status: Stop		Com=0	
Ink operating time		[0 0 0 0]		(hours)			
Ink alarm time		[1 2 0 0]		(hours ; standard value:1200)			
Cumulative op. time		0 0 0 0 0 0		(hours)			
Print count		[0 0 0 0 0 0 0 0]		(prints)			
Ink, makeup ink		JP-K27, TH-TYPE A					
Ink viscosity		100 (standard value:100)					
Ink pressure		0.260 (MPa ; standard value:0.260)					
Ambient temperature		20 (°C; range: 0~45)					
Deflection voltage		0.0 (k V)					
Excitation V-ref.		00 (0~19)					
Excitation frequency		68.9 (kHz)					

1	2	3	4	5	6	7	8	9	0
								Decre- ment	Incre- ment

- 3** Note the ink pressure reading. If it is outside the standard value range, open the maintenance cover and rotate the shaft at the center of the pressure-reducing valve with a flat-blade screwdriver.
Make adjustments so that the pressure reading is the standard value ± 0.002 .



To raise the pressure : rotate clockwise.
To lower the pressure: rotate counterclockwise.

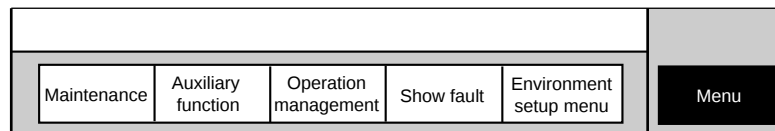
7.13 Excitation Setting Adjustment

(1) Overview

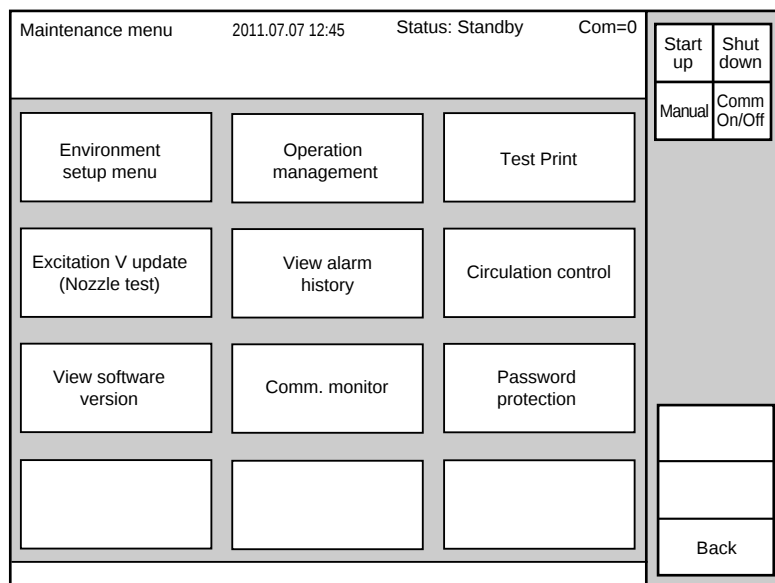
- Excitation V-ref. are from 0 to 19.
- To maintain good printing quality, it is necessary to input an optimum excitation V-ref..
- Conduct a nozzle property test, and set a center value in a range capable of good printing as the optimum excitation V-ref..
(ex.) In the case where the good printing is performed when the excitation V-ref. is 5 to 15 in the nozzle property test, the optimum excitation V-ref. is 10 at the center.
- An ambient temperature when updating the excitation V-ref. is stored as a reference temperature. If the difference between the ambient temperature and the reference ambient temperature exceeds a certain value, a warning "Excitation V-ref. Review" arises. Update the excitation V-ref. in that case.

(2) Operation

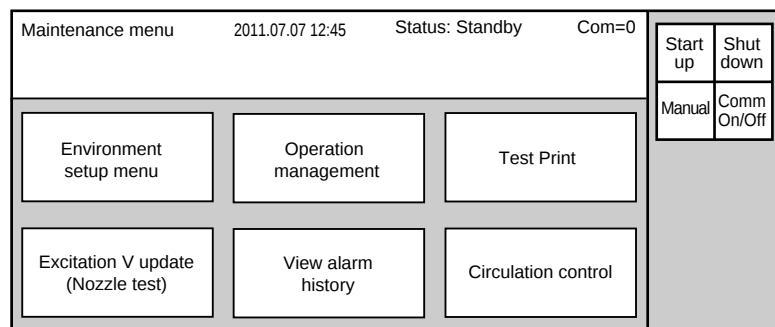
- 1** Press **Maintenance** from the menu.



The "Maintenance" screen then opens.



- 2** Press **Excitation V update (nozzle test)** .



Show cursor

The "Excitation V update" screen then opens.

Excitation V update

2011.07.07 12:45

Status : Standby

Com=0

Excitation V-ref.

[1] [1]

(0 ~ 19)

Ref. ambient temperature

23

(°C)

Automatic update

[2] (0: disable 1: Decrement 2: Increment)

Incremental change

[1] (1-9)

Print trigger source

[2] (1: Button input 2: Sensor)

Print data

[2] (1: For test 2: Data to be displayed)

Perform nozzle property test and find the optimum excitation voltage value.

1	2	3	4	5	6	7	8	9	0
								Decre-ment	Incre-ment

Start up	Shut down
Manual	Comm On/Off
	Show cursor

↑	←
↓	→

Nozzle test

Back

3 Set up the "Print trigger source".

Set up the timing for performing printing.

- 1: Button input → Print on "Start printing" on the control panel.
- 2: Sensor → Print on a sensor signal.

Print data can be set.

- 1: For test: Print will be performed automatically under the following conditions:

Number of lines : 1 line
Character size : 12 X 16 dots
Inter-character space : 1
Character height : 99
Character width : 5
Ink drop use percentage : 1/3
Print description : ■■nn123ABC
(nn shows excitation V-ref.)

- 2: Data to be display: Print will be performed in the print condition, and with content, currently set.

4 Verify that the printer is in "Standby" state. Press **Nozzle test**.

The "Nozzle property test" screen then opens.

```

Nozzle property test      2011.07.07 12:45      Status : Ready      Com=1

Excitation V-ref. [ 1 1 ] (0 ~ 1 9)
Ref. ambient temperature 2 3 (°C)

Automatic update [ 2 ] (0: disable 1: Decrement 2: Increment)
Incremental change [ 1 ] (1-9)
Print trigger source [ 2 ] (1: Button input 2: Sensor)
Print data [ 2 ] (1: For test 2: Data to be displayed)

Excitation V-ref. is printed on the print target.
[ ■ ■ n n . . . . . ]

Printing starts upon signal from sensor.
  
```

5 Set up test conditions of the "Nozzle property test."

① Set up "Excitation V-ref."

Enter the excitation V-ref. for printing.

② Set up "Automatic update"

Enter the condition for updating the excitation V-ref..

0 : Disable → The excitation V-ref. is manually updated.

1 : Decrement → The excitation V-ref. automatically counts down on printing each time.

2: Increment → The excitation V-ref. automatically counts up on printing each time.

③ Set up "Incremental change"

Enter a range of change in the excitation V-ref. on auto update.

6 Perform printing and check printing results.

① In the case where the "Print trigger source" is "1: Button input", press **Start printing**.

Excitation V-ref. is printed on the print target. [■■■■nn.....]	Abort
	Start printing
Printing starts at the press of [Start printing].	

② In the case where the "Print trigger source" is "2: Sensor", input the sensor signal.

- When printing, allow an interval from the previous printing.

7 Check the printing of the other excitation V-ref..

① In the case where the "Automatic update" is "0: disable":

Press the **Increment** and **Decrement** keys to change the excitation V-ref..

Nozzle property test 2011.07.07 12:45 Status : Ready Com=1	
Excitation V-ref. [1 1] (0 ~ 1 9)	
Ref. ambient temperature 2 3 (°C)	
Automatic update [2] (0: disable 1: Decrement 2 : Increment)	
Incremental change [1] (1-9)	
Print trigger source [2] (1: Button input 2: Sensor)	
Print data [2] (1: For test 2: Data to be displayed)	
Excitation V-ref. is printed on the print target. [■■■■nn.....]	↑ Decrement
	↓ Increment
Printing starts upon signal from sensor.	Abort

② In the case where the "Automatic update" is "1: decrement":

The excitation V-ref. automatically decrements by 1 each time the printing is performed.

[ex.] Number of printing times : 1st time → 2nd time → 3rd time
Excitation V-ref. : [11] → [10] → [09]

③ In the case where the "Automatic update" is "2: increment":

The excitation V-ref. automatically increases by 1 each time the printing is performed.

[ex.] Number of printing times : 1st time → 2nd time → 3rd time
Excitation V-ref. : [11] → [12] → [13]

8 Check the range capable of good printing.

- The optimum set value is the center value in the good printing range.
- Summarize the printing results as in the following table, and check excitation voltage capable of printing.

[ex.] Good printing range (5 to 15), optimum value (10)

Date	Ambient temperature	Excitation V-ref.																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
06.1.1	22°C			×	×	×	○	○	○	○	○	○	○	○	○	○	×	×	×

9 Press **Abort**.

The "Excitation V update" screen then opens.

10 Input the optimum value in the "Excitation V-ref.."

- The optimum set value is the center value in the good printing range.

Excitation V update
2011.07.07 12:45
Status : Standby
Com=0

Excitation V-ref. [1] (0 ~ 19)
Ref. ambient temperature 23 (°C)

Automatic update [2] (0: disable 1: Decrement 2: **Increment**)
Incremental change [1] (1-9)
Print trigger source [2] (1: Button input 2: **Sensor**)
Print data [2] (1: For test 2: **Data to be displayed**)

Perform nozzle property test and find the optimum excitation voltage value.

1	2	3	4	5	6	7	8	9	0
								Decre-	Incre-

Start up	Shut down
Manual	Comm On/Off
	Show cursor
↑	←
↓	→
Nozzle test	
Back	

11 To complete the set value update, press **Back** and return to the "Maintenance menu" screen.

⚠ CAUTION

- During the nozzle characteristic test, the condition of ink particle generation may deteriorate depending on the excitation V-ref., and an abnormality such as "Ink Drop Charge Too High" may arise and stop the ink. In such a case, clean the print head and then eject the ink again.
- During the nozzle property test, the continuous printing mode becomes invalid. You can print only once by inputting a signal once.
- During the nozzle property test, the product speed matching setting becomes invalid. Character width may be different from the reality.

7.14 Ink Drop Generation Status Checkout Procedure

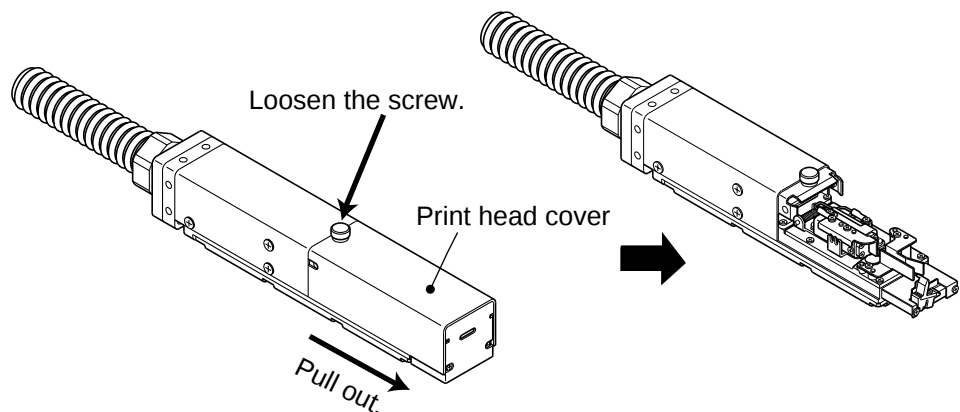
⚠ WARNING

- When checking the ink stream position, wear protectors (safety goggles and mask).
- If the ink or makeup ink should enter your eyes or mouth, immediately flush with warm or cold water and see a physician.
- Before ejecting the ink, ensure that there is no person in the direction of ejection. (The end of the print head must be placed in a beaker or the like.)

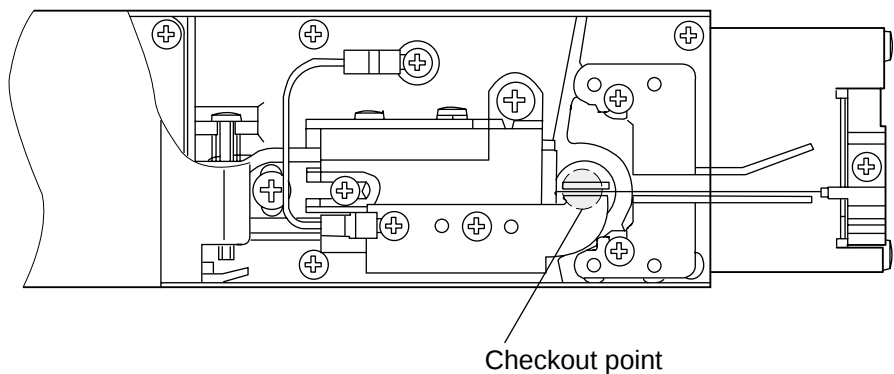
- The procedure set forth below must be performed during ink ejection.

1 Sequentially press the **Start up** key and **Ready** key to enter the "Ready" state.

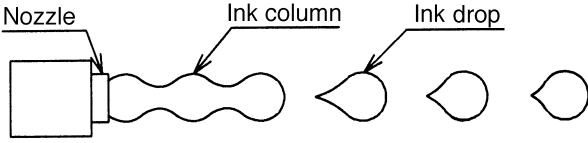
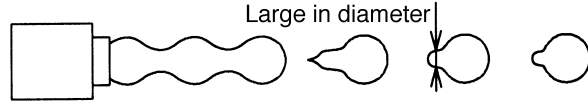
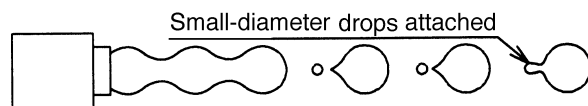
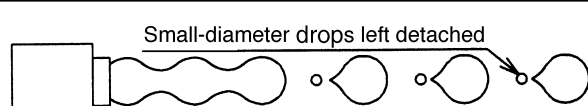
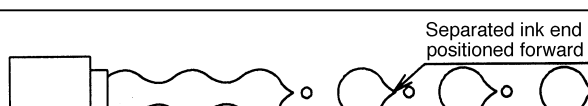
2 Loosen the screws, and then remove the print head cover.



3 With a magnifying glass, check how the ink drops are generated in the charge electrode.



Ink drop generation status checkout table

Ink drop shape	Judgment	Name	Remarks
	○	A mode	Good
	○	B mode	Superior
	○	High-speed small-diameter mode Two or fewer small-diameter drops	Adequate
	×	Constant-speed small-diameter mode	Poor
	×	Low-speed small-diameter mode	Poor

In the case where the ink drop shape is poor, update the set value with an optimum set value as in "7.13 Excitation Setting Adjustment" and check it again, or contact your local distributor.

- 4 After the checkout, mount the print head cover.

7.15 Long-term Shutdown

7.15.1 Process to be performed prior to long-term shutdown

(1) Overview

- This operation is storage work performed in the case where the IJ printer is shut down exceeding the term indicated in Table 1.
- The storage procedure for long-term shutdown is completed by draining the ink from the ink circulation system and cleaning it with the makeup ink.

Table 1 Storage temperature and Term

Storage temperature	Term	*1
0 to 35°C	3 weeks	10 days
35 to 40°C	2 weeks	7 days
40 to 45°C	1 weeks	5 days

*1 JP-K77, JP-K81 and JP-K86 See "1.2.1(4) j Caution of JP-K77, JP-K81 and JP-K86".

Notice

1. Store the printer at a temperature as low as possible.
2. This operation is not necessary in the case where the printer can be operated once during the term indicated in Table 1. Follow 1.2.5 "Cautions on operating time when printer is in service" as to the operating time in that case.

(2) Operating procedure

- 1** Open the "Circulation control" screen, and press the **Process prior to long-term shutdown** key and then the **Start/Continue** key.

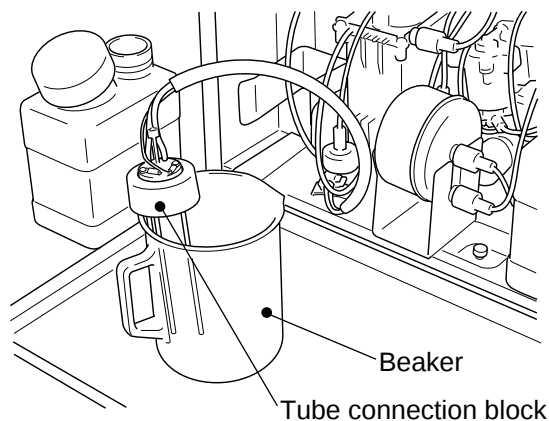
Circulation control			2011.07.07 12:45	Status: Stop
Eject ink (Goes to standby)	Cleaning stop	No-cleaning stop	Prev. menu	Next menu
Nozzle backwash	Gutter cleaning			
Ink replacement	Ink filter replacement	Ink circulation		
Process prior to long-term shutdown	Process after long-term shutdown	Makeup ink refill		
Select option; press [Start/Cont.]			Proc. status:	Cancel
				Start/ Continue

- 2** Perform **2** to **6** of the procedure in "7.5 Ink Replacement."
 - Follow the on-screen instructions for the operation.

3 Next, the following guidance appears.

Circulation control 2011.07.07 12:45 Status:Service		
Function : Process prior to long-term shutdown.		
Operating guide		
Place the ink reservoir tube connection block in a beaker charged with makeup ink. When ready, press [Start/Continue].		
Proc. time: Approx. 6 minutes.		
Proc. status:		
Ink drainage	Abort	
System-clean		
Ink drainage		
System-clean		
		Start/Continue

4 Drain the ink ejected into the beaker, clean the beaker and then put 50ml of the makeup ink and a tube connection block into the beaker.



! CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar. In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

5 Press the **Start/Continue** key.

- The following screen then opens and cleaning of the circulation system starts.

Circulation control 2011.07.07 12:45 Status:Service		
Function : Process prior to long-term shutdown.		
Proc. time: Approx. 6 minutes.		
Proc. status: In progress.		
Ink drainage	Abort	
System-clean		
Ink drainage		
System-clean		

- 6** When the predetermined period of time elapses, the following operating guidance appears.

Circulation control 2011.07.07 12:45 Status:Service	
Function : Process prior to long-term shutdown.	
Operating guide	
Place the ink reservoir tube connection block back into position. When ready, press [Start/Continue].	
Proc. time: Approx. 6 minutes.	
Proc. status:	
Ink drainage	
System-clean	
Ink drainage	
System-clean	
Abort	
Start/Continue	

- 7** Mount the tube connection block on the ink reservoir, and then mount it into the printer.
- Be careful not to break the tube when mounting it into the printer.
- 8** Repeat the operations of **2** to **7** .
(Perform the ink drainage to cleaning of the circulation system twice in total.)
- 9** Mount the nozzle rubber seal.
- Mount the "nozzle rubber seal" between the charge electrode and the orifice plate.

Notice
1. Before installing the nozzle rubber seal, be sure to thoroughly clean it with the makeup ink.
2. When installing the nozzle rubber seal, exercise care not to deform the charge electrode.

The procedure to be performed prior to long-term shutdown is now completed. The circulation system is now charged with the makeup ink. When starting up the printer after a long-term shutdown, be sure to perform the "7.15.2 Startup process to be performed after long-term shutdown."

7.15.2 Startup process to be performed after long-term shutdown

(1) Overview

- This operation is the work for draining the makeup ink which cleaned the ink circulation system at the long-term shutdown of the IJ printer and refilling it with the ink.
- To completely drain the makeup ink from the circulation system, you should charge the circulation system with the ink, drain the ink, and fill the ink again into the system.

(2) Operating procedure

1 Remove the nozzle rubber seal.

2 Press the **Ink stream alignment** key and then the **Start/Continue** key.

Notice

1. ck to see that the makeup ink is ejecting from the nozzle.
If not ejecting, repair it according to "Table 1. Repairing the printer after the long-term shutdown."
2. If it is ejecting, check the stream position. See "7.7 Adjusting the Ink Stream Position" for the method.

3 Open the "Circulation control" screen, and press the **Process after long-term shutdown** key and then the **Start/Continue** key.

Circulation control			2011.07.07 12:45		Status: Stop	
Eject ink (Goes to standby)	Cleaning stop	No-cleaning stop	Prev. menu Next menu			
Nozzle backwash	Gutter cleaning					
Ink replacement	Ink filter replacement	Ink circulation				
Process prior to long-term shutdown	Process after long-term shutdown	Makeup ink refill				
Select option; press [Start/Cont.]			Proc. status:		Cancel	
					Start/Continue	

4 Follow the on-screen instructions for the operation.

- Repeat the same procedure as in "7.5 Ink Replacement" twice.

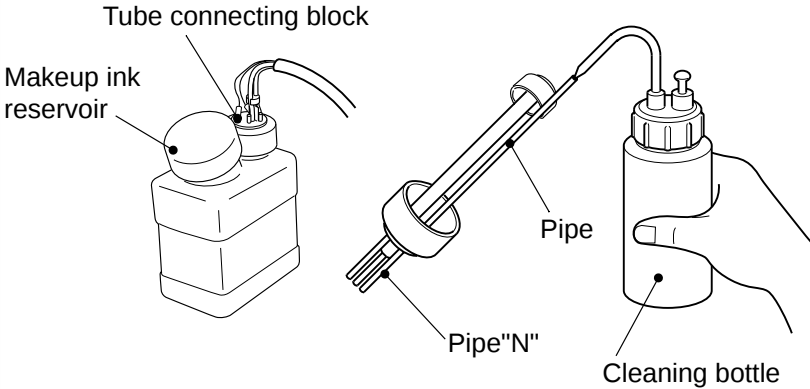
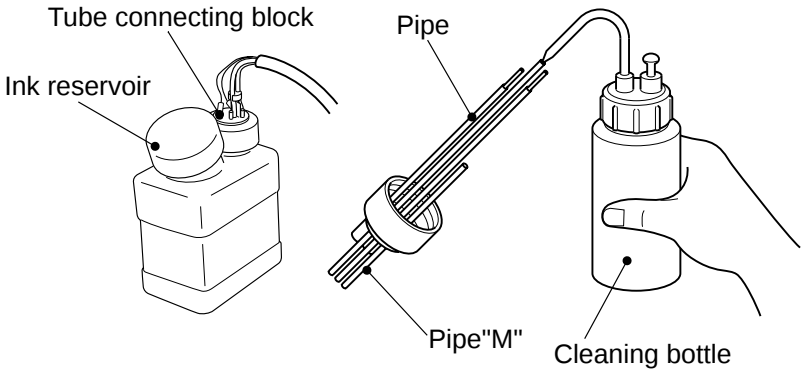
Notice

In the case where you cannot perform the drainage or refill of the ink, repair it according to "Table 1. Repairing the printer after the long-term shutdown."

- 5** Upon completion of the second ink refilling sequence, the "Circulation control" screen opens again.

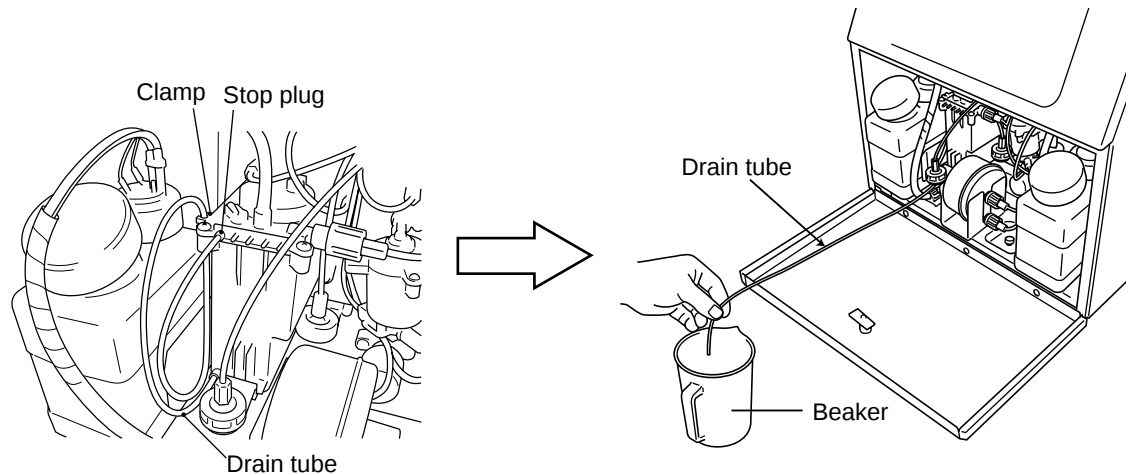
The startup process to be performed after long-term shutdown is now completed.

Table 1 Repairing the Printer after long-term shutdown

Symptom	Repair
No makeup ink comes out from the nozzle.	① Remove the tube connecting block from the makeup ink reservoir. ② Execute the makeup ink refill step. ③ While this step is in progress, put the nozzle of the cleaning bottle containing the makeup ink in the end of a pipe that is connected to pipe "N" and press the body of the cleaning bottle to let the makeup ink flow into the pipe. ④ If the makeup ink flow into the pipe "N", repairing is completed. 
The ink cannot be disposed of or filled up.	① Empty the main ink tank. (See Section 7.16, Draining the Ink from the Main Ink Tank.) ② Execute the Ink refill step. ③ While this step is in progress, put the nozzle of the cleaning bottle containing the makeup ink in the end of a pipe that is connected to pipe "M" and press the body of the cleaning bottle to let the makeup ink flow into the pipe. ④ If the makeup ink flow into the pipe "M", repairing is completed. 

7.16 Draining the Ink from the Main Ink Tank

- If the main ink tank too full fault occurs, the touch panel keys become inoperative. Remove the main ink tank drain tube as shown below to drain the ink in the tank by approximately 50cc. After that, return it to its original position.
- Before replacing the JP-Y37 ink (or 6 months after the ink is replenished), perform this operation and make sure that the ink can be drained. If the ink cannot be drained, execute the long-term shutdown process, referring to "7.15 Long-term Shutdown", to remove any accumulated sediment. If the sediment cannot be removed, replace the main ink tank: When replacing the main ink tank, contact your local distributor.



- After the plug is returned to its original position upon completion of ink drainage, perform ink recharging as directed in Section 7.5, Ink replacement .

If you start operation without refilling the ink, a "Replenishment Time-out" fault will occur. When this happens, cancel the error using the **Clear** key and then turn on the "Ink Refill".

CAUTION

If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar.

In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.

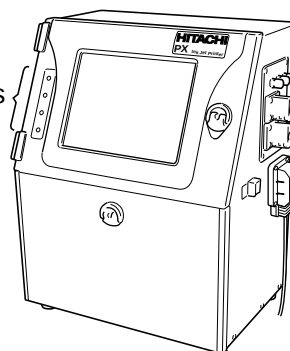


8. If a Warning Condition/ Fault Occurs

8.1 Indications Given When a Warning Condition/Fault Occurs

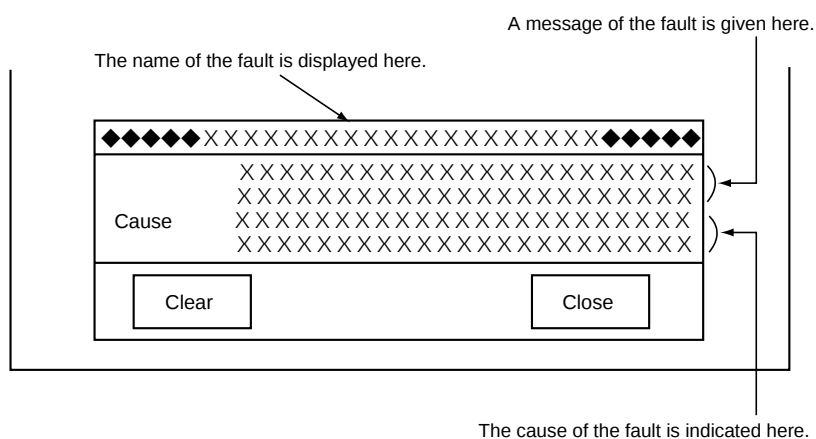
- When a warning condition or fault occurs, the warning or fault lamp comes on.

Operating status indicator lamps



- A confirmation message appears to indicate an operating error or to prompt for process judgment.
- If any "fault" occurs to incur a printing failure while the LCD backlight is extinguished or if a "warning condition" occurs and calls for maintenance although it does not invoke any printing failure, a window opens to display a fault message or warning message.
- The following on-screen indications are given.

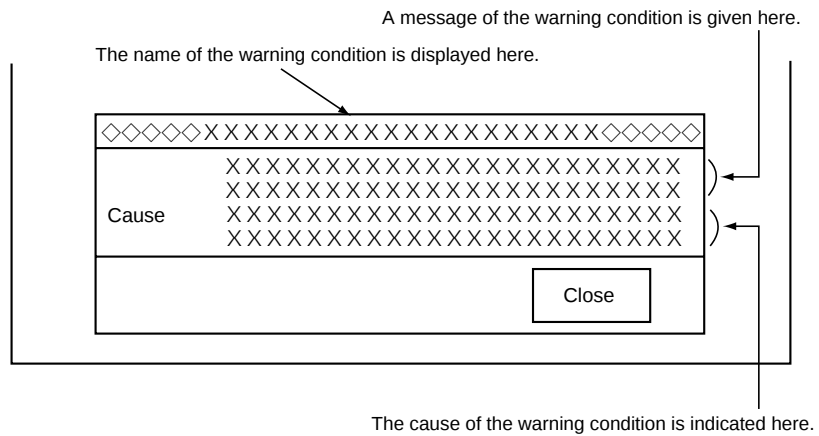
① If a fault occurs



Entering a reset signal will execute the same action. (See Section 1.5.3-9, Input for remote control signals.)

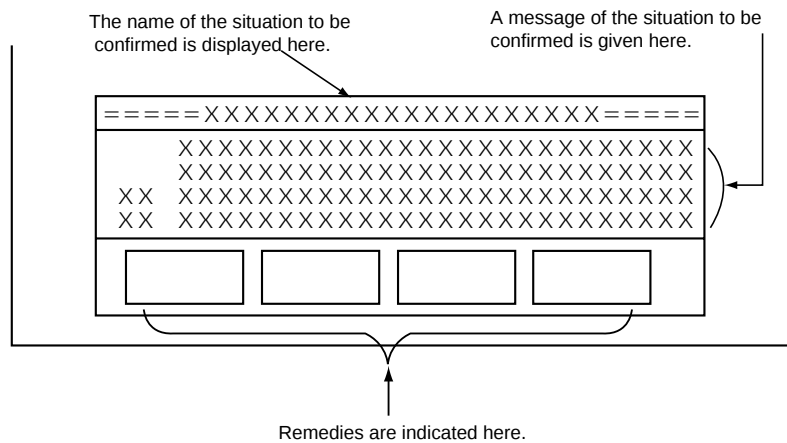
- When you press **Clear** after eliminating the cause, the fault condition clears and the message disappears.
- When you press **Close**, the fault window clears but the fault condition persists.
- However, if the fault condition does not exist any longer, only the **Close** key is displayed.

② If a warning condition occurs



- When you press **Close**, the alarm window clears but the warning condition persists. The alarm display area (see the figure above) indicates the warning condition name.
- When the warning condition is cleared, the warning indication automatically goes off.

③ If an operating error occurs or the system prompts for process judgment



- The contents of confirmation messages are described together with the associated operating procedures.

8.2 On-screen Message Descriptions

8.2.1 Fault messages

(1) Faults that invoke ink stoppage

* : After cleaning, wipe off the makeup ink well from the surface of each component with a piece of wiping paper. Then, dry the surfaces.

No.	Message	Meaning of message	Remedy
1	Ink Low Fault	The ink level in the ink reservoir is too low. (If the ink is not added or replaced within 60 minutes after warning output, the printer comes to a stop with the warning condition replaced by a fault condition.)	• Add ink to the ink reservoir.
2	Main Ink Tank Too Full	The ink level in the main ink tank is unduly high.	• Drain the ink from main ink tank drain tube. ( page 7-45). • In addition, to ensure normal ink density, perform "Ink replacement".
3	Makeup Ink Low Fault	The makeup ink level in the makeup ink reservoir is too low (if replenishment is not effected within 60 minutes after warning output)	• Add the makeup ink to the makeup ink reservoir.
4	Replenishment Time-out	The automatic replenishment sequence is taking too much time.	• Contact your nearest local distributor.
5	Ink Drop Charge Too Low	The ink drops are poorly charged, with too low charge.	• Clean the gutter, deflection electrode, and its surroundings. • Adjust the excitation setting to make sure that the ink drops are well made. • Adjust ink pressure.
6	No Ink Drop Charge	The ink drops are not electrically charged.	• Check if the ink stream is at about the center of the gutter. • Clean the gutter, deflection electrode, and its surroundings. • Adjust the excitation V-ref. to make sure that the ink drops are well made. • Check the ink pressure.
7	Noise Fault M	The engine section malfunctioned due to noise.	• Turn the power OFF and then back ON.
8	Noise Fault S	The engine section malfunctioned due to noise.	• Turn the power OFF and then back ON.
9	Deflection Voltage Leakage	The deflection electrode voltage is too low.	• Dry the deflection electrode and its surroundings.
10	Deflection Voltage Fault	The high-voltage power supply output voltage is too low or too high.	• Contact your nearest local distributor.

No.	Message	Meaning of message	Remedy
11	DC Power Supply Fan Fault	The power supply section is faulty.	● Contact your nearest local distributor.
12	Charge Voltage Fault	The charge electrode is shorted.	● Check that there is no short-circuit with another part.
13	Internal Communication Error S	Data processing within the engine section is faulty.	● Turn the power OFF and then back ON.
14	F memory Fault M	The engine section hardware is faulty.	● Contact your nearest local distributor.
15	F memory Fault 9	The engine section hardware is faulty.	● Contact your nearest local distributor.
16	F memory Fault S	The engine section hardware is faulty.	● Contact your nearest local distributor.
17	Hardware Error C	The controller section hardware is faulty.	● Contact your nearest local distributor.
18	Ink Heating Too High	The ink heating section is faulty.	● Contact your nearest local distributor.
19	Heating Unit Sensor Fault	The ink heating section is faulty.	● Contact your nearest local distributor.
20	Ink Heating Current Fault	An overcurrent flowed to the heating unit.	● Contact your nearest local distributor.
21	Ambient Temperature Sensor Fault	There is an open in the ambient temperature sensing element.	● Contact your nearest local distributor.
22	Viscometer Temperature Sensor Fault	Fault in ink temperature detected by viscometer occurred.	● Contact your nearest local distributor.
23	Pump Motor Fault	Pump motor is faulty.	● Contact your nearest local distributor.
24	Cooling Fan Fault	Cooling fan is defective.	● Contact your nearest local distributor.

(2) Faults that do not invoke ink stoppage

No.	Message	Meaning of message	Remedy
1	Print Overlap Fault	The next print start signal entered before the current printing operation was completed.	● If the printing frequency is high, lower it. ● If the print start signal chatters, perform sensor filter setup.
2	Cover Open	The print head cover is open.	● Remove the cover and then hit the [Clear] key. ● If a magnetic substance is used to fix the cover, it must be replaced with nonmagnetic resin (metal).
3	Improper Sensor Position	While the "signal ON period" mode was selected for continuous printing, the print start signal turned OFF before anything was printed.	● Shift the sensor closer to the nozzle head. ● If the print start signal chatters, eliminate its cause.
4	Target Sensor Fault	The duration of sensor light blockage exceeded the "target sensor timer" setting.	● If the print target is stopped with the sensor ON, remove the print target. ● Review the target sensor timer setting.
5	Target Spacing Too Close	Five or more print targets were placed between the sensor and nozzle head in the noncontinuous print mode.	● Position the sensor closer to the nozzle head so that no more than four print targets can enter between the sensor and nozzle head.
6	Print Data Changeover In Progress S	The IJ printer entered the printing state during a print specifications/print format changeover.	● Do not make prints during print specifications/print format changeover.
7	Print Data Changeover In Progress C	The IJ printer entered the printing state during a print specifications/print format changeover.	● Do not make prints during print specifications/print format changeover.
8	Print Data Changeover In Progress M	The IJ printer entered the printing state during a print specifications/print format changeover.	● The printing frequency is too high. Increase the time intervals between each printing operation.
9	Print Data Changeover In Progress V	The IJ printer entered the printing state during a print specifications/print format changeover.	● The printing frequency is too high. Increase the time intervals between each printing operation.
10	Blank Print Items	All the print contents are not set up or the input data for EAN-13 bar code is not 10 digits.	● Review the setup of print contents and ensure that there is no entirely invalidated line.
11	Excessive Format Count	The number of print format types exceeded 4.	● Perform setup so that the number of print format types does not exceed 4.
12	Substitution Character Undefined	The calendar condition substitution rules are not set up.	● Set up the calendar condition substitution rules.

No.	Message	Meaning of message	Remedy
13	Ink Drop Charge Too High	The value of the signal that detects the ink drop charge is too high.	● Clean the gutter, deflection electrode, and its surroundings. ● Adjust the excitation V-ref. to make sure that the ink drops are well made. ● Adjust the ink pressure. ● Check that the ink stream is correctly retracted.
14	Internal Communication Error C	Data processing within the engine section is faulty.	● Turn the power OFF and then back ON.
15	Internal Communication Error M	Data processing within the engine section is faulty.	● Turn the power OFF and then back ON.

8.2.2 Warning messages

No.	Message	Meaning of message	Remedy
1	Ink Low Warning	The ink level in the ink reservoir is too low.	● Add ink within 60 minutes ( page 7-6).
2	Makeup Ink Low Warning	The makeup ink level in the makeup ink reservoir is too low.	● Add the makeup ink within 60 minutes ( page 7-7).
3	Ink Shelf Life Exceeded	The cumulative ink ejection time exceeded the preselected alarm time.	● Replace the ink ( page 7-8).
4	Operating Temperature Too High	The ambient temperature is higher than the upper-limit operating temperature.	● Ensure that the ambient temperature is within the operating temperature limits.
5	Operating Temperature Too Low	The ambient temperature is lower than the lower-limit operating temperature.	● Ensure that the ambient temperature is within the operating temperature limits.
6	Ink Heating Too Low	The ink heating section is faulty.	● Contact your nearest local distributor.
7	External Communication Error nnn	The external communication function is not normally exercised.	● Note the error code and see that no more errors occur.
8	Battery Low	The built-in battery voltage is too low.	● Contact your nearest local distributor. ● When making prints, set the correct calendar time again from the date/time setup screen ( page 4-10).
9	Product Speed Matching Error	Next speed synchronization signal is entered while printing is turned on by the previous speed synchronization signal.	● Expand the interval between the speed synchronization signals or decrease the dividing ratio.
10	Ink Pressure Low	Ink pressure value is not at the proper level.	● Operate the pressure-reducing valve to adjust the pressure.
11	Ink Pressure High	Ink pressure value is not at the proper level.	● Operate the pressure-reducing valve to adjust the pressure.
12	Viscosity Reading Instability	Measurement results of viscometer vary.	● Contact your nearest local distributor.
13	Viscosity Readings Out of Range	Viscometer does not function normally.	● Contact your nearest local distributor.
14	High Ink Concentration	Ink concentration is high.	● Ink concentration is now adjusted to normal level. If print quality is still poor, replace ink with a new one. ( page 7-8)
15	Low Ink Concentration	Ink concentration is low.	● Ink concentration is now adjusted to normal level. If print quality is still poor, replace ink with a new one. ( page 7-8)
16	Excitation V-ref. Review	Excitation V-ref. needs to be reviewed.	● Find out optimum excitation V-ref. on nozzle property test screen, and update the old excitation V-ref.. ( page 7-34)

8.2.3 Other messages

No.	Message	Meaning of message	Remedy
1	Viscometer not Calibrated	The viscometer needs to be calibrated.	● Contact your nearest local distributor.
2	Ink Temperature Correction Notice	The selected setup does not allow ink temperature corrections to be made.	● Contact your nearest local distributor.
3	No Ink Concentration Control	The current settings have made ink concentration control unavailable.	● Contact your nearest local distributor.
4	Print Data/Settings Notice	Recent changes to print data and printer settings may have been lost. In the previous session, power was cut OFF suddenly.	● Check print contents and each setting value.
5	Storage Media Error	An error occurred when data was written to/from the storage media.	● Replace memory with new one.

8.3 Confirming the Warning Condition and Fault Occurrences

(1) Overview

- You can confirm the time and descriptions of warning condition/fault message generations.
- Up to 90 warning condition/fault message generations can be displayed.
- If the number of message generations exceeds 90, the oldest message is erased.

(2) Operating procedure

Maintenance menu			2011.07.07 12:45	Status: Standby	Com=0	Start up	Shut down
						Manual	Comm On/Off
Environment setup menu	Operation management	Test print					
Excitation V update (Nozzle test)	View alarm history	Circulation control					
View software version	Comm. monitor	Password protection					
						Back	

- 1 While the Maintenance menu screen is displayed, press **View alarm history**.

The following screen then opens to list warning condition/fault occurrences.

View alarm history			2011.07.07 12:45	Status: Standby	Com=0	Start up	Shut down
						Manual	Comm On/Off
Fault / warning log							
No	Date/time		Name of alarm				
01	2005/05/10 12:34	81	Ink Low Warning				
02	2005/05/10 12:40	49	Print Overlap Fault				
03	2005/06/30 23:59	82	Makeup Ink Low Warning				
04	2005/07/05 00:00	50	Cover Open				
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
						Prev. list	Next list
						Back	

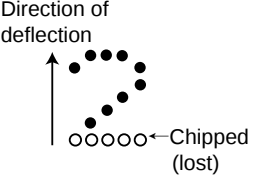
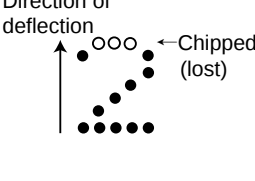
- If there are sixteen or more occurrences, press **Next list** to view the hidden listings. Pressing **Previous list** returns you to the initial screen.

- 2 Press **Back**.

The system then returns you to the "Maintenance menu" screen.

8.4 Remedial Action to Be Taken in the Event of a Printing Failure

- If a printing failure occurs, perform the associated remedial procedures suggested below.
- If the remedial procedures below do not achieve recovery, it is conceivable that the problem is attributable to a PC board or circulation system failure. In such an instance, contact your nearest local distributor.

No.	Printing failure description (phenomenon)	Probable cause	Solution	Reference page
1	Chipped print (minus deflection electrode side) 	Ink and foreign matter are stuck to the gutter.	• Clean the gutter. • Replace the recovery filter.	7-21 7-29
		Ink and foreign matter are stuck to the charge and deflection electrodes.	• Clean the charge and deflection electrodes.	2-5
		Ink and foreign matter are stuck to the ink ejection port.	• Remove the ink and foreign matter.	—
		The ink stream is improperly positioned.	• Adjust the ink stream.	7-19
		The ink pressure is too high.	• Adjust the ink pressure for the standard value.	7-32
		The ink has deteriorated.	• Replace the ink.	7-8
2	Chipped print (plus deflection electrode side) 	Ink and foreign matter are stuck to the charge and deflection electrodes.	• Clean the charge and deflection electrodes.	2-5
		Ink and foreign matter are stuck to the ink ejection port.	• Remove the ink and foreign matter.	—
		The flow within the nozzle is restricted.	• Backwash the nozzle.	7-15
		The character height setting is too great.	• Decrease the character height setting.	3-35
		The ink pressure is too low.	• Adjust the ink pressure for the standard value.	7-32
		The ink has deteriorated.	• Replace the ink.	7-8
3	Varying character height	The clearance between the print head and print target has changed.	• Adjust the clearance between the print head and print target.	—
		Ink and foreign matter are stuck to the charge and deflection electrodes.	• Clean the charge and deflection electrodes.	2-5
		Ink and foreign matter are stuck to the ink ejection port.	• Remove the ink and foreign matter.	—

No.	Printing failure description (phenomenon)	Probable cause	Remedy	Reference page
3	Varying character height	The flow within the nozzle is restricted.	● Backwash the nozzle.	7-15
		The ink pressure has changed.	● Adjust the ink pressure for the standard value.	7-32
		The ink has deteriorated.	● Replace the ink.	7-8
4	Disordered characters	There are water, oil, or other deposits on the print target surface.	● Make prints with the print target clear of deposits.	—
		The ink pressure has changed.	● Adjust the ink pressure for the standard value.	7-32
		Ink and foreign matter are stuck to the charge and deflection electrodes.	● Clean the charge and deflection electrodes.	2-5
		The flow within the nozzle is restricted.	● Backwash the nozzle.	7-15
		The ink has deteriorated.	● Replace the ink.	7-8
		The excitation V-ref. value is improper.	● Adjust the excitation V-ref..	7-34



9. Troubleshooting Guide

If the printer does not normally start up, perform the following checks before you jump to the conclusion that the printer is defective.

Phenomenon	Check	Solution
The power does not turn ON at the press of the power ON/OFF switch.	• Check that the power plug is properly connected to a power outlet. • Check that electrical power is supplied to the employed power outlet.	• Turn OFF the power switch. Ensure that power is supplied the power outlet, and then connect the power plug to the power outlet.
Pressing a key does not invoke its predefined operation.Or the key is not accepted.	• See Section 5.4, Calibrating the Touch Screen Coordinates. • See Section 1.2.10, Protection Sheet for touch panel.	
The calendar time is not correctly printed.	• Check that "clock stop" is not selected from the date/time setup screen. (See Section 4.3, Setting the Date and Time.)	• Select the "same as current time" option. (See Section 4.3, Setting the Date and Time.)
The printer does not become ready for printing at pressing the Start up key.	• Check for an ink stream ejection from the nozzle. • Check whether the ejected ink stream enters the gutter hole.	• Stop the ink ejection sequence by pressing the Shut down key. • See Section 7.6, Correcting a Bent Ink Stream and Clogged Nozzle, and correct the problem.
A fault message is displayed.	See Section 8, If a Warning Condition/Fault Occurs.	
Entering a remote control signal will not cause the system to function.	• Is the confirmation window on? • Is the Touch screen coordinate on? • Is the circulation control screen on?	• Close the window or display another screen, then enter a signal again.

CAUTION

- If the above remedies do not restore the printer to normal, stop using the printer, disconnect the power plug from the power outlet, and contact your Hitachi distributor.



■ Report the following to your local source or service company:

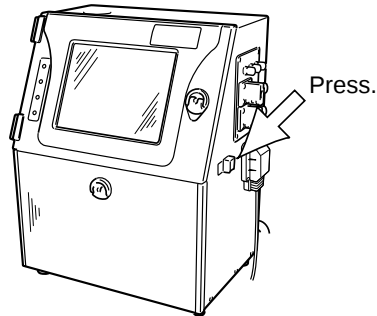
1. TYPE-FORM (model number) ————— IJ printer Model PXR-□□□□
2. SER. No. (serial number) ————— PXR□□□□□□□□
3. Failure description ————— In detail
4. Organization name (department and section names included), name of person in charge, and telephone number

* The model number and serial number are marked on the nameplate that is attached to the right-hand side of the printer.



10. Emergency Procedures

Press the power ON/OFF switch to turn OFF the power.



WARNING

- If an earthquake, fire, or other emergency arises while the printer is making prints or otherwise energized, turn OFF the power by pressing the power ON/OFF switch. Never perform this procedure except in case of emergency.



- Immediately after the emergency is cleared, press the power ON/OFF switch to turn the power back ON and press the **Start up** key to initiate ink ejection.
- If the emergency seems to persist for a period of 5 minutes or longer, open the print head cover, and clean the orifice plate and its surrounding parts and gutter section by pouring makeup ink over them.
When resuming an operation, thoroughly clean the orifice plate and its surrounding parts and gutter section by pouring makeup ink over them, and then initiate ink ejection.
- If the power supply is shut off by a power failure, perform the same procedure as indicated above.



CAUTION

In the event of a power failure

- ① When you use the printer after power restoration, be sure to confirm the printings and other setup data beforehand. If you find any incorrect printings or setup data, correct it.
- ② Note that the count update information for printing is not saved in memory. When you use the printer after power restoration, it is necessary to set the count update information (initial value data) again.



11. Specifications

11.1 Printer Specifications

Specifications			Model	
			PXR-D2*0W	PXR-D4*0W
Maximum number of print lines			2	4
Print characters and line	● The print line count and character size combinations are restricted according to character heigh limitations.	240 charcters × 1 line	○	○
		120 charcters × 2 lines	○	○
		80 charcters × 3 lines	—	○
		60 charcters × 4 lines	—	○
Character size (width x height)	● The character sizes for printing can be selected as desired from the listings.	5×5	1 or 2 lines	1 to 4 lines
		5 × 8 or 5 × 7		1 to 3 lines
		7×10 or		1 to 4 lines
		9×7,9×8		
	● Differing character sizes can be simultaneously used.	12×16	1 line	1 to 2 lines
		18×24	—	1 line
		24×32	—	1 line
Maximum printing speed (characters/second) (5×5; inter-character space: 1dot; in the case of 1-line printing)			2296 (65 μ m nozzle machine) 1514 (40 μ m nozzle machine) 486 (100 μ m nozzle machine)	
Print character types (standard)	Basic characters	● Alphabetical characters, numerals, katakana characters, general symbols (27 types), and space:171 types in total ● Dedicated characters: 24 types in total (7 ×10 and 5 × 7 only; Manufacturer, Year, Month, Day, Best, Term, etc.) ● Punctuation characters: 7 types in total including general symbols and space	○	
	User pattern characters	● 128 characters for each dot matrix	○	
Speed compensation control			○	
Count item			8 items	
Calendar items and elapsed-number-of-days items (total)			8 items	
Bar-code printing		code39, ITF, NW-7, EAN-13,data matrix, code128	○	
Data storage types			150 types	
Display unit		10.4-inch backlit LCD	Color display	
External communication function		RS232-C serial interface (38,400 bps max) Half-duplex communication, Asynchronous, Bit serial transfer, ASCII code compliant, Printings transmission and data message recall transmission, user pattern character transmission, print condition transmission	○	
Input restriction function (password function)			○	
Print head directivity			All directions	
Print head cable length (m)			4m	
Ambient temperature (JP-K67, JP-K69)			0 to 45℃ (65 μ m nozzle machine) 0 to 35℃ (40 μ m nozzle machine) 0 to 35℃ (100 μ m nozzle machine)	
Humidity			30~90% RH (non-condensing)*	
Primary power supply	Input voltage		AC100 to 120V/200 to 240V±10%	
	Power frequency		50/60Hz	
	Power consumption		150VA	
	Grounding		Necessary	
Corrosive gas			There must be no corrosive gas.	
Outside dimensions			See Section 13.1, Outside Dimensions.	
Weight			Approx. 25 kg (operating control/indicator section + circulation mechanism section)	
Cabinet			Stainless hair-line finish IP55	

* When humidity is 85 to 90%RH, please purge inside of print head by dry air.

11.2 Ink Specifications (JP-K67 Specifications)

- (1) Color: Black
- (2) Prime solvent: Methyl ethyl ketone (MEK)
- (3) Use: Common plastics, paper, metal, glass, film, etc.
- (4) Light resistance: No color fading occurs when accelerated light resistance testing is conducted with a sunshine carbon weather meter for a period of 150 hours (equivalent to 1-year exposure to sunshine).
- (5) Drying property: The drying time is about 1 to 2 seconds.
- (6) Adhesive property: The adhesive property varies with the printed surface condition. For confirmation purposes, view the sample prints (contact your Hitachi distributor).
- (7) Operating temperature range: See Section 1.2.1, "Notes on ink and makeup ink"
- (8) Replacement periods
 - Operating hours: 600 to 1200 hours
 - Period: 6 months
 - *1 The ink must be replaced every 600 to 1200 hours of operation or six months, whichever occurs first.
 - *2 Use the above values as a replacement guide only. The replacement periods vary with the operating environment (temperature, humidity, dust, etc.).
- (9) Other
 - Inks contain organic solvents. So, they must be managed in compliance with all appropriate regulations.
 - Inks must be stored as flammable liquids. Storage must comply with local regulatory requirements. Consult the appropriate regulatory agency for further information.
 - The ink must be hermetically sealed and stored in a cool dark place(0 to 20 °C).
 - Waste disposal must comply with all appropriate regulations. Consult the appropriate regulatory agency for further information. Their empty containers must also be disposed of in the same manner.
 - Before using or handling ink, read the Material Safety Data Sheet(MSDS). MSDS is available from your Hitachi distributor upon request.



12. Maintenance

- To maintain the IJ printer in an optimum operating condition, it is necessary to perform the following maintenance programs.
- If you use the JP-K31A, you have to perform maintenance programs other than stated below. See "(4) Ink differences and handling precautions" (1.2.1 Notes on ink and makeup ink).

(1) Consumables replacement

Periodically replace the following filters.

No.	Consumable	Approximate replacement intervals	Replacement procedure reference section
1	Ink filter	2,400 hr	"7.9 Ink Filter Replacement"
2	Circulation filter	2,400 hr	"7.11 Circulation Filter Replacement"
3	Recovery filter	1,200 hr	"7.10 Recovery Filter Replacement"
4	Air filter	2,400 hr	See the next page.

- Operating time of 2400 hours is equivalent to a 1-year operation that is performed 8 hours a day, 25 days a month.
- The minimum retention periods of replacement parts (including consumable parts) are 7 years after closing manufacturing.
- When you order consumable parts, inform the parts name and the parts code.

No.	Consumable	Parts name	Parts code	Note
1	Ink filter	Ink filter parts	451590	Nominally 10 μ m
2	Circulation filter	PTFE filter 20 pack 2	451487	2 pieces/1 pack
3	Recovery filter	Nozzle flat filter 75	451037	
4	Air filter	Air filter parts	451594	3 pieces/1 pack

(2) Other maintenance programs

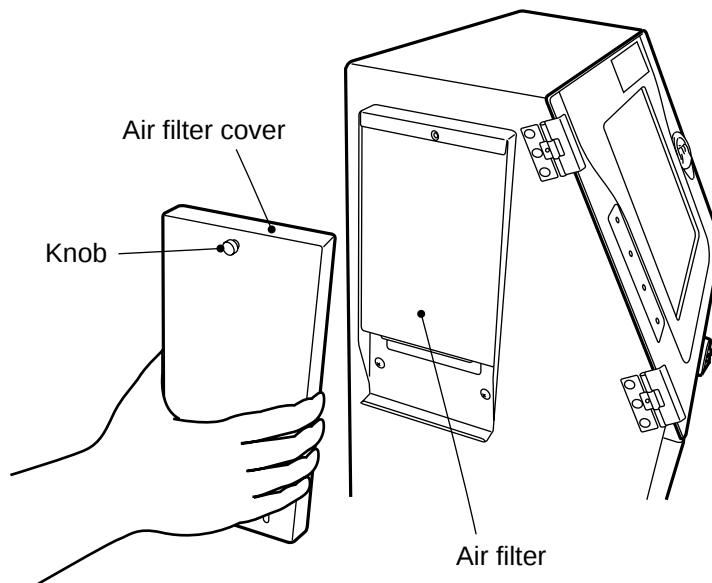
- a. Check for abnormal sound generation from the pump at about 1-week intervals.
- b. Before verifying the print results at the beginning of each day's operations, check that the pressure value is optimal. (For the verification procedure, see Section 7.12, Pressure Adjustment.)
- c. For ink drop and excitation voltage checkout, see Section 7.13, Excitation Setting Adjustment, and Section 7.14, Ink Drop Generation Status Checkout Procedure.

(3) Parts to be replaced periodically

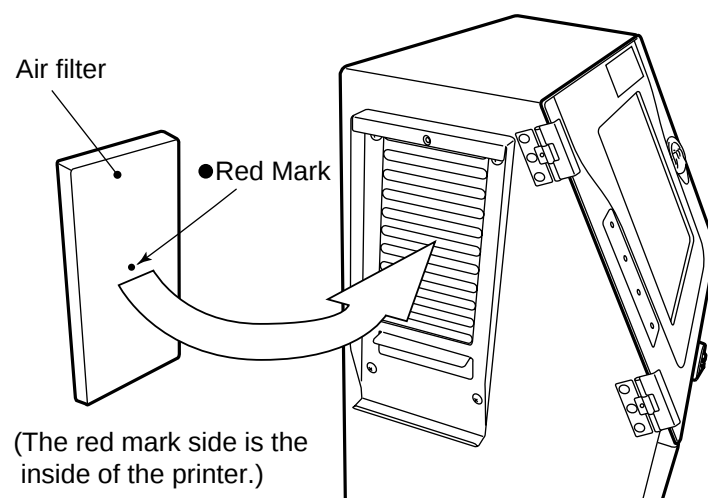
The clock battery, circulation system parts (pump, solenoid valve, etc.), and heating unit need periodic replacement. Consult your Hitachi distributor.

Air filter replacement procedure

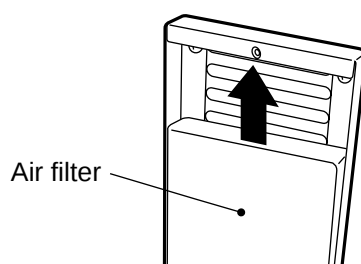
- 1 Loosen the knob and remove the air filter cover.



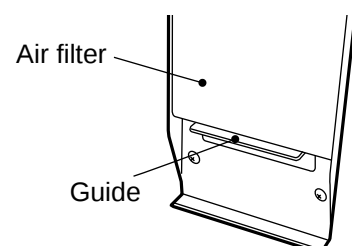
- 2 Remove the air filter, and place a new filter, making sure the orientation is correct.



- (1) First insert the top of air filter.



- (2) Place the bottom of air filter on the guide.



Ink and makeup ink part code numbers

Ink		Makeup ink	
Type	Part code numbers	Type	Part code numbers
JP-K27	451172	TH-TYPE A	451174
JP-K28	451173	TH-TYPE A	451174
JP-K26	451171	TH-TYPE B	451193
JP-R27	451233	TH-TYPE A	451174
JP-B27	451234	TH-TYPE C	451323
JP-G27	451250	TH-TYPE A	451174
JP-K33	451313	TH-18	451022
JP-K31A	451387	TH-TYPE E	451386
JP-Y37	451385	TH-TYPE E	451386
JP-K60	451509	TH-60	451510
JP-K61	451511	TH-23	451049
JP-K62	451512	TH-18	451022
JP-F63	451513	TH-63	451514
JP-T64	451515	TH-18	451022
JP-K65	451516	TH-65	451517
JP-R65	451562	TH-65	451517
JP-K67	451533	TH-TYPE A	451174
JP-K68	451539	TH-TYPE F	451540
JP-K69	451596	TH-69	451597
JP-K70	451650	TH-70	451651
JP-T71	451652	TH-71	451653
JP-K72	451666	TH-18	451022
JP-T75	451678	TH-75	451679
JP-R76	-	TH-76	-
JP-K77	-	TH-77	-
JP-E78	-	TH-78	-
JP-F80	-	TH-80	-
JP-K81	-	TH-81	-
JP-B82	-	TH-82	-
JP-K84	451737	TH-84	451738
JP-K86	451741	TH-86	451742
JP-K87	451745	TH-18	451022

Notice

The ink which you can use differs with areas.
Please confirm ink which you can use to each area's distributors.

Descriptions of maintenance services

Your Hitachi ink jet printer is warranted against defective material or workmanship for a period of one year or 2400 run hours from the date of purchase (free of charge). In the event of any of the failures listed below, repairs will be charged even within the warranty period.

- (1) Failures caused by abnormal use or operation (operation not stated in the operation manual)
- (2) Failure caused by the use of improper material (including ink) or replacement parts
- (3) Failures caused by improper servicing (by unauthorized personnel)
- (4) Failures caused by troubles (conveyor or product troubles) outside the ink jet printer or caused by movement or delivery of the ink jet printer after installation
- (5) Failures caused under improper operating conditions
- (6) Failures caused by fires, floods, or other disasters

Hitachi will not be liable for any manufacturing loss due to a hangup of the ink jet printer and product damages (product or facility loss) due to a trouble or malfunction of the ink-jet printer. However, in the event of a printer hangup, Hitachi will send service engineers as immediately as possible to repair the printer and reduce the hangup time.

Parts availability

The replacement performance parts for this product are available for a period of 7 years after product discontinuation. The replacement performance parts are parts that are required for the maintenance of product functionality.

Fill out the following form for your future reference.

Customer's memo: This memo will be helpful when you contact your Hitachi distributor.

Your Hitachi sales
representative : _____

Telephone _____

Your Hitachi
distributor: _____

Person in charge _____

Telephone _____

Person in charge _____

Date of purchase : yy mm dd



13. Schematic Diagrams

13.1 Outside Dimensions

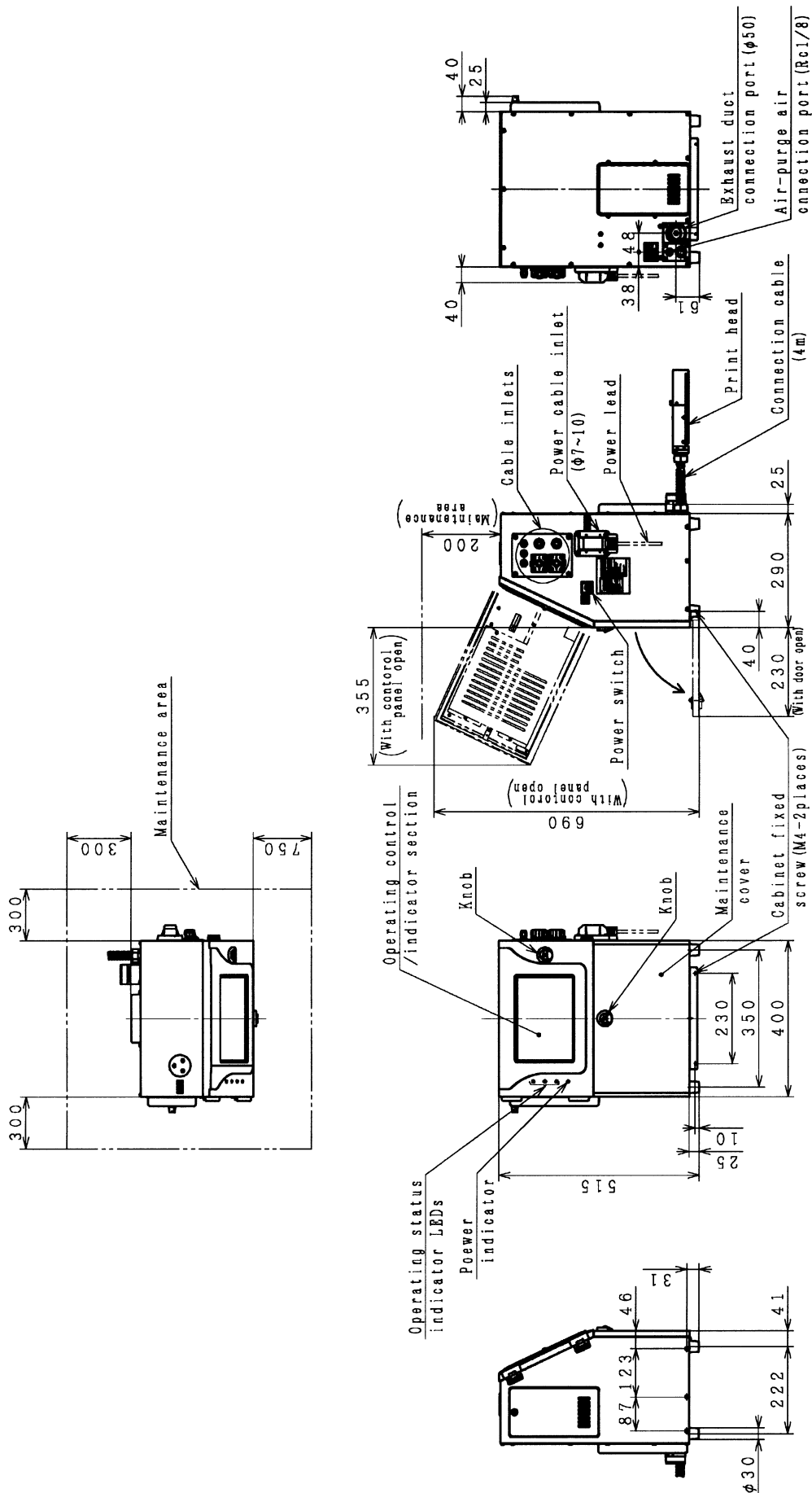


Fig. 13-1 Model PXR IJ printer outside dimensions

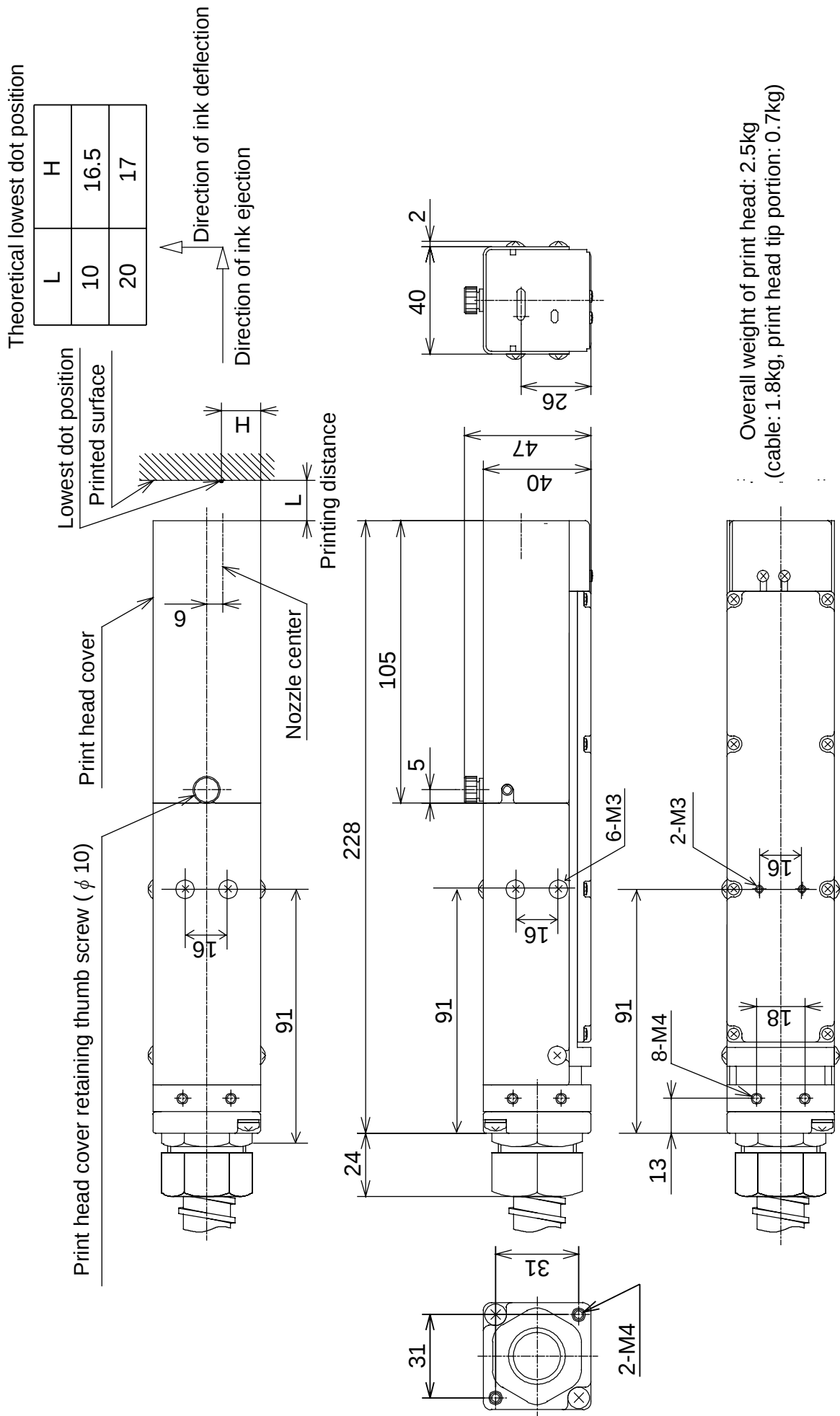


Fig. 13-2 Print head outside dimensions (65 μ m nozzle machine)

Theoretical lowest dot position

L	H
5	15.5

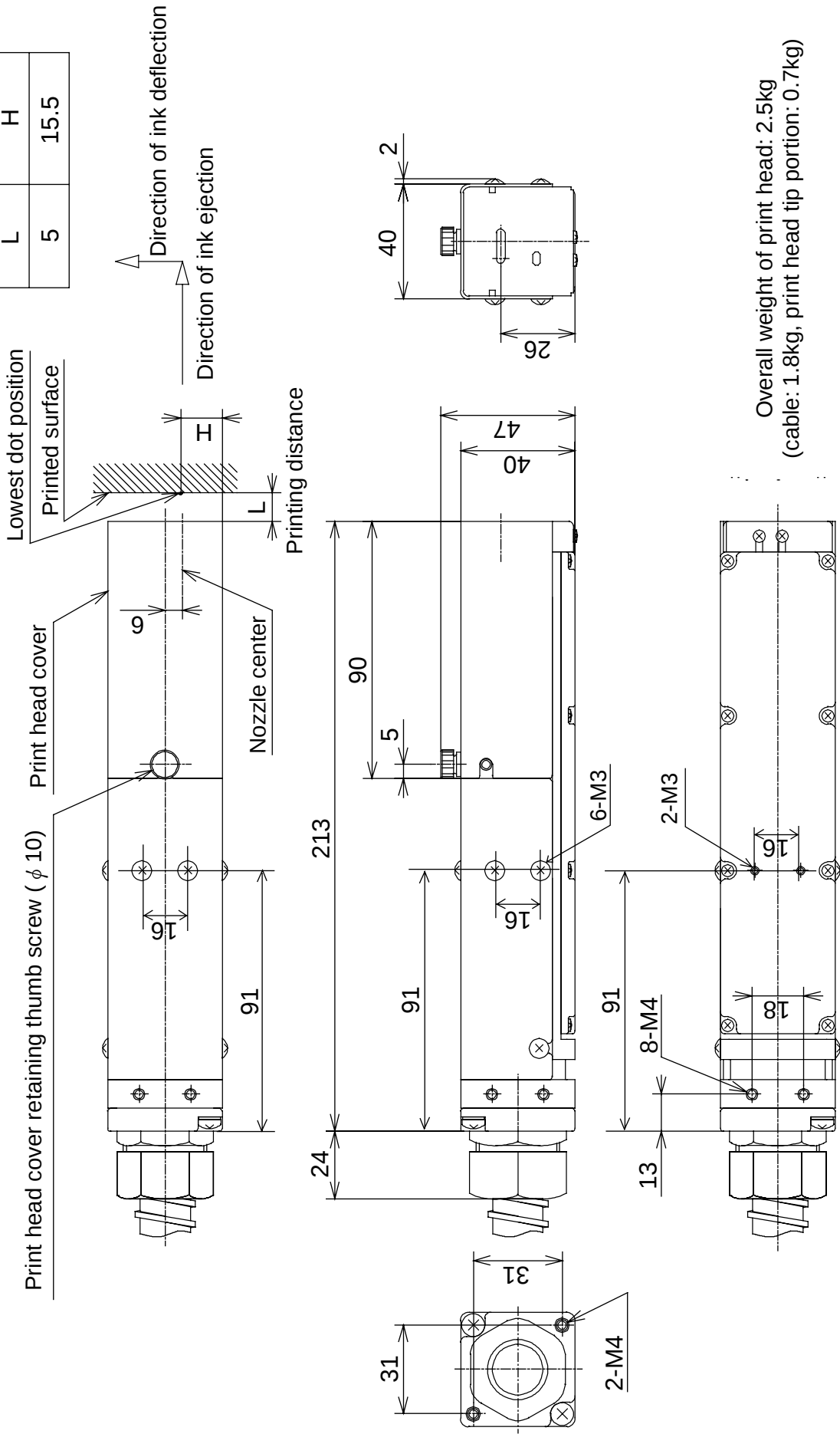


Fig. 13-3 Print head outside dimensions (40 μ m nozzle machine)

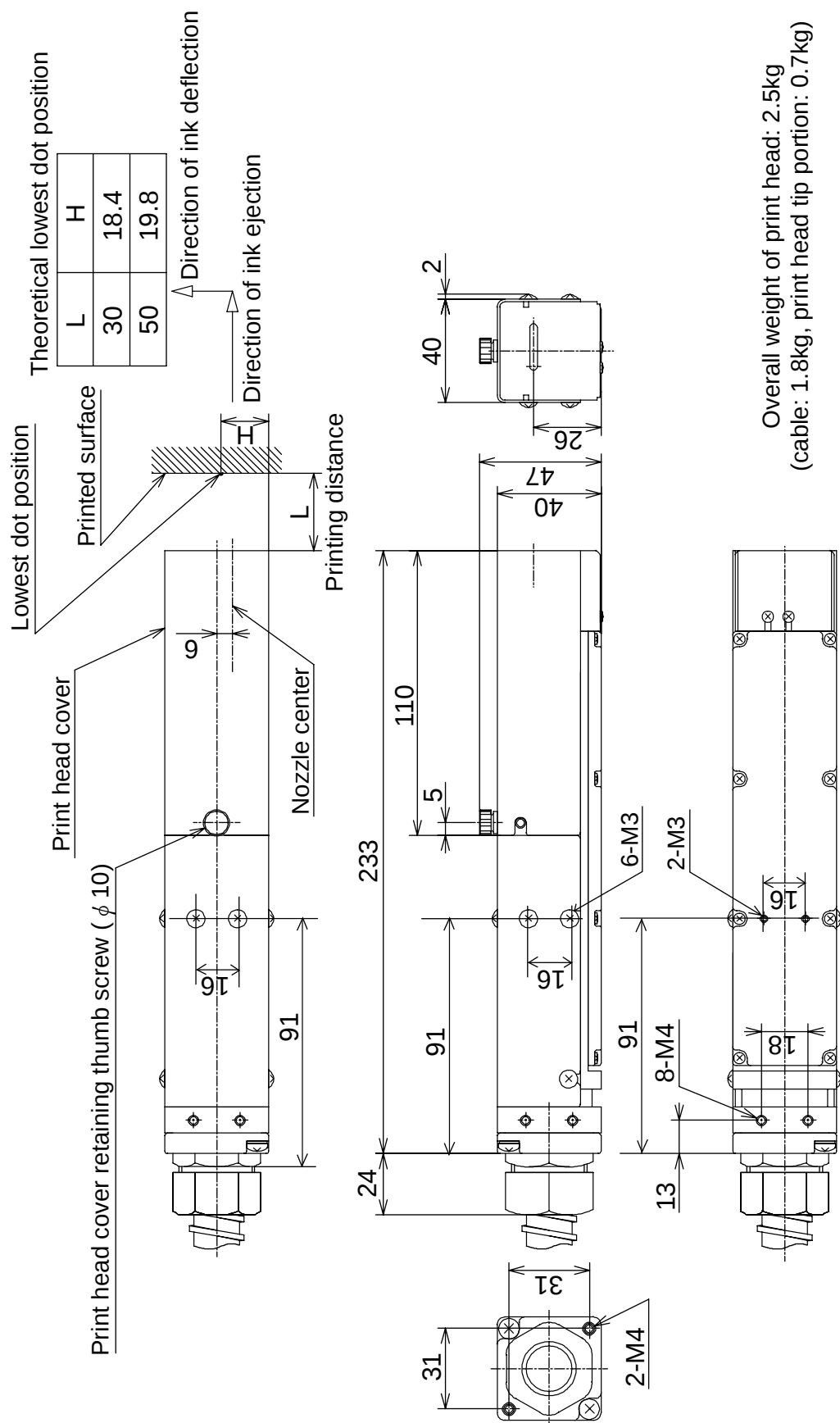


Fig. 13-4 Print head outside dimensions (100 μ m nozzle machine)

13.2 Electrical Connection Diagram

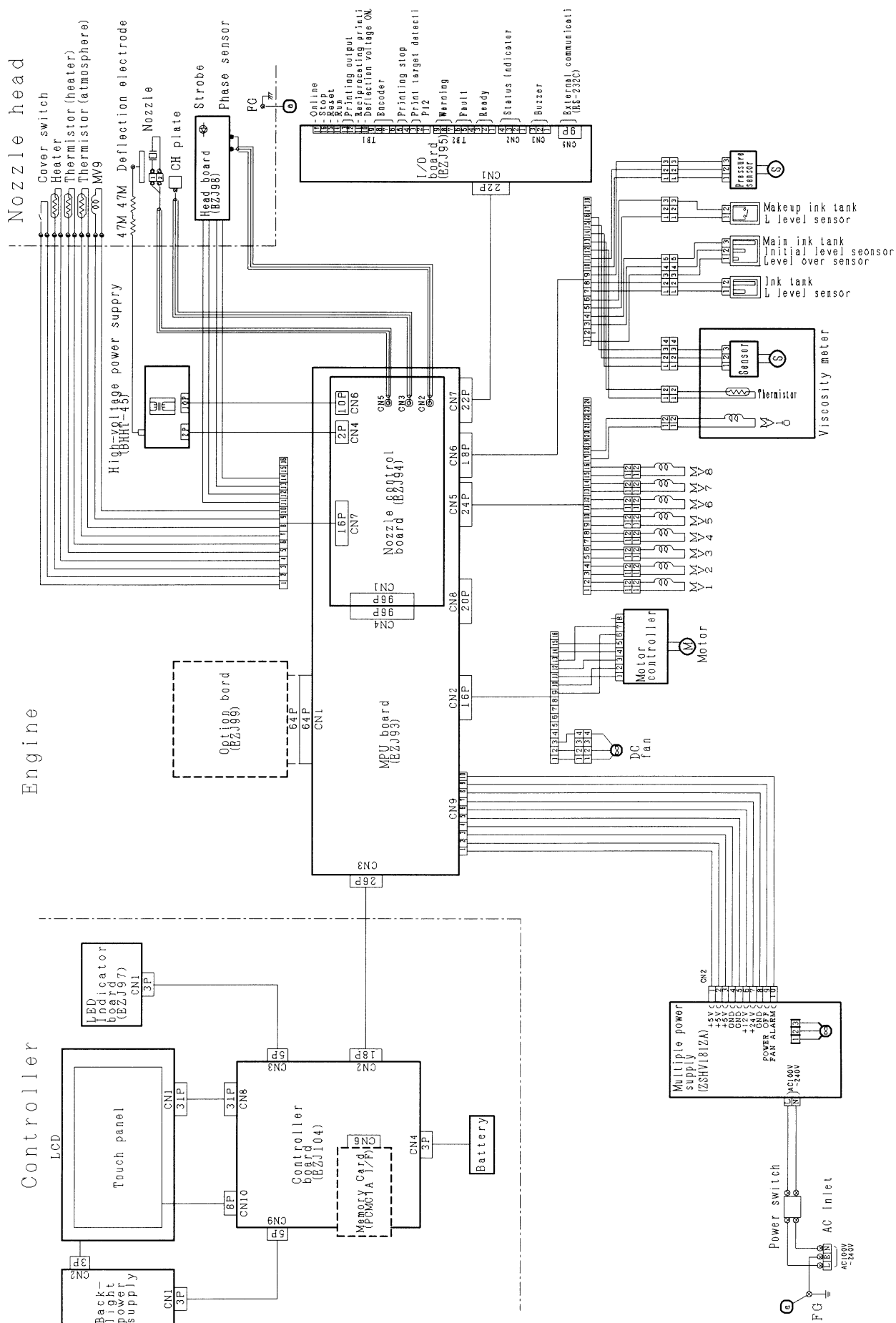


Fig. 13-5 Electrical connection diagram

13.3 Circulation System Diagram

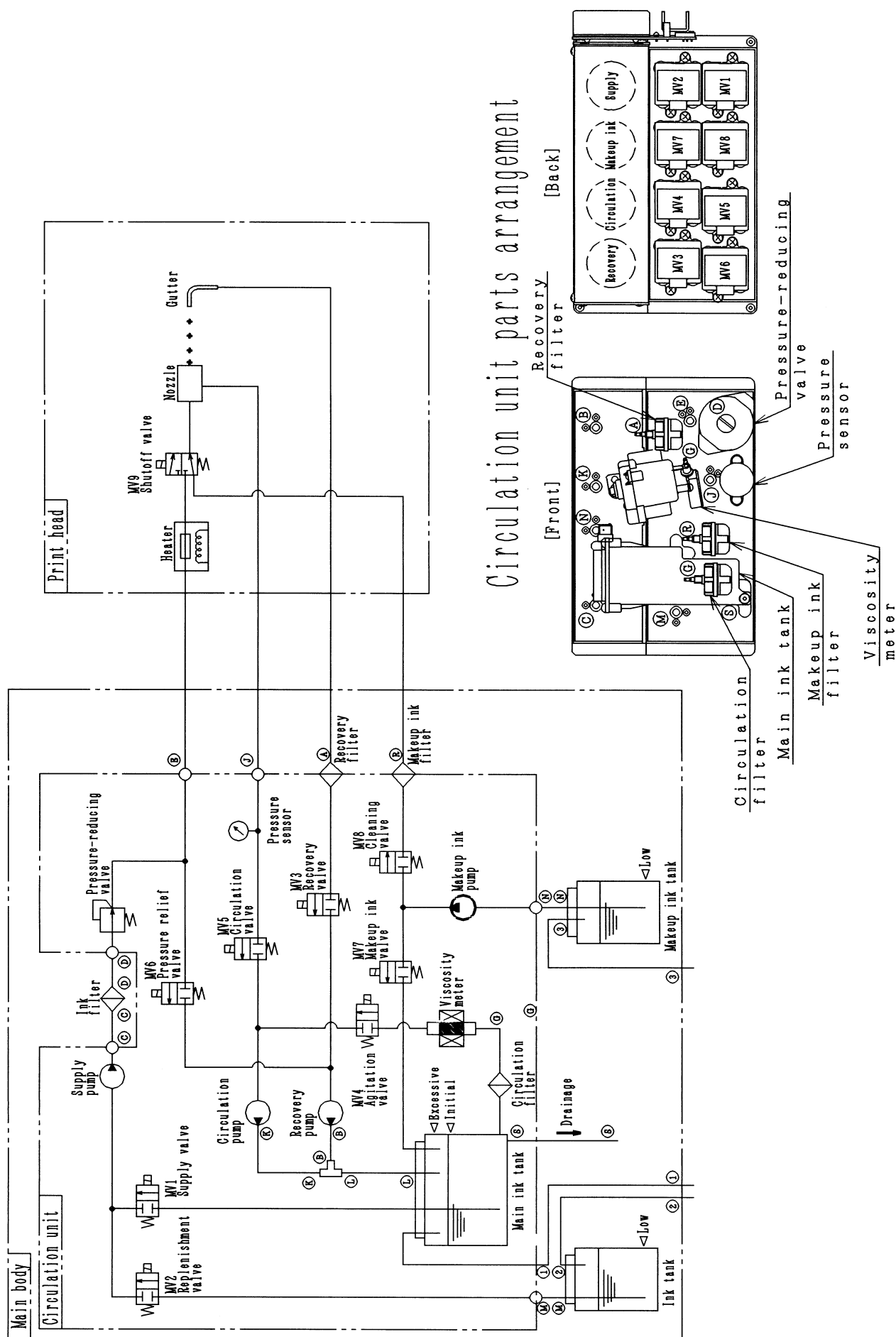


Fig. 13-6 Circulation system diagram



14. Appendix

Terms and definitions

A

■<Abort> key

This key is used to abort the ongoing process execution.

■<Apply> key

This is used to give an instruction to reflect it in printing.

■Auto-phase

This function is used to form, with the timing varied, a small amount of electric charge on ink particles that are not targeted for printing, and detect the timing of ink particle generation by sensing the voltage at the time of gutter recovery. It is instrumental in searching for the charge timing appropriate for printing. If the charge timing is improperly adjusted, proper prints will not be obtained.

■Auxiliary functions

User-created data management and maintenance functions. Manage message, create user pattern, copy data, calibrate touch screen coordinates, select language, and edit standard pattern functions are available.

■Auxiliary function menu

The auxiliary function menu screen allows you to initiate manage message, create user pattern, copy data, calibrate touch screen coordinates, select language, or edit standard pattern execution.

B

■<Back> key

This key is pressed to return to the previous screen.

■<Backspace> key

In a character or numerical value input sequence, this key is pressed to erase the character or numerical value to the left of the current cursor position.

→ (cf.) <Delete> key

■Blank (character)

This is a character that means that "no character" exists as the print content. Characters positioned subsequently to this "no character" will not be printed. When the print contents are displayed by the print content creation screen, this "no character" character is represented by the "·" mark.

C

■Calendar characters

Characters for defining the "year," "month," "day," "hour," "minute" and "second" of date/time values. They are shaded when they are displayed as the printings within the print content creation screen.

■Calendar conditions

This is a feature that is used to define the offset, use of substitutions, zero suppression, and other calendar character attributes. It is called up from the edit message screen.

■Calendar offset

This is a feature that is used to add the calendar values to the offset values and use the results of addition as the printings. When determining the calendar year/month offset, you can choose between "offset from yesterday" and "from today."

■Calendar time

Time on which calendar value calculations are based. While the date/time setup screen is displayed as a maintenance menu option, you can effect calendar time changeover between "same as current time" and "clock stop."

■Calendar values

Date and time values that correspond to calendar characters.

■Calibrate touch screen coordinates

This function is exercised so that the position of touch panel depression coincides with the display position. It is called up from the auxiliary function menu.

■Change message name

This function is used to change the message names of saved print data.

■Change message number

This function effects message number changes by interchanging two print data.

■Charge voltage

Voltage to be applied to the charge electrode for the purpose of charging ink particles.

■Circulation control

This is a feature that institutes procedures in relation to the ink circulation system. The procedures are for ink drainage, ink refilling, ink circulation, nozzle backwash, gutter cleaning, makeup ink refilling, pressure relief, eject ink, cleaning stop, no-cleaning stop, ink stream alignment, ink replacement, ink filter replacement, process prior to long-term shut down, and process after long-term shut down.

This feature is called up from the maintenance menu.

■Circulation system environment setup

With this, you can set a value for ink concentration control. Start it when you are on the second screen of the circulation control menu.

■<Clear> key

While the user pattern creation screen is displayed, this key is used to clear the on-screen pattern.

■Column

Vertical array of print items.

■Communication environment setup

This feature is used to enter various setup data about external communication. It is called up from the environment setup menu.

■Confirmation message

The confirmation message window opens to point out an operating error, indicate operating steps, or prompt for process selection.

■Copy data

This function copies print data and user pattern data on a Memory card. Start it on the auxiliary function menu.

■Count characters

Characters for defining the count control digits. They are shaded when they are displayed as the printings within the print content creation screen.

■Count conditions

The count character range, update unit, and other count character settings can be entered. This count condition setup feature is to be called up from the character input screen.

■Cover open state

State in which the ink is being ejected, no deflection voltage is applied, and the print head cover is open.

■Create messages

Function for editing/registering print data which differs from data being printed. Started from Auxiliary function menu.

■Create user pattern

User pattern creation function. It is called up from the auxiliary function menu.

D

■Date/time setup

This function is used to update the current time and calendar time. It can also be used to effect changeover between 24- and 12-hour clock systems. It is called up from the environment setup menu.

■<Dedicated> key

While the character input screen is displayed, this key is used to display the dedicated character keyboard.

■Dedicated characters

"Manufacture", "Best", "Term", and other standard supported patterns. They can be used with the 5 x 8 and 7 x 10 character sizes. They are underlined when they are displayed as printings within the print description screen.

■Deflection voltage

Voltage applied to the deflection electrodes for the purpose of bending the flying direction of charged ink particles.

■<Delete> key

In a character or numerical value input sequence, this key is pressed to erase the character or numerical value at the current cursor position.

→ (cf.) <Backspace> key

■Delete stored message

This function is used to delete saved print data.

■Dot mixture

Print data having equal column counts and inter-column spaces in all rows and equal character sizes and inter-character spaces in all print items are defined as data containing "no dot mixture."

■Drop adjust state

State in which the ink is being ejected, no deflection voltage is applied, the nozzle head cover is installed, and the auto-phase is not established.

■<Duplicate> key

While the substitution rule setup screen is displayed, this key copies the data at the preceding position to the item position over which the cursor is currently positioned.

E

■Edit message

This function is used to enter characters as print contents. It is called up from the print description screen. In addition to fixed characters, calendar and count characters are entered here.

■Edit standard pattern

A function of arbitrarily editing a dot pattern of the standard characters (alphabetical characters, numbers and symbols). Start it from the auxiliary function menu.

■Excitation frequency

Excitation voltage frequency.

■Excitation setup update

This function changes the excitation setting. Start it while you are on the maintenance menu.

■Excitation voltage

This voltage is applied to a device that converts electrical vibrations to mechanical vibrations. The resultant vibrations cause the nozzle to oscillate, thereby atomizing the ink.

■Excitation V-ref.

The span between the maximum and minimum excitation voltage values is divided into 20 segments, which are then designated 0 through 19. One of such 20 values is referred to as the excitation voltage value.

F

■Fault

An error that inhibits the printer from continuing to make prints. If a fault occurs while the printer is ready for printing, the deflection voltage supply is shut off.

The ink ejection operation may stop or continue depending on the type of the fault. → (cf.) Warning

■Faulty state

State in which a fault exists.

H

■Heating unit

This unit functions to maintain the ink temperature at an appropriate level.

■High-speed printing

When the character size setting is 5×7 dots, and print line is set to 2 or 3 lines, three modes: HS, MS or LS can be selected with the setting of particle use rate 1/1. By selecting the mode, you can get the almost the same print quality as particle use rate setting 1/2 for the line that you can't set to the particle use rate 1/2 and should be set to 1/1 at the previous software.

I

■Ink drop use percentage

The ratio of flying ink particle use. When a ratio of 1/3 is selected, one out of every three particles will be used for printing, with the remaining two particles unconditionally recovered from the gutter.

This value is saved together with the print data.

■Ink stream position

The ink position prevailing within the gutter bore when the ink particle flow reaches the gutter with no deflection voltage applied. If the ink stream position does not coincide with the optimum position, illegal printing or ink spillage from the gutter may result.

■<Insert> key

In a character input sequence, this key is used to switch between the insertion and overwrite modes.

■<Invert dot> key

While the create user pattern screen is displayed, this key is used to reverse the dot at the current cursor position.

L

■Line

One line of print items that comprise a column. The lowermost line is line 1.

M

■Maintenance

This function provides the management and maintenance of various operating environment factors.

■Maintenance menu

The maintenance menu screen allows you to call up the environment setup menu, operation management, test print, excitation V update, view alarm history, circulation control, view software version, comm. monitor and password protection.

■Makeup ink

This liquid is to be mixed with the ink for the purpose of adjusting the ink concentration and compensating for ink component insufficiency.

■Manage message

Saved print data can be managed. The manage message feature offers the change message number, delete stored message, and change message name functions. It is to be called up from the auxiliary function menu screen.

■<Manual> key

This key is constantly displayed at the upper right-hand corner of the display screen. When you press the <Manual> key, a window opens, prompting you to select one of the three subkeys. The subkeys provide three functions: eject ink, no-cleaning stop, and deflection voltage control functions.

■Message name

Name assigned to print data.

N

■Nozzle property test

This function determines an excitation V-ref. for good printout quality while you change the excitation setting. Start it when you are on the excitation update.

O

■Off-line (Com=0)

State in which communication with an external device cannot be established.

■<OK> key

This key is pressed to accept the on-screen contents and proceed to the next step.

■On-line (Com=1)

State in which communication with an external device can be established. In this state, no print data changes can be made.

■Operation management

This is a feature that indicates the operating status and displays the current values concerning the printer operation. It is to be called up from the print description screen or the maintenance menu.

P

■Parts usage time management

This function displays the operation time of the ink filter and other circulation parts.

Start it when you are on the second page of the circulation control menu.

■Password protection

This is a feature that specifies whether print data changes are to be inhibited or permitted. It is called up from the maintenance menu screen. → (cf.)

Password setup/update

■Password setup/update

This function is used to update the password that is to be entered for password protection purposes. It is called up from the environment setup menu.

■Print data

A collection of printings, print format, and print specifications setup data. You can assign a message name to print data and save or recall it.

■Print description screen

This screen offers a feature that allows you to enter and edit the printings, print format, and other print data. It also permits you to recall existing print data or save new one.

■Print format

This is a feature that enables you to define the character size, inter-character space, bar code, and other print item attributes. It is to be called up from the print description screen.

■Printings

Character strings to be printed. The print description screen has an area for displaying printings.

■Print item

Unit of printings. Up to 10 characters (digits) can be entered for each print item. As a standard feature, up to 8 print items can be set up for each print data.

■Print layout

This is a feature that provides a means of positioning rectangular frames with reference to the images to be printed. The print layout appears on the print description screen.

■Print line setup

This is a feature that defines the number of lines. When the "overall column setup" method is chosen, all the columns will be targeted. When the "individual column setup" method is selected, only the designated column will be targeted.

This feature is called up from the print description screen.

■ Print specifications

This is a feature that allows you to enter the character height, character width, print start delay, and other printing-related setup data. It is to be called up from the print description screen.

■Product speed matching

Based on the encoder signal that is proportional to the print target transport speed, this feature exercises print control so as to maintain a fixed character width.

■Pulse rate division Factor

Definition of the ratio of encoder signal referencing. The value "1/12" means that one reception occurs every 12 signals.

R

■Ready for printing

State in which the ink is being ejected with the deflection voltage applied. In this state, prints can be made upon receipt of the print target detection signal.

S

■<Save> key

- (1) While the print description screen is displayed, this key is used to switch to the save message screen.
- (2) While the create user pattern function is used, this key effects switching to the pattern save screen.

■Saving

- (1) Function for saving on-screen print data from the print description screen.
- (2) Function for saving an on-screen user pattern from the create user pattern screen.

■<Select> key

- (1) While the print description screen is displayed, this key is used to open the select message screen.
- (2) While the user pattern creation function is selected, this key is used to open the select pattern screen.
- (3) While print data listings are displayed, this key is used to select print data to be processed.

■Selection

- (1) Function used to recall saved print data from the print description screen.
- (2) Function used to recall a saved user pattern from the create user pattern screen.

■Service state

State in which the circulation control function is being executed

■Set

Columns in which the line count, line spacing, and character size arrangements are the same. Up to four sets can be preselected for each print data.

■Shift code

This function is used to divide a day into multiple work shifts and print a different code for each work shift.

■Solution check

This check is performed to determine whether an encountered fault persists or is cleared. When the encountered fault permits a solution check, the <Reset> key is displayed within a fault window.

■Starting process in progress

State in which the preparations for ink ejection are being made. This state terminates the moment the printer switches to the standby state.

■Standby state

State in which the ink is being ejected, no deflection voltage is applied, the nozzle head cover is installed, and the auto-phase is established.

■Stopping process in progress

This state prevails between the instant at which ink ejection is stopped and the instant at which the printer goes into the inactive state.

■Stop process

This process is performed to stop an ink ejection operation and switch to the inactive state.

■Stop state

State in which the ink is stopped.

■Speed compensation

Based on the encoder signal that is proportional to the print target transport speed, this function prevents the print start delay from varying.

■Substitution rules

Character string correspondence table that defines the relationship between calendar characters and their substitutes.

■Substitution rule setup

This is a feature that allows you to define the substitution rules. Use this feature to enter substitution characters into the correspondence table. This feature is called up from the calendar condition screen.

T

■Test print

This function is for printing by key operation without using a sensor. It is used for test printing. Start this function when you are in the maintenance menu.

■Time count

This function is used to print time count updating in preset time units.

■Touch screen setup

This function adjusts the backlight lighting time. Start it when you are on the environment setup menu.

U

■User environment setup

This is a function that is used to enter various printing method setup data. It is called up from the environment setup menu screen.

■User pattern

This is an arbitrarily created dot pattern that is used as a character.

■User pattern character

→ (syn.) User pattern

■<User pattern> key

While the character input screen is displayed, this key is pressed to display the user pattern character keyboard.

V

■View alarm history

This function is used to display the time and name of 90 newest fault/warning events. It is called up from the maintenance menu.

■View software version

This is a feature that displays the names and versions of installed software. It is called up from the maintenance menu.

W

■Warning

Error that permits the ongoing printing operation to continue but requires the execution of a certain maintenance task. → (cf.) Fault

■Week number

Use this function when you want to print which week of the year the current week is.

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