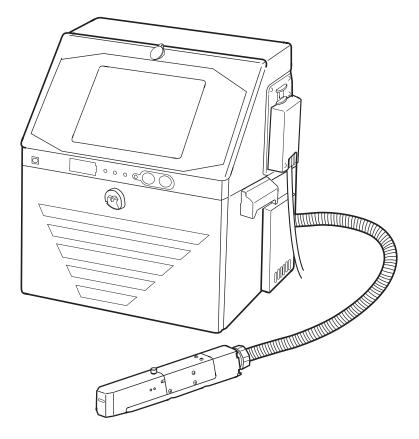


## INK JET PRINTER FOR INDUSTRIAL MARKING

# HITACHI J Printer

## Model UX-P



Thank you for purchasing the Hitachi IJ Printer Model UX-P.

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 UX.-P

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 Instruction Manual chapter 7.8 "Selecting Languages".

## Usage Precaution

- Before using the printer, thoroughly read the following safety precautions for optimum printer use.
- All the instructions set forth in this manual are important and must therefore be observed without fail.
- 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.
- 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. 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.
- Please make sure the print status and print content are correct each time when you start operation of IJP.
- Please implement periodical checkup of print status in the process, even including during production.

## 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.

The product or system including the product cannot be used in countries or areas other than those which have concluded a sales contract.

## Trademark

File management and USB management are carried out using eParts made from eSOL. Ethernet is the product name of Xerox Corporation in America. "EtherNet/IP" is the product name of ODVA (Open DeviceNet Vendor Association).

## **Open Source Software Licenses announcement used in the product**

For the Open Source Software used in this product, refer to Appendix 13-1 of the instruction manual.



# SAFETY PRECAUTIONS

• You should observe the precautions set forth below in order to use the product properly and avoid endangering you or other persons or damaging property. 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 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 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 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.

## Pictograph Examples

	The $\Delta$ symbols are used to indicate precautions (including those related to potential 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 $\bigotimes$ 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).
e	The $\bullet$ 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).

WARNING

## Installation Environment of Printer

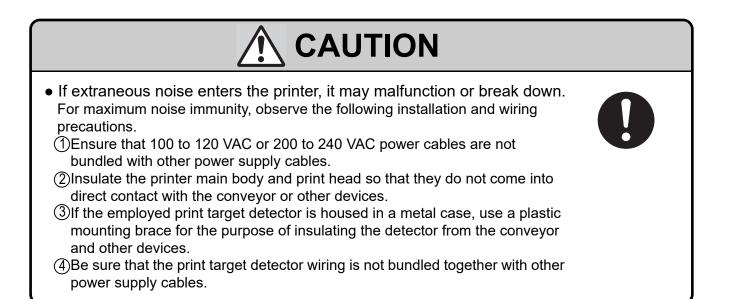
Ensure that there is no flame- or arc-generating device around the printer.

The ink and makeup 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, remove static 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 contain organic solvents, install the printer at an adequately ventilated location.

①Never install the printer in an enclosed space.

- ②Connect exhaust equipment to the printer in order to prevent it from filling with organic solvent vapor.
- ③Secure adequate space for the ink/makeup handling area and printer installation site. At least 200 m must be provided per print head. Ensure that adequate ventilation is provided.





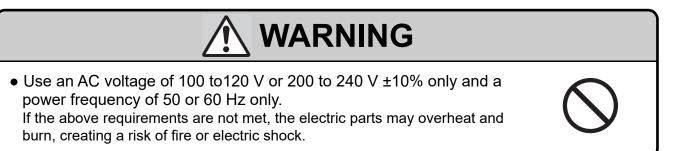




## Grounding

# Ensure that all electrical wiring, connections and grounding comply with applicable cords. Properly connect the printer to its dedicated ground. Complete the above procedure to avoid electrical shock hazards. When welding, keep enough space between the IJ printer and the welding work area to prevent the arc from starting a fire. Also, be sure to insulate the printhead and IJ printer frame to keep the welding current from flowing to the control section of the printer, and to make a separate ground connection for the printer. 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.

## Cable Handling





## Ink and Makeup Handling



• When charging a refill of ink or makeup, exchanging ink, or otherwise handling ink or makeup, take enough care not to spill ink or makeup. If you spill any ink or makeup 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 inside the printer and it is not completely dry. Why? Because vapors of ink or makeup will stay inside the printer and may catch on or cause a fire.

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

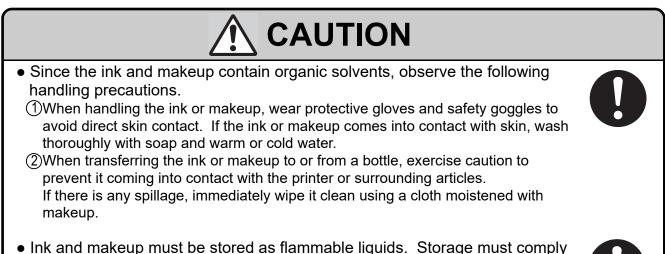
• If you wish to clean the casing of the printer with wiping paper impregnated with makeup, be sure to do so with the power off.

Attempting to clean it when the power is on will cause makeup or vapors of makeup 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 has entered and no vapors remain inside.

 Should you find a leak of ink or makeup 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.

Continuing operation with a leak of ink or makeup will cause an anomaly, resulting in abnormal printing. Ink and makeup are flammable. They may therefore catch on or cause a fire.

• The ink and makeup, their waste solution, used wiping papers and empty containers are flammable. Waste disposal must comply with appropriate regulations. Consult the appropriate regulatory agency for further information.



with local regulatory requirements. Consult the appropriate regulatory

agency for further information.



## Main Body Handling



• 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 covers and/or screws which are not specified on this manual. A high voltage is applied to some sections of the printer. Exercise caution to avoid electric shock and injury. • Exercise caution to avoid inadvertently disconnecting, forcibly pulling, or bending piping tubes. Since the ink and makeup 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 enters your eyes or mouth, immediately flush with warm or cold water and consult a physician. • While the printer is operating, do not look into the ink ejection hole in the end of the print head. Ink or makeup may enter your eyes or mouth or soil your hands or clothing. If any ink or makeup enters your eyes or mouth, immediately flush with warm or cold water and consult a physician. • When ejecting the ink, do it after confirming that there is no one in the ejection direction. (Operate with the end of the print head inserted in a beaker, etc.) • Before servicing the printer, be sure to stop the ink ejection. Because ink or makeup may splash into your eyes or mouth or onto your hands or clothing. If any ink or makeup 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 Main power switch to turn off the power.



- 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.





## **Related Regulations**

# 

- Never drain the ink or makeup waste solution into a public sewer system. Waste disposal must comply with all appropriate regulations. Consult the appropriate regulatory agency for further information.
- The printer must be managed in compliance with all appropriate regulations.

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

## **FCC Notice**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.



# 🕂 WARNING

<Keep all fire away.>

- $\bigcirc$  Ink and Makeup are flammable.
- $\bigcirc$  All fire must be kept away from the machine.
- $\bigcirc$  Spilled Ink and Makeup must be wiped off and dried up immediately.

<Caution when handling Ink/Makeup>

- $\bigcirc$  Storage must comply with local regulatory requirements .
- Read and understand Safety Data Sheet(SDS).
- $\bigcirc$  Be sure to wear protective gloves and safety goggles.
- If the Ink/Makeup in used is an organic solvent, it must be managed in compliance with the Ordinance on the prevention or Organic Solvent poisoning. Refer to the "Instruction Manual" and the "Handling guidance of each ink" for details.

# 

< Tenir hors de portée du feu. >

- L' encre et la composition sont inflammables.
- $\bigcirc$  Tenir la machine hors de portée du feu.
- $\bigcirc$  Nettoyez et séchez immédiatement les projections d'encre et de composition.

<Soyez prudent lorsque vous manipulez l'encre/la composition>

- $\bigcirc$  Le stockage doit respecter les obligations réglementaires locales.
- Lisez attentivement la fiche signalétique de sécurité de l'appareil (FSSP).
- $\bigcirc$  Assurez-vous de porter des gants et des lunettes de protection.
- Si l' encre/la composition utilisée est un solvant biologique, vous devez le manipuler conformément au décret sur la prévention des empoisonnements par solvant biologique. Reportez-vous au «Mode d'emploi» et aux «Conseils de manipulation de chaque type d'encre» pour plus de détails.



# **SECURITY PRECAUTIONS**)

# 

In the control system, the connection with the information and telecommunications system is progressing recently, and it causes for the increased security risk such as cyber attacks. In a system applying this product, both physical security measures mainly in the installation location and security measures against the network usage are required.

[Security risk example via the network]

- Abnormal operation, performance degradation, information leakage and data tampering by attacks from outside
- Malfunction, harm and damage occurrence due to programs and/or data tampering from outside
- It is used as an attacking step for other systems

However, the security level to be determined varies by each control system. In addition, the assumed security risk is not fixed, it will be something to change on a daily basis.

Not only in our products, individual security protection support functions of each product configuring the system is one means to ensure the security level required for the system, it does not completely prevent the security risk growing day by day.

The construction of the security level required for the control systems are responsible by the system and customer. In addition, for the maintenance of the security level will require continuous improvement of measures.

In a system using this product, trouble, accident or damages caused by unauthorized external access, Hitachi Group will not be able to bear any responsibility.

It is required for the customer side to clarify the target of the security protection of the system. Then set up the typical measures as below, and build out and operate the system.

- Utilization and periodic review of the authentication function for the program and the data to be protected
- Utilize the security functions of the device configuring the network
- Prevention of the unspecified connection by use of the function to identify the target connection
- Measures in the operational management, such as to lock the location of devices or restrict the operator

Please use the USB memory only on this device. Please do regularly virus check for the USB by using a computer with the latest antivirus software.

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# **1. DELIVERED GOODS**

• Unpack the equipment and check the delivered goods.

No.	Part Name	Qty	Product code.	Remarks
1	IJ printer body	1	-	
2	Basic Operation manual	1	-	
3	Manual CD	1	-	The instruction manual and technical manual are provided. Be sure to read the manuals thoroughly and get a good understanding so you can use the printer correctly.
4	One-page sheet	1	-	
5	Magnifying glass	1	451274	Used in ink particles shape check, ink beam position check, etc.
6	Tweezers	1	451412	Used when removing the orifice, etc.
7	Cleaning bottle	1	451058	Filled with makeup and used in print head cleaning, etc.
8	Beaker with handle	1	451410	Used in print head cleaning, ink replacement, etc.
9	Waste solution bottle	1	-	Used when replacing ink and filter.
10	Wiping paper	1	-	Use for wiping after print head cleaning, etc.
11	Mini Filter	1	451857	Recovery filter. (Spare parts)
12	O-ring SF7000-5.6	1	451589	An O ring for the orifice plate seal. (spare part).

No.	Part Name		Qty	Product code	Remarks
13	Cable seal		3	-	Seal for power cable and external communications cable.
14	Cable clip		1	-	Cable clip Nozzle rubber seal
15	Plastic bag with zipper		1	-	One page sheet Use to store the one page sheet and nozzle rubber seal.
16	Signal tower holder		1	-	Signal tower
17	Signal tower holder plate		1	-	(Packing) Holder Used for attaching the signal tower.
18	Ferrite core		1	-	Attach to LAN cable when using TUP-I or Ethernet communication. Install by wrapping the cable 1 turn as shown in the figure below. To TUP-I or Ethernet communication.
19	Blower		1	451522	Used for drying print head after cleaning.
20	Stirring bar		1	-	Used when stirring ink in ink bottle or ink tank, and when picking up rotor.
21	Rotor	C	2	451684	Set one rotor each in ink reservoir and main ink tank.

No.	. Part Name		Qty	Product code	Remarks
22	Nozzle Orifice	000	1	451670	(Spare part)
23 (*1)	Nozzle rubber seal	F	1	-	This part is used when IJ Printer is shutdown for several days, or pursuant to "6.15.1 Process prior to long-term shutdown". This parts is mounted on the print head when the product is delivered.

Note "Part Name" and "Product code" when ordering the parts.

(\*1) Store these parts in a plastic bag, etc., to protect it form dirt and dust.



# 2. INSTALLING PRECAUTIONS

## 

## • Ensure that there is no flame- or arc-generating device around the printer.

The ink and makeup 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, remove static electricity from your body, peripheral equipment, and so on. In the interest of safety, position a dry-chemical fire extinguisher near the printer.



①Never install the printer in an enclosed space.

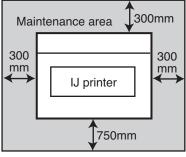
<sup>(2)</sup>Connect exhaust equipment to the printer in order to prevent it from filling with organic solvent vapor.

## 

- The employed ink and makeup contain organic solvents. Furnish an adequate space for the ink/makeup handling area and printer installation site. A space of at least 200 m<sup>3</sup> 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 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  $1.96 \text{m/s}^2$ ).
- (4) The IJ printer main body must be installed with a levelness error of not over ±1°.
- (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 and the better printing.
- (7) The IJ printer requires proper maintenance such as replenishment of ink and makeup and replacement of filters.
- (8) If ambient humidity is 85 to 90%RH, you must air purge inside of print head.

It is necessary to prepare dry-clean air, regulator for pressure of air and air filter.

(Quantities of the air are 1L / minutes.)





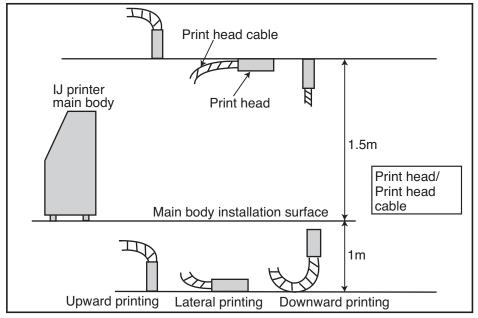
\* Leave a maintenance area of at least 250 mm for the upside of printer.

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

Nozzle diameter	Distance			
65µm	10 to 30mm			



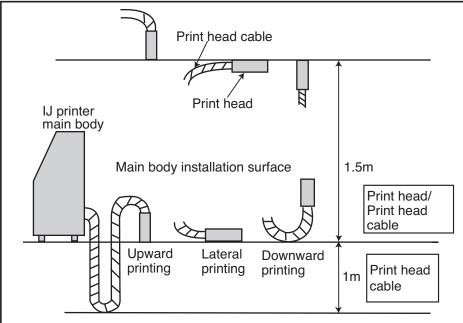
- (9) When installing the print head and print head cable, comply with the following conditions or it will increase the risk of degraded performance of the ink supply and ink recovery behavior.
- a) 0 to 35 °C
  - <sup>(1)</sup>When positioning the end of the print head above the printer main body installation surface, ensure 2 that the distance between the end of the print head and the installation surface does not exceed 1.5 m.
  - <sup>(2)</sup>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.



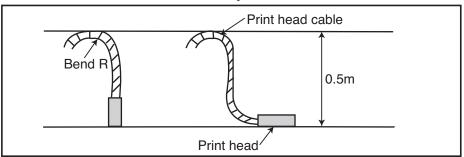
b) 35 to 40 °C

(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.

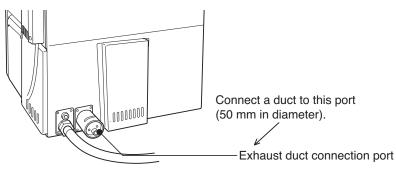
(2)Do not install the end of the print head lower than the body mounting surface.



(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.



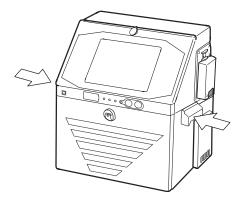
- (11) If you fixed the print head, ensure that the minimum bend radius of the print head cable is at least 150 mm. Handle the headcable with care when wiring it. If the minimum bend radius is less than 150mm, the tubes and wires inside the headcable might be broken.
- (12) The ink stream may bend for 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.
- 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 consumption increases.)



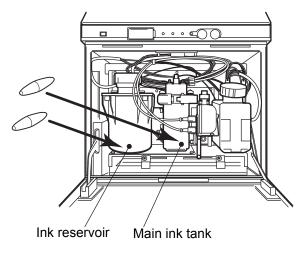
(14) If you try to fix the print head with a magnetic substance (such as iron), the cover switch will malfunction resulting in an "Cover Open" error.

This, you must only use nonmagnetic resins or metals for fixing the print head.

(15) In the case of carrying the printer, use the handles in the drawing below.



(16) The rotor for stirring of ink is including with supply parts. Set one rotor each in ink reservior and main ink tank for installing.



# **3. INSTALLATION CHECK ITEMS**

## 3.1 Print head air purge

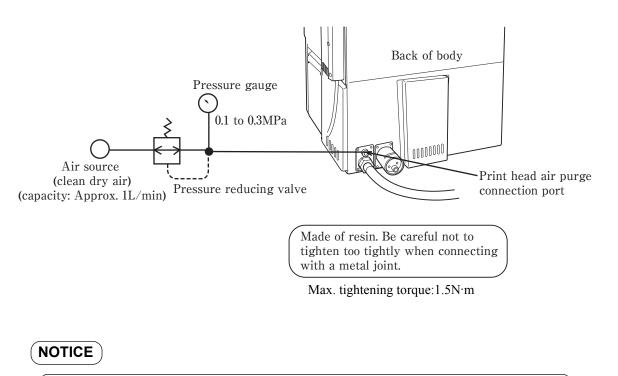
If the makeup remains in the electrode section after cleaning or if you use the IJ printer at high humidity environment, moisture condensation may occur within the print head, causing leakage from the deflection electrode section. It is also important to remember that dust or splashed ink accumulation 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 inks that are indicated on the handling guidance of each ink to complete air-purge procedure.

## (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 0.1 to 0.3 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.



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.

## 3.2 Setting functions which can be performed

## (1) Functions

•Sets whether or not each function is enabled or disabled for each login user.

•The operation buttons of disabled functions are not displayed or the screen cannot be entered.

•"User conditions setup" and "Using environment setup" can be started when the administrator logs in.

• The function restrictions state can be checked at the function restrictions screen. (Refer to "Instruction manual 5.5 Checking functions that can be performed")

Item	Protected function name						
Edit message	<ul> <li>Edit message</li> <li>Calendar conditions</li> <li>Substitution rules setting</li> <li>Count conditions</li> </ul>						
Select message	•Select message						
Save message	•Save message •Overwrite message						
Print specifications	<ul><li>Print specifications</li><li>Various print setup</li><li>Adjust print parameters</li></ul>						
Print format	<ul><li>Print format</li><li>Adjust inter-character space</li></ul>						
Maintenance	[Auxiliary functions] •Manage messages/group •Create user pattern •Calibrate touch screen coordinates •Copy data (IJP→USB) •Copy data (USB→IJP) •Edit standard pattern •Edit substitution rules •Select language	<ul> <li>[Environment setup]</li> <li>User environment setup</li> <li>Date/time setup</li> <li>Communication environment setup</li> <li>Touch screen setup</li> <li>[Maintenance work]</li> <li>Operation management</li> <li>Excitation V update</li> <li>Circulation control</li> <li>Solenoid valve/pump test</li> <li>Periodic replacement parts mgmt.</li> </ul>					
Password setup	•Password setup						

#### Protected functions

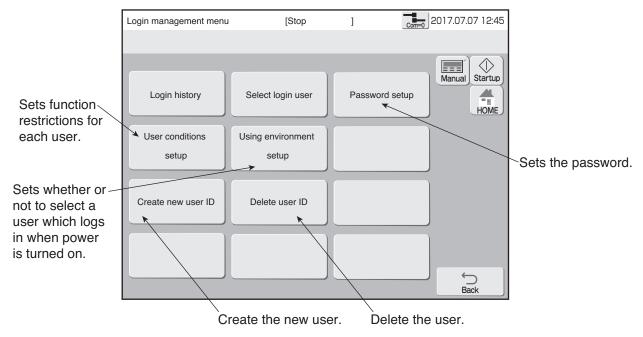
## (2) Operation

The administrator is logged in.

## **1** Press Login management of the Environment setup menu.

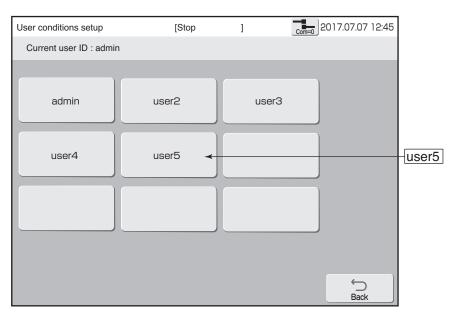
The Login management menu is displayed.

Log in as a user with administrator rights when User conditions setup or Using environment setup are not displayed on Login management menu.



## 2 Press User conditions setup.

The User conditions setup screen is displayed. A user list is displayed.



3 Select user5.

"user5" settings are displayed.

	User conditions setup		[Stop	]	20	017.07.07 12:45	
Modifies the user name.							
namo.	ID : 5 use		Manual Startup				
	Administrator rights	Users	Administrator				
Displays the kind of administrator	Edit message	access	protect			HOME	
rights.	Select message	access	protect				
	Save message	access	protect				
	Print specifications	access	protect				
Sets function	Print format	access	protect				
restrictions.	Maintenance	access	protect			N	
					-	Cancel	Password
	Password update	access	protect			Password setup	setup
							– OK

- 4 Select the administrator rights.
- 5 Select "access" or "protect" for each function item.

### 6 Press Password setup and set the password.

An error message appears when 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 "IGNOREPW" as the password. Use this word if you forget your password.

#### 7 Press OK.

The administrator rights, function restrictions, user name, and password for user "user5" are set.

## 3.2.1 Password protection will be canceled in units of Print item

## (1) Overview

- •When Password protection is valid, it can be canceled in units of Print item.
- •When Administrator logs in, Password protection can be canceled.

## (2) Operation

•The character input is made as follows.

(Column 1)		(Column 2)		
USE	ΒY	-	17.07.15 •	

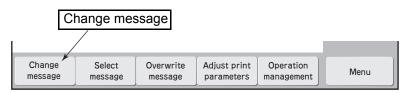
•For "user5" whose "Administrator rights" is "Users", set "Edit message" to "protect".

• Password protection for Column 2 will be canceled.

## 1 Administrator logs in.

2 As described in Section 3.2 "Setting functions which can be performed", make "User conditions setup" enabled for "user5" and set "Edit message" to "protect". At this time, Administrator still logs in.

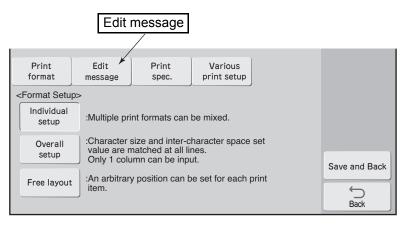
**3** Return to "Print description" screen from "Login management menu".





Press Change message on "Print description" screen.

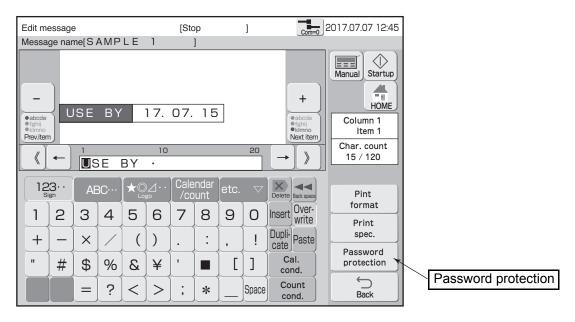
"Change message" screen will be displayed.



## 5

## Press Edit message on "Change message" screen.

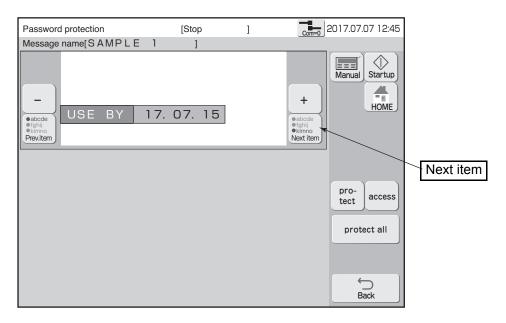
"Edit message" screen will be displayed.



## 6 Press Password protection on "Edit message" screen.

"Password protection" screen will be displayed.

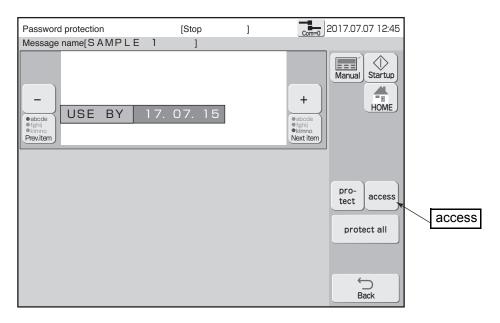
The character input of all the items is restricted by showing shaded characters. The cursor is placed on Column 1.





#### 7 Press Next item.

The cursor moves to Column 2.

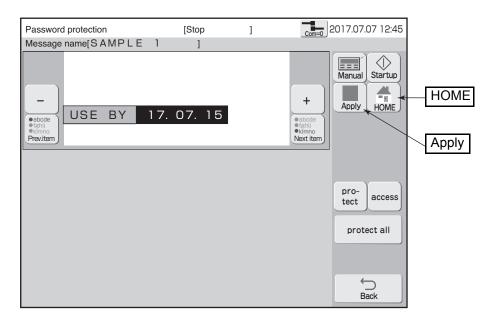




## 8 Press access .

Password protection where the cursor is placed will be canceled and the character's shade will disappear.

The character input will be available on Column 2.



#### Press Apply . 9

All inputs which are set on "Password protection" screen will be applied.

### 10 Press HOME .

It will return to "Print description" screen.

#### 11 Login as "user5" on "Select login user" screen.

Administrator rights "Users" is now applied. The character input will be available ONLY on Column 2 on "Edit message" screen.

## (3) Supplemental explanation

- •The print data which was just edited shall be saved. After saved, when the data is selected, the character input will be available ONLY on Column 2.
- In case the number of Print lines is changed by Print format, the character input of ALL print items will be restricted. IJP status will return to default of "before Password protection canceled".

## 3.3 Selecting login user when power is turned on

## (1) Functions

•Sets whether or not to select a user which logs in when power is turned on.

Possible login methods

	Login method "Disable"	Login method "Enable"
Operation when power is turned on	Immediately displays the Print description screen when the power is turned on. The login user is decided beforehand.	Selects the user which logs in when the power is turned on.

•The login user can be changed by login user change function even when the login method is "Disable".

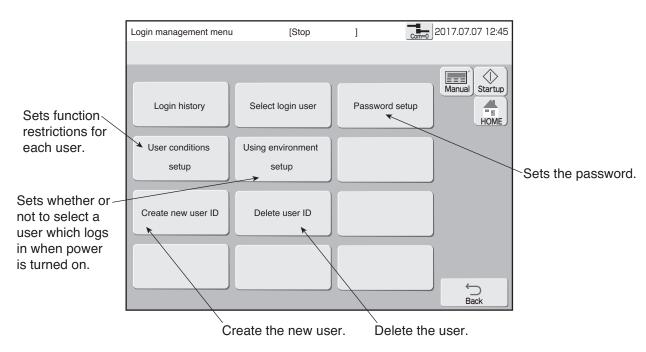
•"User conditions setup" and "Using environment setup" can be started when the administrator is logged in.

## (2) Operation

Log in the administrator.



## Press Login management of the Environment setup menu.



The Login management menu is displayed.

## 2 Press Using environment setup.

The Using environment setup screen is displayed.

When "Disable" is selected, the Print description screen	Using environment setup	[Stop	]	Com=0 2017.07.07 12:45
is immediately displayed when the power is turned on.	Login method Disable Er	nable		
	Default login ID : 1	admin		Manual Startup
	Administrator Automatic Des	select Disable En	able	HOME
Specifies the login user				
In case that Administrator				
logged in to printer this function will switch the				
login condition to Users				Cancel
from Administrator.				

## 3 Press Login method Enable.

When "Enable" is selected, selects the user which logs in when the power is turned on.

Using environment setup	[Stop	1	2017.07.07 12:45
	L P	,	
Login method Disable Enabl	8		Manual Startup HOME
Administrator Automatic Desele	ect Disable E	nable	

## 4 Select the login method and press OK.

Sets whether or not to select a user which logs in when power is turned on.

## CAUTION

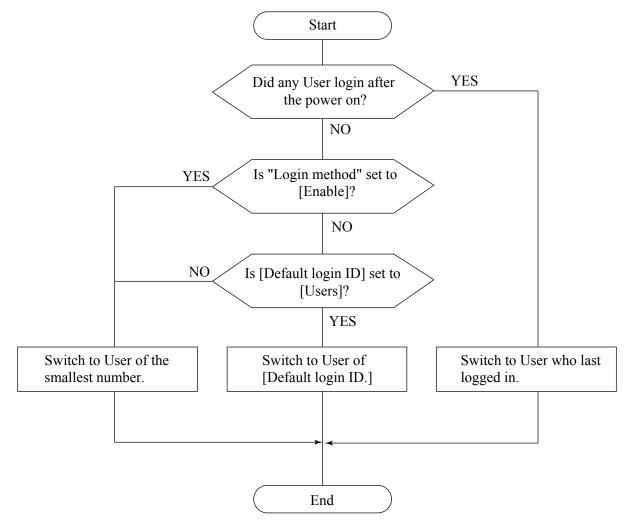
When the Login method is "Enable", the Select login user screen is displayed when the power is turned on. At this time, if the set password is forgotten, the program will not advance to the print description screen. Set and manage the password carefully.

If you forget the password, consult your nearest local distributor.

## 3.4 The state where the administrator login is returned automatically

## (1) Function details

- •In case that Administrator logged in to printer and left the screen untouched for 15 minutes, this function will switch the login condition to Users from Administrator.
- •Flow diagram below shows the steps of switching to User login condition.



## (2) Working conditions

• The working conditions of this function are listed in Table1 below. Only when all the conditions are met, this function will work.

No.	Working conditions
1	"Administrator Automatic Deselect" is set to [Enable].
2	One or more than one user are registered as the Login user.
	One of the menus below appears on the screen. (Print description, Change message, Print format, Adjust Inter-character space, Edit message, Count conditions, Print specifications, Various print setup, Save message, Select message, Adjust print parameters, Operation management, Maintenance menu, Aux. function menu, Environment setup menu)
4	[Apply] key does not appear on the screen.

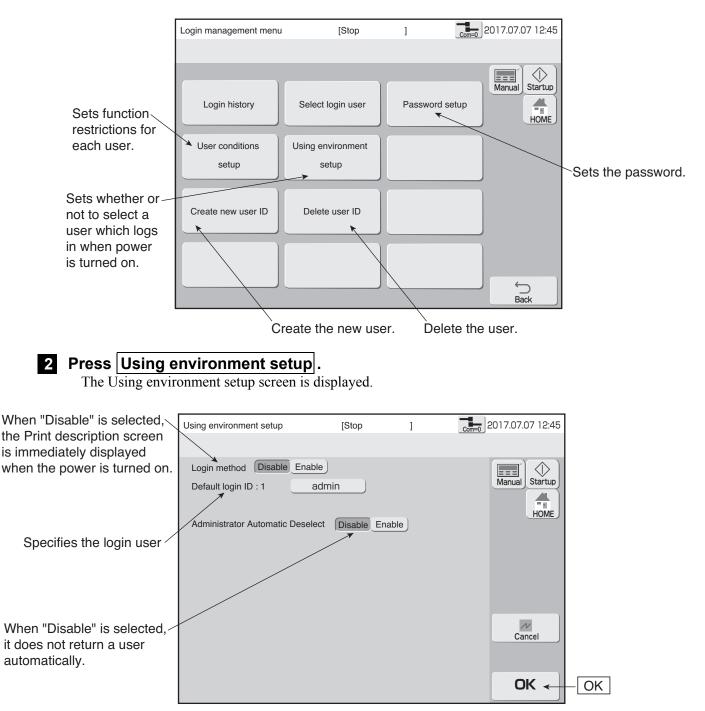
## (3) Operation

Log in as administrator.

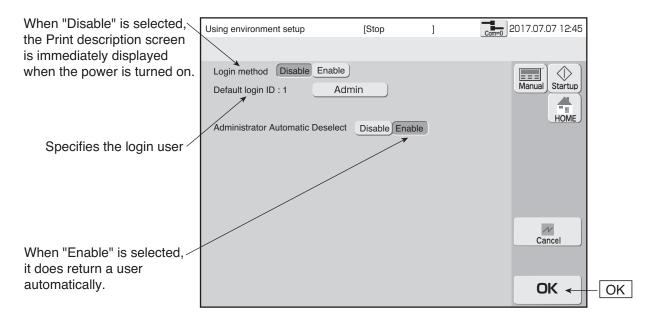


#### **1** Press Login management of the Environment setup menu.

The Login management menu is displayed.



## **3** Press Administrator Automatic Deselect Enable.



**4** Select the Administrator Automatic Deselect and press **OK**.

Administrator Automatic Deselect is set up.

## 3.5 Human Machine Interface [HMI] setup

## (1) Function

- When you log in as a general user, you can set "Human Machine Interface [HMI]" to either Previous or New].
- It is set by "Human Machine Interface [HMI]" on "Touch screen setup" screen. This item is available for display/selection when the administrator user logs in.
- When "Human Machine Interface [HMI]" is set to New, the general user can have an access only to the following seven screens: (Seven screens are hereinafter called [New HMI screens].)
  - [New HMI screens (New icons)]:
  - Print description screen (HOME)
  - Open screen (OPEN)
  - Save screen (SAVE)
  - Adjust print parameters screen (ADJUST)
  - Edit screen (EDIT)
  - Operation management screen (SETTINGS)
  - Select login user screen (LOGIN)
- When Human Machine Interface [HMI] is set to New, the general user cannot leave [New HMI screens].
- You can select one item which will appear on Print description screen of [New HMI screens]. The item selected will be one of the following:

"Ink Pressure", "Ink Filter Replacement Time Left", "Recovery Filter Replacement Time Left", "Circulation Filter Replacement Time Left", "Makeup Filter Replacement Time Left", "Air Filter Replacement Time Left" or "Count Reset".

## (2) Operation

Administrator user logs in.

#### **1** Press Touch screen setup on Environment setup menu screen.

The Touch screen setup screen will be displayed.

	Touch screen setup	[Stop	1	2017.07.07 12:45
	Display	OFF in 3 m	iin.	
	Keyboard layout	ABC	QWERTY	
	ICON Display	Disable	Enable	
	Clock display format	YYYY.MN	I.DD	
If Previous is	Confirmation window for Manual Cor	ntrol Menu	Display Non displa	y
selected, the	Arabic input method	to the left	to the right	
conventional				
HMI screens will 🔍				
be displayed.	k.			
	Human Machine interface [HMI]	Previous	New	
				Back
	1			

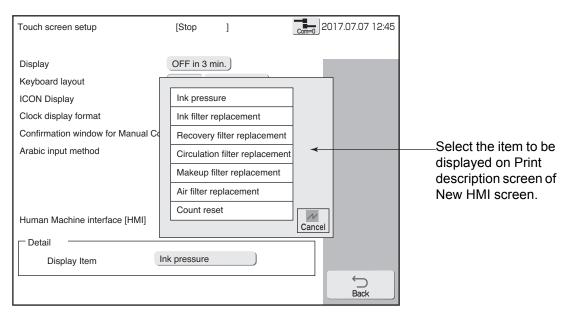
## 2 Press New of Human Machine Interface [HMI].

Detailed specifications will then be displayed.

	Touch screen setup	[Stop ]	2017.07.07 12:45
If <u>New</u> is selected, the new HMI screens will be displayed.	Display Keyboard layout ICON Display Clock display format Confirmation window for Manual Con Arabic input method	OFF in 3 min.) ABC QWERTY Disable Enable YYYY.MM.DD	
	Human Machine interface [HMI] Detail Display Item	Previous New	) Back

#### 3 Press "Display Item" button.

List of display items is then displayed.



#### 4 Select the item you want to display.

The selected item will be displayed on Print description screen of New HMI screen.

#### 5 Press Back

The screen display [HMI] used by general users can be set to new system screen or conventional screen.



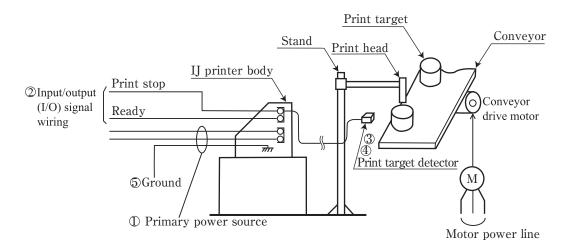
- When Human Machine Interface [HMI] is set to "New," the general user cannot change print format / print specifications, or perform maintenance operations such as circulation control. In the case of these operations, you must login again as the administrator user.
- When Human Machine Interface (HMI) is set to "New", the [New HMI screens] will be displayed at system boot-up, even when the administrator user is selected as a default login ID.
- The functional limitations set for each general user will still apply on [New HMI screens]. For example, when the general user logs in and when "Edit message" is restricted for him/her, "Edit message" is prohibited even if Edit message screen is displayed.
- When Human Machine Interface [HMI] is set to "New," if the administrator mode is automatically canceled while the screen other than the new HMI screen, such as Print format screen, Print specifications screen, Environment setup screen, etc. is displayed, Print description screen of New HMI screen will be displayed.

(See "3.3.2 Operation Scheme" in Instruction Manual.)

# **4. ELECTRIC SIGNAL CONNECTION**

## 4.1 Wiring precautions

- (1)If noise enters the IJ printer from the outside, there is the danger of erroneous operation or trouble. To improve noise resistance, perform wiring work as follows:
  - (1) Separate the power cable to the IJ printer from other power lines for powering use (especially, power line for a speed control inverter, etc.).
    - Wiring the power cable through a separate duct is even better.
  - (2) Do not bundle input/output (I/O) signal wiring together with other power lines. Wire them independently instead.
  - (3) Electrically isolate the print target detector, print head, stand, and IJ printer body from other machinery and equipment (conveyor, etc.).
  - ④ Separate the print target detector wiring from other power lines.
  - (5) Perform that all electrical wiring, connections and grounding comply with applicable cords.
    - (When erroneous operation was caused by noise, etc., use a dedicated ground.)

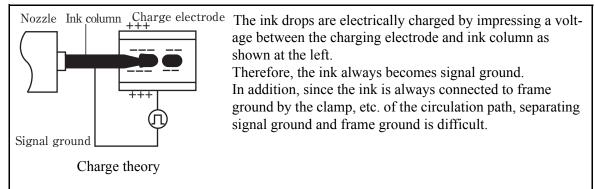


(2) Connection to power supply

Use a suitable plug and always connect the power source to a protective ground. In addition, arrange the receptacles near the IJ printer so that removal is easy.

#### (3) Precautions related to welding current of welder

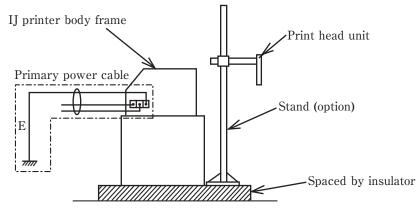
Signal (weak electric) ground and frame ground are connected because the ink drops of the IJ printer are electrically charged.



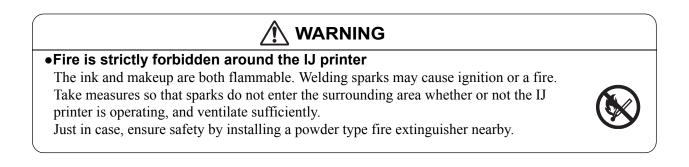
Therefore, when a large current (for example, the welding current of a welder) flows from the outside through frame ground, the current is also diverted to signal ground and the PC boards may be damaged and the earth cable may be fused. For this reason, whenever performing welding work near the IJ printer, proceed as follows:

#### Method

Be sure to insulate the printhead and IJ printer frame to keep the welding current from flowing to the control section of the printer, and to make a separate ground connection for the printer. If this method is used, welding work becomes possible even while the IJ printer is operating.

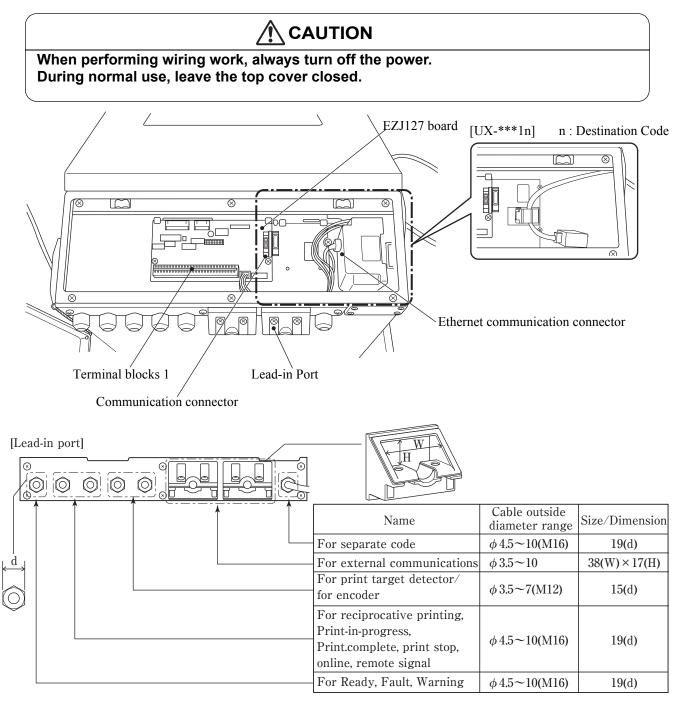


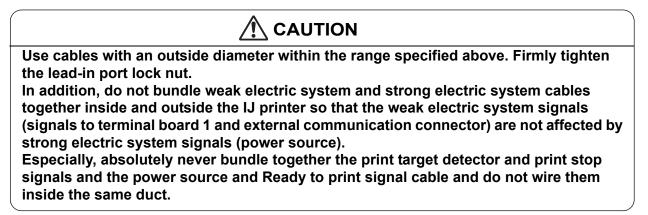
Welding work cautions



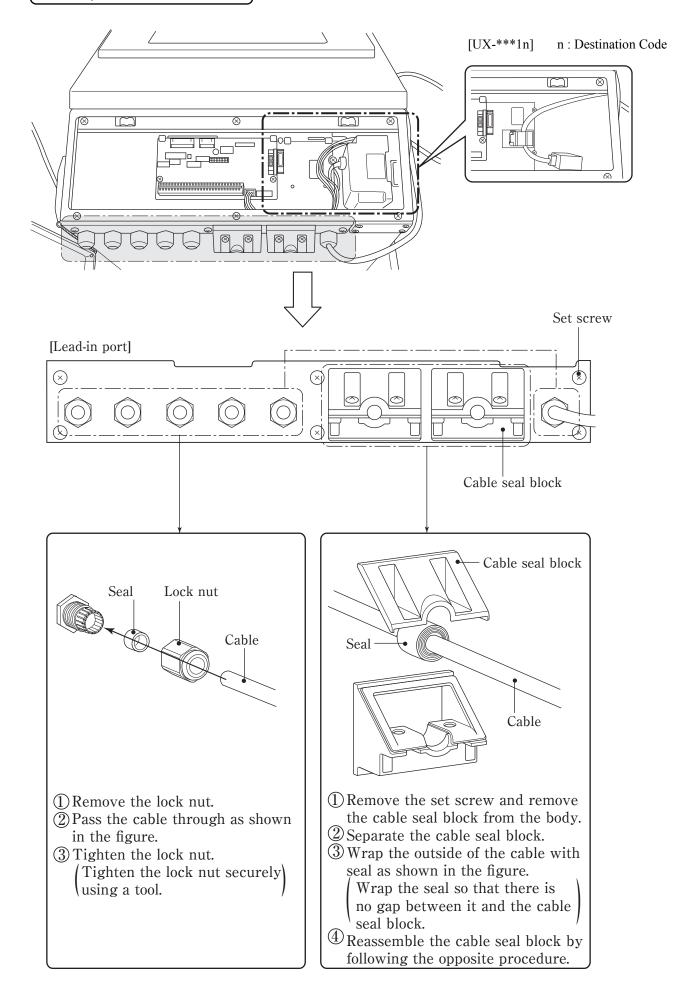
## 4.2 Input/output (I/O) signal connection 4.2.1 Wiring the I/O line

Open the top cover and run the I/O line wiring from the lead-in port on the side and connect it to external connection terminal boards 1 and 2 and the external communications connector inside the IJ printer.





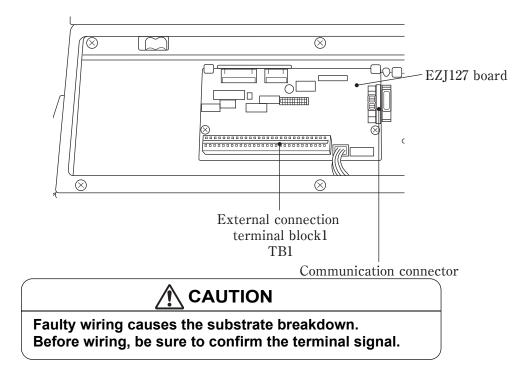
Lead-in port connection method



#### 4.2.2 Connection to input/output (I/O) terminals

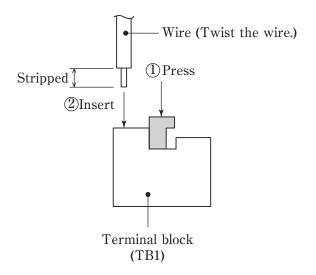
[Overview of Terminals and Connectors]

The terminal blocks and connectors for wiring are located behind the electrical access door (upper front panel door).



[Usage for the External connection terminal block 1 (TB1)]

- Applicable cable size : AWG24 to 16 ( $\Phi$ 0.5 to 1.3)
- Wire covering to be stripped : 8 to 9 mm

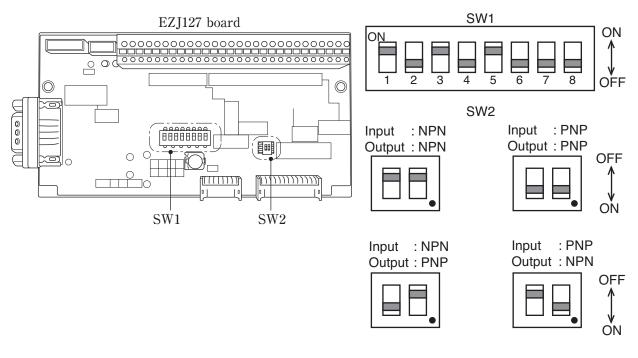


[ Connection to the external connection terminal block (TB1 of EZJ127 board) ]

- The I/F signal with conveyer is connected.
- NPN/PNP interface can be selected for the print target detector and a part of I/O signals.
- Totem pole/Open collector(NPN) can be selected for the encoder signal.

Pin	Na	me	Input/	output	Remarks	
No.	NPN Interface	PNP Interface	NPN	PNP	- Remarks	
1	Power supply for Prin	nt target detector	Output		• DC24V, 100mA max. (*1)	
2	Print target detector		Inj	out	• Power supply, NPN / PNP can be selected	
3	Ground for Print targ	et detector	-	-	by SW1.	
4	Print stop		Input		• NPN / PNP can be selected by SW2	
5	Signal ground		-	-	• INFIN / FINF call be selected by SW2	
6	Power supply for enc	oder	Out	tput	• DC24V, 100mA max. (*1)	
7	Encoder signal (Toter	n pole)	Inj	put	• Totem pole / Open collector (NPN) can	
8	Encoder signal (Oper	n collector NPN)	Inj	out	be selected by SW1	
9	Ground for Encoder		-		• Power supply can be selected by SW1	
10	Ready	-	Output	-	_	
11	Signal ground	-	-	-	• Open collector (NPN) only.	
12	Fault	-	Output	-		
13	Warning	-	Output	-		
14	Deflection voltage O	-	Inp	out	_	
15	Reciprocative print si	gnal	Inp	out	_	
16	Run signal	-		out	• NPN / PNP can be selected by SW2	
17	Reset signal		-	out	_	
18	Stop signal		Input			
19	Print-in-progress / Pr	int-complete	Output		_	
20	Online output		Output		• Print-in-progress/ Print-complete can be	
21	Universal output 1		Output Output		selected with screen operation.	
22	Universal output 2				• NPN / PNP can be selected by SW2	
23	Signal ground		-	-		

(\*1): The supplying power capacity for print target detector and encoder is up to 100mA in total.



(Precautions when using combination of NPN/PNP interfaces)

- Use either NPN or PNP interface for input/output signals #4 to 5 and #14 to 23. Do not use a combination of the interfaces for these input/output signals.
- Interfaces can be combined for units of print material sensor signals (#1 to 3), encoder signals (#6 to 9), input/output signals (#4 to 5, #14 to 18) and status output signals (#19 to 22). (For example, PNP interface can be used for print target detector and NPN interface can be used for status output signals (#19 to 22).

# 4.3 Input/output (I/O) specifications

When handling external signals, observe the voltage, current, and time given in this manual. Operation is not guaranteed if external signals are not handled properly.

#### [Input / Output Signal Specifications]

(1) Input signals (external device  $\rightarrow$ IJ printer)

No.	Signal name	Function	Electrical characteristics		
110.		Function	+NPN input	PNP input	
			+24 V output (Up to 100mA *1)		
1	Print object detection		ON state : I out : 12 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 12 mA max. OFF state: V in: 1V max. *3)	
2	Printing stop	Issues instructions so that printing does not start even if a print object is detected.	ON state : I out : 6 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 6 mA max. OFF state: V in: 1V max. *3)	
3	Reciprocative printing	Issues instructions so as to change the order of characters to be printed. OFF:Transport in normal direction ON :Transport in reverse direction	ON state : I out : 6 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 6 mA max. OFF state: V in: 1V max. *3)	
4	Encoder (for speed follow-up)	Makes a pulse entry in proportion to the print object transport speed.	+24 V output NPN open collector ON state : I out : 20mA max.; OFF state: V out : 24 V *3)	(Up to 100mA *1) Totem pole ON state : I in(at24V): 20mA max. OFF state: V in: 1V max. *3)	
5	Run *2)	Functionally the same as the RUN key on the operator panel. Performs processing from "ink injection" to "ready to print"	ON state : I out : 6 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 6 mA max. OFF state: V in: 1V max. *3)	
6	Reset	Functionally the same as the Reset key and the Message Delete key on the Error Message window. Resets an error.	ON state : I out : 6 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 6 mA max. OFF state: V in: 1V max. *3)	
7	Stop	Functionally the same as the STOP key on the operator panel. Stops injection of ink (automatic flushing).	ON state : I out : 6 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 6 mA max. OFF state: V in: 1V max. *3)	
8	High voltage ON/OFF	Functionally the same as the Deflection Voltage Control function in a message which appears when the CONTROL key on the operator panel is pressed. The deflection voltage is turned on (Ready) and off (Standby) alternately each time this signal is entered.	ON state : I out : 6 mA max.; OFF state: V out : 24 V *3)	ON state : I in(at24V): 6 mA max. OFF state: V in: 1V max. *3)	

\*1) The current supply capacity of +24V for Print object detector and encoder is up to 100mA in total.

\*2) RUN signal instructs to inkjet ink. Handle the signal with care.

\*3) Ensure that the external device transistor leak current doesn't exceed 0.1mA while the input signal is OFF.

(2) Output signals (IJ printer  $\rightarrow$  external device)

No.	Signal name	Function	Electrical ch	aracteristics
1	Ready	Operates when the IJ printer is ready for printing or in input mode.	<ul><li>Open collector (NPN)</li><li>Sink current: 20 mA</li></ul>	max.
2	Fault	Operates when the IJ printer is fault state.	• ON voltage: 0.5 V o	
3	Warning	Operates when the IJ printer is in alarm condition.	• Operating voltage: 3	0 V or less
	Print. in Progress *4)	Operates when the IJ printer is engaged in printing.	<ul><li>Open collector (NPN)</li><li>ON voltage:</li></ul>	Open collector (PNP) • I in: 10 mA max.
4	Print. Completed *4)	Operates when the IJ printer completes a printing process (outputs a pulse of up to 1 second).		<ul><li>(Load resister: 2.2kΩ or more)</li><li>ON voltage: +24V</li></ul>
5	Online output	Operates when the IJ printer is in online mode	• Operating voltage: 30 V or less	

\*4) As regards "Print. in progress" and "Print. completed", either one must be selected from a screen.

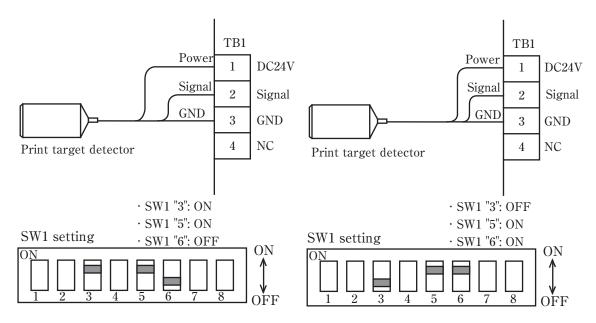
#### 4.3.1 Print target detector input

This function inputs the IJ printer print start signal.

Use a no-contact (transistor) type print target detector. An optoelectronic sensor with built-in amplifier which uses a light beam to detect the print target is ideal. When the total current consumption of the print target detector and the rotary encoder is 100mA or less, power can be supplied from the power supply built into the IJ printer. When the total current consumption exceeds 100mA, provide a dedicated power supply.

In this case, perform wiring and setting as described below.

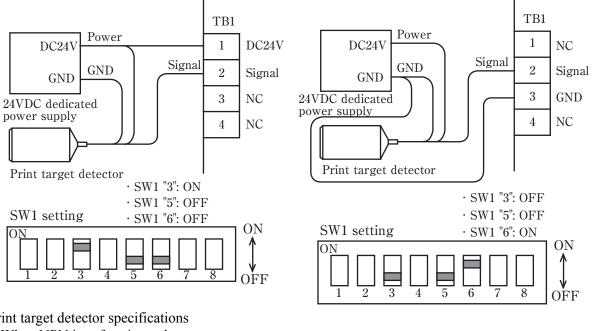
- (1) Print target detector connection method
  - (a) When NPN interface and IJ printer built-in power supply are used
- (b) When PNP interface and IJ printer built-in power supply are used



#### (c) When NPN interface and dedicated power supply are used

#### (d) When PNP interface and dedicated power supply are used

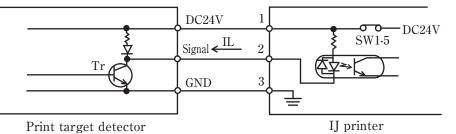
100mA



(2) Print target detector specifications

(a) When NPN interface is used

Internal circuit diagram



When the IJ printer input circuit is a current drive load for the print target detector output circuit and output transistor Tr of the print target detector is ON, it becomes the print start signal input. Use an output transistor Tr which satisfies the following specifications (NPN/PNP):

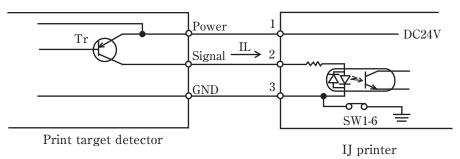
satisfies the following specificat
: 24VDC or greater
: 12mA or greater (IL= 10mA)
: 2V or less
: 0.1mA or less

The IJ printer built-in power supply specifications are:

Power supply voltage	: 24V
Maximum supply current	: 100mA *Note 1
*Note 1: Total power supply to prin	nt target detector and rotary encoder is max.

(b) When PNP interface is used

Internal circuit diagram



\*

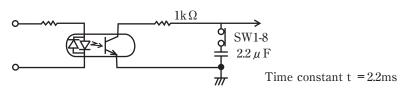
(3) Print target detector signal noise filter

(a) IJ printer built-in noise filter setting.

This function uses to filter the normal noise generated at the print target detector signal and noise generated by water drops, etc. with CR.

The target sensor filter function (See "Instruction manual 4.14 Set the print specifications") is effective against sensor chattering.

Internal circuit diagram

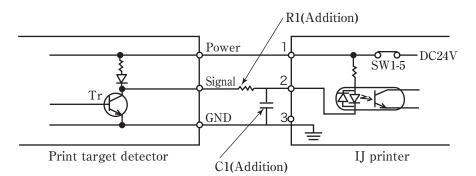


SW1 setting · SW1 "8" ON : Filter ON OFF: Filter OFF

 $\begin{bmatrix} ON \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \end{bmatrix} \xrightarrow{ON} \\ 0FF$ 

(b) Addition of external noise filter

In case that the built-in noise filter cannot eliminate the noise, add the following additional CR filter outside of IJ Printer.

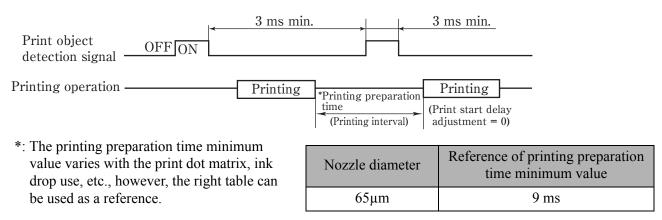


If R1=1kohm (0.5W) and C1=1micro farad /25V, the CR time constant=1ms. If R1=1kohm (0.5W) and C1=1micro farad /25V, the CR time constant=1ms. The filter could eliminate a several hundred micro-seconds of noise. If you need to eliminate bigger noise, add an additional capacitor in parallel with C1.

Notes for addition of CR filter:

- R1 has to be less than 1kohm.
- C1 should be temperature compensating ceramic capacitor. If it is difficult to find such type of capccitor, select high-precision and good temperature characteristics type of high dielectric ceramic capacitor as much as possible.
- R1 and C1 should be placed near IJ Printer as much as possible.

#### (4) Relationship between print object detection signal and printing operation



The accurate printing preparation time can be calculated by following formula.

Necessary printing preparation time (Note 1) = [(One scan time)  $\times$  (N + 1)] (ms)

 $(One scan time) = \frac{(Number of vertical dots + Character width) \times Ink drop use percentage}{(ms)}$ 

Excitation frequency (kHz)

N : (One scan time  $\times$  N)  $\geq$  Remaining number that is set to "a" (a: Refer to the right table.)

Nozzle diameter	а
65µm	5.5

Excitation frequency: 62.5 (Model UX-P, with 65µm nozzle and JP-W89 ink)

Refer to "Handling guidance of each ink" manual to check the supported excitation frequency.

(Note 1) Time for repeated printing of fixed characters. When using the communications function or 2-dimensional bar code function, it will be longer than the time calculated from this formula.

When the speed is followed up, the number of encoder pulses shown below will serve as reference for the minimal value of print space:

(5) Tracking function

- This function achieves printing even when two or more print objects are positioned between the print object detector and print head.
- Up to four print objects can be positioned between the print object detector and print head.
- This function cannot be exercised simultaneously with the repeat-printing function.

#### 4.3.2 Product speed matching function using a rotary encoder

The product speed matching function is used when the speed of the print target or the conveyer carrying the print target changes while the IJ printer is printing. If this function is not used, when the speed changes, the width of the printed characters may change and the characters may be difficult to read.

When the product speed matching function is used, it is necessary to input an external electric pulse having a period proportional to the speed to the IJ printer. Ordinarily a rotary encoder is used for this purpose. The IJ printer can print each vertical line of the printed message in synchronization with the pulses from the rotary encoder.

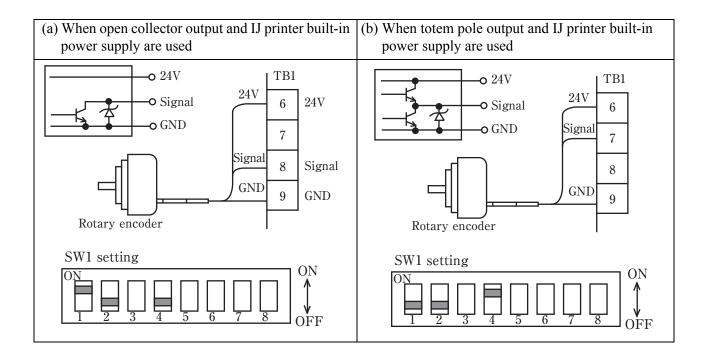
#### 4.3.2-1 Rotary encoder specifications wiring and switch setting

(1) The specifications of the connectable rotary encoders are:

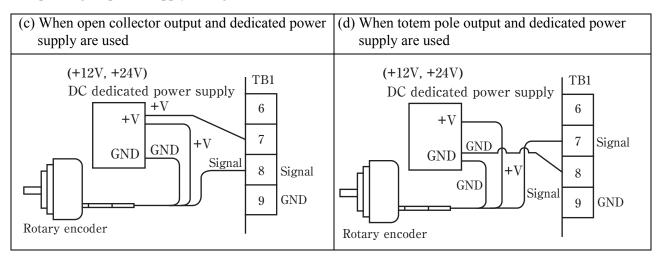
Output waveform	: Square wave (duty: 30 to 70%)
Output withstand voltage	: 24VDC or greater
Load current	: 20mA or greater
Leakage current	: 0.1mA or less
Power supply voltage	: 24VDC
Current consumption	: 100mA or less *Note 1)
	(When the IJ printer built-in power supply is used, the total current consumption with the detectors is 100mA or less.)
Input signal frequency	: 200kHz or less
Number of pulses	: Decided by production line conditions

\*Note 1) The maximum power supply capacity of the IJ printer built-in power supply (24VDC) is 100mA. When the current consumption of the detector and encoder exceeds 100mA and the power supply voltage is outside 24V, use a dedicated power supply and perform the wiring work described in (3) below.

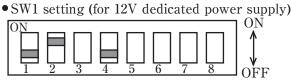
(2) Encoder wiring and setting of SW1 on EZJ127 board when IJ printer built-in power supply is used

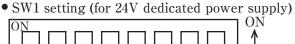


- (3) Encoder wiring and setting of SW1 on EZJ127 board when used with a dedicated power supply
  - Wiring used for a dedicated power supply differs according to output interface of the encoder, but can be the same depending on power supply voltage.



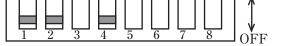
• Switch setting for a dedicated power supply differs according to power supply voltage, but can be the same depending on output interface of the encoder.





\*For open collector output and totem pole output

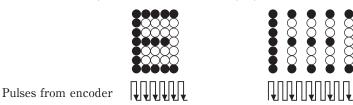
#### 4.3.2-2 Setting to IJ printer



\*For open collector output and totem pole output

- (1) Make the settings related to "Product speed matching" and "Pulse rate div. factor" at the "Print specifications" screen. (See "Instruction manual 4.14 Set the print specifications".)
  - •Set "Product speed matching" to "1: Enable".
  - •Set "Pulse rate div. factor" as required. This function lowers (makes the period longer) the frequency of the input pulses inside the IJ printer. The divided pulses become the pulses used in printing.
  - <Description of pulse division function>

(When division factor: 001) (When division factor: 002)



• The rotary encoder signal pulse frequency, the print scan frequency and the division factor have the relationship shown in (Eq. 1).

Encoder pulse frequency 
$$[kHz] = \frac{Print scan count [kHz]}{Division factor (l/n)} ----(Eq. 1)$$

•Set "Speed compensation" at the "Print specifications" screen to "Enable", as required. <What is "Speed compensation"?>

This function reduces changes in the print start delay when the conveyer speed changes.

#### CAUTION

This function cannot be used when the product speed matching function is not used. In addition, this function cannot be used when "Repeat print" mode is set at the "Print specifications" screen.

When "Speed compensation" is enabled, print start is delayed for 10 scans.

# 4.3.2-3 Method of calculating the conditions which allow product speed matching

Calculate to find whether the Ink drop use and division factor are the conditions which allow product speed matching, based on the following.

Print quality improves as the calculation shown below is performed and the Ink drop use becomes smaller. In addition, when changing Ink drop use, check the print quality.

 Set the Character width on the "Print specifications" as below depending on the Ink drop use. High speed character model : Refer to section 4.14 "Set the print specifications Table 4.14.2 Setting of character width" of Instruction Manual.

Large	Ink drop use	Character width set value
<b></b>	1/1	002
¥	1/2	001
Small	1/3 to 1/16	000

(2) The maximum print scan frequency is found from the following equation by means of the printed character width and highest conveyer speed. Substitute the value according to the nozzle diameter of the type used at d.

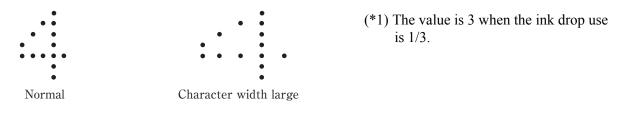
Highest conveyer speed 
$$[m/min] \times \frac{1}{60} \times \frac{\text{Number of horizontal dots -1}}{\text{Character width [mm]-d[mm]}} -----(Eq. 2)$$

Nozzle diameter	d
65µm	0.33

(3) Next, use (Eq. 3) to check if the maximum print scan frequency found from (Eq. 2) can be matched at IJ printer set print speed.

Excitation frequency (f)

- (Number of vertical dots + character width set value +1) × (Denominator of ink drop use (\*1)) [kHz] (Eq. 3) > Max. number of print scans [kHz]
- When the result of (Eq. 3) is smaller than the maximum print scan frequency (Eq. 2), product speed matching is not performed normally and the character width becomes large.



•In addition, when "Product speed matching error" warning is set, a warning is generated. In this case, (1) lower the conveyer speed, (2) widen the print character width, or (3) set Ink drop use larger, so that the maximum print scan frequency becomes smaller than the calculated value of (Eq. 3). (Makes the IJ printer set print speed faster than the highest conveyer speed.)

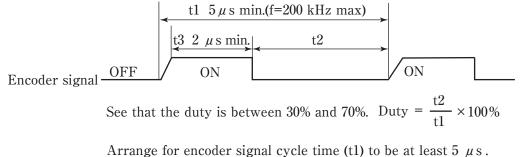
(4) The excitation frequency (f) in (Eq. 3) depends on the type of ink used. The excitation frequency by typical nozzle diameter and ink is shown below. For other inks, refer to the handling guidance of each ink.

Nozzle diameter	Type of ink	Excitation frequency (f)
65µm	JP-W89	62.5kHz

(5) When a rotary encoder is used, the print character width cannot be changed by changing the IJ printer character width set value.

When the print character width must be changed, a device (timing belt, pulley, etc.) which varies the conveyer speed and rotary encoder speed synch signal pulse frequency ratio must be installed.

(6) Restriction of the speed synchronization signal pulse frequency from the rotary encoder



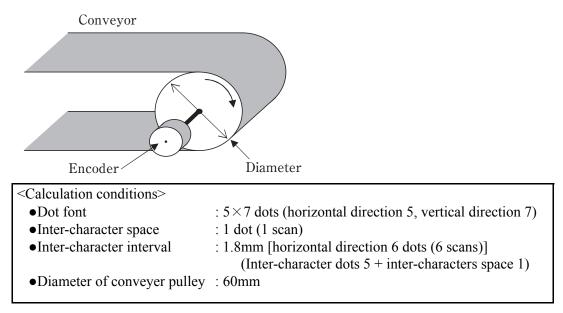
Flat period of encoder signal (t3) : 2  $\mu$  s min.

(7) Rotary encoder selection method and calculation method

The print character width when the product speed matching function is used is determined by the amount of movement of the product per encoder pulse.

Examples are introduced below.

Example 1: Calculate the resolution of the rotary encoder when the rotary encoder is connected directly to the conveyer shaft.

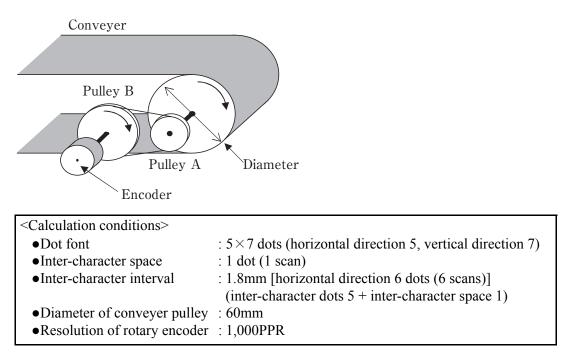


① Distance the conveyer moves per 1 revolution of the rotary encoder 60mm×3.14=188.4mm/rev

- (2) Number of scans which must be executed while the conveyer is moving 1mm 6 scans/1.8mm=3.33 scans/mm
- (3) Required resolution of the rotary encoder (number of output pulses per 1 revolution of the rotary encoder)

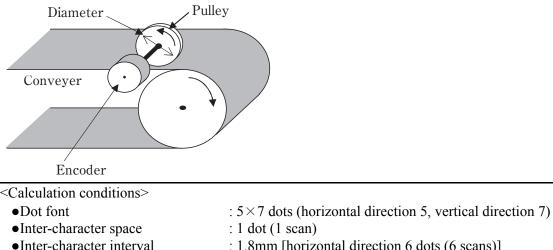
188.4mm/rev × 3.33 scans/mm=628PPR (= 2500PPR, Division factor=4)

# Example 2: Calculate the diameter ratio (RT) of the pulley when the rotary encoder is connected to the conveyer through a pair of pulleys.



(1) Amount of movement of conveyer per 1 revolution of rotary encoder  $60mm \times 3.14=188.4mm/rev$ 

- 2 Number of scans which must be executed while conveyer moves 1mm 6 scans/1.8mm=3.33 scans/mm
- (3) Necessary number of output pulses (resolution) from rotary encoder 188.4mm/rev  $\times$  3.33 scans/mm=628PPR
- Diameter ratio (RT) of pulley RT=Diameter of pulley B/diameter of pulley A=1,000PPR/628PPR=Approx. 1.6/1
- Example 3: Calculate the necessary rotary encoder resolution when a pulley is installed to the shaft of the rotary encoder and this pulley is connected to the conveyer.



r interval : 1.8mm [horizontal direction 6 dots (6 scans)] (Inter-character dots 5 + inter-character space 1)

•Diameter of rotary encoder pulley : 95.5mm

(1) Amount of movement of conveyer per 1 revolution of rotary encoder 95.5mm  $\times$  3.14=300mm/rev

2 Number of scans which must be executed while the conveyer is moving 1mm 6 scans/1.8mm=3.33 scans/mm

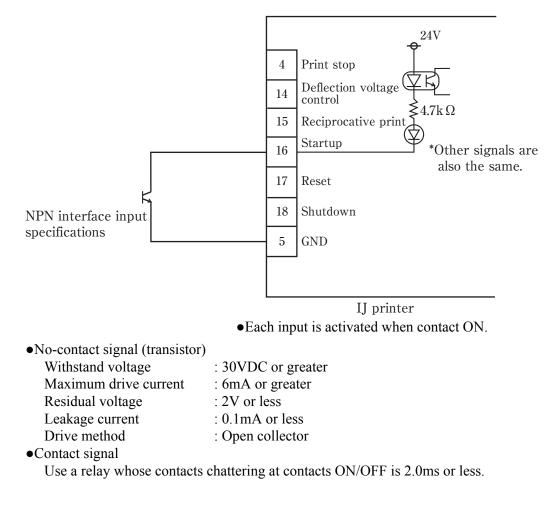
(3) Necessary number of output pulses (resolution) from rotary encoder 300mm/rev  $\times$  3.33 scans/mm=1,000PPR

#### 4.3.3 Input function

The IJ printer can be controlled by inputting print stop, remote operation ("Startup", "Shutdown", "Reset", "Deflection voltage control") and reciprocative print switching to pins 4, 5, and 14 to 18 of TB1 by switch or contact signal from the outside.

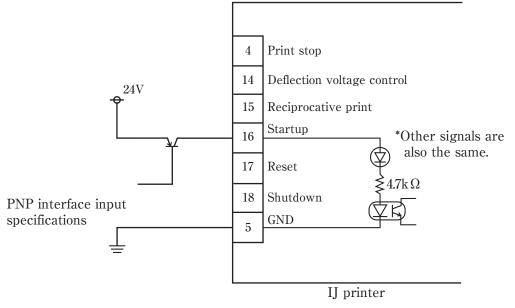
#### Internal circuit diagram

(a) NPN interface input (no voltage input)



#### (b) PNP interface input (voltage input)

•Impressed voltage 24 to 30V



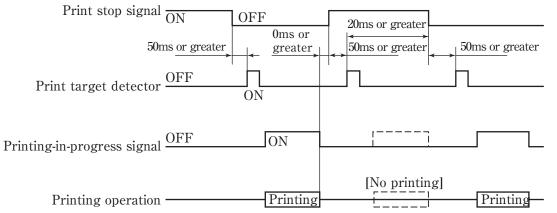
•No-contact (transistor)	
Withstand voltage	: 30VDC or greater
Maximum drive current	: 6mA or greater
Residual voltage	: 2V or less
Leakage current	: 0.1mA or less
Drive method	: Open collector
a	-

•Contact signal

Use a relay whose contacts chattering at contacts ON/OFF is 2.0ms or less.

#### 4.3.3-1 Print stop signal input

- [Function] This function prevents printing from the outside. (Note that the Ready to print output signal does not change even if this signal is input from the outside.)
  - Input ON In the IJ printer Ready to print state, the printer does not print even if the product target detector is turned ON. However, the product being printed cannot be aborted.
  - Input OFF In the IJ printer Ready to print state, the printer prints when the product target detector is turned ON.



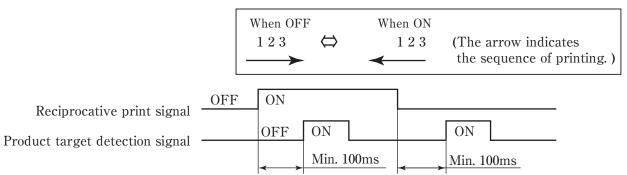
- •Regarding the signal levels, the ON state indicates low level and the OFF state indicates high level.
- The tracking function cannot be used.
- In the tracking mode, the timing which stops printing by print stop signal cannot be specified.
- •When Repeat print is set, the IJ printer is controlled by a print start signal generated internally.

#### 4.3.3-2 Reciprocative print signal input

[Function] This function switches the order of the characters to be printed.

Input OFF : Forward direction (Example)

Input ON : Reverse direction

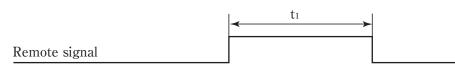


\*When the user environment setup item "Change Character Orientation" was set to "Reverse direction printing", provide a minimum interval of 100ms up to input of the print target detector signal after changeover (ON $\rightarrow$ OFF, OFF $\rightarrow$ ON) of the reciprocative printing signal.

When the Change Character Orientation was set to "normal or inverted" or "Character orientation 0 or 3", provide a minimum interval of 400ms up to input of the print target detector signal after signal changeover.

#### 4.3.3-3 Remote startup signal input

- [Function] This function inputs the same operations as the IJ printer operation state operation keys ("Startup", "Shutdown", "Reset", "Deflection voltage control" (standby state and Ready to print state switching)) by external switch or contact signal.
  - (a) Judgment conditions
    - (a-1) Remote signals in general
      - (1) Remote signal ON time t1 shall be 100ms or greater.



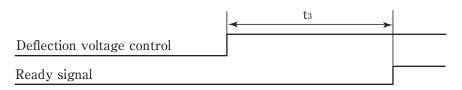
- (2) Take measures so that multiple remote signals are not turned ON simultaneously. If multiple signals are turned ON simultaneously, the signals will not be accepted.
- (3) Signals cannot be received in the following cases:
  - (1) When a confirmation window is open
  - (ii) When the Circulation control screen is opened by maintenance function
  - (ii) When the Touch screen coordinate correction screen is opened by auxiliary function

#### (a-2)"Deflection voltage control"

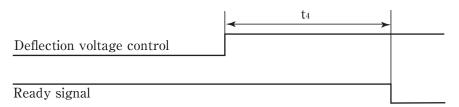
(1) When "Deflection voltage control" is input continuously, a certain OFF period is necessary. When t2 is 10ms or less, OFF is not detected and the signal is not received.



② Time until state changes after "Deflection voltage control" is input t3: Within 3 seconds (Standby→Ready)



t4: Within 100ms (Ready→Standby)



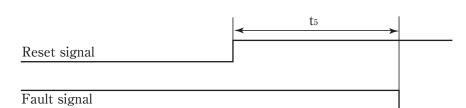
- (3) When "Deflection voltage control" is turned ON, state confirmation is necessary. If "Deflection voltage control" is turned on by mistake during printing, printing is aborted even in the process of printing and the IJ printer is switched from the Ready state to the Standby state. To prevent erroneous printing, input this signal when the printer is in a not printing state.
- (4) When the Product speed matching function is used, and when the print description is changed when the line is stopped during printing, etc., the IJ printer will enter the Standby state by this signal and the print description can be changed.

(a-3) "Reset signal"

(1) Input this signal when the fault signal is ON.

In addition, after signal input, check if "Fault" is cleared.

- (2) Turn on the "Reset signal" 30 seconds or longer after the IJ printer power is turned on.
- (3) The time until the fault is cleared after the "Reset signal" is input. t5: within 100ms.



(a-4)"Startup signal"

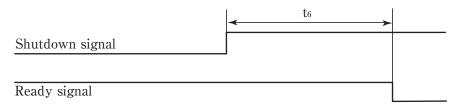
- (1) The "Startup signal" is a signal that specifies an automatic procedure up to ink ejection. Handle it with care.
- (2) When the "Startup signal" is turned ON during ink stop processing, it is ignored.
- (3) Turn on the "Startup signal" 30 seconds or longer after the IJ printer power is turned on. In addition, input this signal after checking if the "Fault" is cleared. Moreover, it takes about 2 minutes for the IJ printer to enter the Ready to print state after the "Startup signal" is turned ON.

(a-5) "Shutdown signal"

(1) Turn off the power after confirming that the IJ printer has entered the Stop state after the "Shutdown signal" is turned ON.

It takes about 3 minutes for the IJ printer to enter the Stop state after the "Shutdown signal" is turned ON.

2 The time until the state changes after the "Shutdown signal" is input. t6: within 100ms

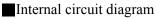


(Notes)

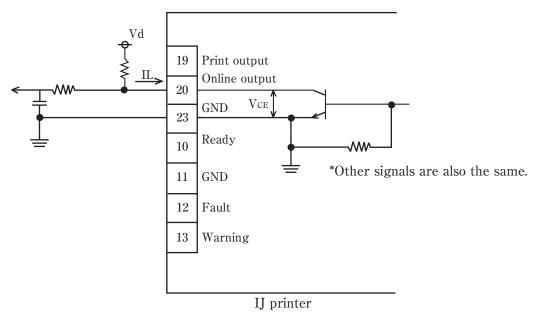
- (1) For key input, input must be confirmed, but when an external signal is input, processing is performed in accordance with the signal instructions. Especially, since "Startup" (startup signal) specifies ejection of the ink, handle it with care.
- (2) When a confirmation window is opened, input of all remote operation signals is disabled. Re-input the signals after the confirmation window is closed. When the line monitor screen is displayed, input of all the remote operation signals is disabled.
- (3) When the Touch screen coordinate correction or Circulation control screen is displayed, input of all the remote operation signals is disabled. Re-input the signals after a different screen was displayed.
- (4) The remote operation signals are enabled even when a rotary encoder is used and the conveyer is stopped during printing.
- (5) When the Shutdown signal is input while the Fault window is open, the ink is stopped with the window remaining displayed.

#### 4.3.4 Output function

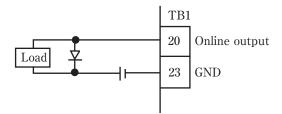
The state of the IJ printer is monitored by connecting the print output ("Print-in-progress" or "Print.complete"), online output, Ready, Fault, and Warning signals to pins 10 to 23 of TB1. (No-contact (transistor) output)



(a) NPN interface output (no-voltage output)



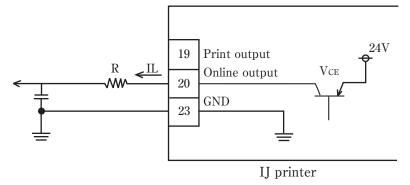
- The output transistor is open collector, and the logic is transistor ON at operation ON.
- •The voltage and current used by the external equipment must satisfy the following specifications: IL ≤20mA (VCE : TYP0.6V, MAX2V) Vd≤ DC30V
- •Wiring precautions



\*Other signals are also the same.

- •When the load is a relay, solenoid, or other inductive load, connect a diode to prevent generation of a counter electromotive force in parallel with the load.
- •The load circuit is DC dedicated. It cannot be used with an AC load.

(b) PNP interface output (voltage output)

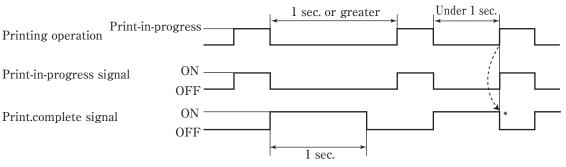


- The output transistor is open collector and the logic is transistor ON (voltage output) at operation ON.
  When used with external equipment, the following shall be satisfied:
  - IL  $\leq 10$ mA(V<sub>CE</sub> : TYP0.6V, MAX2V), Guide line of R : R  $\geq 2.2$ k $\Omega$ Withstand voltage 50VDC or greater (2 times or more of the voltage used)

#### 4.3.4-1 Print output signal (NPN/PNP interface output : TB1-19)

[Function] This function outputs a signal to the outside at IJ Printer Print.complete or Print-in-progress.

- (a) Print-in-progress and Print.complete switching
   Switching of the Print-in-progress and Print.complete signals is set at the User environment setup screen.
   (See Instruction manual "6.1 Set the user environment".)
- (b) Signal timing



\*When the next printing operation started within 1 second, turned OFF at the stage at which the printing operation started.

#### 4.3.4-2 Online output signal (NPN/PNP interface output : TB1-20)

[Function] This function outputs a signal to the outside when the IJ printer is online.

#### 4.3.4-3 Ready output (NPN interface output only : TB1-10)

[Function] This function outputs a signal to the outside to indicate IJ printer Ready-to-print state or input mode state. (It is used to stop the conveyer when the IJ printer cannot print to prevent the product from flowing without being printed.)

#### 4.3.4-4 Fault signal output (NPN interface output only : TB1-12)

[Function] This function outputs an "IJ printer in fault mode" signal to the outside.

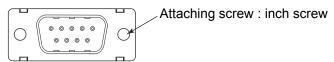
#### 4.3.4-5 Warning signal output (NPN interface output only : TB1-13)

[Function] This function outputs an "IJ printer in warning mode" signal to the outside.

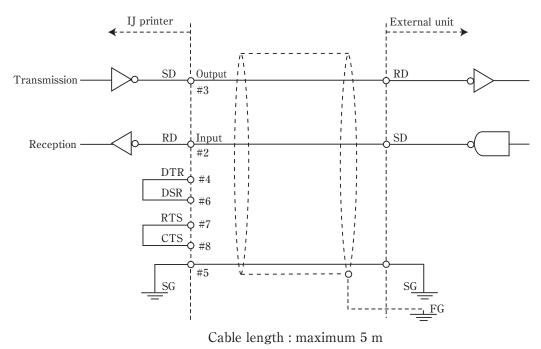
#### 4.3.4-6 External communication (RS-232C)

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

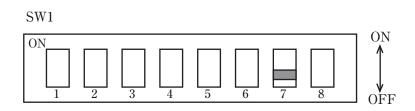
Pin No.	Name	Input/Output	Remarks
1	(NC)	-	
2	RD	Input	
3	SD	Output	
4	DTR	-	Connect with DSR by IJ printer side.
5	SG	-	
6	DSR	-	Connect with DTR by IJ printer side.
7	RTS	-	Connect with CTS by IJ printer side.
8	CTS	-	Connects with RTS by IJ printer side.
9	(NC)	-	



Connector on EZJ127 board :9-pin D sub-connector(plug)



Turn OFF SW1-bit7 on EZJ 127 board.



# 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, etc). Use a cable which is as short as possible.

#### 4.3.5 Product speed matching function without a rotary encoder 4.3.5-1 Auto product speed matching function

Auto product speed matching function is used for detecting the change of speed of the conveyer carrying print target using the print target detector connected to the IJ printer, and prints each vertical line of the print according to the change of speed in the same way as the Speed matching function using a rotary encoder.

Ensure to confirm the print start position and check for the slip of the print target by thoroughly testing before using this function. If the print start position or the character width of print vary widely as a result of the test, use the Speed matching function using a rotary encoder.

-	
No.	Conditions of use
1	In case the print target slips on the conveyer between after the print target passes the print target detector and before IJ printer complete printing.
2	In case the carrying speed changes or the conveyer stops between after the print target passes the print target detector and before IJ printer complete printing.

#### Cases that the speed can not be matched

#### 4.3.5-2 Print target detector

- •Use a no-contact (transistor) output type print target detector with a photoelectric sensor with built-in amplifier which detects the target using the optical beam.
- To start the print from the edge of the print target, place the print target detector so that the "Distance between the print head and print target detector" is larger in width than print target.

#### 4.3.5-3 IJ Printer setup

- •Configure the setting for "Product speed matching", "Print target width", and "Actual print width" on "Print Specifications" screen. (See Chapter 4.14 "Set the print specifications" in the Instruction Manual)
- •Set "Auto" for "Product speed matching".
- •Enter "Print Target width" and "Actual Print width" in mm.

The value for "Actual Print width" must be smaller than "Print Target width".

• "Enable" the "Speed compensation" as required.

# A Precaution

When "Speed compensation" is enabled, the print start position is delayed 2 scans because calculation is performed to reduce the change of the print start position. The position accuracy of the print start position may be worse than the product speed matching function using a rotary encoder, because calculation is performed by sensing the print target detector.

- •When setting the "Sensor filter" on "Print specifications", set the value as small as possible so that the Sensor filter function is completed before the target passes the print target detector.
- •"Repeat count" on "Print specifications" can not be used at the same time.
- The Character width on the "Print specifications" is automatically set as below depending on the Ink drop use.

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

#### 4.3.5-4 Carrying speed

- •Set the minimum speed the target print is carried by conveyer to 1m/min.
- •If the carrying speed the IJ printer detects is faster than the speed of when the printed without Speed matching, print is made with the same interval as when the Speed matching function is not used. (At the time speed exceeds the limit speed in the condition)
- •If "Print Target width" or "Actual Print width" on the "Print specifications" is not entered, the print is made with the same interval as when the Speed matching function is not used.

# **5.COMMUNICATION**

# 5.1 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 data registration transmission

- Transmits Print data's "message number" and "message name" from external unit to the IJ printer.
- The IJ printer provides a "message name" and registers data currently being printed as print data of "registration No."

(4) Print condition transmission

- The external device transmits "print specifications" and "print format" to the IJ printer.
- The IJ printer receives the "print specifications" and "print format", and prepares for making prints under the specified conditions.

(5) Free layout transmission

- An "item number" and "amount of move" are transmitted from the external device to the IJ printer.
- The IJ printer receives the "item number" and "amount of move", and then moves the item specified to the specified position.
- (6) Calendar conditions transmission, count conditions transmission
  - Transmits and sets "initial values", "range" of count conditions, and "Substitution rules No.", "offset", "Substitution rules", "zero suppress" of calendar condition etc. from external unit to the IJ printer.

#### (7) User pattern 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.

#### (8) On-line/off-line transmission procedure

• Specifies switch of online state and offline state from external unit to the IJ printer.

#### (9) Remote operation transmission

• Specifies ink ejection/stop, deflection voltage control (on/off) and error reset from external unit to the IJ printer.

#### (10) Time control

- Transmits and sets "current time", "calendar time", etc., from external unit to the IJ printer.
- Inquires current time from external unit to the IJ printer and the IJ printer returns "current time".

#### (11) Print item deletion transmission

- Specifies print item deletion from external unit to the IJ printer.
- The first print item will be left.

#### (12) Count Reset Transmission

- This function will change the count value to the preset value (reset value).
- All count blocks which have the preset "Reset" value will be reset to "Reset" value.

#### (13) Communication buffer

- The print contents received through print content transmission will not be reflected in printing immediately, but will be temporarily held in buffer.
- The print contents are fetched from the buffer one by one for each printing, and reflected in subsequent printing.

#### (14) Ethernet communication (LAN communication TUP-I)

- Function for Ethernet communication between the IJ Printer and external unit employing a LAN environment.
- Type of Ethernet communication can be selected from Modbus communication.
- Modbus communication require development of a communication program on the external unit side. For the development purpose of communication program, IJP control library will be provided as a development kit.
- See the instruction manual for Ethernet Communication TUP-I for details.

## 5.2 Setting Communication Environment 5.2.1 Setting Communication Environment

#### (1) Overview

Function	Description	Default
State at power-up	<ul> <li>Comm. port is OFF : Offline mode when the power is turned on.</li> <li>Comm. port is ON : Online mode when the power is turned on.</li> <li>OFF fixed : Always offline mode and you cannot change to the online mode.</li> </ul>	Comm. port is OFF
Communication and signal error	<ul> <li>Warning : An external communication error and external signal error are considered to be "Warning".</li> <li>Fault : An external communication error and external signal error are considered to be "Fault". The printer does not print even if the product target detector is turned ON.</li> </ul>	Warning
Baud rate	<ul> <li>Sets the baud rate at which communication is established with the outside.</li> <li>Eleven different settings are selectable: 150, 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, or 115,200 bps.</li> </ul>	4,800bps
Data format	<ul> <li>Sets the data length, parity bit, and stop bits for communication with the outside.</li> <li>The following settings are available. <ol> <li>Data length: 7 or 8 bits</li> <li>Parity bit: none, odd, or even</li> <li>Stop bits: 1 bit or 2 bits</li> </ol> </li> </ul>	Data length: 8 bit Parity bit : none Stop bits : 1 bit
Number of comm. bytes	<ul> <li>Sets the number of character code bytes for communication with the outside.</li> <li>A setting of 1 byte or 2 bytes can be selected.</li> </ul>	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	<ul> <li>Overwrite-protected: No new data will be received until the previously received data is printed.</li> <li>Overwrite-enabled : New data is received even if the previously received data has not been printed. The newly received data overwrites the old data.</li> </ul>	Overwrite- protected
Print message transfer ACK	<ul> <li>t=fixed : The time from receiving the print description from an external device to sending ACK becomes nearly fixed regardless of the transmission volume.</li> <li>t=async. : The system will be ready to print immediately after returning ACK.</li> </ul>	t=async.
Print spec. transfer char. height	<ul> <li>2 digits: Uses 2-digit data for character height setting ([00] to [99]) transmission.</li> <li>3 digits: Uses 3-digit data for transmission.</li> </ul>	2 digits

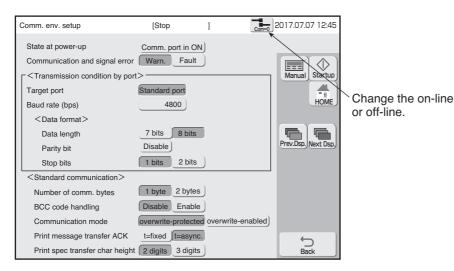
	Settin	g item of LAN communication	
Function		Description	Default
LAN function	<ul><li>No use</li><li>Modbus communication</li></ul>	: LAN function cannot be used. : Modbus communication function can be used.	No use

	Setting item of LAN communication (UX-P**1n) n: I	Destination Code
Function	Description	Default
LAN function	<ul> <li>No use : LAN function cannot be used.</li> <li>Modbus communication : Modbus communication function can be used.</li> <li>EtherNet/IP communication : EtherNet/IP communication function can be used.</li> <li>OPC-UA communication : OPC-UA communication function can be used.</li> </ul>	No use
IP address	Sets IJ Printer's IP address.	192.168. 0. 1
Subnet mask	Sets IJ Printer's Subnet mask.	255.255.255. 0
Default gateway	Sets IJ Printer's Default gateway.	0. 0. 0. 0
Port No.	Sets IJ Printer's Port No.	502
MAC address	Displays IJ Printer's MAC address. * It is a number registered to identify the device on the network. The MAC address consists of 12 digits like 01-23-45-67-89-AB and cannot be changed.	Device specific and cannot be changed

#### (2) Operating procedure

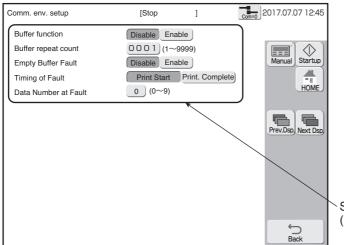
#### **1** Press Communication environment setup from the Environment setup menu.

The "Communication environment setup" screen appears.



#### 2 Press Next settings.

The second screen appears.

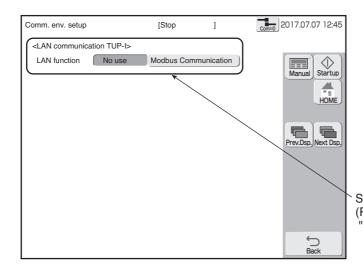


Setting of communication buffer (Refer to " 5.9 Communication buffer".)



#### 3 Press Next settings.

The third screen appears.



Setting of LAN communication TUP-I (Refer to the Instruction manual for "Ethernet Communication TUP-I".)

The third screen appears. (UX-P\*\*1n)

Comm. env. setup	[Stop	]	2018.07.07	12:45
			Nakeup	
<lan communication=""></lan>	<b>`</b>			( )
LAN function	No use		Manual Sta	artup
IP address	192) 168) 0	00) 001		
Subnet mask	255) 255) 2	255) 000	A	DME
Default gateway	000) 000) 0	000 000	)	
Port No.	00502			<b>_</b> ]
MAC Address 00	00 00 00	00 00	Prev.Dsp. Nex	t Dsp.
			$\rightarrow$	
				$\searrow$
				Setting o
				(Refer to
				Ethernet
			Back	

n : Destination Code

LAN communication the Instruction manual for Communication.)

#### 5.2.2 Transmission Specifications

- (1) Communication method : Half duplex
- (2) Startup method : Started up by host
- (3) Synchronization method : Asynchronous
- (4) Transmission method
- (5) Baud rate
- d : Bit serial transmission : 150, 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400,
- (6) Codes transmitted 57
  - 57,600, 115,200(bps): Alphanumerical characters, symbols, dedicated characters, user pattern characters, and punctuation characters
- (7) Data format
- : Formats A through J are selectable (see the table below). No other formats can be chosen.

Item	Start bit	Data length	Parity bit	Stop bits
Format	(bits)	(bits)	(bits)	(bits)
А	1	7	1 (even)	2
В	1	7	1 (odd)	2
С	1	7	1 (even)	1
D	1	7	1 (odd)	1
Е	1	8	None	2
F (default)	1	8	None	1
G	1	8	1 (even)	1
Н	1	8	1 (odd)	1
Ι	1	8	1 (even)	2
J	1	8	1 (odd)	2

#### Data format table

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

Format	s A and	В									
Start	bo	bı	b2	b3	b4	<b>b</b> 5	b6	Parity	Stop	Stop	
	<u> </u>	-									
Format	s C and	D									
Start	bo	bı	b2	<b>b</b> 3	b4	b5	<b>b</b> 6	Parity	Stop	]	
										_	
Format	s E										
Start	<b>b</b> 0	<b>b</b> 1	<b>b</b> 2	b3	b4	<b>b</b> 5	<b>b</b> 6	<b>b</b> 7	Stop	Stop	
	•		•	·	•	•	•		•		•
Format	s F										
Start	bo	bı	b2	b3	b4	<b>b</b> 5	b6	b7	Stop	]	
										-	
Format	s G and	Н									
Start	<b>b</b> 0	<b>b</b> 1	<b>b</b> 2	<b>b</b> 3	b4	<b>b</b> 5	<b>b</b> 6	<b>b</b> 7	Parity	Stop	
	•	•	•	•	•	•	•	•	•		•
Format	s I and .	J									
Start	<b>b</b> 0	bı	b2	b3	b4	<b>b</b> 5	<b>b</b> 6	<b>b</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

# **5.3 Transmission Sequences**

#### **5.3.1 Common Transmission Sequences**

External device EN IJ printer When ENQ is om External device IJ printer	ACK	STX		Text	ETX			
When ENQ is om External device	mitted:					AC	к	
External device								
15 printer		STX		Text	ETX		K	
hen DC2 (retrar	nemiceio		lo ie ue	• od		AC	ĸ	
nen no response a switched)					n issued a	nd yet	the co	ntents
External device	DC2	ENQ	[	STX	Text	ET	x	
IJ printer	ACK		ACK	0			ACI	
External device EN	Iter is inca			•			rranaa	
External device EN IJ printer	Iter is inca			•				us me 
External device EN IJ printer Donormal transm External device EN		peratio		en the tex	t contain	s an e		us me 
External device EN IJ printer DOORMAL TRANSME External device EN IJ printer Hen BCC code		peratio		en the tex		s an e		us me 

	Example)	Print format	Print format	Print format	Print specification	Print specification	Print content	
--	----------	--------------	--------------	--------------	---------------------	---------------------	---------------	--

The user pattern can be positioned anywhere within the above data chain.

"Line count / print format uniformity", "Format setup change", "Free layout transmission", "Print item deletion transmission" and "Count reset transmission" 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 3000 bytes of data can be transmitted at a time, including "STX" and "ETX". If the 3000-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 At 01 minute of every hour.

(10) Transmit to the existing print item after creating a transmission objective print item.

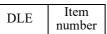
#### 5.3.2 Printings Transmission

#### 5.3.2-1 Text

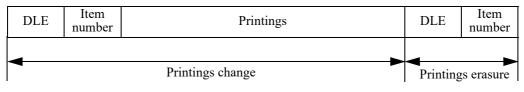
#### (1) When printings are to be changed

DLE	Item number	Printings
-----	----------------	-----------

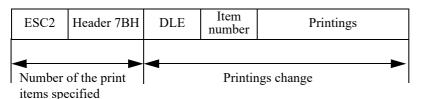
#### (2) If deleting character string within print item



#### (3) When multiple printings are to be designated



#### (4) When the print contents are changed by specifying the number of the print items



- 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.
- Print items not transmitted are not changed.
- When "the number of the print items" and the print items are transmitted at a item by Number-of-the-print-items specifying transmission, the print items beyond "the number of the print items" will be deleted.
- Number-of-the-print-items specifying transmission shall NOT be made with the other data, such as the print format or the print specification.
- Both calendar characters and count characters can be transmitted.
- For UX-D161, if printings are transmitted for a print item for which Micro QR setup is completed, a communication error occurs.
- If transmission is made to the item number(s) which does NOT exist, the new item number(s) of the message will be added, which format type is either "Individual" or "Free layout".

Item number	1	2	3	4	5	6	7	8	9	10
Code	31H	32H	33H	34H	35H	36H	37H	38H	39H	3AH
Item number	11	12	13	14	15	16	17	18	19	20
Code	3BH	3CH	3DH	3EH	3FH	40H	41H	42H	43H	44H
Item number	21	22	23	24	25	26	27	28	29	30
Code	45H	46H	47H	48H	49H	4AH	4BH	4CH	4DH	4EH
Item number	31	32	33	34	35	36	37	38	39	40
Code	4FH	50H	51H	52H	53H	54H	55H	56H	57H	58H
Item number	41	42	43	44	45	46	47	48	49	50
Code	59H	5AH	5BH	5CH	5DH	5EH	5FH	60H	61H	62H
Item number	51	52	53	54	55	56	57	58	59	60
Code	63H	64H	65H	66H	67H	68H	69H	6AH	6BH	6CH
Item number	61	62	63	64	65	66	67	68	69	70
Code	6DH	6EH	6FH	70H	71H	72H	73H	74H	75H	76H
Item number	71	72	73	74	75	76	77	78	79	80
Code	77H	78H	79H	7AH	7BH	7CH	7DH	7EH	7FH	80H
Item number	81	82	83	84	85	86	87	88	89	90
Code	81H	82H	83H	84H	85H	86H	87H	88H	89H	8AH
Item number	91	92	93	94	95	96	97	98	99	100
Code	8BH	8CH	8DH	8EH	8FH	90H	91H	92H	93H	94H

#### 5.3.2-2 Item number

• The order of print items is indicated below.

(3-column example) Circled number: Item number

Row1	Row2	
	4	
2	5	
3	6	

#### 5.3.2-3 Printings

- An array of "character codes".
- 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	Alphanumerical		User p	attern			Calendar
Number of communication	characters and	Dedicated characters	(00 to 47)	(19 + 100)	Punctuation mark	Katakana	characters, Count
bytes		characters	(00 10 47)	(48 to 199)	mark		characters
1-byte mode	ASCII	ASCII	ASCII	2-byte code	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	2-byte code

#### 5.3.2-4 Character codes

#### (1) 2-byte code (number of communication bytes: 1-byte mode)

- For 1-byte mode, 2-byte codes are sandwiched between "SI" and "SO".
- 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	Low-order
byte	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
-------	-------	--------------------	-------------------	--------------------	-------------------	-------

#### 5.3.2-5 Example of print contents transmission

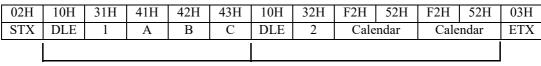
#### (1) Example when No. of communication bytes: 1 byte mode

02H	10H	31H	41H	42H	43H	10H	32H	0FH	F2H	52H	F2H	52H	0EH	03H
STX	DLE	1	Α	В	С	DLE	2	SI	Cale	ndar	Cale	ndar	SO	ETX

Print item 1

Print item 2

#### (2) Example when No. of communication bytes: 2 byte mode



Print item 1

Print item 2

[Transmission results] Print item 1 ABC Print item 2 DD

DD:Calendar character "day"

#### (3) Example when the number of the print items is changed to three (3) from two (2)

		1.511	TDU	1011	2011	(11)		1011	0.011	(011	6 411	0.011	
C	)2H	1FH	7BH	10H	32H	61E	H 62H	10H	33H	63H	64H	03H	
S	STX	ESC2	Header	DLE	2	a	b	DLE	3	с	d	ETX	
		umber o ems spec	f the prin ified	t	Print ite	em 2			Print	item 3			
[	Tran	ismissic	on results	5]									
	Prin	nt item 1	Print it	em 2	Print ite	m 3	Print item	<sup>4</sup> г	<u> </u>	Print	item 1	Print item 2	Print item 3
	A	ABC	DE	F	GHI	[	JKL		$\neg$	Α	ВC	a b	c d

#### 5.3.3 Print Data Recall Transmission 5.3.3-1 Text

ESC2	Header 20H	Classification 31H	1000s place	100s place	10s palce	Units place

Print data message number (0001 to 2000)

[	Existing ma	achine messa	age] Existir	ig machine i	message car	1 also be use	d.
	ESC	Header 56H	100s place	10s place	Units place		
		l	Print data me	essage number (	(001 to 999)		
	ESC	Header 26H	10s place	Units place			
		Prin	it data message	number (01 to	99)		

#### 5.3.3-2 Print data message number

- An already saved print data number is to be designated as the print data message number.
- The message number is expressed by a combination of three ASCII codes.

#### 5.3.3-3 Example of print contents transmission (1) Example of specifying 4-digit print data registration No.

02H	1FH	20H	31H	30H	30H	31H	32H	03H
STX	ESC2		1	0	0	1	2	ETX
								Ī

Header, classification Print data message number

[Transmission results]

Calls print data of print data message number 12.

#### 5.3.4 Print data registration transmission 5.3.4-1 Text

• Specifies message number

ESC2	Header 21H	Classification 31H	1000s place	100s place	10s place	Units place

Print data message number (0001 to 2000)

• Specifies registration No. and message name.

ESC2	Header 21H	Classification 31H	1000s place	100s place	10s place	Units place	(Contd.)

Print data message number (0001 to 2000)

ESC2	Header 21H Classification 32H		Message name (1 to 12 digits)
			Message name : ASCII code (20H to 5FH, 61H to 7AH)

Message name : ASCII code (20H to 5FH, 61H to 7AH)

[Exis	sting mach	ine message]	Existing m	nachine mes	sage can als	o be used.					
• S	pecifies re	gistration No									
	ESC	Header 55H	100s place	10s place	Units place						
			Print data me	essage number	(001 to 999)	J					
	ESC	Header 25H	10s place	Units place	]						
		Prin	t message num	ber (01 to 99)	J						
• S	pecifies re	gistration No	. and messa	ge name.							
	ESC	Header 55H	100s place	10s place	Units place	ESC	Header 86H	Message name (1 to 12 diguts)			
	Print data message number (001 to 999)										
	ESC	Header 25H	10s place	Units place	ESC	Header 86H	Message nan	ne (1 to 12 diguts)			
		Pr	int data messag	ge number (01 t	ao 99)						

#### 5.3.4-2 Message name

#### (1) message number specified

- A message name is automatically attached when print data is registered.
- Based on the message name displayed in the upper left hand corner of the screen, the last 4 digits are replaced with the message number and used as the new message name.
  - (Example) Registering for No. 123

Contents displayed in upper left hand corner of the screen Message name after registration

:"ABCDEFGHIJKL" :"ABCDEFG 0123"

#### (2) Message number and message name specified

• The specified message name attached when print data is registered.

#### (3) Same message name is used for other message number

- If a message name is in use for other message number, new message name will be created by using original message name as a base and replacing its 7th and 8th digits with AA to ZZ.
  - (Example) Message name [ABC] is already registered on No.1. Register on No.2 using identical message name.

Message name of No.1: [ABC	C ]
Message name of No.2: [ABC	C AA ]

#### (4)Characters available for message name

• Characters used for setting the message name transmission are different from characters used in manual input on registration screen.

Function	Alphameric character/ Symbols	Accent character/ Arabic character		
Manual input	Available	Available		
Message name transmission	Available	Unavailable		

Numbers/symbols (ASCII code): 20H to 5FH, 61H to 7AH

#### 5.3.4-3 Supplement

• When transmitting print data together with the print contents, send the print contents last.

#### 5.3.4-4 Example of print data registration transmission (1) Example of registering by specifying message name

0	2H	1FH	21H	31H	30H	30H	31H	32H	1FH	21H	32H	41H	42H	43H	03H
S	TX	ESC2	!	1	0	0	1	2	ESC2	!	2	А	В	С	ETX
															J

Header, classification Print data message unmber Header, classification Message name

[Transmission results]

Message name "ABC" is assigned to current print data and is registered under message number 12.

# 5.3.5 Print Condition Transmission

## 5.3.5-1 Text

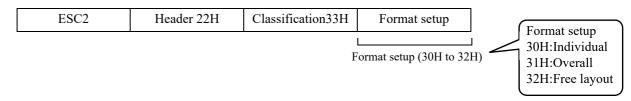
## (1)Line count / print format uniformity

ESC2 Header 22H Classification 31H

- Line count and print format are made uniform for all print items.
- Line count of all rows are made uniform based on the first row.
- Space between lines, character size, space between characters, whether or not to use bar code and double width size are made uniform based on the setting value of the first print item.
- Send the message independently. The message cannot be sent together with print format, print specs., and print contents.
- If transmission is made to the message which format setup is "Free layout", a communication error will occur.

[Exist	ting machine	e message] Exis	sting machin	e message can also be used.
	ESC	Header 2BH	30H	]

## (2) Format setup change



- This transmission can change the format setup.
- The print data will be adjusted to match the "After-change" Format setup.
- Print condition transmission shall be made independently. Print condition can not be transmitted with Print format, Print specification or Print description.

## (3)Configuration of print format text

• Print item not specified

Print format text

If item No. is not specified, it is set for all items.

To transmit print format and print specs. consecutively, transmit in the order of (1) print format and (2) print specs. If transmitted the other way round, an error will occur.

• Print item specified

ESC2	Header 70H	Item No.	Print format text

Item No. specified (1 to 100)

Only specified print item is applicable for change.

[E	xisting mach	ine message]	Existing mac	hine message can also l	be used.
	ESC2	Header 24H	Item No.	Print format text	]
	Item No	specified (1 to 1			

## (4)Print format text

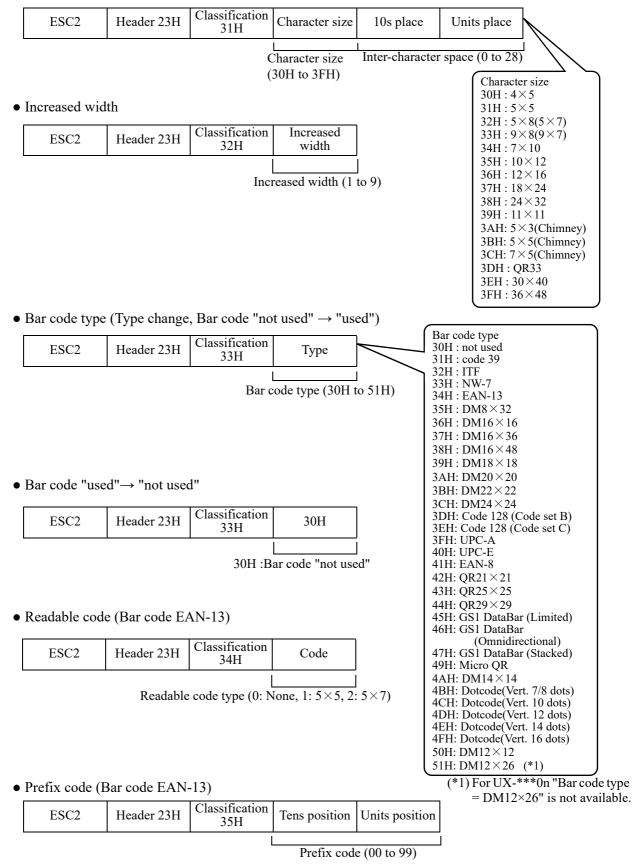
• Line count and Line spacing

ESC2	Header 22H	Classification 32H	Line count	Line spacing

Line count (1 to 5) Line spacing (0 to 4) (5 lines : 0 to 2)

(5 line

• Character size and inter-character space



• Two or more print format items can be consecutively transmitted in a single chain.

[Existing mac	hine message]	Existing ma	chine messag	e can also be	used.	
• Line count ar	nd Line spacing					
ESC	Header 22H	Line count	Line spacing			Character size 30H:5×5
	Li	ne count (1 to 5)	Line spacing (	) to 2)		31H:5×8(5×7) 32H:7×10 33H:12×16
• Character siz	e and inter-char	acter space				34H:18×24 35H:24×32
ESC	Header 21H	Character size	inter-character space			
	Charact	er size (1 to 5)	inter-character	r space (0 to 8)		Bar code type 30H : code 39
• Bar code type	e					31H : ITF 32H : NW-7
ESC	Header 2AH	Туре	]			33H : EAN-13 34H : DM16×16
	Bar	code type (30H t	to 3CH )			$35H : DM8 \times 32$ 36H : Code 128
• Bar code "us	ed" $\rightarrow$ "not used"	,				37H : DM16×36 38H : DM16×48
ESC	Header 29H	30H	]			39H : DM18×18
	Used or	not used (0:not	t used, 1:used)			3AH: DM20×20 3BH: DM22×22
• Bar code "no	t used" $\rightarrow$ "used"	'				3CH: DM24×24
ESC	Header 29H	31H	ESC	Header 2AH	Туре	
	U	sed or not use	d (0:not used	1. 1:used)		
• ID code (Bar				, ,		
ESC	Header 7DH	Code	]			
	Code	type (0:none	] 1:5×5, 2:5×7)			
	0000	sype (onione,				
• Prefix code (	Bar code EAN-13	3)				
ESC	Header 2CH	10s place	Units place			
		Prefix cod	e (00 to 99)	1		
• Code set (Co	de128)					
ESC	Header 3FH	Code set	]			
	L (0:0	Code set B, 1:Cod	de set C)			
• Increased with	dth					
ESC	Header 28H	Increased width	]			
	l Inc	reased width (1	to 9)			

## (5)Print specifications

• Character height

ESC2	Header 25H	Classification 31H	10s place	Units place
		-	Channa tan hai	-1+(00+00)

Character height (00 to 99)

• Ink drop use percentage

ESC2	Header 25H	Classification 32H	10s place	Units place

Ink drop use percentage (01 to 16)

• High-speed printing

ESC2	Header 25H	Classification 33H	Mode
			1

Mode (0:HM, 1:NM, 2:QM, 3:SM)

#### • Character width

ESC2	Header 25H	Classification 34H	1000s place	100s place	10s place	Units place

Character width (0000 to 3999)

#### • Character orientation

ESC2	Header 25H	Classification 35H	Character orientation

Character orientation (0 to 3)

#### • Print start delay

ESC2	Header 25H	Classification 36H	1000s place	100s place	10s place	Units place

Print start delay (0000 to 9999)

#### • Print start delay (reverse)

ESC2	Header 25H	Classification 37H	1000s place	100s place	10s place	Units place

Print start delay (reverse) (0000 to 9999)

#### • Product speed matching

ESC2	Header 25H	Classification 38H	Character orientation

Product speed matching (0:Time-based, 1:Encoder based, 2:Auto-encoder based)

#### • Pulse rate division Factor

ESC2	Header 25H	Classification 39H	100s place	10s place	Units place
		l			/

Pulse rate division Factor (001 to 999)

• Repeat count

ESC2	Header 25H	Classification 3DH	1000s place	100s place	10s place	Units place

Repeat count (0000 to 9999)

• Repeat intervals

	ESC2	Header 25H	Classification 3EH	10000s place	1000s place	100s place	10s place	Units place
--	------	------------	-----------------------	--------------	-------------	------------	-----------	-------------

Repeat intervals (00000 to 99999)

• Target sensor timer

ESC2	Header 25H	Classification 3FH	100s place	10s place	Units place

Target sensor timer (000 to 999)

#### • Target sensor filter

ESC2 Header 25H Classification 40H	Division
------------------------------------	----------

Division (1:time setup, 2:until end of print)

• Target sensor filter setting value

ESC2 Header 25H Classification 41H 1000s place 10	e 100s place 10s place Units p
---	--------------------------------

• Ink drop charge rule

Value (0000 to 9999)
----------------------

ESC2 Header 25H	Classification 42H	Charge rule
-----------------	-----------------------	-------------

Charge rule (31H:Standard, 32H:Mixed single scan and interlaced 33H:Dot mixed)

#### • Leading character width control

ESC2	Header 25H	Classification 43H	Leading character width control
			1 1

Leading character width control (0:Disable, 1:Enable )

• Leading character width control (width)

ESC2	Header 25H	Classification 44H	10s place	Units place	10s place	Units place
			1st row width	(00 to 32)	2nd row ridt	th (00 to 32)

• Two or more print specification items can be consecutively transmitted in a single chain.

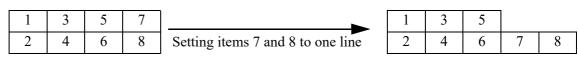
-	hine message]	Existing ma	chine message	e can also be	used.
Character hei ESC	Header 30H	10s place	Units place	]	
		. <u> </u>		1	
Character wi	dth	Character hei	ght (00 to 99)		_
ESC	Header 31H	100s place	10s place	Units place	
Character or	entation	Charao	cter width (000 to	199)	
ESC	Header 32H	Units place	ן		
Donostintom		er orientation (	0 to 3)		
Repeat interv ESC	Header 34H	1000s place	100s place	10s place	Units place
	1		epeat intervals		
Repeat count	11 1 2511	1000 1	100 1	10 1	TT 1
ESC	Header 35H	1000s place	100s place	10s place	Units place
Print start de	lav	Rep	peat count (0000 t	o 9999)	
ESC	Header 33H	1000s place	100s place	10s place	Units place
	I			0000	
	lay (reverse)	Print	start delay (0000	to 9999)	
ESC	Header 36H	1000s place	100s place	10s place	Units place
Target sensor ESC	timer Header 37H	Print 100s place	start delay (rever 10s place	rse) (0000 to 9999 Units place	?) ]
Target sensor	filter	Target	sensor timer (000	) to 999)	J
ESC	Header 38H	1000s place	100s place	10s place	Units place
	1	- 		(0000 +- 0000)	-
ESC	Header 39H	Division	arget sensor filter	(0000 to 9999)	
			1		
High-speed p		(1:time setup, 2:	until end of print)		
ESC	Header 3AH	Mode	]		
Product speed		e (0:HM, 1:NM, 2	2:QM)		
		Character	ו		
ESC	Header 3BH	orientation	J		
Produc Pulse rate div	t speed matching ( ision Factor	0:Time-based, 1:1	Encoder based)		
ESC	Header 3CH	100s place	10s place	Units place	ן
				-	, J
Ink drop use	percentage	Pulse rate	division Factor (	001 to 999)	
ESC	Header 3DH	10s place	Units place		
250					

## 5.3.5-2 Text setup rules

### (1) 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.

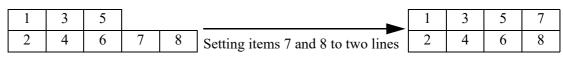
(Example)



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)



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.

### (2) 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 an 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.

### (3) Character size and inter-character space

- The available inter-character space varies with the character size. See "4.7.4 Set dot matrix, inter-character space, and other parameters" ④ of the Instructions Manual.
- The total number of vertical dots cannot exceed the limit.

Machine type	Maximum number of vertical dots
UX-P	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.

See "4.7.4 Set dot matrix, inter-character space, and other parameters" ③ of the Instructions Manual.

• 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.

### (4) Bar code use and bar code type

- Two or more bar code types cannot coexist.
- When bar code set up is completed for a print item, its inter-character space can not be changed. (The inter-character space need not be transmitted in this case.)
- 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 deleted.

No.	Input rule	Input example
1	Characters must be paired to make an	(Correct) [012345]
1	entry.	(Incorrect) [01234]

• 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. See "4.7.5 Print a bar code" of the

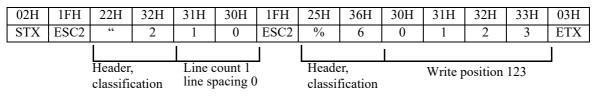
- Instructions Manual.
- FNC1 is a control code used for Code128, 2-byte code of 81A6, indicated as % on print layout screen.
- For the item that QR code  $33 \times 33$  has been set, only "bar code = not used" transmission is available. If other bar code type is sent, external communication error will occur. If changed QR code  $33 \times 33$  to none bar code, the dot matrix (character size) will be changed to  $24 \times 32$  automatically.
- For UX-D161, "Bar code type = 49H: Micro QR" is not available.

## 5.3.5-3 Caution for format type "Free layout"

• When the format setup is "Free layout" and if "Line count / print format uniformity" or "Line count and line spacing" or "High-speed printing" or "Ink drop charge rule" is transmitted, a communication error will occur.

# 5.3.5-4 Example of print conditions transmission

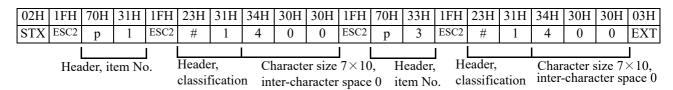
### (1) Example where print item is not specified



[Transmission results]

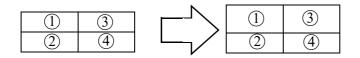
All print items are set as 1 line, write position is changed to 0123.

### (2) Example where print item is specified



#### [Transmission results]

Upper line character size is changed.



# 5.3.6 Free Layout Transmission

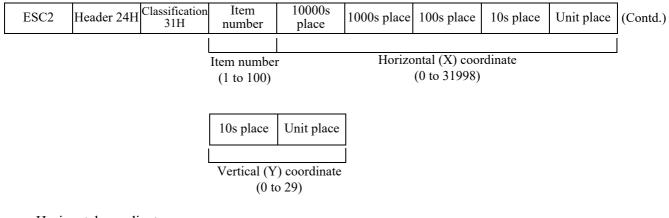
## 5.3.6-1 Overview

- When Format setup is "Free layout", the selected print item can be moved individually.
- Free layout transmission shall be made independently. Free layout transmission can NOT be transmitted with Print format or Print specification or Print description.
- If transmission is made to the item number(s) which does not exist, a communication error will occur.
- If transmission is made when the format setup is either "Individual" or "Overall", a communication error will occur.

# 5.3.6-2 Text

## (1) Specify Horizontal/Vertical coordinate and move

- Specify the bottom-left coordinate and the print item will be moved.
- Horizontal and Vertical coordinate



#### • Horizontal coordinate

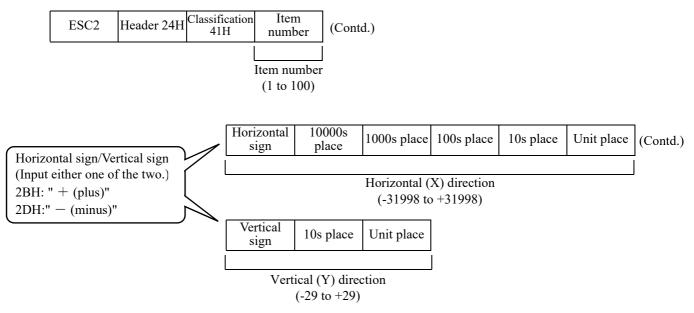
ESC2	Header 24H	Classification 32H	Item number	10000s place	1000s place	100s place	10s place	Unit place
			Item number $(1 \text{ to } 100)$	ſ		(0  to  31998)		
			(1 to 100)			(0 to 31998)		

### • Vertical coordinate

ESC2	Header 24H	Classification 33H	Item number	10s place	Unit place
		l			
		Ι	tem number (1 to 100)	Vertical (Y) (0 to	

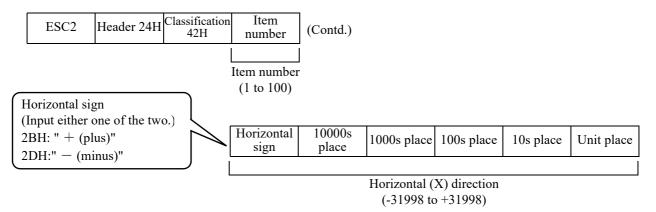
## (2)Specify Horizontal/Vertical directions and move

- Specify the number of dots for moving and the print item will be moved.
- Horizontal and Vertical move

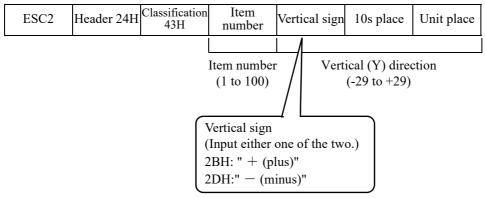


- -- Either plus(+) or minus(-) sign to be input for both Horizontal/Vertical directions.
- -- In case there will be NO horizontal move, input either "+00000" or "-00000".
- -- In case there will be NO vertical move, input either "+00" or "-00".

Horizontal move



- -- Either plus(+) or minus(-) sign to be input for Horizontal direction.
- -- In case there will be NO horizontal move, input either "+00000" or "-00000".
- Vertical move



-- Either plus(+) or minus(-) sign to be input for Vertical direction.

-- In case there will be NO vertical move, input either "+00" or "-00".

## 5.3.6-3 Example of Free layout transmission (1) Specify Horizontal/Vertical coordinate and move

02H	1FH	24H	31H	35H	30H	30H	31H	32H	30H	32H	35H	03H	
STX	ESC2	\$	1	5	0	0	1	2	0	2	5	ETX	
		Hea	ader,	Item No		Ho	rizontal		Vertic				
		classif	fication			coordinate					coordinate		

[Transmission result]

Print item 5: Horizontal (X) coordinate will be set to 120 and Vertical (Y) coordinate to 25.

02H	1FH	24H	32H	31H	31H	32H	33H	34H	35H	03H		
STX	ESC2	\$	2	1	1	2	3	4	5	ETX		
			ider,	Item No	•		rizontal oordinat					

[Transmission result]

Print item 1: Horizontal (X) coordinate will be set to "12345".

02H	1FH	24H	33H	94H	30H	30H	03H
STX	ESC2	\$	3	100	0	0	ETX
		Hea	der, 1	[tem No	al (Y)	-	
		classif	ication		coord	linate	

[Transmission result]

Print item 100: Vertical (Y) coordinate will be set to "0".

## (2) Specify Horizontal/Vertical directions and move

02H	1FH	24H	41H	3AH	2BH	30H	30H	31H	30H	30H	2BH	32H	30H	03H
STX	ESC2	\$	Α	10	+	0	0	1	0	0	+	2	0	ETX
		Header, Item No.				Horizontal (X) direction						(Y) dir	ection	_

classification

[Transmission result] Move print item 10 rightward by 100 and upward by 20.

02H	1FH	24H	41H	44H	2DH	30H	30H	30H	32H	30H	2DH	30H	35H	03H
STX	ESC2	\$	Α	20	_	0	0	0	2	0	—	0	5	ETX
														J
		Header, Item No.			•	Hor	izontal (	X) direc	ction		Vertical	(Y) dir	ection	_

classification

[Transmission result] Move print item 20 leftward by 20 and downward by 5.

02H	1FH	24H	41H	32H	2BH	31H	32H	33H	34H	35H	2DH	30H	30H	03H
STX	ESC2	\$	Α	2	+	1	2	3	4	5	_	0	0	ETX
	I	Hea	ider, I	tem No		Horizontal (X) direction Vertical (Y) direction							ection	•
		classif	ication											

[Transmission result] Move print item 2 rightward by 12345.

02H	1FH	24H	41H	62H	2BH	30H	30H	30H	30H	30H	2DH	31H	30H	03H
STX	ESC2	\$	А	50	+	0	0	0	0	0	_	1	0	ETX
		Header,	, 1	tem No		Horizontal (X) direction Vertical (Y) direction								•
		classifie	cation											

[Transmission result] Move print item 50 downward by 10.

02H	1FH	24H	42H	34H	2DH	30H	30H	31H	30H	30H	03H
STX	ESC2	\$	В	4	—	0	0	1	0	0	ETX
			ider, 1 ication	ltem No		Hor	izontal (	X) direc	ction		

[Transmission result] Move print item 4 leftward by 100.

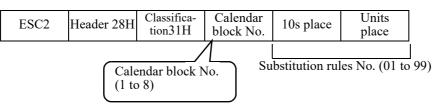
02H	1FH	24H	43H	80H	2BH	30H	35H	03H
STX	ESC2	\$	С	80	+	0	5	ETX
	I	Hea	der,	Item No	. Vertica	ıl (Y) di	rection	
		classif	ication					

[Transmission result] Move print item 80 upward by 5.

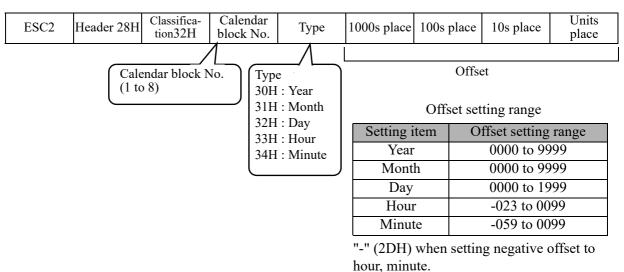
## 5.3.7 Calendar Conditions Transmission 5.3.7-1 Text

## (1) Calendar Conditions Transmission

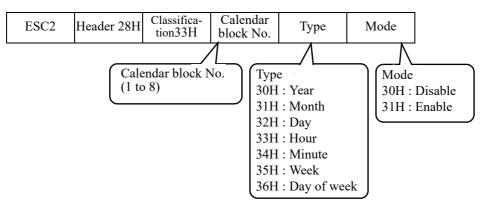
• Substitution rules No.



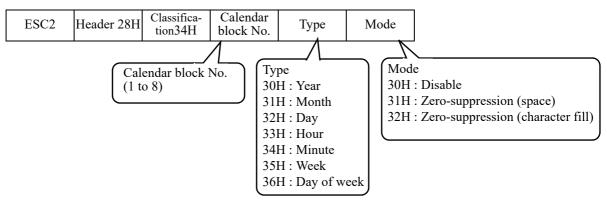
• Offset

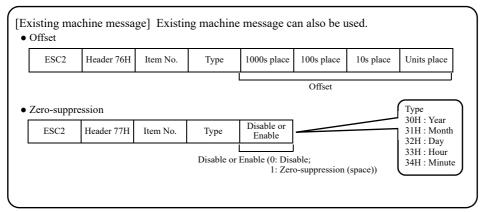


Substitution rules

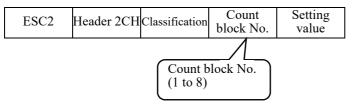


#### • Zero-suppression





## (2) Count Conditions Transmission



Classification	Item name	Setting value
31H	Initial value	Character code
32H	Range 1	Character code
33H	Range 2	Character code
34H	Update setting range (In progress)	000000 to 999998
35H	Update setting range (Unit)	000001 to 999999
36H	Increment setting range	01 to 99
37H	Direction	0: up, 1: down
38H	Jump from	Character code
39H	Jump to	Character code
3AH	Reset	Character code
3BH	Reset signal (option)	0:signal 1, 1:signal 2
3EH	External signal count (option)	0: Disable, 1: Enable

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.

	al valu	ie, Range,	Jump from,	Jump to, F	Reset					
ES	SC	Header 80H	Item No.	Туре	Setting	value				
Codo o	ftuno									
Code o	птуре			D 0	X C	<b>x</b> .	D			
1.0		Initial value	Range 1	Range 2	Jump from	Jump to	Reset			
AS	CII	30	31	32	33	34	35			
					AS	SCII is hexaded	imal number.			
Charac	ter co	de of settir	ng value							
	Mode	Alpl	nanumeric	User pattern						
1-b	yte moo	de .	ASCII	ASCII						
2-b	yte moo	de .	ASCII	1-byte code						
*) [	When co	ount characte	rs has been div	rided (e.g. [		, transmit four-	digits characte	rs		
),	when ev	Sunt enaracte		idea (e.g., [		, transmit iour-	digits characte	13.		
(2) Upd	late se	etting rang	е							
					100000					1
ES	SC	Header 81H	Item No.	Туре	100000s place	10000s place	1000s place	100s place	10s place	Units place
L		1	1	1	1 *	1	1		1	1
S In	progres		000000 to 9999							
In (3) Dire	Unit		000000 to 9999 000001 to 9999 ignal count,	998 999 , Reset sign Type	0/1 Direction	al count (0: Di	, 1: down) sable, 1: Enab gnal1, 1:Signal			
(3) Dire	Unit ection,	External s	000000 to 9999 000001 to 9999 ignal count,	998 999 , Reset sign Type	0/1 Direction External signs	al count (0: Di	sable, 1: Énab			
(3) Dire	Unit ection,	External s	000000 to 9999 000001 to 9999 ignal count,	998 999 , Reset sign Type	0/1 Direction External signs	al count (0: Di	sable, 1: Énab			
(3) Dire	Unit ection, SC	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa	al count (0: Di	sable, 1: Énab gnal1, 1:Signal Reset	2) signal		
(3) Dire	Unit ection,	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa	al count (0: Di (0:Sig	sable, 1: Énab gnal1, 1:Signal	2) signal		
(3) Dire	Unit ection, SC	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa	al count (0: Di (0:Sig ignal count	sable, 1: Énab gnal1, 1:Signal Reset	2) signal 2		
(3) Dire	Unit ection, SC	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa	al count (0: Di (0:Sig ignal count	sable, 1: Enab gnal1, 1:Signal Reset	2) signal 2		
(3) Dire	f type	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa External s 3	al count (0: Di (0:Sig ignal count i1	sable, 1: Enab gnal1, 1:Signal Reset	2) signal 2		
(3) Dire	Unit ection, SC	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa	al count (0: Di (0:Sig ignal count	sable, 1: Enab gnal1, 1:Signal Reset	2) signal 2		
(3) Dire	f type	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa External s 3	al count (0: Di (0:Sig ignal count i1	sable, 1: Enab gnal1, 1:Signal Reset	2) signal 2		
(3) Dire	f type Asc	External s Header 82H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa External s 3	al count (0: Di (0:Sig ignal count i1	sable, 1: Enab gnal1, 1:Signal Reset	2) signal 2		
(3) Dire	f type Asc	External s Header 82H CII t Header 83H	000000 to 9999 000001 to 9999 ignal count, Item No.	998 999 Reset sign Type	0/1 Direction External signa Reset signa External s 3	al count (0: Di (0:Sig ignal count i1 As	sable, 1: Enab gnal1, 1:Signal Reset	2) signal 2		

## 5.3.7-2 Example of calendar conditions transmission (1) Example of offset

02H	1FH	28H	32H	32H	32H	30H	30H	31H	32H	03H
STX	ESC2	(	2	2	Day	0	0	1	2	ETX
		Header, classific		Calenda block N			Offse	t 12 day	'S	

[Transmission results]

Defines offset 12 days for calendar block 2.

## 5.3.7-3 Example of count conditions transmission (1) Example of reset

02H	1FH	2CH	3AH	31H	30H	30H	30H	30H	30H	03H
STX	ESC2	,	:	1	0	0	0	0	0	ETX
		Header,	(	Count		Reset	value 0	0000	-	

classification block No.

[Transmission results]

Defines reset value 00000 for count block 1.

# 5.3.8 User Pattern Character Transmission

## 5.3.8-1 Text

• When the number of communication bytes is set to "1" for communication

ESC2	Header 32H	Classification	Character code	Pattern data array

Character size

• When the number of communication bytes is set to "2" for communication environment setup purposes

ESC2	Header 32	2H Classif	fication	High-order byte	Low-order byte	Pattern data array
		Charac	ter size	Charact	er code	
U U	c	nunication by		message can al: o "1" for commun Pattern data ar	ication environmen	Character size
		5120	code			0 : 5x5 1 : 5x8(5x7) 2 : 7x10 3 : 12x16
						4 : 18x24 5 : 24x32
When the r	iumber of comm	nunication byt	es is set to	"2" for communi	cation environment	4 : 18x24 5 : 24x32
When the r ESC2	number of comm Header 20H		es is set to ligh-order byte	Low order	cation environment Pattern data array	4 : 18x24 5 : 24x32

## 5.3.8-2 Character size

• The character size is represented by the codes shown in the following table.

## 5.3.8-3 Pattern data

## (1) Pattern data length

• The pattern data length per character varies with the character size as indicated below.

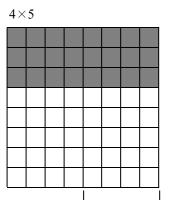
No.	Character size	Character size code	Pattern data length (bytes)	Remarks
1	4×5	30H	8	
2	5×5	31H	8	
3	$5 \times 8(5 \times 7)$	32H	8	
4	9×8(9×7)	33H	16	
5	7×10	34H	16	
6	10×12	35H	32	
7	12×16	36H	32	
8	18×24	37H	72	
9	24×32	38H	128	
10	11×11	39H	32	
11	$5 \times 3$ (chimney)	3AH	5	
12	$5 \times 5$ (chimney)	3BH	5	
13	$7 \times 5$ (chimney)	3CH	7	
14	30×40	3EH	200	
15	36×48	3FH	288	

Character		anda	talala
Character	SIZC	coue	laure

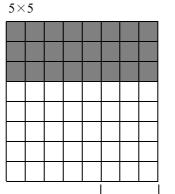
## (2) Pattern data structure

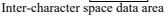
The pattern data structure and data creation rules are explained below.

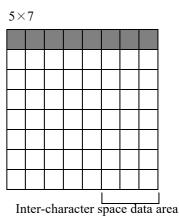
- a) Rules
  - Each pattern data unit consists of 8 bits. For each bit, dot presence is indicated by the value 1 (dot present) or 0 (dot not present).
  - Vertically arrayed 8 dots correspond to 8 bits (1 byte).
  - For character sizes of 4×5, 5×5, 7×10, 5×7, and 9×7, etc., some portions of 8-bit data are unavailable. Set such portions to "0". (Even if you set them to "1", processing will be performed with their settings changed to "0".)

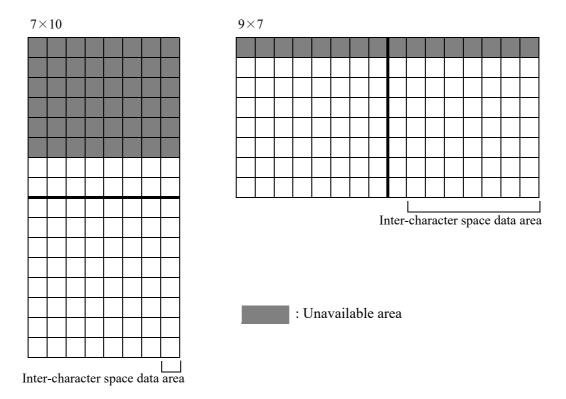


Inter-character space data area



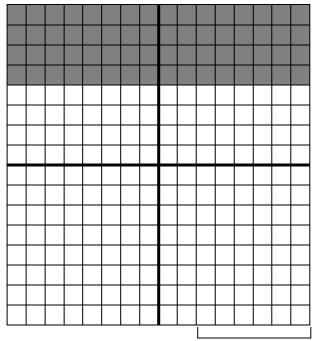






## Note: The inter-character space is 1 dot at the maximum for $7 \times 10$ .










Inter-character space data area

5×3 (Chimney)

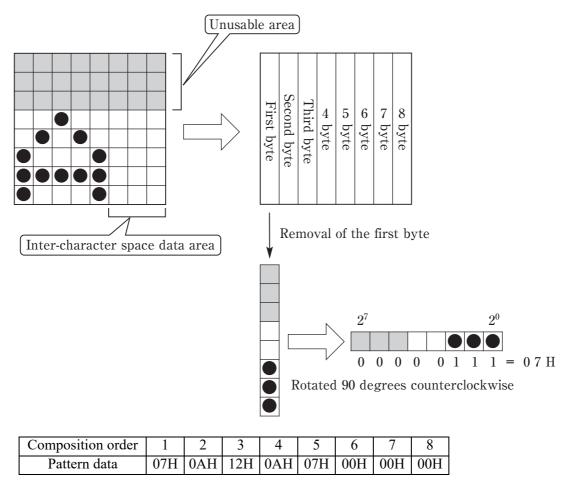
$5 \times 5$	(Chimney)
--------------	-----------

7×5 (Chimney)

• 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

[For a character size of  $5 \times 5$ ]



[For a character size of  $18 \times 24$ ]

			 					_										 	 
				Õ	Õ	Õ	-		Õ	Õ	Õ								
			Õ			-			-										
			Ŏ	ŏ							Ŏ	ŏ	Ŏ						
			ŏ	-								ŏ							
												-							
				$\bullet$					$\bullet$										
		Õ						<u> </u>											
ŏ	Õ	Õ												ŏ	Ŏ	Ŏ			
														ŏ					

თ byte	ه byte	თ byte	12 byte	15 byte	10 byte	21 byte	A byte	27 byte	30 byte	3 byte	% byte	39 byte	식 byte	45 byte	4 byte	5 byte	5 byte	57 byte	6 byte	3 byte	6 byte	8 byte	7 <sup>2</sup> byte
∾ byte	u byte م	∞byte	11 byte	4 byte	12 byte	있 byte	လွှစyte	& byte	있 byte	3 byte	35 byte	8 byte	4 byte	4 byte	4 byte	50 byte	3 byte	50 byte	59 byte	8 byte	53 byte	8 byte	71 byte
1 byte	d byte	∼ byte	10 byte	13 byte	10 byte	19 byte	2 byte	25 byte	a byte	31 byte	ઝ byte	37 byte	₽ byte	43 byte	4 <sup>6</sup> byte	와 byte	53 byte	55 byte	58 byte	61 byte	64 byte	6 byte	7 <sup>2</sup> byte

## 5.3.8-4 Character codes

For character code designation, either ASCII codes or 2-byte codes are used.

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	<u>D0</u>	<u>D1</u>	<u>D2</u>	<u>D3</u>	<u>D4</u>	<u>D5</u>	<u>D6</u>	<u>D7</u>	<u>D8</u>	<u>D9</u>	DA	DB	DC	DD	DE	<u>DF</u>
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	<u>E0</u>	<u>E1</u>	<u>E2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>	<u>E6</u>	<u>E7</u>	<u>E8</u>	<u>E9</u>	EA	<u>EB</u>	<u>EC</u>	ED	<u>EE</u>	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	<u>F0</u>	<u>F1</u>	<u>F2</u>	<u>F3</u>	<u>F4</u>	<u>F5</u>	<u>F6</u>	<u>F7</u>	<u>F8</u>	<u>F9</u>	FA	<u>FB</u>	<u>FC</u>	FD	<u>FE</u>	FF

(1) ASCII codes (when the number of communication bytes is 1)

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)

User pattern character 00: F140 = high-order byte F1 + low-order byte 40See "5.4.1 Code Tables".

## 5.3.8-5 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.

## 5.3.8-6 Example of user registration character transmission

(1) Example where number of communication bytes of communication environment settings is "1 byte," character size is "5 x 5" and character code is "47."

02H	1FH	32H	31H	FFH	07H	0AH	12H	0AH	07H	00H	00H	00H	03H
STX	ESC2	2	5x5	47	-	-	-	-	-	-	-	-	ETX
													1
Header, Code 47 Patter classification								attern da	ata arran	igement			<u>.</u>

[Transmission results]

Defines character size  $5 \times 5$ , character code 47 user pattern.

# 5.3.9 On-line/off-line Transmission Procedure 5.3.9-1 Text

### (1) Change to online

ESC2 Header 73H

Header 74H

## (2) Change to offline

ESC2

[Existing machine message] Existing machine message can also be used.
(1) Change to online

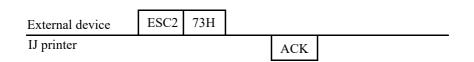
ESC Header 79H

(2) Change to offline

ESC Header 7AH

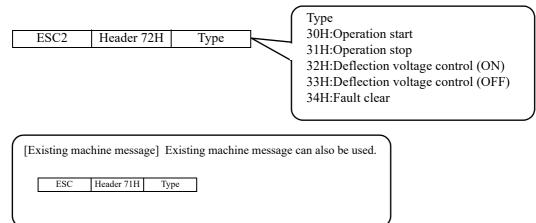
- In the following cases, Online/Offline transmission cannot be performed. If it is attempted, NAK code will be the reply:
  - (1) "Apply" key is displayed while inputting set value.
  - (2) In the "Communication environment setup" screen, "Off fixed" is selected for "State at power-up" item.
  - 3 During input of count conditions.
  - (4) The confirmation window is open.
  - (5) The circulation control screen is opened by the maintenance function.
  - $(\mathbf{\hat{6}})$  The touch screen setup screen is opened by the auxiliary function.
  - $(\overline{7})$  The communication monitor screen is opened.

## 5.3.9-2 Transmission example



ENQ, STX and ETX are not required.

# 5.3.10 Remote Operation Transmission 5.3.10-1 Text



# 5.3.10-2 Types of control

No.	Туре	Content	Function enabled status
1	Operation start	Starts to jet ink, and shifts from stop status to ready status. (Same process as with <startup> button)</startup>	Stop status
2	Operation stop	Stops ink jet, and shifts to stop status (Same process as with <shutdown> button)</shutdown>	When ink is being jetted (standby, ready status, etc.)
3	Deflection voltage control (ON)	Turns deflection voltage on (Same process as with <ready> button in Manual control menu window)</ready>	Standby status
4	Deflection voltage control (OFF)	Turns deflection voltage off (Same process as with <standby> button in Manual control menu window)</standby>	Ready status
5	Fault clear	Closes the window for any fault that has occurred. However, the window will remain if the cause of fault is not resolved.	When fault has occurred

#### Types of control for operation

• Specify only one category of control at a time.

• Even if executing function is not possible, ACK will be answered, but no function will be executed.

## 5.3.11 Time control 5.3.11-1 Text

## (1) Date/time setup transmission

• Current time

ESC2	Header 2EH	Classification 31H	1000s place	100s place	10s place	Units place	10s place	Units place	
									(Contd.)
				Ye	ar		Ν	Ionth	
10s	Units	10s	Units	10s	Units	10s	Units		
place	place	place	place	place	place	place	place		
							1		
Da	ay	Hou	r	Mi	nutes	Seco	nd		

#### • Calendar time control

	ESC2	Header 2EH	Classification 32H	Control type
--	------	---------------	-----------------------	-----------------

Control type (31H: Same as current time; 32H: Clock stop)

#### • Calendar time

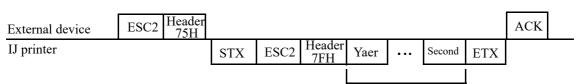
ESC2	Header 2EH	Classification 33H	1000s place	100s place	10s place	Units place	10s place	Units place	(Contd.)
				Ye	ar		Μ	lonth	
10s	Units	10s	Units	10s	Units	10s	Units		
place	place	place	place	place	place	place	place		
Da	ау	Hou	r	Mi	nutes	Seco	nd		

#### • Clock system

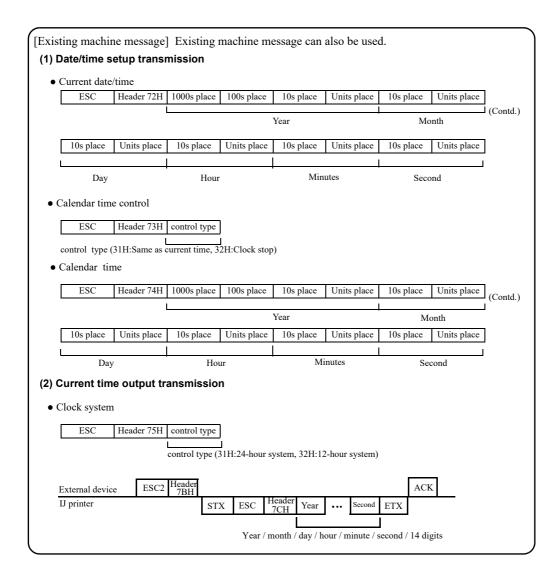
Control type (31H: 24-hour system; 32H: 12-hour system)

### (2) Current time output transmission

Outputs current time of IJ printer internal calendar.



Year / month / day / hour / minute / second / 14 digits



## 5.3.11-2 Date/time setup

(1) This function allows operator to set each item on "Date/time setup screen" for Maintenance menu.

No.	Setting item	Setting contents
1	Current time	Current date time displayed across the very top of screen (year/month/day/hour/minute/second)
2	Calendar time control	Same as current time, clock stopped
3	Calendar time	Time reflected in calendar characters of print contents
4	Clock system	24/12-hour system

- (2) After receiving date and time setting transmission, the print contents calendar characters and current time display are updated.
- (3) When transmitting "calendar time", first transmit the message for "calendar time: clock stop": Simultaneous transmission is also possible.
- (4) When changing the calendar time control from "clock stop" to "same as current time", the values on calendar time will not be saved.

# 5.3.11-3 Example of time control transmission

## (1) Example of setting current time

02H	1FH	2EH	31H	32H	30H	31H	35H	30H	37H	30H	37H	31H	32H	34H	35H	30H	30H	03H
STX	ESC2		1	2	0	1	2	0	7	0	7	1	2	4	5	0	0	ETX
Не	ader, c	lassifi	cation		Year			Moi	nth	Da	ıy	Но	our	Mi	nutes	Sec	cond	

[Transmission results]

Set current time to 2015/07/07, 12:45:00.

# 5.3.12 Print item deletion transmission

## 5.3.12-1 Overview

- The first print item will be left.
- All the print message in the first print item will be deleted.
- The print format of the first print item will be kept.
- The transmission shall be made independently. Do NOT make this transmission with the other data such as the print format, the print specification or the print message.

## 5.3.12-2 Text

ESC2	Header 7AH
------	------------

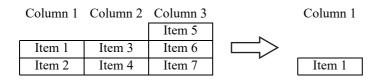
## 5.3.12-3 Example of print item deletion transmission

02H	1FH	7AH	03H
STX	ESC2	Header	ETX
	Print iter		

I fint hem defetto

[Transmission results]

Only the first print item will be left and transmitted.



# 5.3.13 Count Reset Transmission

## 5.3.13-1 Overview

- Count Reset Transmission will change the count value to the preset value (reset value), and simultaneously reset the ongoing count figures to zero.
- Count Reset Transmission will not be executed unless the reset value is entered to "Reset" on the second screen of "Count conditions".

Input the reset value in "Reset" on the second screen of "Count conditions", and then send Count Reset Transmission.

• The transmission shall be made independently. Do NOT make this transmission with the other data such as the print format, the print specification or the print message.

If an attempt is made to send it together with the other data, a communication error (NAK response) occurs.

## 5.3.13-2 Text

ESC2 Header 2CH Classification 41H

## 5.3.13-3 Example of Count Reset Transmission

02H	1FH	2CH	41H	03H
STX	ESC2	Header 2CH	Classification 41H	ETX

# 5.4 Code Tables 5.4.1 Code Tables

(1)Transmission control

ASCII	Name	Description
02H	STX (start)	Code that is transmitted immediately before text.
03H	ETX (end)	Code that is transmitted immediately after text.
05H	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.
06H	ACK (acknowledgment)	<ul> <li>(1) When the IJ printer is ready for reception, it transmits this code in response to an "ENQ" code reception from the external device.</li> <li>(2) This code reports that text reception is normally completed.</li> </ul>
0EH	SO (shift out)	When the 1-byte transmission mode prevails, this code is positioned at the end of 2-byte code for transmission purposes.
0FH	SI (shift in)	When the 1-byte transmission mode prevails, this code is positioned at the beginning of 2-byte code for transmission purposes.
10H	DLE (start of item)	This code is positioned at the beginning of printings for each print item for transmission purposes.
12H	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.
13H	DC3 (retransmission)	The same as DC2. However, when receiving DC3, the IJ printer terminates printing forcibly.
15H	NAK (negative acknowledgment)	<ol> <li>The IJ printer transmits this code if it is not ready for reception when it receives the "ENQ" code from the external device.</li> <li>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)</li> </ol>
1BH	ESC (start of header)	This code is positioned at the beginning of a header for transmis- sion purposes. The header is a code that recognizes the transmission data type and is transmitted next to STX. (Existing machine / message specs.)
1FH	ESC2 (start of header)	This code is positioned at the beginning of a header for transmis- sion purposes. The header is a code that recognizes the transmission data type and is transmitted next to STX.

High-order	0	1	2	3	4	5	6	7	8	9		В	С	D	Е	F
Low-order	0	1	2	3	4	2	6	/	8	9	А	В	C	D	E	Г
0		DLE	Space	0		Р		р	个	↑	ſ	保质		<u>00</u>	<u>16</u>	<u>32</u>
1			!	1	А	Q	а	q	元	<b>↑</b>	有限	Ţ		<u>01</u>	<u>17</u>	<u>33</u>
2	STX	DC2	"	2	В	R	b	r	g	饮用	ſ	Ţ		<u>02</u>	<u>18</u>	<u>34</u>
3	ETX	DC3	#	3	С	S	с	s	年	<b>↑</b>	ſ	使用		<u>03</u>	<u>19</u>	<u>35</u>
4			\$	4	D	Т	d	t	月	<b>↑</b>	生产	↑		<u>04</u>	<u>20</u>	<u>36</u>
5	ENQ	NAK	%	5	Е	U	e	u	B	期限	ſ	↑		<u>05</u>	<u>21</u>	<u>37</u>
6	ACK		&	6	F	V	f	v	制造	ſ	ſ	合格		<u>06</u>	<u>22</u>	<u>38</u>
7			,	7	G	W	g	W	ſ	ſ	批号	ſ		<u>07</u>	<u>23</u>	<u>39</u>
8			(	8	Н	Х	h	х	ſ	日期	ſ	Ţ		<u>08</u>	<u>24</u>	<u>40</u>
9			)	9	Ι	Y	i	у	品名	ſ	ſ			<u>09</u>	<u>25</u>	<u>41</u>
А			*	:	J	Ζ	j	Z	ſ	Ť	供货			<u>10</u>	<u>26</u>	<u>42</u>
В		ESC	+	;	K	[	k		↑	期至	ſ			<u>11</u>	<u>27</u>	<u>43</u>
С			,	<	L	¥	1		名称	ſ	ſ			<u>12</u>	<u>28</u>	<u>44</u>
D			-	=	М	]	m		↑	<b>↑</b>	有效			<u>13</u>	<u>29</u>	<u>45</u>
Е	SO			>	N	×	n		↑	时	ſ			<u>14</u>	<u>30</u>	<u>46</u>
F	SI	ESC2	/	?	0	_	о		食用	公司	1			<u>15</u>	<u>31</u>	<u>47</u>
Category	ssi	smi- on trol		Sta	ndard	charac	ters			Dedi chara					er patt haract	

## (2)ASCII codes

: Unusable

 $\uparrow$  : Dedicated character consisting of multiple codes

<u>nn</u> : User pattern character number

NOTICE ① As regards a dedicated character (e.g., 制造(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.

## (3)Dedicated characters (2-byte codes)

Dedicated characters	个	元	g	年	月	日	制造	~	~	品名	~	~	名称	~	<i>←</i>	食用
2-byte code	F040	F041	F042	F043	F044	F045	F046	F047	F048	F049	F04A	F04B	F04C	F04D	F04E	F04F
Dedicated characters	$\leftarrow$	$\leftarrow$	饮用	$\leftarrow$	←	期限	←	←	日期	←	←	期至	~	$\leftarrow$	时	公司
2-byte code	F050	F051	F052	F053	F054	F055	F056	F057	F058	F059	F05A	F05B	F05C	F05D	F05E	F05F
Dedicated characters	$\leftarrow$	有限	¥	¥	生产	$\leftarrow$	<i>~</i>	批号	<i>~</i>	<i>~</i>	供货	<i>~</i>	<i>←</i>	有效	<i>←</i>	$\leftarrow$
2-byte code	F060	F061	F062	F063	F064	F065	F066	F067	F068	F069	F06A	F06B	F06C	F06D	F06E	F06F
Dedicated characters	保质	$\leftarrow$	$\leftarrow$	使用	<i>←</i>	$\leftarrow$	合格	<i>←</i>	<i>←</i>							
2-byte code	F070	F071	F072	F073	F074	F075	F076	F077	F078							

 $\leftarrow$ : Dedicated characters consisting of two or more codes.

"制造" consists of three characters (F046, F047, and F048).

## 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			F342				-			-	-	F34B	F34C	F34D	-	-
Characters	Õ	Ö	Ù	Ú	Û	Ü	Æ	Ç	Ñ	Œ		Å	Ø		£	€
Communication code	-	F351	~	•	F354	•	л <u>с</u> F356	-	F358			R F35B			х F35E	-
Characters	à	á	â	ã	ä	è	é	ê	ë	ì	í	î	ï	ò	ó	ô
Communication code						-	-	-	-	_	-	-	-	F36D	-	
Characters	õ	ö	ù	ú	û	ü	æ	ç	ñ	œ	ß	å	ø			
Communication code	-	-	<b>G</b> F372					•					-			
Characters	İ	Ι	Ğ	Ş	Ů	Ý	Č	Ď	Ě	Ň	Ř	Š	Ť	Ž	Ą	Ć
Communication code				,	-		_					-	-	<b>Z</b> F38D	_	
Characters	Ę	Ł	Ń	Ś	Ź	Ż	Ĺ	Ľ	Ŕ	Ð	Ő	Ű	°C	0		
Communication code	•	F391								F399	>	)	-	F39D		
Characters	i	1	ğ	Ş	ů	ý	č	ď	ě	ň	ř	š	ť	ž	ą	ć
Communication code	F3A0	F3A1	-	-	F3A4	1	F3A6	F3A7	F3A8	F3A9	F3AA	F3AB	F3AC	F3AD	_	F3AF
Characters	ę	ł	ń	ś	ź	ż	ĺ	ľ	ŕ	đ	ő	ű				
Communication code	•			F3B3			F3B6	- F3B7	F3B8	F3B9	F3BA	F3BB				
Characters																ς
Communication code																F29F
Characters													Α			
Communication code													F2AC			
Characters	В	Г	Δ	E	Ζ	Η	Θ	Ι	Κ	$^{\circ}\Lambda$	М	Ν	[1]	0	П	Р
Communication code	F3C0	F3C1	F3C2	F3C3	F3C4	F3C5	F3C6	F3C7	F3C8	F3C9	F3CA	F3CB	F3CC	F3CD	F3CE	F3CF
Characters	Σ	Т	Y	Φ	Χ	Ψ	Ω									α
Communication code	F3D0	F3D1	F3D2	F3D3	F3F4	F3D5	F3D6									F3DF
Characters	β	γ	δ	3	ζ	η	θ	l	κ	λ	μ.	ν	ξ	•	_	ρ
Communication code		•						-			•		2	0	π	
Characters	F3E0	•	F3E2	F3E3	F3E4	F3E5	F3E6	_	F3E8		•	E3EB	•	0 F3ED		F3EF
۹ ا	F3E0 <b>σ</b>	•	F3E2 V	F3E3 <b>Ф</b>	F3E4 χ	F3E5 ¥	F3E6 <b>W</b>	_	F3E8		•	E3EB	•	_		F3EF
Communication code	σ	53E1 τ		φ	χ	Ψ	ω	F3E7	F3E8		•	E3EB	•	_		F3EF
Communication code Characters	σ	53E1 τ	υ	φ	χ	Ψ	ω	F3E7	F3E8 3		•	E3EB K	•	_		F3EF O
	σ F3F0 A	F3E1 τ F3F1 <b>Б</b>	<b>v</b> F3F2 <b>B</b>	φ F3F3 Γ	<b>х</b> F3F4 Д	ψ F3F5 <b>E</b>	<b>w</b> F3F6 <b>Ë</b>	F3E7 Ж	3	F3E9 И	F3EA Й	K	БЗЕС Л	F3ED	F3EE H	0
Characters	σ F3F0 A	F3E1 τ F3F1 <b>Б</b>	<b>v</b> F3F2 <b>B</b>	φ F3F3 Γ	<b>х</b> F3F4 Д	ψ F3F5 <b>E</b>	<b>w</b> F3F6 <b>Ë</b>	F3E7 Ж	3	F3E9 И	F3EA Й	K	БЗЕС Л	F3ED M	F3EE H	0
Characters Communication code	σ F3F0 A F540 Π	F3E1 τ F3F1 <b>Б</b> F541 <b>P</b>	υ F3F2 B F542 C	φ F3F3 Γ F543 Τ	<b>х</b> F3F4 Д F544 <b>У</b>	Ψ F3F5 E F545 Φ	ω F3F6 Ë F546 <b>X</b>	F3E7 Ж F547 Ц	<b>3</b> F548 <b>प</b>	F3E9 И F549 Ш	F3EA Й F54A Щ	К F54B <b>Ъ</b>	ЕЗЕС Л F54C Ы	F3ED M F54D	F3EE H F54E <b>Э</b>	О F54F Ю
Characters Communication code Characters	σ F3F0 A F540 Π	F3E1 τ F3F1 <b>Б</b> F541 <b>P</b>	υ F3F2 B F542 C	φ F3F3 Γ F543 Τ	<b>х</b> F3F4 Д F544 <b>У</b>	Ψ F3F5 E F545 Φ	ω F3F6 Ë F546 <b>X</b>	F3E7 Ж F547 Ц	<b>3</b> F548 <b>प</b>	F3E9 И F549 Ш	F3EA Й F54A Щ	К F54B <b>Ъ</b>	ЕЗЕС Л F54C Ы	F3ED M F54D <b>b</b>	F3EE H F54E <b>Э</b>	О F54F Ю
Characters Communication code Characters Communication code	σ F3F0 A F540 Π F550 <b>Я</b>	F3E1 <b>τ</b> F3F1 <b>B</b> F541 <b>P</b> F551 <b>B</b>	<b>v</b> F3F2 <b>B</b> F542 <b>C</b> F552	φ F3F3 F543 T F553 Jb	Х F3F4 Д F544 У F554 Њ	ψ F3F5 E F545 Φ F555 <b>h</b>	ω F3F6 Ë F546 X F556 Ļ	F3E7 Ж F547 Ц	<b>3</b> F548 <b>प</b>	F3E9 И F549 Ш	F3EA Й F54A Щ	К F54B <b>Ъ</b>	ЕЗЕС Л F54C Ы	F3ED M F54D <b>b</b>	F3EE H F54E <b>Э</b>	О F54F Ю
Characters Communication code Characters Communication code Characters	σ F3F0 A F540 Π F550 <b>Я</b>	F3E1 <b>τ</b> F3F1 <b>B</b> F541 <b>P</b> F551 <b>B</b>	<b>v</b> F3F2 <b>B</b> F542 <b>C</b> F552 J	φ F3F3 F543 T F553 Jb	Х F3F4 Д F544 У F554 Њ	ψ F3F5 E F545 Φ F555 <b>h</b>	ω F3F6 Ë F546 X F556 Ļ	F3E7 Ж F547 Ц	<b>3</b> F548 <b>प</b>	F3E9 И F549 Ш	F3EA Й F54A Щ	К F54B <b>Ъ</b>	ЕЗЕС Л F54C Ы	F3ED M F54D <b>b</b>	F3EE H F54E <b>Э</b>	О F54F Ю
Characters Communication code Characters Communication code Characters	σ F3F0 A F540 Π F550 Я F560 a	F3E1 <b>τ</b> F3F1 <b>B</b> F541 <b>P</b> F551 <b>B</b> F561 <b>6</b>	<b>v</b> F3F2 <b>B</b> F542 <b>C</b> F552 J F562	φ F3F3 F543 T F553 Jb F563 <b>Γ</b>	χ F3F4 J F544 У F554 Hb F564 д	ψ F3F5 <b>E</b> F545 Φ F555 <b>h</b> F565 <b>e</b>	00 F3F6 E F546 X F556 E E E	F3E7 Ж F547 Ц F557 Ж	3 F548 <b>Y</b> F558 <b>3</b>	F3E9 И F549 Ш F559	F3EA Й F54A Щ F55A Й	К F54B Б555В К	ЕЗЕС Л F54C Ы F55C Л	F3ED M F54D F55D M	F3EE H F54E <b>Э</b> F55E H	О F54F Ю F55F
Characters Communication code Characters Communication code Characters Communication code Characters	σ F3F0 A F540 Π F550 Я F560 a	F3E1 <b>τ</b> F3F1 <b>B</b> F541 <b>P</b> F551 <b>B</b> F561 <b>6</b>	υ F3F2 B F542 F552 J F552 B	φ F3F3 F543 T F553 Jb F563 <b>Γ</b>	χ F3F4 J F544 У F554 Hb F564 д	ψ F3F5 <b>E</b> F545 Φ F555 <b>h</b> F565 <b>e</b>	00 F3F6 E F546 X F556 E E E	F3E7 Ж F547 Ц F557 Ж	3 F548 <b>Y</b> F558 <b>3</b>	F3E9 И F549 Ш F559	F3EA Й F54A Щ F55A Й	К F54B Б555В К	ЕЗЕС Л F54C Ы F55C Л	F3ED M F54D F55D M	F3EE H F54E <b>Э</b> F55E H	О F54F Ю F55F
Characters Communication code Characters Communication code Characters Communication code Characters	σ F3F0 A F540 Π F550 <b>Я</b> F550 <b>8</b> F570 <b>0</b>	F3E1 τ F3F1 <b>Б</b> F551 <b>P</b> F551 <b>Б</b> F551 <b>6</b> F571 <b>π</b>	υ F3F2 <b>B</b> F542 F552 J F552 <b>B</b> F572	φ F3F3 F543 T F553 Jb F563 F573 c	χ F3F4 F544 У F554 Hb F564 Д F574 T	ψ F3F5 <b>E</b> F545 Φ F555 <b>ħ</b> F565 <b>e</b> F575	0 F3F6 E F546 X F556 L F556 ё F576 ¢	F3E7 Ж F547 Ц F557 Ж F577 х	3 F548 <b>U</b> F558 <b>3</b> F578 <b>U</b>	F3E9 И F549 Ш F559 И F579 Ч	F3EA Й F54A Щ F55A Й F57A Ш	К F54B Б F55B К F57B щ	ЕЗЕС Л F54C БІ F55C Л F57C <b>Ъ</b>	F3ED M F54D F55D M F55D	F3EE H F54E <b>Э</b> F55E H F57E <b>b</b>	О F54F Ю F55F
Characters Communication code Characters Communication code Characters Communication code Characters Communication code	σ F3F0 A F540 Π F550 <b>Я</b> F550 <b>8</b> F570 <b>0</b>	F3E1 τ F3F1 <b>Б</b> F551 <b>P</b> F551 <b>Б</b> F551 <b>6</b> F571 <b>π</b>	υ F3F2 <b>B</b> F542 <b>C</b> F552 J F552 <b>B</b> F572 <b>p</b>	φ F3F3 F543 T F553 Jb F563 F573 c	χ F3F4 F544 У F554 Hb F564 Д F574 T	ψ F3F5 <b>E</b> F545 Φ F555 <b>ħ</b> F565 <b>e</b> F575	0 F3F6 E F546 X F556 L F556 ё F576 ¢	F3E7 Ж F547 Ц F557 Ж F577 х	3 F548 <b>U</b> F558 <b>3</b> F578 <b>U</b>	F3E9 И F549 Ш F559 И F579 Ч	F3EA Й F54A Щ F55A Й F57A Ш	К F54B Б F55B К F57B щ	ЕЗЕС Л F54C БІ F55C Л F57C <b>Ъ</b>	F3ED М F54D Б F55D M F57D Б Б	F3EE H F54E <b>Э</b> F55E H F57E <b>b</b>	О F54F Ю F55F

For UX-P161n, "communication code = F39C :  $^\circ C$  , F39D :  $^\circ$  " is not available. 5-43 •Code tables

# Arabic characters (2-byte codes)

Characters	ث	۵	ĵ	ث	ټ	Ä	ï	ت	ب	÷	ŗ	Ų	ι			
Communication code	F44D	F44C	F44B	F44A	F449	F448	F447	F446	F445	F444	F443	F442	F441			F440
Characters	د			٦.	Ś	ż	ć	Ś	5	ג	>	5	ę	Ŗ	<i>ج</i>	ج
Communication code	F45B			F45A	F459	F458	F457	F456	F455	F454	F453	F452	F451	F450	F44F	F44E
Characters	س	س	سر	س	ز			ز	د			ر	ذ			ذ
Communication code	F465	F464	F463	F462	F461			F460	F45F			F45B	F45D			F45C
Characters	ط	ط	ط	ط	ض	ض	ۻ	ض	ص	Ą	Q	ص	ش	ش	شر	ش
Communication code	F475	F474	F473	F472	F471	F470	F46F	F46E	F46D	F46C	F46B	F46A	F469	F468	F467	F466
Characters	ف	ف	ۈ	ڧ	8	Ŕ	غ	Ė	8	Q	ع	٤	ظ	ظ	ظ	ظ
Communication code	F485	F484	F483	F482	F481	F480	F47F	F47E	F47D	F47C	F47B	F47A	F479	F478	F477	F476
Characters	م	۵	م	م	Դ	T	J	J	ك	ک	٢	ك	ق	ق	ē	ق
Communication code	F495	F494	F493	F492	F491	F490	F48F	F48E	F48D	F48C	F48B	F48A	F489	F488	F487	F486
Characters	ي	÷	ř	ي	و			و	۹	£	ھ	ò	ن	¥	j	Ċ
Communication code	F4A3	F4A2	F4A1	F4A0	F49F			F49E	F49D	F49C	F49B	F49A	F499	F498	F497	F496
Characters				٤	ى			ى	ä			ö	Л			ע
Communication code				F4AA	F4A9			F3A8	F4A7			F4A6	F4A5			F4A4
Characters	ۈ			ۋ	ĩ			I	ļ			Į	Į			İ
Communication code	F4B2			F4B1	F4B0			F4AF	F4AE			F4AD	F4AC			F4AB
Characters	ئ	i	j	ئ	Й			٧	Й			Ą	Ц			لأ
Communication code	F4BC	F4BB	F4BA	F4B9	F4B8			F4B7	F4B6			F4B5	F4B4			F4B3
Characters							٩	٨	۷	٦	٥	٤	٣	٢	١	•
Communication code							F4C6	F4C5	F4C4	F4C3	F4C2	F4C1	F4C0	F4BF	F4BE	F4BD

## (4)User pattern characters (2-byte codes) Fixed size

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 character	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 character	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 character	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 character	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 character	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 character	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 character	B2	В3	B4	В5	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	C8	С9	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	E0	E1	E2	E3
2-byte code	F1C0	F1C1	F1C2	F1C3	F1C4	F1C5	F1C6	F1C7	F1C8	F1C9	F1CA	F1CB	F1CC	F1CD	F1CE	F1CF
User pattern character	E4	E5	E6	E7	E8	E9	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9
2-byte code	F1D0	F1D1	F1D2	F1D3	F1D4	F1D5	F1D6	F1D7	F1D8	F1D9	F1DA	F1DB	F1DC	F1DD	F1DE	F1DF
User pattern character	G0	G1	G2	G3	G4	G5	G6	G7	G8	G9	H0	H1	H2	Н3	H4	Н5
2-byte code	F1E0	F1E1	F1E2	F1E3	F1E4	F1E5	F1E6	F1E7	F1E8	F1E9	F1EA	F1EB	F1EC	F1ED	F1EE	F1EF
User pattern character	Н6	H7	H8	Н9	10	I1	I2	13	I4	15	I6	I7	I8	19	JO	J1
2-byte code	F1F0	F1F1	F1F2	F1F3	F1F4	F1F5	F1F6	F1F7	F1F8	F1F9	F1FA	F1FB	F1FC	F1FD	F1FE	F1FF
User pattern character	J2	J3	J4	J5	J6	J7	J8	J9								
2-byte code	F220	F221	F222	F223	F224	F225	F226	F227								

# User pattern character display scheme

<u>00,01</u>	<u>09</u>	(0 to 9)
<u>10,11</u>	<u>19</u>	(10 to 19)
:		
<u>90,91</u>	<u>99</u>	(90 to 99)
<u>A0,A1</u>	<u>A9</u>	(100 to 109)
:		
<u>J0,J1</u>	<u>J9</u>	(190 to 199)

#### Free size

User pattern character	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
2-byte code	F640	F641	F642	F643	F644	F645	F646	F647	F648	F649	F64A	F64B	F64C	F64D	F64E	F64F
User pattern character	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2-byte code	F650	F651	F652	F653	F654	F655	F656	F657	F658	F659	F65A	F65B	F65C	F65D	F65E	F65F
User pattern character	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
2-byte code	F660	F661	F662	F663	F664	F665	F666	F667	F668	F669	F66A	F66B	F66C	F66D	F66E	F66F
User pattern character	48	49														
2-byte code	F670	F671														

## (5)Punctuation characters (2-byte codes)

Punctuation character	"		:	,	Space	;	!
2-byte code	F240	F241	F242	F243	F244	F245	F246

## (6)Katakana (when KANA and dedicated characters can be input)

(1) Available character sizes

	5×8	7×10	10×12	12×16	18×24
Inter-character space (dots)	1 to 3	1	2	4	6

#### (2) Character codes table (2-byte code) (1) Character size 5x8, 7x10

	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
834*	Г	P	イ	イ	ウ	ウ	Н	Н	オ	オ	力		キ		ク	
835*	ケ		П		サ		シ		ス		セ		ソ		タ	
836*	チ		ツ	ツ		テ		Р		ナ	11	ヌ	ネ	)	ハ	
837*		Ł			フ			$\langle$			ホ			7	111	
838*	Д	メ	モ	ヤ	ヤ	ユ	ユ	Ħ	Е	ラ	IJ	ル	レ	П		ワ
839*			ヲ	ン										~	0	-

#### (2)Character size 10x12, 12x16, 18x24

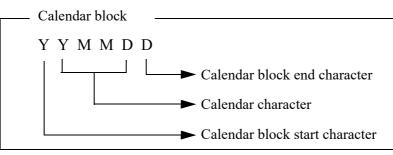
	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
834*	P	P	イ	イ	ウ	ウ	Н	H	オ	オ	力	ガ	キ	ギ	ク	グ
835*	ケ	ゲ	П	Ĩ	サ	ザ	シ	ジ	ス	ズ	セ	ゼ	ソ	ゾ	タ	ダ
836*	チ	ヂ	ツ	ツ	ヅ	テ	デ	ŀ	ド	ナ	11	ヌ	ネ	)	ハ	バ
837*	パ	F	ビ	۲°	フ	ブ	プ	$\sim$	Ÿ	$\sim$	ホ	ボ	ポ	7	"	
838*	Д	メ	モ	ヤ	ヤ	ユ	ユ	Э	Е	ラ	IJ	ル	V	П		ワ
839*			ヲ	ン												

Character code of long "— " is 815B.

## (7)Calendar character code

• Set "calendar block starting character" as the first character and set "calendar block ending character" as the last character.

(Example)



	Year	Month	Day	Hour	Minute	Second	Total number of days	Month 3-digit	Weeks	Day of week
Calendar character	F250	F251	F252	F253	F254	F255	F256	F257	F258	F259
Calendar block start character	F260	F261	F262	F263	F264	F265	F266	F267	F268	F269
Calendar block end character	F270	F271	F272	F273	F274	F275	F276	F277	F278	F279

Specified number of digits for calendar characters

Calendar character	Specified number of digits
Year	1 to 4 digits
Month	1 to 3 digits
Day	1 to 3 digits
Hour	1 to 2 digits
Minute	1 to 2 digits
Second	1 to 2 digits
Total number of days	1 to 3 digits
Month 3-digit	3 digits
Weeks	1 to 3 digits
Day of week	1 to 3 digits

Calendar character is 2-byte code only.

- In "Month 3-digit code handling" on the User environment setup screen, select the content to be printed when transmitting the Month 3-digit code.
  - ①Set "Month 3-digit code handling" to "Numeric"
    - It is used when printing the month with three digits of numbers. It prints with the contents shown below.
      - The printed result when printing with 3-digit numbers

1110	The printed result when printing with 5-digit numbers													
001	002	003	004	005	006									
007	008	009	010	011	012									

- ②Set "Month 3-digit code handling" to "JAN,FEB,--"
  - It is used when printing the month with three digits of alphabetic characters. It prints with the contents shown below.
  - When transmitting the Month 3-digit code for the first time, the substitution rule of "Month" shown below is set to the substitution rule No.99.
    - If the substitution rule has already been set, the substitution rule will not be set.
  - When transmitting the Month 3-digit code for the first time, it will take longer time by 60 ms until ready to print.

The printed result when printing with 3-digit alphabetic characters

JAN	FEB	MAR	APR	MAY	JUN
JUL	AUG	SEP	OCT	NOV	DEC

# Example of when performing printings transmission of calendar character (Example 1) Example of when setting a calendar block to print item 1

STX DLE 1 SI Start character Cal	endar Calendar	r End character	SO	ETX

YM

[Transmission results]

Calendar block

Print item1 —



: Calendar block range

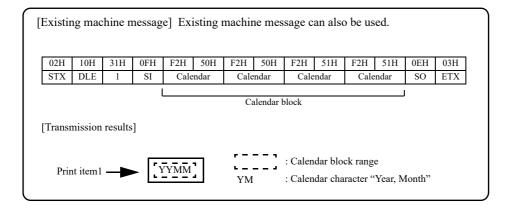
: Calendar character "Year, Month"

#### (Example 2) Example of when setting 2 calendar blocks to print item 1

STX     DLE     1     SI     Start character     Calendar     Calendar     Calendar     Calendar     End character     SO	02H	10H	31H	0FH	F2H	60H	F2H	50H	F2H	51H	F2H	51H	F2H	52H	F2H	72H	0EH	(Contd.)
	STX	DLE	1	SI			Cale	ndar	Cale	ndar	Cale	ndar	Cale	ndar	1		SO	(conta.)

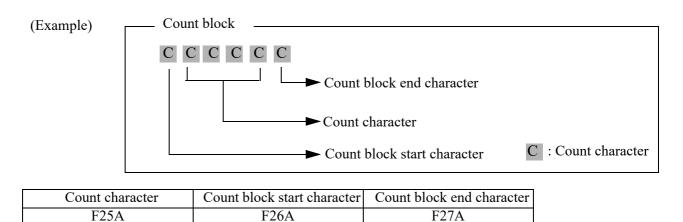
41H	42H	43H	0FH	F2H	62H	F2H	52H	F2H	53H	F2H	73H	0EH	03H
А	В	С	SI	Sta chara	art acter	Cale	ndar	Cale	ndar	E1 chara	nd acter	SO	ETX
												ĺ	

Calendar block 1



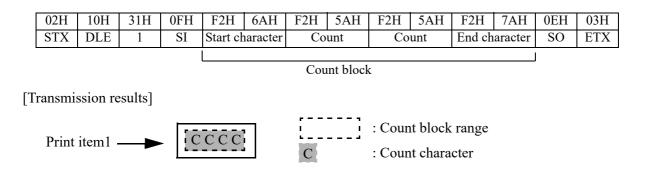
#### (8)Count character code

• Set "count block starting character" as the first character and set "count block ending character" as the last character.



Count character is 2-by	te code only.
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# Example of when performing printings transmission of count character (Example 1)Example of when setting a count block to print item 1



#### (Example 2)Example of when setting 2 count blocks to print item 1

	10H	31H	0FH	F2H	6AH	F2H	5AH	F2H	5AH	F2H	5AH	F2H	5AH	F2H	7AH	0EH	(Contd.)
STX	DLE	1	SI	Sta chara		Со	unt	Co	unt	Co	unt	Co	unt	E1 chara		SO	(Conta.
			l														
								Count	block	: 1							
41H	42H	43H	0FH	F2H	6AH	F2H	5AH	F2H	5AH	F2H	7AH	0EH	03H				
				Sta						Er							
А	В	С	SI	chara		Со	unt	Co	unt	chara		SO	ETX				
			l									J					
						С	ount b	lock 2									
		1.	-														
ismis	sion r	results									r						
Print item1 CCCCCCC ABC CCCCC : Count block range												}	: Coi	int blo	ock ra	nge	
Prin		1		$\sim$							C		: Coi	int ch	aracte	r	
Prin		1 —		<b>L</b>				<b>b</b>			C					1	
Prin		.1 —		<b>L .</b>							C					1	
			messag				messag		llso be	used.						1	
			messag						llso be	used.						1	
[Exis	sting m 2H 10	achine	H OFH	ge] Exi	sting m	nachine F2H	messag	ge can a	Ilso be	H 5AI						1	
[Exis	sting m	achine		ge] Exi	sting m	nachine	messag	ge can a			H 0EH SO	03H ETX	]			1	
[Exis	sting m 2H 10 TX DI	achine H 31F E 1	H OFH SI	ge] Exi	sting m	F2H Cou	messag	ge can a		H 5AI			]			1	
[Exis	sting m 2H 10 TX DL nsmissio	achine H 31F E 1 on resul	H OFH SI ts]	ge] Exi	sting m	F2H Cou	5AH 1 nt unt block	ge can a F2H 5/ Count	AH F2	H 5AI			]			1	
[Exis	sting m 2H 10 TX DI	achine H 31F E 1 on resul	H OFH SI ts]	ge] Exi	sting m 5AH punt	F2H Cou	messaş 5AH   1 nt   unt block ] : Cou	ge can a	AH F2	H 5AI			]			1	

### (9)Control code (For Bar code)

- For code 128, Data Matrix (DM) and QR code, the control code shown in the Table below can be transmitted.
- "RS" and "EOT" codes can be transmitted only to  $QR33 \times 33$ .
- "B code" and "C code" can be transmitted only to Code128.

Control code	FNC1(GS)	RS	EOT	B code	C code
2-byte code	81A6	81A8	81A9	81A4	81A3

### 5.4.2 Header Table

ESC2

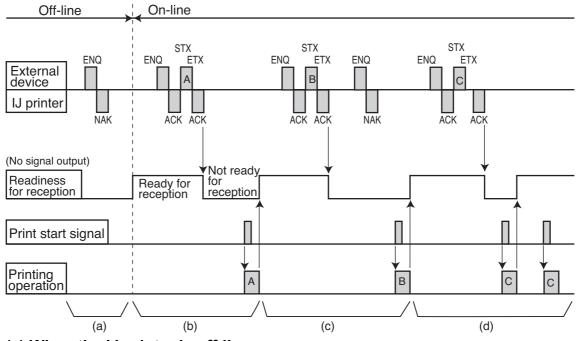
Header Classification

	Туре	Header	Classification	Data count	Data section
Recall	Message number	20H	31H	4	0001 to 2000
Registration	Message number	- 21H	31H	4	0001 to 2000
Registration	Message name	2111	32H	1 to 12	Message name: Max 12 digits
	Line count, print format uniformity		31H	0	-
	Line count/Line spacing	22H	32H	2	Line count : 1 to 6 Line spacing: 0 to 4 (5 or 6 lines : 0 to 2)
	Format setup change		33H	1	Format setup : 30H to 32H
Print format	Character size/ inter character space		31H	3	Character size : 30H to 3FH Inter character space : 00 to 28
	Increased width		32H	1	1 to 9
	Bar code	23H	33H	1	30H to 51H
	Readable code		34H	1	0 to 2
	Prefix Code		35H	2	00 to 99
	Horizontal and Vertical coordinate		31H	8	Item number : 1 to 100 Horizontal (X) coordinate: 0 to 31998 Vertical (Y) coordinate : 0 to 29
	Horizontal coordinate	24H	32Н	6	Item number : 1 to 100 Horizontal (X) coordinate : 0 to 31998
	Vertical coordinate		33H	3	Item number : 1 to 100 Vertical (Y) coordinate : 0 to 29
Free layout	Horizontal and Vertical move		41H	10	Item number : 1 to 100 Horizontal (X) direction : -31998 to +31998 Vertical (Y) direction : -29 to +29
	Horizontal move		42H	7	Item number : 1 to 100 Horizontal (X) direction : -31998 to +31998
	Vertical move		43H	4	Item number : 1 to 100 Vertical (Y) direction : -29 to +29
	Character height		31H	2	00 to 99
	Ink drop use percentage		32H	2	01 to 16
	High-speed printing	]	33H	1	0 to 3
	Character width	]	34H	4	0000 to 3999
	Character orientation		35H	1	0 to 3
	Print start delay	]	36H	4	0000 to 9999
D . /	Print start delay (reverse)		37H	4	0000 to 9999
Print specifications	Product speed matching	25H	38H	1	0 to 2
op controllo	Pulse rate division Factor	]	39H	3	001 to 999
	Repeat count	]	3DH	4	0000 to 9999
	Repeat intervals		3EH	5	00000 to 99999
	Target sensor timer		3FH	3	000 to 999
	Target sensor filter		40H	1	1 to 2
	Target sensor filter value		41H	4	0000 to 9999
	Ink drop charge rule		42H	1	Charge rule : 31H to 33H

	Туре	Header	Classification	Data count	Data section
	Substitution rules No.		31H	3	Calendar block : 1 to 8 Substitution rules No. : 01 to 99
Calendar condition	Offset (Year / month / day / hour / minute)	28H	32Н	6	Calendar block : 1 to 8 Type : 0 to 4 Offset : Year 0000 to 0099 Month 0000 to 0099 Day 0000 to 1999 Hour -023 to 0099 Minute -059 to 0099
	Substitution rules usage (Year / month / day / hour / minute / week / Day of week)		33H	3	Calendar block : 1 to 8 Type : 0 to 6 Mode : 0 to 1
	Zero suppress usage (Year / month / day / hour / minute / week / Day of week)		34H	3	Calendar block : 1 to 8 Type : 0 to 6 Mode : 0 to 2
	Initial value		31H	Variable	Count block : 1 to 8 Initial value : max 20 digits
	Range 1		32H	Variable	Count block : 1 to 8 Range 1 : max 20 digits
	Range 2		33H	Variable	Count block : 1 to 8 Range 2 : max 20 digits
	Update (in progress)		34H	7	Count block : 1 to 8 Update (in progress) : 000000 to 999998
	Update (unit)		35H	7	Count block : 1 to 8 Update (unit) : 000001 to 999999
Count	Increment	2011	36H	3	Count block : 1 to 8 Increment : 01 to 99
condition	Direction	2CH	37H	2	Count block : 1 to 8 Direction : 0 to 1
	Jump from		38H	Variable	Count block : 1 to 8 Jump from : max 20 digits
	Jump to		39H	Variable	Count block : 1 to 8 Jump to : max 20 digits
	Reset		3AH	Variable	Count block : 1 to 8 Reset : max 20 digits
	Reset signal		3BH	2	Count block : 1 to 8 Reset signal : 0 to 1
	External signal count		3EH	2	Count block : 1 to 8 External count : 0 to 1
	Current time		31H	14	Year, Month, Day, Hour, Minute, Second (14 digits)
Date/time	Calendar time control	2EH	32H	1	1 to 2
setup	Calendar time	2.511	33H	14	Year, Month, Day, Hour, Minute, Second (14 digits)
	Clock system		34H	1	1 to 2
User pattern character transmission	Character size fixed pattern	32H	30H to 3FH	-	Character code + pattern data
	Count Reset	2CH	41H	-	
	Item No. specification	70H	Item No.	-	Used together with print format message
	Remote operation	72H	30H to 34H	-	
	Online	73H	-	-	No STX/ETX
	Offline	74H	-	-	No STX/EXT
	Current time inquiry	75H	-	-	No STX/ETX; Inquiry
Other	Communication buffer Claer buffer	76H	-	-	
	Communication buffer Reset printing	77H	-	-	
	Print item deletion	7AH	-	-	
	Number of the print items specified	7BH	-	-	Used together with printings transmission
	Current time output	7FH	-	14	Year, Month, Day, Hour, Minute, Second (14 digits)

### 5.5 Communication Timing 5.5.1 Signal Timing

(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-line / Off-line button 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.
- (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.

③When 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

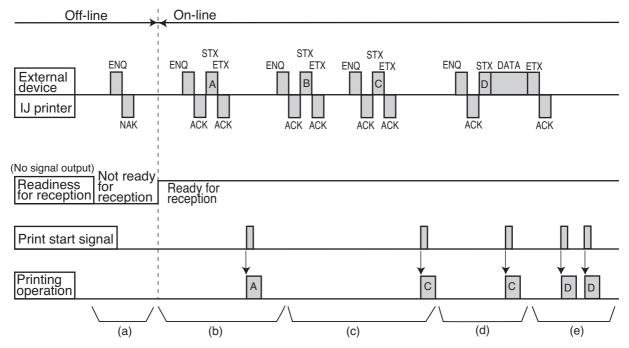
- Error-free transmission data is stored in the IJ printer. The same contents are printed until different transmission data is transmitted to the IJ printer.
- If the data transmitted from the external device is in error, the IJ printer printings remain unchanged. In such an instance, retransmit the data beginning as explained in (b). The retransmission equat estim must be determined from the device side.

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

- 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.
  - Press the Comm<u>On-line / Off-line</u> button to enter the off-line mode, and then switch back to the on-line mode.

#### (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.

#### (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.

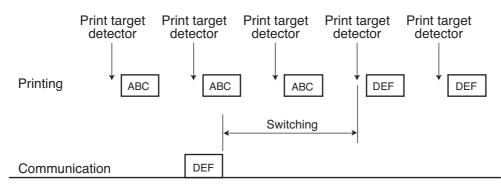
#### (f) When a data transmission is aborted (the transmission of up to the ETX code is not completed)

- 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-line / Off-line button to enter the off-line mode, and then switch back to the on-line mode.

#### (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) The IJ printer switches printing to the received contents: It will print the previous data during switching.

No.	Transmission type	Conditions	Maximum time (ms)
1	Print description	-	100
		When the character height, character width, character orientation, ink drop use percentage, or print format changes before or after recall.	500
2	Print data recall	When the character height, character width, character orientation, ink drop use percentage, or print format does not change before or after recall.	100
3	Print conditions	-	500

Switching time

• The fewer characters, the shorter the time.

• The fewer different time of the print format, the shorter the time.

#### (b) Restrictions

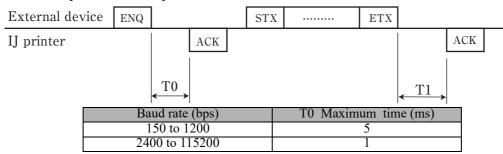
Perform communications only under the conditions shown below. If even one of these conditions is not met, any input to print target detector while the communicated contents are being printed will cause fault "Print data changeover in progress M" to occur.

Conditions that the	print target	detector i	nput will	not cause	an abnormality
	r8				

No.	Conditions
1	Make sure that none of the following software options are provided: Barcode Reader Connection (SOP-08)
2	Set the Print data changeover on User environment setup screen to "Disable".
3	Set the Communication mode on Communication environment setup screen to "overwrite-enabled".
4	Set the Buffer function on Communication environment setup screen to "Disable".
5	Transmit print contents independently, and do not package print content transmission with print condition transmission.
6	Transmit to print items with no count block.
7	Do not transmit the count characters.

### 5.5.2 Response Time

# 5.5.2-1 Time interval (T1) between external device communication and IJ printer response



#### (1) When Print format is set to "Individual" or "Overall"

Time interval T1 when Print format is set to "Individual" or "Overall"

No. Transmission type		Conditions	T1 Maximu	ım time (ms)	Dementer
		Conditions	Within 24 items	25 items or more	Remarks
		The print message transfer ACK condition is t=fixed.	10	45	*1
1	Print description	The print message transfer ACK condition is t=async.	$\frac{M}{10} +25$ (M: Number of communication characters)	$\frac{\frac{M}{10}}{(M: Number of communication characters)} +75$	*1 *2
2	Print data recall	-	5	30	
3	Print data registration	-	1800	1800	
4		Print specifications	10	10	
5		Print format	20	50	
6	6 Print conditions	Line count / print format uniformity	20	50	
7		Format setup change	100	100	
	Free layout	-	-	-	
8	User pattern character	-	M+10 (M: Number of communication patterns)	M+10 (M: Number of communication patterns)	
9	Date/time setup	-	5	5	*3
		Error reset	15	15	
10	Remote operation	Operation start, operation stop, deflection voltage control	20	50	
11	Print item deletion	-	100	100	
12	Number of the print items specified	-	100	100	
13	Count Reset	-	5	30	

• When the Print format is set to "Individual" or "Overall" and Free layout transmission is made, a communication error will occur.

\*1 For "t=fixed" and "t=async.", see Section 5.2.1, "Setting Communication Environment ".

\*2 When there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting, the time is as follows:

\*3 If time changes just before 3ACK transmission, ACK transmission may be delayed about 20 ms.

Time T1 when there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting

Barcode type	Character size	T1 Maximu	ım time (ms)
Darcoue type		Within 24 items	25 items or more
Data matrix	5×8, 10×12	8×N+20	100
	12×16, 18×24	$15 \times N + 40$	150
	QR (21×21)	200×N	200×N
OR code	QR (25×25)	300×N	300×N
QK code	QR (29×29)	400×N	400×N
	QR (33×33)	500×N	500×N
Micro QR	(15×15)	100×N	100×N
GS1 DataBar		$15 \times N+30$	15×N+30
	Vert. 7/8/10 dots	300×N	300×N
Dotcode	Vert. 12 dots	400×N	400×N
Doicode	Vert. 14 dots	600×N	600×N
	Vert. 16 dots	700×N	700×N

(N : Number of Barcode)

#### (2) When Print format is set to "Free layout"

No. Transmission turns				im time (ms)	Dementer
No.	Transmission type	Conditions	Within 24 items	25 items or more	Remarks
		The print message transfer ACK condition is t=fixed.	60	120	*4
	Print description	The print message transfer ACK condition is t=async.	$\frac{M}{10} + 110$ (M: Number of communication characters)	$\frac{M}{10} + 270$ (M: Number of communication characters)	*4 *5
2	Print data recall	-	30	30	
3	Print data registration	-	1800	1800	
4		Print specifications	20	20	
5		Print format	20	50	
	Print conditions	Line count / print format uniformity	-	-	
6		Format setup change	100	100	
7	Free layout	-	20	20	
8	User pattern character	-	M+10 (M: Number of communication patterns)	M+10 (M: Number of communication patterns)	
9	Date/time setup	-	5	5	*6
		Error reset	15	15	
10	Remote operation	Operation start, operation stop, deflection voltage control	100	250	
11	Print item deletion	-	100	100	
12	Number of the print items specified	-	100	100	
13	Count Reset	-	30	30	

Time interval T1 when Print format is set to "Free layout"

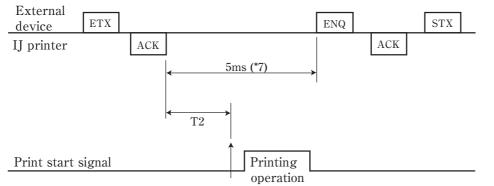
• When the Print format is set to "Free layout" and Print condition transmission of "Line count/Print format uniformity" is made, a communication error will occur.

\*4 For "t=fixed" and "t=async.", see Section 5.2.1, "Setting Communication Environment". \*5 When there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting, the time is as follows: \*6 If time changes just before 3ACK transmission, ACK transmission may be delayed about 20 ms.

Time T1 when there is a data matrix	, QR code, Micro QR, GS1 DataBar and Dotcode	setting
This IT when there is a data matrix	, Qit couc, micro Qit, Obi Dutubui una Doteoue	Journa

Barcode type	Character size	T1 Maximum time (ms)		
Barcode type		Within 24 items	25 items or more	
Data matrix	5×8, 10×12	58	250	
	12×16, 18×24	85	600	
	QR (21×21)	300	600	
QR code	QR (25×25)	400	600	
	QR (29×29)	500	700	
Micro QR	(15×15)	200	500	
GS1 DataBar		60	250	
	Vert. 7/8/10 dots	400	600	
Dotcode	Vert. 12 dots	500	700	
Doicode	Vert. 14 dots	700	800	
	Vert. 16 dots	800	900	

#### 5.5.2-2 Time interval (T2) between IJ printer response and printing start



#### (1)When Print format is set to "Individual" or "Overall"

Time interval T2 when Print format is set to "Individual" or "Overall"

2Print data recalluse percentage, or print format changes before or after recall1002Print data recallWhen the character height, character width, character orientation, ink drop use percentage, or print format does not change before or after recall403Print data registration-304Print specifications4005Print conditions400	Domonita
1Print descriptionIntegration between the print message transfer ACK condition is t=fixed.(M: Number of communication characters)(M: Number of communication characters)2Print data recallThe print message transfer ACK condition is t=async.002Print data recallWhen the character height, character width, character orientation, ink drop use percentage, or print format changes before or after recall4004003Print data registration-30304Print specifications4004005Print conditions400400	Remarks
ACK condition is t=async.002Print data recallWhen the character height, character width, character orientation, ink drop use percentage, or print format changes before or after recall4004002Print data recallWhen the character height, character width, character orientation, ink drop use percentage, or print format does not change before or after recall4004003Print data registration-30304Print specifications4004005Print conditions400400	*8 *11
2Print data recallwidth, character orientation, ink drop use percentage, or print format changes before or after recall4004002Print data recallWhen the character height, character width, character orientation, 	
When the character height, character width, character orientation, ink drop use percentage, or print format does not change before or after recall40403Print data registration-30304Print specifications4004005Print conditions400400	*9
4Print specifications4004005Print conditionsPrint format400400	*10
5 Print conditions Print format 400 400	
Drint conditions	*9
Finit conditions	*9
6 Line count / print format uniformity 200 200	*10
7 Format setup change 200 200	
Free layout	
8User pattern character2525	
9 Date/time setup - $\frac{M}{10} + 15$ $\frac{M}{10} + 30$ (M: Number of printing characters) $\frac{M}{10} + 30$ (M: Number of printing characters)	*8
10         Print item deletion         -         200         200	
11Number of the print items specified-400400	
12 Count Reset - 40 40	

• 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.
- The more different items of the print format, the longer the time until ready to print.
- When the Print format is set to "Individual" or "Overall" and Free layout transmission is made, a communication error will occur.
- \*7 If the communication time interval is not sufficiently secured, it may not operate normally.
- \*8 When there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting, the time is as follows:
- \*9 When there is a QR code setting, T2 Minimum time is 400xN (ms) (N : Number of QR codes).
- \*10 When there is a QR code setting, the time is as follows:

\*11 When there is a GS1 Data Bar setting, the time is as follows:

5-57 • Communication Timing

		T2 Minimum time (ms)		
Barcode type	Character size	Within 24 items	25 items or more	
Data matrix	5×8, 10×12	8×N+20	100	
	12×16, 18×24	$15 \times N+40$	150	
	QR (21×21)	200×N	200×N	
QR code	QR (25×25)	300×N	300×N	
QR code	QR (29×29)	400×N	400×N	
	QR (33×33)	500×N	500×N	
Micro QR	(15×15)	100×N	100×N	
GS1 DataBar		$15 \times N+30$	$15 \times N+30$	
	Vert. 7/8/10 dots	300×N	300×N	
Dotcode	Vert. 12 dots	400×N	400×N	
Doicode	Vert. 14 dots	600×N	600×N	
	Vert. 16 dots	700×N	700×N	

Time T2 when there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting

(N: Number of Barcode)

#### (2) When Print format is set to "Free layout"

Time interval T2 when Print format is set to "Free layout"

No.	Transmission type	Conditions	T2 Minimu	m time (ms)	Remarks
INO.	Transmission type	Conditions	Within 24 items	25 items or more	Kennarks
1	Print description	The print message transfer ACK condition is t=fixed.	$\frac{\frac{M}{10}+50}{(M: Number of communication characters)}$	$\frac{M}{10} + 150$ (M: Number of communication characters)	*12
		The print message transfer ACK condition is t=async.	0	0	
2	Print data recall	When the character height, character width, character orientation, ink drop use percentage, or print format changes before or after recall	400	400	
2	Print data recali	When the character height, character width, character orientation, ink drop use percentage, or print format does not change before or after recall	40	250	*12
3	Print data registration	-	150	250	
4		Print specifications	400	400	
5	Print conditions	Print format	400	400	
		Line count / print format uniformity	-	-	
6		Format setup change	200	250	
7	Free layout	-	400	400	
8	User pattern character	-	25	25	
9	Date/time setup	-	$\frac{\frac{M}{10}+50}{(M: Number of printing characters)}$	$\frac{\frac{M}{10} + 150}{(M: Number of printing characters)}$	*12
10	Print item deletion	-	200	200	
11	Number of the print items specified	-	400	400	
12	Count Reset	-	40	250	

• 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.)

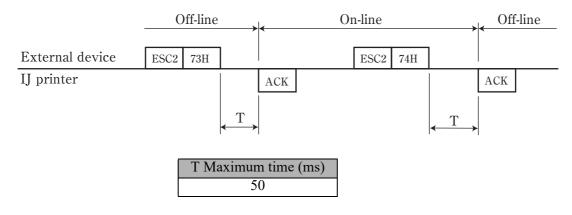
- When a print start signal is input with shorter timing than T2, the fault "Print data changeover in progress M" occurs.
- The more different items of the print format, the longer the time until ready to print.
- When the Print format is set to "Free layout" and Print condition transmission of "Line count/Print format uniformity" is made, a communication error will occur.

- \*7 If the communication time interval is not sufficiently secured, it may not operate normally.
- \*12 When there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting, the time is as follows:

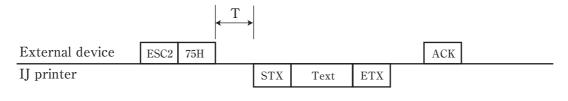
	Character size	T2 Minimu	ım time (ms)
Barcode type	Character size	Within 24 items	25 items or more
Data matrix	5×8, 10×12	58	250
Data matrix	12×16, 18×24	85	600
	QR (21×21)	300	600
QR code	QR (25×25)	400	600
	QR (29×29)	500	700
Micro QR	(15×15)	200	500
(	GS1 DataBar	60	250
	Vert. 7/8/10 dots	400	600
Dotcode	Vert. 12 dots	500	700
Doitoue	Vert. 14 dots	700	800
	Vert. 16 dots	800	900

Time T2 when there is a data matrix, QR code, Micro QR, GS1 DataBar and Dotcode setting

#### 5.5.2-3 On-line/Off-line Transmission



### 5.5.2-4 Current time output Transmission



Baud rate (bps)	T Maximum time (ms)
150 to 1200	15
2400 to 115200	5

### **5.6 Communication Monitor Function**

- The contents of serial communications between the external device and IJ printer are displayed.
- Up to 3,000 bytes of data can be acquired at a time.
- When you press the Start button, the system erases monitored data and acquires new data.
- When you press the USB output button, the communication description which is displayed on screen can be output to USB memory.

C	Comm. monitor [Re							eady	'		]				Con	<b>L</b> ]2	2017.07	.07 1	2:45				
	Blue : DLE2,ESC2,DLE,ESC Red : Failed line																						
	No	Tra	ans.				C	Com	nur	nica	tion	des	scrip	otio	n								
	1		R	05																	=== Manua	Shut	D
	2	S		06																	Ivialiua		
	3		R	02	10	31	41	42	43	44	45	10	32	31	32	33	34	35	03				
	4	S		06																		НС	DME
	5		R	05																			
	6	S	_	06																		] 6	<b>-</b> )
	7		R	-	10	31	41	42	43	44	45	10	32	31	32	33	34	7F	03		Prev.Ds	Nex	t Dsp
	8	S		15																			
																					A	bort	
																					USB	outp	ut
																					St	art	
	Det	ectio	on		)isa	ble	En	able	,)			Pro	).	stat	us :	Hal	ted				E	) lack	

#### (1) Screen display

Item	Description			
Trans.	External device $\rightarrow$ IJ printer : R (Receive)			
	IJ printer $\rightarrow$ External device : S (Send)			
Communication	Sended/received data are displayed in hexadecimal notation. Sixteen bytes of			
description	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	<ul> <li>This switches over whether the system is to detect error-ridden locations.</li> <li>Disable: The system will not detect error-ridden locations. The system will memorize up to bytes 3,000 of data transmitted and received.</li> <li>Enable: The system will display error-ridden locations in red. The system will memorize up to transmitted and received data up to the location where an error was detected.</li> </ul>
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.
USB output	The Communication description which is displayed on screen can be output to USB memory.
Back	Returns you to the maintenance menu.

#### (3) Explanation of USB output function.

- When you press the USB output button, the Communication description which is displayed on screen can be output to a USB memory.
- The Communication description which is displayed on screen can be output to a USB memory. when "Comm. monitor"screen is displayed AND Comm. monitor is in "Halted" status.
- The Communication description is output in a Text file format.
- Explanation of file composition and file name.
  - UXCLOG holder is automatically created right below the USB memory.
  - The Communication description is output in the name of LOG\_Serial number\_YYMMDDhhmmss.txt right below the UXCLOG holder.

<ul> <li>USB Memory</li> <li>UXCLOG ¥ LOG_Serial number_YYMMDDhhmmss.txt</li> </ul>	YYMMDDhhmmss stands for Year, Month, Date, Hour, Minute and Second.

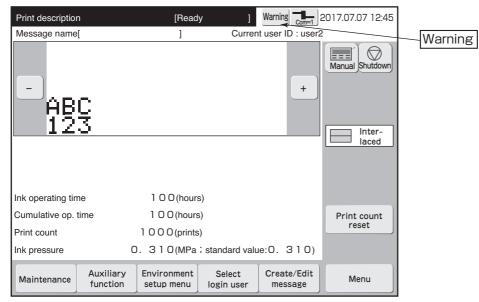
- Explanation of content of output.
  - A Target port is output in the lead, such as "Standard" for the standard port and "Secondary" for the expansion port.
  - Compositions of the Text file are output in the order of No., Trans, and Communication description. (No.: 4 digit number; Trans.: "S" for sending and "R" for receiving.)
  - An asterisk (\*) is output in front of the error part when an error was detected.

Standard
0001,R,05, A Target port is output.
0002,S,06,
0003,R,02,10,31,41,42,43,44,45,10,32,31,32,33,34,35,03,
0004,S,06,
0005,R,05, It is an error part.
0006,S,06,
0007,R,02,10,31,41,42,43,44,45,10,32,31,32,33,34, (*7F,)03,
0008,S,15,
Trans. is output with "S" for sending and "R" for receiving.
No. is output in 4 digit number.

- Explanation of content of notes.
  - The data is NOT output by pressing the USB output button if the Communication description does NOT Exist.
  - The data is NOT output by pressing the USB output button when the Line monitor is in operation.
  - <USB Memory Error> is displayed when the USB memory is NOT installed on the IJP.
  - <USB Memory Error> is displayed when the USB memory runs out of its capacity.
  - The data is overwritten if the same file name already exists in the USB memory.
  - Do NOT remove the USB memory when the USB data output is in process.

### 5.7 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.



#### Error code table

Error	NL	Description	<u>C11</u>
code	Name	Description	Check
001	Transmission code error	<ul><li> The transmitted code was not defined for communication use.</li><li> The transmitted message had an illegal structure.</li></ul>	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.
	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	<ul> <li>An attempt was made to establish communication while the "not ready for reception" state prevailed.</li> <li>"Apply" key and message window were both displayed.</li> <li>"Off-line fixed" has been set in Communication environment.</li> <li>Communication monitor screen was displayed.</li> <li>Communication was conducted during the stop or shutdown process.</li> </ul>	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.
013	ESC code error (ESC, ESC2)	The ESC code position was illegal.	Check the transmission procedure and ESC code.

Error code	Name	Description	Check
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	<ul> <li>An illegal 2-byte code (2 bytes per character) was transmitted.</li> <li>Only one byte of 2-byte code was transmitted.</li> </ul>	Check the 2-byte code transmission text.
020	Print data code error	<ul><li> The print data registration number was illegal.</li><li> An unregistered number was encountered.</li></ul>	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	<ul> <li>When necessary conditions for high speed printing were not satisfied, NM or QM mode was transmitted.</li> <li>When High speed printing NM or QM mode was set, a setting which did not satisfy necessary conditions for high speed printing was transmitted.</li> </ul>	Check the print specifications communication text.
024	Calendar/count conditions error	<ul> <li>Transmitted to block where calendar/count characters were not present.</li> <li>Set value was outside specifications.</li> <li>Zero suppression transmission was performed to print item for which barcode had been set.</li> </ul>	Check calendar/count condition communication text.
026	Bar code setup error	<ul> <li>A character undefined for bar code use was found in the printings.</li> <li>The number for ITF did not consist of an even number of numerals beginning with an odd digit position.</li> <li>The input data for EAN-13 was not numeric.</li> <li>The number of DM, QR code, Micro QR code or GS1 DataBar is 2 or more when Format setup is Free Layout.</li> </ul>	Check the printings print format communication text.
027	Printings error	<ul> <li>A dedicated character or katakana was transmitted in a character size which cannot be inputted.</li> <li>The three characters of a dedicated character string were not properly grouped.</li> <li>A count value is out of a count range.</li> </ul>	Check the printings communication text
031	Create messages error	<ul> <li>While "Create messages" function was operating, on-line transmission was performed.</li> <li>On-line transmission was performed when print data which was controlled separately from data created and registered by print description screen, was present.</li> </ul>	Check the timing of on-line transmission.

Error code	Name	Description	Check
032	Setting conditions error	• Setting value does not satisfy the required conditions.	Communication text re-check.
033	Setting range error	• Setting value is out of stipulated range.	Communication text re-check.
036	Free layout transmission- Communication error	• Free layout transmission was made when Format setup is "Individual" or "Overall".	Check the Communication text.
037	Free layout transmission- Setup error	<ul> <li>The specified item number does not exist.</li> <li>Character other than "+" or "-" is input to Horizontal sign or Vertical sign.</li> <li>Set value of the Coordinate or Horizontal/Vertical dot count is invalid.</li> </ul>	Check the free layout communication text.
038	Free layout transmission- Reflection error	When the item was moved by Free layout transmission, the item after move went to the area other than Free layout area.	Check the free layout communication text.
039	Free layout transmission- Format setup reflection error	<ul> <li>When the Print content was changed by Print content transmission, the print item after move went to the area other than Free layout area.</li> <li>When Character size, Inter-character spacing, Bold, or Barcode of the item is changed by Print condition trans- mission, the print item after move went to the area other than Free layout area.</li> </ul>	Check the Printings text and Print format communication text.
040	Free layout transmission- Format setup communication error	When the Format setup is set to "Free layout", Print condition transmission of "Line count/Print format uniformity", "Line count, Line spacing", "High speed printing" or "Ink drop charge rule" was made.	Check the Communication text.

### **5.8 Precautions**

#### 5.8.1 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.
  - $\bigcirc$  Issue the print abort code "DC3". After the IJ printer returns an "ACK" response,
- (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
65µm	5.5

1 scan time = (Vertical dot count + character width setting) X Ink drop use percentage (ms)

Excitation frequency (kHz)

When "Speed compensation" is enabled, print start is delayed for 10 scans.

#### 5.8.2 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.

<standard communication=""></standard>	
Communication mode overwrite-protected overwrite-enabled)	
Print message transfer ACK t=fixed t=async.	
Print spec transfer char height 2 digits 3 digits	Back

> Data digts of the character height

• Character height (when the 3-digit data format is chosen)

ESC	Header 30H	100s place	10s place	Units place

Character height (000 to 099)

Note: If the value is within the range from 100 to 999, an error occurs.

### **5.9 Communication Buffer**

#### 5.9.1 Overview

#### (1) Print content transmission

- The print contents received through print content transmission will not be reflected in printing immediately, but will be temporarily held in buffer.
- The print contents are fetched from the buffer one by one for each printing, and reflected in subsequent printing.

[Example of transmitting print contents constantly during printing]

External device	Α	]	В	С		D		Е		F		G		Print content transmission
IJ printer					↓		↓		↓		╞			<ul> <li>Detection of print start signal</li> </ul>
Printing						А	][	В	] [	С	] [	D	]	Printing

[Example of transmitting collective print contents at the beginning]

External device	А	В	С	D	]	Е	F	G					
IJ printer									↓ .	ļ,	↓ ·	Ļ	
Printing									А	В	С		D

#### 5.9.2 Description of Functions

#### (1) Application procedure

• Prepare the following in advance:

	Preliminary Preparation Items
No.	Procedure
1	Specify "overwrite-enabled" for communication mode on the communication environment screen.
	In addition, specify "t=fixed" for print message transfer ACK.
2	Set the buffer function on the second page of the communication environment setting screen to
	"enable".
	Confirm the setting values for "Buffer repeat count", "Empty Buffer Fault", "Timing of Fault" and
	"Data number at Fault" on the second page of the communication environment setting screen.

Setting items	Description	Initial values				
Buffer function	Selects enable/disable for buffer function.	Disable				
Buffer repeat count	affer repeat count Sets how many times printing is to be executed before switching the printing contents.					
Empty Buffer Fault	Selects whether or not communication buffer errors are to be generated. The conditions for occurrence are set by "Timing of Fault" and "Data number at Fault".	Disable				
Timing of Fault	Selects timing by which communication buffer errors are to be generated.	Print Start				
	Sets the number of print data items by which a communication buffer error is to be generated.	0				

S	etting items of communication environment setting screen

Comm. env. setup	[Stop ]	2017.07.07 12:45
Buffer function	Disable Enable	
Buffer repeat count	0001 (1~9999)	
Empty Buffer Fault	Disable Enable	Manual Startup
Timing of Fault	Print Start Print. Complete	
Data Number at Fault	0 (0~9)	HOME
		Prev.Dsp Next Dsp
		Back

- The function (application) will be valid only when the printer is online and in the ready status. Offline will set to standard-mode printing.
- The following shows the application procedure :

	Application Procedure					
No.	Procedure					
1	Switch to online.	Procedure No.1 and 2 can be in random order				
2	Set to the ready status.					
Transmit print contents accordingly so that print contents sent at least N times remain in the						
5	<sup>5</sup> (N: Data number at Fault)					
4	4 Print.					
5	5 Subsequently repeat steps 3 and 4 above.					

#### (2) Buffer

- The print content receive buffer has a queue structure (beginning with oldest data, in sequence).
- Print content is fetched from the buffer for each printing.
- Once the Ready status is set, the first print content will be fetched from the buffer.
- The buffer capacity is 100 print items (total 1000 chracters). An alarm will be raised if it exceeded its capacity.
- The buffer will be cleared when offline is set.
- The buffer is always empty immediately after power is turned on.
- The buffer will not be cleared even if the status is changed to that other than the print enable status.
- When offline is switched to online, the contents in buffer will be cleared, and then the standard-mode print operation will continue. In this case, print contents of at the time it was changed offline will be printed, then subsequently same print contents will be printed. However, this option feature will be effective again by reconfiguring the setting according to the procedure described in the previous page.
- If printing is interrupted because of some fault (print overlap fault, etc.), printing will restart from the subsequent data in buffer.

#### (3) Character types available

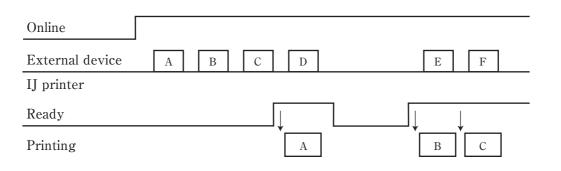
- Calendar characters and count characters are not available.
- To use user pattern characters, define them in advance using "Create user pattern" function. Undefined user pattern characters will be printed as spaces.

#### (4) Examples of operational procedure

(Example 1) Normal operation:

Online		
External device	A B C D E F	-Print content transmission
IJ printer		
Ready		-Detection of print start signal
Printing	A B C	Printing

## (Example 2) When status is restored to that other than ready during normal operation, and printing is to restart in ready status:



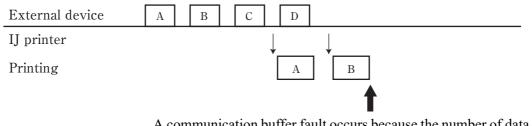
## (Example 3) When offline is restored during normal operation, and printing is subsequently performed in standard mode:

Online	
External device	A B C D
IJ printer	
Ready	
Printing	A B B B B

#### (Example 4) Buffer repeat count is 2.

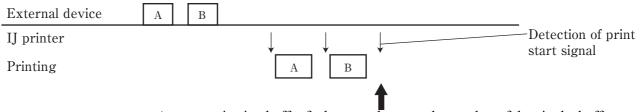
External device	А	В	С	]					
IJ printer				Ļ	$\downarrow$	ļ	<i>,</i>	$\downarrow$	
Printing				А	А	]	В	В	

(Example 5) Timing of Fault : Print completed, Data count when error occurs : 2



A communication buffer fault occurs because the number of data in the buffer is 2 after B is printed.(C and D in the buffer are not printed)

(Example 6) Timing of Fault : Print started, Data count when error occurs : 0



A communication buffer fault occurs because the number of data in the buffer is 0 after B is printed followed by detection of print start signal.

#### 5.9.3 External Communications

#### 5.9.3-1 Transmitting print contents

- (1) Function
  - The received print content will not be reflected in printing immediately, but temporarily held in buffer.



• To facilitate operation, first input fixed characters that do not need to be changed, and then transmit only the print items to be changed.

#### (2) Restriction

• The maximum number of print items which can be sent at 1 time is 8 print items (maximum 80 characters).

#### 5.9.3-2 Clearing buffer and restarting printing

- (1) Function
  - When text "clear buffer" is transmitted, the print contents held in buffer will be cleared.
  - To restart printing, perform the following procedure after transmitting text "clear buffer". If this procedure is not followed, the print contents stored before the buffer cleared may be printed.
  - Procedure: ① Transmit print contents so that print contents sent at least N times remain in the buffer.
    - (N: Data number at Fault)
    - 2 Transmit text "restart printing".
    - ③ Printing is possible whenever the print start signal is input.

External device	STX ESC	2 Header ET	X	Header 76h : Clear buffer
IJ printer			АСК	Header 77h : Restart printing
[Existing machine mes	sage] Existing macl	nine message ca	n also be used.	
External device S	TX ESC Header ETX	-	Ieader 2Dh : Clea Ieader 77h : Rest	

#### [Conceptual diagram of transmission procedure]

Online		
External device	1 20	Clear 21 ··· 40 Restart
IJ printer		
Ready	Standby	Ready
Print start signal		
Printing		1 21 22

#### (2) Restriction

- Independently transmit text "clear buffer" or "restart printing": These cannot be transmitted with another text (print content transmission, print data call-up transmission, etc.).
- Transmit text "clear buffer" or "restart printing" only while printing is not in progress.
- Input the print start signal at least 500 ms after ACK is returned to "restart printing".

#### 5.9.3-3 Print data call-up transmission

(1) When calling up print data via communication, always execute the call-up before transmitting data to the buffer. If call-up is executed in the Ready status, the called up print content will be printed.

#### 5.9.4 Errors

#### (1) Errors during external communications

		1
No.	Condition	Type of error
1	Not all received print contents could be held in buffer because its capacity was exceeded	NAK is returned. However, this will not cause any external communication error.
2	when there are reception contents more than 81 characters.	External communication error 030
3	Calendar or count character was included in print data call-up transmission	External communication error 027

#### Errors during print content transmission and print data call-up

#### Error when buffer is cleared

No.	Condition	Type of error
1	Text was transmitted together with another text	External communication error 002

#### (2) Errors during printing

#### Errors during printing

No.	Condition	Type of error
1	The number of received contents in buffer was less than "Data number at Fault".	Fault "Communication Buffer Fault"
2	Print start signal was received during print data switching immediately after ACK was returned to "restart printing"	Fault "Invalid Data Change Timing"

• When "communication buffer fault" occurs, the window will be cleared, followed by standby status.

#### (3) Error when status is changed

#### Error when status is changed

No.	Condition	Type of error
1	Calendar characters or count characters were included to	Confirmation message
1	existing print contents when restored to online.	"Communication buffer error"

# 6. CIRCULATION SYSTEM WORK AND ADJUSTMENT METHOD

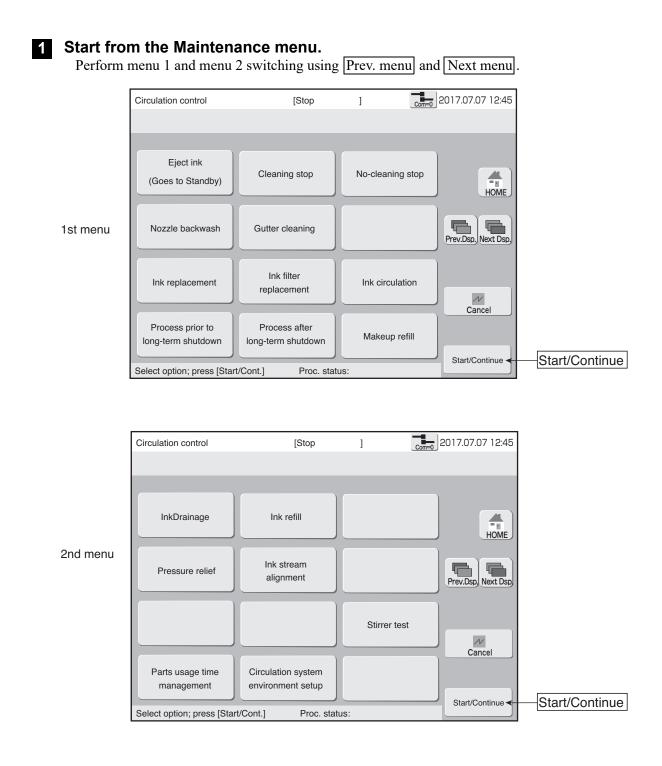
#### 

<ul> <li>Never pour the ink and makeup waste into a sewer, etc. Have the ink and makeup drainage processed by an industrial waste processor as special control industrial waste and used wiping papers and the empty container as industrial waste.</li> <li>Do not remove, apply unreasonable force to, or bend the piping tubes unnecessarily. Since high pressure is applied to parts of the ink and solvent inside the piping tube, the ink and solvent may spurt out and get into your eyes and mouth or soil your hands and clothing. If the ink or solvent gets into your eyes or mouth, immediately rinse it out with warm water and see a doctor.</li> </ul>	$\bigcirc$
<ul> <li>When replenishing the ink and makeup, changing the ink, or performing other work in which the ink and makeup are handled, be sure not to spill the ink and makeup. If the ink and makeup is accidentally spilled, quickly wipe it off with wiping paper, etc. Do not close the maintenance cover until you verify that the wiped parts are completely dry.</li> <li>Since the ink and makeup vapor will collect inside the printer especially in the state in which the ink and makeup was spilled inside the printer and was not wiped off completely, it will cause ignition and fire.</li> <li>When wiping is difficult in the energized state, perform shutdown processing with the maintenance cover remaining open and turn off the power, then perform wiping again.</li> <li>If leaking of the ink and makeup inside the printer was detected during printer operation or maintenance, quickly wipe it with wiping paper, etc. and perform shutdown processing with the maintenance cover remaining open and turn off the power, then repair the leak.</li> <li>If operation is continued when the ink and makeup is leaking, it will cause trouble and prevent normal printing will become.</li> <li>In addition, since the ink and makeup are combustible, they may cause a fire.</li> <li>The ink and makeup, their waste solution, used wiping papers and empty containers are flammable. Waste disposal must comply with appropriate regulations.</li> <li>Consult the appropriate regulatory agency for further information.</li> <li>When the ink particles are caught in a beaker during test printing, etc., use a conductive beaker and securely connect the beaker to a ground.</li> <li>In addition, be sure that the print head is not inserted into the beaker.</li> </ul>	
connected to a ground, the charge load will gradually increase and cause a fire.	
<ul> <li>Pay careful attention to the following items regarding handling of the ink and makeup:         <ol> <li>Wear gloves and goggles so that the ink and makeup will not directly contact your skin.</li> <li>If the ink or makeup gets on your skin, wash it off with soap and warm water.</li> </ol> </li> </ul>	0
② When taking the bottle from the printer, be careful that the ink does not get on the printer or surroundings. If the ink or makeup gets on the equipment or surroundings, immediately wipe it off with makeup.	
③ Since the vapor pressure of the makeup is generally high, if the ambient temperature is high such as in the summer, etc., the internal pressure will rise and makeup could spurt out when the outside cover is removed. Therefore, when unplugging,	
•do not hold the bottle near your face	

•place the bottle on a level surface

•open while covering the opening with a rag, etc.

### 6.1 Circulation control screen operation and contents 6.1.1 Circulation control screen operation



2 Select the function you want to perform and press Start/Continue.

#### 3 Different operation guides are displayed depending on the selected function.

- Perform operation in accordance with the operation guide.
- When you want to stop operation, press Abort.

### 6.1.2 Circulation control contents

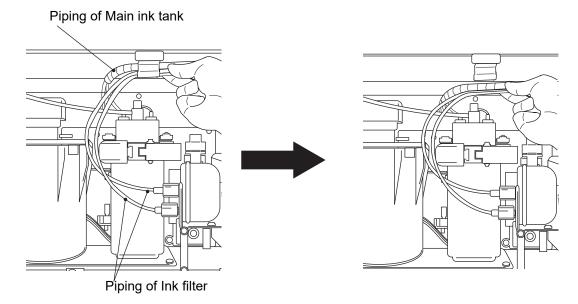
- During generation of an "Main Ink Tank Too Full" fault, input from any of the keys is not accepted. Perform operation after referring to "6.12 Draining ink from the main ink tank" and clearing the fault.
- The receivable states are different depending on the contents of circulation control. Note that operation cannot be performed from states other than those shown in the table below.

Circulation control name	Contents	Receivable state
Eject ink (Goes to Standby)	Used for startup at maintenance. (Ink ejection only. The IJ printer does not enter the Ready state.)	Stop
Cleaning stop	Normal shutdown processing. The nozzle is automatically cleaned and the printer is stopped.	Ready or Standby
No-cleaning stop	Shutdown processing used when stopping temporarily. Automatic nozzle cleaning is not performed.	Ready or Standby
Nozzle backwash	Makeup is sucked in from the nozzle and the nozzle is cleaned. Perform this operation while pouring makeup from the cleaning bottle onto the nozzle tip (orifice plate surface).	Stop
Gutter cleaning (Recovery-line cleaning)	Makeup is sucked in from the gutter and cleaning of the recovery-line is performed. Perform this operation while pouring makeup from the cleaning bottle onto the end of the gutter.	Stop
Ink replacement	Used when replacing the ink inside the IJ printer with new ink. This operation performs from ink drainage to refilling consecutively.	Stop
Ink filter replacement	Used when replacing the ink filter. This operation performs from ink drainage to refilling consecutively.	Stop
Ink circulation	Used when bleeding the air from inside the circulation line and when making the ink inside the flow lines uniform. This operation can be performed even while ink is being ejected. At the end of this operation, the IJ printer enters the Eject ink (standby) state.	Standby
Process prior to long-term shutdown	Used before printer is shutdown for a long time.	Stop
Process after long-term shutdown	Used when the printer is restarted after long-term shutdown.	Stop
Makeup refill	Used to fill the cleaning path with the makeup at the time of printer installation.	Stop
Ink drainage	Used when draining the ink inside the ink drainage unit.	Stop
Ink refill	Used when refilling the IJ printer with ink. The amount of ink in the main ink tank is set to the initial level. After refilling, the IJ printer enters the Eject ink (standby) state.	Stop
Pressure relief	Depressurizes the inside the entire circulation system. (Used when performing maintenance work.)	Stop
Ink stream adjustment	Used when adjusting the ink stream position. Ejects makeup from the nozzle.	Stop
Parts usage time management	Used when managing the usage time of the circulation system parts. Used when checking the amount of ink and makeup consumption.	All status
Circulation system environment setup	Used when selecting ink concentration management.	Stop
Stirrer test	Used to confirm the rotation of rotor inside the ink tank and main ink tank.	Stop

### 6.1.3 Removing or Attaching the Main ink tank clamp

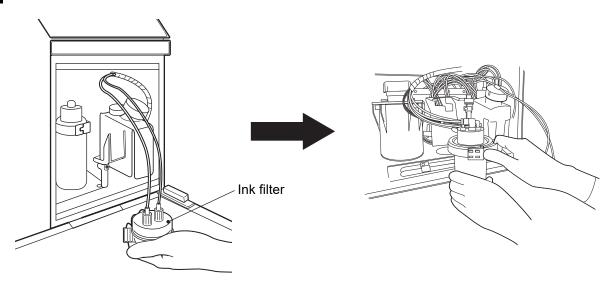
1

Remove the piping of main ink tank and ink filter from clamp on the ceiling.

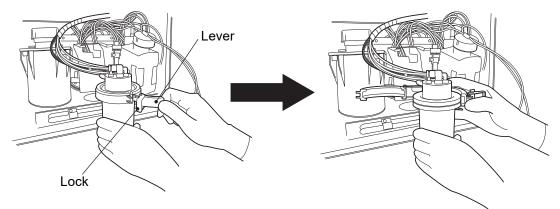




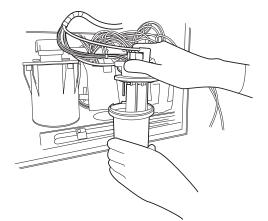
**2** After the ink filter removed, pull the main ink tank forward.



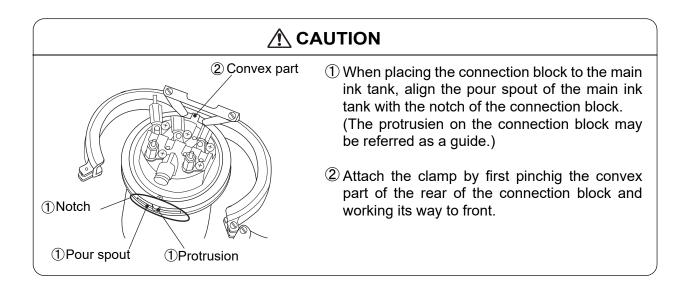
**3** Pull the clamp lever and release the lock to remove the clamp out of the main ink tank.







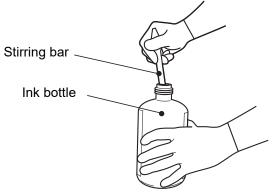
• To attach the clamp, perform the procedures above in the reverse order.



### 6.2 Replacing the ink

#### (1) Overview

- This operation is performed when replacing old ink with new ink.
- Do not perform this operation while ink is being ejected. Perform it after setting the IJ printer to the "Stop" state.
- Stir pigmented ink components that have settled inside ink bottle using stirring bar before replenishment.

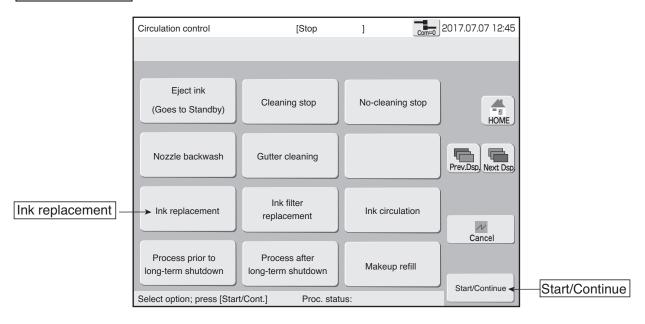


Refer to the Instruction Manual "1.1 (1) Ink and makeup replenishment" for <Stirring point>.

- Stir ink until you can confirm that there is no settled substance at the bottom of the ink bottle.
- If replenishment is performed without stirring ink, printing density may become thin and print will be uneven.
- Clean stirring bar after using it.
- \* If replacement of the filters is performed together with ink replacement, ink will not be wasted.

#### (2) Operation

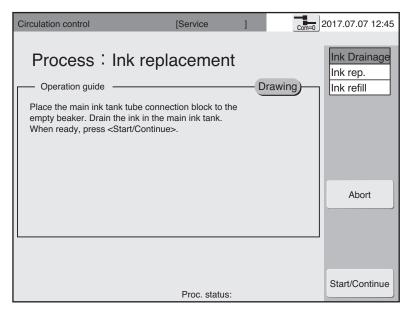
## Display the Circulation control screen and press the Ink replacement $\rightarrow$ Start/Continue.

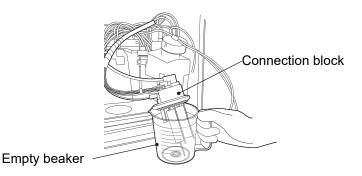




#### Remove the connection block from the main ink tank.

• Remove the connection block from the main ink tank, referring to "6.1.3 Removing or Attaching the Main ink tank clamp".





- Remove the rotor from the main ink tank using stirring bar, and clean the rotor with makeup. (Rotor will be attracted to the stirring bar by magnetic force.)
- Remove any remaining ink inside the main tank and dispose it by using another tank.
- Check for abrasion of rotor.

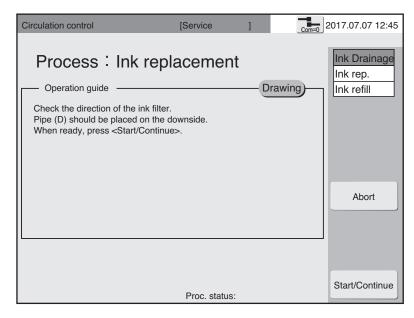
### 

- 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.
- Press Start/Continue afer draining ink from the main ink tank.

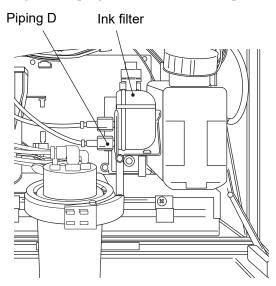


#### 3 Drain ink in accordance with the operation guide on the screen.

- When you want to stop drainage, press Abort.
- When abort processing was performed, repeat operation from step 1.



• Open the maintenance cover and make sure that the ink filter is set in the status shown in the diagram. (Piping D is set on the lower position.)



#### **4** Press the Start/Continue after checking is complete.

The screen shown below then opens and the ink in the printer drains away via the connection block.

Circulation control	[Service	]	2017.07.07 12:45
Process : Ink	replacemen	t	Ink Drainage Ink rep. Ink refill
Proc. time: Approx.	4 minutes.		Abort
	Proc. status	In progr	ess

- To abort the sequence, press the Abort. Then, follow the on-screen instructions to return the connection block to its original position and press the <u>Start/Continue</u>. You are then returned to the "Circulation control" screen.
- When you have aborted the sequence, perform the procedure from again.
  \* When aborting the operation, be sure to return the connection block to its original position.

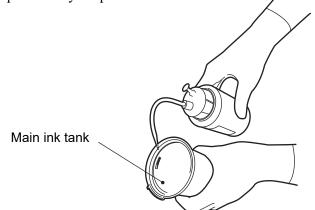
#### 

• During ink drainage, hold the beaker as well as the Connection block so as not to knock over the beaker.

**5** When the predetermined period of time elapses, the following operating guidance appears on the display.

Circulation control	[Service	]	2017.07.07 12:45
Process : Ink r Operation guide Clean the ink inside of the ma with makeup. When ready, press <start cor<="" td=""><td>n ink tank</td><td>Draw</td><td>Ink rep. Ink refill</td></start>	n ink tank	Draw	Ink rep. Ink refill
Proc. time: Approx. 4	minutes.	In progress	

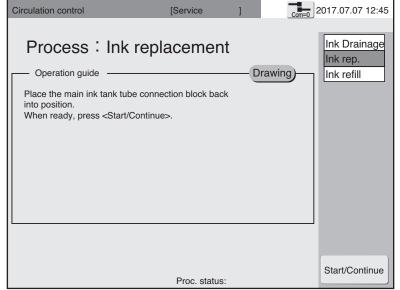
• Wash and clean off any ink residue after disposing of ink inside the main ink tank using makeup. If ink residue adheres, tightening clamp of the main ink tank may be difficult and solvent component may evaporate.



- Also wash inside of main tank with makeup.
- Confirm whether or not bottom of main ink tank is worn.

6 Press the Start/Continue.

The following operating guidance appears.

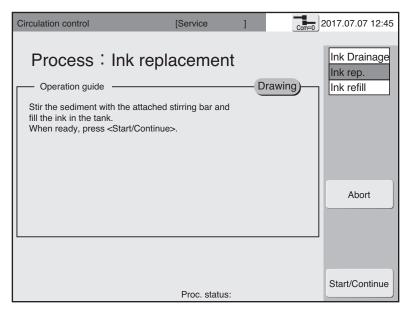


• Be sure to put the rotor which has been removed back into the main ink tank, and then return the connection block.



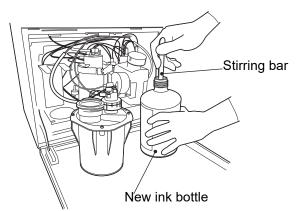
#### Press the Start/Continue.

The following operating guidance appears.

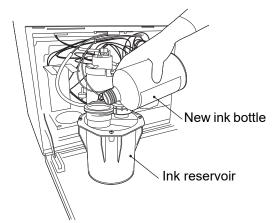


#### 8 Add the new ink to the ink reservoir.

- Remove the rotor from the ink reservoir using stirring bar, and clean the rotor with makeup. (Rotor will be attracted to the stirring bar by magnetic force.)
- Clean ink adhering to inside of ink reservoir with makeup.
- Check for abrasion of rotor and the bottom of ink reservoir.
- Stir any pigmented ink components that have settled inside ink bottle using stirring bar before charging ink.



- Stir ink until you can confirm that there is no settled substance at the bottom of the ink bottle.
- If replenishment is performed without stirring ink, printing density may become thin and print will be uneven.



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.

• Be sure to put the rotor which has been removed back into the ink reservoir.

#### 9 Fasten the cap of the ink reservoir.

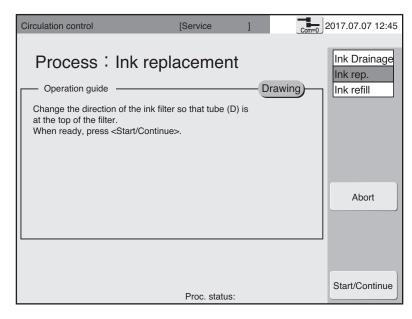
- Fasten it securely. Solvent components may evaporate.
- **10** Push in the reservoir to return it to the original position.

#### Place the end of the print head in a beaker. 11

• Provide against an ink stream bend.

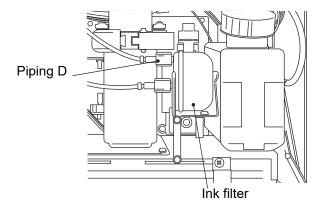
#### 12 Press the Start/Continue.

• The following screen then opens.





13 Set the ink filter as follows (piping D is the upside).



#### 14 Press the Start/Continue.

- 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	[Service	]Com=0	2017.07.07 12:45
Process : Ink r	replacement	- Drawing	Ink Drainage Ink rep. Ink refill
			Abort
Proc. time: Approx.	4 minutes		
		7	
	Proc. status: Ir	n progress	

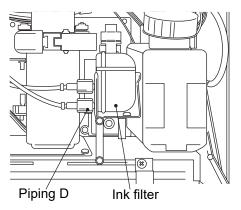
- To abort the sequence, press the <u>Abort</u>, and follow the on-screen instructions. After aborting, you are returned to the "Circulation control" screen.
- When you have aborted the sequence, select the "Ink refill" from the "Circulation control" screen and perform it.
- \* When aborting the operation, 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, select "Ink refill" on "Circulation control" screen and execute refill. If the same message appears again, contact your nearest local distributor.

#### **15** The screen shown below opens on completion of the ink refill.

Circulation control	[Service	1	2017.07.07 12:45
Process : Ink Operation guide Change the direction of the at the bottom of the filter. When ready, press <start c<="" td=""><th>ink filter so that tube (D)</th><td>Drawing</td><td>Ink Drainage Ink rep. Ink refill</td></start>	ink filter so that tube (D)	Drawing	Ink Drainage Ink rep. Ink refill
	Proc. status: e	ended.	Start/Continue





#### 17 Press the Start/Continue.

• The "Circulation control" screen then opens as follows.

Circulation control	[Stop	]	2017.07.07 12:45	
Eject ink (Goes to Standby)	Cleaning stop	No-cleaning	y stop	
Nozzle backwash	Gutter cleaning		Prev.Dsp. Next Dsp.	
Ink replacement	Ink filter replacement	Ink circula		
Process prior to long-term shutdown	Process after long-term shutdown	Makeup re		
Select option; press [Start/Cont.] Proc. status:				

Open the "Operation management" screen, and set the operating time to "0".
 For the procedure, see the Instruction Manual "5.2 Monitor operational status".

## **19** Open the control menu and sequentially press the Ready and OK to enter the "Ready" state.

#### **20** Perform test print and confirm print condition.

- Confirm the print condition with the current excitation setting and also excitation setting values just before and after current value.
  - (For example, if current setting is "10", confirm with "9", "10" and "11".)
- If print condition is good with all three settings, use with the original excitation setting value. (In above example, "10")
- If print condition is not good with even one of the three settings, perform nozzle property test and change the excitation setting value to the center value of the excitation setting values to ensure good print condition.
- Refer to "6.10 Excitation V adjustment" for details of nozzle property test.

# 6.3 How to correct ink stream bending and nozzle clogging

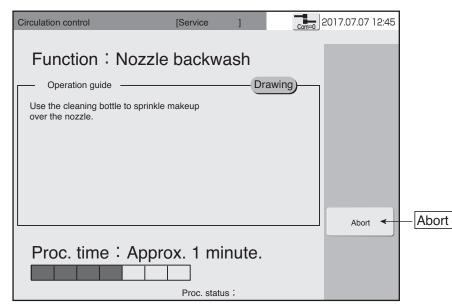
#### 

- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.
- Perform work after confirming that there is no one in the ink ejection direction. (Perform this work by inserting the print head tip into a beaker, etc.)

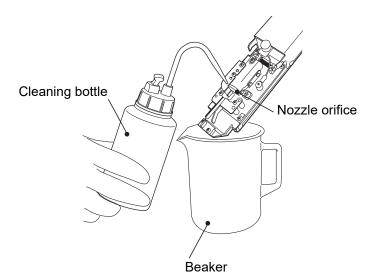
## 6.3.1 Nozzle backwash

- Sucks in makeup from the nozzle and remove clinging foreign matter, etc.
- To prevent thinning of the ink, do not perform this more than 3 consecutive times.
- Do not perform this work while the ink is being ejected. Perform it after setting the IJ printer to the Stop state.
- 1 Prepare a cleaning bottle filled with makeup and a beaker and remove the print head cover.

**2** Press the Maintenance menu Circulation control  $\rightarrow$  Nozzle backwash. The nozzle backwash screen is displayed.



**3** Suction begins automatically. Sprinkle the nozzle orifice with makeup.



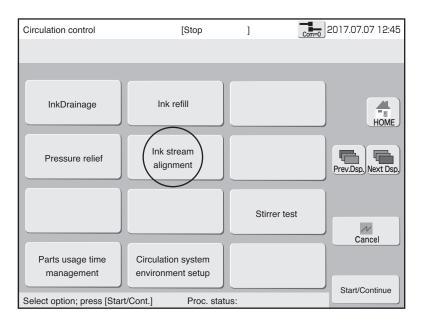


#### 4 Suction ends in about 1 minute and the screen returns to the Circulation control screen.

• To stop operation, press Abort

#### 5 Check if ink stream bending or nozzle clogging has been repaired.

• Display the screen after the Circulation control screen.

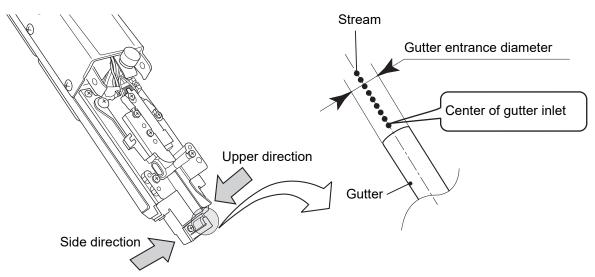


#### With the print head cover removed, press the link stream alignment $\rightarrow$ 6 Start/Continue to eject the makeup.

• Perform this work with the print head tip inserted into a beaker.

#### Confirm that the stream is in the center of the gutter.

• Confirm the stream position from the horizontal direction and vertical direction of the print head as shown in the figure.



• If the ink stream is not in the center of the gutter, perform nozzle backwash again. If the stream is not corrected even after the nozzle backwash has been performed 3 times, perform "6.3.2 Nozzle orifice disassembly and cleaning".



7

#### 8 At the end of confirmation, press Abort and stop ejection of the makeup.

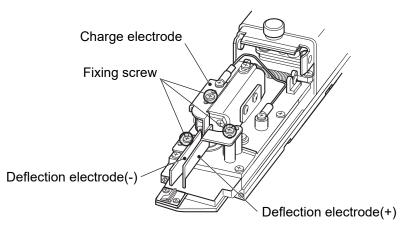
# 6.3.2 Nozzle orifice disassembly and cleaning

- This is the procedure when ink stream bending or nozzle clogging is not repaired even when nozzle backwash was performed.
- Do not perform this work while ink is being ejected. Perform it after setting the IJ printer to the Stop state.
- Do not touch the ejection port of the nozzle orifice directly with your hand. (Use the accessory tweezers.)
- If the ejection port of the nozzle orifice is damaged, it may be impossible to fulfill its function.

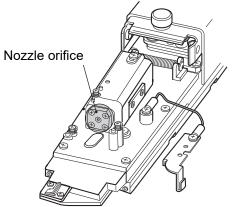
Handle the nozzle orifice carefully so that the ejection port is not damaged by the tool.

#### **1** Remove and clean the nozzle orifice.

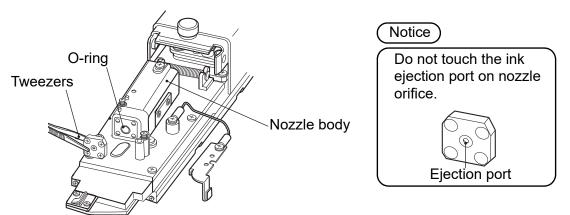
(a) Loosen the fixing screw and remove the charge electrode and two deflection electrodes. To prevent dropping, do not remove the screw.



(b) Remove the four screws holding the nozzle orifice.



(c) Use the tweezers to remove the nozzle orifice from the nozzle body.



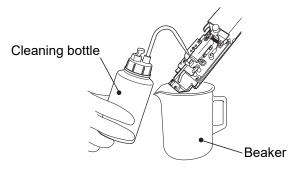
The O-ring may detach from the nozzle orifice at this time. If it does, put the O-ring in a beaker with makeup and take care not to lose it.

(d) Place the removed nozzle orifice into a beaker containing makeup and clean the orifice.



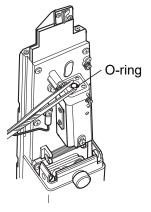
#### Clean the nozzle section.

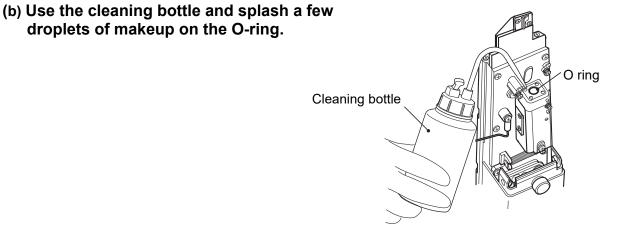
Using the cleaning bottle, pour the makeup over the nozzle section to clean it, from which the nozzle orifice has been removed.



- 3 Install the nozzle orifice.
  - (a) Use the tweezers to hold the O-ring and put it into the nozzle body.

droplets of makeup on the O-ring.



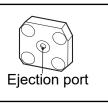


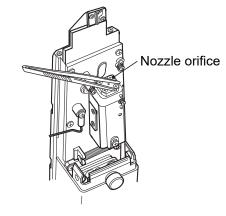
(c) Insert the nozzle orifice and use tweezers to lightly depress the nozzle orifice from the top.

Notice )

Do not touch the ink ejection port on nozzle orifice.

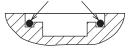
6-18 •How to correct ink stream bending and nozzle clogging

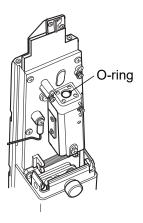




(d) Remove the nozzle orifice once and make sure that the O-ring has been installed.

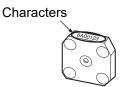
Attach to the groove





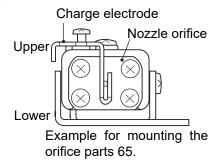
# (e) Reinsert the nozzle orifice, and use the four screws to secure it.

• Use the four screws to secure the nozzle orifice so that the characters on it face up.



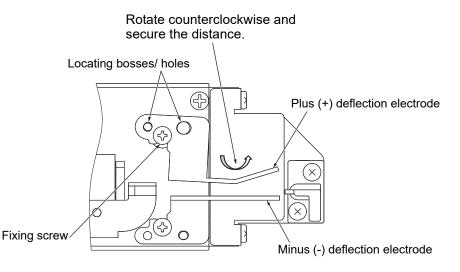
Orifice parts S65

• Tighten the four screws little by little alternately.



#### (f) Reinstall the charge electrode and two deflection electrodes.

• When you assemble Plus (+) deflection electrode, press Plus (+) deflection electrode by your finger toward an arrow direction as shown below so that the distance between Plus (+) and Minus (-) deflection electrodes is widened.



# 4 Press the Ink stream alignment → Start/Continue and confirm that bending of the stream and clogging of the nozzle have been repaired.

- Perform this operation with the tip of the print head inserted into a beaker.
- When the ink stream is way outside the gutter, cleaning of the nozzle orifice may not be sufficient. Disassemble and clean the nozzle orifice again.
- When the ink stream position has deviated from the center of the gutter, adjust it in accordance with "6.4 Stream alignment".

# 6.3.3 Nozzle orifice replacement

- If the unit does not recover even when the procedure in "6.3.2 Nozzle orifice disassembly and cleaning" is performed, replace the orifice plate..
- Spare nozzle orifice is packed in the accessories.



#### Remove the nozzle orifice.

(1) Following 1 in "6.3.2 Nozzle orifice disassembly and cleaning", remove the nozzle orifice. (2) To store removed nozzle orifice, dunk in makeup.

(By dunking in makeup, dirt adhering to the plate may be removed.)



#### Clean the nozzle section.

Following **2** in "6.3.2 Nozzle orifice disassembly and cleaning", clean the nozzle.



#### Attach a new nozzle orifice.

Following **3** in "6.3.2 Nozzle orifice disassembly and cleaning", attach a spare nozzle orifice.



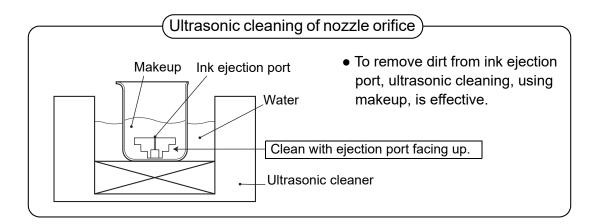
#### 4 Adjust the ink stream position.

- (1) If a different nozzle orifice is attached, ink stream position may drift from the center. Adjust following the procedure in "6.4 Stream alignment".
- (2) Adjustment with Ink stream adjustment is performed using makeup. If continuously adjusted, ink inside main ink tank may become thin.

After confirming that stream is set at the center, press Abort to stop adjustment.

#### Confirm printing and change the excitation setting value. 5

If different nozzle orifice is attached, optimum excitation setting may be changed. Change the set value following the procedure in "6.10 ExcitationV adjustment".



# 6.4 Stream alignment

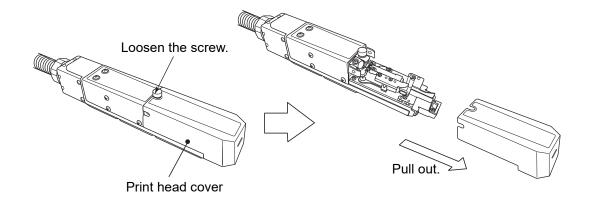
## 

- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.
- Perform work after confirming that there is no one in the ink ejection direction. (Perform this work by inserting the print head tip into a beaker, etc.)

This operation is performed when the nozzle or nozzle orifice has been replaced. Ordinarily, ink stream alignment is unnecessary.

- Adjust the stream position so that the stream ejected from the nozzle is at the center of the gutter.
- Adjustment in 2 directions, horizontal direction and vertical direction, is necessary.

#### **1** Remove the print head cover in the stop state.



**2** At the Circulation control screen, press the Ink stream alignment  $\rightarrow$  Start/Continue.

• Perform this operation with the print head tip inserted into a beaker.

#### **3** Adjust the horizontal direction and vertical direction positions.

## 

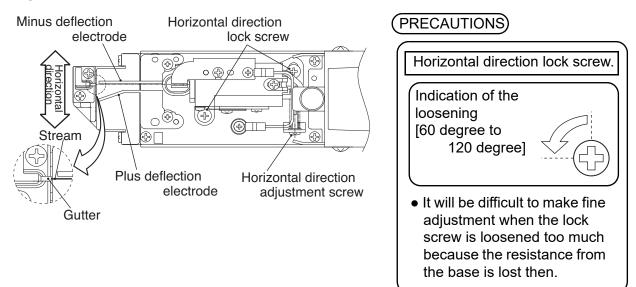
• Do not simultaneously loosen the horizontal direction lock screw and vertical direction lock screw because the adjustment is difficult.

#### (a) Horizontal direction adjustment procedure

- (1)Slightly loosen the two horizontal direction lock screws.
  - As to the screw loosening, please see the precautions) below.
- (2) Turn the horizontal direction adjustment screw and adjust the position of the makeup.
  - When you want to move in the minus electrode direction : Turn clockwise
  - When you want to move in the plus electrode direction : Turn counterclockwise

#### Adjust so that the stream is approximately at the center of the gutter.

(3)After adjustment, tighten the two horizontal direction lock screws.



#### (b) Vertical direction adjustment procedure

(1)Slightly loosen the two vertical direction lock screws.

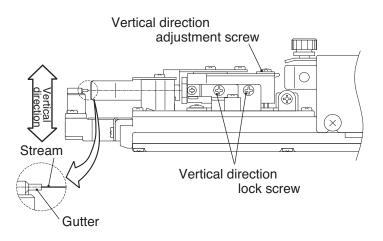
 $(\overline{2})$ Turn the vertical direction adjustment screw and adjust the position of the stream.

When you want to move to the bottom of the gutter : Turn counterclockwise

When you want to move to the top of the gutter : Turn clockwise

Adjust so that the stream is approximately at the center of the gutter.

(3)After adjustment, tighten the two vertical direction lock screws.



At the end of adjustment, press Abort.

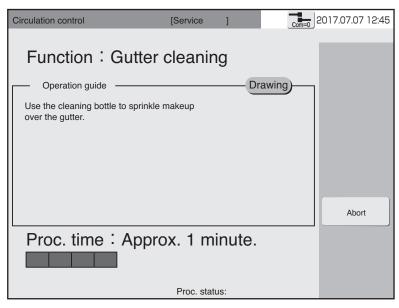
# 6.5 Cleaning the Gutter

- When the ink recovery system becomes dry or clogged, the line from the gutter to the ink main tank can be cleaned by performing "Gutter cleaning".
- Do not perform this operation while ink is being ejected. Perform it after setting the IJ printer to the "Stop" state.
- Have ready a cleaning bottle filled with makeup and a beaker and remove the print head cover.
- If recovery-line cleaning is performed continuously, the ink will become thin and cause printing distortion. Since ink replacement may become necessary after repair, do not perform cleaning more than 2 consecutive times.

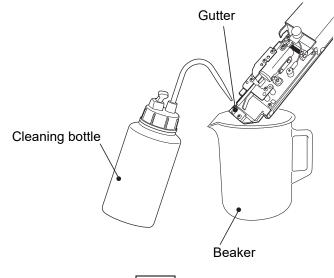
1

# Display the Circulation control screen and press the Gutter cleaning → Start/Continue.

#### **2** Perform cleaning in accordance with the operation guide.



• Pour makeup onto the gutter.

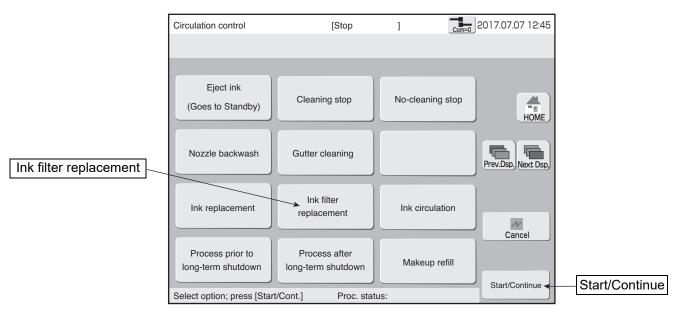


- To stop operation, press Abort.
- 3 Cleaning ends in about 1 minute and the screen returns to the Circulation control screen.

# 6.6 Replacing the ink filter

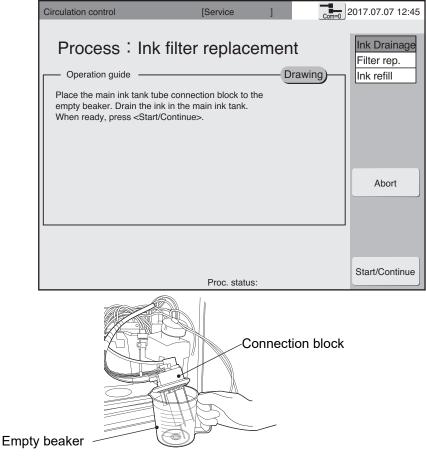
Perform it in a state in which the ink has been drained. The ink is not wasted if performed simultaneously with the ink replacement.

# 1 Display the Circulation control screen and press the Ink filter replacement → Start/Continue.



**2** Remove the connection block from the main ink tank.

• Remove the connection block from the main ink tank, referring to "6.1.3 Removing or Attaching the Main ink tank clamp".



- Remove the rotor from the main ink tank using stirring bar, and clean the rotor with makeup. (Rotor will be attracted to the stirring bar by magnetic force.)
- Remove any remaining ink inside the main tank and dispose it by using another tank.
- Check for abrasion of rotor.

# 

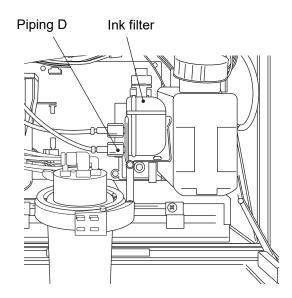
- If ink is accidentally spilt, wipe it up promptly with wiping paper or something similar. In addition, do not close the maintenance cover until you are sure that the wiped portion has completely dried.
- Press Start/Continue afer draining ink from the main ink tank.

3 Drain ink in accordance with the operation guide on the screen.

- When you want to stop drainage, press Abort.
- When abort processing was performed, repeat operation from step  $\blacksquare$  .

Circulation control	[Service	]	Com=0	2017.07.07 12:45
Process : Ink f	k filter. n the downside.		wing)	Ink Drainage Filter rep. Ink refill Abort
	Proc. status	:		Start/Continue

• Open the maintenance cover and make sure that the ink filter is set in the status shown in the diagram. (Piping D is set on the lower position.)





The screen shown below then opens and the ink in the printer drains away via the connection block.

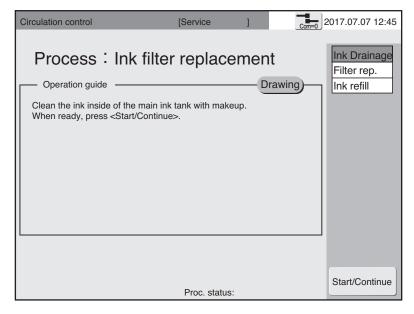
Circulation control	[Service	]	Com=0	2017.07.07 12:45
Process : Ink	filter replace		t rawing)	Ink Drainage Filter rep. Ink refill
				Abort
Proc. time: Approx.	4 minutes.			
	Proc. status	: In progre	ess	

- To abort the sequence, press the Abort. Then, follow the on-screen instructions to return the connection block to its original position and press the <u>Start/Continue</u>. You are then returned to the "Circulation control" screen.
- When you have aborted the sequence, perform the procedure from 1 again.

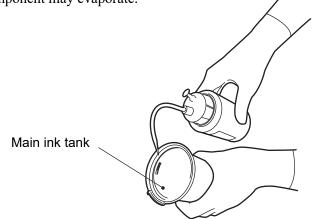
# 

• During ink drainage, hold the beaker as well as the Connection block so as not to knock over the beaker.

# **5** When the predetermined period of time elapses, the following operating guidance appears on the display.



• Wash and clean off any ink residue after disposing of ink inside the main ink tank using makeup. If ink residue adheres, tightening clamp of the main ink tank may be difficult and solvent component may evaporate.



• Also wash inside of main tank with makeup.

6 Press the Start/Continue .

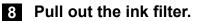
• Confirm whether or not bottom of main ink tank is worn.

The following operat	ing guidance	appear	s.	
Circulation control	[Service	]	Com=0	2017.07.07 12:45
Process : Ink fi	connection block bac	D	t rawing)—	Ink Drainage Filter rep. Ink refill
	Proc. status	6:		Start/Continue

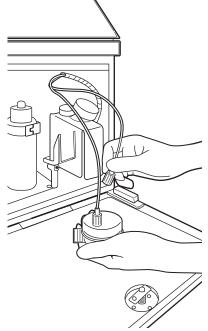
• Be sure to put the rotor which has been removed back into the main ink tank, and then return the connection block.

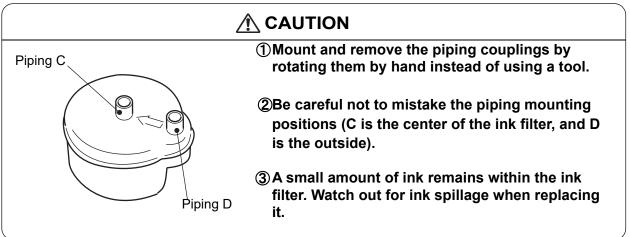
**7 Press the Start/Continue**. The following operating guidance appears.

Circulation control	[Service	]	Com=0	2017.07.07 12:45
Process : Ink filt Operation guide Replace the ink filter. When ready, press <start contir<="" td=""><td></td><td>ement Drawi</td><td>ing)</td><td>Ink Drainage Filter rep. Ink refill Abort</td></start>		ement Drawi	ing)	Ink Drainage Filter rep. Ink refill Abort
	Proc. status	:		Start/Continue



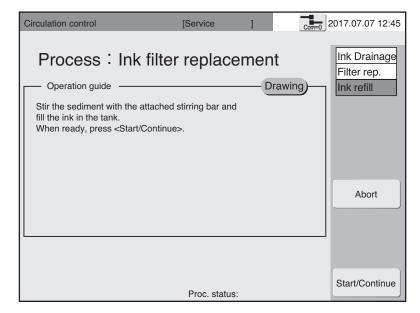
9 Remove the piping couplings (C and D), and replace it with a new ink filter.





# 10 Press the Start/Continue.

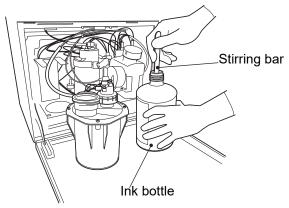
• The following screen then opens.



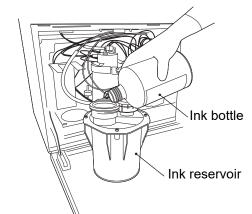


#### **11** Add the new ink to the ink reservoir.

- Remove the rotor from the ink reservoir using stirring bar, and clean the rotor with makeup. (Rotor will be attracted to the stirring bar by magnetic force.)
- Clean ink adhering to inside of ink reservoir with makeup.
- Check for abrasion of rotor and the bottom of ink reservoir.
- Stir any pigmented ink components that have settled inside ink bottle using stirring bar before charging ink.



- Stir ink until you can confirm that there is no settled substance at the bottom of the ink bottle.
- If replenishment is performed without stirring ink, printing density may become thin and print will be uneven.



- 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.
- Be sure to put the rotor which has been removed back into the ink reservoir.

#### **12** Fasten the cap of the ink reservoir.

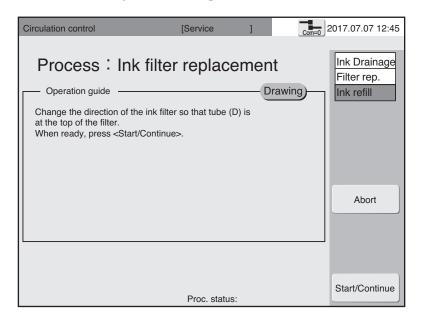
- Fasten it securely. Solvent components may evaporate.
- Push in the reservoir to return it to the original position. 13

#### **14** Place the end of the print head in a beaker.

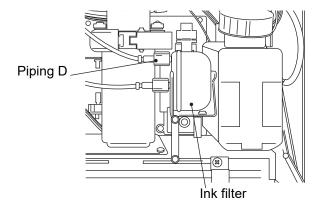
• Provide against an ink stream bend.

**15** Press the Start/Continue.

• The following screen then opens.



**16** Return the ink filter to its original state (piping D is the upside).



#### 17 Press the Start/Continue.

- 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	[Service	]	2017.07.07 12:45
Process : Ink	filter replace		awing Abort
Proc. time: Approx.	4 minutes.		
	Proc. status	: In progres	55

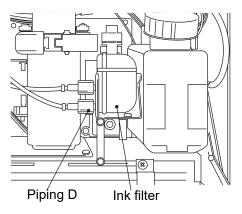
- To abort the sequence, press the <u>Abort</u>, and follow the on-screen instructions. After aborting, you are returned to the "Circulation control" screen.
- When you have aborted the sequence, select the "Ink refill" from the "Circulation control" screen and perform it.
- \* When aborting the operation, 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, select "Ink refill" on "Circulation control" screen and execute refill. If the same message appears again, contact your nearest local distributor.

#### **18** The screen shown below opens on completion of the ink refill.

Circulation control	[Service	]	Com=0	2017.07.07 12:45
Process: Ink fi Operation guide Change the direction of the in so that tube (D) is at the botto the filter. When ready, press <start con<="" td=""><td>k filter m of</td><td></td><td>t rawing)</td><td>Ink Drainage Filter rep. Ink refill</td></start>	k filter m of		t rawing)	Ink Drainage Filter rep. Ink refill
				Abort
Proc. time: Approx. 4	minutes.			
	Proc. status	s: In progre	ess	





#### **20** Open the "Parts usage time mgmt." screen (menu 2 of the "circulation control" screen), and set the ink filter time to "0".

	Parts usage time mgmt.		[Stop	]	Com=0	2017.07.07 12:45
		(hours)			(hours)	
ſ	Ink filter	00000		Circulation unit		
`	Recovery filter	01000	) ト	leating unit	01000	
	Circulation filter	01000	) N	IVN	01000	HOME
	Makeup filter	01000	Ν	AV2	01000	
	Air filter	01000	) N	εVN	01000	
	MGV filter	01000	Ν	AV4	01000	Prev.Dsp, Next Dsp.
	R. Air filter	01000	Ν	AV 5	01000	
			Ν	4V6	01000	
	<consumption></consumption>		Ν	AV7	01000	
	Ink 001	000 (ml)	) N	8 V N	01000	
	Makeup 001	000 (ml)	) N	e V N	01000	
	Print count 000	0001000				
	Update log 2017/03/22	08:15				Back



#### **21** Perform test print and confirm print condition.

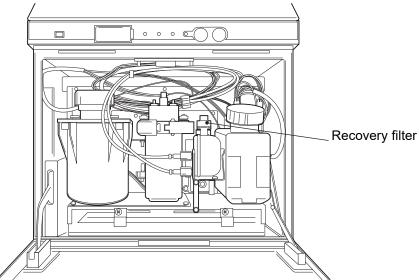
• Confirm the print condition with the current excitation setting and also excitation setting values just before and after current value.

(For example, if current setting is "10", confirm with "9", "10" and "11".)

- If print condition is good with all three settings, use with the original excitation setting value. (In above example, "10")
- If print condition is not good with even one of the three settings, perform nozzle property test and change the excitation setting value to the center value of the excitation setting values to ensure good print condition.
- Refer to "6.10 Excitation V adjustment" for details of nozzle property test.

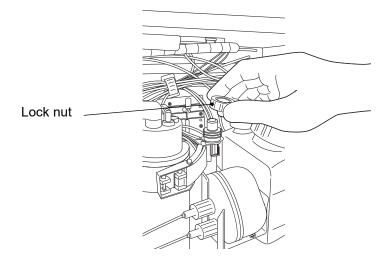
# 6.7 Replacing the recovery filter

• Do not perform this operation while ink is being ejected. Perform it after setting the IJ printer to the "Stop" state.

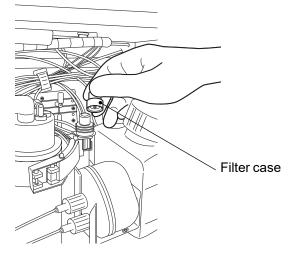




Remove the lock nut by turning it by hand.

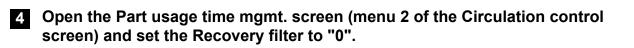


**2** Remove the filter case upward and set the new filter case.





Set the new filter case and fix it with the Lock nut.



Parts usage time mgmt.	[SI	top ]	Com=0	2017.07.07 12:45
	(hours)		(hours)	_
Ink filter	01000)	Circulation unit	01000	
Recovery filter	00000	Heating unit	01000	
Circulation filter	01000	MV 1	01000	HOME
Makeup filter	01000	MV2	01000	
Air filter	01000)	МVЗ	01000	
MGV filter	01000	MV4	01000	Prev.Dsp. Next Dsp.
R. Air filter	01000	MV5	01000	
		MV6	01000	
<consumption></consumption>		MV7	01000	
Ink 001	000 (ml)	MV8	01000	
Makeup 001	000 (ml)	MV9	01000	
Print count 000	001000			
Update log 2017/03/22	08:15			Back

# 6.8 Replacing the circulation filter

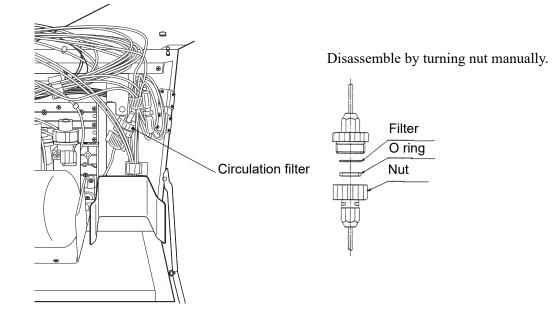
Perform it in a state in which the ink has been drained. The ink is not wasted if performed simultaneously with the ink replacement.



**1** Perform "6.2 Replacing the ink". (The state in which there is no ink within the circulation path).

#### **2** Replace the circulation filter at the position shown below.

• Hold the makeup reservoir and pull it forward.



**3** Open the Part usage time mgmt. screen (menu 2 of the Circulation control screen) and set the Circulation filter to "0".

Parts usage time mgmt.	[	Stop	]	Com=0	2017.07.07 12:45
	(hours)			(hours)	
Ink filter	01000	Circ	ulation unit	01000	
Recovery filter	01000	Hea	ting unit	01000	
Circulation filter	00000	Mν	1	01000	HOME
Makeup filter	01000	MV	2	01000	
Air filter	01000)	ΜV	3	01000	
MGV filter	01000	ΜV	4	01000	Prev.Dsp. Next Dsp.
R. Air filter	01000	ΜV	5	01000	
		ΜV	6	01000	
<consumption></consumption>		ΜV	7	01000	
Ink 001	000 (ml)	ΜV	8	01000	
Makeup 001	000 (ml)	ΜV	9	01000	
Print count 000	001000				
Update log 2017/03/22	08:15				Back

# 6.9 Adjusting the pressure

- Check the pressure before printing state check at the start of operation.
- Do not perform this operation in the Stop state. Perform it in the state in which ink is ejected.

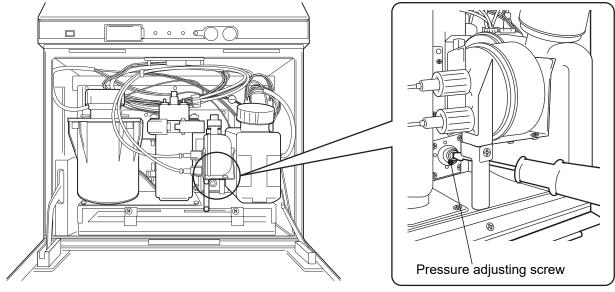
#### **1** Open the Operation management screen.

#### (a) New HMI

(b) Previous HMI	(b)	Previous	HMI
------------------	-----	----------	-----

Op	eration management	$   riangle   \otimes$ Stop $ $	OFFLINE   2017.07.07 12:45	Operation management [Ready ]	7.07.07 12:45
©	Ink Operating Time	Ink Alarm Time (Standard Value: 600)	Cumulative Op.Time		
	<b>0</b> h	<b>600</b> h	<b>0</b> h	Ink operating time 0000 (hours) Ink alarm time 600 (hours: standard value: 600)	
	Ink/Makeup	Ink Viscosity (Standard Value ; 100)	Ink Pressure (Standard Value:0,310)		anual Shutdown
0	JP-W89/TH-73	(01001000000000000000000000000000000000	0.310 MPa	Cumulative op. time         0 0 0 0 0 0 0 (hours)           Print count         0 0 0 0 0 0 0 0 (prints)	
	•	Excitation V-ref			HOME
4	Deflection Voltage	(Range:0-19)	Excitation Frequency	Ink, makeup JP-W89, TH-73	
Ĺ	5.7 kV	11	62.5 kHz	Ink viscosity 100 (standard value:100)	
	Ambient Temperature (Correct Range: 0-40)			Ink pressure 0. 310 (MPa; standard value: 0. 310)	
	<b>20</b> ℃			Ambient temperature 20 (°C; range: 0~40)	
	Print Count			Deflection voltage 5. 7 (kV)	
			Calibrate touch	Excitation V-ref. 11 (0~19)	
	0		screen coordinates	Excitation frequency 62. 5 (kHz)	
ŀ		AVE ADJUST EDIT	SETTINGS LOGIN		S Back

2 Check the displayed ink pressure value. If there is a difference of 0.010 or more from the standard value, adjust the pressure to the standard value ±0.002 with a flat-blade screwdriver.



To raise the pressure : rotate clockwise. To lower the pressure : rotate counterclockwise.

# 6.10 Excitation V adjustment

## (1) Overview

- The Excitation V set value is 0 to 19. The state of the ink drops is different for each setting.
- The optimum Excitation V set value must be input to maintain good print quality.
- Perform nozzle property test printing, and the center value of the range where printing is good is the optimum Excitation V set value.

(Example) When printing is good at the Excitation V set value 5 to 15 range at nozzle property test, the optimum Excitation V set value is the center value 10.

• Memorizes the ambient temperature when the Excitation V set value was updated as the reference ambient temperature.

If the ambient temperature and the reference ambient temperature difference exceeds a certain value during use, "Check Excitation V set value" warning will be generated. In that case, readjust the Excitation V setting.

# (2) Operation

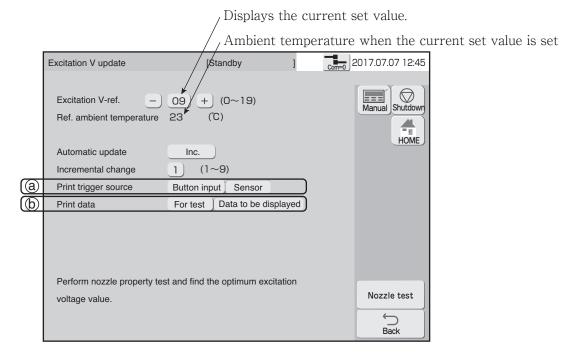
• For Excitation V setting, select the optimum set value from the result of test printing for each set value and input the selected value from the operation panel. Perform operation in accordance with the following procedure:



2

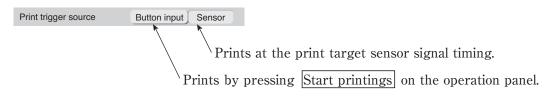
#### At the Maintenance menu, press Excitation V update (nozzle test)

• The Excitation V update screen is displayed.



#### Set a Print trigger source and b Print data of nozzle property test printing. a Print trigger source

Select the timing at which printing is performed.



#### **b** Print data

Select the contents and conditions of the characters to be printed.

Print data	For test Data to	be displayed
		ints using the currently set print escription and print conditions.
Prints using the fo	ollowing test c	conditions:
• Number of lin	es	: 1 line
· Character size	<u>e</u>	: $12 \times 16$ dots
• Inter-characte	er space	:1
<ul> <li>Character hei</li> </ul>	ght	: 99
· Character wid	lth	: 5
· Ink drop use		: 1/3
· Print characte	er description	:nn123ABC
		(nn: Excitation V set value)

3 Confirm that the IJ printer is in the Standby state and press Nozzle test.

• The Nozzle property test screen is displayed. The IJ printer enters the Ready to print state.

	Nozzle property test	[Ready ]	Com=0 2017.07.07 12:45
$\odot$	Excitation V-ref.	09 + (0~19)	
Ľ	Ref. ambient temperature	23 (°C)	
<b>(</b>	Automatic update	Inc.	
Ľ	Incremental change	1 (1~9)	
	Print trigger source	Button input Sensor	
	Print data	For test Data to be displayed	
	Excitation V-ref. is printed of	n the print target.	
	[ <b>•••</b> n n • • • • •	•]	Abort
	Printing starts at the press of	of [Start printings].	
			Start
			printings

#### © Excitation V-ref.

Input the set value you want to print. (Set value is 00 to 19.) Change the setting using = + or input a value by touching the number.

#### **d** Automatic update

Select whether or not to automatically switch to the next set value after printing one setting.

Disable	: Set value does not change.
Dec.	: Set value is automatically decremented at each printing.
Inc.	: Set value is automatically incremented at each printing.

At "Inc.", the change width by which the value is automatically switched is set.

#### Perform nozzle property test printing. 4

• When "Print trigger source" is Button input, press Start printings. When "Print trigger source" is (Sensor), input the sensor signal.

# 

• During the nozzle property test, the state of creation of the ink drops may become poor and an "Ink Drop Charge Too High" or other fault may be generated and the ink may stop, depending on the Excitation V value.

In this case, after cleaning the print head, eject the ink again. (Refer to "3.1.2 When an error occurred at the start of operation" of the instruction manual and perform the same work.)

The possibility of fault is high when Excitation V is set less than 5. When performing test printing again, start from setting 10 and test print while decrementing.

#### 5 Check the printed result.

• Check the Excitation V range at which printing is good. The center of that range is the optimum value.

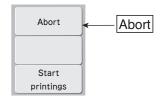
															O: (	Goo	od >	: B	ad	Spa	ce:	Not checked
Check date	Ambient temperature								]	Exci	tatio	n V	valu	e								optimum
Check date		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	value
2017.07.07	25°C			×	×	×	$\bigcirc$	0	$\bigcirc$	0	0	0	0	0	0	0	0	×	×	×	×	10

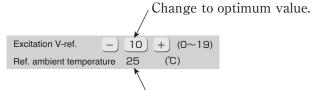
(Example) Printing good range 5 to  $15 \rightarrow \text{Optimum value } 10$ 



#### 6 Update the Excitation V-ref. value.

- (a) At the end of test printing, press [Abort] of the "Nozzle property test" screen and return to the "Excitation V update" screen.
- (b) Change "Excitation V-ref." to the optimum value confirmed at step 5





Changes to current ambient temperature.

When the screen is returned to the "Maintenance menu" by Back set value change is complete.

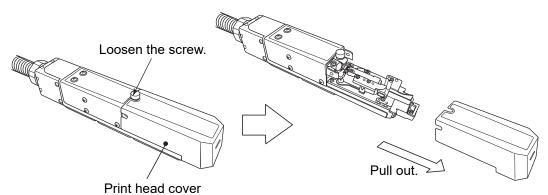
# Repeat print setting is disabled during the nozzle property test. Only one printing is performed by one input signal. Product speed matching setting is disabled during the nozzle property test. The character width may be different from the actual character width.

# 6.11 Ink drop state check method

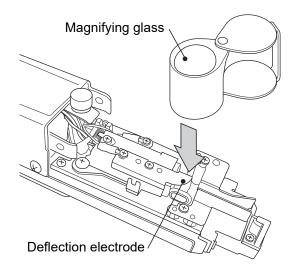
- The state of the ink drops can be checked by using a magnifying glass.
- Perform this work in the Eject ink state.

#### 

- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.
- Perform work after confirming that there is no one in the ink ejection direction. (Perform this work by inserting the print head tip into a beaker, etc.)
  - 1 Confirm that the IJ printer is in the Standby state and then remove the print head cover.



2 Using a magnifying glass, observe the ink drops in the charging electrode.



# 

• Don't stare at the red LED for a long time, OR it may adversely affect your eyes.

Ink drops creation state confirmation table

Ink drop shape	Judgment	1	Remarks
Nozzle Ink column Ink drop	0	A mode	Good
Large in diameter	0	B mode	Perfect
Small-diameter drops attached	0	High-speed small-diameter mode Two or fewer small-diameter drops	Allowable
Small-diameter drops left detached	×	Constant-speed small-diameter mode	Not allowed
Separated ink end positioned forward	×	Low-speed small-diameter mode	Not allowed

When the shape of the ink drops is not allowed, update to the optimum set value reffering to "6.10 Excitation V adjustment" and check again. Or contact your local distributor.

#### **3** After the check, install the print head cover.

# 6.12 Draining ink from the main ink tank

• When the main ink tank too full fault is generated, the ink cannot be drained by screen operation. Drain the ink and refill with new ink as follows:

## 

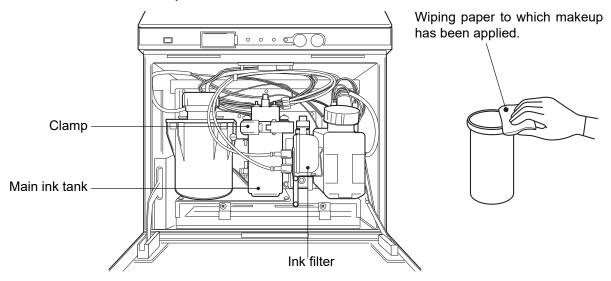
- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.

**1** Following the procedures described in "6.1.3 Removing or Attaching the Main ink clamp", remove the clamp and drain the ink in the tank by approximately 50ml.

After draining, wipe and clean any remaining stain on the tank using wiping paper to which makeup has been applied.

#### After tightening the clamp firmly, return the ink filter to their original positions.

• If the ink stain on Main ink tank is left as it is, the clamp may become hard to be closed and solvent volatilization may be caused.



#### **2** Return the circulation system to its original state and display the Circulation control screen and press the Ink refill $\rightarrow$ Start/Continue.

\*Note that if operation is started without refilling the ink, a "Replenishment Time-out" fault will be generated. If it is the case, press Abort to clear the fault and implement ink refill.

# 

• If the ink is accidentally spilled, quickly wipe if off with wiping paper, etc. In addition, do not close the maintenance cover until you confirm that the wiped part is completely dry.

# 6.13 Testing operation of solenoid valve and pump

- The operation confirmation of solenoid valve and pump is performed. (2) Replenishment valve (MV2)
- (1) Supply valve (MV1)
- (4) Agitation valve (MV4)
- $(\overline{7})$  Makeup valve
  - (MV7)
- (8) Cleaning valve

(5) Circulation valve

(1) Pump

- (1) Viscosity meter

(MV5)

(MV8)

(3) Recovery valve

(9) Shutoff valve

(6) Pressure relief valve

(MV3)

(MV6)

(MV9)

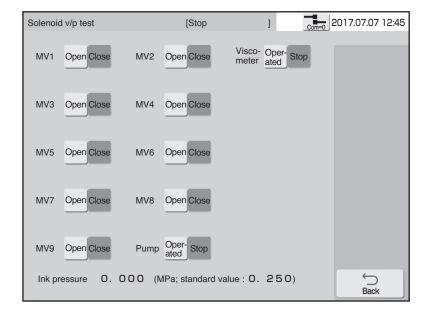
- •If circulating system can not be operated due to no ink ejection, ink overflow from the gutter and such, there are possibilities of solenoid valve or pump failure. Please perform operation test under service personnel's guidance.
- •In an operation state, only an operating state is displayed.

Different operations by state
-------------------------------

Ink stop state	Except for Ink stop state
The operation confirmation of solenoid valve and pump is performed (Operates each valves	Displays operating state only. Operating test such as open/close valve cannot
individually).	be performed.

At the maintenance menu, press Solenoid valve / pump test .

The solenoid valve / pump test screen is displayed.



#### Press operation button. 2

The operating state of the solenoid valve and the pump is displayed. (Confirm the operation by an operating sound.)

- : The solenoid valve is opened.
- Open
- Close : The solenoid valve is closed.
- Operated : The pump is operated.
- : The pump is stopped. Stop

# 6.14 On-Screen reminder for maintenance parts replacement

- When the maintenance parts replacement period arrives, a message that informs the operator can be displayed. (Objective maintenance parts)
  - "Ink filter, Recovery filter, Air filter".
- The maintenance parts operating time is incremented by 1 each hour in the ink jet state.
- When the maintenance parts operating time exceeds the alarm time, the message "Parts life Expired" is displayed.

# **1** Press Periodic replacement parts mgmt. in the maintenance menu.

The Periodic replacement parts mgmt. screen is displayed.

	Periodic replacement pa	rts mgmt.	[Stop	]	Com=0	2017.07.07 12:45
	Alarm display	bisable Enable	)			
Select"Disable"as		Alarm time		Operation tir	me	
the initial value.	Ink filter	02400		00000		-
	Recovery filter	01200		00000		HOME
	Circulation filter	02400		00000		
	Makeup filter	10000		00000	)	
	Air filter	02400		00000		Prev.Dsp. Next Dsp.
	MGV filter	02400		00000	)	
	R air filter	04800		00000	)	
	Supply pump	10000		00000	)	
	Makeup pump	10000		00000	)	
	Circulation pump	10000		00000	)	
	Recovery pump	10000		00000	)	- C
						Back

When"Enable"is selected, when the operating time exceeded the alarm time, the message "Parts Life Expired" is displayed.

(2 -	nade)
(2-	paye)

Periodic replacement	parts mgmt. [Stop	]	2017.07.07 12:45
	Alarm time	Operation time	
Heating unit	16000	00000	
MV 1	10000	00000	
MV2	10000	00000	HOME
MV3	10000	00000	
MV4	10000	00000	
MV5	10000	00000	Prev.Dsp. Next Dsp
MV6	10000	00000	
MV7	10000	00000	
MV8	10000	00000	
MV9	10000	00000	
	10000	00000	
Circulation unit	10000	00000	Back

2 Set "Alarm display" to "Enable".

#### 3 Press Back.

<ul> <li>"Warning" is set for the Alarm display. To return the Alarm display to "Disable/ Enable", contact your local distributor.</li> </ul>									
Alarm display	Disable Enal	ble Warning	"Warning" is selected, and you can not						
			return to "Disable/Enable".						

# 6.15 Long-term Shutdown

# A special work is required to perform the Long-term Shutdown procedure. It is recommended to contact your local distributor and ask for the work. Should you desire to conduct the work by yourself, the cautions must be fully understood beforehand. It is recommended to contact the local distributor and ask for an advice even you desire to conduct it by yourself, too. Even the Long-term shutdown is conducted, ink fixing may occur in the circulation system depending on the ink or the storage temperature or the storage period.

It is strongly recommended to contact your local distributor and ask for the work when you conduct "Startup process after long-term shutdown", especially in case the storage temperature is high (30 degrees Celsius or more) or the storage period exceeds 6 months.

- To secure safety, make sure to follow the procedures explained in "6.15.2 Startup process after long-term shutdown.
- When the IJ Printer was left for a period of time without conducting Long-term shutdown, make sure to follow the procedures explained in "6.15.2 Startup process after long-term shutdown.
- In "6.15.2 Startup process after long-term shutdown, should the circulation system be operated continuously when the printer does not operate normally, the pressure in the recovery line would be increased and it is going to be dangerous. There is a possibility that the ink is ejected from the nozzle strongly or the ink is reversely ejected from the gutter strongly. In such cases, stop the printer operation immediately and contact the local distributor.

# 6.15.1 Process prior to long-term shutdown

#### (1) Overview

- This operation is the storage work performed when the IJ printer is shut down for exceeding the period 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.

U	1 1
Storage temperature	Shutdown Period Guideline *1
0 to 35 °C	3 weeks
35 to 40 °C	2 weeks
40 to 45 °C	1 week

Table 1 Storage temperature and its period

\*1: Maximum period when the printer can be continuously shutdown without being operated.

- The figures in the table are for MEK-based ink.
- Handling of ink other than the above requires special handling in accordance with the handling guidance of each ink.
- Please note the ink may harden within a week when it is stored in 45 °C or higher.

# 

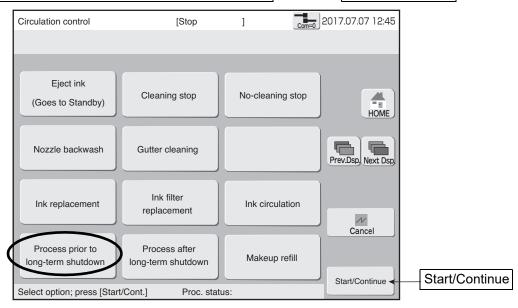
- 1. Store the printer at a temperature as low as possible.
- This operation is not necessary in case that the printer can be operated at least once during the period indicated in Table 1. Follow Instruction manual "1.5 Cautions on operating time when printer is in service" and Handling guidance of each ink as to the operating time.
- 2. Even the process prior to long-term shutdown is conducted, ink fixing may occur in the circulation system depending on the ink or the storage temperature or the storage period.
- 3. If the printer was shutdown for a period mentioned above without conducting the long-term shutdown, check the printer status in "6.15.2 Startup process after long-term shutdown, 1 Operation check". If the problem exists, contact your local distributor.

#### (2) Operating procedure

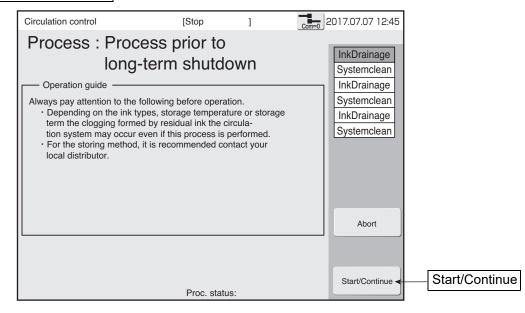
#### 

- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.
- Perform work after confirming that there is no one in the ink ejection direction. (Perform this work by inserting the print head tip into a beaker, etc.)

#### 1 Open the "Circulation control" screen, and press the Process prior to long-term shutdown and the Start/Continue.



#### 2 The following guidance appears. Confirm the message and Press Start/Continue .



#### 3 Drain the Ink.

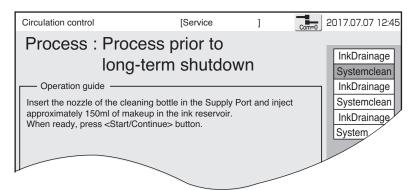
#### Perform procedures 2 to 6 operation in "6.2 Replacing the ink".

- Conduct until ink drainage.
- Perform operation in accordance with the operation guide on the screen and drain the ink.

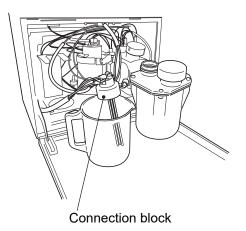


#### 4 Clean the circulation system.

• Perform operation in accordance with the operation guide on the screen.



(a) Drain the ink ejected into the beaker, clean the beaker and then put 50ml of the makeup and a tube connection block into the beaker.



# 

If ink is accidentally spilt, wipe it up promptly with wiping paper or equivalent. In addition, do not close the maintenance cover until you are sure that the wiped area is completely dried.

#### (b) Press Start/Continue .

- Cleaning in the circulation system starts.
- (c) When the predetermined period of time elapses, the following operating guidance appears.

#### 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.

Circulation control	[Service	]	Com=0	2017.07.07 12:45
Operation guide	g-term shutdov			InkDrainage Systemclean InkDrainage Systemclean InkDrainage Systemclean
				Abort
Proc. time: A	pprox. 6 minu	ites		
	Proc. status:	In progress		Start/Continue

#### 5 Repeat the operations of 3 to 4.

(Perform the ink drainage to cleaning of the circulation system threr times in total.)

#### 6 Mount the nozzle rubber seal.

• Mount the "nozzle rubber seal" between the charge electrode and the nozzle orifice.

# 

- 1. Before installing the nozzle rubber seal, be sure to thoroughly clean it with the makeup.
- 2. When installing the nozzle rubber seal, be careful not to deform the charge electrode.

The "Process prior to long-term shutdown" is now completed.

The circulation system is now charged with the makeup.

When starting up the printer after a long-term shutdown, be sure to perform the "6.15.2 Startup process after long-term shutdown".

# 6.15.2 Startup process after long-term shutdown

## [Overview]

- This operation is the work for draining the makeup which cleaned the ink circulation system at "Process prior to long-term shutdown" and the work for refilling it with the ink.
- To completely drain the makeup from the circulation system, you should charge the circulation system with the ink, drain the ink, and refill the ink into the system.
- To secure safety, conduct " 1 Operation check" before "Startup after long-term shutdown".

# 

Make sure to conduct "1 Operation check" before "Startup after long-term shutdown". If the printer does not operate normally after operation check, a special work is required for restoration. Contact your local distributor. Should the circulation system be operated continuously before normal operation is confirmed, the pressure in the recovery line would be increased and it is going to be dangerous. There is a possibility that the ink is ejected from the nozzle strongly or the ink is reversely ejected from the gutter strongly. In such case, stop the operation immediately and contact the local dis-

## **1** Procedure of the operation check

# 

- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.
- Perform work after confirming that there is no one in the ink ejection direction. (Perform this work by inserting the print head tip into a beaker, etc.)
- (a) Remove the nozzle rubber seal.
- (b) Press "Solenoid valve/pump test" on Circulation maintenance screen to confirm that each valve of MV1 to MV9, MV11 and MV12 operates normally.
   Refer to Technical manual "6.13 Test of solenoid valve/pump" for detail.
   MV11 and MV12 are installed in UX-E only.
   (It is operating normally if the solenoid valve gives out the operation sound.)

# 

The solenoid valve maybe firmly fixed if the operational sound is not heard. For restoration, a special work is required. Contact your local distributor.

# (c) Open the "Circulation control" screen, and press the Ink stream alignment key and then the Start/Continue key.

- Check if the ink stream is going into the gutter and it's in the center of the gutter.
- Check whether the gutter absorbs the liquid.

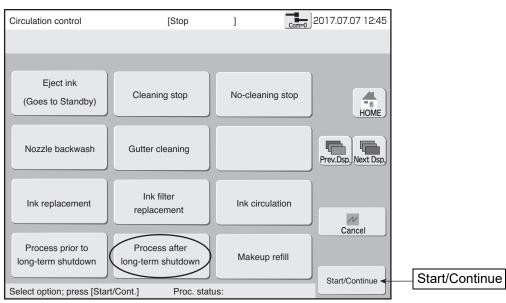
# 

If the ink is not being ejected, press Ink stream alignment key again. An ink fixing may be caused if the ink is not ejected after Ink stream alignment is conducted two times. A special work is required for restoration. Contact your local distributor.

If the "Ink steam bending" occurs, refer to Technical manual "6.3 How to correct ink stream bending and nozzle clogging" for restoration. If the ink stream bending is not corrected, a special work is required. Contact your local distributor.

## **2** Operating procedure- "Process after long-term shutdown"

(a) Open the "Circulation control" screen, and press the Process after long-term shutdown then the Start/Continue.



- (b) Follow the on-screen instructions for the operation.
  - Repeat the same procedure twice as explained in "6.2 Replacing the ink".
- (c) At the end of operation, screen returns to the Circulation control screen.

# 

Put the end of print head into the beaker then press Ink refill and Start/Continue. The ink will be ejected in a few minutes.

If the ink does not eject after pressing Ink refill and Start/Continue or "Ink pressure low" or "No ink drop charge" is displayed, a special work is required for restoration. Contact your local distributor.

Ink may be hardened in the viscometer when the message of "Viscosity Reading Out of Range" is displayed on the screen. A special work is required for restoration. Contact your local distributor.

**3** Open the "Operation management" screen. Arbitrarily rotate the handle of Pressure-reducing valve clockwise/counterclockwise and check if the pressure changes. After confirming the change, adjust the valve and set the lnk pressure to standard setting with a tolerance of 0.002.

#### (a) New HMI (b) Previous HMI Operation management | △ | ⊗ STOP | □ OFFLINE | 2017.07.07 12:45 Operation management [Ready Com=0 2017.07.07 12:45 Ink Operating Time Ink Alarm Time d (Standard Value:600) Cumulative Op.Time **0** h **600** h **0** h Ink operating time 0000 (hours) Manual Shutdov Ink alarm time600(hours; sCumulative op. time000000(hours) Ink alarm time 600 (hours; standard value: 600) Ink Pressure (Standard Value: 0.310) Ink/Makeup Ink Viscosity (Standard Value: 100) 4 JP-W89/TH-73 Print count 00000000 (prints) 100 0.310 MPa HOME Excitation V-ref (Range:0-19) Deflection Voltage Excitation Frequency JP-W89, TH-73 Ink, makeup 5.7 kV 11 62.5 kHz Ink viscosity 100 (standard value:100) Ink pressure 0. 310 (MPa; standard value: 0. 310) Ambient Temperature (Correct Range:0-40) Ambient temperature 20 (°C; range: 0~40) **20** ℃ Deflection voltage 5. 7 (kV) Print Count Excitation V-ref. 11 (0~19) Calibrate touch 0 Excitation frequency 62. 5 (kHz) ð ĤĪ Ħ Ø ę ⊖ Back $\widehat{\mathbf{u}}$ номе OPEN SAVE ADJUST EDIT

# 

# A special work is required when the lnk pressure does not change by rotating the handle of Pressure-reducing valve. Contact your local distributor.

The "Startup process after Long-term shutdown" is now completed.

# 6.16 Automatic stirring during shutdown

Pigmented ink is ink whose components are likely to be deposited. When the IJ printer is continuously shut down for extended time, there is the possibility of problem such as no ink ejection when operating the printer, or no recovery possible due to accretion of ink inside the printer. To prevent the above problems, automatic stirring function during shut down is provided. By using this function, stable operation can be ensured for the next operation.

## (1) Overview

- In automatic stirring operation, ink inside the system can be automatically stirred in the shut down period and leaving the power of system turned on in the pause mode.
- By using this function when the printer is going to shut down for long time but not so long that procedure for long-term shutdown (see "6.15 Long-term shutdown") is necessary stable operation can be ensured for the next operation.
- Range where stirring is applied is ink inside ink reservoir and main ink tank and also ink inside circulation unit. Ink circulation to the print head side is not applied.

# (2) Operating procedure

#### Leave the power switch ON in the "stop" state.

- Keep the power cable connected.
- When the unit is kept in the above status, stirring operation will be automatically performed once every 24 hours.
- When Automatic stirring function is executed during "Stop" state, the state indication is changed to "Service".
- At the time of next operation, normal operation can be ensured by pressing Start up.

# (3) When operation is going to shut down continuously without using automatic stirring function during shutdown:

• If shut down is for one week or more continuously, stir ink inside ink tank and main ink tank using stirring bar before starting the next operation.

## Cautions when automatic stirring is performed: \_

- Since the power switch is kept ON, if indication setting of the display has been set to "Always ON", displayed contents will be kept as is.
- To change the setting, refer to the Instruction Manual "6.3 Set up the touch screen". • Keep main ink tank with the normal use status.

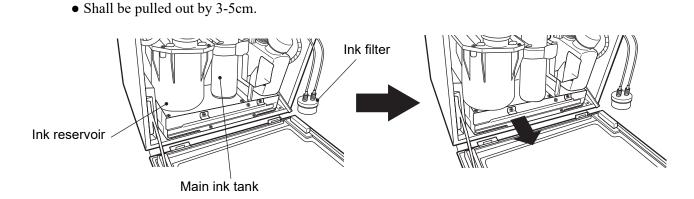
(If connection block is removed, circulating ink could splash out.)

# 6.17 How to check the rotor in Ink reservoir and Main ink tank

## 

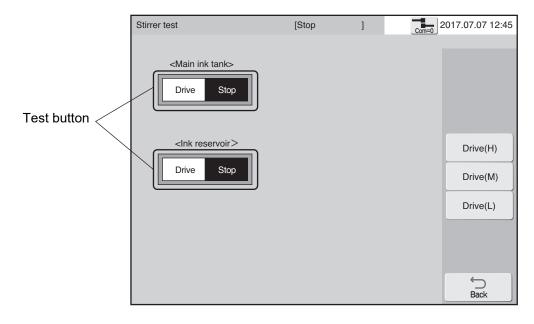
- Wear protective gear (goggles and mask).
- If the ink or makeup gets in your eyes or mouth, immediately rinse with warm water and consult a doctor.
- The rotor status shall be checked.
- If any print disorder such as thin prints etc, occurs, it may be because the rotor is missing in Ink reservoir or Main ink tank, or it may be because the firmly-fixed rotor which is caused by the settled pigment in Ink reservoir or in Main ink tank disturbs proper dispersion of ink in Ink reservoir or in Main ink tank.
- Check the rotor by following the procedures below.
- Do not perform this operation while the ink is being ejected. Perform it after setting the IJ Printer.

## **1** Remove the lnk filter, and pull out lnk reservoir and Main ink tank.



## 2 Display the Circulation control screen and press the Stirrer test – Start/Continue.

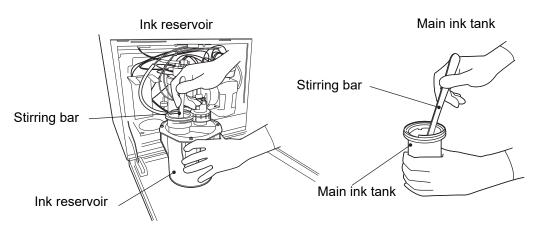
• Stirrer test screen is displayed.





### **3** Press test button.

- The stirrer operatin is displayed. Drive : The stirrer will start rotation. Stop : The stirrer will stop rotation.
- Check the operating sound stirrer makes to find out whether the rotor is set in ink reservoir or Main ink tank respectively, or to find out whether the rotor is firmly-fixed in Ink reservoir or Main ink tank.
  - (When the rotor is set there and it is not fixed, a sound is given when the stirrer is rotaing.)
- When the rotor is not set ink reservoir or in Main ink tank make sure to set tit there.
- When the rotor is firmly-fixed, use the stirring bar to re-disperse the Pigments which are settled at the bottom of Ink reservoir or Main ink tank.





# 7. MAINTENANCE SERVICE

• For the IJ printer to operate smoothly, the following maintenance work is necessary.

# 

Use Hitachi approved consumables and periodic replacement parts. Using products that are not designated by Hitachi could cause a failure in certain functions.

#### (1)Replacement of consumables

Replace the following filters according to the "Replacement guideline".

No.	Consumable	Replacement guideline	Replacement procedure description			
1	Ink filter 2,400h		"6.6 Replacing the ink filter"			
2	Recovery filter 1,200h		"6.7 Replacing the recovery filter "			
3	Circulation filter 2,400h		"6.8 Replacing the circulation filter "			
4	Air filter	2,400h	Refer to the description below.			

- In the case of standard operation (8 hrs/day, 25 days/month operation), 2400 hours corresponds to 1 year.
- The minimum retention period of IJ printer repair parts, including consumables, is 7 years after discontinuation of manufacture.
- When ordering consumables, please specify the following order name and part code No.

No.	Consumable	Order name	Part code No.	Remarks
1	Ink filter	Ink filter parts	451590	
2	Recovery filter	Mini filter parts	451857	2 pcs/pack
3	Circulation filter	Nozzle flat filter 75	451037	
4	Air filter	Air filter AF3 parts	451963	2 pcs/pack

#### (2) Other maintenance

- a. About once a week, check whether or not the pump makes an abnormal sound (metal sound, etc.).
- b. Before performing print state check at the start of operation, check whether or not the pressure is suitable.
  - (See "6.9 Adjusting the pressure" for a description of the check procedure.)
- c. For a description of ink drops and excitation voltage checks, see "6.10 Excitation V adjustment" and "6.11 Ink drops state check method".

#### (3) About periodic replacement parts

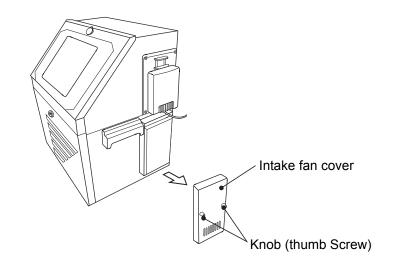
- a. To use the IJ printer stably, clock battery, circulation system parts (pump, solenoid valve, etc) and heating unit must be periodically replaced. Please consult your nearest local distributor.
- b. The stainless filter inside the sealing valve(MV9 inside print head) requires periodical replacement. Contact your nearest local distributor for replacement. (Reference for replacement : Every 2400 hours)
- c. Makeup filter requires periodical replacement. Contact your nearest local distributor for replacement.
- d. R.Air filter requires periodical replacement. Contact your nearest local distributor for replacement.

# Replacing the air filter

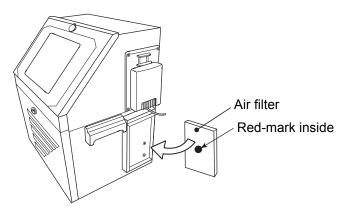




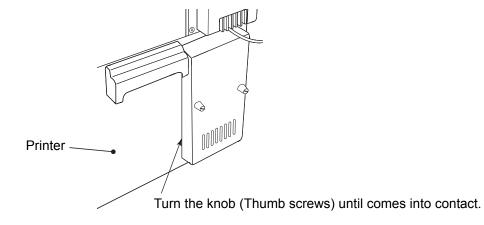
**2** Loosen the knobs (thumb screws) and remove the intake fan cover.



**3** Remove the old filter and set the new filter. (Please set the new filter with red-mark being invisible.)



4 Set the intake fan cover. (Turn the knobs until the intake fan cover comes into contact with the printer.)





# **5** Open the Part usage time mgmt. screen (menu 2 of the Circulation control screen) and set the time of the air filter to "0".

	Parts usage time mgmt.	[	Stop ]	Com=0	2017.07.07 12:45		
I							
I		(hours)		(hours)			
I	Ink filter	00000	Circulation unit	01000			
I	Recovery filter	01000	Heating unit	01000			
I	Circulation filter	01000	MV 1	01000	HOME		
I	Makeup filter	01000	MV2	01000			
1	Air filter	00000)	КVЗ	01000			
I	MGV filter	01000	MV4	01000	Prev.Dsp, Next Dsp		
I	R. Air filter	01000	MV5	01000			
I			MV 6	01000			
I	<consumption></consumption>		MV7	01000			
I	Ink 001	000 (ml)	M V 8	01000			
I	Makeup 001	000 (ml)	MV 9	01000			
I	Print count 000	001000					
	Update log 2017/03/22	08:15			Back		

## About maintenance service

If trouble or damage occurs within 1 year after delivery or accumulated operating time of 2400 hours, whichever is sooner, repairs will be made free of charge. However, the following cases are outside the warranty even within the free warranty period:

- (1) When trouble was due to handling outside the instruction manual
- (2) When materials and parts other than ours, including the ink, were used and damage was caused by them
- (3) When repair was performed by other than us or our designated representative and damage was caused by this
- (4) When trouble was due to external causes (abnormal print target, etc.) other than this equipment or by moving or transportation of the equipment after delivery
- (5) When operated in a usage environment outside the specifications of "12. Specifications" of the instruction manual.
- (6) When damaged by fire, water, or other natural disaster

Loss of production due to down time and physical loss due to trouble or error of delivered equipment (loss of print target, related facility, etc.) is outside the warranty. If trouble occurs, an engineer shall be dispatched as quickly as possible and maximum efforts will be made so that the down time is as short as possible.

If there is no danger of being misread, excessive or insufficient dot configuration shall be considered allowable.

The IJ printer has an alarm function to prevent major printing faults before they happen, but this function does not inspect the quality of the printed characters. Consideration shall be given so that the printed character state is visible at some process.

## Parts retention period

The retention period of the performance parts for repair of this equipment is 7 years after discontinuation of manufacture.

"Performance parts for repair" are parts necessary to maintain the functions of the product.

		ng with the	service in charge.	
sentative:			Tel:	
			Person in charge:	
:			Tel:	
			Person in charge:	
year	month	day		
	Useful when sentative:	Useful when communicatin sentative:	Useful when communicating with the sentative:	Useful when communicating with the service in charge.         sentative:       Tel:         Person in charge:         Tel:         Person in charge:

# 8. SCHEMATIC DIAGRAMS

# 8.1 Outside Dimensions

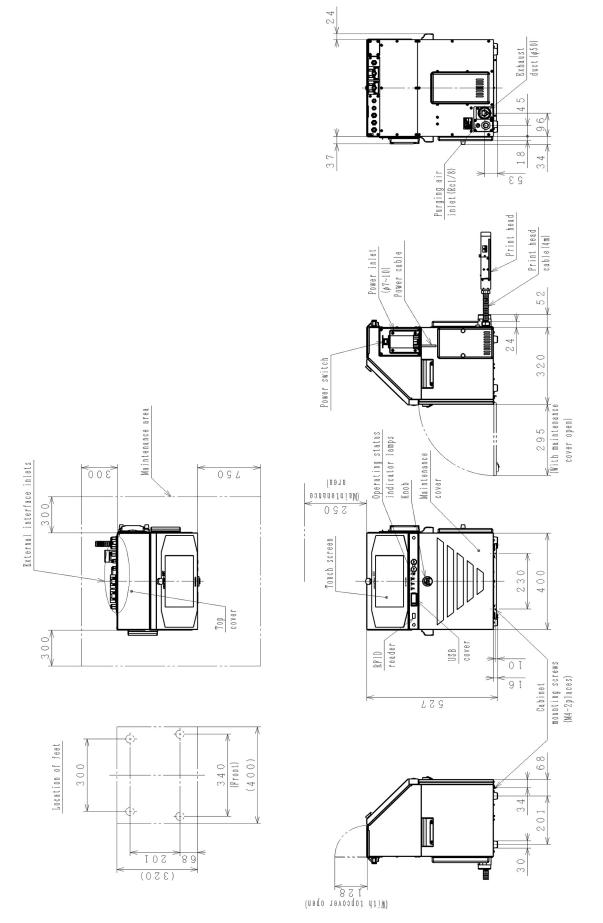


Fig.8-1 Model UX-P IJ printer outside dimensions

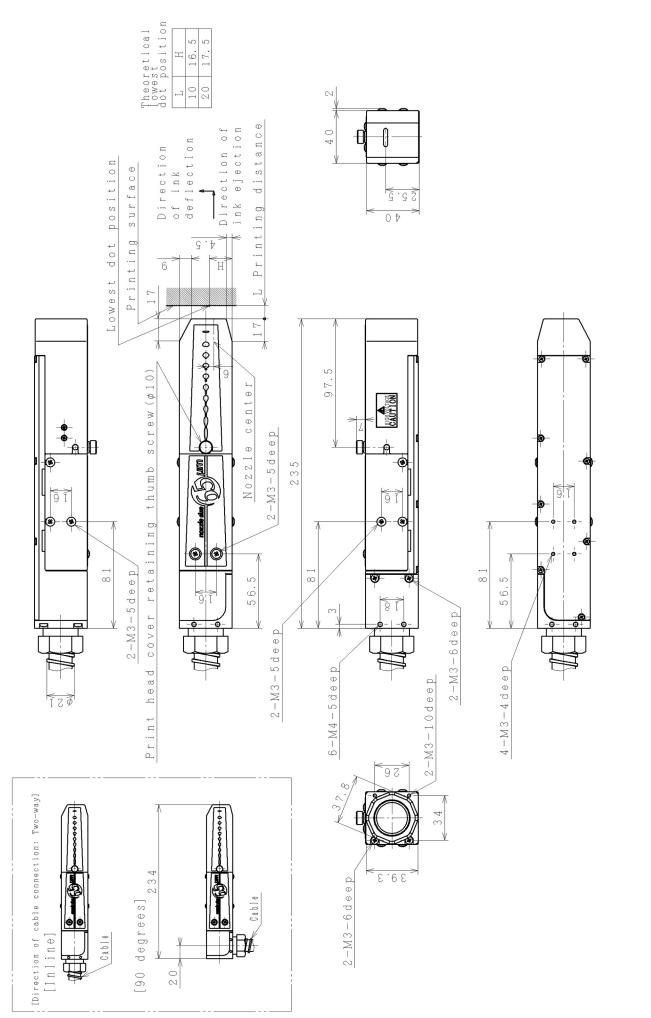


Fig.8-2 Model UX-P Print head outside dimensions

# 8.2 Electrical Connection Diagram (1)UX-P

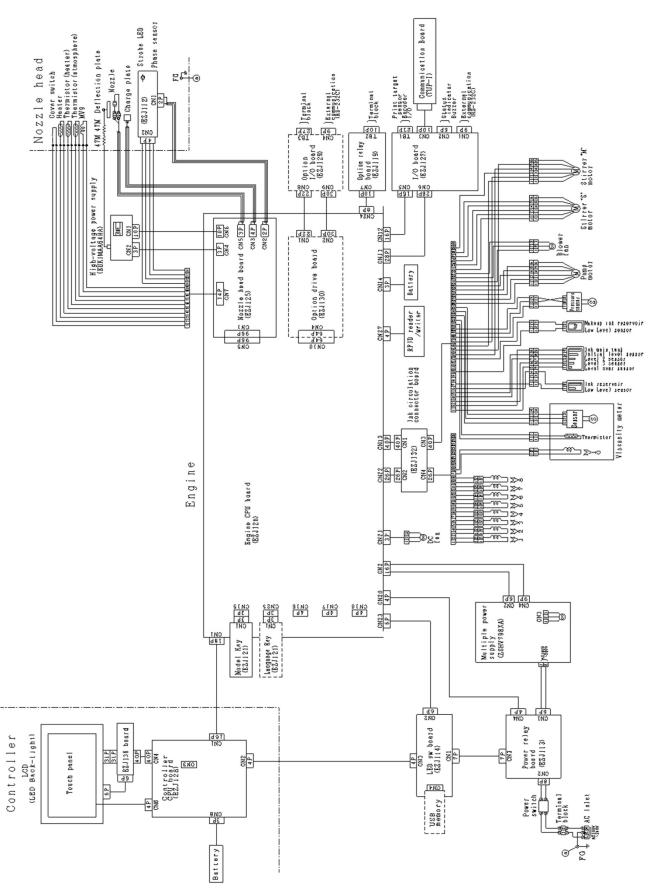
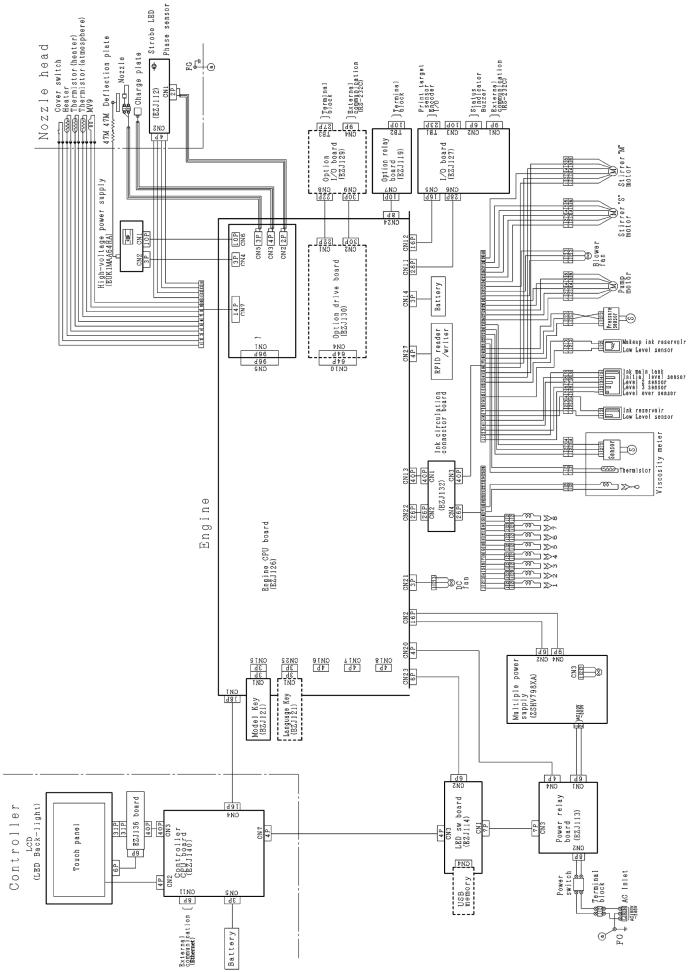
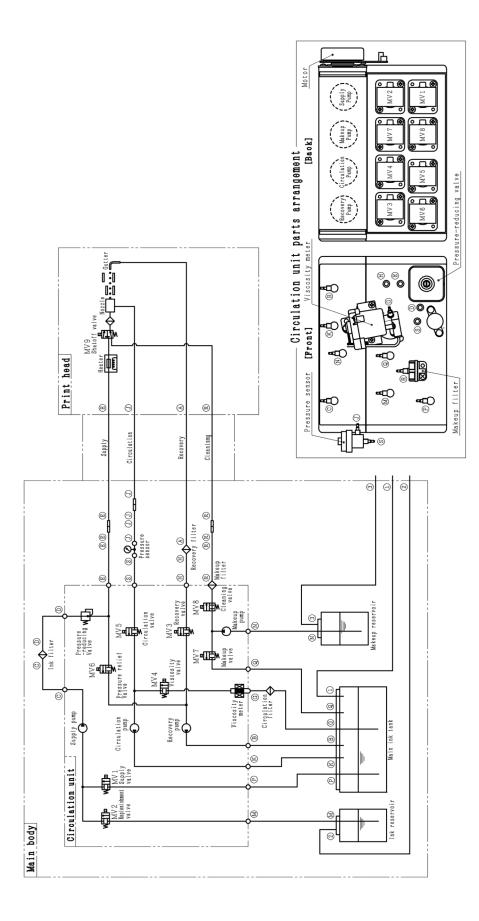


Fig.8-3 Model UX-P Electrical connection diagram

# (2)UX-P\*\*1n



# 8.3 Circulation System Diagram



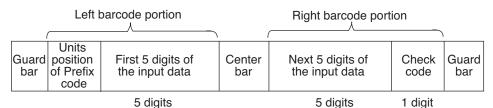
# 9. APPENDIX

# Bar code, 2-dimensional code

• See "4.7.5 Print a bar code" and "4.14.3 Set various printing" in the Instruction Manual.

## (1) Precautions when using EAN-13 code

- When bar code is "EAN-13" and "EAN-13 Add-On 5" the area for inputting the 2-digit "country code" is displayed on the print format screen. Be sure to input the country code. The country code can be input at the beginning of the data on the character input screen. See "4.14.3 Set various printing" in the Instruction Manual.
- Guard bar, center bar and check code are automatically added.



• When adding Readable code (number; human readable code), select either 5×5 or 5×7 as the size of the numbers added.



identification numbers



Example of EAN13 Add-On 5 with identification numbers

Conditions whereby Readable code can be added to be printed

No.	Condition
1	Made the number of lines of the EAN-13, EAN-8, UPC-A, UPC-E and EAN-13 Add-On 5 printing item 1 line or 2 lines.
2	Set character size $12 \times 16$ , $18 \times 24$ , or $24 \times 32$ (1 line only).
3	Set "Barcode printing" to "Normal" on Various print setup screen.

# (2) Precautions when using EAN Prefix

• Whether to set bar code EAN-13, EAN-8, EAN-13 Add-on 5 country code by character input or print format is selected.

Number of digits of bar code

	6										
	Country code	Data	Check digit	Total number of digits							
EAN-13	2	10	1	13							
EAN-8	2	5	1	8							
EAN-13 Add-On 5	2	15	1	18							

	Set value						
	Character input	Print format					
Handling of country code	Country code is input at the head of the data.	Set by print format without including country code in the data.					
Print format screen	Country code is not displayed.	Set the country code.					
Edit message screen	For EAN-13, input 12 digits, for EAN-8, input 7 digits and for EAN-13 Add-On 5, input 17 digits, all including the country code. However, check digit is excluded.	For EAN-13 input 10 digits, for EAN-8, input 5 digits and for EAN-13 Add-On 5, input 15 digits, without including the country code. However, the check digit is excluded.					

EAN Prefix

• When the country code is changed at the Print format screen, the country code for all the bar code items in that message is changed to the same value.

## (3) Precautions when using code 128

- The 2 modes include Code set B (Alphanumeric, numbers, symbols) and Code set C (numbers only). The mode can be changed by pressing "Code B" or "Code C" on the keyboard.
- In the case of continuous numbers, the bar can be shortened by setting to code set C.
- When printing in 2 lines or more, only one "code 128" can be set for one column. If you attempt to set more than one "code 128" for the same row, an "illegal bar code 2" error occurs.
- When code set was changed over, return to the original code set.

```
(Example)
```

1)Code set B: ABCD<C>0123<<u>B></u>

(2)Code set C: 0123<B>ABCD<C>45<B>EF<<u>C></u>

1

<B>, <C>: Code set changeover keys Return to original

## (4) Precautions for use of DM code

- Set as shown below for print item to which DM is to be set:
  - (i) Number of lines : 1 line
  - (ii) Character size :  $5 \times 8$ ,  $10 \times 12$ ,  $12 \times 16$ ,  $18 \times 24$
- Set barcode type on the print format screen.

	Type of Divi size and Waximum number of characters											
Char	racter size	$5 \times 8$	10>	<12	$12 \times 16$				18×24			
DM size		8×32	12×12	12×26	$14 \times 14$	16×16	16×36	$16 \times 48$	$18 \times 18$	$20 \times 20$	$22 \times 22$	$24 \times 24$
No. of v	ertical dots *1	8	12	12	14	16	16	16	18	20	22	24
	Numbers only	20	10	32	16	24	64	98	36	44	60	72
	Alphabetical characters only	10	5	16	8	12	32	49	18	22	30	36
Maximum number of characters	Combination of numbers, alphabetical characters and symbols	10-19	5-9	16-31	8-15	12-23	32-63	49-97	18-35	22-43	30-59	36-71
	Uppercase alphabet	13	6	22	10	16	-	-	-	-	-	-
	Lowercase alphabet	13	6	22	10	16	-	-	-	-	-	-

#### Type of DM size and Maximum number of characters

(The number of characters that can be coded differs according to the numbers/characters string.) (\*1) Use the number of vertical dots provided in the table for speed calculation.

[Type of Encoding]

IJ printer automatically judges the character string which is input and executes the encoding as follow:

- [1] When the number of digits of characters which are input is less than or that of Maximum number of characters (Alphabet only), ASCII Encoding is executed.
- [2] If the number of digits exceeds Maximum number of characters (Alphabet only), C40 Encoding or Text Encoding is executed.

[Rules for calculating number of digits]

[1] In case that Alphanumeric and Symbols are mixed. (ASCII Encoding)

Alphabetical characters and symbols are treated as one digit per character.

Single independent numbers are treated as one digit per number.

In the case of consecutive numbers, two numbers are treated as one digit.

If a single number is left over, it is treated as one digit.

The total is within 12 digits for  $16 \times 16$  and within 10 digits for  $8 \times 32$ .

(Example 1) Basic calculation rule

$$\frac{A \quad B \quad C}{3 \text{ characters}} = 3 \text{ digits} \qquad \frac{1 \quad 2}{1 \text{ digit}} = \frac{3 \quad 4}{1 \text{ digit}} = \frac{5 \quad D \quad 6 \quad E}{1 \text{ digit}} = 3 \text{ digits}$$

$$Total 9 \text{ digits}$$

[2] In case that Numbers and Uppercase characters are mixed. (C40 Encoding) 3 characters are treated as 2 digits.

(Example 2) Basic calculation rule

<u>A B 1</u>	<u>C D 2</u>	<u>E F 3</u>	<u>G H 4</u>	<u>IJ5</u>	K Total 11 digits
3 characters	3 characters	3 characters	3 characters	3 characters	$\setminus$
= 2 digits	= 2 digits	= 2 digits	= 2 digits	= 2 digits	1 digit

[3] In case that Numbers and Lowercase characters are mixed. (Text Encoding) 3 characters are treated as 2 digits.

(Example 3) Basic calculation rule

а	b	1	c	d	2	e	f	3	g	h	4	i	j	5	k	Total 11 digits
3 ch =	aracto 2 dig	ers jits	3 cł =	aract 2 dig	ers gits	3 ch =	aract 2 dig	ers gits	3 c	harac = 2 di	ters gits	3 0	harac = 2 d	cters igits	1 dig	git

(Example 4) Example of Character input for DM  $16 \times 16$ 

Encode	Print contents	Number of	Digit calculation	Doable or not	
2		characters	result	(DM16×16)	
ASCII	123456789012345678901234 1 digit 1 digit	24 characters	12 digits	Doable. Result is less than or equal to	
	1234567890123456789012A 1 digit 1 digit	23 characters	12 digits	maximum of 12 digits.	
	123456789012345678901AB 1 digit 1 digit	23 characters	13 digits	Not doable. Result exceeds maximum of 12 digits.	
C40	AB1 CD2 EF3 GH4 IJ5 K 2 digits1 digit (Encoding switching code, 1 digit is added.)	16 characters	12 digits	Doable. Result is less than or equal to	
Txet	ab1 cd2 ef3 gh4 ij5 k 2 digits 1 digit (Encoding switching code, 1 digit is added.)	16 characters	12 digits	maximum of 12 digits.	

- Input characters within the specified digit number for print item to which barcode has been set.
- When alphabet letters and numerals occur together, the number of characters which can be coded will vary depending on character string.
- When "DM8×32" is used, set item "character size 1" on the user environment setup screen to "5×8".

#### [DM16×16: Regarding Cell size (1 dot / 2 dots)]

- When DM(16×16) is selected and when Bold is set to 2, IJ printer can print Cell size (width and height) of 2 dots.
- Ink drop use percentage: If Bold is set to 2, for optimal printing quality, ink drop use percentage should be set to 1/5 1/16.
- Adjust the printing distance so that the printed dots do not overlap, and adjust horizontal and vertical ratio even.

[Note]

- Please confirm the readability of DM with actual usage conditions (Print size, Print speed, Barcode reader, etc.) in advance, and use this function.
- If cell size of 2 dots is used by the user who is already using DM(16×16) with cell size of 1 dot, please note that the print speed is reduced because the number of print dots increases.

# (5) Precautions when using QR Code and Micro QR

- Set as shown below for print item to which QR code or Micro QR is to be set:
  - (i) Number of lines : 1 line
  - (ii) Character size  $: 18 \times 24, 24 \times 32$  (for QR code),  $12 \times 16$  (for Micro QR), QR33 (for QR code  $33 \times 33$ )
- Set barcode type on the print format screen.
- Set error correction level on the various print setup screen.

For Micro QR, printing will be performed in error correction level M even if level Q selected.

If QR code  $33 \times 33$  will be set, error correction level has to be set to M in advance.

	Character size	18×24		24×32				QR33	$12 \times 16$
QR c	21×21		25×25		29×29		33×33	$15 \times 15$	
No. of vertice	cal dots (for speed calculation)	2	1	2	5	2	9	15	
E	rror correction level					М	Q	М	М
	Numbers only	34	27	63	48	101	77	149	18
Max. number of	Capital alphabetical characters, numbers	20-29	16-22	38-58	29-43	61-96	47-72	90-144	11-15
characters	Combination of alphabetical characters, numbers and symbols	14-29	11-22	26-58	20-43	42-96	32-72	62-144	7-15

QR code: Type of size and max	ximum character number
-------------------------------	------------------------

(The number of characters that can be coded differs according to the character string.)

- Input characters within the specified digit number for print item to which barcode has been set.
- When alphabet letters and numerals occur together number of characters which can be coded will vary depending on character array.
- "QR code printing" is added on "User environment setup" screen. It makes users possible to select the direction of QR code / Micro QR code to be printed.
- Please check if QR code / Micro QR code can be read properly by barcode reader before executing this new function of "QR code printing".

Character orientation	QR code printing	Printing example	Remarks
0 or 1	180-degree rotation	初日 第一日 第一日 第一日 第一日 第一日 第一日 第一日 第一日 第一日 第一	Rotated by 180 degrees and printed.
0 or 1	Normal		Printed in normal direction.
2 or 3	180-degree rotation	回来 125 125	Printed in normal direction.
	Normal	回3回 2555 ABC 2556 123	Rotated by 180 degrees and printed.

[About QR code 33×33]

- If the all conditions of the Table below are satisfied, dot matrix "QR33" and Bar code "QR $(33 \times 33)$ " will appear on Print format screen.
- Ink drop use percentage : For better printing quality, ink drop use percentage should be set to 1/7 or 1/6.
- Printing direction of QR code  $33 \times 33$ : For better printing quality, QR code  $33 \times 33$  should be printed in a state where is rotated by 180 degrees.

No.	Item	Condition		
1	Format Setup	Individual setup or Overall setup		
2	Column for QR code 33×33	1 line		
3	Ink drop use percentage	1/2 - 1/16		
4	QR Error correction level	M (15%)		

The conditions for printing QR code  $33 \times 33$ 

• Edit message screen : When the print item of QR code 33×33 is selected, "FNC1", "RS" and "EOT" button appear on the keyboard and can be input QR code 33×33.

No.	Control code	Usage				
1	FNC1(GS)	The control code that indicates GS1 standard symbol or where the data ends.				
2	RS	The control code that indicates the end of strings (record).				
3	ЕОТ	The control code that indicates the conclusion of a transmission.				

Available control codes for QR code  $33 \times 33$ 

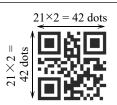
#### [QR code 21×21: Regarding Cell size (height)]

- When QR(21×21) is selected and when Bold is set to 2, IJ printer can print Cell size (width and height) of 2 dots.
- (When Format setup is Free layout on the Change message screen, the setting for Bold is fixed to 1.)
- Ink drop use percentage: When  $QR(21 \times 21)$  with cell size of 2 dots is set, the ink drop use shall be in the range of 1/5 to 1/16.
  - If Bold is set to 2 for optimal printing quality, ink drop use percentage should be set to 1/7 1/16.
- Printing direction of QR code: For optimal printing quality, QR code should be printed in a state where is rotated by 180 degrees.
- Adjust the printing distance so that the printed dots do not overlap, and adjust horizontal and vertical ratio even.

#### [Note]

- Please confirm the readability of QR with actual usage conditions (Print size, Print speed, Barcode reader, etc.) in advance, and use this function.
- If cell size of 2 dots is used by the user who is already using QR(21×21) with cell size of 1 dot, please note that the print speed is reduced because the number of print dots increases.





1 Cell = 1 dot (Vertical 1 dot  $\times$  Horizontal 1 dot) 1 Cell = 2 dots (Vertical 2 dots  $\times$  Horizontal 2 dots) Printed image of QR code 21 $\times$ 21

# (6) Precautions when using GS1 DataBar(Limited, Omnidirectional, Staced) code

- Thirteen(13) characters can be inputted.
  - When a GS1 DataBar Limited is set, the heading character shall be 0 or 1 (zero or one).
- When adding Readable code (number; human readable code), select either 5×5 or 5×7 as the size of the numbers added.

When GS1 DataBar with Human readable code is printed, the printed width will be bigger than that of "without Human readable code".

- Application Identifier(01) is automatically added to Human readable code.
- Please pay attention to the fact that there is an output of Application Identifier(01) or no output of Application Identifier(01), depending on the barcode reader.





Example of GS1 DataBar (Omnidirectional) with identification numbers



Example of GS1 DataBar (Stacked) with identification numbers

Conditions whereby Readable code can be added to be printed

No.	Condition
1	Made the number of lines of the GS1 DataBar printing item 1 line or 2 lines.
	In case of GS1 DataBar (Limited and Omnidirectional) :
2	Set either of character size $12 \times 16$ , $18 \times 24$ , or $24 \times 32$ (1 line only).
2	In case of GS1 DataBar (Stacked) :
	Set character size $18 \times 24$ (1 line only).
3	Set "Barcode printing" to "Nornmal" on Various print setup screen.

# (7) Precautions when using DotCode

- The column which includes DotCode shall be set as follows.
  - (i) Number of lines : 1 line 4 lines\*
    - \* When printing in 2 lines or more, only one "DotCode" can be set in one column. Two (2) or more DotCode cannot be set in the same column.
  - (ii) When printing 2 lines or more with DotCode, as to the column including DotCode, the dot matrix of the line(s) other than the line where DotCode is included shall be set to either  $4 \times 5$  or  $5 \times 5$  or  $5 \times 7(8)$  in advance.

(iii) 7 or 8 dots of DotCode height shall be set by "Char. size menu 1" on "User environment setup" screen.

- Set "Bar code" to "DotCode", and then select the "DotCode Height" on "Print format" screen.
- The number of horizontal dots of DotCode is variable according to the number of characters input and the character type. (Max. horizontal 128 dots) Please confirm first the readability of DotCode with user's usage conditions (Print size, Print speed, Barcode reader, etc.), and use this function.
- For the best result, "Ink drop use percentage" on "Print specifications" screen shall be set to 1/3 1/16.
- Adjust the print distance so that the printed dots placed obliquely do not overlap or the printed dots are not separated too much.

Char	acter size	5×7	5×8	7×10	10×12	12>	<16
DotCode Height (Horizontal dots; for speed calculation)		7	8	10	12	14	16
	Numbers only	62	70	90	108	126	128
Maximum number of characters	Alphabetical characters only	30	34	44	53	62	72
	Combination of numbers, alphabetical characters and symbols**	30-61	34-69	44-89	53-107	62-126	72-127

DotCode size and Maximum number of characters

\*\*The number of characters that can be coded differs according to the alphanumeric character string.

# Setting high-speed printing

# (1) Overview

• Four modes of HM, NM, QM or SM can be selected.

By selecting the mode, high quality printing result can be ensured according to the line speed.

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.		

## (2) When performing high-speed printing by 1 to 3 lines. (Nozzle diameter : 65µm)

(1) Necessary conditions to perform high-speed print

• When all necessary conditions from Nos. 1 to 7 are satisfied, high-speed print HM, NM, QM or SM mode can be selected.

No.	Item	Conditions
1	Print line	Number of lines of all columns is the same. (Refer to Table in "(2)Type of high-speed print and number of
1		vertical dots used" for number of print lines available.)
		Character size of all print items is the same.
2	Character size	(Refer to Table in "2)Type of high-speed print and number of
		vertical dots used" for character sizes available.)
5 IL ine spacing		Line spacing of all columns is the same. However, if Line spacing is set to 3 or more, High-speed printing is NOT available.
4	Barcode	NOT available.
5	Character orientation	0 or 1.
6	Ink drop use rate	1/1
7	Ink drop charge rule	Standard (Single scan or interlaced)

Print specifications	[Stop	]Com=0	2017.07.07 12:45	
Message name [	1			
1st screen 2nd s	creen 3rd screen			
Characte	r height 90	) (0~99)	Manual Startup	
	Ink drop use	(1/1~1/16)	HOME	
A	High-speed print HM	•	THOME	
	Character width 0002	(0~3999)		High-speed print
Character 0: A B C 1:	ABC 2:087 3:08	Arrow : Prin-		
		ting direction	Edit message	
Printing method 2 (1	Single scan 2 : Interlace	ed 3 : Mixed)		
Print start	ABC123		Print format	
delay	<b>`</b>		Change unit	
Sensor	Print start			
Print start delay	0000		$\leftarrow$	
(0~9999	) SC		Back	

(2) Type of high-speed print and number of vertical dots used

- Number of vertical dots used in high-speed print is shown in Table below.
- When calculating printing preparation time, etc., pay attention to number of vertical dots.

L	1/1				1/2	
Ink drop use rate		HM	NM	QM	SM	-
1-line print	Character size $12 \times 16$	16	24	-	-	32
	Character size $5 \times 5$	10	15	-	13	20
2.1	Character size $5 \times 7$	14	21	-	18	28
2-line print	Character size $5 \times 8$	16	24	-	21	32
	Character size $7 \times 10$	20	30	-	-	40
	Character size $5 \times 5$	15	20	25	22	30
3-line print	Character size $5 \times 7$	21	28	35	31	42
	Character size $5 \times 8$	24	32	40	36	48

Number of vertical dots used in the nozzle diameter is  $65 \mu m$ .

## (3) When performing high-speed printing by 4 lines.

(1) Necessary conditions for high-speed printing

•When all necessary conditions from Nos. 1 to 7 are satisfied, high-speed print HM, NM, QM or SM mode can be selected.

No.	Item	Conditions
1	Print line	Print line of all columns is the 4.
2	Character size	Character size of all print items is the same. (Refer to Table in "②Type of high-speed print and number of vertical dots used" for character sizes available.)
3	Line spacing	Line spacing of all columns is the same. However, if Line spacing is set to 3 or more, High-speed printing is NOT available.
4	Barcode	NOT available.
5	Character orientation	0 to 3.
6	Ink drop use rate	1/2
7	Ink drop charge rule	Standard (Single scan or interlaced)

(2) Type of high-speed print and number of vertical dots used

- Number of vertical dots used in high-speed print is shown in Table below.
- When calculating printing preparation time, etc., pay attention to number of vertical dots.

Ink drop use rate		1/1		1/	/2	
		-	HM	NM	QM	SM
4-line print	Character size $5 \times 5$	20	40	-	-	36
	Character size $5 \times 7$	28	56	-	-	50
	Character size $5 \times 8$	32	64	-	-	58

Number of vertical dots used in the nozzle diameter is  $65\mu m$ .

# Using reverse scan print

## (1) Overview

- Printing by reverse scan that inclines the particles in the reverse order of the conventional order by reverse scan control becomes possible.
- The tilt of the characters when the print target is transferred at high speed becomes smaller compared to the conventional control method.
- Since the control method is different from in the past, reverse scan print dedicated character pattern is used.

(1) Conditions necessary to perform reverse scan print

• When all the necessary conditions 1 to 6 are satisfied, reverse scan printing can be selected.

No.	Item	Condition
1	Reverse scan print	Enable
2	Print line	Print line of all columns is the 1.
3	Character size	Character size of all print items is $5 \times 8$
4	Ink drop use rate	1/1 (High speed character model : High-speed print mode is M1)
5	Change Character orientation	Disable
6	Format setup	Individual setup or Overall setup

• When the necessary reverse scan print conditions are not satisfied, printing is performed by the conventional method.

Maniana aniata atua	[Oto	1	
Various print setup	[Stop	1	Com=0 2017.07.07 12:45
Message name [	]		
Calendar offset	Offset from yesterday	From today	
DIN print	Disable	Enable	Manual Startup
EAN Prefix	Edit message P	rint format	HOME
Barcode printing	Normal Reverse		TIOMIL
QR Error correction lev	vel M (15%)	Q (25%)	
Revers scan print	Disable	Enable	

(2) Icon display when the necessary reverse scan print conditions are satisfied

• When the necessary reverse scan print conditions are satisfied, the following is displayed at the print method icons of the print contents screen.

Print description	[Stop	) ]	Com=0	2017.07.07 12:45	
Message name[	]	Curren	t user ID : user2		
- ABC			+	Manual Startup Reverse control	Print method icon Displayed in red at reverse control
Ink operating time	100(hours)	)			
Cumulative op. time	100(hours)	1		Print count	
Print count	1000(print)			reset	
Ink pressure	0.000(MPa;star	ndard value :0.	310)		
	elect Overwrite ssage message	Adjust print parameters	Operation management	Menu	

Print description screen

• When set, reverse scan print "Enable", cannot be set even if any of the following user environment setup items are set.

Moreover, when reverse scan print "Enable" print data is called under this ondition, it is corrected to "Disable".

No.	Item	Set value					
1	Char. Size menu 1	"5×7"					
2	Change Character orientation	Other than "Disable"					

### (2) Recommended setting when using reverse scan

• To use at the optimum printing quality, perform printing at the following recommended conditions. Be careful because printing quality cannot be maintained when outside the recommended conditions.

N	o. Item	Condition
1	Printing distance	10 mm to 15 mm
2	2 Line speed	250m/min to 400m/min

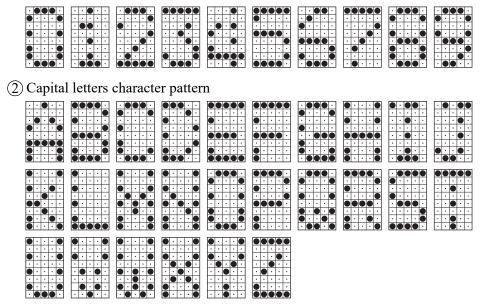
### (3) Print pattern when using reverse scan

- For optimum printing quality, the printing character pattern is changed.
- The character orientation is 0 and 1, and the character pattern of the alphanumeric symbols (I, J, 4, ') to be printed is different.
  - When the character orientation is changed, the character pattern is automatically switched.
- The character types whose character pattern changes are shown in the table below. The character patterns of the table are not objectives of editing by edit Standard patter.

	character types whose character pattern changes									
No.	Character size	Character type	Pattern change character							
1		Numeric	0 to 9 (10 characters)							
2	$5 \times 8$	Capital letters	A to Z (26 characters)							
3		Symbols	" ' " (1 character)							

Character types whose character pattern changes

(1) Numeric characters pattern



(3) Symbols character pattern



(4) Character pattern of alphanumeric characters (I, J, 4, ') when used with character orientation 1

·	·	٠	•	•	1	ŀ			·			•	٠				·	ŀ		٠	Ŀ
·	·	٠	·	ŀ	1	ŀ	·	•	·	•		•	٠	٠	·	•	·	·	•		Ŀ
·	٠	•	•	ŀ	1	ŀ	•		·	•		•	٠	٠		•	·	·		٠	Ŀ
·		٠	·	ŀ	1	•	•	•	·	•		•	٠	٠	•	•	·		•	٠	Ŀ
	·	·	•	ŀ	1	•	•		·	•		•	·	·		•	·	·	•	٠	Ŀ
·	·	·	·	•	1	•	•	•	·	•	1	•	·	·	•	•	·	·	•	·	Ŀ
	•	•	•	•	1	•	•		·	•	1		·	·		•	·	·	•	·	Ŀ
·	•	•	•	•	1	•				•	1	•	•		•	•	·	•	•	٠	Ŀ

### (4) Usage precautions

(1) Printing preparation time (printing interval)

- When the user environment setup screen Print data changeover error was set to "Disable", the printing preparation time (printing interval) becomes longer than when it is set to "Enable"
- The minimum value (criteria time) of the printing preparation time by print data changeover error setting becomes the table shown below.
- Refer to Technical Manual "4.3.1 Print target detector input" for details.

Print data changeover error	Nozzle diameter	Criteria time
Enable	65µm	9 ms
Disable	65µm	16 ms

# Using High quality mode

# (1) Overview

- In terms of printing condition indicated in the table below, better printing quality would be obtained than normal one particularly when the product speed matching function is applied to print something at low speed, if a specific dot pattern which lessens a distortion of printing is adopted.
- When High quality mode is set to "Enable" under the necessary conditions below, the dedicated character patterns for high quality mode printing are used. The dedicated character patterns are different by the condition No. 1-4. Please see the following patterns. The character patterns of the table below, "Character types whose character patterns are changed" are not the objectives for editing by "Edit Standard pattern".
- When the following conditions are not satisfied, even if high quality mode is set to "Enable", the characters printed are those of the normal patterns.
- Please refer to Instruction manual "4.14 Set the print specifications" and Technical manual "Setting high-speed printing" for details of "High-speed print", "Printing method" and "Character orientation".

### Usage precautions

- Please make sure to check the sample you printed because the dot matrix displayed on the screen is not changed from that of normal mode even when a specific dot matrix for high quality mode printing is adopted.
- If the dot matrix is switched from 5x7 to 5x8, please note that actual printing width becomes longer than printing is as 5x7. Please refer to Instruction manual "6.1 Set the user environment" for details of switching 5x7 and 5x8.

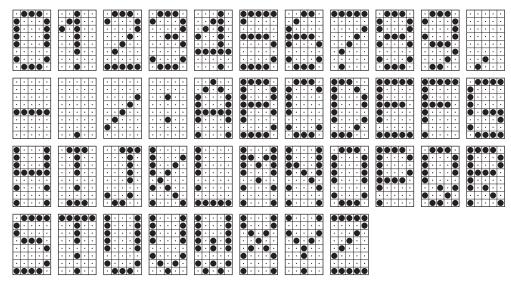
			1.00000000					
]	No.	Character size	Lines	Ink drop use rate	Printing method	Character orientation		
	1	5×8	2 liens	1 (High-speed print : HM)	Interlaced	0 or 1		
	2	5×8	2 liens	1 (High-speed print : HM)	Interlaced	2 or 3		
	3	5×8	3 liens	1 (High-speed print : HM)	Interlaced	0 or 1		
	4	5×8	3 liens	1 (High-speed print : HM)	Interlaced	2 or 3		

Necessary conditions for high quality mode printing

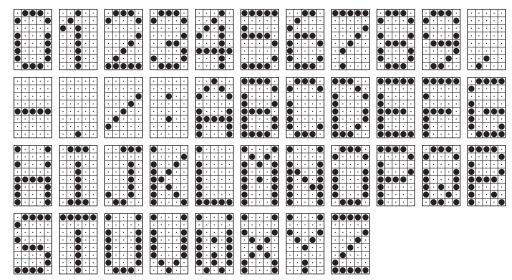
Character types	whose character	patterns are changed

		71	
No.	Character size	Character type	Pattern change character
1		Numeric	0 to 9 (10 characters)
2	$5 \times 8$	Capital letters	A to Z (26 characters)
3		Symbols	"." "/" "-" "," ":" (5 characters)

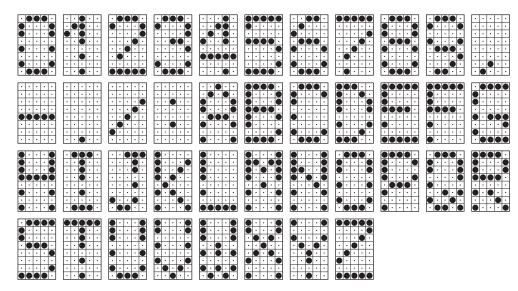
<The patterns for  $5 \times 8$ , 2 lines, char. orientation = 0 or 1>



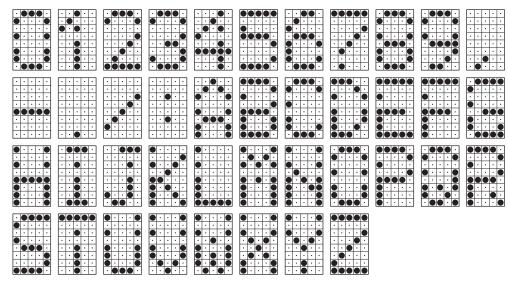
<The patterns for  $5 \times 8$ , 2 lines, char. orientation = 2 or 3>



<The patterns for  $5 \times 8$ , 3 lines, char. orientation = 0 or 1>



<The patterns for  $5 \times 8$ , 3 lines, char. orientation = 2 or 3>



# **Change of Buttons, Icons and Status Colors**

When you would like to make changes on the buttons, icons and status colors, please contact your nearest local distributor.

## (1) "Standby/Ready Change Button"

- When the Control Menu Buttons are available on the touch screen, "Standby/Ready Change Button" will be displayed ([Disable] and [Enable]).
- When this button is used (i.e., Enabled), the number of button pressing can be reduced by one (1).

State	Standby/Ready Change Button			
State	Disable	Enable		
Standby	[standby ]	[ Standby ]		
Ready	[Ready ]	[ Ready ]		

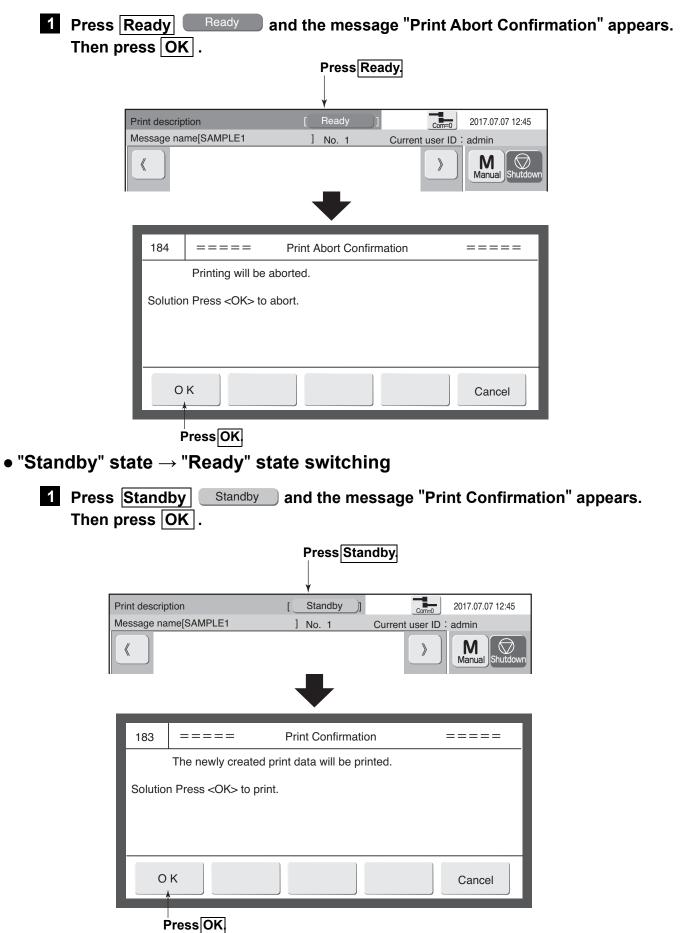
Standby/Ready Change Button

	Standby state (with button)				
	Ļ				
Print description	[ Standby ]	Com=0 2017.07.07 12:45			
Message name[SAMPLE1	] No. 1	Current user ID : admin			
		Manual Shutdown			

	Ready state (with button)				
	Ļ				
Print description	[Ready]	Com=0 2017.07.07 12:45			
Message name[SAMPLE1	] No. 1	Current user ID : admin			
		Manual Shutdown			

## • "Ready" state $\rightarrow$ "Standby" state switching

• With the conveyor interlock being activated by "Ready" signal, should this "Ready" signal be turned to "Standby", the conveyor will stop.



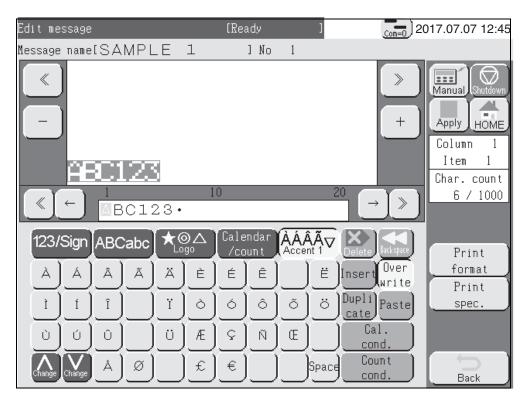
# (2) Change of Icons

- The icons displayed on touch screen will be changed.
- With this change, the icons displayed on the screen can be seen easily.
- For icon type selection, please contact your local distributor.
- Icons displayed or not is set by "ICON Display" [Enable] or [Disable] on touch screen setup.

	Supported Icons						
No.	Icon Type		Example				
110.	Outline	Description	Startup	Manual	1 line		
1	Default	Factory default	Startup	M Manual	∶ 1 line		
2	English	Icon + English language	Startup	<b></b> Manual	1 line		
3	Japanese	Icon + Japanese language		<b>===</b> 制御			
4	No Text	Icon only	$\diamond$				

Supported Icons

#### <Example of Icon Type : 'English'>



# (3) Change of Status Color

- The background color of IJP status will be changed.
- With this changes, the background color of "Ready" will be green which is the same color as the status indicator light.

		Status Color				
State	Before Change		After Change			
Stop	White	[Stop ]		White	[Stop ]	
Standby	Green	[Standby ]		Light blue	[Standby ]	
Ready	Blue	[Ready ]		Green	[Ready ]	
Starting	Green	[Starting ]		Light blue	[Starting ]	
Ink heating	Green	[Ink heating ]		Light blue	[Ink heating ]	
Stopping	Green	[Stopping ]		Light blue	[Stopping ]	
Drop adjust	Green	[Drop adjust ]		Light blue	[Drop adjust ]	
Cover open	Green	[Cover open ]		Light blue	[Cover open ]	
Service	Green	[Service ]		Light blue	[Service ]	
Fault	Red	Fault		Red	Fault	

#### Background Colors of IJP Status

# Icon List (1) Operation Control Buttons Group

	D // N	lcon				
No.	Button Name	Default	English	Japanese	No Text	
1	Startup	Startup	Startup	◎ (重) (重) (重) (重) (重) (重) (重) (重) (重) (重)	$\Diamond$	
2	Shutdown	Shutdown	Shutdown		$\bigcirc$	
3	Manual	Manual	<b></b> Manual	<b>===</b> 制御		
4	Com=0	Com=0	Com=0	t7512	-	
5	Com=1	Com=1	Com=1	<b>1</b> 2512	~	
6	HOME	номе	HOME	<b>本</b> ーム		
7	Apply	Apply	Apply	確定		

Icon List 1 - Operation Control Buttons Group

# (2) Common Buttons Group

Icon List 2 - Common Buttons Group

Na	Dutten News	Icon				
No.	Button Name	Default	English	Japanese	No Text	
8	Decrement	Decre- ment	Decre- ment	—— 減 少	-	
9	Increment	Incre- ment	Incre- ment	_ <b>+</b> 増 加	+	
10	Enter	Ent Enter	Enter	Enter	Enter	
11	Previous column	Prev.col.	Prev. col.	前列		
12	Next column	Next col.	Next col.	次列		
13	Previous item	● abode ● fghij ● klimno Prev.item	● 12345 ● ABCDE ● abcde Prev. item	●12345 ●ABCDE ●abcde 前項目	● 12345 ● ABCDE ● abode	
14	Next item	● abcde ● fghij Nextitem	● 12345 ● ABCDE ● abcde Next item	●12345 ●ABCDE 次項目	● 12345 ● ABCDE ● abode	
15	Previous display	Prev.Dsp.	Prev. dsp.			
16	Next display	Next Dsp.	Next dsp.			
17	Back space	HT Back space	Back space	<b>◆</b> 後 退	►	
18	Delete	Delete	<b>X</b> Delete	<b>★</b> 削除	×	
19	ОК	ок	ОК	ОК	ОК	
20	Cancel	Cancel	✓ Cancel	~ 取消	~	
21	Back	Back	Back	同る	Ĵ	

# (3) Keyboard Buttons Group

No.	Button Name	Default	English	Japanese	No Text		
22	Change <sub>A</sub>	Change	Change		Λ		
23	Change V	Change		切替之	$\vee$		
24	ABC	ABC··	ABCabc	ABCabc	ABCabc		
25	123/Sign	123. Sign	123/Sign	123/Sign	123/Sign		
26	Logo	<b>★@⊿…</b> Logo		★⊚∆ ∄ ∄	★⊚△		
27	Accent 1	ÀÁÂ∽ ∇ Accenti	ÀÁÂÃ~ Accent 1	ÀÁÂÃ주 アウセント 1	ÀÁÂÃ⊽		
28	Accent 2	ÀÁÂ∽ ∇ Accent2	<b>àáâã⊽</b> Accent 2	àáâã⊽ アウセント2	àáâã⊽		
29	Greek	ABF. ▼	ABF∆⊽ <sub>Greek</sub>	<b>ΑΒΓΔ</b> ₩IJジャ	ABΓ∆ <sub>▽</sub>		
30	Russian 1	A6B·· ∨ Ressian1	ABBΓ⊽ Russian 1	<b>АБВГ</b> ⊽ □シア1	АБВГ▽		
31	Russian 2	A6B·· ∨ Russian2	абвг⊽ <sub>Russian 2</sub> ⊽	абвг⊽ ¤୬72	абвг⊽		
32	Arabic 1	ירוי Arabic number ∨	£٣٢١•√ Arabic num.	<b>٤٣٢١.▽</b> アラビア数字	۲۳۲۱.∆		
33	Arabic 2	ابت. Arabic 1	√ابٽٽ Arabic 1	ابەت 7兆?文字1	√ابٽڻ		
34	Arabic number	ابت، Arabic2 🗸 🗸	√ابٽٽ Arabic 2	ابکٹ ۲٫テンゔ文字2	√ <sup>ابتٹ</sup>		
35	Dedicated	期限 V	期限 <sub>▼</sub>	期限 <sub>専用文字</sub> ⊽	期限▽		
36	Kana	アイウ 🗸 <sub>Kana</sub>	アイウマ <sub>Kana</sub>	<b>アイウ</b> マ	アイウマ		
37	Kana Convert	あさ <b>→朝</b> ∨ Kana Conv.	あさ→朝√ Kana Conv.	<b>あさ→朝</b> ▼ かな変換	<sup>あさ→</sup> 朝 <sub>▽</sub>		
38	SP Kanji Convert	a→啊 <sub>▽</sub>	a→啊 <sub>▽</sub>	a→啊∨	a→啊 <sub>▽</sub>		
39	Code Convert	区点 漢字 ▽	0286→♪ Code Conv.	<b>0286→♪</b> ▼ 区点変換	0286→♪▽		

Icon List 3 - Keyboard Buttons Group

# (4) Mini-Keyboard Buttons Group

		Icon				
No.	Button Name	Default	English	Japanese	No Text	
40	ABC	ABC	ABC	ABC	ABC	
41	123	123	123	123	123	
42	Logo	<b>★@⊿</b> Logo	★_A Logo	★ <mark>●</mark> △ ≊ 録	★⊚△	
43	Special 1	ÀÁÂ Specialt	Àà Special 1	Àà <sup>持殊 1</sup>	Àà	
44	Special 2			<b>∆5</b> <sup>特殊 2</sup>	ΔБ	
45	Arabic number	<b>Si</b> + Arabic	<b>٤٣٦٦-</b> Arabic num	<b>2111-</b> 75ビア 数字	£871-	
46	Kana	アウ Kana	アウ <sub>Kana</sub>	アウ	アウ	

Icon List 4 - Mini-Keyboard Buttons Group

# (5) Print Format Screen Buttons Group

Icon List 5 - Print Format Screen Buttons Group

	Dutter News	Icon				
No.	Button Name	Default	English	Japanese	No Text	
47	1 line	I line	T ➡ 1 line	1 段	_→	
48	2 lines	: 2 lines	2 lines	2段	<u>⊥</u> •=	
49	3 lines	: ➡ 3 lines	I ➡ 3 lines	3 段	Ĩ⇒≣	
50	4 lines	: • 4 lines	<b>⊥</b> → 4 lines	<b>⊥</b> → 4 £2		
51	1st line	↓ 1st line	📕 🗕 1st line	📕 🗕 1 段目	<b>■</b> ₊	
52	2nd line	← 2nd line	<b></b> ←2nd line	← 2 段目	<b>_</b> +	
53	3rd line	← 3rd line	<b>──</b> ← 3rd line	━━━━━━━━= 3段目	<b>—</b> +	
54	4th line	4th line	th line <b>€</b>	■ 4段目	■*	
55	To overall	To Overall	To overall	一 括		
56	Delete column	Delete C.	<b>₽</b> Delete col.	● 列削除	•	
57	Inset column	Insert C.	Insert col.			
58	Add column	Add Col.	Add col.	■■■ 「■ 末尾追加		

# **IC Card Function**

Because the IC card is an optional component, it is not included with the IJ printer main unit. Please buy it separately.

This function is not available at the area the license by the Radio Law is not acquired.

# Handling the IC Card

# Because this product contains electronic components, please pay careful attention to handling.

- Please store away from direct sunlight, high temperature and high humidity.
- Avoid placing external stress on the product, such as bending, twisting or pressing.
- Do not put it in a wallet, back pocket, or other curved space.
- Do not place in locations where strong magnetic fields may be generated.
- Do not make holes, etc. in the product.
- Do not use overlapped with another card.

# (1) Overview

This optional IC card utilizes the IJ printer main unit's internal RFID (short-range wireless communication) function to provide the following functions.

No.	IC Card Function	Details
1	User Login Function	You can login as the registered user by holding the IC card up to the printer unit.
2	Print Data Selection Function	Registered print data can be selected by holding the IC card up to the printer unit.

\* One IC card can use either the "user login function (1 user)" or the "print data selection function (1 print data)".

# (2) IC Card Creation Procedure

Before using an IC card it is necessary to set up the card to be used for either user login or print data selection.

# (2)-1 Creating an IC card for user login

# **1** Login with administrator privileges.

See section 3.2 "Setting functions which can be performed".

# 2

# Press Create IC card in the Auxiliary function menu.

Aux. function menu	function menu [Stop		2017.07.07 12:45
Manage messages / Group	Create user pattern	Calibrate touch screen coordinates	Manual Startup HOME
Copy data (IJP → USB)	Copy data (USB → IJP)	Edit Standard pattern	
Edit substitution rule	Select Languages		
	Create IC card		→ Back
	Press C	reate IC card.	



# 3 Press Login ID.

Select a Login ID ("user" in this example), press OK.

Create IC card	[Stop ]	2017.07.07 12:45	
IC card type Login ID	Login ID Print data user admin user Cancel	<u>Com=0</u>	
		Confirmation Cancel	
		ок	_ Press OK.

4 When the message, "Create IC card is in progress. Please pass IC card over the reader." is shown, pass the IC card over the reader on the IJ printer main unit (Fig. 1).

By pressing Abort, "Create IC card" can be aborted.

Create IC card		[Stop	]	2	017.07.07 12:45
IC card type Login ID	Login ID user	Print data			
					Abort
Create IC card is i Please pass IC ca	n progress. Ird over the reader.				

Position the IC card so that it is parallel to the reader. (Read/write range 0-10 mm)

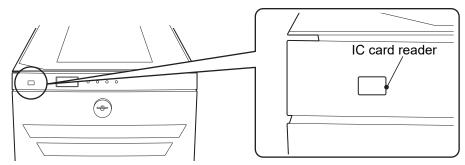


Fig.1 IC card Reader

5 When the message, "Create IC card is succeeded." is shown, creation of an IC card for user login is complete.

Pressing Cancel will return you to the original screen.

Create IC card	[Stop	]	2017.07.07 12:45	
IC card type Login ID	Login ID Print data			
			Confirmation	Press Cancel.
Create IC card is su	icceeded.		ОК	

\* Creation of an IC card fails "Create IC card is failed" will be shown. Press OK and when the message, "Create IC card is in progress. Please pass IC card over the reader." is shown, pass the IC card over reader on the IJ printer main unit.

# (2)-2 Creation of an IC card for print data selection

**1** Login with administrator privileges.

See section 3.2 "Setting functions which can be performed".

- **2** Press Create IC card in the Auxiliary function menu.
- **3** Press "Print data" and the print data selection screen will be shown. Select the print data to be registered on the IC card ("SAMPLE 1" in this example), press OK.

Create IC card	[Stop	]	Com=0	2017.07.07 12:45
IC card type	Print da	ata		
No No SAMPLE 1 SAMPLE 2 SAMPLE 3 4 SAMPLE 4	No	Message na	ame )	Select page 1/1 Confirmation Cancel

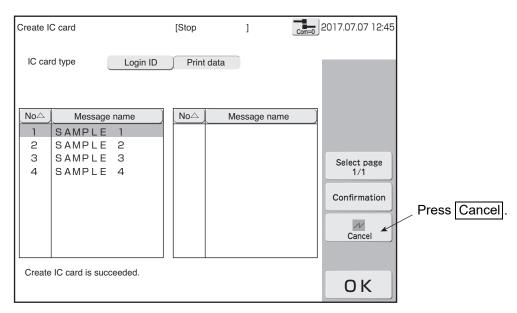
4 When the message, "Create IC card is in progress. Please pass IC card over the reader." is shown, pass the IC card over the reader on the IJ printer main unit.

By pressing Abort, "Create IC card" can be aborted.

Create IC card	1		[Stop	]	Com=0	2017.07.07 12:45
IC card typ	e [	Login ID	Print c	lata		
2 SA 3 SA	Message MPLE MPLE MPLE MPLE	1 2 3	No	Message na	ame	Abort
Create IC o Please pas		progress. over the reade	er.			

5 When the message, "Create IC card is succeeded." is shown, creation of an IC card for print data selection is complete.

Pressing Cancel will return you to the original screen.



\* Creation of an IC card fails "Create IC card is failed." will be shown. Press OK and when the message, "Create IC card is in progress. Please pass IC card over the reader." is shown, pass the IC card over reader on the IJ printer main unit.

# **Precautions during IC card creation**

One IC card can use either the "user login function (1 user)" or the "print data selection function (1 print data)", but not both. Even if an IC card has already been created with one of the functions, it can be set up to use the other function instead by following "(2) IC Card Creation Procedure" again.

Also, when using multiple IJ printers, please be aware that the following restrictions apply.

IC Card Function	Usage Conditions
User login function	An IC card can be used to login to a printer, even if it is not the same printer that was used to create the IC card, as long as the login ID is the same as that for the registered printer. However, because the password is recorded on the IC card, if the password is changed from the IJ printer side the card will need to be recreated. If the IC card is being shared between multiple IJ printers the password will need to be updated on the other IJ printers as well.
Print data selection function	Because only the print data registration number is recorded on the IC card, if the registration number is changed or deleted on the IJ printer side the card will no longer be able to select the print data. If the message name is changed, the print data will still be selectable. Because this function can only be used with the IJ printer on which the IC card was created, when multiple IC cards are used it is recommended that the product number of the IJ printer and registration number be recorded on the IC card.

# (2)-3 Confirmation of IC card registration contents

# **1** Login with administrator privileges.

See section 3.2 "Setting functions which can be performed".

### **2** Press Create IC card in the Auxiliary function menu. 2017.07.07 12:45 Aux. function menu [Stop ] Manual $\Diamond$ Startup Manage messages / Create user Calibrate touch HOME Group pattern screen coordinates Copy data Copy data Edit Standard $(IJP \rightarrow USB)$ $(USB \rightarrow IJP)$ pattern Edit substitution Select Languages rule Create IC card € Back

Press Create IC card

# 3 Press Confirmation .

Create IC card		[Stop	]	Com=0	2017.07.07 12:45	
IC card type Login ID	Login ID user	Print data			Confirmation	Press Confirmation
					Cancel	

# 4 When the message, "Please pass IC card over the reader." is shown, pass the IC card over the reader on the IJ printer main unit.

The data registered on the IC card (login ID or print data registration number:

4 half-width numerical digits) will be shown next to "Login ID" or "Print data".

## Pressing Back will return you to the previous screen.

\* Before the IC card is passed over the reader this space will be blank. Either the registered login ID or the print data number will be shown (Both are shown below for example purposes).

Create IC card	[Stop	]	2017.07.07 12:45	
Confirm your Login	ID and Print data.			
Login ID	user			
Print Data	0001			
				_Press Bac
Please pass IC car	d over the reader.		Back	

# (3) Operating Instructions

(3)-1 User login function



Pass the IC card you made for user login over the reader on the IJ printer main unit while the "Print description (HOME screen)" is shown.

- The "User ID confirmation" message will be shown. 2 Press OK and you will be logged in using the user ID registered on the card.
  - On Previous HMI, pressing "Cancel" will cause the "User ID confirmation" message to disappear and the user ID to remain unchanged.
  - On New HMI, pressing either x or Cancel will cause the "User ID confirmation" message to disappear and the user ID to remain unchanged.

Print description	⊗ STOP	COFFLINE 2017.07.07 12:45	Print description	[Stop	] 2017.07.07 12:45
SAMPLE 1		ID:User	Message name[SAMPLE	1]	Current user ID : admin
					+
	CONFIRMATION	×	ABC123		
User ID Confirmation		No.077			Single
User ID will be ch	ange to "user	".	077 =====	User ID confi	rmation =====
			User ID will be o	hange to "user	39
ОК		Cancel			
			ок		Cancel
	AVE ADJUST ED				Cancer
Press OK			Press OK.		
New	/ HMI		P	revious HM	l

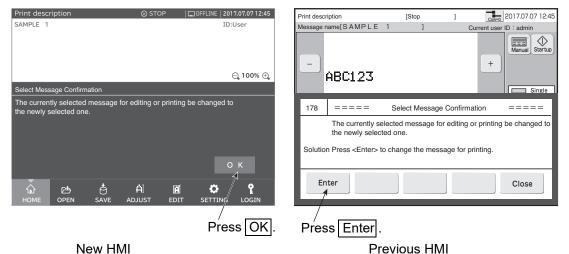
# (3)-2 Print data selection function

Pass the IC card you made for print data selection over the reader on the IJ printer main unit while the "Print description (HOME screen)" is shown.

2 The message preview of selected print data and "Select Message Confirmation" message will be shown.

Press OK and the print data registered on the card will be selected.

- On Previous HMI, pressing Cancel will cause the "Select Message Confirmation" message to disappear and the selected print data to remain unchanged.
- On New HMI, pressing x will cause the "Select Message Confirmation" message to disappear and the selected print data to remain unchanged.



1

# (4) Troubleshooting

Phenomenon	Check	Solution
IC card cannot be read/ written to.	• Is the IC card passed parallel to the reader on the IJ printer main unit and within the read/write range (0-10 mm)?	• Pass the IC card parallel to the reader on the IJ printer unit within the read/ write range (0-10 mm). Also, when the IC card is being read/written to, do not remove it until the confirmation message is shown. If the IC card still cannot be read/written to, either the card or the RFID reader may be broken, etc. Contact your nearest local distributor.
User login/print data selection cannot be carried out with the card.	<ul> <li>Are you passing the IC card over the reader on the IJ printer unit while the "Print description (HOME screen)" is being shown?</li> <li>Are the messages (Confirmation, Warning and Fault) displayed?</li> </ul>	<ul> <li>Press "HOME", and after the "Print description (HOME screen)" is shown, pass the IC card over the reader.</li> <li>Pass the IC card over the reader after you delete the messages when these (Check, Warning and Error) are displayed.</li> </ul>
"IC card read error" (warning) is shown.	<ul> <li>Has IC card creation been carried out?</li> <li>If it is an "IC card for user login", has the registered login ID been registered on the IJ printer main unit? If it is an "IC card for print data selection", is it being used with the IJ printer it was created by?</li> <li>Are print data selection settings set to restricted use?</li> </ul>	<ul> <li>If IC card creation has not been carried out, follow "(2) IC Card Creation Procedure" to create the IC card.</li> <li>There could be a mismatch between the print data registered on the IC card and the print data registered on the IJ printer main unit.Follow "(2) IC Card Creation Procedure" again to create the IC card.</li> <li>If print data selection settings are set to restricted use, "IC card read error" will be shown. Change the settings to remove the use restrictions.</li> </ul>
"RFID Reader Failure" (warning) is shown.	• Temporarily cut the power supply to the IJ printer. Is the message still shown after power supply is restored?	• If "RFID Reader Failure" (warning) is still shown after power supply is restored, the RFID reader may be broken, etc. Contact your nearest local distributor.

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