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At all times the printer must be operated with EC-JET approved spares and consumables. Maintenance not identified in this user manual must be carried out by EC-JET engineers or authorized distributors.

## About this Manual

The purpose of this user manual is to provide the operator with sufficient information to operate the ECJET Ink Jet Printer. The information in this manual applies to EC-JET1000Pro series inkjet printers.

Products described in this user manual are subject to continuous development, and reviews of this user manual will be made accordingly in subsequent editions or reissues.

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## 1. Safety

### 1.1 Warnings and Cautions

At appropriate points within the text of this manual, additional safety statements will be displayed. These are designed to alert your attention to hazards and important information that assists you in carrying out your activities on this printer safely and efficiently. Each safety statement has a separate meaning so that you can identify the importance of the information provided. Examples and descriptions of safety statements have been provided as follows:



**WARNING:** A WARNING ALERTS YOU TO HARMFUL OR POTENTIALLY LETHAL ACTIVITIES. A DESCRIPTION OF THE HAZARD IS GIVEN AND THE CONSEQUENCES OF IGNORING THEM. A WARNING CAN ALSO BE SHOWN AS A SPECIFIC HAZARD, FOR EXAMPLE, EYEROTECTION (SEE BELOW).



THE EYE PROTECTION WARNING ICON IS SHOWN THROUGHOUT THE MANUAL TO INDICATE. THAT APPROVED EYE PROTECTION, WHICH CONFORMS TO EUROPEAN AND INTERNATIONAL SAFETY STANDARDS, MUST BE WORN WHEN CARRYING OUT INK OR SOLVENT RELATED ACTIVITIES.



**CAUTION:** A CAUTION ALERTS THE USER TO ACTIVITIES THAT MAY CAUSE DAMAGE TO EQUIPMENT OR REDUCE ITS OPERATING EFFICIENCY, BUT IS NOT DIRECTLY HAZARDOUS TO PERSONNEL.

**NOTE:** A Note provides important additional information but is not safety related. The hand icon may not always be shown depending on the importance of the Note. A Note with a hand icon indicates that you should take particular notice of the information provided.

### 1.2 Lethal Voltages

**WARNING:** LETHAL VOLTAGE. DANGEROUS VOLTAGES ARE PRESENT IN THIS EQUIPMENT WHEN ELECTRICAL POWER IS APPLIED. THERE IS A DANGER OF DEATH OR INJURY FROM ELECTRIC SHOCK.



UNDER NO CIRCUMSTANCES ARE YOU TO ATTEMPT TO OPEN THE SCREEN DOOR OR THE BACK ACCESS DOOR AND REMOVE OR ADJUST ANY COMPONENTS FITTED WITHIN THE PRINTER.

ONLY FULLY TRAINED OPERATORS OR APPROVED SERVICE ENGINEERS ARE QUALIFIED TO OPEN THE FRONT INKSYSTEM DOOR WHEN ADDING INK OR SOLVENT, ONLY FULLY TRAINED EC-JET APPROVED SERVICE ENGINEERS ARE QUALIFIED TO OPEN THE THE SCREEN DOOR OR THE BACK ACCESS

DOOR TO MAINTAIN OR ADJUST THE INTERNAL PARTS.

### 1.3 Operation

All users operating the printer must be aware of the following hazards associated with ink jet printers.

The following safety information should be made available to all personnel and is applicable to anybody in the printer's operating environment. Only fully trained and competent personnel should operate or maintain EC-JET printers. If you are in any doubt as to your ability to operate or maintain the printer, did not hesitate to consult your supervisor for guidance or contact your local EC-JET distributor who will be happy to advise you.

1. Don't smoke or use naked flames in the vicinity of the printer. The printer contains flammable inks and solvents.
2. Always ensure that the printer electrical supply is isolated prior to performing cleaning or maintenance activities. Lethal voltages are present in the printer cabinet and printhead when mains power is applied which can cause death or serious injury if the correct electrical procedures are not observed. When a main operated external alarm is connected to the external alarm socket, this must be disconnected before any maintenance activities are carried out.
3. Only the fully trained operators or service engineers qualified to open the front ink system door to add the ink or solvent. Only fully trained EC-JET approved service engineers qualified to open the screen door or the back access door
4. Always check that all covers are correctly fitted and all doors are closed before you use it. If you are not sure, ask your supervisor for guidance. Covers act as safety barriers and also ensure the printer retains its electromagnetic compatibility.
5. It is recommended that the printer is situated at least 600 mm from floor level for your comfort.

### 1.4 Inks and Solvents

Whenever inks and solvents are used, safety eyeglasses to the appropriate European and International Directives must be worn. Solvent resistant gloves must be worn when contact with inks or solvents is likely.

The effects of solvents and inks are potentially harmful. Prior to use, ensure the printing area is properly ventilated and the Material Safety Data Sheets have been read and fully understood. If you are unsure, contact your supervisor for guidance.

If the Material Safety Data Sheets have not been supplied or are not available, please contact your local EC-JET distributor. Always refer to the Material Data Safety Sheets before working with inks and solvents.

Store all inks and solvents in original containers, in a well-ventilated cabinet and away from heat sources. Ensure all spilt ink or ink deposits are removed immediately using the correct solvent for the ink used.

## 1.5 First Aid

Ensure that first aid information is readily available in the event of ingestion, inhalation, or contact with the skin or eyes. Ideally all operators should be trained in First Aid and should be aware of the effects of working with flammable and toxic substances. All operators should have access to the ink and solvent Material Safety Data Sheets, which explain the hazards and medical action to be taken if first aid is necessary.

### 1.5.1 Eye Contact

Flush eyes using clean running water for a minimum of 10 minutes. Obtain immediate medical attention.

### 1.5.2 Skin Contact

Remove any contaminated clothing and wash the affected skin area thoroughly with proprietary cleaner. Do NOT attempt to use solvents to remove ink from skin.

### 1.5.3 Inhalation

Evacuate the person into a fresh air environment. If the person experiences any difficulty in breathing, obtain immediate medical attention.

### 1.5.4 Ingestion

Do not induce vomiting; obtain immediate medical attention and give the casualty half a litre of water to drink.

## 1.6 In Case of Emergency

If the printer needs to be stopped quickly due to an emergency, press the red [stop] key on the printer to stop the printing and switch the printer power switch on the rear panel of the printer to the 'O' (off) position. Call for medical assistance as required.

## 1.7 Noise Emissions

The noise emission level from this printer does not exceed 70 dBA. This means that there is no hazard to hearing and, therefore, no legal requirement for ear protection to be worn when working in the vicinity of this printer.

## 2. Introduction

A Safety section has been provided at the front of this manual for your use. You are strongly advised to read the Safety section carefully before attempting to use the EC-JET printer.

### 2.1 Printer System Overview

The EC-JET printers provide a means of application of printed information onto a wide range of products. This information would typically be the date, production codes, consumer information, product or corporate identification, product traceability, and many others. It can be widely used in pharmaceutical, chemical, food, construction materials, tobacco, ceramics, electronics and other industries.

The printer is normally fixed to a production line in such a way that printing takes place as the product passes the print head. The presence of the product and printing can be synchronized using a product detecting sensor.

The printer consists of a cabinet and a print head. The cabinet houses the electronics module, the ink system, a power supply and a message screen display. The print head is attached to the rear of the cabinet via a flexible conduit.

The print head is supplied with ink by the ink system which the print head forms into a continuous stream of ink drops which recycle to the ink system. When printing is required, drops of ink for printing the message are deflected from the stream out of the print head onto the product, providing a non-contact method of printing. The process is controlled by the electronics module which also stores the messages to be printed. The message is programmed using the touch screen.



## 2.2 System Description

The EC-JET printers are designed to provide versatile, uninterrupted operation in factory environments. The models available, together with available raster types and compatible print heads are as follows:

PRINTER MODEL	PRINTERHEAD TYPE	RASTER TYPE	CHARACTERS
EC-JET 1000Pro	60µm	7 Dot Standard Speed	5、 7
		9 Dot Standard Speed	5、 7、 9
		12 Dot Standard Speed	5、 7、 9、 12
		16 Dot Standard Speed	5、 7、 9、 12、 16
		24 Dot Standard Speed	5、 7、 9、 12、 16、 24
		24 Dot High Quality	5、 7、 9、 12、 16、 24
		25 Dot Standard Speed	5、 7、 9、 12、 16、 24

### 2.2.1 Operating Simplicity

Easy start-up and shutdown requires minimal operator intervention. Messages are easily created using the built-in QWERTY keyboard, and the printer offers print adjustment and message editing facilities.

### 2.2.2 Diagnostics

A comprehensive diagnostics package is built into the printer to enable problems to be identified and rectified quickly.

### 2.2.3 Print head Design

The print head is robustly designed for industrial environments. It is hermetically sealed and is permanently attached to the printer itself by a 2 metres length of conduit.

### 2.2.4 Printing Drops

To form a printed pattern, each drop must be directed to a different place on the product being printed. To achieve this, the drops pass through a charge electrode (within the print head), which applies a different charge to each drop. This causes the flight path of the drops to differ as they travel between two deflector plates. When the drops reach the product, they form one line of drops called a raster. As the product passes under the print head, rasters are laid down side by side to form the printed message.

### 2.2.5 Leaving Gaps

Unprinted drops in a raster carry no charge and are therefore not deflected. These drops are captured by a gutter in the print head, and returned to the ink tank. Gaps between raster (perhaps to separate

readable characters) are created by the printer simply not printing a raster as the product continues to move past the printhead.

### **2.2.6 Detecting Products**

A photocell or product detecting sensor is used to inform the printer when the product has been detected. After a predefined delay, the first raster of the pattern will be printed, followed by the remaining rasters of the pattern, as described above.

### **2.2.7 Conveyor Speed**

For production setups using a conveyor, variation in conveyor speed can produce variation in the appearance of the printed message. If the product is moving very slowly, the rasters could be printed too close together and the characters formed would be too thin. Conversely, if the product is moving very fast, the rasters could be printed too far apart, resulting in unprinted gaps between the rasters. This problem is overcome by either varying the print width (through a user menu option) to match the production of rasters with the conveyor speed, or by using a shaft encoder to control the rate at which each raster is printed in relation to the conveyor movement.

### **2.2.8 Ink Blockage Prevention**



It is essential to use the correct solvent for the ink being used, i.e. the solvent used in the ink base: MEK solvent for MEK based ink, ETHANOL solvent for ETHANOL based ink, etc.

The principle of continuous ink jet printing has proved to be the most effective means of printing with an ink which is required to dry instantly, within a second, on almost any surface.

### **2.2.9 Blockages**

If ink is required to dry on the product it will also have a tendency to dry in the printer, with a possibility of causing a blockage.

The continuous ink jet printer overcomes this problem by continuously producing the print drops in operation. Although the ink is evaporating quickly during this process, it does not cause a nozzle blockage, as there is a constant replacement of ink in the nozzle.

### **2.2.10 Automatic Cleaning at Shutdown**

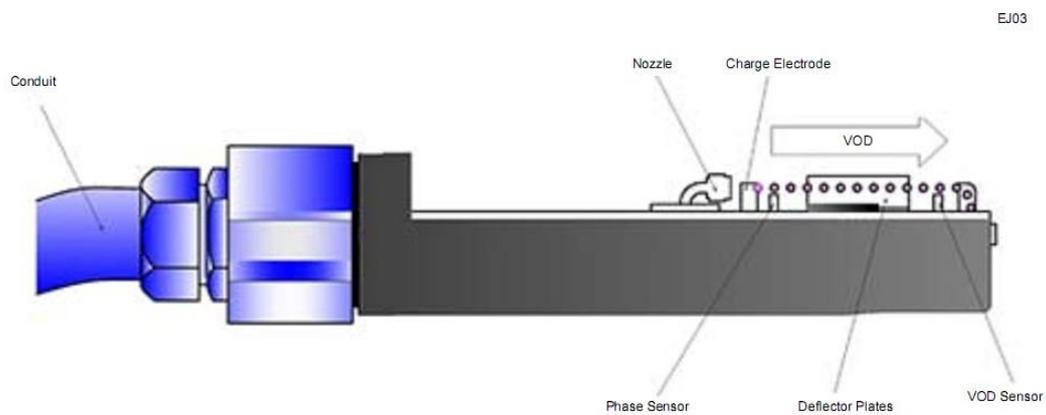
A potential problem arises on shutdown when ink is left in the nozzle; as it is fast drying it will soon dry and clog up the nozzle. To overcome this, special procedures to clear the nozzle are necessary.

With EC-JET printers the clean-up procedures at shutdown are achieved by an automatic flushing system. On shutdown, the ink is removed from the ink nozzle assembly by suction through a purge line. Just prior to shutdown, a solvent flush system introduces solvent into the printhead, and runs solvent through the nozzle and gutter, thus clearing ink from these vital components. This automatic procedure makes it unnecessary to clean the printhead for shutdown.

### 2.2.11 Velocity of Drop

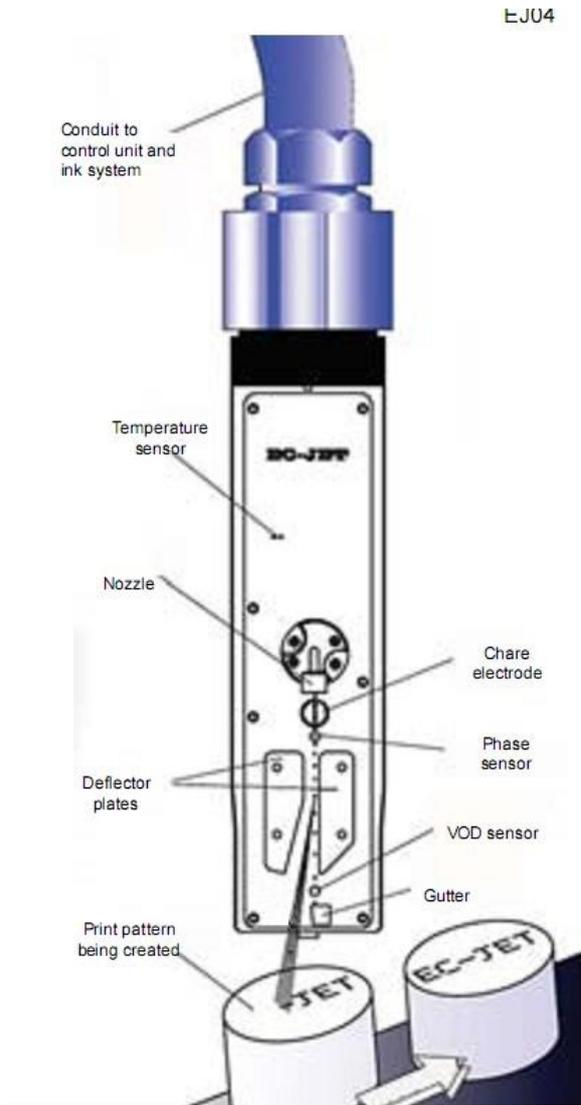
Ink velocity can impose a minor change in the mass of a drop, which will affect the final printing position of the drop. However, precise placement of drops is more dependent on the speed of the drops as they travel through the deflector plates;

For this reason, the velocity of drop (VOD) is constantly monitored and compared with the optimum (VOD reference) value printed on the print head conduit. A “feedback loop” is used to increase or decrease ink pressure, thus maintaining the correct speed of drops for accurate placement and therefore quality of print. The following illustrates principle:



### 2.3 Principles of Operation

A conducting ink is supplied under pressure to an ink gun and forced out through a small nozzle of typically 40 to 70 micro diameters. As it passes through the nozzle the liquid is piezo-electrically pulsed (modulated) and the stream breaks up into a continuous series of drops which are equally spread and are of the same size.



Surrounding the jet at the point where the drops separate from the liquid stream is a charge electrode. A voltage is applied between the charge electrode and the drop stream. When the drop breaks off from the stream it carries a charge proportional to the applied voltage at the instant at which it breaks off. By varying the charge electrode voltages at the same rate as the drops are produced, it is possible to charge every drop to a predetermined level.

The drop stream continues its flight and passes between two deflector plates which are maintained at a constant potential, typically plus and minus 5 kilovolts. In the presence of this field a drop is deflected towards one of the plates by an amount proportional to the charge carried. Drops which are uncharged are unselected and are collected by a gutter to be recycled into the ink tank. Those drops which are charged, and, therefore, deflected, are printed on the substrate, which is travelling at a certain degree and speed to the direction of the drop deflection.

By varying the charge on the individual drops, whatever pattern is required (including alphanumeric characters) may be printed. A series of

drops deflected across the substrate is known as

a raster.

### 3. Controls and Indicators

#### 3.1 Getting Started

This section of the manual is intended to help you understand the setting-up of the printer and tells you how to switch it on, program a simple message, start the printer jet, print the message and stop the printer.

Apart from familiarizing you with the machine and some of the most frequently used software, it will enable you to verify that all is well and the printer and accessories have reached you in good condition.

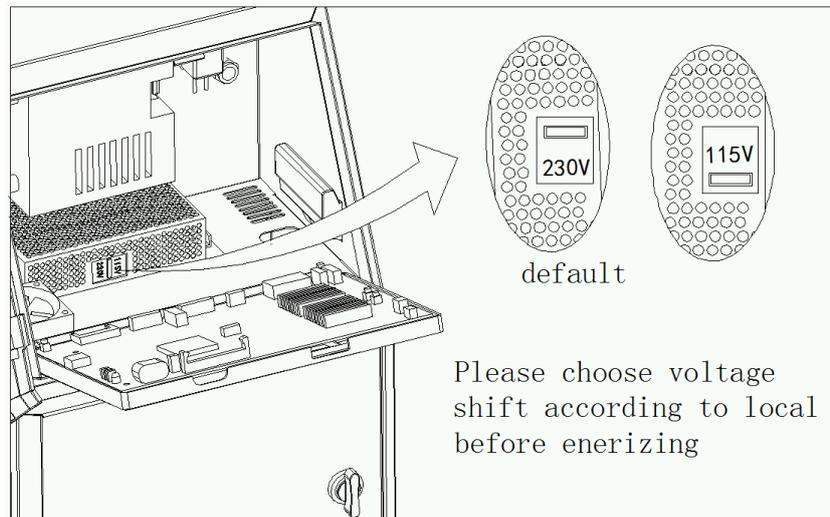
#### 3.2 Installation

The printer should always be installed by a fully trained, EC-JET approved, service engineer. Guarding and safety interlocks should all be in place and working correctly. EC-JET can accept no liability for damage to either machine or personnel in the event of the printer being installed, moved or maintained by unauthorized and/or untrained personnel.

If the printer is relocated or changes to the production line are made, information on how to install and set up the printer can be found in "Appendix 1: Installation and Setting Up".

EC-JET printers can be fit to a single-phase 50/60 Hz AC power supply of 115V or 230 V.

Switch on the right voltage before power on, the shift button can be found as the picture shows:



There are two types of power supply:

115V for the range of 85-132Vac, 50/60Hz

230V for the range of 170-264Vac, 50/60Hz

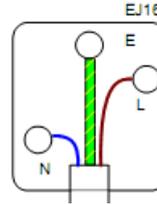
**NOTE: Disconnect the power supply plug before your switch on. Use a flat screwdriver to switch.(the figures shown on the PSU value )**

Input current: < 2.00A@115Vac, < 1.20A @ 230Vac

### 3.3 Connection

Before connecting to the power supply, make sure the ON/OFF switch is in the OFF position. The wires in this electrical supply lead are colorized in accordance with the following code:

GREEN-YELLOW	EARTH (E)
BLUE	NEUTRAL (N)
BROWN	LIVE (L)



**WARNING: THIS PRINTER MUST BE EARTHED. THIS PRINTER MUST ONLY BE WIRED BY A QUALIFIED ELECTRICIAN. EC-JET CAN ACCEPT NO RESPONSIBILITY FOR ANY DAMAGE CAUSED TO EITHER MACHINE OR PERSONNEL DUE TO INCORRECT OR FAULTY WIRING.**

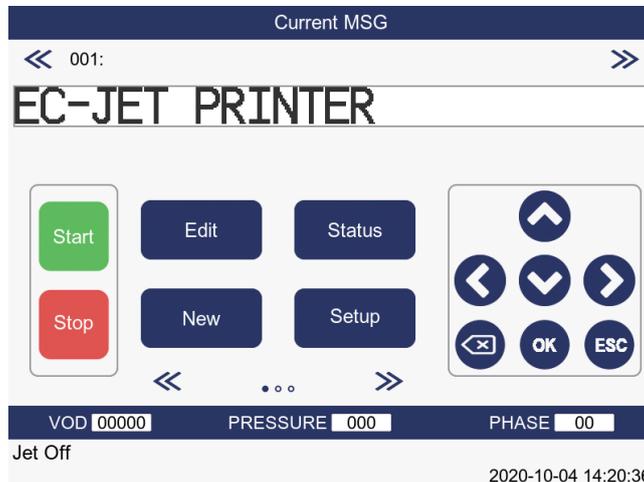
#### 3.3.1 Switch on the printer

Plug the printer into a suitable supply and switch the printer power switch at the rear right of the machine to on.

The following screen is displayed when power is switched on:



There will be a delay of a few seconds while the computer logic carries out internal checks. When these checks are complete, the following display will be seen:



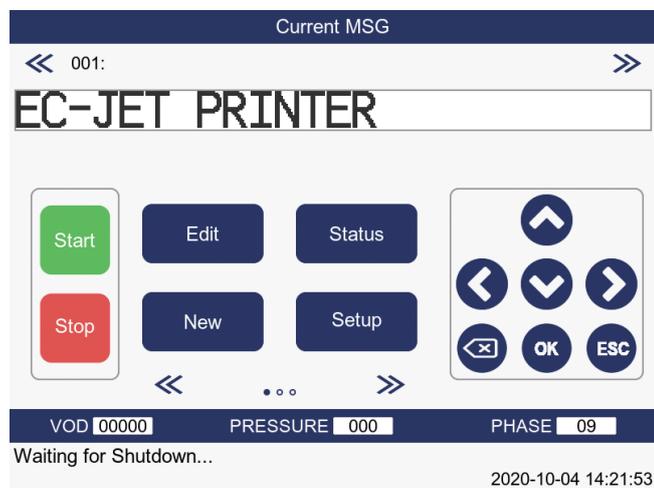
### 3.3.2 Start and Stop keys

#### Start Key

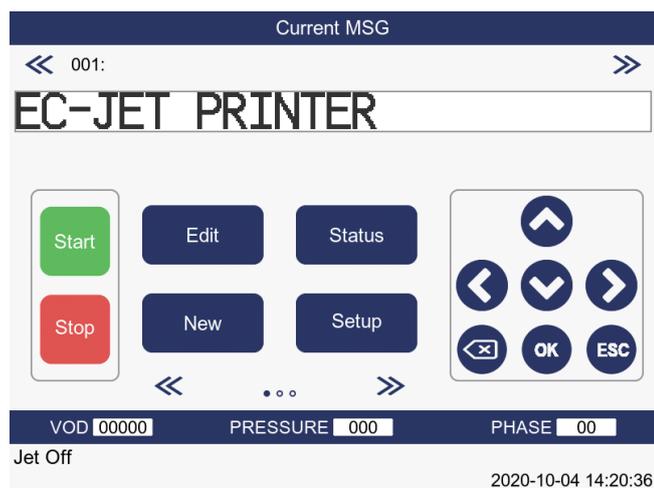
This initiates the start-up sequence which is responsible for carrying out internal checks and regulating the ink flow until it is ready for printing.

#### Stop Key

This initiates the shutdown sequence which purges the nozzle of ink and automatically carries out procedures to clean the nozzle. This prevents a potentially serious blockage of the nozzle caused by dried ink. Simply press the [stop] key and the printer will initiate the shutdown sequence, which takes approximately 3 minutes. While the machine is shutting down, the following message will appear in the status line of the screen:



When the printer has finished the shutdown sequence, the following message will appear in the status line of the screen:

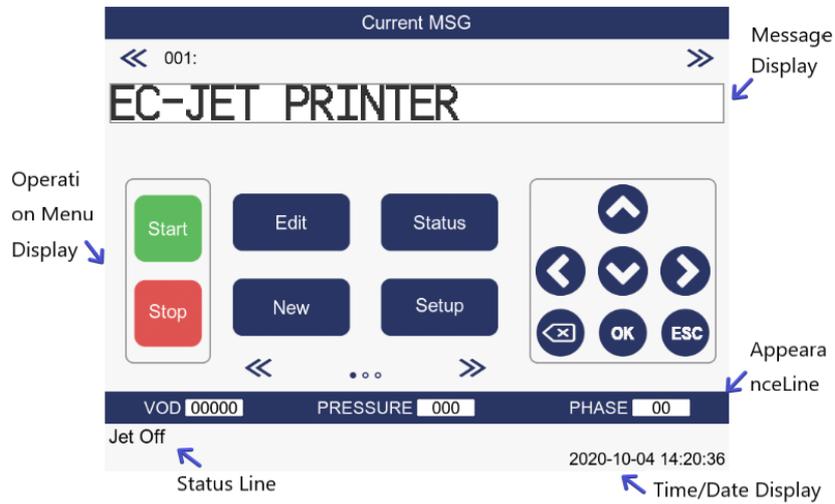


The machine may now be switched off by the power switch at the rear of the printer.

**CAUTION:** Never switch off until the printer tells you to do so when it displays: "Jet Stopped: You may

now switch off", in the status line of the screen. Whenever the Start or Stop keys are pressed, the CURRENT MESSAGE screen is displayed.

### 3.4 Screen Display



#### Message Display

This part of the display area is used for displaying, creating and editing messages to be printed.

#### Operation Menu Display

This is used to display the operation message.

#### Appearance Line

This is used to display valve of VOD, pressure and phase.

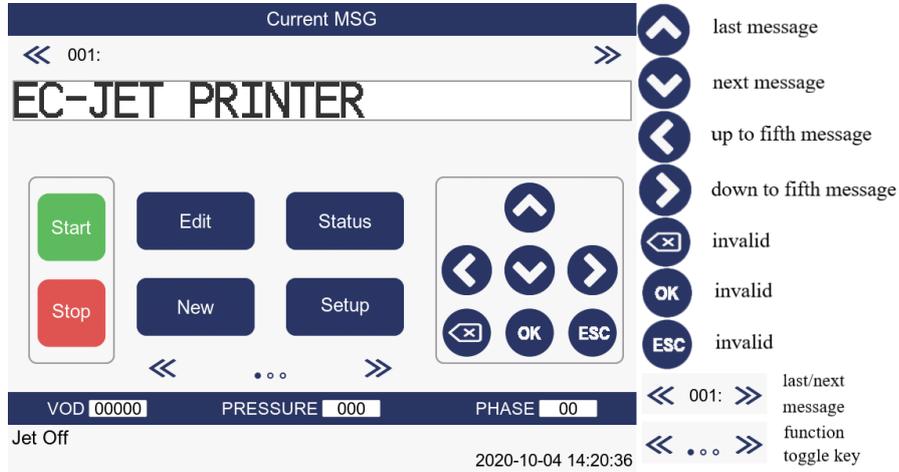
#### Status Line

The status line is present in all menu displays. It is used to convey warning messages and print failure conditions, to the operator.

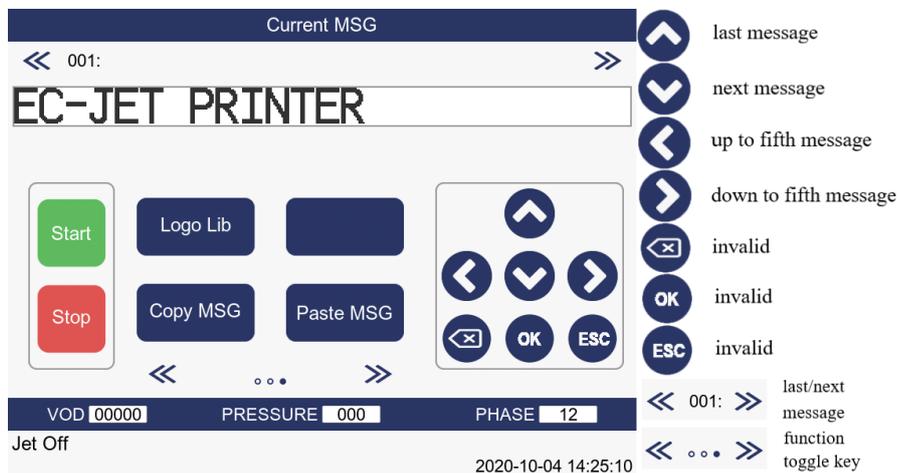
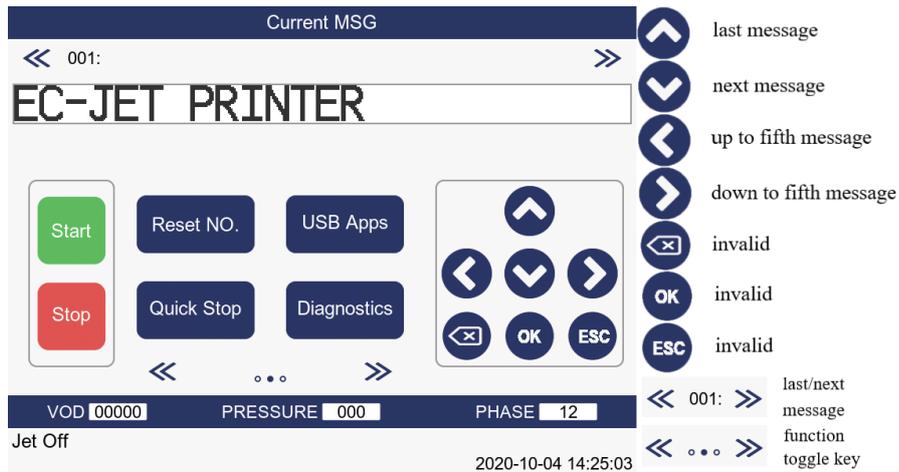
#### Time / Date Display

This displays time and date.

### 3.4.1 Display Brief Introduction



<< ... >> This button is to shift the functions and data shown in the OPERATION MENU. As below pictures:



### 3.4.2 Cursor Control Keys

The left/right arrow keys are used to scroll through the multiple choices/values of a menu option.

The up/down arrow keys are used to select messages and move up and down through the options of a menu.

The cursor keys are also used to move the edit cursor when creating or editing patterns to be printed.



### 3.4.3 Text Control Keys



This key is to lock the keyboard into upper case and type upper case (Capital) characters.



This key is to delete the character at the current cursor position without moving the cursor.



This key is to shift the typing mode to Number and Character.



This key is to shift the typing mode to English.



This key is to display and undisplay the QWERTY keyboard.

### 3.4.4 General Control Keys



This key is to return you to the previously selected menu.



This key is to tell the printer that you have finished making your selection and you want the printer to act upon it.

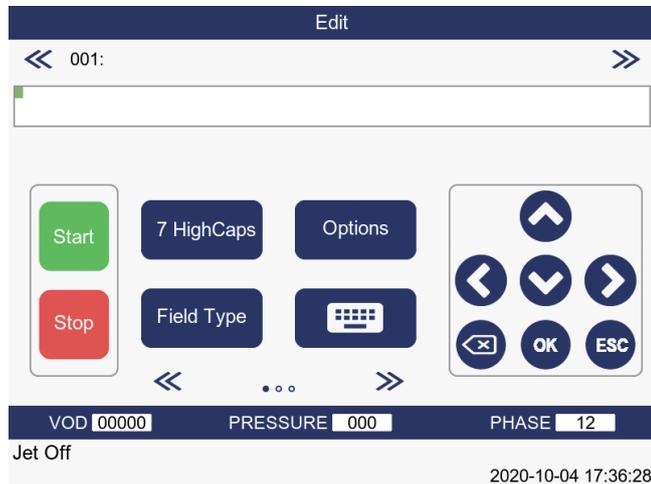
### 3.5 Creating a Simple Message

If there are no messages stored in the printer memory, selecting : New Message from the “CURRENT MESSAGE” screen will display the “MESSAGE HEIGHT” menu:



Select the raster type you require by moving the cursor next to it and press   for more raster type, then pressing .

The EDIT MESSAGE screen will then be displayed:



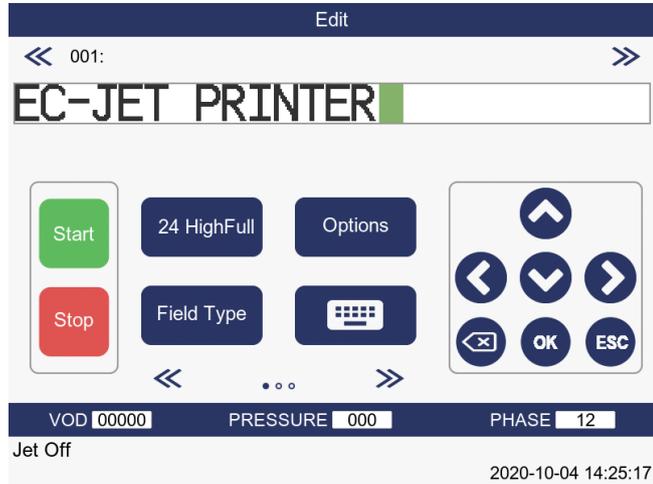
Type in your message which will appear in the message area of the display, then press  key when you have finished.

The character set can be altered by pressing . Each time  key is pressed, a different character is selected.

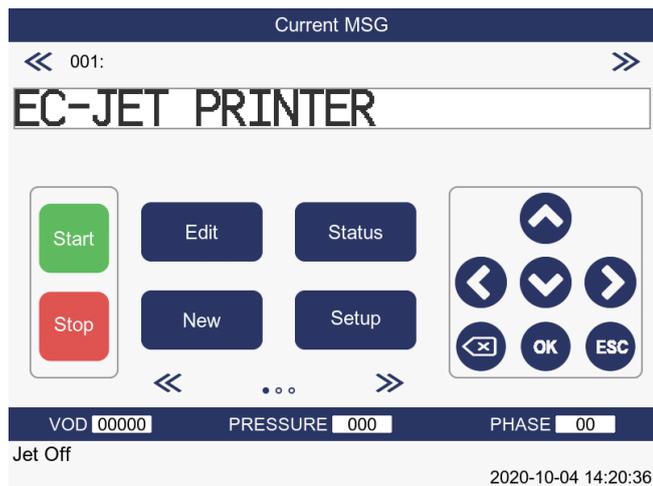
You can use the Field Type function to include a time, date or sequential count, by pressing .

 key. This option is fully described later. See “Using the System”.

In the following example, the simple message "EC-JET PRINTER" has been typed:



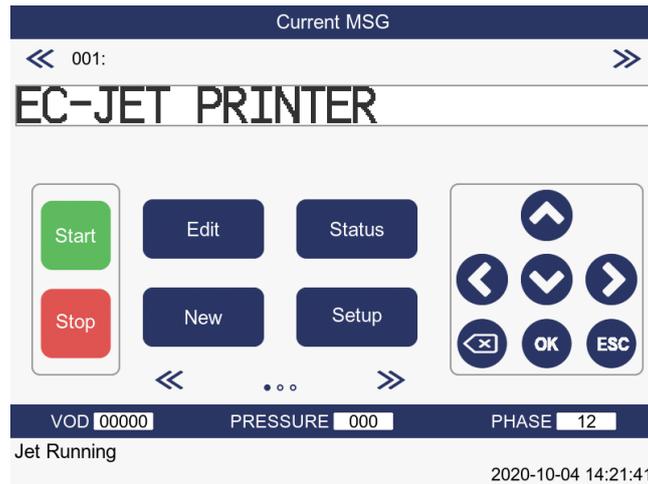
Press  key to exit the EDIT MESSAGE screen and the CURRENT MESSAGE screen will be displayed:



Now Press  key on the keyboard, the following message will be displayed in the status line:

**“Starting Jet: Please Wait”**

When the system is ready to print, the message will disappear and the function key assignments will change as shown below:



**NOTE:** Printing will stop but the jet will remain running.

## 3.6 Advanced Editing Features

To make editing easier and give further control over the appearance of messages, there are a number of extra features available from the keyboard.

### 3.6.1 Moving to Pixel (Drop) Locations

Each character of a message is made up of a number of drops. Each drop is called a pixel.

Press **<< ... >>** key, and **<< ... >>** will be displayed, then press **<** key or **>** key, cursor will move one pixel each time.

This is useful when the spacing between characters needs to be adjusted to improve readability and/or appearance. Also, this makes it possible to adjust the position along a vertical axis, perhaps to centralize a 7 high field against a 16 high field.



### 3.6.2 Moving to the Beginning of Message

In the Editable condition, press **<< ... >>** key twice, and **<< ... >>** will be displayed, then press **<** key or **>** key, cursor will move 20 rasters backward.

### 3.6.3 Quick shifting the Character Font or New line

In the Editable condition, press **<< ... >>** key to shift the first character (between English and Chinese) or to begin a new line, which improves the speed of character shifting or new line beginning.

### 3.6.4 Quick selecting the message with Arrows Key

 or  This key is to turn 5 messages at one time to leftward or rightward.

 or  This key is to turn 1 message at one time upward or downward.

### 3.6.5 Copying and Pasting the Message

Press  key twice, and  will be displayed, there are two options in the menu:

 and , press  key to copy the message needed. Move to the certain section where you want to put the message, press  key twice, and  will be displayed, press  key to paste the message and its setting.

## 3.7 Starting the Printer

Set the printhead and the printing distance, start the conveyor and then press the  key to print.

If all the settings are correct, the printing performance will be good.

If the printing is not so good, see “Troubleshooting” and check all the setting.

Contact with your EC-JET Distributor if there is any identified failure.

## 3.8 Stopping (switching off) the printer

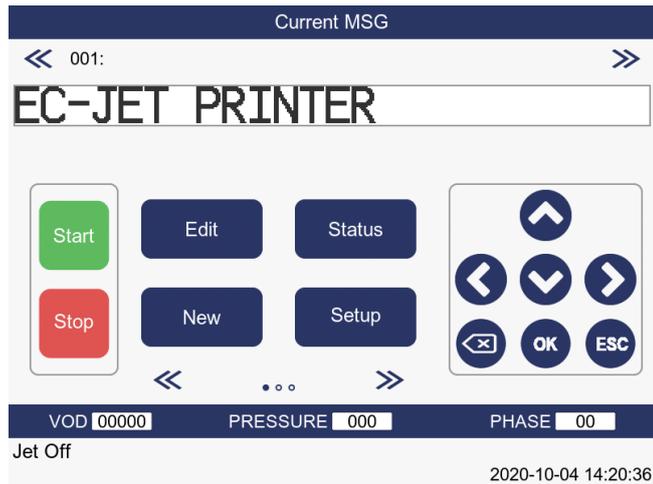
Caution: Never switch off until the printer tells you to do so when it displays “Jet Stopped: You may now switch off.” Otherwise, it may lead to the print head failure. System should be reset completely if there is any working failure.

Press  key and the printer will initiate the shutdown sequence, which takes approximately 3 minutes. While the machine is shutting down, the following message will be displayed in the status line:

**“Stopping Jet: Please Wait”**

Wait for the system to carry out its shutdown functions, which among other things, includes cleaning the nozzle of the print head.

When the printer has finished the shutdown sequence, the following message will appear in the statue line of the screen:



The machine may now be switched off by the power switch at the rear of the printer.

### 3.9 Passwords

The PASSWORD menu will be active if the password function has been turned On in the SETUP menu (see “Changing the System Setup”).

Press the  key in the CURRENT MESSAGE screen to enter the PASSWORD menu:



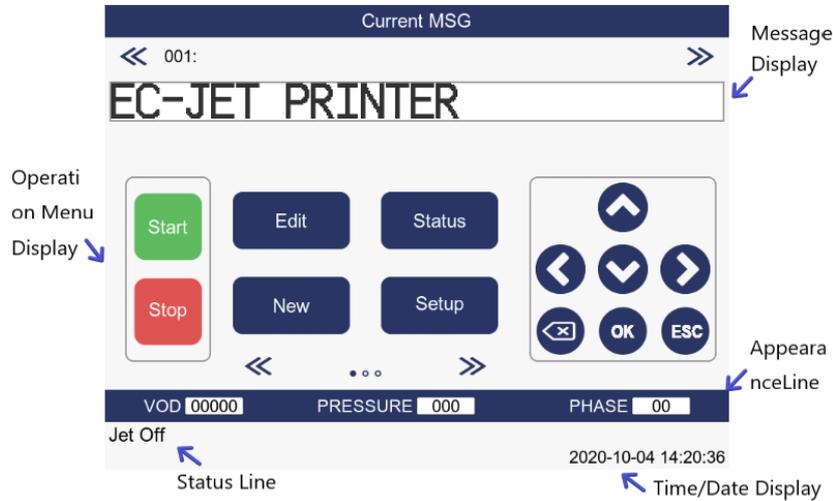
Type in the password and press the  key.

It is recommended that you continue to use these passwords, but you may wish to use the Change Password option of the SETUP menu to alter the passwords (see “Changing the System Setup”).

### 3.10 Screen Calibration

After the machine start up, click CURRENT MESSAGE on the top of the screen to enter SCREEN CALIBRATIO. Please note that the Screen Calibration function can only be operated when JET STOP.

## 4. Using the System



### 4.1 Moving around the Menus

The CURRENT MESSAGE screen is the first to be displayed after the start up procedure has been completed, and at this stage it is necessary to press one of the function keys  ,  ,  and  ) to select the appropriate menu.

### Selecting Menus

Menus are selected either by pressing a function key (as described above) or, in some cases, a further menu may be selected in response to a menu option being selected. For example, you will see later that by selecting the Change Language option of the SETUP menu, a menu entitled CHANGE LANGUAGE will be selected. This is to prompt you to choose which language you wish the system to use.

#### Menu Options

Each option of a menu is preceded by either a black or white “bullet”. A black bullet indicates the option can be selected. A white bullet indicates the option is for display only and cannot be altered.

For example, some options can be selected during message creation but not message editing. Similarly, the Set Time option in the SETUP menu cannot be used when the printer is printing.

#### Locating menu options

Menu options are located by scrolling up or down by using   keys.

#### Selecting and changing options

When the menu cursor is pointing to the required option, the option is selected by pressing the  key.

If the option is a direct command (e.g. Print Height from the SETUP menu), the command will be executed.

Normally however, menu options show a value on the right of the display, separated by a colon. When

the  key is pressed on such a menu option, the menu cursor will move right to replace the colon, and the value will be highlighted. At this point, the new value can be typed in from the keyboard and press

 key to enter the new value. Or press  key to go back to the previously selected menu.

The system will validate the change and reject it if it is out of range or the wrong type of data (numeric data in an alphabetic field, and vice versa).

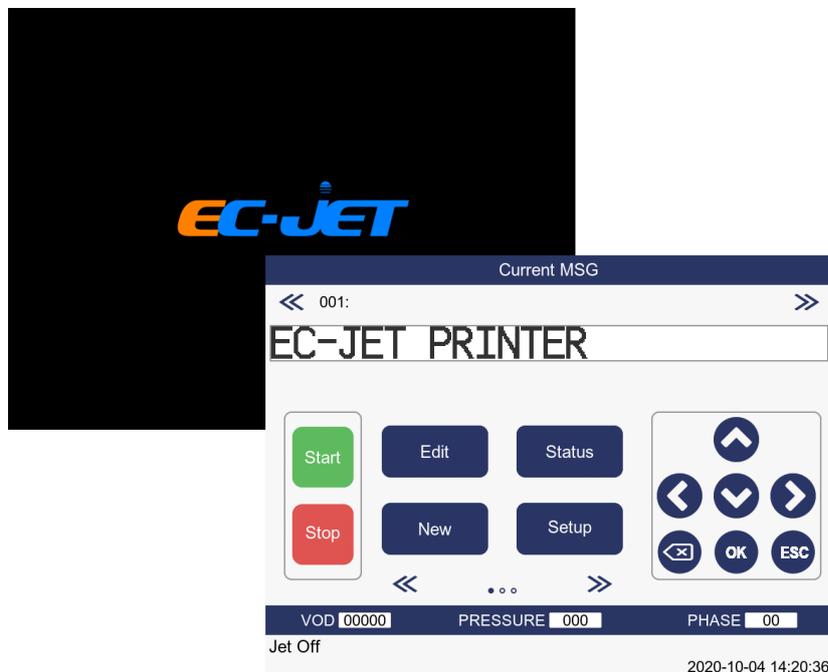
In some instances, a set range of options is offered for selection, e.g. Sensor “Permitted”, “Out-source” or “Triggered”.

In these cases, the left and right arrow keys are used to select the desired option and then the  key is pressed as described above.

## 4.2 Select and edit

### 4.2.1 Current Message Screen

After switching the printer on, the title screen will be displayed, followed shortly afterwards by the CURRENT MESSAGE screen.



Edit

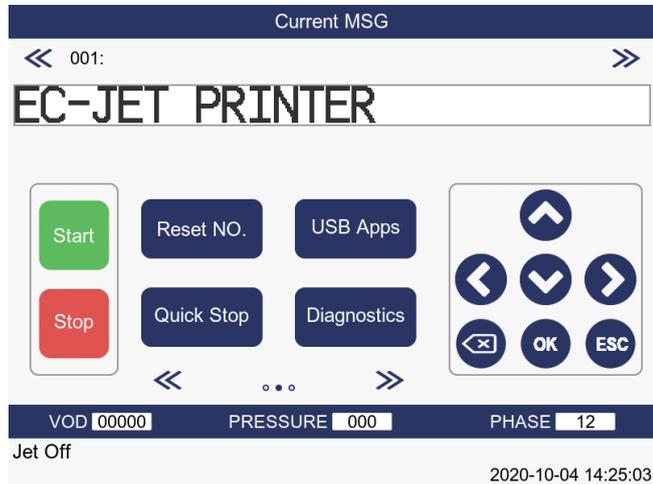
This will display the EDIT MESSAGE screen.

Status

This will display the PRINT STATUS screen.

**New** This will display the MESSAGE HEIGHT menu.

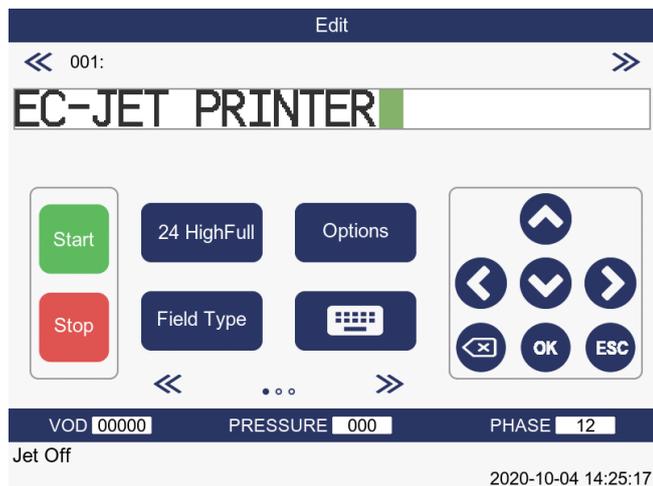
**<< ... >>** This will shift the functions (Sequential Number, Screen Lock, Quick Switch Off and Diagnosis) quickly. The current menu will be displayed:



**<< ... >>** this will support quick copy and paste if pressed twice.

#### 4.2.2 Editing a Message

To edit a message, press the arrows until the message for editing appears on the screen (up/down arrow to move a piece of message and left/right arrow to move 5 pieces of messages). Press **Edit** key to edit the message see “Creating a New Message” and “Editing a Message”.



**24 HighFull** This key is to set the font.

**Options** This key is to toggle bold on or off.

**Field Type** This key is to insert time, timed message, sequential number, date, logo, remote and

more.



This key is to set Chinese character input mode.

## 4.3 Checking the Current Status of the Printer

The EC-JET printer provides two on-screen visual guides as to its current status (condition) – the System Status Line and the PRINT STATUS screen.

### 4.3.1 System Status Line

#### System Failures

System failures occur when a condition is detected that prevents normal printer operation.

If a System Failure message is displayed, contact your local distributor immediately. Note any information from the display as this will help diagnosis of the problem.

#### Print Failures

Print Failures occur when a condition is detected that affects printing.

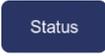
If a Print Failure occurs, a message is displayed on the System Status Line and, if the jet is running, a jet shutdown sequence is started.

#### System Warnings

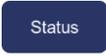
System Warnings inform the user of problems which may affect the operation of the printer but are not serious enough to turn off the printer. However, they should be acted upon at the earliest possible opportunity.

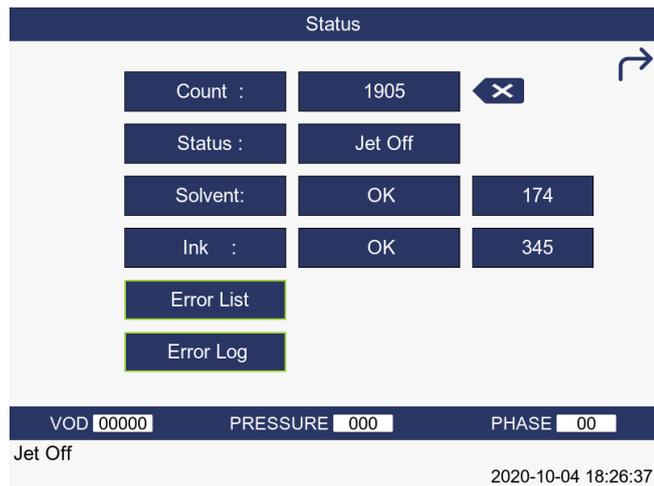
### 4.3.2 Print Status Screen

The PRINT STATUS screen shows the current state of the printer with respect to jet status, ink and solvent levels and print count, and lists errors logged in the system.

The PRINT STATUS screen is accessed by pressing  the F2 key from the CURRENT MESSAGE screen. (See “Using the System” - “Checking the Printer Status”)

## 4.4 Checking the Printer Status

To check the current printer status, press the  key from the CURRENT MESSAGE screen.



**Error List**

Shows the warning message of the printer.

**Count**

Shows the number of prints made by the printer.

This value can be reset to 0 (zero) from the SETUP menu (see later “Changing the System Setup”)

**Status**

Show the operational status of the printer.

“Jet Off” – The jet has been stopped.

“Jet running” – The jet is running but printing is stopped.

“Printing” – The jet is running and the printer is ready to print.

**Ink**

Show status of ink level check:

OK – Ink level is acceptable.

LOW – Add one bottle of ink  
(see “Routine Maintenance”)

**Solvent**

Shows status of solvent level check:

OK – Solvent level is acceptable.

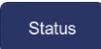
LOW – Add one bottle of solvent.  
(see “Routine Maintenance”)

The ink and solvent levels should show OK. If not, they must be refilled with the correct ink or solvent.

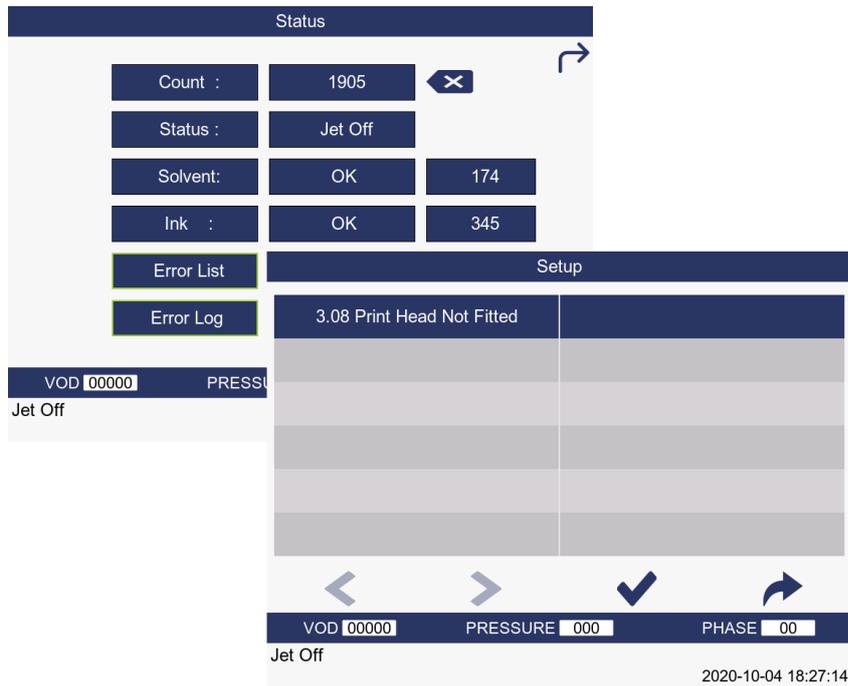
CAUTION: Only One bottle of APPROVED Ink or Solvent (500ml) should be added when the level is reported Low. If the level is still reported LOW after adding one bottle of ink or solvent, it could be that the level sensors are faulty. In this case you should contact your local EC-JET distributor.

## 4.5 Listing Error Messages

The printer maintains a current error list. This list will display any errors which have occurred since the printer was switched on and is a record of the errors reported on the status line of the display. The

ERROR LIST menu can be viewed by pressing  from the CURRENT MESSAGE screen to

display the PRINT STATUS screen, then press **Error List** to display the ERROR LIST menu.



The errors in the ERROR LIST menu will be deleted automatically when the power is switched off, after shutdown or when the error is cleared. (For a detailed list of the different error messages and their meanings, see “Error Messages”).

## 4.6 Password

If the password option is turned to Off a User Level 1, then only User Level 1 options will be displayed until a higher level password has been entered.

### 4.6.1 Password Level

#### Basic level

This is the default level when the password isn't known. The user can only perform simple operations such as start, stop and check status.

#### User Level 1

The user has restricted access to the SETUP menu. Allowed to change Level 1 password only.

#### User Level 2

The user has full access to the SETUP menu. Restricted access to the DIAGNOSTICS menu is allowed. Full access to all user menus and functions is allowed. Allowed to change User Level 1 and User Level 2 passwords.

Setup Menu Options	USER LEVEL 1 PASSWORD			USER LEVEL 2 PASSWORD		
	Jet Off	Jet Running	Printing	Jet Off	Jet Running	Printing
Password	●	●	●	●	●	●
Print Height	●	●	●	●	●	●
Scale Height	●	●	●	●	●	●
Print Width	●	●	●	●	●	●
Print Delay	●	●	●	●	●	●
Print Count	●	●	●	●	●	●
Reverse Message	●	●	○	●	●	○
Bold Ratio	●	●	○	●	●	○
Set Time	●	●	○	●	●	○
Set Date	●	●	○	●	●	○
Aux In	○	○	○	●	●	○
Photocell	●	●	○	●	●	○
Shaft Encoder	●	●	○	●	●	○
Conduit Length	—	—	—	●	○	○
Head Height	—	—	—	●	○	○
Print Head Code	—	—	—	●	○	○
Ref Modulation	—	—	—	●	●	●
Ink Selection	—	—	—	●	○	○
Calibrate Print Head	—	—	—	○	●	●
Alarm Warning	—	—	—	●	○	○
Change Password	—	—	—	●	●	●
Change Language	—	—	—	●	●	○
Remote Setup Menu	—	—	—	●	●	●
Diagnostic Menu	—	—	—	●	●	●
Solv Add Time	—	—	—	○	○	○

## 4.6.2 Password

The PASSWORD menu will be active if the password function has been turned On in the SETUP menu.

Press  key to enter the SETUP menu.

On: Enable password

Off: Disable password

Can be turned to Off so the user can enter and exit menus at will without having to use the password. If the password option is turned to Off at User Level 1, then only User Level 1 options will be displayed until the higher level password has been entered. This value is retained on switching off the printer.

## 5. Creating, Editing and Deleting Message Fields

### 5.1 Introduction

#### 5.1.1 The message used has a complete mix of all field types:

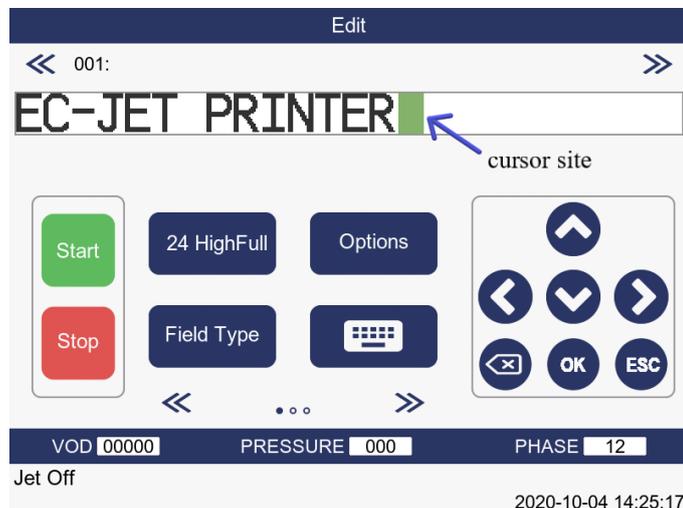
- Time
- Timed Message
- Sequential Number
- Date
- Logo
- Remote

Messages are created and edited using the EDIT MESSAGE menu. Creating text is simply a case of entering characters via the keyboard. Sequential numbers, times and dates are created by making

choices from menus displayed after pressing  for Field Type.

#### The Message Cursor

The message cursor is completely different to the menu cursor described earlier. Its position in a message is made visible by flashing the character it occupies, between normal and inverse display:

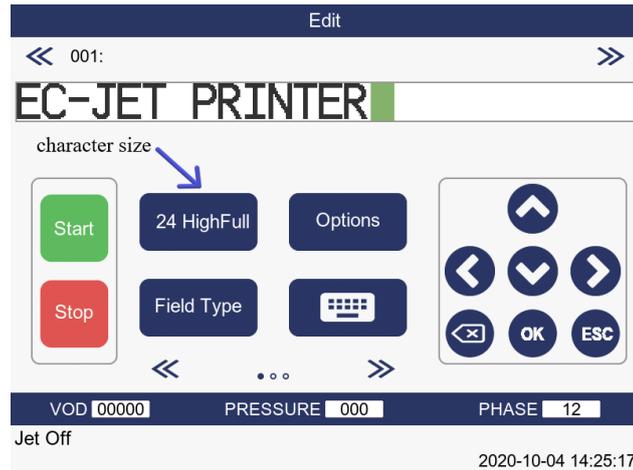


The cursor size will relate to the last selected field. This means that its size will remain fixed, even as it moves through fields of different character heights. As soon as a field is selected (by pressing the “enter” key), the cursor will readjust to the character size of the selected field.

#### Character Height

Before creating a field, the character height of the field must first be set by choosing the character type

from those available. This is achieved by pressing the  key of the EDIT MESSAGE menu until the desired character is displayed:



The character sets available in Chinese as follows: 7 Chinese, 9 Chinese, 12 Chinese, 16 Chinese, 24 Chinese. The character sets available in English, number and symbol as follows: 5 High Caps, 7 High Caps, 9 High Caps, 12 High Caps, 16 High Caps, 16 High Full, 24 High Full, 32 High Full and Logo Edit. Note: The numerical value in each raster type and character set indicates the height of the printed characters in pixels (drops).

If  is pressed to create a new message, the message area is cleared, thus destroying the current message, and the message area of the EDIT MESSAGE screen would be empty.

As a precaution,  must be pressed a second time to confirm the message deletion.

## 5.1.2 Message Fields

### Date Fields

These are created by pressing  key from the Field Type menu of the EDIT MESSAGE screen. The format can be defined and an offset in terms of days can be applied so that sell or use by dates can automatically be calculated by the printer.

It is mostly like creating the date field. Press  key in the Field Type menu and selected "Create the Time Message Fields". Up to 10 timed messages can be stored in the system, each comprising up to 20 characters. Each message is assigned a time from which it is to be printed. It will continue to be printed until another timed message becomes due. This will then print until another timed message becomes due, and so on.

### Sequential Numbers

These are also created by pressing key  using a menu selected from the Field Type menu of the EDIT MESSAGE screen, the length of the numbers maximum 20.

The count(s) will increment each time a product is detected.

### Time fields

These are also created using a menu selected from the  menu of the EDIT MESSAGE screen. Similarly, the time format can be selected from a range of choices to suit requirements.

### Logo Fields

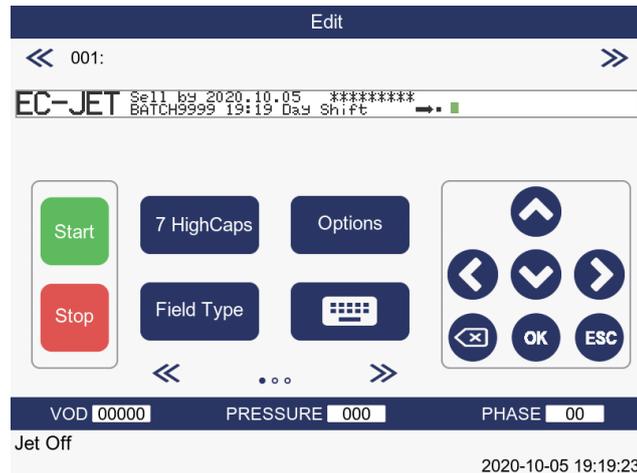
Only available if logos are included in the software. It enables logos to be placed into the message area.

### Remote Fields

A remote field reserves an area in the message for data to be entered from a remote computer and then print out the message.

## 5.2 Editing and Deleting Message Fields

An example message comprises all types of field is used here to show how to create and modify message fields:



The message used has a complete mix of all field types: Time, Timed message, Sequential Number, Date, Logo and Remote.

In the following pages, you will be shown how to use the message editing menus.

You may use the  key to delete the character immediately whilst typing the text at Text Field.

### 5.2.1 Editing Fields

A field may be edited by pressing the  key while the cursor is anywhere in the field.

### 5.2.2 Text Fields

The  and  can be used to move the cursor to a character in the field, change the message and press  key to delete the message.

### 5.2.3 Other Fields

When the key is pressed with the cursor anywhere in a Date, Time, Timed Message, Sequential Number, Logo and Remote field, the appropriate menu will be displayed. For example, if the key is pressed while the cursor is located in a Sequential Number field, the SEQUENTIAL NUMBER menu will be displayed:

Setup	
Current Number	0
Start Number	0
End Number	0
Accumulated Number	1
Number of Repeats	1
Repeats Count	0

<
>

VOD 00000
PRESSURE 000
PHASE 00

Jet Off 2020-10-05 18:15:29

The field can thus be altered in the same way it was originally created (see later “Creating: “Date”, “Time”, “Timed Message”, “Sequential Number” and other Fields”).

### 5.2.4 Deleting Fields

All fields (whether Date, Time, Timed Message, Sequential Number, Logo and Remote) are deleted in the same way.

Quite simply, move the cursor to any character with the field to be deleted, hold key down and press key: the field will vanish from the display. The and keys may then be used to position the cursor where needed.

## 5.3 Creating Text Fields

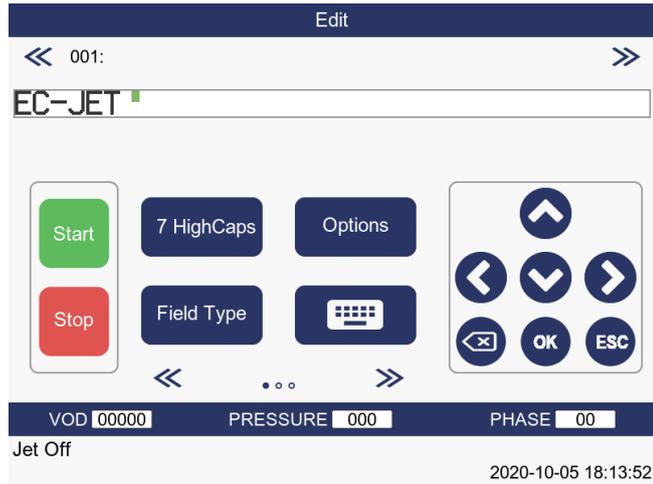
### 5.3.1 Creating Date Fields

These are useful for sell by dates, use by dates, or any date related to statistical information.

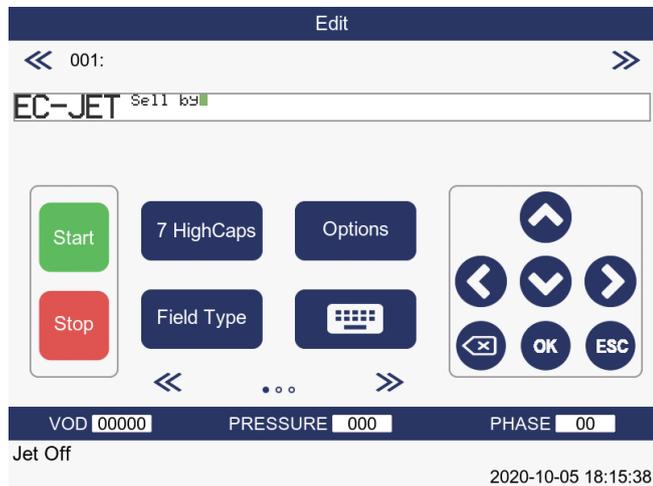
Before creating the date field, the example being used here will be satisfied first, by creating a text field reading: “Sell by” in the top of the display. With the cursor located in the next available space, press

24 HighFull

key to change the character set being used to “7 High Caps”:

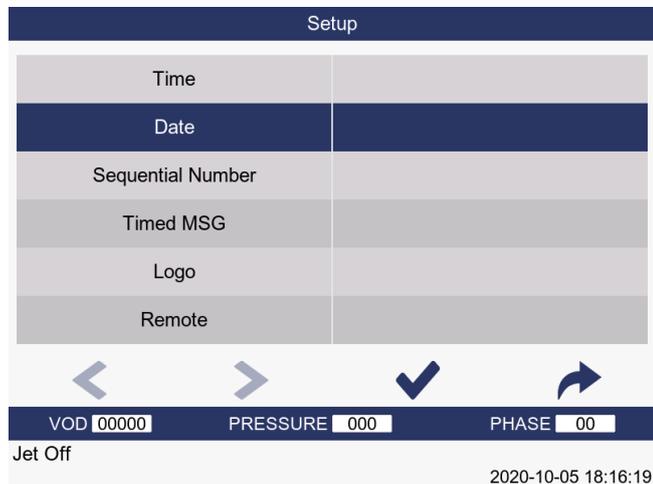


Notice the new size of the cursor. The cursor is located in a position not already occupied by a field, so type in the words "Sell by":

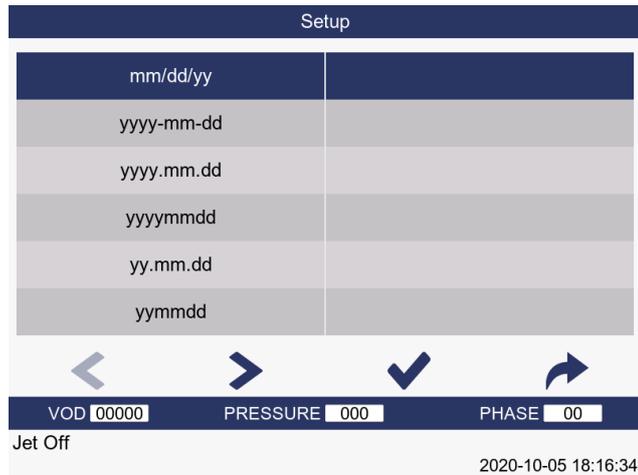


The cursor is located at the end of the text so press the space bar to create some space between the text and the date field that are about to create.

Now press  from the EDIT MESSAGE screen and this will display the SELECT FIELD TYPE menu:



Select the Date as shown above, then press  key to display the DATE FORMAT menu:



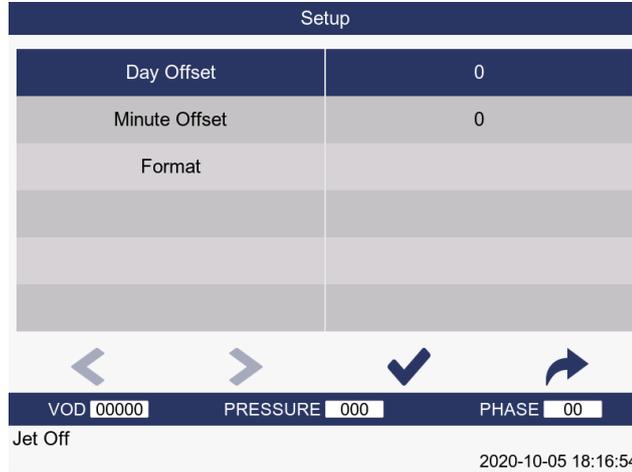
The DATE FORMAT menu gives the option to select from the following range of predefined formats:

yyyy/mm/dd	e.g. 2013/03/15
yyyy-mm-dd	e.g. 2013-03-15
yy yy.mm.dd	e.g. 2013.03.15
yy/mm/dd	e.g. 13/03/15
yy.mm.dd	e.g. 13.03.15
mm/dd/yy	e.g. 03/15/13
mm/dd	e.g. 03/15
dd.mm.yy	e.g. 15.MAR.13
dd mmm yy	e.g. 15 MAR1 3
mmm dd yy	e.g. MAR 15 13
mmm dd yyyy	e.g. MAR 15 2013
d	e.g. Day of week (0 through 6 – Sun to Sat)
d(1-7)	e.g. Day of week (1 through 7 – Mon to Sun)
dd	e.g. Day of month (1 through 31)
ww	e.g. Week number (1 through 52)
mm	e.g. Month number (1 through 12)
mmm	e.g. Month (e.g. JAN, FEB, etc.)
y	e.g. Last digit of year (0 through 9)
yy	e.g. Last two digit of year (00 through 99)
yyyy	e.g. Full year (2000)

The most commonly used date formats are available completed, as shown above (e.g. mm/dd/yy), and the printer will read (for example) “15 Mar 13”, when the message is actually printed on that day. The individual date segments shown separately (e.g. dd) are provided to allow you to create non-standard

formats of your own.

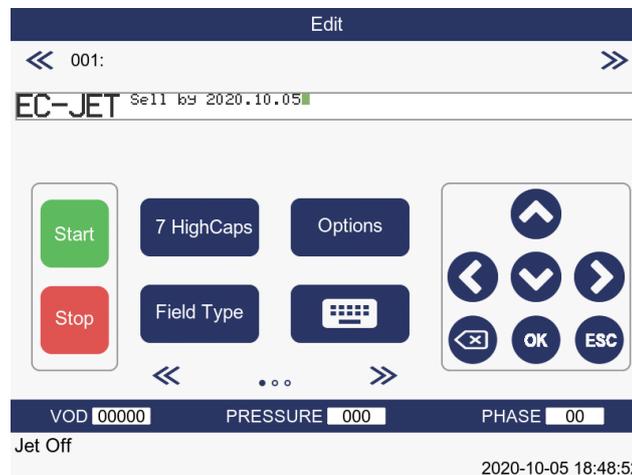
This is done by moving the cursor to the required format using the < > keys. The format is then selected by pressing the ✓ key. The following menu will then be displayed:



- Offset**            Number of days to be added to current date to create printed date. Range 0 through 7,300 days.
- Minute Offset**    The date of printing is the current date plus the number of minutes passed
- Format**            Format (see above) in which date will be printed.

The date offset may be changed by pressing the ✓ key to move the menu cursor to the value, typing in the new value and pressing the ✓ key to activate the change.

If the date offset and format shown is correct (as on the menu above), press the ✓ key until the EDIT MESSAGE screen is displayed, which will show the new date field added:



Notice that the actual date is not shown at this stage because it is still under editing. When editing is

completed, the “dd mmm yy” will be replaced with the relevant information from the current date.

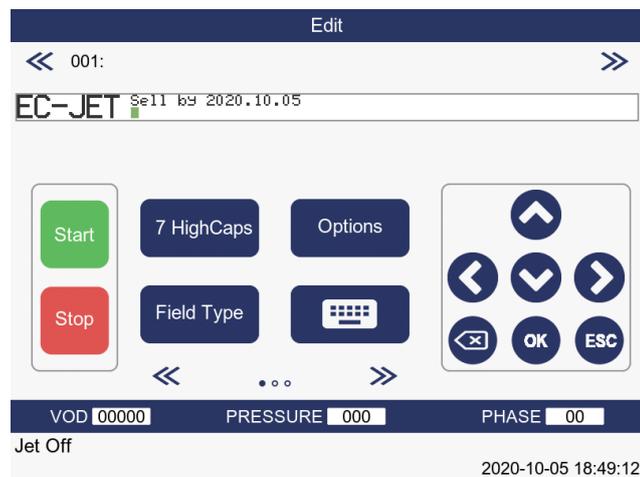
### 5.3.2 Creating Sequential Number Fields

These are useful for batch numbers, item counts, etc.

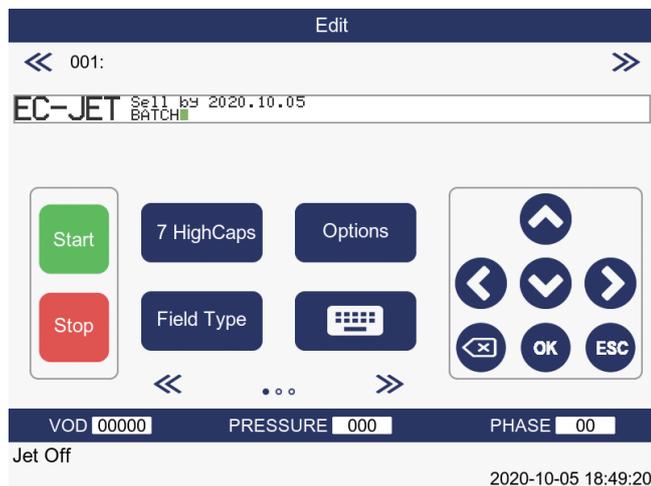
Before creating the sequential number field, the example being used here will be satisfied, by creating a text field which reads “BATCH”, underneath the “Sell By” date of the display.

There is no need to change the Character Set but we do need to move the cursor so it is underneath the “Sell By” date. To do this, use  key to move the cursor to the bottom of the message area, and then

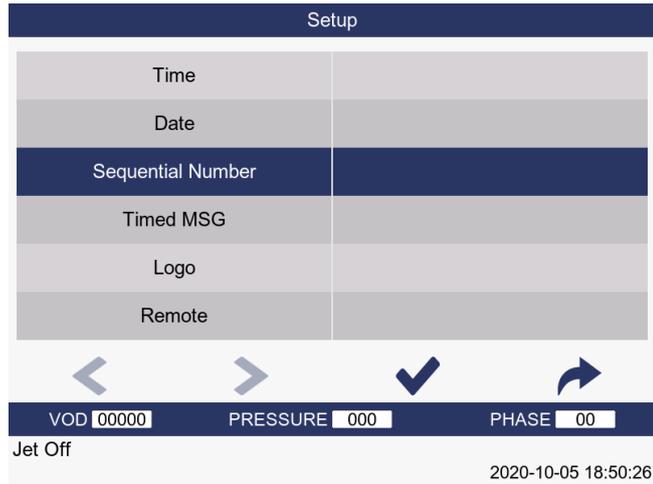
 key to move the cursor to where the batch number should begin:



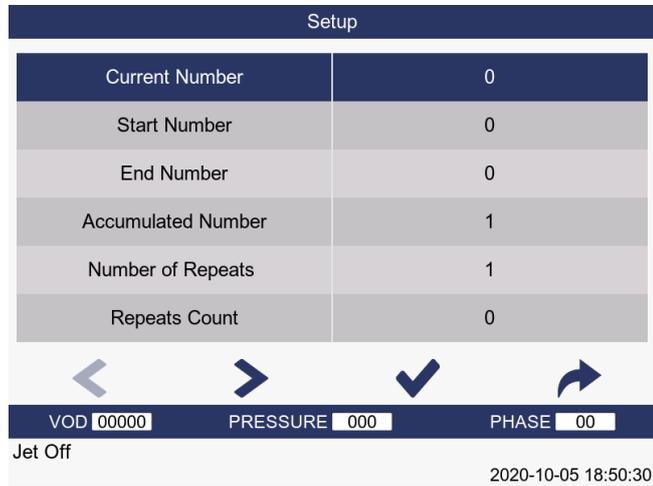
The cursor is now located in a position not already occupied by a field, so type in the word “BATCH”:



Press  (Field Type) from the EDIT MESSAGE screen and this will display the SELECT FIELD TYPE menu:



The SEQUENTIAL NEMBER menu will be displayed:

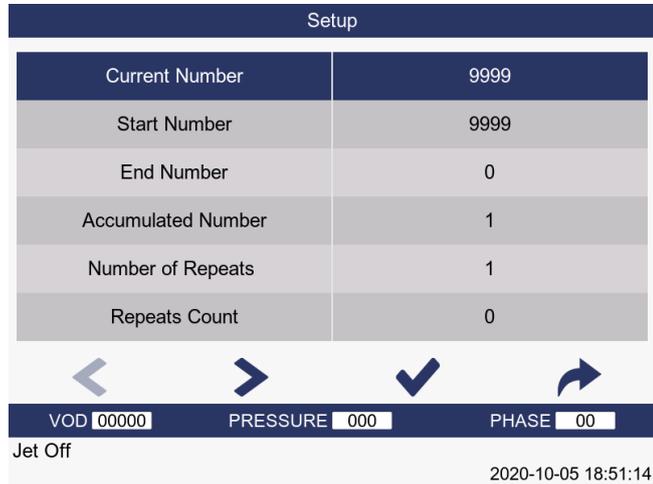


- Reset Number**            Used to reset the Current Number to the Start Number and set the Repeat Count to Zero.
- Hexadecimal**            Off: Decimal (the default setting), On: Hexadecimal
- Current Number**        Displays the current number
- Start Number**            The first value of the sequential number, it may consists of maximum 20 characters or number.
- End number**              The last value of the sequential number, it may consists of maximum 20 characters or number.
- Interval**                 Value by which to increment or decrement. For example if this was set to 5 with a Start Number of 00, the counting sequence would be 0, 5, 10, 15, and so on. Range 1 through 127.
- Repeat Count**            Number of times the sequential number has been printed for its current value. Maximum value No. of Repeats minus 1.
- Repeated Count**         0

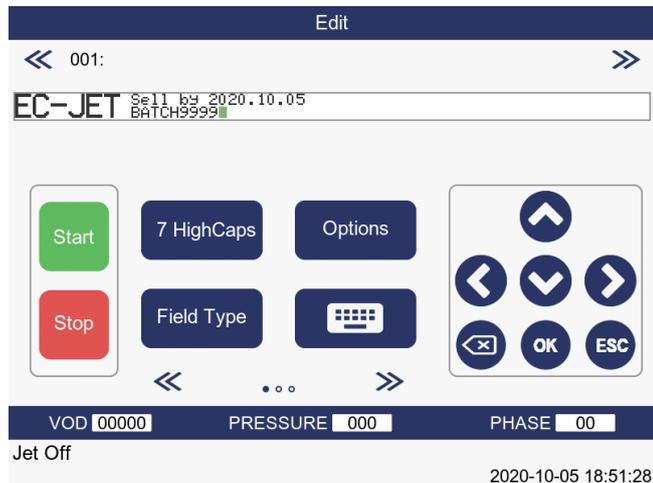
**Detrimental Count**

To count down from a number, simply set the End Number to a value less than the Start Number.

For example, select the End Number, press the key to select it and type in the value 0000 and press the key. In response to this, the system will default to a Start Number of 9999 and a Current Number of 9999:



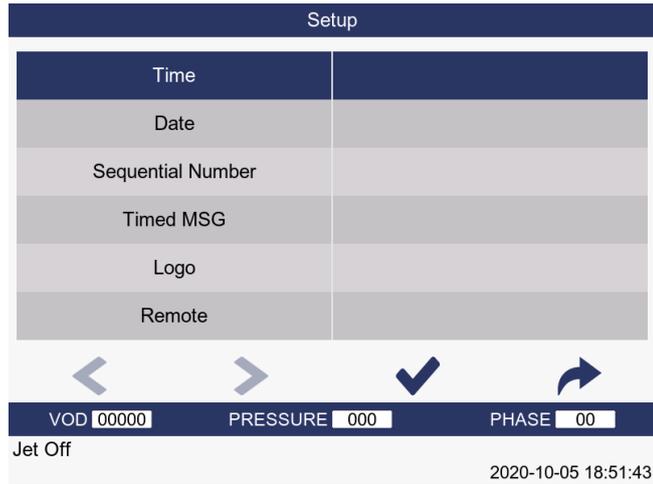
When satisfied that the sequential number has been set up correctly, press key to return to the EDIT MESSAGE screen.



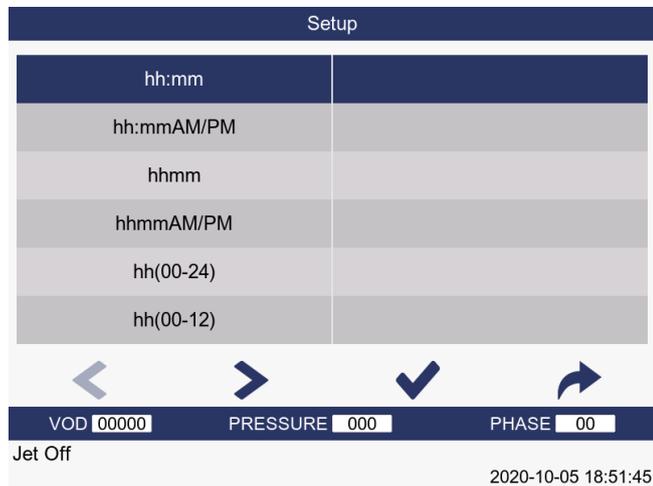
Notice the value is set to the start number of 9999.

### 5.3.3 Creating Time Fields

For the example here, use key to move the cursor a few characters to the right. There is no need to change the character set, so just press the function key to display the SELECT FIELD TYPE menu:



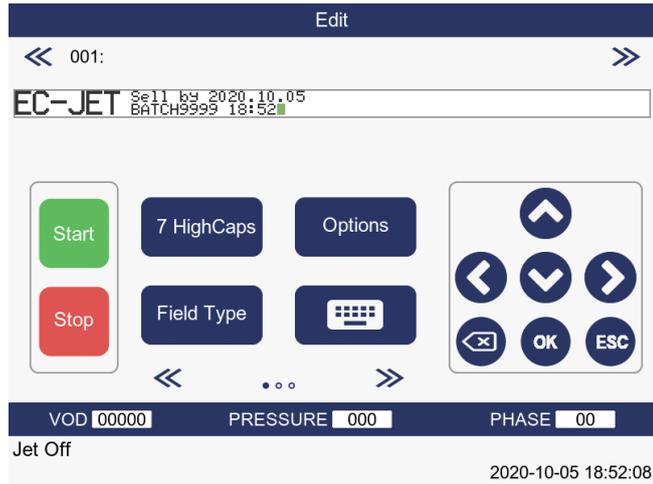
Locate the Time option and press the  key to display the TIME menu:



Choose from the range of formats:

- hh:mm            24 hour clock hours and minutes
- hh:mmpm        12 hour clock hours and minutes
- hhmm            24 hour clock hours and minutes
- hhmmpm        12 hour clock hours and minutes
- hh (24h)        24 hour clock hours
- hh (12h)        12 hour clock hours
- mm                minutes
- s s                seconds

Use   keys to locate the desired format, in this case hh:mm, and press the  key to select that format and return to the EDIT MESSAGE screen:

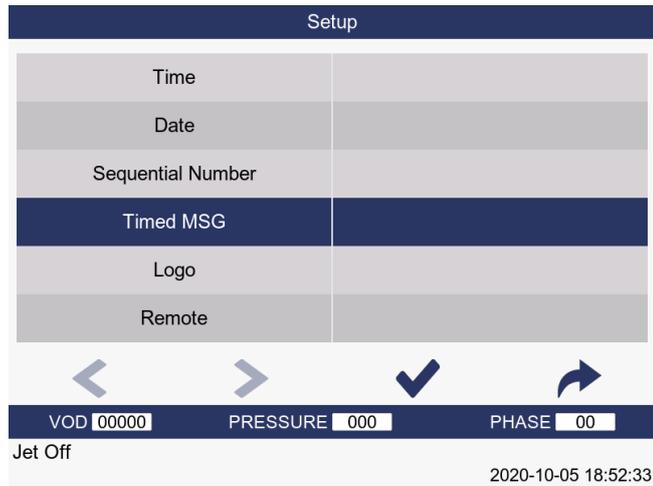


The current time will replace the hh:mm when editing is complete.

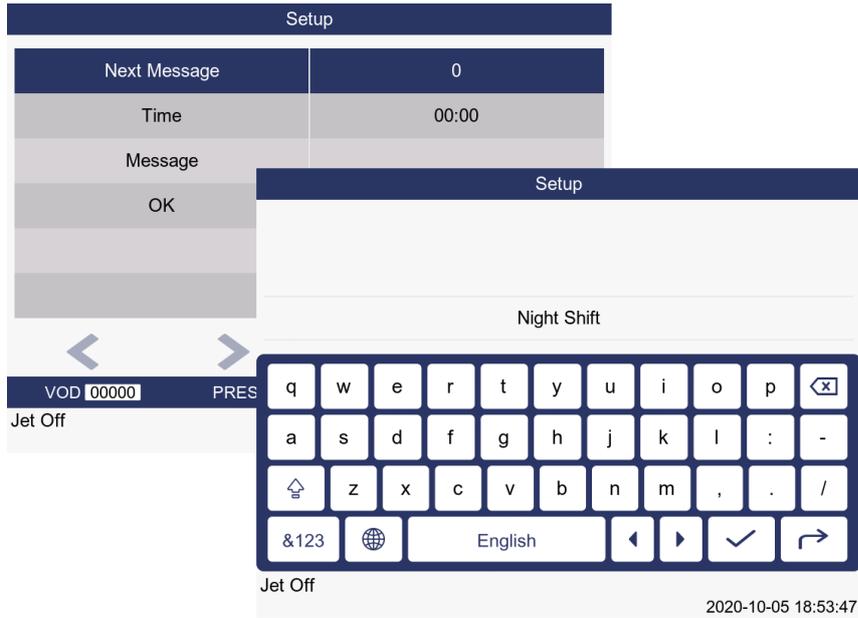
### 5.3.4 Creating Timed Message Fields

Up to 24 timed messages are allowed per Timed Message field, each associated with a unique time at which the timed message will appear in the current printer message. In this example, a timed message is set to occur at 12 midnight (zero hours) to read: "Night Shift".

Press  key from the EDIT MESSAGE screen to display the SELECT FIELD TYPE menu:



Locate the Timed Message option and press  key to display the TIMED MESSAGE menu:



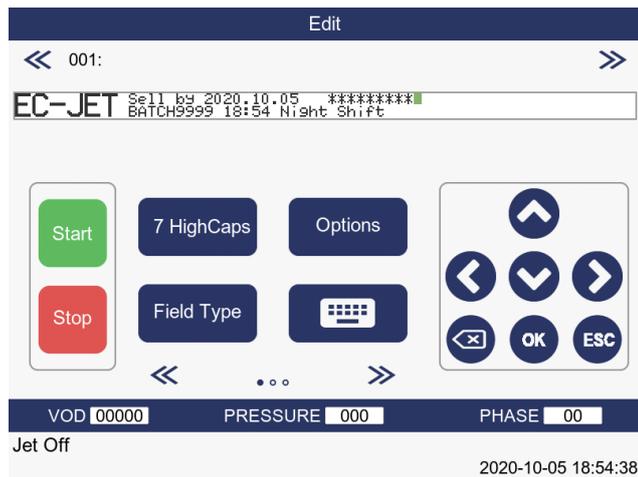
**Next Message** Scroll through existing timed messages (if this field is being edited), or create an additional timed message if the field is being created for the first time.

**Time** Time at which to begin printing timed message.

**Message** Text to be printed from the time set above. Maximum 20 characters

If several timed messages were created - for example one to start at 10:15, one at 12 noon and another at 15:00 hours - the first would begin from 10:15 through to 12 noon, the second would print from 12 noon to 15:00 and the third would print from 15:00 to 10:15, and so on.

To create the timed message, use the menu cursor to locate and change the options as shown in the TIMED MESSAGE menu above. Use a space or separator (/ . : ; , etc.) between the hours and minutes. Press the [esc] key to return to the EDIT MESSAGE screen:



### Minimum of Two Timed Messages

One timed message is not enough. Based on this example so far, the system will wait until midnight before printing the message, which is exactly what we have asked for. However, it will not stop printing until another timed message occurs. Since the only message defined so far occurs at midnight, the system will print until one minute before midnight, whereupon it will start printing again at midnight. In other words, once it starts printing, it will never stop. In practice, therefore, it is necessary to have at least

two timed messages in a field.

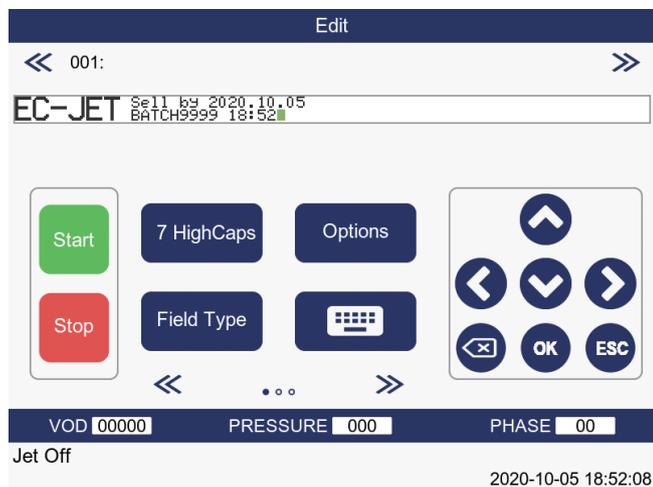
Although we can edit the Timed Message field by pressing  the [enter] key to display the TIMED MESSAGE menu, the menu will only allow alteration of existing Timed Messages which were created when the field was generated.

Since we cannot add another Timed Message, we will have to delete the field we have just created, and start again.

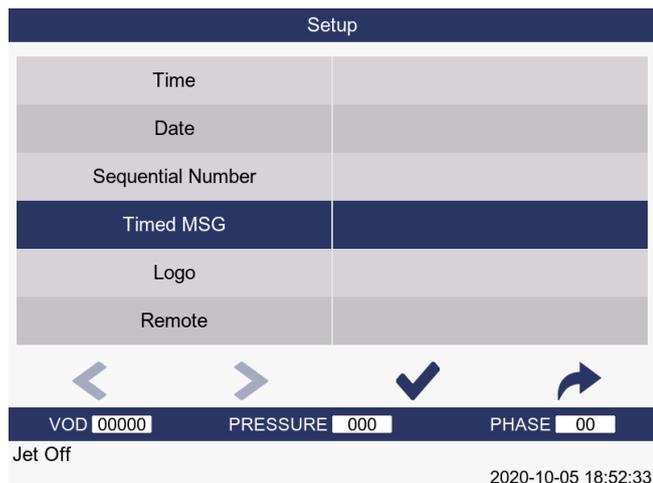
To do this, make sure the cursor is somewhere in the timed message field we have just created,

press  the [del] key; the field will vanish from the display:

Now to create the timed message as we did before, to occur at 12 midnight (zero hours) to read: "Night Shift".



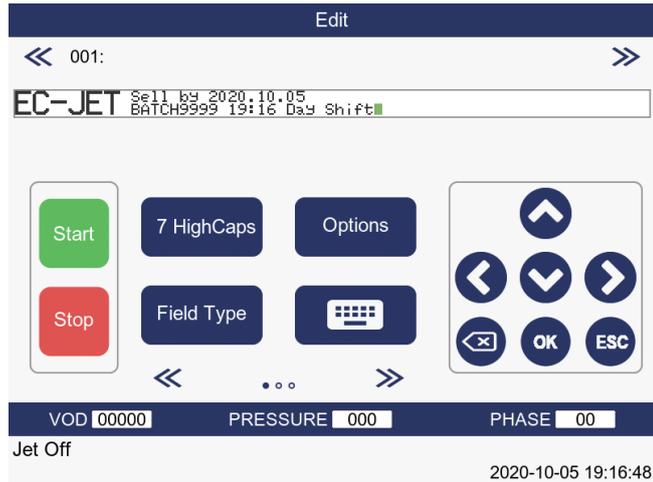
Press  key from the EDIT MESSAGE screen to display the SELECT FIELD TYPE menu:



Locate the Timed Message option to enter the TIMED MESSAGE menu.

Create the timed message, using the menu cursor to locate and change the options as before:





Notice that the last created timed message is displayed in the message area. This will be replaced with the appropriate message at the time of printing.

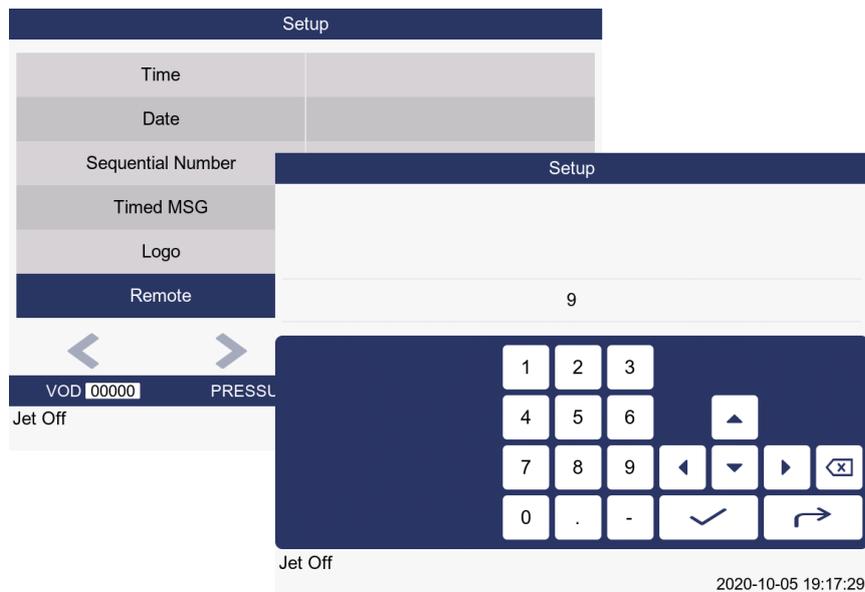
The “Day Shift” text will print from 6 a.m. to 0:00 (midnight) and the “Night Shift” text will print from 0:00 (midnight) until 6 a.m.

### 5.3.5 Creating Remote Fields

This only applies if your software has been enabled to use the facility. A remote field reserves an area in the message for data to be entered from a remote computer. Several remote fields can be created, in which case the data received from the remote computer will be used to fill the first remote field, then the second, and so on.

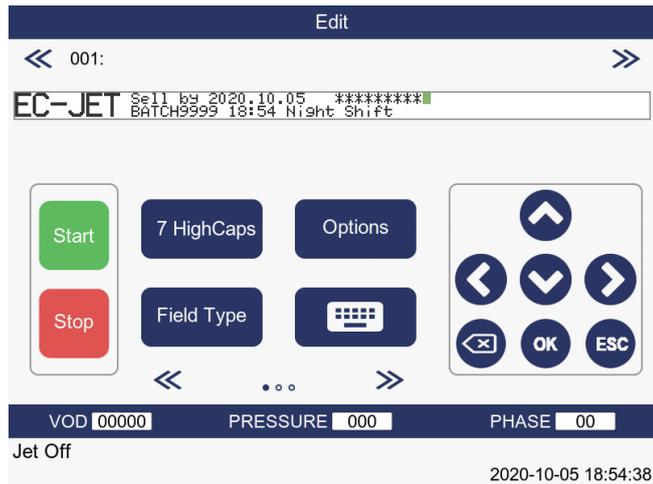
Position the cursor in an unoccupied part of the message area where the Remote field is to appear and

choose  key from the SELECT FIELD TYPE menu to display the REMOTE menu:



Type in the number of characters which to be downloaded into the field from the remote computer.

Press **OK** key and the EDIT MESSAGE screen will be displayed:



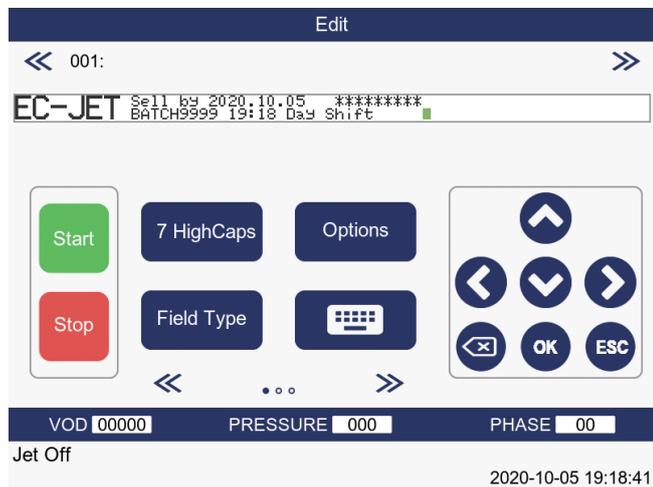
Note that the remote field have created here is denoted by a row of asterisks (\*) equivalent to the number of characters we specified in the REMOTE menu.

### 5.3.6 Creating Logo Fields

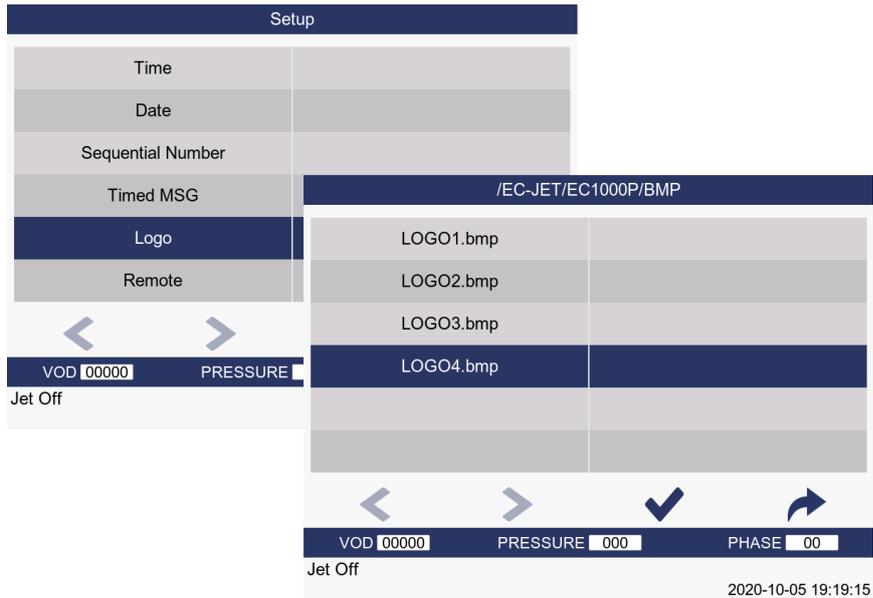
This only applies if your software has been configured with logos.

Logo should be kept at the certain folder “\EC-JET\EC230\BMP” if it is in a USB. Name of logo should be single color BMP bitmap with its name consists of English character or number and its pixel size not exceeds the message size.

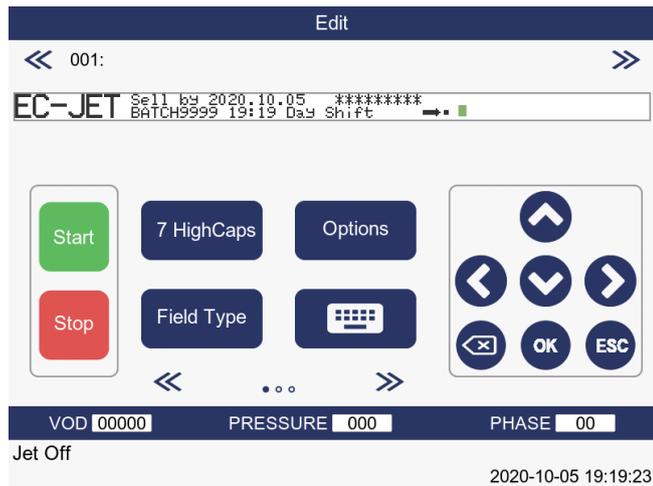
Position the cursor in an unoccupied part of the message area where the logo is to appear and choose the Logo option from the SELECT FIELD TYPE menu; this will open the LOGO menu:



Locate the Logo you wish to use and press **OK** key to enter the SETUP menu.



Select the logo and press  key to activate the choice. The Logo (in this case an arrow symbol) will be inserted in the message at the current cursor position:



## 5.4 Logo Editor

EC-JET printer equips with logo/graphic editor, can create and edit message easily.

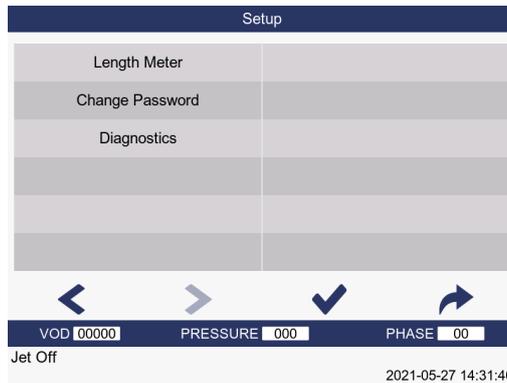
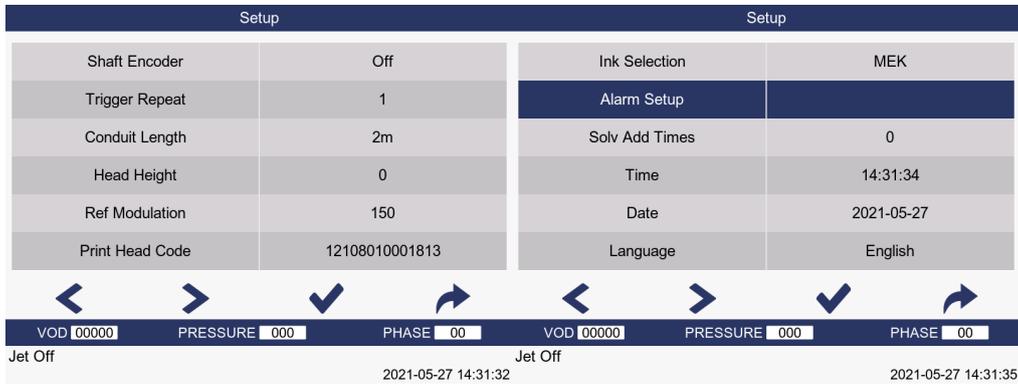
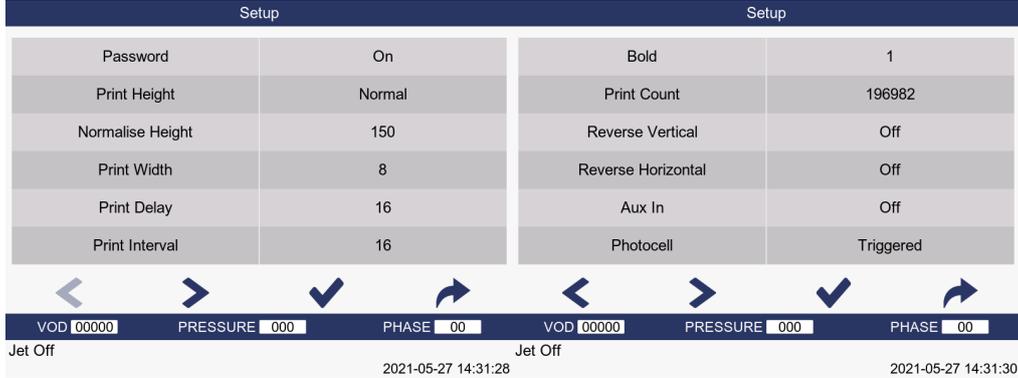
When editing, press  key and shift to LOGOEDIT page.

Dot print: Press  key at the cursor position to print dot, change the dot direction by different arrows.

Erase: Press  key to erase the dot on the left of the cursor.

## 6. Changing the System Setup

Many system functions can be altered to suit individual requirements; this is achieved by using the SETUP menu:



- |                               |                                 |                        |
|-------------------------------|---------------------------------|------------------------|
| <b>Password</b>               | <b>Reverse Print Horizontal</b> | <b>Ref Modulation</b>  |
| <b>Print Height</b>           | <b>Bold Ratio</b>               | <b>Print Head Code</b> |
| <b>Scale Height</b>           | <b>Aux In</b>                   | <b>Ink Selection</b>   |
| <b>Print Width</b>            | <b>Photocell</b>                | <b>Alarm Set Up</b>    |
| <b>Print Delay</b>            | <b>Shaft Encoder</b>            | <b>Solv Add Time</b>   |
| <b>Print Interval</b>         | <b>Trigger Repeat</b>           | <b>Time</b>            |
| <b>Print Count</b>            | <b>Conduit Length</b>           | <b>Date</b>            |
| <b>Reverse Print Vertical</b> | <b>Conduit Height</b>           | <b>Change Language</b> |

**Meter Counter****Change Password****Diagnosis**

## 6.1 Adjusting Ref. Information

### 6.1.1 Print Height

Allows the user to select a suitable print height for optimum print quality.

This range can be tuned to individual requirements, by adjusting the print height over a range of -30% to +30%.

### 6.1.2 Scale Height

This enables a greater print height range and can be used to eliminate deflector plate/gutter clipping at maximum and minimum drop deflection.

### 6.1.3 Print Width

Minimum width (i.e. the fastest the printer can print) is 0. The width of printed characters may be increased by increasing the stored value. When used in conjunction with Shaft Encoder "On" the width is equivalent to shaft encoder pulses between raster.

### 6.1.4 Print Delay

This is the delay between prints (Photocell Off/Enable) or the delay between the photocell triggering and print appearing on the product (Photocell Triggered).

#### NOTES:

1. Too small a delay may result in a "3.02 Over Speed (Print Go)" or "3.04 Variable Data" warnings.
2. Minimum width and delay settings are interactive to allow sufficient time between printing for Phasing and VOD to occur.

### 6.1.5 Print Interval

On entering a value less than the minimum against the Print Delay option (for example: 16), the following message will be displayed: "Value not set: too small"

### 6.1.6 Print Count

This display shows the number of products printed so far. To reset or change this value, type in the required number.

### 6.1.7 Reverse Message (Vertical)

The print must be stopped to change this option.

**Off:** the message will be printed as on the display.

**On:** the message will be printed rotate 180° vertically.

### 6.1.8 Reverse Message (Horizontal)

**Off:** the message will be printed as on the display.

**On:** the message will be printed rotate 180° horizontally.

### 6.1.9 Bold Ratio

A bold ratio of 1 is equivalent to standard print, e.g. one vertical line of drops per vertical in a 7 HI raster or two vertical lines of drops per vertical in a 16 HI raster. Simply enter the ratio required.

**NOTE:** If large, dense print is required, a bold ratio of 9 and a print height of +30% may produce the required density.

To change this option on an existing pattern printing must be stopped, the ratio changed and the pattern edited.

### 6.1.10 Aux In

<b>Off</b>	Not available.
<b>Resets SN</b>	Will reset the Sequential Number once got a triggered signal
<b>INV MSG LV</b>	Change the print direction, the direction depends on the level signal.
<b>INV MSG TR</b>	Change the print direction, the direction change depends on every trigger.
<b>Meter Count Reset</b>	The meter field in the current printing message plays a reset function. When the auxiliary photocell receives a trigger signal, the current value of the meter field will reset and the meter buffer is cleared.

### 6.1.11 Photocell

Printing must be stopped to change this option. Select the required setting by using the left or right arrow keys. This can be set to any of the following values:

<b>Triggered</b>	One trigger equals one print.
<b>Enabled</b>	The printer will print continuously as long as the photocell remains triggered.
<b>Remote</b>	Start printing when receiving the signal from the RS-232 port.
<b>Off</b>	Printer ignores the photocell signal and will print continuously at a rate dictated by the Print Width and Print Delay settings.

### 6.1.12 Shaft Encoder

The print must be stopped to change this option. Select "On" if a shaft encoder is to be used, or "Off" if it is not.

(See "Appendix 1: Installation and Setting Up" for shaft encoder setup).

### 6.1.13 Repeated Trigger

The printer must be stopped to change this option, and the Photocell must be set in Triggered Mode. Then put in the Triggered Number. The default triggered number is 1, in other words, it will print 1 time for every trigger. If the triggered number is 2, it will print twice for every trigger, and so on.

### 6.1.14 Alarm Set Up

Before changing this setting, the printer must be in a state where the JET has stopped. The machine has three built-in alarm output ports. The user can make settings according to actual needs. When the alarm is turned off, the external alarm is invalid.

The trigger mode of alarm output has the following two ways:

<b>Pulsed</b>	The external alarm is operating normally, that is, when a warning occurs, the alarm
---------------	---

beeps twice.

**Continuous:** The external alarm will sound continuously while a System Warning is present.

Alarm Setup	
Out 1	Off
Out 2	Off
Out 3	Off

Alarm Setup	
Alarm Out	Continuous
Alarm Signal	Fail Only

VOD 00000  
Jet Off

VOD 00000 PRESSURE 000 PHASE 00  
Jet Off

2021-05-27 14:30:49

#### The alarm signal has the following options

- Fault** The external alarm will alarm only when printing failure.
- Fault or Warning** When a printing failure or system warning occurs, the external alarm will give an alarm. The system warning type can be set separately according to the user's needs (such as: low ink, low pressure).
- Jet Running** When the JET is running, the external alarm will prompt the alarm.
- Printing** When printing is normal, the external alarm will give an alarm.
- No Printing** When the printing prohibition alarm is triggered, an external alarm will alarm. Alarm Warning

## 6.2 Changing the Installation Setup

### 6.2.1 Set Time

Printing must be stopped to change this option. Simply enter, in a 24 hour format, the time required.

### 6.2.2 Set Date

Printing must be stopped to change this option. Simply enter the date required in Day, Month, and Year order.

### 6.2.3 Conduit Length

The jet must be stopped to set up this option. Select the appropriate conduit length for the print head fitted by using the left or right arrow keys.

### 6.2.4 Head Height

The jet must be stopped to set up this option. Pressure varies by 5 units for every metre above and below the printer. You may change the value between -9.5 and +9.5 metres, however, print heads are currently a maximum of 6 metres in length, so the maximum value here should be 6.0. Simply specify, in terms of half or whole meters, how far above or below the printer the print head is mounted. For practical purposes, the measurement should be made from the space bar of the keyboard to the print head nozzle assembly. If the print head is mounted below the printer, the value should be inputting the following format - X.Xm. If the print head is mounted above the printer it is not necessary to place + in front of the value. The value may be entered simply as - X.Xm.

**NOTE:** Care must be exercised with this option; poor printer performance will result if incorrectly set.

This will automatically change the pressure reference from which the Solvent Add values calculated and shown on the MONITOR JET menu.

### 6.2.5 Meter Counter

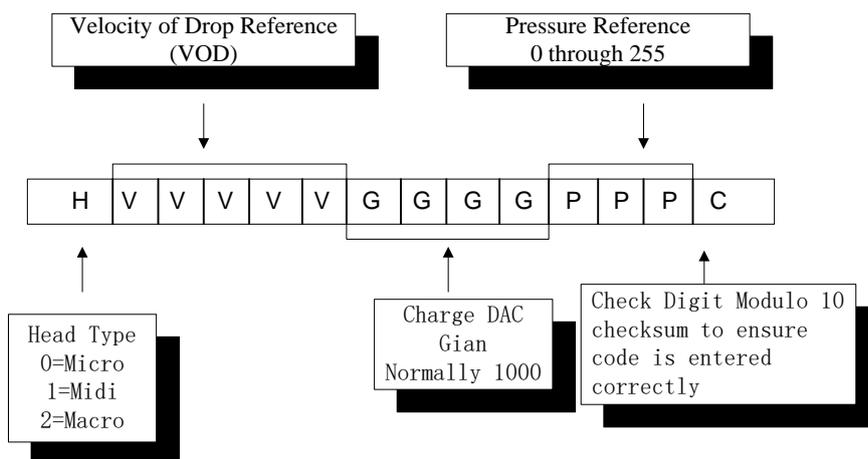
After turning on the meter counter, you can use the meter counter function in the data editing module.

## 6.3 Changing System Set Up

### 6.3.1 Print Head Code

This can only be entered if the jet is stopped. It will also need re-entering if a PCB or software is replaced. To be used when a new print head has been fitted to the printer and/or when a reset to default has occurred. The 14 digits are encoded as follows:

EJ68



### 6.3.2 Ref. Modulation

Displays the current Reference Modulation. A new reference value may be added with a User Level 2 password.

### 6.3.3 Ink Selection

A choice between MEK, Ethanol or Pigmented.

### 6.3.4 Password

**On:** Enable password

**Off:** Disable password

Can be turned to Off so the user can enter and exit menus at will without having to use the password. If the password option is turned to Off at User Level 1, then only User Level 1 options will be displayed until a higher level password has been entered. This value is retained on switching off the printer.

### 6.3.5 Change Password

Selecting this option and pressing the [enter] key, the PASSWORD menu will be displayed, first ask you to enter the original password.

If the User Level 1 password is typed into this screen, the CHANGE PASSWORD menu is displayed with the option to change only the User Level 1 password. If a User Level 2 password had been typed into the PASSWORD screen, the CHANGE PASSWORD menu would have provided the option of changing both levels of password.

### 6.3.6 Change Language

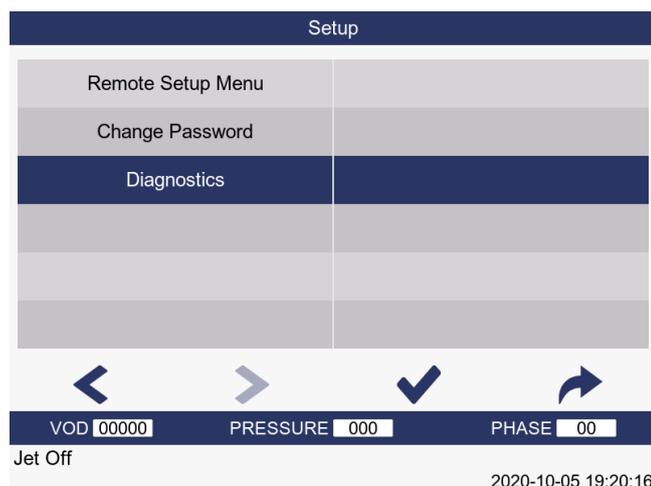
Printing must be stopped to change this option. It allows the user to define which language the screens and menus are displayed in.

### 6.3.7 Remote Setup Menu

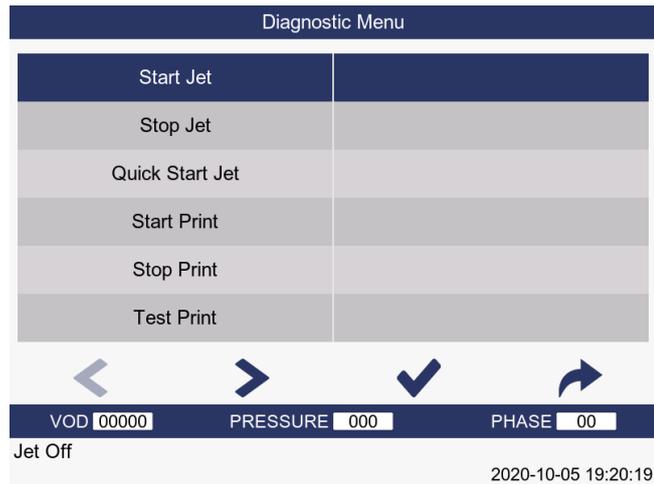
### 6.3.8 Diagnostic Menu

Allows the user to access certain parameters to confirm correct printer operation.

Entry to the DIAGNOSTICS menu is made by using the up/down arrow keys to locate the Diagnostic Menu option from the SETUP menu:



Alternatively, a short cut may be used by pressing  key on the keyboard.



The menu option selected will be the one which was selected the last time the DIAGNOSTICS menu was used.

The options available from the DIAGNOSTICS menu are described in another chapter of this manual

### 6.3.9 Solvent Add Time

This shows the total time that the printer has added solvent since the printer has been switched on.

## 7. Diagnostics

There are a large number of diagnostic functions. However, not all functions are valid at all times – some are only valid when the jet is stopped (e.g. “Clear Nozzle”); some are valid only when the jet is running and printing is stopped (e.g. “Start Print”), and some are only valid when both the jet and printing have been started (e.g. “Test Print”).

To keep the size of the diagnostics menu small, and to prohibit the use of functions which are invalid for the current state of the printer, only valid functions are displayed and are selectable at any given time. This is in addition to menu variations due to the password level.

Diagnostics menu	Password		
	Jet stop	Operation	Jet printing
Start Jet		—	—
Stop Jet	—		—
Quick Start Jet	●	—	—
Start Print	—	●	—
Stop Print	—	—	●
Test Print	—	—	●
Clear Nozzle	●	—	—
Flush Nozzle	○	○	○
Flush Shut Down	●	●	●
Monitor Jet	●	●	●
System Times	●	●	●
System Configuration Information	●	●	—
Set Pressure	○	○	○
Filter Purge	●	—	—
Real-Time Switch or Edit Message	○	○	○

### 7.1 Start Jet

Attempts to start the jet but does not start printing.

The following message will be displayed while starting the jet:

**“Starting Jet : Please Wait”**

## 7.2 Stop Jet

Stops the jet as normal (i.e. as per the  button, but without returning to the CURRENT MESSAGE screen)The following message will be displayed in the status line of the display while stopping the jet:

**“Stopping Jet : Please Wait”**

and when the jet has stopped, the following message will be displayed:

**“Jet Stopped: You May Now Switch Off”**

## 7.3 Quick Start Jet

Start the jet without printing. (The checking system mentioned below is different from that of “Start Jet”)

Please note this operation does not check any of the following:

- Ink
- Solvent
- Service time
- Phase
- VOD
- Modulation

i.e. it simply switches the jet on at the reference running pressure and reference modulation.

The following message will be displayed while starting the jet:

**“Starting Jet : Please Wait”**

**WARNING:** THIS COMMAND WILL START THE JET EVEN IF THE INK LEVEL IS LOW.  
THE PUMP MAY BE DAMAGED IF IT IS RUN WITHOUT INK.

## 7.4 Start Print

Make the printer ready to print, i.e. as per  button but without returning to the “CURRENT MESSAGE” screen.printing will not be started and the following message will be displayed if there is no message stored in the printer memory:

**“Print Not Starts : No Message”**

Note that this has the lower level function than the main start button which sets, for example, Phase Fault “On” when pressed. Start Print will leave Phase Fault in its current state.

## 7.5 Stop Print

Stops printing but does not shutdown the jet.

The following message will be displayed while stopping printing:

**“Stop Print Please Wait”**

## 7.6 Clear Nozzle

This option allows you to specify the number of Clear Nozzle sequences you wish to run on the printhead. A minimum of three Clear Nozzle sequences is recommended in an attempt to clear a blockage or obstruction. The routine of three Clear Nozzle sequences should be repeated no more than 10 times.

The following message will appear in the status line of the display while the Clear Nozzle sequence is being performed:

**“Clearing Nozzle: Please Wait”**

During this cycle, the print head must be inverted and the correct type of solvent applied to the nozzle. The procedure for clearing the nozzle is described later in this manual. (See “Troubleshooting – Clearing the Printhead Nozzle”)

## 7.7 Flush Nozzle

Commonly we recommend flushing the nozzle after clearing. This is to make sure the nozzle is unblocked. When flushing the nozzle, the status line will display:

**“Waiting for nozzle flush”**

The nozzle will be flushed automatically. The flushing takes about 3 minutes and after that the solvent will be spurted out from the nozzle, the status line will display:

**“The print has stopped.”**

## 7.8 Flush Shut Down

The Flush Shutdown routine introduces solvent into the print head and nozzle, during jet shutdown, to remove any ink in preparation for a period of non-use. The option has three settings:

**Off** This is the disabled setting. When set to Off, the printer will not carry out the flush part of the flush shutdown routine when the jet is stopped.

**On** This is the enabled setting. When set to On, the printer will carry out the flush part of the flush shutdown routine when the jet is stopped.

**Auto** This is the default setting for normal operation. In this mode, the decision as to whether or not a flush shutdown is performed is dependent on the time since the previous flush shutdown, as follows:

- for ethanol inks, if the time since the previous flush shutdown is less than 40 minutes (80 minutes for a 4 -meter conduit), a non-flush shutdown will be performed.

- for all other inks, if the time since the previous flush shutdown is less than 15 minutes (30 minutes for a 4 -meter conduit), a non-flush shutdown will be performed.

**NOTE:** For a successful overnight shutdown, the printer should be run for greater than the times specified above. As with any shutdown routine, it is most important that the printer is allowed to complete the full routine and is not switched off before the following message is displayed:

**“Jet Stopped: You May Now Switch Off”**

## 7.9 Monitor Jet

This groups together the ink and solvent control parameters on a single screen.

The parameters are displayed only; they cannot be changed by the user.

Monitor Jet			
Press	000	Solv Add	185
VOD	00000	Ref VOD	21082
MOD	150	Ref Press	181
Phase	00	Read Press	001

VOD 00000	PRESSURE 000	PHASE 00
-----------	--------------	----------

Jet Off 2020-10-05 19:20:45

### Press

The pressure currently set on the pressure DAC (same as Set Pressure).

### VOD

The most perfect VOD value should equivalent to the Ref VOD.

NOTE: The warning “No VOD readings” will be displayed on the status line when a valid VOD has not been obtained for 15 minutes. The warning will be redisplayed every 15 minutes while no VOD readings as obtained.

### MOD

The current modulation voltage.

### Phase

The system will load the phase automatically when it is On. And unload when Off.

### Solvent Add

When Press (Set Pressure) exceeds this value, solvent will be automatically added by the printer.

### Ref. VOD

The reference VOD as input with the pinhead code.

### Ref. MOD

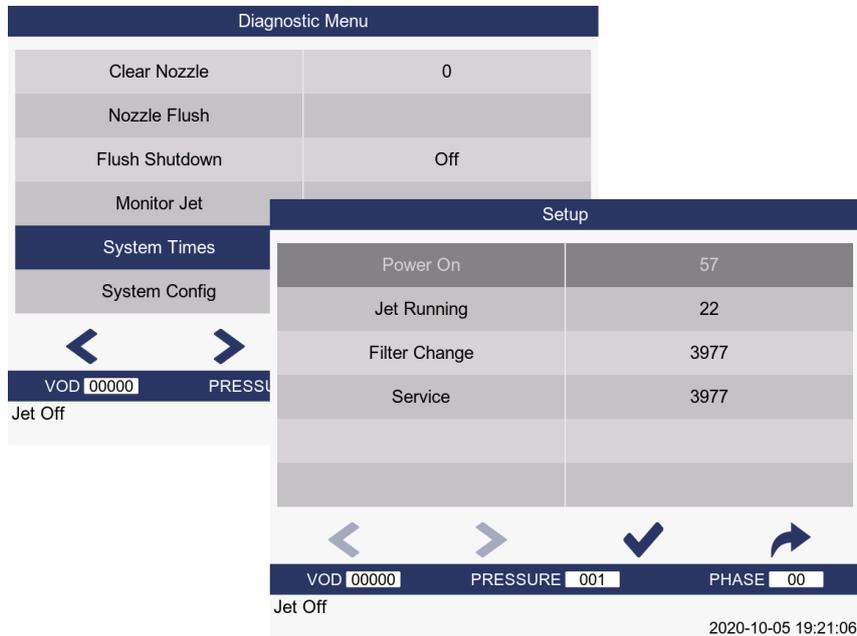
The reference modulation determined by the last print head calibration or set by the user (same as Ref Modulation in the SETUP menu).

### Read Press

The current read pressure being measured by the pressure transducer. This will normally be the +2/3 of the Press (Set Pressure).

## 7.10 System Times (System Timing Information)

The System Times menu shows statistical information on the number of hours the power has been on and the jet has been running, the filter life expired and the time due until service.



### Power On

Number of hours power has been on.

### Jet Running

Number of hours the jet has been running.

### Filter Change

Recommended hours left until a main ink filter change is required. Starts at 4000 and counts down by the number of hours the jet has been running. When the value is less than 0, Service Time warning will be alarmed.

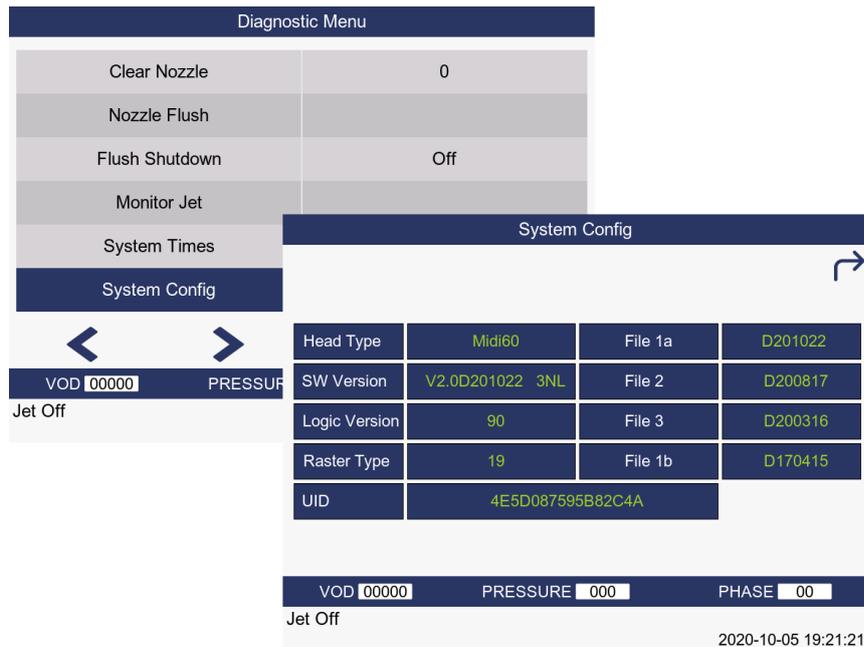
### Service

Recommended hours left until service required. Starts at 4000 and counts down by the number of hours the jet has been running. When the value is less than 0, Service Time warning will be alarmed.

## 7.11 System Configuration Information

It is useful to know at a glance what version of software or data forms are fitted what raster type is being used and which type of print head is fitted to the printer.

All this information is shown in the system configuration menu which is displayed by selecting the System Configuration option from the diagnostic menu:



### Head Type

Shows the print head type fitted to the printer: Micro, Midi or Macro.

### SW Version

Shows the version number of the software installed in your printer.

### Logic Version

Display the logical version number of the installed machine.

### Raster Type

The raster is created by an algorithm which compensates for interaction between drops in flight. Several raster types exist, each catering for different operating conditions. This option of the menu displays a separate screen which shows which raster types your printer is using.

## 7.12 Set Pressure

Displays the current pressure set on the pressure DAC.

Your local distributor may ask you to use this option to:

1. Diagnose and/or check for any pressure loss.
2. Purge the filter without resetting the filter time, e.g. if changing ink only.
3. Clean out print head by use of the venture vacuum.
4. Use Quick Start Jet to try and obtain VOD measurements and ascertain if ink is thick or thin.

## 7.13 Filter Purge

Used by EC-JET approved Service Engineers when a new main ink filter is fitted:

- On** Sets a fixed pressure of 120 bits to purge the new filter and resets the Filter Change time to 2000 hours.
- Off** Sets the pressure back to zero.

## 7.14 Real-Time Switch or Edit Message

EC-JET provides a flexible function of switching message even if the printing is working or editing message. the steps are as follows:

### 7.14.1 Real-time Switch Message

1. Change the “REAL-TIME SWITCH MESSAGE” menu in the “DIAGNOSIS” menu and select “ON”.
2. Return to the main menu.
3. Under the printing condition, the first line of the display is the printing message, choose the

message need to print (now the first line of the display is the current message), press  key to make printing switch.

### 7.14.2 Real-time Edit Message

1. Change the “REAL-TIME SWITCH MESSAGE” menu in the “DIAGNOSIS” menu and select “ON”.
2. Return to the main menu.
3. Under the printing condition, the first line of the display is the message under printing, choose the message need to edit (now the first line of the display is the current message).

4. Press  key to make edit the message.

5. Press  key to switch the edited message to the printing message.

6. Return to the previous menu by pressing  key, and now the first line of the display is current message.

### 7.14.3 Real-time New Message

1. Change the REAL-TIME SWITCH MESSAGE menu in the DIAGNOSIS menu and select ON.
2. Return to the main menu.
3. Under the printing condition, the first line of the display is the message under printing, locate the message to delete or add a new message。

4. Press  key to edit the message, now the first line of the display is Edit Message.

5. Press  key to switch the new message to the printing message. Return to the previous menu by pressing  key, and now the first line of the display is current message.

**Note:** The setting data of the new message should as the same of the previous setting of the printing message. In other words, when the printer is printing and the Real-time Switch Message is ON, the new message setting should be the actual setting of the message that is printing. And other new messages should be set default.

## 8. Routine Maintenance

There are two levels of routine maintenance: User – performed by the operator, and Service – performed by EC-JET Trained Service Engineers.

User maintenance is required daily (each time the printer is used) and weekly.

Service (scheduled) maintenance is required after every 4000 jet running hours.

The following table defines the user maintenance requirements for EC-JET printers:

	Monitor	Clean	Change/Add
Printer Cabinet	Daily/ Each time is used	Weekly/ On demand	No need
Print head	Daily/ Each time is used	Daily/ On demand	No need
Ink and Solvent	Start up/In use	No need	On demand
Air Filter	Daily /once a week	Weekly/ By need	On demand

### 8.1 Cleaning the Printer Cabinet

#### 8.1.1 General

The exterior of the printer can be cleaned using a soft cloth lightly soaked in a mild detergent.

CAUTION: Do not use abrasive cleaning agents. Do not use excessive pressure when wiping over the LCD screen; excessive pressure can cause damage.

#### 8.1.2 Ink Spillages

If ink is accidentally spilled onto the exterior of the printer the following procedures are recommended:



**WARNING:** ALWAYS WEAR RUBBER GLOVES AND SAFETY GLASSES WHEN HANDLING SOLVENT. DO NOT USE SOLVENTS IN CONFINED AREAS WITHOUT ADEQUATE VENTILATION.



**CAUTION:** USE ONLY EC-JET SOLVENT. ENSURE THAT THE SOLVENT MATCHES THE TYPE USED IN THE PRINTER.

Do not use excessive amounts of solvent. It is not recommended that solvent is used frequently to remove ink from the front panel and LCD screen as this can lead to deterioration of the membrane surface.

#### 8.1.3 Cleaning the Nozzle

Select the Nozzle cleaning Procedure in the DIAGNOSIS menu, type in 3 as the cleaning times (3 times as a full cleaning set), squirt the solvent in the gutter, then flush the nozzle intermittently until the procedure is over.

#### 8.1.4 Cleaning the Print head



**CAUTION:** USE ONLY EC-JET SOLVENT. ENSURE THAT THE SOLVENT MATCHES

THE TYPE USED IN THE PRINTER.

**WARNING:** POTENTIALLY LETHAL VOLTAGES ARE PRESENT WITHIN THE PRINTHEAD. BE SURE ALL POWER IS SWITCHED OFF BEFORE THE PRINTHEAD IS



OPENED FOR INSPECTION AND CLEANING.

### Print head Cleaning Procedure

While wearing approved, solvent resistant gloves: Remove the print head cover tube and hold the print head as shown below. Place a suitable container underneath and wash the entire printed circuit board (PCB) surface with the appropriate solvent. Do not use the wrong solvent; make sure it is the solvent corresponding to the ink type being used in the printer.

Simply squirt the solvent in short bursts onto the affected parts with a short delay between bursts to allow ink to dissolve. The surplus solvent will run down the print head and can be collected in the container for disposal.

Allow the print head to dry completely by letting it stand for a few minutes. Do not dry the print head with a cloth or towel as this may leave fibers that could interfere with the printed drops. Particular care should be taken to ensure that the space between the nozzle and charge electrode is free of solvent. If not, it can usually be removed by inverting the wash bottle and blowing off the excess solvent.

**WARNING:** MOST INK BASES ARE FLAMMABLE. IT IS THEREFORE IMPORTANT TO DISPOSE OF THE WASTE CLEANING FLUID IN ACCORDANCE WITH LOCAL REGULATIONS.



**CAUTION:** DO NOT BE TEMPTED TO IMMERSE THE PRINTHEAD IN SOLVENT OR AN ULTRASONIC BATH. THIS MAY DAMAGE THE PRINTHEAD AND WILL VOID THE WARRANTY



## 8.2 Replenishing Ink and Solvent

### 8.2.1 NOTE

1. When ink or solvent low, printer can't start up normally.

2. Add only EC-JET ink and solvent
3. Check the ink or solvent specification are consistent with the using printer before replenishing
4. Only add ink or solvent when ink or solvent low warning, each add no more than 500ML

### 8.2.2 EC1000 Consumable verification

1. When the ink or solvent level is low, the printer will display following interface:



Note: if you do not follow up the instruction to verify the CSN of consumables, printer will remind every 15 minutes

2. Open the ink system door and find the RFID assembly which is located at the right of the rear door



3. Hold the ink or solvent bottle, keep label alignment of RFID, putting into the groove about 2 seconds. When the light of the RFID turns green with one-long alarm, it means read successfully.

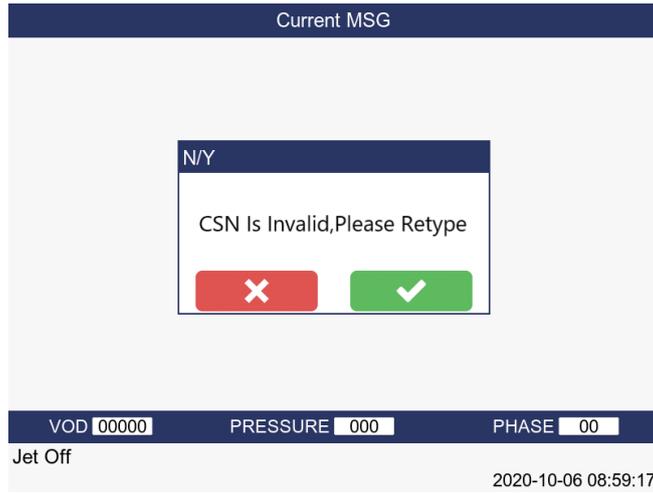


When shown the following interface, printer read the correct CSN

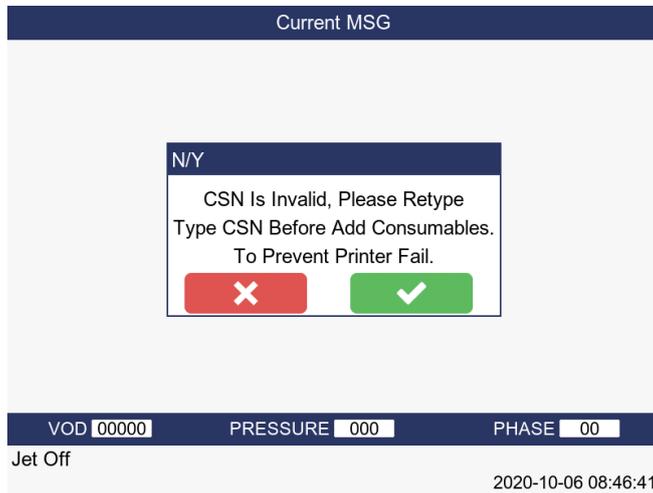


Click OK

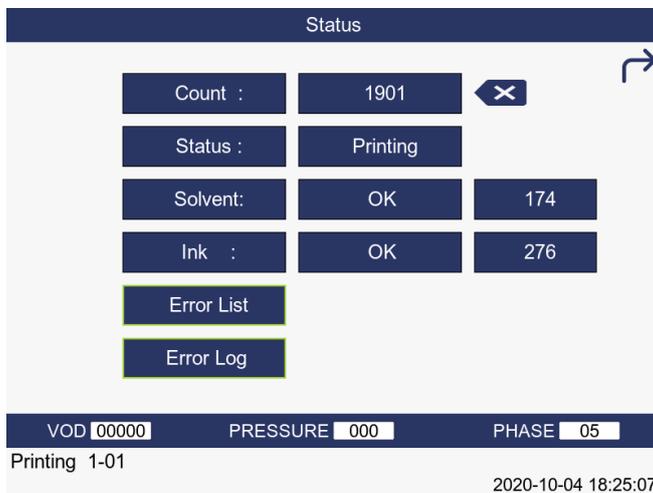
Note 1: If can't read the correct CSN, then printer show the following interface. Please check whether choose the correct consumable , then continue to verify.



Note 2: if do not verify the CSN and refill ink or solvent directly, printer will show the following interface, and flash every 15 minutes



Note 3: On "Status" interface, you can see the remaining time of the ink or solvent, as shown in Figure 174 (hours) solvent and the 276 (hours) ink



Note 4: printer show the remaining time of ink only after "printing" status lasted for more than a minute

### 8.2.3 Refilling the ink or solvent

1. Withdraw the ink system gently until stop, if necessary, another hand hold the ink routine gently.
2. Remove the ink or solvent bottle cap, then cut the sealing foil along the edge more than half circle and fold inside
3. Pour the ink or solvent into the corresponding tank. After the liquid in the bottle is finished, take away the empty tank.(Note: the solvent tank is white and the ink tank is black.)
4. Tighten the cap of ink or solvent tank after refilling, push back the ink system.





## 8.3 Cleaning/Replacing the Air Filter

There are two air filters (the inlet and outlet filter) in the model.

### 8.3.1 Cleaning and replacement of air inlet filter

1. The inlet air filter is located in the rear of the machine. According to the environment, periodically perform routine maintenance. Suggest to clean every week, to replace filter when is blocked by dust.



2. Clean or replace the inlet air filter, open the inlet air baffle and inlet air filter cover on the back of the machine

3. Take out the inlet air filter, clean the filter by taping or blowing with compressed air

4. Re-install the filter into outlet air cover

### **8.3.2 Cleaning/Replacing the air outlet filter**

1. Unscrew the thumb screw in the back of machine and open the ink system door

2. Unscrew ink tank limit thumb screw of the guide rail.(Some machine only have one guide rail)

3. Open the front door (ink system door), hold ink system by hand and gently take it out from the printer

4. Take out Ink system tank assembly
5. Unscrew the thumb screw in the outlet of the fans
6. Replace the dust proof cotton and return to each part according to the reverse steps.



## 8.4 Quick Maintenance Mode

This new maintenance mode is for users requesting to maintain and repair the machine urgently, but the EC-JET authorized engineers can't come on users' site. Sending EC1000 machines to agents or resellers by courier for maintenance or repairing, easy operation, no need to empty the ink tank and solvent tank.

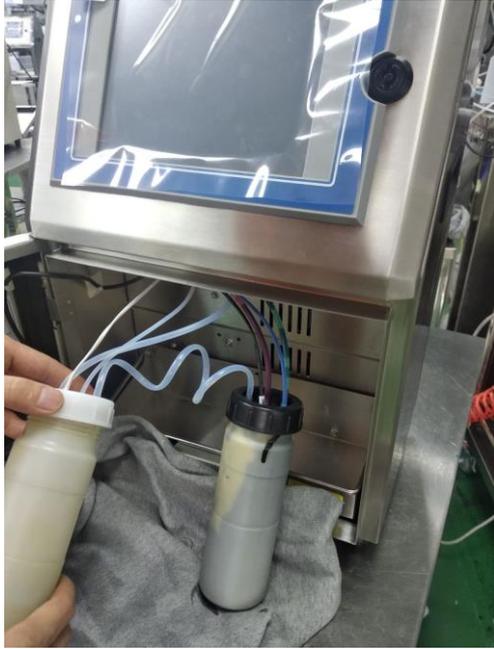
1. Open the ink system door
2. Hold the ink system and draw out until it can't move



3. Take out the ink tank, put a clean cloth or paper under the ink tank, unscrew the connector of the ink routine, take out the ink dip tube and level sensor carefully then put into the SMART bottle, show as following picture, screw the connector of routine.



4. Follow the same instruction, replace the solvent tank with SMART solvent bottle.
5. Screw the ink tank and solvent tank cap, then store in case avoiding high temperature and fire.
6. Clean the SMART ink and solvent bottle and put in the ink-system bracket, setup the bracket, screw the thumb and close the ink-system door.
7. Pack the machine, send back to agents or resellers, EC-JET and agents or resellers will provide you more dedicated service.



8. EC-JET Agents or resellers will send the machine back to customer. Follow above opposite steps to change the SMART bottles into ink and solvent tank, then you can use the printer normally.

## 9. Warning and Fault Messages

### 9.1 Warning and Fault Messages

This section describes the printer warning messages for the EC-JET printers.

The error messages may occur at any time and are NOT a direct response to user commands, although a user response may be required.

Each system warning is given a unique code number which identifies the type and source of the error, and is followed by a short description when displayed on the screen, e.g.:

**“3.03 Ink Low”**

### 9.2 Summary of Warning Messages

#### 9.2.1 System Failures

These prevent normal printer operation.

#### 9.2.2 Print Failures

These occur when the software detects a problem which affects printing.

- 2.00 Print head temperature
- 2.01 Deflector voltage
- 2.02 Charge
- 2.03 VOD
- 2.04 300V power supply
- 2.05 Temperature /Deflector
- 2.06 Ink tank empty
- 2.12 Pressure
- 2.16 Internal Spillage
- 2.17 Maintenance time or period of use

#### 9.2.3 System Warnings

These are errors which are not serious enough to shut down the printer, but give advance warning of potential problems.

- 3.00 No VOD Adjustments
- 3.01 Jet Shut Down Incomplete
- 3.02 Over Speed (Print Go)
- 3.03 Ink Low
- 3.04 Solvent Low
- 3.05 Print Go Remote Data
- 3.06 Service Time

- 3.07 Print Head Cover Off
- 3.08 Print Head Not Fitted
- 3.09 New Print Head Fitted
- 3.10 Charge Calibration Range
- 3.11 Safety Override Detected
- 3.12 Low Pressure
- 3.13 Modulation"
- 3.14 Over Speed
- 3.15 Default Language
- 3.16 Memory Failure
- 3.17 Memory Corrupt
- 3.18 Not Storing Message In Memory

## 9.3 System failures

System failures occur when the software detects a condition which prevents normal printer operation.



**WARNING:** LETHAL VOLTAGE. UNKNOWN HIGH VOLTAGES MAY BE PRESENT WITH SOME SYSTEM FAILURES. DO NOT TAMPER WITH THE PRINTER OR PRINTHEAD. WAIT UNTIL THE FAILURE SHUTDOWN IS COMPLETE.

These prevent normal printer operation. Contact with EC-JET distributor when necessary.

### 9.3.1 Print Failures

These occur when the software detects a problem which affects printing.

When a Print Failure occurs, a message is displayed on the screen status line and a jet shutdown sequence is started.

The internal alarm buzzer is switched on, the 'print ready' line set low and the alarm relay is activated (if enabled).

The keyboard is inactive while the shutdown is taking place.

When the shutdown sequence is complete the Print Failure screen is displayed:



The user should normally select  to reset the printer.

Following a print failure shutdown, the software sets:

- Pressure to zero
- EHT off
- All valves closed
- 300V off these settings cannot be altered until the print failure has been cleared (i.e. the jet cannot be restarted).

The following pages give a brief description of each Print Failure and what should be done to correct it. In each case, if the suggested action does not rectify the error condition, you should contact your local distributor.

### 9.3.2 2.00 Print head Temperature

The print head temperature sensor indicates that a temperature around or in the print head has exceeded the safe operating limit. This may mean that a fire has occurred within the head cover.

#### Possible causes

- Excessive local heat source:  
Relocate the print head away from the heat source.
- Fire in the print head:  
Have your printer checked by your local engineer.

### 9.3.3 2.01 Deflector Voltage

The voltage on the deflector plates has discharged which is normally caused by ink build-up.

#### Possible causes

- Excess build-up of ink on deflector plates:  
Clean the print head as described earlier in this manual (see "Routine Maintenance").
- Static discharge:  
Check for any source of excess static electricity.



- Printhead still wet after cleaning:  
Allow the print head to fully dry before starting the jet.
- Debris or fibers creating a discharge path:  
Clean the print head and check for fibers.

### 9.3.4 2.02 Charge

This failure occurs when the jet is being started, or when it is running.

#### Possible causes

- Blocked nozzle or misaligned jet:  
Carry out the nozzle clear procedure described in the Troubleshooting section of this manual (see “troubleshooting - Clearing the Print head Nozzle”).
- Print head code or modulation values set incorrectly:  
Check the Print head and Modulation (MOD) values printed on the print head serial number label found on the conduit, with the stored values. (see “Changing the System Setup”).

### 9.3.5 2.03 Velocity Of Drop

This failure may occur when the jet is being started.

#### Possible causes

- Misaligned jet:  
Carry out the nozzle clear procedure described in the Troubleshooting section of this manual. (see “Troubleshooting - Clearing the Print head Nozzle”).
- Print head code or modulation values set incorrectly:  
Check the Print head and Modulation values printed on the print head serial number label found on the conduit, with the stored values. (see “Changing the System Setup”).



- Build-up of ink on the sensors:  
Clean the print head.
- Blocked filter:  
Contact your local EC-JET distributor for assistance.

### 9.3.6 2.04 300V Power Supply

#### Possible cause

- The 300 Volt power supply output is out of tolerance or has failed:  
Call your local EC-JET distributor.

### 9.3.7 2.05 Temperature/Deflector

A failure has occurred which the printer has not been able to fully identify (see Print Failures “2.00” and “2.01”).

### 9.3.8 2.06 Ink Tank Empty

This failure occurs when the ink level sensor has been indicating low for a predetermined time:

**Midi** 8 hours

This prevents the ink from running out completely if the user fails to top up the ink reservoir following an “Ink Low” error (see System Warning “3.03”). This failure only occurs when the jet is running since the jet cannot be started when the ink is low.

### 9.3.9 2.16 Internal Spillage Fault

This may occur either at switch on, or during normal running. A sensor within the ink system detects the unwanted presence of ink or solvent within the cabinet tray.

#### Possible causes

- The ink or solvent tanks have been overfilled.
- A leak has developed within the ink system.
- A Lure fitting has become loose on the main filter or damper.

To cure the fault, the cause needs to be rectified and the ink tray completely cleaned and dried. Contact your local EC-JET distributor.

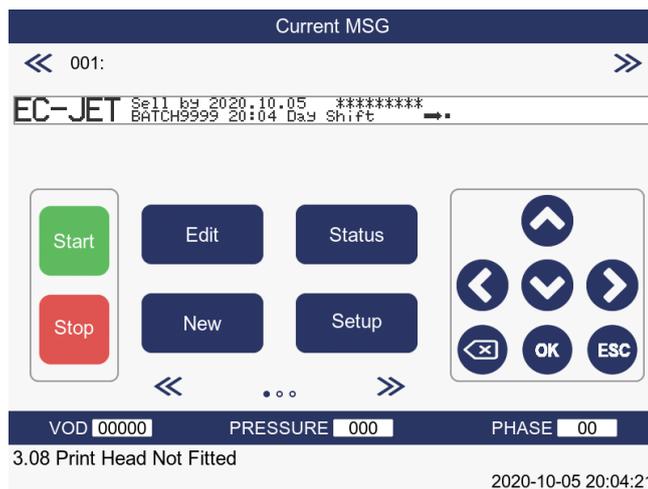
## 9.4 System Warnings

System Warnings inform the user of problems which may affect the operation of the printer but are not serious enough to require a shutdown.

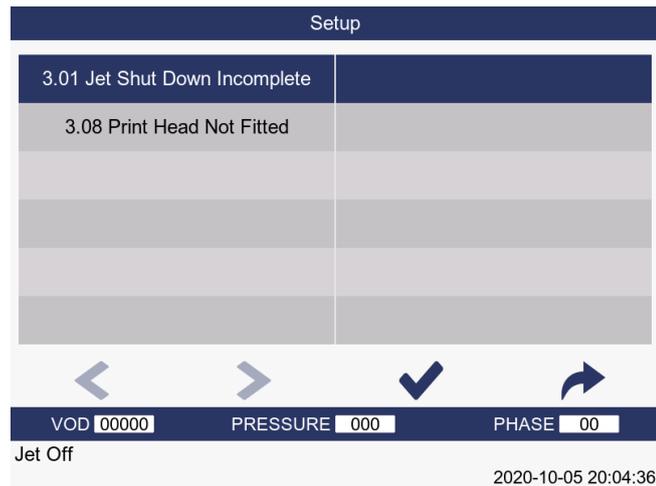
When a System Warning occurs, a message is displayed on the screen status line for a minimum time of approximately 3 seconds.

The internal alarm buzzer is sounded twice and the alarm relay activated twice (if enabled) using 1 second pulses.

The error will remain on display after the 3 second interval until the user presses any key, or another error occurs, or a warning message is displayed, e.g.:



All warnings and faults are logged and may be displayed by selecting **Status** and then **Error List** screen which displays all errors that have occurred:



The following pages describe the System Warnings, together with the actions to be taken (if any).

### 9.4.1 3.00 No VOD Adjustments

This warning can occur when the jet is being started, or when the jet has been running for some time.

#### Possible causes

- Printhead code values are set incorrectly:  
Check the Printhead and Modulation values printed on the print head serial number label found on the conduit, with the stored values. (see “hanging the System Setup”).
- Ink viscosity is excessively out of range:  
Allow the printer to run to bring the viscosity back into range.
- There is a pressure loss in the system:  
Call your local EC-JET distributor.

### 9.4.2 3.01 Jet Shut Down Incomplete

This indicates that the printer was previously switched off while the jet was running or before the printer had completed the shutdown routine. Completion of the shutdown routine is important and must be allowed to finish.

The warning does not stop the printer from functioning. It will be reported at every subsequent printer start-up until a jet shutdown routine is fully completed. Press the [stop] key and wait for the message:

**“Jet Stopped: You May Now Switch Off ”**

### 9.4.3 3.02 Over Speed (Print Go)

This indicates that the printer may have missed printing at least one pattern or is receiving false triggers from the photocell.

When the Photocell Mode is set to Trigger, each print delay is started following the photocell trigger.

At the end of the delay a “print go” is issued to start printing. If the printer has not printed the last pattern by this time, the warning is reported and the new pattern is not printed. In effect, this will mean that alternate objects will NOT be printed on.

The warning applies to the currently printing pattern is reset automatically when printing is restarted.

#### Possible cause

- The next object has arrived at the print head before the last pattern is complete because:
  1. The line speed is too fast.
  2. The pattern is too long compared to the size of the objects to be printed on.
- The photocell is giving false triggers.

#### 9.4.4 3.03 Ink Low



If the ink level sensor indicates that the ink reservoir is low then this warning is given. It is cleared automatically when a sufficient amount of ink is added (500ml).

DO NOT put in more than one bottle. If the ink low condition is detected before the jet is started, then the jet cannot be started until the ink tank is replenished.

If the condition is detected while the jet is running, the jet will continue to run for several hours until the ink is dangerously low, at which point a failure will occur (see Print Failure “2.06”).

#### 9.4.5 3.04 Solvent Low



If the solvent level sensor indicates that the solvent reservoir is low then, this warning is given. It is cleared automatically when a sufficient amount of solvent is added to the reservoir.

DO NOT put in more than one bottle (500ml). If the solvent low condition is detected before the jet is started, then the jet cannot be started until the solvent tank is replenished.

If the condition is detected while the jet is running, the jet will continue to run regardless, but no attempt will be made to add solvent.

#### 9.4.6 3.05 Print Go / Remote Data

A “print go” has occurred and printing data has not been received from the remote interface.

Make sure the transmission cable and the port are right setting.

#### 9.4.7 3.06 Service Time

When the jet is started, the time remaining to the next service is checked. If it exceeds 4000 hours then this warning is reported and the jet is started as normal.

This warning will be reported on every jet start up until the service time has been reset.

Maintenance should be made when there is warning, otherwise it will affect the machine performance and stability.

#### 9.4.8 3.07 Print Head Cover Off

This warning is reported if the print head cover is removed.

The supply to the EHT plates is switched off (by hardware) when the cover is removed.



WARNING: THERE IS A LINK WHICH, WHEN FITTED, DISABLES THIS AUTOMATIC SHUT OFF. THEREFORE, THE PRESENCE OF THIS WARNING IS NOT A GUARANTEE THAT THE EHT IS OFF.

Printing is suspended when the cover is removed and is resumed a few seconds after the cover is refitted.

The warning applies to the currently printing pattern - it is reset automatically when

printing is restarted.

#### **9.4.9 3.08 Bad Print Head Code**

At start up the software checks the type of print head that is fitted. If it does not recognize the print head type this warning is reported.

The system will continue to operate on the assumption that the print head has not been changed, and will continue with the same print head type as used previously (i.e. the currently stored NVR print head type).

If a new type of print head has been fitted, but has not been detected correctly, the modulation frequency, voltage, etc., will all be incorrect. Therefore, the jet will not break up properly, and a phase fault (2.02) will probably occur when starting the jet.

#### **9.4.10 3.09 New Print Head Fitted**

At start up the software checks the type of print head fitted. The last print head type used is stored in the printer's memory.

If the currently fitted type is not the same as the type stored in the memory then this error is reported and the type in memory is updated.

This warning should only ever occur when a new print head is fitted. If it occurs at other times then the memory may be corrupt, or the print head connector faulty.

Under normal circumstances this warning just confirms that the print head type has been changed. The defaults for VOD, modulation, etc., will be used, until the user enters a new print head code in the SETUP menu.

If the wrong type of print head has been detected for any reason, the modulation frequency, voltage, etc. will all be incorrect. Therefore, the jet will not break up properly, and a phase fault (2.02) may occur when starting the jet, or poor print quality may result.

#### **9.4.11 3.10 Charge Calibration Range**

Contact your local EC-JET distributor if this error is reported.

#### **9.4.12 3.11 Safety Override Detected**

This warning message alerts the user when the safety override link is fitted.

WARNING: DO NOT START THE PRINTER WHEN THIS ERROR MESSAGE IS PRESENT. PRINTER SAFETY CIRCUITS AND SENSORS WILL NOT BE FUNCTIONING. IN THE EVENT OF THIS ERROR MESSAGE OCCURRING, SWITCH OFF THE PRINTER AND CONTACT YOUR LOCAL EC-JET DISTRIBUTOR IMMEDIATELY.

#### **9.4.13 3.12 Low Pressure**

When start to jet, the printer has detected a loss of ink pressure, which will affect the printer's performance.

##### **Possible causes**

- The main ink filter is blocked.
- Pump output is low.

Contact your local EC-JET distributor.

#### 9.4.14 3.14 Over Speed (Variable Data)

This indicates that the printer has missed at least one pattern because it cannot generate the pattern's variable data (e.g. sequential numbers) at the required rate - i.e. the printer was still generating pixel data for the next "print go" when the "print go" occurred.

The warning applies to the currently printing pattern - it is reset automatically when printing is restarted.

##### **Possible cause**

- The amount of variable data in the pattern is too long for the current rate of print triggers. Reduce the amount of variable data, if possible.

**NOTE:** This warning indicates the printer cannot generate pixels fast enough, whereas System Warning 3.02 indicates the printer cannot print the raster fast enough.

This warning is only likely to occur for fast raster (e.g. raster smaller than 16 drops for Micro print head), where pixel generation by the software is slower than the rate at which the hardware can print raster.

#### 9.4.15 3.15 Default Language

There is little chance of fault of default language.

Otherwise, contact your local EC-JET distributor.

#### 9.4.16 3.16 Memory Failure

##### **Possible cause**

- The battery backup has failed (exhausted battery). Recharge the battery by switching the printer on for 24 hours. Otherwise, contact your local EC-JET distributor.

#### 9.4.17 3.17 Memory Corrupt

The system will still function but some values may have been reset to their defaults.

##### **Possible cause**

- The battery backup has failed (exhausted battery). Recharge the battery by switching the printer on for 24 hours. Otherwise, contact your local EC-JET distributor.

#### 9.4.18 3.18 No Message Stored In Memory

This warning is reported if there is no message stored in memory. Printing cannot be started if there is no message stored.

##### **Possible causes**

- The user has cleared the message memory by selecting  and has then failed to enter a new message.
- The battery backup has failed:

Contact your local EC-JET distributor.

## 10. Troubleshooting

### Introduction

This section provides general advice on fault diagnosis on the EC-JET Ink Jet Printers, as well as specific procedures for identifying and rectifying faults. Fault diagnosis is complicated by the number of variables involved in producing good print quality. Fast, non-contact printing involves fluid dynamics, physics, electronics, computing and chemistry.

Many of the faults that could occur within the printer are self-diagnosed by the integral software. Upon diagnosis, the operator is alerted by way of error messages (warnings and faults) which appear in the status line of the display screen.

Before attempting any fault diagnosis for the first time, operators are advised to familiarize themselves with the “Warning and Fault Messages” section of this manual, as it contains information which is useful in rectifying many simple faults.

Problems can be found to have either a single cause or several combined causes. The complications arising from the simultaneous failure of several different components make it impossible to consider such faults in this user manual. In this section, individual problems are linked to their most probable causes.

The most successful fault diagnosis technique will be found by investigating each problem, separately, in turn. Do not begin by assuming the most complicated combination of faults; always start by investigating the simplest possibilities.

### 10.1 Where to Start

All problems with printer operation are distinguished from each other by the symptoms displayed. These symptoms can be obvious faults with the print quality; error messages on the display; or any other signs by which it is apparent that the printer is not functioning correctly. When the symptoms have been correctly identified, the possible cause(s) of the symptoms the printer is displaying can be investigated.

The recommended fault diagnosis sequence is as follows:

1. Collect as much information as possible on ALL the symptoms that the printer is displaying, including error messages, print samples and signs of electrical or mechanical malfunctions.
2. Use the “Identifying Faults;” sub-section to identify all the possible causes of the symptoms that the printer is displaying.
3. Start with the most probable cause, and investigate each of the possible causes in turn. This will eliminate all the possible causes that are not responsible for the problem, until the actual cause is established.
4. When the actual cause of the symptoms has been established, use the “Problem Solving” sub-section to perform the necessary adjustments and repairs to rectify the fault.
5. Finally, check that the printer operates correctly and that any error messages have been cleared, and that there is not a second fault causing supplementary symptoms.

If, after rectifying one fault the symptoms have not been eliminated, continue with the fault diagnosis until all faults have been identified and rectified. Only when all faults have been eliminated, and the printer is operating correctly, has the fault diagnosis been completed.

The “Identifying Faults” sub-section includes lists of symptoms (by print sample and by description), and gives references to fault codes which identify the particular type of fault.

The “Problem Solving” sub-section provides problem solving instructions for each fault code number, and defines checks, adjustments and repair procedures for all the faults identified in “Identifying Faults”.

These procedures explain how to check whether the fault is present and how to rectify it.

Use the following list of action points to approach fault diagnosis in a logical way:

- If possible, ask whoever found the problem to describe it in detail, including any action taken.
- Do not jump to conclusions. Take the time to examine the printer carefully. Is there sufficient ink and solvent? Are there any signs of ink leakage? Are there any loose wiring connections?
- Check the Print Status option for any error messages that have been logged.
- Make use of the Diagnostics options to check and record the jet monitoring parameters of Pressure, Velocity Of Drop, Modulation and Phase. Compare these with the reference values and identify any out-of-specification measurements. (See “Diagnostics”)
- Make print samples (if possible) and examine the prints carefully for signs of print quality problems.
- Only when all of the symptoms have been noted should an attempt be made to identify the possible cause of the problem.

## 10.2 Identifying Faults

Some faults are best identified by the appearance of the print when a sample of the test pattern is printed. Other faults may not permit a print to be made, or may produce other symptoms such as fault messages. To accommodate these differences, this sub-section is divided into two parts: “Identifying Faults by Print Sample” and “Identifying Faults by Symptom”.

### 10.3 Identifying Faults by Print Sample

This part of the manual is intended to help distinguish between different types of print fault, in order to identify the possible causes.

There are several ways in which print quality can be affected, and in some cases print quality problems can be caused by more than one fault. For most faults, it is not difficult to identify the cause of the problem, but some faults have similar symptoms, making accurate diagnosis a little more difficult. For example, a low modulation problem can give similar symptoms to high viscosity.

In cases where the cause of the print fault is not immediately obvious from the print sample, secondary symptoms should always be sought that will help to distinguish between the possible causes. In the example above, the current modulation would need to be checked, and the pressure, the Velocity Of Drop, and the operation of the ink system components investigated. These additional pieces of information will then enable you to decide which of the possible causes is the reason for the print fault.

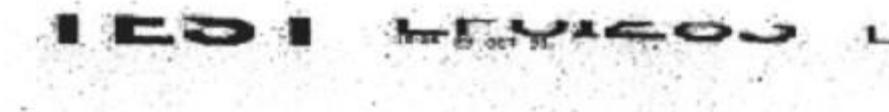
The following list classifies faults by the appearance of the print samples they produce. The list shows print samples of the standard test pattern which can be compared with samples taken from the printer under investigation. Below each sample, or set of samples, is a brief description of the fault symptoms. Also provided are the possible causes of the fault and a reference to a particular fault code number in the

“Problem Solving - Print Samples” part, where the problem and its method of rectification is described in more detail.

**NOTE:** Throughout this manual, reference to the “top” of the print means the part of the pattern closest to the negative deflector plate of the print head (i.e. the least deflected drop).

Identifying Faults by Print Sample:

EJ93



*Top (or bottom) of pattern missing*  
Gutter Clipping..... FC05



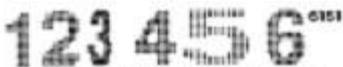
*Section of the pattern missing or distorted.*  
Printhead Cover Catch (obstruction in cover slot).....FC06



*Uneven stretching of the pattern.*  
Shaft Encoder Faults (shaft encoder slipping).....FC09



*Squashed print. Pattern not blurred.*  
Deflector Voltage Faults.....FC10



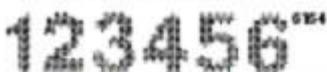
*Product tilting along the axis of the conveyor travel.*  
Vibration Problems..... FC36



*Product tilting across the axis of the conveyor travel.*  
Vibration Problems.....FC36



*High frequency vibration along the axis of the conveyor travel.*  
Vibration Problems.....FC36



*High frequency vibration across the axis of the conveyor travel.*  
Vibration Problems..... FC36

## 10.4 Identifying Faults by Symptom

When it is not possible to identify a fault by the visible effect on the print sample, it becomes necessary to look for other symptoms. For example, it may not be possible to start the jet satisfactorily, so it will be

impossible to obtain any sort of print.

However, in most circumstances there will be some obvious indication as to the nature of the fault, the best example being the fault messages displayed in the screen status line.

The “ Warning and Fault Messages” section lists all of the warning and fault messages. This section also gives a detailed explanation of the condition that the printer control logic has detected which has resulted in the particular message being displayed. If there is no fault message, or if the message on its own is not enough to identify the problem, refer to the following list of symptoms to identify the possible cause of the fault.

The list is organized to group the symptoms into the five different stages of printer operation:

- 1. Before switching on.**
- 2. After switching on.**
- 3. When the jet is started.**
- 4. During printing.**
- 5. After the jet is stopped.**

**Note:** that these groupings only indicate the earliest point at which the symptom could be observed; the symptom could also be observed later in the cycle of printer operation. For example, solvent contamination might be observed at any time, but it is included in the first group because it is possible to check this symptom before switching on.

The text below each symptom describes the different types of fault that can give rise to the symptom, with references to fault code numbers by which the faults are identified in the “Problem Solving” subsection, where the problem and its method of rectification is described in more detail.

<b>Symptom and Possible Causes</b>	<b>Fault Code</b>
<b>BEFORE SWITCHING ON</b>	
<b>Ink deposits in the print head or on the cover slot.</b>	
JetAlignmentProblems .....	..FC32
<b>Ink leaking from gutter</b>	
GutterProblems.....	..FC35
<b>AFTER SWITCHING ON</b>	
<b>Ink leaking from gutter.</b>	
Gutter Problems.....	FC35
<b>Low pressure warning on start-up.</b>	
Pressure Loss (mechanical).....	..FC12
<b>Partial or total pressure loss</b>	
Pressure Loss (mechanical).....	.. FC12
<b>Discrepancy between Set and Read Pressures</b>	
Pressure Loss (mechanical).....	.. FC12

Symptom and Possible Causes	Fault Code
-----------------------------	------------

**WHEN THE JET IS STARTED**

**No jet at start-up.**

Jet Alignment Problems (nozzle blockage)..... FC32

**Messy print head at start-up.**

Jet Alignment Problems (nozzle out of alignment)..... FC32

**No VOD adjustment on start-up.**

Pressure Loss (mechanical)..... .. FC12

**Blocked gutter.**

Gutter Problems..... .. FC35

**Jet catching print head cover slot.**

Printhead Cover Catch..... . FC06

Jet Alignment Problems..... . FC32

**Ink leaking from gutter or poor gutter action.**

Gutter Problems..... FC35

**DURING PRINTING**

Poor print quality..... Refer to "Identifying Faults by Print Sample"(page 75)

**Jet velocity reduces - increased VOD reading.**

Gutter Problems..... ..FC35

**Messy print, missing drops**

Gutter clipping..... ..FC05

Printhead cover catch.....FC06

**No Print**

Print Delay value incorrectly set..... .. FC39

Part of message missing..... .. FC40

**AFTER THE JET IS STOPPED**

**Poor purge of nozzle at shutdown.**

Gutter Problems..... .. FC35

## 10.5 Problem Solving

This sub-section describes the faults identified in the previous sub-section "Identifying Faults".

For each fault, identified by a fault code (FC) number, procedures are given for confirming the presence of the fault, and actions necessary to rectify the fault.

Fault codes not referenced in this manual are faults that can only be rectified by a Service Engineer.

## 10.5.1 Problem Solving - Print Samples

### FC05 Gutter Clipping

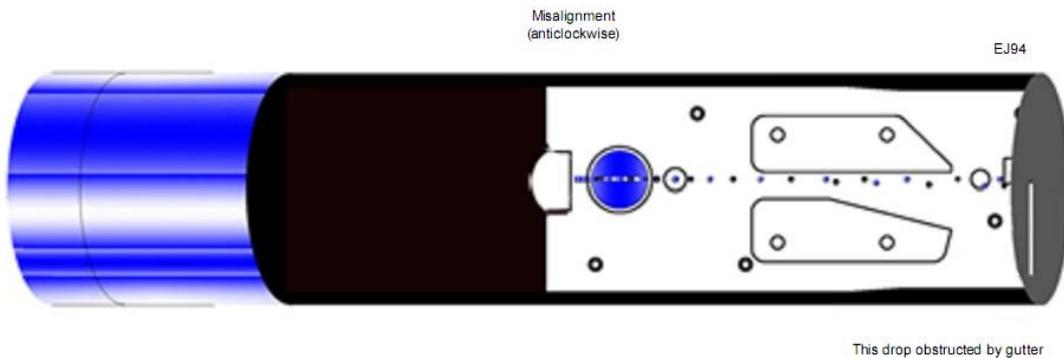
#### Diagnosis

This fault is also known as “gutter catch” and is similar to the associated problem of Printhead Cover Catch. The problem occurs when the least deflected drops clip the gutter and are thus not printed.

If the jet is misaligned on the gutter, the least deflected drops may catch the edge of the gutter. This will cause the loss of the drops from the top of the print pattern.

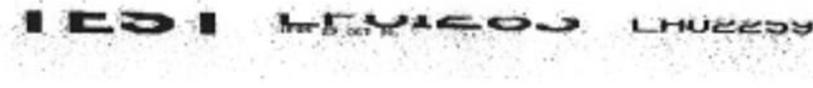
As printing continues, the ink will build up on the gutter edge and the print loss will increase, sometimes leading to deflector plate shorting and EHT failures.

The following diagram illustrates the problem:



PRINT SAMPLE(Gutter clipping)

EJ95



This print sample shows gutter clipping, resulting in loss of the top part of the print.

#### Cause and Cure:

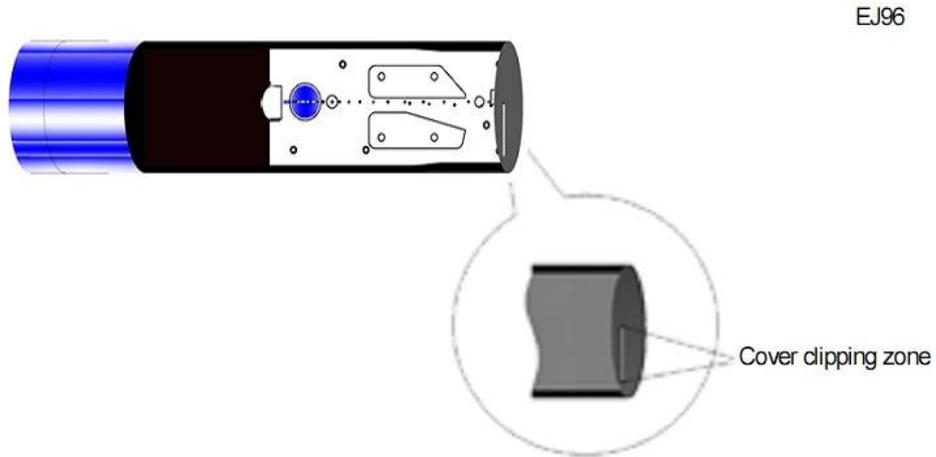
Check the EHT settings (see - “Changing the System Setup”). Check the jet alignment.

### FC06 Printhead Cover Catch

#### Diagnosis

This problem is caused by the most deflected drops catching the edge of the exit slot in the printhead cover, and thus failing to be printed.

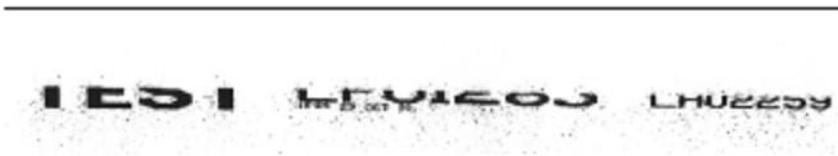
The following diagram illustrates the condition:



**NOTE:** It is sometimes possible for the least deflected drops to clip the cover slot, in which case the effect is similar to the Gutter Clipping fault

PRINT SAMPLE(Gutter clipping)

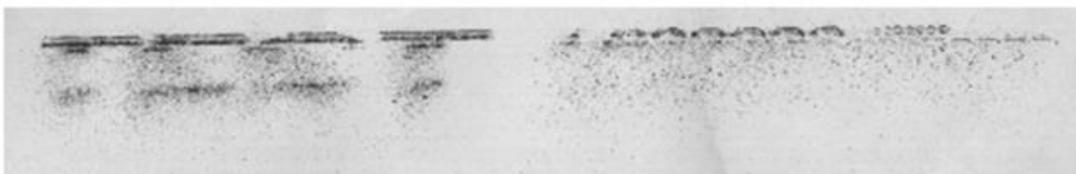
EJ95



Most commonly, the drops are lost at the bottom of the print, as in the above print sample. Whether the top or the bottom of the print is missing, a typical result of print head cover catch is a fine diffuse spray of drops.

**Cause and Cure:**

Check the settings and connections of EHT. Check the print head cover slot for an obstruction, which may be accumulation of ink. If the print head cover is badly out of place on the print head, the drops to be printed may miss the cover slot altogether. Ensure that the conduit is not pulling the print head out of line with the cover slot

**Print Samples**

The above print sample shows what can happen if the print head cover slot is obstructed by dried ink, dust or some other contaminant, such as a hair.

**Cause and Cure:**

Clean the exit slot using the appropriate solvent for the type of ink being used in the printer. Make sure that the print head cover is correctly positioned and securely fitted on the print head.

NOTE: Some of the Printhead Cover Catch print samples may show similarities with Phasing Errors problems. The fundamental difference to note is that phasing errors still print ALL the drops, although not in the correct positions, while print head cover catch (or clipping) problems show a considerable loss in the number of drops printed.

**10.5.2 Problem Solving - Ink System Mechanical Faults****FC12 Pressure Loss**

There are several ways in which a pressure loss can manifest itself:



- a Low Pressure warning on start-up (error 3.12);
- a No VOD Adjustments warning (error 3.00);
- a significant discrepancy between Set Pressure and Read Pressure when the pressure is set to 255 by the service engineer in Diagnostics;
- an obvious leak of ink from around the pump, the tubing or the manifold.

The following identifies how each of the ink system components can contribute to a loss of pressure in the system:

**Ink Tank Reservoir**

- debris in the ink tank can cause either a partial or a total pressure loss. The debris can be pieces of foil seals from ink bottles, or other extraneous material that has fallen into the reservoir.

**Pre-Pump Filter**

- debris from the ink tank reservoir that has been drawn into the body of the filter can cause a total, or more usually a partial, pressure loss;
- over tightening of the connectors onto the threaded stud of the filter body can cause a partial pressure loss by constricting the olive and reducing the size of the flow aperture;
- the actual filter membrane may have become blocked; it has done its job of protecting the pump.

**Pump Assembly**

The pump assembly is an electromagnetically-coupled gear pump.

- the pump motor has failed, resulting in loss of drive and hence total pressure loss;
- the motor has decoupled from the pump, so that the motor is spinning wildly but not turning the gears in the pump head, again resulting in a total pressure loss;
- the gears in the pump are worn, resulting in less than totally efficient drive and a partial pressure loss;
- a leak has developed on the output side of the pump.

**NOTE:** If the pump motor is turning but the pump itself is not, there will be a normal reading for Set Pressure, but a zero reading for Read Pressure.

**Main Ink Filter**

- the filter has fulfilled its task and has eventually collected an excess of debris and become blocked;
- the PTFE tubing has been incorrectly fitted to the filter. If the tubing is pushed too far into the elbow

assembly, a pressure loss can result due to reduced flow;

- the stainless steel inserts, when pushed into the PTFE tubing, have pared off a little of the inner wall of the tubing causing a blockage which reduces flow, and hence pressure;
- a leak has developed at an assembled or welded joint.

#### **Manifold Assembly**

- the pressure transducer is faulty. Check the transducer and its associated wiring before suspecting a fault in the pressure circuit hybrid of the IPM PCB;
- the vacuum venture has either become blocked, or the stainless steel insert has been lost through incorrect assembly;
- a leak has developed at an assembly joint or crack. The manifold has simply become worn-out after years of ink flow.

### **10.5.3 1 Problem Solving - Printhead Mechanical Faults**

#### **FC32 Jet Alignment Problems**

##### **Possible causes:**



- the jet has been shut down incorrectly;
- ink has been leaking from the nozzle during a period of non-use;
- the ink is contaminated causing quantities of salt deposits to build up around the nozzle;
- the nozzle problem (the cap loosed, the diamond cracked, the nozzle assembly distorted)

Before attempting to rectify a jet alignment problem, it is advisable to investigate which of these possible causes is most likely to have occurred, and to take the appropriate steps to ensure it does not reoccur.

The first thing to do is to clear the nozzle, which will most often cure the problem. Clearing the nozzle should remove any deposits of ink or debris which could be causing an obstruction in the nozzle orifice, resulting in jet misalignment.

If clearing the nozzle does not solve the problem, it will be necessary to call your local Distributor for a EC-JET approved engineer.

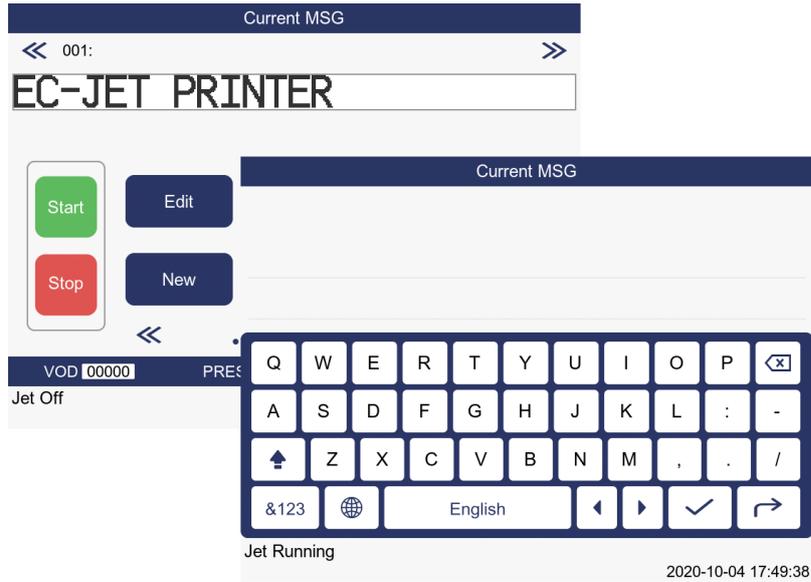
#### **How to clearing the Printhead Nozzle**

The nozzle has a very small orifice and it is possible for this orifice to become blocked in a number of ways, for instance: dried ink, foreign debris introduced into the ink supply, or contamination of ink types.

The most common occurrence is when ink has dried within the nozzle and caused a restriction. In this situation, the first course of action is to perform a series of nozzle clear routines. In normal operation, ink is supplied to the nozzle under pressure and is emitted from the orifice as a jet. When a nozzle clear is performed, vacuum is applied to the nozzle, and air and solvent can be drawn the reverse way into the nozzle to clear any restrictions.

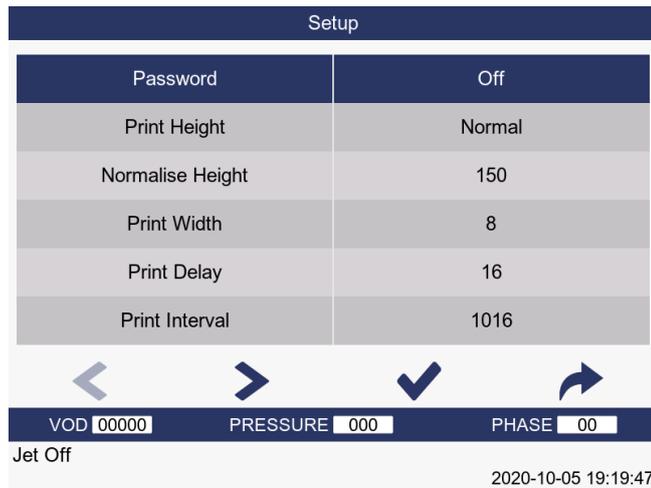
To perform a series of nozzle clears, call up the Setup menu from the CURRENT MESSAGE screen, by

pressing the  key:



If password protection is switched on (see “Changing the System Setup”), the PASSWORD menu will appear at this stage, as shown above.

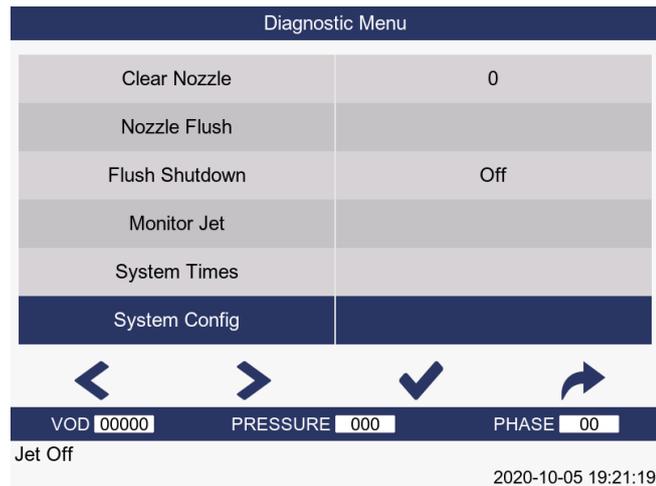
Type in “XXXX” for the password, press the key and the SETUP menu will be displayed:



Scroll through the menu options using keys until the Diagnostics option is

selected, then press key to call up the DIAGNOSTICS menu. Alternatively you can simply press

key which will call up the DIAGNOSTICS menu directly.



Locate the Clear Nozzle option. Type in the number of Clear Nozzle sequences you wish to run. DO NOT

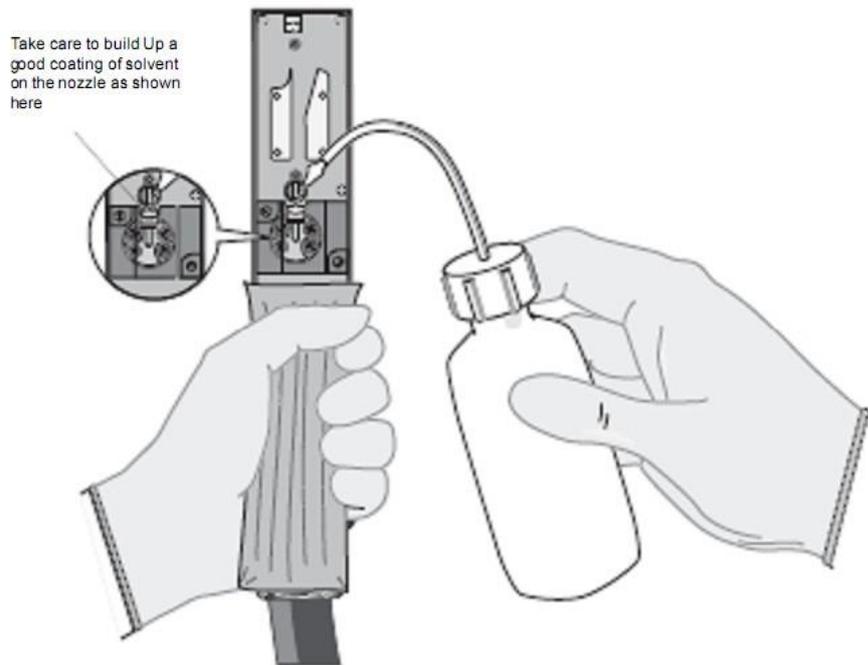
press  key to start the nozzle clear sequence yet - the following procedure must be carried out first:

NOTE: A minimum of three Clear Nozzle sequences is recommended in an attempt to clear a nozzle blockage. This can be performed as a continuous routine by entering “3” in the Clear Nozzle option and

pressing  [enter].

While wearing disposable gloves:

1. Remove the print head cover.
2. Wash the print head as described in “Cleaning the Printhead” ensuring the nozzle area is clean.
3. Invert the print head, with some absorbent material wrapped around it where it connects to the conduit, and hold it in a vertical position.
4. Activate the Clear Nozzle routine by pressing  the [enter] key.
5. The status line will indicate that the printer is clearing the nozzle.
6. Apply small amounts of solvent to the inverted nozzle face as illustrated below. It should be observed that when a small drip of solvent is applied to the nozzle face, it will be drawn in through the nozzle orifice and back into the assembly.
7. Apply drops of solvent repeatedly until no more solvent is drawn in.
8. The routine of three Clear Nozzle sequences should be carried out a maximum of 10 times, with an attempt to start the jet at the end of each routine. If the nozzle is still blocked after the 10 routines have been completed, the print head should be replaced.



**CAUTION:** Be certain to use the correct solvent that corresponds to the ink type being used in the printer.

### **FC35 Gutter Problems**

The faults which can occur in the gutter line are as follows:

- blocked gutter which can be due to:
  - incorrect shutdown not purging the gutter;
  - print head mounted lower than the printer (causing siphoning effect);
- ink leaking from the gutter during a period of non-use:
  - print head mounted lower than the printer (causing siphoning effect).
- poor gutter action (inadequate suction):
  - Very thick ink, e.g. pressure is 40 points above the reference pressure value.

If you suspect a gutter blockage, do not attempt to clear it yourself; contact EC-JET or your local distributor.

### **FC36 Vibration Problems**

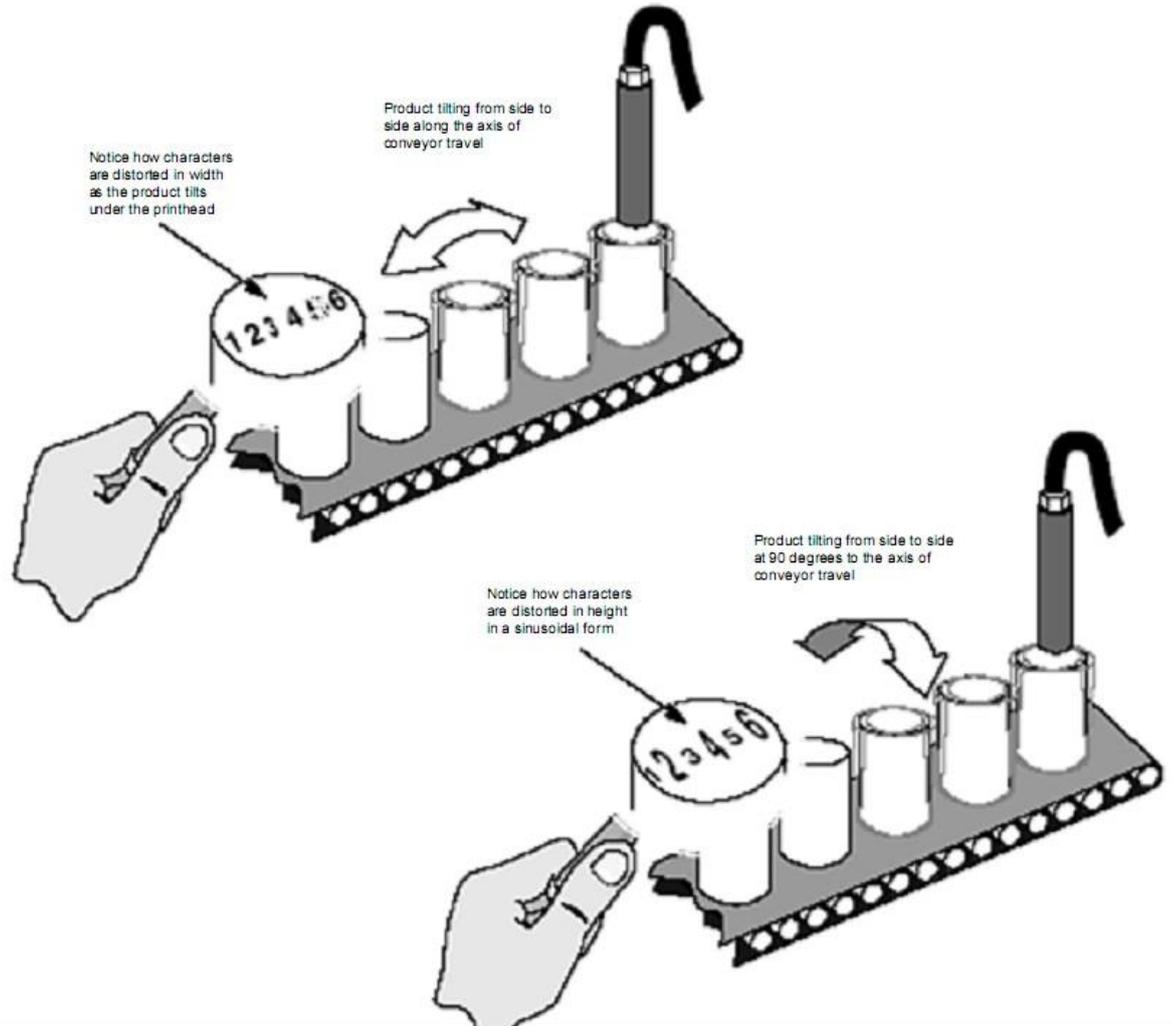
Poor print quality is the most common indicator of vibration problems. This is because the print drops are relatively stable while in flight, so vibration in either the product being marked or the print head it will result in the drops being misplaced or obstructed.

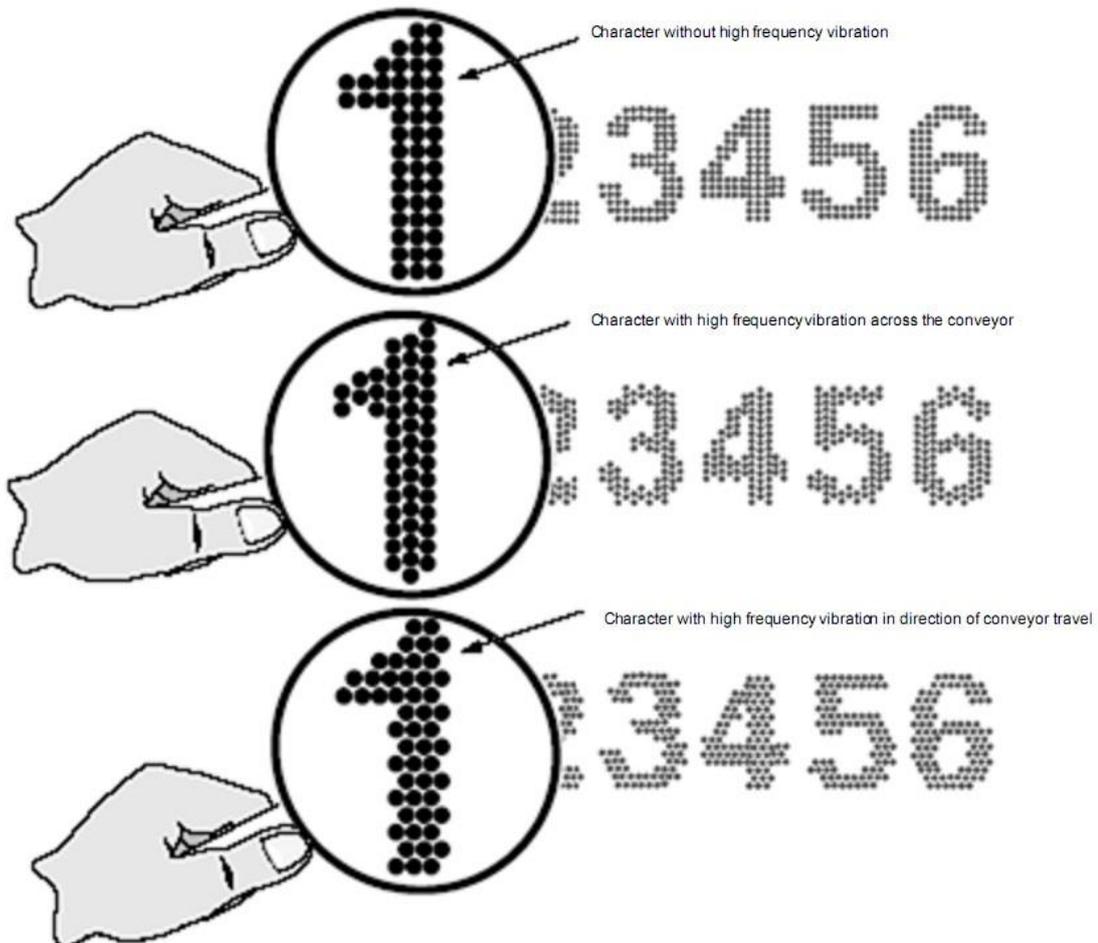
#### **Diagnosis**

To determine whether high frequency vibration is affecting the product or the print head, simply pass a piece of paper under the print head and trigger the print. Take care to move the paper at a steady speed.

If it is the product which is vibrating, then the print quality will be good. If the print quality is poor, the vibration is likely to be coming from the print head.

To test for print head vibration, pass a piece of paper under the print head in the same way as described above, but this time hold the print head with your other hand to dampen any vibration in it. If print quality improves as a result, then the print head is suffering from the effects of vibration.





The various types of vibration and their effects are described in the following:

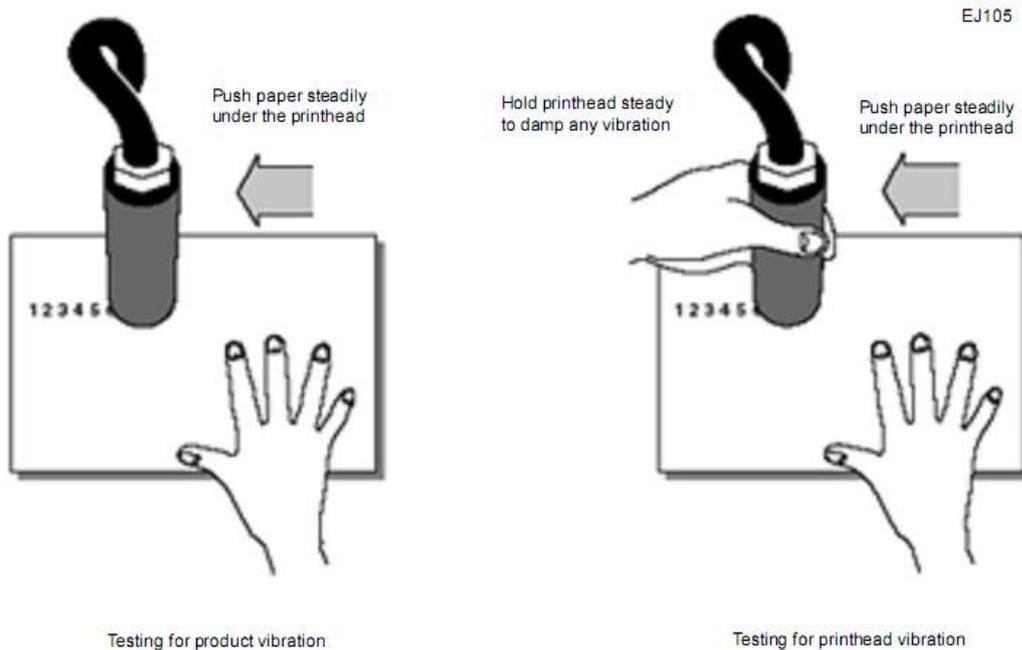
### 1) Tilting

The product can tilt from one side to the other, either along the axis of the conveyor travel or at 90 degrees to it (i.e. across the conveyor width)

When the product tilts along the axis of the conveyor travel, the width of some characters will be contracted and some expanded, as the product tilts first one way then the other.

Similarly, when the product tilts at 90 degrees to the axis of the conveyor travel, the height of some characters will be contracted and some expanded, as the product tilts first one way then the other.

This is shown in the following illustrations:



### Knocking and Strong Vibration

Strong vibration and knocking to the print head is the most serious vibration problem likely to occur, since this will affect operation of the printer itself. Severe vibration or knocking will lead to the printer shutting itself down and displaying one or both of the following fault messages:

“ 2.01 Deflector Voltage ”

“ 2.03 Velocity of Drop “

It will also be found necessary to clean the print head more often than would be expected.

To understand what is happening, consider that the stream of drops is relatively stable once in flight.

Therefore, if the print head suffers vibration or sudden movement, the drops will be obstructed either by the VOD sensor or the edge of the gutter. This will cause ink to be splashed on the VOD sensor and deflector plates, and to build up deposits on the gutter.

### 10.5.4 Blockage Caused by Knocking and Strong Vibration

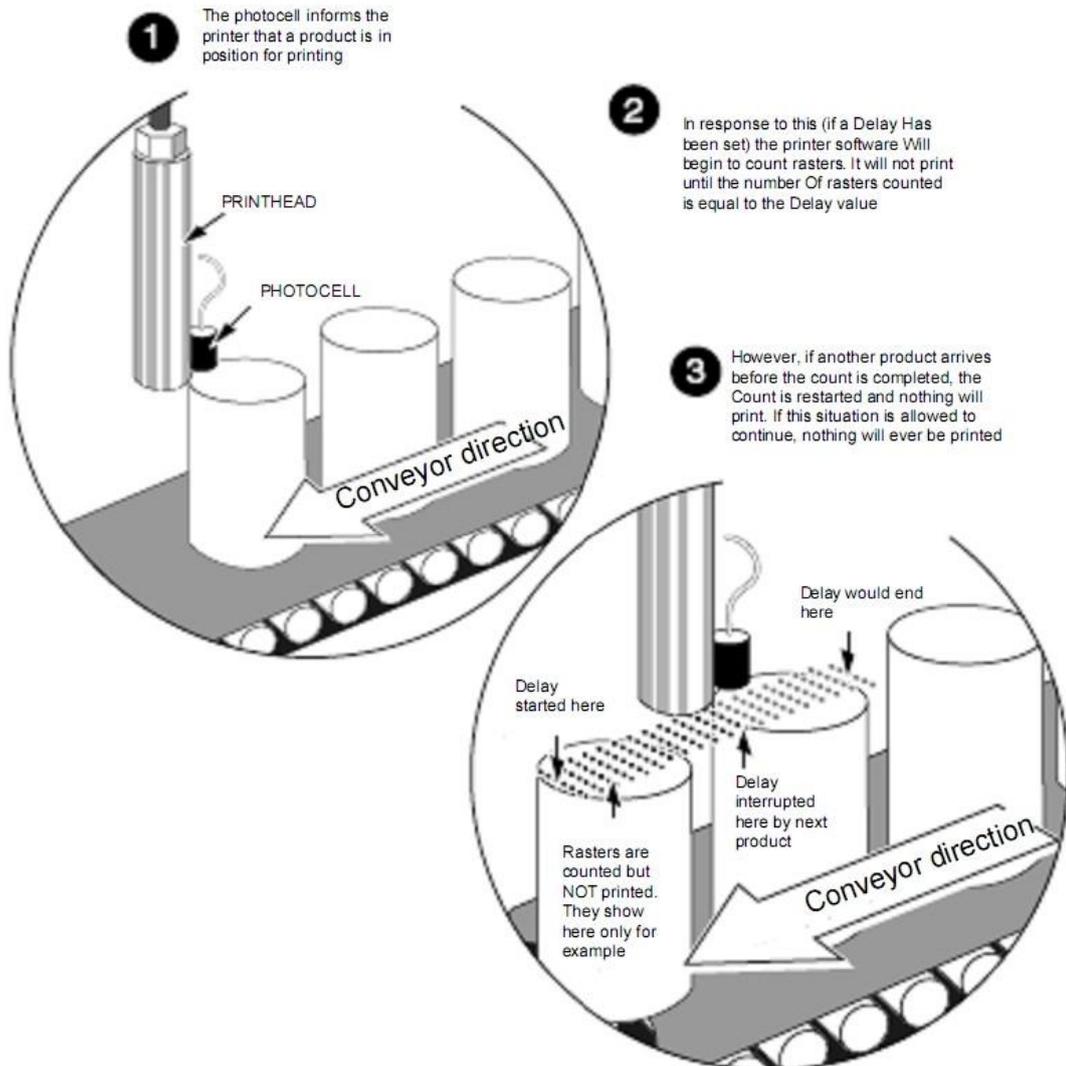
#### FC39 No Print - Print Delay Problem

Normally, when the system detects a product passing the photocell, it will activate a “print go” signal which causes the current message to be printed immediately. The Print Delay option of the SETUP menu is used to delay printing to allow the product to travel further before printing, thus controlling exactly where the message is to be printed. For instance, if the product is a long one and the message is to be printed in the middle, it will be necessary to set the delay to a value appropriate to the speed of the conveyor and the length of the message, which will cause printing to occur at the desired place.

What actually happens is that when the system detects a product passing the photocell, it will delay printing by counting the number of raster it would have printed, until that count becomes equal to the value of the Print Delay option.

However, if the Print Delay value is set to an inappropriate value, it is possible for the next product to arrive before the delay expires. This resets the delay to begin counting again, and since the conveyors travelling at the same speed, the next product will once again arrive before printing has occurred and the delay will be reset; and so on. If this is allowed to continue, printing will never occur.

The following illustrates this problem:



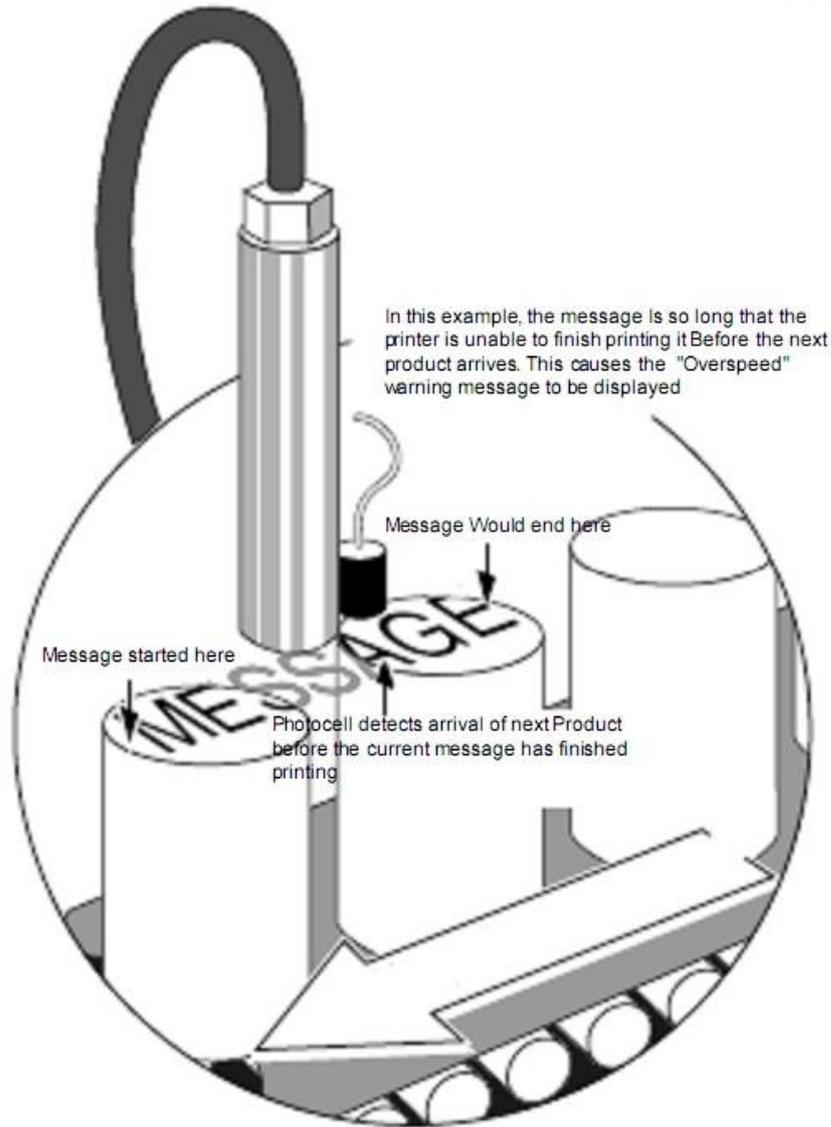
### FC40 Part of Message Missing - over speed Error

If the message to be printed is too long for the product or the conveyor is travelling faster than the system can print, the following warning message will be displayed in the status line of the display:

#### “3.02 Over Speed (Print Go)”

The following illustrates the problem:

EJ108



## Appendix 1: Installation & Setting Up

This appendix is to help you install and set up the printer. Normally this procedure will be carried out by EC-JET Service Engineers when commissioning a new printer.

These notes are provided as a guide to be used if the printer is relocated or changes are made to ancillary equipment. Guarding and safety interlocks should all be in place and working correctly. ECJET can accept no liability for damage to either machine or personnel in the event of the printer being installed, moved or maintained by unauthorized and/or untrained personnel.

If you are unsure of any procedure it is recommended that you contact your local EC-JET distributor.

Unpacking the System

### 1.1 Unpacking the System

Please carefully remove the cardboard packaging and check for the following contents:

- EC-JET printer
- EC-JET User Manual
- Final test print sample sheet
- Total Quality Plan packing card
- Key for cabinet
- A Guide to Quick Use

### 1.2 Where to Put the Printer

The EC-JET printer must be sited on a firm, solid base (preferably a EC-JET cabinet or mounting table) and with a clean power supply, i.e. free from electrical interference.

The printer physical dimensions, in millimeters, are as follows:

360 (wide) x 404 (high) x 261 (deep).

The printer weighs 14 kg (not including ink or packaging).

### 1.3 Accessories

The following accessories are available for purchase with the EC-JET printer:

- RS232 Communications Cable - allows multiple, remote printer control from Windows based PC system
- Shaft Encoder - enables even print width at uneven line speeds
- Photocell - detects presence of product
- Printhead Gantry
- Positive Air Kit - to prevent dust interfering with print quality

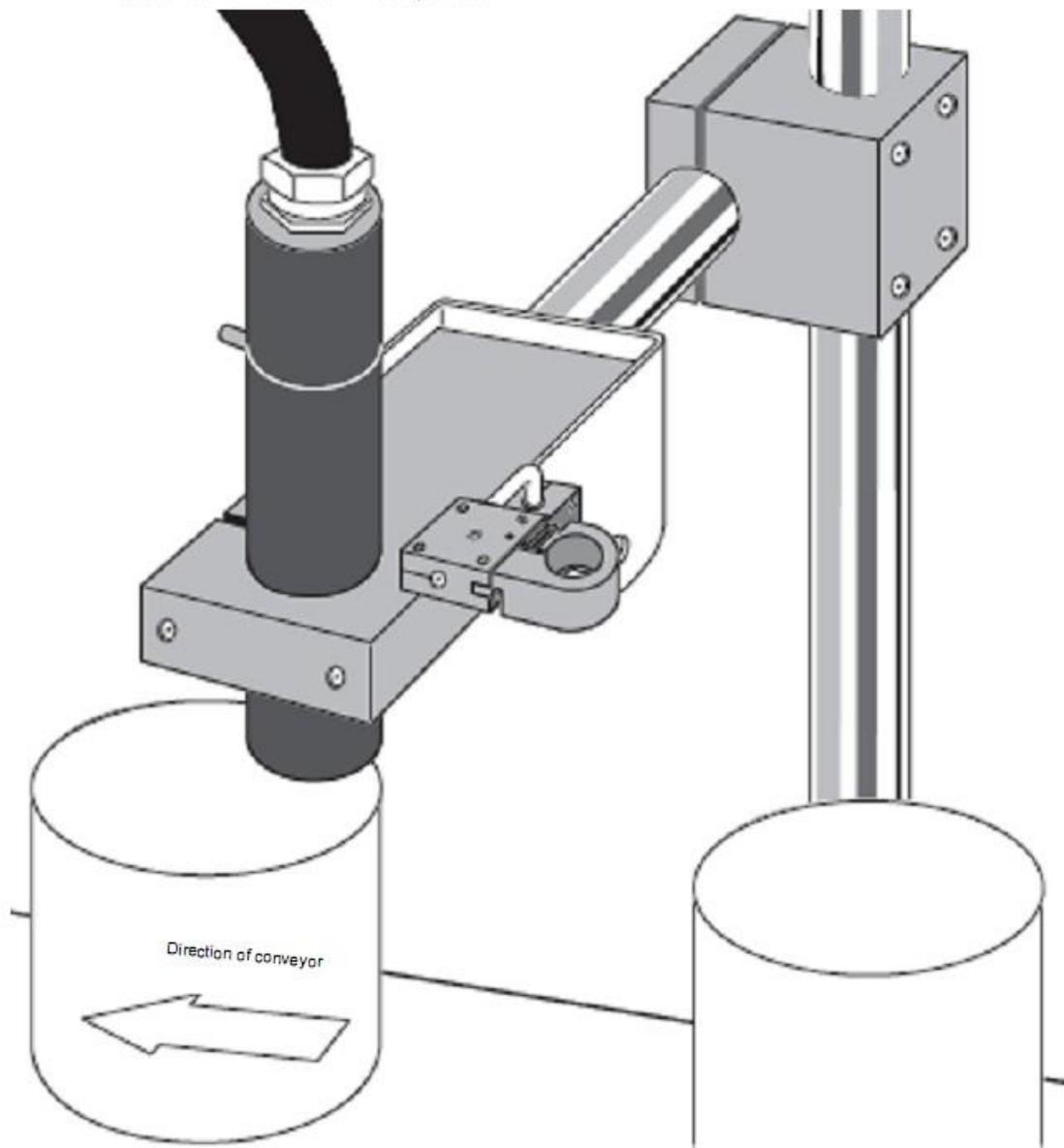
For a full list of all available accessories, please contact EC-JET or your EC-JET distributor.

## 1.4 Power Connection

Please Refer to the chapter 3.1.2

## 1.5 Attaching the Printhead to the Production Line

The print head can operate from any angle if clamped in place with a EC-JET head bracket to ensure secure and vibration free operation.



### 1.5.1 Print Height

If the printhead is moved nearer to the surface to be printed, height of the printed character will decrease - if moved further away, its height will increase.

However, adjustment of the print height should be controlled through the SETUP menu.

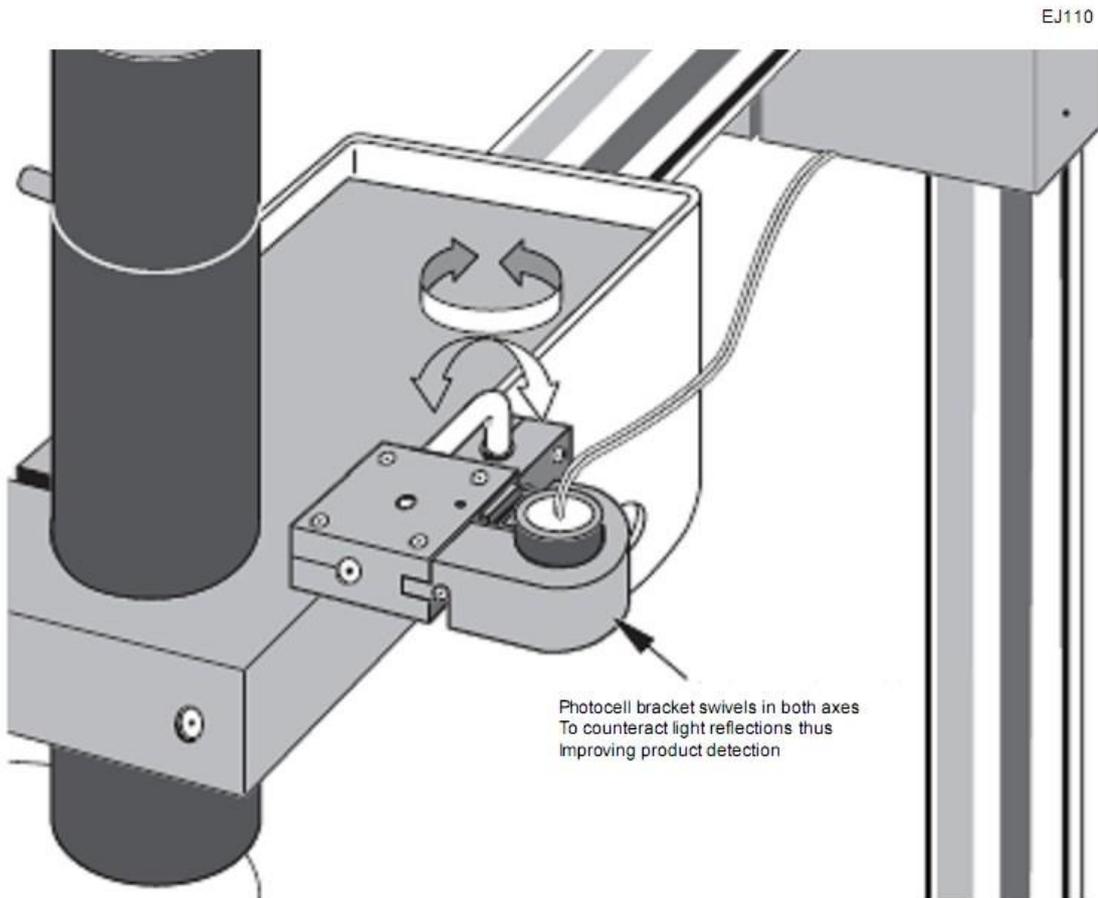


**NOTE:** Do not attempt to adjust the printed character height by changing the print head-to-product distance. This may result in deterioration of print quality.

## 1.6 Setting up the Photocell

The photocell is used to detect the presence of a product to be printed on. There are variations in the way this "trigger" can be interpreted by the system, but usually a message is printed in response to a signal from the photocell.

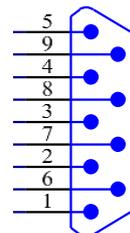
The photocell should be mounted upstream of the print head (so it detects the product before the product reaches the print head), as close to the print head as possible and at a distance from the product which gives consistently reliable triggering when a product passes it. A delay between the photocell being triggered and the print taking place can be set by a menu command, to aid fine adjustment of print positioning on the product.



### 1.6.1 Photocell Connections

The photocell is connected to the system via a 9-pin D - Type connector. The function of each pin is described below:

Pin 1	+24 volts
Pin 2	0 volts
Pin3	+5 volts
Pin 6	Next Object Signal



If the photocell has a screened conductor, it should be connected to the shell of the D - Type connector

and to the printer chassis at the printer end of the cable (it must not be connected to D volts).

**CAUTION:** Electromagnetic Compatibility performance may be compromised by the use of unsuitable photocells. Use only EC-JET approved accessories.

## 1.7 Setting up the Shaft Encoder

Shaft encoders are recommended for production lines where variable speed is likely. A shaft encoder generates a pulse for a fixed distance of product movement. This can be used to produce constant width print as the line speed increases or decreases.

If an encoder is to be fitted, it should be attached to a suitable production line drive shaft, with appropriate gearing if necessary. It must be installed and driven in a position where it best follows the movement of the product being printed on.

The calculations shown in the next few pages should be used to select the optimum arrangement for your application. EC-JET will be happy to advise on the best position and gearing for shaft encoder installation.

The selection of encoder and gearing will determine the printed pitch and the maximum possible line speed for the application. The printer allows some variation using the Print Width parameter, but the initial selection of the encoder and gearing is critical.

EC-JET offer a range of shaft encoders:

- 2500 pulses per revolution
- 5000 pulses per revolution
- 10000 pulses per revolution

Each is available with either a 3 m or 5 m connecting cable.

For applications where the encoder needs to be driven from a conveyor belt or from the product, ECJET

Provide the encoder wheels:

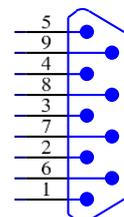
- 188.8mm circumference (60mm diameter)

A given encoder and drive gearing will have a fixed encoder pitch - that is, the distance travelled by the product for each pulse cycle of the encoder output. The width control in the printer is used to generate raster at integer multiples of the encoder pitch. This multiplier is the pitch factor and will always be a whole number. The calculations on the following pages show how this is used and explain the difference between pitch factor and print width.

### 1.7.1 Shaft Encoder Connections

The shaft encoder is connected to the system via a 9-pin D - Type connector. The function of each pin is described below:

Pin 1	+24 volts
Pin 2	0 volts
Pin3	+5 volts
Pin 8	Single Ended Input



The screened conductor should be connected to the shell of the D - Type connector and to the printer chassis at the printer end of the cable (it must not be connected to 0 volts).

**CAUTION:** EMC performance may be compromised by the use of unsuitable shaft encoders. Use only EC-JET approved accessories.

### 1.7.2 Selecting the Encoder, Gearing, and Print Width

When using a shaft encoder it is vitally important that the calculations are followed and the print width is computed based on the geometry of the set up. If guessed at, messages will not be printed at the required size; raster will be printed too close together or too far apart.

The calculations take you through a series of steps as shown below. There is also a worked example and a problem solving section afterwards.

Step 1: Define the required raster pitch for the application.

Step 2 :Select the encoder, gearing and pitch factor that gives an actual raster pitch close to that required.

Step 3 :Check the calculated print performance (size and speed) is adequate.

Step 4: Calculate the print width from the pitch factor and enter it.

Step 5: Check print samples for performance.

#### Step 1: Define the Required Raster Pitch for the Application

For each raster type on each printhead type there is a drop pitch which gives the best quality print, i.

e. 1:1 aspect ratio at the default printer settings. This value is known as the ideal pitch; a table later in the section lists them. For a particular application you may want to choose a different pitch, bearing in mind that the aspect ratio can be adjusted using the Print Height setting (see "Changing the System Setup").

The required raster pitch is calculated by:

Required raster pitch (mm)

$$\frac{\text{Printed Length (mm)}}{\text{Number of Characters x Character Width (rasters)}} = \frac{\text{Printed Length (mm)}}{\text{Number of Rasters in Message}}$$

Where:

Printed length = length of message on product. This must be less than the length of any area left clear for printing.

Number of characters = number of characters in the longest line of the message.

Character width = number of rasters in each character; see the following table.

(Alternatively, obtain the number of rasters in the message by creating the message on the printer and noting the x-position of the cursor just after the end of the message.)

The character width varies with the size of character chosen. The figures in the table include the gaps between characters; this will introduce a small error as the gap after the last character is not printed.

Character setting	Character height	Character width
5 HighCaps	5	6
7 HighCaps	7	6
7 Chinese	7	8
9 HighCaps	9	8
9 Chinese	9	10
12 HighCaps	11	10
12 Chinese	12	13
16 HighCaps	15	11
16 HighFull	15	11
16 Chinese	16	17
24 HighCaps	24	16
24 Chinese	24	25

For example:

Consider printing "Sell By 19 Nov 0000" in 7 High Full using a Midi print head and the 7 GEN STD raster onto a print area 38 mm long.

From the table above, the width of each character is 6 rasters. The message is 17 characters long including spaces. Therefore, the required raster pitch is given by:

$$\text{Required raster pitch (mm) (mm)} = \frac{38\text{mm}}{17 \text{ Character} \times 6 \text{ Raster}} = 0.373\text{mm}$$

This will be the maximum pitch possible; any larger and the message will not fit in the print target area (38mm) .

**Note: the ideal drop pitch for the 60 micron printhead of EC-JET is 0.4mm.if the actual drop pitch is bigger than 0.4mm, the raster distance will be wider, the line speed will increase.**

### Step 2:Select the Encoder, Gearing, and Pitch Factor

A particular combination of encoder and encoder drive (gearing or wheel) will give a particular encoder pitch; that is, the distance the product will travel for each cycle of the encoder output signal. The encoder pitch will be multiplied by the pitch factor (a whole number) to give the actual raster pitch. This should be as close as possible to the required raster pitch.

The table below gives the encoder pitches for standard EC-JET encoders and wheels. The encoder pitch for other gearing or drives can be calculated using:

$$\text{Encoder Pitch (mm)} = \frac{\text{Wheel Circumference (mm)}}{\text{Encoder Pulses Per Revolution}}$$

Where:

Wheel Circumference = Distance the product moves for one revolution of the encoder. This may be 3.14 x roller diameter, or 3.14 x star-wheel diameter, etc., depending on the application.

The encoder pitch will be multiplied by a whole number to give the actual raster pitch. By selecting a suitable encoder and gearing, the actual raster pitch can be made close to the required raster pitch.

$$\text{Actual Raster Pitch (mm)} = \text{Encoder Pitch (mm)} \times \text{Pitch Factor}$$

Where:

Pitch Factor is a whole number.

This will probably require trial and error.

For each encoder pitch you try, the starting point for the pitch factors can be:

$$\text{Pitch Factor} = \frac{\text{Required Pitch (mm)}}{\text{Encoder Pitch (mm)}}$$

rounded to the nearest whole number.

Using the example from Step 1, the required raster pitch is 0.373 mm. A standard EC-JET encoder and wheel will be used to try to achieve this.

No	shaft/shaft wheel	Encoder Pitch X pitch factor=Actual Raster Pitch		
1	2500ppr/188.2mm	0.075mm	5	0.375
2	5000ppr/188.2mm	0.0375mm	10	0.375
3	10000ppr/188.2mm	0.0188mm	20	0.375

For this example, the actual pitch using EC-JET standard encoder wheel and the resulting two encoder are close to the desired pitch, taking into account the higher pulse value, the higher cost encoder, we will start with 5000PPR encoder with EC-JET standard encoder wheel (diameter 60mm, perimeter 188.2mm) factor 10 (this is covered in later sections).

### Step 3: Check the Expected Print Performance

Any difference between the required raster pitch and the actual raster pitch will influence the print performance. There is also a limitation due to the frequency of the encoder signals. In particular, the printed message length and the maximum line speed must be checked. If there are any problems with these, the selection process must be repeated.

$$\text{Printed Message Length (mm)} = \text{Number of Rasters} \times \text{Actual Raster Pitch (mm)}$$

Where:

Number of Rasters = as calculated in Step 1

Actual Raster Pitch = as calculated in Step 2.

$$\text{Max. Line Speed (m/s)} = \text{Actual Raster Pitch (mm)} \times \text{Raster Rate (kHz)}$$

Where:

Actual Raster Pitch = as calculated in Step 2

Raster Rate = Maximum Rate of Raster Production.

The raster rate varies with printhead type and raster:

Raster Type	60um PH Raster Speed (KHz)
7 GEN STD	5.714
16 GEN STD	1.5
24 GEN STD	0.895

The maximum line speed calculated above should be compared with that expected for the production line - use the section "Line Speeds Per Product Frequency" later in this manual if necessary.

The line speed may also be limited by the encoder signal response:

Max. Encoder Speed (m/s) = Encoder Pitch (mm) x Specified Frequency (kHz)

Where:

Encoder Pitch = value from table in Step 2 for encoder/gearing

Specified Frequency = Limiting Signal Frequency (see the following table).

The specified frequency varies with encoder type:

Shaft Encoder	Frequency (KHz)
2500ppr	20.0
5000ppr	80.0
10000ppr	

This gives the following maximum encoder speeds for standard EC-JET encoders and wheels:

Encoder	Maximum Encoder Speeds for EC-JET Standard Wheel (188.2mm)	
	2500ppr	0.075
5000ppr	0.0375	3m/s
10000ppr	0.0188	1.5m/s

**The maximum encoder speed must also be higher than the production line maximum speed.**

Referring back to the example, the actual raster pitch is 0.375 mm (Step 2) and the number of rasters is 102 (Step 1).

Printed Message Length (mm) = 102 x 0.375 (mm)

=38.25 mm

This will fit in the target area of 38 mm.

The message is printed using the Midi 7 GEN STD raster with a raster rate of 5.33 kHz.

Max. Line Speed (m/s) =  $0.375 \text{ mm} \times 5.33 \text{ kHz}$   
= 2 m/s.

The Max. Encoder Speed of the 5000ppr encoder/gearing chosen in Step 2 is 3m/s

This will not limit the expected printable maximum line speed.

If we chose 2500ppr or 10000ppr encoder with EC-JET standard wheel, The Max. Encoder Speeds are only 1.5m/s will limit the expected printable maximum line speed.

#### Step 4: Enter the Print Width Parameter

The “Print Width” parameter is used by the printer to generate the pitch factor and print rasters at the actual pitch calculated in Step 2. Print Width is a setting accessed from the SETUP menu. The way it can be changed is described in “Changing the System Setup”.

The relationship between Print Width and Pitch Factor is:

Print Width = Pitch Factor - 1

The requirement to subtract 1 arises from the printer software operation.

Referring back to the worked example, the pitch factor calculated at Step 2 is 10.

Therefore, the Print Width parameter entered at the printer must be  $10 - 1 = 9$ .

This will print one raster for every 9 encoder pulses.

#### Step 5: Check the Print Performance

Having entered the print width and created a message using the character size and raster from the calculation, prints must be taken at a variety of normal running speeds to confirm the settings. This must include the maximum running speed.

**Note: If the customer has strict requirement on the message width, necessary to calculate the drop pitch as requirement and design encoder wheel diameter rather than using EC-JET standard encoder wheel and choose the right encoder, check if suitable following Step 3**

### 1.7.3 Encoder and Print Width Problems

Important Notes:

1. Never assume that the entered print width value is correct; always go back to the calculations.
2. Never assume that the line speed is known accurately; try to measure it or estimate it as you see it on the day. (Refer to the “Line Speeds per Product Frequency” section later in the manual).

The encoder will only maintain a fixed print width up to the lower of the maximum line speed and the maximum encoder speed calculated in Step 3. When this speed is exceeded, the printed message length can increase dramatically and unpredictably. The same effect can be seen if the print width value is incorrectly calculated or entered. Very often a printer will be set up on line with a shaft encoder, the pitch factor poorly calculated (if at all) and print samples taken.

Troubleshooting must follow a logical sequence:

1. If the message length measured on the print samples is larger than that calculated in Step3, then it is

possible that the line speed is too high. This can easily be checked:

- a) From the SETUP menu, set Shaft Encoder to Off. Note down the original Print Width setting, then set Print Width to 0.
- b) Note the original Print Delay setting. Multiply this by the original Print Width setting. Enter the new value.
- c) Run the line at the same speed and take print samples.

The printer will now be generating rasters at its maximum rate.

- (i) If the printed length of the message is still too long, then the line speed is too high for the print head/raster being used. No adjustment of the encoder, gearing, or Print Width will influence this.
- (ii) If the printed length of the message is now shorter than required, the original print width was wrong. It may need to be increased or decreased. Only going through the calculations will give the correct value to enter. Remember to check the maximum encoder speed.

Remember to enable the shaft encoder using the SETUP menu and adjust the Print Delay.

2. If the message length measured on the original samples (i.e. with the shaft encoder enabled and the original Print Width setting) was shorter than that required, then the print width must be increased. The calculations will give the correct setting; if guessed at the results could still be unpredictable.

## 1.8 Using the Printer Alarm Output

When there is a print warning or failure, the printer activates a 24 volt external alarm, where fitted.

The Alarm Beacon available from EC-JET is as follows:

Alarm Beacon Single Stage 24V.

The pin connections are as follows:

Alarm out A

Pin 9 Alarm –Out\_0 (24V signal)

Pin 5 GND

Alarm out B (Reserve)

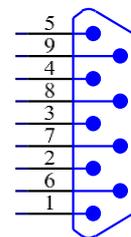
Pin 1 Alarm –Out\_0 (24V signal)

Pin 6 GND

Alarm out C (Reserve)

Pin 4 Alarm –Out\_0 (24V signal)

Pin 8 GND



## 1.9 Filling with Ink and Solvent

Switch the printer on and check if the ink or solvent level warning messages are displayed. Fill the system with ink and solvent as necessary (see "Routine Maintenance").

## **1.10 Purging (or priming) the Filters**

After a main ink filter change, the filter must be completely filled with ink before the system is run. For this purpose, a Filter Purge option is available from the DIAGNOSTICS menu.

This procedure should only be performed by an authorized service engineer following filter replacement.

## Appendix 2: Technical Specification

### 2.1 Introduction

The EC-JET Continuous Inkjet Printer is a fast, reliable, non-contact printer capable of applying sell by dates, batch codes and other variable information to a wide range of substrates on the production line.

### 2.2 Technical Data

#### 2.2.1 Cabinet

Construction

Base tray unit: Stainless steel grade 304

Top cover: Stainless steel grade 304 (Special surface)

#### 2.2.2 Dimensions

External height: 528 mm

External width: 264 mm

External depth: 325 mm

#### 2.2.3 Weight

Printer weight: 18.1kg (excluding ink, solvent and packaging)

#### 2.2.4 Power Requirements

Voltage: 85 V (3 A) to 132V (1 A) a.c., A.C 50/60 Hz

Power rating: 230 VA



This equipment is a Class 1 earthed Electrical connections at the rear of the cabinet comply with the extra low voltage safety requirements.

**WARNING: THIS PRINTER MUST BE EARTHED/GROUNDED.** (Acquired EN60204 Certificate)

#### 2.2.5 Environmental

Operating temperature: -5 to +45 Celsius ambient

Humidity range: Up to 90% relative humidity, non-Condensing

Acoustic emission: Less than 70 DB

## 2.3 Ink System

### 2.3.1 Construction

System enclosure: Stainless steel grade 304

Ink tank: MDPE black

Solvent tank: MDPE nature

### 2.3.2 Capacity

Ink tank: 1600 ml approximately

Solvent tank: 1600 ml approximately

### 2.3.3 Pressure

Pressure range: Up to 4.48 bar (65 p.s.i.) normal operating pressure

Maximum pressure: 6.2 bar (90 p.s.i.) maximum under fault conditions

### 2.3.4 Level Control

Ink tank sense low: Warning reported at approximately 400 ml

Solvent tank sense low: Warning reported at approximately 400 ml

### 2.3.5 Performance

Solvent consumption: <10 ml/h at 20 Celsius ambient using EC1240 MEK black ink

## 2.4 Memory Capacity

Message storage capacity: Up to 4 areas, 23 messages for each area

Logo storage capacity: Up to 100 logos

Chinese Character: GB2312 TrueType

## 2.5 Printhead

### 2.5.1 Types

Midi: 60 micron

### 2.5.2 Construction

Printhead: POM

Cover tube: Stainless steel grade 304

Minimum Conduit bend radius: 230mm

### 2.5.3 Dimensions

Conduit length:	2m
Conduit diameter:	20mm

### 2.5.4 Throw Distance (recommended)

Midi:10 mm

## 2.6 Printing Performance Data

### 2.6.1 Raster Information

Lines of print:	Maximum one line of 25High characters, or up to three lines of 7 High characters, or up to five lines of 5 High characters
Rasters available:	Paired raster set (printer model dependent ) of 7 Chinese , 9 Chinese , 12 Chinese , 16 Chinese , 24 Chinese; and of English/Number/Symbol 5 Height Caps, 7 Height Caps, 9 Height Caps, 12 Height Caps, 16 Height Caps, 16 HeightFull, 24 HeightFull, Logo Edit.

### 2.6.2 Character Height Range

Minimum character height:	1.0 mm (Midi print head) using 5 Min raster
Maximum character height:	15 mm (Midi print head) using 24 raster

## 2.7 Certificate Acquired

### 2.7.1 EMC

CERTIFICATE

**CERTIFICATE**  
Of Conformity  
EU Council Directive 2014/30/EU  
Electromagnetic Compatibility

**Registration No.: AT18230EC101077**

**Report No.: 18230EC10107701**

**Applicant :** GUANGZHOU EC-PACK PACKAGING EQUIPMENT CO., LTD.  
No.16, Huang Qi Shan Road, Yonghe Economic Zone, GETDD, 511356 Guangzhou, Guangdong Province,China.

**Product :** Ink-jet Printing Machine

**Identification :** Model No. : EC-JET1000Pro  
Trade Mark : EC-JET  
Rating : Input: 100-240VAC 50/60Hz 150W

**Test Standards :** EN 55032: 2015+A11: 2020  
EN IEC 61000-3-2: 2019  
EN 61000-3-3: 2013+A1:2019  
EN 55035: 2017+A11: 2020

The certificate of conformity is based on an evaluation of a sample of the above-mentioned product. Technical report and documentation are at the applicant's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex II of Council Directive 2014/30/EU, in its latest amended version, referred to EMC Directive. The certificate does not imply assessment of the production and does not permit the use of Lab's logo. The applicant of the certificate is authorized to use this certificate in connection with EU declaration of conformity to Article 15 of the Directive.

Jun. 09, 2021  
Date

Certified by  
  
KingKong Jin

The CE Marking may only be used if all relevant and effective EU Directives are complied with

**Shenzhen Anbotek Compliance Laboratory Limited**  
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128  
Tel: (86)755-26066440 Fax: (86)755-26014772  
Http://www.anbotek.com Email: service@anbotek.com

## 2.7.2 LVD

<b>CERTIFICATE</b>	
	<b>CERTIFICATE</b> Of Conformity Low Voltage Directive 2014/35/EU Registration No.: AT18230SC100499
	Report No.: 18230SC10049901
	Applicant : GUANGZHOU EC-PACK PACKAGING EQUIPMENT CO., LTD. No.16, Huang Qi Shan Road, Yonghe Economic Zone, GETDD, 511356 Guangzhou ,Guangdong Province,China.
	Product : Ink-jet Printing Machine
	Identification Model No. : EC-JET1000Pro
	Trade Mark : EC-JET
	Rating : Input: 100-240VAC 50/60Hz 150W
	Test Standards : EN 62368-1:2014+A11: 2017
	The certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical report and documentation are at the applicant's disposal. This is to certify that the tested sample is in conformity with Low Voltage Directive 2014/35/EU relating to electrical equipment designed for use within certain voltage limits. The certificate does not imply assessment of the series-production of the product. The applicant of the certificate is authorized to use this certificate in connection with EU declaration of conformity specified in Article 15 and Annex IV of the Directive.

Jun. 09, 2021  
Date

Certified by  
  
Jeff Zhu

**CE** The CE Marking may only be used if all relevant and effective EU Directives are complied with **CE**

Shenzhen Anbotek Compliance Laboratory Limited  
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China. 518102  
Tel: (86)755-26066440 Fax: (86)755-26014772  
Http://www.anbotek.com Email: service@anbotek.com

## Appendix 3: Printable Line Speeds

The following table shows the line speed at which good printing will be obtained for each raster type and print head model at ideal pitch:

7 Dot Standard Speed	120	9 Dot Standard Speed	81.5
12 Dot Standard Speed	55.5	16 Dot Standard Speed	34
24 Dot Standard Speed	20		

The line speeds shown above can be adjusted if printing at more than ideal pitch, i.e. double or treble pitch (see “Appendix 1: Installation and Setting Up”).

NOTE: Print quality will be impaired if printing takes place at anything other than ideal pitch.

### Ideal Pitch

Otherwise known as single pitch, this is dependent on the raster (i.e. printer type) being used. Printers with the faster raster has an increased pitch capacity because the overall character height is larger. This helps to form “square” (more precise and uniform) characters.

### Double Pitch

Twice the ideal pitch. Print height may need to be increased to maintain character proportion.

### Triple Pitch

Three times the ideal pitch. Print height may need to be increased to maintain character proportion.

## Appendix 4: Dimension Layout

