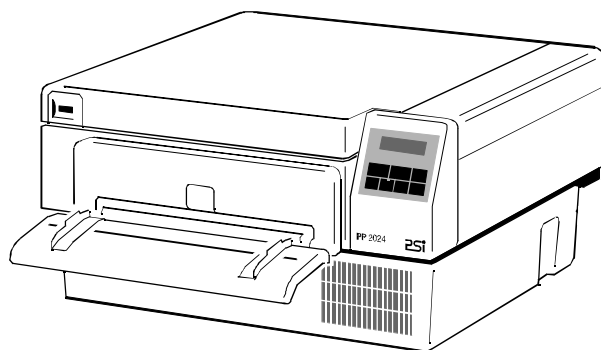


User's Manual

PP 2024



Acknowledgements

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Eiserfelder Straße 316

57080 Siegen · Germany

<http://www.psi-si.de>

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Great care has been taken to ensure that the information in this handbook is accurate and complete. However, should any errors or omissions be discovered or should any user wish to make suggestions for improving this handbook, please feel encouraged to send us the relevant details.

The contents of this manual are subject to change without notice.

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Safety Regulations for the Laser Printer PP 2024

The laser printer **PP 2024** fulfils the safety regulations according to IEC and TÜV/GS for computer systems (EN 60950) and laser products (EN 60825-1). UL 1950 3rd Edition / CAN/CSA C22.2 No 950-95; 21 CFR 1040.10 and 1040.11.

The mains cable must be connected to a ground protected wall-socket. The selected voltage of the printer needs to be in accordance with the local mains voltage.

The power plug must be easily accessible at any time so that it can be disconnected immediately in case of danger or for maintenance purposes.

Before installing the printer, check the surrounding conditions in which the printer is intended to be used (see next page, Operating Environment).

During thunderstorm you should never attempt to connect or disconnect any data transfer cable.

The power supply should only be opened and checked by authorized personnel. Repairs and maintenance beyond the descriptions of chapter 5 may only be attempted by authorized personnel as well. Repairs done inappropriately may cause damage to the device and severe danger for the user.

Caution: The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

During the printing process ozone will be produced. Take care that the printer is standing in a room with good ventilation. The limit of ozone concentration should be **0,1 ppm (0,2 mg/m³)**. Note that the specific gravity of ozone is higher than that of air.

Electromagnetic Compatibility

We certify that the equipment at issue,

Type: **Printer PP 2024**

corresponds to the law regulations ruling electromagnetic compatibility of appliances (89/336/EEG) and, therefore, fulfils the requirements for conformity marking with the CE-sign.

Note: This equipment has been tested and found to comply with the limits for a **CLASS A** digital device pursuant to **Part 15** of the **FCC** Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

To guarantee that the device stays within the limits according to the approval regulations for conducted and radiated emission (EN 55022, Class B) and immunity according to EN 50081-1, Generic Standard in any case shielded interface cables are to be used only.

Changes and modifications not explicitly allowed by the equipment's manufacturer could void the user's authority to operate the equipment.

Operating Environment

Avoid installing the printer where it is exposed to moisture or heat (eg. direct sun light).

- Temperature: + 10°C to + 32.5°C (+50°F to +90.5°F)
- Humidity: 20% to 80%

Slots and openings in the printer's housing are provided for ventilation. Always ensure that these openings are not obstructed.

Also ensure that the cables at the rear of the printer do not interfere with the output paper path.

Safety Regulations for the intelligent Paper Stacker iPS 2024

The **intelligent Paper Stacker iPS 2024** fulfils the safety regulations according to IEC and VDE/GS for computer systems (EN 60950); UL 1950 3rd Edition, CAN/CSA C22.2 No.950-95.

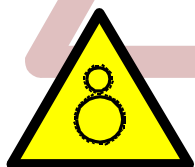
The mains cable must be connected to a ground protected wall-socket. The selected voltage of the intelligent paper stacker needs to be in accordance with the local mains voltage.

The power plug must be easily accessible at any time so that it can be disconnected immediately in case of danger or for maintenance purposes.

Before installing the intelligent paper stacker, check the surrounding conditions in which the intelligent paper stacker is intended to be used (see next page, Operating Environment).

During thunderstorm you should never attempt to connect or disconnect any power cable.

The power supply should only be opened and checked by authorized personnel. Repairs may only be attempted by authorized personnel as well. Repairs done inappropriately may cause damage to the device and severe danger for the user.



Caution, the chain of the motor to move the paper exit tray up and down will start automatically or after pushing the key at the left side of the table.

Electromagnetic Compatibility

We certify that the equipment at issue,

Type: **intelligent Paper Stacker iPS 2024**

corresponds to the law regulations ruling electromagnetic compatibility of appliances (89/336/EEG) and, therefore, fulfils the requirements for conformity marking with the CE-sign.

Note: This equipment has been tested and found to comply with the limits for a **CLASS A** digital device pursuant to **Part 15** of the **FCC** Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

To guarantee that the device stays within the limits according to the approval regulations for conducted and radiated emission (EN 55022, Class B) and immunity according to EN 50081-1, Generic Standard in any case shielded interface cables are to be used only.

Changes and modifications not explicitly allowed by the equipment's manufacturer could void the user's authority to operate the equipment.

The intelligent Paper Stacker can only be used in conjunction with the printer PP 2024.

Operating Environment

Avoid installing the intelligent paper stacker where it is exposed to moisture or heat (e.g. direct sun light).

- Temperature: + 10°C to + 32.5°C (+50°F to +90.5°F)
- Humidity: 20% to 80%

Also ensure that the cables at the rear of the printer do not interfere with the output paper path. The feet of the laser printer PP 2024 should be positioned over the four screws on the stacker's table.

Table of Contents

Preface	XIV
About this Manual	XIV
Conventions used in this guide	XVI
1. Getting Started	1-1
1.1 Unpacking	1-1
- Printer Package	1-1
- Contents of Starter Kit Box	1-2
- Transportation Hints	1-4
1.2 Installing the Consumables	1-5
- Installing the Developer Unit	1-6
- Filling in Starter Toner	1-8
- Inserting the Ozone Filter	1-10
- Installing the Waste Toner Container	1-11
- Inserting the Cleaner Felt	1-12
- Installing the OPC Drum	1-13
1.3 The Power Supply	1-14
1.4 Power ON/OFF Switch	1-15
1.5 Inserting Fanfold Paper	1-17
1.6 Connection to the Computer	1-21
1.7 Connecting the Stacker System	1-22

2. Printer Operation	2-1
2.1 Control Panel	2-1
2.1.1 Description of the Four Indicators	2-1
2.1.2 description of the LCD Display	2-2
2.1.3 Function Keys	2-3
2.2 Menu Mode	2-4
2.2.1 Activate the Menu	2-5
2.2.2 Confirm a new Selection	2-6
2.3 Status and Error Messages	2-7
3. Configuring the Printer	3-1
3.1 What is Configuring	3-1
3.1.1 Profiles	3-1
- Profiler	3-2
3.1.2 Basic Printer Settings	3-2
3.1.3 Test Mode	3-2
3.2 Printout of Standard Configuration	3-3
3.2.1 How to Start a SELF TEST	3-4
- SELF TEST Sample	3-5
3.3 Printout of the 10 Profiles	3-6
3.4 Menu Structure	3-7
3.5 Menu Item Description	3-9
- SELECT PROFILE	3-9
- PAPER MENU	3-10
- PCL MENU	3-11
- HEXDUMP MENU	3-12
- GENERAL MENU	3-13
- CONFIG MENU	3-14
- TEST MENU	3-15
- INFO MENU	3-16

3.6	Configuration Programs	3-17	4.2.3	HEXDUMP MENU	4-11
–	Profiler	3-17	–	UEL COMMAND	4-11
–	Profile Selector	3-17	4.2.4	GENERAL MENU	4-12
3.6.1	Installation	3-17	–	EMULATION	4-12
3.6.2	Profiler	3-18	–	AUTO FORM FEED	4-12
3.6.3	Selector	3-23	–	PAPER RETRACT	4-12
4	Explanation of Individual Menu Items	4-1	4.3	Menu Mode BASIC SETTINGS	4-13
4.1	Menu Mode SELECT PROFILE	4-2	4.3.1	CONFIG. MENU	4-13
4.2	Menu Mode CHANGE PROFILE	4-2	–	POWER SAVE	4-13
4.2.1	PAPER MENU	4-2	–	ALARM BELL	4-13
–	PAPER	4-2	–	LANGUAGE	4-13
–	PAPER LENGTH	4-3	–	MENU ACCESSS	4-14
–	LENGTH FACTOR	4-3	–	RECALL FACTORY	4-14
–	IMAGE WIDTH	4-4	4.4	Menu Mode TEST MODE	4-15
–	ORIENTATION	4-4	4.4.1	TEST MENU	4-15
–	LANDSCAPE MODE	4-5	–	PANEL TEST	4-15
–	ORIENT. MODE	4-6	–	SELF TEST	4-15
–	PAPER EXTENDED	4-7	–	CONT SELF TEST	4-15
–	PAPER SELECTION	4-7	–	CONFIG. PRINT	4-15
–	FUSER TEMP.	4-7	–	PCL TYPEFACE LIST	4-16
–	VER SHIFT	4-7	4.4.2	INFO MENU	4-18
–	HOR SHIFT	4-7	–	MACHINE COUNT	4-18
4.2.2	PCL MENU	4-8	–	ENGINE ID	4-18
–	FONT NUMBER	4-8	–	FIRMWARE VERSION	4-18
–	PITCH	4-8	–	STACKER VERSION	4-18
–	POINT SIZE	4-8			
–	SYMBOL SET	4-9			
–	LINE SPACING	4-10			
–	TOP MARGIN	4-10			
–	LEFT MARGIN	4-10			
–	RIGHT MARGIN	4-10			
–	TEXT LENGTH	4-10			
–	PERF. SKIP	4-10			

5 Maintenance	5-1	7.2. Operating the intelligent Paper Stacker	7-7
5.1 Installing the Parts of the Toner Kit	5-1	7.2.1 Inserting Paper	7-7
- Filling in Toner	5-2	7.2.2 Adjusting the Paper Length	7-8
- Replacing the Waste Toner Container	5-4	7.2.3 Power On the intelligent Paper Stacker	7-9
- Changing the Cleaner Felt	5-6	7.2.4 Tear Off and Remove Paper	7-10
5.2 Replacement of the OPC Drum	5-7	7.3. Troubleshooting and Diagnostics	7-11
5.3 Replacement of the Developer Unit	5-9	7.3.1 Printer stops because of wrong page length selection	7-11
- Filling in Starter Toner	5-11	7.3.2 Printer stops when the paper exit tray is full	7-11
- Inserting the Ozone Filter	5-13	7.3.3 Paper not stacked in Right Order	7-11
5.4 Replacement of the Fuser Unit	5-14	7.3.4 Proceeding after Power Down or Inadvertently Power Off	7-12
5.5 Exchanging the Control Unit	5-15	8. Technical Data	8-1
6. Trouble Shooting and Diagnostics	6-1	8.1 Printer Specification	8-1
- How to Use this Section	6-1	8.2 Paper Specification	8-3
6.1 Power-related Problems	6-2	8.3 Connectivity	8-4
6.2 Error Messages	6-2	8.4 Consumables	8-5
7. Intelligent Paper Stacker iPS 2024	7-1	8.5 Specification of Intelligent Paper Stacker	8-6
7.1. Assembling the Intelligent Paper Stacker	7-1	8.6 Paper Specification for Intelligent Paper Stacker iPS 2024	8-7
7.1.1 Unpacking	7-1		
- Delivery Contents	7-1		
7.1.2 To Mount the Tear Off Bar	7-2		
7.1.3 Paper Exit Tray Assembly	7-3		
7.1.4 The Pendulum	7-4		
7.1.5 Put the Printer onto the Table	7-5		
7.1.6 The Power Supply	7-6		

9 Paper Specification	9-1	A-2 List of Supported PJJ Control Function	A-6
9.1 Basic Theory of Operation	9-1	A-2.1 Basic Rules for PJJ Programming	A-6
9.2 Storing Media	9-1	A-2.1.1 PJJ Syntax Rules	A-6
9.3 Environmental Considerations	9-2	A-2.1.2 PJJ Environments	A-7
9.4 Guidelines and Specification for Selected Fanfold Paper	9-2	A-2.1.3 List of Supported PJJ Commands	A-8
9.4.1 General Guidelines	9-3	A-2.1.4 List of Supported PJJ Variables and Values	A-10
– Quality	9-3	A-2.1.5 List of Supported PJJ Variables and Values for PCL	
– Basic weight	9-3	Personality	A-13
– Transport holes	9-4		
– Perforation	9-5	A-3 List of Supported PCL5 Control Functions	A-14
9.4.2 Typical Paper Properties for Laser Printer	9-6	A-3.1 Job Control Commands	A-14
9.4.3 Paper / Form Properties	9-7	A-3.2 Page Control Commands	A-15
9.4.4 Label Carrier Properties	9-9	A-3.3 Cursor Positioning Commands	A-17
9.4.5 Label Properties	9-10	A-3.4 Font Selection Commands	A-19
		A-3.5 Font Management Commands	A-20
		A-3.6 Macro Control Commands	A-21
		A-3.7 Graphic Commands	A-22
10 Maintenance / Logbook	10-1	A-4 Support of Semigraphics for SAP/R3	A-23
10.1 Toner Kit	10-1		
10.2 OPC Drum	10-3	A-5 Barcode Programming	A-24
10.3 Developer Unit	10-4	A-5.1 Resident Barcode Font Code 39 HP Compatible	A-24
10.4 Fuser Unit	10-5	A-5.2 Resident Barcode Controlled by Private Command Sequence	A-25
10.5 Inspection Report	10-6	A-5.2.1 Programming	A-26
10.6 Customer Remarks	10-7	– Barcode Print Position	A-26
		– Barcode Print Orientation	A-26
		– Barcode Type	A-27
		– Barcode Height	A-28
		– Barcode Data	A-28
		– Barcode Text Control	A-29
		– Barcode Module Width	A-29
		– Barcode Ratio	A-30
		– Start and Stop Characters	A-31
		– Error Checking Characters	A-31
		– Unprinted Areas	A-31
Appendix A Programming Guide	A-1	A-5.3 Barcode Programming Examples	A-32
A-1 Support of Printer Specific Features and Functions	A-2		
A-1.1 Profiles	A-2		
A-1.2 Paper Size Select	A-2		
A-1.3 Semigraphics Support under SAP R/3	A-3		
A-1.4 EURO Symbol Support	A-3		
A-1.5 Support of Logical and Physical Pages	A-4		
A-1.7 Conventions	A-5		

Appendix B Symbol Sets	B-1
Appendix C Miscellaneous	C-1
C-1 Order Numbers	C-1
C-2 Printer Drivers	C-1

Preface

About this Manual

This manual covers the printer including the Control Unit. The Control Unit is an integral part of the printer which determines the functionality of the printer especially regarding the user and system interface. Due to the variety of Control Units different printer models are defined which, with respect to the user interface however, all behave the same.

The structure of this manual is such that the operator is led step-by-step through the various procedures. Starting with unpacking and installation of the consumables it moves on to setting-up configuration parameters and ends with the mounting of options.

The manual is divided into the following chapters:

1. Getting Started

This chapter covers the unpacking and setting-up of the printer and the installation of the consumables. By the end of this chapter the printer should be fully functional and tested in its primary form. It is not yet connected to the host computer system and no options are mounted.

2. Operating the Printer

This chapter discusses in great detail the operation of the operator panel, all menu functions, and the general operation of the menu. General status messages are also described.

3. Configuring the Printer

This chapter explains how to use the Profiles and to configure the printer so that it can communicate with the corresponding system environment.

Furtheron this chapter includes a view of the Menu Structure and thoroughly describes in a short form the printer's operating controls. Finally you will find a description of the Configuration Programs **Profiler** and **Profile Selector**.

The Profiler is a menu controlled program and supports the printer configuration via PC. Different configurations can be downloaded into the printer.

Profile Selector is a program for quick access to a profile.

4. Explanation of Individual Menu Items

In this chapter are the individual menu items are explained in detail.

5 Maintenance

This chapter explains how to replace the consumables.

6. Trouble Shooting and Diagnostics

suggests how to identify and correct simple problems.

7. Intelligent Paper Stacker iPS 2024

Description of assembling and operating the printer PP2024 in combination with the Intelligent Paper Stacker iPS 2024

8. Technical Data

All technical details or data about the printer and the Intelligent Paper Stacker can be found here.

9. Paper Specification

Guidelines, Specification, Paper and Label properties are defined in this chapter.

10. Maintenance / Logbook

All activities of maintenance should be written down here.

Appendix A Programming Guide

This appendix describes command extension of PCL5 and PjL in section A-1, A-2, and A-3. Bar Code Programming is described in section A-5.

Appendix B Symbol Sets

All supported Symbol Sets are listed.

Appendix C Miscellaneous

- Order Numbers
- Printer Driver

Conventions Used in this Guide

The following conventions are used:

Bold	Headlines and important information.
Note:	Contains special advice to facilitate handling.
Caution:	Contains important information to prevent damage of the equipment.
[ENTER]	Key functions are always depicted in brackets or indicated by the corresponding symbol.

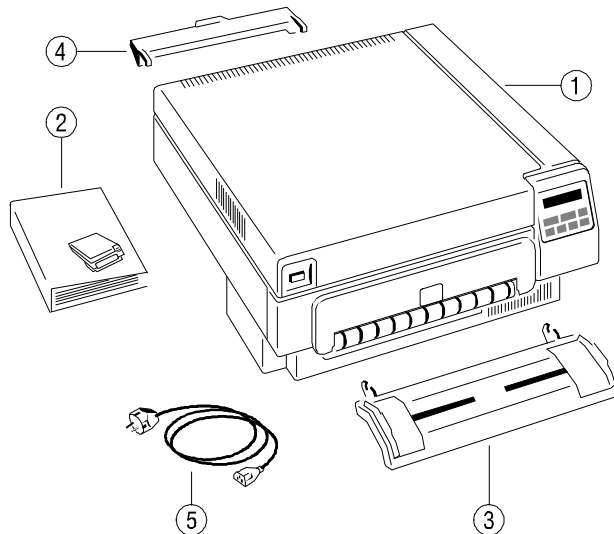
1. Getting Started

1.1 Unpacking

The Laser Printer is delivered in two boxes, the larger one contains the printer itself, the smaller one contains the Starter Kit. Check each box contents against the list below. Contact your delivery agent immediately if any item is missing or damaged.

Printer Package

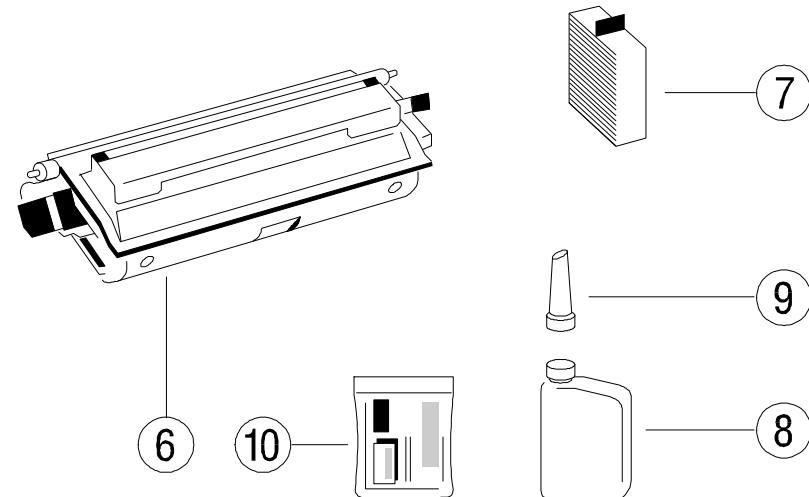
- Laser Printer (1)
 - Control Unit (already mounted)
 - this User's Manual (2)
- another small box contains:
- one (plastic) front paper guide (3)
 - one (plastic) exit paper guide (4)
 - one power cord (5)



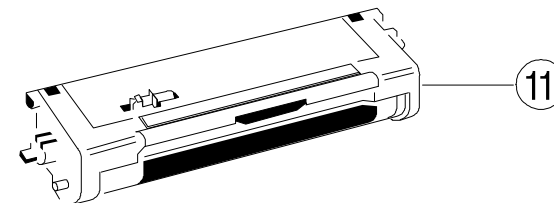
Note: Printer Driver for Windows® are available - (see Appendix C)

Contents of Starter Kit Box

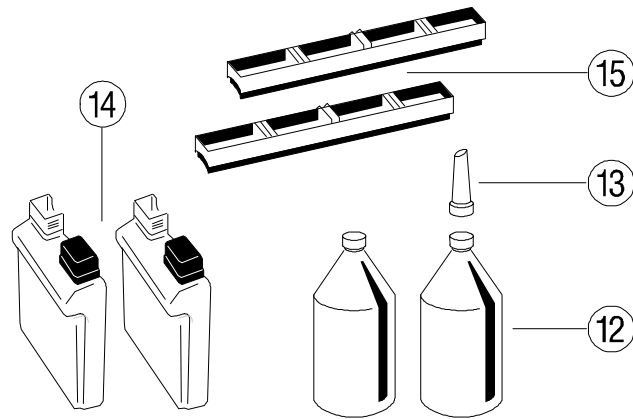
- one Developer Kit consisting of:
 - one Developer Unit (6)
 - one Ozone Filter (7)
 - one bottle with Starter Toner (8)
 - one spout (9)
 - one Cleaning Kit (10)



- one OPC Drum (11)



- one Toner Kit consisting of:
 - two Toner bottles (12)
 - one spout (13)
 - two Waste Toner Containers (14)
 - two Cleaner Felts (15)



Note: Do not connect the printer to the mains until the mains voltage selection has been checked and the consumables have been installed (see the following pages).

Transportation Hints

Save all packing material and boxes for future transportation of the printer.

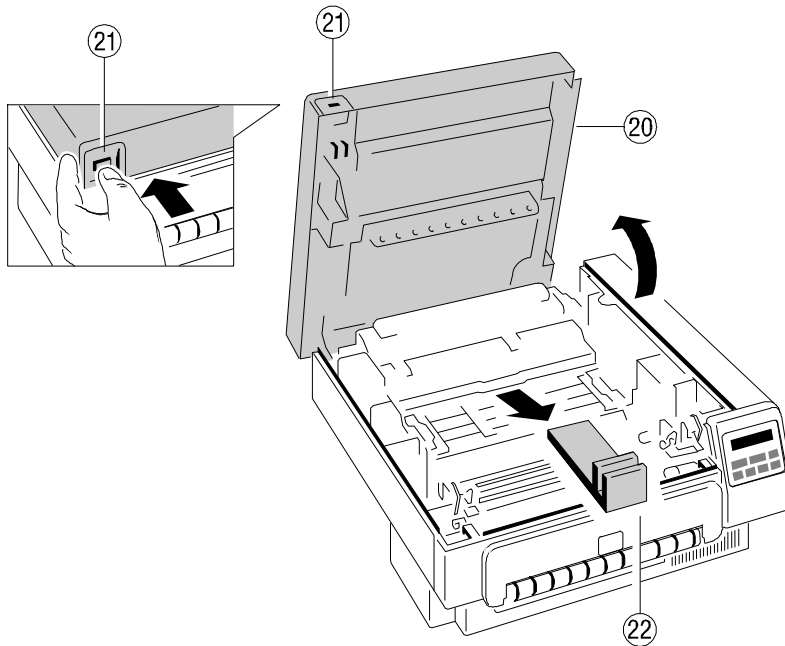
To ensure maximum protection when transporting the printer, please pay attention to the following:

1. always remove the plastic paper guides and the power cord
2. remove the Developer Unit
3. empty the Toner box
4. remove the OPC Drum
5. remove the Waste Toner Container and lock it with the green cap
6. put the printer into its original packing material and ship it in its original box
7. put the Developer Unit into its original packing box.
8. Wrap the OPC Drum with stuffed antistatic and lightproof foil and pack it into its original packing box.

1.2 Installing the Consumables

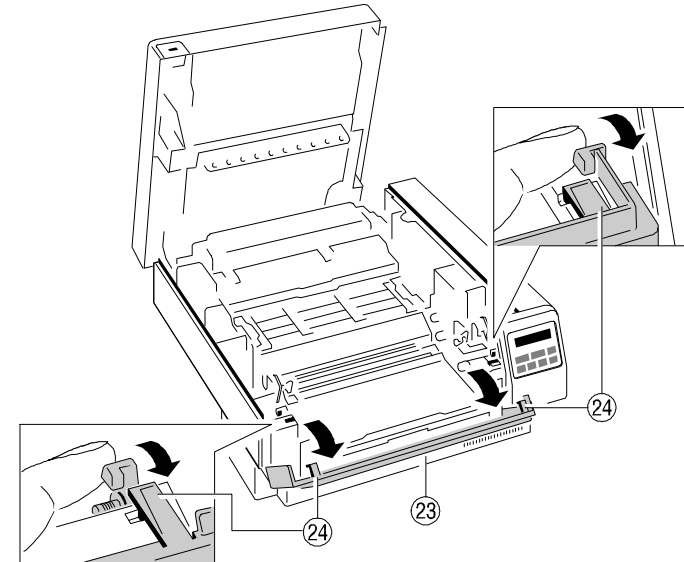
Open the cover (20) by firmly pressing the button (21) at the left top corner of the printer and swinging the cover up.

Remove the polyfoam transport lock (22) inside the printer underneath the Fuser Unit.



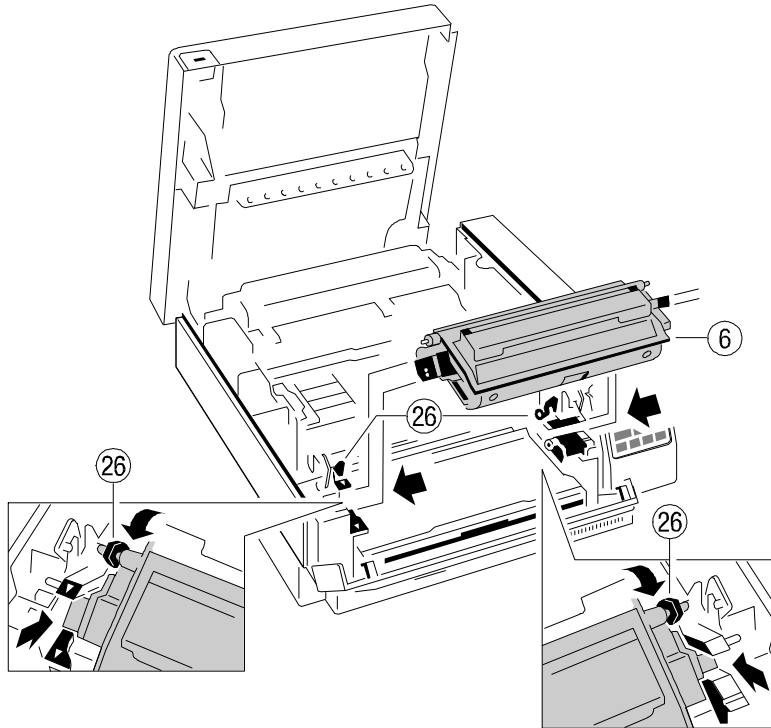
Installing the Developer Unit

Gently lift the plastic tabs (24) inside the printer, at the left and at the right side of the cover, and pull the front cover (23) in forward direction. The front cover will only open to a 45 degree angle. Please **do not** force this cover beyond a 45 degree angle.



Now the rail guides inside the cabinet are free to accept the Developer Unit. Remove the Developer Unit (6) from its foil package and turn it so that the sleeve roller (26) is toward the back of the printer.

Slide the Developer Unit fully into the printer along the plastic rails on the left and right. To lock push down the two green plastic tabs.

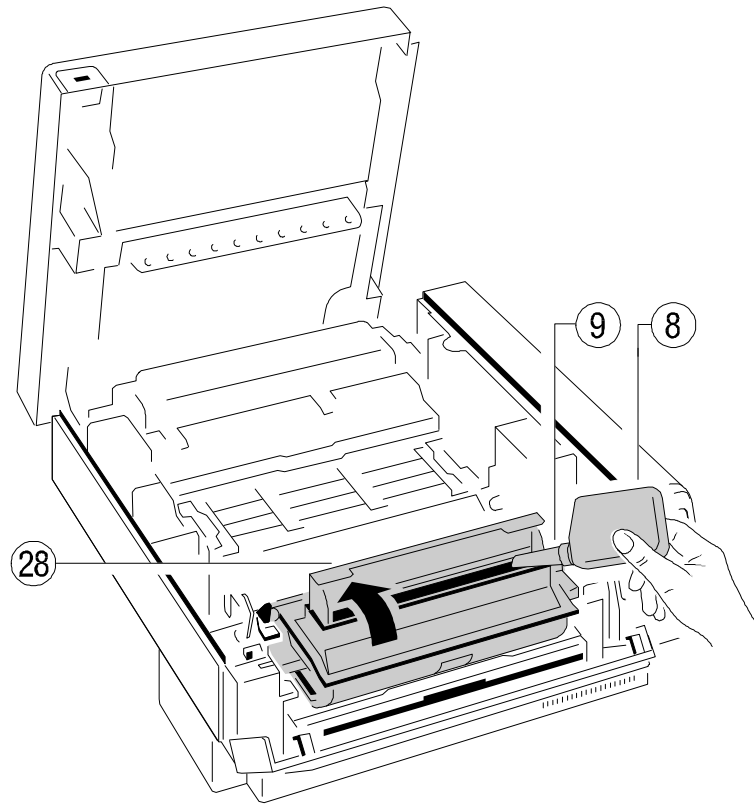


Filling in Starter Toner

Before using the Developer Unit for the first time, you have to fill it with Starter Toner. One bottle of Starter Toner (8) with a spout (9) is in the box of the Developer Unit. Shake the bottle several times to mix the carrier and the toner. Carefully open the seal underneath the cap of the toner bottle and attach the spout to the bottle. Open the top cover (28) of the Developer Unit. Spread the toner evenly across the opening.

Note: Do not squeeze the toner bottle since the toner could be blown out of the hopper and contaminate the printer. If the toner bottle does not completely empty, gently tap the end of the bottle while holding it upside down over the hopper.

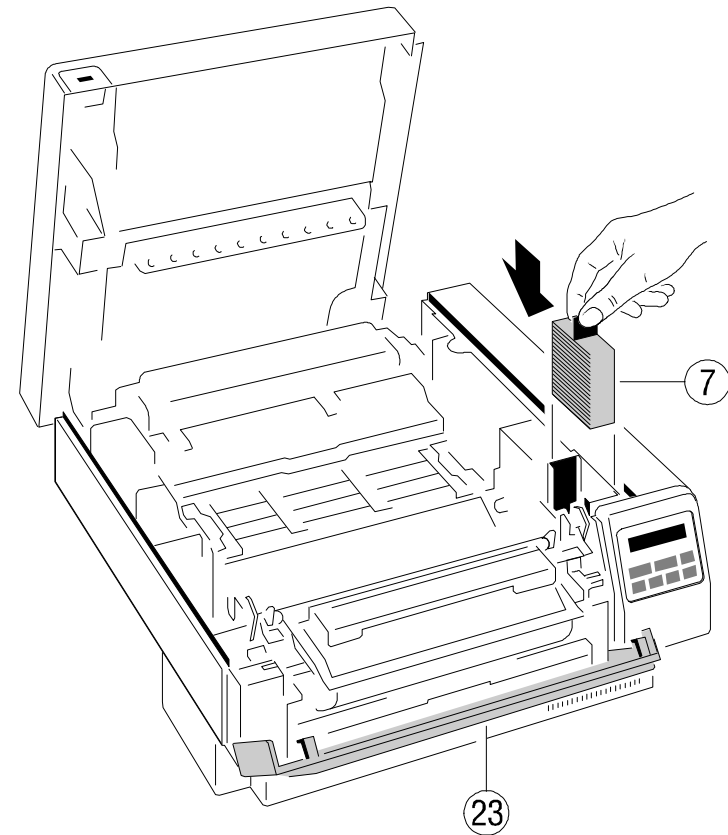
This first filling only allows Starter Toner to be used. Refilling any other toner is not allowed before the message "Toner Low" appears on the display.



Close the top cover (28) of the Developer Unit. If you hear a "click" the shutter is closed completely.

Inserting the Ozone Filter

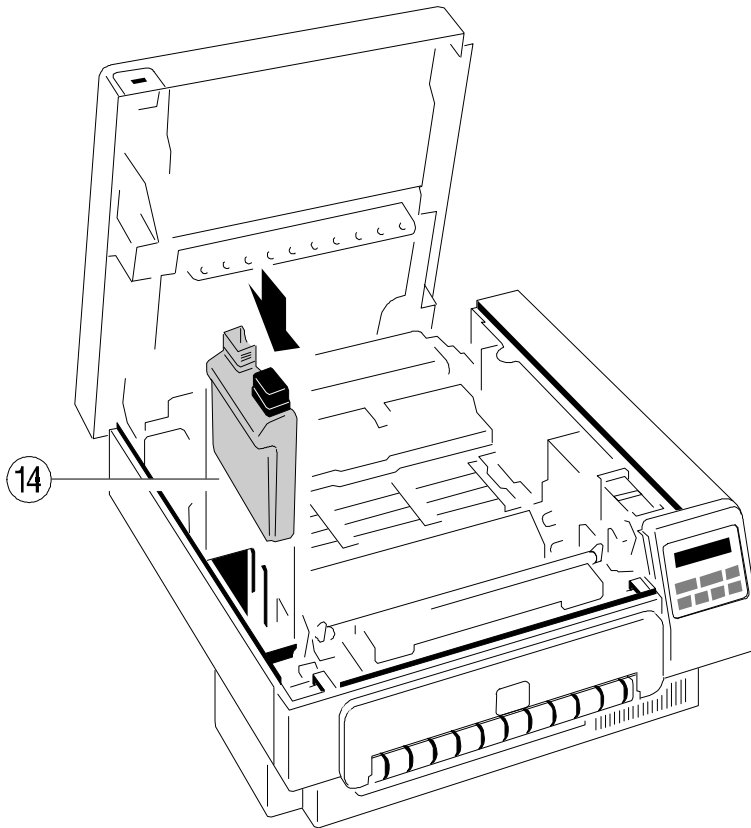
The box of the Developer Unit also contains an Ozone Filter (7), a black rectangular block. On one of the narrow sides there is a small tab to hold the filter. Insert the Ozone Filter into the slot immediately behind the operator panel and besides the Developer Unit.



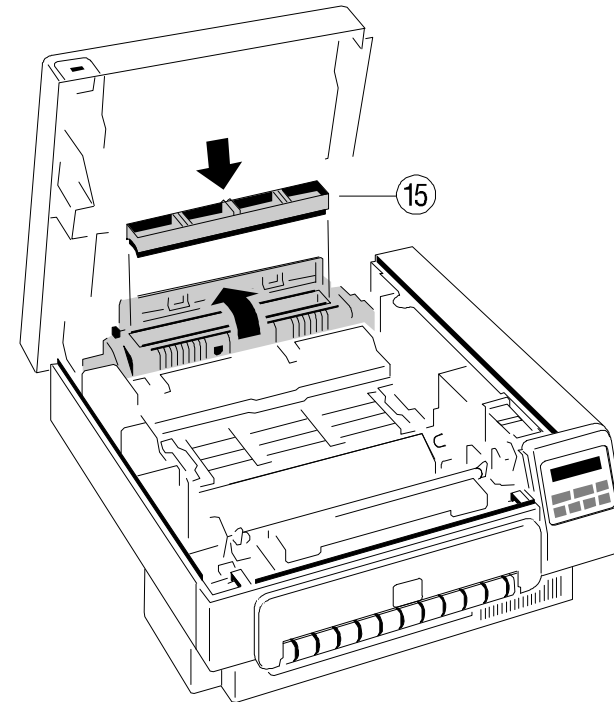
Firmly close the front cover (23).

Installing the Waste Toner Container

The toner box contains two Waste Toner Containers (14). Take one of them and insert it into its opening at the inner left side of the printer immediately behind the Developer Unit. Be sure the green cap is on the cap holder and not blocking the filling hole of the container.

**Inserting the Cleaner Felt**

The toner box also contains two Cleaner Felts (15). Take one of them and put it under the top cover of the Fuser Unit in the back of the printer. After inserting the felt the top cover does not lock completely. Don't worry about this, the printer top cover will provide the necessary pressure to keep the cleaner felt cover tight.

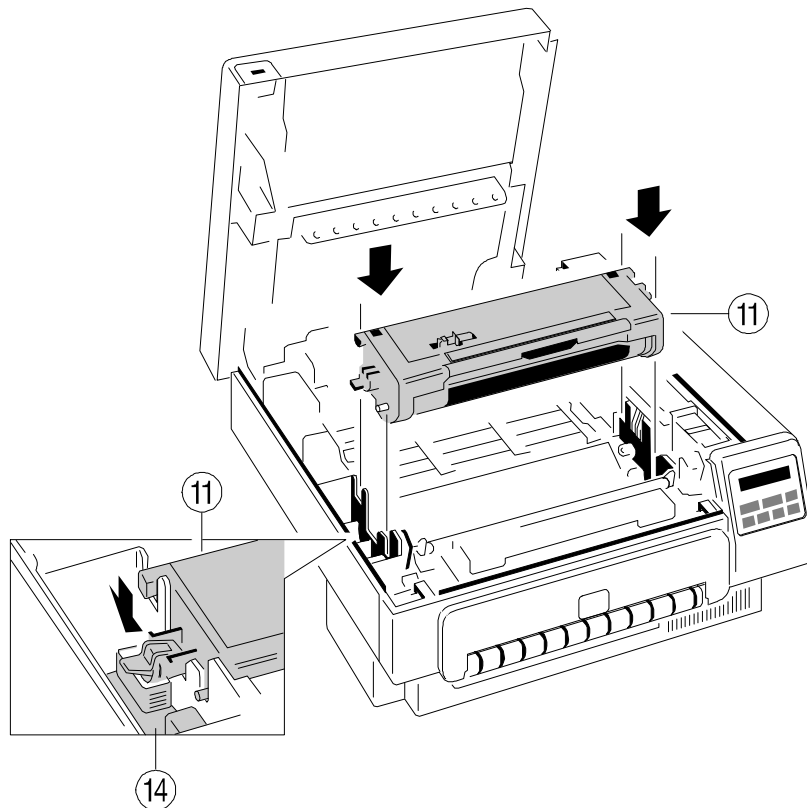


Installing the OPC Drum

The OPC Drum (11) is packed separately in the Starter Kit. The OPC Drum is very light-sensitive, so it is wrapped up in lightproof foil. Carefully remove the drum from its foil container.

Note: Do not touch the green part of the OPC Drum with your fingers. Oil and dirt degrade print quality.

Do not expose the light-sensitive OPC Drum to room lighting or sunlight any longer than necessary.

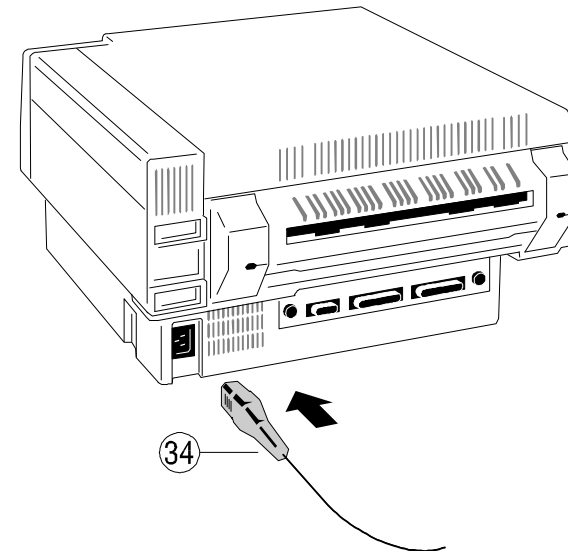


Insert the OPC Drum into the printer behind the Developer Unit. Gently press the top of the OPC unit to make sure it is fully down. The opening for toner waste is now just over the Waste Toner Container (14).

1.3 The Power Supply

Since an incorrect voltage selection can seriously damage the printer, please pay special attention to the following:

- Make sure that the specified voltage on the type plate corresponds to your mains voltage:
230 V for 220 to 240 V alternating current

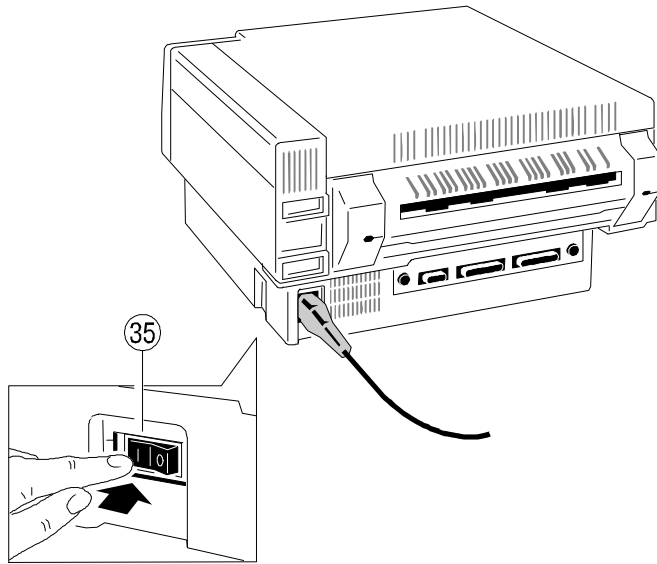


- Connect the printer to the mains using the power cord (34). First connect the cable to the power cord socket and then to the mains.

Note: As the power cord serves as a safety cut-off, its connection to the printer must be accessible any time.

1.4 Power ON/OFF Switch

The power ON/OFF switch (35), at the right side at the rear of the printer, turns the printer's power supply ON or OFF.



When switched **ON** shortly the revision level of the Bootstrap software that is installed in the printer appears on the display:

P	P	2	0	2	4		B	O	O	T	S	T	R	A	P
R	E	V	I	S	I	O	N					2	.	0	0

The display signals the message:

M	E	M	O	R	Y		T	E	S	T			
P	L	E	A	S	E		W	A	I	T	.	.	.

After successful completion the following message appears:

I	N	I	T	I	A	L		T	E	S	T		O	K	
S	T	A	R	T	I	N	G		P	P	O	S	.	.	.

Further tests are performed now. The indicators **READY**, **DATA**, and **ONLINE** are switched off; all fields of the display shortly show black squares and a short beep sounds.

On the display two messages pop up shortly after each other:

O	N	L	I	N	E		(	1)
P	C	L							

After WARMING UP the display changes into:

O	N	L	I	N	E		(	1)

Now the printer is ready for operation, the indicators **READY** und **ONLINE** light up.

1.5 Inserting Fanfold Paper

The printer has a tractor which can handle fanfold paper of a minimum width of 4inch and a maximum width of 10 inch.

Ensure that the printer is placed on its printer stand (option) to guarantee an optimal paper run. If you do not use the printer stand align the printer with the front edge of the table.

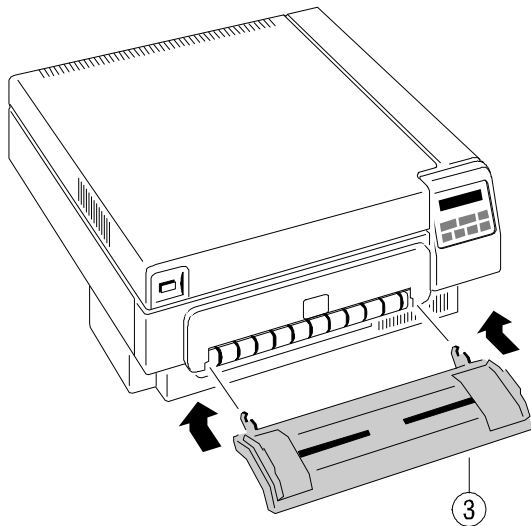
Depending on paper property it would be helpful to use the printer together with the Stacker System (option).

The cables at the rear of the printer should not block the paper path.

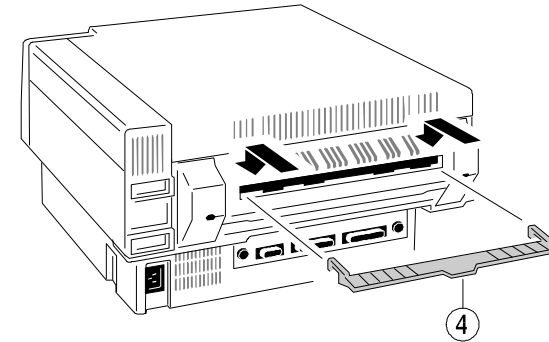
Installation of Paper Guides

Use the delivered paper guides to ensure a straight paper path. The paper guides are in the same box as the power cord.

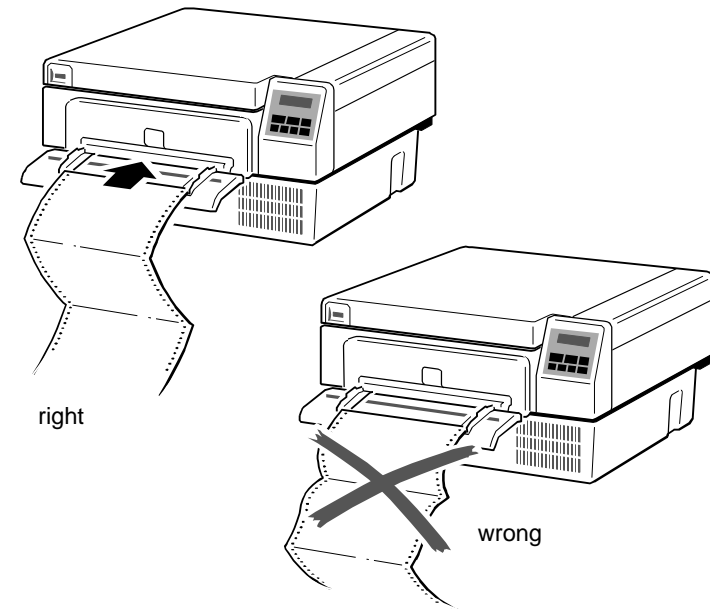
Insert the larger Entry Paper Guide (3) into the front of the printer so that the plastic hooks fit just inside the right and left edges of the paper entry slot.



Insert the smaller Exit Paper Guide (4) at the rear of the printer so that the plastic hooks fit just inside the right and left edges of the paper exit slot. The edge of this paper guide also serves as tear-off edge.

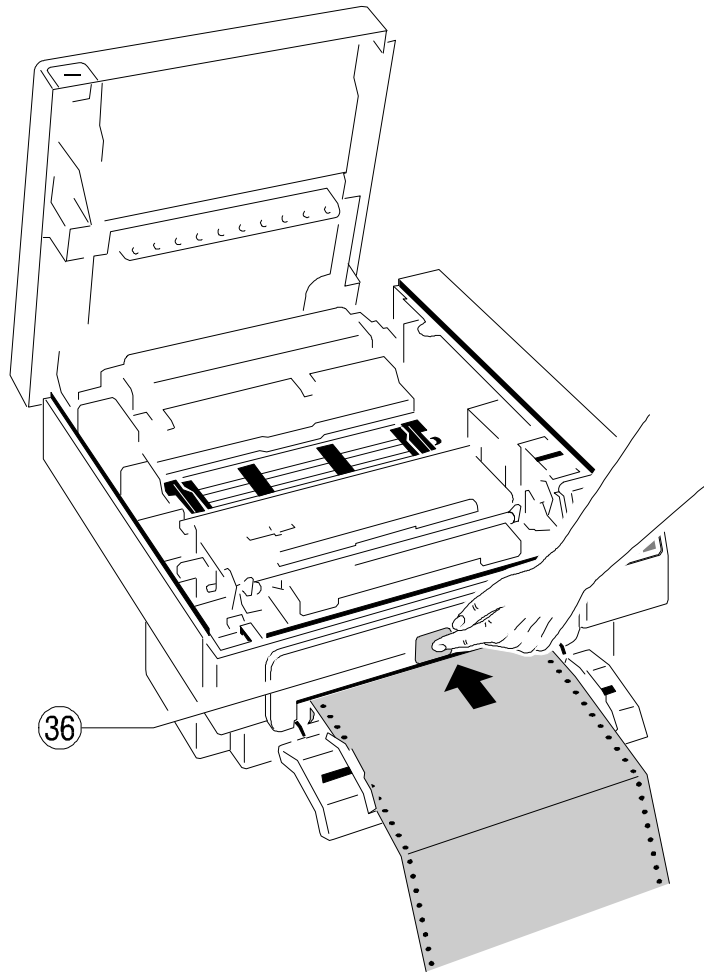


Note: A correct paper operation of the printer together with the intelligent Paper Stacker (iPS) is only assured if the fold behind the first page is positive i.e. the fold points to the operator. If the fold is negative (it points to the printer) the first page must be torn off (see also chapter 7.2.1 Inserting Paper).



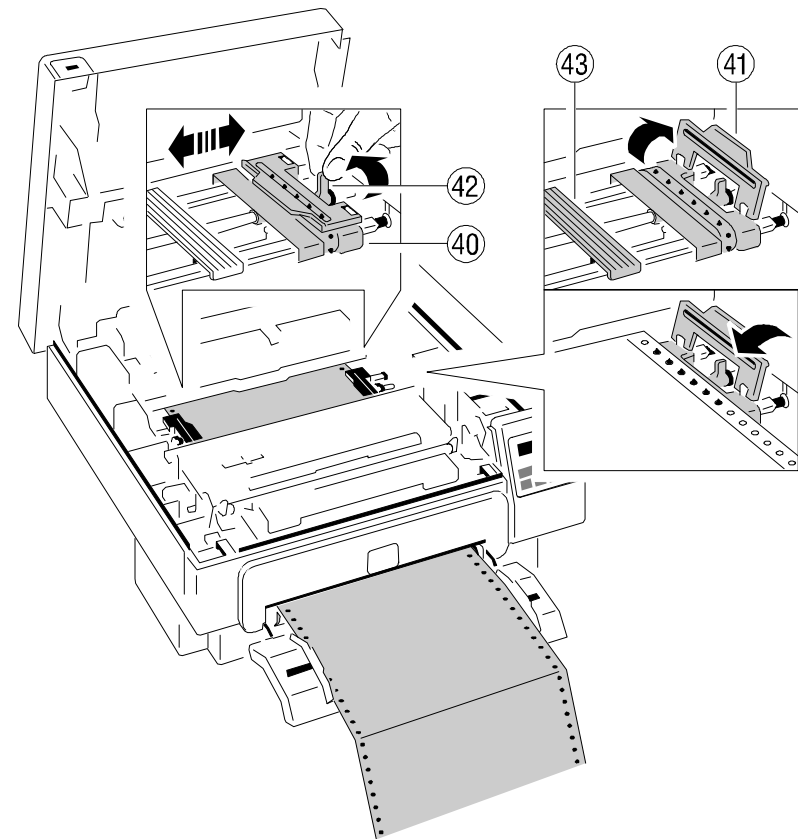
Inserting paper for the first time or changing to another paper width:

1. Power on the printer and open the top cover
2. Insert the paper into the slot at the front of the printer. Press and hold the button (36) on the center front of the printer. The button releases the paper rollers for paper insertion. Shift the paper into the slot until it appears behind the OPC unit near to the tractors. If you now release the button the paper is kept by the rollers and your hands are free to adjust the tractor.



3. Unlock the tractors (40) by moving the two green locking levers (42) to their upright position.
4. Roughly adjust the tractors (40) to the paper width, and space out the paper supports (43) evenly.
5. Open the tractor covers (41) and place the paper evenly on the pins. Close the tractor covers (41). Be sure the top edge of the paper does not extend the tractors.
6. Adjust the width of the tractors that the paper is taut between the tractors and secure the tractors using the locking levers (42).

Note: The pins of the tractor (40) must be centered into the transport punches of the paper.

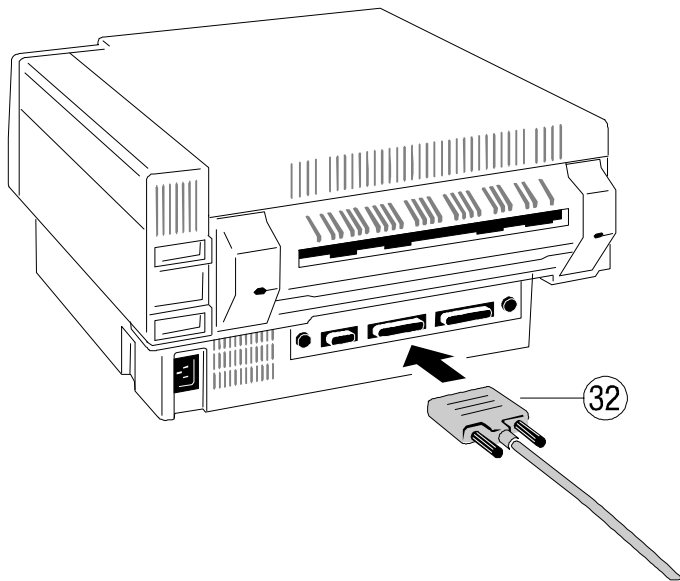


1.6 Connection to the Computer

Parallel/serial Interface

- Switch the printer and the computer OFF.
- Connect the interface cable coming from the computer to the printer's parallel port (32) .

Note: The serial interface is not supported in the Firmware rev. 1.20 or higher.
The datatransmission rate of the serial interface is not fast enough to ensure continuous printing in typical PCL applications.



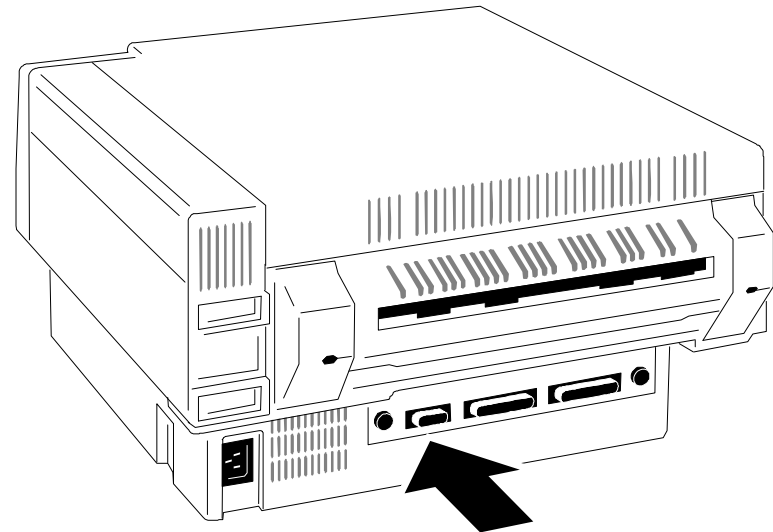
1.7 Connecting the Stacker System

As an option to the printer there is also an active Stacker System available.

For installation please follow the instructions in **chapter 7** . These instructions also explain how to connect the stacker and the printer to the mains.

The Control Unit of the printer has a stacker interface. This is a 9-pin plug at the left side of the Control Unit's cover at the rear.

Connect the stacker to the printer by means of the cable that comes with the stacker. The printer now takes care that the motors of the stacker are only activated in case of paper movement.



2 Printer Operation

2.1 Control Panel

The control panel

- gives information about the printer status
- controls various parameter settings
- allows manual control of the paper handling

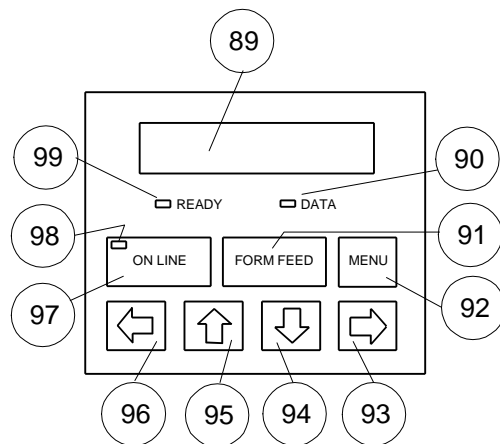
2.1.1 Description of the four Indicators

The 2-line Liquid Crystal Display (LCD) (89) indicates the current status of the printer. If any error occurs (e.g. COVER OPEN), the resulting error message will be displayed. While configuring the printer menu settings and parameters appear on the display.

The indicator READY (99) is lit, if the printer is supplied with power by setting the power ON/OFF switch to ON or when an error condition was cleared (e.g. the cover is closed).

The indicator DATA (90) is lit, if the buffer contains data. While data is transmitted the display is flashing.

The green indicator in the field ONLINE (98) is lit when the printer is in the ONLINE mode. Print jobs can be accepted and executed.



2.1.2 Description of the LCD Display

The LCD Indicator gives information about the status of the printer.

In general you can distinguish the following messages:

- ONLINE messages
- OFFLINE messages

When the printer is in the **ONLINE** mode the display shows:

```
O N L I N E      ( 1 )
```

When the printer is in the **OFFLINE** mode status information, error messages or menu messages can be displayed.

Status and error messages are displayed:

```
O F F L I N E      ( 1 )
m e s s a g e
```

Example: The printer is warming up:

```
O F F L I N E      ( 1 )
W A R M I N G      U P      6 0 %
```

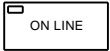
Example: Display after pressing the ON LINE (97) and MENU (92) key:

```
O F F L I N E      ( 1 )
S E L E C T      P R O F I L E
```

2.1.3 Function Keys


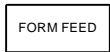


The function keys of the operator panel are grouped into two rows. The function of the seven keys (91) to (97) depends on the printer operation state.



Short Description of Keys in the **ONLINE** mode

Number	Symbol	Display
		– Function
97		OFFLINE (1) - Changing to the OFFLINE mode - Stops data transfer

Note: In the ONLINE mode all other keys have no function.

Short Description of Keys in the **OFFLINE** mode

Number	Symbol	Display
		– Function
97		ONLINE (1) - Changing to the ONLINE mode - Starts data transfer - Leaving the MENU-mode
91		FORMFEED - Formfeed is only activated if data are in the buffer
92		OFFLINE (1) SELECT PROFILE - activates the MENU mode
93		CURSOR Keys - navigation through the menu - selection of parameters - activation of adjustments

Note: The cursor keys   have an auto repeat function.

2.2 Menu Mode

All operator selectable features are accessible via the control panel and combined in the printer MENU.

This feature provides:

- easy handling of configuration (language, etc.)
- quick parameter changes
- activation of test functions

There are four entry points:


- **SELECT PROFILE** – for profile selection
- **CHANGE PROFILE** – to change the profile settings
- **BASIC SETTINGS** – to control the printer (power save, menu access)
- **TEST MODE** – to make test prints and get information about the printer

The menu has three levels:

- **Level 1** the Main Function
allows the selection of a group of subfunctions
- **Level 2** Subfunctions
can be activated as a function or allows to choose a group of values
- **Level 3** Parameters and values
can be selected / activated in this level

2.2.1 Activate the Menu

To activate the menu please follow the next steps:

- Press 

The printer changes from the **ONLINE** mode into the **OFFLINE** mode and the display shows

OFFLINE (1)

- Press 



the display shows



OFFLINE (1)
SELECT PROFILE →

The number in brackets indicates the actual profile!

The next, but not visible items are:

CHANGE PROFILE
BASIC SETTINGS
TEST MODE
RESET SYSTEM



- Press  or ; the keys have a wrap around function, i.e. after the last value the first value is repeated.



After selecting **CHANGE PROFILE** by pressing first  and than  you have entered the main function level of the Menu Mode:

CHANGE PROFILE (1)
PAPER MENU →

The next, but not visible items are:

PCL MENU
GENERAL MENU

To switch to the next level first scroll with the  key to the requested menu item below the head line. Then press .

Now you are in a Subfunction. Movement in both directions is possible by using the  key or the  key.

If the selection is e.g. **PCL MENU** the display will indicate:



PCL MENU
FONT NUMBER →

The next, but not visible items are:

PITCH or POINT SIZE (depending on selected Font)
SYMBOL SET
LINE SPACING



and if PAPER = CUSTOM the following parameters are also selectable

TOP MARGIN
LEFT MARGIN
RIGHT MARGIN
TEXT LENGTH
PERF. SKIP


Now select the requested menu item of this menu (for example **PERF. SKIP**) by pressing  following by  to enter the lowest level.

At the last level to select/confirm values, the asterisk (*) at the right indicates the actual selection.


PERF. SKIP
OFF *
ON

By using the  or  key you are able to change OFF into ON.

2.2.2 Confirm a new Selection

- press ; the confirmed value is displayed with an asterisk (*) in the last position as shown in the picture before.

Note: All new values will be saved at once!

The Menu mode is left by pressing the  key.

Note: All actual parameter settings can be printed with the function **SELF TEST** in the **TEST MODE**.




2.3 Status and Error Messages

If the printer is powered on and ready to execute a print job the following messages can be displayed on the operator panel:

Status or Error Message	Action
POWER SAVE	None (only information)
The printer enters this mode after a user defined time period has elapsed without printing. In power save mode the printer switches off the fuser lamps, the fans, and motors. Power dissipation in POWER SAVE mode is less than 40 watt . A new print job resumes the ONLINE mode	
WARMING UP	Wait (only information)
This message is displayed when the printer was in idle mode and the fuser unit of the printer is warming up to the chosen temperature. When this temperature level is reached the printer switches to the ONLINE mode and starts printing when the entire contents of a page is received.	
STACKER BUSY	None / wait (only information)
This message is just a hint. The Paper Exit Tray of the stacker is moving up or down before reaching the working position. The printer is waiting and automatically getting ready when the stacker is finished its startup sequences.	
WRONG PG. LENGTH	User the LENGTH FACTOR
This message is displayed if a page length shorter than 8 inch or longer than 16 inch is to be operated in conjunction with the stacker iPS 2024. The stacker can only handle a page length between 8 and 16 inch. This message is considered being a warning; the stacker continues to operate however the pendulum does not move at the right frequency. The message disappears as soon as a page length in the specified range is selected.	

The following messages are displayed if a condition exists which prevents normal operation of the printer. The printer enters the **OFFLINE** mode and is sending a short acoustical signal.

Status or Error Message	Action
NO PAPER	Open the cover, resolve the error, close the cover
Displayed if the host sends a form feed or print command and the tractor is empty. Load paper and close cover.	
COVER OPEN	Close the cover
Displayed if the top cover is open. After closing the cover the printer enters the ONLINE mode.	
PAPER JAM (<i>Position</i>)	Open the cover, clear the paper path, close the cover
<p>Displayed if line feeds fail to move fanfold paper correctly. The value <i>Position</i> shows the jam area. The toner before the Fuser is not fixed yet. Remove the paper in the following way:</p> <ul style="list-style-type: none"> – tear off the paper at the input and output area – open the tractors – remove the remaining paper in direction of the paper output <p>Note: For <i>Position</i> see paragraph 6.2 Error Messages</p> <p>Important: If the printer works in conjunction with the iPS the paper must newly be inserted with the positive fold (fold points outwards) - see paragraph 7.2.1 Inserting Paper</p>	
TONER EMPTY	Open the cover, refill toner, close the cover
The toner box is empty. Fill in new toner (see chapter 5 Maintenance - paragraph Filling in Toner).	

Status or Error Message	Action
CHK TONER BOTTLE	Open the cover, resolve the error, close the cover
The waste toner bottle is not correctly mounted or missing. Insert the waste toner bottle correctly (see chapter 1 Getting Started - paragraph Inserting the Waste Toner Bottle)	
STACKER FULL	Remove paper, press 
Remove paper off the iPS, after pressing  the printer resumes printing.	
STACKER ERROR	Press 
Error when reading the EEPROM of the stacker. The stacker is further operational but the parameter setting after the last power off has been lost. In case of a malfunction of the pendulum new paper must be inserted because the information about the paper fold has been lost. If the printer works in conjunction with the iPS the paper must newly be inserted with the positive fold (fold points outwards) - see paragraph 7.2.1 Inserting Paper	

Note: In case of other messages like **NO DRUM UNIT**, **TPS ERROR**, etc. ... see Chapter 6 **Troubleshooting and Diagnostics**.

3 Configuring the Printer

3.1 What is Configuring ?

This chapter describes how to use the control panel and menu to set up or configure your printer so that the printer and your computer system can communicate correctly with each other.

The important menus are:

- SELECT PROFILE
- CHANGE PROFILE
 - PAPER MENU
 - PCL MENU or HEXDUMP MENU
 - GENERAL MENU
- BASIC SETTINGS
 - CONFIG. MENU
- TEST MODE
 - TEST MENU
 - INFO MENU

3.1.1 Profiles

All parameters which characterise a print job and its corresponding form (e.g. **PAPER, PAPER LENGTH, FUSER TEMP.**) are contained in one profile. In total **10 PROFILES** are available and can be either programmed via the operator panel or by means of the utility called **Profiler**. The Profiler provides an utmost comfortable way of creating profiles. More about the Profiler on next page.

There are two items in the **OFFLINE MENU** which deal with profiles, **SELECT PROFILE** to activate a profile and **CHANGE PROFILE** to define its contents. All parameter settings via the operator panel, via the Profiler or via PJI commands are effecting the actually selected profile. The number of the actually selected profile is shown in the first line of the operator panel. After switching on the printer the last selected profile will be active.

The function **RECALL FACTORY** in the **CONFIG. MENU** is setting all parameters of all profiles to the factory default values.

Different application use also different settings. All these settings for an

application are collected in a **PROFILE**. Up to 10 Profiles are available. For example: Application A needs 8 inch fanfold paper with a top margin of one line, application B processes 12 inch fanfold paper split up into 2 forms of 6 inch. Simply by pressing **SELECT PROFILE** the Profile containing the information for the specific application requirements can be activated.

– Profiler

The Profiler represents a utility which can be used for printer configuration. It provides the capability to program up to 10 profiles whose contents can be defined and archived on a PC and downloaded into the printer. All relevant configuration parameters are presented on the screen in a similar way as they are shown on the printer's operator panel display. The utility runs under Windows 95 /Windows 98 or Windows NT.

Attention: The printer must be in the **ONLINE** state when profiles are downloaded from the PC.

Note: For detailed description of the Programm see Paragraph **3.6 Configuration Tools**.

3.1.2 Basic Printer Settings

All parameters which characterise general printer features and functions can be defined in the menu mode **BASIC SETTINGS** and the submenu **CONFIG. MENU**.

3.1.3 Test Mode

- The **TEST MENU** allows running of various self tests and configuration print outs.
- The **INFO MENU** allows to display all release informations of the printer.

3.2 Printout of Standard Configuration

The factory default configuration can be printed within the **TEST MENU** and is shown on the following page.

The upper part of the **SELFTEST** printout shows the actual selections and parameter values.

Main functions appear in the first line of each menu block.

Second and following lines show the selection at subfunction level and the selected parameters behind the "=" sign.

Below the menu section on the test page information is given about the hardware and software configuration of the printer and stacker:


- FLASH memory size for printer firmware and fonts
- memory size (DRAM)
- Printer and Stacker firmware version
- Panel version
- available emulations

The rest of the page is filled up with a diagonal test pattern. The black frame around the test page reflects the actual paper format. The default format is 12 inch for paper length and 8.25 inch for image width.








3.2.1 How to Start a SELF TEST

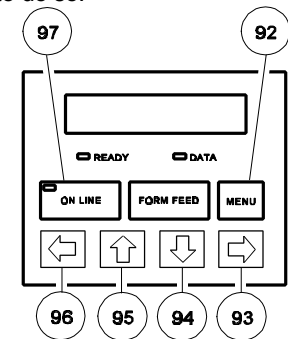
Panel keys are now used and associated display messages are shown for the next steps. The following example demonstrates how to do so:

Key Display


1. Switch the printer on. ONLINE (1)
2. Press  (97) OFFLINE (1)

Note: The number in brackets behind **ONLINE** or **OFFLINE** indicates the selected Profile.

3. Press  (92) OFFLINE (1)
SELECT PROFILE →
4. Press  (95) OFFLINE (1)
RESET PRINTER →
5. Press  (95) OFFLINE (1)
TEST MODE →
6. Press  (93) TEST MODE
TEST MENU →
7. Press  (93) TEST MENU
PANEL TEST →
8. Press  (94) TEST MENU
SELF TEST
9. Press  (93) TEST MENU
SELF TEST *



The printer starts with the SELFTEST printout. When printing is completed, the following message will be displayed

10. TEST MENU
SELF TEST
11. Press  (97) ONLINE (1)

The printer returns to the operating mode after pressing the **ONLINE** key:

Sample of the **SELF TEST**

--- Self Test ---			
OFFLINE MENU			
SELECT PROFILE	= 1	PAPER MENU	
CHANGE PROFILE		PAPER	= CUSTOM
BASIC SETTINGS		PAPER LENGTH	= 12 INCH
TEST MODE		LENGTH FACTOR	= 1
RESET SYSTEM	= NO	IMAGE WIDTH	= 8.25 INCH
		ORIENTATION	= PORTRAIT
		LANDSCAPE MODE	= REVERSE
		ORIENT. MODE	= FIXED
		PAPER EXTENDED	= NO
		PAPER SELECTION	= ONLY P/L
		FUSER TEMP.	= 165
		VER SHIFT	= 0/100 INCH
		HOR SHIFT	= 0/100 INCH
GENERAL MENU		CONFIG. MENU	
EMULATION	= PCL *)	POWER SAVE	= 15 MIN
AUTO FORM FEED	= OFF	ALARM BELL	= ON
PAPER RETRACT	= ON	LANGUAGE	= ENGLISH
		MENU ACCESS	= ALL
		RECALL FACTORY	= NO
INFO MENU		TEST MENU	
MACHINE COUNT	= XXX PAGES	PANEL TEST	
DRUM COUNT	= XXX PAGES	SELF TEST	
ENGINE ID	= XX	COT SELF TEST	
FIRMWARE VERS.	= 2.XX 208XXXXX	CONFIG. PRINT	
STACKER VERS.	= 1.XX	PCL TYPE LIST	
Program Memory (Flash)	: 41xxxx		
Data Memory (DRAM)	: 16xxxx		
Bootstrap Version	: 1.xx		
Processor Release Level	: 0xXX		
Emulations:			
PCL			
HEXDUMP			
!#\$%&'()*+,-./0123456789;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!#\$%&'()*+,-./0123456789;<=>?@AB			
!#\$%&'()*+,-./0123456789;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!#\$%&'()*+,-./0123456789;<=>?@ABC			
#\$%&'()*+,-./0123456789;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!#\$%&'()*+,-./0123456789;<=>?@ABCD			

*) Depending on setting of **EMULATION** in the **GENERAL MENU** either **PCL MENU** or **HEXDUMP MENU** is indicated.

) This value is depending on the selected **FONT NUMBER;
for **FONT NUMBER 0, 39 - 44 = PITCH** and
for **FONT NUMBER 1 - 38 = POINT SIZE**

See Paragraph **3.4 Menu Structure** for the different entry points and Chapter **4 Explanation of individual Menu Items** !

3.3 Printout of the 10 Profiles

To printout the contents of all 10 Profiles use the same sequence as described in paragraph **3.2.1 How to Start the SELF TEST** up to point 6.

After selecting **CONFIG. PRINT** the printer starts to print **all 10 Profiles**.

Sample of **PROFILE 1**

--- Configuration (Active) ---> Profile 1 ---			
PAPER MENU		PCL MENU *)	
PAPER	= CUSTOM	FONT NUMBER	= 0
PAPER LENGTH	= 12 INCH	PITCH	= 10.00 **)
LENGTH FACTOR	= 1	SYMBOL SET	= ROMAN-8
IMAGE WIDTH	= 8.25 INCH	LINE SPACING	= 6 LINES / INCH
ORIENTATION	= PORTRAIT	TOP MARGIN	= 0 LINES
LANDSCAPE MODE	= REVERSE	LEFT MARGIN	= 0 COLUMNS
ORIENT. MODE	= FIXED	RIGHT MARGIN	= MAXIMUM
PAPER EXTENDED	= NO	TEXT LENGTH	= 72 LINES
PAPERSELECTION	= ONLY P/L	PERF. SKIP	= OFF
FUSER TEMP.	= 165		
VER SHIFT	= 0/100		
HOR SHIFT	= 0/100		
CONFIG. MENU			
POWER SAVE	= 15 MIN		
ALARM BELL	= ON		
LANGUAGE	= ENGLISH		
MENU ACCESS	= ALL		
RECALL FACTORY	= NO		
GENERAL MENU			
EMULATION	= PCL		
AUTO FORM FEED	= OFF		
PAPER RETRACT	= ON		

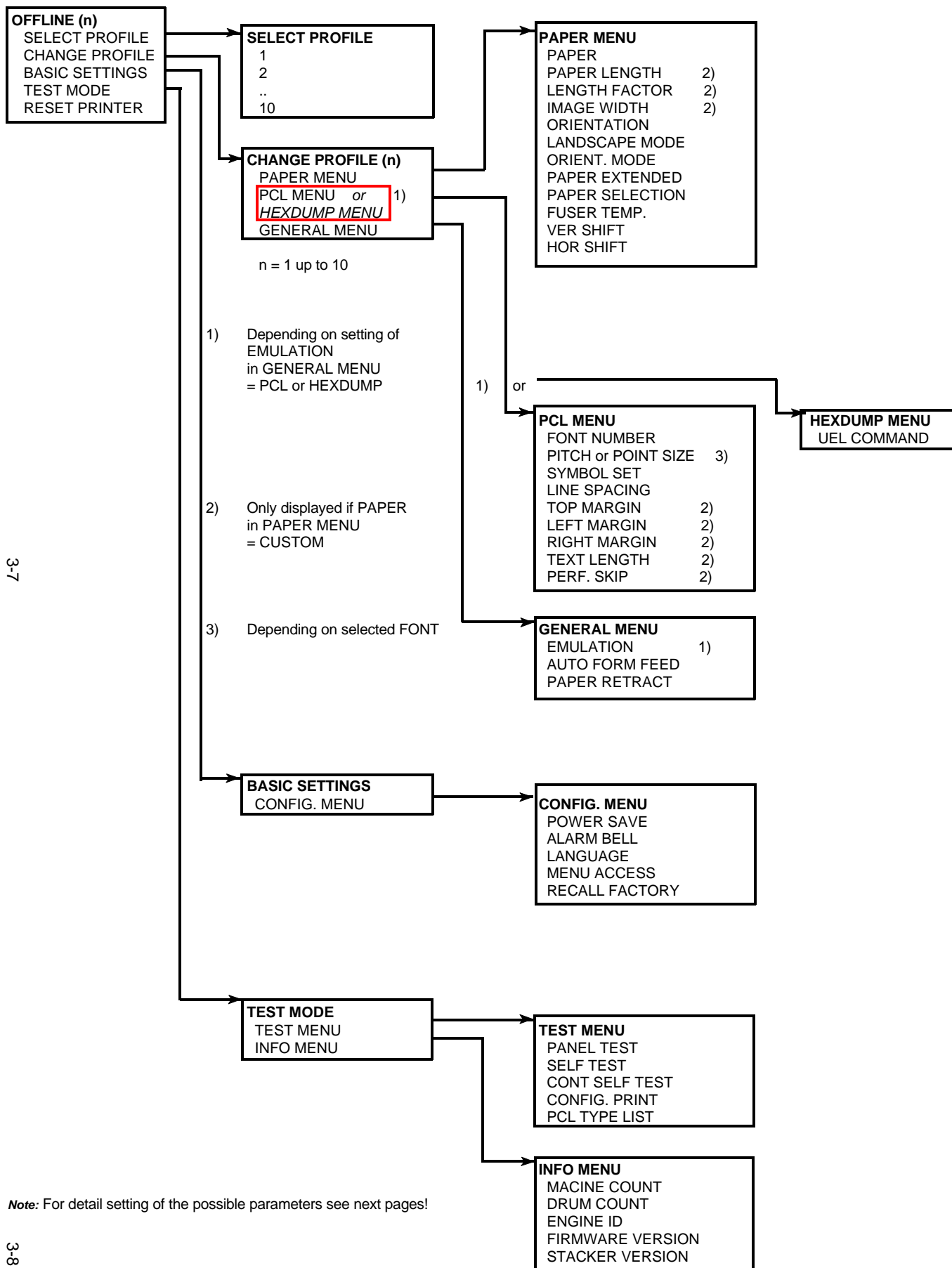
*) Depending on setting of **EMULATION** in the **GENERAL MENU** (see **TEST PRINT**) either **PCL MENU** or **HEXDUMP MENU** is indicated.

) This value is depending on selected **FONT NUMBER;
for **FONT NUMBER 0, 39 - 44 = PITCH** and
for **FONT NUMBER 1 - 38 = POINT SIZE**

See Paragraph **3.4 Menu Structure** for the different entry points and Chapter **4 Explanation of individual Menu Items** !

3.4 Menu Structure

n = 1 up to 10



3.5 Menu Item Description

The following tables show menu modes, submenus and parameters.
 Precondition is: Access to all menu items is allowed. (MENU ACCESS = ALL)
 Otherwise restrictions are to observed.

SELECT PROFILE

Entry Point = **SELECT PROFILE**

PARAMETER	VALUE
SELECT PROFILE	1 *
	2
	..
	..
	10 (Max 10 Profiles are possible)

Note: A asterisk (*) after the value indicates the actual setting!

PAPER MENU

Entry Point = **CHANGE PROFILE (n = 1 - 10) ---> PAPER MENU**

Paper Menu	Value / Parameter
PAPER	CUSTOM * LETTER A4
PAPER LENGTH (Only for CUSTOM)	12 INCH * (Range: 3...20 inch; in steps of 1/6 or 1/8 inch)
LENGTH FACTOR (Only for CUSTOM)	1 * (Range: 1 - 20 logical pages)
IMAGE WIDTH (Only for CUSTOM)	8.25 INCH * (Range: 0.5 ... 8.25 inch; in steps of 0.05 inch)
ORIENTATION	PORTRAIT * LANDSCAPE
LANDSCAPE MODE	REVERSE * PCL COMPATIBLE
ORIENT. MODE	FIXED * AUTOMATIC
PAPER EXTENDED	NO * YES
PAPER SELECTION	ONLY PjL * RECOGNIZE IGNORE
FUSER TEMP.	185 * (Range; 165 up to 185 in steps of 5)
VER SHIFT	0/100 INCH * (Range: -16/100 up to +50/100 inch)
HOR SHIFT	0/100 INCH * (Range: -50/100 up to +50/100 inch)

PCL MENU

Entry Point = **CHANGE PROFILE (n =1-10) ---> PCL MENU**

Note: The **PCL MENU** will be displayed if the **EMULATION** in the **GENERAL MENU** is set to **PCL**

PCL Menu	Value / Parameter
FONT NUMBER	0 * (Range: Font No. 0 up to 54)
PITCH	10.00 * (For Font No. 0, 39...44 are values 0.44...99.99 CPI possible)
POINT SIZE	12.00 * (For Font No. 1...38 are values 4.00...999.75 in steps of 0.25 PT) (Font No. 45...54 are not scalable)
SYMBOL SET	ROMAN-8 * ISO L1 (31 symbol sets are selectable)
LINE SPACING	6 LINES/ INCH * (Range: 1,2,3...48 LPI)
TOP MARGIN	0 LINES * (Range: 0 - 999 lines)
LEFT MARGIN	0 COLUMNS * (Range: 0 - 999 columns)
RIGHT MARGIN	MAXIMUM * (Range: 0 - 999 columns and Maximum)
TEXT LENGTH	72 LINES * (Range: 0 - 999 lines)
PERF. SKIP	OFF * ON

HEXDUMP MENU

Entry Point = **CHANGE PROFILE (n = 1 - 10) ---> HEXDUMP MENU**

Note: The **HEXDUMP MENU** will be displayed if the **EMULATION** in the **GENERAL MENU** is set to **HEXDUMP**

Hexdump Menu	Value / Parameter
UEL COMMAND	RECOGNIZE * IGNORE

GENERAL MENU

Entry Point = **CHANGE PROFILE (n = 1 - 10) ---> GENERAL MENU**

General Menu	Value / Parameter
EMULATION	PCL * HEXDUMP
AUTO FORM FEED	OFF * (Range: OFF or 1 - 120 sec.)
PAPER RETRACT 1)	ON * OFF

- 1) The non-retract mode works only in conjunction with an engine firmware equal or higher than ENGINE ID 10 (see SELF TEST).
- If the paper will be teared off in the non-retract mode, press the black tumbler switch at the intelligent Paper Stacker (iPS) to bring the paper exit tray to the lowest position. Now the pendulum controlled the paper in the right way.
 - If the operational mode is changed forth and back between PAPER RETRACT = ON or OFF the paper must always be inserted newly after such change.

CONFIG MENU

Entry Point = **BASIC SETTING ----> CONFIG MENU**

Config Menu	Value / Parameter
POWER SAVE	15 MIN * (Range: 15 up to 60 minutes; in steps of 15 min.) OFF
ALARM BELL	ON * OFF
LANGUAGE	ENGLISH * FRANCAIS, DEUTSCH, ITALIANO, ESPANOL
MENU ACCESS	ALL * PROFILES ONLY NONE
RECALL FACTORY	NO * YES (Up to 2 minutes may expire to execute the reset) During the procedure you get the mesage: xx% DONE

TEST MENUEntry Point = **TEST MODE ---> TEST MENU**

Test Menu	Function / Action
PANEL TEST	Check up of the Operator Panel display
SELF TEST	Printout of the actual settings
CONT SELF TEST	More pages with the actual settings
CONFIG. TEST	Printout of all 10 Profiles
PCL TYPE LIST	Print out of the resident Typeface List

INFO MENUEntry Point = **TEST MODE ---> INFO MENU**

Info Menu	Function / Action
MACHINE COUNT	Numbers of printed pages
DRUM COUNT	Displays the page counter for the currently installed OPC (drum)
ENGINE ID	Displays the actual Engine Firmware revision
FIRMWARE VERSION	Displays the actual PPOS revision
STACKER VERSION	Display the actual Stacker Firmware revision

3.6 Configuration Programs

The following programs for printer configuration are available:

- **Profiler**
A program for easy programming of all print job specific parameters into **Profiles**.
- **Profile Selector**
For easy selection of one predefined profile.

Note: Both programs are running under Windows 95/98 and NT 4.0.

3.6.1 Installation

Follow the standard procedures:

- For installation of the English version of the Profiler from the CD select in the Windows Start Menu the function **Run ...** and type the command:

```
D:\profiler\install\usa\disk1\setup.exe
```

- For installation of the English version of the Profile Selector from the CD select in the Start Menu the function **Run ...** and type the command:

```
D:\selector\install\usa\disk1\setup.exe
```

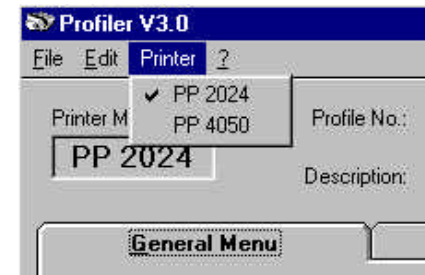
Note: In both examples the letter **D:** is used for the CD-ROM drive.

After installation both programs are listed in the screen **Programs** of the Windows Start Menu.

3.6.2 Profiler

For easy handling of the Profiler an online help text for each menu item is available.

The first step is to select the Profiler for the actual printer. Use the pull down menu **PRINTER** to select **PP 2024**.

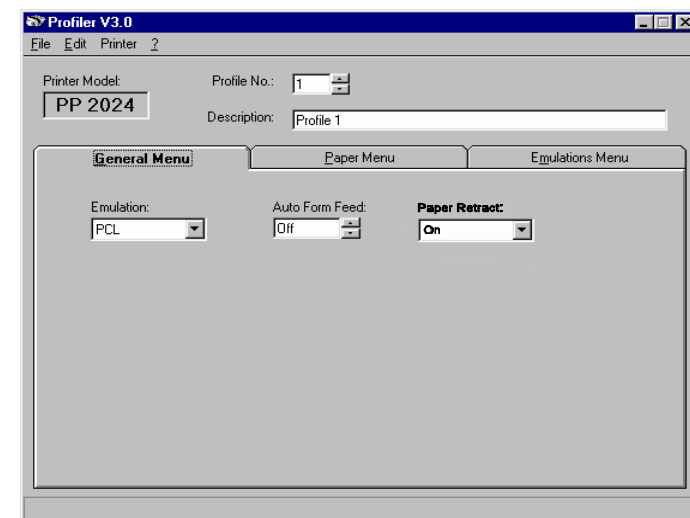


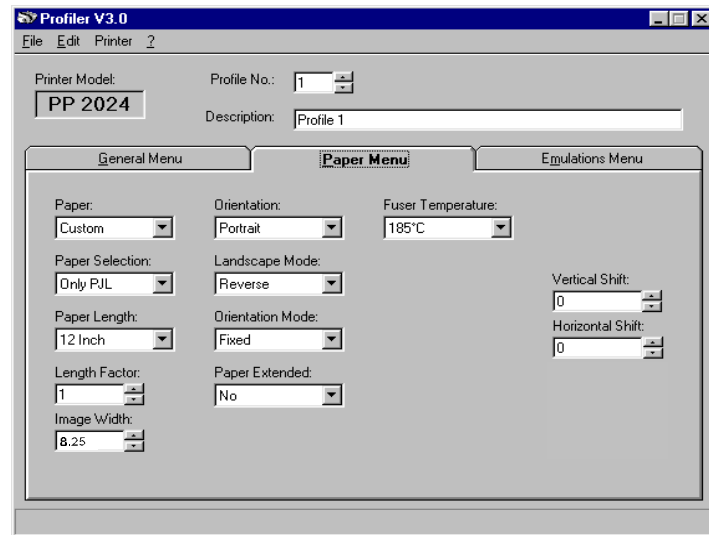
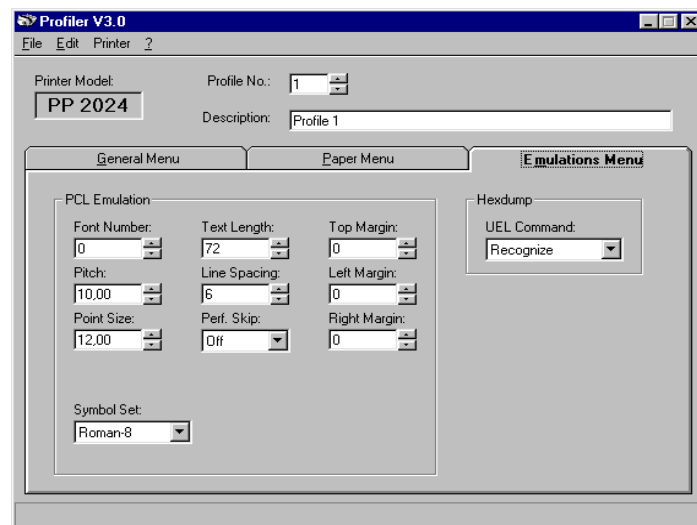
In the Profiler the following menus are available:

- General Menu
- Paper Menu
- Emulations Menu

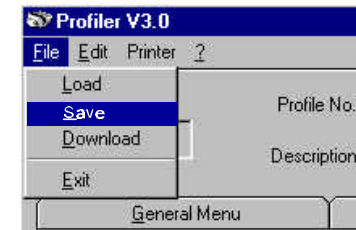
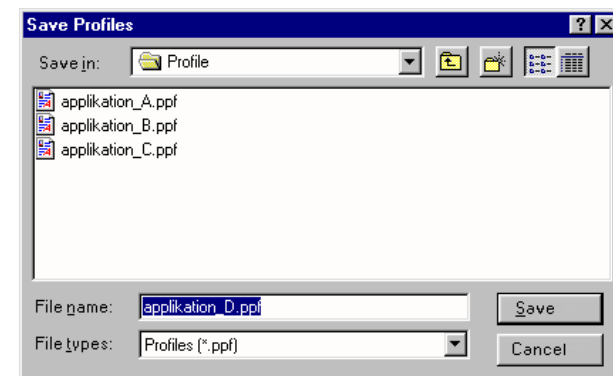
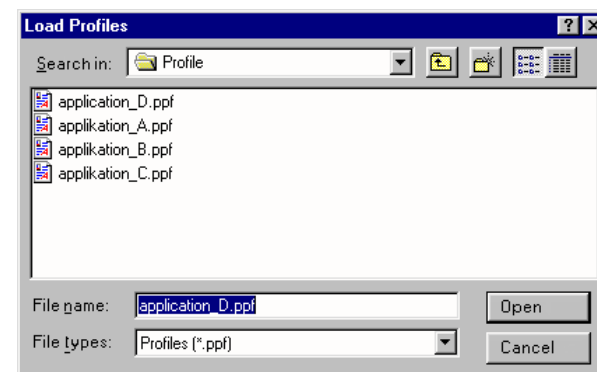
Note: These three menus are available for all profiles.

General Menu:

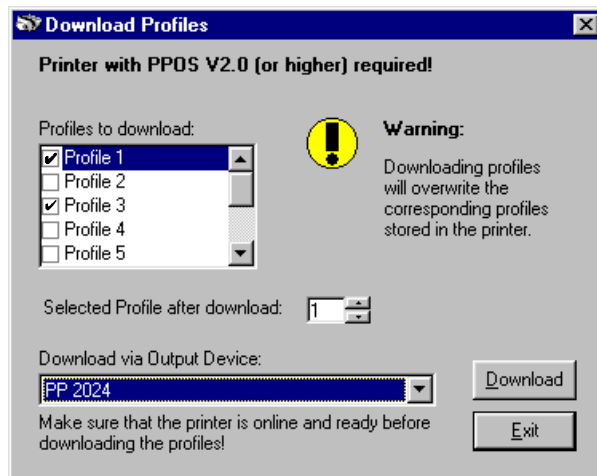


Paper Menu:**Emulations Menu:**

Already defined profiles can be saved, loaded for updating, and downloaded into the printer:

**Save Profile:****Load Profile for updating:**

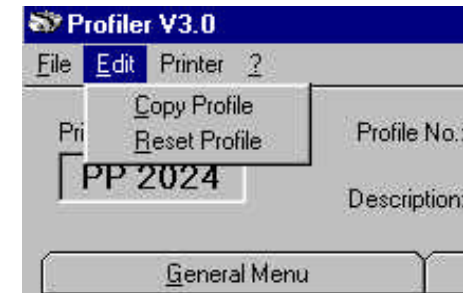
Downloading of profiles into the printer and activating of one profile:



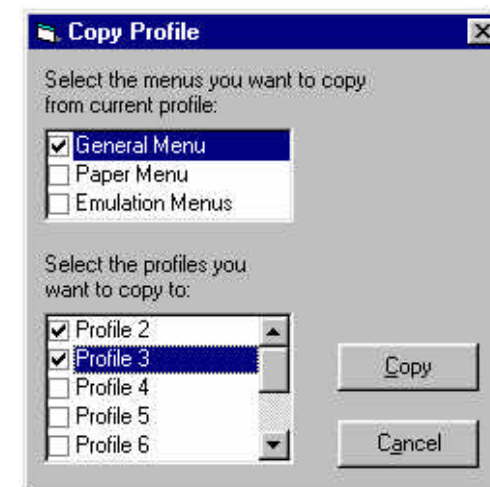
Warning: All downloaded profiles will overwrite the corresponding profiles stored in the printer!

Edit Profile:

Copying of already defined profiles or resetting of profiles to factory settings:



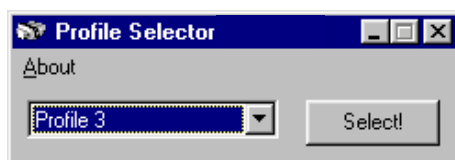
Copy of menus into profiles:



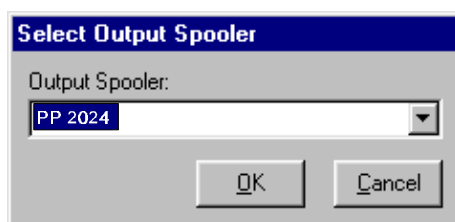
3.6.3 Profile Selector

The activation of a profile stored in the printer will be done in two steps:

- Profile selection:



- Selection of the output spooler and transferring of the profile select sequence:



4 Explanation of Individual Menu Items

In **OFFLINE** mode



- the different PROFILES can be programmed,
- the BASIC SETTINGS can be configured,
- and the printer can be set into the TEST MODE.

- **SELECT PROFILE**
To activate one out of **10** possible set up parameter blocks called **Profiles**, for quickly changing the application specific printer set up.

- **CHANGE PROFILE**
To change one out of 10 possible set up parameter blocks called **Profiles**, determining the application specific printer set up.

Note: Each profile contains all print job relevant set up parameters specifying the features and functions grouped into different submenus like PAPER MENU, PCL MENU, and GENERAL MENU. For details see chapter **4.2**.

- **BASIC SETTINGS**
In this menu mode it is possible to configure all the basic operation related features of the Printer (e.g. **Power Save**, **Language**, or **Menu Access**).

- **TEST MODE**
This function initiates a printout of the parameter settings, Profile definitions, and PCL typeface list. This printout is helpful for future reference and in case a Profile need to be changed.
To actually start the print operation it is necessary to enter the **OFFLINE** mode (by pressing  and  - see also Paragraph **3.2** and **3.3**).

- **RESET PRINTER**
In case a print job needs to be cancelled this function interrupts a print operation, flushes the data buffer, and resets the printer to a state as if it were powered-on.
Note: Before resetting the printer the job must be cancelled on the host system.

4.1 Menu Mode SELECT PROFILE

Activation of one out of 10 Profiles

4.2 Menu Mode CHANGE PROFILE

Configuration of one specific Profile.

4.2.1 Submenu PAPER MENU

– PAPER

A choice out of three different paper sizes can be made:

A4
LETTER
CUSTOM.

If **A4** or **LETTER** is selected the printer automatically sets all parameters which define the allocation of the print image on a page. Those parameter values are in accordance to the PCL5 definition.

In case of **A4** the contents of an A4 page is printed asymmetrically onto a 12 inch form which leads to a larger bottom margin than top margin.

In case of **LETTER** the page contents are printed onto an 11 inch form.

Note: If the paper size is changed from one format into another the printer selects the default values of the format describing parameters (PAPER LENGTH, IMAGE WIDTH etc.) which belong to the chosen paper size.

Paper size (PAPER) can be selected at the control panel or by means of PCL- or PJL-commands from the host system (see also **PAPER SELECTION**).

– PAPER LENGTH ¹⁾

The paper length (physical paper length) can be selected in the range from 3 inch (76.2 mm) up to 20 inch (508.0 mm) in steps of $\frac{1}{6}$ (4.23 mm) or $\frac{1}{8}$ inch (6.35 mm):


3 ; 3 $\frac{1}{8}$; 3 $\frac{1}{6}$; 3 $\frac{1}{4}$; 3 $\frac{1}{3}$; 3 $\frac{3}{8}$; 3 $\frac{1}{2}$
 3 $\frac{3}{4}$; 3 $\frac{5}{6}$; 4 ;12 ;20

Note: If ORIENTATION = LANDSCAPE is selected the paper length now corresponds to the page width.

In case of forms with paper length > 13.5 inch (345.45 mm) the data buffer of 16 MB might not be sufficient to ensure a continuous printing. In those applications an additional memory module must be inserted.

– LENGTH FACTOR ¹⁾

The length factor divides the physical paper length into an integer multiple of logical pages.

A physical page is printed when its pertaining last logical page is completed with a Form Feed command. If the number of logical pages isn't a multiple of the **LENGTH FACTOR**, the contents of the residual logical pages will remain in the printer. The key  and the functions **AUTO FORM FEED** in the **GENERAL MENU** cause the printer to print the residual logical pages and to feed the paper in the raster of a physical page.

Example: The **PAPER LENGTH** is **12 inch** and the **LENGTH FACTOR** is **3**. That means that the application prints three logical pages of 4 inch each on one physical page (12 inch by 6 lines per inch).

The range is 1 up to 20 logical pages per physical page.

¹⁾ This menu item is only displayed if PAPER size **CUSTOM** is selected.

– IMAGE WIDTH ¹⁾

The print image is always centered on a page - not at the left or right margin. The width of the print image can be selected from min. 0.5 inch (12.7 mm) up to max. 8.25 in steps of 0.05 inch:

0.50; 0.55; 0.60; 0.65;**8.25**;

Note: If ORIENTATION = LANDSCAPE is selected the image width now corresponds to the page height.

– ORIENTATION

The orientation of the print image may either be **PORTRAIT** or **LANDSCAPE**. The physical orientation of the print image is also influenced by the setting of **LANDSCAPE MODE** and **ORIENTATION MODE**.

Note: If the orientation is changed from one direction into the other the page describing parameters (MARGINS, IMAGE WIDTH, VER SHIFT, HOR SHIFT etc.) are set to the corresponding default values. The physical page length will not be changed.

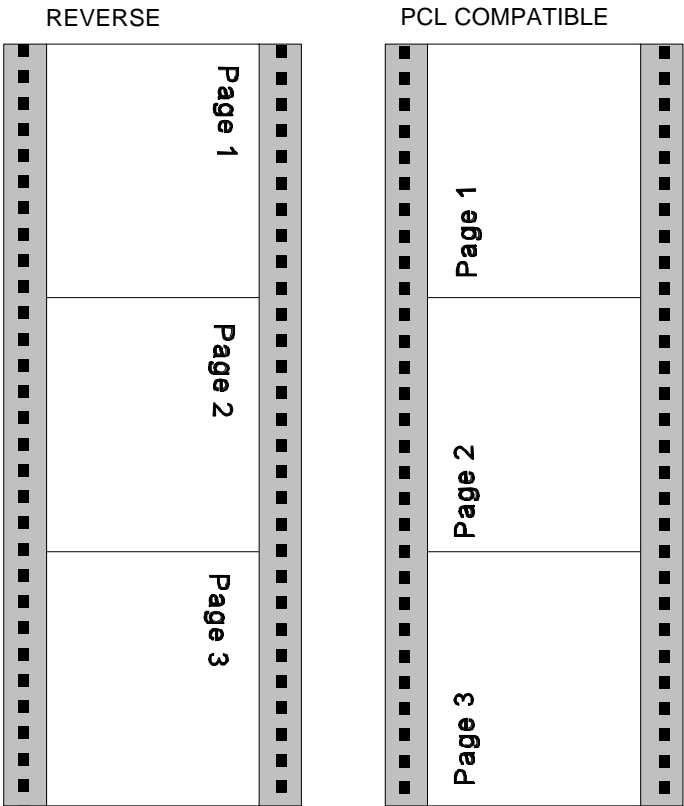
If printing is performed in **LANDSCAPE** and the selected values for image width and line spacing don't lead to an integer multiple of lines within this image area the result will be a displacement in the print image between two contiguous pages. An evenly arranged print image can only be achieved by either adapting the image width to the line spacing or by selection of **PERF.SKIP = ON**.

¹⁾ This menu item is only displayed if PAPER size **CUSTOM** is selected.

– **LANDSCAPE MODE**

The orientation of the print image is influenced by this parameter. Setting Landscape Mode to **REVERSE** (default) rotates the image of LANDSCAPE to REVERSE LANDSCAPE and REVERSE LANDSCAPE to LANDSCAPE. This makes continuous pages with landscape orientation readable like a book. Selection of **PCL COMPATIBLE** is according to the landscape definition of PCL i.e. rotation by 180° counter clockwise.

Print sample for **LANDSCAPE MODE** if
ORIENTATION = LANDSCAPE and **ORIENT. MODE = FIXED** selected:

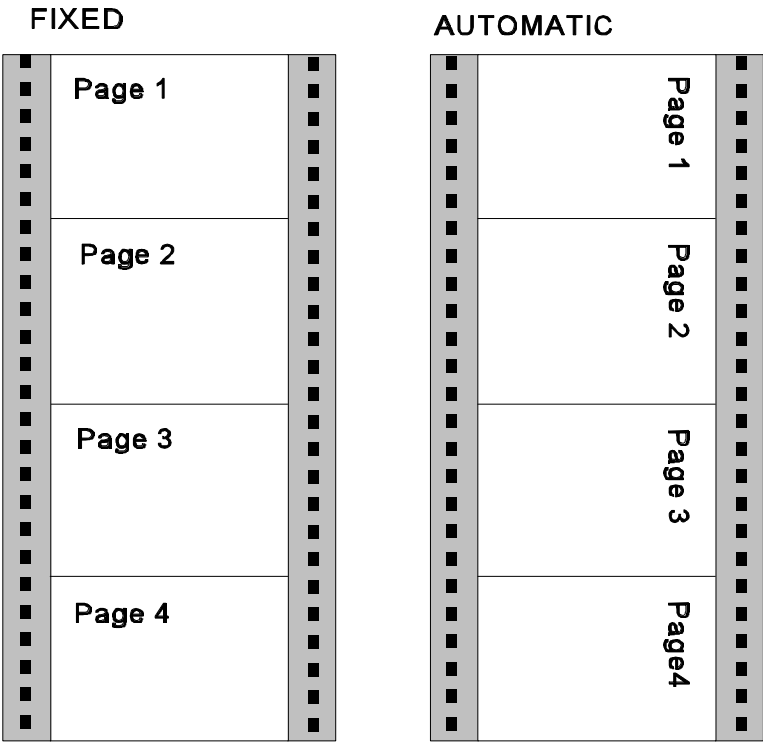


– **ORIENT. MODE** (Orientation Mode)

The Orientation Mode defines the print image rotation for CUSTOM paper format. Setting the Orientation Mode to **FIXED** (default) ensures that the print orientation of a form with paper length shorter than the image width is not rotated.

Setting the Orientation Mode to **AUTOMATIC** rotates the print image if the form length is shorter than the image width. This selection is required for applications which make use of the PCL compatible automatic rotation.

Print sample for **ORIENTATION MODE** if
ORIENTATION = PORTRAIT and **LANDSCAPE MODE = RESERVE** selected:



– **PAPER EXTENDED**

With **PAPER EXTENDED** set to **NO** printing into the border areas of **A4** and **LETTER** pages is not possible which is in line with the PCL5 definition.

However, for compatibility to existing applications which use the border areas **PAPER EXTENDED** can be set to **YES**. Now the entire physical page is printable at which the default cursor position remains unchanged.

With format **CUSTOM** the complete page can also be printed but the default cursor position is always the first dot at the upper left corner.

– **PAPER SELECTION**

Selecting the paper format (A4, LETTER, CUSTOM) from the host can be done with PCL or PJL commands. The execution of this commands can be influenced by the parameter **PAPER SELECTION**.

- | | |
|------------------|---|
| RECOGNIZE | - A change of PAPER is possible via interface by means of PCL- or PJL-commands. |
| ONLY PJL | - Only via PJL-command (default) |
| IGNORE | - Any command to change the paper format will be ignored; the paper format can only be modified via the operator panel. |

Note: **PAPER SELECTION** by the printer driver needs the setting **RECOGNIZE** or **ONLY PJL**.

The PSi printer driver for Windows® uses PCL and PJL sequences.

– **FUSER TEMP.** (Fuser Temperatur)

This parameter allows to adjust the fuser temperature.

Default value is 185° C, selection is possible from 165° C to 185° C in steps of 5° C. Fuser temperature adjustment is necessary when temperature sensitive formsets (e.g. labels) are printed.

– **VER SHIFT** (VERTICAL SHIFT)

– **HOR SHIFT** (HORIZONTAL SHIFT)

The parameters **VER SHIFT** and **HOR SHIFT** allow to precisely position the print image vertically (-16...+50/100) and horizontally (-50...+50/100). The adjustment can be done in steps of 1/100 inch (0.25 mm); factory default value of both parameters is zero.

4.2.2 PCL MENU

Definition of the parameters for character presentation on a page.

Note: The PCL MENU will only be displayed if EMULATION = PCL is selected in the GENERAL MENU.

– **FONT NUMBER**

The font number selects one of the 55 PCL typefaces as the default font within the PCL emulation. A printout of the PCL TYPE LIST can be started within the TEST MENU. Default is font no. 0 (COURIER)

– **PITCH**

Pitch defines the character size for FONT NUMBER 0 and 39 to 44. Any value from 0.44 to 99.99 CPI can be selected. Default value is 10.00 characters per inch.

– **POINT SIZE**

For FONT NUMBER 1 to 38 character scaling is defined as point size. Values can be selected from 4.00 to 999.75 PT in steps of 0.25. Default value is 12.00 PT.

Note: FONT NUMBER 45 to 54 are not scalable, neither the menu item PITCH nor POINT SIZE is applicable.

– SYMBOL SET

Symbol Set means a code table of characters and symbols.

Factory default is the ROMAN-8 symbol set. One of the following 33 different sets can be chosen being the standard set in PCL.

Display	Symbol Set	ID number
ROMAN-8	Roman-8	8U
ISO L1	ISO 8859/1 Latin 1	0N
ISO L2	ISO 8859/2 Latin 2	2N
ISO L5	ISO 8859/9 Latin 5	5N
ISO L9	ISO 8859/15 Latin 9	9N
PC-8	PC-8 Code Page 437	10U
PC-8 DN	PC-8 Danish/Norwegian	11U
PC-850	PC-850 Multilingual	12U
PC-852	PC-852 Latin 2	17U
PC-858	PC-858 Multilingual	13U
PC-8 TK	PC-Turkish	9T
WIN L1	Windows 3.1 Latin 1	19U
WIN L2	Windows 3.1 Latin 2	9E
WIN L5	Windows 3.1 Latin 5	5T
DESKTOP	Desktop	7J
PS TEXT	PS text	10J
VN INTL	Ventura International	13J
VN US	Ventura US	14J
MS PUBL	Microsoft Publishing	6J
MATH-8	Math-8	8M
PS MATH	PS Math	5M
VN MATH	Ventura Math	6M
PI FONT	Pi Font	15U
LEGAL	Legal	1U
ISO-4	ISO United Kingdom	1E
ISO-6	ISO US ASCII	0U
ISO-11	ISO Swedish	0S
ISO-15	ISO Italian	0I
ISO-17	ISO Spanish	2S
ISO-21	ISO German	1G
ISO-60	ISO Norwegian	0D
ISO-69	ISO French	1F
WIN 3.0	Windows 3.0 Latin 1	9U

– LINE SPACING

The distance between print lines is determined in lines/inch; selectable values are: 1,2,3... 48 lines/inch. Default is 6 lines/inch.

– TOP MARGIN ¹⁾

This parameter defines the number of lines between the top edge of the page and the first print line. Any value from 0 up to 999 lines can be chosen; factory default value is 0.

– LEFT MARGIN ¹⁾

This parameter defines the displacement of the first print position of a print line from the left border of the printable area. Any value from 0 up to 999 positions can be selected; factory default value is 0.

– RIGHT MARGIN ¹⁾

The parameter value defines the distance of the last print position within a line from the left border of the logical page. Any value in the range from 0 up to 999 and **MAXIMUM** can be selected; factory default is MAXIMUM.

Right Margin should only be set to a defined value if the application requires a text formatting by the printer.

Note: Setting **RIGHT MARGIN** in applications with download fonts or use landscape orientation may cause loss of characters in a line.

– TEXT LENGTH ¹⁾

The parameter defines the number of lines on a page; exceeding this limit leads to a transition onto the next following page. Any value from 0 up to 999 can be selected; factory default value is 72. The parameter is ignored if **PERF. SKIP = OFF** was selected.

– PERF. SKIP (PERFORATION SKIP) ¹⁾

In case of **PERF. SKIP = ON** the printer takes the values of TOP MARGIN and TEXT LENGTH into account on each page.

If **PERF. SKIP = OFF** is selected the printer prints over the perforation. At the transition onto a next following page the values of TOP MARGIN and TEXT LENGTH are ignored. Factory default selection is OFF.

¹⁾ This menu item is only displayed if PAPER size **CUSTOM** is selected.

4.2.3 HEXDUMP MENU

The HEXDUMP MENU defines the execution of control sequences when the HEXDUMP mode has been activated.

Note: The HEXDUMP MENU will only be displayed if EMULATION in the GENERAL MENU is set to HEXDUMP.

– UEL COMMAND

Universal Exit Language commands can be set to **RECOGNIZE** or **IGNORE**. That means this code can be executed in HEXDUMP mode or the command is ignored and printed out as hex code. UEL commands are part of the Printer Job Language (PJL).

4.2.4 GENERAL MENU

Configuration of the basic operating parameters for a print job.

– EMULATION

The Emulation determines the printer's set of command codes.

Default emulation is PCL (PCL5E).

The function HEXDUMP is useful to analyze the data received by the printer. Control codes are not executed, instead all data including command codes are printed out in hexadecimal format and as ASCII characters. Any non-printable character, such as CR, is represented as a dot (.) in the ASCII list.

– AUTO FORM FEED

If the printdata does not fill a complete page or if there is no Form Feed command (HEX 0C) at the end of a page this page is not printed. The page contents remain in the printer's memory if this parameter is set to **OFF** and is printed when the page is fed manually. If AUTO FORM FEED is set to ON such a not completed page is automatically printed out after a selectable time period at the end of a print job. (Break in datastream) The time period can be set from **1 to 120 second**. The time out will also be activated at the end of the print job.

– PAPER RETRACT

In general the paper is retracted into the start position if printing is resumed after a stop.

If this menu function is set to OFF the form will never be moved backwards. The non-retract mode shall be activated if critical paper or labels are in use which should leave the printer immediately after printing. If those forms were retracted labels might peel off or the hot media might get damaged when touching mechanical parts in the paper path.

- Note:**
- The non-retract mode works only in conjunction with an engine firmware equal or higher than ENGINE ID 10 (see SELF TEST).
 - If the paper will be teared off in the non-retract mode, press the black tumbler switch at the intelligent Paper Stacker (iPS) to bring the paper exit tray to the lowest position. Now the pendulum controlled the paper in the right way.
 - If the operational mode is changed forth and back between PAPER RETRACT = ON or OFF the paper must always be inserted newly after such change.

4.3 Menu Mode BASIC SETTINGS

4.3.1 CONFIG MENU

In the Configuration Menu general settings for the printer's operation are defined.

– POWER SAVE

The time until the power save mode is entered can be set to **15, 30, 45, 60 MIN** or **OFF**; factory default is **15 MIN**.

- **OFF** The printer doesn't switch into the POWER SAVE mode.

In power save mode the printer switches off the fuser lamps, the fans, and motors. Power dissipation in POWER SAVE mode is **less than 45 watt**. The message **POWER SAVE** is displayed. A new print job causes the POWER SAVE mode to be left.

If there are no new messages to be displayed within the next **15 minutes** the panel light is switched off as well. This function is independent of the chosen POWER SAVE time.

– ALARM BELL

Any error that occurs during a print operation is reported by a corresponding error message on the display, additionally the buzzer in the operator panel electronics is activated. The signals can be stopped by either pressing any key on the panel or by opening the cover. The default setting is **ON**. To disable this function set the value to **OFF**.

– LANGUAGE

Selects the language of the menu.

Default is **ENGLISH**; available are:

ENGLISH, FRANCAIS, DEUTSCH (German), ITALIANO, and ESPANOL




Note: Only in English and German all display messages are fully supported in the individual language.

– MENU ACCESS

The menu **CONFIG MENU** has been extended by the new function

MENU ACCESS, defining the access rights to various submenus. The access rights could be defined being **ALL**, **ONLY PROFILE**, or **NOTHING**. The locked submenus aren't displayed on the panel. However, configuration changes by means of P.J.L. commands are possible.

The access rights can be changed with the following combination of operator panel keys:

- Choose the new access right in **MENU ACCESS**.
- Choose the option and save it with the key . An asterisk indicates the selection
- Press **ESCAPE**  within the next two seconds.
- Save with the key  once more.

Note: A wrong key sequence results in cancelling the current trial and the complete sequence has to be started again.

– RECALL FACTORY

By calling up **RECALL FACTORY** in **CONFIG. MENU** all menus, including all profiles are reset to the factory defaults. This function needs to be confirmed by the additional prompting YES/NO to prevent unintended reset of all parameters.

Note: The printer needs up to **two minutes** for reset !

4.4 Menu Mode TEST MODE

Within the TEST MODE general printer status informations can be accessed and test printouts can be generated.

The TEST MODE is split into:

- TEST MENU
- INFO MENU

4.4.1 Submenu TEST MENU

– PANEL TEST


Use this point to check all Operator Panel display functions.

– SELF TEST

This selection starts the printout of the test page with the actual configuration settings of the actual Profile and diagonal character test (see Paragraph 3.2.1

How to Start the SELF TEST)

– CONT SELF TEST (Continuous Selftest)

If this function is selected the printer continuously prints the test page (see SELF TEST) until the  key is pressed.

– CONFIG. PRINT (Configuration Print)

This selection starts a printout of all Profiles with the information about the PAPER MENU, PCL MENU, GENERAL MENU, and the CONFIG. MENU (see Paragraph 3.3 **Printout of the 10 Profiles)**

– PCL TYPEFACE LIST

By activating the PCL TYPEFACE LIST a printout of all available PCL Typefaces is started including information about the scalability and corresponding font number.

Typeface	Pitch / Point	Font #
Courier SWC	scalable	I 0
Dutch801 SWC	scalable	I 1
Dutch801 SWC Bold	scalable	I 2
Dutch801 SWC Italic	scalable	I 3
Dutch801 SWC Bold Italic **)	scalable	I 4
ZapfHumst Dm SWC	scalable	I 5
ZapfHumst Dm SWC Bold *)	scalable	I 6
ZapfHumst Dm SWC Italic	scalable	I 7
ZapfHumst Dm SWC Bold Italic	scalable	I 8
Ribbon 132 SWC Italic	scalable	I 9
Clarendon SWCCondensed Bold *)	scalable	I 10
Swiss742 SWC	scalable	I 11
Swiss742 SWC Bold	scalable	I 12
Swiss742 SWC Italic	scalable	I 13
Swiss742 SWC Bold Italic	scalable	I 14
Swiss742 Cn SWC Condensed	scalable	I 15
Swiss742 Cn SWC Condensed Bold	scalable	I 16
Swiss742 Cn SWC Condensed Italic **)	scalable	I 17
Swiss742 Cn SWC CondensedBold Italic **)	scalable	I 18
Incised901 SWC	scalable	I 19
Incised901 SWC Bold	scalable	I 20
Incised901 SWC Italic	scalable	I 21
OrigGaramond SWC	scalable	I 22
OrigGaramond SWC Bold	scalable	I 23
OrigGaramond SWC Italic	scalable	I 24
OrigGaramond SWC Bold Italic	scalable	I 25
Audrey Two SWC *)	scalable	I 26
Flareserif821 SWC	scalable	I 27
Flareserif821 SWC Bold *)	scalable	I 28

continuation see next page

Typeface	Pitch / Point	Font #
Swiss SWM *)	scalable	I 29
Swiss SWM Bold *)	scalable	I 30
Swiss SWM Italic *)	scalable	I 31
Swiss SWM Bold Italic	scalable	I 32
Dutch SWM *)	scalable	I 33
Dutch SWM Bold	scalable	I 34
Dutch SWM Italic *)	scalable	I 35
Dutch SWM Bold Italic **)	scalable	I 36
Symbol Set SWA	scalable	I 37
MoreWingbats SWC	scalable	I 38
Courier SWC Bold	scalable	I 39
Courier SWC Italic	scalable	I 40
Courier SWC Bold Italic	scalable	I 41
Letter Gothic	scalable	I 42
Letter Gothic Bold	scalable	I 43
Letter Gothic Italic **)	scalable	I 44
Line Printer *)	16.67/8.50	I 45
Line Printer *)	16.67/8.50	I 46
Line Printer *)	16.67/8.50	I 47
Line Printer *)	16.67/8.50	I 48
Line Printer *)	16.67/8.50	I 49
Line Printer *)	16.67/8.50	I 50
OCR A *)	10.0/12.0	I 51
bar code 39 *)	8.11/12.0	I 52
bar code 39 *)	4.69/12.0	I 53
OCR B *)	10.0/12.0	I 54

*) It is not possible to print the EURO sign with this typeface

***) EURO sign not with the attribute "*Italic*"

4.4.2 INFO MENU

In this submenu the following printer details are displayed on the Operator Panel:

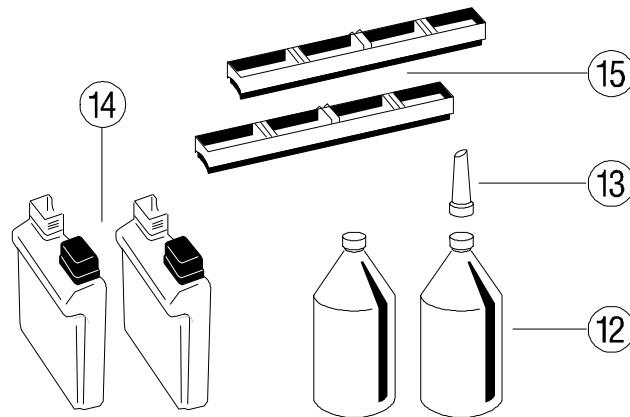
- **MACHINE COUNT**
Number of printed pages
- **DRUM COUNT**
Number for this drum printed pages
- **ENGINE ID**
The actual Engine Firmware version.
- **FIRMWARE VERSION**
The actual Printer Operating System (PPOS) version.
- **STACKER VERSION**
The actual Stacker Software version.

5 Maintenance

5.1 Installing the Parts of the Toner Kit

A Toner Kit comprises:

- two Toner bottles (12), 8,000 pages each
- one spout (13)
- two Waste Toner Containers (14)
- two Cleaner Felts (15)



Note: Save the box and all packing material of the Toner Kit!

Please, help to protect the environment and make use of the recycling program that is offered to you!

In the Toner Kit box there is a label which explains how to treat the used parts.

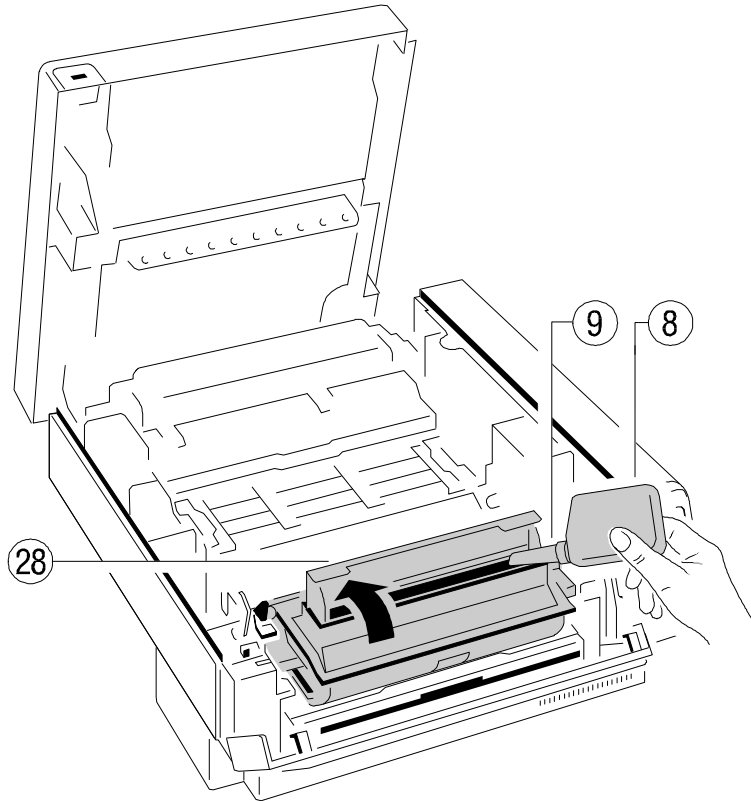
Filling in Toner

By the message "TONER EMPTY" in the display the printer indicates that toner has to be added to the developer.

Only toner that has been released for the printer must be used. This toner is part of the before mentioned Toner Kit (for order number see Appendix C). The toner will do for about 16,000 pages based upon a density of 5% per page.

Shake the bottle (12) several times to mix the toner well. Open the cover of the Developer Unit (28) to its upright position. Carefully open the seal underneath the cap of the toner bottle and attach the spout to the bottle. Spread the toner evenly across the opening of the Developer Unit.

Note: Do not squeeze the toner bottle since the toner could be blown out of the hopper and contaminate the printer. If the toner bottle does not completely empty gently tap the end of the bottle while holding it upside down over the hopper.



Close the top cover of the Developer Unit (28). If you hear a "click" the shutter is closed completely.

Replacing the Waste Toner Container

In case the Waste Toner Container is already filled considerably it is advised to replace it.

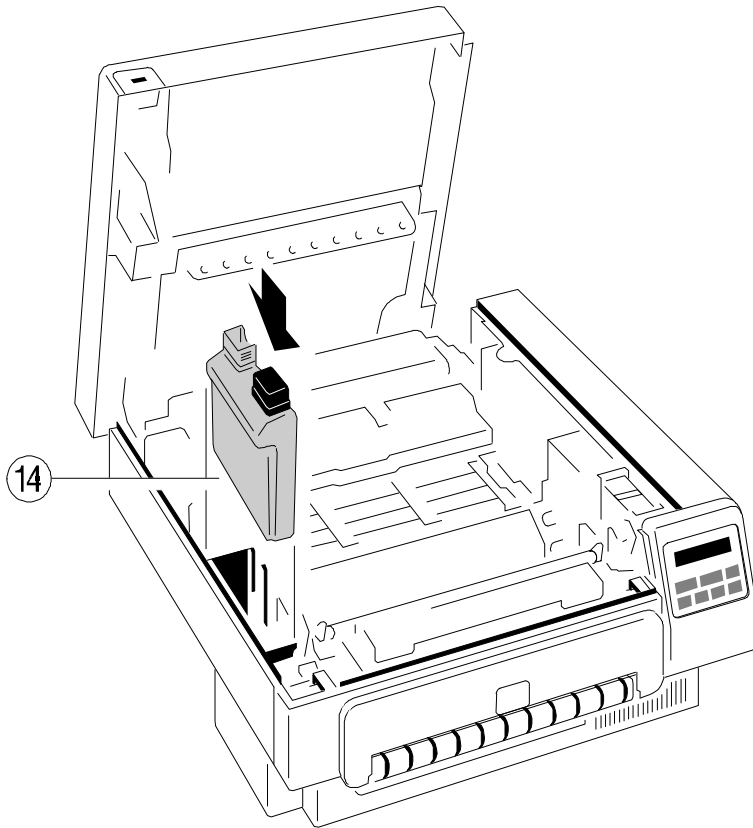
First lift the OPC Drum out of the printer and carefully set it aside on a clean surface.

Note: Do not touch the green part of the OPC Drum with your fingers. Oil and dirt will degrade print quality.

Do not expose the light-sensitive OPC Drum to room lighting or sunlight any longer than necessary.

Now remove the old Waste Toner Container from its compartment close to the Developer Unit. Close the filling hole with the green cap. Take care that the cap fits tightly over the opening.

When shipped two Waste Toner Containers (14) are in the box of the Toner Kit. Take one of them and put it into the compartment. Please observe that the green cap is placed on the cap holder and not over the filling hole.

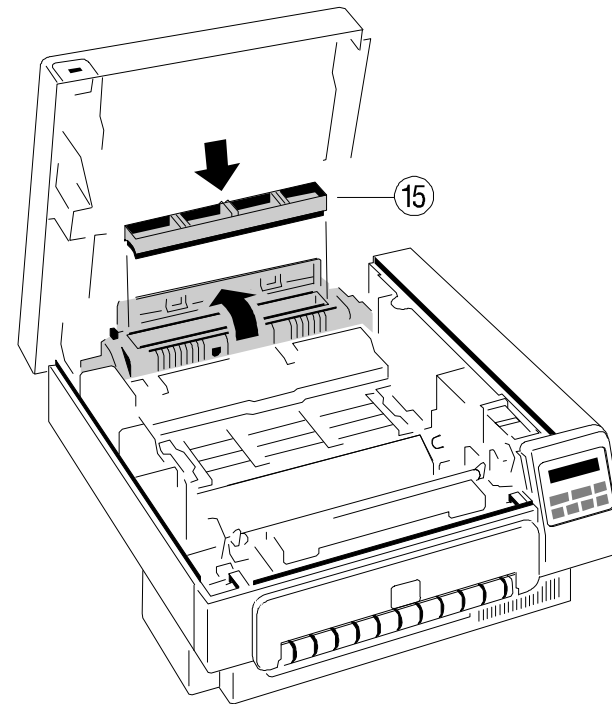


Carefully place the OPC Drum (11) back into the printer and by slightly pressing make sure that it is fully seated. The opening for toner waste is now just over Waste Toner Container (14).

Changing the Cleaner Felt

If toner is refilled you should also check the status of the Cleaner Felt. The Cleaner Felt is below the cover of the fuser unit at the rear of the printer.

If the Cleaner Felt is very dirty, you have to replace it. A new Cleaner Felt (15) is in the box of the Toner Kit. Insert it below the top cover of the Fuser Unit at the rear of the printer. After inserting the felt the top cover does not lock completely. Don't worry about this, the printer top cover will provide the necessary pressure to keep the Cleaner Felt cover tight.

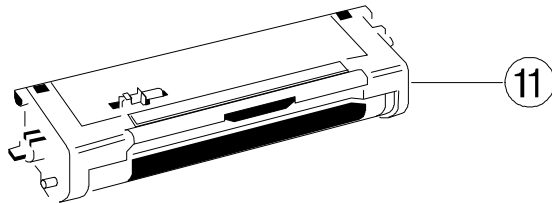


Note: Depending on the used paper type it may be necessary to change the Cleaner Felt more often.

5.2 Replacement of the OPC Drum

If the print quality gets worse or as a preventive measure after printing about 30,000 pages the OPC Drum (11) should be replaced. The display indicates this status by the message "EXCHANGE DRUM". This message is considered being a warning, the user is free to continue printing. But with every new print job the message will be displayed again.

It is only allowed to use an OPC Drum that has been released for the printer.
(For order numbers see Appendix C).

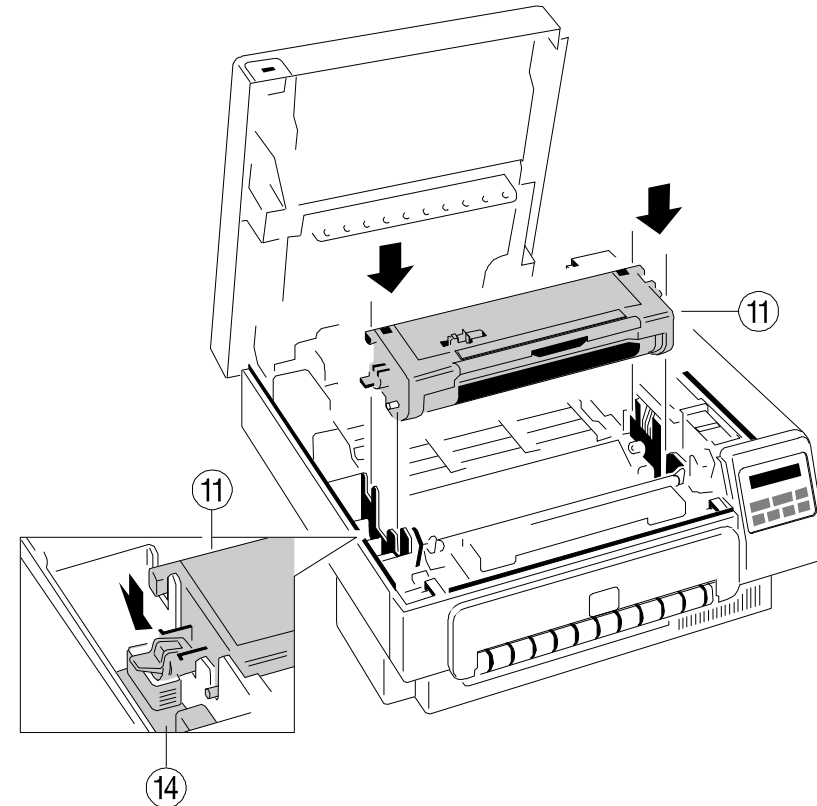


1. Open the top cover of the printer.
2. Remove the old OPC Drum carefully from the printer and set it aside on a clean surface.
3. Remove the paper from the printer.
4. Clean the inside of the printer with the cleaning pads which are in the box of the Cleaning Kit and pay special attention to the "Corona" wire below the OPC Drum. Clean it with the brush which is also in the box of the Cleaning Kit.

The OPC Drum is very light-sensitive, so it is wrapped up in lightproof foil. Carefully remove the drum from its foil container.

Note: Please do not touch the green part of the OPC Drum with your fingers. Oil and dirt degrade print quality.

Do not expose the light-sensitive OPC Drum to room lighting or sunlight any longer than necessary.



Insert the new OPC Drum into the printer behind the Developer Unit. Gently press the top of the OPC unit to make sure it is fully down. The opening for toner waste is now over the Waste Toner Container (14).

Note: Please contact your delivery agent for the recycling program of OPC Drums!

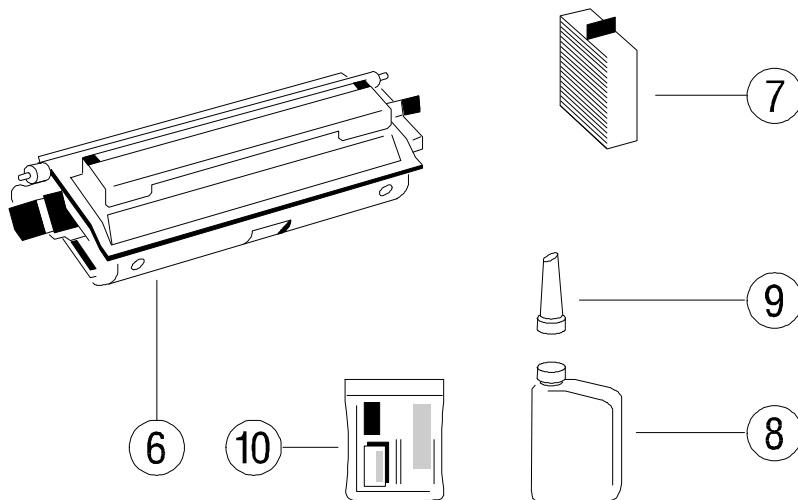
5.3 Replacement of the Developer Unit

To guarantee a good print quality you have to replace the Developer Unit after having printed about 100,000 pages.

It is only allowed to use a Developer Unit which has been released for the printer (for order numbers see Appendix C).

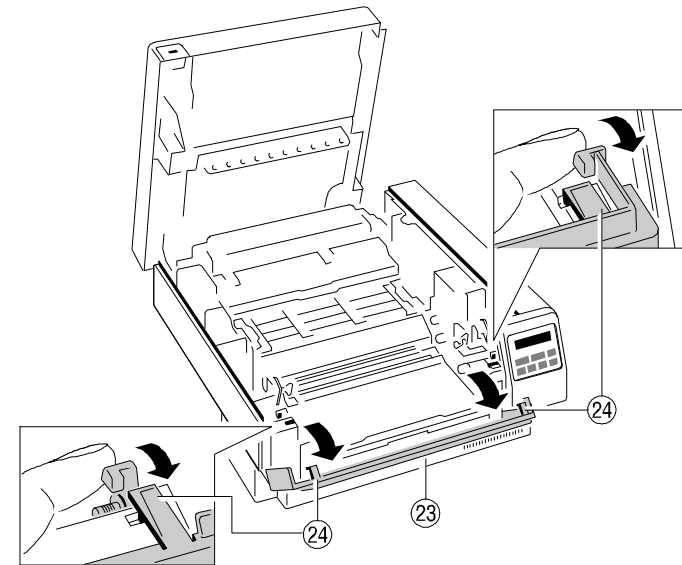
The Developer Unit is part of the "Developer Kit" which consists of:

- the Developer Unit (6)
- one Ozone Filter (7)
- one bottle with Starter Toner (8)
- one spout (9)
- one Cleaning Kit (10)

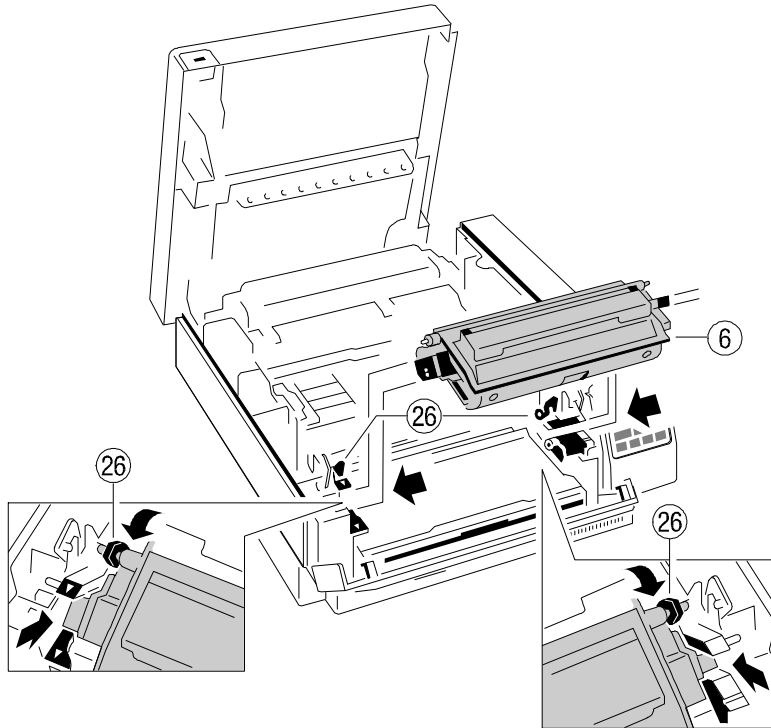


Gently lift the plastic tabs inside the printer, at the left and at the right side of the cover, and pull the front cover (23) in forward direction. The front cover will only open to a 45 degree angle. Please **do not** force this cover beyond a 45 degree angle.

Move the two green locking levers at the right and left of the Developer Unit to their upright position. Pull the Developer Unit out of the printer.



Slide the new Developer Unit fully into the printer along the plastic rails on the left and right. To lock push down the two green plastic levers.

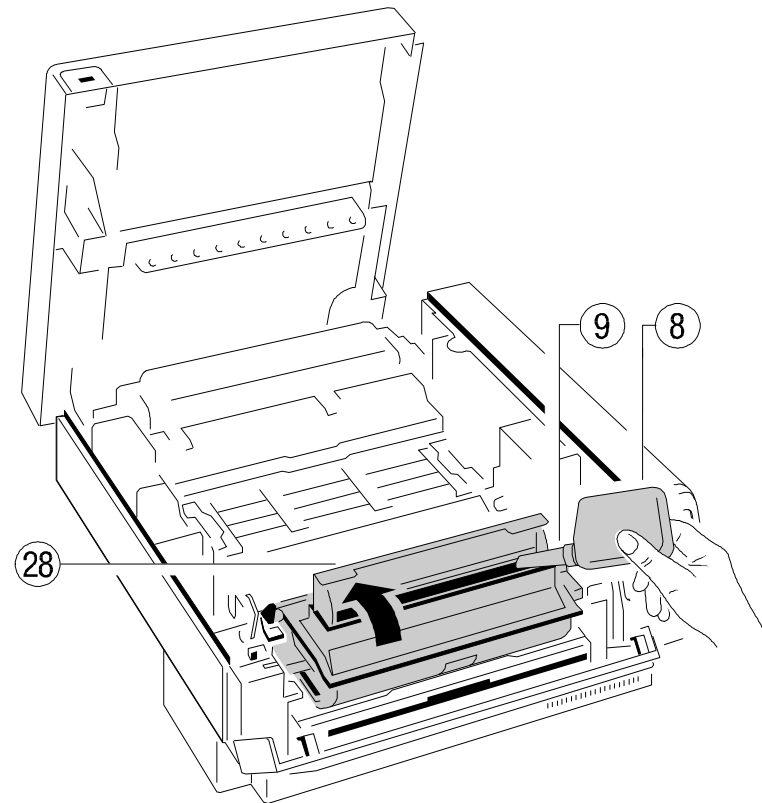


Filling in Starter Toner

Before using the Developer Unit for the first time, you have to fill it with Starter Toner. One bottle Starter Toner (8) with a spout (9) is in the box of the Developer Unit. Shake the bottle several times to mix the carrier and the toner. Carefully open the seal underneath the cap of the toner bottle and attach the spout to the bottle. Spread the toner evenly across the opening of the Developer Unit.

Note: Do not squeeze the toner bottle since the toner could be blown out of the hopper and contaminate the printer. If the toner bottle does not completely empty, gently tap the end of the bottle while holding it upside down over the hopper.

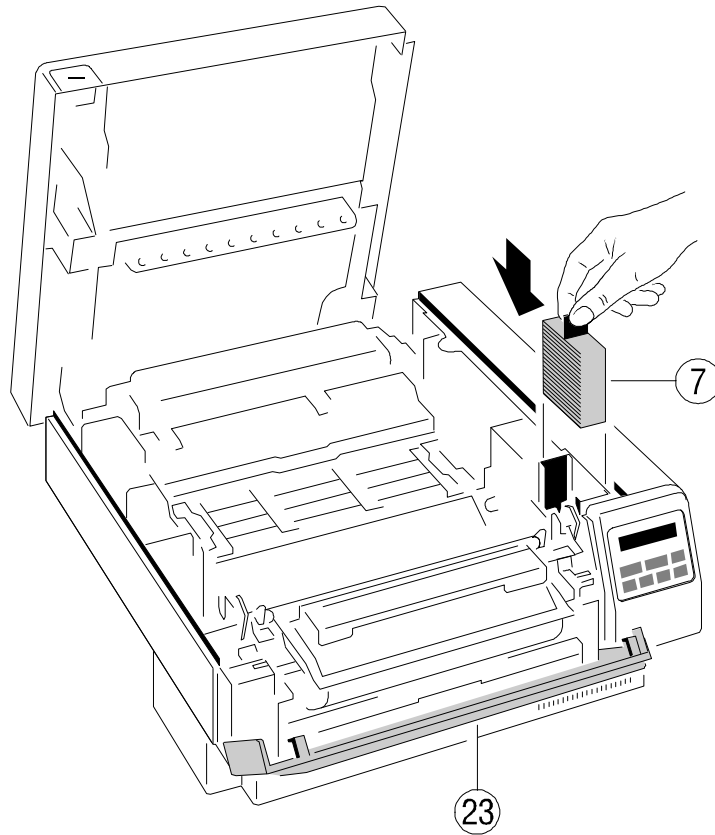
This first filling only allows Starter Toner to be used. Refilling any other toner is not allowed before the message "TONER EMPTY" appears on the display.



Close the top cover of the Developer Unit. If you hear a "click" the shutter is closed completely.

Inserting the Ozone Filter

When replacing the Developer Unit you should also replace the Ozone Filter. The box of the Developer Unit also contains an Ozone Filter (7), a black rectangular block. At one of the short sides there is a small tab to hold the filter. Insert the Ozone Filter into the slot immediately behind the operator panel and besides the Developer Unit.



Firmly close the front cover (23).

Note: Please contact your delivery agent for the recycling program of Developer Units.

5.4 Replacement of the Fuser Unit

The Fuser Unit has a lifetime of approximately 300,000 pages. To check the lifetime of the Fuser Unit the page count should be written to a log manual every time a Fuser Unit has been changed.

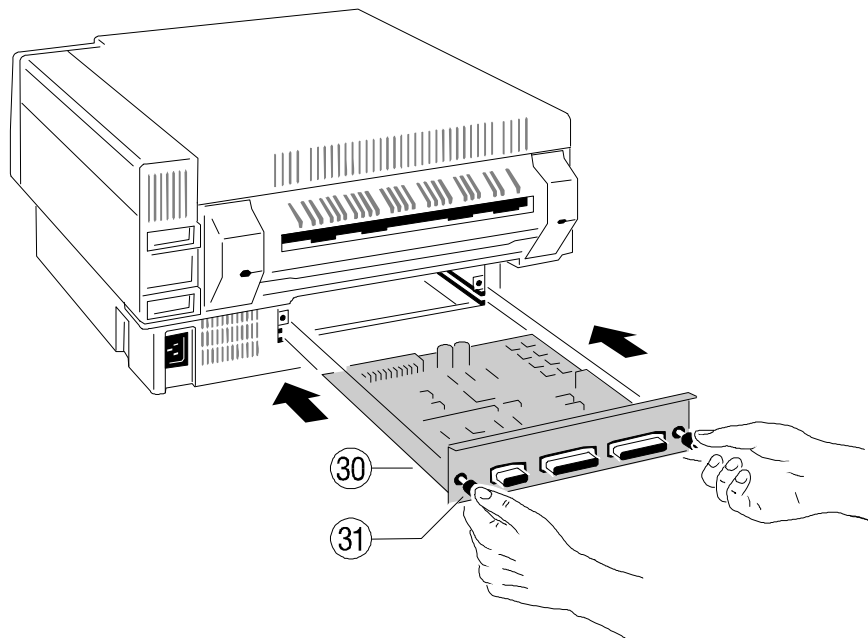
Replacement of the Fuser Unit should only be performed by a Service Technician.

5.5 Exchanging the Control Unit

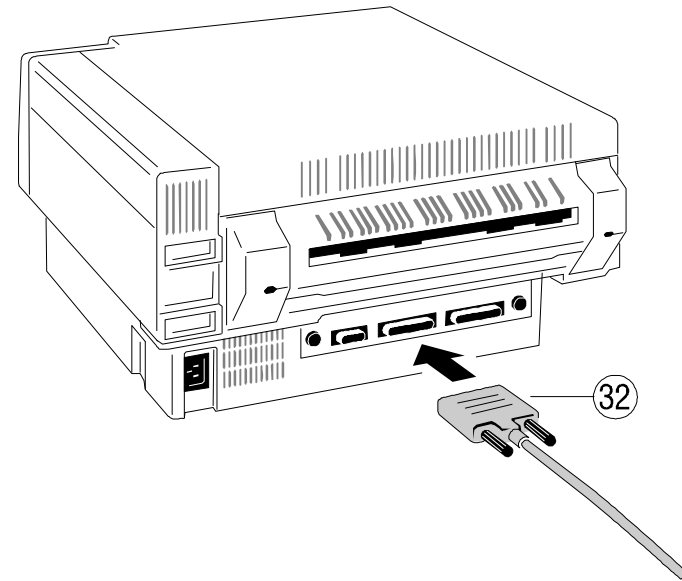
When shipped the Control Unit (30) is already installed in the printer.

If your host system requires it might be necessary to exchange the Control Unit (CU); this can easily be done:

The Control Unit is accessible at the rear of the printer. Loosen the two green lock screws and pull the Control Unit out of the printer. Insert the new Control Unit into the mounting rails until the connector fully engages. Hand tighten the two lock screws (31).



The picture below shows the standard version of the Control Unit which is equipped with a serial and parallel (32) interface. For detailed information about your CU see Chapter 2.



- Note:**
-) To avoid damage due to electrostatic discharge, do not touch the connector pins or components of the CU.
 -) Never attempt to install or remove a CU while the printer is switched ON.

6 Troubleshooting and Diagnostics

How to Use This Section

1. Find the category in which your problem occurs. The problem categories are:
 - Power-related Problems
 - Error Messages
2. Find the description that most closely matches the printer symptom.
3. Try the first suggestion under that heading.
4. If none of the suggestions enable you to continue printing, or if the fault is not listed, contact your service.

Every time the printer is switched ON an internal selftest is started.

The actual version of the "Bootstrap" software is displayed:

PP2024 BOOTSTRAP
REVISION X.XX

After that the memory is tested:

MEMORY TEST
PLEASE WAIT...

If memory test is completed successfully the Operating System is started:

INITIAL TEST OK
STARTING PPOS...

After initialization the printer enters the normal operation mode:

ONLINE (1)

If an error message is displayed please refer to the section 6.2 **Error Messages**.

All other messages during normal operating are described in section 2.4 **Status and Error Messages**.

6.1 Power-related Problems

Display elements do not lit when power is switched On

- Check that the power cord and plug are securely fitted to the printer and to an electrical outlet. If the printer is equipped with the paper stacker iPS2024 the power for the printer is supplied by the stacker and switched together. (see **chapter 7**)
- Ask for the power connector connections (and fuse, if fitted) to be verified.
- Ask for the building electrical supply to be verified.

6.2 Error Messages

After selftest the printer enters the ONLINE mode.

In case of a failure following messages may be shown on the display and with special errors the alarm bell is activated if set to **ON**. Open the top cover or press one of the keys to stop the alarm bell.

Display	That means ...	Measure
CHK TONER BOTTLE	The Waste Toner Bottle is not correctly mounted or missing.	Open cover, insert the Toner Bottle, close cover. Note: The waste toner level inside the bottle is not controlled. The user has to check the waste toner bottle every time when refilling new toner.
COVER OPEN	Top cover open	After closing the cover the printer switches to the ONLINE mode.

Display	That means ...	Measure
ENG. EEPROM LIFE	A warning that the typical life cycle of the EEPROM is reached.	The EEPROM should be changed. Call service
ENGINE LIFE	This warning indicates that the engine has printed 3,000,000 pages. This is the maximum page count for the engine.	Please contact your service partner. The printer has to be refurbished due to general wear out of the engine.
EXCHANGE DRUM	A warning that the typical life cycle of the Drum is reached.	The Drum should be changed.
LD STACKER Vx.xx	A new version of the stacker firmware is transferd from the printer to the stacker.	Wait
NO DRUM UNIT	The OPC drum is not correctly mounted or missing.	Open cover, insert a OPC Drum, close cover
NO PAPER	Displayed if a print job is in process and the paper guide is running empty.	Open cover, load paper into the tractor, close cover

Display	That means ...	Measure
PAPER JAM <i>n</i>	Displayed if line feeds fail to move fanfold paper correctly. The parameter <i>n</i> gives more detailed information: <i>n</i> = 0 paper jam at paper entry of the fuser unit <i>n</i> = 1 paper jam at the rear paper exit of the printer <i>n</i> = 2,3 malfunction of the Top of Form sensor <i>n</i> = 4 error with paper transportation in the tractor unit <i>n</i> = 5 malfunction when opening or closing the fuser <i>n</i> = 6 error with paper transportation in/after the fuser unit	Open the cover, clear the paper path, close the cover
POWER SAVE	After a period of time defined by the parameter power save without printing the printer changes into the state power save Power Consump. < 45 W	The next print job changes the status
SERVICE EEPROM	Checksum error of EEPROM.	Power OFF/ON again Error still there call service

Display	That means ...	Measure
SERVICE FUSER <i>n</i>	The mechanics of the Fuser base is not working correct. The parameter <i>n</i> gives more detailed information: <i>n</i> = 0 malfunction when opening or closing the fuser rollers or the sensor is defective. <i>n</i> = 1 malfunction when opening or closing the fuser rollers. <i>n</i> = 2 malfunction of sensors at the speed control plate.	Power OFF/ON again Error still there call service
SERVICE HEATER <i>n</i>	The heater of the fuser unit is not working correct. The parameter <i>n</i> gives more detailed information: <i>n</i> = 0 indication of thermistor broken wire. <i>n</i> = 1 indication for thermistor short or extraordinary high temperature. <i>n</i> = 2 defect heating, warm up not completed within specified time. <i>n</i> = 3 defect heating, not keeping temperature during print.	Power OFF/ON again Error still there call service

Display	That means ...	Measure
SERVICE LSU <i>n</i>	No correct function of the Laser Scanning Unit. The parameter <i>n</i> gives more detailed information: <i>n</i> = 0 no laser beam detected. <i>n</i> = 1 no locking signal of Phase Lock Circuit. <i>n</i> = 2 Phase Lock Circuit lost synchronisation. <i>n</i> = 3 malfunction of LSU motor control.	Power OFF/ON again Error still there call service
SERVICE VSYNC	Error in synchronisation of paper transport system	Power OFF/ON again Error still there call service
ST. EEPROM LIFE	A warning that the typical life cycle of the EEPROM of the stacker is reached. The stacker is further fully operational until a program error occurs.	The EEPROM should be changed. Call service
STACK. COM ERROR	Error with data communication between printer and stacker.	Check power cable Check interface cable Power OFF/ON again Error still there call service

Display	That means ...	Measure
STACK. PROG. ERR	An error was detected when programming the EEPROM of the stacker.	Power OFF/ON again If this error is continuing after switching power on again the EEPROM is defect and must be changed - call service.
STACKER BUSY	The Paper Exit Tray of the iPS is moving up and down and stops at working position	Wait
STACKER ERROR	Error when reading the EEPROM of the stacker. The stacker is further operational but the parameter setting after the last power off has been lost.	Paper must be inserted with positive fold, because the information about the paper felt has been lost. The EEPROM must be changed - call service
STACKER FULL	The basket of the stacker is full with paper the printer is stopped.	Remove paper off the iPS after pressing the ONLINE key the printer resumes printing.
TONER EMPTY	The toner is empty	Open the cover, refill toner, close the cover

Display	That means ...	Measure
UPD. STACKER FW	Message during loading the stacker firmware	wait
WARMING UP	This message is displayed when the printer was in idle mode and the fuser unit of the printer is warming up to the chosen temperature.	wait
WRONG PG. LENGTH	If PAPER LENGTH in the PAPER MENU is set to a value less than 8 inch or greater than 16 inch the WRONG PG. LENGTH message is displayed. If the paper length is less than 8 inch the movement of the pendulum will be for a page length of 8 inch, and greater than 16 inch a movement for a page length of 16 inch. A correct stacking can not be guaranteed since the paper length is exceeding the operating range of the stacker.	See in PAPER MENU the parameter LENGTH FACTOR

7 Intelligent Paper Stacker iPS 2024

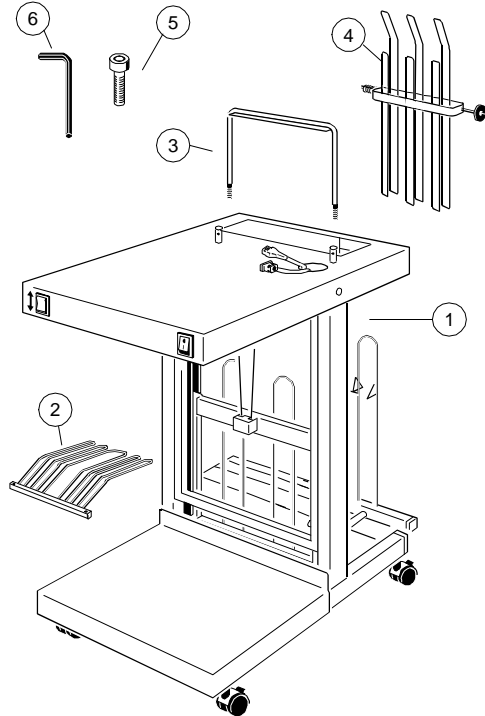
7.1 Assembling the Intelligent Paper Stacker

7.1.1 Unpacking

The intelligent Paper Stacker (iPS) will be delivered in one box. Please check each item against the check list detailed below. Contact your delivery agent immediately if any item is missing or damaged.

Delivery Contents

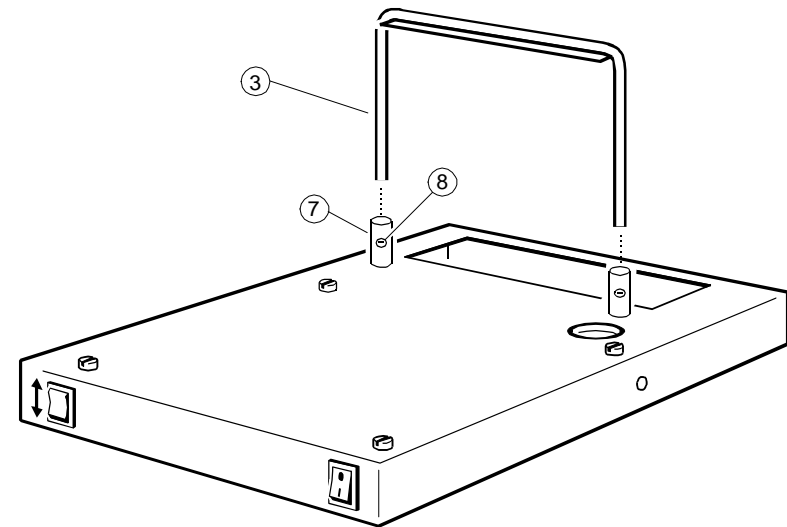
- Stacking System (1)
- Tear off Bar (3)
- Two screws (5)
- Paper Exit Tray (2)
- Pendulum (4)
- 2 Allen wrenches (2 + 5 mm) (6)



Note: To facilitate unpacking of the iPS the carton may be turned on the right or left side.

7.1.2 To Mount the Tear Off Bar

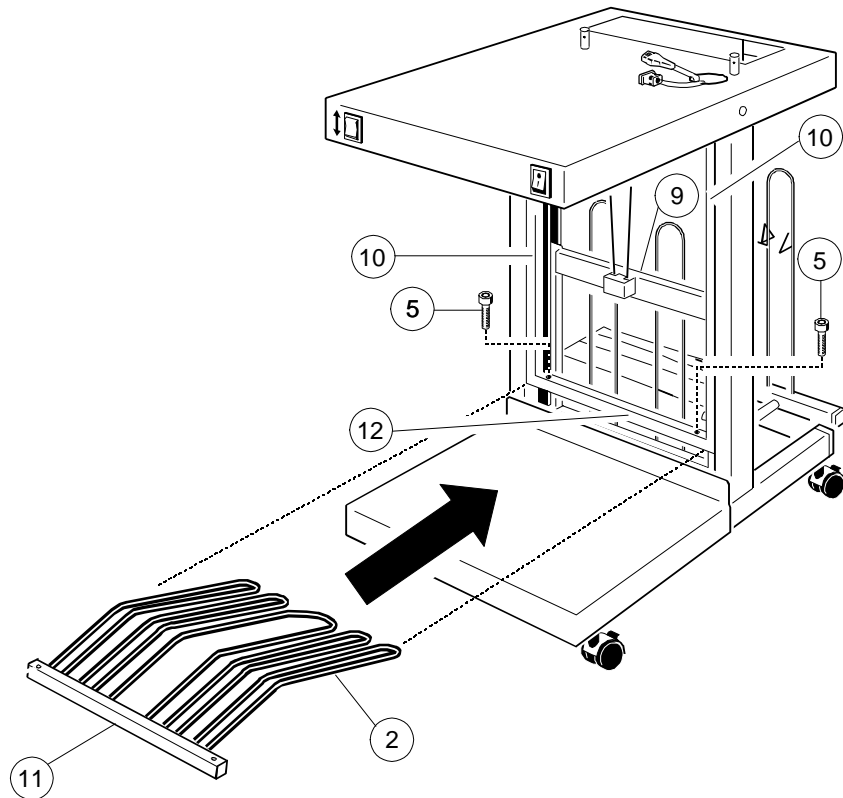
The tear off bar (3) will be pushed from the top into premounted hulls (7) on the table surface and fixed by stuck allen head screws (8) using the 2mm allen wrench.



7.1.3 Paper Exit Tray Assembly

The frame (9) between the two vertical bars (10) bears the paper exit tray (2):

- Push the tray (2) from the front underneath the bar (12) into the frame.
- Align the tray's bar (11) with the bar (12) of the frame (9) such that the screw holes fit to each other.
- Insert the allen head screws (5) from the top and turn them until they dig into the thread of the bar (11). Use the enclosed allen wrench to tighten the screws.

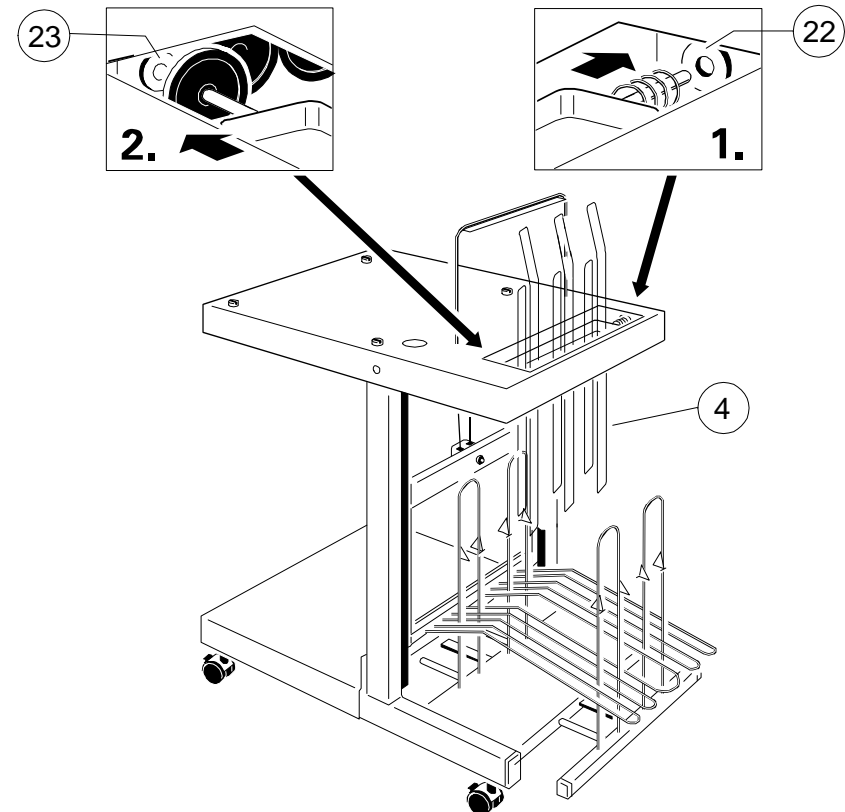


7.1.4 The Pendulum

The pendulum is to be mounted such that the gear points to the left with the bent sheet metal guides to the top.

- Insert the pendulum through the opening in the table from the bottom
- Push the axis into the bush (22) at the left.
- Press the axis to the bush (22) until it snaps into the bush (23) at the right.

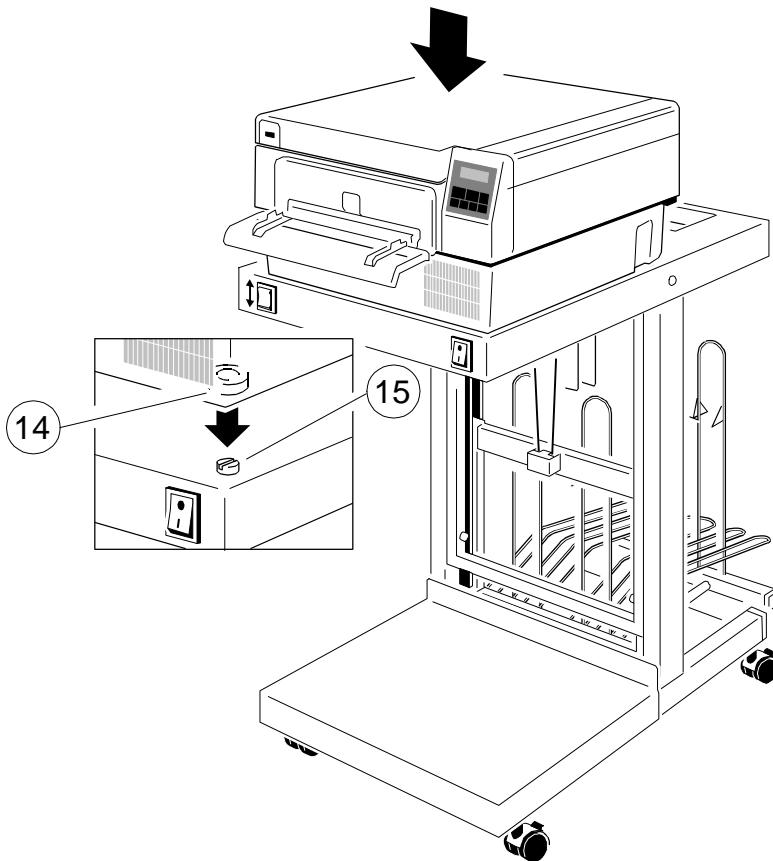
Note: The position of the pendulum is arbitrary. After power on the stacking system moves the pendulum automatically into the right starting position.



7.1.5 Put the Printer onto the Table

Position the printer that the printer's feet (14) align and settle onto the four screws (15) in the table (see drawing below).

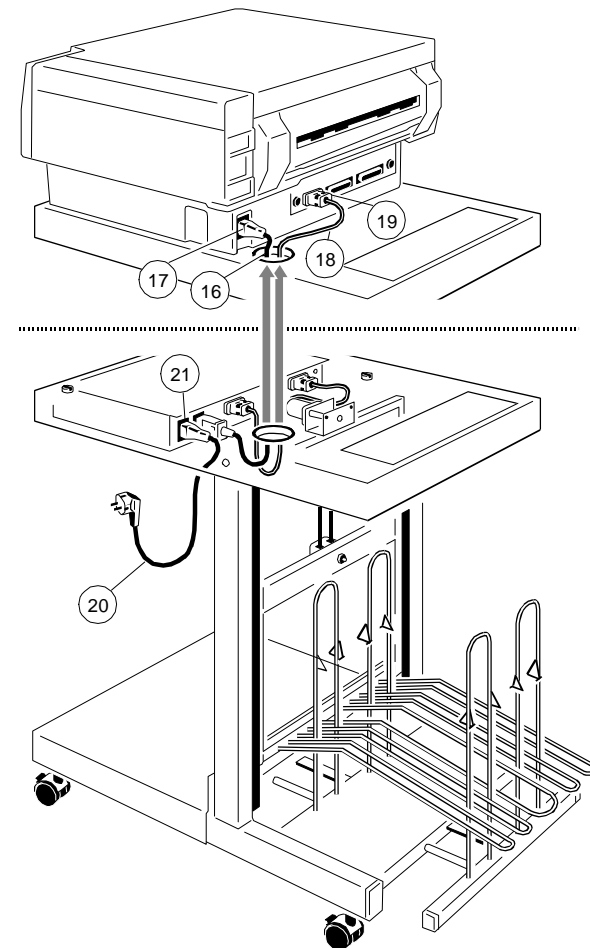
Note: Please, loosen the cables before the printer is put onto the table.



7.1.6 The Power Supply

- Plug the mains power cable (16) into the mains input connector of the printer (17) and the stacker interface cable (18) into the 9pin connector (19).
- The printer is delivered with a power cord. Plug this power cord (20) into the mains connector of the stacker (21) and connect it with the wall socket outlet.
- Set the power switch of the printer into **ON** position.

Note: You find the stacker's mains input connector (21) at the electronics underneath the table.



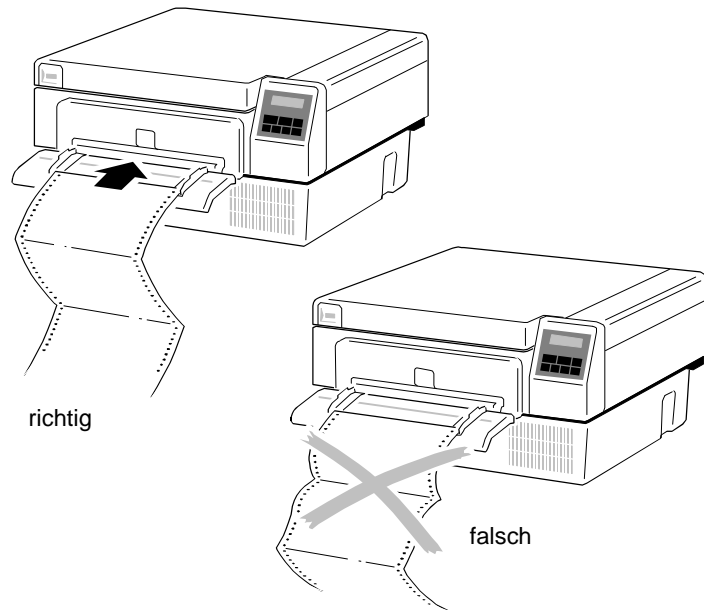
7.2 Operating the Intelligent Paper Stacker

7.2.1 Inserting Paper

Correct operation of the stacker is only assured if the fold behind the first page is positive i.e. the fold points to the operator. If the fold is negative (it points to the printer) the first page must be torn off.

Note: The before mentioned procedure is only necessary for inserting new paper (e.g. a new pile of paper or newly inserting the paper after paper jam).

See also chapter 1.5 **Inserting Fanfold Paper** in the User's Manual.

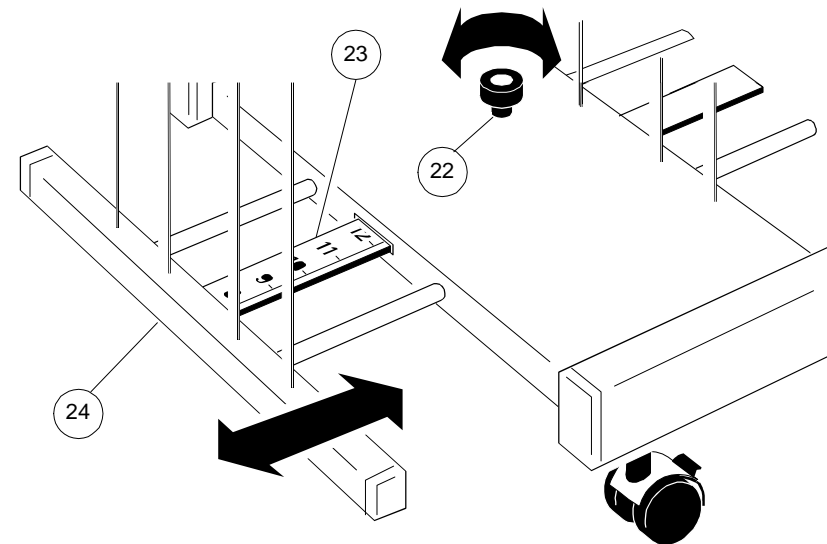


7.2.2 Adjusting the Paper Length

To operate properly the intelligent Paper Stacker need to be adjusted to the paper length. This is done by means of the metal frame at the rear between the horizontal bars. To set the paper length perform the following steps:

- Loosen the adjustment screw (22)
- Move the bar (24) until the required length is visible on the ruler (23) (in the drawing 12")
- Tighten the adjustment screw (22).

Note: The adjustment range for the form length is from 8 inch up to 16 inch.

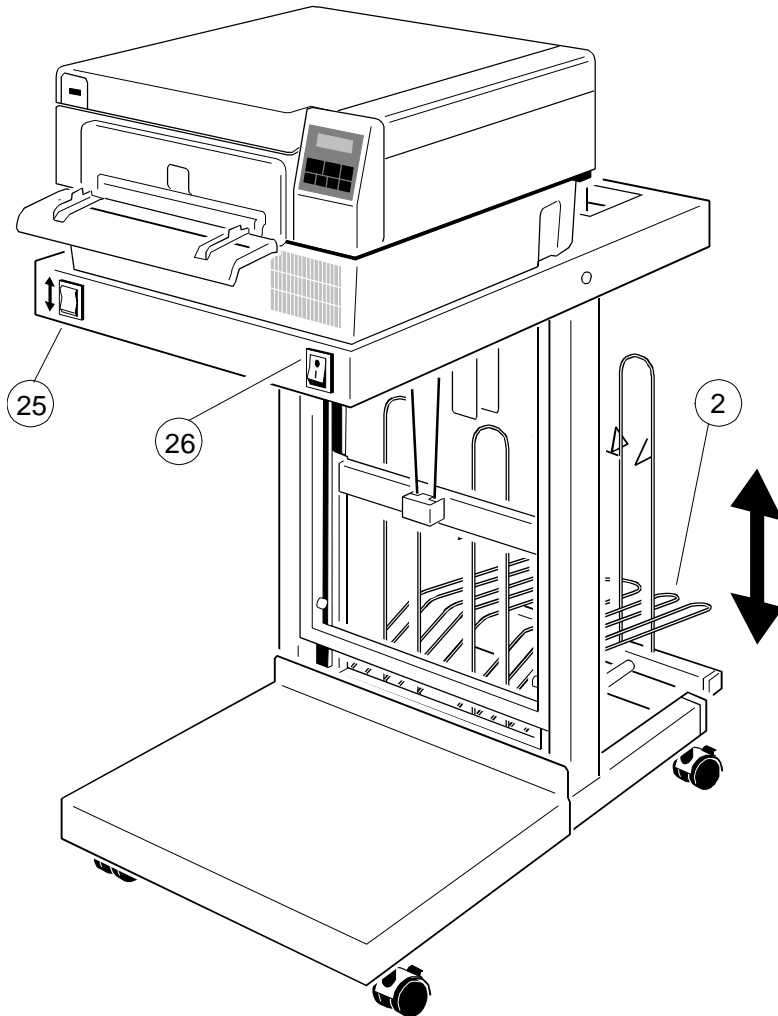


7.2.3 Power On the intelligent Paper Stacker

There are two switches at the front of the table:

- left side: Switch (25) to move the paper exit tray (2) up and down.
- right side: Mains switch (26) to power on and off the intelligent Paper Stacker and the Printer.

Note: The power switch of the printer must be in **ON** position.

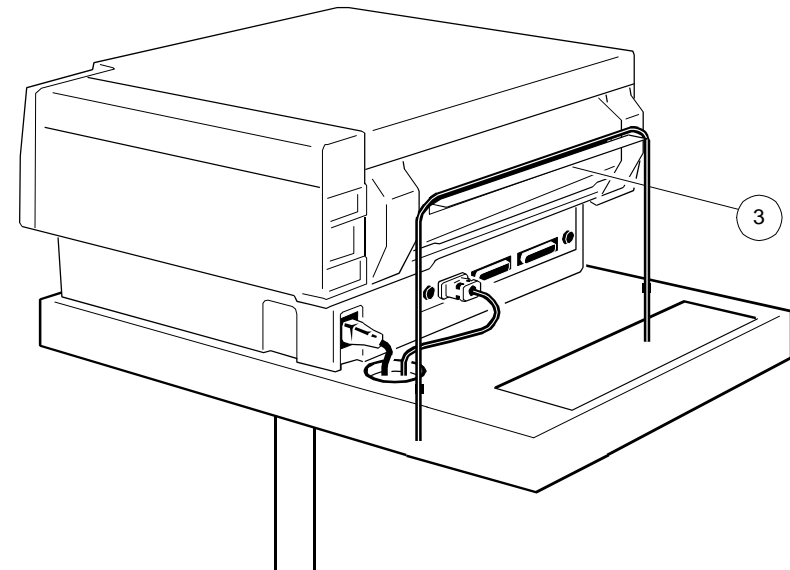


7.2.4 Tear Off and Remove Paper

At the end of a print job the printer automatically feeds the last printed page to the tear off position. For tearing off pull the paper from the left to the right and slightly to the top across the tear off bar (3).

For easier removal of the paper the paper exit tray might be moved down (see chapter 7.2.3).

Note: The paper exit tray is automatically lifted into the right position after 30 seconds. During the movement of the tray the printer is stopt.



7.3. Troubleshooting and Diagnostics

7.3.1 Printer stops when the paper exit tray is full

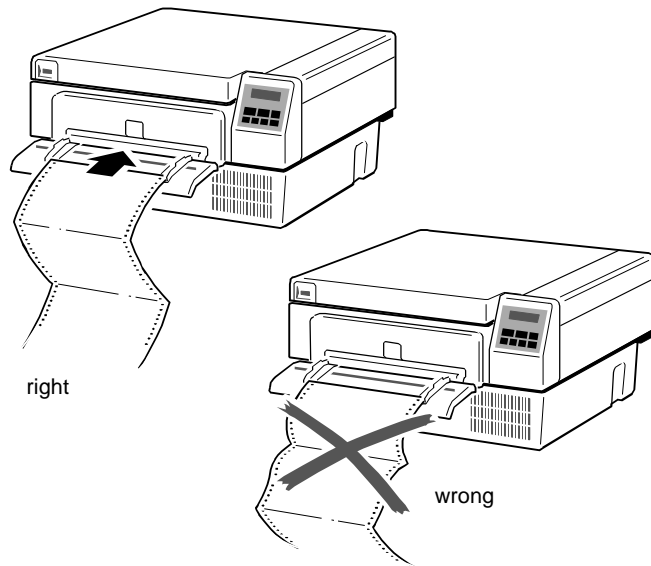
The height of the pile of paper in the paper exit tray is controlled. The Intelligent paper Stacker indicates stacker full if the tray touches the lower frame of the stacker during the paper press cycle. The printer stops with the display message: "STACKER FULL". To continue printing the paper has to be removed out of the tray (see chapter **2.3 Status and Error Messages**).

7.3.2 Paper not Stacked in the Right Order

Check if the fold behind the first page is the positive one. If not remove the paper and insert it again with a positive fold (see also chapter **7.2.1 Inserting Paper**).

7.3.3 Proceeding after Power Down or Inadvertently Power Off

The paper must be inserted again before a new print job is startet. The fold behind the first page must be positive (see also chapter **7.2.1 Inserting Paper**).



8. Technical Data

The technical data specified in this chapter are applicable to a printer equipped with a control unit that supports the serial and parallel interface.

8.1 Printer Specification

Print Technology

- Electrophotographic with diode laser
- Organic photoconductor (OPC) drum
- 1 1/2 component toner/developer system
- Heat and pressure fusing with adjustable fusing temperature

Paper Transport

- Plane, straight-through paper path
- Adjustable, retractable tractor with auto-centering
- Paper top-edge detection
- No forms waste if last printed page is not torn off

Print Image Area

max. width 8.25 inch (210 mm)
 min. length 3 inch (76.2 mm)
 max. length 33 inch (838.2 mm)

Resolution

300 x 300 dpi

Process Speed

4.4 inch/s (112.23 mm/s)

Print Speed

24 pages per minute (ppm) at 11 inch page length

Warm-up Time / Begin of Printing

≤ 3 min from ambient temperature
 after ≤ 20 s at operating temperature
 after ≤ 30 s from stand-by

Fuser Control Modes

- operating: The printer keeps the fuser at fusing temperature which is in the range of 165°C to 185°C.
- stand-by: The printer keeps the fuser at stand-by temperature, at approx. 165°C.
- idle: The printer lets the fuser cool to almost ambient temperature by turning the fuser off.

Dimensions

460 mm x 248 mm x 498 mm (W x H x D)

Weight

25.5 kg incl. consumables
 22.0 kg no consumables

Mains Voltage

220 - 240 V AC, 50 Hz

Power Dissipation

- operating: < 1.000 W
- stand-by: < 300 W
- idle: ≤ 40 W

Environmental Conditions

- operating: 10 to 32.5°C, 20 to 80% rel. humidity
- storage: -30 to 60°C, 10 to 95% rel. humidity

Noise Level

(based upon ISO 7779 at the bystander position)

- operating: ≤ 53 dB(A)
- stand-by: ≤ 47 dB(A)

Duty Cycle / Reliability

- Duty cycle: up to 50,000 pages per month
- Lifetime: 3,000,000 pages
- MPBF: 300,000 pages (depends on usage)
- MTTR: < 45 min

Approvals

- TÜV/GS EN 60950, EN 60825
- CE EN 55022 Class B, EN 50082-1

8.2 Paper Specification (for detail see Chapter 9 Paper Specification)

- Type: Continuous form fanfold or roll media with 0.5 inch tractor feed pin holes
- Weight: 56 g/m² - 90 g/m²
optimal 68 g/m² - 75 g/m²
- Caliper: 0.08 - 0.2 µm
- Smoothness: 100 - 180 Sheffield or 20 -Bekk
100 - 250 Sheffield for labels
- Width: min. 4 inch (101.6 mm) edge to edge,
3.5 inch (88.9 mm) pin to pin

max. 10 inch (254 mm) edge to edge,
9.5 inch (241.3 mm) pin to pin
- Form Length: min. 3 inch (76.2 mm)
max. 33 inch (838.2 mm)
in increments of 1/6 or 1/8 inch
- Shelf Life: 1 year at min. 22°C and 50% rel. humidity

8.3 Connectivity**Interfaces**

- IEEE 1284 Type B parallel
- Connector to Stacker System
- Further interfaces with optional Control Units:
- Centronics parallel with IGP emulation
- Serial RS-232/V24 with IGP emulation
- Ethernet 10Base2 and 10BaseT

Processor

AMD 29240 32 Bit RISC Processor

Buffer

16 MB standard, optionally expandable

Emulations/ Page Description Languages

- HP LaserJet 4 (PCL 5e)
- HP-GL/2
- IGP 10-20-40 with optional Control Unit

Fonts

- 45 scalable fonts
- 6 bitmap fonts with fix pitch 16.67 CPI
- OCR-A and OCR-B
- 2 Barcode fonts Code 39

Barcode

- Code 39
- 2 of 5 industrial
- 2 of 5 interleave
- EAN 8 and EAN 13
- Code 128
- UPC-A and UPC-E
- Codabar
- MSI
- Code 93
- Postnet
- KIX Code

8.4 Consumables

Toner Kit 16.000 pages at 5% density

comprises two of each

- bottle Toner
- Waste Toner Container
- Cleaner Felts

OPC Kit 30,000 pages

- OPC drum

Developer Kit 100,000 pages

comprises

- one Developer Unit
- one Ozone Filter
- one bottle Starter Toner (200g Toner, 40g Carrier)
- one Cleaning Kit

Fuser Unit 300,000 pages

The Fuser Unit should be exchanged by a Service Technician.

Note: The before mentioned number of pages is based upon xerographic quality paper with 9.5 inch x 11 inch size and 75 g/m² paper weight.

Storage of consumables is possible for 18 months from date of manufacture. For shipping or storage of consumables the following environmental conditions have to be met:

-10°C to 40°C

10% to 90% rel. humidity.

8.5 Specification of the intelligent Paper Stacker

Dimensions

420 mm x 950 mm x 800 mm (W x H x D)

(if 12 inch forms are selected)

Weight

27 kg

Mains Voltage

100 - 120 V AC, 60 Hz, 10 A

Power Dissipation

- operating: < 1,000 W
- stand-by: ≤ 40 W

Environmental Conditions

- operating 10 to 32,5°C; 20 to 80% rel. humidity
- storage: -30 to 60°C; 10 to 95% rel. humidity

Noise Level

(based upon ISO 7779 at the bystander position)

- operating: ≤ 15 dB(A)
- stand-by: none

8.6 Paper Specification for Intelligent Paper Stacker iPS 2024

- Type: Continuous form fanfold or label stock
with 0.5 inch tractor feed pin holes
- Weight: 56 g/m² - 90 g/m²
optimal 68 g/m² - 75 g/m²
- Smoothness: 100 - 180 Sheffield or 20 -Bekk
100 - 250 Sheffield for labels
- Width: min. 4 inch (101.6 mm) edge to edge,
3.5 inch (88.9 mm) pin to pin

max. 10 inch (254 mm) edge to edge,
9.5 inch (241.3 mm) pin to pin
- Form Length: min. 8 inch
max. 16 inch
in increments of 1/6 or 1/8 inch
- Shelf Life: 1 year at min. 22°C and 50% rel. humidity
- max. Capacity: 2,500 pages

9 Paper Specification

9.1 Basic Theory of Operation

Laser printers use the electrophotographic technology. The laser beam writes an electrostatic image onto a rotating photosensitive drum (Photoconductor). As this image passes the developer station, a dry, powdery toner is attracted to the image areas. The developed image then advances to the transfer station where the drum contacts the fanfold paper and the toner image is electrostatically transferred onto the paper. After transfer, the paper passes through the fuser where heat and pressure are applied and the toner fuses (melts) onto the paper. The fanfold paper is then deposited to the paper exit.

To create the printed image, all print media must be transported through the printer, charged electrostatically, and heated. This is why paper properties such as electrical resistivity, caliper, finish, and stiffness can affect the print quality and paper handling performance of the laser printer.

9.2 Storing Media

Follow these guidelines when stacking and storing fanfold paper:

- Do not store cartons with fanfold paper directly on the floor. Place cartons on a pallet or on shelves.
- The carton itself must have a relative humidity of 33 up to 47 % at a temperature of 19° to 23° C (68° to 73° F). Otherwise the humidity penetrates from the carton into the fanfold paper.
- Do not store the fanfold paper near heating elements, water pipes, open windows, clammy walls, or in direct sunlight.
- The fanfold paper in the carton and plastic wrap should be stored at a room temperature of 18° to 24° C (65° to 75° F) and of a relative humidity of 40 to 60 %.

9.3 Environmental Considerations

The printer is designed to operate in a wide range of environmental conditions. For best performance, store and use fanfold paper at 19° to 23° C (68° to 73° F) and a relative humidity of 33 to 47 percent.

Follow these guidelines when media is used in an environment outside the temperature and humidity ranges:

- Do not expose the paper to humidity or temperature extremes. If paper is left unwrapped or on the paper input shelf of the stacker, extreme changes in the environment will cause the paper to take on unwanted properties.
- In the case of humidity extremes, keep paper tightly wrapped in plastic.
- If a significant temperature difference occurs between the paper storage area and the printer's operating environment, before unwrapping the paper, allow it time to adjust to the temperature in the printer's operating environment. The greater the temperature difference and the greater the amount of paper to acclimate, the longer this time period should be. Allow one day for every 10° C (18° F) difference in temperature between storage environment and printing environment.

9.4 Guidelines and Specifications for Selected Fanfold Paper

Properties of fanfold paper are subject to change. It is the user's responsibility to monitor the quality of the paper.

The printer is designed to print onto standard electrophotographic (laser type) paper. Because there are many types of media and variations can occur in the process of manufacturing media, it is important to select the best media for the printing application.

9.4.1 General Guidelines

– Quality

The printer works best with high-quality media. Quality fanfold media for the laser printer is characterized by uniform physical properties, freedom from dust and lint, accurate fold, and proper packaging. Proper packaging protects media from moisture and physical damage.

Avoid paper with curled or bent edges, spots, dust or lint, wrinkling, or inaccurate size. All these characteristics can cause misfeeding, jamming premature wear out of printer parts, or unsatisfactory print quality.

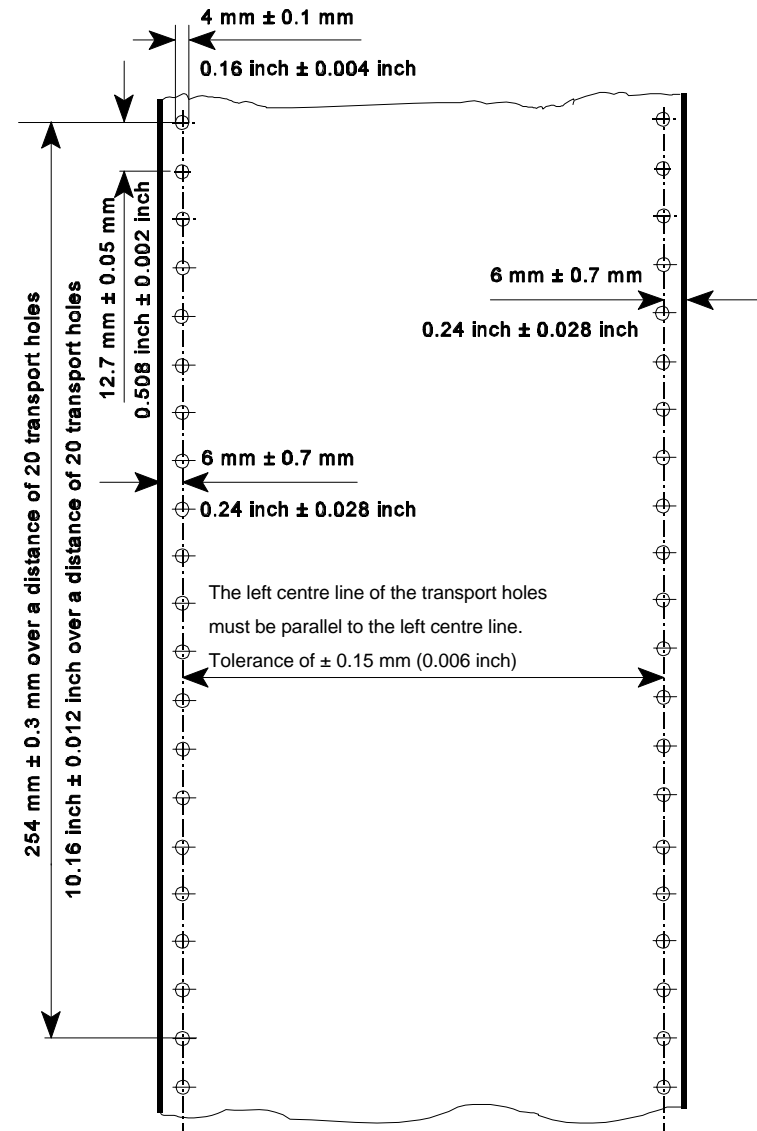
– Basis weight

Basis weight (also called grammage) is an important characteristics of paper. Paper that is too light or too heavy can cause misfeeds, misstacking, paper jams, poor image quality, or excessive mechanical wear out in the printer.

The range of paper weight is from 64 to 155 g/m² ± 5% (17 to 41 lb).

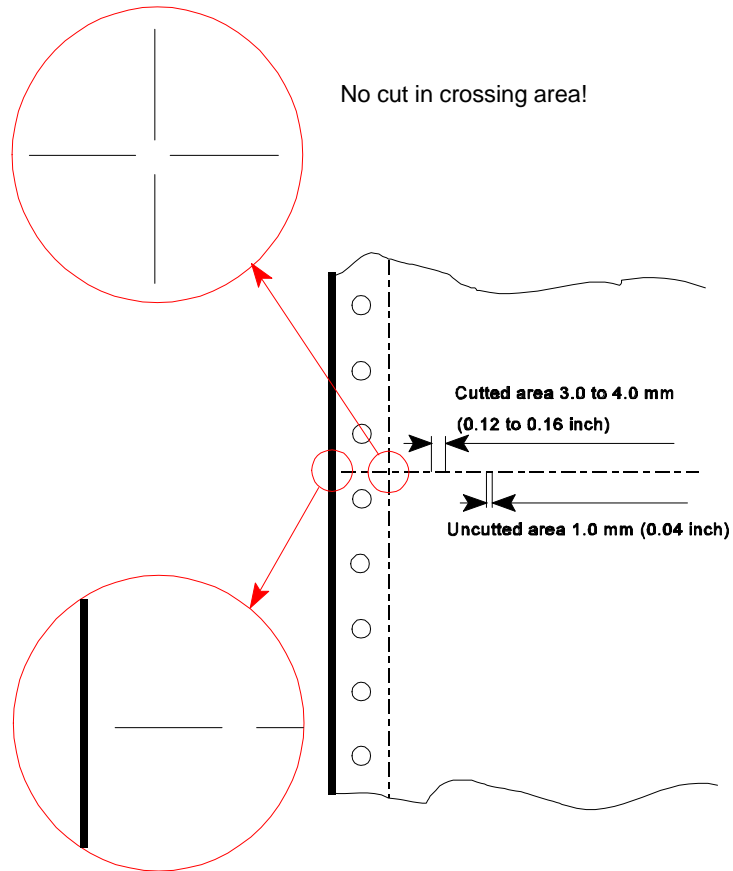
– Transport holes

Note: All measurements conditioned at 23° C (68° F) and 50% RH



– Perforation

Note: All measurements conditioned at 23° C (68° F) and 50% RH



9.4.2 Typical Paper Properties for Laser Printers

Description	Specifications	Applicable Standard / Method
curl	5mm (0.2 inch); no diagonal curl at conditioned (23 ± 2)° C and (15 ± 5) % RH	
stability of dimension cross to paper path	maximum 0.8% in heat chamber at 110° C for 20 minutes	
electrical surface resistivity	10 ⁸ to 10 ¹⁰ ohms/square inch (conditioned at 23° C and 50% RH)	PTS-P: 101/84
electrical volume resistivity	< 10 ¹⁰ ohms/square inch (conditioned at 23° C and 50% RH)	DIN 53 482
high-temperature stability	< 0.4 %	DIN 54 354
raise dust	no loose parts; paper should be free from dust	DIN 53 109
fusing compatibility	must not scorch, melt, offset, or release hazardous emissions when heated to 190° C (395° F) for nearly 0.1 second	FOGRA-Method

9.4.3 Paper/Form Properties

Description	Specifications	Applicable Standard / Method
basic weight	64 to 155 g/m ² ± 5% (17 to 41 lb)	DIN EN ISO 536
condition	no callous, folds, holes, no raised parts	
relative humidity	(40 ± 7) % at (21 ± 2)° C	DIN EN ISO 287
specific volume	1.3 ± 0.2 cm ³ /g	DIN EN ISO 438
arch	maximum 5 mm	DIN 6724
bending force	minimum 0.1 Nmm	DIN 53 121
humidity stretching	for every 10% difference of humidity between 40 and 60% length maximum 0.04% cross maximum 0.2%	DIN 53 130
smoothness by Bekk	minimum 18s; maximum 30s	DIN 53 103
porosity by Bendtsen	5.3 ± 2.5 μm / (Pa × s)	DIN 53 120
humidity entering (Cobb 60)	23 ± 5 g/m ²	DIN 53 132
pH-value	> 5.0	DIN 53 124
opacity	> 75 %	DIN 53 146
paper width	minimum: 4 inch (101.6 mm) maximum: 10 inch (254 mm)	

Description	Specifications	Applicable Standard / Method
Paper length: Printer with iPS Printer without iPS	minimum: 8 inch maximum: 16 inch minimum: 3 inch maximum: 20 inch	
relative humidity	(40 ± 7) % at (21 ± 2)° C	DIN EN ISO 287
difference between humidity of paper and ambience	maximum 10% RH	
difference between paper and room temperature	maximum ± 2° C	
batch incline	12 mm for a pile of paper 50 mm high	
distance between centre of transport hole and paper edge	6.00 mm ± 0.7 mm	DIN EN ISO 2784
diameter of transport holes	4.00 mm ± 0.1 mm	DIN EN ISO 2784
breaking strength of perforation	16 ± 2 N / cm	

9.4.4 Label Carrier Properties

Description	Specifications	Applicable Standard / Method
specific volume	$(1.3 \pm 0.2) \text{ cm}^3/\text{g}$	DIN EN ISO 438
arch	maximum 5 mm	DIN 6724
break stability	vertical minimum 85 N horizontal minimum 40 N	DIN 53 112
crack stability	minimum 150 kPa	DIN EN ISO 2758
roughness by Bendtsen	200 to 500 ml/mim	DIN EN ISO 2494
bending force	minimum 0.1 Nmm	DIN 53 121 measure distance: 10 mm bending angle 12°
humidity stretching	for every 10% difference of humidity between 40 and 60% length maximum 0.04% cross maximum 0.2%	DIN 53 130
electrical surface resistivity	10^8 to 10^{10} ohms/square inch (conditioned at 23° C and 50% RH)	PTS-P: 101/84

9.4.5 Label Properties

Description	Specifications	Applicable Standard / Method
condition	no callous, folds, holes, no raised parts	DIN 6730
specific volume	$(1.3 \pm 0.2) \text{ cm}^3/\text{g}$	DIN EN ISO 438
arch	maximum 5 mm	DIN 6724
break stability	vertical minimum 65 N horizontal minimum 40 N	DIN 53 112
roughness by Bendtsen	200 to 500 ml/mim	DIN EN ISO 2494
bending force	minimum 0.1 Nmm	DIN 53 121 measure distance: 10 mm bending angle 12°
humidity stretching	for every 10% difference of humidity between 40 and 60% length maximum 0.04% cross maximum 0.2%	DIN 53 130
electrical surface resistivity	10^8 to 10^{10} ohms/square inch (conditioned at 23° C and 50% RH)	PTS-P: 101/84
electrical volume resistivity	$< 10^{10}$ ohms/square inch (conditioned at 23° C and 50% RH)	DIN 53 482
relative humidity	$(40 \pm 7) \%$ at $(21 \pm 2)^\circ \text{ C}$	DIN EN ISO 287

Description	Specifications	Applicable Standard / Method
difference between humidity of paper and ambience	maximum 10% RH	
difference between paper and room temperature	maximum $\pm 2^{\circ}$ C	
curl	5mm (0.2 inch); no diagonal curl at conditioned (23 ± 2) $^{\circ}$ C and (50 ± 5) % RH	DIN 6724
stability of dimension cross to paper path	maximum 0.8% in heat chamber at 110° C for 20 minutes	
removable stability	(2.0 ± 0.2) cN / 10 mm	FINAT FTM 3
high-temperature stability	< 0.4 % no dropping of glue particles	DIN 54 354

Note: Cutting through a sticky label leaves glue on the blade, leading to problems with the cutting device. Small parts of a cut through label could detach from its paper and block the cutter or the paper path completely.

[illegible]

10.3 Developer Unit

[illegible]

10.5 Inspection Report

[illegible]

[illegible][illegible]

Appendix A Programming Guide

The printer supports the PJL Printer Job Language and PCL5 Printer Language.

All the printer's unique feature and functions which can be controlled by the application software via PJL or PCL5 commands.

Among those functions are the following:

- Job Control Support using profiles see paragraph A-1.1
- Support of various paper sizes see paragraph A-1.2
- Support of semigraphics for application under SAP/R3 see paragraph A-1.3
- Euro symbol support for a restricted number of code pages and type faces see paragraph A-1.4
- Support of Logical and Physical Pages see paragraph A-1.5

- Printer set up configuration via PJL commands see chapter A-2
- Printer set up configuration via PCL5 commands see chapter A-3
- Support of 13 resident Barcodes by privat PCL5 commands see chapter A-5

The features described below refer to the **Firmware Revision V2.xx** of the printer.

Note: For more information regarding PJL and PCL5 programming please refer to the

- PJL Printer Job Language (5961-0704)
- PCL5 Printer Language Technical Reference Manual (5961-0509) published by Hewlett-Packard® Company.

A-1 Support of Printer Specific Features and Functions

The Fanfold Laser Printer provides programming support of Printer Specific Features

and Functions. These Functions are implemented with special Printer Job Language commands. The following hints show in combination with application examples how to use and program these functions:

A-1.1 Profiles

The printer can store 10 separate printer configuration settings called Profile.

One profile should be used for one specific application. This application requires a special setting for the paper format, the paper path, fuser temperature...

In an system environment where the application can not use a driver to select the application specific parameters a profile can be selected with a specific PJL command which has to be send to the printer before sending the application file.

Example:

```
ESC%-12345X@PJL DEFAULT PROFILE = 5
ESC%-12345X
```

A-1.2 Paper Size Select

The printer supports paper format A4, Letter and CUSTOM.

With paper format CUSTOM the page size can be set by PJL commands.

These PJL commands have to be send to the printer before sending the data of the application file.

In the following Example (with PJL SET) the paper format selection is only valid for one PCL application file. After a power off or PJL reset the USER DEFAULT environment variables are valid:

```
ESC%-12345X@PJL SET PAPER = CUSTOM
@PJL SET PAGELENGTH = 11 1/3
@PJL SET IMAGEWIDTH = 7.15
@PJL ENTER LANGUAGE = PCL
ESCE.....PCL application file.....ESCE
```

A-1.3 Semigraphics Support under SAP R/3

To increase the printer performance when the printer is running under SAP R/3 Psi provides printer specific SAP R/3 device types. These device types make use of the special semigraphic line draw elements. (see chapter **A-4 Support of Semigraphics for SAP/R3**)

The SAP R/3 device type ZPSI2024.PRI including installation description can be downloaded from the Psi homepage: www.psi-si.de

A-1.4 EURO Symbol Support

The printer supports printing of the EURO symbol as printer resident character within the following code tables (see also **Appendix B**):

- ISO 8859 / 15 LATIN 9
- PC - 858 Multilingual
- SYMBOL
- WINDINGS

Note: The EURO symbol is not supported in combination with all printer typefaces.

A-1.5 Support of Logical and Physical Pages

One Physical page can be spitt into Logical pages by the parameter **LENGTHFACTOR**.

The Pagelength must be configured or programmed according to the physical length of one page to enshure proper function of the attached stacker. Up to 20 logical pages can be placed on one physical page. The lengthlimit for an attached stacker (minimum pagelength is 8 inch) is only valid for the physical pagelength. Two Logical pages of 6 inch can be printed on physical paper with 12 inch length with LENGTHFACTOR = 2.

The following example shows the PJP commands for an application with imagewidth = 8.5 inch and a logical pagelength of 3 inch to be printed on a physical pagelength of 12 inch:

```
ESC%-12345X@PJP SET PAPER = CUSTOM
@PJP SET IMAGEWIDTH = 8.5
@PJP SET PAGELENGTH = 12
@PJP SET LENGTHFACTOR = 4
@PJP ENTER LANGUAGE = PCL
ESC E....PCL file page 1....FF....page 2....FF
....page3....FF ESC E....
```

Note: PJP or PCL commands which are related to the physical page like paper source, number of copies, and cut force a feeding of the paper to the top of the next physical page.

These settings are valid until a PJP RESET condition. (PJP SET command)

A-1.7 Conventions

The following conventions are used in the command listings:

ESC	Escape (1/B), introduces an escape sequence
@	Introduce a PJJ command
P1	Numeric parameter, or number of units that specify a distance or quantity pertaining to the escape sequence, control function or control string. Accepted values are 0...9999. If the parameter is in normal notation like "200" the programming in hex-code is according to a ASCII table. ("200" = 32,30,30 in hex).
␣ or <SP>	Spaces may appear between characters in sequence for clarity; they are not part of the format. A Space character (hex 20) is indicated by the grafik symbol ␣ or by <SP>.
<CR>	Carriage Return (hex 0D)
<LF>	Line Feed (hex 0A)

A-2 List of Supported PJJ Control Functions

The Fanfold Laser Printer provides limited support of Printer Job Language (PJJ). PJJ topics which are described in this chapter are:

Basic Rules for PJJ Programming

- PJJ Environments
- List of supported PJJ Commands
- List of supported PJJ Variables and Values
- List of supported PJJ Variables and Values for PCL Personality

For more information on topics covered in this section, please refer to the Printer Job Language Technical Reference Manual by Hewlett-Packard, Inc.

A-2.1 Basic Rules for PJJ Programming

Printer Job Language (PJJ) command sequences are used to define all specific parameters for one print job. PJJ commands provide the following major functions:

- Printer language switching between jobs
- Job separation
- Printer configuration
- Status readback from the printer to the host

At the beginning of every print job the UEL command (ESC % - 1 2 3 4 5 X) is used to switch from the print emulation (PCL, Postscript, HEXDUMP...) to the PJJ command level.

A-2.1.1 PJJ Syntax Rules

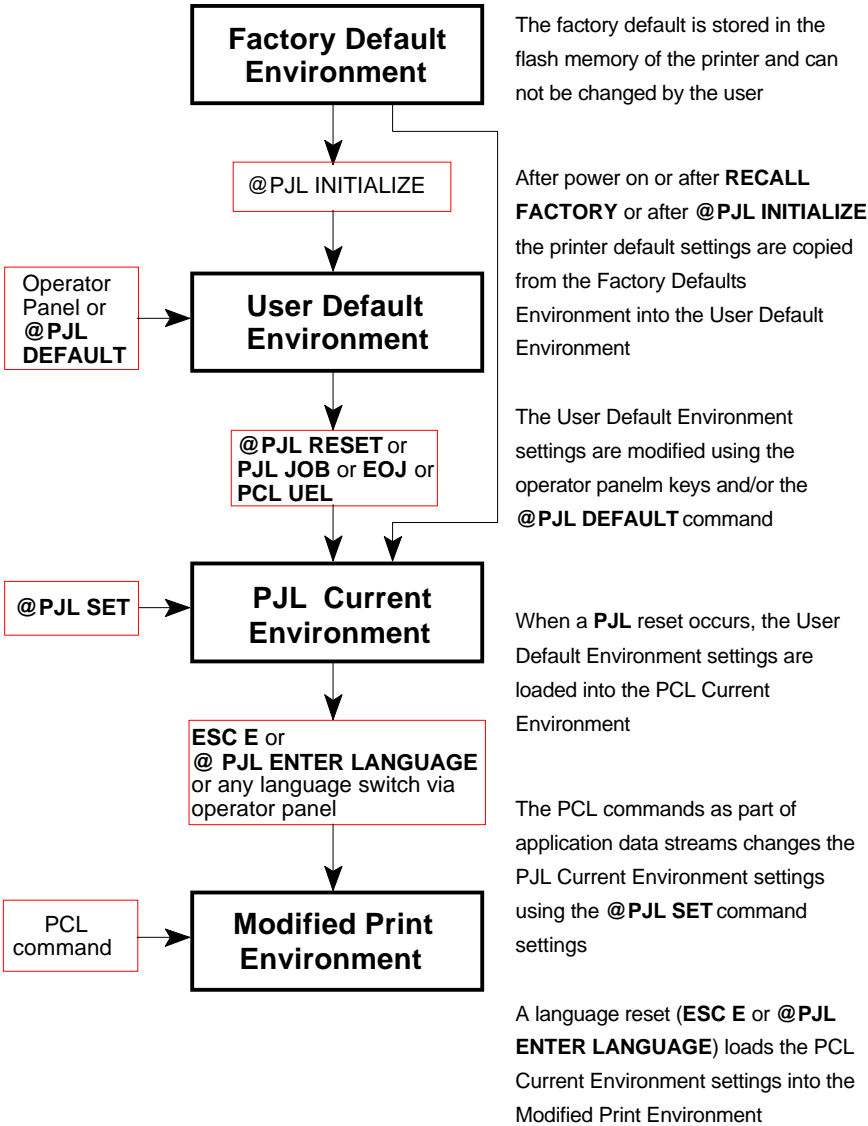
- Use only uppercase characters
- All parts of a PJJ command line must be separated by a <SP> (Space)
- Every PJJ command line must start with the prefix @PJJ.
- Every PJJ command line must end with <LF> (Line Feed)

Sample of typical PJJ command line:

```
@PJJ <SP>DEFAULT<SP> LPARM : PCL <SP> PTFsize = 12<LF>
PREFIX <SP> COMMAND <SP> Com. Modifier : Value <SP> Variable = Value<LF>
```

Note: The first PJJ command after the UEL must start with @PJJ....! (no <SP>)

A-2.1.2 PJJ Environments



A-2.1.3 List of Supported PJJ Commands

PJJ COMMAND	Description
@PJJ COMMENT ["text"]	The COMMENT command is used for adding a line of information or a comment within a set of PJJ commands.
@PJJ JOB [NAME= "text"] [START= #] [END = #]	Defines the name and pages of a PCL print job. NAME = file name (ASCII text) START = first page, range 1 to 214783647 END = last page, range 1 to 214783647
@PJJ EOJ [NAME="job name"]	The EOJ command marks the end of the job which was started with the previous JOB command. It resets the PJJ Current Environment to the User Default Environment. The JOB and EOJ commands should always be used in pairs. Do not use one without the other.
@PJJ ENTER LANGUAGE = personality	Supported personality options are PCL , HEXDUMP
@PJJ RESET	The RESET command resets the PJJ Current Environment variables to their User Default Environment values (see Figure x.y for a descriptions of PJJ Environments).
@PJJ INITIALIZE	The INITIALIZE command resets the PJJ Current Environment and the User Default Environment variables to their Factory Default Environment values.
@PJJ DEFAULT [LPARM : personality] Variable = value	The DEFAULT command sets the User Default Environment value for a specified variable. Personality : PCL, HEXDUMP For supported variables and values see table: A-2.1.4 PJJ Variables and Values

PJL COMMAND (cont.)	Description
@PJL SET [LPARM : personality] Variable = value	The SET command allows the user to change the value of PJL Current variables for the length of a PJL job, or until a PJL reset condition returns the value to its default. Personality : PCL, HEXDUMP For supported variables and values see table: A-2.1.4 PJL Variables and Values
@PJL RDYMSG ["text of message"]	Display a message in the 1 st line of the printer's operator panel The message length is at max. 16 characters The printer remains online
@PJL RDYMSG [""]	Clear the message on the printer's operator panel
@PJL OPMSG ["text of message"]	Display the message in the 1 st line of the printer's operator panel The message length is at max. 16 characters The printer gets off line After prompting of this status by pushing the offline/online button, the printer goes ONLINE again

A-2.1.4 List of Supported PJL Variables and Values

The following variables can be programmed by the PJL commands:

- **@PJL SET** "variable" = "value"
- **@PJL DEFAULT** "variable" = "value"

PJL VARIABLE	VALUES
PROFILE	1, 2, 3,, 10
PAPER	A4, LETTER, CUSTOM
PAGELENGTH	3, 3 1/8,, 20 in steps of 1/4, 1/6, or 1/8 inch Note: value 3 1/6 programming is 3<SP>1/6
LENGTHFACTOR	1, 2, 3,, 20
IMAGEWIDTH	0.5, 0.55,, 8.25 inch in steps of 0.05 inch
LENGTHFACTOR	1, 2, 3,, 20
ORIENTATION	PORTRAIT, LANDSCAPE
LANDSCAPEMODE	REVERSE, PCLCOMPATIBLE
ORIENTATIONMODE	FIXED, AUTOMATIC
PAPEREXTENDED	NO, YES

PJL VARIABLE (cont.)	VALUES
PAPERSELECT	RECOGNIZE, ONLYPJL, IGNORE
FUSERTEMP	165 to 185 in steps of 5
VERSHIFT	-50, -49,, -1, 0, 1, 2,, 50
HORSHIFT	-50, -49,, -1, 0, 1, 2,, 50
PERSONALITY	PCL, HEXDUMP
AUTOFORMFEED	OFF, 1, 2,, 120
PAPERRETRACT	ON, OFF

Note: All parameter which can be programmed with PJL Variables can also be configured by the Operator Panel of the printer.
For detailed description of parameters see chapter **4 Explanation of Individual Menu Items**

The following variables can be programmed by the PJL command:

– @PJL DEFAULT "variable" = "value"

PJL VARIABLE	VALUES
POWERSAVE	OFF, 15, 30, 45, 60
ALARMBELL	ON, OFF
LANG	ENGLISH, GERMAN
MENUACCESS	ALL, PROFILESONLY, NONE

Note: These variables can not be used by the PJL COMMAND SET.
For detailed description of parameters see Chapter **4 Explanation of Individual Menu Items**

A-2.1.5 List of Supported PJJ Variables and Values for PCL Personality

The following variables can be programmed by the PJJ commands:

- @PJJ SET LPARM : PCL "variable" = "value"
- @PJJ DEFAULT LPARM : PCL "variable" = "value"

PJJ VARIABLE	VALUES
FONTNUMBER	1, 2, 3,, 54
PITCH	0.44,, 99.99 (in steps of 0.01)
PTSIZE	4.00, 4.25,, 99.75 (in steps of 0.25)
SYMSET	ROMAN8, ISOL1, ISOL2, ISOL5, ISOL9, PC8, PC8DN, PC850, PC852, PC858, PC8TK, WINL1, WINL2, WINL5, DESKTOP, PSTEXT, VNINTL, VNUS, MSPUBL, MATH8, PSMATH, VNMATH, PIFONT, LEGAL, ISO4, ISO6, ISO11, ISO15, ISO17, ISO21, ISO60, ISO69, WIN30
LINESPACING	1, 2, 3,, 48
TOPMARGIN	0, 1, 2,, 999
LEFTMARGIN	0, 1, 2,, 999
RIGHTMARGIN	0, 1, 2,, 999, MAXIMUM
TEXTLENGTH	0, 1, 2,, 999
PERFORATIONSKIP	OFF, ON

Note: All parameter which can be programmed with PJJ Variables can also be configured by the Operator Panel of the printer.

For detailed description of parameters see Chapter 4 **Explanation of Individual Menu Items**

A-3 List of Supported PCL5 Control Functions

A-3.1 Job Control Commands

JOB CONTROL COMMANDS	Description
ESC % - 12345 X	Universal Exit / Start of PJJ Change to PJJ Language Interpretation Mode Reset the printer like performing a Reset command Print all data received before the UEL command
ESC E	Reset Reset to PJJ Current Environment Printing of any partial pages Deleting of all temporary download resources, as macros, fonts, and patterns
ESC & I # X	Number of Copies Number of printed copies for each page
ESC & I # U	Left Offset Registration Position of the logical page across width of the physical page
ESC & I # Z	Top Offset Registration Position of the logical page along length of the physical page
ESC & u # D	Unit of Measure Measure for PCL unit cursor movements

A-3.2 Page Control Commands

PAGE CONTROL COMMANDS	Description
ESC & I # A (Private Command)	Page Size Definition of the paper size and in turn of the logical page size. Parameters: # = 2 : Letter # = 26 : A4 # = 101 : Custom
ESC & I # O	Orientation Different rotations of the logical page # = 0 : Portrait # = 1 : Landscape # = 2 : Reverse Portrait # = 3 : Reverse Landscape
ESC & a # P	Print Direction Rotation of the page coordinate system related to the current position in steps of 90°
ESC & a # L	Left Margin Setting to the left edge of the page (columns)
ESC & a # M	Right Margin Setting to the right edge of the page (columns)

PAGE CONTROL COMMANDS (cont.)	Description
ESC 9	Clear Horizontal Margins Resetting of the right and left margin
ESC & I # E	Top Margin Setting top of the text area in lines
ESC & I # F	Text Length Number of printing lines per page Setting of the bottom margin
ESC & I # L	Perforation Skip # = 0 : Disable # = 1 : Enable
ESC & k # H	Horizontal Motion Index Width of the columns where # (x 1/120 inch)
ESC & I # C	Vertical Motion Index Height of rows where # (x 1/48 inch)
ESC & I # D	Line Spacing Number of lines printed per inch # = 1, 2, 3,, 48

A-3.3 Cursor Positioning Commands

CURSOR POSITIONING COMMANDS	Description
ESC & a # C	Horizontal Position in Columns
ESC * p # X	Horizontal Position in PCL Units
ESC & a # H	Horizontal Position in Decipoints
ESC & a # R	Vertical Position in Rows
ESC * p # Y	Vertical Position in PCL Units
ESC & a # V	Vertical Position in Decipoints
ESC =	Half Line Feed
ESC & k # G	Line Termination
ESC & f # S	Push / Pop Cursor Position
ESC & a # C	Horizontal Position in Columns
ESC * p # X	Horizontal Position in PCL Units
ESC & a # H	Horizontal Position in Decipoints
ESC & a # R	Vertical Position in Rows
ESC * p # Y	Vertical Position in PCL Units
ESC & a # V	Vertical Position in Decipoints
ESC =	Half Line Feed

CURSOR POSITIONING COMMANDS (cont.)	Description
ESC & k # G	Line Termination # = 0 : CR = CR, LF = LF, FF = FF # = 1 : CR = CR+LF, LF = LF, FF = FF # = 2 : CR = CR, LF = CR+LF, FF = CR+FF # = 3 : CR = CR+LF, LF = CR+LF, FF = CR+FF
ESC & f # S	Push / Pop Cursor Position # = 0 : Push (Store) # = 0 : Pop (Recall)
ESC & s # C	End-Of- Line Wrap # = 0 : Enable # = 1 : Disable
CR (hex 0D)	Carriage Return
SP (hex 20)	Space
BS (hex 08)	Backspace
HT (hex 09)	Horizontal Tab
LF (hex 0A)	Line Feed
FF (hex 0C)	Form Feed

A-3.4 Font Selection Commands

FONT SELECTION COMMANDS	Description
ESC (<i>ID</i>	Symbol Set , primary *) <i>ID</i> = Code for Symbol Set, see Chapter 4 Explanation of Individual Items and here point SYMBOL SETS or a Printout of PCL TYPEFACE LIST
ESC (s # P	Spacing, primary *) # = 0 : Fixed Spacing # = 1 : Proportional Spacing
ESC (s # H	Pitch, primary *) # = Number of character per inch
ESC (s # V	Height, primary *) # = Character height in point
ESC (s # S	Style, primary *) # = 0 : Upright # = 1 : Italic
ESC (s # B	Stroke Weight, primary *) # = 0 : Medium # = 3 : Bold
ESC (s # T	Typeface, primary *) # = Code number for Typeface, see Printout of PCL TYPEFACE LIST
ESC (s # X	Font Selection by ID #, primary *)
ESC (3 @	Select Default Font as primary *)

*) All commands for primary with ?(?) parenthesis can be used for secondary with ?)?) parenthesis

A-3.5 Font Management Commands

FONT MANAGEMENT COMMANDS	Description
ESC & d # D	Enable Underline # = 0 : Fixed position # = 3 : Floating position
ESC & d @	Disable Underline
ESC & p # X [data]	Transparent Print Data
ESC * c # D	Assign Font ID #
ESC * c # F	Font Control
ESC * c # R	User Defined Symbol Set ID Code
ESC (f # W [data]	User Defined Symbol Set Data
ESC * c # S	User Defined Symbol Set Control
ESC) s # W [data]	Soft Font Descriptor
ESC * c # E	Soft Font Character Code
ESC (s # W [data]	Soft Font Download Character
ESC Y	Display Functions Mode On
ESC Z	Display Functions Mode Off

Note: For detailed informations see PCL 5 Technical Reference Manual from HP

A-3.6 Macro Control Commands

MACRO CONTROL COMMANDS	Description
ESC & f # Y	Macro ID
ESC & f # X	Macro Control # = 0 : Start macro definition (last ID specified) # = 1 : Stop macro definition # = 2 : Execute macro (last ID specified) # = 3 : Call macro (last ID specified) # = 4 : Enable macro for automatic overlay (last ID specified) # = 5 : Disable automatic overlay # = 6 : Delete all macros # = 7 : Delete all temporary macros # = 8 : Delete macro (last ID specified) # = 9 : Make macro temporary (last ID specified) # = 10 : Make marco permanent (last ID specified)

Note: For detailed informations see PCL 5 Technical Reference Manual from HP

A-3.7 Graphic Commands

GRAPHIC COMMANDS	Description
ESC * v # N	Source Transparency Mode
ESC * v # O	Pattern Transparency Mode
ESC * c # G	Area Fill ID
ESC * v # T	Select Current Pattern
ESC * c # W [data]	Define User Defined Pattern
ESC * p # R	Set Pattern Reference Point
ESC * c # Q	User Defined Pattern Control
ESC * t # R	Raster Graphic Resolution
ESC * r # F	Raster Graphic Presentation
ESC * r # T	Raster Graphic Heighth
ESC * r # S	Raster Graphic Width
ESC * r # A	Start Raster Graphics
ESC * b # Y	Raster Graphic Y Offset
ESC * b # M	Raster Graphic Compression Mode
ESC * b # W [data]	Transfer Raster Graphic Data
ESC * B or ESC * C	End of Raster Graphic
ESC * c # A	Horizontal Rectangle Size, PCL Units
ESC * c # H	Horizontal Rectangle Size, Decipoint
ESC * c # B	Vertical Rectangle Size, PCL Units
ESC * c # V	Vertical Rectangle Size, Decipoints
ESC * c # G	Pattern ID for Area Fill
ESC * c # P	Fill Rectangle Area
ESC * c # X	HPGL Horizontal Picture Frame Size
ESC * c # Y	HPGL Vertical Picture Frame Size
ESC * c 0 T	HPGL Picture Frame Anchor Point
ESC * c # K	HPGL Horizontal Plot Size
ESC * c # L	HPGL Vertical Plot Size
ESC % # B	Enter HPGL Mode
ESC % # A	Return from HPGL to PCL Mode

Note: For detailed informations see HP PCL 5 Technical Reference Manual.

A-4 Support of Semigraphics for SAP/R3

Semigraphical Symbols in Symbol Set ISO 8859/1 and PC-8

The symbol set ISO 8859/1 and PC-8 contain 11 semigraphical symbols to optimally support line drawing functions in SAP/R3 applications:

Position in ISO 8859/1	Character PC-8	Position in PC-8
9/0	3	C/5
9/1	)	C/4
9/2	*	B/3
9/3	+	D/A
9/4	,	B/F
9/5	.	C/0
9/6	-	D/0
9/7	/	C/3
9/8	1	B/4
9/9	0	C/2
9/A	2	C/1

The symbols are selected from the symbol set table with the specified typeface 4099 (courier) with fix spacing and pitch, default style and default stroke weight.

ESC(ON(s0p16.67h0s0b4099T

A-5 Barcode Programming

A-5.1 Resident Barcode Font Code 39 HP Compatible

The barcode Code 39 is integrated as two bitmapped fonts into the Operating System for the printer as resident printer font. This bitmapped fonts can be used compatible to the cartridge implementation from Hewlett Packard **Bar Code & More** for HP laser printers.

The printer resident barcode font Code39 can be selected either from the operator panel of the printer as internal font number 52 and 53 (for programming detail see **PCL Typeface List**) or by PCL command with the following parameters:

- symbol set **0Y** pitch **8.17** typeface **0** (line printer) or
- symbol set **0Y** pitch **4.71** typeface **0** (line printer)
-

The printer offers variety set of resident Barcodes which can be addressed by means of additional PCL 5 control sequences.

This HP barcode fonts can be used like any other bitmapped font in the PCL5 emulation. Position and rotation is possible by PCL5 commands.

Note: Horizontal scalling is only possible to the values **8.17** or **4.71** CPI.
Vertical enlargement is possible by printing more lines.

Print sample:



Code 39f9



Code 39f9

A-5.2 Resident Barcode Controlled by Private Command Sequence

Generally barcodes are programmed in three steps:

1. Select a barcode type and define the barcode specific parameter set of
 - height
 - module width
 - ratio of bars to spaces
 - text control
2. Define barcode print position and print orientation
3. Print the barcode by sending the barcode data command

Note: For every barcode an individual set of parameters (height, module width, ratio, text control) is stored. The default values (see table on page A-29) of these parameters are activated with the first selection of a barcode type.

Programming a new parameter modifies only the value of the actual selected barcode type. The value is applied until it is overwritten by a new value or the printer is switched off. (Barcode parameters are not stored in the printer environment !)

– The Resident Barcodes are:

Code 39,
 2 of 5 industrial,
 2 of 5 interleaved,
 EAN 8 SC2, EAN 8 SC6, EAN 8 SC9,
 EAN 13 SC2, EAN 13 SC6, EAN 13 SC9,
 UPC-A SC2, UPC-A SC6, UPC-A SC9,
 UPC-E SC2, UPC-E SC6, UPC-E SC9,
 Codabar,
 MSI,
 Code 93,
 Postnet,
 Code 128, and
 RM4SCC/KIX.

A-5.2.1 Programming

Programming of the resident barcodes is achieved by means of six new control sequences added to the PCL5 emulation.

The print position and print orientation of a barcode is controlled by standard PCL5 commands.

– Barcode print position

Printing of any barcode starts at the current actual cursor position. The position can be set with any standard PCL5 cursor movement command. Moving the cursor with printed characters, spaces and carriage return and line feed is the simplest possibility.

Setting the cursor to an absolute or relative position in PCL units is the best way to position a barcode:

ESC * p P1 X	absolute horizontal position to P1
ESC * p + P1 X	relative horizontal position P1 to the left
ESC * p - P1 X	relative horizontal position P1 to the right
ESC * p P1 Y	absolute vertical position to P1
ESC * p + P1 Y	relative vertical position P1 down
ESC * p - P1 Y	relative vertical position P1 up

Note: – The barcode **REFERENCE POSITION** is the left upper edge except for Postnet where the reference position is the character baseline.

– The **cursor position is not changed** after printing the barcode. The cursor must be set to a new position for the next printable character.

– One PCL unit is the unit of measure for cursor movements. The default value is 300 units per inch.

– Barcode print orientation

Barcodes are printable in all four print directions, selectable with the following PCL5 command:

ESC & a P1 P P1 = 0, 90, 180, 270 default = 0°

– Barcode type

This command selects a barcode type:

ESC * z P1 V	default = 0
P1 = 0	Code 39
P1 = 1	2 of 5 industrial
P1 = 2	reserved
P1 = 3	reserved
P1 = 4	2 of 5 interleaved
P1 = 102	EAN 8 SC2
P1 = 106	EAN 8 SC6
P1 = 109	EAN 8 SC9
P1 = 122	EAN 13 SC2
P1 = 126	EAN 13 SC6
P1 = 129	EAN 13 SC9
P1 = 142	UPC-A SC2
P1 = 146	UPC-A SC6
P1 = 149	UPC-A SC9
P1 = 162	UPC-E SC2
P1 = 166	UPC-E SC6
P1 = 169	UPC-E SC9
P1 = 180	Codabar
P1 = 181	MSI
P1 = 188	Code 93
P1 = 200	Postnet
P1 = 210	Code 128
P1 = 220	RM4SCC/KIX

Note: EAN and UPC code selection supports ADD2 and ADD5 extensions by sending those additional digits.

– Barcode height

This command defines the height of the actual selected barcode:

ESC * z P1 H P1 = height in PCL units

For every barcode type an individual value is stored. The default height value for barcode is 0.5 inch (P1 = 150) except EAN, UPC and Postnet.

The default height for EAN and UPC is defined with the scaling factor SC 2, 6 or 9. The height of Postnet is fixed.

Barcode height values are selectable in the range from 0.1 inch (P1 = 30) to 10 inch (P1 = 3000).

Note: One PCL unit is the PCL scaling unit. Default is 300 units per inch.

– Barcode data

This command specifies the barcode data field. Two command formats are supported. The first format is conforming to earlier PCL3 commands and does not report the number of data bytes in front of the data field:

ESC * z < **data** > Z **data** = barcode data field

The barcode data are enclosed in the two brackets. If the right bracket itself is part of the data field it has to be sent twice.

The second format is according to typical PCL5 commands. The number of bytes in the data field is indicated before sending the data:

ESC * z P1 Z **data** P1 = number of bytes in the barcode field **data**

Note: The number of barcode data bytes must correspond to the selected barcode type, otherwise the command is ignored.

– Barcode text control

This command controls the optional printing of barcode data as an added text string.

ESC * z P1 Q

P1 = 0	disable text
P1 = 1	text above barcode with OCR-B font
P1 = 2	text below barcode with OCR-B font (default)
P1 = 3	text above barcode with actual selected font
P1 = 4	text below barcode with actual selected font

The text string is centred to the printed barcode.

Note: – For EAN code with OCR-B font the pitch is not 10 CPI.

- For actual fonts the vertical distance between barcode and text is equal to the maximum bar width. The programmer has to ensure that the actual selected font is adequate to be printed in combination with the barcode.

– Barcode module width

Horizontal scaling of the barcode is selectable by the module width.

This parameter defines the width of the narrow bar in PCL units.

ESC * z P1 S P1 = module width in PCL units

Value range is from 1 to 32,767. The default values for the different barcode are described in the table on the next page.

Note: For barcode types EAN and UPC the predefined values given with the scaling factor (see table) must not be modified.

For Postnet and KIX code the module width is fixed.

– Barcode ratio

This command selects one of the available ratios between wide and narrow bars (spaces).

ESC * z P1 O P1 = 2.0 ; 2.5 ; 3.0 ; default is 2.5

Note: This command is not applicable to all barcodes; refer to table below.

Default values for module width and ratio:

Bar code code No. type		Module width		Ratio	
		default ¹⁾	variable	default	variable
0	Code 39	6	yes	2.5	yes
1	2 of 5 industrial	6	yes	2.5	yes
4	2 of 5 interleaved	6	yes	2.5	yes
102	EAN 8 SC 2	4	yes *)	fixed	no
106	EAN 8 SC 6	6	yes *)	fixed	no
109	EAN 8 SC 9	8	yes *)	fixed	no
122	EAN 13 SC 2	4	yes *)	fixed	no
126	EAN 13 SC 6	6	yes *)	fixed	no
129	EAN 13 SC 9	8	yes *)	fixed	no
142	UPC - A SC 2	4	yes *)	fixed	no
146	UPC - A SC 6	6	yes *)	fixed	no
149	UPC - A SC 9	8	yes *)	fixed	no
162	UPC - E SC 2	4	yes *)	fixed	no
166	UPC - E SC 6	6	yes *)	fixed	no
169	UPC - E SC 9	8	yes *)	fixed	no
180	Codabar	6	yes	2.5	yes
181	MSI	6	yes	2.5	yes
188	Code 93	6	yes	fixed	no
200	Postnet	fixed	no	fixed	no
210	Code 128	6	no	fixed	no
220	RM4SCC/KIX	fixed	no	fixed	no

¹⁾ in 1/300 inch

*) for optimum readability module width should not be changed

– **Start and Stop characters**

For barcode types EAN, UPC, Code 93, Code 128 and Postnet the printer automatically adds start and stop characters.
For barcode type Code 39, 2 of 5 industrial and 2 of 5 interleaved the printer adds start and stop characters only if they are not generated by the system.
For barcode type Codabar the application has to generate the start and stop characters.

Following start and stop characters are accepted by the printer:

Barcode Type	Start Character	Stop Character
Code 39	*	*
2 of 5 types	:	;
Codabar	a, b, c, d, A, B, C, D	t, n, *, e, A, B, C, D

Note: Following combinations (start / stop) are specified for Codabar, but not checked by the printer:
(a / t) (b / n) (c / *) (d / e) (A / A) (B / B) (C / C) (D / D)

– **Error checking characters**

Error checking characters are added by the printer only for barcode types Code 128, Code 93 and Postnet. For all other barcode types the application has to generate error checking characters and transmit them to the printer.

– **Unprinted areas**

To ensure proper readability of a barcode unprinted areas in front and behind the barcode are required. The printer does not insert these areas itself; the amount of space has to be calculated by the application.

A-5.3 Barcode Programming Examples

– **Example for Code 39**

type	= Code 39:	ESC * z 0 V
Height	= 0.6 inch	ESC * z 180 H
text	= OCR-B above	ESC * z 1 Q
data	= CODE 39	ESC * z < CODE 39 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	30	56	1B	2A	7A	31	38	30	48	1B	2A	7A	31
51	1B	2A	7A	3C	43	4F	44	45	33	39	3E	5A			

Print sample:



– **Example for 2 of 5 industrial**

type	= 2 of 5 industrial:	ESC * z 1 V
Height	= 0.6 inch	ESC * z 180 H
mod. width	= 10 PCL units	ESC * z 10 S
text	= OFF	ESC * z 0 Q
data	= 1 2 3	ESC * z < 1 2 3 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	31	56	1B	2A	7A	31	38	30	48	1B	2A	7A	31
30	53	1B	2A	7A	30	51	1B	2A	7A	3C	31	32	33	3E	5A

Print sample:



– Example for 2 of 5 interleaved

type	= 2 of 5 interleave:	ESC * z 4 V
position	= X=500; Y=500	ESC * p 5 0 0 x 5 0 0 Y
orientation	= 90°	ESC & a 9 0 P
text	= actual font below	ESC * z 4 Q
data	= 1 2 3 4	ESC * z < 1 2 3 4 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	34	56	1B	2A	70	35	30	30	78	35	30	30	59
1B	26	61	39	30	50	1B	2A	7A	34	51	1B	2A	7A	3C	31
32	33	34	3E	5A											

Print sample:



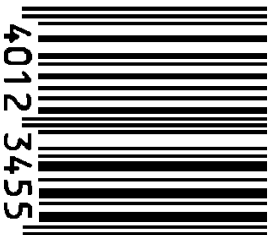
– Example for EAN 8 SC2

type	=EAN 8 SC2:	ESC * z 1 0 2 V
orientation	= 270°	ESC & a 2 7 0 P
text	= OCR-B below	ESC * z 2 Q
data	= 4 0 1 2 3 4 5 5	ESC * z 8 Z 4 0 1 2 3 4 5 5

The HEXDUMP datastream for this example is:

1B	2A	7A	31	30	32	56	1B	26	61	32	37	30	50	1B	2A
7A	32	51	1B	2A	7A	38	5A	34	30	31	32	33	34	35	35

Print sample:



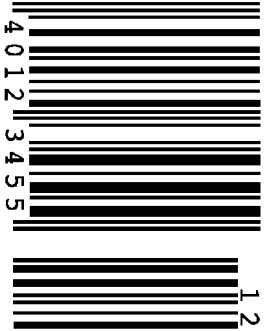
– Example for EAN 8 SC6 add 2

type	=EAN 8 SC6	ESC * z 1 0 6 V
orientation	= 270°	ESC & a 2 7 0 P
text	= actual font below	ESC * z 4 Q
data	= 4 0 1 2 3 4 5 5 1 2	ESC * z 1 0 Z 4 0 1 2 3 4 5 5 1 2

The HEXDUMP datastream for this example is:

1B	2A	7A	31	30	36	56	1B	26	61	32	37	30	50	1B	2A
7A	34	51	1B	2A	7A	31	30	5A	34	30	31	32	33	34	35
35	31	32													

Print sample:



– Example for EAN 8 SC9 add 5

type = EAN 8 SC9: ESC * z 1 0 9 V
 text = OCR-B above ESC * z 1 Q
 data = 4 0 1 2 3 4 5 5 8 6 1 0 4 ESC * z 1 3 Z 4 0 1 2 3 4 5 5 8 6 1 0 4

The HEXDUMP datastream for this example is:

1B	2A	7A	31	30	39	56	1B	2A	7A	31	51	1B	2A	7A	31
33	5A	34	30	31	32	33	34	35	35	38	36	31	30	34	

Print sample:



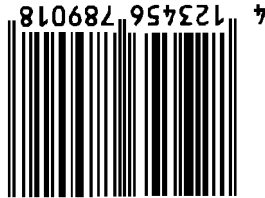
– Example for EAN 13 SC2

type =EAN 13 SC2: ESC * z 1 2 2 V
 orient. = 180° ESC & a 1 8 0 P
 text = OCR-B below ESC * z 2 Q
 data = 4 1 2 3 4 5 6 7 8 9 0 1 8 ESC * z 1 3 Z 4 1 2 3 4 5 6 7 8 9 0 1 8

The HEXDUMP datastream for this example is:

1B	2A	7A	31	32	32	56	1B	26	61	31	38	30	50	1B	2A
7A	32	51	1B	2A	7A	31	33	5A	34	31	32	33	34	35	36
37	38	39	30	31	38										

Print sample:



– Example for Codabar

type = Codabar ESC * z 1 8 0 V
 ratio = 3.0 ESC * z 3 . 0 O
 text = OCR-B below ESC * z 2 Q
 data = a 0 1 2 3 4 5 6 7 8 9 t ESC * z 1 2 Z a 0 1 2 3 4 5 6 7 8 9 t

The HEXDUMP datastream for this example is:

1B	2A	7A	31	38	30	56	1B	2A	7A	33	2E	30	4F	1B	2A
7A	32	51	1B	2A	7A	31	32	5A	61	30	31	32	33	34	35
36	37	38	39	74											

Print sample:



– Example for Code 128

act. font	= Ribbon SWC 20 Pt	ESC (s 1 p 2 0 v 1 s 0 b 4 1 1 6 T
type	= Code 128:	ESC * z 2 1 0 V
orient.	= 90° ESC & a 9 0 P	
text	= actual font below	ESC * z 4 Q
data	= C o d e 1 2 8	ESC * z < C o d e 1 2 8 > Z

The HEXDUMP datastream for this example is:

1B	28	73	31	70	32	30	76	31	73	30	62	34	31	31	36
54	1B	2A	7A	32	31	30	56	1B	26	61	39	30	50	1B	2A
7A	34	51	1B	2A	7A	3C	43	6F	64	65	31	32	38	3E	5A

Print sample:



Code 128

– Example for POSTNET

type	= POSTNET	ESC * z 2 0 0 V
data	= 123456789	ESC * z < 123456789 > Z
	CR LF LF	0D 0A 0A
	Mark Pollmann CR LF	Mark Pollmann 0D 0A
	101 Main St CR LF	101 Main St 0D 0A
	Anytown US	Anytown US

The HEXDUMP **POSTNET** datastream for this example is:

1B	2A	7A	32	30	30	56	1B	2A	7A	3C	31	32	33	34	35
36	37	38	39	3E	5A										

Print sample:



Mark Pollmann
101 Main St
Anytown US

– Example for RMS4SCC / KIX

type	= KIX	ESC * z 2 2 0 V
data	= 9 7 2 5 K E 5 6 x 4 3	ESC * z < 9 7 2 5 K E 5 6 x 4 3 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	32	32	30	56	1B	2A	7A	3C	39	37	32	35	4B
45	35	36	78	34	33	3E	5A								

Print sample:



Appendix B Symbol Sets

– Roman-8

Display: **ROMAN-8**ID Number: **8U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p				—	â	Å	Á	Þ	0
01			!	1	A	Q	a	q			À	Ý	ê	î	Ã	þ	1
02			"	2	B	R	b	r			Â	ý	ô	Ø	ã	·	2
03			#	3	C	S	c	s			È	°	û	Æ	Ð	μ	3
04			\$	4	D	T	d	t			Ê	Ç	á	å	ð	¶	4
05			%	5	E	U	e	u			Ë	ç	é	í	Í	¾	5
06			&	6	F	V	f	v			Î	Ñ	ó	ø	ì	—	6
07			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó	¼	7
08			(	8	H	X	h	x			´	ï	à	Ä	Ò	½	8
09			)	9	I	Y	i	y			`	¿	è	ì	Õ	ª	9
10			*	:	J	Z	j	z			^	¤	ò	Ö	õ	°	A
11			+	;	K	[	k	{			¨	£	ù	Ü	Š	«	B
12			,	<	L	\	l	|			˘	¥	ä	É	š	■	C
13			-	=	M	]	m	}			Ù	§	ë	ï	Ú	»	D
14			.	>	N	^	n	~			Û	f	ö	ß	ÿ	±	E
15			/	?	O	_	o	⌘			£	¢	ü	Ô	ÿ		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO 8859/1 Latin 1

Display: **ISO L1**ID Number: **0N**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p		+		°	À	Ð	à	ð	0
01			!	1	A	Q	a	q		—	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r		|	¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s		ƒ	£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t		Œ	¤	´	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u		Ɔ	¥	μ	Å	Ö	å	õ	5
06			&	6	F	V	f	v		Ɔ	ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w		Ɔ	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x		Ɔ	¨	˘	È	Ø	è	ø	8
09			)	9	I	Y	i	y		Ɔ	©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z		Ɔ	ª	°	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			Ɔ	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ	E
15			/	?	O	_	o	⌘			-	¿	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO 8859/2 Latin 2

Display: ISO L2

ID Number: 2N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	Ř	Đ	ř	đ	0
01			!	1	A	Q	a	q			Ą	ą	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r			˘	˙	Â	Ń	â	ñ	2
03			#	3	C	S	c	s			Ł	ł	Ă	Ó	ă	ó	3
04			\$	4	D	T	d	t			⌘	˘	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			Ł	ł	Í	Ó	í	ó	5
06			&	6	F	V	f	v			Š	š	Č	Ö	č	ö	6
07			'	7	G	W	g	w			§	˘	Ç	×	ç	÷	7
08			(	8	H	X	h	x			˘	˙	Č	Ř	č	ř	8
09			)	9	I	Y	i	y			Š	š	É	Û	é	û	9
10			*	:	J	Z	j	z			Ş	ş	Ț	Ú	Ț	ú	A
11			+	;	K	[	k	{			Ť	ť	Ě	Ů	ě	ů	B
12			,	<	L	\	l	|			Ž	ž	Ě	Ů	ě	ů	C
13			-	=	M	]	m	}			-	˘	Í	Ý	í	ý	D
14			.	>	N	^	n	˘			Ž	ž	Î	Ť	î	ť	E
15			/	?	O	_	o	⌘			Ž	ž	Ď	ß	d'	˘	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ _{e+}

– ISO 8859/9 Latin 5

Display: ISO L5

ID Number: 5N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ğ	à	ğ	0
01			!	1	A	Q	a	q			ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r			¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t			¤	˘	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v			ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w			§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			˘	˙	È	Ø	è	ø	8
09			)	9	I	Y	i	y			©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	˘			®	¾	Î	Ş	î	ş	E
15			/	?	O	_	o	⌘			˘	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ _{e+}

– ISO 8859/15 Latin 9

Display: ISO L9

ID Number: 9N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Đ	à	đ	0
01			!	1	A	Q	a	q			i	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r			¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t			€	Ž	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v			Š	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w			§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			š	ž	È	Ø	è	ø	8
09			)	9	I	Y	i	y			©	¹	É	Ù	é	ù	9
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			¬	œ	Ì	Ü	ì	ü	C
13			-	=	M	|	m	}			-	æ	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	ÿ	Î	Þ	î	þ	E
15			/	?	O	_	o				-	ı	İ	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Ne

Note: € sign in position A4 (hex)

– PC-8 Code Page 437

Display: PC-8

ID Number: 10U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⌌	⌌	α	≡	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	⌌	⌌	β	±	1
02	☛	↕	"	2	B	R	b	r	é	Æ	ó	⌘	⌌	⌌	Γ	≥	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⌌	⌌	π	≤	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⌌	⌌	⌌	Σ	∫	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	⌌	⌌	⌌	σ	∫	5
06	♠	–	&	6	F	V	f	v	å	û	ª	⌌	⌌	⌌	μ	÷	6
07	•	↕	'	7	G	W	g	w	ç	ù	º	⌌	⌌	⌌	τ	≈	7
08	◼	↑	(	8	H	X	h	x	ê	ÿ	ı	⌌	⌌	⌌	Φ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	⌌	⌌	⌌	⌌	Θ	·	9
10	◼	→	*	:	J	Z	j	z	è	Ü	⌌	⌌	⌌	⌌	Ω	·	A
11	♂	←	+	;	K	[	k	{	ï	¢	½	⌌	⌌	⌌	δ	√	B
12	♀	⌌	,	<	L	\	l	|	î	£	¼	⌌	⌌	⌌	∞	ⁿ	C
13	♫	↔	-	=	M	|	m	}	ì	¥	ı	⌌	⌌	⌌	φ	²	D
14	♫	▲	.	>	N	^	n	~	Ä	Pt	«	⌌	⌌	⌌	€	▪	E
15	⚙	▼	/	?	O	_	o	◻	Å	f	»	⌌	⌌	⌌	∩		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

– PC-8 Danish/Norwegian Display: PC-8 DN

ID Number: 11U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⌞	⌚	α	≡	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	⌞	⌚	β	±	1
02	●	↑↓	"	2	B	R	b	r	é	Æ	ó	⌘	⌞	⌚	Γ	≥	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⌞	⌚	π	≤	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⌞	⌚	⌚	Σ	∫	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	⌞	⌚	⌚	σ	∫	5
06	♠	–	&	6	F	V	f	v	å	û	õ	⌞	⌚	⌚	μ	÷	6
07	●	↑↓	'	7	G	W	g	w	ç	ù	Õ	⌞	⌚	⌚	τ	≈	7
08	◼	↑	(	8	H	X	h	x	ê	ÿ	ı	⌞	⌚	⌚	Φ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	ã	⌞	⌚	⌚	Θ	·	9
10	◼	→	*	:	J	Z	j	z	è	Ü	Ä	⌞	⌚	⌚	Ω	·	A
11	♂	←	+	;	K	[	k	{	ï	ø	ℓ	⌞	⌚	⌚	δ	√	B
12	♀	⌞	,	<	L	\	l	|	î	£	ñ	⌞	⌚	⌚	∞	"	C
13	♫	↔	-	=	M	]	m	}	ì	Ø	ı	⌞	⌚	⌚	φ	²	D
14	♫	▲	.	>	N	^	n	˘	Ä	L	³	⌞	⌚	⌚	€	▪	E
15	⚙	▼	/	?	O	_	o	◊	Å	f	¼	⌞	⌚	⌚	∩		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘

– PC-850 Multilingual

Display: PC-850

ID Number: 12U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⌞	ø	Ó	-	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	⌞	Ð	ß	±	1
02	●	↑↓	"	2	B	R	b	r	é	Æ	ó	⌘	⌞	Ê	Ô	=	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⌞	È	Ò	¾	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⌞	⌚	È	õ	¶	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	⌞	ı	Õ	§	5
06	♠	–	&	6	F	V	f	v	å	û	ª	Â	ã	Í	μ	÷	6
07	●	↑↓	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸	7
08	◼	↑	(	8	H	X	h	x	ê	ÿ	ı	◉	⌞	Ï	Þ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	®	⌞	⌚	⌚	Ú	ˆ	9
10	◼	→	*	:	J	Z	j	z	è	Ü	⌞	⌚	⌚	⌚	Û	·	A
11	♂	←	+	;	K	[	k	{	ï	ø	½	⌞	⌚	⌚	Ü	¹	B
12	♀	⌞	,	<	L	\	l	|	î	£	¼	⌞	⌚	⌚	Ý	³	C
13	♫	↔	-	=	M	]	m	}	ì	Ø	ı	⌞	⌚	⌚	Ÿ	²	D
14	♫	▲	.	>	N	^	n	˘	Ä	×	«	¥	⌞	⌚	ı	ˆ	E
15	⚙	▼	/	?	O	_	o	◊	Å	f	»	⌞	⌚	⌚	ı	ˆ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘

– PC-852 Latin 2

Display: PC-852

ID Number: 17U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	Ł	d	Ó	-	0
01	☺	◄	!	1	A	Q	a	q	ü	Ł	í	⋮	Ł	Đ	ß	"	1
02	●	↑	"	2	B	R	b	r	é	Í	ó	⋮	Ł	Ď	Ô	,	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	Ł	Ě	Ň	˘	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	Ą	Ł	Ł	đ	ń	˘	4
05	♣	§	%	5	E	U	e	u	û	Ł	ą	Á	Ł	Ň	ň	§	5
06	♠	—	&	6	F	V	f	v	é	ł	Ż	Â	Ă	Í	Š	÷	6
07	●	↑	'	7	G	W	g	w	ç	Ś	ż	Ě	ă	Î	ș	,	7
08	◼	↑	(	8	H	X	h	x	ł	ś	Ę	Ś	Ł	ě	Ř	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	ę	Ł	Ł	Ł	Ú	"	9
10	◼	→	*	:	J	Z	j	z	Ő	Ü		||	Ł	Ł	Ł	·	A
11	♂	←	+	;	K	[	k	{	ő	Ť	ž	Ł	Ł	Ł	Ů	ů	B
12	♀	└	,	<	L	\	l	|	î	ť	č	Ł	Ł	Ł	ý	Ř	C
13	♪	↔	-	=	M	]	m	}	Ž	Ł	š	Ž	=	Ł	Ý	ř	D
14	♪	▲	.	>	N	^	n	˘	Ä	×	«	ž	Ł	Ł	Ł	▪	E
15	⚙	▼	/	?	O	_	o	◊	Ć	č	»	Ł	Ł	Ł	Ł		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⚙

– PC-858 Multilingual

Display: PC-858

ID Number: 13U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	Ł	ð	Ó	-	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⋮	Ł	Đ	ß	±	1
02	●	↑	"	2	B	R	b	r	é	Æ	ó	⋮	Ł	Ê	Ô	=	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	Ł	È	Ò	¼	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	Ł	Ł	È	ö	¶	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	Ł	€	Õ	§	5
06	♠	—	&	6	F	V	f	v	â	û	ª	Â	ã	Í	μ	÷	6
07	●	↑	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	,	7
08	◼	↑	(	8	H	X	h	x	ê	ÿ	ı	◉	Ł	İ	þ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	®	Ł	Ł	Ł	Ú	"	9
10	◼	→	*	:	J	Z	j	z	è	Ü	™	||	Ł	Ł	Ł	·	A
11	♂	←	+	;	K	[	k	{	ï	ø	½	Ł	Ł	Ł	Ù	¹	B
12	♀	└	,	<	L	\	l	|	î	£	¼	Ł	Ł	Ł	ý	³	C
13	♪	↔	-	=	M	]	m	}	ì	Ø	ı	Ł	=	Ł	Ý	²	D
14	♪	▲	.	>	N	^	n	˘	Ä	×	«	Ł	Ł	Ł	Ł	▪	E
15	⚙	▼	/	?	O	_	o	◊	Å	f	»	Ł	Ł	Ł	Ł		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⚙

Note: € sign in position D5 (hex)

– PC-Turkish

Display: PC-8 TK

ID Number: 9T

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⊥	⊥	α	≡	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	⊥	⊥	β	±	1
02	☼	↕	"	2	B	R	b	r	é	Æ	ó	⌘	⊥	⊥	Γ	≥	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⊥	⊥	π	≤	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⊥	⊥	⊥	Σ	∫	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	⊥	σ	∫	5
06	♠	—	&	6	F	V	f	v	å	û	Ğ	⊥	⊥	⊥	μ	÷	6
07	•	↕	'	7	G	W	g	w	ç	ù	ğ	⊥	⊥	⊥	τ	≈	7
08	◼	↑	(	8	H	X	h	x	ê	İ	ı	⊥	⊥	⊥	Φ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	⊥	⊥	⊥	⊥	Θ	·	9
10	◉	→	*	:	J	Z	j	z	è	Ü	⊥	⊥	⊥	⊥	Ω	·	A
11	♂	←	+	;	K	[	k	{	ï	ç	½	⊥	⊥	⊥	δ	√	B
12	♀	⊥	,	<	L	\	l	|	î	£	¼	⊥	⊥	⊥	∞	ⁿ	C
13	♫	↔	-	=	M	]	m	}	ı	¥	ı	⊥	⊥	⊥	φ	²	D
14	♫	▲	.	>	N	^	n	~	Ä	Ş	«	⊥	⊥	⊥	€	▪	E
15	☼	▼	/	?	O	_	o	△	Å	§	»	⊥	⊥	⊥	∩		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☼

– Windows 3.1 Latin 1

Display: WIN L1

ID Number: 19U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ð	à	ð	0
01			!	1	A	Q	a	q		'	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r	,	'	ç	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u	...	•	¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v	†	—	|	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x	^	˘	˙	˚	È	Ø	è	ø	8
09			)	9	I	Y	i	y	‰	™	©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{	◁	▷	«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|	Æ	æ	¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ	E
15			/	?	O	_	o	⌘		ÿ	—	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☼

– Windows 3.1 Latin 2

Display: WIN L2

ID Number: 9E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	Ř	Đ	í	đ	0
01			!	1	A	Q	a	q		‘	˘	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r	,	’	ˇ	˙	Â	Ň	â	ň	2
03			#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó	3
04			\$	4	D	T	d	t	„	”	ⱥ	ˆ	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u	...	•	Ą	μ	Ł	Ő	Í	ő	5
06			&	6	F	V	f	v	†	—	ı	¶	Ć	Ö	ć	ö	6
07			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			˝	˙	Č	Ř	č	ř	8
09			)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů	9
10			*	:	J	Z	j	z	Š	š	Ş	ş	Ě	Ú	ě	ú	A
11			+	;	K	[	k	{	<	>	«	»	Ě	Ů	ě	ů	B
12			,	<	L	\	l	|	Š	š	¬	Ł	Ě	Ů	ě	ů	C
13			-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý	D
14			.	>	N	^	n	~	Ž	ž	®	ı	Î	Ť	î	ť	E
15			/	?	O	_	o	☒	Ž	ž	Ž	ž	Đ	ß	đ	·	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ne

– Windows 3.1 Latin 5

Display: WIN L5

ID Number: 5T

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ğ	à	ğ	0
01			!	1	A	Q	a	q		‘	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r	,	’	¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t	„	”	ⱥ	ˆ	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u	...	•	¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v	†	—	ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x	^	˘	˝	˙	È	Ø	è	ø	8
09			)	9	I	Y	i	y	‰	™	©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z	Š	š	ˆ	˙	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	ü	B
12			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	İ	í	ı	D
14			.	>	N	^	n	~			®	¾	Î	Ş	î	ş	E
15			/	?	O	_	o	☒		ÿ	—	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– Desktop

Display: **DESKTOP**ID Number: **7J**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	‘	p				“	—	◁	α	ˆ	0
01			!	1	A	Q	a	q			¶	”	±	▷	ο	˘	1
02			"	2	B	R	b	r			§	μ	×	«	æ	^	2
03			#	3	C	S	c	s			†	‰	÷	»	Æ	ˆ	3
04			\$	4	D	T	d	t			‡	•	°	,	ð	˜	4
05			%	5	E	U	e	u			©	●	’	„	Ð	˘	5
06			&	6	F	V	f	v			®	◦	”	·	ij	˘	6
07			’	7	G	W	g	w			™	○	¼	ı	IJ	ˆ	7
08			(	8	H	X	h	x			%	■	½	ı	ı	°	8
09			)	9	I	Y	i	y			¢	■	¾	Pl	Ł	˙	9
10			*	:	J	Z	j	z			—	□	1	ℓ	œ	˘	A
11			+	;	K	[	k	{			—	□	2	£	œ	˘	B
12			,	<	L	\	l	|			...	’	3	¥	ø	˘	C
13			-	=	M	]	m	}			fi	¬	/	¤	Ø	˙	D
14			.	>	N	^	n	~			fl	|		f	p	ı	E
15			/	?	O	_	o	⊗				=		β	Ɔ		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	hex

– PS text

Display: **PS TEXT**ID Number: **10J**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	@	P	'	p							—			0
01			!	1	A	Q	a	q			i	—	˘		Æ	æ	1
02			"	2	B	R	b	r			¢	†	˘				2
03			#	3	C	S	c	s			£	‡	ˆ		a		3
04			\$	4	D	T	d	t			/	·	˜				4
05			%	5	E	U	e	u			¥		˘			ı	5
06			&	6	F	V	f	v			f	¶	˘				6
07			'	7	G	W	g	w			§	•	˙				7
08			(	8	H	X	h	x			¤	,	ˆ		Ł	ı	8
09			)	9	I	Y	i	y			'	„			Ø	ø	9
10			*	:	J	Z	j	z			“	”	°		œ	œ	A
11			+	;	K	[	k	{			«	»	˘		°	β	B
12			,	<	L	\	l	|			<	...					C
13			-	=	M	]	m	}			>	‰	”				D
14			.	>	N	^	n	~			fi		˘				E
15			/	?	O	_	o				fl	ı	˘				F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊕

– Ventura International Display: VN INTL

ID Number: 13J

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	‘	p			„	‰	â	Å	Á	Æ	0
01			!	1	A	Q	a	q			À	“	ê	î	Ã	æ	1
02			"	2	B	R	b	r			Â	”	ô	Ø	ã	¶	2
03			#	3	C	S	c	s			È	°	û	Æ		‡	3
04			\$	4	D	T	d	t			Ê	Ç	á	å		‡	4
05			%	5	E	U	e	u			Ë	ç	é	í	Í	—	5
06			&	6	F	V	f	v			Î	Ñ	ó	ø	ì	–	6
07			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó		7
08			(	8	H	X	h	x			©	ì	à	Ä	Ò		8
09			)	9	I	Y	i	y			®	í	è	ì	Õ	ª	9
10			*	:	J	Z	j	z			™	ª	ò	Ö	õ	º	A
11			+	;	K	[	k	{		↵	<	£	ù	Ü	Š	«	B
12			,	<	L	\	l	|		→	>	¥	ä	É	š	•	C
13			-	=	M	]	m	}		↳	Ù	§	ë	ĩ	Ú	»	D
14			.	>	N	^	n	~		·	Û	f	ö	ß	ÿ		E
15			/	?	O	_	o			□		ø	ü	Ô	ÿ	...	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	next

– Ventura US

Display: VN US

ID Number: 14J

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	‘	p		„	‰						0
01			!	1	A	Q	a	q			“						1
02			"	2	B	R	b	r			”					¶	2
03			#	3	C	S	c	s			°					‡	3
04			\$	4	D	T	d	t								‡	4
05			%	5	E	U	e	u								—	5
06			&	6	F	V	f	v								–	6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x			©						8
09			)	9	I	Y	i	y			®						9
10			*	:	J	Z	j	z			™						A
11			+	;	K	[	k	{			¼						B
12			,	<	L	\	l	|			½					•	C
13			-	=	M	]	m	}			¾						D
14			.	>	N	^	n	~			¸						E
15			/	?	O	_	o				□					...	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	?

– Microsoft Publishing Display: MS PUBL

ID Number: 6J

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				²		‘					°				Ω		0
01			¹								’	•	`	˘			1
02			”		℞					”	•	’	˘				2
03			³		Š	%	š			^	●	^	˘				3
04			⁴		™					~	◦	˘	˘				4
05			⁵								○	˘	˘			₁	5
06			⁷								○	˘	˘		IJ	ij	6
07			’								■	˘	˘		L	l	7
08			⁹								■	˘	˘		Ł	ł	8
09			⁰		ÿ					fi	■						9
10			⁸		Ž		ž			fl	◻	°	°				A
11			†							ff	◻	˘	˘				B
12			,	”		ℓ				ff	◻						C
13			–	‡	–					ff	‰	”	”				D
14			...		–	⁶		“		Pt	<	◆	˘	˘			E
15			/		Œ	=	α		f	>	◇	˘	˘	˘	˘		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Σ ₊

– Math-8

Display: MATH-8

ID Number: 8M

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	∴	Π	∴	π				—	⊕	Å	Γ	Γ	0
01			✓	1	A	P	α	ρ			↑	V	⊙	⇐	└	└	1
02			”	2	B	Σ	β	σ			→	∃	⊗	⇐	└	└	2
03			°	3	Γ	T	γ	τ			↓	T	⊖	⊥	}	}	3
04			∞	4	Δ	Υ	δ	v			←	⊥	⊗	⊃	└	└	4
05			÷	5	E	Φ	ε	φ			↑	U	Λ	∫	∫	∫	5
06			α	6	Z	X	ζ	χ			⇒	∩	v	φ	φ	∫	6
07			’	7	H	Ψ	η	ψ			↓	∈	∇	∠	J	↓	7
08			(	8	Θ	Ω	θ	ω			⇐	∃	⇐	∅	∇	˘	8
09			)	9	I	∇	ι	∂			↑	≠	○	κ	||	>	9
10			×	e	K	∂	κ	φ			↔	⊂	˘	∫	∠	∫	A
11			+	ε	Λ	ζ	λ	π			↕	⊃	•	∫	/	\	B
12			,	<	M	≤	μ	≈			⇐	♀	•	℄	–	<	C
13			–	=	N	≠	ν	≡			⇐	♂	○	℄	=	≠	D
14			.	>	Ξ	≥	ξ	≠			Σ	⊂	†	℄	*	±	E
15			/	≈	O	—	o	⊗			˘	⊃	‡	℄	≡		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Σ ₊

– PS Math

Display: PS MATH

ID Number: 5M

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	≅	Π	—	π				°	ℵ	∠	◇		0
01			!	1	A	Θ	α	θ			Υ	±	ℑ	∇	⟨	⟩	1
02			∀	2	B	P	β	ρ			'	"	ℌ	®	®	∫	2
03			#	3	X	Σ	χ	σ			≤	≥	∅	©	©	∫	3
04			∃	4	Δ	T	δ	τ			/	×	⊗	™	™	|	4
05			%	5	E	Y	ε	v			∞	α	⊕	Π	Σ	J	5
06			&	6	Φ	ς	φ	ω			f	∂	∅	✓	{	}	6
07			↻	7	Γ	Ω	γ	ω			♣	•	∩	·	|	|	7
08			(	8	H	Ξ	η	ξ			♦	÷	∪	¬	|	|	8
09			)	9	I	Ψ	ι	ψ			♥	≠	⊃	∧	┌	┐	9
10			*	:	∂	Z	φ	ζ			♠	≡	⊇	∨	|	|	A
11			+	;	K	[	κ	{			↔	≈	⋈	↔	└	┘	B
12			,	<	Λ	∴	λ	|			←	...	⊂	←	|	|	C
13			−	=	M	]	μ	}			↑	|	⊆	↑	{	}	D
14			.	>	N	⊥	ν	~			→	−	∈	⇒	|	|	E
15			/	?	O	—	ο				↓	↙	⋈	↓	|		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Key

– Ventura Math

Display: VN MATH

ID Number: 6M

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	\equiv	Π	π				\diamond	\otimes	\leq	\downarrow	|	Π	0
01			!	1	A	Θ	α	θ			\checkmark	\supset	\blacklozenge	\leftarrow	\cdot	TM	1
02			\forall	2	B	P	β	ρ			|	\supseteq	\geq	\otimes	\angle	\Leftarrow	2
03			#	3	X	Σ	χ	σ			\int	\int	∂	"		\Leftrightarrow	3
04			\exists	4	Δ	T	δ	τ			|		\aleph	f		\vee	4
05			%	5	E	Y	ε	v			|	\clubsuit	'	\aleph	{	Σ	5
06			&	6	Φ	ς	ϕ	ϖ			|	\oplus	\aleph	\odot	\int	TM	6
07			\ni	7	Γ	Ω	γ	ω			|	\otimes	\varnothing	\pm	\rangle	|	7
08			(	8	H	Ξ	η	ξ			\Uparrow	\subseteq	∞	\rightarrow		\int	8
09			)	9	I	Ψ	ι	ψ			\Rightarrow	U	\spadesuit	\uparrow	\neg	\varnothing	9
10			*	:	ϑ	Z	φ	ζ			\Downarrow	-	α	\neq	∇	\cap	A
11			+	;	K	[	κ	{			\hookleftarrow	\nsubseteq	\dots	\bullet	\equiv	\int	B
12			,	<	Λ	\therefore	λ				\rightarrow	\subset		/	$^\circ$		C
13			-	=	M	]	μ	}			\sqcup	J	\wedge	\heartsuit	\leftrightarrow	|	D
14			.	>	N	\perp	ν	\sim			\cdot	|	\hookleftarrow	\times	\int	|	E
15			/	?	O	$_$	o				\square	|	\approx	Υ	\int	\div	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	\int_{e+}

– Pi Font

Display: **PI FONT**ID Number: **15U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				ˆ	::	ℙ	┐	└									0
01				˘	△	∅	└	└									1
02			„	˘		℞	┐	└									2
03			,	˙		Σ	┐	└									3
04			“	↗			+	+									4
05			”	↘			+	+									5
06			‘	↙	ƒ		—	+									6
07			’	↖			||	|									7
08			<	△	ℏ		U	U									8
09			>	▷			∩	∏									9
10			™	▽			∏	∏									A
11			SM	△			∏	∏									B
12			®	▲	ℒ		∏	□	■								C
13			©	§	ℓ		∏	◇	◆								D
14			®	▼		<											E
15				¶	>		☒										F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌂ ₊

– Legal

Display: **LEGAL**ID Number: **1U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	°	p									0
01			!	1	A	Q	a	q									1
02			”	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			’	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	[	k	§									B
12			,	=	L	®	l	¶									C
13			-	=	M	]	m	†									D
14			.	¢	N	©	n	™									E
15			/	?	O	—	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌂ ₊

– ISO United Kingdom Display: ISO-4 ID Number: 1E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	[	k	{									B
12			,	<	L	\	l	|									C
13			-	=	M	]	m	}									D
14			.	>	N	^	n	~									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO US ASCII Display: ISO-6 ID Number: 0U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	[	k	{									B
12			,	<	L	\	l	|									C
13			-	=	M	]	m	}									D
14			.	>	N	^	n	~									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO Swedish

Display: ISO-11

ID Number: 0S

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	É	P	é	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			¤	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	Ä	k	ä									B
12			,	<	L	Ö	l	ö									C
13			-	=	M	Å	m	å									D
14			.	>	N	Ü	n	ü									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO Italian

Display: ISO-15

ID Number: 0I

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	§	P	ù	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	°	k	à									B
12			,	<	L	ç	l	ò									C
13			-	=	M	é	m	è									D
14			.	>	N	^	n	ì									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO Spanish

Display: ISO-17

ID Number: 2S

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	\$	P	`	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	ı	k	°									B
12			,	<	L	Ñ	l	ñ									C
13			-	=	M	ı	m	ç									D
14			.	>	N	^	n	~									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO German

Display: ISO-21

ID Number: 1G

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	\$	P	`	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	Ä	k	ä									B
12			,	<	L	Ö	l	ö									C
13			-	=	M	Ü	m	ü									D
14			.	>	N	^	n	ß									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO Norwegian

Display: ISO-60

ID Number: 0D

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	@	P	`	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	Æ	k	æ									B
12			,	<	L	Ø	l	ø									C
13			-	=	M	Å	m	å									D
14			.	>	N	^	n	ˆ									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	e ₊

– ISO French

Display: ISO-69

ID Number: 1F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	à	P	μ	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	°	k	é									B
12			,	<	L	ç	l	ù									C
13			-	=	M	§	m	è									D
14			.	>	N	^	n	ˆ									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	e ₊

– **Windows 3.0 Latin 1** Display: **WIN 3.0** ID Number: **9U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ð	à	ð	0
01			!	1	A	Q	a	q		‘	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r		’	¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ	5
06			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w			§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			¨	¸	È	Ø	è	ø	8
09			)	9	I	Y	i	y			©	¹	É	Ù	é	ù	9
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ	E
15			/	?	O	_	o	⌘			¯	¿	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	hex

– **Symbol** Display: **none** ID Number: **19M**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	≡	Π	¬	π				°	κ	∠	◇	€	0
01			!	1	Α	Θ	α	θ			Υ	±	ℑ	∇	<	>	1
02			∀	2	Β	Ρ	β	ρ			'	"	℞	®	®	∫	2
03			#	3	Χ	Σ	χ	σ			≤	≥	∅	©	©	∫	3
04			∃	4	Δ	Τ	δ	τ			/	×	⊗	™	™	|	4
05			%	5	Ε	Υ	ε	υ			∞	α	⊕	Π	Σ	Ј	5
06			&	6	Φ	ς	φ	ω			f	∂	∅	√	/	\	6
07			∋	7	Γ	Ω	γ	ω			♣	•	∩	•	|	|	7
08			(	8	Η	Ξ	η	ξ			♦	+	∪	¬	\	/	8
09			)	9	Ι	Ψ	ι	ψ			♥	≠	⊃	∧	|	|	9
10			*	:	Θ	Z	φ	ζ			♠	=	⊇	v	|	|	A
11			+	;	K	[	κ	{			↔	≈	℄	⇔	|	|	B
12			,	<	Λ	∴	λ	|			←	...	⊂	←	|	|	C
13			-	=	M	]	μ	}			↑	|	⊆	↑	{	}	D
14			.	>	N	⊥	v	~			→	—	∈	⇒	|	|	E
15			/	?	O	_	ο				↓	↙	∉	↓	|		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	hex

Note: € sign in position **F0** (hex)

This Symbol Set is only addressable via a PCL Command

– Windings

Display: none

ID Number: 579L

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				📁	✂️	📁	📁	📁	📁	📁	📁	📁	📁	📁	📁	📁	0
01			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	1
02			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	2
03			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	3
04			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	4
05			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	5
06			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	6
07			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	7
08			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	8
09			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	9
10			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	A
11			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	B
12			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	C
13			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	D
14			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	E
15			✂️	📁	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	✂️	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex

Note: € sign in position 7F (hex)

This Symbol Set is only addressable via a PCL Command

Appendix C Miscellaneous

The following options respectively consumables are available for the printer.

C-1 Order Numbers

Options

Printer Stand	8707 294 90502
Stacker System	8707 294 90503

Consumables

Toner Kit	8709 003 24001
OPC Kit	8709 003 24101
Developer Kit	8709 003 24201
Fuser Unit	8709 003 24301

C-2 Printer Drivers

The printer drivers for Windows® are available on Internet Address:

<http://www.psi-si.de>