Leica IP C

Automated printing system for tissue cassettes

Operating Instructions

Leica IP C
V1.6 English - 07/2005
Always keep this manual together with the instrument.
Read this instruction manual carefully before working with the instrument.

Leica
MICROSYSTEMS

The information, numerical data, notes and value judgments contained in this manual represent the current state of scientific knowledge and state-of-the-art technology as we understand it following thorough investigation in this field.
We are under no obligation to update the present manual according to the latest technical developments, nor to provide our customers with additional copies, updates etc. of this manual.
For erroneous statements, drawings, technical illustrations etc. contained in this manual we exclude liability as far as permissible according to the national legal system applicable in each individual case. In particular, no liability whatsoever is accepted for any financial loss or consequential damage caused by or related to compliance with statements or other information in this manual.
Statements, drawings, illustrations and other information as regards contents or technical details of the present manual are not to be considered as warranted characteristics of our products.
These are determined only by the contract provisions agreed between ourselves and our customers.
Leica reserves the right to change technical specifications as well as manufacturing processes without prior notice. Only in this way is it possible to continuously improve the technology and manufacturing techniques used in our products.

For the instrument serial number and year of manufacture, please refer to the name plate at the back of the instrument.

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Symbols used in this manual and their meaning

Warnings appear in a grey box and are marked by a warning triangle ⚠.

Notes, i.e. important user information appears in a grey box and is marked by an information symbol i.

(5) **Figures in brackets refer to item numbers in drawings.**

LOAD **Function keys to be pressed on the touch screen are written in boldprint capital letters.**

Designated use

Leica IP C tissue cassette printer for printing standard histology cassettes.

The instrument has been designed for use in pathology, histology, cytology, toxicology and similar laboratories, and there only for printing tissue cassettes.

- Imprints of adequate quality and resistance to subsequent processing in tissue processors can only be guaranteed when using the cassettes and reagents specified in Chapter 3.3.
- The instruments may be operated only according to the instructions contained in this manual.

Any other use of the instrument is considered improper!

Instrument type

All information provided in this manual applies only to the instrument type indicated on the title page.

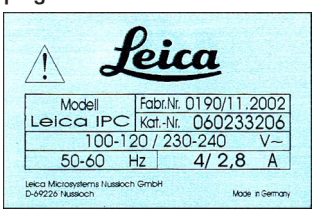


Fig. 1

A name plate indicating the instrument serial number is attached to the back of the instrument.

Qualification of personnel

- The Leica IP C may be operated only by trained laboratory personnel.
- All laboratory personnel designated to operate the Leica IP C must read this instruction manual carefully and must be familiar with all technical features of the instrument before attempting to operate the Leica IP C.

Make sure to comply with the safety instructions and warnings in this chapter.
Make sure to read these instructions, even if you are already familiar with the operation and use of other products.

2.1 Safety instructions

This instruction manual includes important instructions and information related to the operating safety and maintenance of the instrument.
It is an important part of the product, which must be read carefully prior to operating the instrument for the first time and must always be kept with the instrument.

If additional requirements on accident prevention and environmental protection exceeding the scope of this manual, are imposed by laws/ regulations of the country of operation, this instruction manual must be supplemented by appropriate instructions to ensure compliance with such requirements.

This instrument has been built and tested in accordance with the following safety regulations on IT equipment:

- EN 55022
- EN 55024
- EN 61000-3-2
- EN 61000-3-3
- EN 60950
- EN 60491
- EN 60598-2-9

In order to maintain this condition and to ensure safe operation, the operator must comply with the instructions and warnings contained in this instruction manual.

The protective devices on both instrument and accessories may neither be removed nor modified.
Only authorized and qualified service personnel may access and repair the internal components of the instrument.

2.2 Warnings

The safety devices installed in this instrument by the manufacturer only constitute the basis for accident prevention.
Primarily responsible for accident-free operation is above all the institution which owns the instrument and, in addition, the designated personnel who operates, services or repairs the instrument.
To ensure trouble-free operation of the instrument, make sure to comply with the following instructions and warnings.

Warnings - Transport and Installation

- Once unpacked, the instrument may be transported only in an upright position.
- Do not expose the instrument to direct light (window, lamps with strong light)!
- The instrument MUST be connected to an earthed mains power outlet socket.
  The instrument must not be connected to an extension cord without protective earth conductor.
- Do not operate the instrument in rooms with explosion hazard.
- Condensation water may form in the instrument, if there is an extreme difference in temperature between the warehouse and the installation site and if air humidity is high at the same time. In these cases, a waiting period of at least two hours must be observed before the instrument is switched on. Failure to adhere to this waiting period may result in damage to the instrument.

Warnings - Markings on the instrument itself

- Warning labels on the instrument marked with a warning triangle indicate that the correct operating instructions (as defined in this manual) must be followed when operating or replacing the item marked.
- Failure to adhere to these instructions may lead to accidents causing personal injury and/or damage to the instrument or accessories.

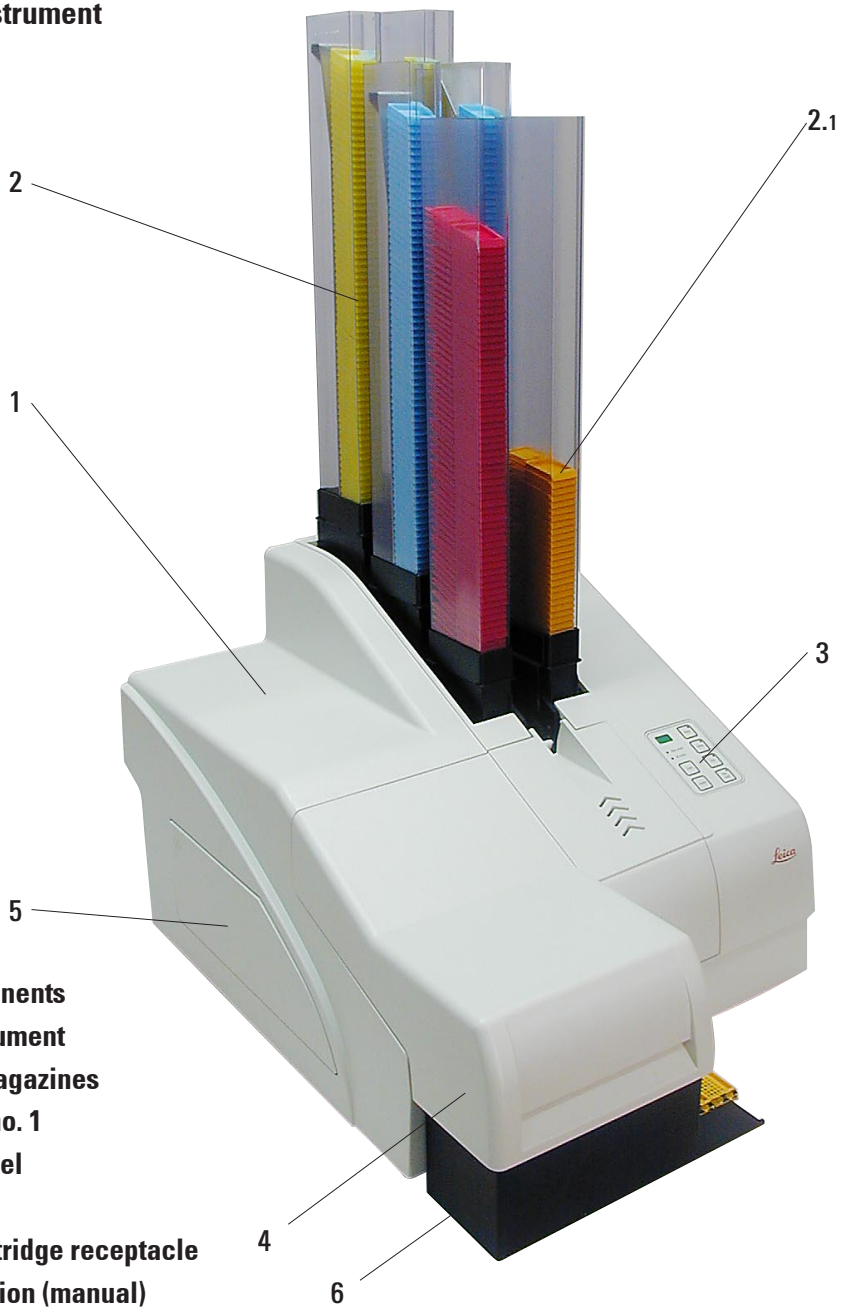
Warnings - Instrument operation

- The Leica IP C may only be operated by trained laboratory personnel, according to its designated use and as per the present instruction manual.
- In the event of an emergency, switch off the mains switch and unplug the instrument from mains.
- Do not touch the ramp during operation. Risk of injury.
- Do not open the reflector flap of the flashlight while the instrument is ON - risk of burns and blinding.

Warnings - Cleaning and maintenance

- Each time before cleaning, switch the instrument OFF and unplug from mains.
- Do not use alcohol, detergents containing alcohol (window cleaner!), abrasive cleaning powders and/or solvents containing acetone or xylene for cleaning.
  The painted surfaces and the control panel of the instrument are not resistent to xylene or acetone!
- Prevent liquids from entering the interior of the instrument while the instrument is being cleaned or during operation.

3.1 Overview - instrument



Overview
instrument components

1 - Basic instrument
2 - Cassette magazines
2.1 - Magazine no. 1
3 - Control panel
4 - Lid
5 - Cover - cartridge receptacle
6 - Unload station (manual)

Fig. 2

Front view without lid

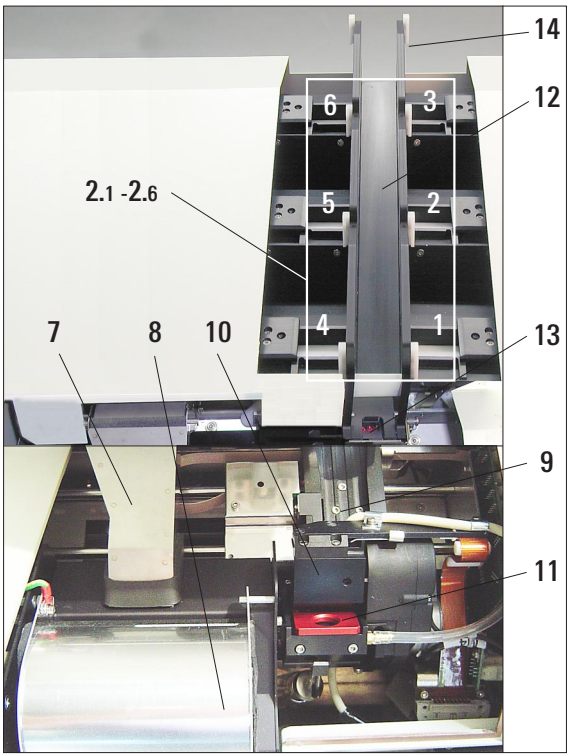


Fig. 3

2.1-2.6 - Magazine receptacles nos. 1 - 6
7 - Drying module
8 - Cover - flashtube
9 - Cassette carrier
10 - Print head
11 - Magazine holder
12 - Feeding chute with cover
13 - Transfer point: chute --> cassette carrier, with sensor
14 - Location plate
15 - External alarm jack
16 - Socket for printer cable

Rear panel and electrical connections

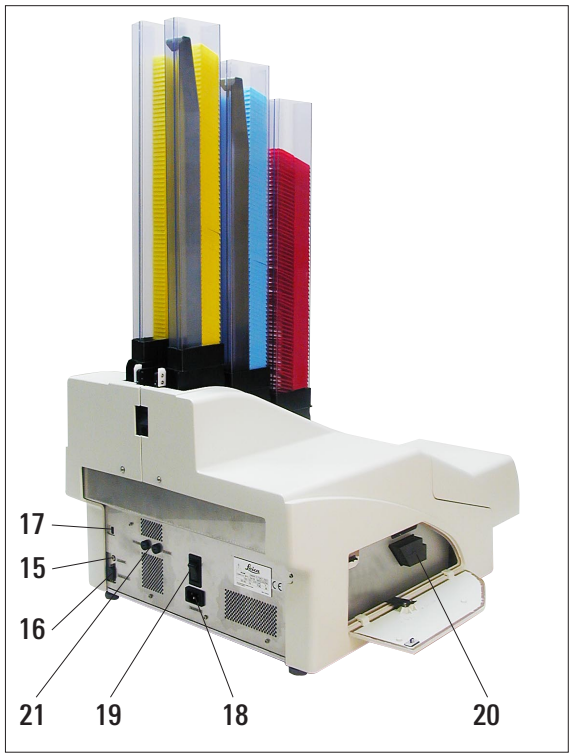


Fig. 4

17 - DIL - Switch
18 - Mains connection
19 - Mains switch
20 - Storage fluid cartridge
21 - Secondary fuses

Attention item pos. 20.
The instrument is delivered with the storage cartridge installed!
Prior to operation, the storage fluid cartridge must be exchanged for an ink cartridge - see chapter 4.9 !

3.2 Technical data

General

Admissions:	all instrument-specific admission labels are located at the rear panel of the instrument, next to the name plate
Nominal voltage:	100 V - 120 V +/- 10% 200 V - 240 V +/- 10%
Nominal frequency:	50 to 60 Hz
Maximum power draw at 100 - 120 V:	4.0 A
Maximum power draw at 200 - 240 V:	2.8 A
Leakage current at 240 V/ 50 Hz	approx. 2.4 mA
Maximum power draw:	480 VA
IEC 1010 classifications:	protective class 1 pollution degree 2 overvoltage installation category II: • 800 V impulse (120 V systems) • 1500 V impulse (240 V systems)
Secondary fuses:	2 x 3.15 A T (UL - listed)
Operating temperature range:	15 °C to 35 °C
Relative humidity:	10 % to 80 %, non-condensing

Dimensions and weight

Dimensions of basic instrument	
Width x Depth:	475 x 650 mm
Height - with magazine inserted:	895 mm
Dimensions with unload station connected	
Width x Depth:	548 x 650 mm
Height - with magazine inserted:	655 mm
Weight	
Basic instrument:- dry weight:	approx. 28 kg
Weight incl. packing material:	approx. 65 kg
Unload station - dry weight:	approx. 14 kg
Weight incl. packing material:	approx. 32 kg

Performance

Loading capacity:	up to 6 magazines, up to 80 cassettes per magazine
Printing speed [1]	
Batch job printing:	15 cassettes/minute
Single-cassette printing:	10 secs per cassette
Ink cartridge capacity [2]:	approx. 60.000 or 3.5 month
Flashtube lifespan:	approx. 150,000 flashes

Printing

Print resolution: [3]	360 x 360 dpi / 180 x 180 dpi, selectable
Imprintable objects:	standard histology cassettes, max. 28.9 x 80.0 mm (with lid) max. 6.2 mm high
Print formats:	cassette 35°, cassette 45°
Imprint surface:	cassette 35°: max. 28.2 x 8.0 mm cassette 45°: max. 28.2 x 7.1 mm

PC system requirements

IBM-compatible PC	
Processor frequency:	minimum 800 Mhz
Main memory (RAM):	minimum 256 MB
Hard drive:	minimum 6 GB
CD ROM drive	
1 free serial port	
Operating system:	Windows NT, Windows 2000, Windows XP

[1]) Average value - exact speed in each individual case depending on system configuration and software used.

[2]) Average value - exact number of cassettes in each individual case depending on quantity being imprinted and on density of imprint.

[3]) Measured in addressable dots per inch

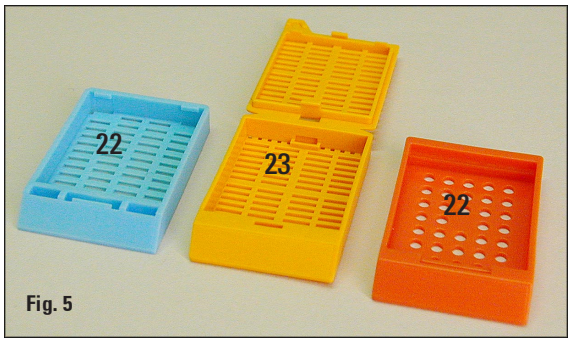


Fig. 5

3.3 Print specifications

Only standard histology cassettes, which are reliably guided in the magazines, can be used in the Leica IP C.

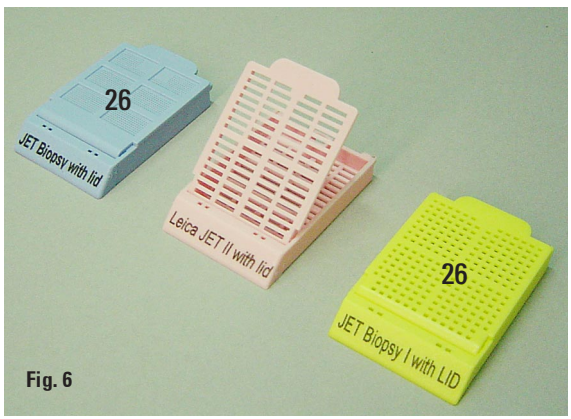


Fig. 6

3.3.1 Requirements for Cassettes

A wide variety of standard histology cassettes may be used in the IP C, however there are some restrictions.

- Suitable for printing are all standard cassettes without lids (**22**), of the following dimensions:

  Length x Width = max. 41.0 x 28.9 mm

  (see also technical specifications on page 11).
- Cassettes with lids attached have to be one-piece units (**23**); the lids must not just be linked to the body by a hinge (**25**).
- Cassettes with a flexible hinge can't be used unless the lid is detached or closed.
- Cassettes with closed lids must be checked to be certain that all four corners of the lid are firmly closed and flat.
- For details on how to correctly insert the cassettes into the magazines, please refer to chapter 4.7.

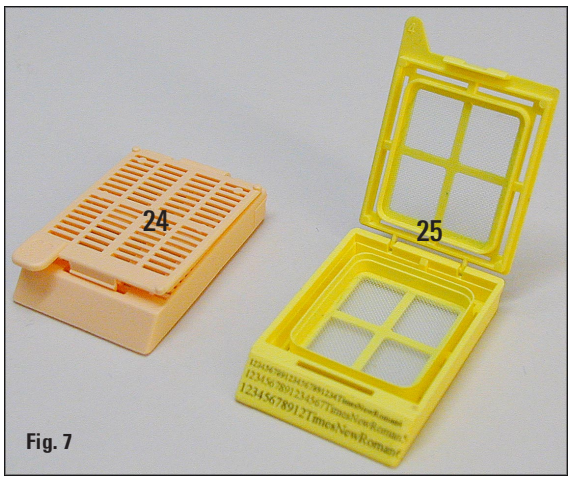


Fig. 7

Tested and recommended print media for the Leica IP C ink jet printer

IMPORTANT!
The use of other print media may result in unsatisfactory print quality and/or jamming of slides/cassettes during the printing process!
If the slides/cassettes you are currently using are not listed above, please contact your local Leica Microsystems' representative.

The following cassettes have been successfully tested with the Leica IP C.

Cassette type	Imprinting in Leica IP C	Cassette type	Imprinting in Leica IP C
Leica Jet I	without lid only	Simport M 480	ok
Leica Jet II	with closed lid only	Simport M 492	with closed lid only
Leica Jet III	with closed lid only	Simport M 493	with closed lid only
Leica Jet IV *	ok	Simport M 502	without lid only
Leica Jet V *	without lid only	Simport M 503	with closed lid only
Leica Jet Bx	with closed lid only	Simport M 505	ok
Leica Jet I Bx	with closed lid only	Simport M 506	without lid only
Leica Jet II Bx	ok	Simport M 507	with closed lid only
Leica Jet III Bx	ok		
Leica Jet IV Bx	ok		
Leica Jet V Bx *	ok		
SakuraTissue Tek MESH	without lid only		
Sakura Tissue Tek II	ok		
Sakura Tissue Tek III	ok		

***** Highly recommended, especially for printing 1 and 2 dimensional bar codes.
Distributed by many major lab supply companies.

Cassettes of other manufacturers must be tested before use. The test must include the following steps:
Mechanical compatibility with the instrument. Imprint quality.
Chemical and mechanical resistance of the imprints against the reagents used during the subsequent processing steps.
Important!
Leica Microsystems assumes no responsibility whatsoever for any damages suffered as a consequence of imprints of poor quality or imprints made with non-reagent-resistant ink.

3.3.2 Print specifications

Fig. 8

Printing area

The printing area parameters listed in the table below are defined in the printer driver.

	Width		Height	
Format	Dots	mm	Dots	mm
Cassette 35°	400	28.2	114	8.0
Cassette 45°	400	28.2	100	7.1

Printing area

There are two different cassette types, the difference between them being the width of the angle shown below (Fig. 9), which is either 35° or 45°. Depending on the width of the angle, the size of the imprintable surface is bigger or smaller.
This must be taken into account when selecting the printer settings (chapter 5.4).

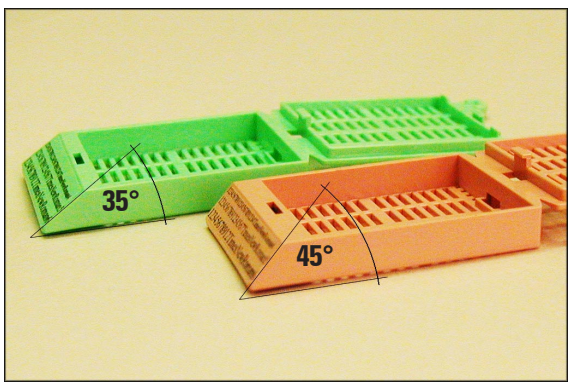


Fig. 9

Print resolution

The print head of the instrument has a preset resolution of 360 dpi in both directions (vertical and horizontal).

Each printed line has a maximum height of 128 dots corresponding to 9.03 mm.

In horizontal direction, the printable surface is limited only by the size of the object to be imprinted (Fig. 8).

The above values must be taken into consideration when defining the print area (“paper size“) in the application you are going to print from.

Print quality

Quality and resolution of the imprints depend on:

- the cassette material and the dyes used to color the cassette material.
- the surface finish of the cassette imprint field (**26**) .

The final resolution of the imprints is not determined only by the resolution of the print head.
If a cassette surface not capable of 360 dpi resolution is imprinted at 360 dpi, “running“ ink will lead to poor printing results. In such cases it is better to work at a lower resolution.
The printer driver allows you to change the resolution from 360 dpi to 180 dpi (see chapter 5.4 for further details).

3.3.3 Printing bar code

Printing readable bar code depends on various factors that need to be taken into consideration in order to achieve results suitable for reliable and durable archiving.

The main factors influencing the bar code results are:

- printer technology
- how the bar code is created
- the type of object being printed on
- the type of scanner used to read the bar code

Printer technology

- As a dot matrix printer, the IP C can handle information only in the form of dots printed or not printed. It is not possible to transmit bar code data or to select specific bar code types or use the printer to create and print the bar code required.

Creating bar codes

- Since there is only limited printing space on the cassettes, the bar code should not contain more information than necessary.
- You should use an error-checking code, which makes it easier for the bar codes scanners to recognize possible errors. Some codes even support error correction.
- When calculating and creating bar code, always bear in mind the resolution of the printer.
  The module size is the width of the smallest element of a bar code. Wider bars and spaces are calculated in multiples of the module size.
  The module size always has to be an entire divisor of the printer resolution, as, due to the technology applied, only 'whole' dots can be printed. Reading errors may occur (even if the print appears to be crisp and correct), if, due to conversion, module width and resolution do not match any longer.

Data should never be printed as bar code only, but also as text (line of optical characters above or below the bar code), to ensure that no information is lost for the above reasons.

Requirements for Barcode Printing

The quality and readability of printed barcodes will depend on several factors that include:

- Texture and quality of the print surface on the selected cassette or slide
- Color of the selected cassette or slide
- Bar code style
- Number and types of characters required in the barcode
- The quality and resolution capabilities of the bar code reader

As always, using Leica recommended print media would produce the highest quality print. However, it is highly recommended that any barcode solution be tested prior to implementation.
Please check with your local representative for details on achieving the maximum number of characters with 1D or 2D bar codes.

Bar code scanners

The scanning results obtained not only depend on the correct bar code creation and on the quality of the cassettes but also on the features of the barcode scanner used.

Features to bear in mind are:

- Reading tolerance:
  difference between actual bar width and nominal module size.
- Light color:
  the light color of the barcode scanner should be opposite (highly contrasting) to the color of the cassettes being used.
- Optical resolution:

  must be better than the module size.

Depending on the application, the following features should also be considered:

- Maximum readable distance
- Maximum inclination angle

Leica has tested successfully the following readers:

Datalogic - Model 'Gryphon' (for 1D-Barcode)

Datalogic - Model 'Lynx D 200' (for 1D and 2D-Barcode)

3.3.4 Resistance against reagents

Important!
All laboratories must perform their own tests to ensure that the ink is resistant against the various reagents the cassettes will subsequently be exposed to.
A wide range of factors beyond Leica's control can have negative effects on the results.
The test conditions stated below can therefore only serve as an outline for individual laboratory test specifications.
The laboratory operating the unit shall bear full responsibility for the legibility of the imprint after processing with reagents.

Test conditions

Imprinted cassettes were tested with a variety of reagents in an environment simulating the conditions present during tissue processing.

The following cassette types were tested:

- Leica Jet with/without lid
- Simport Type M with/without lid
- Tissue Tek II without lid
- Tissue Tek III with lid

A variety of colors of all of the above cassette types (although not all colors available of each cassette type) were tested.

An influence of the cassette color on the resistance of the imprint could not be verified.

It cannot be guaranteed that the ink will be absolutely smudge-proof under all foreseeable laboratory conditions, as stability of the ink against wiping largely depends on the surface structure of the imprint field of the cassettes being imprinted.

Important!
The imprint field of imprinted cassettes should never be touched or wiped while damp.

Take care when removing excess paraffin from cassettes. Scraping may damage the imprint field, making the print illegible.

4.1 Site requirements

The installation site must be well-ventilated.
The instrument must not be operated in areas at risk of explosion.

- The Leica IP C needs approx. 650 x 500 mm floor space. The printer needs approximately 20 cm (8") of free space around all sides of the instrument.

  Additional space is required for the PC containing the control software.
- Stable laboratory bench and practically vibration-free floor.
- Stable ambient temperature between +10 °C and +35 °C.
- Relative air humidity of maximum 80 %, non-condensing.
- Avoid vibrations, bright direct light and strong temperature fluctuations.
- The AC socket must be close to the printer and easily accessible.

4.2 Installing the printer

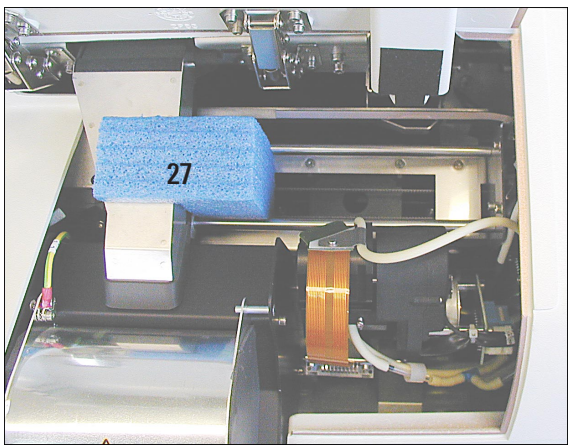


Fig. 10

Carefully pull out the blue transport safeguard (**27**) that protects the print head during transport. Carefully remove any adhesive tape remnants.

When unpacking the printer, at least two people (one person on each side of the printer) are required to lift the printer out of the box and place it onto the laboratory bench.

- Check the instrument for transport damage.
- Check all accessories delivered against your order to make sure there are no discrepancies.
- Remove the transport safety device (**27**, Fig. 10) from the instrument.
- Carry out the following installation steps:
  - Insert the shielding glass
  - Insert the flashtube (see page 22).
  - Connect to mains.
  - Remove storage fluid cartridge with ink cartridge.
  - Establish data connection to PC.
  - Install printer driver.
  - Fill with cassettes.
  - Run a test print (see page 29).

4.3 Standard delivery - packing list

The Leica IP C standard delivery consists of the following items:

1 Leica IP C, basic instrument without unload station	0602 33206
1 Storage fluid cartridge (in the instrument)	0601 35811
1 Ink cartridge Leica	0601 42350
1 Entnahmestation (manuell), kpl.	0602 35998
1 Accessory-Kit consisting off:	0602 38351
1 Flash tube	0601 37152
6 Set of magazines for cassettes, 2 packs at 3 magazines each	0602 36688
1 Set of power cords:	
1 Power cord "UK" ST/BU F-5A	0411 36959
1 Power cord "D"	0411 36958
1 Power cord "USA-C-J"	0411 36960
1 Printer cable, serial	0601 37044
1 Tool set:	
1 Screw driver 3 x 50	0170 11568
1 Allen key size 2.5	0222 04137
1 Brush “Leica“	0183 30751
1 Set of replacement fuses:	
2 Fuses 3.15 A T	6943 03150
1 Protecting block (in the instrument)	0601 39615
2 shielding glass	0601 42533
1 Cleaning swabs, pack of 25	0601 39637
1 IP CD ROM (printer driver and documentation,instruction manual)	0601 37173

Optionales Zubehör:

• Automated multi-level cassette unload station (for Leica IP C)	0602 33226
• Set of cassette trays for automated unload station (pack of 10)	0602 33253
• Magazine holder ”C” for 6 magazines	0602 36946

4.4 Installing the manual unload station

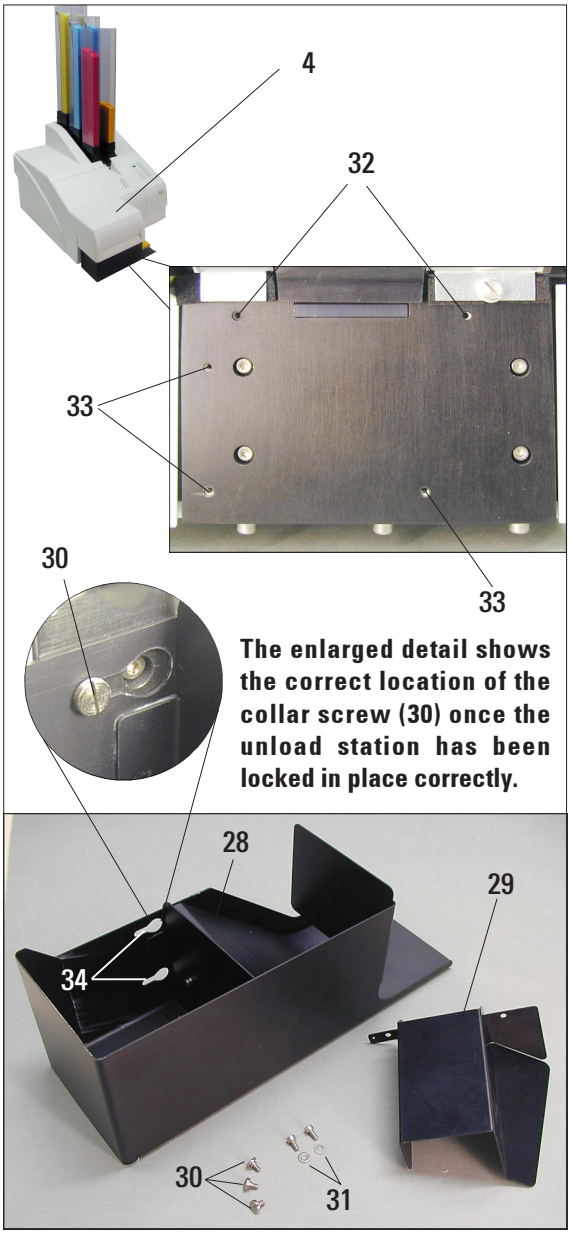


Fig. 11

The unload station supplied consists of:

28 - Unload station

29 - Shielding cover

30 - Collar screws (3 pcs.)

31 - Slotted screws with washers (2 pcs.)

Install as follows (see):

- Open lid (**4**).
- There are 5 tapped holes (2 x item no. **32** and 3 x item no. **33**) in the installation surface located below the reflector.
- With a screwdriver, insert 3 collar screws (**30**) in tapped holes (**33**) as far as they will go.
- Then, fasten cover (**29**) in tapped holes (**32**) using the two slotted screws (and washers) (**31**).
- To fasten the unload station to the instrument, place the wider end of the three oblong holes (**34**) over the heads of the three collar screws (**30**). Press the unload station against the installation surface, pushing it simultaneously to the right until it locks in place (see enlarged detail).
  If the unload station does not easily slide past the shielding cover, slightly lift the front end of the device.
- Close lid (**4**) - make sure the unload station does not obstruct the lid.

4.5 **Automated unload station** (optional)

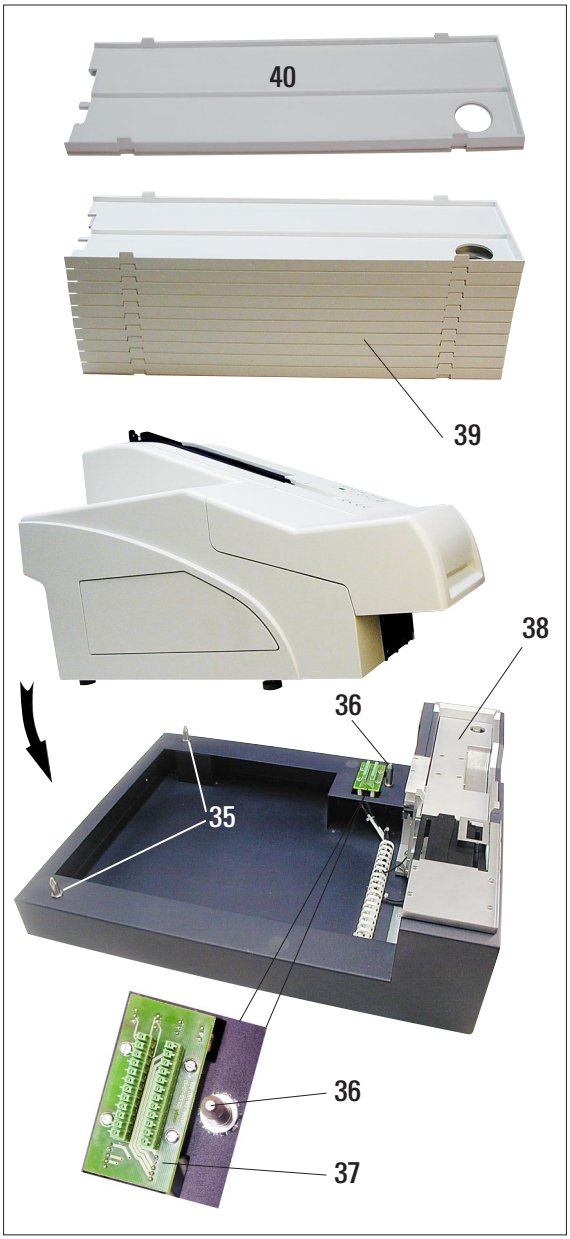


Fig. 12

Optionally available for the printer is an automated multi-level cassette unload station, where the imprinted cassettes are collected on individually removable and stackable trays (**40**).

The multi-cassette unload station comes complete with 10 trays, all of which can be inserted simultaneously. Each tray holds up to 10 cassettes.

Installing the multi-cassette unload station:

- Unpack the unload station and place it on a stable laboratory bench at the installation site.

Important!
Priot to installation, the printer must be switched off and unplugged from mains.
The manual unload station (chapter 4.4) and the collar screws (30 in Fig. 11) must be removed prior to placing the printer onto the automated unload station.

- Place the instrument onto the unload station. **2 persons are required to do this!**
- Hold the printer on both sides (right and left) and first insert the two rear bolts (**35,** Fig. 12) of the unload station into the openings in the base plate of the printer.
  Then carefully lower the front part of the printer unto the third bolt (**36**) so that the plug connection (**37**) locks into place in the printer base plate and the printer remains securely fastened on the unload station.
- Place the stack of trays (**39**) onto the lifting table (**38**) of the automated unload station. See chapter 5.2, p. 37 for details on the lifting table controls.

4.6 Installing/exchanging the flashtube

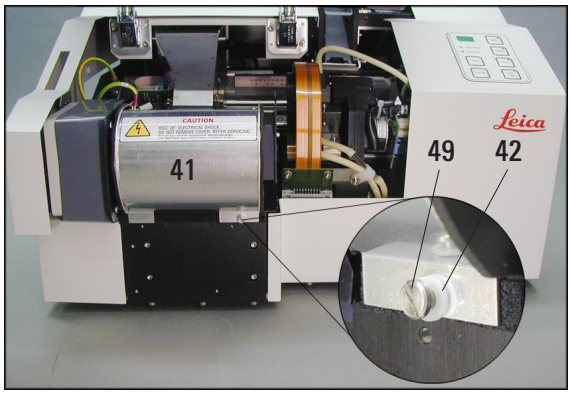


Fig. 13

Removing the old flashtube

Switch the instrument off and unplug it from mains.Allow the flashtube to cool before removing it. Do not handle the flash tube with bare hands. Use a glove or tissue.

- Open the lid (**4**, Fig. 2) to gain access to the reflector.
- Remove screw (**49**) (use screwdriver supplied as part of tool set). - Mind the washer (**42**).

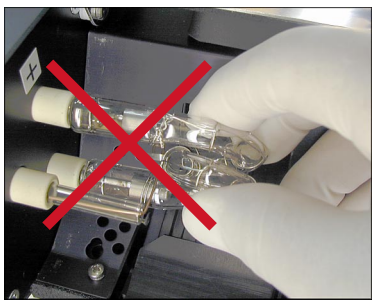


Fig. 14

Caution!

To insert / remove, hold the flashtube as shown in Fig. 15 (right). Do not take hold of the sides of the flashtube or compress it as shown in Fig. 14 (risk of splintering) .

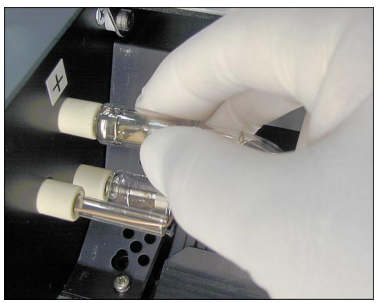


Fig. 15

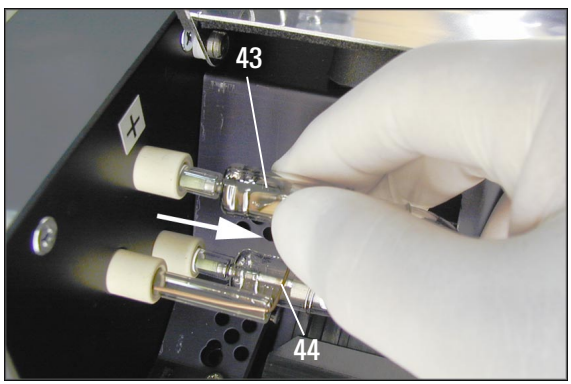


Fig. 16

- Swing the reflector (**41**) upwards.
- Carefully pull out the old flashtube (**43**) straight to the right, do not twist it. If the flashtube cannot be pulled out easily, gently rock it back and forth to get it unseated from the socket.
- Make sure the contact spring (**44**) is removed from the priming wire (**45**) of the lamp. (See also Fig. 17 and 20).

Inserting the new flash tube

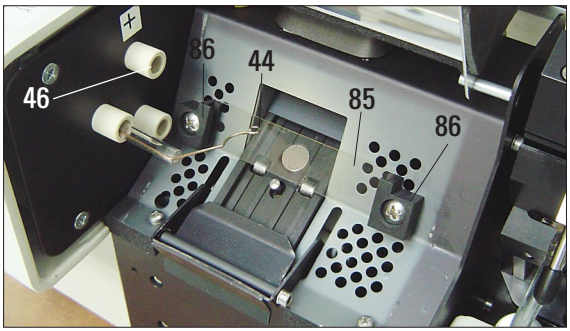


Fig. 17

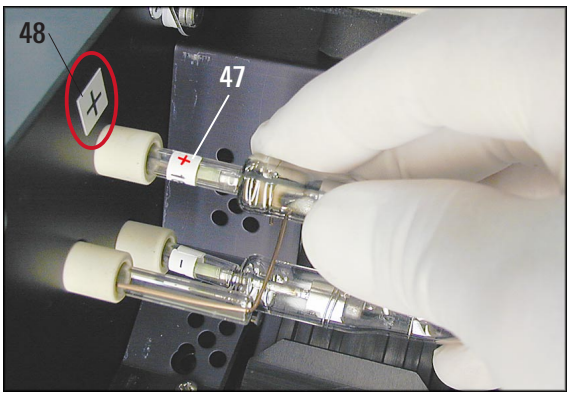


Fig. 19

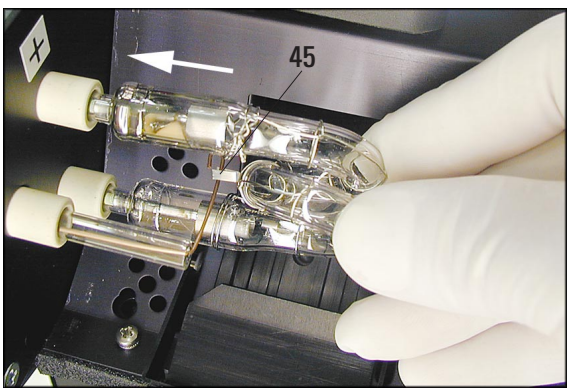


Fig. 20

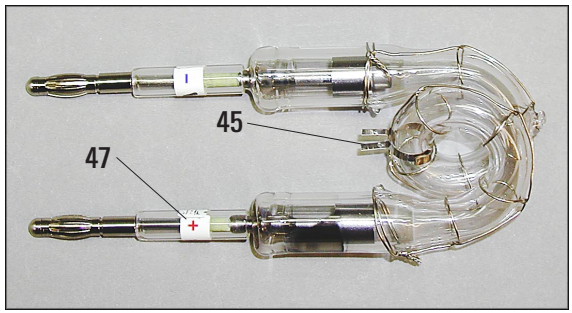


Fig. 18

- Insert the shielding glass (**85**) in the two holders (**86**) (Fig. 17).
- Insert the new flashtube into socket (**46**) (Fig. 19); then push it carefully inwards as far as it will go (Fig. 20) (the polarity marker (+) (**47**) must not be visible any longer). If necessary, move flashtube gently up and down.
- Important!
  Make sure that the new flashtube is inserted correctly – the lamp electrode (**47**) marked with a **+** must be inserted into the socket (**46**) that bears the same mark (**48**) (Fig. 19).

Caution!
If the lamp electrodes are inserted the wrong way, the flashtube will still work, but will wear out and break much faster.

- Once the flashtube has been inserted, contact spring (**44**) must sit close to the priming wire (**45**) of the lamp.
- Swing the reflector downwards. Reinsert and retighten screw (**49**).
- Close lid (**4**) of the instrument again.

4.7 Filling and inserting the magazines

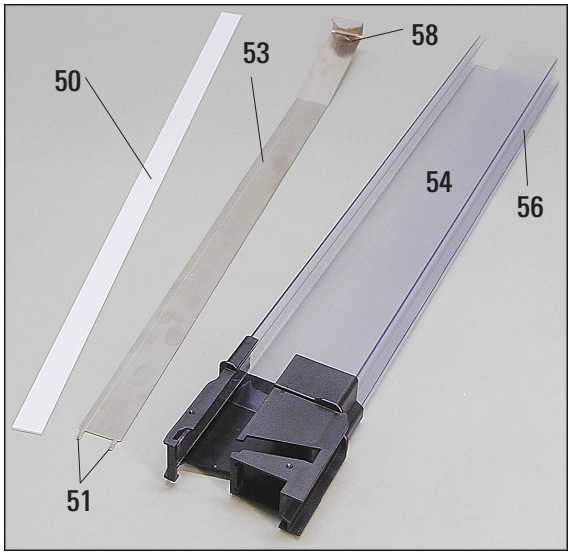


Fig. 21

Metal strip

Insert the metal strip (**53**) so that angled end (**58**) of the metal strip fits against rear wall (**56**) of the magazine (**54**) and the two pins (**51**) lock into the slots (**52**) in the base of the magazine.

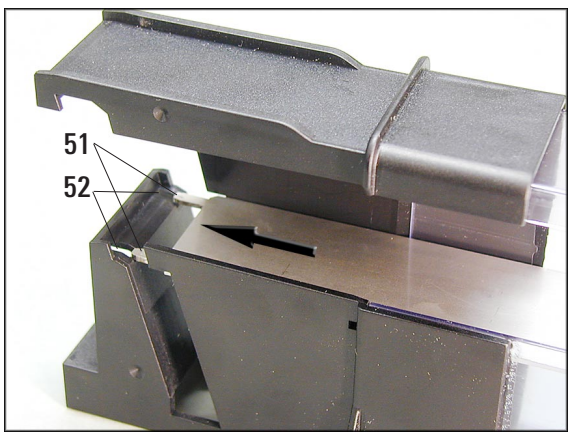


Fig. 22

Inserting the strips

Depending on the type of cassette used, additional inserts must be placed into the magazine (**54**) to guide the cassettes properly:

531 - Metal strip

50 - Plastic strip, adhesive (2 mm thick)

The table below shows which type of cassette works best with which type of insert.

Cassette type	Additional insert
Leica JET cassette without lid	Metal strip
Tissue Tek II without lid (US Versions also)	Metal strip + plastic strip in front
Tissue Tek III with lid	Without any insert
Tissue Tek III (US) with lid	Plastic strip in front
Tissue Tek III (US) 35° with lid	Without any insert
Simport (M505, M506) with lid	Plastic strip in front
Simport without lid	Metal strip

When using other cassette types, try both inserts to determine what works best.

Attaching the 2-mm plastic strip (50)

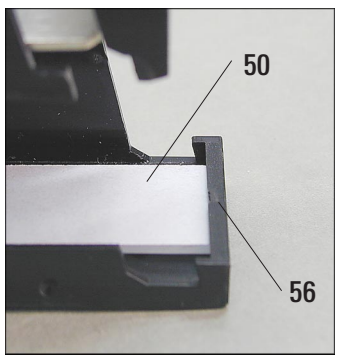


Fig. 23

Remove protective foil and attach plastic strip in magazine so that it is centered in the front part of the magazine and fits against the bottom (**55**) of the magazine.

Filling and inserting the magazines

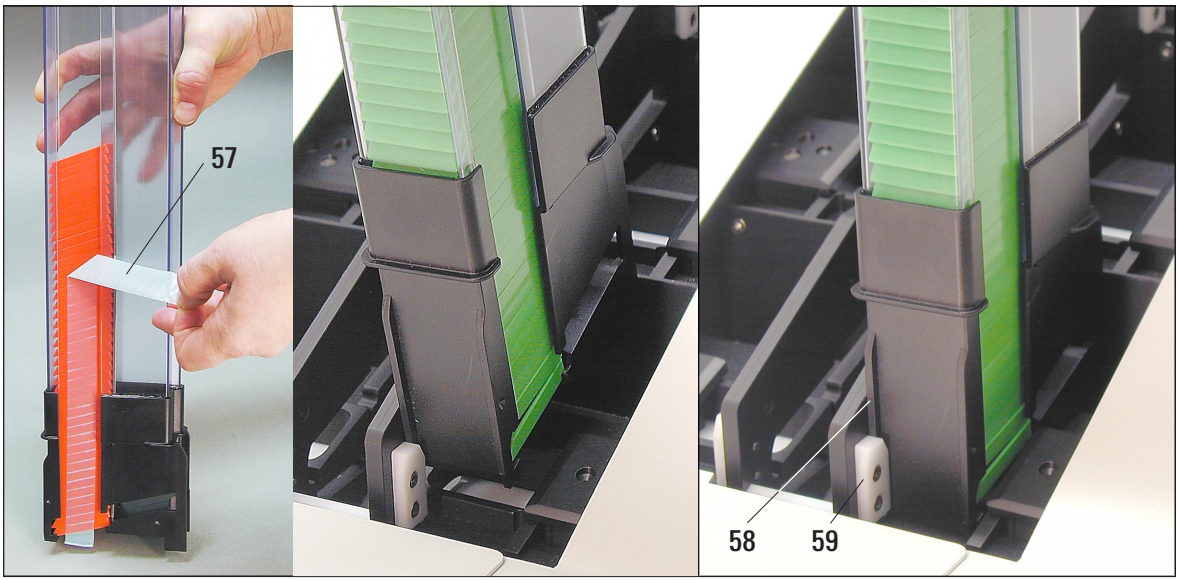


Fig. 24

- If cassettes are individually loaded, be certain that they are aligned properly and that there are no gaps between the cassettes.
- If taped cassettes are used, be certain that a newly added stack aligns properly against previously loaded cassettes.
  Remove the tape(**57**) **from top to bottom**.

Depending on the type of cassettes, each magazine holds up to 80 cassettes.

- Insert the filled magazine (**54**) into printer as shown in the center picture, and fit it into the holder.
- Tilt the magazine backwards as far as it will go, then firmly push the magazine downwards. Guide rail (**58**) must lock into holder (**59**).
- Insert the remaining magazines the same way.

Important note!
Only the cassette types listed in the table on page 24 have been tested with the Leica IP C.
Leica does not guarantee that cassette types other than those tested can be processed in the instrument.

4.8 Electrical connection

The instrument MUST be connected to a grounded mains socket.
Of the set of power cords supplied, be sure to use only the one that is appropriate for the local power supply (plug must fit on-site wall outlet).

Instrument rear panel
Electrical connections

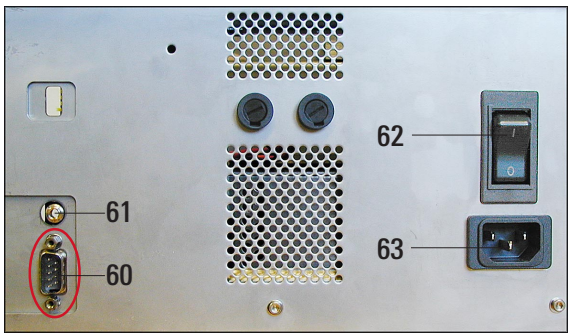


Fig. 25

Setting up the data connection

- To use the printer, a serial data cable is required (part of standard delivery).

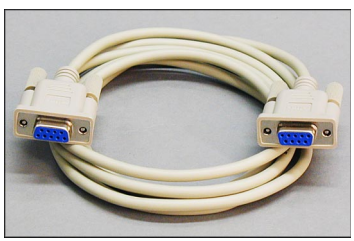


Fig. 26

- Connect the cable to printer port (**60**).
- Connect the cable to one of the serial ports (COM 1, COM 2) of the computer containing the control software.

Connecting to mains

- Make sure the printer is switched **OFF** - mains switch (**62**) in position "**0**" = **OFF**.
- Insert the correct power cord into into the mains input socket (**63**).
- Switch on mains switch (**62**) (switch to position "**I**"= ON).

Once switched on for the first time, the mains switch (62) should always remain in position "I" = ON .

Connecting a remote alarm device

- If required, connect the external alarm system (optional) to jack (**61**).
- The remote alarm device is connected to the printer via a 3.5 mm-diameter jack connector (optional accessory).
- For details about the remote alarm see chapter 5.3.

Any device that is connected to any one of the instrument interfaces must have been tested in accordance with EN 60950 and must satisfy the requirements for SELV circuits.

4.9 Exchanging the cartridge

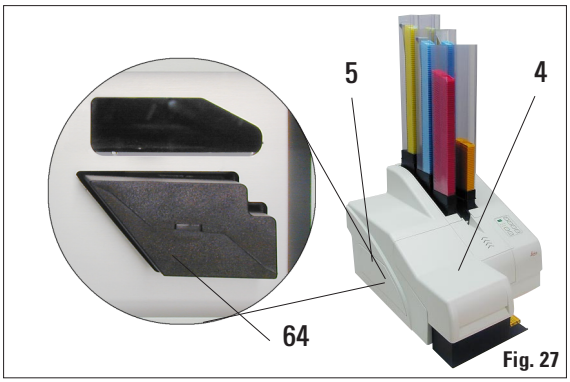


Fig. 27

Fig. 28

Fig. 29

The Storage Cartridge should only be used if the instrument will not be used for a period of one month or longer, if the instrument is being moved from one location to another or if the main power switch will be turned off for 6 hours or longer.

The printer is delivered with the storage fluid cartridge inserted. To be able to print, the storage cartridge must be exchanged for an ink cartridge.

To do so, proceed as follows:

- Switch on the instrument mains switch located at the back panel (see (**62**) in Fig. 28)
- Open the cover plate (**5**) on the left side of the instrument (pressing its top left corner).
- Pull out storage fluid cartridge (**64**) located at the left of the instrument.

When a cartridge is being pulled out, a sensor in the cartridge slot automatically starts the software routine for changing from storage fluid to ink and vice versa.

- All functions are disabled, in order to ensure that no air is drawn into the ink system. The indicator **LED** "Ink Empty" lights up and remains **ON**.

Ink empty

Be sure to always store used cartridges in a horizontal position and in a sealed container to prevent leaks!

- Insert a new ink cartridge (**65**) (one ink cartridge is part of standard delivery) and push it fully home (limit stop).
- Reclose the cover plate (**5**).
  The coverplate must close easily - otherwise, the ink cartridge is not inserted correctly.

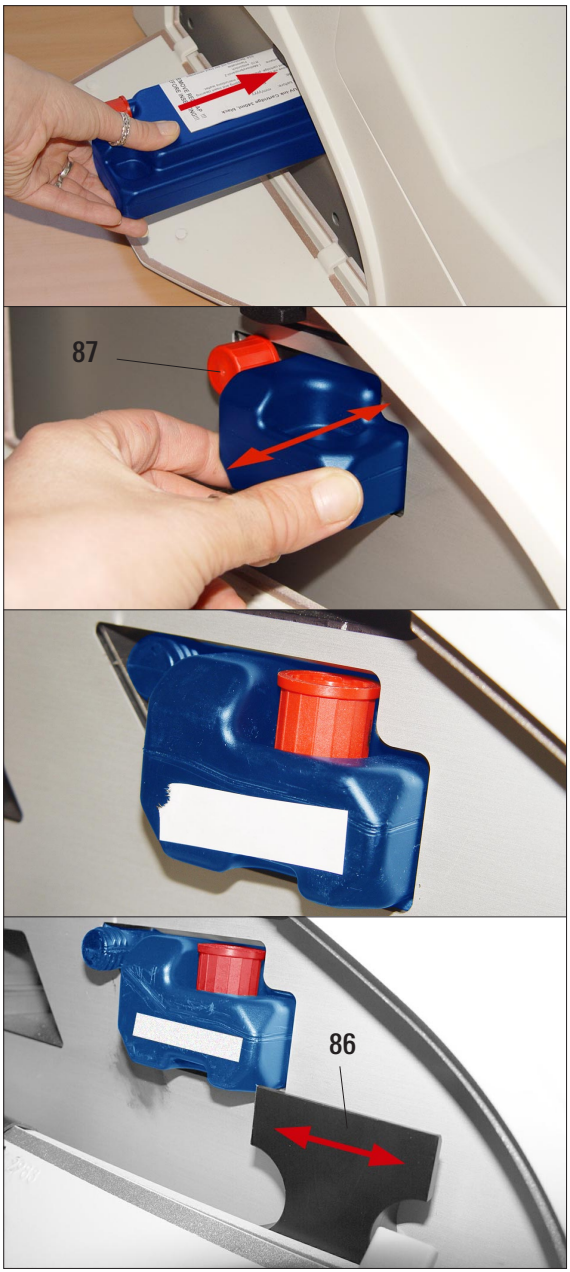


Fig. 30

- Insert the cartridge into the receptacle located behind the cover on the left side of the printer. Loosen the red screw-on cap one full turn but do **not yet** remove it.
- Insert the cartridge completely into the receptacle applying moderate pressure. You have to use a certain amount of force to pierce the seals.
- Withdraw the cartridge by about 1 ½ inch (30 mm) and push it back in as far as it will go, repeat this step three times.
- Unscrew the red cap completely from the nozzle of the cartridge and store the screw-on cap in the groove indented into the cartridge for that purpose.

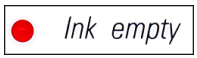
Important!
Prior to each transport, the cap must be screwed onto the nozzle to prevent the ink from spilling.

- Directly next to the cartridge receptacle is a safety catch. To ensure safe operation of the printer, slide the safety catch sidewise in front of the cartridge to prevent the cartridge from sliding out of the receptacle.

This step is very important to ensure safe operation of the printer!

- If your particular instrument is not equipped witha safety catch, look for it in the accessories kit.

  Before installing the cartridge, you need to install the safety catch, in unbolted position.
- If there is no safety catch in your printer nor is it included in the accessories kit, please contact your sales representative.



- The sensor in the cartridge slot recognizes the presence of a new cartridge.

- The indicator **LED** "Ink Empty" goes out, code '**88**' appears in the display.

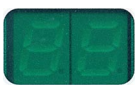
At this point, the instrument has to be "told" which type of cartridge has been inserted.

There are three options:

1. **New ink cartridge:**
   Press **LOADED** - the printer sets the ink level meter to 'full'.

2. **Used ink cartridge:**
   Press **ERROR** - the printer resumes measuring at the ink level where it previously left off.

3. **Used or new storage fluid cartridge:**
   Press the key **CLEAN** - the current ink level is stored.



- After one of the three buttons has been pressed, the ink exchange software routine starts; air is evacuated from the hoses and the system is refilled with liquid.
- Display indication '**88**' is extinguished once the ink exchange has been completed.

Running a test print

- Run a test print to verify whether the printing head works correctly.
- For that purpose, fill some cassettes into a magazine and insert the magazine into magazine position 1.

- Press and hold the **CLEAN** button until '**00**' is displayed - then release the button. A cassette is imprinted with a test image stored in the printer for that purpose. If the print result is not satisfactory, this step can be repeated several times.

4.10 Installing the printer driver

This printer driver only runs under the operating systems Microsoft Windows NT 4.0, Windows 2000 and Windows XP. The description below refers to the installation of the driver under Windows NT. Any steps that need to be carried out in a different way when installing under other Windows versions are also explained below.
"Microsoft", "Windows NT", "Windows 2000" and "Windows XP" are registered trademarks of Microsoft Corporation.
For successful installation of the printer driver, you need to log in at a level where you have full access to all printer settings.

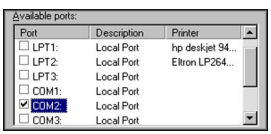
Starting installation:

1. Access the printer folder:
   START --> SETTINGS --> PRINTERS
2. Double-click on **ADD PRINTER**, the **ADD PRINTER WIZARD**, guiding you through all further installation steps, is started.

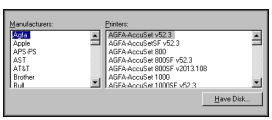
Printer installation wizard

1. The printer is controlled by the computer to which it is connected - therefore, tick the check box **MY COMPUTER**.

2. Insert the correct information - according to your current system - in the dialog boxes that follow. Click **NEXT** to move on to the next dialog box.

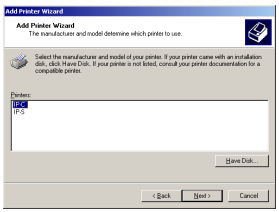


3. In the next dialog box, a serial interface (COM 1, ...) must be selected, as the printer only works with RS 232 interfaces. **Do not** select a parallel printer port (LPT ...)!



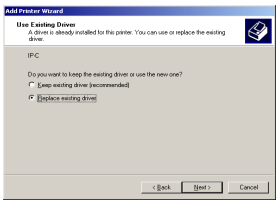
4. Next, select the printer manufacturer and model. Click on **HAVE DISK** to access the **INSTALL FROM DISK** dialog box.

5. Insert the CD containing the printer driver (part of standard delivery) into the CD-ROM drive and enter the following path in the input field:
   `X:\IP_Driver\IP_C\English` - click **OK** to confirm.
   '`X`' is to be replaced by the letter corresponding to the drive containing the CD.

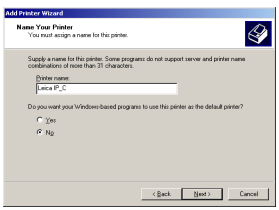


6. In the dialog box, select **PRINTER** IP-C (highlighted in blue color).

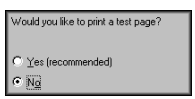
If no (or other) selectable options are displayed, click on "HAVE DISK" to return to the previous dialog box and repeat insertion of the path.



7. If the message shown on the left is displayed, the driver has already been installed on your PC on a previous occasion (e.g. interrupted installation or update).
In this case, be sure to select **REPLACE EXISTING DRIVER**.



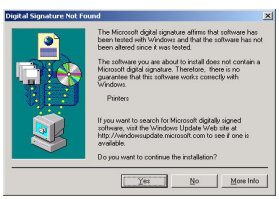
8. In the **PRINTER DEVICE NAME** box, you can insert any printer name you wish - the printer name you insert will subsequently be displayed in the printer folder and in the **PRINT** menu of all Windows applications.
To avoid erroneous printouts, select **NO** when asked whether you want to use this printer as the default printer.



9. Two more on-screen prompts will be displayed:

- When prompted whether you wish to share the printer in a network, select --> **NOT SHARED,** if the printer is used on a local host.
- When prompted whether you would like to print a test page, select --> **NO**.

10. Click **FINISH** to complete the installation of the printer driver. The printer name selected in step **8** (see above) will displayed in the printer folder and in all print menus.



When installing under Windows 2000 or Windows XP, at this point the message "DIGITAL SIGNATURE NOT FOUND" will be displayed. This message is displayed simply to inform you that the printer driver has not yet been certified by Microsoft. BE SURE to click YES to continue installing.

11. Finish installation by restarting your computer.

Configuring the serial port:

1. Open the printer folder:
   START --> SETTINGS --> PRINTERS
2. Right-click on the icon of the newly installed printer, a quick menu opens up.
   Click on **PROPERTIES**.
3. The **PROPERTIES** dialog box contains several tabs - select the **PORTS** tab.

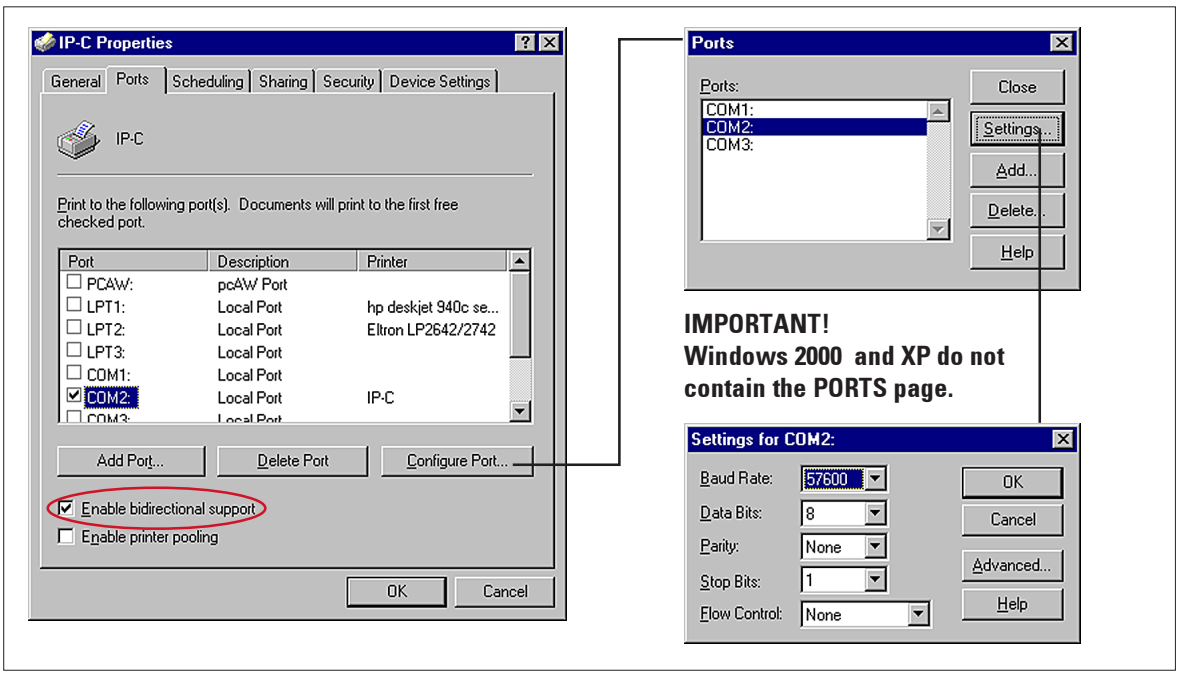


Fig. 31

4. The port selected during installation (COM 2 in the example here) must be highlighted. Tick the check box **ENABLE BIDIRECTIONAL SUPPORT**.
5. Click on **CONFIGURE PORT** to open the **PORTS** dialog box. Select the corresponding port and click on **SETTINGS**. The **SETTINGS FOR ...** dialog box opens up. Set **BAUD RATE** to 57600. Leave all other settings as shown in Fig. 31.

5.1 Control panel functions

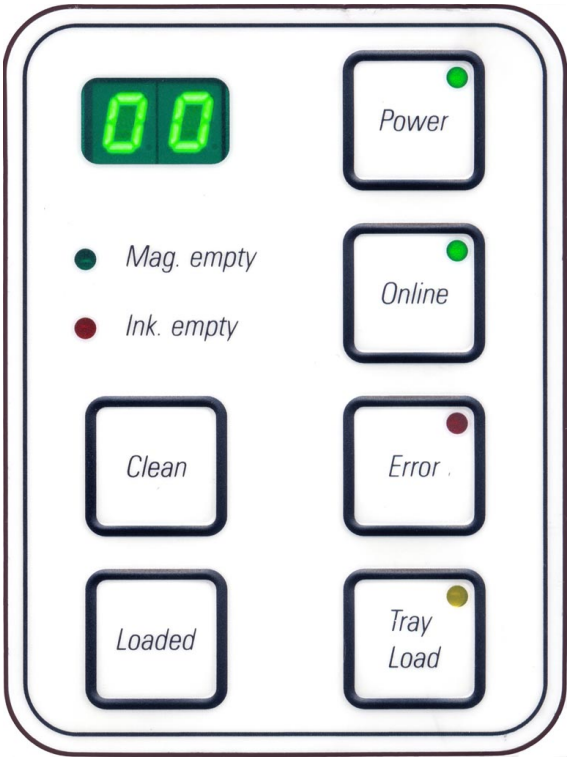


Fig. 32

INK EMPTY LED

Ink empty

LED off:

Sufficient quantity of ink remaining - printing is possible without any restrictions.

LED flashes:

Ink cartridge will be empty shortly - keep replacement cartridge handy.

LED illuminates:

Ink cartridge empty, no further printing possible.

The control panel

- consists of a membrane keyboard with six pressure-sensitive keys (four of them with an **LED**), two **LED** displays and a two-figure seven-segment display.
- controls the printer functions and the print jobs that are defined via the control software.
- indicates current printer status and processes in progress.
- indicates errors and / or error messages.
- controls the (optional) automated multilevel cassette unload station.

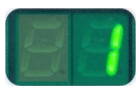
MAG. EMPTY LED

Mag. empty

LED off:

Magazines are full or up to that point no further cassette has been requested from a magazine that has just been emptied.

LED flashes: Mag. empty



Flashing **LED** and number on display indicate which magazine is empty.

If several magazines are emptied at the same time, the corresponding magazine numbers are indicated in a recurring sequence.

After refilling the magazine, **LOADED** must be pressed to inform the printer that the magazine has been refilled.

The printer will resume the interrupted print job where previously left off.

POWER

Switching from POWER ON to STANDBY mode and back

LED on – **POWER ON** mode:

- Power is supplied to all printer systems.
- The flash mains power supply is continuously being recharged.
- The printer is ready to print immediately.

LED flashes – **STANDBY** mode:

- All power absorbers of the printer are switched off, with the exception of those related directly to the processor (power saving mode).
- The printer performs a print head clean at regular intervals (e.g. 4 times a day). For that purpose it switches into **POWER ON** mode for a short period of time.

LED off – Printer disconnected from mains

Printing is possible in POWER ON mode only.
To activate POWER ON with the printer being in STANDBY mode, press POWER. - POWER ON will be activated via the PC interface.
If no print job is received within a certain period of time, the printer automatically switches over to STANDBY mode.
After switching from STANDBY mode to POWER ON mode, there will be a reduced print throughput until all systems have reached their proper operating temperature.

LOADED

To confirm a magazine exchange

Pressing **LOADED** briefly:

Informs the printer that an empty magazine has been refilled and put back into place. (Or, e.g., that a magazine has been removed and replaced by another one containing cassettes of a different color).

Pressing and holding **LOADED** for approx. 10 secs in off-line mode:

Informs the printer that a cartridge has been exchanged.
(see also chapter 4.9 'Exchanging the cartridge').

ON-LINE

Interrupting a print job in progress

LED 'On-line' on:
Printer is ready and waiting for new a print job.

LED 'On-line' flashing:
A data transmission is in progress or a print job is being carried out.

- Pressing **On-line** while a print job is in progress interrupts printing. The on-line LED goes out.
  At that point the printer can be accessed e.g. to remove a half-empty magazine and refill it).
- To resume the previously interrupted print job, press **On-line** again.
  The On-line LED goes back on or - if there are still print jobs that have not been completed - the LED starts flashing.

LED 'On-line' off:
No data transmission in progress. Either no print job is in progress or a print job in progress has been temporarily interrupted.

ERROR

To acknowledge an error code being displayed.

LED 'Error'

LED flashing:
An error has occurred.
The corresponding error message is being displayed.

If **ERROR** is pressed after having eliminated the source of an error and after all obstacles in the processing areas have been removed, the printer resumes normal operation and the error indication disappears.
If several errors occur simultaneously, the highest priority error code is displayed first. After that error has been acknowledged by pressing **ERROR** , the second highest priority error code is displayed and so on.

CLEAN

Cleaning the print head and carrying out a print test

Pressing CLEAN briefly

While a print job is in progress:

- The print job is interrupted. Code "**00**" is displayed for about 2 seconds.
- A print head clean is carried out and subsequently the print job is resumed.

If no print job is in progress:

- A print head clean is performed immediately after "**00**" has been displayed.

Pressing the CLEAN button briefly and then releasing it starts a print head clean (indicated by '00' being displayed). The total duration of the cleaning procedure can be extended to 10 seconds, if CLEAN is pressed once more as soon as '00' is displayed. Hold CLEAN for as long you wish to continue cleaning (max. duration = 10 sec).

Pressing CLEAN for a longer period of time (minimum 3 seconds)

While a print job is in progress:

- The print job is interrupted. Printer switches to off-line mode. "**00**" will appear in the display for about 2 s.
- A print head clean is performed and subsequently a test print is carried out on the cassette currently being processed. The printer then remains in off-line mode to enable the user to verify the print quality before resuming the current print job.
  If necessary, an additional clean can be performed.
- To resume printing, press **On-line** to return to on-line mode.
- The print job is resumed where previously left off.

If no print job is in progress:

- The printer switches to Off-line mode.
- All steps are performed as described above.

When operating continuously, the printer pauses regularly for intermediate print head cleans.
Printing is interrupted for approximately 10 seconds, after which time the instrument automatically resumes operation.

TRAY LOAD

If your printer is not equipped with an automated unload station, no function is assigned to this button!

Fig. 33

Function:

- The imprinted cassettes are pushed out of the printer and onto the uppermost tray.
- At the right end of each tray there is a sensor (**66**), which triggers a signal when covered (Fig. 35). The tray stack is then moved upwards by one tray.
- Once all trays are full, the instrument emits an acoustic signal (beep), the **LED** in the **TRAY LOAD** button starts blinking, the stack of trays can be removed.

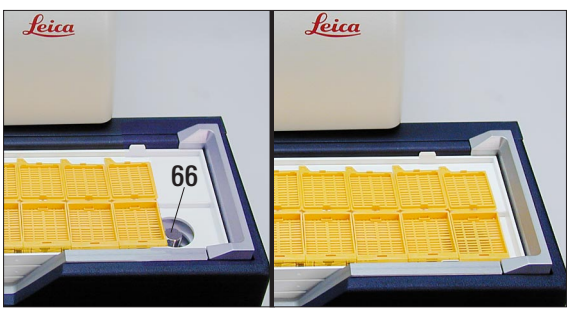


Fig. 34

Controls the movement of the lifting table of the automated unload station (optional)

Place a stack of trays (**39**) onto the lifting table of the unload station (Fig. 33).
Any number of trays between 1 and 10 can be inserted, as the printer counts the trays when they are inserted.
Once the lifting table has reached its upper limit position, the **LED** in the button starts blinking.

Press and hold **TRAY LOAD** longer than 1 sec:

- The tray stack moves completely into the unload station, the **LED** in the button goes off, the printer switches to **ONLINE** mode.
- Pending print jobs will be carried out.

If **TRAY LOAD** is pressed briefly when the stack of trays has moved into the unload station completely or partly:

- the stack of trays moves up by one tray.

If **TRAY LOAD** is pressed and held longer than one second when the stack of trays has moved into the unload station completely or partly:

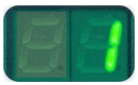
- The stack of trays moves completely out of the unload station, the **LED** in the button starts flashing. Any print job in progress is interrupted.

Every time the printer is switched on, the stack of trays automatically moves one tray up, to ensure that the new print job is started with an empty tray.

Be careful about getting near the sensor (66). Any object getting closer than 2 mm to the sensor will trigger a lifting movement.

5.2 Display indications

Display indication **Magazine empty (in combination with 'Mag. Empty' LED)**



01 - magazine no. 1 empty **04** - magazine no. 4 empty
02 - magazine no. 2 empty **05** - magazine no. 5 empty
03 - magazine no. 3 empty **06** - magazine no. 6 empty

If "**MANUAL FEED**" has been selected in the printer driver settings, "**0**" will appear in the display after the print job has been sent. The printer will wait for an individual cassette to be placed in the feeding chute for printing.

Display indication **Status messages**

00 **Clean cycle in progress.**

11 **Temperature in the flash power supply is too high.**
Printer is too hot - there will be a short cool-down period.
The print job will be resumed automatically after a short period of time. To prevent frequent job interruptions due to heat build-up, make sure the ventilation grids of the printer are unobstructed and keep the printer away from other heat sources.
Consider operating the printer in an air-conditioned room.
If the temperature does not drop to a value within the allowed range within 10 minutes, '**55**' is displayed. Switch the instrument off and let it cool; check ambient temperature.

12 **Drying module temperature too low / too high.**
If the temperature does not drop to a value within the allowed range within 6 minutes, '**43**' is displayed.

13 **Flash tube has reached is maximum life.**
The flash lamp has reached the end of its specified service life and must be replaced.
If this message is ignored, the resistance of subsequent printouts can be affected.

14 **Prompt requesting maintenance**
If this message is displayed, the instrument will be due for maintenance within the next few weeks.
Confirm the prompt pressing **ERROR**.
After about 3 weeks the message will be displayed again and will not disappear from the screen when pressing **ERROR**.
You can still continue printing but maintenance must be carried out urgently.

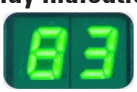
15 **Print head cleaning**
Screen prompt requesting the operator to manually clean the print head (foam swab + alcohol).
The printer is off-line. No new print jobs are accepted.

19 **Intensive clean in progress**
Instrument waiting for user intervention by pressing **CLEAN**.

87 After the last **cartridge change CLEAN** has been pressed to indicate that a storage fluid cartridge had been inserted.
The printer has received a print job but is unable to print because the cartridge contains storage fluid instead of ink.
Remedy: Cancel the print job. Switch the printer off and back on and change the cartridge. Then press **LOADED** or **ERROR** and wait for 2 minutes. Carry out the same procedure after accidentally pressing the **CLEAN** key.

88 Ink cartridge has been changed; instrument waiting for confirmation via **ERROR**, **CLEAN**, or **LOADED** button.
Caution! Never press **LOADED** after reinserting an ink cartridge which has already been used. This could cause permanent damage to the printer.

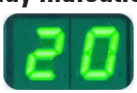
Display indication



Warning - Problem with cassette ejection from a magazine

81 The code displayed consists of two figures:
to "**8**" indicates that a magazine ejection mechanism does not work properly.
86 The second digit indicates the number of the magazine concerned.

Display indication



Error Messages

All displayed numbers between **20** ... **78**, and also **89** ... **93.**

5.3 Alarm functions

The Leica IP C is equipped with two different alarm functions:

Instrument alarm

The printer has a beeper that emits acoustic signals indicating important instrument states and functions.

- Pressing a button: 1 short beep
- Magazine empty/tray stack full: 2 short beeps
- Error: 5 short beeps

Back panel of instrument

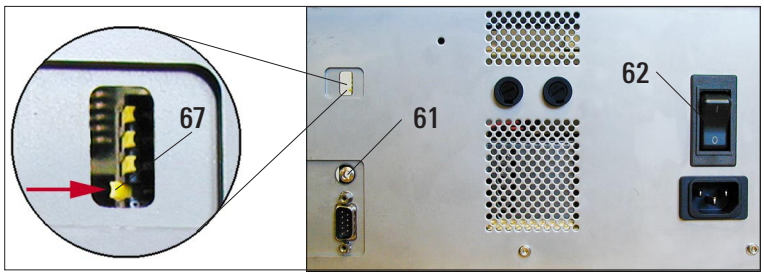


Fig. 35

The beeper can be deactivated by means of the DIL- switches at the back panel of the printer.

To deactivate the beeper, push the bottommost switch (**67**) to the right (in the direction of the red arrow in Fig. 35).

Remote alarm

This alarm is external to the Leica IP C.

- The remote alarm device is connected to the printer via a 3.5 mm-diameter jack connector (optional accessory) that is inserted into socket (**61**).
- The remote alarm is generated, if no mains power is supplied to the printer or if mains switch (**62**) at the back panel of the printer is switched off.

The remote alarm device connected to the instrument must be rated at less than 100 mA. A maximum voltage of 24 V DC must not be exceeded.
For details on how to connect a remote alarm device to the Leica Printer IP C, please contact your local Leica sales office or the manufacturer Leica Microsystems Nussloch GmbH directly.

5.4 Printer driver settings

With the Leica IP C cassette printer you can print cassettes from any Windows application allowing the user to individually configure the printing parameters.
The description below refers to "Microsoft Wordpad", a program that is part of any Windows installation and therefore available on all PCs supported by the printer driver.
The dialog boxes to be accessed in other programs may be named differently, but the driver parameters that need to be selected are named identically in all programs.

Configure the printer in the application that will be used for imprinting the cassettes.

1. Click on **FILE --> PRINT** to open the **PRINT** dialog box.

2. From the list of available printers, select Leica IP C (the name of that printer was added when installing the printer driver, see chapter 4.10, p. 30) and confirm by pressing the corresponding button.

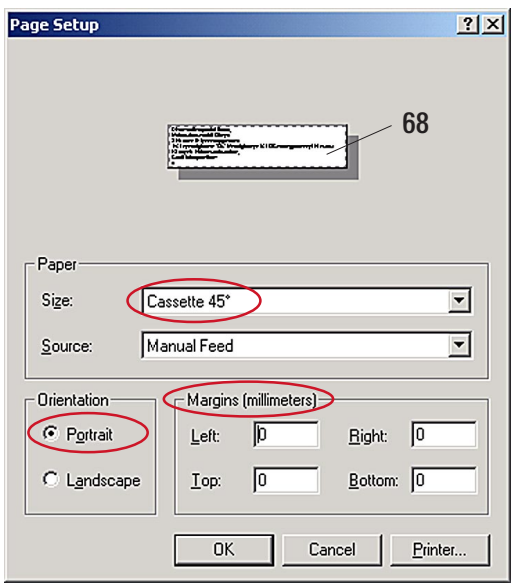


Fig. 36

1. First, the page settings must be selected:
   Click on **FILE** --> **PAGE SETUP** to open the Page Setup dialog box (Fig. 36).
2. In **MARGINS**, set all margins to "0 mm"; the print range (**68**) will change as shown in Fig. 36.
3. In **ORIENTATION**, select **PORTRAIT**.
4. Once the printer has been set up as described above, a cassette format will automatically be shown in the **SIZE** input field in the **PAPER** dialog box.
   You can choose between two cassette formats 'cassette 35°' and 'cassette 45°'.
5. In the **SOURCE** input field you can select the magazine(s) which will supply the cassettes to be imprinted.

The cassette type (angle 35° or 45°) selected in PAPER --> SIZE and the cassette type actually used must match. Otherwise, the print head can be damaged.

Selectable options in the PAPER --> SOURCE dialog box

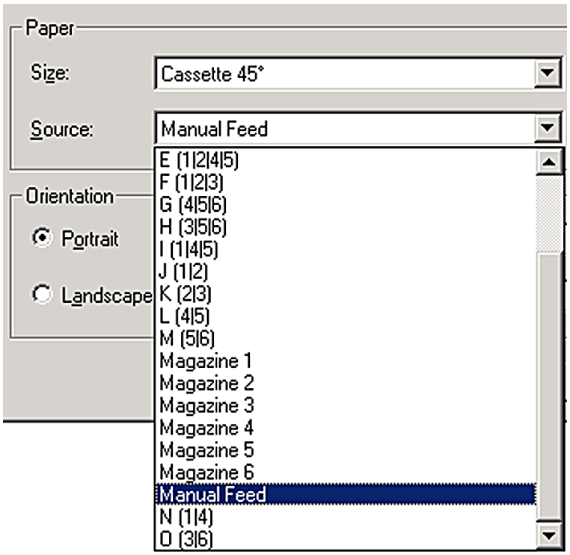


Fig. 37

When clicking on the **SOURCE** input field, an alphabetical list of all cassette supply options from all 6 magazines opens up.

- **MANUAL FEED** means, that individual cassettes will be placed onto the chute (**12** in Fig. 3, p. 9) and imprinted. The printer will not start printing until the sensor (**13** in Fig. 3) reacts (see also chapter 5.2).
- Further options are magazines 1 through 6. If a particular magazine has been selected as supply source, printing will stop once that magazine is empty.
- If a group of magazines is selected (such as **C**(1|2|4|5|6)), printing will continue until the last magazine of the group selected is empty, i.e. printing will not stop when just one magazine is empty.

Working with magazine groups is useful for printing large jobs requiring more cassettes than fit into one magazine or when several magazines have been filled with cassettes of the same type (e.g. same color). The magazines will be processed in the indicated order.

Advanced Options

- To select advanced parameters, click on **PRINTER** to access the printer selection menu. Click on **PROPERTIES** and **ADVANCED** to access the **ADVANCED OPTIONS** menu.

The ADVANCED button does not exist under Windows NT 4.0. Clicking on PROPERTIES in Windows NT leads you directly into the ADVANCED OPTIONS menu.

ADVANCED OPTIONS menu

Clicking onto the individual menu items opens up a pull-down menu to their right, where you can select the desired parameters.

Any menu items not described here are of no importance for the printer. Therefore, the standard settings of all menu items not described here should remain unchanged.

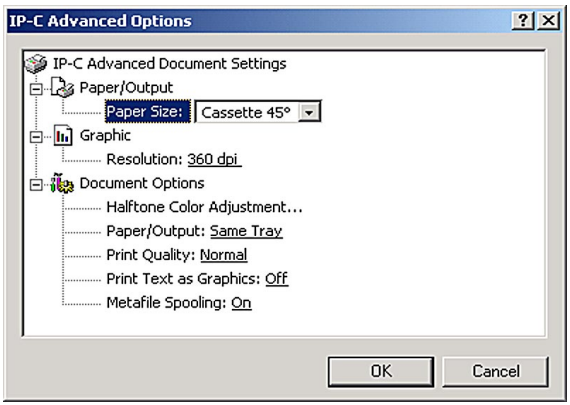
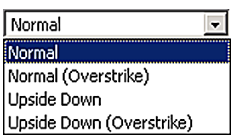


Fig. 38

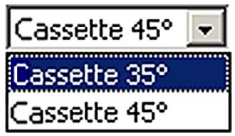
- In this menu you can select whether an imprint is to be applied onto a cassette once (**NORMAL**) or twice (**OVERSTRIKE**). Faint imprints can be improved using the overstrike option.



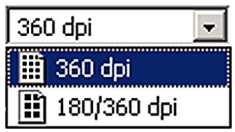
- **UPSIDE DOWN** imprints are rotated 180°. Here again, **OVERSTRIKE** can be selected.

As OVERSTRIKE considerably increases the consumption of ink, we recommend that you only select OVERSTRIKE when really necessary.

- In the **PAPER SIZE** menu you select the type of cassette, i.e. the size of the imprintable zone of the cassette. The cassette type selected in this menu should be identical to the one selected in **PAGE SETUP** (Fig. 37).



- Selectable print head **RESOLUTION** settings are 360 and 180 dpi. With cassette surfaces not appropriate for 360 dpi resolution, printing results will be poor when selecting 360 dpi. For such cassettes, 180 dpi should be selected.



- The **PAPER/OUTPUT** menu item is important above all for the multi-cassette unload station.

- **SAME TRAY**:
  cassettes keep being deposited onto a tray until the tray is full.
- **JOB IN NEW TRAY**:
  each print job starts with a new tray.
- **NEW TRAY**:
  only for special applications - **do not** select this option under standard Windows programs.

When working with the manual unload station, the instrument ignores the parameters selected in the Paper/Output menu.

6.1 Cleaning the instrument

Prior to cleaning the instrument, always switch off mains and unplug the power cord!
When handling cleaning detergents, follow the instructions of the manufacturer and make sure all laboratory regulations in force in your country are complied with.
Do not use any of the following for cleaning the outside surfaces of the instrument: alcohol, detergents containing alcohol (window cleaner!), abrasive cleaning powders, solvents containing acetone or xylene!
No liquid may come into contact with the electrical connections or spill into the interior of the instrument!
The Leica IP C needs to be vacuum cleaned weekly.

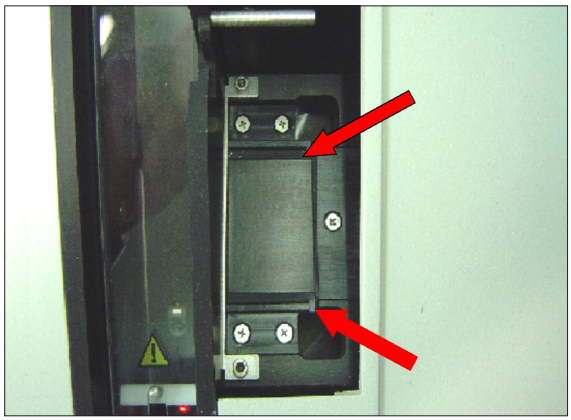


Fig. 39

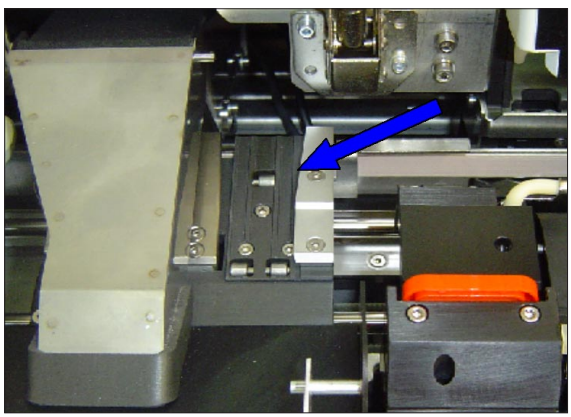


Fig. 40

Cassette guiding mechanisms

Cleaning of the following IP modules signed by an arrow is of particular importance:

- Load Station Magazine & Chute Fig. 39

  The magazines and magazine holders, the cassette ejection units of the magazines. Always ensure that the sensor at the end of the chute is clean.

- Transport-Sation Fig. 40

  Remove dust and debris from the Cassette-Clamp.

Cassette guiding mechanisms

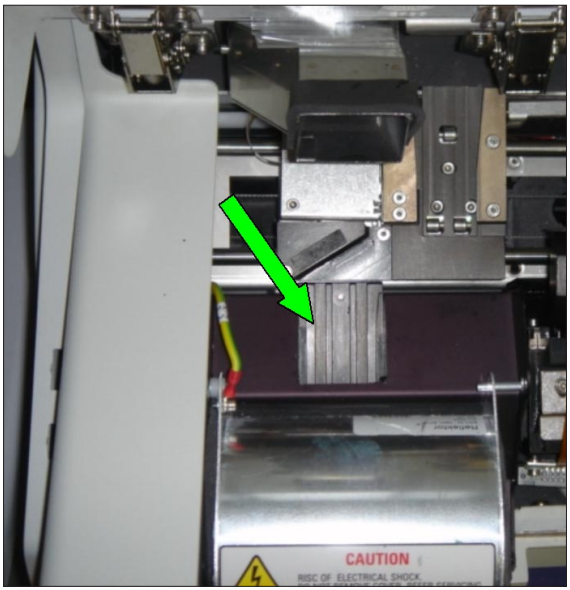


Fig. 41

- Drying-Station, Fig. 41
  The chute must be clean.

Caution!
Sensitive electronics components are located in this area.
Use no liquid in this area!

Outer surfaces

- Clean the outer surfaces (including those of the automated cassette unload station) with a mild detergent and subsequently dry with a slightly moistened cloth.
  Do not use any solvents for cleaning the outer surfaces and the lid!

Automated cassette unload station

- Remove the unload trays; with a brush, remove dust and debris from guides and ejector.
- The trays themselves can be cleaned with a household cleaner.
- Do not use any solvents to clean the trays!
- Prior to reinserting them into the instrument, the trays must be completely dry.

6.2 Print head cleaning

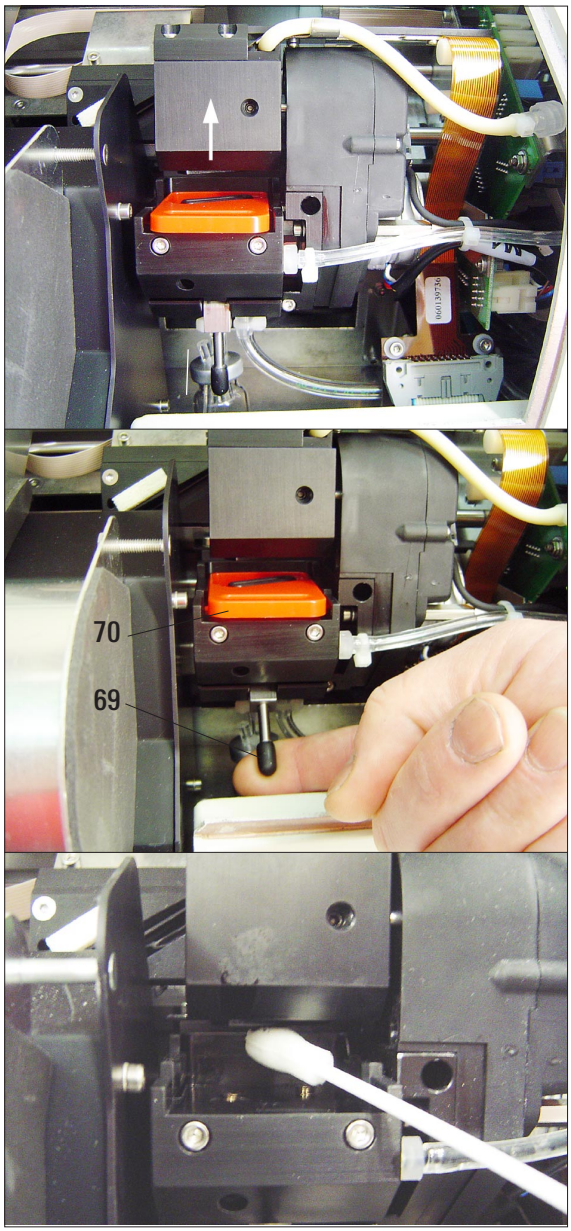


Fig. 42

Preparing the printer

Once a week or if message "**15**" is displayed, the print head must be cleaned manually.

- Open the printer lid and then press buttons **CLEAN** and **LOADED** simultaneously.

- The print head moves upward, to a position approx. 1 cm (½ inch) away from the sealing lip.

- Push the small lever (**69**) upwards, than remove red location plate (**70**) together with sealing lip .
- Moisten one of the foam swabs (supplied with the instrument) with some alcohol. Be sure not to use too much alcohol - none of the alcohol must drip into the instrument.

  Never use acetone or xylene!

  Only use alcohol 95% or 100% for cleaning purposes.
- Carefully insert the swab into the gap under the print head. Apply **light** pressure upwards (on print head) and move the foamswab back and forth (approx. 10 times).

  This procedure removes dried ink residues.

Never rotate the foamswab - the backing plate of the print head could become scratched and prematurely worn.

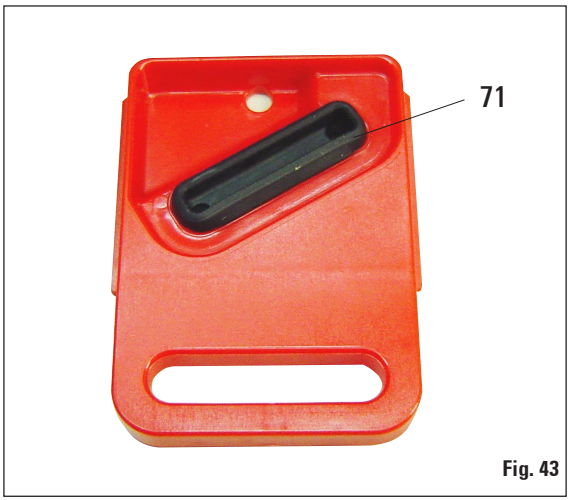


Fig. 43

If no button is pressed to acknowledge the end of the cleaning procedure, the print head will be closed automatically after a few minutes to prevent it from drying out.

- Also clean the location plate and sealing lip with (clean) alcohol.
  The sealing lip (**71**) must be completely clean - no ink residue must be left.
- Check whether the sealing lip is damaged.
  Replace the location plate if the sealing lip is damaged.
- Reinsert the location plate. Attention! The location plate must be completely dry.
- Once you are finished cleaning, press any key to acknowledge the end of cleaning procedure.
- The print head moves back to parking position - message "**15**" disappears from the display.
- The printer is once again ready for printing.
- Message "**15**" however, will still be displayed, as the printer software assumes that no manual cleaning procedure has taken place.

6.3 General maintenance

Only authorized and qualified Leica service personnel may repair the instrument and access the instrument's internal components.

The instrument is virtually maintenance-free.
To ensure smooth operation of the instrument over many years we do recommend the following:

- Clean the instrument thoroughly on a daily basis.
- Regularly remove dust from the ventilation slots on the back of the instrument using a brush or a small vacuum cleaner.
- Have the instrument inspected once per year by a qualified service engineer authorized by Leica.
- At the end of the warranty period, enter into a service contract. For more information, please contact your local Leica technical service center.

7.1 General

If the printer malfunctions during printing, a corresponding error code is displayed and simultaneously the LED in the ERROR button starts flashing.

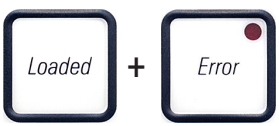
How to eliminate the problem:

- Determine the cause of the error - see error list in (chapter 7.3).
- Remove obstruction(s) - open lid if required.
- **Important!**
  Remove all cassettes which are still in the chute, in or next to the cassette carrier or in the drying module!
  These cassettes should not be reused.

Confirm elimination of error

- Close the lid and press **ERROR** to confirm to the printer that the source of the error has been eliminated.
- The printer then verifies whether all processing paths are unobstructed and whether the source of the error has been eliminated.
- If there are still some obstructions left, or if the source of error has not been thoroughly eliminated, the printer displays another error message.
- Interrupted print jobs are resumed where previously left off.
- If an error message is displayed several times although all possible causes have been eliminated, a Reset should be carried out.

Reset:



- Press and release **LOADED** and **ERROR** simultaneously.
- A Reset restores the printer to the same state as directly after switching on. All print jobs in the print queue are deleted.
- If the same error continues to be displayed even after a Reset, switch the printer off via the mains switch (back panel) and, after a short waiting period of approx. 30 secs, switch it back on. If this does not eliminate the problem either, call Leica Technical Service.

7.2 Status messages

(See also chapter 5.2, p. 39, 40)

Display Indication	LED	Meaning
0	"Mag. empty" flashes	The printer is waiting for an individual cassette to be placed in the feeding chute for printing.
1	"Mag. empty" flashing	Magazine no. 1 empty
2	"Mag. empty" flashing	Magazine no. 2 empty
3	"Mag. empty" flashing	Magazine no. 3 empty
4	"Mag. empty" flashing	Magazine no. 4 empty
5	"Mag. empty" flashing	Magazine no. 5 empty
6	"Mag. empty" flashing	Magazine no. 6 empty
00	–	Clean cycle in progress.
11	–	Temperature in the flash power supply is too high
12	–	Drying module temperature too low / too high.
13	–	Flash tube has reached is maximum life.
14	–	Prompt requesting maintenance.
15	–	Print head cleaning
19	–	Intensive clean in progress Instrument is waiting for user intervention by pressing **CLEAN**.
88	"Ink empty" flashing	Ink cartridge has been changed; instrument waiting for confirmation via **ERRO**R, **CLEAN**, or **LOADED** button.

7.3 Error messages

Display code	Source of error	Troubleshooting solution
20	Magazine output mechanically blocked.	Remove the cause of the block.age
21	Faulty ejection of a cassette. Magazine output blocked.	Remove the cassette.
22	Transfer of a cassette from the chute to the cassette carrier failed. Horizontal motor either incorrectly positioned or mechanically blocked.	Remove the cassette.
23	Cassette is stuck in the feeding chute.	Remove the cassette.
32	Horizontal drive is mechanically blocked.	Remove the cassette.
33	Vertical drive is mechanically blocked.	Remove the cassette.
34	Rotational motion is mechanically blocked.	Remove the cassette.
35	Cassette not correctly clamped in cassette carrier. Cassette did leave the feeding chute but did not reach the cassette carrier.	Remove the cassette from the cassette carrier.
36	Cassette did not leave the cassette carrier or was still located in the cassette carrier during initialization.	Remove the cassette from the cassette carrier.
37	The ink print head is getting too hot. Ambient temperature too high or electronics defective	Switch instrument off and let it cool off. The instrument remains disabled until the print head has cooled down to a temperature value within the permissible range. Check ambient temperature.
38	No or incorrect voltage at ink print head.	Call Leica Technical Service.

Error messages (continued)

Display code	Source of error	Troubleshooting solution
41	Cover (4 in Fig. 2) not closed properly. Safety switch triggered.	Ensure that the cover is not blocked by, e.g., the manual unload station. Close cover completely.
	Flash standby state not reached within the prescribed time. Charging electronics defective.	Call Leica Technical Service.
42	No flash or flash duration too short. Flash bulb dirty or defective.	Check whether flashtube works – to do so, observe the stray light on the cover. **Never open the cover to check whether a flash is triggered!** No flash --> install a new flash bulb. See chapter 4.6.
43	The temperature in the drying module is not within the permissible temperature range.	Carry out a **RESET**. See chapter 7.1.
44	Unload station mechanically blocked.	Remove the cause of the blockage.
45	Heater fan not running or running too slowly.	Call Leica Technical Service.
46	No cassette in the drying module for flashing. Cassette left the cassette carrier, but did not reach the drying module.	Remove the cassette.
47	Cassette not successfully ejected from drying module.	Remove the cassette.
48	Cassette in the drying module during initialization or prior to a print job being carried out.	Remove the cause of the blockage.
49	The flap of the drying module either does not close or does not open; flap is blocked (e.g. by a cassette).	Remove the cause of the blockage.
50	Lifting table end sensor does not switch.	Call Leica Technical Service.
51	Lifting table position sensor does not switch during positioning.	Call Leica Technical Service.

Error messages (continued)

Display code	Source of error	Troubleshooting solution
55	Flash power supply: overtemperature for more than 10 minutes.	Call Leica Technical Service.
60	Faulty control data received (program bug) Settings for the serial interface incorrect or the instrument configuration conflicts with the PC configuration.	Carry out a **RESET** on the printer. Check cable connection to the PC. Check configuration of serial port of the PC and reboot the PC.
63	Transmitted data do not contain confirmation of receipt or data transmission was not confirmed by the PC.	Follow the same procedure as for **ERROR 60**. Try another printer cable.
64	Print image exceeding the vertical limit.	Error caused by application software.
65	Print image exceeding the horizontal limit.	Error caused by application software.
66	The CRC test of the EEPROM returned an error when the instrument was switched on.	Call Leica Technical Service.
70 ... 78	Internal firmware error or defective controller.	Call Leica Technical Service.
81 ... 86	Mechanical problem makes ejection of cassettes from magazine difficult.	Check ejection mechanism. Remove foreign bodies, then clean with brush.
87	A print job was attempted with a storage fluid cartridge inserted.	Remove storage cartridge and insert ink cartridge. Press **LOADED** to confirm (see chapter 4.9, page 29).
89	Mains power supply unit does not achieve standard operating voltage.	Call Leica Technical Service.
90	Firmware only partially loaded or not loaded at all. Flash memory defective.	Call Leica Technical Service.,,
93	Wrong firmware.	Call Leica Technical Service.

7.3 Changing the flash bulb

Code **13** is displayed when the flash bulb has reached its maximum serviceable life.

When code **13** is issued, the bulb has to be changed.

For details on how to insert / replace the flash tube, please refer to chapter 4.6, page 22.

10 sec.

Before replacing the flash bulb, switch off the printer and unplug the instrument from mains.

After changing the bulb, switch the printer back on.

Then go to Off-line mode and press and hold the **ERROR** button for 10 seconds - code **13** disappears from the display.

7.4 Power failure

Fig. 44

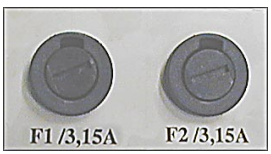


Fig. 45

- Check whether there is a general power failure (no mains power).
- Check whether the mains plug is inserted correctly into the wall outlet and whether the wall outlet is switched on, if applicable.
- Check whether the mains switch is switched on correctly. Possibly, the primary fuse has reacted. If so, the main switch will be in **"0"** = **OFF** position (Fig. 44).
- Check whether one of the two secondary fuses is defective. (**F1**, **F2** located at the back panel of instrument, Fig. 45).
  Some instrument malfunctions / failures are caused by defective fuses.

Malfunction / failure	**Fuse to be checked**
• Instrument not functioning. • No display indication.	Fuse **F1**
• Instrument not working at normal speed. • Printing a cassette takes approx. 8 secs, even after the warm-up phase has been completed.	Fuse **F2**

7.5 Replacing the secondary fuses

Prior to exchanging a fuse, always switch the instrument off and unplug from mains.

Defective fuses may be replaced only with the replacement fuses supplied together with the instrument.

Replacing the fuses

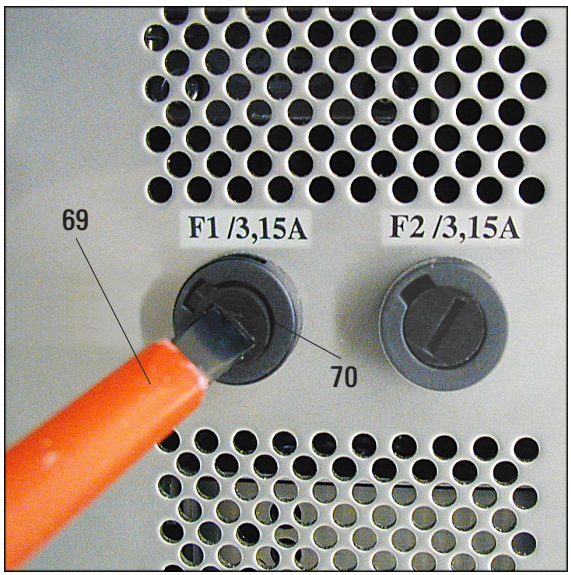


Fig. 46

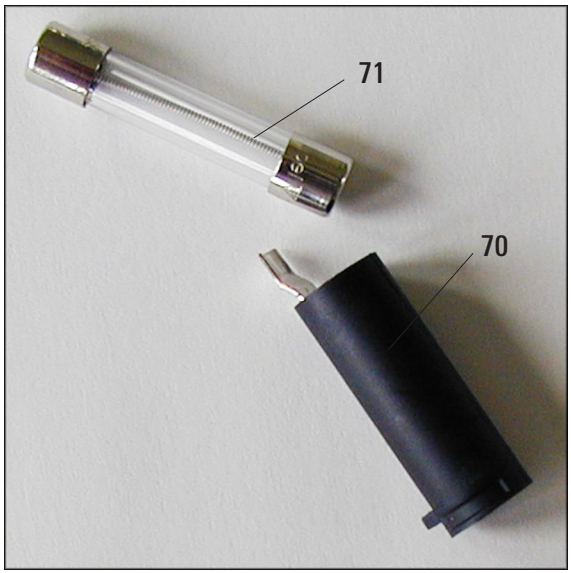


Fig. 47

- Insert a screwdriver (**69**) into the slot in fuse holder (**70**) - push slightly inwards and at the same time rotate the screwdriver 1/4 turn to the left.
- The fuse holder is released and can be removed.
- Remove the defective fuse (**71**) from the fuse holder (**70**) and insert the correct type replacement fuse.
- Reinsert the fuse holder together with the fuse. Insert the screwdriver into the slot in the fuse holder, push slightly inwards and at the same time rotate the fuse holder 1/4 turn to the right.

Warranty

Leica Microsystems Nussloch GmbH guarantees that the contractual product delivered has been subjected to a comprehensive quality control procedure based on the Leica in-house testing standards, and that the product is faultless and complies with all technical specifications and/or agreed characteristics warranted.

The scope of the warranty is based on the content of the concluded agreement. The warranty terms of your Leica sales organization or the organization from which you have purchased the contractual product shall apply exclusively.

Technical service information

If you require technical service or replacement parts, please contact your Leica sales representative or dealer who sold the product.

Please provide the following information:

- Model name and serial number of the instrument.
- Location of the instrument and name of the person to contact.
- Reason for the service call.
- Date of delivery.

Decommissioning and disposal

The instrument or parts of the instrument must be disposed of in compliance with the local laws.