ZENJET ESSENTIAL & DYNAMIC OPERATING MANUAL

English

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Contents

General Information

General Survey

Congratulations! You have purchased a high-quality Zenjet print system. Our concern is to make sure that you benefit from this system to your entire satisfaction over many years. Enjoy using and working with our Zenjet printers!

Limitation of Liability

All pieces of information and notes of this manual have been done in consideration of applicable standards and regulations, state-of-the-art technology as well as our cognition and experiences over many years.
The manufacturer assumes no liability for damages caused by:

- Non-observance of this manual
- Non-observance of the intended use
- Use of unqualified personnel
- Manipulations at the system
- Technical changes
- Use of spare parts that are not approved by the manufacturer

The actual scope of delivery may differ from the explanations and illustrations provided herein in the case of special designs, additional order options or after recent technical changes.
The obligations of the supply contract the General Trading Conditions as well as the Terms of Delivery of the manufacturer and the valid legal regulations at the moment of conclusion of a contract generally apply.

Technical changes within the scope of improvement and development are subject to change without notice.

Warranty Clause

The warranty conditions are conforming to the valid General Trading Conditions of the manufacturer at the moment of purchase.

Copyright Protection

Purpose and Scope of this operating manual

This manual enables safe and effective use of the Zenjet Printer.
The Operating manual is a component of the device and must be stored close to the device to be accessible to the staff at all times. The staff must have read this manual thoroughly and understand the content before starting any work. Compliance with all safety notes and instructions given in this manual is a basic prerequisite to safe operation.
Furthermore, the local accident prevention regulations and general safety provisions for the area of application of the device are applicable.
Images in this manual serve to provide a basic understanding and may differ from the actual device version.

In addition to this manual, the instructions in the annexure on the components included are also applicable.

Hints for Use of this Manual

Please find in the following a detailed explanation of the notations and representations used in this manual.

Keys and buttons which you must push appear in squared or round brackets.

Example: Push [Enter] - button to save changes...

Procedures which should be followed in a specific order are listed in numbered paragraphs.

Step	Procedure
1	Disconnect power plug

Important messages are written in bold text and/or highlighted in grey.

This is an example for an important message!

Special notes:

⇨	… refers to a result, following an action by the operator.
→	… *refers to a chapter or document*.

Figures and drawings are numbered serially in the particular chapter. For example, **„Fig. 2-1“is** the first figure in chapter 2.

Images in this manual serve to provide a basic understanding and may differ from the actual system version. Figures may be stated without protection device for clarification.

Explanation of Technical Terms

Technical Term	Explanation
CartClip	HP cartridge holder for storage of already opened cartridges to protect them against leaking or drying out of nozzle plate
Cartridge	See ink cartridge
Conveyor	The conveyor transports the products, which should be printed and pass them by the print head
DPI	**D**ots **P**er **I**nch 1 Inch = 25,4mm
Encoder	See shaft encoder
Flexbracket	Flexible mounting bracket of the control system
HP	Hewlett Packard – Manufacturer for ink cartridges
Ink cartridge	Original HP-cartridge TIJ 2.5 , model type 45 or 45si
LED	Light emitting diode
Nozzle plate	On the nozzle plate is the two-rowed arrangement of per 300 nozzles, which ejected the ink.
Print direction	Direction of movement of the product on the conveyor belt viewed from the control system in the print direction
Print intensity	Contrast of the print image. If necessary, this parameter must be changed to optimize the print image. A higher intensity gives greater blackening and longer ink drying time
Print speed	Print speed = Speed of the conveyor. The speed of the conveyor must be keep constant
Print start delay	Offset print, i.e. by how much is printing delayed in millimeters after the product is detected by the light barrier.
Print width	The number of pixel can be increased or decreased using this parameter. The print image becomes narrower or wider.
Product sensor	A sensor for the detection of the product. Mostly used are optical sensors (photo sensor, light barrier, reflex sensor)
Right hand	Installation of the system with cartridge holder on the right side (standard configuration)
Sensor	See Product-sensor
Shaft encoder	A shaft encoder is used for the automatic detection of the conveyor speed and defines the print speed
TIJ	Thermal Ink Jet - print function of the HP cartridges

Customer Service

Please contact your local Zenjet distributor or our Local Subsidiaries for Sales and Technical information.

If failures at the print system occur, you should be prepared with the following information:

- Detailed error description.
- All information on the name plate of the print system.
- Version number of the system software and of the DESIGNline Software
- Configuration (Essential and Dynamic)
- Special functions of the software or hardware
- When did the error occur for the first time?

Prior to call our hotline service, please have a look at the manual (→ ***Chapter*** Faults***, Page***) for potential references to eliminate the error.

Furthermore, our staffs are always interested in new information and experiences with the use of the product and which may be valuable for improvements to our products.

Safety Regulations

Behavior in Case of an Emergency

The operating personnel have to be familiar with the operation and the location of safety, accident notification-, first aid- and rescue devices.

What to do in Case of an Emergency?

- Initiate immediately all required emergency measures for injured persons. Observe valid safety regulations in any case in order to avoid further damages to persons.
- Call medical attendance for injured persons.
- Eliminate all accident causes.

General Safety Regulations

Safety regulations provide information in written and symbol form in order to warn you against dangers and to instruct you to avoid any damage to persons or to properties.
Safety regulations are started by signal words indicating the level of danger.
Safety regulations may be placed directly at the print system or in documents about this print system.

Explanation of Danger Degrees

DANGER	This symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury. All safety regulations have to be observed to avoid any damage to persons.
WARNING	This symbol indicates a hazardous situation which, if not avoided, could result in death or serious injury. All safety regulations have to be observed to avoid any damage to persons.
CAUTION	This symbol indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. All safety regulations have to be observed to avoid any damage to persons.
NOTICE	This symbol indicates a hazardous situation which, if not avoided, may result in damage to properties. All safety regulations have to be observed to avoid any damage to properties.

Intended Use

The working reliability of the print system is ensured only with intended use.
The **Zenjet Printer** has been designed, built and must be used exclusively for the intended purpose described.
The **Zenjet Printer** serves to create print images and to print these from the top or side onto smooth and absorbent product surfaces. The product must be properly positioned on a conveyor belt.

All working conditions and instructions, prescribed in this manual, will be observed.
Any use beyond the intended use or any alternative use of the equipment is regarded as misuse and may lead to hazardous situations.

Misuse of the device may lead to hazardous situations. Refrain, in particular, from subjecting the apparatus to the following:
Modification, retrofitting or alteration of the apparatus or individual sub-assemblies.

Any claims arising from damages due to undesignated use are rejected.

Reasonably Foreseeable Misuse

Another use as fixed in the „Intended Use “or even more applies as not intended!

For damages caused by not intended use

- the operator bears the complete responsibility,
- the manufacturer assumes no liability.

If you do not use the system according to the regulations, risks may occur!

Not intended uses are e.g.:

- operation in explosive atmosphere
- the print system comes in contact with food …

Retrofitting and Changes at the Zenjet Printer System

Unauthorized retrofitting and changes at the system lead to an immediate expiration of liability and warranty covered so far by the manufacturer! This is also valid for interventions and program changes at programmable control systems as well as program changes at control units as far as they are not described in this Manual.
The electromagnetic performance of the system can be affected by amendments or changes of any kind.
Do not arrange any changes or amendments at the systems without consultation and written approval of the manufacturer.

Warning Notices at Zenjet Print System

Particular sources of danger at the print system are marked by yellow labels. The used pictograms point out to following dangers:

Danger to Life

Special hazards

The following section identifies the remaining risks, determined following a risk analysis.

Observe the safety notes listed here and the warnings in other chapters of the manual to minimize health hazards and avert hazardous situations.

WARNING **Danger to life through electric shock!**

DANGER TO LIFE!

Contact with live parts poses imminent danger to life. Damaged insulation or individual components can be lethal.

Therefore:

- Immediately switch off the power supply and initiate repairs if the insulation is damaged.
- Work on the electrical system may only be performed by electricians.
- Before working on the electrical system, disconnect from the mains (remove mains plug) and check that power is off.
- Always disconnect mains before performing cleaning and repair tasks.
- Keep moisture from live parts. Moisture may cause a short-circuit.

CAUTION **Risk of injury through incorrect handling of batteries!**

RISK OF INJURY!

Rechargeable and primary batteries contain toxic heavy metals. They must be treated as special refuse and deposited at municipal collection points or be disposed of by a specialized company. Batteries must be handled with particular care.

Therefore:

- Never throw batteries into a fire or subject batteries to high temperatures. Explosion hazard.
- Do not charge batteries. Explosion hazard.
- Fluid escaping through incorrect use may cause skin irritations. Avoid contact with the fluid. In case of contact with the fluid, rinse with ample water. If the fluid comes into contact with the eyes, rinse immediately with water for 10 minutes and consult a doctor without delay.

⚠CAUTION **Edges and corners pose risk of injury!**

 RISK OF INJURY!

Sharp edges and pointed corners may cause abrasions and cuts to the skin.

Therefore:

– Be cautious when working near sharp edges and pointed corners.
– If in doubt, wear protective gloves.

⚠CAUTION **Risk of stumbling posed by dirt, objects lying about and connecting lines!**

 RISK OF INJURY!

Dirt, objects lying about and connecting lines for power, data- and signal lines may cause slipping and stumbling resulting in severe injuries.

Therefore:

– Always keep working area clean.
– Remove objects no longer required.
– Mark stumbling areas with yellow-black marking tape.
– Non tension connecting lines to system and pass it that no places of danger do arise

Remaining Risks

The print system is designed for a safe operation. Hazards that are not preventable due to construction purposes are limited as far as possible by protection devices. A certain amount of risk is always existent! The knowledge about the remaining risks assists you to arrange your work safer and to avoid incidents. In order to avoid the dangers, please observe additionally the particular security advice in the single chapters.

Disposal

This print system complies with the RoHS EU-Regulation 2002/95/EG with observance of the fixed using prohibitions and avoiding pollutants.

Unauthorized persons

Work with the Zenjet print system should only be performed by trained personnel. Please comply with the legal age!

Only trained personnel are allowed to operate the print system. Trainees, apprentices etc. must be supervised by an experienced person while working at the print system.

Prior to start running the labeler the operator has to ensure that the manual of the labeler is available to all users of the machine and that the users have read and understood the manual. Only then the system may be put in operation.

The responsibility for the different tasks at the print system must be clearly specified and kept. There must be no ambiguous authorities for this may put the safety of the users at risk. Arrange a detailed work schedule if several persons work on the machine.

All work on the electrical equipment must be carried out by skilled electricians only.
Failures may be eliminated by authorized personnel only.
All work associated with the assembly, adjustment and maintenance at the machine may be carried out only by trained or instructed personnel.
The operator of the machine must ensure that the personnel are trained in dealing with the integrated control system prior to fix machine errors or maintain the system.

Personal Protective Equipment

Wear following protective equipment when performing work at the system:

SAFETY SHOES

Wear for protection against falling off parts and slipping.

PROTECTIVE CLOTHING

Are tight-fitting clothes with low tensile strength, with tight sleeve and without distant parts
Wear a hairnet if applicable
Do not wear jewelry or wrist watches

PROTECTIVE GOGGLES

For protection against splashes of detergents and flying parts

SAFETY GLOVES

For protection against sharp-edged items

Personal Protective Equipment for the following tasks	Protective Clothing	Safety Shoes	Safety Gloves	Protective Goggles
				
Transport	x	x	x	
Setting up and connecting of the system	x	x	x	x
Maintenance Work	x		x	x
	The documentation of the manufacturer of the single system components has to be observed!			

Technical Specifications

General

Dimensions (H x W x D in mm)	97 x 75 x 133 (excluding bracket, ink cartridge cover and connections)
Weight	<800 g
Environmental Temperature:	5 - 40 ° C
Environmental Conditions:	10-90 % relative humidity (non-condensing)
Protection Rating	IP 40 and IP65 for the Zenjet IP
Maximum operating time	The system is designed for continuous operating

Electrical

Voltage Power Supply: Four country-specific power plugs	100 - 240 VAC / 50-60Hz (1~)
Voltage System:	max. 1,25 A @ 12V, 0,625 @ 24V
Current consumption:	max. 1,25 A
Power consumption:	max. 15 W
Power consumption Standby:	1,6 W

Data interfaces

EIA 232	Sub-D 15 Pol
Ethernet	RJ45
USB	USB-A socket for stick

Inks

Specification	Type
Black	Cartridge HP 45 for water base inks Cartridge HP 45si for solvent base inks Contact your local distributor for complete catalogue
Color	Cartridge HP 45 for water base inks Cartridge HP 45si for solvent base inks Contact your local distributor for complete catalogue
Optional	Special inks Pigmented ink Contact your local distributor for complete catalogue
Other	On request Contact your local distributor for complete catalogue

Transport, Packaging and Storage

Transport

Check the delivery for completeness and transport damages immediately upon receipt. Proceed as follows in case of externally visible transport damage:

- Decline delivery or accept with reservation only.
- Record extent of damage in the transport documentation or on the delivery note of the carrier.
- Initiate complaint.

Scope of Delivery

The scope of delivery of the Zenjet Printer depends on the ordered options and the customer's application. Please control the scope of delivery when receiving the systems on the basis of the delivery note.

Scope of Delivery: 1 x System unit Zenjet Standard

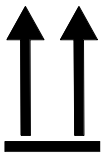
- 1x Power supply 24V / 15W
- 1x USB-Stick
- 1x Operating Manual and Quick guide on the USB-Stick
- 1x DESIGNline Software on the USB-Stick

Optional:

- Mounting bracket
- Ethernet cable 3m
- External light barrier or specific photocells
- Shaft encoder

Symbols on Packaging

As part of the installation and further use it may happen that the operator put user or maintenance personnel in charge of handling of packages. Therefore, note the following important notes:



This way up

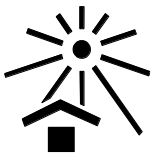
The arrowheads indicate the top of the package. They must always face upward to avoid damage to the content.

Fragile

Identifies packages with fragile or sensitive contents.
Handle the package with care, do not drop or subject to impacts.

Keep dry

Keep packages away from moisture and keep dry.



Protect from heat

Protect packages from heat and direct sunlight.

Transport and Unpacking

Safety Instructions

NOTICE

Material damage due to incorrect transport!

Remove the packaging material and the transportation safety devices on installation site and transport the print system in its original packaging to the place of installation.

CAUTION

Danger due falling parts!

– Wear safety shoes!

Packaging

On Packaging

The individual packages are packed in accordance with the expected transport conditions. Only environmentally-friendly materials were used for packaging.
Packaging serves to protect the individual components against transport damage, corrosion and other damage, up to the assembly stage. Do not, therefore, damage the packaging - remove shortly before assembly only.

Original packaging is available from the manufacturer to ensure optimal dispatch of the system.
Please contact your local distributor.

Handling of packaging materials

Dispose of packaging material in accordance with the applicable statutory provisions and local regulations.

NOTICE

Environmental damage!

Packaging materials are valuable raw materials and can, in many cases, be re-used or profitably recycled and re-used.

Therefore:

- Dispose of packaging materials in an environmentally-responsible manner.
- Observe the locally applicable disposal regulations. If necessary, commission a specialized company for disposal.

Storage

Zenjet Printers

Store the Zenjet printers under the following conditions:

- Do not store outdoors.
- Keep dry and free of dust.
- Do not expose to aggressive media.
- Keep away from direct sunlight.
- Avoid mechanical shock.
- Storage temperature: 5°C to 45°C.
- Relative humidity: maximum 60%.

Ink cartridge

New original sealed ink cartridges have a shelf life of up to 1 year depending on the ink base. Observe the printed expiry date! The shelf life of different cartridge types differs.

Storage under 2 days:
Leave the ink cartridges in the print head holder and wipe off or rinse, if necessary, before restart.
→ ***See Chapter*** To rinse the nozzles manually

Storage over 3 days:
Insert the ink cartridge in a cartridge clip (CartClip).
→ ***See Chapter*** Store Ink cartridge

Store Ink cartridge

If ink cartridges are not used for an extended period of time, they must be stored in a cartridge clip (CartClip) to prevent the ink in the nozzles from drying out.
To do this, the ink cartridges must be removed from the controller.
→ ***See Chapter*** Removing Ink Cartridge

Instruction
To insert the ink cartridge in the CartClip:

Step	Procedure
1	Close the CartClip over the ink cartridge and press until the top flap of the CartClip snaps into the holder. (see Fig. 4-1)

Fig. 4-1: Inserting the HP ink cartridge in the CartClip

Instruction
To remove the ink cartridge from the CartClip:

Step	Procedure
1	Lift the top flap of the CartClip until the ink cartridge is released.
2	Pull the ink cartridge upward out of the CartClip. (see Fig. 4-2)

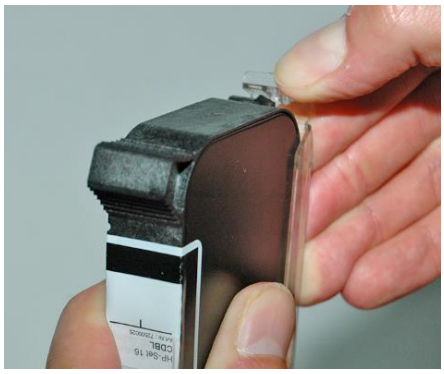


Fig. 4-2: Removing the HP ink cartridge in the CartClip

Construction and function

Brief description

The **Zenjet Printer** is a thermal Inkjet Coder of Zenjet Coding, for printing images quickly and cleanly onto smooth and absorbent product surfaces.
A print image, for instance, contains product descriptions, graphics, quantities, shelf life data, barcodes and product serial numbers.
The print images can be created directly with PC installed DESIGNline software and can be loaded in/or sent to the **Zenjet Printer** by means of a USB stick or a network.
Up to 9 print images can call up for printing via keyboard.

The **Zenjet Printer** comprises the controller and an external 24V power supply.

The **Zenjet Printer** comprises essentially an integrated electronics board, a cartridge bay with clamp and the connections for the power supply, shaft encoder, external photo sensor, in-/outputs at the back side of the system. At the top are a keypad with 4 control LEDs and a USB-A socket for a data transfer via USB-Stick.
The system unit is directly installed with an optional mounting bracket on the production line. The coder consists of a system unit and an ink cartridge from Hewlett Packard.
Standard the HP cartridge holder is mounted on the right side, also referred to as right-hand.
The preferred print direction is from left to right. When printing from right to left, the minimum print start is 25 mm to the box front edge. If a lower distance is desired, an external photo sensor must be installed. Or the system can be modified to left-hand.
The preferred print direction is than from right to left. When printing from right to left, the minimum print start is 25 mm to the box front edge.

Ink cartridge

The ink is contained in the cartridge ink ducts and the viscosity and surface tension of the ink prevents it from running out.
A heating element, which generates a steam bubble when current is briefly applied (1.9 µs), is fitted behind each jet opening.
This steam bubble gives the ink between the heating element and the jet opening an impulse and therefore “shoots” a defined quantity of ink out of the opening.
When the steam bubble reforms, a corresponding quantity is drawn from the storage container and the process can begin again. This process of ejecting an ink drop can be repeated 18,000 times a second.
Print images 1 mm to 12.7 mm high can be produced with a wide variety of fonts.
Various special inks are available for coding on many different surfaces.

SmartCard Functionality

The Zenjet Printer system is equipped with a SmartCard identification of the cartridges.

The Zenjet Printer has an additional contact block which connects the SmartCard chip with the analysis electronics by insertion of the SmartCard cartridge.

View of the SmartCard contacting cartridge

View of the SmartCard

The chip is detected by inserting the cartridge. The LEDs show this:

The Status-LED blinks green for 3 seconds if the SmartCard is detected.

The LED blinks green/red if a cartridge without SmartCard is inserted. The system works without the advantages of the SmartCard data.

If the print system isn't activating for the use of cartridges without SmartCard, the LED will be blink red and the print system doesn't print.

The LED blinks yellow/red if there is a read error on the SmartCard chip and the cartridge prints without consideration of the SmartCard data.

SmartCard Functions

The SmartCard functions are supported by the current software version of Dynamici and Essential model and also for the Zenjet Handy Wifi.

Automatic storage of the ink filling level in 1% steps. The correct ink level of a cartridge is always detected, even by changing the cartridges. No more missing prints by interchanged cartridges.

Automatic detection of the ink type and automatic setting of the optimal ink parameters. Ink volume, drop size, nozzle voltage and firing time are stored on the Smartcard chip.

The current ink type is displayed for control and prevention of wrong cartridges.

Exact ink consumption calculation. The usable number of drops is calculated by the ink weight (g), specific weight (g/ml) and drop size (in pl). The values are read out of the chip, depending on the ink type.

Warning message with expired shelf life - date of filling and shelf life are stored on the SmartCard chip

Warning message if cartridge is open for too long (installed life) - date of first insertion and maximum operating time are stored on the SmartCard chip.

DESIGNline displays the ink part number for easy reordering.

Following data are stored on the SmartCard chip for checking claims:

Date of the first cartridge insertion, serial number of the controller, firmware version of the controller

Date of the last cartridge insertion, serial number of the controller, firmware version of the controller

Number how many times the cartridge was used.

The ink type cannot set manually by using SmartCard cartridges.

The ink level is set automatically and cannot be reset.

System versions

The **Zenjet Printer** system without controller are available in different versions:
Dynamic, Essential, Slim, IP, Handy Wifi.

The specifications of the different versions are available on request.
Please contact your local contact for any questions on our offering and Zenjet printer range.

Complete overview Zenjet Dynamic (Essential do not have the cover and no Wifi)

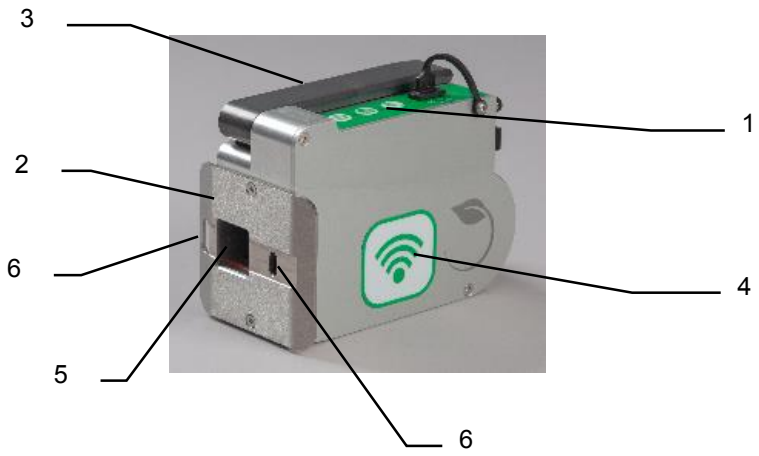


Fig. 0-1: Zenjet Dynamic

No.	Description
1	CONTROL PANEL WITH ENTRY KEYS AND LED-STATUS LIGHTS
2	FRONT PANEL
3	COVER AND INK CARTRIDGE INSIDE
4	WIFI LOGO FOR THE DYNAMIC MODEL
5	CARTRIDGE NOZZLE PLATE
6	OPENING FOR INTERNAL AND EXTERNAL LIGHT BARRIER

Fig. 0-2: Zenjet Silver

No.	Description
1	USB STICK SOCKET
2	NETWORK CONNECTION (RJ45)
3	OPTIONAL DEVICE CONNECTION (SUB-D 15 POL) FOR ENCODER OR CELLS
4	OPENING FOR EXTERNAL LIGHT BARRIER (OPTION)
5	GROUND CONNECTION

Flexible bracket (Flexbracket)

The Flexbracket is an optional available mounting bracket, which adjust a variable distance up to 20 mm between print system and product. The print system is provided with a special formed deflector and a linear movable bracket.
The print system is mounted on the production line that the product hit the deflector. The print system is pressed in position, against the spring power of the Flexbracket.
After the product passes the print system moves the print system by spring power back in starting position.

The Flexbracket should use for print speeds up to 30 m/min. For higher speeds is a constant guide not guaranteed and the print result can be manipulated negative.

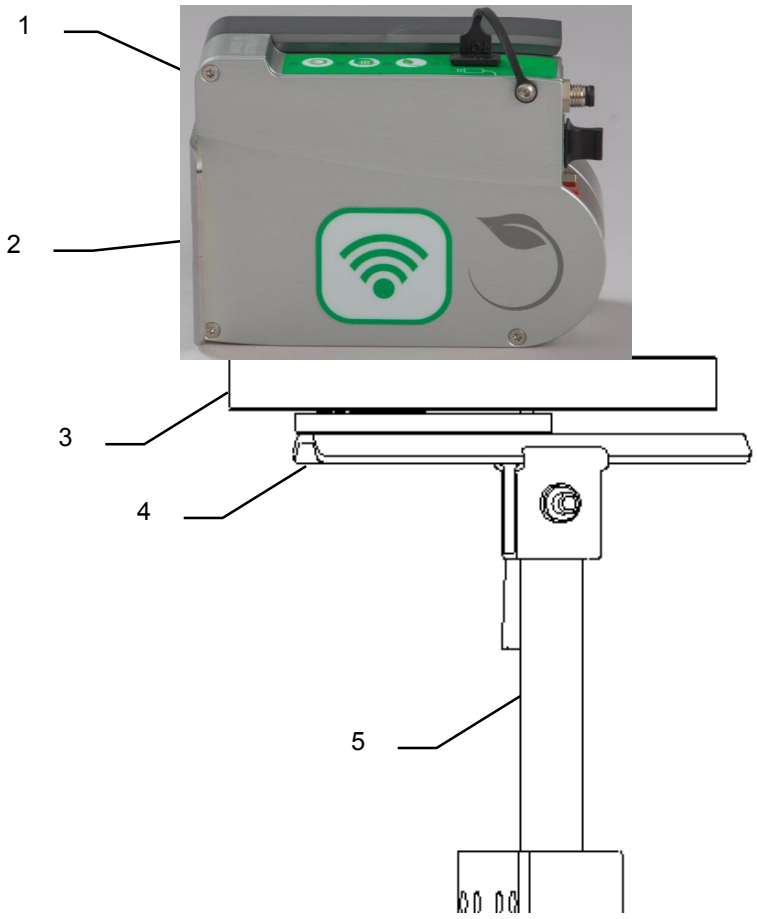


Fig. 0-3: Zenjet printer with Flexbracket and universal mounting bracket

No.	Description
1	DYNAMIC PRINTER
2	FLEXBRACKET DEFLECTOR
3	FLEXBRACKET
4	MOUNTING RAIL
5	CLAMP BRACKET

Installation and Initial Operation

Safety notes

WARNING

Danger to life through electric shock!

DANGER TO LIFE!

Contact with live parts poses imminent danger to life. Damaged insulation or individual components can be lethal.

Therefore:

- Immediately switch off the power supply and initiate repairs if the insulation is damaged.
- Work on the electrical system may only be performed by electricians.
- Before working on the electrical system, disconnect from the mains (remove mains plug) and check that power is off.
- Always disconnect mains before performing cleaning and repair tasks.
- Keep moisture from live parts. Moisture may cause a short-circuit.

CAUTION

Risk of stumbling posed by dirt, objects lying about and connecting lines!

RISK OF INJURY!

Dirt, objects lying about and connecting lines for power, data- and signal lines may cause slipping and stumbling resulting in severe injuries.

Therefore:

- Always keep working area clean.
- Remove objects no longer required.
- Mark stumbling areas with yellow-black marking tape.
- Non tension connecting lines to system and pass it that no places of danger do arise

⚠CAUTION **Edges and corners pose risk of injury!**

 RISK OF INJURY!

Sharp edges and pointed corners may cause abrasions and cuts to the skin.

Therefore:

– Be cautious when working near sharp edges and pointed corners.
– If in doubt, wear protective gloves.

Installation

Requirements to the Site of Installation

When choosing the installation location, the following conditions apply:

- The installation location must be a dry and dust-free room, ideally with an ambient temperature of approx. 18…25 °C.
- The installation location may not be subject to fast temperature fluctuations (condensation!).
- Do not set up the **Zenjet printer** directly next to or above hot surfaces, since this will affect cooling of the printer.
- If **the Zenjet printer** is generally mounted with a universal bracket attached to the conveyor.
- The **Zenjet printer** may not be exposed to flammable, explosive, corrosive gases or chemical vapors.
- The **Zenjet printer** may not be installed next to high voltage equipment.
- The **Zenjet printer** may not be submitted to direct vibrations or shocks.
- Keep the **Zenjet printer** away from oil or water.
- The **Zenjet printer** may not be exposed to strong magnetic or electric fields.

Placing properly the Zenjet printer

- The installation position has to provide sufficient access for user and service technician.
- Observe that all mounting parts are attached strongly and properly secured.
- Consider all points of the "Intended Use" in the chapter safety regulations.

To achieve a clean, sharp print result the distance from the product to be printed to the cartridge nozzle plate is important. The optimum distance is 0 to 4 mm between the deflector and the product. A greater distance will adversely affect the print result, particularly at high conveyor belt speeds.
The higher the print speed the shorter must be the distance. At speeds of less than 20 m/min a distance of up to 4 mm between the nozzle plate and the product may still be acceptable.

Positioning the Print System

NOTICE

Material damage due to improper print system installation!

With the print system switched on, a defect may occur in the system electronics.

Therefore:

– Only install the system when it is switched off.
– Network cables only connect or disconnect if the power supply is dead voltage.

NOTICE

Possible material damages!

Product mounting rails prepared by the customer protect the system unit from vibrations and damage whilst the product is passing the system unit. (Position B in Fig. 4)

Required Resources

- Setscrew wrench (Allen key®)

Instruction

Please install the print system as follows:

Step	Procedure
1	Attach mounting brackets to the production line.
2	Insert the mounting rail fitted underneath the controller into the clamping piece of the mounting holder and lock.

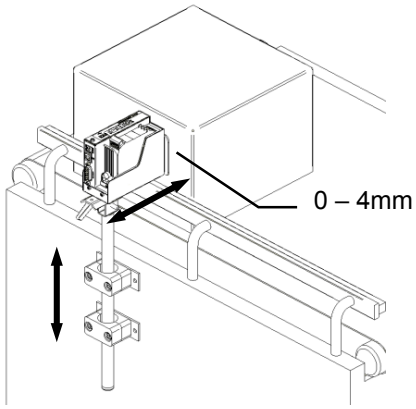


Fig. 0-1: Installation of the Zenjet printer at the production line

3	Set the distance from the print head to the product surface. A distance of 0 to 4 mm is optimal. (see Fig. 0-1)

Overview of the print system connectors

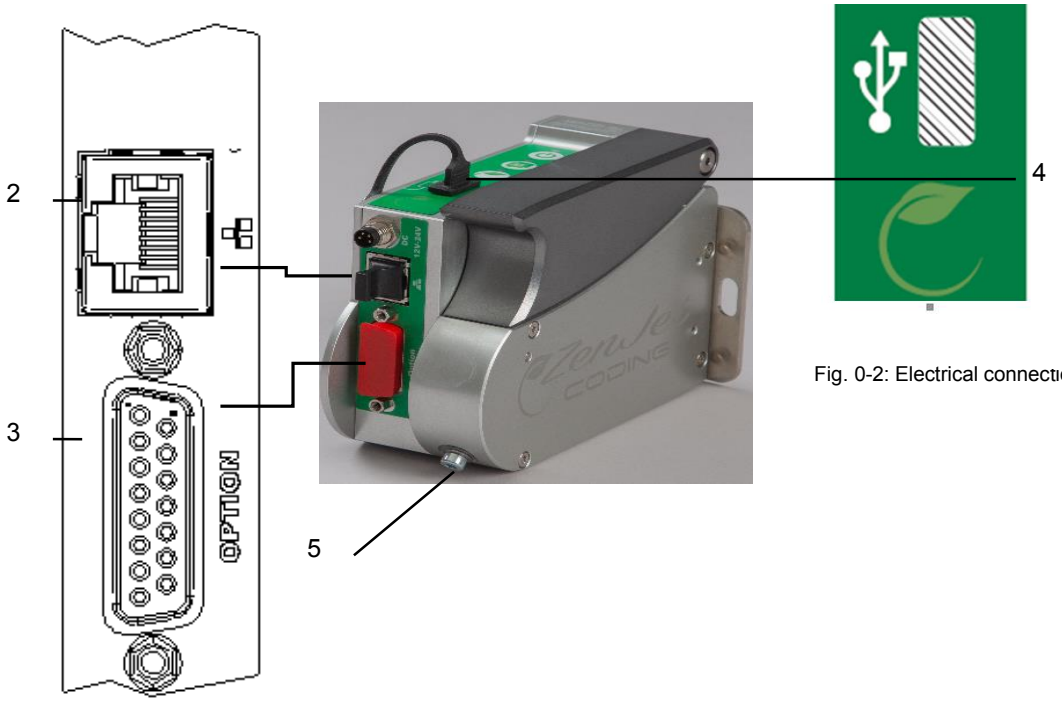


Fig. 0-2: Electrical connections

No.	Description
2	ETHERNET
3	OPTIONS
4	USB-A
5	GROUND CONNECTION

Ground print system

Instruction

Please connect the ground connection of the print system with ground connection of the conveyor as follows:

No.	Description
1	Connect the ground connection of the print system with ground of the conveyor.

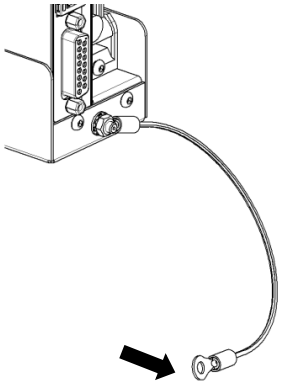


Fig. 0-3: Ground connection at the print system

Connecting to Supply Voltage

Requirements

- Power supply according to "Technical Data" is installed close (max. 1,5 m away) to the printing site.

Instruction

Please connect the print system with supply voltage as follows:

Step	Procedure
1	Enclosed the power supply are several country-specific power plugs. Mount the right power plug to the power supply (see Fig. 0-4).

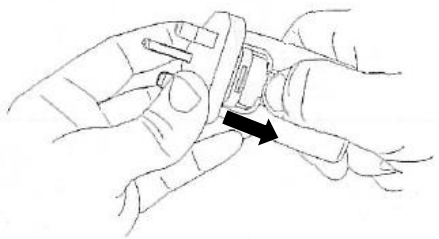


Fig. 0-4: Installation power plug

2	Connect the power plug to the power socket on the Zenjet printer (DC 24V).
3	Connect the power pack with the power supply.

Connecting the optional Shaft Encoder

If more options will be used simultaneously, a splitter-cable can be used.

Requirements

- The optional shaft encoder is mounted at the production line.
- Ideally runs the measuring wheel of the shaft encoder on the conveyor belt, near the print system.

Instruction

Please connect the optional shaft encoder with the print system as follows:

Step	Procedure
1	If necessary install the optional shaft encoder on the production line and connect it to the option-connection socket.

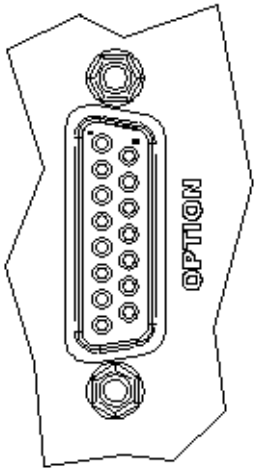


Fig. 0-5: Option-Socket (Sub-D 15-pole) on the system-back and Sensor-LED on the top side of the system

2	Set the system-clock to Shaft encoder by the DESIGNline software. (System settings – Print parameter)
3	Set the shaft encoder resolution by the DESIGNline software. 600 dpi with the delivered shaft encoder from Weber. (System settings – Print Parameter)
4	Set the intensity by the DESIGNline software so, that the desired effective resolution can be reached. (System settings – Print parameter)
5	The Sensor / Encoder LED lights red, if the shaft encoder isn't connected or doesn't rotate.

Connecting the optional Product Sensor

If more options will be used simultaneously, a splitter-cable can be used.

Requirements

- The optional product sensor is mounted at the production line or on the Zenjet printer.

When mounting on the production line:

- The sensor is mounted in product running direction, near the Zenjet printer.
- Between the sensor and the nozzle plate is maximum a product, because another print activation is otherwise ignored

Instruction

Please connect the optional product sensor with the print system as follows:

Step	Procedure
1	If necessary install the optional product sensor on the production line or on the Zenjet printer and connect it to the option-connection socket.

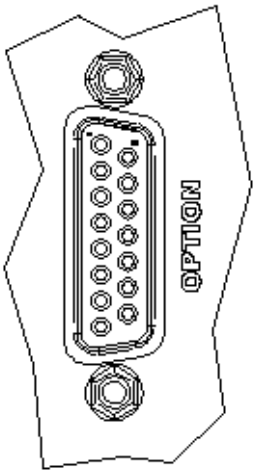


Fig. 0-6: Option-Socket (Sub-D 15-pole) on the system-back and Sensor-LED on the top side of the system

2	Set the sensor input of the system to External by the DESIGNline software. (System settings – Advanced settings - Periphery)
3	The Sensor LED lights green with print activation from product identification to the end of the print.
4	If no print image is loaded, the Sensor LED lights yellow as long as the sensor is covered.

Connection to a network

A RJ-45-connection allows a connection of the print system to the customer LAN (Local Aera Network).
The LED on the top of the system lights green if a network is available. The LED flashes yellow with data communication.

Instruction
Please connect the print system with the network as follows:

Step	Procedure
1	If required connect the print system to the network by a RJ45 socket.

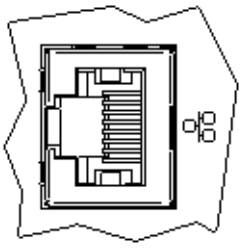


Fig. 0-7: Ethernet-socket (RJ 45) on the system-back and network LED on the top side of the system.

2	Set the desired IP address by the DESIGNline software. (System settings – System Config – IP-Address)
3	Add the system in the DESIGNline software to operate it by the DESIGNline software. (Connections – Add system – Enter name and IP address)

Each IP address can place in a network once only. Otherwise there is an address conflict and the system can't address. Please contact your system administrator.

Inserting Ink Cartridge

Zenjet Essential, Dynamic, Slim, IP, Zenjet Handy WiFi

If a new ink cartridge is inserted, the cartridge counters must be reset.
→ *See **Chapter*** Reset ink **counter**.

Instruction
Please insert the ink cartridge in the print system as follows:

Step	Procedure
1	Remove the protective foil or CartClip from the nozzle plate an insert the ink cartridge in the holder.
2	Before replacement of the cartridge, wipe the nozzle plate once with a lint-free cloth.
3	Insert the ink cartridge in the cartridge holder diagonally (see Fig. 0-8).

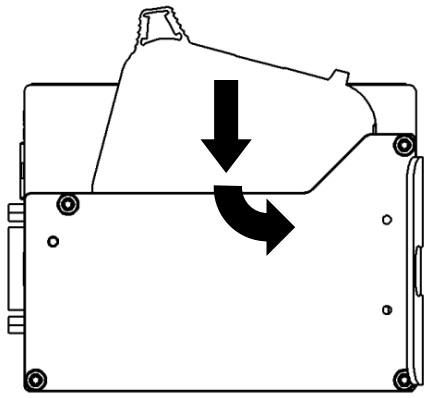


Fig. 0-8: Insert the ink cartridge

4	Click the ink cartridge by lightly pressure at the end.

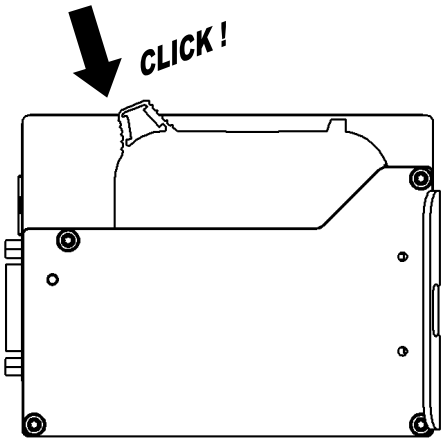


Fig. 0-9: Fixing the ink cartridge

The correct position of the ink cartridge is displayed by the Ink-LED. The LED lights green after resetting the cartridge counter and after inserting a new ink cartridge.

Removing Ink Cartridge

Zenjet Essential, Dynamic, Slim, IP, Zenjet Handy WiFi

NOTICE

Damages by misuse!

An electronic fault can't waive with a going print process and simultaneous removing of the cartridge.

Therefore:

– Only change the cartridge when the print process is stopped.

Instruction

Please remove the ink cartridge from the print system as follows:

Step	Procedure
1	Press diagonal upwards at the end of cartridge.
2	Tip the cartridge from behind upwards. (see Fig. 0-10)

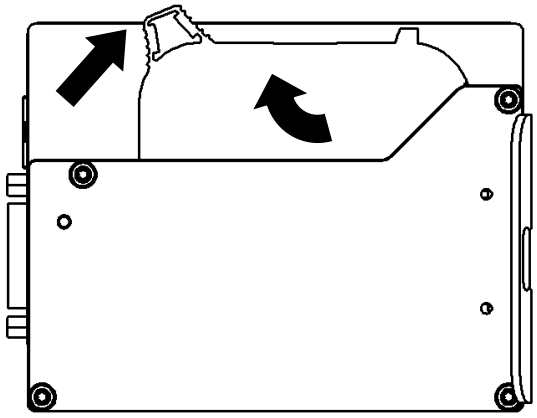


Fig. 0-10: Remove the ink cartridge

Operation

User interface of the Zenjet Printer system

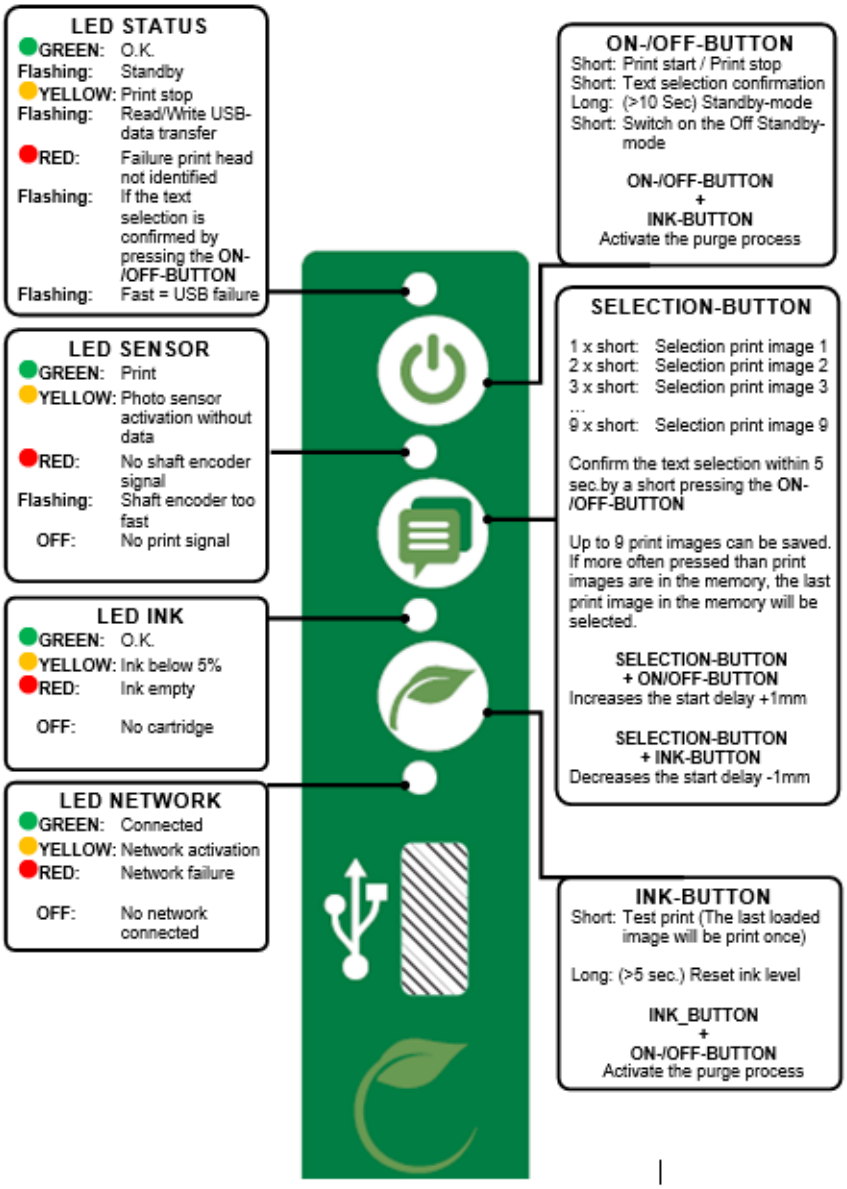


Fig. 0-1: User interface on the top side of the system

When starting the system unit, the progress of the starting process can be monitored on the LED's. If errors occur during booting, an error code is transmitted via the LED's and can be analyzed in more detail.

Switching ON

Requirements

- The print system is connected with power.
- The system is in standby-mode

Instruction

Please switch the print system on as follows:

Step	Procedure
1	Press short on the [ON-/OFF]-Button on the top side of the print system.
	
	Fig. 0-2: ON-/OFF-BUTTON on the top side of the system
2	The system conducts a self-test and is ready to use after approx. 10 seconds.

Switching OFF/Standby mode

Requirements

- The print system is connected with power and switched on.
- To use the standby mode, it must be activated in DESIGNline
- The settings for the standby mode in DESIGNline
- Functions>>Settings>>System>>Special settings

Instruction

Please switch the print system off as follows:

Step	Procedure
1	Keep the [ON-/OFF]-Button on the top side of the print system pressed for approx. 10 seconds. The print system passes to standby mode.
	
	Fig. 0-3: ON-/OFF-BUTTON on the top side of the system
2	The Status LED flashes every 10 seconds shortly in the standby-mode.
3	Disconnect the power supply from the print system for a completely switch off.

Print Stop

Instruction

Please activate a Print Stop / a Print Pause as follows:

Step	Procedure
1	Presses once short the [ON-/OFF]-Button on the top side of the print system.
	
	Fig. 0-4: ON-/OFF-BUTTON on the top side of the system
2	The Power LED lights yellow on print stop.

Print Start

Instruction

Please activate a Print Start as follows:

Step	Procedure
1	Presses once short the [ON-/OFF]-Button on the top side of the print system.
	
	Fig. 0-5: ON-/OFF-BUTTON on the top side of the system
2	The Power LED lights green with successful print activation.

Select Print Image

Up to nine print images can be saved in the memory of the Zenjet Printer for a direct call up at the system unit.

Instruction

Please select a print image as follows:

Step	Procedure
1	To select the saved print image, ranks third for example, press the [SELECT]-Button three times short.
	 Fig. 0-6: SELECT-BUTTON on the top side of the system
2	To confirm the text selection pressing the [ON-/OFF]-Button within 5 seconds.
	 Fig. 0-7: ON-/OFF-BUTTON on the top side of the system
3	After pressing the [ON-/OFF]-Button, the selected text is confirmed with the flashing STATUS LED. I.e. if text 3 is selected, the STATUS LED flashes three times.
	 Fig. 0-8: Status-LED on the top side of the system
4	The print images 1.00I to 9.00I can selected for printing in this way.

Loading Print Image

Print Images can be loaded to the Zenjet print system as follows:

- USB-Stick
- Software DESIGNline with existing network connection via RJ45 or
- By serial interface EIA 232

Load print images incl. fonts, logos and parameter with a USB-stick automatically.

The files can load to a USB-stick by DESIGNline.

After the connection of a USB stick an automatic run of commands will be made to query the system status.
At the same time a directory and a subdirectory with the name of the serial number of the system, i.e." R09123" will be created in the main directory of the USB stick. There will be saved all system specific data.
The stick must be connected once on the system to post this information, so that the DESIGNline software can work with the system after that.

The transfer of the data and commands happen by the Zenjet Printer directly after the connection of the stick.

Process:
After the connection and identification of the stick, the data will be read from the stick and the Status LED flashes quickly meanwhile (4x/second)
Thereafter, data written on the stick and the Status LED flashes slowly meanwhile (2x/second)
If the LED lights constant, the stick can be removed after 2 seconds.

Load print image with a USB-Stick

Needed tools

- USB-Stick

Requirements

- The used USB stick must be connected first for an “Initialization“ to the Zenjet Printer print system.
- The print image, created with the DESIGNline Software, is transferred to the USB stick via the PC with the DESIGNline previously installed.

Instruction

Please load the print image from the USB-Stick to the memory of the Zenjet Printer print system after you have created the messages with the DESIGNline software and PC:

Step	Procedure
1	Connect the USB-Stick to the USB-socket on the top side of the print system.
	 Fig. 0-9: USB-A socket on the top side of the system
2	Wait until the data exchange is completed. The STATUS LED flashes during the data exchange and lights constant after finishing.
	 Fig. 0-10: STATUS-LED on the top side of the system
3	Remove the USB-Stick from the print system (2 seconds after the LED flashes constantly).

If the USB-stick is removed early or during data transfer, it can happen a data loss.

Set print start delay

Change the print start delay on the system with a key combination.

Instruction

Please set the print start delay on the system as follows:

Step	Procedure
1	Press the [SELECT]-button and [ON-/OFF]-button to increase the print start delay.
	
	Fig. 0-11: SELECT-BUTTON and ON-/OFF-BUTTON
2	The delay increases about 1 mm with each keypress.
3	Press the [SELECT]-button and the [INK]-button to decrease the print start delay.
	
	Fig. 0-12: SELECT-BUTTON and INK-BUTTON
4	The delay decreases about 1 mm with each keypress.

Loading Print Image with DESIGNline

Requirements

- The **Zenjet printer** is connected with the DESIGNline Software by a network or serial interface to a PC.

Instruction

Please load a print image from DESIGNline to the memory of the **Zenjet Printer** as follows:

Step	Procedure
1	Select the menu Functions on the left side of DESIGNline
2	If several print systems are connected with the DESIGNline software, click on the illustration of the corresponding print system which shall be selected.
3	Click on the button [Print].
4	Select the desired directory by pressing the directory button. The print images, saved in DESIGNline can be found in the directory C:\user\public\DESIGNline\label standard.
5	Click to select the desired print image. The selected print image is shown in the preview.
6	Click on the button [Print start] to print the selected print image. A window with “Print start ok” is shortly shown for the confirmation.

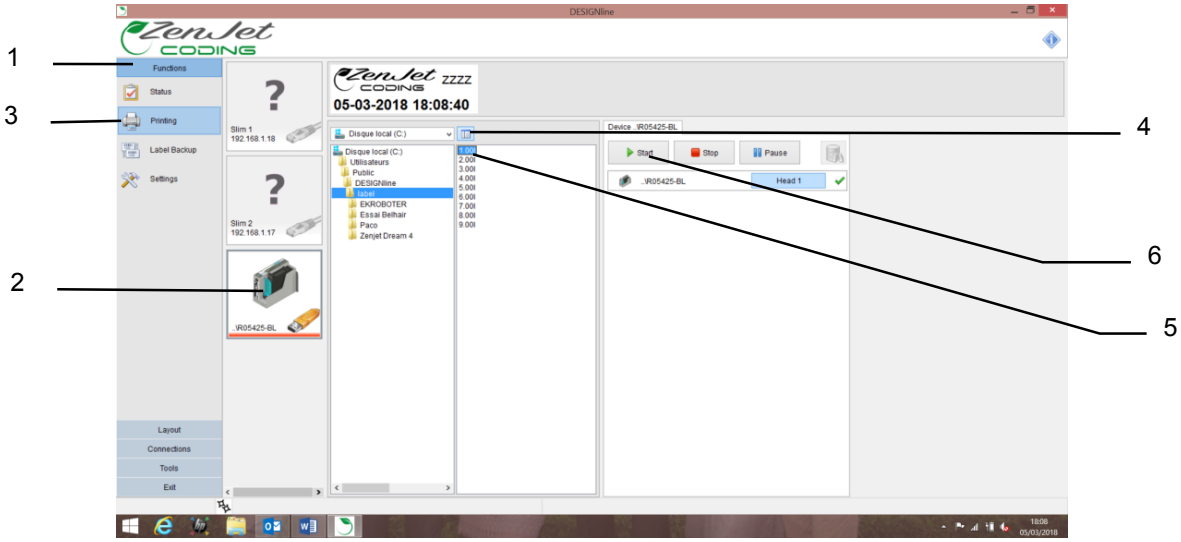


Fig. 0-13: Print image selection in DESIGNline

Setting of the parameter by DESIGNline software, i.e. Print Start Delay

The print start delay can be set in this menu, i.e. by how much is printing delayed in millimeters after the product is detected by the light barrier.
The delay can be selected between 0 and 999 millimeters.
The print start delay relates to the beginning of the print layout.

Requirements

- The **Zenjet Printer** print system is connected with the DESIGNline software via a network or serial interface.

Instruction

Please set the print start delay via the DESIGNline software as follows:

Step	Procedure
1	Select the menu Functions on the left side of DESIGNline.
2	If several print systems are connected with the DESIGNline software, click on the illustration of the corresponding print system which shall be selected.
3	Click on the button [Settings].
4	Click on the menu slide „Print parameter“ to call up the corresponding menu.
5	Set up the print start delay by click on the arrow keys or by input via keypad.

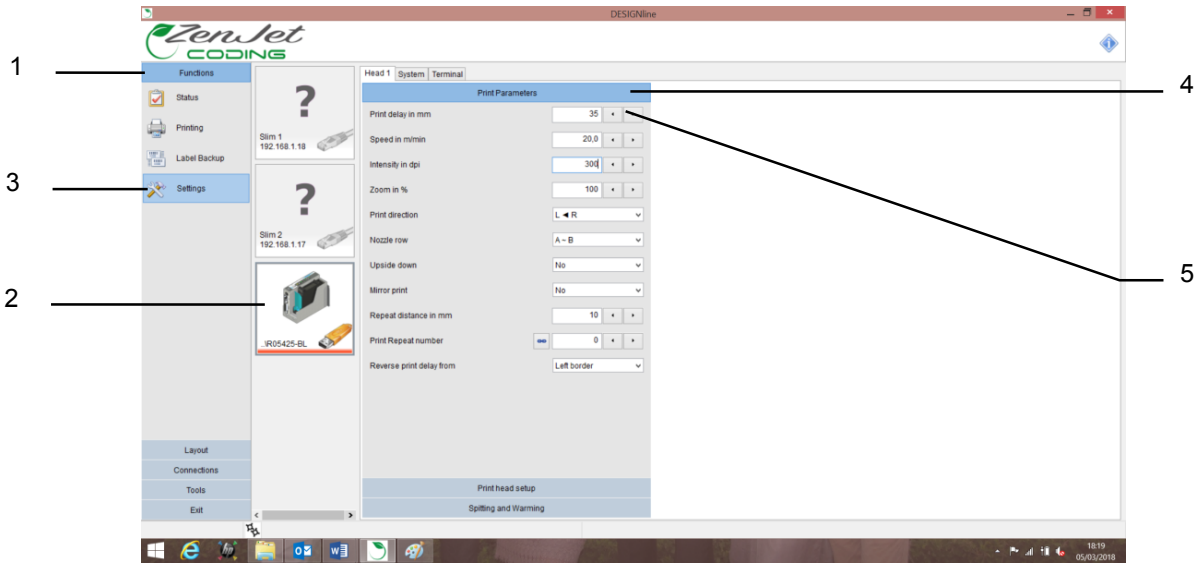


Fig. 0-14: Set up the print start delay in DESIGNline

Reset ink counter

The ink counter must be reset after inserting a new ink cartridge.
Not necessary for MK2/Mk3 system with SmartCard control.

Instruction

Please reset the ink counter as follows:

Step	Procedure
1	Press the [Ink]-button longer than 5 seconds.
	
	Fig. 0-15: INK-BUTTON on the top side of the system
2	The green Ink LED lights after a successful reset.
	
	Fig. 0-16: INK-LED on the top side of the system

The Ink LED lights yellow by nearly empty cartridge (<5%).
The Ink LED lights red by empty cartridge.

To rinse the nozzles manually

NOTICE

Material damage due to squirting ink!

During spitting, squirting ink soils the surroundings.

Therefore:

– Hold an absorbent cloth in front of the ink cartridge nozzle plate.

After extended periods of no printing, it may be necessary to rinse the ink cartridges to open up clogged nozzle channels again.
During rinsing (purging), all ink cartridge nozzle ducts are addressed to eject some ink. The rinse process takes max. 2 seconds or rather so long as the button will be pressed and hold.

Needed tools

- Absorbent cloth
- Or paper / cardboard

Instruction

Please rinse the nozzle channels as follows:

Step	Procedure
1	Hold an absorbent cloth or paper on front of the nozzle plate of the ink cartridge.
2	Press the [ON / OFF]-button and the [INK]-button on the top of the system simultaneously.
	
	Fig. 0-17: [ON / OFF]-button and [INK]-button on the top of the system
3	Wipe the nozzle plate off carefully to remove excess ink.

Web-Interface (PC, Tablet, Smartphone)

The WEB Interface can only be called from one terminal at the same time!
If the WEB Interface of a print system should be operated by another terminal, the existing connection must stop before!

In any case, you can open your World Wide Web browser, as Internet explorer, Google Chrome, Firefox, Opera, Safari, Flock…, and type the IP address of your device: eg: 192.168.1.10 in the address bar to reach the printer web page. See the pictures here below as an example for the descriptions of the main functions.

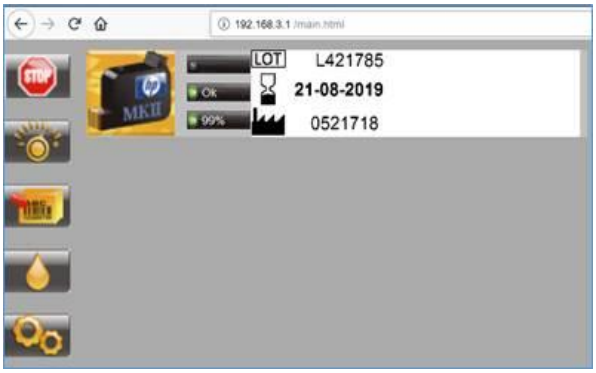
After that, the status screen is displayed, from which you can navigate.

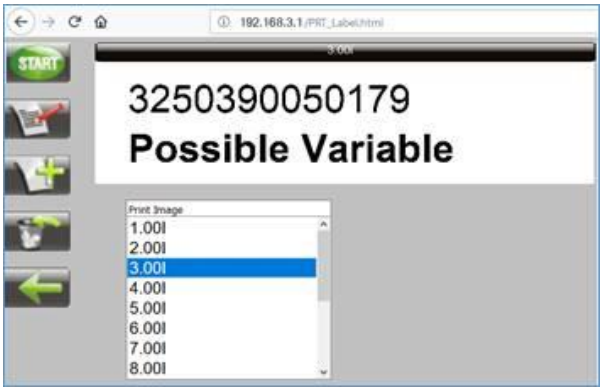
Use the arrow keys to scroll through the print image.

By a click on the print image, the print image name, the number of the previously print image and the number of prints of the selected print image, which can be print with a full cartridge, are displayed.

The print can start again or another print image can select with 

.





Configurable In-/Outputs

NOTICE

Material damage due to short-circuit!

The outputs are open Collector outputs and may load with max. 100 mA.

The **Zenjet Printer** has at the 15-pole option socket two in- and four outputs. A variety of configurations are possible and so the connectors for output of status messages (OK, Warning, Error), cartridge level messages (5% low / empty), print ready and print pulse are possible to use. On the input side signals for heating, print direction, upside print, stop and text selection are possible.
The texts for input 1 must be called „!EXT00.00I“ and „!EXT01.00I“ with an external text selection by the inputs. The texts „!EXT00.00I“ to „!EXT03.00I“ can be assigned if both inputs are used.

The setting can be done with DESIGNline Software in *Functions* → *System settings* → *Advanced settings* or via Web-Browser in *Settings* → *Advanced settings*.

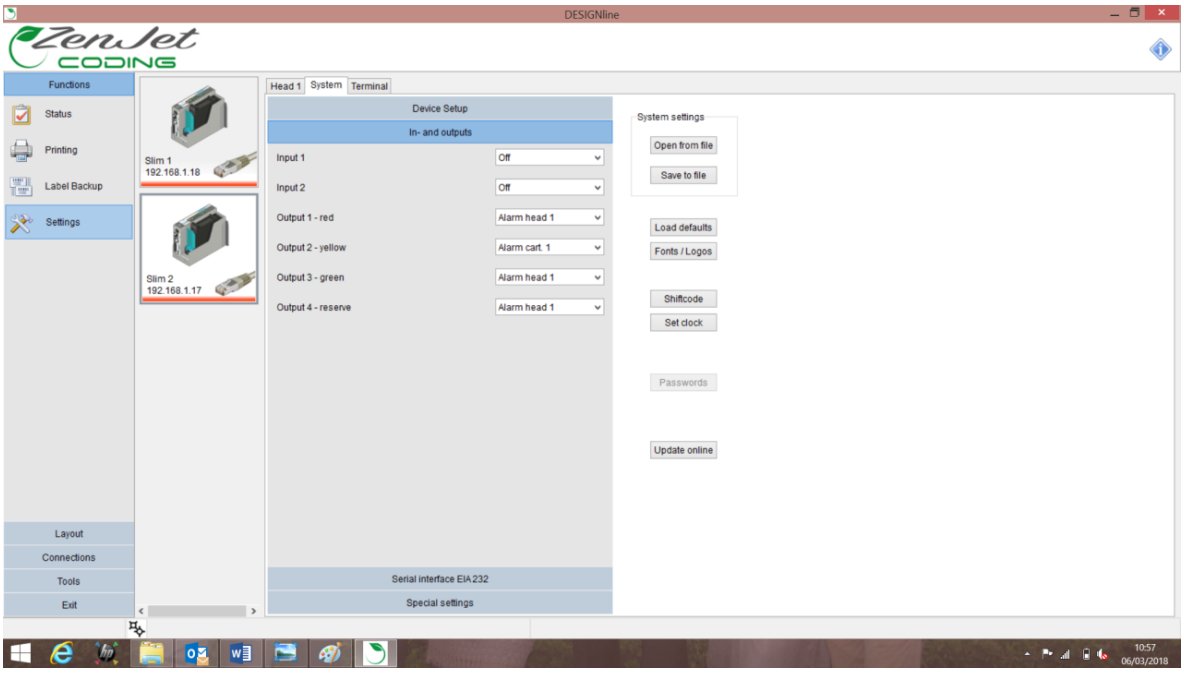


Fig. 0-18: User interface Software DESIGNline

Settings by DESIGNline software

Following print parameter can set up with the DESIGNline software:

- Print start delay
- Print direction
- Overhead
- Zoom

- Fixed speed
- Speed (Only adjustable if fixed speed is adjusted)
- Intensity (Only adjustable if fixed speed is adjusted)

- Shaft encoder
- Shaft encoder resolution (only adjustable if shaft encoder is adjusted)
- Shaft encoder divider (only adjustable if shaft encoder is adjusted)

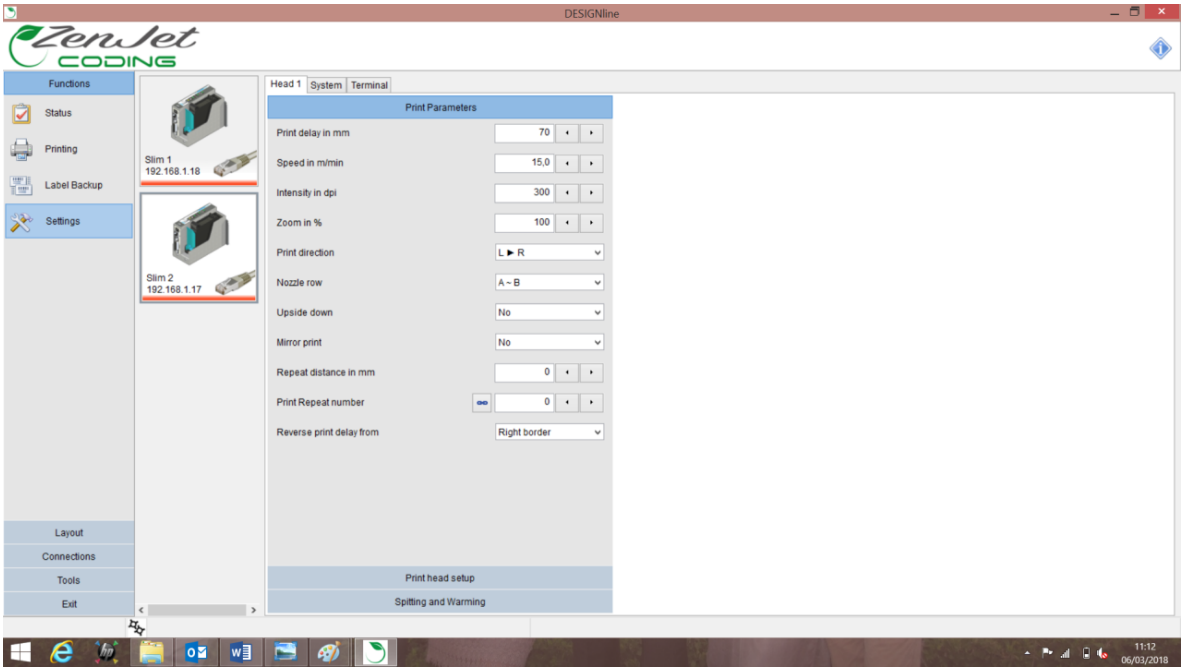


Fig. 0-18: Set print parameter by DESIGNline

DESIGNline

Create a print image

No print images can be created on the **Zenjet Printer** system unit itself.
Print images can be created and processed with the DESIGNline software stored on the USB stick. For this purpose, this must be installed on a commercially available PC (follow the enclosed DESIGNline operating instructions).

The diagram below shows the operating surface of the DESIGNline software

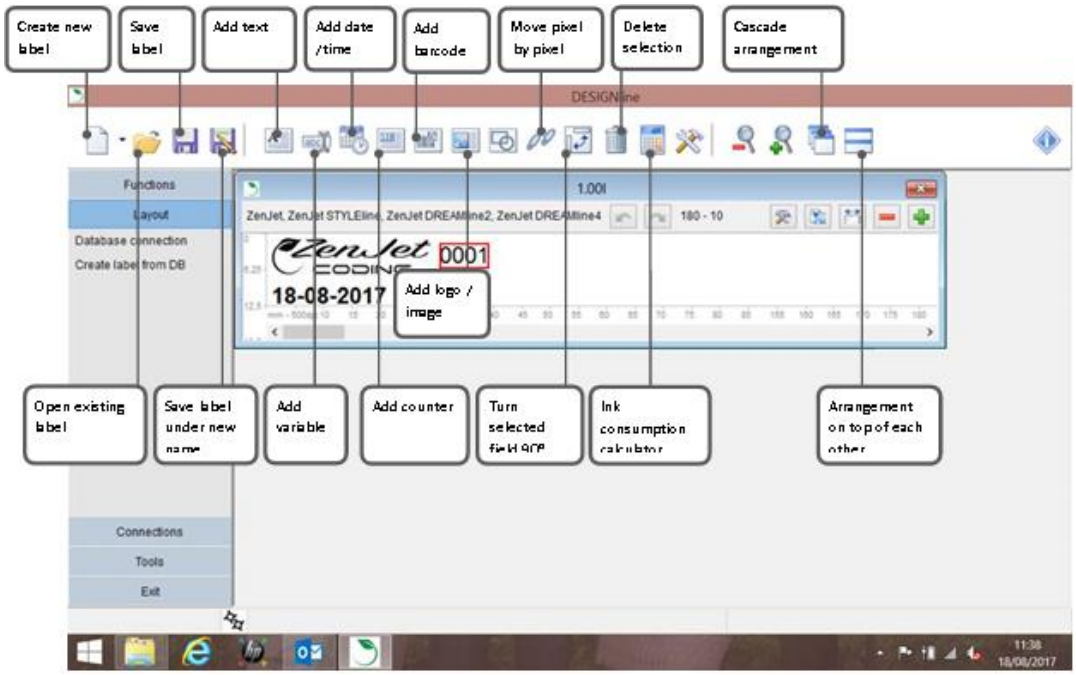


Fig. 0-1: User interface Editor DESIGNline Software

Ethernet Connection establishing

To establish an Ethernet connection to the printer you have to know a free Ethernet address.
Please ask your system administrator.

Instruction

How to set the Ethernet address in the system:

Step	Procedure
1	Connect a USB stick to the Zenjet printer and wait that the status LED stops blinking.
2	Connect the USB stick to a PC with DESIGNline software. The system will be shown in DESIGNline.
3	Click in DESIGNline with the mouse on the system icon and enter the requested IP address under Functions / Settings / System / IP address. Confirm the IP address and add the connection to DESIGNline.
4	Now connect the USB stick again to the Zenjet printer. The Zenjet printer should now be visible under the desired IP address.

Faults

The following chapter describes possible causes of malfunctions and how to remedy these.

Please contact your local distributor with regard to faults that cannot be remedied with the information provided below.

Table of faults

Faults	Possible causes	Troubleshooting	Recovered by
System unit does not start	No power supply	Check power supply	Electrician
	No 24V DC	Check 24V voltage, Change power supply	Electrician Instructed Person
System unit does not produce a print image	System on Standby	Press On / Off button	Instructed Person
	Print image not assigned	Assign print image	Instructed Person
	Stop print	Start print	Instructed Person
	Missing start pulse	Check photo sensor and connection cable	Electrician
	Missing ink cartridge	Insert ink cartridge	Instructed Person
	Empty ink cartridge	Insert new ink cartridge	Instructed Person
	Defect ink cartridge	Insert new ink cartridge	Instructed Person
	Dry up ink cartridge	Clean ink cartridge	Instructed Person
	Ink cartridge not inserted correctly	Remove and reinsert ink cartridge	Instructed Person
	Print parameter incorrect	Check print parameter, adjust if necessary	Instructed Person
	Fault in the electronics of the controller or the print head	Send controller or print head in for repairs	Manufacturer
	Faulty rotary encoder or incorrect rotary encoder settings	Check rotary encoder and encoder settings	Instructed Person
Bad and fuzzy print image	The distance between print head and product is too big	Reduce distance to 0 -4 mm …5 mm	Qualified person
	Low intensity	Increase intensity	Instructed Person
	Empty ink cartridge	Change ink cartridge	Instructed Person
	Blocked nozzles	Spitting and wipe the nozzle plate if necessary.	Instructed Person

Trouble shooting tasks

Cleaning the ink cartridge

NOTICE

Material damage due to incorrect cleaning!

Incorrect cleaning may scratch the nozzles of the ink cartridges, causing blurred print images since the scratches around the nozzles divert the ink.

Therefore:

– Use only lint-free and absorbent cloths to clean the cartridges.
– Wipe slowly without pressure.

- To be done by instructed person.
- To be done if print quality deteriorates during printing or after extended period of non-use.

During printing the print quality may deteriorate due to dust and ink vapor. In this case, wipe the nozzle plate of the ink cartridge with a lint-free cloth.

Needed tools

- Absorbent cloth

Instruction

Please clean the nozzle plate as follows:

Step	Procedure
1	Remove the ink cartridge from the holder. → ***Chapter*** Removing Ink Cartridge
2	Hold the ink cartridge with the nozzle plate facing downward.
3	Slowly wipe across the nozzle plate in the direction of the arrow, using a lint-free cloth. Do not shake the ink cartridge!

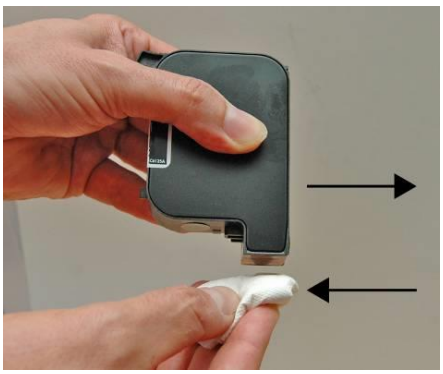


Fig. 0-1: Cleaning the nozzle plate

4	Reinsert the ink cartridge in the holder. → ***See Chapter*** Inserting Ink Cartridge

Disassembly

When end of the useful life expires, the system must be disassembled and disposed in an environmentally-friendly manner.

Safety

Staff

WARNING **Danger to life through electric shock!**


DANGER TO LIFE!

Contact with live parts poses imminent danger to life. Damaged insulation or individual components can be lethal.

Therefore:

- Immediately switch off the power supply and initiate repairs if the insulation is damaged.
- Work on the electrical system may only be performed by electricians.
- Before working on the electrical system, disconnect from the mains (remove mains plug) and check that power is off.
- Always disconnect mains before performing cleaning and repair tasks.
- Keep moisture from live parts. Moisture may cause a short-circuit.

CAUTION **Risk of injury caused by improper disassembly!**


WARNING!

Stored residual energy, sharp-edged components, points and corners on and inside the apparatus or on the required tools may cause injuries.

Therefore:

- Ensure adequate space before starting any work.
- Handle exposed sharp-edged components with care.
- Keep the work area clean and tidy! Loosely stacked or scattered components and tools are potential causes of accidents.
- Secure components to prevent falling down or falling over.
- Consult the manufacturer if uncertain.

- Disassembly may only be performed by specially trained specialized staff.
- Work on the electrical system may only be performed by electricians

Disposal

NOTICE

Environmental damage due to incorrect disposal!

Electrical scrap, electronic components, lubricants and other auxiliary materials are subject to hazardous waste treatment regulations and may only be disposed of by approved specialized companies!

Unless return or disposal agreements were made, submit disassembled components for recycling:

- Scrap metals.
- Submit plastic components for recycling.
- Dispose of other components according to material composition.

The local municipal authorities or specialized disposal companies provide information on environmentally compatible disposal

This is the end of the Zenjet Essential & Dynamic Operating Manual