# F80 High-Level Automatic Cutting Machine User Manual


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Contents

# 1.Operating Instructions

## 1.1. Safety Precautions

To ensure correct use and operation of the cutting machine and to prevent potential hazards, it is imperative to strictly follow the relevant instructions in the User Manual.

- The User Manual provides essential information to guarantee the operator's safe use of the machine.
- All personnel operating the machine must adhere to the User Manual, with particular attention to the safety instructions.

Furthermore, to avoid safety incidents, rules and regulations must be displayed adjacent to the machine during operation, and all relevant personnel are required to comply without exception.

**Certain special symbols used in this User Manual denote the following meanings:**

**Danger Symbol**

This symbol signifies an immediate threat to personal life and health; disregarding these warnings may result in severe injury or fatality.

**Important Information and Notices**

This symbol denotes an important notice essential for the correct operation of the machine. Failure to comply with these notices may result in machine malfunction or damage to associated components.

## 1.2. Operator Responsibilities

Prior to operating the machine, the operator must strictly adhere to the following requirements:

- Be thoroughly familiar with fundamental workplace safety and accident prevention regulations, have completed relevant training on the cutting machine, and be competent in its correct operation and use;
- Have read and understood the Safety Section and Warning Notices in the User Manual, and have signed to confirm this understanding;

**The operator responsible for safety must continuously maintain vigilance regarding personal work safety.**

## 1.3. Individual Responsibilities

All personnel intending to use this machine must strictly comply with the following:

- Adhere to the fundamental rules of workplace safety and accident prevention;
- Read the Safety Section and Warning Notices in the User Manual, fully understand them, and provide a signed confirmation;

**Operators must provide a signed confirmation verifying their understanding of the Safety Section, warnings, and hazard notes.**

## 1.4. Operational Hazards

This machine has been manufactured in accordance with applicable technical and safety standards. Nonetheless, its operation may present hazards to the operator or others, and may cause damage to the machine (or its components) or associated equipment.

This machine must be operated under the following conditions:

- Normal usage;
- Operation under prescribed safety conditions;

Any interference that could compromise the machine’ s safety must be rectified immediately!

## 1.5. Correct Usage

This machine is designed to be used under the conditions specified in the 'Machine Operation' chapter. Use of the machine outside its intended purpose is inappropriate, and the company assumes no liability for any consequences arising from such use.

Proper use also includes the following:

- Adherence to all notes and instructions in the User Manual;
- Regular inspection and maintenance;

## 1.6. Rights and Responsibilities

Terms related to sales and delivery are always accessible, enabling users to contact us promptly. Injuries or damages resulting from the following causes will not be covered:

- Improper use of the machine;
- Incorrect assembly, operation, control, or maintenance of the machine;
- Assembly or maintenance performed by unauthorized personnel;
- Operating machines with safety defects or with safety equipment that is improperly assembled or not fully functional;
- Failure to comply with the user manual instructions regarding transportation, storage, assembly, initialization, operation, maintenance,

and preparation of the machine;

- Unauthorized modification of the machine structure or unauthorized connections to the machine;
- Using or replacing non-original machine components;
- Using defective machine components;
- Improper repairs;
- Damage to the machine caused by external objects or excessive pressure;

# 1.7. Safety Policies

## 1.7.1. Organizational Measures

- Emphasizing the operator ' s personal responsibility to protect the equipment;
- All existing safety equipment must be regularly inspected;

## 1.7.2. Safety Equipment

- Before operating the machine, all safety equipment must be properly installed and fully functional;

Safety equipment may only be removed under the following conditions:

- The machine shall not restart after stopping unless explicitly planned;
- In accordance with regulations, safety equipment must be properly installed by the operator when transferring components;
- Following any structural modifications to the machine or adjacent equipment, safety equipment compliant with applicable standards must be installed, and such equipment must be verified by authorized safety personnel;

### 1.7.3. Non-Formal Safety Measures

- The user manual must always be kept at the machine’ s workplace;
- Furthermore, general safety regulations for accident prevention and environmental protection, along with local laws, must be readily accessible at all times;
- All safety and machine hazard signage must be maintained in clearly visible locations;
- Only trained and authorized personnel are permitted to operate this machine.
- Personal responsibilities must be clearly understood during assembly, operation, preparation, maintenance, and repair of the machine.
- Trained personnel may operate the machine only under the supervision of experienced and qualified staff.

### 1.7.4. Machine Control

- Under no circumstances shall programming modifications be made to the software.
- Only personnel who have successfully completed training are authorized to operate the machine.

### 1.7.5. Safety Measures for Normal Operation

- The machine shall only be operated when all safety equipment is fully functional.

- Before powering on, ensure that starting the machine will not pose any risk of injury to personnel.
- Each time the machine is relocated, at least one inspection must be

performed to confirm that all visible hazard markings and safety equipment are intact and operational.

## 1.7.6. Electrical Hazards

- Only qualified experts are permitted to perform live electrical work, in accordance with DIN, VDE, and EN safety standards.
- The machine’ s electronic equipment shall be subjected to regular inspections;

- Only authorized personnel are permitted to open and operate the machine using keys or tools;
- Loose connections, damaged wires or cables, or any other safety-related defects must be immediately rectified or removed;
- The electrical control cabinet and clamping box must remain closed at all times;
- As the machine outputs voltage during operation, compliance with effective safety regulations in accordance with DIN, VDE, and EN standards is mandatory;

## 1.7.7. Hazards Associated with Compressed Air

- Only personnel possessing professional expertise and experience in pneumatics are authorized to operate pneumatic systems;

- Certain systems and pressure lines intended to be opened must be fully depressurized prior to operation;
- Gas pipelines must be replaced appropriately, even if no related safety defects are apparent.

### 1.7.8. Specific Hazards

- Refer to Chapter 3.3 for the list of hazards.

### 1.7.9. Storage, Transportation, and Operating onditions

**Storage and Transportation Conditions**

Ambient Temperature: -25 to 55°C◦

Ambient Humidity: below 80% RH

**Operating Conditions:**

Temperature: 5 to 40°C◦

Relative Humidity: between 10% and 80% RH

Installation Altitude: absolute altitude below 1000 meters

Power Supply Voltage: 400 V (3P+N+PE) ±5%

Power Supply Frequency: 50 ±1 Hz

Power Input Line: the power input line for each electrical control box must be connected to the designated terminal inside the control box via a waterproof connector.

Power Protection: the main power line must be connected to the equipment through a voltage stabilizer, which shall be provided by the customer according to actual requirements.

Personal Protection: There are no mandatory personal protective equipment requirements for operators; however, operators may equip themselves according to their individual needs.

## 1.8. Maintenance and Servicing

- Adjustment, maintenance, and inspection tasks must be performed

regularly.

- Relevant operators must be notified prior to any maintenance or inspection work.
- All components and operating media at the front and rear of the machine, such as pneumatic and hydraulic systems, must be used only under proper authorization.
- During all maintenance, inspection, and repair activities, the machine must be de-energized, and the main switch must be confirmed to be in the OFF position.

**If necessary, the main switch must be turned off and locked.**

**The switch must be locked and warning signs placed to prevent the machine from being powered on inadvertently.**

- When relocating, larger component assemblies must be moved safely using a hoist or platform.
- Upon completion of maintenance, the functionality of all safety equipment must be thoroughly rechecked.

# 2.System Overview

## 2.1. Scope of Application

This machine is intended solely for its specified application range: cutting single or multiple layers of fabric, primarily textiles. The number of fabric layers and their height depend on the machine’ s design, fabric type, and other relevant factors.

This machine must only be used within the specified application range and is not permitted for other uses.

The company disclaims any liability for damages resulting from improper operation. Proper use is defined as follows:

Adhere strictly to all provisions outlined in the operation manual.

Adhere to all terms of the inspection and maintenance requirements.

## 2.2. System Description

### 2.2.1. Required Hardware

A CNC industrial computer is used for the operating system.

VGA graphics card and high-resolution display.

To process a large volume of files and numerous points, a minimum of 1GB RAM and a 2GHz processor are required.

### 2.2.2. Required Software

The operating system must be Windows 10 or Windows 11.

If the cutting machine operator has administrator privileges, we strongly recommend regularly running the disk defragmentation utility to ensure high-speed data processing by the computer.

## 2.2.3. Overall Appearance

The overall appearance of the cutting machine is shown in Figure 2-1.


Figure 2-1 Cutting Machine Model F80

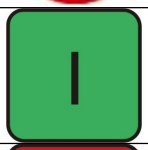
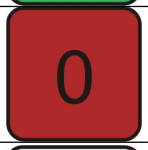
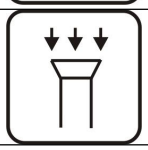
## 2.2.4. Control Panel

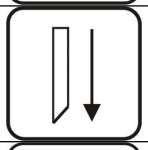
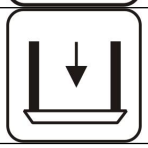
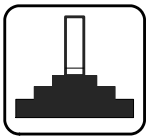
The cutting machine' s control panel is shown in Figure 2-2; this panel enables manual operation of the cutting machine.


Figure 2-2 Cutting Machine Control Panel

**Note:**

Depending on the machine configuration and selected options, individual operation keys and sequences may differ. The machine may only be operated when the main power switch is turned on and the machine is unlocked. Keys can only be operated in Manual Mode, with the exception of certain individual keys.

| Key | Description of Key Functions |
|---|---|
|  | Emergency Stop: Press this key in an emergency to immediately halt all machine operations. |
|  | Power On: Activate this switch to supply power to the servo system. |
|  | Power Off: Press this key to shut down power to the servo system. |
|  | Confirm: Use this key to confirm individual alignment points during the cutting initialization sequence,thereby positioning the cutting area. |
|  | Interrupt: Press this key to interrupt the initialization sequence, causing the cutting machine to return to the home position. |
|  | Restart Cutting: Use this key to restart a program that has been stopped.<br>Initialization Sequence: Skipping the re-check of alignment points allows the cutting machine to begin cutting immediately. |
|  | Stop: Stops the cutting program. Use restart to resume cutting or to initiate a new material discharge. |
|  | Manual Mode On/Off:Use this key to toggle between Manual Mode and Standby Mode. The indicator light illuminates when Manual Mode is enabled. |
|  | Vacuum On/Off: Use this key to turn the vacuum on or off. |

| | |
|---|---|
|  | Knife Sharpening Button: In Standby Mode, pressing this button initiates the knife sharpening process; in Manual Mode, pressing it only rotates the knife sharpening grinding wheel. |
|  | Lateral Cutting: In Standby Mode, press this key to execute lateral cutting. |
|  | Knife Down: In Manual Mode, use this key to lower and raise the knife. |
|  | Lower knife Disk: In Manual Mode, press this key to lower or raise the knife disk. |
|  | Joystick control button: In Manual Mode, the cutting head will only move when this button is pressed simultaneously while operating the joystick. Pressing this button activates the laser light. The duration for which the laser remains continuously illuminated can be set through the software.<br>The laser spot offers the following capability: it interfaces with the software to verify whether the overall dimensions of the material discharge correspond to the actual fabric position on the cutting machine. If the fabric is not placed straight, the laser spot can be used to adjust the initialization reference point. After the reference point is confirmed, the machine will automatically apply parameter compensation to correct the misaligned fabric. |
|  | Cutting knife Drive On/Off: In Standby Mode, press this key to activate the cutting knife drive. |
|  | Bristle Brick Conveyor Reverse: Press this key to jog the bristle brick backward incrementally. |
|  | Bristle Brick Conveyor Forward: Press this key to jog the bristle brick forward incrementally. |
|  | Manual Window Passing: The material receiving platform and the bristle bed move synchronously. |

| | |
|---|---|
|  | Bristle Bed Automatic Conveyance: In Standby Mode, press this key to automatically advance the bristle brick by the preset distance. Bristle Bed Automatic Cleaning: In Manual Mode, activate the vacuum function, then press this key to initiate automatic cleaning of the bristle bed. The vacuum is used during cleaning to remove dust and fabric debris. To prevent vacuum formation, ensure that no plastic film covers the bristle block. Also, the plastic film must be properly wound onto the rod to avoid being drawn onto the bristle block. |

## 2.2.5. Introduction to Basic Machine Parameters

Maximum linear speed: 100 m/min

Maximum acceleration: 9.8 $m/s^2$

Maximum knife frequency: 6000 rpm

Cutting range: Length 1800 mm, Width 1800 mm

Cutting thickness: ≤ 80 mm

Maximum negative pressure: -19 kPa

Noise Level: ≤80 dB

Power Supply Voltage: 400 V (3P+N+PE) ±5%, 50 Hz

Total Power Consumption: 42 kW

# 3.Maintenance and Technical Specifications

## 3.1. Adjusting the Machine’s Material Discharge

A separate table contains several material discharge samples primarily intended for testing and adjustment purposes. Different test files should be selected according to the specific test function to verify the proper operation of the corresponding features. The path to the test files remains unchanged after installation. The functional test file table is provided below.

C:\cutter — these test files are used for testing and adjusting machine parameters and are applied under vacuum conditions, with paper placed underneath and a thin film covering on top during cutting.

| Material Discharge Name | Application Purpose |
|---|---|
| QUAD200.ISO | This area, with an edge length of 200 mm, is used to check the offset of the cutting tool (the x- and y-distances to the laser point). The initial point is located near the laser point and must be marked on the plastic film prior to cutting. Since there is only one Material Discharge area, the initial point of the Material Discharge diagram must align with the corresponding edge of this area. (The lower-left edge of the area is executed on the left side, while the lower-right corner of the Cutting Machine is executed on the right side.)After cutting, you may verify whether the edge of the verification area (cutting contour) is accurately positioned at the Laser Point. If it is not, the respective parameter values for 'Cutter X-axis Offset' and 'Cutter Y-axis Offset' must be adjusted accordingly. |
| QUAD400.ISO | This area, with an edge length of 400 mm, can be used to verify the precision of the X-axis and Y-axis. The edge length of |

| | |
|---|---|
| | this area—from the start of paper cutting—must be exactly 400 mm. If an offset occurs in length or width, the corresponding parameters 'X-axis precision compensation' and 'Y-axis precision compensation' must be adjusted. |
| KREUZ43.ISO | Verify the drilling offset of the drill bit (M43). With proper tool compensation, the 'Punch Drill 1 X-direction offset' and 'Punch Drill 1 Y-direction offset' parameters must ensure that the drilling is precisely at the intersection of the cutting lines. |
| KREUZ44.ISO | If a second drilling material discharge device is present, it is used to verify the drilling offset of the auxiliary drill bit (M44). With proper tool compensation, the 'Punch Drill 2 X-direction offset' and 'Punch Drill 2 Y-direction offset' parameters must ensure that the drilling is precisely at the intersection of the cutting lines. |
| CTEST.ISO | Used for adjusting the C-axis. Perform one cutting cycle of two circumferences and two rectangles in the clockwise direction, and one cutting cycle in the counterclockwise direction. If the two circumferences differ in size, this indicates that the insertion point is not located on the mechanical pivot of the Cutting knife Drive (Cutting knife Guide). |
| QUAD16.ISO | A layout composed of 16 square tiles, each 1 meter in side length, tested for window openings and cutting. |

## 3.2. Knife Guide Testing

Perform cutting down and cutting up at 0°, 90°, 180°, and 270° positions respectively to test the knife guide accuracy. For knife guide testing, it is recommended to apply thick double-sided tape at the corresponding bristle bed position, then use a laser pointer to align with the center of the tape before conducting the test.

If the deviation is excessive, please contact service to perform a physical adjustment of the knife rail.

## 3.3. List of Hazards

| Sequence | Hazard Type | Resolution | Precision to Standard |
|---|---|---|---|
| 1 | Hazard During Movement of the Cutting Beam | Strictly adhere to the operation manual.<br>Caution when near the machine.<br>Safety Block (Stops Operation in Emergency) | EN 292<br>VBG |
| 2 | While the cutting knife is in operation. | Strictly adhere to the operation manual.<br>Caution when near the machine. | EN 292<br>VBG |
| 3 | When pressing down the fastener or moving components. | Strictly adhere to the operation manual.<br>Caution when near the machine. | EN 292<br>VBG |
| 4 | Working on the machine without shutting it down or unintentionally starting it. | Strictly adhere to the operation manual.<br>Caution when near the machine. | EN 292<br>VBG |
| 5 | Risk of conveyor belt crushing when transferring or moving the machine (moving cutting machine). | Strictly adhere to the operation manual.<br>Caution when near the machine. | EN 292<br>VBG |

## 3.4. Technical Specifications

| | | |
|---|---|---|
| Working Width | | 1800mm |
| Working Length | | 1800mm |
| Maximum Cutting Height | | Dependent on the material<br>Single layer - 80 mm (under vacuum conditions) |
| Maximum positioning speed | | Dependent on circumstances<br>Maximally not exceeding 100 m/min |
| Maximum cutting speed | | Dependent on circumstances<br>Maximally not exceeding 100 m/min |
| Bristle brick | | Determined based on actual conditions |

| | | |
|---|---|---|
| Maximum acceleration | | Dependent on circumstances<br>Maximum 1g (g = 9.8 m/s²) |
| Data format | | ISO format<br>GBR standard format |
| Data transmission | Offline | Hard disk |
| | Online | Network (Internet or other networks) |
| Input Voltage | | 400V/50Hz<br>Special Voltage as Specified |
| Energy Consumption | Vacuum Equipment | Dependent on circumstances |
| | Cutting Machine | Determined by Configuration |
| Pressure-vacuum Consumption During Cutting | | 200 I/min at 6 Atmospheres |
| Environmental Factors | | The Voltage of the Control Electrical Cabinet Must Remain Stable<br>(Maximum Tolerance +/- 5%)<br>The Environment (Actual Humidity and Temperature) Should Be Appropriate for the Fabric Being Processed (Air Conditions) |

# 3.5. Frequently Asked Questions

## 3.5.1. Cutting Machine Software Issues

**1) How to Respond if the Software System Crashes During Operation?**

Response: During operation of the cutting machine, interference, abnormal operations, or other special conditions may occasionally cause the software to crash. If the cutting process is currently in progress, immediately disconnect the power using the emergency stop switch or safety switch, then close and reopen the software.

**2) What should I do if I click on a CAD file in the work queue but it fails to open?**

Answer: Some larger CAD files may load slowly; please wait patiently. If the file still does not open after an extended period, please verify whether the CAD file is in a format compatible with cutting. If none of the above methods open the CAD file, please contact our technical support team or send the CAD file along with a detailed description of the issue to our after-sales email. We will address your problem promptly.

### 3.5.2. Industrial Control Computer / Driver Issues

**1) What should I do if the cutting machine software is unresponsive and the driver’s red indicator light is flashing?**

Answer: The red indicator on the driver would flashes due to a communication interruption between the industrial control computer and the driver. Please first verify that the driver communication cable and power cable connections are secure and intact. If the cable is loose, securely reconnect it. Otherwise, Please power off the CNC controller, restart it, and attempt to re-establish the connection.

### 3.5.3. Operation Process Issues

**1) The power start button (green button) on the control panel does not activate?**

Answer: Verify that all emergency stop switches have been fully reset.

**2) Unable to unlock the Cutting Machine Software after launching?**

Answer: Inspect the status of all modules and verify signal outputs.

## 3.6. Contact Information

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