Lead Forming & Cutting Machine

User Manual

FD-40-20 · Double-Cylinder Side-Pull Type · One-Pass Lead Pulling, Cutting & Forming

Model FD-40-20 · Cutter cylinder 40-20 · Solenoid valve 310 (220 V AC)

FD-40-20 lead forming & cutting machine (double-cylinder side-pull type)

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About This Manual

This manual applies to the LUOYIYUN FD-40-20 lead forming & cutting machine (double-cylinder side-pull type), and can also serve as an operation reference for other FD-series forming cutter machines on the same platform.

Read Chapter 1 “Safety Instructions” in full before first use; perform installation and daily operation according to Chapters 5 and 6. If equipment parameters differ from this manual, the finally confirmed drawings, order and nameplate agreed by both parties shall prevail.

1 Safety Instructions

This chapter contains mandatory safety requirements. Read it in full and inform all operators before use.

1.1 General Safety

- The equipment must be operated by trained personnel; confirm that every operator has read this manual.
- Place the equipment on a ventilated, dry and level floor, away from water sources and flammable or explosive materials.
- Non-professionals must not disassemble the machine; faults must be handled by professionally skilled maintenance personnel.
- Switch off power and air supply and protect the machine from dust when it is not in use.

1.2 Electrical Safety

- Power supply is 220 V AC 50 Hz; before use, check that the mains voltage matches the nameplate and is stable.
- The equipment must be reliably earthed and the earthing kept in good condition.
- A fuse / air switch / leakage switch is recommended in the power circuit.

WARNING Never move the equipment while it is energized; do not strike, disassemble or re-fit any parts of the electrical section. Disconnect the power before any electrical servicing.

1.3 Pneumatic & Mechanical Safety

- Connect the air supply at 0.6 MPa; the pressing pressure is generally set between 0.1 and 0.2 MPa.
- Confirm the quick-connect fittings are locked and there is no leakage before powering on.
- Never put fingers into the die set, cutter or cylinder movement area; disconnect air and power before any setup.
- Disconnect power and air before installing or replacing a die set (see Section 5.3).
- Drain the water from the filter regularly to protect the cylinders and solenoid valve.

WARNING The cutter edge is sharp. Before any operation that touches the blade or removes the cutter, disconnect air and power; wear cut-resistant gloves when necessary.

1.4 Personal Protection

- Safety glasses are recommended; long-haired operators must tie their hair up.
- Use tweezers or the die set to load/unload products; keep hands away from the cutter edge.

2 Product Overview

This chapter introduces the FD-40-20 positioning, model numbering, application fields and key advantages.

2.1 Introduction

The FD-40-20 lead forming & cutting machine (double-cylinder side-pull type) is designed for one-pass lead pulling, cutting and forming of magnetic-ring inductors: the machine completes pulling, cutting and forming in a single stroke, which effectively streamlines the following processes (de-molding, board insertion, etc.) and raises productivity. It is air-driven and controlled by a foot switch — compact and easy to operate.

2.2 Model Numbering and Product Types

FD-series forming cutter machines are named after the cutter cylinder specification: on the same platform, the FD-60-35A model carries a 60-35 cutter cylinder (see its factory parameter sheet); accordingly, the FD-40-20 corresponds to a cutter cylinder of 40-20. Matching forming die plates are custom-made per product pitch/row spacing, in D2, SKD11 or SKH-9 tool steel depending on the model.

FD-40-20 lead forming & cutting machine, overall view

2.3 Application Fields

- Target products: magnetic-ring inductors (brand: LUOYIYUN, official mall data);
- Target process: one-pass pulling, cutting and forming of inductor leads, streamlining de-molding and board-insertion processes;
- Applicable wire: copper wire (wire-diameter range per the factory inspection sheet supplied with the machine).

2.4 Key Advantages

- Pulling, cutting and forming completed in one stroke — less handling between processes;
- Double-cylinder design (cutter cylinder + side cylinder) with independently adjustable pulling force and pressing pressure for stable forming quality;
- Quick-change die sets: switching products only requires swapping the die set matched to the pitch/row spacing;
- Foot-switch control keeps both hands free for loading and unloading — safe and efficient.

3 Technical Specifications

This chapter lists the standard parameters of the FD-40-20 and the selection reference of the same series. Listed items are regular configurations; special requirements can be customized.

3.1 FD-40-20 Standard Specifications

Item	Parameter
Model	FD-40-20
Machine name	Lead forming & cutting machine (double-cylinder side-pull type)
Brand	LUOYIYUN
Target products	Magnetic-ring inductors
Power supply	220 V AC 50 Hz
Solenoid valve	Type 310, 220 V AC
Air supply pressure	0.6 MPa
Pressing pressure	0.1–0.2 MPa (adjustable via regulator gauge)
Cutter cylinder	40-20 (per model numbering)
External air tubing	8 mm

Note 1: power supply, solenoid valve, air pressure and tubing size are standard configurations of this platform (per the factory documents of the same-platform FD-60-35A).

Note 2: wire-diameter range, product size, magnetic-ring outer diameter, side-cylinder specification and machine weight are subject to the factory inspection sheet supplied with the machine.

3.2 FD-Series Selection Reference (Official Mall Data)

Forming cutter machines / die plates of the same platform are selected by pitch, row spacing and wire diameter:

Model	Type	Max pitch / row spacing	Max copper wire dia.	Die-plate material
FD-6320	Forming cutter machine	25 × 25 mm	1.5 mm	D2 (matching die plate)
FD-8020	Forming cutter machine	25 × 25 mm	2.0 mm	D2 (matching die plate)

FD-8040	Forming cutter machine	50 × 50 mm	2.0 mm	SKD11 (matching die plate)
FD-8040A	Forming cutter machine	50 × 50 mm	2.5 mm	SKD11 (matching die plate)
FD-10040	Forming cutter machine	60 × 60 mm	2.5 mm	SKD11 (matching die plate)
FD-10050	Forming cutter machine	90 × 70 mm	2.5 mm	SKH-9 (matching die plate)
6320 / 8020	Forming die plate	—	—	D2
8040 / 8040A	Forming die plate	—	—	SKD11
10040	Forming die plate	—	—	SKD11
10050	Forming die plate	—	—	SKH-9

4 Structure and Key Components

This chapter describes the overall structure and the lead pulling/cutting mechanism, die sets, pneumatic system and foot-switch control.

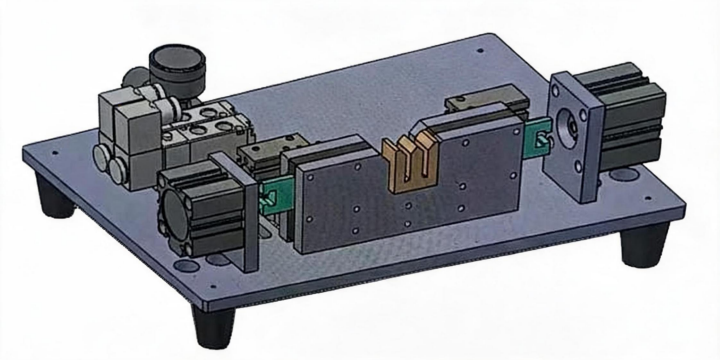
4.1 Overall Structure

The machine consists of the frame, cutter cylinder, side (pull) cylinder, pull-cut mechanism, die-set slot, pressure regulators (one each for pulling force and pressing pressure), filter-regulator unit, solenoid valve, foot switch and the electrical control section.

FD-40-20 mechanism inside the housing

4.2 Pull-Cut Mechanism

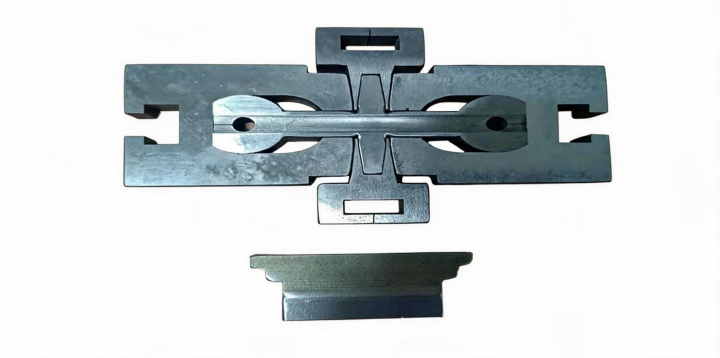
The cutter cylinder drives the cutter to cut the leads; the side cylinder pulls the leads through the lower-pull clamp to complete pulling and forming. The die set determines the forming angle and the pitch/row spacing.



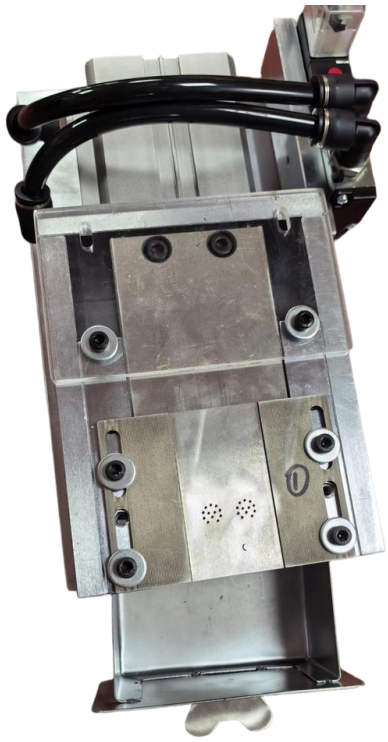
Pull-cut mechanism (schematic)

4.3 Die Set

Die sets are custom-made per product pitch/row spacing; the side with the polished chamfer is the front face — observe the orientation when installing (see Section 5.3).



Die set spread (customized by pitch / row spacing)



Die set mounted in the slot

4.4 Pneumatic System

The 8 mm external air tubing feeds the filter-regulator unit, then splits into two branches: one through the pressure regulator controlling the pulling force (side cylinder), one through the gauge next to the pressing cylinder controlling the pressing pressure (0.1–0.2 MPa).

4.5 Electrical and Foot-Switch Control

Powered by 220 V AC; the type-310 solenoid valve (220 V AC) switches the air circuit; the foot switch triggers one working cycle.

5 Installation and Air Connection

Complete unpacking inspection, installation, die-set installation and power/air connection in the order of this chapter; be sure to read Chapter 1 before first use.

5.1 Unpacking Inspection

After unpacking, check the packing list: machine, foot switch, power cord, 8 mm air tubing, quick air connector, hex wrenches, etc. (per the packing list supplied with the machine), and check for transport damage.

5.2 Installation Environment

- Place on a level, ventilated and dry floor; leave room around the machine for foot-switch operation;
- Keep away from water sources and corrosive gases;
- Power supply is 220 V AC; the equipment must be reliably earthed.

5.3 Die-Set Installation

- Step 1 — Do not connect power or air before installing the die set;
- Step 2 — Put the die set into the die-set slot and align it; observe the front/back faces (the side with the polished chamfer is the front);
- Step 3 — Tighten the die-set screws;
- Step 4 — Only after the die set is confirmed in place, connect power and air.

5.4 Power and Air Connection

Connect to 220 V AC with good earthing; connect the air supply through the 8 mm tubing and quick connector; confirm the gauge reads 0.6 MPa and there is no leakage.

6 Operation

Follow this chapter for daily operation.

6.1 Pre-Operation Check

Before use, check that the air pressure and the power indicator lamp are normal; confirm the die set is tightened and the cutter edge has no chipping.

6.2 First-Article Inspection and Pressure Adjustment

- Step 1 — First-article inspection before volume production: cut and form one sample product and check whether the PIN forming is OK;
- Step 2 — If the PINs are not straight after forming, increase the pulling force: raise the pulling-force regulator pressure;
- Step 3 — If sample PINs are pulled off / broken, reduce the pulling force;
- Step 4 — The gauge next to the pressing cylinder controls the pressing pressure — generally set it between 0.1 and 0.2;
- Step 5 — Once the first article is confirmed OK, volume production can start.

Foot switch (triggers the working cycle)

6.3 Volume Production

The foot switch triggers the working cycle so both hands load and unload products; spot-check PIN forming quality and the cut edge for burrs during production; do not keep the foot switch pressed while handling products.

6.4 Shut-Down

After production, disconnect power and air and clean the machine and its surroundings; when the machine is idle, disconnect power and air and protect it from dust.

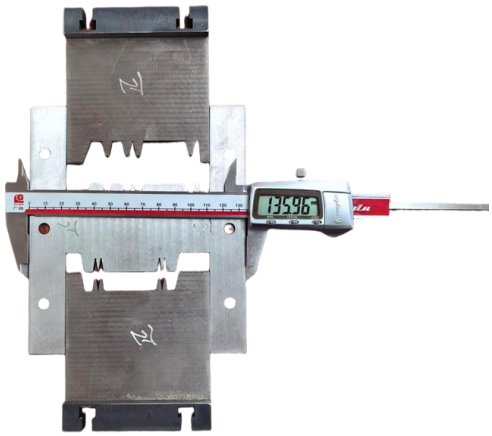
7 Maintenance

Inspect and maintain on the cycles below to keep the equipment reliable over the long term.

7.1 Maintenance Schedule

Interval	Maintenance work
Every 10 days	Remove the cover and the die set; repeatedly press the foot switch and spray rust-preventive oil 3–5 times on the cutter guide rails for lubrication
Weekly	Check whether the blade springs on the cutter are broken; replace broken springs promptly
Weekly	Stand the machine up and check from the bottom clamp-head position

	whether the lower-pull clamp spring is broken; replace if broken
Periodically	Check the cutter edge for chipping; if chipped, remove the cutter and send it back to the factory for re-sharpening, otherwise burrs will appear on cut PINs
Periodically	Drain water from the external filter to protect the cylinders and solenoid valve from moisture in the air tubing
During standstill	Disconnect power and air and protect the machine from dust



Cutter edge check (send chipped cutters back for re-sharpening)

7.2 Maintenance Precautions

All replacement parts must be genuine originals; otherwise our company will no longer provide warranty or maintenance. Disconnect air and power before removing the cutter or springs.

8 Troubleshooting

The table below lists common faults and remedies. Any work involving electrical parts must be performed by professional personnel with the power disconnected.

Symptom	Possible cause	Remedy
PINs not straight / forming incomplete	pulling force too low	raise the pulling-force regulator pressure
PINs pulled off / broken at trial cut	pulling force too high	reduce the pulling-force pressure
burrs on the cut edge	cutter edge chipped or worn	remove the cutter and send it back to the factory for re-sharpening, or replace the cutter
slow / weak cutter action	insufficient air pressure; water in the filter; leaking tubing	confirm 0.6 MPa supply; drain the filter; re-tighten the quick connectors

pressing pressure damages products	pressing pressure set too high	set the pressing pressure back to 0.1–0.2
foot switch does not trigger	loose foot-switch plug / solenoid valve fault	check the plug connection; replace the type-310 solenoid valve
abnormal noise / jerky cylinder motion	guide rails dry or contaminated	clean the rails and spray rust-preventive oil
blade spring / lower-pull clamp spring broken	fatigue failure	replace the spring promptly
power indicator off	power not connected / fuse blown	check the 220 V supply and fuse (with power disconnected)

9 Packing, Transport and Storage

- Factory packing: machine, foot switch, power cord, 8 mm air tubing, quick air connector, hex wrenches, product certificate, factory inspection report (per the packing list supplied with the machine);
- Transport: handle with care; avoid violent vibration, impact and rain; keep the original packing for long-distance transport.
- Storage: store in a dry, ventilated warehouse; before long-term standstill, clean the machine and disconnect power and air.

10 Warranty and After-Sales Service

We provide complete warranty service and lifetime technical support for every unit.

10.1 Warranty Terms

- Whole-machine warranty of 1 year from the date of acceptance. Within the warranty period, failures caused by the equipment's own quality or natural damage of core parts (non-human) are repaired free with free genuine parts; labor, parts and transport are borne by us;
- Damage caused by human impact, dropping, irregular wiring, over-specification use, operation against this manual, or unauthorized disassembly/modification is not covered by the free warranty;
- After the warranty period, lifetime paid technical service is provided and genuine parts are supplied at cost price;
- After a repair request, we respond online (phone / WeChat / video) and guide troubleshooting remotely.

10.2 Service Commitments

Service item	Content
Warranty period	1-year free whole-machine warranty from the date of acceptance
Warranty scope	within the warranty period, failures caused by the equipment's own quality or natural damage of core parts (non-human) are repaired free with free genuine parts; labor, parts and transport borne by us
Response	fast online response (phone / WeChat / video) after receiving a repair request, with remote troubleshooting guidance

After warranty	lifetime paid technical service; genuine parts supplied at cost price long-term
Customization	die-set pitch / row spacing, die-plate material and cutter specification are all customizable
Supplied documents	one operation manual and one maintenance manual

10.3 Ordering and Contact

For more specifications, quotations or die-set customization, feel free to contact us (see Appendix B).

Appendix A Glossary

Term	Meaning
Pull-cut forming	process of pulling the leads into position, then cutting and forming them in one stroke
Die set	tooling that determines lead pitch, row spacing and forming angle; the polished-chamfer side is the front face
Pitch / row spacing	distance between adjacent leads / between adjacent rows
First-article inspection	inspection of the first formed product before volume production
Burr	rough edge left on the cut face, usually caused by a chipped or worn cutter
Cutter cylinder / side cylinder	the two cylinders that cut the leads and pull-form them respectively
Solenoid valve	component that switches the air circuit (type 310, 220 V AC on this machine)
Pressure regulator	component that sets the pulling force (side cylinder) and the pressing pressure
Filter-regulator unit (FRL)	air-supply treatment component that filters compressed air and stabilizes pressure

FAQ: quotation & lead time, die-set pitch / row-spacing customization, cutter re-sharpening service, air & power requirements.

Note: equipment specifications and technical parameters are subject to the finally confirmed drawings, order and nameplate agreed by both parties.