

DCS-LD Series Electric Flow Scale

Operation and Installation Manual

English Translation - Edition 002-2018

Manufacturing License No. Wan Zhi 00000108

Ewinall Packaging Machine Co., Ltd.

Notice to Users

Thank you for choosing the high-technology equipment manufactured by Anhui Yongcheng Electronic & Mechanical Technology Co., Ltd. We are committed to supporting your factory with high-quality service.

This manual explains the product configuration, performance, technical specifications, installation, commissioning, operation, and routine maintenance. Read it carefully before using the equipment. The manufacturer is not liable for losses caused by operation that does not comply with this manual.

Every effort has been made to ensure that the information is accurate and reliable. The manufacturer reserves the right to modify and improve the product without prior notice, provided that such changes do not materially affect normal use.

National service hotline: 400 698 0002

Customer complaint hotline: 18805640901

Warnings and Precautions

WARNING

- 1 Electric-shock hazard.
- 2 Switch off the power supply during thunderstorms and lightning.
- 3 Keep hands clear of pinch points.
- 4 Disconnect the power supply before cleaning or repair.

General Precautions

- Use a dedicated circuit and outlet, and ensure reliable protective grounding.
- Do not start or stop the machine by inserting or removing the power plug.
- Do not store flammable or explosive materials near the equipment.
- Do not connect welding machines or other high-current, high-electromagnetic-radiation equipment to the same distribution circuit.
- If an abnormal condition such as an unusual odor occurs, stop the machine immediately and disconnect the main power.
- Do not wash the equipment with water or operate it with wet hands.
- Disconnect the main power before inspection, maintenance, or cleaning.
- Do not insert fingers into the equipment while it is operating.
- Disconnect the main power when the equipment will not be used for an extended period.
- Do not alter electrical wiring or mechanical structures without authorization.
- Do not manually pull or press the weighing hopper.
- Perform daily maintenance and use compressed air to remove dust from the load cells.
- The user is responsible for compliance with all applicable metrology, safety, and inspection regulations.

During the warranty period, defects caused by equipment quality will be repaired free of charge. Damage caused by relocation, misuse, unauthorized disassembly or parts replacement, abnormal voltage, fire, external factors, or non-compliant operation is the user's responsibility.

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1. Safety

1.1 Environmental Conditions

- 1 Install the equipment where the ambient temperature is 0 to +40°C, relative humidity is 30% to 90%, and altitude is below 1,000 m.
- 2 Keep the room clean and well ventilated. Keep the equipment away from corrosive gases, flammable or explosive gases, and vapor.
- 3 For supply voltage and frequency, refer to the equipment nameplate.
- 4 Provide adequate space for operation, servicing, and inspection.

1.2 Warning Symbols

The warning symbols used in the source manual identify hazards that may cause serious injury, minor or moderate injury, or equipment damage that could lead to personal injury. Understand every safety label and follow the stated preventive measures.

1.3 Safety Labels

- 1 Hazardous locations on the equipment are identified with safety labels.
- 2 Understand every label and follow its instructions during installation, adjustment, operation, maintenance, and inspection.
- 3 Replace any label that becomes loose, damaged, or illegible.

1.4 Responsibilities and Precautions

- 1 Only personnel who fully understand this manual may operate the equipment.
- 2 Ensure operators are familiar with the instructions and the specific hazardous areas.
- 3 Follow all safety rules and accident-prevention regulations.
- 4 Management shall provide safety training and comply with national, local, and internal company rules.
- 5 Any modification must not impair equipment function or safety.
- 6 The manufacturer accepts no liability for accidents or damage resulting from failure to follow this manual.

1.5 Safety During Operation, Inspection, and Maintenance

- 1 Only specially trained technicians may operate, inspect, service, or maintain the equipment.
- 2 Set motor rotation strictly according to the direction labels.
- 3 Never remove, cover, bypass, or bridge safety devices.
- 4 Keep hands away from moving parts. Inspection, repair, and cleaning may begin only after the machine has completely stopped.
- 5 After stopping, disconnect the main power before servicing.
- 6 Pay particular attention to areas marked with safety labels.
- 7 If welding or spark-producing tools are required, strictly apply dust-explosion and fire-prevention measures.
- 8 Repair or replace damaged parts promptly.
- 9 Do not open motor terminal boxes until the circuit is de-energized.

1.6 Personal Protection and Accident Prevention

- The operating company is responsible for measures protecting machine operators.
- Fully isolate power to the drive motors before repair, commissioning, inspection, or maintenance.
- Clean, lubricate, or oil the machine and its components only while stopped.
- Remove accumulated dust, dirt, and material frequently. Clean equipment improves production safety and helps prevent dust explosions.
- Only trained professionals may operate the machine.

1.7 Dust Explosion and Fire Prevention

1.7.1 Housekeeping

- Keep combustible-dust work areas clean.
- Do not store bags or loose material between machines.
- Remove dust frequently and effectively.

1.7.2 Electrical Equipment

- Inspect electrical equipment regularly.
- Repair or replace faulty electrical devices immediately.
- Do not route unsheathed cables on the floor.
- Switch off the equipment power after the shift.

1.7.3 Static Electricity

Remove paint from electrical bonding points to ensure continuity and prevent spark-discharge explosions.

2. Overview

2.1 Composition

The DCS-LD Series Electric Flow Scale mainly consists of a feeding mechanism, weighing mechanism, electrical control box, and frame.

2.2 Operating Process

In Automatic mode, the batching controller first performs automatic zeroing and then opens the feeding mechanism. Material continuously enters the weighing hopper. The load cells convert weight into an electrical signal and send it to the controller. The controller displays the material weight and outputs control signals according to the configured parameters so that the feeding mechanism supplies material at a defined flow rate. After the target batch is reached, the measured weight is recorded. The weighing-hopper discharge gate opens and material flows out through the discharge chute by gravity, completing one weighing cycle.

2.3 Application

Suitable for free-flowing granular materials with good flow characteristics, including paddy and rice.

2.4 Technical Performance

- Power supply: 4N-AC380V, 50 Hz. A dedicated regulated power supply is required.
- Ambient temperature: 0 to 40°C. A well-insulated environment supports longer service life.

- Relative humidity: $\leq 90\%$. Avoid corrosive gases, high-frequency vibration, and strong electromagnetic interference.

Model	DCS-50LD/2	DCS-100LD/2	DCS-200LD/2	DCS-300LD/2	DCS-400LD/2
Capacity (kg/h)	$\leq 20,000$	$\leq 40,000$	$\leq 60,000$	$\leq 80,000$	$\leq 100,000$
Accuracy class	0.5	0.5	0.5	0.5	0.5
Power	0.9 kW	0.9 kW	0.9 kW	0.9 kW	1.1 kW
Dimensions W x D x H (mm)	1142x1035x1768	1283x1148x1911	1412x1312x2855	1585x1520x2930	1670x1620x3330

All performance figures were tested using paddy as the material.

2.5 Main Assemblies (DCS-100LD Example)

2.5.1 Electrical Control Box

The electrical control box is the complete electrical assembly. It includes the digital batching controller and associated components such as resistance-strain load cells, the external power connection, and proximity sensors.

Special note: DCS-LD2 is not a standard configuration and is supplied only as an option for special customer requirements.

Control Panel Functions

Control / Indicator	Function
Batching controller	Displays weight, flow, totals, parameters, and operating status.
Power indicator	Indicates that control power is available.
Run indicator	Indicates that the machine is operating.
Emergency Stop	Cuts control power if the feed-chute or weighing-hopper geared motor fails.
Start / Stop	Starts or stops the operating sequence.
Discharge	Operates the discharge function in manual control.
Manual / Automatic	Selects manual or automatic operation.

The two seven-pin sensor aviation connectors must be connected in the upper/lower positions shown on the machine and must not be interchanged. The four-pin external HMI connector is fitted only on DCS-LD2 models.

2.5.2 GM8804C5 Digital Batching Controller

Main display: six digits for weight, flow, cumulative quantity, and controller parameters.

Secondary display: three digits for analog values and parameter prompts.

Indicator	Meaning
ZERO	Zero: on when hopper weight is 0 +/- 1/4 d.
STAB	Stable: on when weight variation is within the stability range.
RUN	On while batching is in progress.
OVER / UNDER	Batch exceeds the target plus tolerance / is below the target plus under-tolerance.
HOLD / SUM	Current shipment/receipt total / grand total.

Indicator	Meaning
GROSS / NET / TARE	Gross weight / net weight / tare operation.
GO	Cumulative-total overflow flag.
SP1 / SP2 / SP3	Coarse / medium / fine feed output active.
DISC	Discharge output active.
NZ	Current weight is below the configured near-zero value.

Key Functions

The keypad provides Zero/Clear Total, Select/Tare, Page, Enter, User Parameter, Escape, numeric entry, System Parameters (1), Calibration (2), Batch Count (3), Time (4), Date (5), Totals (6), Print (7), I/O Test (8), Recipe (9), and I/O Definition (0).

Errors and Alarms

Message	Meaning
ERR	Invalid input; check the permitted parameter range and re-enter.
ERR 1	Shipment completed.
ERR 2	Current weight exceeds the zeroing range.
ERR 3	Scale is unstable during zeroing.
ERR 4	Incorrect password entered more than three times.
ERR 5	Custom switch function is disabled.
OVER / UNDER during zero calibration	Load-cell input signal is too high / too low.
OFL	Measurement overflow.

3. Transportation

The equipment is normally transported by road freight. Observe safe loading and unloading practices. Stack only in the specified orientation and within the permitted stacking limit. Secure the equipment firmly and protect it from rain, sunlight, impact, and overturning.

4. Installation

4.1 Installation Safety

- 1 Placement and handling must be performed by qualified personnel.
- 2 Use the specified lifting tools and follow the specified lifting sequence and method.
- 3 Keep unauthorized personnel out of the lifting area.
- 4 The rated capacity of lifting equipment must exceed the total equipment weight.
- 5 For temporary storage, keep the machine level, indoors, clean, and at normal temperature.
- 6 Before installation, retain parts in their original packaging and protect them from rain, sunlight, moisture, and wind.

4.2 Installation Location

Consider the storage hopper size, position, load capacity, and installation access. Use a solid concrete foundation. Avoid strong vibration and magnetic fields, reserve maintenance clearance, and coordinate the installation with other production-line equipment.

4.3 Remove Transport Restraints

Remove the transport fixing plates, sleeves, straps, and other shipping restraints from the weighing hopper and weighing suspension rods before commissioning. Confirm that the rod-end bearings and weighing mechanism move freely.

4.4 Power Connection

Connect the three-phase, four-wire supply to the power terminal block in the electrical section of the scale.

4.5 Equipment Anchoring

Each of the four base plates has a 13 mm mounting hole. After final positioning and commissioning, secure the frame using 12 mm x 80 mm expansion bolts. Install the storage hopper rigidly so that it cannot sway.

5. Commissioning

5.1 Preparation

5.1.1 Cable Connections

- 1 Connect the seven-pin plug of the level sensor to the seven-pin socket on the bottom of the control box. The low-level sensor is installed on the lower collection hopper. If material is not discharged in time, its indicator turns on and inhibits the flow-scale feed gate until the material clears.
- 2 Check that motor cable glands, feed-gate and discharge-gate proximity-sensor connectors, and load-cell connectors are tight.
- 3 For a separate control box, connect and lock every aviation plug according to its factory label.

5.1.2 Power Input

Connect AC380V to the marked terminals on the terminal strip inside the control box.

5.2 No-load Test

- 1 Turn on the control-box power switch, release Emergency Stop, verify that the power indicator is on, and check that all four feed-gate and discharge-gate proximity sensors are secure.
- 2 Set the Manual/Automatic selector to Manual.
- 3 Use the internal test buttons one at a time to verify normal forward and reverse operation of the geared motors on the feeding mechanism and weighing hopper.

5.3 Material Test

- 1 Switch on the scale and allow it to warm up for 30 minutes. Ensure material is available in the upper hopper. Set a target, for example 50 kg, and select Automatic. The feed gate opens and supplies the weighing hopper; gate travel may be adjusted using the proximity sensors.
- 2 When the displayed weight reaches the fine-feed cutoff point (target minus parameter F1.4), the feed gate begins to close. A small difference from 50 kg does not affect cumulative accuracy because every batch result is added to the total. For large deviations, stabilize the supply flow and adjust the fine-feed cutoff value.

- 3 After weighing, discharge starts automatically. When the weight falls into the near-zero range, the discharge gate closes and the next cycle begins.
- 4 To stop, press Manual. The feed gate closes and ERR01 may appear; press ESC to clear it.
- 5 Because the final hopper weight may be below the target, use the controller's Last Batch function. It is normally configured to record the final weight automatically.

6. Operation

6.1 Inspection and Preparation

- 1 Inspect the scale and surrounding area, verify all cable connections, energize the power and required utilities, confirm a normal controller display, and warm up the system.
- 2 Check the stored cumulative weight. Clear or record it so the current production total can be determined. For shipment mode, set the shipment target while stopped using key 3. Receipt mode is normally used.
- 3 Use the Totals key (6) to display total production. Follow the controller prompts to clear the current shipment/receipt total only when required.

6.1.1 Target and Recipe Settings

- 1 With the scale stopped, open recipe selection. The secondary display shows REC and the main display shows recipe 01-20. Enter the desired recipe number; recipe 01 is normally used.
- 2 Press ENTER to confirm, or ESC to discard the change.
- 3 Enter recipe query/edit mode. If parameter F6 is ON, enter the password (factory default 000000); if F6 is OFF, no password is required.
- 4 The main display shows the value and the secondary display shows parameter number Fx.x. Use the numeric keys to edit, ENTER to save and advance, Page to retain the original and advance, and ESC to return.

Parameter	Default	Description
F1.1	000000	Target value for each weighing-hopper batch.
F1.2	000000	Coarse-feed cutoff advance.
F1.3	000000	Medium-feed cutoff advance.
F1.4	000000	Fine-feed cutoff advance.

Normally only F1.1 is changed. Do not change the other values after commissioning; incorrect settings can significantly increase measurement error.

6.2 Starting and Running

- 1 Check material in the upper hopper. Start upstream feeding equipment if required and adjust the control gate.
- 2 Start the conveyor below the flow scale first to prevent material blockage.
- 3 Start the flow scale and coordinate the upstream and downstream equipment so that overall flow is balanced and meets production requirements.

6.3 Stopping, Totals, and Printing

- 1 Press Manual on the control box to stop the flow scale.

- 2 Display the grand total using the Totals key. Zero it only while the equipment is stopped.
- 3 Display the current shipment/receipt total with SUM and HOLD indicators on. This total may be cleared independently; the grand total remains unchanged.
- 4 During operation, totals may be viewed but not cleared. Viewing totals does not interrupt weighing.
- 5 For printing while stopped, press Print, wait for 'Pint', and press ENTER. The printout includes date/time, current total (Total1), grand total (Total2), and flow (Flux).
- 6 Remove residual dust and debris from the weighing hopper to prevent weight error or incomplete closing of the discharge gate.
- 7 Disconnect the main power and utilities, and clean the equipment and surrounding area.

7. Maintenance

7.1 Cleaning

Material may contain substantial dust. Keep the equipment clean to protect performance and service life. Avoid mechanical impact to the load cells during cleaning. Wipe plated parts with a small amount of machine oil. Clean the equipment after every shift.

7.2 Moving Parts

- Inspect moving parts regularly, especially motor-drive connections.
- Ensure the locknut at each rod-end bearing is locked.
- Check rod-end bearing movement and lubricate periodically with machine oil or bag-closing-machine oil.

7.3 Electrical Safety Inspection

During severe thunderstorms, stop production, switch off power, and unplug the supply. If workshop voltage is abnormal, measure the outlet voltage and confirm it is normal before restarting. Inspect wiring regularly for open circuits and poor connections.

Specifications and dimensions are subject to change without notice.

8. Appendices

Appendix 1 - Controller Calibration (10 kg Example)

Stop the machine, remove all material from the weighing hopper, and ensure the empty hopper is stable before calibration.

- 1 Press key 2 to enter calibration.
- 2 At the password prompt, enter the factory password 000000.
- 3 Press ENTER. 'CAL on' is displayed for approximately two seconds, then the unit setting appears.
- 4 Press ENTER and select two decimal places.
- 5 Press ENTER and set the minimum division to 10 g.
- 6 Press ENTER and set maximum capacity to 15 kg.
- 7 Press ENTER to review sensitivity, then the millivolt reading.
- 8 Press ENTER to perform zero calibration with the hopper empty.
- 9 Press ENTER to enter gain calibration.

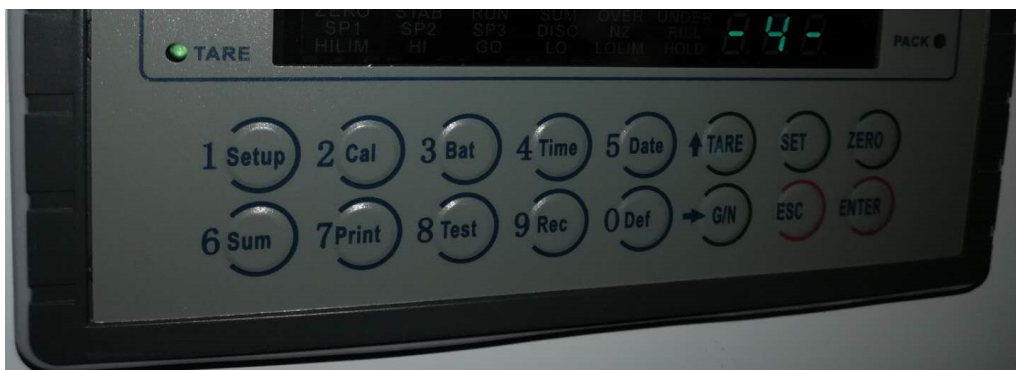
- 10 Place a certified 10 kg test weight in the hopper and allow the millivolt reading to stabilize.
- 11 Press ENTER and enter 10 kg as the applied test weight.
- 12 Press ENTER. When prompted to change the calibration password, retain or update it as required.
- 13 Press ENTER to return to the hopper-weight display. Remove the test weight; calibration is complete.



Calibration display sequence - unit and decimal settings



Calibration display sequence - capacity and sensitivity



Calibration display sequence - zero/gain calibration



Calibration display sequence - test-weight entry

Appendix 2 - Replacing Printer Paper

- 1 Push the latch downward in the direction of the arrow.
- 2 Open the cover downward.
- 3 Insert the printer paper roll in the orientation shown on the printer.
- 4 Close the cover and move the latch upward to lock it.



Printer latch



Printer cover and paper-roll arrangement

Appendix 3 - DOP-B07S515 HMI Operation (Optional)

At startup, select Chinese or English on the cover screen. Touch the upper-right button to open the Main Menu. The Main Menu displays current weight, current flow, cumulative weight, and batching status.

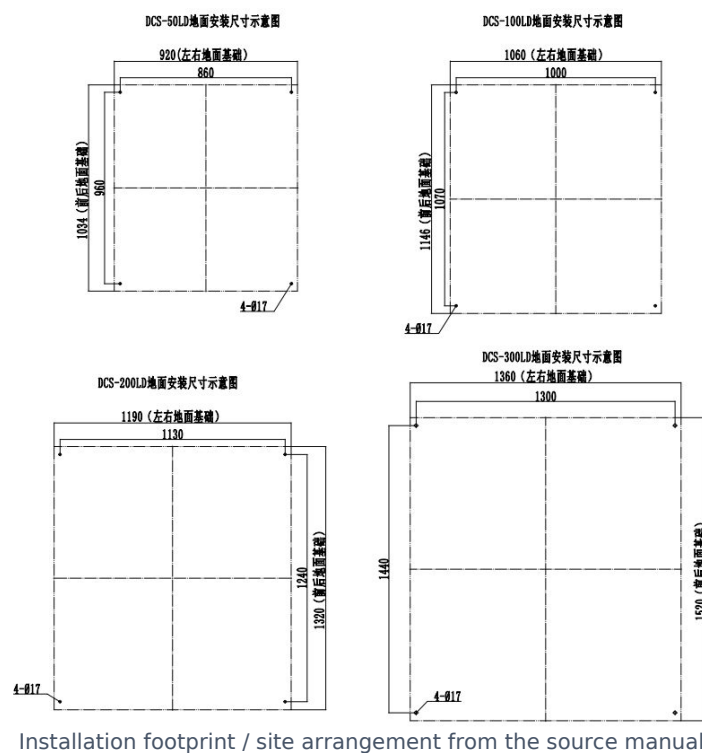
Button	Function / Password
Print	Prints the report. Password: 1111.
Stop	First press stops batching and generates a completion alarm; press again to clear the alarm and stop the equipment.
Zero	Zeros the current displayed weight.
Clear Total	Clears cumulative weight. Password: 1111.
Parameter Settings	Opens parameter settings. Factory settings are already adjusted; do not change them without authorization. Password: 5555.
Store Current Parameters	Stores the current parameter set.
Restore Original Values	Restores controller parameters if changes prevent operation. Password: 5555.



Optional HMI interface

Appendix 4 - Basic Installation-Site Requirements

- 1 Power: dedicated regulated 4N-AC380V, 50 Hz supply is strongly required.
- 2 Grounding: provide reliable protective grounding in accordance with national or local standards.
- 3 Environment: 0 to 40°C, relative humidity up to 90% without condensation, with dust effects minimized.
- 4 Space: provide the footprint and service clearance shown on the installation drawing. For multiple machines, prepare a level floor layout that allows convenient operation.
- 5 Foundation: solid concrete, larger than the equipment footprint and at least 100 mm deep.
- 6 Locate the equipment away from vibration sources.
- 7 Locate the equipment away from large motors and other high-power devices to minimize strong electromagnetic interference.



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