

Metal-Asia

COMMISSIONING & INSTALLATION SUPERVISION GUIDE

Industrial Equipment for Reinforcement Mesh Production & Wire Drawing

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Target Markets: Europe, North America, Middle East, Africa, Southeast Asia, Latin America

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1. DEFINITIONS & REGULATORY FRAMEWORK

1.1 Key Terminology

Term	Definition
Commissioning Supervision	A comprehensive engineering service involving oversight of equipment assembly, installation, and calibration by a manufacturer's representative to ensure compliance with factory specifications
Startup & Commissioning (S&C)	Works ensuring preparation and commissioning of installed equipment for commercial operation
Commissioning Engineer	Manufacturer's (supplier's) specialist assigned to the customer's site to perform installation supervision and startup services

Term	Definition
Commissioning Team	A group of specialists led by a responsible manufacturer's representative
Test Run	Trial operation of equipment with production of a control batch of finished product
Performance Run	72-hour (or other specified) continuous operation to confirm equipment performance

1.2 Regulatory Framework

Document	Status	Scope
OST 108.002.128-80	Industry standard	"Commissioning and Startup of Power Equipment. General Provisions" — foundational document regulating commissioning organization and execution
ISO 9001:2015	International standard	Quality management systems
IEC 60204-1	International standard	Electrical safety of machinery
OSHA Standards	US regulation	Occupational safety requirements
Machinery Directive 2006/42/EC	EU regulation	Safety of machinery within European Union

2. OBJECTIVES & SCOPE

2.1 Objectives

1. **Quality Assurance** — ensure installation meets manufacturer specifications
2. **Warranty Preservation** — maintain manufacturer warranty conditions
3. **Correct Startup** — proper first-time equipment commissioning
4. **Personnel Training** — prepare operators for independent operation
5. **Breakdown Prevention** — eliminate damage from installation errors

2.2 Scope of Commissioning Services

No.	Task	Description
1	Completeness inspection	Verify all units, parts, and spare parts against packing lists
2	Storage condition check	Verify proper storage conditions before installation
3	Facility readiness verification	Check foundation, utilities, and electrical supply

No.	Task	Description
4	Technical guidance	Advise customer's installation team
5	Installation quality control	Ensure compliance with manufacturer's technical documentation
6	Pre-startup works	Flushing, purging, electrical connection verification
7	Startup & calibration	Parameter setup, test runs
8	Test batch production	Manufacturing of control product batch
9	Personnel training	Theoretical and practical instruction
10	Documentation	Preparation of protocols, reports, and acceptance certificates

3. COMMISSIONING PHASES

Phase 1: Preparation (Day 1–2)

No.	Activity	Responsible Party	Deliverable
1.1	Completeness verification	Commissioning team + customer	Completeness certificate
1.2	Mechanical damage inspection	Commissioning team + customer	Inspection report
1.3	Technical documentation verification	Commissioning team	Documentation list
1.4	Storage condition check	Commissioning team	Storage condition report
1.5	Foundation readiness check	Commissioning team + customer	Foundation readiness certificate
1.6	Electrical supply verification	Commissioning team + customer	Electrical supply readiness certificate
1.7	Cooling system verification	Commissioning team + customer	System readiness certificate
1.8	Pneumatic/hydraulic verification	Commissioning team + customer	System readiness certificate
1.9	Consumables availability check	Customer	Inventory list

Phase completion criterion: Signing of facility readiness certificate.

Phase 2: Mechanical Installation (Day 3–10)

No.	Activity	Executor	Commissioning Oversight
2.1	Equipment unpacking	Customer's installation team	Verify handling procedures
2.2	Machine bed/base installation	Customer's installation team	Check level and alignment
2.3	Mechanical unit assembly	Customer's installation team	Verify against drawings and specs
2.4	Welding portal installation	Customer's installation team	Check parallelism and height
2.5	Wire feeding system installation	Customer's installation team	Check tension and direction
2.6	Unloading/stacking system installation	Customer's installation team	Check synchronization
2.7	Mechanical connections	Customer's installation team	Check torque specifications
2.8	Protective cover installation	Customer's installation team	Check completeness

Phase completion criterion: Signing of mechanical installation completion certificate.

Phase 3: Utility Connections (Day 11–13)

No.	Activity	Requirements	Oversight
3.1	Power cable connection	Copper 120 mm ² x 3+1, 380V 50Hz	Verify cable size and connections
3.2	Grounding connection	Ground resistance ≤4 Ohm	Measure resistance
3.3	Cooling water connection	Closed-loop, cooling tower, pressure-rated	Verify leak-tightness and pressure
3.4	Pneumatic connection	≤0.8 MPa, receiver 1 m ³ x 2	Check pressure, verify no leaks
3.5	Air drying system	Dryer unit, filters (3 pcs.)	Check dew point
3.6	Control cable routing	Shielded cables	Verify correct connections
3.7	Control cabinet connection	Per electrical schematics	Verify phase rotation

Phase completion criterion: Successful completion of pre-startup utility tests.

Phase 4: Startup & Calibration (Day 14–20)

No.	Activity	Description	Deliverable
4.1	Electrical circuit verification	Insulation check, ground resistance, phase rotation	Measurement report
4.2	Variable frequency drive setup	Configure drive parameters	Drive configuration
4.3	PLC programming	Load program, set control logic	Working program
4.4	Sensor calibration	Position, pressure, temperature sensors	Calibration report
4.5	Dry run	Run without wire, check drum rotation/unit movement	Dry run certificate
4.6	Welding parameter setup	Current, impulse time, electrode pressure (welding machines)	Process card
4.7	Mesh pitch calibration	Calibrate longitudinal and transverse wire pitch	Dimensional verification
4.8	Safety system verification	Check emergency stops, limit switches, guards	Safety inspection report

Phase completion criterion: Successful dry run completion and all parameter setup.

Phase 5: Test Run (Day 21–25)

No.	Activity	Description	Deliverable
5.1	Lubricant filling	Gearbox oil, hydraulic oil, drawing powder	Filling certificate
5.2	Cooling system startup	Start cooling tower, water circulation	Temperature verification
5.3	Trial run with wire	Low-speed startup with material	Parameter monitoring
5.4	First production batch	Manufacturing of control batch	Product batch
5.5	Geometry verification	Measure cell dimensions, wire diameter	Measurement report
5.6	Weld strength verification	Destructive/non-destructive weld testing	Test report
5.7	Material-specific parameter adjustment	Optimize settings for specific raw material	Working process card
5.8	72-hour performance run	Continuous operation test	Performance run certificate

Phase completion criterion: Product meets specifications; acceptance certificate signed.

Phase 6: Personnel Training (Day 26–30)

No.	Topic	Format	Duration
6.1	Equipment construction overview	Theoretical instruction	4–8 hours
6.2	Control system principles	Theory + practice (touchscreen)	4–8 hours
6.3	Wire/material loading	Practical exercise	2–4 hours
6.4	Startup and shutdown	Practical exercise	2–4 hours
6.5	Parameter adjustment	Practical exercise	4–8 hours
6.6	Tool/die change	Practical exercise	2–4 hours
6.7	Daily maintenance	Theory + practice	4–8 hours
6.8	Troubleshooting	Theoretical instruction	2–4 hours
6.9	Safety procedures	Instruction with signature	1–2 hours

Training outcome: Training completion certificate signed.

4. COMMISSIONING OF CHINA-SOURCED EQUIPMENT — SPECIFICS

4.1 Engineer Deployment

Parameter	Description
Specialist source	Manufacturer (China) or supplier (local representative)
Team size	1–3 specialists (depending on complexity)
Deployment timeline	Typically 2–4 weeks after visa issuance
Deployment conditions	Per pre-agreed schedule

4.2 Travel & Accommodation Expenses

Expense Item	Description	Cost Responsibility
Visa processing	Business visa, invitation letter	Customer
Air travel	Economy/business class	Customer
Accommodation	Hotel/apartment	Customer
Meals	Per diem or meal provision	Customer
Local transportation	Travel to/from facility	Customer
Translator	Language support (if required)	Customer

4.3 Engineer Daily Rates

Equipment Type	Daily Rate	Duration
Single machine (1 unit)	USD 60–100	3–7 days
Medium line	USD 80–150	7–14 days
Complex automated line	USD 100–200	14–30 days
Full equipment set (4 units)	USD 100–200	21–45 days

4.4 Language Support

Solution	Description	Cost
Translator	Professional Chinese/English/Local language interpreter	USD 200–400/day
English-speaking engineer	If supplier has English-speaking specialists	Usually premium rate
Remote support	Video conferencing with factory for issues	Free/per contract

5. FACILITY REQUIREMENTS

5.1 General Requirements

Parameter	Requirement	Notes
Floor space	Min. 900–1,100 m ² (all equipment)	Including aisles and storage
Ceiling height	Min. 3.5 m	For overhead crane clearance
Temperature	+5°C to +40°C	Year-round
Humidity	≤80%	
Ventilation	Forced exhaust	Especially at welding stations
Lighting	Min. 200 lux	At workstations

5.2 Electrical Supply

Parameter	OM-2500Q	OM-2000D	LZ6/560	Wire Drawing Machine
Voltage	380 V, 50 Hz	380 V, 50 Hz	380 V, 50 Hz	380 V, 50 Hz
Phases	3-phase + N + PE	3-phase + N + PE	3-phase + N + PE	3-phase + N + PE
Power	>400 kW	>120 kW	~127 kW	~66 kW
Cable size	120 mm ² x 3+1	120 mm ² x 3+1	Per calculation	Per calculation

Parameter	OM-2500Q	OM-2000D	LZ6/560	Wire Drawing Machine
Ground resistance	≤4 Ohm	≤4 Ohm	≤4 Ohm	≤4 Ohm

5.3 Cooling System

Parameter	Requirement
Type	Closed-loop with cooling tower
Water flow	Per system design
Pressure	Per technical documentation
Water temperature	Max. +25°C at inlet
Water quality	Soft, free of mechanical contaminants

5.4 Compressed Air

Parameter	Requirement
Pressure	≤0.8 MPa
Compressor capacity	Per calculation
Drying	Mandatory (air dryer)
Filtration	3-stage filtration
Receiver	1 m ³ x 2 units

6. COMMISSIONING TEAM STRUCTURE

6.1 Recommended Team Composition

Position	Quantity	Functions
Team Lead	1	Overall management, document signing, customer liaison
Mechanical Engineer	1	Mechanical installation oversight, assembly
Electrical Engineer	1	Electrical connections, PLC setup, automation
Welding Specialist	1	Welding parameter setup (for welding machines)
Drawing Specialist	1	Drawing line calibration (for drawing machines)
Translator	1	Language support (if required)

6.2 Minimum Team for Equipment Set

Variant	Team Size	Duration	Notes
Minimum	1 engineer (universal) + translator	21–30 days	Sequential commissioning
Standard	2 engineers (mechanical + electrical)	14–21 days	Parallel works
Optimal	3 engineers + translator	10–14 days	Full parallelization

7. PRICING & TERMS

7.1 Cost Structure

Cost Item	Description	Rate
Engineer labor	Commissioning team labor	USD 60–200/person/day
Travel expenses	Flights/ground transport	At actual cost
Accommodation	Hotel/apartment	At actual cost
Meals	Per diem or catering	At actual cost
Visa	Visa processing, invitation	At actual cost
Translator	Interpreter services	USD 200–400/day
Downtime	Delays caused by customer	Per agreement

7.2 Commissioning Cost Estimates

Option A: Daily Rate

Equipment Type	Daily Rate	Duration	Total
1 welding machine (OM-2000D)	USD 100–150	7–10 days	USD 700–1,500
1 welding machine (OM-2500Q)	USD 120–180	10–14 days	USD 1,200–2,500
Drawing line (LZ6/560)	USD 120–180	10–14 days	USD 1,200–2,500
Wire drawing machine (set)	USD 100–150	7–10 days	USD 700–1,500
Full set (4 units)	USD 150–250	21–45 days	USD 3,150–11,250

Option B: Fixed Price

Equipment Type	Fixed Price	Included
Mesh welding machine	From USD 1,500	Assembly, startup, production, training up to 3 persons
Medium line	USD 2,500–5,000	Full scope
Complex line	USD 5,000–10,000	Full scope + extended training

Option C: Percentage of Equipment Cost

Complexity	Percentage of Equipment Value
Simple equipment	5–8%
Medium equipment	8–12%
Complex equipment	12–15%

8. DOCUMENTATION & ACCEPTANCE PROTOCOLS

8.1 Required Documents

No.	Document	Timing	Signatories
1	Completeness verification certificate	Day 1	Commissioning team + customer
2	External inspection report	Day 1	Commissioning team + customer
3	Facility readiness certificate	Day 1	Commissioning team + customer
4	Electrical supply readiness certificate	Day 1	Commissioning team + customer
5	Mechanical installation completion certificate	Phase 2	Commissioning team + customer
6	Pre-startup test report	Phase 3	Commissioning team + customer
7	Dry run certificate	Phase 4	Commissioning team + customer
8	Parameter setup process card	Phase 4	Commissioning team
9	Test run certificate	Phase 5	Commissioning team + customer
10	Product measurement report	Phase 5	Commissioning team + customer
11	Training completion certificate	Phase 6	Commissioning team + customer
12	Equipment acceptance certificate	Phase 5	Commissioning team + customer
13	Technical report	Upon completion	Team Lead

No.	Document	Timing	Signatories
14	Works completion certificate	Upon completion	Commissioning team + customer

9. PERSONNEL TRAINING PROGRAM

9.1 Training Curriculum

No.	Topic	Theory	Practice	Total
1	Equipment construction overview	4 hrs	—	4 hrs
2	Control system principles	4 hrs	4 hrs	8 hrs
3	Wire/material loading	—	2 hrs	2 hrs
4	Startup and shutdown procedures	1 hr	2 hrs	3 hrs
5	Parameter adjustment	2 hrs	4 hrs	6 hrs
6	Tool/die change procedures	—	2 hrs	2 hrs
7	Daily maintenance	2 hrs	2 hrs	4 hrs
8	Troubleshooting	2 hrs	—	2 hrs
9	Safety procedures	2 hrs	—	2 hrs
TOTAL		17 hrs	16 hrs	33 hrs

9.2 Trainee Capacity

Variant	Number of Trainees	Notes
Standard	Up to 3 persons	Included in standard pricing
Extended	Up to 5 persons	Additional fee applies
Full program	Up to 10 persons	Separate contract

9.3 Training Outcomes

No.	Outcome
1	Operators can independently start up and shut down equipment
2	Operators can adjust parameters for various product types
3	Operators can perform daily maintenance
4	Operators can diagnose basic malfunctions
5	Operators know safety rules for equipment operation
6	Training completion certificate signed

10. WARRANTY CONDITIONS

10.1 Warranty Preservation Requirements

Condition	Requirement
Mandatory commissioning	Warranty valid only with certified commissioning
Self-installation	Warranty may be partially or fully voided
Commissioning engineer instructions	Must be followed by customer
Non-compliance with instructions	May void warranty
Unauthorized modifications	Warranty voided without prior approval

10.2 Warranty Period

Equipment Type	Warranty Period
Welding machines	12 months from startup
Drawing machines	12 months from startup
Electrical equipment	12 months
Mechanical units	12 months

11. COMMON ISSUES & SOLUTIONS

11.1 Preparation Phase Issues

Issue	Cause	Solution
Incomplete delivery	Transport losses	Prepare certificate, order missing items
Mechanical damage	Improper transport	Certificate, repair/replacement under warranty
Facility not ready	Construction delays	Reschedule commissioning
No electrical supply	Incomplete electrical works	Temporary connection or reschedule

11.2 Installation Phase Issues

Issue	Cause	Solution
Foundation mismatch	Dimensional/level deviations	Foundation modification
Bolt fit issues	Hole obstruction	Cleaning, reaming
Guide rail play	Improper assembly	Reassembly, adjustment
Drum misalignment	Improper installation	Repositioning, alignment

11.3 Startup Phase Issues

Issue	Cause	Solution
PLC won't start	Incorrect connection	Check cables, reboot
VFD error	Wrong parameters	Reconfigure per manual
Cooling system leak	Non-sealed connection	Tighten fittings, replace seals
No air pressure	Leak, compressor issue	Find and eliminate leak

11.4 Test Run Phase Issues

Issue	Cause	Solution
Weld defects	Wrong welding parameters	Adjust current, time, pressure
Dimensional inaccuracy	Incorrect calibration	Recalibrate pitch
Wire breakage	Wrong tension	Adjust tension
Drum overheating	Insufficient cooling	Check cooling system, water flow

12. CHECKLISTS

12.1 Customer Pre-Commissioning Checklist

- Commissioning contract signed
- Advance payment made
- Production floor ready (space, height, flooring)
- Electrical supply connected (380V, required capacity)
- Grounding system installed (resistance ≤ 4 Ohm)
- Cooling water connected (cooling tower operational)
- Drainage system installed
- Pneumatic system connected (compressor, receivers, dryer)
- Raw materials and consumables procured
- Installation team assigned and ready
- Personnel appointed by official order
- Accommodation for commissioning team booked
- Translator arranged (if required)
- Workspace for commissioning team prepared
- Crane/forklift for equipment unloading arranged
- Spare parts storage area prepared

12.2 Commissioning Acceptance Checklist

- All certificates signed
- Technical report received
- Setup parameters documented
- Personnel trained (certificate signed)

- Product manufactured and verified
- Warranty certificate received
- Operation manuals received (English)
- Spare parts handed over to responsible storage
- Service contact information received

12.3 Typical Commissioning Schedule (Full Set, 4 Machines)

Day	Activity	Team Size
1	Completeness check, inspection, facility readiness	2 engineers
2–4	Mechanical installation — OM-2000D	2 engineers + installers
5–7	Mechanical installation — OM-2500Q	2 engineers + installers
8–10	Mechanical installation — LZ6/560	2 engineers + installers
11–12	Mechanical installation — Wire drawing machine	2 engineers + installers
13	Utility connections (electrical, water, air)	2 engineers + electricians
14–16	Startup & calibration — OM-2000D	2 engineers
17–19	Startup & calibration — OM-2500Q	2 engineers
20–22	Startup & calibration — LZ6/560	2 engineers
23–24	Startup & calibration — Wire drawing machine	2 engineers
25–27	Test run — all machines	2 engineers
28–30	Personnel training	2 engineers
31	Documentation, certificate signing	Team Lead

Total: 31 days (with 2 engineers)



Turnkey commissioning and installation supervision with global deployment support

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