USER GUIDE

2.2KW 110V Water-Cooled ER20 Spindle Motor & VFD Kit

2.2 kW / 24,000 RPM / 400 Hz water-cooled spindle, 2.2 kW 110V variable frequency drive (Huanyang HY-series compatible), 80 mm mount, 80W pump, hose and 14 ER20 collets



Contents:

1. Safety warnings
2. What's in the box
3. Specifications
4. Mounting the spindle
5. Water cooling setup
6. Electrical wiring
7. Drive keypad operation
8. Drive parameter setup
9. First startup, warm-up and break-in
10. Operation tips
11. Using the ER20 collets
12. Maintenance
13. Troubleshooting
14. Warranty and support

Read this entire guide before installing or powering the kit. Keep it with the machine. The drive settings in this guide are typical values for this type of kit. Always confirm them against the paper sheet supplied in the box and the nameplates on the spindle motor and the drive before changing anything. Installation and wiring should be done by a qualified electrician.

1. Safety warnings

⚠ DANGER — ELECTRIC SHOCK

- Turn off and lock out the input power before any wiring or service. After power is removed, wait until the drive display and its CHARGE lamp are completely off before touching any terminal. The drive holds dangerous voltage for some time after switch-off.
- Never connect mains power to the drive output terminals U, V, W. Input power goes only to R, S, T. Reversing them destroys the drive.
- The drive and the spindle motor must both be properly grounded. Do not operate without a ground connection.
- Keep the drive cover on whenever power is applied. Never connect or disconnect the spindle plug while the drive is powered or running.
- Do not open, modify or repair the drive or the spindle internally.

⚠ WARNING — MOTOR DAMAGE

- **Wrong voltage or frequency settings can destroy the spindle.** This is a 110V, 400 Hz, 24,000 RPM motor. Confirm every drive setting against the motor nameplate and the paper sheet in the box before running.
- **Never run the spindle without cooling water flowing.** Even a short dry run can overheat and permanently damage the windings and bearings.
- Do not exceed 400 Hz / 24,000 RPM. Do not run the spindle below 9,000 RPM (150 Hz).
- The spindle is designed to turn clockwise only (follow the arrow on the housing).

CAUTION — GENERAL

- Keep hands, hair, clothing and loose items away from the rotating collet and cutter. Wear eye protection and hearing protection, and use dust collection when cutting.
- Mount the drive vertically on a non-combustible surface (such as metal), with free air around it, away from water, dust, direct sun, heat and vibration. Ambient temperature for the drive: −5 °C to 40 °C (23–104 °F), non-condensing.
- Do not install contactors, switches, capacitors or surge absorbers between the drive output (U, V, W) and the motor.
- Do not start and stop the spindle by switching the drive's input power on and off. Use the drive's RUN/STOP controls.
- Use a dedicated power supply. Do not share the circuit with a welder or other heavy, noisy equipment.
- Keep the machine out of reach of children and untrained people.

2. What's in the box

Qty	Item
1	2.2 kW 110V water-cooled ER20 spindle motor (80 mm diameter)
1	2.2 kW (3 HP) 110V variable frequency drive (VFD), Huanyang HY-series compatible
1	80 mm cast aluminum spindle mount
1	80W 110V submersible water pump
1	5 m water pipe
14	ER20 collets: 1, 2, 3, 3.175, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 mm
1	ER20 wrench
1	Aviation plug (spindle connector)
1	Paper instruction sheet

Unpack everything and check for shipping damage before installation. Check the drive nameplate and the motor nameplate to confirm that both are 110V models. Check that the drive keypad buttons work and that no terminals are loose. If anything is missing or damaged, contact your seller before installing.

Not included (you will need): power cable and plug or hard-wiring materials for the drive, a 4-conductor shielded motor cable between the drive and the spindle (if not already attached), a circuit breaker, a coolant reservoir (bucket or tank), hose clamps, and mounting bolts for the mount and drive.

3. Specifications

Spindle motor

Power	2.2 kW
Voltage	110V AC
Current	15A
Frequency	400 Hz
Speed	0–24,000 RPM. Do not run below 9,000 RPM. Clockwise only.
Collet	ER20
Body size	80 mm dia. × 213 mm (3.15 × 8.39 in)
Cooling	Water-cooled
Accuracy	0.003–0.005 mm
Runout	Less than 0.01 mm
Bearings	4 P4-class angular contact (2 × C7005, 2 × C7002), grease lubricated
Body	Stainless steel
Poles	2 (24,000 RPM at 400 Hz)

Variable frequency drive

Power	2.2 kW / 3 HP
Control mode	SPWM (V/F)
Input	110V AC (±15%), 1 or 3 phase, 50/60 Hz
Output	110V AC, 3 phase, 0–400 Hz
Protection	Overload, over-current, over-voltage, under-voltage, over-heat, short circuit to ground

Water pump and hose

Power	80W, 110V
Flow	3,500 L/H
Max. lift	3.5 m (11.5 ft)
Nozzle	6 mm (0.24 in)
Hose	5 m included

Mount

Mount	Cast aluminum, fits 80 mm (3.15 in) spindles

Intended for non-metallic materials and soft metals such as wood, plastic, acrylic, PVC, PCB, carbon fiber, MDF, copper and aluminum. If the nameplate on your motor or drive differs from this table, the nameplate takes priority.

4. Mounting the spindle

1. Bolt the 80 mm mount firmly to your machine's Z-axis plate. The mounting surface must be flat and rigid. TYPICAL
2. Set the spindle so the water ports and the cable connector are at the top (away from the cutter), and the collet nut points down toward the work.
3. Slide the spindle into the clamp so the clamp grips the cylindrical body, not the nose or nut area. Leave clearance so the hoses and plug are not pinched. TYPICAL
4. Tighten the clamp bolts evenly and gradually. Do not over-tighten. Uneven or excessive clamping force can distort the housing and damage the bearings.
5. Check that the spindle axis is square (perpendicular) to the machine table and aligned with the Z travel. Misalignment causes vibration and poor cut quality. Tram the spindle if your machine allows it. TYPICAL
6. Route the motor cable and water hoses with a little slack so they move freely through the full machine travel without pulling on the spindle connections. Use a drag chain if available. TYPICAL

Mounting the drive

- Mount the drive upright (vertical) on a metal or other non-combustible panel, with at least about 120 mm (4.7 in) of free space above and below and 50 mm (2 in) at each side for airflow.
- Keep it away from coolant, dust, chips and heat sources. If it goes inside an enclosure, ventilate the enclosure so the inside stays below 40 °C (104 °F).
- Keep the drive-to-spindle cable as short as practical. The drive manual warns that cable runs over 15 m (49 ft) for this voltage class can damage motor insulation.

5. Water cooling setup



Cooling loop: reservoir → pump → spindle inlet → spindle outlet → back to reservoir

Connecting the loop

1. Fill a clean reservoir (a bucket or tank) with coolant. A larger volume stays cooler during long jobs; around 5 gallons (20 L) or more is common. TYPICAL
2. Place the pump in the reservoir. **The submersible pump must be fully under the coolant whenever it runs.**

3. Cut the 5 m hose into two lengths. Connect one from the pump outlet to one spindle port, and the other from the second spindle port back into the reservoir. Secure each end with a hose clamp or zip tie. TYPICAL
4. If the ports are marked IN and OUT, follow the markings. Make sure the return hose ends inside the reservoir so you can see the water returning.
5. Switch on the pump and check for a steady return flow and no leaks at any connection before powering the spindle.

Coolant

- Use clean distilled, deionized or purified water. Do not use dirty water, hard tap water or corrosive liquids, which cause scale, blockage and corrosion.
- **Freezing:** if the machine is in a space that can drop below 0 °C (32 °F), add an automotive-type antifreeze (glycol) to the water or drain the spindle and hoses completely. Frozen water inside the cooling jacket can crack the spindle. TYPICAL
- A small amount of coolant additive or algaecide helps prevent growth in the reservoir. Cover the reservoir to keep dust and chips out. TYPICAL

> ⚠ **NEVER RUN DRY**
>
> Always turn the pump **on before** starting the spindle and confirm water is returning. When finishing, **stop the spindle first** and leave the water running for a few minutes until the spindle has cooled, then switch off the pump. Check the return flow regularly during a job. If flow stops, stop the spindle immediately.

Tip TYPICAL: wiring the pump so it is powered whenever the machine is on (or using a flow switch interlock) reduces the risk of accidentally running the spindle without cooling.

6. Electrical wiring

> ⚠ **QUALIFIED ELECTRICIAN**
>
> Wiring must be done with all power off and locked out, following local electrical codes. Double-check every connection before applying power. Input power to R/S/T only — never to U/V/W.



Drive to spindle wiring (input power on the left, output U/V/W and ground to the 4-pin aviation plug on the right)

Input power (110V)

Supply	Connect to drive
Single-phase 110V: line (L) and neutral (N)	Any two of R, S, T (the wiring diagram shows R and S)
Three-phase 110V	R, S, T
Supply ground	Drive ground terminal (E)

Output to the spindle

Drive terminal	Aviation plug pin
U	Pin 1
V	Pin 2
W	Pin 3
Ground (E)	Pin 4 (spindle housing ground)

- Use a 4-conductor shielded motor cable rated for the motor current (15A). Ground the cable shield at the drive end. TYPICAL
- If the spindle turns the wrong way (counter-clockwise), swap any two of U, V, W (power off first). Do not swap the ground.
- Do not let the output wires touch the metal of the drive enclosure.
- Do not connect braking-resistor terminals P+ / PR unless a braking resistor is used. Leave them empty for normal use.

Breaker and supply circuit

- Install a circuit breaker (no-fuse breaker) between the supply and R/S/T. If a ground-fault (GFCI/RCD) device is used, choose one suitable for drives, because drives have normal high-frequency leakage that can trip ordinary GFCIs.
- Size the breaker and wire for the drive's input current shown on its nameplate. A 2.2 kW load on 110–120V draws more than a standard 15A household outlet circuit is designed for, so this kit usually needs a dedicated, higher-rated circuit sized by your electrician. TYPICAL
- Do not install a contactor or switch on the drive output, and do not use the input breaker as the normal on/off control for running.

Grounding

- Connect the drive ground terminal and the spindle ground (pin 4) to a proper earth ground. Keep the ground wire as short as possible.
- Do not share a ground wire with welders or other large equipment. Keep control and signal wiring separate from motor and power wiring.

7. Drive keypad operation

Key names vary slightly between drive versions. The table lists the label you are likely to see and the equivalent name used in the HY-series manual.

Key / control	Function
RUN	Start the spindle (when the run command source is the keypad, PD001 = 0).
STOP / RESET	Stop the spindle. Also clears (resets) a fault after the cause is fixed.
REV (F/R)	Changes rotation direction. **This spindle must run clockwise only** — see PD023 to disable reverse.
PRGM (PROG)	Enter and exit programming (parameter) mode.
SET (ENTER)	Open the selected parameter to view its value; press again to save a changed value (display briefly shows END).
▲ / ▼	Increase / decrease the selected digit or value. While running, changes the running frequency.
SHIFT (>>)	Moves the flashing cursor to the next digit. In run mode, cycles the display (frequency, current, RPM, etc.).
Knob	On most compact units the front knob adjusts the speed when frequency source is the keypad (PD002 = 0). If it does not, use ▲/▼. TYPICAL

Indicator lamps

FOR / REV: motor running forward / reverse. Hz: display shows frequency. A: display shows current. ROTT (or RPM): display shows motor speed.

How to change a parameter

1. Press **PRGM**. The display shows a parameter number such as `PD000`.
2. Use **▲/▼** and **SHIFT** to select the parameter number you want (for example `PD005`).
3. Press **SET** to show the current value.
4. Use **▲/▼** and **SHIFT** to change the value.
5. Press **SET** to save. The display shows END, then moves to the next parameter.

6. Press **PRGM** to leave programming mode.

Write down the original value of every parameter before you change it, so you can go back if needed.

Reading speed

This is a 2-pole motor, so spindle RPM = frequency (Hz) × 60:

Frequency	150 Hz	200 Hz	250 Hz	300 Hz	350 Hz	400 Hz
Spindle speed	9,000 RPM	12,000 RPM	15,000 RPM	18,000 RPM	21,000 RPM	24,000 RPM

8. Drive parameter setup

⚠ READ BEFORE CHANGING ANY SETTING

The drive is normally **preset at the factory for this spindle**, and many users can run it without changing anything. Check the existing values first. The values below are **typical** settings for a 110V, 400 Hz, 2-pole, 24,000 RPM spindle on an HY-series drive. **Confirm each one against the paper sheet in the box and the motor nameplate before changing it.** If they disagree, the nameplate and the paper sheet take priority. **A wrong voltage or frequency setting can damage the motor.**

Code	Name	Typical setting	Notes
PD000	Parameter lock	0 (unlocked)	Must be 0 to change other parameters. 1 = locked.
PD001	Source of run commands	0 (keypad)	1 = external terminals, 2 = RS-485 communication (for CNC control).
PD002	Source of frequency	0 (keypad)	1 = external analog signal (0–10V etc.), 2 = communication.
PD003	Main (set) frequency	e.g. 300 Hz (18,000 RPM)	Speed used when RUN is pressed. Must be between PD011 and PD005.
PD004	Base frequency	400 Hz	Must match the motor's rated frequency on its nameplate (400 Hz).
PD005	Max. operating frequency	400 Hz	Limits top speed to 24,000 RPM. Never set above the motor's 400 Hz rating.
PD006	Intermediate frequency (V/F)	Leave at factory value	Part of the V/F curve. The manual warns that an improper value causes over-current, low torque or tripping.
PD007	Min. frequency (V/F)	Leave at factory value	Starting point of the V/F curve (range 0.1–20 Hz).
PD008	Max. voltage	110 V	Set to the motor nameplate voltage. Do **not** set it to 220 V on this 110V motor.
PD009	Intermediate voltage (V/F)	Leave at factory value	If the spindle struggles to start, raise it only in small steps while watching output current.
PD010	Min. voltage (V/F)	Leave at factory value	Starting voltage of the V/F curve. Must stay below PD009.
PD011	Frequency lower limit	150 Hz (9,000 RPM)	Prevents running the spindle too slowly. Must be lower than PD005.
PD014	Acceleration time 1	About 10 s **TYPICAL**	Time from 0 to max frequency. Too short can cause over-current trips (E.oC.A).
PD015	Deceleration time 1	About 10 s **TYPICAL**	Time from max frequency to 0. Too short can cause over-voltage trips (E.ou.d).
PD023	Reverse rotation select	0 (reverse disabled) **TYPICAL**	Recommended so the spindle cannot be run backward by mistake.
PD141	Rated motor voltage	110 V	Per motor nameplate.
PD142	Rated motor current	15 A (or per nameplate)	Used by the drive to protect the motor from over-current.
PD143	Motor pole number	2	Per motor nameplate. This spindle is 2-pole.
PD144	Rated motor revolution	3000	This value is the motor speed **at 50 Hz** (max 9999). For a 2-pole, 24,000 RPM / 400 Hz spindle that is 3,000; the RPM display will then read 24,000 at 400 Hz. Display only.

Other useful parameters

- **PD013 — Parameter reset.** Setting 08 restores all factory defaults. Factory defaults are for a general-purpose 50 Hz motor, **not** for this spindle, so you must re-enter every setting above afterward. Avoid using it unless necessary. (Works only when PD000 = 0.)
- **PD041 — Carrier frequency.** Leave at the factory value. Lower it if the drive runs hot, the motor cable is long, or the drive interferes with other electronics.
- **PD026 — Stopping mode.** 0 = decelerating stop (factory setting, recommended); 1 = coast to stop.
- **PD177–PD180** show the last four faults. **PD172** = 01 clears the fault record.

CNC control via the drive's terminals or RS-485 (PD001/PD002 = 1 or 2, PD163–PD165 for communication) depends on your controller. Follow your controller's documentation.

9. First startup, warm-up and break-in

Before first power-up

- Recheck wiring: input on R/S/T only, U/V/W to pins 1/2/3, ground to pin 4 and to the drive ground.
- Check that no metal chips, wire scraps or tools are left in the drive or on its terminals and that all screws are tight.
- Remove any cutter from the collet. Turn the spindle shaft by hand; it should rotate smoothly with no rubbing.
- Start the pump and confirm steady water return.

First power-up

1. Switch on the drive. It runs a short self-test, then shows the set frequency.
2. Check (and if needed set) the parameters in section 8, against your paper sheet and nameplate.
3. With no cutter installed, press RUN at the low end of the speed range (150 Hz / 9,000 RPM). Confirm the spindle turns clockwise (viewed from above, looking down the shaft toward the collet: follow the arrow on the housing). If it turns the wrong way, press STOP, power off, wait for the display to go dark, and swap two of U/V/W.
4. Listen for smooth, even sound. Any grinding, knocking or strong vibration: stop and investigate.

Break-in (new spindle or after long storage) TYPICAL

A gradual run-in helps the bearing grease distribute evenly. A typical schedule with no load:

Step	Frequency	Speed	Time
1	150 Hz	9,000 RPM	10 min
2	200 Hz	12,000 RPM	10 min
3	300 Hz	18,000 RPM	10 min
4	400 Hz	24,000 RPM	5–10 min

Check the housing temperature and sound at each step. Mild warmth is normal; the spindle should not become too hot to touch. If it does, stop and check the cooling flow.

Daily warm-up TYPICAL

Before each work session, and always after the spindle has been idle for a long time, run it at low-to-medium speed for about 10–15 minutes before heavy cutting, stepping the speed up gradually.

10. Operation tips

- Always: pump on → confirm flow → spindle on. Spindle off → let it cool with water flowing → pump off.
- Let the spindle reach full set speed before the cutter touches the material. TYPICAL
- Small-diameter cutters generally need higher speeds; large cutters and harder materials generally need lower speeds within the 9,000–24,000 RPM range. Follow your cutter manufacturer's speed and feed recommendations. TYPICAL
- Avoid sudden heavy cuts and long periods at overload. Take lighter passes rather than one deep cut. A rising current reading on the drive display means the spindle is working harder.
- Watch for abnormal noise, vibration, overheating or water leaks. Stop immediately if any appear.
- Do not exceed 24,000 RPM and do not run continuously below 9,000 RPM.

11. Using the ER20 collets



MODEL	RANGE	D	D1	D2	L	L1	L2	L3	CLASS A	CLASS B
ER20	1-13	21	20	17.4	31.5	23.9	6.36	4.8	0.008	0.015

ER20 collet set: 1, 2, 3, 3.175, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 mm

1. **Power off** the drive (and wait for the spindle to stop completely) before changing any tool.
2. Choose the collet that matches your cutter's shank size exactly (for example, 3.175 mm for a 1/8 in shank, 6 mm for 6 mm shanks). ER collets grip a small range just under their nominal size. TYPICAL
3. Clean the collet, the nut and the spindle taper. Chips or dust on the taper cause runout.
4. Snap the collet into the nut first (press it in at an angle until it clicks into the nut's eccentric ring), then thread the nut onto the spindle by hand. TYPICAL
5. Insert the cutter shank deep into the collet — typically at least two-thirds of the collet length — without bottoming out on the flutes. TYPICAL
6. Hold the spindle shaft (with the flat or a second wrench if provided) and tighten the nut with the ER20 wrench. Tighten firmly but do not over-tighten, which can damage the collet or shaft.
7. Do not tighten the nut without a tool in the collet; this can deform the collet. TYPICAL

12. Maintenance

When	What to do
Every use	Check coolant level and return flow, hoses and connections for leaks. Clean chips from the collet nut and spindle nose.
Every tool change	Clean the collet, nut and taper. Replace worn, damaged or deformed collets promptly.
Regularly (e.g. monthly) TYPICAL	Replace the coolant, clean the reservoir, pump intake and hoses to prevent scale and blockage.
Periodically	With power off and the display dark: check that drive terminals are tight and wires undamaged, clean dust from the drive vents and heat sink, and check that the supply voltage matches the drive rating. Do not perform insulation (megger) tests on the drive.
Bearings	The bearings are grease-lubricated and sealed; they do not need re-greasing. If noise, vibration or temperature rise increases, stop using the spindle and have the bearings serviced by a qualified technician.
Storage	Drain the coolant (especially in cold conditions). Store the spindle dry and dust-free; turn the shaft by hand from time to time to keep the bearings from rusting. Store the drive in a dry place (−20 to 65 °C). If the drive is stored for a long time, power it up at least once a year for a few hours.

13. Troubleshooting

Drive fault codes

Fault codes appear as **E.xx.y**. The last letter shows when the fault happened: **S** = at stop, **A** = while accelerating, **n** = at constant speed, **d** = while decelerating. Fix the cause, then press STOP/RESET to clear the fault.

Code	Meaning	What to check
E.oC.A	Over-current while accelerating	Short circuit or damaged insulation on motor/cable; acceleration time (PD014) too short — increase it; incorrect drive settings (check section 8).
E.oC.n	Over-current at constant speed	Motor or cable short/insulation; spindle jammed or sudden heavy load; sudden supply voltage change.
E.oC.d / E.oC.S	Over-current while decelerating / at stop	Output wiring insulation and motor short; deceleration time (PD015) too short — increase it; DC braking set too high. If it persists, the drive may need repair.
E.GF.x	Short circuit to ground	Motor cable or spindle winding shorted to ground; check insulation. If no wiring fault is found, the drive needs repair.
E.ou.x	Over-voltage	Deceleration too fast — increase PD015; supply voltage too high or unstable.
E.Fb.x	Fuse broken	Internal fuse failure. The drive needs repair.
E.Lu.x	Low voltage	Supply voltage too low; undersized wiring or circuit; sudden load change; a missing phase (3-phase supply).
E.oH.x	Drive overheated	Drive fan blocked or debris in the heat sink; ambient temperature too high; not enough space or ventilation around the drive.
E.oL.x	Drive overload (150% for 1 min)	Load too heavy for the drive; mechanical jamming; incorrect V/F settings (PD004–PD010).
E.oA.x	Motor overload (150% for 1 min)	Sudden load changes; motor hot or insulation deteriorating; supply voltage fluctuating; missing phase; cutting load too heavy. Check PD142.
E.oT.x	Motor over-torque	Fluctuating mechanical load; load too large for the motor.
E.bT.x / E.bS.x	Braking transistor / contactor feedback	Contact your seller; the drive likely needs repair.
E.EC.x / E.EE.x	CPU / EEPROM fault	Internal fault. Contact your seller.
Er	External interference	Isolate the source of electrical noise; separate signal and power wiring; improve grounding.
ES	Emergency stop	An emergency stop input is active.
Pr	Setting error	A parameter setting is invalid; correct the setting.
Dob	DC braking status	Shown while DC braking is active (not a fault).

Common problems

Problem	Possible causes and fixes
Spindle does not run when RUN is pressed	Run source (PD001) or frequency source (PD002) not set for the keypad; set frequency is zero or too low; drive is in fault protection (clear it); wiring or parameter error; motor or drive failure.
Parameters cannot be changed	Parameter lock is on — set PD000 to 0. Some parameters cannot be changed while running — stop first. If the keypad does not respond, power off, re-seat the keypad and try again.
Spindle turns the wrong way	Power off and swap any two of U, V, W. Set PD023 = 0 to stop accidental reverse.
Spindle stops too slowly	Deceleration time (PD015) is too long; reduce it gradually (too short can trip E.ou).
Spindle overheats	No or low coolant flow (check pump, kinked hose, blocked jacket, low reservoir); load too heavy; drive settings not matched to the motor (check PD004, PD005, PD008, PD141–PD144); ambient temperature too high.
Abnormal noise during operation	Bearing wear or damage, unbalanced or poorly clamped cutter, loose mount, insufficient cooling. Stop immediately and inspect.
Excessive vibration or poor finish	Unbalanced or dull cutter; dirty or worn collet; tool not inserted deep enough; spindle clamped off-axis; machine resonance — try a slightly different speed, or adjust the carrier frequency (PD041) or skip frequencies (PD056–PD059).
Spindle has low power or stalls on start	Supply circuit too weak (voltage drops); V/F settings wrong; acceleration too fast. Confirm PD008 = 110 and PD004 = 400.
Drive interferes with other electronics	Lower the carrier frequency (PD041); improve grounding of drive and motor; use shielded motor cable in metal conduit; keep power and control wiring separate; add input/output noise filters.
Ground-fault breaker trips	Normal drive leakage current may trip a standard GFCI; use a drive-rated device and shorter motor cable, or lower the carrier frequency. Also check the wiring for a real ground fault.
Water leaks	Loose or damaged hose; missing clamp; cracked fitting. Never run while leaking. A cracked housing after freezing needs service.

14. Warranty and support

Warranty terms are provided by the seller from whom you purchased this kit. Damage caused by improper installation or wiring, incorrect drive settings, running without cooling water, freezing, overload, misuse, or unauthorized disassembly or modification is generally not covered.

For technical help, replacement parts or warranty service, **contact your seller**. Please have your order details, the photos of the motor and drive nameplates, and any fault code shown on the drive ready.

NOTE ON SETTINGS

The drive settings in this guide are typical values for a 110V, 400 Hz, 2-pole, 24,000 RPM water-cooled spindle with an HY-series compatible drive. Always confirm them against the paper sheet supplied in the box and the nameplates on the motor and drive before changing them. A wrong voltage or frequency setting can damage the motor.