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SPECIFICATION SHEET

2.2 kW Water-Cooled VFD Spindle Motor Kit, 110V ER20

High-speed spindle motor + 2.2 kW (3 HP) variable frequency drive + 80 mm mount for CNC routers, engraving machines, and milling machines.

SKU	UPC	SHIPPING WEIGHT
100-53505	785004503381	23.19 lb



Complete 2.2 kW, 110V water-cooled spindle motor kit for CNC routers, engraving machines, and milling machines. The kit pairs a high-speed ER20 spindle with a matching 2.2 kW (3 HP) variable frequency drive, an 80 mm aluminum mount, a submersible cooling pump, hose, and a 14-piece ER20 collet set.

WHAT'S IN THE BOX

- 1 × 2.2 kW 110V water-cooled ER20 spindle motor
- 1 × 2.2 kW 110V variable frequency drive
- 1 × 80 mm spindle motor mount
- 1 × 80W 110V water pump
- 1 × 5 m water pipe
- 14 × ER20 collets, sizes 1, 2, 3, 3.175, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 mm
- 1 × ER20 wrench
- Aviation plug (shown with the kit)

> Intended for non-metallic work and soft metals such as wood, plastic, acrylic, PVC, PCB, carbon fiber, MDF, copper, and aluminum.

80 MM MOUNT

Material	Cast aluminum with a sandblasted finish
Fit	Fits 80 mm (3.15 in) diameter spindle motors

WATER PUMP AND HOSE

Power	80W, 110V
Flow	3,500 L/H
Maximum lift	3.5 m (11.5 ft)
Nozzle	6 mm (0.24 in)
Pump size	15.3 × 8.8 × 10.8 cm (6 × 3.5 × 4 in)
Water pipe	5 m included

COOLING NOTES

The spindle is water-cooled. The submersible pump must be fully immersed while running. Use the included 5 m water pipe to complete the cooling loop between the pump and the spindle. Install and operate the kit according to the included instructions. Do not run the spindle below 9,000 RPM.

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. The spindle rotates clockwise only.
Collet	ER20
Body size	80 mm diameter × 213 mm length (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 bearings (2 × C7005 and 2 × C7002), grease lubricated
Body material	Stainless steel

VARIABLE FREQUENCY DRIVE

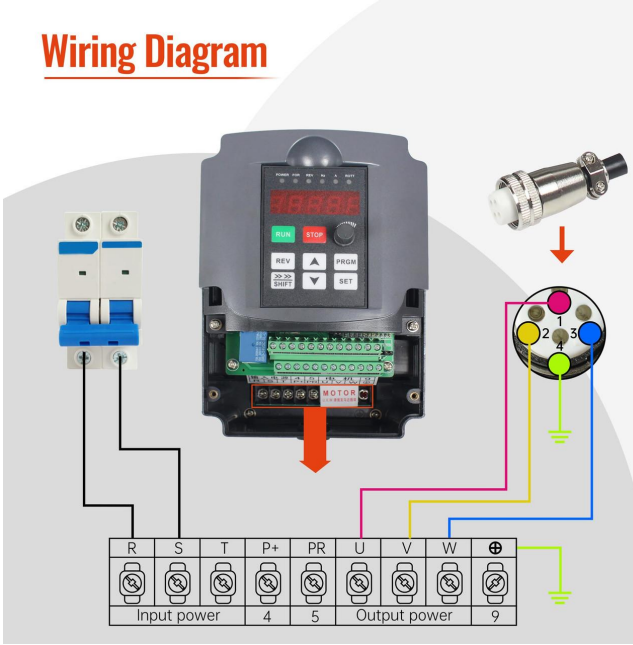
Power	2.2 kW / 3 HP
Control model	SPWN
Input	110V AC (±15%), 1 or 3 phase, 48–63 Hz (50/60 Hz)
Output	110V AC, 3 phase, 0–400 Hz
Setup	Typically preconfigured for use; follow the included instructions if parameters need to be set
Protection	Overload, over-voltage, under-voltage, and over-heat

WIRING NOTE

On the spindle aviation plug, terminals 1, 2, and 3 connect to the drive output terminals U, V, and W. Terminal 4 is ground. Connect input power to the drive R, S, or T terminals as shown on the wiring diagram.

- Aviation plug terminals 1, 2, and 3 → drive output U, V, and W
- Aviation plug terminal 4 → ground
- Input power → drive terminals R, S, or T

The drive is typically preconfigured for use. Follow the included instructions if parameters need to be set.



VFD to spindle wiring diagram

Specifications shown are those published for USA Tools SKU 100-53505. This sheet is provided for reference. Confirm installation, wiring, and cooling requirements with the instructions included in the kit before operating the equipment.