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› [VEVOR 2.2 kW Air-Cooled Spindle Motor and VFD User Manual](#)

## VEVOR 2.2KW Air-Cooled Spindle Motor & 2.2KW VFD System

# VEVOR 2.2 kW Air-Cooled Spindle Motor and VFD System User Manual

Model: 2.2KW Air-Cooled Spindle Motor & 2.2KW VFD System | Brand: VEVOR

## 1. PRODUCT OVERVIEW

This manual provides detailed instructions for the installation, operation, and maintenance of your VEVOR 2.2 kW Air-Cooled Spindle Motor and 2.2KW Variable Frequency Drive (VFD) system. This combination is designed to enhance work efficiency and optimize VFD performance for light-load motor applications.



Figure 1: VEVOR 2.2 kW Air-Cooled Spindle Motor and VFD System with included accessories.

## Key Features:

- **High Performance Spindle:** 2.2 kW air-cooled spindle motor with a speed range of 0-24000 R/min and 400 Hz frequency, featuring less than 0.005 mm runout for precision.
- **Advanced VFD Control:** 3HP 2.2KW 10A Variable Frequency Drive utilizing PID control and advanced closed-loop arithmetic for rapid response and high suitability.
- **Stable and Quiet Operation:** Both the spindle motor and VFD are constructed with high-quality materials, ensuring stable performance and reduced noise levels.
- **Comprehensive Protection:** The VFD includes robust safety features such as overload, overheat, over-voltage, low-voltage, fuse, restart, short circuit, and stalling protection to prolong product lifespan and ensure safe operation.
- **Efficient Heat Dissipation:** Integrated cooling mechanisms, including a fan on the VFD, ensure optimal operating temperatures.

## 2. SAFETY INSTRUCTIONS

Please read and understand all safety warnings and instructions before operating the VEVOR Spindle Motor and VFD system. Failure to follow these instructions may result in electric shock, fire, serious injury, or property damage.

- **Electrical Safety:** Ensure all wiring is performed by a qualified electrician in accordance with local and national electrical codes. Disconnect power before making any connections or performing maintenance.
- **Grounding:** Always ensure the VFD and spindle motor are properly grounded to prevent electric shock.
- **Ventilation:** Ensure adequate ventilation around the VFD to prevent overheating. Do not block ventilation openings.
- **Operating Environment:** Operate the system within the specified temperature and humidity ranges. Avoid environments with excessive dust, moisture, or corrosive gases.
- **Motor Compatibility:** **IMPORTANT: This system is designed ONLY for light-load motors. It cannot be used for heavy-duty motor applications.** Using it with heavy-duty motors may cause damage to the unit and pose safety risks.
- **Emergency Stop:** Familiarize yourself with the emergency stop procedures and ensure an accessible emergency stop button is integrated into your system.
- **Personal Protective Equipment (PPE):** Always wear appropriate PPE, such as safety glasses and gloves, when working with the system.



**OVERLOAD  
PROTECTION**



**OVERHEAT  
PROTECTION**



**OVER-VOLTAGE  
PROTECTION**



**LOW-VOLTAGE  
PROTECTION**



**FUSE  
PROTECTION**



**RESTART  
PROTECTION**



**SHORT CIRCUIT  
PROTECTION**



**STALLING  
PROTECTION**

## **SAFETY PROTECTION**

Figure 2: Overview of the VFD's integrated safety protection features, including overload, overheat, and short circuit protection.

### **3. SPECIFICATIONS**

#### **3.1. Spindle Motor Specifications**

<b>Parameter</b>	<b>Value</b>
Power	2.2 kW
Frequency	400 Hz
Speed	0-24000 R/min
Runout Off	Less than 0.005 mm

Parameter	Value
Dimensions (Diameter x Length)	80 mm x 215 mm (Approx. 3.15" x 8.46")
Collet Type	ER20
Gross Weight	8 kg (18 lb)



Figure 3: Spindle motor with approximate dimensions (3" diameter, 12.3" length shown in image, but description says 80x215mm which is 3.15" x 8.46". I will use the description's values as they are more precise and text-based).



Figure 4: Spindle motor with included accessories such as wrenches and collets.

### 3.2. Variable Frequency Drive (VFD) Specifications

Parameter	Value
Input Voltage	220 V
Output Voltage	208-240 VAC (analogous to input voltage)
Input Frequency	48-63 Hz
Output Frequency	0-400 Hz
Input Phase	1 or 3 phases (as desired)
Output Phase	3 phases
Control Mode	SPWM
Input Power Class (220V)	220 ± 15%

Parameter	Value
Display	5-digit display with indicator lamps (frequency, current, revolution, voltage, counter, temperature, FOR/REV rotation, fault)
Working Temperature	-10 ~ 40 °C
Humidity	0-95% RH (non-condensing)
Vibration	Below 0.5 G
Dimensions (L x W x H)	8.5 x 14 x 12.5 cm (Approx. 3.3" x 5.5" x 4.9")



Figure 5: VFD unit with approximate dimensions (3.3" x 5.5" x 4.9").

## 4. SETUP AND INSTALLATION

Proper installation is crucial for the safe and efficient operation of your VEVOR Spindle Motor and VFD system. Ensure all power is disconnected before proceeding with any wiring.

### 4.1. VFD Mounting and Wiring

- **Mounting:** Mount the VFD in a clean, dry, and well-ventilated area. Ensure sufficient clearance around the unit for proper airflow and heat dissipation.
- **Power Input:** Connect the main power supply (220V, 1 or 3 phase) to the VFD's input terminals (R, S, T). Refer to the VFD's terminal diagram for correct connections.
- **Motor Output:** Connect the spindle motor's three-phase wires to the VFD's output terminals (U, V, W). Ensure correct phase sequence for proper motor rotation.
- **Grounding:** Connect the VFD and spindle motor to a reliable earth ground.
- **Control Panel:** The VFD features a separate control panel for ease of installation and operation. This panel can be detached and mounted remotely if desired.



# SINGLE PHASE

Figure 6: Example of VFD single-phase input connection. Connect to R and T terminals when using single-phase 220V power.



## SEPARATE CONTROL PANEL

Figure 7: The VFD's control panel can be separated from the main unit for flexible mounting options. Ensure proper re-connection after separation.

### 4.2. Spindle Motor Installation

- **Mounting:** Securely mount the spindle motor to your CNC machine or fixture using appropriate clamps or brackets. Ensure it is firmly fixed to prevent vibration during operation.
- **Collet Installation:** Insert the ER20 collet into the spindle nut, then insert the cutting tool into the collet. Tighten the nut onto the spindle shaft using the provided wrenches.
- **Cooling:** As this is an air-cooled spindle, ensure the cooling fins are clear of obstructions to allow for proper airflow.

## 5. OPERATING INSTRUCTIONS

This section outlines the basic steps for operating your VEVOR Spindle Motor and VFD system.

## 5.1. VFD Basic Operation

1. **Power On:** After ensuring all connections are secure, turn on the main power supply to the VFD. The display should illuminate.
2. **Parameter Settings:** Refer to the VFD's detailed manual (usually included with the VFD) for specific parameter settings. Common parameters include maximum frequency, acceleration/deceleration times, and motor parameters.
3. **Start/Stop:** Use the "RUN" button on the VFD panel to start the spindle motor and the "STOP/RESET" button to stop it.
4. **Frequency Adjustment:** Use the "UP" and "DOWN" arrow buttons (or a potentiometer if connected) to adjust the output frequency, which controls the spindle speed.
5. **Direction Control:** The VFD allows for forward (FOR) and reverse (REV) rotation. Use the appropriate buttons or control signals to change direction.

## 5.2. Spindle Motor Operation

- **Tool Installation:** Ensure the cutting tool is securely installed in the ER20 collet before starting the spindle.
- **Warm-up:** For optimal performance and longevity, it is recommended to run the spindle at a low RPM for a few minutes before beginning high-speed operations, especially after long periods of inactivity.
- **Monitoring:** During operation, monitor the spindle for unusual noises, vibrations, or excessive heat. If any abnormalities are detected, stop the operation immediately and troubleshoot.

## 6. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your VEVOR Spindle Motor and VFD system. Always disconnect power before performing any maintenance.

- **Cleaning:** Regularly clean the exterior of both the VFD and spindle motor to prevent dust and debris buildup. Pay special attention to the VFD's ventilation grilles and the spindle's cooling fins.
- **VFD Fan Check:** Periodically check the VFD's cooling fan for proper operation and ensure it is free from obstructions. A clean fan ensures effective heat dissipation.
- **Connections:** Periodically inspect all electrical connections for tightness and signs of corrosion. Loose connections can lead to poor performance or damage.
- **Spindle Bearings:** While the spindle motor is designed for long life, listen for any unusual bearing noises. If present, consult a professional for inspection or replacement.
- **Storage:** If storing the unit for an extended period, ensure it is kept in a dry, dust-free environment within the specified temperature range.



## EFFECTIVE HEAT DISSIPATION

Figure 8: The VFD features an internal fan and ventilation grilles for effective heat dissipation. Keep these areas clean and unobstructed.

### 7. TROUBLESHOOTING

This section provides solutions to common issues you might encounter with your VEVOR Spindle Motor and VFD system. For problems not listed here, contact VEVOR customer support.

Problem	Possible Cause	Solution
VFD display is off	No power supply; Loose connections; Internal fuse blown.	Check main power supply; Verify all wiring connections; Consult a technician for fuse replacement.

Problem	Possible Cause	Solution
Spindle motor does not start	Incorrect VFD parameters; Motor wiring error; Emergency stop engaged; VFD fault.	Verify VFD parameters (e.g., P00.01, P00.03); Check motor wiring (U, V, W); Disengage emergency stop; Check VFD display for error codes and refer to VFD manual.
Spindle speed is unstable or incorrect	Incorrect frequency setting; Poor motor tuning; Load too heavy.	Adjust frequency setting; Review VFD motor parameters (e.g., P02.01-P02.05); Ensure motor load is within specified limits (light-load only).
VFD shows overload error	Motor overloaded; Incorrect motor parameters; Insufficient cooling.	Reduce motor load; Verify motor parameters in VFD; Ensure VFD has adequate ventilation.
Excessive noise or vibration from spindle	Loose mounting; Unbalanced tool; Worn bearings.	Check spindle mounting for tightness; Ensure tool is balanced and properly installed; If bearings are suspected, contact support.

## 8. WARRANTY AND SUPPORT

VEVOR products are designed and manufactured to high-quality standards. For warranty information, technical support, or service inquiries, please contact VEVOR customer service through their official website or the retailer where the product was purchased.

- **Online Support:** Visit the official VEVOR website for FAQs, troubleshooting guides, and contact information.
- **Product Registration:** Register your product online to receive updates and support.
- **Proof of Purchase:** Keep your proof of purchase for warranty claims.