

## SKI780

# SAKO SKI780 Variable Frequency Drive User Manual

Model: SKI780

## 1. INTRODUCTION

This user manual provides comprehensive instructions for the installation, operation, maintenance, and troubleshooting of the SAKO SKI780 Micro Variable Frequency Drive (VFD). The SKI780 series is designed for precise motor speed control, offering reliable performance for various industrial and commercial applications. Please read this manual thoroughly before installation and operation to ensure safe and efficient use of the device.

## 2. SAFETY INFORMATION

### **WARNING: High Voltage! Risk of Electric Shock!**

- Ensure all power is disconnected before installation, wiring, or maintenance. Wait at least 5 minutes after disconnecting power for capacitors to discharge.
- Only qualified personnel should install, operate, and maintain this equipment.
- Do not touch the terminals or internal components when power is applied or immediately after power is disconnected.
- Proper grounding is essential to prevent electric shock.
- Protect the VFD from moisture, dust, corrosive gases, and direct sunlight.
- Do not operate the VFD with damaged cables or if the enclosure is open.

## 3. PRODUCT OVERVIEW

## 3.1 Features

- Compact design for space-saving installation.
- Single-phase 220V input, three-phase 220V output.
- Suitable for motor speed control applications, including stepper motors as specified.
- Integrated control panel with digital display and buttons.
- Multiple protection functions (overcurrent, overvoltage, undervoltage, overload, etc.).

## 3.2 Physical Appearance and Controls

The SAKO SKI780 VFD features a user-friendly front panel for operation and monitoring, along with clearly marked terminals for power and motor connections.



Figure 3.2.1: Front view of the SAKO SKI780 Variable Frequency Drive, showing the digital display, control buttons (PROG, M-FUN, UP, DOWN, SHIFT, ENTER, RUN, STOP/REST), and terminal blocks for power input (RST) and motor output (UVW).



Figure 3.2.2: Angled view of the SAKO SKI780 VFD, providing a perspective of its compact size and overall design.

Key controls on the front panel include:

- **Digital Display:** Shows frequency, voltage, current, and parameter settings.
- **PROG Button:** Enters/exits parameter setting mode.
- **M-FUN Button:** Multi-function button, often used for quick access to common functions.
- **Up/Down Arrows:** Adjusts frequency, navigates parameters, changes parameter values.
- **SHIFT Button:** Shifts cursor position during parameter editing.
- **ENTER Button:** Confirms parameter settings.
- **RUN Button:** Starts the motor.
- **STOP/REST Button:** Stops the motor and resets faults.

## 4. INSTALLATION

### 4.1 Mounting

The VFD should be mounted vertically in a well-ventilated area, away from direct sunlight, excessive dust, moisture, and corrosive gases. Ensure sufficient clearance around the unit for proper heat dissipation.

- **Installation Size:** 130mm × 73mm
- **Dimensions:** 145mm (H) × 110mm (W) × 85mm (D)
- Use appropriate screws to secure the VFD to a stable surface.

### 4.2 Wiring

**IMPORTANT: Ensure power is OFF before wiring. Incorrect wiring can damage the VFD and motor.**

Refer to the wiring diagram below for proper connections. Use appropriate wire gauges for the rated current.



Figure 4.2.1: Wiring diagram for the SAKO SKI780 VFD. R, S, T are for single-phase 220V input. U, V, W are for three-phase 220V motor output. P+ and PB are for braking resistor connections if applicable.

- **Input Power (R, S, T):** Connect single-phase 220V AC power to terminals R and S. Terminal T is

typically not used for single-phase input, or can be connected to S for some configurations. Refer to specific product labeling.

- **Motor Output (U, V, W):** Connect the three-phase motor to terminals U, V, and W. Ensure correct phase sequence for desired motor rotation.
- **Ground (PE):** Connect the ground terminal to a reliable earth ground.
- **Braking Resistor (P+, PB):** If a braking resistor is required for applications with high inertia loads, connect it to P+ and PB terminals.

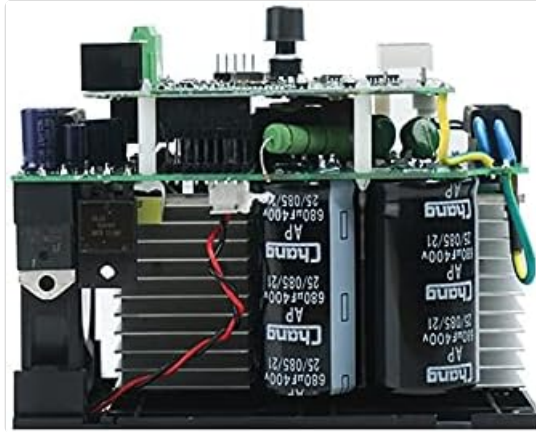


Figure 4.2.2: Internal view of the SAKO SKI780 VFD, illustrating the circuit board layout and large capacitors. This view is for reference and should not be accessed by unauthorized personnel.

## 5. SETUP

After successful wiring, proceed with initial setup. The specific parameters may vary, but common initial settings include motor parameters and control mode.

1. **Power On:** Apply single-phase 220V power to the VFD. The digital display should light up.
2. **Initial Parameter Check:** Press the **PROG** button to enter parameter setting mode. Use the Up/Down arrows to navigate through parameters.
3. **Motor Parameters:** Set the motor's rated power (KW), rated voltage (V), rated current (A), and rated frequency (Hz) according to the motor's nameplate. These are crucial for optimal performance and protection.
4. **Control Mode:** Select the desired control mode (e.g., V/F control for general applications).
5. **Max/Min Frequency:** Set the maximum and minimum output frequencies as required by your application.
6. **Acceleration/Deceleration Time:** Adjust these parameters to control how quickly the motor speeds up or slows down.
7. **Save Settings:** After adjusting parameters, ensure they are saved (refer to the VFD's specific parameter saving procedure, usually by pressing ENTER or PROG again).

## 6. OPERATING

Once the VFD is installed and set up, you can begin operation.

1. **Start Motor:** Press the **RUN** button. The VFD will accelerate the motor to the set frequency based on the acceleration time.
2. **Adjust Frequency:** In running mode, use the Up/Down arrows to adjust the output frequency, thereby changing the motor speed.
3. **Stop Motor:** Press the **STOP/RESET** button. The VFD will decelerate the motor to a stop based on the deceleration time.
4. **Fault Reset:** If a fault occurs, the VFD display will show an error code. After resolving the issue, press the **STOP/RESET** button to reset the fault.

For advanced operation modes (e.g., external terminal control, multi-speed operation), refer to the detailed programming manual for the SAKO SKI780 series.

## 7. MAINTENANCE

Regular maintenance ensures the longevity and reliable operation of your VFD.

- **Cleaning:** Periodically clean the VFD's exterior and cooling fins to prevent dust accumulation, which can hinder heat dissipation. Use a soft, dry cloth. Do not use liquid cleaners.
- **Inspection:** Regularly inspect wiring connections for looseness or signs of overheating. Check for any unusual noises or smells during operation.
- **Environment:** Ensure the operating environment remains within specified temperature and humidity ranges.
- **Fan Check:** Verify that the cooling fan (if present) is operating correctly and not obstructed.
- **Capacitor Life:** Electrolytic capacitors have a finite lifespan. While not user-serviceable, be aware that performance may degrade over many years of continuous operation.

**WARNING: Disconnect all power and wait for capacitor discharge before performing any maintenance inside the VFD.**

## 8. TROUBLESHOOTING

This section provides solutions to common issues you might encounter.

Problem	Possible Cause	Solution
VFD does not power on.	No input power; incorrect wiring; internal fuse blown.	Check power supply; verify wiring connections; consult qualified technician for internal inspection.

Problem	Possible Cause	Solution
Motor does not run.	RUN command not issued; motor wiring incorrect; VFD in fault state; parameters not set correctly.	Press RUN button; check motor connections (U, V, W); reset fault; verify motor parameters.
Overcurrent fault (OC).	Motor overload; short circuit in motor or wiring; acceleration time too short.	Reduce motor load; check motor and wiring for shorts; increase acceleration time.
Overvoltage fault (OV).	Input voltage too high; deceleration time too short; regenerative load.	Check input voltage; increase deceleration time; consider adding a braking resistor.
Undervoltage fault (UV).	Input voltage too low; momentary power loss.	Check input voltage stability; ensure power supply meets requirements.

For other fault codes or persistent issues, refer to the complete SAKO SKI780 programming manual or contact technical support.

## 9. SPECIFICATIONS

Parameter	Value
Model	SKI780
Input Voltage	Single-phase 220V
Output Voltage	Three-phase 220V
Power Range	0.75KW / 1.5KW / 2.2KW (1HP for 0.75KW variant)
Rated Current (0.75KW)	4 A
Rated Current (1.5KW)	7 A
Rated Current (2.2KW)	9.6 A
Dimensions (L×W×H)	145mm × 110mm × 85mm
Installation Size	130mm × 73mm
Panel Cut-out Size	61mm × 81mm
Weight	1 kg
Material	Metal
Motor Type (as per product description)	Stepper Motor

## 10. WARRANTY AND SUPPORT

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For warranty information, technical support, or service inquiries, please contact the retailer or manufacturer directly. Keep your purchase receipt as proof of purchase.

For detailed programming instructions and advanced features, refer to the full SAKO SKI780 series programming manual, which can often be found on the manufacturer's official website.