



GoHz Programmable Frequency Converter

Programmable 50Hz, 60Hz, 400Hz Frequency Converter

Solutions for Converting

- 110V 60Hz to 220V 50Hz,
- 120V 60Hz to 240V 50Hz,
- 230V 50Hz to 110V 60Hz,
- etc...

Power Capacity from 500 VA to 50 kVA - HZ-60 series

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Chapter I. Safety Precautions

- ◆ Read this user manual before using GoHz frequency converters.
- ◆ Keep this user manual near the frequency converter for reading at any time.
- ◆ Handle with care when transporting the frequency converter to avoid collision.
- ◆ Do not put the frequency converter on uneven or inclined place.
- ◆ Do not block the venting holes or slits to keep the frequency converter well-cooling effect, the back of the frequency converter should keep 10 cm (4 inches) away from the wall.
- ◆ Double check the frequency converter and power supply specifications are matching and well-wired before power connection to avoid any careless damaged.
- ◆ Frequency converters have different installations according to different capacities and voltage levels, choose an appropriate configuration and wire diameter.
- ◆ Do not overload the frequency converter and wire to prevent the electric shock or cause fires.
- ◆ Please follow the implementation of electrician laws and regulations.
- ◆ In case of abnormal phenomenon happens, follow this user manual in troubleshooting or contact the manufacturer.
- ◆ Please keep frequency converter clean and do not put heavy objects on top of it.
- ◆ Prevent any liquids and sundries into the frequency converter, in order to avoid poor contact or short circuit to cause electric shock or fire.
- ◆ Better to unplug the power cord in storm, lightning or thunder days.
- ◆ Avoid placing in direct sunlight, raining or humid place.
- ◆ Keep it away from the source of ignition and heat to prevent overheat.
- ◆ Shutdown the power cord during moving or maintaining the frequency converter.

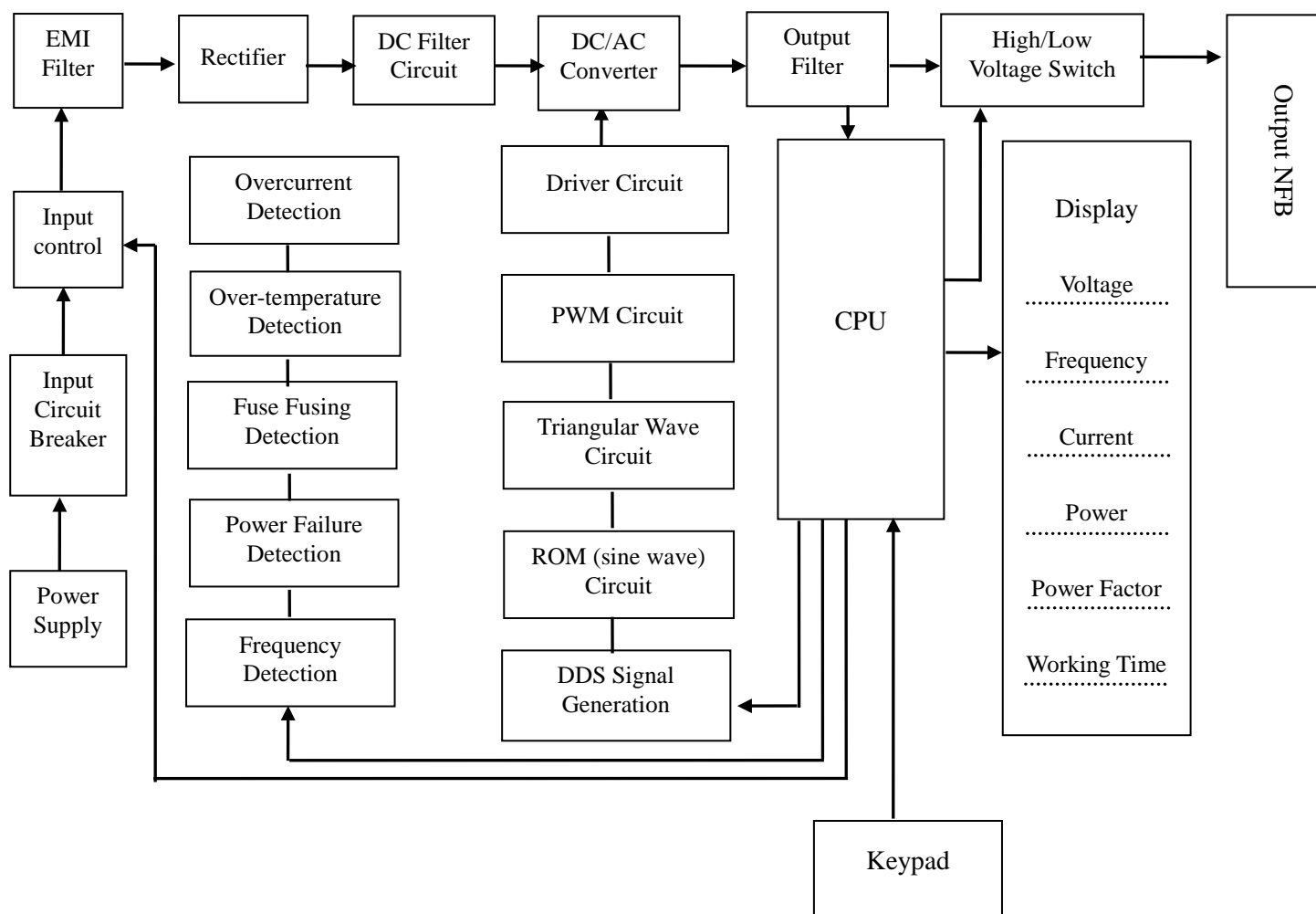
Chapter II. Working Principle

GoHz multi-function programmable frequency converter is a standard AC power supply electronic device, it can simulate international standard power supplies, convert fixed AC voltage and frequency power into stable pure sine wave power by internal AC to DC, DC to AC current rectifying, with high activation current, and displays a number of parameters (Such as: voltage, frequency, current, apparent power, power factor etc.).

GoHz programmable frequency converters adopt advanced PWM (Pulse Width Modulation) technology with compact size, light weight and high efficiency features. Digital Signal Processor technology provides high precision measurements function of voltage, frequency, current, apparent power and power factor etc. The use of high power IGBT module design to reduce circuit complexity, enhance frequency converter stability and reduce power consumption. And the isolation transformers completely isolate the mains and the loads, in order to improve the loads stability and a variety of testing performance, to ensure the accuracy of test values for the loads.

GoHz programmable frequency converter provides voltage (0 - 300V) and frequency (standard 40Hz - 120Hz, 120Hz to 499.9Hz is optional), suitable for general commercial electrical and electronic machines.

Frequency Converter Circuit Block Diagram



Chapter III. Introduction

Product Features

- Adopt high brightness LED display, clear and eye-catching, wide view angle;
- Adopt IGBT module design, output stable pure sine wave power, less interference, high precision and low noise;
- Adopt advanced Direct Digital Synthesizer (DDS) waveform generation technology, high frequency stability and good continuity;
- Adjustable wide range output voltage, 0-300V, keypad input directly;
- Output current limitation feature;
- 10 sets parameters preset records, store common parameters (Voltage V, Frequency Hz and Running Time S) for recall easily;
- RS232 (Optional) communication interface can be connected with computer to constitute intelligent power supplies;
- Protection of overvoltage, overcurrent, overload, short circuit, current limitation;
- High accuracy digital key input voltage, frequency;
- Fault code records, easy for troubleshooting.

Applications

Laboratory standard power supply	Air compressor testing	Monitor Testing
Quality assurance / Control / lifetime testing in Manufacturers	Air conditioning equipment testing	Transformers / TRIAC / SCR and other parts testing
Switching power supply testing	Motor equipment testing	Fluorescent lamp ballast testing
All kinds of electrical machines with motors	Copiers, scanners, OA product testing	R&D departments require best power supplies

Checklist

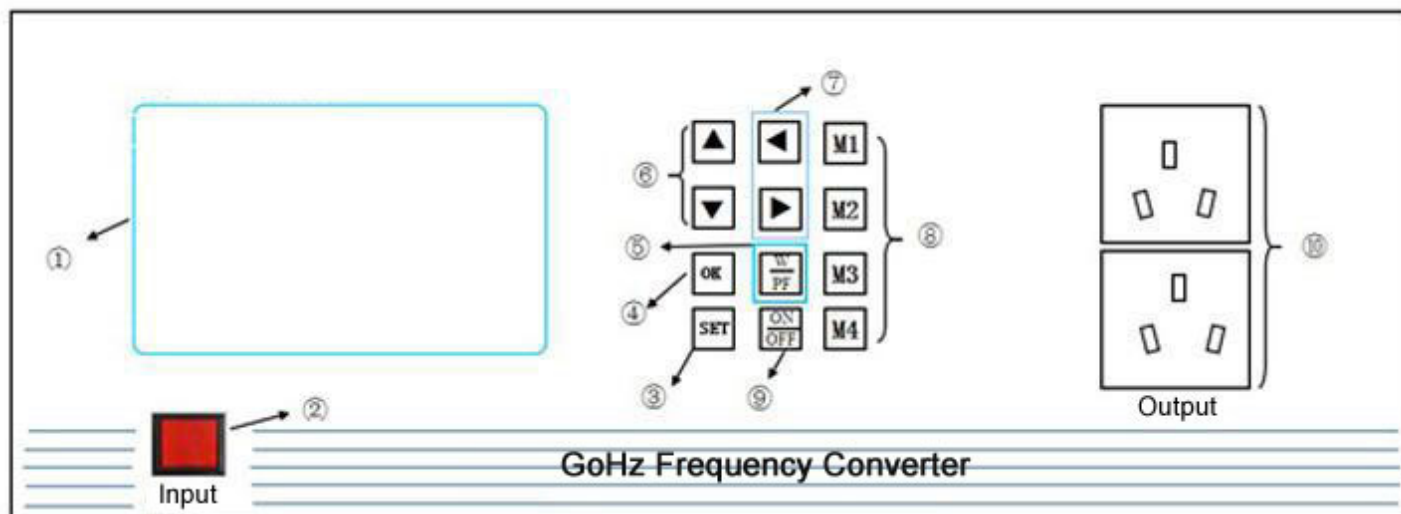
Every frequency converter has functional test before leaving factory, the frequency converter is wooden packaged, includes:

- 1 unit frequency converter
- 1 unit input power cable (only for 500VA & 1kVA)
- Operation manual

Nameplate

GoHz Frequency Converter	
Model:	HZ-60-1101
Capacity:	1kVA
Input:	1P2W 220V 50Hz/60Hz
Output:	1P2W 0 – 300V, 40.0 – 499.9Hz
Serial Number:	GoHz-20150101010

Chapter IV. Operation Panel and Functions



- ① Display panel
- ② Input Switch
- ③ SET: set voltage and frequency values in standby mode
- ④ OK button to confirm
- ⑤ W/PF: power and power factor switch
- ⑥ ▲▼Up & Down: adjust voltage
- ⑦ ◀▶Left & Right: adjust frequency
- ⑧ M1-M4: shortcut of parameters preset records
- ⑨ ON/OFF: start/stop button
- ⑩ Output socket.

Chapter V. Operating Guide

Menu Selection

Turn on the input switch, press SET button enter into main menu user interface, the main menu is divided into four options:

1) Parameter Set; 2) Operating Parameters; 3) Abnormal Display; 4) Program Settings.

Press up/down ▲▼ buttons to adjust the selection, press OK button to enter the option.

Parameter Setting Procedure

1. Enter into "Parameter Set" user interface, press up/down ▲▼ buttons to select the parameter sets (M0-M9), press left/right ◀▶ buttons to change the underline position, press up/down ▲▼ buttons to set the values.
2. Enter into "Operating Parameters" user interface, press up/down ▲▼ buttons to adjust the voltage value, left/right ◀▶ buttons to adjust the frequency value. Note: the frequency converter output must in turn-on state, otherwise the values can not be adjusted.
3. W/PF, switch power and power factor, the frequency converter default display is power.
4. Abnormal Display, display the frequency converter operating abnormality.
5. Program Settings, press up/down ▲▼ buttons to switch terminate-parameter-sets, elect-parameter-sets and running mode, press left/right ◀▶ buttons to change the sub-options of terminate-parameter-sets, elect-parameter-sets and running mode. (The default running mode is "CYCLE", without special requirements, please do not change it to "SEQUENCE".) Power output is only used for displaying whether the frequency converter has output or not.

Specific Operation Settings

1. The frequency converter displays "Parameter Set" user interface after its power on.
2. Select the parameter sets (M0-M9).
 - (1) M1, M2, M3, M4 are the shortcut sets, press ▲▼◀▶ to set the values, each set can be selected on the operator interface directly.
 - (2) M0, M5, M6, M7, M8, M9 parameter sets are programmable for connecting computer operation.
 - (3) After parameters finalized, connect loads and press ON/OFF button, then the operator interface will display frequency, current and power.
 - (4) Press up/down ▲▼ buttons to set voltage, left/right ◀▶ buttons to set frequency online (with loads).
3. To change the operating voltage, press ON/OFF button to cut output, select the preset parameters stored in M1-M4 and press ON/OFF to enable output.

Chapter VI. Placement

The environment of the frequency converter being placed has direct affect to converter's function and lifetime, the environment should follow the conditions:

Moving:

- Please shut down and disconnect all wirings before moving the frequency converter.
- Do not move the frequency converter upside down.
- Handle the frequency converter with care in moving to avoid collision.

Placement

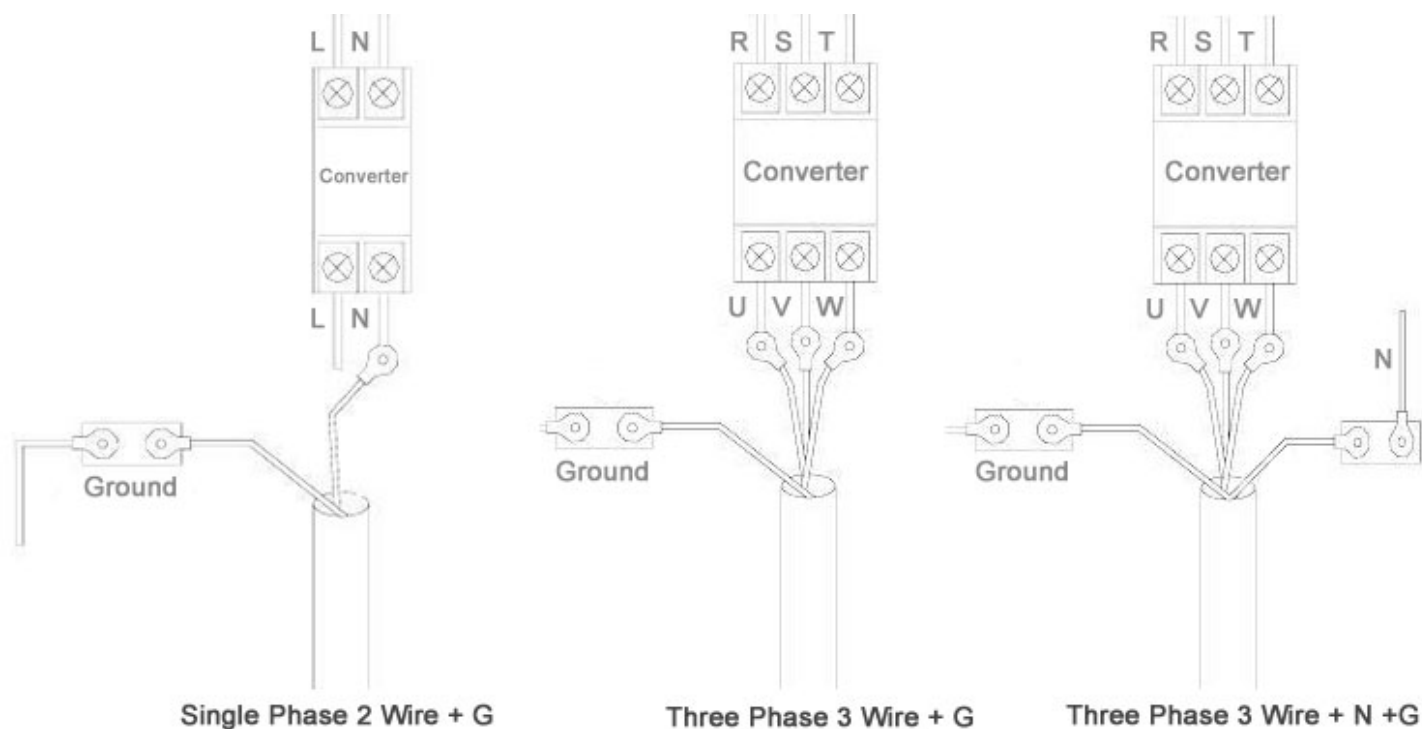
- Do not put the frequency converter on uneven or inclined place.
- Avoid direct sunlight, rain or humid place
- Keep it away from fire and high temperature place to prevent overheating.
- Avoid oil mist, salt, corrosive gases erosion.
- Avoid dust, cotton and small metal objects intrusion.
- Keep the frequency converter in a well-ventilated place, keep the frequency converter's back away from the wall at least 10cm to ensure sufficient ventilation.
- Operating temperature 0 - 40°C, humidity 0 - 90% (non-condensing).

Chapter VII. Installation

Wiring Precautions

- Whether the capacity of the frequency converter in accordance with your loads.
- Whether the frequency converter damaged during transportation, if so, do not connect it to power source.
- Shut down power before wiring, check the input voltage before installation.
- Make sure the specification of the wire in accordance with the frequency converter before wiring to avoid damages. The wire diameter should follow the voltage level and capacity of the frequency converter.
- Please refer to electrician wiring regulations, or following the "wire diameter reference" table.
- Avoid the switch of the frequency converter share with other appliances.
- Use O-type wiring terminals, make sure it's well-wired, tighten screws to avoid poor contact and prevent electric shock.
- Make sure the polarity is correct where it's single phase frequency converter or three phase converter.
- For grounding, please refer to page 12.
- Make sure all switches on "OFF" status before connecting the frequency converter to power source.
- Make sure the power source, frequency converter and loads are matching before power on.
- Internal semiconductor components are sensitive to static electricity, be careful in touching the metal control panel.

Wiring Diagram



Wire Diameter Reference Table

1Ø2W 220V/110V				1Ø	
Model	Input			Output	
GoHz	Max. I/P Current	Protection Breaker	Power Wire	Max. O/P Current	Power Wire
1102 2KVA	12.6A	30.0A	2.0mm ²	110V:18.2A 220V:9.1A	2.0mm ²
1103 3KVA	19.0A	30.0A	3.5mm ²	110V:27.2A 220V:13.6A	5.5mm ²
1105 5KVA	25.5A	50.0A	3.5mm ²	110V:45.4A 220V:22.7A	8.0mm ²
1110 10KVA	63.1A	75.0A	22.0mm ²	110V:91.0A 220V:45.5A	30.0mm ²
3115 15KVA	94.7A	100.0A	30.0mm ²	110V:136.4A 220V:68.2A	22.0mm ²
3120 20KVA	12.6A	150.0A	38.0mm ²	110V:181.8A 220V:90.9A	60.0mm ²
3130 30KVA	189.4A	200.0A	80.0mm ²	110V:272.8A 220V:136.4A	125.0mm ²

3Ø4W 220V/ 380V, 3Ø3W 380V				3Ø	
Model	Input			Output	
GoHz	Max. I/P Current	Protection Breaker	Power Wire	Max. O/P Current	Power Wire
3306 6KVA	12.6A	30.0A	2.0mm ²	110V:18.2A 220V:9.1A	3.5mm ²
3310 10KVA	20.5A	30.0A	3.5mm ²	110V:30.2A 220V:15.1A	5.5mm ²
3315 15KVA	31.5A	40.0A	5.5mm ²	110V:45.5A 220V:22.7A	8.0mm ²
3320 20KVA	42.2A	50.0A	8.0mm ²	110V:60.6A 220V:30.3A	14.0mm ²
3330 30KVA	63.0A	75.0A	22.0mm ²	110V:91.0A 220V:45.5A	30.0mm ²
3345 45KVA	95.0A	125.0A	30.0mm ²	110V:136.0A 220V:68.0A	38.0mm ²
3360 60KVA	126.0A	150.0A	38.0mm ²	110V:182.0A 220V:91.0A	60.0mm ²
3375 75KVA	158.0A	187.5A	50.0mm ²	110V:227.0A 220V:113.5A	100.0mm ²
33100 100KVA	210.5A	250.0A	80.0mm ²	110V:303.0A 220V:151.5A	150.0mm ²
33120 120KVA	252.5A	300.0A	100.mm ²	110V:363.6A 220V:181.8A	200.0mm ²

Power Polarity Identification Methods

1. Fire Wire to Ground or Neutral (i.e. line to line voltage) Wire, there are 173V, 190V, 200V, 208V, 220V, 230V, 240V, 380V, 400V, 415V, 440V, 480V according to different specifications. This is for three-phase three-wire or three-phase four-wire system.

2. Neutral Wire to Fire Wire, there are 100V, 110V, 115V, 120V, 127V, 132V, 139V, 220V, 230V, 240V, 254V, 277V etc according to different specifications, to Ground Wire it's approx. 0.5V-2.0V. There is no Neutral Wire in three-phase three-wire system.

3. Ground Wire to ground rods. Three-phase four-wire systems are: 173V / 100V, 190V / 110V, 200V / 115V, 208V / 120V, 220V / 127V, 230V / 132V, 240V / 139V, 380V / 220V, 400V / 230V, 415V / 240V, 440V / 254V, 480V / 277V. Three-phase three-wire systems are: 173V, 190V, 200V, 208V, 220V, 230V, 240V, 380V, 400V, 415V, 440V, 480V. Two-wire systems are: 100V, 110V, 115V, 120V, 127V, 132V, 139V, 220V, 230V, 240V, 254V, 277V. If the voltage between Ground Wire and Neutral Wire is higher than 5V or the equipment has specific requirement, please find a qualified electrician to reinstall the ground wiring system for safety factors.

4. Fire Wire marks: single-phase system marked with L, L1, L2; three-phase system marked with R, S, T, U, V, W.

5. Neutral Wire marks: both single-phase and three-phase systems are marked with N.

6. Ground Wire marks: marked with "G" or "E" (Earthing), or symbol "≡".

7. Single-phase wire color distinguishes:

- L, L1, L2 (Fire Wire): Red
- N (Neutral Wire): Black
- G or E (Ground Wire): Black

8. Three-phase wire color distinguishes:

- R-Phase (input) and U-Phase (output): Red
- S-Phase (input) and V-Phase (output): Green
- T-Phase (input) and W-Phase (output): Yellow
- N (Neutral Wire): Black
- G or E (Ground Wire): Black

Note: if the voltage between Neutral Wire and Ground Wire is higher than 5V or the system has specific requirement, you can short the null line and ground line, but it's not a must.

Grounding System

1. In addition to safety consideration, well-grounded system also can avoid the power system interferes equipment normal operation.
2. Ground Wire should be separated with Neutral Wire if it's not neutral wire, unless special applications.
3. Ground Wire should be 8AWG wire at least or the diameter is basically the same.
4. Ground Wire is for specified frequency converter only, poor ground will cause interference for other machines.
5. Use ground rods in grounding for the best.

6. Ground Types:

Item	Applications	Resistance values
1	Low voltage power supply system or high voltage electrical equipment of three-phase four-wire multi-grounded systems grounding	10Ω or less
2	Ungrounded high-voltage electrical equipment grounding system.	25Ω or less
3	Low voltage power supply system of three-phase three-wire ungrounded system.	50Ω or less
4	1. Low voltage electrical equipment grounding 2. Inner system grounding 3. Frequency converter secondary grounding 4. Low voltage electrical equipment metal body grounding.	1. Ground voltage less than 150V is 100Ω or less. 2. Ground voltage 151V to 300V is 50Ω or less. 3. Ground voltage higher than 301V is 10Ω or less.

Chapter VIII. Specifications

Capacity		500VA	1KVA	2KVA	3KVA	5KVA	10KVA	15KVA	20KVA	30KVA	50KVA	
Input	Phase	Single Phase						Three Phase				
	Voltage	220V±10%						380V±10%				
	Frequency	50Hz, 60Hz										
Output	Phase	1Φ2W										
	Voltage	Low grade 0-150V AC / High grade 0-300V AC										
	Frequency	40Hz-120Hz (120Hz-499.9Hz Specified)										
	Current	L=110V	4.2A	8.4A	16.8A	25A	84A	84A	125A	168A	250A	420A
H=220V		2.1A	4.2A	8.4A	12.5A	21A	42A	62.5A	84A	125A	210A	
Display		Voltage, Current, Frequency, Power, Power Factor.										
Voltage Regulation		0.10%										
Load Regulation		0.50%										
Total Harmonic Distortion (THD)		1% (Pure resistive loads)										
Frequency Stability		0.01%										
Voltage Resolution		0.1V										
Frequency Resolution		0.1 Hz										
Current Resolution		0.01A						1A				
Measurement Accuracy	Voltage	0.5%FS+5dgt										
	Current	0.5%FS+5dgt										
	Power	0.5%FS+5dgt										
	Frequency	0.01%FS+5dgt										
Setting Accuracy	Voltage	1%FS										
	Frequency	0.1%FS										
Parameter Sets		10 sets (M0 - M9), record voltage, frequency and running time										
Communication Interface		RS232C (Optional)										
Protection		Overcurrent, over temperature, overload, short circuit etc.										
Operating Environment		0-40°C, 20-80%RH										

Chapter IX. Troubleshooting

Please pay attention to internal high voltage components, only qualified electricians can maintain the frequency converter.

Turn off the frequency converter before proceeding troubleshooting procedures if it's not necessary to do live troubleshooting.

Phenomenon	Inspection methods	Troubleshooting
No input power	<ol style="list-style-type: none"> 1. Input switch is turn on or not? 2. Input voltage is right or not? 3. The fuse is burn down or not? 	<ol style="list-style-type: none"> 1. Turn the power supply input switch. 2. Connect to correct voltage power supply. 3. Check the fuse and replace the fuse with same specification if necessary.
Output power outage	<ol style="list-style-type: none"> 1. Is it power off or momentary power off? 2. Is it overload? 	<ol style="list-style-type: none"> 1. Press the activate switch (ON) to reboot 2. Make sure the loads are within the frequency converter's capacity.
No output voltage	<ol style="list-style-type: none"> 1. Is the fuse burn down or not? 2. Is it overloaded? 	<ol style="list-style-type: none"> 1. Check the fuse and replace the fuse with same specification if necessary. 2. Replace a larger capacity frequency converter
Voltmeter, ammeter and power show "0" when the output frequency is normal.		<ol style="list-style-type: none"> 1. Turn the power switch to "OFF" position. 2. Change output voltage switch to zero. 3. Turn the power switch to "ON" position.
Voltmeter, ammeter and power show "0" and alarm rings when the output frequency is normal.		<ol style="list-style-type: none"> 1. Check and decrease the loads' current. 2. Press the shutdown/reset button (OFF/RESET) 3. Re-operation
High temperature	<ol style="list-style-type: none"> 1. Is it overload? 2. Cooling fan speed is slowdown or not to work 	<ol style="list-style-type: none"> 1. Decrease loads. 2. Replace a new cooling fan.
Emergency		<p>Please advise:</p> <ol style="list-style-type: none"> 1. Frequency converter model & serial number. 2. Date & Time of the failure. 3. Loads. 4. Detailed description of the failure.

Chapter X. Maintenance

GoHz frequency converters do not require daily maintenance, a regular maintenance is benefited of longer lifetime, the maintain times is in accordance with the environmental conditions.

Preventive Measures:

- Do not put any liquid objects on the top of the frequency converter.
- If the frequency converter is installed in a harsh environment, such as windy and dusty, pay more attention to make the frequency converter clean or do more frequent maintenances.

Maintenances:

- Turn off the power switch
- Clean inner dusts
- Wipe the cabinet, cover and venting holes with a soft cloth and detergent.
- Visual inspection of all power lines and terminals, see if there is collision, loose, hot corrosion, moisture, insect bites or rat bites, do some repairs or replaces if necessary.

Note: DO NOT do any maintenance if you are not a qualified electrician, and make sure the frequency converter is discharged completely before proceeding any maintenance.