Solid-state Frequency Converter
Mobile w/ Wheels
Instruction Manual

Safety Information

- Read this user manual before using frequency converter.
- Keep this user manual near the frequency converter for reading at any time.
- Careful in transporting the frequency converter to avoid impact.
- Do not put the frequency converter on uneven or inclined surface.
- 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 matched and well-wired before power connection to avoid any careless damage.
- Frequency converters have different installations according to different capacities and voltage levels, choose an appropriate configuration and cable diameter.
- Do not overload the frequency converter to prevent the electric shock or cause fires.
- Please follow all applicable local and national electrical and building code.
- 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, electric shock, or fire.
- Unplug the power cord in stormy weather.
- Avoid placing in direct sunlight, raining or humid place.
- Keep it away from the source of ignition and heat to prevent overheat.
- Unplug the power cord during moving or maintaining the frequency converter.

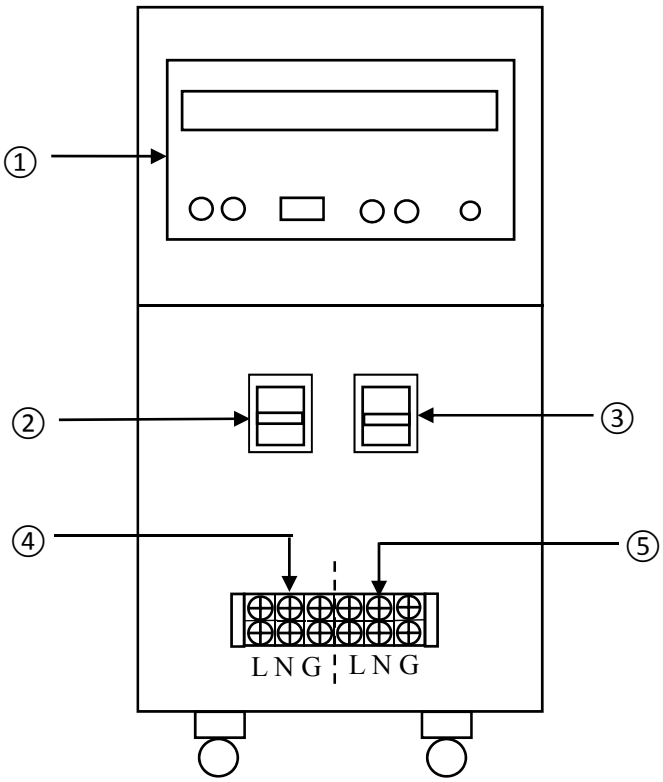
Product Features

- Frequency converter is suitable for use with resistive, capacitive, inductive and non-linear loads.
- Compatible with 50 Hz & 60 Hz input frequency.
- Adjustable single phase 0-300v AC, three phase 0-520v AC output voltage.
- Adjustable 40.0 to 120 Hz output frequency, customize 499.9Hz.
- Precise 4 LED digital display output frequency, voltage, ampere and wattage.
- Isolated operation, no harmonic distortion (EMI, EMC).
- Pure sine wave output.
- IGBT/PWM technology enhances compact size, low noise and high reliability.
- Capable to simulate global voltage, frequency power supplies.
- Frequency converters are equipped with electronic circuit/instant trip breaker/buzzer alarm for over voltage, over current, over temperature, output short circuit protection.

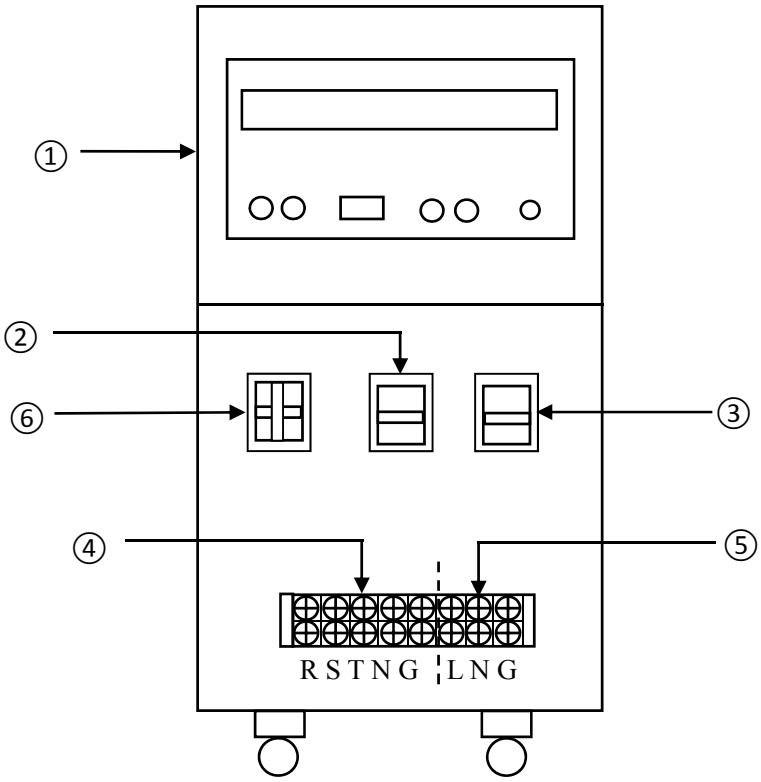
Checklist

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

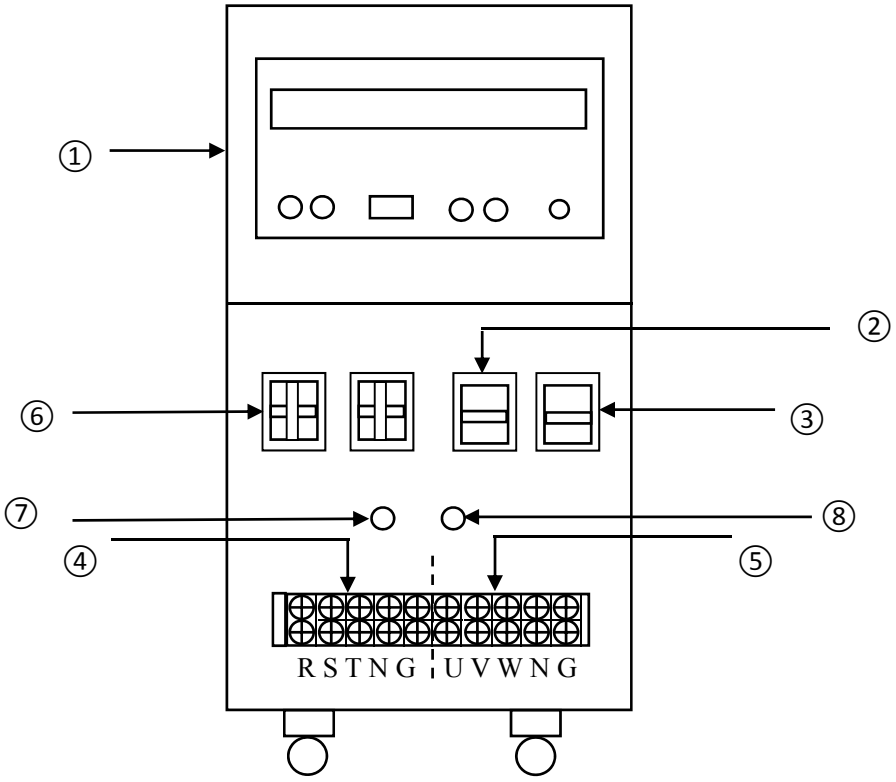
- 1 unit frequency converter
- Operation manual



Single Phase



Three Phase to Single Phase



Three Phase

① Operation Panel

② Input Air-switch

③ Output Air-switch

④ Input Terminals

⑤ Output Terminals

⑥ Low/High Voltage Switch (For 30kVA and Above)

⑦ Low/High Voltage Indicator (For 3-Phase 3kVA to 20kVA)

⑧ Phase/Line Voltage Switch (For 3-Phase 3kVA to 20kVA)

Wiring Precaution

- 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 cable in accordance with the frequency converter before wiring. The cable diameter should follow the voltage level and capacity of the frequency converter.
- Please refer to electrician wiring regulations, or following the "Cable Diameter Reference" table.
- Avoid sharing the power switch of the frequency converter 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 power source is correct to match single phase or three phase frequency converter.
- For grounding, refer to the next page.
- 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.

Grounding System

- In addition to safety consideration, well-grounded system also can avoid the power system interferes equipment normal operation.
- Ground Cable should be separated with Neutral Cable, unless special applications.
- Ground Cable should be 8AWG cable at least or the diameter is basically the same.
- Ground Cable is for specified frequency converter only, poor ground will cause interference to other machines.
- Use ground rods in grounding for the best.
- Ground Types:

Item	Application	Resistance value
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. round voltage less than 150V is 100Ω or less. 2. round voltage 151V to 300V is 50Ω or less. 3. round voltage higher than 301V is 10Ω or less.

Cable Diameter Reference Table

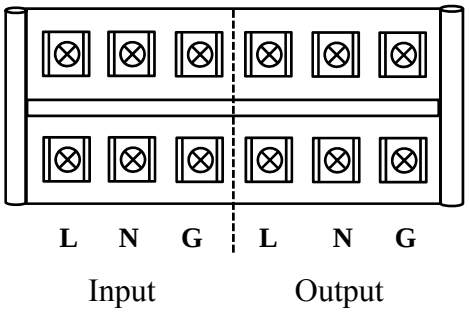
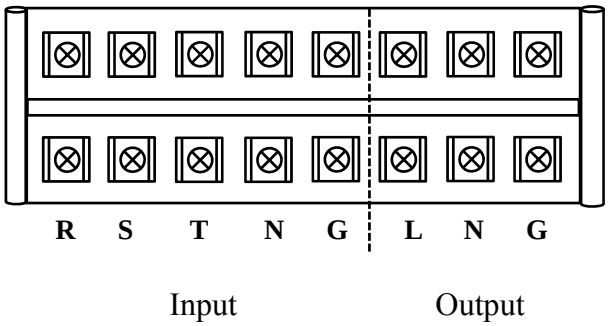
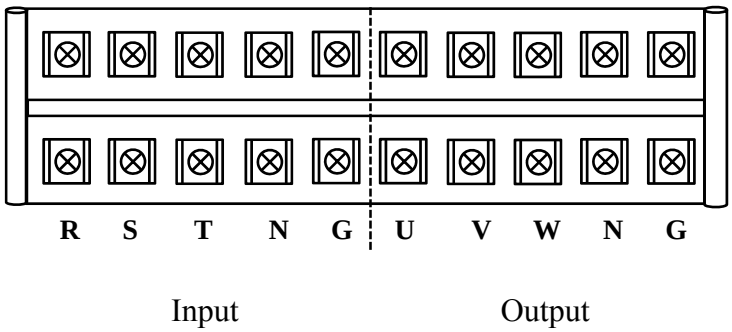
1Ø 2W / 220V					1Ø 2W / 0-300V				
	Capacity	Input			Max. O/P Current		Output		
		L	N	G	**Low**	**Hi**	L	N	**G**
	2kVA	⩾2.5mm^2		2.5mm^2	16.8A	8.4A	⩾2.5mm^2		2.5mm^2
	3kVA	⩾4mm^2		2.5mm^2	25A	12.5	⩾4mm^2		2.5mm^2
	5kVA	⩾6mm^2		6mm^2	41.6A	20.8A	⩾6mm^2		6mm^2
	10kVA	⩾10mm^2		10mm^2	83.2A	41.6A	⩾16mm^2		10mm^2
	15kVA	⩾16mm^2		10mm^2	125A	62.5A	⩾25mm^2		10mm^2
	20kVA	⩾25mm^2		10mm^2	166.6A	83.3A	⩾35mm^2		10mm^2
	30kVA	⩾35mm^2		10mm^2	250A	125A	⩾50mm^2		10mm^2

3Ø 4W / 380V							1Ø 2W / 0-300V				
	Capacity	Input					Max. O/P Current		Output		
		R	S	T	N	G	**Low**	**Hi**	L	N	**G**
	10kVA	⩾4mm^2				6mm^2	83.2A	41.6A	⩾16mm^2		10mm^2
	15kVA	⩾6mm^2				6mm^2	125A	62.5A	⩾25mm^2		10mm^2
	20kVA	⩾6mm^2				6mm^2	166.6A	83.3A	⩾35mm^2		10mm^2
	30kVA	⩾10mm^2				10mm^2	250A	125A	⩾50mm^2		10mm^2
	45kVA	⩾16mm^2				10mm^2	375A	187.5A	⩾75mm^2		10mm^2
	50kVA	⩾16mm^2				10mm^2	416.6A	208.3A	⩾83mm^2		10mm^2
	60kVA	⩾25mm^2				10mm^2	500A	250A	⩾100mm^2		10mm^2
	75kVA	⩾30mm^2				10mm^2	625A	312.5A	⩾150mm^2		10mm^2
	90kVA	⩾35mm^2				10mm^2	750A	375A	⩾180mm^2		10mm^2
	100kVA	⩾50mm^2				10mm^2	833.3A	416.7A	⩾200mm^2		10mm^2
	120kVA	⩾70mm^2				10mm^2	1000A	500A	⩾250mm^2		10mm^2
	150kVA	⩾95mm^2				10mm^2	1250A	625A	⩾300mm^2		10mm^2

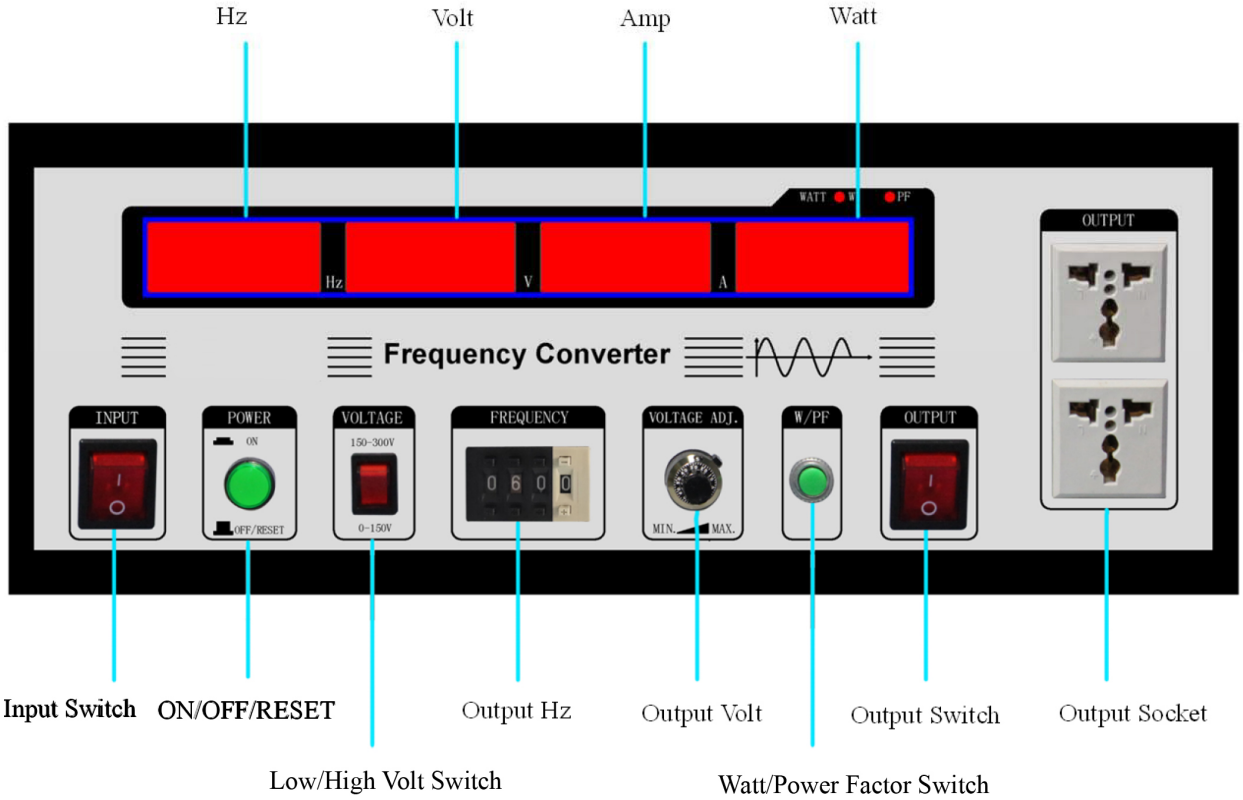
3Ø 4W/ 380V							3Ø 4W / 0-520V						
	Capacity	Input					Max. O/P Current		Output				
		R	S	T	N	G	Low	Hi	U	V	W	N	G
	3kVA	⩾1.5mm^2				2.5mm^2	8.4A	4.2A	⩾2mm^2				6mm^2
	10kVA	⩾4mm^2				2.5mm^2	27.6A	13.8A	⩾6mm^2				6mm^2
	15kVA	⩾6mm^2				6mm^2	41.6A	20.8A	⩾8mm^2				6mm^2
	20kVA	⩾6mm^2				6mm^2	55.6A	27.8A	⩾10mm^2				6mm^2
	30kVA	⩾10mm^2				6mm^2	83.2A	41.6A	⩾16mm^2				6mm^2
	45kVA	⩾16mm^2				10mm^2	125A	62.5A	⩾25mm^2				10mm^2
	60kVA	⩾25mm^2				10mm^2	166.6A	83.3A	⩾35mm^2				10mm^2
	75kVA	⩾30mm^2				10mm^2	208.3A	104.2A	⩾42mm^2				10mm^2
	90kVA	⩾35mm^2				10mm^2	250A	125A	⩾50mm^2				10mm^2
	100kVA	⩾50mm^2				10mm^2	277.7A	138.8A	⩾70mm^2				10mm^2
	120kVA	⩾70mm^2				10mm^2	333.3A	166.6A	⩾95mm^2				10mm^2
	150kVA	⩾95mm^2				10mm^2	416.6A	208.3A	⩾120mm^2				10mm^2
	200kVA	⩾120mm^2				10mm^2	555.5A	277.7A	⩾185mm^2				10mm^2
	300kVA	⩾180mm^2				10mm^2	833.3A	416.6A	⩾240mm^2				10mm^2

Note: user can choose different cables according to the input and output conditions, when the input or output cable length exceeds 20 meters, the cable diameter should be doubled.

Wiring Terminals

Single Phase Input, Single Phase output.	
Three Phase Input, Single Phase Output.	
Three Phase Input, Three Phase Output.	

Chapter V. Operation Panel



Some models may differ slightly in layout

Chapter VI. Operation Guide

Proper operating procedures allow you to use the frequency converter more smoothly and avoid unnecessary troubles.

1. Make sure the POWER ON switch is on OFF position.
2. Make sure the switches, rotary buttons, displays are not loosen or damaged.
3. Make sure the power supply is matching with the frequency converter specifications (110V, 220V etc.) before turning the input POWER ON switch to ON position.
4. Set the output frequency by "FREQUENCY SET" switch. Note, press OFF/RESET for setting hundreds frequency (1xx.x).
5. Choose the Low/High Voltage output voltage according to the loads, for ≤150V change 0-150V (low) and 1-300V (high) base on required voltage.
6. Press to POWER ON switch (ON).
7. Connect loads cable and turn on the AC OUTPUT switch to obtain required standard AC power supplies.
8. Frequency converter has overcurrent (overload), over temperature, short circuit, instantaneous power off protection and warning indicators. In case of above phenomenon happens, the protection circuit cut off output immediately and trigger warning buzzer.
9. Press OFF / RESET switch to cut off the output.

Caution: For 30kVA frequency converter (and above), to switch Low/High voltage, if the frequency converter is connected loads, the frequency converter must be powered off and turn off the output switch before switching the voltage.

Chapter VII. Specification

Single Phase Input, Single Phase Output

Capacity			500VA	1kVA	2kVA	3kVA	5kVA	10kVA	15kVA	20kVA
Input	Voltage (Optional)		1 Phase 2 Wire: 110V/220V/230V/240 ± 10%							
	Frequency		50Hz or 60Hz ± 5%							
Output	Voltage		0-150V (Low Voltage range)							
			0-300V (High Voltage range)							
	Frequency		40.0Hz to 120Hz (Higher than 120Hz is customized)							
	Current	Low-grade	4.2A	8.4A	16.8A	25A	41.6A	83.2A	125A	166.6A
		High-grade	2.1A	4.2A	8.4A	12.5A	20.8A	41.6A	62.5A	83.3A
	Load stabilization Rate		≤±1%							
	Frequency Stability		≤±0.01%							
	Harmonic Distortion		Pure Sine Wave ≤2%							
	Frequency meter		4 digit, digital frequency meter, resolution 0.1Hz/Step							
	Voltmeter		4 digit, digital voltage meter, resolution 0.1V							
	Ammeter		4 digit, digital ammeter, resolution 0.1A							
	Watt meter		4 digit, digital Watt meter, resolution 0.1W							
Protection			With overload, short circuit, over temperature							
			Instantaneous power failure protection and alarm device							
Working Environment			Temperature	0 - 40 deg. ℃						
			Humidity	0 - 90% (Non condensation)						

Three Phase Input, Single Phase Output

Capacity			10kVA	15kVA	20kVA	30kVA	45kVA	50kVA	60kVA
Input	Voltage (Optional)		3 Phase 4 Wire: Wye Type 190/110, 200/115, 208/120, 220/128, 230/132, 240/139V±10%						
			3 Phase 4 Wire: Wye Type 380/220, 400/230, 415/240, 440/254, 460/265, 480/277V ± 10%						
			3 Phase 4 Wire: Della Type 220, 230, 240, 380, 400, 415, 440V ± 10%						
	Frequency		50Hz or 60Hz ± 5%						
Output	Voltage		0-150V (Low Voltage range)						
			0-300V (High Voltage range)						
	Frequency		40.0Hz to 120Hz (Higher than 120Hz is customized)						
	Current	Low-grade	83.2A	125A	166.6A	250A	375A	416.6A	500A
		High-grade	41.6A	62.5A	83.3A	125A	187.5A	208.3A	250A
	Load stabilization Rate		≤±1%						
	Frequency Stability		≤±0.01%						
	Harmonic Distortion		Pure Sine Wave ≤2%						
	Frequency meter		4 digit, digital frequency meter, resolution 0.1Hz/Step						
	Voltmeter		4 digit, digital voltage meter, resolution 0.1V						
	Ammeter		4 digit, digital ammeter, resolution 0.1A						
	Watt meter		4 digit, digital Watt meter, resolution 0.1W						
Protection			With overload, short circuit, over temperature						
			Instantaneous power failure protection and alarm device						
Working Environment			Temperature	0 - 40 deg. ℃					
			Humidity	0 - 90% (Non condensation)					

Three Phase Input, Single Phase Output

Capacity			75kVA	90kVA	100kVA	120kVA	150kVA
Input	Voltage(Optional)		3 Phase 4 Wire: Wye Type 190/110, 200/115, 208/120, 220/128, 230/132, 240/139V±10%				
			3 Phase 4 Wire: Wye Type 380/220, 400/230, 415/240, 440/254, 460/265, 480/277V ± 10%				
			3 Phase 4 Wire: Della Type 220, 230, 240, 380, 400, 415, 440V ± 10%				
	Frequency		50Hz or 60Hz ± 5%				
Output	Voltage		0-150V (Low Voltage range)				
			0-300V (High Voltage range)				
	Frequency		40.0Hz to 120Hz (Higher than 120Hz is customized)				
	Current	Low-grade	625A	750A	833.3A	1000A	1250A
		High-grade	312.5A	375A	416.6A	500A	625A
	Load stabilization Rate		≤±1%				
	Frequency Stability		≤±0.01%				
	Harmonic Distortion		Pure Sine Wave ≤2%				
	Frequency meter		4 digit, digital frequency meter, resolution 0.1Hz/Step				
	Voltmeter		4 digit, digital voltage meter, resolution 0.1V				
	Ammeter		4 digit, digital ammeter, resolution 0.1A				
Protection			With overload, short circuit, over temperature				
			Instantaneous power failure protection and alarm device				
Working Environment			Temperature	0 - 40 deg. ℃			
			Humidity	0 - 90% (Non condensation)			

Three Phase Input, Three Phase Output

Capacity			3kVA	10kVA	15kVA	20kVA	30kVA	45kVA	60kVA
Input	Voltage (Optional)		3 Phase 4 Wire: Wye Type 190/110, 200/115, 208/120, 220/128, 230/132, 240/139V±10%						
			3 Phase 4 Wire: Wye Type 380/220, 400/230, 415/240, 440/254, 460/265, 480/277V ± 10%						
			3 Phase 4 Wire: Della Type 220, 230, 240, 380, 400, 415, 440V ± 10%						
	Frequency		50Hz or 60Hz ± 5%						
Output	Voltage		0-260V (Low Voltage range)						
			0-520V (High Voltage range)						
	Frequency		40.0Hz to 120Hz (Higher than 120Hz is customized)						
	Current	Low-grade	8.4A	27.6A	41.6A	55.6A	83.2A	125A	166.6A
		High-grade	4.2A	13.8A	20.8A	27.8A	41.6A	62.5A	83.3A
	Load stabilization Rate		≤±1%						
	Frequency Stability		≤±0.01%						
	Harmonic Distortion		Pure Sine Wave ≤2%						
	Frequency meter		4 digit, digital frequency meter, resolution 0.1Hz/Step						
	Voltmeter		4 digit, digital voltage meter, resolution 0.1V						
	Ammeter		4 digit, digital ammeter, resolution 0.1A						
	Watt meter		4 digit, digital Watt meter, resolution 0.1W						
Protection			With overload, short circuit, over temperature						
			Instantaneous power failure protection and alarm device						
Working Environment			Temperature	0 - 40 deg. ℃					
			Humidity	0 - 90% (Non condensation)					

Three Phase Input, Three Phase Output

Capacity			75kVA	100kVA	120kVA	150kVA	200kVA	300kVA
Input	Voltage (Optional)		3 Phase 4 Wire: Wye Type 190/110, 200/115, 208/120, 220/128, 230/132, 240/139V±10%					
			3 Phase 4 Wire: Wye Type 380/220, 400/230, 415/240, 440/254, 460/265, 480/277V ± 10%					
			3 Phase 4 Wire: Della Type 220, 230, 240, 380, 400, 415, 440V ± 10%					
	Frequency		50Hz or 60Hz ± 5%					
Output	Voltage		0-260V (Low Voltage range)					
			0-520V (High Voltage range)					
	Frequency		40.0Hz to 120Hz (Higher than 120Hz is customized)					
	Current	Low-grade	208.3A	277.7A	333.3A	416.6A	555.5A	833.3A
		High-grade	104.2A	138.8A	166.7A	208.3A	277.7A	416.6A
	Load stabilization Rate		≤±1%					
	Frequency Stability		≤±0.01%					
	Harmonic Distortion		Pure Sine Wave ≤2%					
	Frequency meter		4 digit, digital frequency meter, resolution 0.1Hz/Step					
	Voltmeter		4 digit, digital voltage meter, resolution 0.1V					
	Ammeter		4 digit, digital ammeter, resolution 0.1A					
	Watt meter		4 digit, digital Watt meter, resolution 0.1W					
Protection			With overload, short circuit, over temperature					
			Instantaneous power failure protection and alarm device					
Working Environment			Temperature	0 - 40 deg. ℃				
			Humidity	0 - 90% (Non condensation)				

Chapter VIII. 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	roubleshooting
No input power	1. put switch is turn on or not? 2. put voltage is right or not? 3. The fuse is burn down or not?	1. Turn the power supply input switch. 2. onnect to correct voltage power supply. 3. heck the fuse and replace the fuse with same specification if necessary.
Output power outage	1. Is t power off or momentary power off? 2. Is it overload?	1. Press he activate switch (ON) to reboot. 2. ake sure the loads are within the capacity of the frequency converter.
No output voltage	1. Is he fuse burn down or not? 2. Is t overloaded?	1. heck the fuse and replace the fuse with same specification if necessary. 2. eplace a larger capacity frequency converter.
Voltmeter, ammeter and power show "0" when the output frequency is normal.		1. Turn the power switch to "OFF" position. 2. hange 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.		1. Check and decrease the loads' current. 2. Press he shutdown/reset button (OFF/RESET). 3. Re-operatio
High temperature	1. Is it overload? 2. ooling fan is slowdown or not worked.	1. Dec ase loads. 2. eplace a new cooling fan.
Emergency		Please advise: 1. Fr uency converter model & serial number. 2. ate & Time of the failure. 3. oads. 4. etailed description of the failure.

Chapter IX. Maintenance

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 towel 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.

Chapter X. Storage

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

Moving:

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

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℃, humidity 0 - 90% (non-condensing).

THESE INSTRUCTIONS MAY NOT COVER ALL DETAILS OR VARIATIONS OF THIS PRODUCT FOR YOUR EQUIPMENT OR INSTALLATION REQUIREMENTS. SHOULD FURTHER INFORMATION NOT COVERED BY THESE INSTRUCTIONS BE REQUIRED, PLEASE CONTACT LARSON ELECTRONICS BY EMAIL AT SALES@LARSONELECTRONICS.COM OR BY PHONE AT 1-877-348-9680 FOR FURTHER ASSISTANCE.

PLEASE VISIT LARSONELECTRONICS.COM FOR **WARRANTY** AND **RETURN** INFORMATION.