

# Dongguan Merrock Industry Co.,Ltd

3212 Room ,Star of DongJiang, Wanjiang District , Dongguan City , GuangDong Province , China

Whatsapp: +86 13217696818

Contactor: Lucy Luo Tel: 86-769-23291966 Mobile:0086 13217696818

E-Mail: [dgmerrock@hotmail.com](mailto:dgmerrock@hotmail.com) Web: <http://www.stonefloorpolisher.com/>

## 20" GRINDER Operating Manual



## **20” GRINDER Operating Manual**

This book has important information for use and safe operation of this machine. Failure to read this book prior to operating or attempting any service or maintenance procedure to your concrete Grinder could result in injury to you or other personnel, damage to the machine or to other property could occur as well. You must have training in the operation of this machine before using it.

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### **Model Specifications**

Description.....	20” Grinder
Voltage.....	230V
Working Width.....	540MM /20 IN
Rotation Speed (rpm).....	0-1500
Transmission.....	Gear
Power (hp).....	5-1/2
Power Cord (mt).....	10 M / 33 FT
Water Tank.....	32L/ 8.45 Gal
Weight.....	171.50 kg (378 lbs)
Add weight iron.....	18.5 kg (40 lbs)
Disc Quantity.....	6
Inverter.....	yes

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## Machine Instructions



## Attaching Diamond/Resin Tooling

### Moving the machine

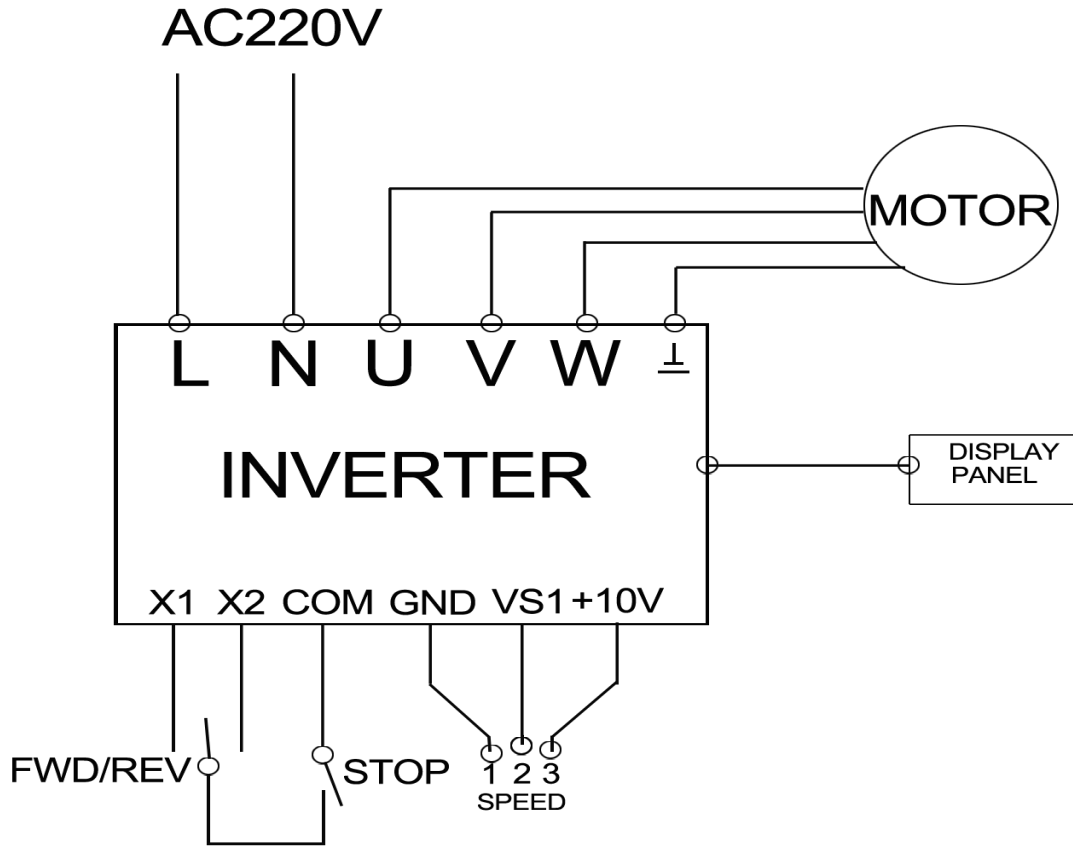
Take away the add weight iron, insert lever sheath, adjust handle to horizontal position, and lift machine.

### Changing/Attaching tooling

Tip over the machine as shown in pictures below



# Electrical Diagram



## Cable Connection



Note:

1. Machine electrical system must be in strict accordance with parameters marked on the plate (voltage, frequency), Before connected to the input supply. Ensure the input power supply voltage and frequency comply with voltage a
2. Machine must be connected to the power systems which have grounding connection to prevent the operator of electrical shock.
3. The machine (3 phase) power cord with three leading cable and ground wire. The plug must be connected to a suitable outlet. Green, yellow stripes wire is ground wire which is strictly prohibited to connect to the non-socket.



Warning:

1. Plug must be connected
2. Make sure the power plug is connected
3. Three phase voltage
4. To use an extension cord
5. Prohibit removing, cutting or damaging

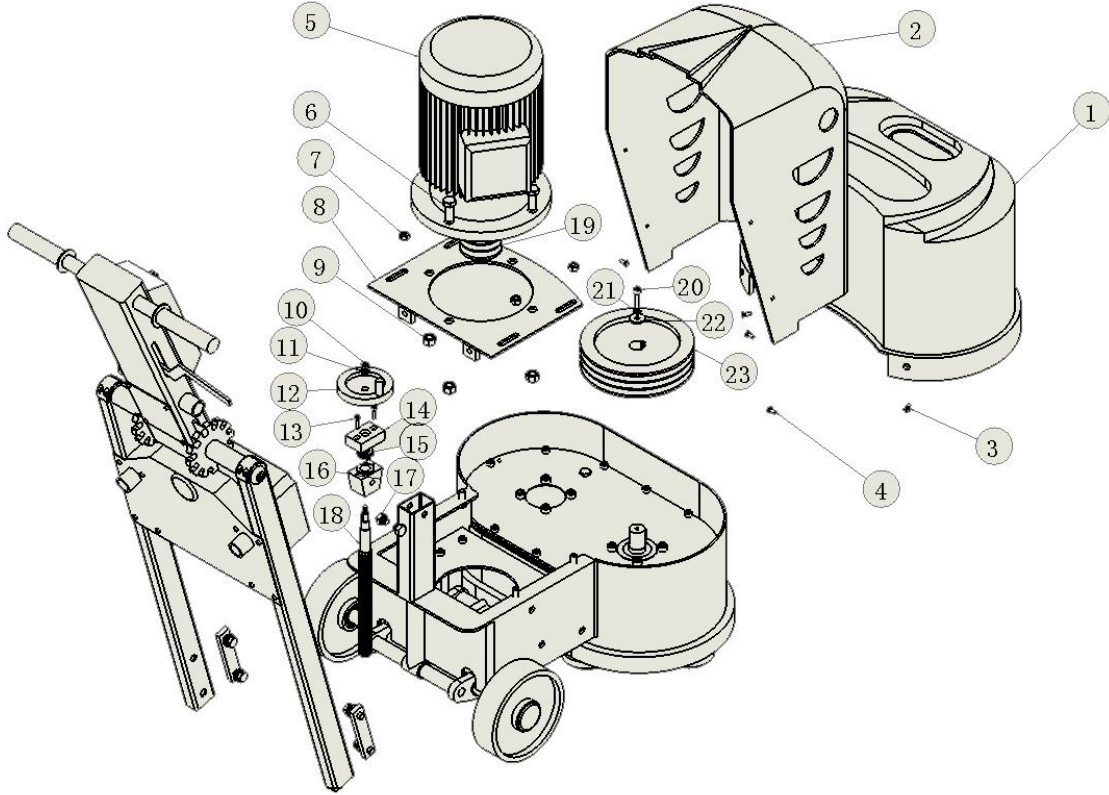


Connection Way:

1. One phase power connect terminal R, T; Three phase power connection R, S, T terminals, and pay attention to the machine model.
2. Terminal U, V, W connect motor
3. Potentiometer connects VCC, VIN, GDN terminals.

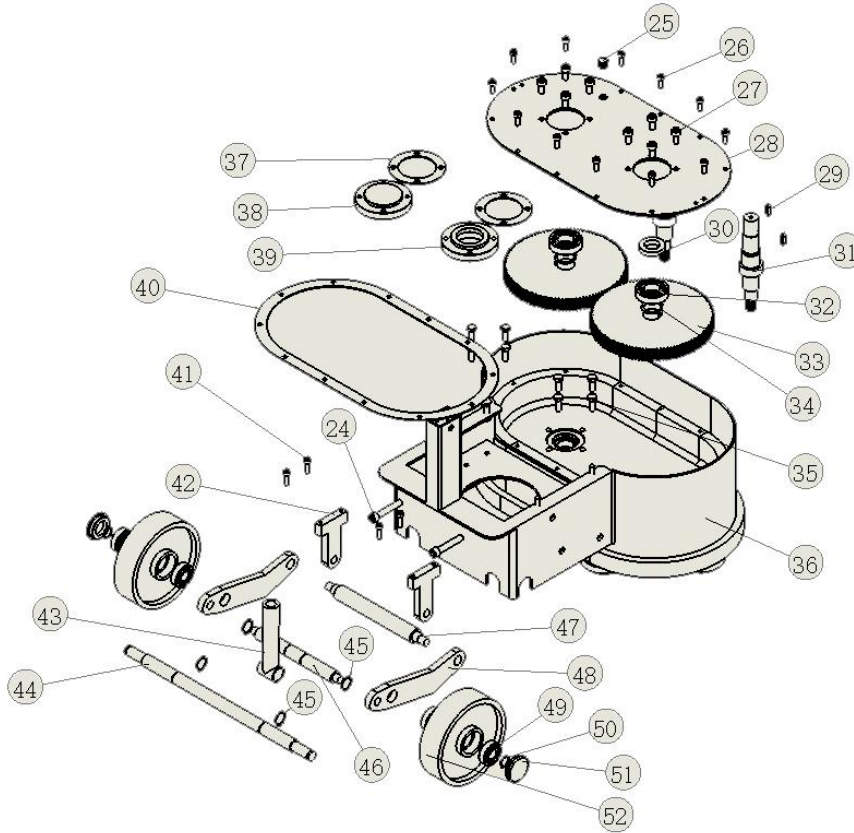
# Spare Parts

**Fig.01 Machine Complete**



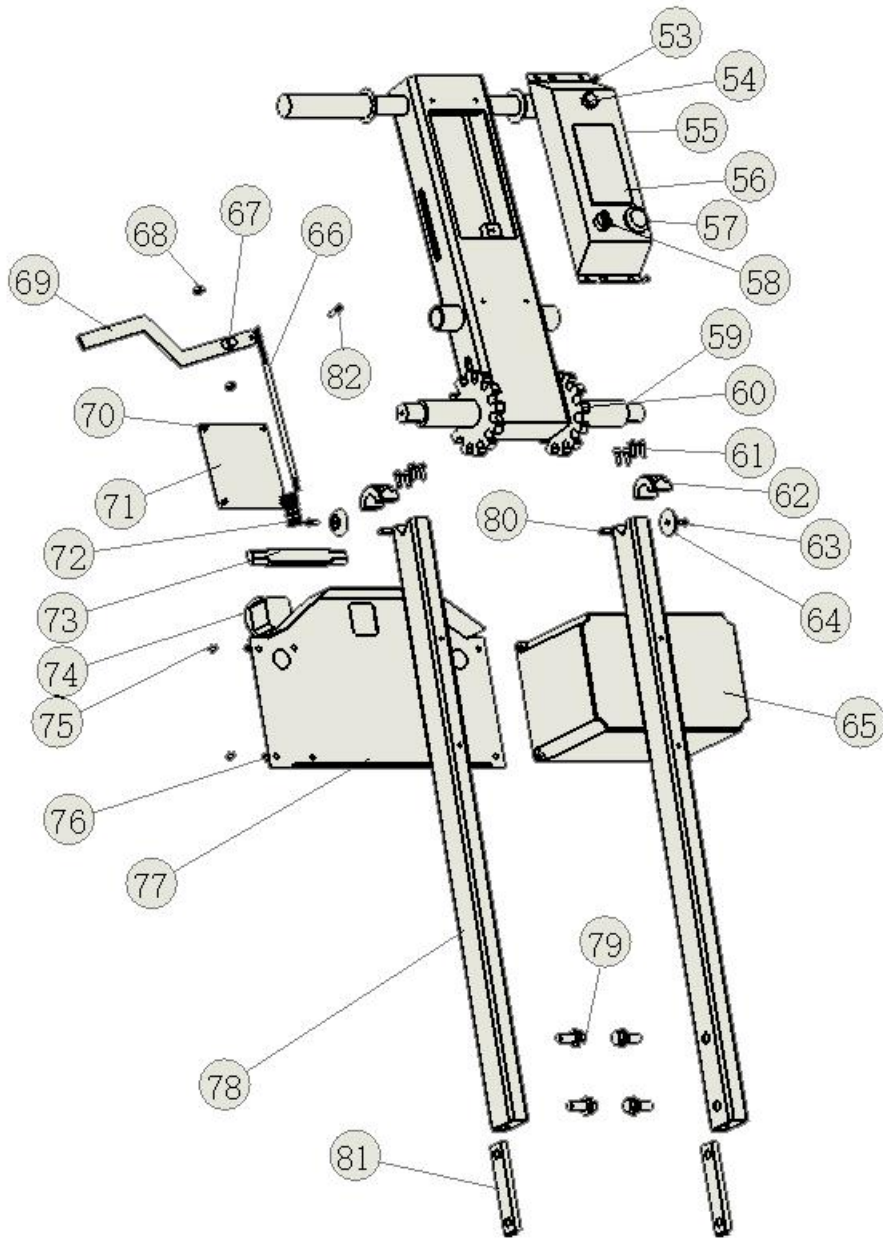
Item	Name	quantities	Item	Name	quantities
1	Water tank	1	11	Spring washer M8	1
2	Cover	1	12	Hand wheel	1
3	Cross screw M5*30	4	13	Inner Hexagon M6*20	2
4	Outer Hexagon M6*12	4	14	Screw rod bearing seat	1
5	Motor	1	15	Bearing 51102	1
6	Inner Hexagon M14*35	4	16	Screw rod fixing seat	1
7	Nut M10	4	17	Screw rod fixing screw	2
7	Flat pad M10	4	18	Lifting screw rod	1
7	Spring washer M10	4	19	Belt pulley 3"A3	1
8	Motor board	1	20	Inner Hexagon M8*30	1
9	Spring washer M14	4	21	Spring washer M8	1
9	Nut M14	4	22	Flat pad M8	1
10	Nut M8	1	23	Belt pulley 8"A3	1
11	Flat pad M8	1	24	Inner Hexagon M12*65	2

# Machine Chassis



Item	Name	quantities	Item	Name	quantities
25	Exhaust plug	1	39	Upper main bearing seat	1
26	Inner Hexagon M8*20	12	40	Gear box seal	1
27	Inner Hexagon M10*25	8	41	Inner Hexagon M8*20	4
28	Gearbox cover plate	1	42	Wheel frame seat	2
29	Flat key 8*7	3	43	Screw rod sleeve	1
30	Passive shaft	1	44	Wheel shaft	1
31	Diving shaft	1	45	Outer spring 25	4
32	Bearing 6206	2	46	Screw rod horizontal axis	1
33	Gear	2	47	Bearing connecting shaft	1
34	Outer hexagon M10*24	2	48	Wheel carrier plate	2
35	Outer hexagon M10*25	8	49	Bearing 6204	4
36	Gear box	1	50	Outer snap spring 20	2
37	Bearing seat seal	2	51	Wheel cover	2
38	Upper bearing seat	1	52	Wheel	2

# Handle Breakout

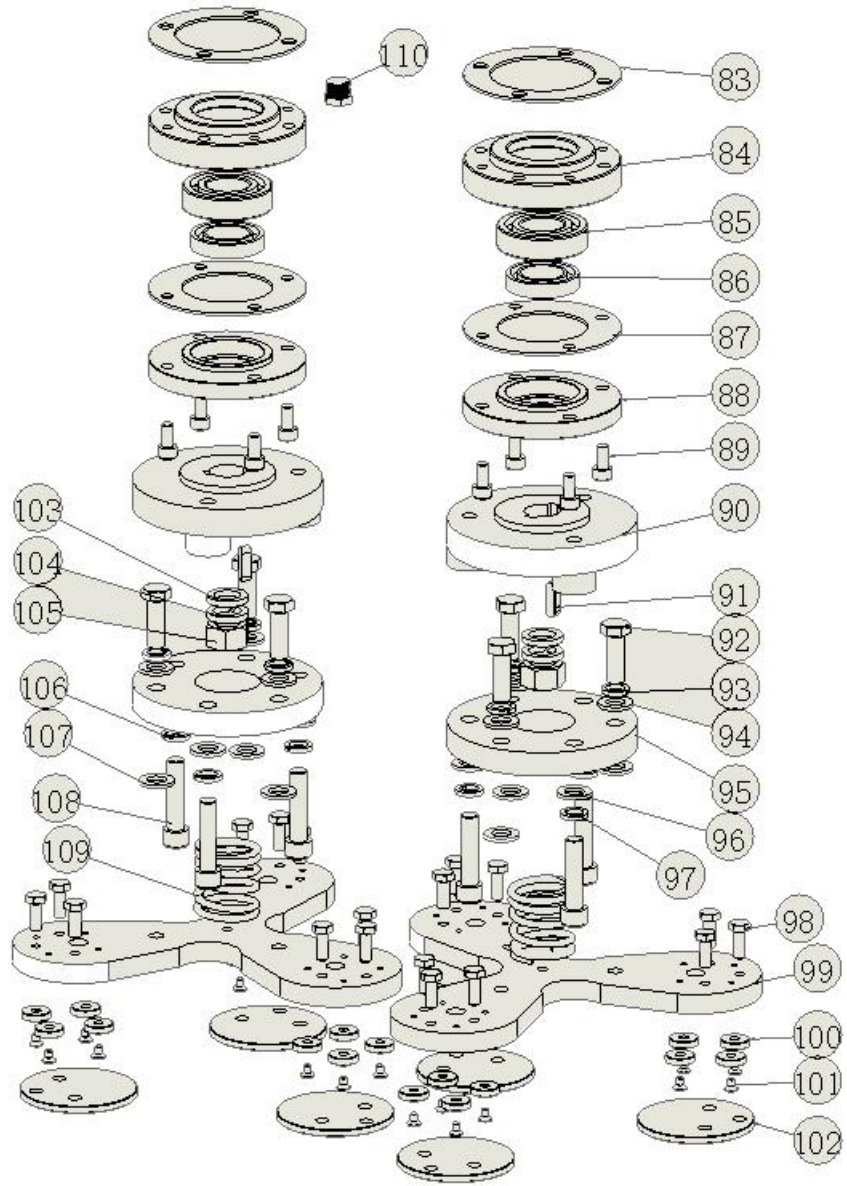




## Handle Breakout

Item	Name	quantities
53	Cross screw M5*10	4
54	Speed switch	1
55	control box	1
56	Display panel	1
57	Emergency stop switch	1
58	Start switch	1
59	Handle shaft	1
60	Handlebar disk	2
61	Inner hexagon M6*16	8
62	Handle cover	2
63	Flat head inner hexagon M6*16	2
64	Press cover	2
65	Inverter	1
66	Handle screw rod	1
67	Rivet	1
68	Nut M8	4
69	Handle	1
70	Inner hexagon M4*16	4
71	Sealing plate	1
72	Hold strip spring	1
73	Hold strip	1
74	Time-meter	1
75	Cross screw M6*12	4
76	Cross screw M5*25	4
76	Nut M5	4
77	Electric box board	1
78	Side handle square tube	2
79	Outer hexagon M12*30	4
79	Flat pad M12	4
79	Spring washer M12	4
80	Flat key 8*7	2
81	Handle fixing block	2
82	Handle head	1

# Tool Plates



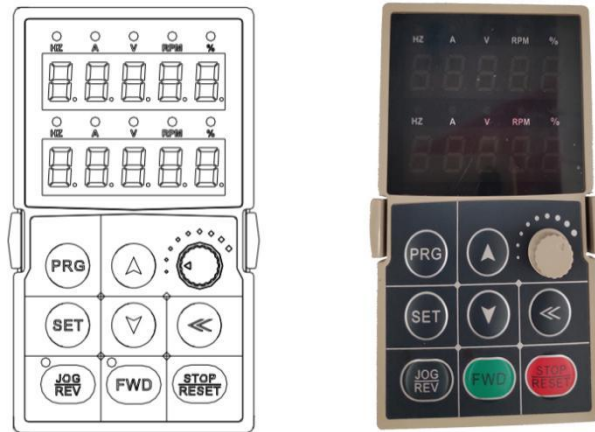
## Tool Plates









Item	Name	quantities
83	Bearing seat seal	2
84	Lower bearing seat	2
85	Bearing 6206	2
86	Oil seal 30*50*10	3
87	Oil seal cover seal	2
88	Oil seal cover	2
89	Inner hexagon M8*16	8
90	Three hold disc	2
91	Flat key 8*7	2
92	Outer hexagon M12*35	6
93	Flat pad M12	6
94	Spring washer M12	6
95	Buffer rubber pad	2
96	Flat pad M12	6
97	Spring washer M12	6
98	Outer hexagon M8*20	18
99	Tooling holder	2
100	Magnet	24
101	Flat head cross screw M5*10	24
102	Conversion grinding head	6
103	Flat pad M18	2
104	Spring washer M18	2
105	Net M18	2
106	Spring washer M12	6
107	Flat pad M12	6
108	Inner Hexagon M12*45	6
109	Chassis spring	2
110	Plug	1
111	Belt A39	3

# Inverter Programming

## AC70 Vechi Frequency Inverter

The standard Inverter is installed with LED display panel, as shown in Figure below



Key	Name	Function
	Menu key	Entry or exit programming key
	Confirm/modify key	Confirm saving the data or modify the date
	Up/down key	Increase /Decrease value or parameter
	Shift key	Selecting display parameter and shift
	Forward run key	While run/stop is controlled by keyboard, press this key, the inverter forward rotate and the indicator is always on. While reverse, the indicator sparks.
	Jog/reverse key	In the mode of display panel control, jog start the Inverter
	Stop/reset key	In the mode of display panel control, to stop the Inverter and reset fault
	Keyboard potentiometer	Can be used as input channel for given frequency, upper frequency limit, given torque, given PID or PID feedback setting.

# Trouble Shooting

## Scratch on Floor

1. Machine standing still while running
2. Grinding method is not correct
3. Using incorrect pads
4. Incorrect operation

## Machine wobbles during operation

1. Check ground level for level difference.
  - a. If level difference is serious (2mm above), first repair with the angle grinder machine
  - b. Then, grind slowly from higher level to lower level with constant speed and shape moving
2. Make sure pad holders are tight
3. Make sure all pads are the same
4. Make sure pads are on same level
5. Adjust connector between machine frame and machine base, keep the pad holders and wheels in the same level

## Machine suddenly STOPS running (Over current protection)

1. Tap the STOP button, then after 5 seconds tap the RUN button to restart. Gently press the handle when restarting to make sure pad holder has small friction which will restart easier.

## Machine will not run

1. Check plug for proper connection-on machine AND at wall outlet
2. Check building circuit breaker
3. Look at the Inverter parameters and debug according to the “ERR” instructions below.

**ERR 1 Open-phase at input side**      Open-phase infrequency inverter three phase input power phase  
Check three phase input power and wiring

**ERR 2 Output grounding**      Frequency inverter has device grounding short circuit at the outputside  
Check peripheral device, grounding line, motor insulation

**ERR 6 Keyboard communication fault** 1-Keyboard wiring fault  
2-Keyboard communication component damaged

Check the Keyboard wiring, Ask for technical support

## Parameter Input Resetting

1. Unlock firstly, set E-00 to E-63, reset should change 2 to 0 for changing allowed  
Press PRG, until show “E-00” on the panel, press “<<” key , adjust to E-63, press SET key, the second line of LED screen flashing, adjust to 1 (all parameter can be changeable), press SET key again.\*

E-63	Parameters change protection	Range:0-2	default: 0
------	------------------------------	-----------	------------

0: All the parameters changing allowed Except for the parameters only for inquiry, any other parameters can be changed (Note: Some parameters only can be changed in the stop state, some parameters can not be changed in any condition) .

1: Only keyboard digital given parameter changing allowed Except for the keyboard digital given frequency and keyboard number PID given quantitative parameter, any other parameter don't allow changing.

2: All the parameters prohibit changing All the parameters of frequency inverter unchangeable; When users need to change the parameter, They have to change this parameter as 0 or 1.

2. Restore factory default setting value

Press “<<” key, adjust to E-64 on the first line of LED screen, press SET key, adjust to 1 (restore Original Setting), press SET key again.

E-64	Parameter initialization	Range:0 ~ 4	Default:0
------	--------------------------	-------------	-----------

0: Null

1: Restores to factory default setting value Function parameters will restore to factory default setting after performed parameters initialization.

2. Clear fault record All historical fault record will be cleared.

3. Transfer parameters of inverter to keypad and save. Copy parameters saved of inverter to keypad and preserve.

4. Transfer parameters saved of keypad to inverter Download parameters of keypad to inverter.

3. The first line of LED screen shows E-64, press “<<” key, adjust to E-34, press SET key again, the second line of LED screen flashing, adjust to 1, press SET key again.

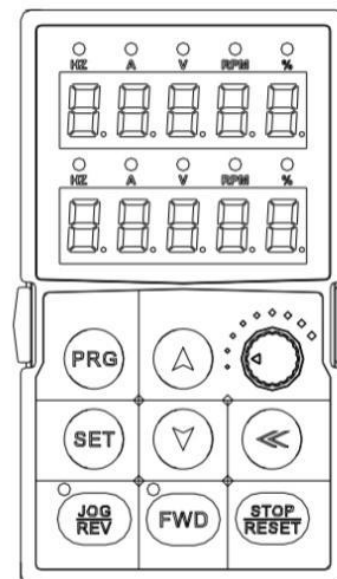
4. The first line of LED screen shows E-34, press “<<” key, adjust to E-02, press SET key, the second line of LED screen flashing, adjust to 2, press SET key again..

5. The first line of LED screen shows E-02, press “<<” key. adjust to E-01, press SET key, the second line of LED screen flashing, adjust to 1 (Terminal control such as buttons), change number to 0 (control panel keyboard control), press SET key again.

**Note: The panel keyboard is locked before ex-factory.**

**Do not touch the buttons on the control panel casually.**

Only if terminal buttons are broken, change number to 0 and the machine can be operated by control panel keyboard.



## Parameter Programming

Put machine down at first, then with power

1. Unlock (E-63 0)

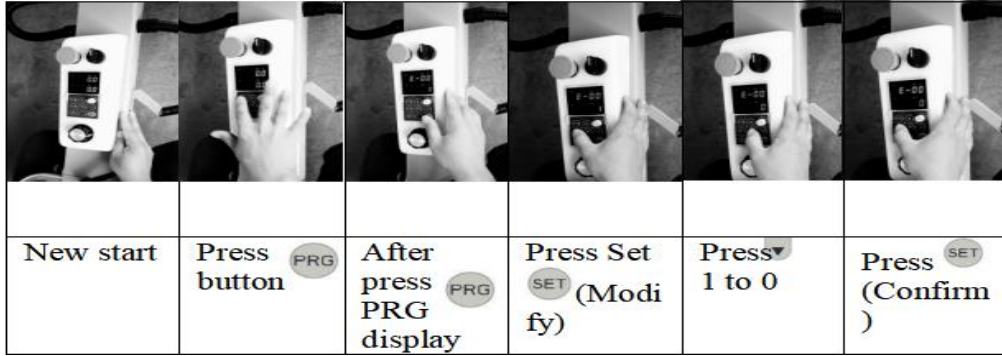
Press PRG, Set E-00 to E-63, reset should change 2 to 0 for changing allowed

2. Restore Factory Settings (E64 1)

Press SET, re-setting for inverter to make E-64 to put 1

3. Control Mode Chosen (changed) (E-00 0)

Press SET, E-00 choose the number to 0 , then press SET



4. Motor Rated Power (H-52 4)

Change E-00 to H-52, press SET, then change the number to 4 (4KW check motor power) , press SET again, H-52 4 showing

5. Hz Setting (H-53 60)

Change H-52 to H-53, press SET, then change the number to 60Hz, press SET again, H-53 60.00 showing

6. Motor Speed r/min (H-54 1725)

Change H-53 to H-54, press SET, then change the number to 1725(check motor), press SET again, H-54 1725 showing

7. Motor Rated Voltage (H-55 220)

Change H-54 to H-55, press SET, then change the number to 220, press SET again, H-55 220 showing

8. Motor Rated Current (H-56 15.2)

Change H-55 to H-56, press SET, then change the number to 15.2(check motor 220V 60Hz current), press SET again, H-56 15.2 showing

9. Motor Synchronizing (H-62 1 SET FWD)

Change H-56 to H-62, press SET, Up to 1 and SET, Press FWD in Green light,the motor is running and synchronizing program, wait for the motor stop and back to two lines display

10. Control Way (E-01 1)

.Press PGR, E-00 0 showing on the screen, change to E-01, press SET, E-01 showing, set the number to 1, press SET

E-02 2 (Frequency Giving Selection)

E-03 2

E-06 change to 5 (RMPS)

E-07 change to 3(input voltage) or 4 (output voltage)

E-09 60 (Hz)

E-10 60 (Hz)

E-13 Default 10 (means 10 seconds)

E-14 change to 5 (means 5 seconds)

E-20 Default to 5

E-34 change to 1 (emergence stop)

E-46 1 (forward reverse run) omit this step if there is no need to change direction

E-59 Default 100

F-57 60(Hz)

12. Locking










Change F-57 to E-63, press SET, set the number to 2 (All the parameters prohibit changing)

13. Final

Press PRG two times.

# Fault Diagnoses and Processing

## Fault Information and Details

Keyboard display	Fault code	Fault type	Possible causes	Treatment
	L.U.1	Too low voltage while stop	<ul style="list-style-type: none"> <li>● Power supply is too low</li> <li>● Voltage detection circuit is abnormal</li> </ul>	<ul style="list-style-type: none"> <li>● Check input power, clear fault.</li> <li>● Seek support from factory.</li> </ul>
	E.LU2	Too low voltage in run	<ul style="list-style-type: none"> <li>● Power supply is too low</li> <li>● Power capacitance is too small, or there is big impact current in the power grid.</li> <li>● Inner DC main contactor is not connect well</li> </ul>	<ul style="list-style-type: none"> <li>● Check input power, clear fault.</li> <li>● Improve power supply.</li> <li>● Seek support from factory.</li> </ul>
	E.oU1	Accel. over-voltage	<ul style="list-style-type: none"> <li>● Power voltage fluctuation over limit.</li> <li>● Start when motor is running .</li> </ul>	<ul style="list-style-type: none"> <li>● Detect power voltage and clear fault.</li> <li>● Restart motor until it completely stop. Set E-30 as 1 or 2.</li> </ul>
	E.oU2	Decel. over-voltage	<ul style="list-style-type: none"> <li>● Deceleration time is too short.</li> <li>● Load potential energy or inertia is too large.</li> <li>● Power voltage fluctuation over limit.</li> </ul>	<ul style="list-style-type: none"> <li>● Prolong Deceleration time.</li> <li>● Reduce load inertia or improve inverter capacitance or add braking unit.</li> <li>● Detect power voltage and clear fault.</li> </ul>
	E.oU3	Constant speed over-voltage	<ul style="list-style-type: none"> <li>● Power voltage fluctuation over limit.</li> </ul>	<ul style="list-style-type: none"> <li>● Detect power voltage and clear fault.</li> <li>● Install input reactor.</li> </ul>
	E.oU4	Over-voltage while stop	<ul style="list-style-type: none"> <li>● Power voltage fluctuation over limit.</li> </ul>	<ul style="list-style-type: none"> <li>● Check input power, clear fault.</li> <li>● Seek support from factory.</li> </ul>
	E.oC1	Accel. over-current	<ul style="list-style-type: none"> <li>● Acceleration time is too short.</li> <li>● Start running motor.</li> <li>● V/F curve setting is not suitable. Or torque boost too high.</li> <li>● Inverter capacitance is too small.</li> </ul>	<ul style="list-style-type: none"> <li>● Prolong acc time.</li> <li>● Restart motor until it totally stop. Set E-30 as 1 or 2.</li> <li>● Reset V/F curve or torque boost value.</li> <li>● Select inverter with right capacitance.</li> </ul>
	E.oC2	Decel. over-current	<ul style="list-style-type: none"> <li>● Deceleration time is too short.</li> <li>● Load potential energy or inertia is too large.</li> <li>● Power voltage fluctuation over limit.</li> </ul>	<ul style="list-style-type: none"> <li>● Prolong Deceleration time.</li> <li>● Connect external braking resistance or braking unit.</li> <li>● Select inverter with right capacitance.</li> </ul>
	E.oC3	Constant speed over-current	<ul style="list-style-type: none"> <li>● Sudden load change.</li> <li>● Power grid voltage is too low.</li> </ul>	<ul style="list-style-type: none"> <li>● Check load change and clear it.</li> <li>● Check input power, clear fault.</li> </ul>



E.oL1	E.oL1	Motor over-load	<ul style="list-style-type: none"> <li>● V/F curve setting is not suitable. Or torque boost too high.</li> <li>● Power grid voltage is too low.</li> <li>● incorrect overload protection setting.</li> <li>● Locked-rotor run or too heavy load.</li> <li>● Universal motor long time low speed run.</li> </ul>	<ul style="list-style-type: none"> <li>● Reset V/F curve or torque boost value.</li> <li>● Check input power,clear fault.</li> <li>● Unreasonable H-56 setting.</li> <li>● Adjust load or select inverter with right capacitance.</li> <li>● If need long time low speed run, please choose special motor for inverter.</li> </ul>
E.oL2	E.oL2	Inverter over-load	<ul style="list-style-type: none"> <li>● Load is too heavy.</li> <li>● Acceleration time is too short.</li> <li>● Start running motor.</li> <li>● V/F curve setting is not suitable.Or torque boost too high.</li> </ul>	<ul style="list-style-type: none"> <li>● Select inverter with right capacitance.</li> <li>● Prolong acceleration time</li> <li>● Restart motor until it totally stop.Set E-30 as 1or2.</li> <li>● Reset V/F curve or torque boost value.</li> </ul>
E.SC	E.SC	System abnormality	<ul style="list-style-type: none"> <li>● Acceleration time is too short.</li> <li>● Short circuit between inverter output phases or earth.</li> <li>● Module is damaged.</li> <li>● Electromagnetic disturb.</li> </ul>	<ul style="list-style-type: none"> <li>● Prolong acceleration time.</li> <li>● Check periphery equipments and restart after fault cleared.</li> <li>● Seek support from factory.</li> <li>● Check system wiring, earth, shield and deal as required.</li> </ul>
E.oH	E.oH	Inverter over-heat	<ul style="list-style-type: none"> <li>● Temperature is too high.</li> <li>● Air channel is blocked.</li> <li>● Fan connection parts is loose.</li> <li>● Fan is damaged.</li> <li>● Temperature detection circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>● Make the environment meeting therequirement.</li> <li>● Clear the air channel.</li> <li>● Check and re-connect the wire</li> <li>● Change the same new fan.</li> <li>● Seek support from factory.</li> </ul>
E.FE1	E.TE1	Motor static detection fault	<ul style="list-style-type: none"> <li>● Detection overtime</li> <li>● Perform static detection while motor is running.</li> <li>● Capacitance difference is too big between motor and inverter.</li> <li>● Motor parameter setting mistake.</li> </ul>	<ul style="list-style-type: none"> <li>● Check motor connection wire.</li> <li>● Detect after motor stop totally.</li> <li>● Change inverter model.</li> <li>● Reset parameter according to nameplate.</li> </ul>
E.FE2	E.TE2	Motor rotation detection fault	<ul style="list-style-type: none"> <li>● Detect while motor is running.</li> <li>● Detect with load.</li> <li>● Detection overtime</li> <li>● Capacitance difference is too big between motor and inverter.</li> <li>● Motor parameter setting mistake.</li> </ul>	<ul style="list-style-type: none"> <li>● Detect after motor stop totally.</li> <li>● Re-detect without load.</li> <li>● Check motor connection wire.</li> <li>● Change inverter model.</li> <li>● Reset parameter according to nameplate.</li> </ul>
93SE	93SE	Memory fault	<ul style="list-style-type: none"> <li>● Electromagnetic disturb in memory period.</li> <li>● EEPROM damage.</li> </ul>	<ul style="list-style-type: none"> <li>● re-input and save.</li> <li>● Seek support from factory.</li> </ul>
LIFE	LIFE	Reserved		<ul style="list-style-type: none"> <li>● Seek support from factory.</li> </ul>
Err1	ERR1	Input phase missing	<ul style="list-style-type: none"> <li>● 3 input phase missing</li> </ul>	<ul style="list-style-type: none"> <li>● Check 3phase input power and phase.</li> <li>● Check 3phase input power wiring.</li> </ul>
Err2	ERR2	Output phase missing	<ul style="list-style-type: none"> <li>● 3 phase output of inverter missing connection with motor</li> </ul>	<ul style="list-style-type: none"> <li>● Check wire between inverter and motor, earth and motor insulation.</li> </ul>

Err3	ERR3	Current detection fault	<ul style="list-style-type: none"> <li>● Detect circuit fault.</li> <li>● Phase imbalance</li> </ul>	<ul style="list-style-type: none"> <li>● Seek for technique support.</li> <li>● Check motor and wiring.</li> </ul>
Err4	ERR4	Inverter external fault	<ul style="list-style-type: none"> <li>● Peripheral equipment fault protection.</li> </ul>	<ul style="list-style-type: none"> <li>● Check peripherequipment.</li> </ul>
Err5	ERR5	Swing frequency fault	<ul style="list-style-type: none"> <li>● User not set right swing frequency running parameter.</li> </ul>	<ul style="list-style-type: none"> <li>● Set parameter again.</li> </ul>
Err6	ERR6	Keyboard connect fault	<ul style="list-style-type: none"> <li>● Keyboard wire fault.</li> <li>● Keyboard component damage.</li> </ul>	<ul style="list-style-type: none"> <li>● Check keyboard wire</li> <li>● Seek support from factory.</li> </ul>
E.CPE	E.CPE	Parameter copy fault	<ul style="list-style-type: none"> <li>● Parameter copy communication is fault.</li> <li>● Copy keyboard is not match the inverter.</li> </ul>	<ul style="list-style-type: none"> <li>● Check wire.</li> <li>● Select the specified external keyboard model.</li> </ul>
E.CE	E.CE	RS485 communication fault	<ul style="list-style-type: none"> <li>● Baud rate not right.</li> <li>● Communication connection not right.</li> <li>● Communication format not right.</li> </ul>	<ul style="list-style-type: none"> <li>● Set right Baud rate</li> <li>● Check communication wiring</li> <li>● Check Communication format</li> </ul>
SEn	SEn	Feedback sensor fault	<ul style="list-style-type: none"> <li>● Alarm while PID analog value feedback signal is small than [H-28].</li> <li>● PID feedback wire problem.</li> <li>● Feedback sensor problem.</li> <li>● Feedback input circuit problem.</li> </ul>	<ul style="list-style-type: none"> <li>● Confirm sensor state, change it if problem</li> <li>● Check wiring.</li> <li>● Adjust feedback channel signal</li> </ul>
E.PAn	E.PAn	Keyboard connect fault	<ul style="list-style-type: none"> <li>● Keyboard wire fault.</li> <li>● Keyboard component damage.</li> </ul>	<ul style="list-style-type: none"> <li>● Check keyboard wire</li> <li>● Seek support from factory.</li> </ul>
E.EF	E.EF	Inverter external fault	<ul style="list-style-type: none"> <li>● Peripheral equipment fault protection.</li> </ul>	<ul style="list-style-type: none"> <li>● Check peripherequipment.</li> </ul>
E.PAn	E.PAn	Keyboard connect fault	<ul style="list-style-type: none"> <li>● Keyboard wire fault.</li> <li>● Keyboard component damage.</li> </ul>	<ul style="list-style-type: none"> <li>● Check keyboard wire</li> <li>● Seek support from factory.</li> </ul>

## Daily Maintenance

### Matters Need Attention:

1. In principle, the box gear oil can be used for 1.5 years, and should be replaced whether it is used or not.
2. When the temperature is lower than minus 10 degrees Celsius, the gear oil is frozen sometimes, please carry out normal operation after the machine runs for 20 minutes before use.
3. Magnet is a strong magnet, one of the main materials is rare earth, the magnetic strength has low, especially in the case of high temperature, magnetic weakening is obvious, for operation safety suggests that the magnet is replaced once every 8 months.
4. Elastic devices, such as torsion pads, elasticity will gradually reduce, especially in

the mud and other harsh environment easy to aging. It is easy to cause uneven chassis, so it is strongly recommended to replace the torsion pads every 12 months.

5. If one elastic device is damaged, all the remaining elastic devices of one equipment should be replaced, otherwise the chassis will be uneven due to the different elasticity of the old and new elastic devices.

6. When the equipment is not in use, please store the equipment in the room to avoid direct sunlight.

Doing a good job of grinding equipment is an important part of better use of equipment. It can not only extend the service life of the equipment, but also reduce the failure of the equipment in use.

Check time / Inspection item	daily	Use 20 hours	Use 50 hours	Use 150 hours	Use 1,000 hours
Steel bars and obstacles	check				
Cleaning and inspection & maintenance of fasteners	check				
Check the pad holder junction	check				
Maintenance and inspection of the chassis			check		
Check of the power cord type and plug	check				
Inspection of the electrical parts such as the motor switch		check			
Grind head Velcro check for replacement				renewal	
Examination of the belt, torsion pads, and magnets				check	renewal
Overhaul and maintenance of this machine					* check
Belt inspection			check & tighten		renewal