Preface

Version：1.78

Thank you very much for choosing high quality, multifunction, low-level noise and energy cost product by Isacon Power Control Tech. Co., Ltd --A2 series inverters.

This manual contains the user setup, parameter setting, fault diagnosis, daily maintenance, and safety precautions. Please read this manual carefully before installing and operating the products. This manual is contained in the accessories of the productions. Please keep it safe for further referencing.

If there is any problem that isn't listed in this manual, please contact the local dealer or Isacon's custom service center.

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Contents

Chapter 1   Safety Precautions

1.1   Safety precautions
- The environment cannot contain any explosive gas.
- It must be wired by professional wiring staff. Otherwise, it may cause electronic shock.
- Cut off the power supply before wiring. Otherwise, it may cause electronic shock.
- Do not touch any control port, internal boards, and their electronic components while the electricity is turned on. Otherwise, it may cause electronic shock.
- Please make sure that the product's ground wiring port is correctly connected according to national electricity safety standards or other related standards.
- Do not touch any internal board or component until 10 minutes after power shutdown. Please do an electricity check before internal board maintenance. Otherwise, it may cause electronic shock.
- It is forbidden to connect AC power to product's output port (U,V,W) or other control ports except for Lk,Lb,Lz. Otherwise, it may cause damage to the inverter.
- Since internal IC can be destroyed by electrostatic, please do not touch any PCB, IC, or IGBT components without any protection. Otherwise, it may cause unknown fault.
- Make sure that any unexpected conductor such as screws, gasket, etc., is not left inside the inverter during maintenance. Otherwise, it may cause damage to the inverter or even fire.
- If an overcurrent happens during starting up, please check the wiring and start up again.
- Do not stop the machine by cutting off power. Power can be cut off after the motor stops.
- Do not leave the inverter in the sunshine. Otherwise, it may cause damage to the inverter.

1.2   Package inspection

A2   series inverter production undergoes a strictly qualification test. Please check the damage caused by the delivery and the type specification during package inspection.

- Accessories: 1 Inverter, 1 user manual.
- If anything is missing, please contact local dealer or Isacon's custom service center.

Chapter 2 User Setup

2.1 Environment requirement

- No corrosive gas, vapour and oily dust. Without direct sunshine.
- No floating dust or mental particle.
- Air moisture 20%~90%.
- Vibration < 5.8m/s2(0.6g).
- No electromagnetic interference.
- Temperature:-10℃~50℃, make sure proper ventilation if the temperature is greater than 40℃.
- Without any inflammable or explosive gas, liquid and solid.
- Please use electric cabinet or remote operation in non-standard environment. Make sure proper ventilation.

2.2 Install space
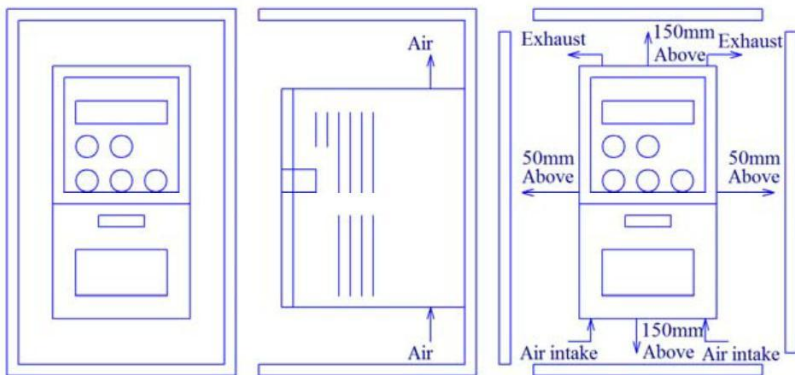
2.3 Basic wiring

There are two wiring part: main-loop and control-loop. Please do wiring correctly according to the following two figures.

Wiring figure (single phase)
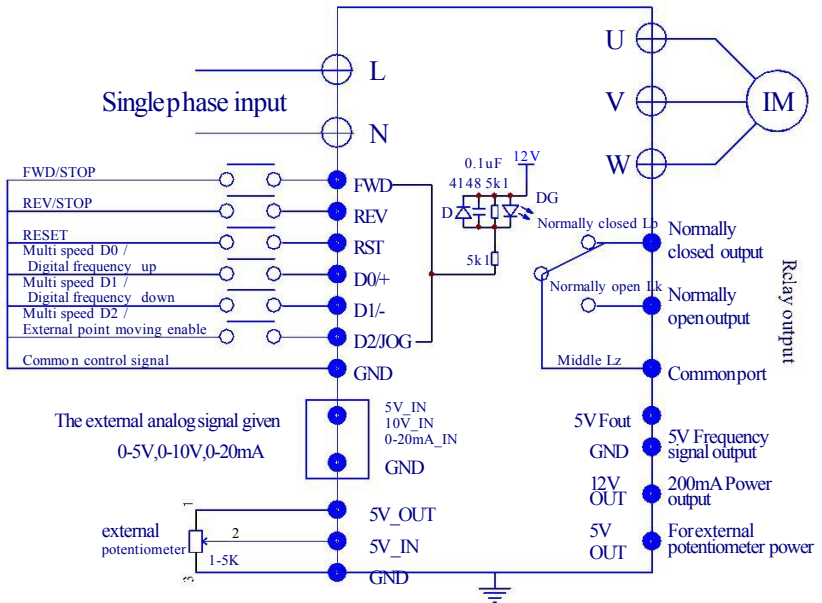
⊕ main-loop port

● control-loop port

Port name	Description
L N	Single phase power input。
U V W	Three phase AC output ports can only connect to pure resistance or inductance load such as motors or electric heater.

Wiring figure (three phase)
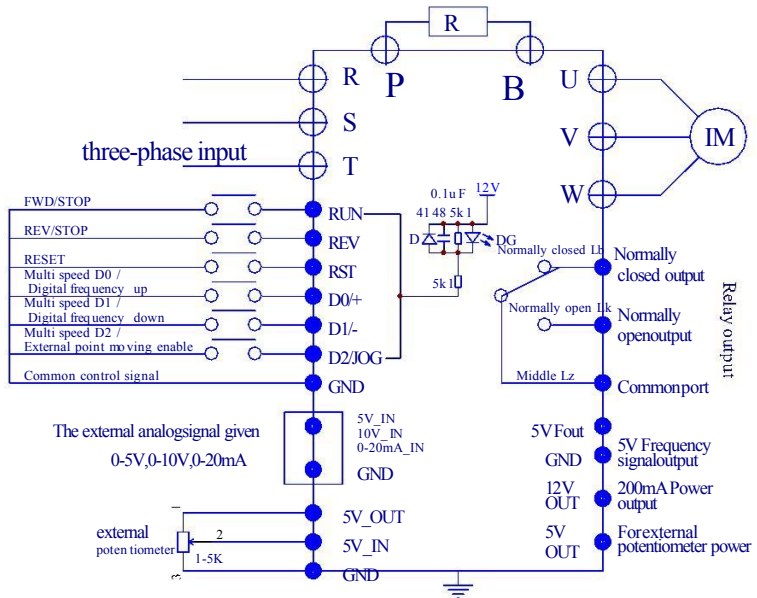
$\bigoplus$ main-loop port

● control-loop port

Port name	Description
R S T	Single phase 220V power connect R and T. Three phase 220V power connect R , S , T . Voltage specifications: 8xxx, single phase 220 input connection R and T
U V W	Three phase AC output ports can only connect to pure resistance or inductance load such as motors or electric heater.

Chapter 3　Control Panel

Button	**Description**
RUN STOP	Switch between run and stop state by single press.
STOP RESET	It has different meanings to push this button during different modes: 1.if the inverter is running, it would stop; 2. If a fault happens, the inverter would be reset; 3. If it is operated on menus, it returns to parent menu.
REV	Change the inverter's direction. It also works during the runtime.
SET	Enter menu mode. If it is on item, the data would be saved and lower level menu would be displayed.
▲▼	Change items in the menu or modify the parameter data.
◄►	Modify the menu content and point move in panel.
Potentiometer	Change runtime frequency.

7

Content	Description
ERROR	Fault indicator.
FWD	Clockwise rotation indicator.
REV	Anticlockwise rotation indicator.
ANALOG	Analog input frequency indicator.
SEGMENT	Segment input frequency indicator.
PANEL	Panel input frequency indicator.
Digital tube	Inverter runtime frequency. If inverter stops, it flashes. The display data is given by "Pn01" data.

Chapter 4   Parameter Set Method

4.1 Parameter set and modification

Set parameter when inverter is stopped and the parameter is not locked (Pn32=1). First, enter parameter set menu by push button "SET". Second, push button ▲/▼ to choose the certain item. Third, push button "SET" again to enter the item. Fourth, push button ◄/► to choose certain bit and push ▲/▼ to modify the value. Finally, push button "SET" to save the new parameter or push button "STOP" to parent menu without any saving.

Push button "SET" to save the new parameter or push button "STOP" to parent menu without any saving.

4.2 Button notice

When modify parameters, long push ▲/▼ to rolling number of current bit between 0-9.

Chapter 5   Table of Configure Parameters

Item	Description Modify by button ▲ or ▼	Range Modify by button ▲ or ▼	Default Value	
			Default (3)	Default (6)
Pn 01	Default display content	1—30000	1	1
Pn 02	Initial start up frequency by panel or other method	0.01－400.00.00	400Hz	50
Pn 03	Source of runtime frequency	1－7	2	1
Pn 04	Source of runtime command	1－2	1	1
Pn 05	clockwise / anticlockwise disable	1－3	3	3
Pn 06	Method to stop inverter	1－2	2	2
Pn 07	Start again by external signal	1－2	1	1
Pn 08	Acceleration time	000.01S－650.00S	50S	10S
Pn 09	Deceleration time	000.01S－650.00S	50S	10S
Pn 10	Maximum runtime frequency	000.10Hz－400.00Hz	400Hz	50Hz
Pn 11	Minimum runtime frequency	000.10Hz－400.00Hz	1.5Hz	1.5Hz
Pn 12	Motor rating frequency	010.00Hz－400.00Hz	400Hz	50Hz
Pn 13	Torque compensation	0.0—4.0	0.0	0.0
Pn 14	Torque compensation frequency	0.01Hz—600.00Hz	500Hz	80Hz
Pn 15	Startup DC braking voltage	1V—100V	30V	30V
Pn 16	Startup DC braking time	000.00S—650.00S	0S	0S
Pn 17	Stop DC braking voltage	1V—100V	30V	30V
Pn 18	Stop DC braking time	000.00S—650.00S	0S	0S
Pn 19	Source of multi-segment speed 0	1—5	1	1
Pn 20	Multi-segment speed 1 frequency	000.10 Hz—400.00Hz	10	10
Pn 21	Multi-segment speed 2 frequency	000.10 Hz—400.00Hz	20	20
Pn 22	Multi-segment speed 3 frequency	000.10 Hz—400.00Hz	30	30
Pn 23	Multi-segment speed 4 frequency	000.10 Hz—400.00Hz	40	40

Item	Description Modify by button ▲ or ▼	Range Modify by button ▲ or ▼	Default Value	
			Default (3)	Default (6)
Pn 24	Multi-segment speed 5 frequency	000.10 Hz—400.00Hz	50	50
Pn 25	Multi-segment speed 6 frequency	000.10 Hz—400.00Hz	60	60
Pn 26	Multi-segment speed 7 frequency	000.10 Hz—400.00Hz	70	70
Pn 27	Point move frequency	000.10 Hz—400.00Hz	10Hz	10Hz
Pn 28	Choice of relay output	1—6	3	3
Pn 29	2rd acceleration time	000.01S—650.00S	2S	2S
Pn 30	2rd deceleration time	000.01S—650.00S	2S	2S
Pn 31	2rd deceleration stop frequency	000.01Hz—400.00Hz	1Hz	1Hz
Pn 32	Parameter management	1—6	1	1
Pn 33	Software version	32029	*****	*****
Pn 34	Auto recover while lost power suddenly	0—99Hz	0	0
Pn 35	Production date	*	*****	*****

Please refer Chapter 7 for detail description of each item

Remark：If over-voltage happens during deceleration, it will stop.
Note：

　　If over-voltage happens during deceleration, inverter will stop deceleration until the voltage goes back to normal level. If better deceleration is needed, please switch to inverter with braking.

Chapter 6   Description of Control Ports

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
12V OUT	5V OUT	5V IN	10V IN	20mA IN	5V Fout	GND	FWD	REV	RST	D0 +	D1 –	D2 JOG	Lk	Lb	Lz

Port name	Port Description
12V OUT	12V output, with maximum currency 200mA.
5V OUT	5V output, with maximum currency 50mA.
5V IN	5V input, analog input, with maximum effective voltage 5V, no more than 6V
10V IN	10V input, analog input, with maximum effective voltage 10V, no more than 12V
20mA IN	20mA input, analog input, with maximum effective currency 20mA, no more than 25mA
5V Fout	Frequency signal output, maximum output voltage 5V
GND	Power source ground 0V.
FWD	External clockwise rotation input
REV	External anticlockwise rotation input
RST	External reset signal
D0 +	Multi-segment speed D0 input，external "+" signal means clockwise point move input
D1 -	Multi-segment speed D1 input，external "-" signal means anticlockwise point move input
D2 JOG	Multi-segment speed D2 input, external enable signal input
Lk	Relay ON
Lb	Relay OFF
Lz	Relay ON/OFF

Chapter 7   Description of Configure Parameters

Pn 01   Default display content：1——30000
      RUN：   1 means it will display runtime frequency
             Otherwise, it displays motor's synchronization speed.
             2——30000 is motor synchronization speed
      STOP：it will display frequency given by external signal.

Pn 02   Initial startup frequency by panel or other method
      Range：000.01Hz－400.00Hz，the initial panel data and
             external signal frequency during startup.

Pn 03   Source of runtime frequency with range：1—7
      1 Potentiometer   2 Panel button
      3 External 0-5V signal   4 External 0-10V signal
      5 External 0-20mA signal   6 External digital signal
      7 Multi-segment signal

Pn 04   Source of runtime command with range：1—2
      1 Panel button control   2 External signal control

Pn 05   clockwise / anticlockwise disable with range：1—3
      1 clockwise enable only   2 anticlockwise enable only
      3 clockwise / anticlockwise enable

Pn 06   Method to stop inverter with range：1—2
      1 stop by itself   2 stop by deceleration

Pn 07   Start again by external signal with range：1—2
      1 disable   2 enable
      Description: when the power on the external operation of
      the signal is allowed to start effectively.

Pn 08   Acceleration time with range：000.01S－650.00S
   Accelerate time (from 0Hz to Pn10).

Pn 09   Deceleration time with range：000.01S－650.00S
Decelerate time (from Pn10 to 0Hz).

Pn 10   Maximum runtime frequency with range：000.10Hz－400.00Hz
Maximum output frequency by inverter.

Pn 11   Minimum runtime frequency with range：000.10Hz－400.00Hz
If the frequency from command below this value, inverter
will stop. It wouldn't recover until command frequency up
this value.

Pn 12   Motor rating frequency with range：010.00Hz－400.00Hz
It is used for modify the V/Fcurve.

Pn 13   Torque compensation with range：0.0—4.0
Large parameter may cause damage to the motor.

Pn14   Torque compensation frequency：0.01Hz—400.00.00Hz
Inverter doesn't provide torque compensation if runtime
frequency is larger than this value.

13
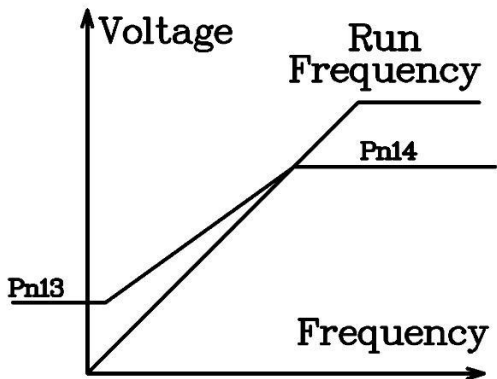
Pn 15   Startup DC braking voltage：1V—100V
By proper tuning of this parameter, motor can start normally from fully stop state without any difficult caused by motor's free motion and rotate direction.

Pn 16   Startup DC braking time：000.00S—650.00S
DC braking time before motor startup to ensure that motor is started from fully stop state.

Pn 17   Stop DC braking voltage：1V—100V
Braking voltage during DC braking period to ensure that motor is fully stopped in brake time.

Pn 18   Stop DC braking time：000.00S—650.00S
DC braking time to prevent the slide move after stopping.

Pn 19   Source of multi-segment speed 0：1—5
Multi-segment speed mode 0-segment frequency source：
    1 Potentiometer   2 Panel button
    3 External 0-5V signal   4 External 0-10V signal
    5 External 0-20mA signal

Pn 20   Multi-segment speed 1 frequency：000.10 Hz—400.00Hz
Multi-segment speed mode 1-segment frequency

Pn 21   Multi-segment speed 2 frequency：000.10 Hz—400.00Hz
Multi-segment speed mode 2-segment frequency

Pn 22   Multi-segment speed 3 frequency：000.10 Hz—400.00Hz
Multi-segment speed mode 3-segment frequency

Pn 23   Multi-segment speed 4 frequency：000.10 Hz—400.00Hz
         Multi-segment speed mode 4-segment frequency

Pn 24   Multi-segment speed 5 frequency：000.10 Hz—400.00Hz
         Multi-segment speed mode 5-segment frequency

Pn 25   Multi-segment speed 6 frequency：000.10 Hz—400.00Hz
         Multi-segment speed mode 6-segment frequency

Pn 26   Multi-segment speed 7 frequency：000.10 Hz—400.00Hz
         Multi-segment speed mode 7-segment frequency

Pn 27   Point move frequency：000.10 Hz—400.00Hz
         Point move frequency

Pn 28   Choice of relay output：1—6
         1 Stop inverter   2 Run inverter
         3 Inverter fault   4 Frequency increasing
         5 Frequency decreasing 6 Frequency reached
         If output condition is satisfied, ON/OFF states reverse.

Pn 29   2rd acceleration time：000.01S－650.00S
         2rd acceleration time

Pn 30   2rd deceleration time：000.01S－650.00S
         2rd deceleration time

Pn 31   2rd deceleration stop frequency：000.10 Hz—400.00Hz
         When runtime frequency is larger than this value,
             acceleration/deceleration time is defined by Pn08,Pn09
         When runtime frequency is smaller than this value,
             acceleration/deceleration time is defined by Pn29,Pn30
         As shown in Figure:
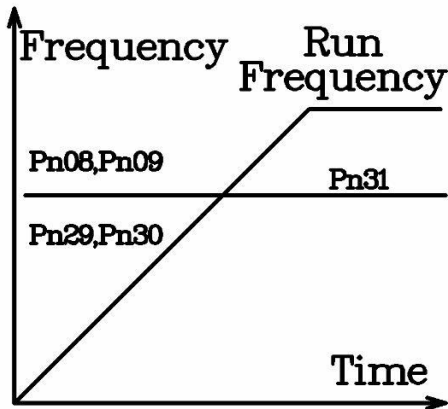
Pn 32   Parameter management：1—3
        1 modification enable   2 modification disable
        3 initialization for 400Hz parameters
        4 read OEM initialization parameter
        5 write OEM initialization parameter
        6 initialization for 50Hz parameters
        Note: the password for the OEM parameter is: 61633

Pn 33   Software version

Pn 34   Auto recover while lost power suddenly
        0 disable this function
        99 means do auto recover in infinite time, starting from
          low frequency
        Other value：
            If indicator displays LU-X(any code) during runtime
            and power source recovers in 2 seconds, inverter
            would start up again and reduce runtime frequency
            with magnitude of under voltage time(s) multiply
            frequency of this component(Hz).
        The maximum power lost time is 2.5s. Beyond this time,
        it would be seen as over voltage without any auto recover.

Pn 35   Production date

16

Chapter 8   Operation Examples

8.1 Operation by panel

Pn 04 = 1(Command from panel)，Pn 03 = 1(Frequency from potentiometer)。
Push button "RUN" on the panel, inverter starts up and running indicator is on.
Push the button again, inverter would stop.

8.2 Operation by external signal

Pn 04=2 (command from port "FWD/REV")
Pn 03=3 (frequency from port "5V")

8.3 Multi-segment speed

Pn 04=2(command from port "FWD/REV")
Pn 03=7(frequency from multi-segment 0-7)

8.4 Point move by panel

Command（Pn 04）must come from panel（=1）. Frequency（Pn 03）must be
specified by button（=2）.After inverter stops, push button "←" to clockwise
point move and "→" to anticlockwise point move.

8.5 Point move by external signal

Command（Pn 04）must come from port "FWD/REV"（=2）. Frequency
（Pn 03）must come from external digital port（=6）. After inverter stops,
connect "D0" and "JOG" to "GND" to point move clockwise, connect "D1" and
"JOG" to "GND" to point move anticlockwise.

Chapter 9   Error Message and Fault Diagnosis

9.1 Fault table

Display	Meaning	Cause	Diagnosis
OU –o	Overvoltage	Overvoltage of power source	Check voltage of power source
OU –u	Acceleration overvoltage	Overvoltage of power source	Check voltage of power source
OU –d	Deceleration overvoltage	Overvoltage of power source or large inertia	Overvoltage of power source, increase deceleration time, add brake components
OU –r	Steady state Overvoltage	Overvoltage of power source	Check voltage of power source
LU –o	Stop state undervoltage	Undervoltage of power source	Check voltage of power source
LU–u	Acceleration undervoltage	Undervoltage of power source, small acceleration time	Check voltage of power source, increase acceleration time
LU –d	Deceleration undervoltage	Undervoltage of power source	Check voltage of power source
LU –r	Steady state undervoltage	Undervoltage of power source or large inertia	Check voltage of power source, decrease load
OC –o	Stop state overcurrent	Component fail, interference	Push "RESET". Component fail if it happens again.

18

Display	Meaning	Cause	Diagnosis
OC –u	Acceleration overcurrency	Small acceleration time or component fail	Increase acceleration time
OC –d	Deceleration overcurrency	Small deceleration time or component fail	Increase deceleration time
OC –r	Steady state overcurrency	overload or component fail	Check motor load
OT –o	Overheat while stop	High environment temperature or fail temperature sensor	Check whether air temperature is over 50, check CZ55 connection
OT –u	Overheat while acceleration	High environment temperature, small acceleration time	Check whether air temperature is over 50, increase acceleration time
OT –d	Overheat while deceleration	High environment temperature, small deceleration time	Check whether air temperature is over 50, increase deceleration time
OT –r	Overheat in steady state	High environment temperature, overload	Check whether air temperature is over 50, check overload

9.2 Other unexpected fault

1、Inverter is in normal condition but without any output
　　1. Internal fuse fail
　　2. Internal drive module fail

Chapter 10　Maintenance and Repair

Due to the environmental influences such as temperature, humidity, dust, and vibration etc., and aging components, the inverter may fail at some time. So it needs periodic maintenance and repair.

Notice: please check the following items before maintenance and repair. Otherwise, it may cause electronic shock.

1. Power source is cut off.
2. Indicator on panel is OFF.
3. Maintenance is performed by professionals.

10.1 Daily maintenance and repair

The Inverter must be installed in the standard environment according to this manual. There may be some unexpected situations during runtime. Please do daily maintenance work according the following table. Keep a good runtime environment, log daily data and detect fault causes early. It can extend the life of the inverter.

Item	Check			Criterion
	Content	Period	Method	
environment	(1) temperature, humidity (2) dust, water (3) corrosive gas	anytime	(1)thermometer, hygrometer (2)watch (3)smell	(1)temperature range -10℃ ~+40℃ (2)any mark of water (3)odor
inverter	(1)heat, vibration (2)noise	anytime	(1)touch shell (2)sound	(1) steady vibration, normal temperature (2)abnormal sound
motor	(1)heat (2)noise	anytime	(1)touch (2)sound	(1)abnormal heating (2)abnormal sound

10.2 Periodic maintenance

The Inverter needs periodic maintenance every 1 or 3 months which depends on the runtime environment.

Notice: Machine maintenance or component replacement must be performed by professionals. If any metal objects such screws or washer are left inside the machine, it would cause fatal damage to the inverter!

Check items：

1、 Whether the control port screws are loose or not;
2、 Whether the main loop port is loose or not. Or is there any sign of overheating in the line of the main loop;
3、 Is there any trauma in the power and control cable? Especially, check the robber skin in the contact with other metal;
4、 Is the insulation bandage of the power cable loose;
5、 Use vacuum cleaner to clean the dust on board and ventilation channel;
6、 If the motor needs examination, please disconnect the motor wire from inverter's U,V,W port. Otherwise, it may cause fatal damage to the inverter.

Notice: Inverter has already passed the pressure test. Any the improper test may cause fatal damage to the inverter!

10.3 Replace the wearing parts

The wearing parts contain a cooling fan and filter electrolytic capacitor whose lifetime depends on environment and load. When the temperature is 25℃, the lifetime of the cooling fan is 20~40Kh and that of the capacitor is 30~50Kh. Users can decide when to replace these components.

1. Cooling fan
   Cause of damage: wear bearing, aging fan, heavy dust environment.
   Criterion: rip in fans, abnormal vibration during runtime.

2．filter electrolytic capacitor

Cause of damage: high environment temperature, frequently load change, long-time fully load.

Criterion: liquid leak, wrong position of safety valve, capacity measurement.

10.4 Store of inverter

Precautions for storing inverter:

1. It cannot be stored in high temperature, moist, dusty, metal dust, corrosive gas places.

2. It will speed up the capacitor aging during long-time store. Make sure that turn on inverter once every year. The operation time cannot below 8 hours. And the input voltage increases slowly to the rating value.

10.5 Warranty

Range: inverter itself;

If any following situation happens, Isacon will provide warranty:

Any fault or damage happens during the standard use in 18 months. Beyond 18 months, Isacon will charge for the maintenance and repair;

If any following situation happens, even in 18 months, Isacon still can charge for maintenance and repair:

a、damage caused by wrong operation；

b、damage caused by voltage abnormal and nature disaster such fire and floods etc.;

c、apply inverter in non-standard user case.

Costs can be counted as listed on contract or actual cost.

Chapter 11   Type Description

11.1 Type description

A2-xxxxB

    A2   is the vfd series，

    xxxx   For power and voltage levels.

    B   is Brake unit

11.2 Power description

1XXX	1: input 3phase 220V, output 3phase 220V
2XXX	2: input 1phase 220V, output 3phase 220V
3XXX	3: input 3phase 380V, output 3phase 380V
5XXX	5: input 1phase 220V, output 3phase 380V
6XXX	6: input 1phase 380V, output 3phase 380V
	Note: three phase input can also be.
8XXX	8: input 1-3phase 220V,output 3phase 220V

XXX	Power specification：
007	0.75kW
015	1.5kW
300	30kW

11.3 model examples

A2-2022	single phase 220 input, three-phase 220 output, 2.2kw
A2-2022B	single phase 220 input, three-phase 220 output, 2.2kW, with braking unit.
A2-3075	three phase 380 input, three-phase 380 output, 7.5kw
A2-3075B	three-phase 380 input, three-phase 380 output, 7.5kW, with braking unit.