IRIS-IMAC DRIVER

B-type

USER MANUAL

Version：V5.13

Safety Precautions and Warnings!

⚠ CAUTION! WARNING! ⚠

Pay attention to these ⚠ CAUTION, WARNING, and ⚠ signals on the device or instruction documents. They indicate danger to human body or damage to the device. Before installing and putting the device into operation, please read the safety precautions and warnings following this page.

1. Make sure that the warning signs are kept in a legible condition and replace missing or damaged signs.
2. Before starting, familiarize yourself with the operation of the inverter. It may be too late if you start working with the inverter before read this instruction manual.
3. Never permit unqualified personnel to operate the inverter.

⚠ WARNING!

- This inverter produces dangerous electrical voltages and controls rotating mechanical parts.
- Death, severe injury or substantial damage to property can occur if the instructions in this operating manual are not completed with.
- Only personnel with appropriate qualifications should work with this inverter. These personnel must be familiar with all the warning signs and precautions laid out in these operating instructions for the transport, installation and operation of this device.
- The successful and safe use of this inverter depends on the correct installation, commissioning, operation and maintenance of the device.
- This device operates at high voltages.

⚠ CAUTION!

- The DC-link capacitors remain charged to dangerous voltages even the power is removed. For this reason it is not permissible to open the inverter cover until five (5) minutes after the power has been turned off.
- When handling the open inverter it should be noted that live parts are exposed. Do not touch these live parts.
- The terminals R, S, T, U, V, W, P, N, B, PR, and BR can carry dangerous voltages even if the motor is inoperative.
- Only qualified personnel may connect, start the system up and repair faults. These personnel must be thoroughly acquainted with all the warnings and operating procedures contained with this manual.
- Certain parameter settings may cause the device to start up automatically after power on or power recover.

DEFINITIONS

- Qualified Person

  For the purposes of this manual and product labels, a qualified person is one who is familiar with the installation, construction, operation and maintenance of this device and with hazards involved. In addition, the person must be:

  - Trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.
  - Trained in the proper care and use of protective equipment in accordance with established safety practices.
  - Trained in rendering first aid.
- DANGER

  For the purposes of this manual and product labels, DANGER indicates that loss of life, severe personal injury or substantial property damage WILL result if proper precautions are not taken.
- WARNING

  For the purposes of this manual and product labels, WARNING indicates that loss of life, severe personal injury or substantial property damage CAN result if proper precautions are not taken.
- CAUTION

  For the purpose of this manual and product labels, CAUTION indicates that minor personal injury or property damage CAN result if proper precautions are not taken.
- NOTE

  For the purpose of this manual and product labels, NOTES merely call attention to information that is especially significant in understanding and operating the inverter.

⚠ DANGER and WARNING

- Make sure that the location selected for installation is safe, protected from moisture and splash and drip-proof!
- Children and the general public must be prevented from accessing or approaching the equipment!
- The equipment may only be used for the purpose specified by the manufacturer. Unauthorized modifications and the use of spare parts and accessories that are not sold or recommended by the manufacturer of the equipment can cause fires, electric shocks and injuries.
- Keep these operating instructions within easy reach and give them to all users!

⚠ WARNING

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Contents

1. Product Introduction

1.1 Check Items

To avoid the carelessness during packing and delivery, please check the list below carefully。

Items	Amount	Contents
IRIS IMAC-B Manual	1 book	Please read carefully and keep with care for referring usage.
IRIS IMAC-B Driver	1 set	Check the spec. of the device with the case label is same or not. Check the out looking of the device to make sure that there is no defect on it. All screws should be tighten and exist.

If any miss or defect happened, please contact with the agency to get resolve of the problem.

1.2Description of Nameplate Content

1.2.1 The Label on the Packing Case

2R5-IMAC-STD-B-R

220V

The contents of indication:

1. 2R5 → Indicates that this driver should access 220 Volt power and the rated output is 5A.
2. IMAC → Suit for IMAC motor.
3. STD → Standard type
4. B → Indicates that this driver is a Basic type.
5. R → Indicates that the control panel of this driver .

Description of Control Panel		
C	C-Panel	
R	R-Panel	

6. 220V → Indicate the suitable power rating individually.

1.2.2 The Driver Rating Label

The figure below is a sample of the rating label that is put on the outside of the driver.

MODEL	2R5-IMAC-STD-B-R
INPUT	AC 3ψ 220V / 50/60HZ
OUPUT	3ψ 5A/ 2KVA/ 0~400HZ
Serial NO	080A0001
JPS	MADE IN TAIWAN CE

The contents of rating label are showed below:

MODEL：2 R □ - IMAC- STD - B- R

Input voltage	2 : 220VAC
	4 : 380VAC
Model series	R : IRIS Series
Output current	According to Driver-Current
Suit motor	IMAC: Induction Motor Type
Firmware	Standard
Function	Factory Only
Panel	R Panel

INPUT ：AC3Ø220 / 50/60HZ

Power-Type	A.C. 1 or 3 Phase, 220Volt.
Power Frequency	50Hz/60Hz

OUTPUT : 3Ø5A 2KVA / 0~400Hz

Phase / Current	3Phase/5A
Capacitance (KVA)	2KVA
Output Frequency Range	0 ~ 400HZ

1.3 The Specification of IRIS Series

1.3.1The Rating

220V Series：

2R□	2	3P5	5	7	11	17	24	33	46	61	90
Output Current	2	3.5	5	7	11	17	24	33	46	61	90
Horse Power(HP)	0.5	1	1.5	2	3	5	7.5	10	15	20	30
Rated Capacity(KVA)	0.65	1.3	1.8	2.5	4.0	6.5	9.5	13	19	25	34
Rated Power(KW)	0.4	0.75	1	1.5	2.2	3.7	5.5	7.5	11	15	22.5
Max Output Voltage(V)	Match 3 phase Input Voltage										
Dimension	P1				P2		P3		P4		

380V Series：

4R□	5P5	8P5	12	17	23	31	45
Output Current(A)	5.5	8.5	12	17	23	31	45
Horse Power(HP)	3	5	7.5	10	15	20	30
Rated Capacity(KVA)	4.0	6.5	9.5	13	19	25	34
Rated Power(KW)	2.2	3.7	5.5	7.5	11	15	22.5
Max Output Voltage(V)	Match 3 phase Input Voltage						
Dimension	P2		P3		P4		

1.3.2 The Specification of Hardware

☐Driver type	B Type
Digital Input	6 Unit
Digital Output(Signal)	2 Unit
Digital Output (Relay)	1 Unit
Analog Input	2 Unit(12bit resolution)
Analog Output	1 Unit
RS485 Communication Interface	2 Units
Fan Malfunction & Precaution Function	Included
Over Heat Protect Function	Included
PG Feedback Interface	None
Brake Discharge MOS-FET	Included

2. Condition of Storage Environment

This driver should be contained in the packing case. If do not use this driver temporarily, in order to ensure this driver in our warranty scope, please follow the items below:

- The ambient temperature must be in the scope of - 20℃ to +65℃, relative humidity 0% to 95%, and no dew clings.
- Must be preserved in the environment that is dustless, stainless, and dry.
- Avoid to store under the environment that has caustic gas or liquid.

3. Attention of Installation

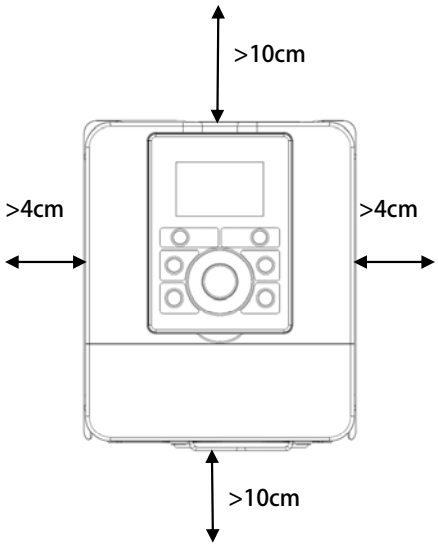
⚠ WARNING

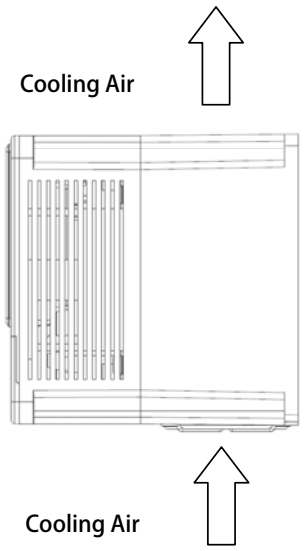
To guarantee the safe operation of the equipment it must be installed and commissioned properly by qualified personnel in compliance with warnings laid down in these operating instructions.

Take particular note of the general and regional installation and safety regulations regarding work on high voltage regulations, as well as the relevant regulations regarding the correct use of tools and personal protective gear.

Make sure that the unobstructed clearance for each of the cooling inlets and outlets above and below the inverter is at least 100mm.

Make sure that a space of 40mm is kept free at the sides of the inverter to permit the cooling air to escape from the side slits.





Ensure that the temperature does not exceed the specified level when the inverter is installed in cubicle.

Avoid excessive vibration and shaking of the equipment.

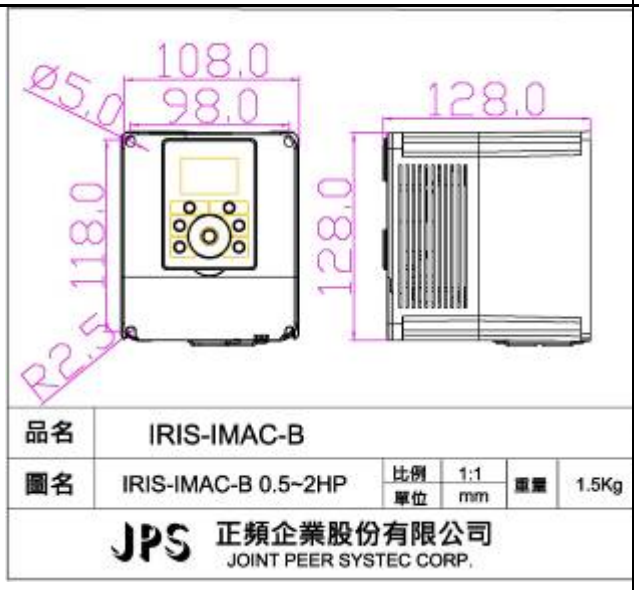
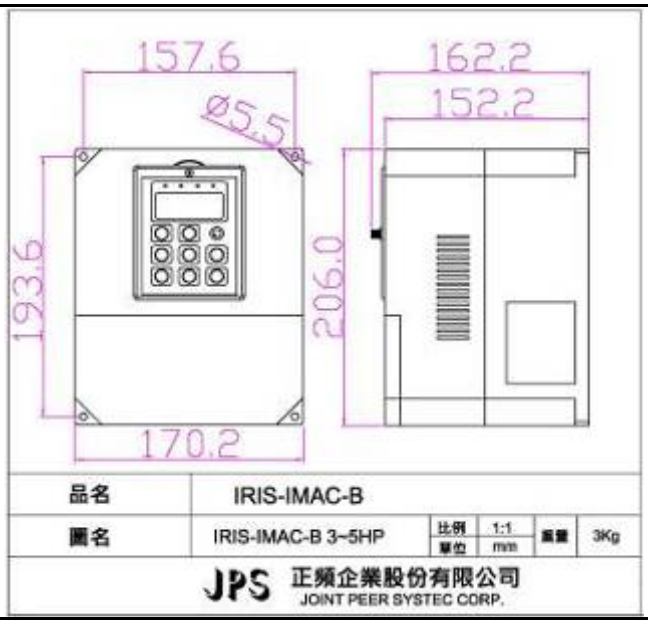
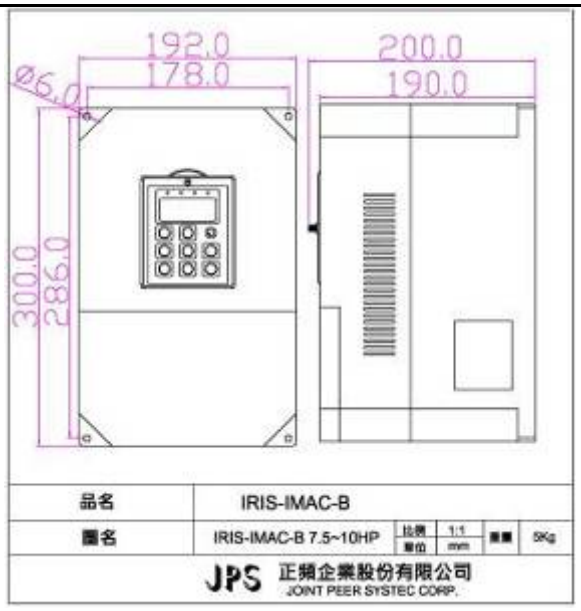
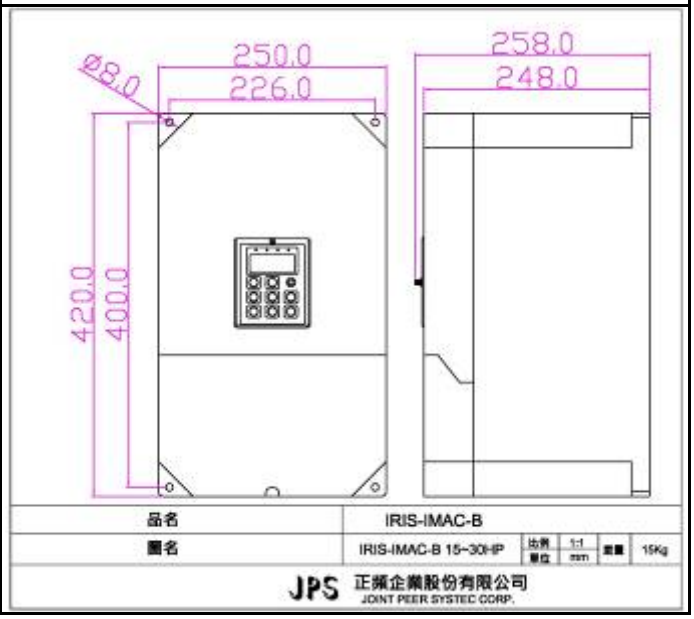
Do not be obstructing the cooling fan that installed on the inverter, it is used to build proper airflow for heat sink thermo dissipation. And do not touch the fan hole when it is running.

Please consider the possible use of options, such as RFI suppression filters at the planning stage.

⚠ WARNING

To prevent electrical shock, do not open cover for at least 5 minutes after removing AC power to allow capacitors to discharge.

4. Outline Dimension

P1：0.5HP~2HP　Unit：mm	P2：3HP~5HP　Unit：mm
	
P3：7.5 HP~10HP　Unit：mm	P4：15HP~30HP　Unit：mm
	

5. Description of Wiring

The upper cover must be removed in order to connect the electrical leads.

5.1Power Terminal

The power terminals are divided into three portions:

1. The power input terminals (R, S, T) receives power for the operation of the inverter.
2. The output terminals (U, V, and W) deliver output power to motor.
3. Brake resistor should be connects to icon⌐⋀⌐.

⚠ NOTE: The terminal has icon ⏚ should be connected to Earth properly.

⚠ WARNING: Never connect power source line to U, V, W, P, N, B terminals.

5.1.1The Power Input Terminals (R, S, T)

⚠ WARNING! NOTE!

- The power input terminals are R, S, and T. Never connect power source line to U, V, W, P, N, B terminals.
- Between the power source and driver, add NFB for system protection.
- There are static sensitive components inside the Printed Circuit Board. Avoid touching the boards or components with your hands or metal objects.
- Make sure to connect the power terminals tight and correctly.
- Make sure that the power source supplies the correct voltage and is designed for the necessary current.
- The terminal has icon ⏚ should be connected to Earth properly.

5.1.2The Output Terminals (U, V, W to Motor)

- Make sure the motor’s rated voltage and current are suitable with driver’s specification.

⚠WARNING: Do not insert contactors between driver and motor; the U, V, W terminals should be connected to motor directly.

5.2The Control Signal Terminals

⚠WARNING! NOTE!

All the input/output control signal lines, or remote panel lines and communication lines must be laid separately from the high current power/motor/brake lines. They must not be fed through the same cable conduit/trucking.

5.3 Brake Resistor Terminals

⚠ NOTE: This driver contains braking discharge circuits. The terminals have icon ⏦ are used to connect external resistor to discharge the re-generating energy when in braking condition.
Refer to the list below when choosing resistor for braking discharge. The wattage of resistor can be increased for heavier re-generating energy or higher discharge duty.

Model	Resistance（ohm）	Wattage (W)
2R2	400	40
2R3P5	300	60
2R5	200	80
2R7	100	150
2R11	60	250
2R17	40	300
2R24	30	500
2R33	20	600
2R46	15	1000
2R61	10	1500
2R90	10	2000
4R5P5	250	250
4R8P5	150	300
4R12	100	500
4R17	75	750
4R23	50	1000
4R31	40	1500
4R45	40	2000
The discharge duty is 10 %		

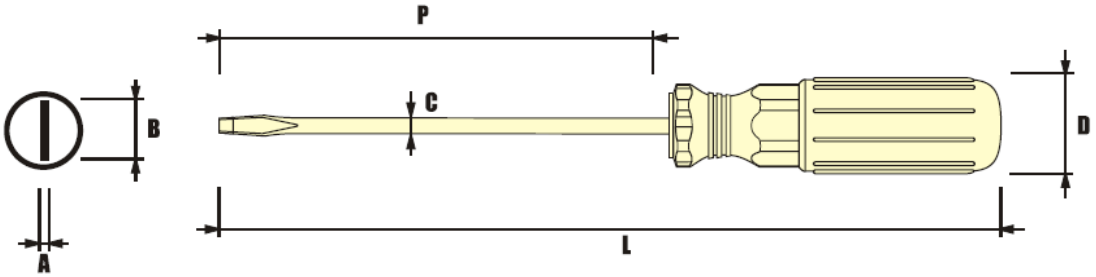
5.4The Input Reactor

When power supply capacity is larger than 500KVA and /or using thyrister, phase advance capacitor etc. from same power supply, must fit an A.C.L. in front of R.S.T. power input to curb instantaneous current and to improve power efficient ratio. Refer to the list below to choose proper reactance.

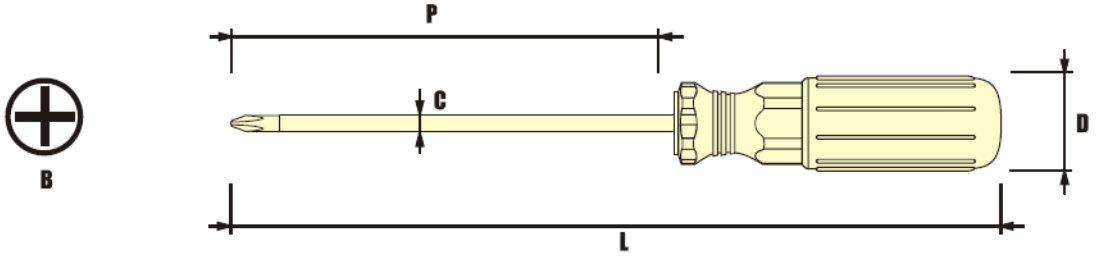
Voltage (V)	Model	Current (A)	Inductance
220	2R2	6	1.8
	2R3P5	6	1.8
	2R5	6	1.8
	2R7	10	1.1
	2R11	11	0.71
	2R17	17	0.53
	2R24	24	0.35
	2R33	33	0.26
	2R46	46	0.18
	2R61	61	0.13
	2R90	120	0.09
380	4R5P5	7.5	3.6
	4R8P5	10	2.2
	4R12	15	1.42
	4R17	20	1.0
	4R23	30	0.7
	4R31	40	0.53
	4R45	60	0.36

5.5 The Proper Screw Drive for Power Terminals

It is necessary to choose proper tool for wiring connection to avoid screw stripped or burst. Please refer to the list below to choose a proper screw drive for driving power terminals.

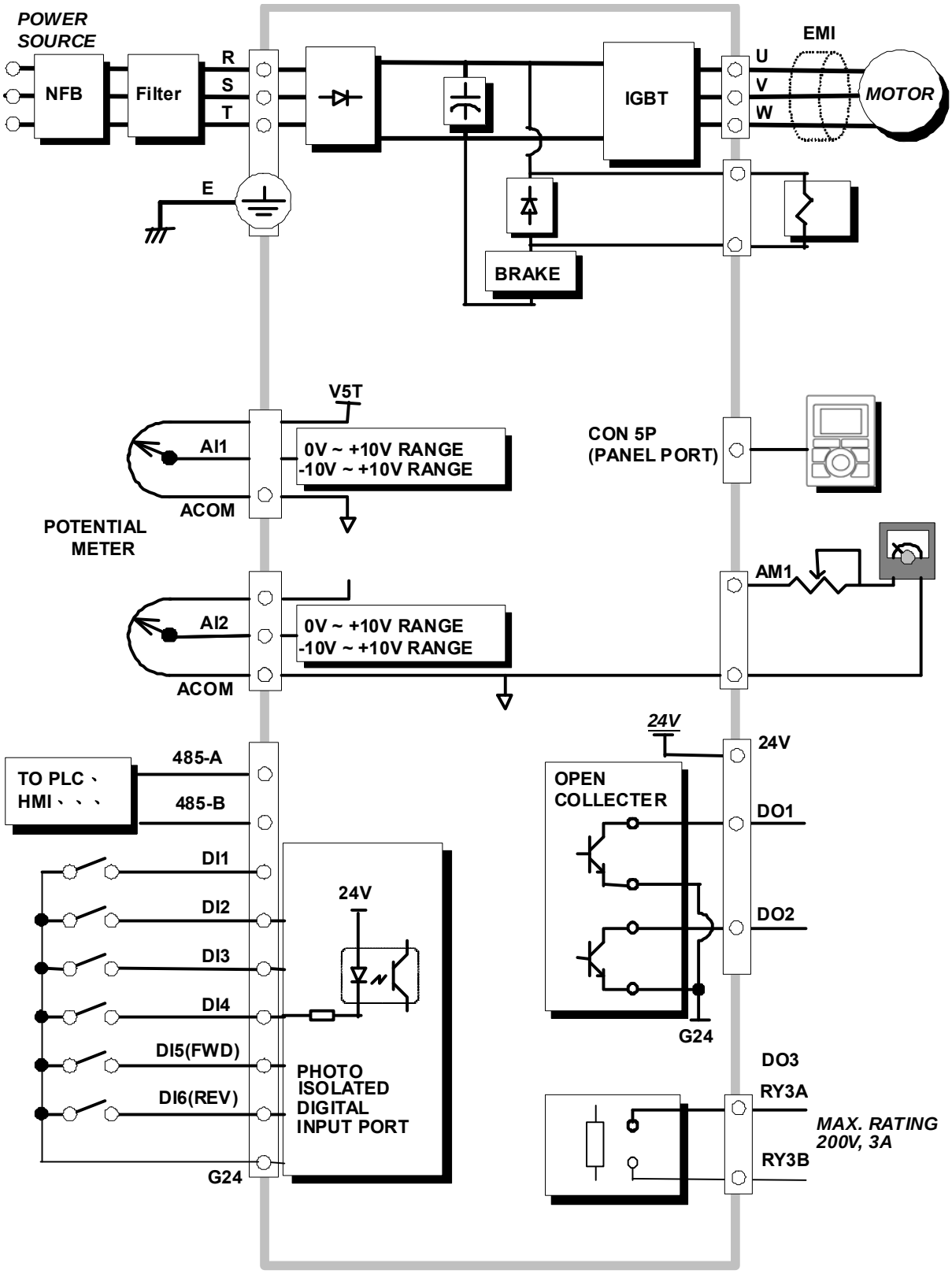


A - B mm	C mm	D mm	P mm	L mm
0.6 - 3.3	3.3	-	-	-



B	C mm	D mm	P mm	L mm
#0	3.3	-	-	-

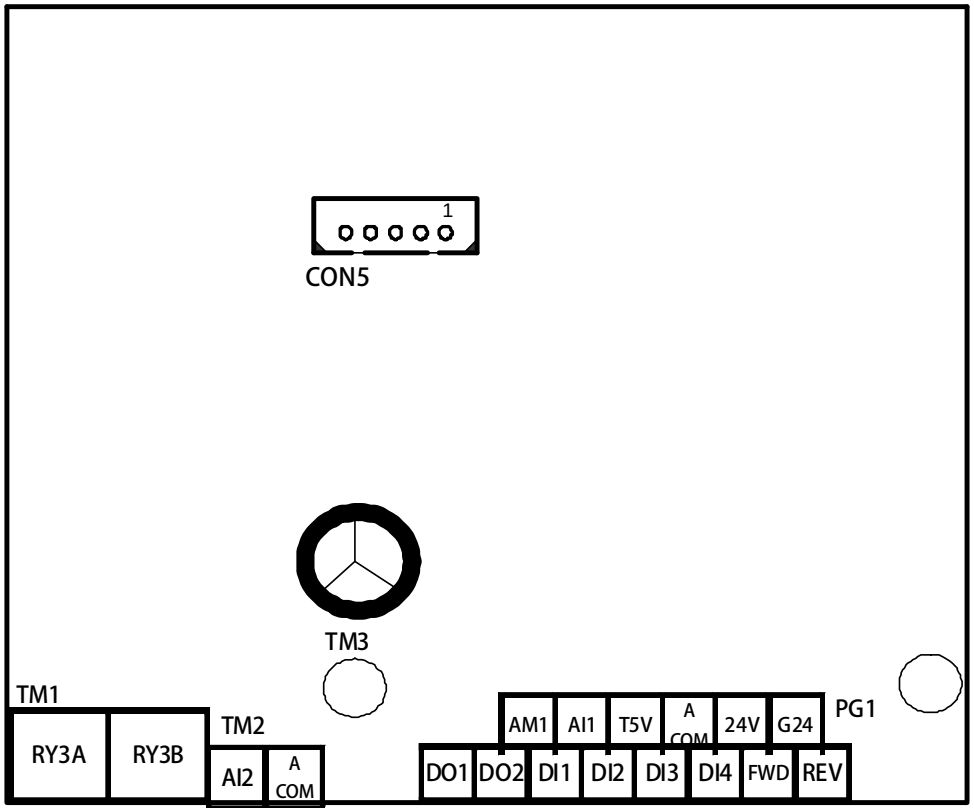
6.Basic Wiring Diagram for IRIS Series Drive



7. I/O Interface

7.1【0.5~2HP】The Map of I/O Terminal Position

Refer to the position map to locate the terminals or interface.

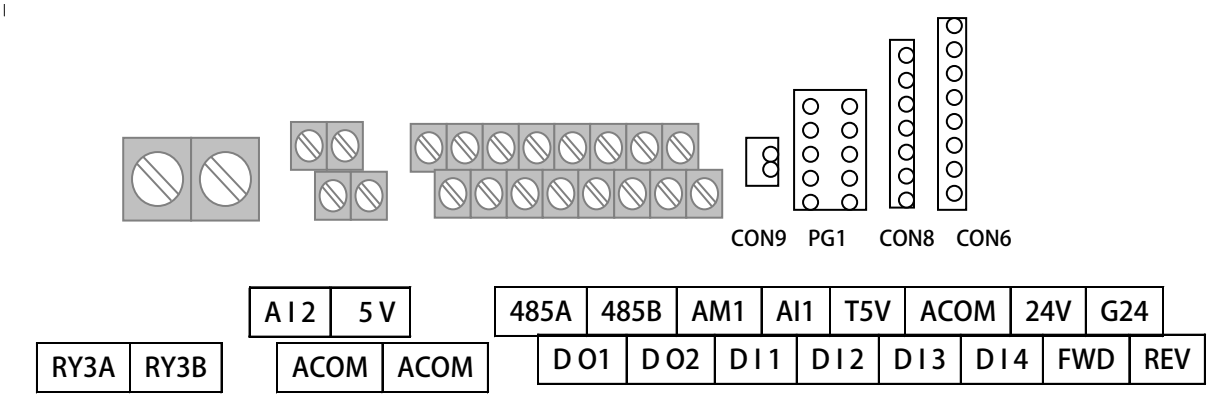


CON5 → RS485 Communication port; using to connect Control Panel.

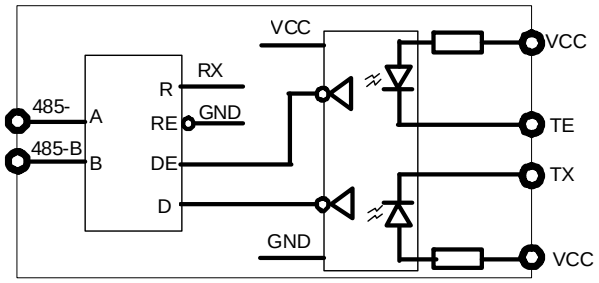
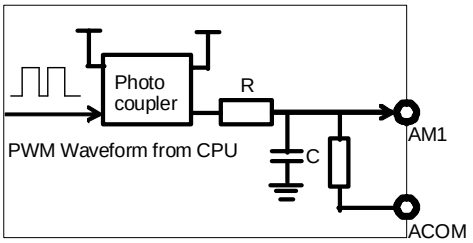
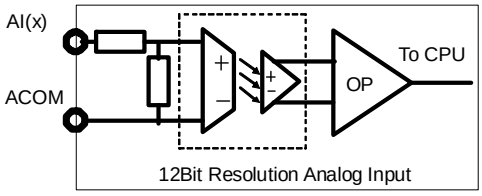
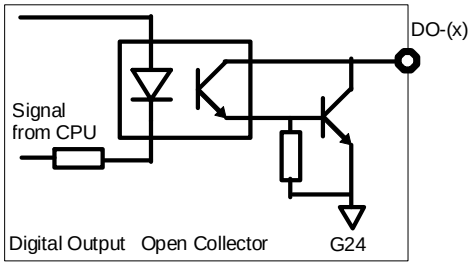
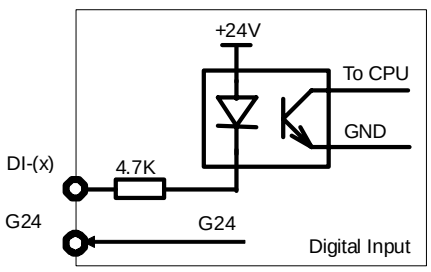
TM1 → Relay A type output terminal.

TM3 → Digital I/O、Analog I/O、Communication port, etc.

7.2【3~30HP】The Map of I/O Terminal Position



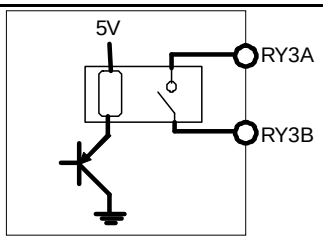
7.3 TM3 Description

Terminal	Name	Function	Hardware construction
TM3	485-A	RS485 communication port (photo coupler isolated)	
	485-B		
	AM1	Analog output (refer to ACOM)	
	AI1	Analog Input (refer to ACOM)	
	AI2		
	T5V	5V reference voltage (refer to ACOM)	⚠NOTE 1. ACOM and G24 are not the same electric level. 2. 5V is used to be a voltage reference for analog signal; 24V is used for digital input / output signal connection; do not use both these two voltage as power supplier to external circuits.
	ACOM	The reference ground of Analog signal system.	
	24V	24V output power (refer to G24)	
	G24	The reference ground of digital I/O system.	
	DO1, DO2	Digital output terminals. (reference ground is G24) Only be used under 24V voltage level to keep system stable. Programmable by setting parameter value.	
	DI1~DI4, FWD, REV	Digital input terminals. (reference ground is G24) Only be used under 24V voltage level to keep system stable. Programmable by setting parameter value.	

7.4 Connector CON5

Pin No.	Function	Description
Pin1	5V	Default designed to be the communication port of Control Panel. It is not suitable to apply to another communication usage.
Pin2	0V	
Pin3	LCD-A	
Pin4	LCD-B	
Pin5	N.C.	

7.5 Terminal Block TM1

Terminal	Function	Construction
RY3A RY3B	Relay A type output terminals. Rating: 200V, 3A Only be used under 24V voltage level to keep system stable. Programmable by setting parameter value	 RY3A/RY3B also named as DO3

8. Quick Start

8.1 Run Command Set from Digital Input Terminals

⚠NOTE!

＊Attention：DI5 is correspond with FWD function，DI6 is correspond with REV function。

Step 1：Setting Basic Parameters and V/F Curve

A. Recover the Parameters to default

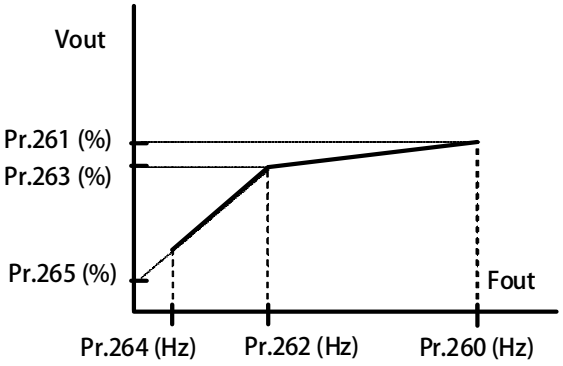
If necessary or it is the first time to use this drive, please recover the parameters to default setting to make sure the result of operation. Setting Pr.369 to be 1 and Reset the drive will make the parameters to default value; The description of operation declared below is under the condition of default parameter settings.

B. Setting the Parameter of Motor

Refer to the nameplate on motor to set the following parameters:

1. Pr.210：Full Load Current (%)
   This parameter defines the percentage of the motor’s rating and the driver’s rating.
   Full Load Current (%) = (Rated Current of Motor / Rated Current of Driver) x 100%
2. Pr.116：Motor Pole No.
3. Pr.260：Max. Speed Limit

C. V/F Curve set



Parameter	Description
260	Max. Speed
261	Max. Voltage
262	Base Frequency
263	Base Voltage
264	Start Frequency
265	Boot Voltage

Setting Example:

A 220V / 50Hz motor always set as below:

(1) Pr.260 = 100 → Setting the 2 times of the rating speed as the Max. Speed.
(2) Pr.261 = 100 → Setting the output voltage at the Max. Speed.
(3) Pr.262 = 50 → Setting the rated speed as the Base Frequency.
(4) Pr.263 = 100 → Setting the Base Voltage at Base Frequency.
(5) Pr.264 = 5 → Setting the Start Frequency.
(6) Pr.265 = 5.0 → Setting the Boot Voltage.

Step 2：Start to Run

1. Pr.270 = 5. → Setting Speed Set 0 = 5Hz.
2. Connect FWD and G24 terminals, the motor will start and run at 5Hz speed.
3. Pr.065=73 → FWD Input terminal function selection：open
4. Pr.068 = 0 → Virtual input terminal function selection：no function

8.2 RUN Command Set from Control Panel

8.2.1 R-Panel operation method：

1. Pr.270 = 5.00 ➔ Setting Speed Set 0 = 5Hz。
2. Directly click FWD button to operate。

8.2.2 C-Panel operation method：

1. Pr.270 = 5.00 ➔ Setting Speed Set 0 = 5Hz.
2. Pr.065 = 0 ➔ Disable FWD terminal function.
3. Pr.068 = 73 ➔ Setting virtual terminal function to be 73 (FWD function).
4. Pr.059 = 1 ➔ Enable the Run / Stop function.

Now, the motor can be set to run or stop directly from Panel’ s run / stop keys.

8.3 Change the Definition of Motor’ s Direction

If in regular condition, the driver can drive motor normally and want to change the direction definition of motor. Please following the steps listed below:

- Turn off AC input power
- Change the V and W wire connection.
- Turn on the AC input power.

9. Parameter Description

9.1 IRIS-IMAC-B Parameter List

Driver Specification Group <Refer to Chapter-10.1> *There is different setting for different model.							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
071	Unit Address	1	1	63	--	FR/W；R	00-00
097	version	--	0	FFFF	Version	F	00-01
130	AC INPUT LINE VOLTAGE	*220	10	1000	Vac(rms)	FR/W	00-04
209	INVERTER Rated output current	*5.0	1.0	6000.0	Ampere	FR/W	00-05
239	CARRIER SETTING	*10.0	2.0	16.0	Khz	FR/W；R	00-06
337	Special Function	*0	0	65535	--	F	00-03
348	Motor type	2	0	4	--	F	00-02
368	EAROM Lock	0	0	1	--	FR/W	00-07
369	EAROM-PRELOAD	0	0	1	--	R/W	00-08
Digital Input Group <Refer to Chapter-10.2>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
011	DIx Status	0000	0000	FFFF	--	M	01-00
059	EN/DISABLE "DI8"	0	0	1	--	R/W	01-17
061	DI1 function select	0	0	255	--	R/W	01-01
062	DI2 function select	0	0	255	--	R/W	01-02
063	DI3 function select	0	0	255	--	R/W	01-03
064	DI4 function select	0	0	255	--	R/W	01-04
065	DI5 function select	73	0	255	--	R/W	01-05
066	DI6 function select	74	0	255	--	R/W	01-06
067	DI-7 function Select (FAN-Detector))	30	30	30	--	F	01-07
068	DI-8 function Select	0	0	255	--	R/W	01-08
475	DI-15 function Select(virtual input, links to DO15)	0	0	255	--	R/W	01-15
476	DI-16 function Select(virtual input, links to DO16)	0	0	255	--	R/W	01-16
【NOTE】Digital input function definition can’ t be repeated. Check this point after finish setting this group.							

Digital Output Group <Refer to Chapter-10.3>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
012	DOx Status	0000	0000	FFFF	--	M	02-00
111	DO1 function select	0	0	255	--	R/W	02-01
112	DO2 function select	0	0	255	--	R/W	02-02
113	DO3 function select	0	0	255	--	R/W	02-03
165	DO15 function select(virtual output, links to DI15)	0	0	255	--	R/W	02-15
166	DO16 function select(virtual output, links to DI16)	0	0	255	--	R/W	02-16

Analog Input Group <Refer to Chapter-10.4>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
229	AI-1 Adc data	0	0	4095	--	M	03-00
230	AI-1 Positive Maximum Reference	4095	0	4095	--	FR/W	03-01
231	AI-1 Zero(/Middle) Reference	2048	0	4095	--	FR/W	03-02
232	AI-1 Negative Minimum Reference	0	0	4095	--	FR/W	03-03
233	AI-1 TYPE	0	0	1	--	R/W;R	03-04
234	AI-1 Command Value	0.00	0.00	100.00	%	M	03-05
235	AI-1 D-band Value	0	0	1000	--	R/W	03-06
477	AI-2 Adc data	0	0	4095	--	M	
481	AI-2 Positive Maximum Reference	4095	0	4095	--	FR/W	
482	AI-2 Zero(/Middle) Reference	2048	0	4095	--	FR/W	
483	AI-2 Negative Minimum Reference	0	0	4095	--	FR/W	
484	AI-2 TYPE	0	0	1	--	R/W;R	
485	AI-2 Command Value	0.00	0.00	100.00	%	M	
486	AI-2 D-band Value	0	0	1000	--	R/W	
487	AI-2 Compare Set Value	50	0.00	100.00	%	R/W	
488	AI-1 Compare Set Value	50	0.00	100.00	%	R/W	

Analog Output Group <Refer to Chapter-10.5>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
370	AMOUT-Select Data	0	0	15	--	R/W;R	05-00
371	AMOUT-Full-Scale Data Range	0	0	65535	--	FR/W	05-01
372	AMOUT-Test Data(0~100% Full scale)	0.0	0.0	100.0	%	RAM	05-02
373	AMOUT-100% Full Scale adjustment	0.0	0.0	100.0	%	FR/W	05-03
374	AMOUT-75% adjustment	0.0	0.0	100.0	%	FR/W	05-04
375	AMOUT-50% scale adjustment	0.0	0.0	100.0	%	FR/W	05-05
376	AMOUT-25% scale adjustment	0.0	0.0	100.0	%	FR/W	05-06
377	AMOUT-12.5% scale adjustment	0.0	0.0	100.0	%	FR/W	05-07

IMAC Motor Group <Refer to Chapter-10.7>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
116	Motor pole no.	8	2	128		FR/W；R	10-02
198	Motor Ke(Back Emf constant)	0	0	1000	V/krpm	FR/W	10-03
202	No-Load Speed						
203	Full-Load SLIP-RPM						
210	Full Load Current(% of AMP-Rating-Current)	50	0	200	%	FR/W	10-00
211	Field Current(% of Full-Load-Current)	30	0	200	%	FR/W	10-01
215	Electronic Over-Load Thermal Relay Time	3	0	120	sec	R/W	10-04
216	RESISTANCE(between V&W, U phase open)	1.000	0.000	60.000	Ohm	FR/W	10-05
217	INDUCTANCE(between V&W, U phase open)	1.00	0.00	60.00	mH	FR/W	10-06
218	Specific Frequency						

IMAC Control Group <Refer to Chapter-10.8>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
003	Drive Operation mode	11	0	29		R/W；R	21-00
004	Current loop P-gain	1000	0	3000		R/W	21-01
005	Current loop I-gain	100	0	3000		R/W	21-02
008	Current loop filter level	0	0	7		R/W	21-03
018	Speed loop P/I gain select	1	1	2		R/W	21-04
095	Current Compare Leve	100	0	300	%	FR/W	
221	SLIP Compensation Response	100	0	100	--	FR/W	
228	VOUT Compensation	0	0	100	%	FR/W	

IMAC Multi-Speed Setting Group <Refer to Chapter-10.9>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
260	MAX_FREQUENCY	60.00	60.00	650.00	Hz	R/W	
269	Actual HZ Set Command	0.00	0.00	650.00	Hz	M	
270	VF-HZset 0	0.00	0.00	650.00	Hz	R/W	
271	VF-HZset 1	0.00	0.00	650.00	Hz	R/W	
272	VF-HZset 2	0.00	0.00	650.00	Hz	R/W	
273	VF-HZset 3	0.00	0.00	650.00	Hz	R/W	
274	VF-HZset 4	0.00	0.00	650.00	Hz	R/W	
275	VF-HZset 5	0.00	0.00	650.00	Hz	R/W	
276	VF-HZset 6	0.00	0.00	650.00	Hz	R/W	
277	VF-HZset 7	0.00	0.00	650.00	Hz	R/W	
278	Select Speed Source when SWx=000	0	0	19	rpm	R/W；R	22-09

IMAC Acc/Dec/S-curve Group <Refer to Chapter-10.10>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
283	VF-ACC Time (0 ~ Base Frequency-Pr.262)	10.0	0.0	6500.0	Sec	FR/W	
284	VF-DEC Time (Base Frequency-Pr.262 ~ 0)	10.0	0.0	6500.0	Sec	FR/W	
285	VF-Scurve T1 time	1.00	0.00	5.00	Sec	FR/W	
286	VF-Scurve T2 time	1.00	0.00	5.00	Sec	FR/W	
287	VF-Scurve T3 time	1.00	0.00	5.00	Sec	FR/W	
288	VF-Scurve T4 time	1.00	0.00	5.00	Sec	FR/W	
291	BRAKE HOLD TIME	1.00	0.00	60.00	Sec	FR/W	

IMAC V/F Pattern Group <Refer to Chapter-10.6>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
259	VF-PATTERN Select	0	0	10		FR/W；R	
260	MAX_FREQUENCY	60.00	0.00	650.00	Hz	FR/W	
261	MAX_VOLTAGE	100.0	0.0	100.0	%	FR/W	
262	BASE_FREQUENCY	60.00	0.00	650.00	Hz	FR/W	
263	BASE_VOLTAGE	100.0	0.0	100.0	%	FR/W	
264	START FREQUENCY	1.00	1.00	650.00	Hz	R/W	
265	BOOST VOLTAGE	5.0	0.0	30.0	%	R/W	
266	DC-Inject-Braking Start-frequency	1.00	0.00	650.00	Hz	R/W	
267	DC-Inject-Braking Current-Set	50	0	150	%	R/W	

Counter Group <Refer to Chapter-13.1>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
240	PULSE_COUNTER-Mon1	0	0	65535	Counts	M	
241	PULSE_COUNTER-Mon2	0	0	65535	Counts	M	
242	PULSE_COUNTER-Mon3	0	0	65535	Counts	M	
243	PULSE_FREQUENCY-Mon1	0	0	65535	Hz	M	
244	PULSE_FREQUENCY-Mon2	0	0	65535	Hz	M	
245	PULSE_FREQUENCY-Mon3	0	0	65535	Hz	M	
246	COMPARE_SET-1	0	0	65000	--	R/W	
247	COMPARE_SET-2	0	0	65000	--	R/W	
248	COMPARE_SET-3	0	0	65000	--	R/W	

Timer Group <Refer to Chapter-13.3>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
249	TIMER-A, Type Select	2	0	2		R/W	62-00
250	TIMER-A, T1 Period	1.00	0.01	300.00	Sec	R/W	62-01
251	TIMER-A, T2 Period	1.00	0.01	300.00	Sec	R/W	62-02
252	TIMER-B, Type Select	2	0	2		R/W	62-03
253	TIMER-B, T1 Period	1.00	0.01	300.00	Sec	R/W	62-04
254	TIMER-B, T2 Period	1.00	0.01	300.00	Sec	R/W	62-05

Speed Compare Group <Refer to Chapter-13.4>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
206	SPEED_ZERO_REFERENCE	30	0	30000	Rpm	R/W	65-00
207	SPEED_EQUAL_REFERENCE	1000	0	30000	Rpm	R/W	65-01
208	SPEED_EQUAL_RANGE	30	0	30000	Rpm	R/W	65-02
222	SPEED Feedback Filter(For DOx)	1000	50	1000	ms	R/W	CB16

Up/Down Group <Refer to Chapter-13.5>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
104	Up/Dn Setting Mode	0	0	1		R/W	64-00
105	Up/Dn Data Preset Value	0	0	3000	Rpm	R/W	64-01
106	Up/Dn Rate (Trigger active)	1.00	0.00	300.00	Rpm/Trigger	R/W	64-02
107	Up/Dn Rate (Level active)	100	0	30000	Rpm/Sec	R/W	64-03
117	Up/Dn Data Temperary Value	0	0	30000	Rpm	M	

Rotary Switch Group <Refer to Chapter-13.6>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX.
118	RSW TYPE	0	0	3	--	R/W;R	66-00
137	RSW Data	0	0	65535	--	M	66-01
138	RSW Backup Memory	0	0	65535	--	R/W	66-02
152	RSW Data Max. Limit	1000	0	65535	--	R/W	66-03

DC-BUS adjust Group <Refer to Chapter-10.11>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
131	DC bus measurement adjust	100	80	120	%	FR/W	82-00
132	DC bus voltage	0	0	1000	Vdc	M	82-01
151	Over-Discharge-Protect time	5.0	0.0	10.0	sec	R/W	82-02
159	UP Recovery	0	0	1	--	R/W	

THERMISTOR adjust Group <Refer to Chapter-10.12>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
140	Heat sink temperature (degC)	0	0	250	degC	M	83-00
150	OVER-Temperature Protect LEVEL	80	50	100	degree	R/W	83-01

FAN adjust Group <Refer to Chapter-10.13>							
No.	Name	Default	Min.	Max.	Unit	Type	GXX-XX
146	FAN control type	0	0	1	--	R/W	84-00
148	FAN measure Speed	0	0	65535	rpm	M	84-02
149	FAN Speed Warning/Trip Level	2000	0	30000	rpm	R/W	84-03

9.2 Monitor Type Parameters' Address

The table showed below list the Monitor parameters, and there address. User can read it by communication。

Name	Unit	Address (Pr.)
Driver's output voltage	V	013
Motor's actual speed	rpm	019
Driver's output frequency	Hz	030
Alarm message	--	035
Driver's output current	rms(Amp)	213

9.3 Parameter's Type

The table showed below describing the different type of all the parameter of this manual:

Type	Description
R/W	The parameter is Readable and Writable, and can be stored in EAROM. All this type parameters can be initialized by the Pr.369 function.
FR/W	The parameter is Readable and Writable, and can be stored in EAROM. This type of parameter is specially set by Factory and not for user normally usage. This type of parameter only can be modified by authorized person.
RAM	The parameter is Readable and Writable, but it uses the RAM to temporally store the change of parameter. After power on or reset it will be recover to be default value.
M	The parameter is Monitor type. Only readable and no effect for writing this parameter.
F	Factory set parameter, and should not be changed.
R	To indicate that any change of this type of parameter have to Reset the driver to enable the change.

10. IRIS-IMAC-B Parameter Description

10.1 Driver Specification Group

- Pr.071 ➔ Unit Address (for communication)
  This parameter can be set from 1 to 63. If there are above 2 driver connected to the communication line, the unit address should be set for individual number.
  【NOTICE】The communication port format should be 19200bps、8bits、1stop、no parity.
- Pr.097 ➔ System software version
  Indicate the CPU software version.
- Pr.130 ➔ Input AC power voltage
  This parameter defines the input AC power voltage level:
  For 220V driver, it should set 220;
  For 380V driver, it should set 380.
  【NOTE】
  This parameter has been defined well before leaving factory. User should not change it.
  If necessary to adjust it, please measure the R, S, T voltage and get the average to write into this parameter.
  ※ If the R, S, T input voltage is different form the designed level exceed 10%, please contact with the agency or producer to confirm. Rashly change this parameter may cause damage to this driver or public danger.
  The driver will follow this parameter’ s setting to calculate the followed voltage check level:
  ※ *Over Potential* trip level = 1.414 x Pr.130 x 130 %。
  ※ *OP* recover level = 1.414 x Pr.130 x 120%。
  ※ *Under Potential* trip level = 1.414 x Pr.130 x 70%。
  ※ *UP* recover level = 1.414 x Pr.130 x 80%。
  ※ CONTACTOR ON level = 1.414 x Pr.130 x 69%。
  ※ CONTACTOR OFF = 1.414 x Pr.130 x 65%。
  【NOTE】The Contactor is inside the driver to short the charging resistor.
  Brake Discharge start level = 1.414 x Pr.130 x 117%。
- Pr.209 ➔ Rated Output Current
  This parameter defines the rated output current of driver.
  【NOTE】This parameter is set as the specification of driver, and there is no need to change it.
- Pr.239 ➔ Carrier Frequency
  This parameter defines the PWM carrier frequency. The range can be set from 2 KHz~16 KHz.
  If setting higher carrier frequency, the output waveform will be less distortion for sinusoidal, and the human ear will hear less noise, but the electronically interference to the environment will be larger, and generate more switching loss on power module.
  If setting lower carrier frequency, the output waveform there will be more distortion for sinusoidal, and the human ear will hear more noise, but the electronically interference environment will be less, and the switching loss on power module will be less too.

- Pr.337 ➔ Special function select
  This parameter shows firmware of this driver.
- Pr.348 ➔ Motor Type
  This parameter shows motor type of this control.
- Pr.368 ➔ EAROM Lock

Value	Description
0	The parameter value can be changed and stored into EAROM.
1	The change of parameter value will not be stored into EAROM

【NOTE】The value of Pr.368 will not be changed after reset.
If Pr.368=0, after reset the Pr.368=0.
If Pr.368=1, Pr.368=1.

- Pr.369 ➔ Recover Parameters to Default
  If setting Pr.369 to be 1, all the R/W type parameters in EAROM will be initialized to default value. After changing the value of this parameter, must reset the driver.

10.2 Digital Input Group

- Pr.011 ➔ Status of DI1~DI16
  This parameter shows the DI1 ~ DI16 status by hexadecimal numerical data. Converting this data to be binary format, status of DI1 ~ DI16 will be presented from LSB to MSB of the data.
  For example:
  if Pr.011=0 ➔ Converting to binary is "0000 0000 0000 0000". The DI1 ~ DI16 are OFF.
  If Pr.011=5 ➔ Converting to binary is "0000 0000 0000 0101". The DI1 and DI3 are ON, and others are OFF.
- Pr.059 ➔ The Enable Switch of Run/Stop
  If Pr.059 = 0， the Run/Stop keys have no function.
  If Pr.059 = 1， the Run/Stop keys have function.
  【NOTE】The Run/Stop can be enabled or disabled from Dix(21)
  This parameter is only for c-panel
- Pr.061 ➔ DI1 Function Select
- Pr.062 ➔ DI2 Function Select
- Pr.063 ➔ DI3 Function Select
- Pr.064 ➔ DI4 Function Select
- Pr.065 ➔ FWD (DI5) Function Select
  FWD terminal has been set to be 73 ➔ Forward Run.
- Pr.066 ➔ REV (DI6) Function Select
  REV terminal has been set to be 74 ➔ Reverse Run.
- Pr.067 ➔ FAN running status (Factory set, cannot be changed)
  This parameter is fixed set by factory and cannot be changed. The FAN running status will showed on the bit7 of Pr.011.
- Pr.068 ➔ The Run/Stop keys function select
  Only in Monitor mode or Fly wheel mode can operate this way:
  Click FWD，the virtual input DI8 will be set to be ON，check Pr.011 can see DI8 ON。
  Click STOP，the virtual input DI8 will be set to be OFF，check Pr.011 can see DI8 OFF。
  【NOTE】Usually the Pr.068 is set to be 73 (FWD) or 74 (REV).
- Pr.475 ➔ DI15 Function Select (virtual input, links to DO15)
- Pr.476 ➔ DI16 Function Select (virtual input, links to DO16)
  DI15 and DI16 are virtual inputs, and are directly links to DO15 and DO16 respectively.
  【NOTE】 The digital input function definition can't be repeated. Check this point after finish setting this group.

10.3 Digital Output Group

- Pr.012 ➔ Status of DO1~DO16
  This parameter shows the DO1 ~ DO16 status by hexadecimal numerical data. Converting this data to be binary format, status of DI1 ~ DI16 will be presented from LSB to MSB of the data.
  For example:
  if Pr.012=0 ➔ Converting to binary is "0000 0000 0000 0000". The DO1 ~ DO16 are OFF.
  If Pr.012=5 ➔ Converting to binary is "0000 0000 0000 0101". The DO1 and DO3 are ON, and others are OFF.
- Pr.111 ➔ DO1 Function Select
- Pr.112 ➔ DO2 Function Select
  DO1~DO2 are reality output terminals. The function of these terminals can be selected by setting these parameters.
- Pr.113 ➔ DO3 Function Select
  DO3 actual output terminals are the RY3A and RY3B of TM1. It is a A-type relay output. The function of this terminal can be selected by setting this parameter.
- Pr.165 ➔ DO15 Function Select (virtual output, links to DI15)
- Pr.166 ➔ DO16 Function Select (virtual output, links to DI16)
  DO15 and DO16 are virtual outputs, and are directly links to DI15 and DI16 respectively.

10.4 Analog Input Group

10.4.1 Analog Input：AI1

- Pr.229 ➔ AI-1 Adc data
  This parameter displays the A/D value of AI1 input.
- Pr.230 ➔ AI-1 Positive Maximum Reference
  Applying the maximum input voltage to AI1 read the data from Pr.229 and set into this parameter as the AI1 input maximum limit.
- Pr.231 ➔ AI-1 Zero(/Middle) Reference
  Appling 0V to AI1 read the data from Pr.229 and set into this parameter as the AI1 0V input reference.
- Pr.232 ➔ AI-1 Negative Minimum Reference
  Appling the minimum input voltage to AI1 read the data from Pr.229 and set into this parameter as the AI1 input minimum limit.
- Pr.233 ➔ AI1 Input Type
  Select the AI1 input type of voltage range.

Value	Description
0	The input voltage range is 0 ~ +10V.
1	The input voltage range is -10V ~ +10V.

- Pr.234 ➔ AI-1 Command Value
  The displayed data = (AI1 actually input voltage / AI1 input range) x 100 %.
  The AI1 input range is adjusted by Pr.230 ~ Pr.232.
- Pr.235 ➔ AI-1 D-band Value
  If Pr.233 select type 0, the AI1 input in the range of Pr.232 +/- Pr.235 will be negated.
  【NOTE】Only when Pr.233 select type 1, the function of Pr.235 is available.
- Pr.488 ➔ AI-1 Compare Set Value
  Setting Pr.488 to compare with Pr.234 AI-1 Command Value。
  Unit：%

10.4.2 Analog Input：AI2

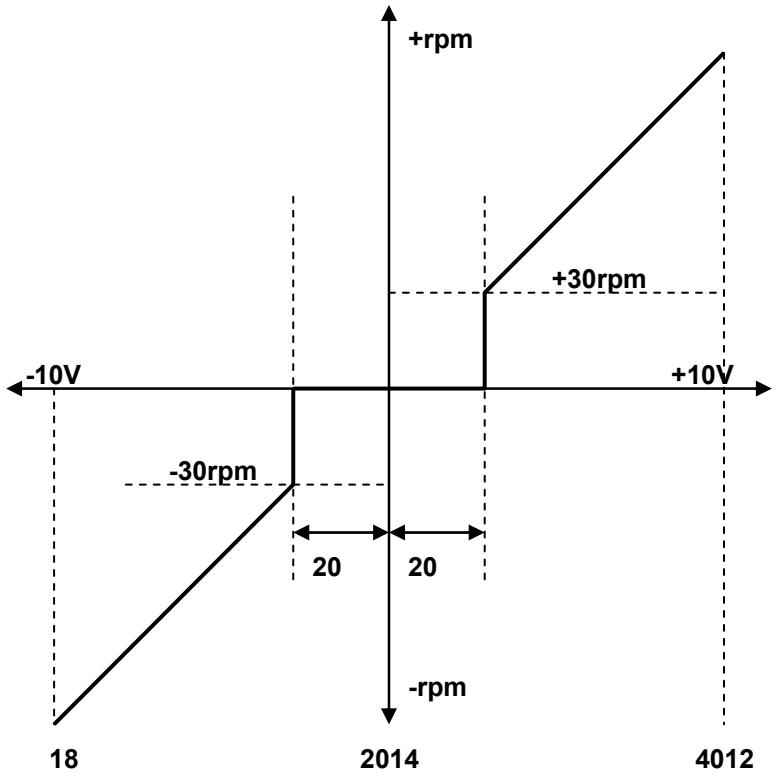
- Pr.477 ➔ AI-2 Adc data
  This parameter displays the A/D value of AI2 input.
- Pr.481 ➔ AI-2 Positive Maximum Reference
  Applying the maximum input voltage to AI2 read the data from Pr.477 and set into this parameter as the AI2 input maximum limit.
- Pr.482 ➔ AI-2 Zero(/Middle) Reference
  Appling 0V to AI2 read the data from Pr.477 and set into this parameter as the AI2 0V input reference.
- Pr.483 ➔ AI-2 Negative Minimum Reference
  Appling the minimum input voltage to AI2 read the data from Pr.477 and set into this parameter as the AI2 input minimum limit.
- Pr.484 ➔ AI2 Input Type
  Select the AI2 input type of voltage range.

Value	Description
0	The input voltage range is 0 ~ +10V.
1	The input voltage range is -10V ~ +10V.

- Pr.485 ➔ AI-2 Command Value
  The displayed data = (AI2 actually input voltage / AI2 input range) x 100 %.
  The AI2 input range is adjusted by Pr.481 ~ Pr.483.
- Pr.486 ➔ AI-2 D-band Value
  If Pr.484 select type 0, the AI2 input in the range of Pr.482 +/- Pr.486 will be negated.
  【NOTE】Only when Pr.484 select type 1, the function of Pr.486 is available.
- Pr.487 ➔ AI-2 Compare Set Value
  Setting Pr.487 to compare with Pr.485 AI-2 Command Value。
  Unit：%

Example 1: AI1 input range -10V ~ +10V

AI1 input range is -10V ~ +10V, and rated speed of motor is 3000rpm. Setting Pr.233 = 1, and Pr.235 = 20. Please following the situation listed below to learn how to use the parameters.



※ Input +10V to AI1, and read Pr.229 = 4012.

※ Set Pr.230 = 4012.

※ Input 0V to AI1, and read Pr.229 = 2014.

※ Set Pr.231 = 2014.

※ Input -10V, and read Pr.229 = 18.

※ Set Pr.232 = 18.

※ By the equation 3000 ÷ (4012-2014) 1.5 to know that one A/D count is about 1.5rpm.

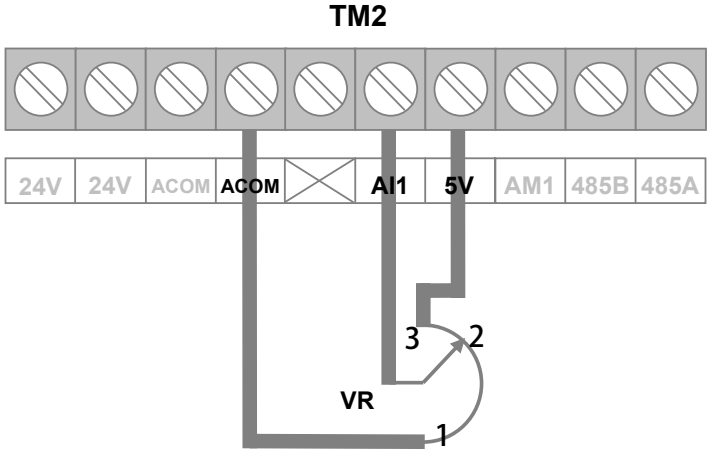
※ By the equation 20x1.5=30 to know the range of Blind Zone is +/-30rpm.

If the input voltage of AI1 is in the range of 2014+/-20, the motor will not run.

If the input voltage of AI1 exceeds f the range of 2014+/-20, the motor will run, and the min. start speed of motor will be about 30rpm.

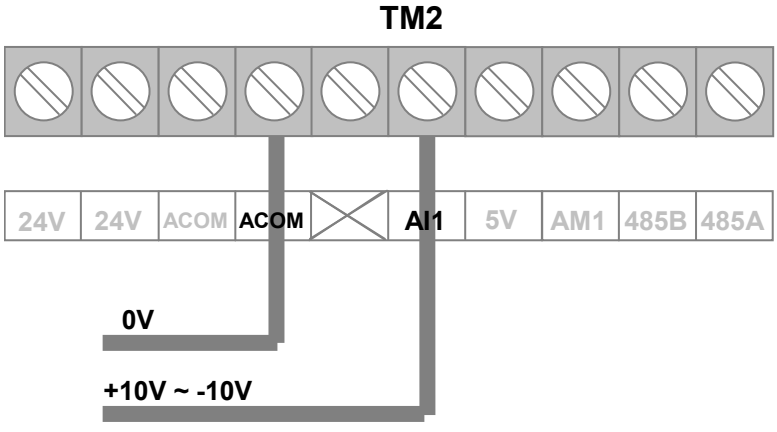
Example 2: Simply using a variable resistor to set the running speed

1. Wiring the variable resistor (VR) to control input terminals as the figure showed below.
2. Setting Pr.233 = 0. ➔ Select AI1 input range (0 ~ 10V).
3. Turn the VR to the maximum input position and read Pr.229.
4. Write the Pr.229 value into Pr.230 ➔ Setting AI1 maximum value.
5. Turn the VR to the min. input position and read Pr.229.
6. Write the Pr.229 value into Pr.231. ➔ Setting AI1 0V value.
7. Write the Pr.229 value into Pr.232 ➔ Setting AI1 min. value.
8. Setting Pr.278 (Speed Command Select)=1 ➔ Select AI1 input as speed command.
9. Reset the driver. ➔ Change Pr.278, must reset driver.



Example 3: Using external +10V ~ -10V signal as speed command.

1. Wiring the input signal lines to control terminals as the figure showed below.
2. Setting Pr.233 = 1 ➔ Select AI1 input range (-10V ~ +10V).
3. Input maximum voltage to AI1, read Pr.229.
4. Write Pr.229 value into Pr.230. ➔ Setting AI1 maximum value.
5. Input 0V to AI1, read Pr.229.
6. Write Pr.229 value into Pr.231. ➔ Setting AI1 0V value.
7. Input min. voltage to AI1, read Pr.229.
8. Write Pr.229 value into Pr.232. ➔ Setting AI1 min. value.
9. Setting Pr.278 (Speed Command Select) =1 ➔ Select AI1 input as speed command.
10. Reset the driver. ➔ Change Pr.278, must reset driver.



10.5 Analog Output Group

【NOTE】 The output signal of AM1is used to drive the external analog meter. The rating of meter is 1V/1mA.

- Pr.370 → AM1 Function Select

Value	Description	
0	No output.	
1	Output Frequency.	
2	Output Current	
3	Output Voltage	
4	Motor′ s Actual Speed	
5~9	Reserved.	
10	100% Test Output.	【NOTE】 All these 5 functions are used to adjust the linearity of AM1 output. Normally, the linearity had been adjusted in factory already; therefore, users don′ t have to do it again.
11	75% Test Output.	
12	50% Test Output.	
13	25% Test Output.	
14	12.5% Test Output.	
15	The output of AM1 is set by Pr.372.	

Description:

Select =0 → AM1 has no output.
Select =1 → The output of AM1 presents the driver′ s output frequency. The accuracy is 0.01Hz.
Select =2 → The output of AM1 presents the driver′ s output current. The accuracy is 0.1A.
Select =3 → The output of AM1 presents the driver′ s output voltage. The accuracy is 1V.
Select =4 → The output of AM1 presents the motor′ s actual speed. The accuracy is 1rpm.
Select =5~9 → All these are reserved. Should not select these function numbers for operation safety.
Select =10 → AM1 send out 100% volume for adjusting. The output is adjusted by Pr.373.
Select =11 → AM1 send out 75% volume for adjusting. The output is adjusted by Pr.374.
Select =12 → AM1 send out 50% volume for adjusting. The output is adjusted by Pr.375.
Select =13 → AM1 send out 25% volume for adjusting. The output is adjusted by Pr.376.
Select =14 → AM1 send out 12.5% volume for adjusting. The output is adjusted by Pr.377.
Select =15 → The output of AM1 is set by Pr.372.

【NOTE】After change this parameter, the driver should be reset to let the changes be effect.

- Pr.371 ➔ AM1 Full Scale Data Range

  This parameter sets the maximum full scale of the external analog meter. Note the rules listed below:

  1. When execute the adjustment of AM1 signal, the output full scale is 100.0%; therefore, this parameter should set to be 1000 for the need.
  2. After finishing the adjustment of AM1 signal, the output full scale should refer to the actual external analog meter.
  3. AM1 output rating is 1V/1mA.

  Example:

  - Frequency Meter (full scale 60.00Hz) ➔ the full scale should set to be 6000.
  - Current Meter (full scale 20.0A) ➔ the full scale should set to be 200.
  - Voltage Meter (full scale 500V) ➔ the full scale should set to be 500.
  - Speed Meter (full scale 1800rpm) ➔ the full scale should set to be 1800.

- Pr.372 ➔ AM1 Output Volume Setting

  IF Pr.370 select function 15, the output of AM1 is set by this parameter. The range of this parameter is 0.0% ~ 100.0%.

- Pr.373 ➔ AM1 100% Full Scale Adjustment

  Be used for AM1 100% output scale adjustment.

- Pr.374 ➔ AM1 75% Scale Adjustment

  Be used for AM1 75% output scale adjustment.

- Pr.375 ➔ AM1 50% Scale Adjustment

  Be used for AM1 50% output scale adjustment.

- Pr.376 ➔ AM1 25% Scale Adjustment

  Be used for AM1 25% output scale adjustment.

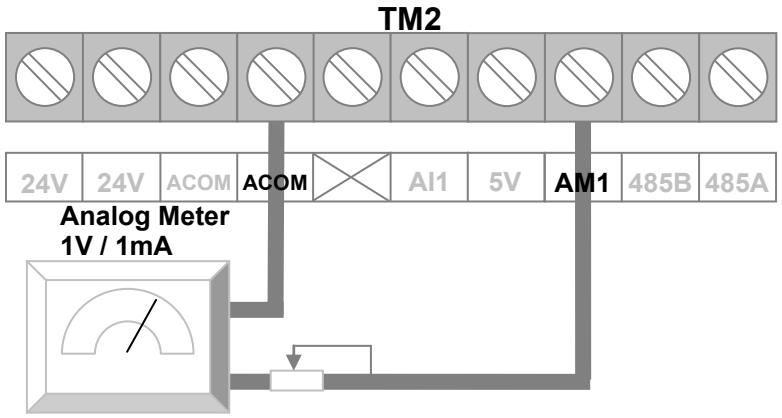
- Pr.377 ➔ AM1 12.5% Scale Adjustment

  Be used for AM1 12.5% output scale adjustment.

EXAMPLE: Introduce how to use an external analog speed meter.

The meter′ s full scale is 1800rpm.

Connect the meter to the AM1 and Acom terminals as showed in the following figure.



Follow these steps to use the meter properly.

1. Pr.370=4 → Set AM1 function to output motor′ s actual speed.
2. Pr.371=1800rpm → Set AM1 full scale data range to be 1800rpm.
3. Execute RESET → After reset the driver， the setting of AM1 is finished.

【NOTE】If there is need to adjust the output linearity of AM1， please follow below steps.

1. Pr.371=1000 → Set AM1 Full Scale Range to be 1000.

---

2. Pr.370=10 → Set AM1 function to send 100% scale output.
   - ☛ Pr.373=100 → Check if the meter point to 1800rpm
   - ☛ 【NOTE】If it is not in proper position， adjust by the VR knob of the meter.
3. Pr.370=11 → Set AM1 function to send 75% scale output.
   - ☛ Pr.374=(check meter to set%) → Adjust the Pr.374 to let the meter point to 1800x75%=1350.
4. Pr.370=12 → Set AM1 function to send 50% scale output.
   - ☛ Pr.375=(check meter to set%) → Adjust the Pr.375 to let the meter point to 1800x50%=900.
5. Pr.370=13 → Set AM1 function to send 25% scale output.
   - ☛ Pr.376=(check meter to set%) → Adjust the Pr.376 to let the meter point to 1800x25%=450.
6. Pr.370=14 → Set AM1 function to send 12.5% scale output.
   - ☛ Pr.377=(check meter to set%) → Adjust the Pr.377 to let the meter point to 800x12.5%=225.

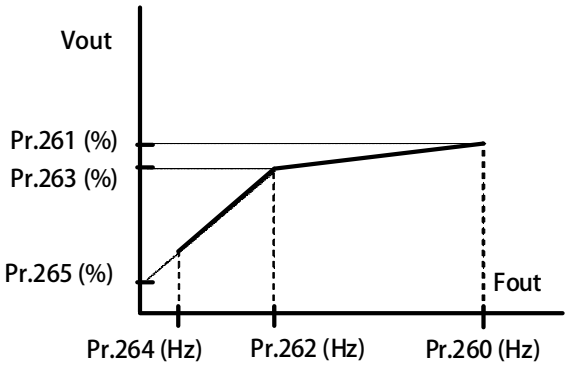
---

7. Pr.370=4 → Set AM1 function to output motor′ s actual speed.
8. Pr.371=1800 → Set AM1 full scale data range to be 1800.
9. Execute RESET → After reset the driver， the setting of AM1 is finished.

10.6 IMAC V/F Pattern Group

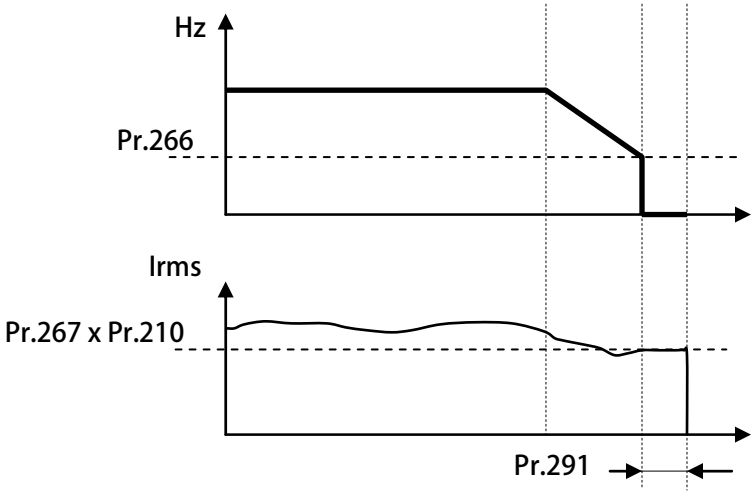
- Pr.259 ➔ V/F pattern select
- Pr.260 ➔ Max. frequency
- Pr.261 ➔ Max. voltage
- Pr.262 ➔ Base frequency
- Pr.263 ➔ base voltage
- Pr.264 ➔ Start Frequency
- Pr.265 ➔ Boost voltage

The above 6 parameters' definition is showed by the chart below:



In this chart, the 6 parameters define a V/F curve, that defines the output voltage relate to the frequency of motor. By this curve the IRIS drive can control the motor's output torque, power; and the efficiency of motor can be advanced, too.

- Pr.266 ➔ DC inject braking start frequency
- Pr.267 ➔ DC inject braking current set



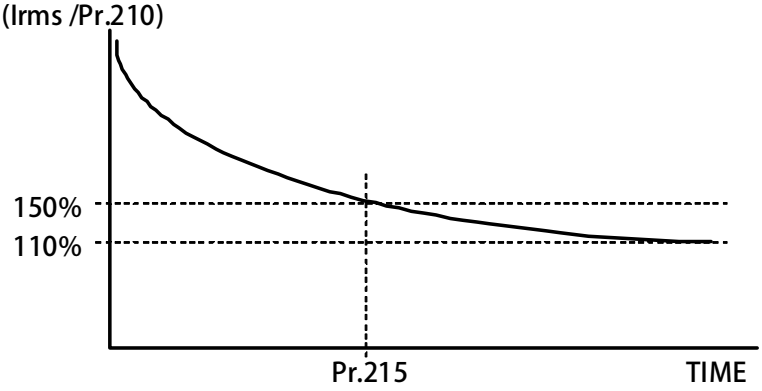
Example:

If Pr.266=10, when the frequency down below 10Hz, the drive will output a dc inject braking energy. The volume of the dc inject braking is determinated by Pr.267, the actual output current can be counted by Pr.267 x Pr.210.

Pr.291 is the Brake hold time.

10.7 IMAC Motor Group

- Pr.116 ➔ Motor pole no.
  According to the data of the motor′ s manufacturer, set correct value.
- Pr.198 ➔ Motor Ke(Back Emf constant)
  Set output voltage(rms) when speed is 1000 rpm。
- Pr.202 ➔ No-Load Speed
  According to the rated speed data of the motor′ s manufacturer。
- Pr.203 ➔ Full-Load SLIP-RPM
  According to the slip rpm data of the motor′ s manufacturer。
- Pr.210 ➔ Motor Full Load Current Ratio (%)
  Set the ratio of the motor′ s rating to the driver′ s rating.
  Motor Full Load Current ratio (%) = (motor's full load current / driver's rating current) x100%。
- Pr.215 ➔ Electronic Thermo Relay Time
  This Driver has built an electronic thermo function. If the driver volume is large then the motor which is used, this function can prevent the motor overload. If this parameter sets to be 0, the Electronic Thermo protect function is disabled.



- Pr.216 ➔ RESISTANCE(between V&W, U phase open)
- Pr.217 ➔ INDUCTANCE(between V&W, U phase open)
  These two parameters should refer to the data of motor′ s manufacturer, or can be auto tuned by driver.
- Pr.218 ➔ Specific Frequency
  This parameter set by factory，please do not change this parameter。

10.8 IMAC Control Group

- Pr.003 ➔ Drive Operation mode
  Please select 0, and don’ t choice another function number.
  Refer to the followed table to set the operation mode. Don’ t select other value!

Value	Description
0	IMAC V/F mode. This is standard operation mode for this driver. To operate in this mode, the motor and feedback signal should be connect correctly.
6	Execute the Auto Current Gain Tuning.
7	Execute the Auto R&L Tuning.

  【NOTE】After change this parameter, the driver should be reset then the change is effect. If select wrong mode may cause damage to the driver and motor or the facility that use this driver and motor.
- Pr.004 ➔ Current Loop P-gain
  Set the current loop P gain of the driver.
- Pr.005 ➔ Current Loop I-gain
  Set the current loop I gain of the driver.
  【NOTE】This parameter is auto set by executing Auto Current Gain Tuning.
  Pr.004 should keep larger then Pr.005.
- Pr.008 ➔ Current Loop Filter Level
  Define the current loop filter level.
- Pr.095 ➔ Torque Compare Level (% of Motor Rated Torque)
  Set the compared torque value for Over-torque-warning in this parameter.
- Pr.221 ➔ SLIP Compensation Response
  This parameter set SLIP Compensation Response
- Pr.228 ➔ VOUT Compensation
  This parameter set VOUT Compensation

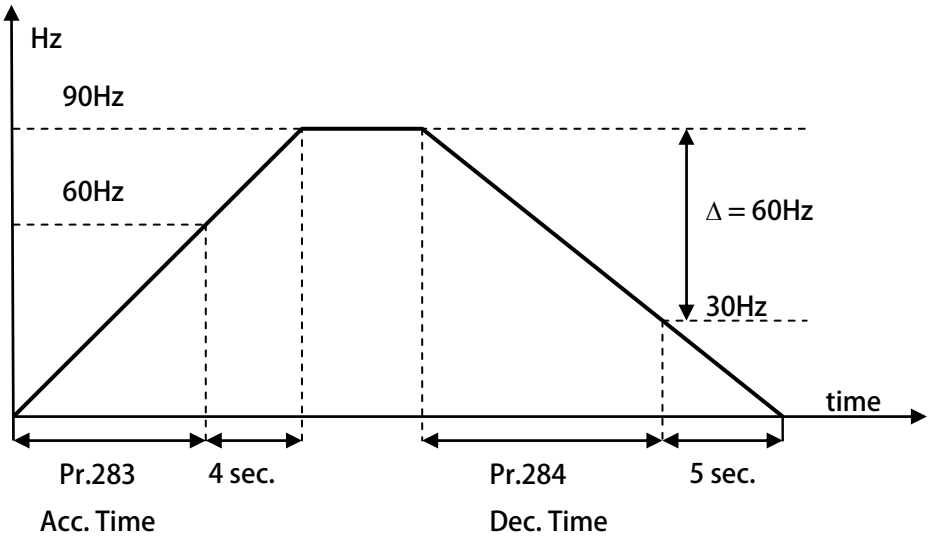
10.9 IMAC Multi-Speed Setting Group

- Pr.260 ➔ Max. frequency
  Refer to the data from motor’ s manufacturer to get correct setting value.
- Pr.269 ➔ Actual Hz setting
  This parameter displays the actual speed command send to motor.
- Pr.270 ➔ VF-HZset0
- Pr.271 ➔ VF-HZset1
- Pr.272 ➔ VF-HZset2
- Pr.273 ➔ VF-HZset3
- Pr.274 ➔ VF-HZset4
- Pr.275 ➔ VF-HZset5
- Pr.276 ➔ VF-HZset6
- Pr.277 ➔ VF-HZset7
  The parameters Pr.270~Pr.277 can set 8 sets different frequency speed, and can be selected by digital input terminals.
  【NOTE】If want to select Pr.270 ~ Pr.277 speed, the parameter Pr.278 must set 0.
- Pr.278 ➔ Select Speed Source when SWx=000

Value	Description
0	The speed command select from Pr.270 ~ Pr.277 setting.
1	The speed command set from AI1 input.
2	The speed command set from Speed Up / Down Counter output.
3~18	Reserved
19	The speed command set from Rotary Switch.
20	The speed command set from AIP (VR of then R-Panel Only)

10.10 IMAC Acc/Dec/S-curve Group

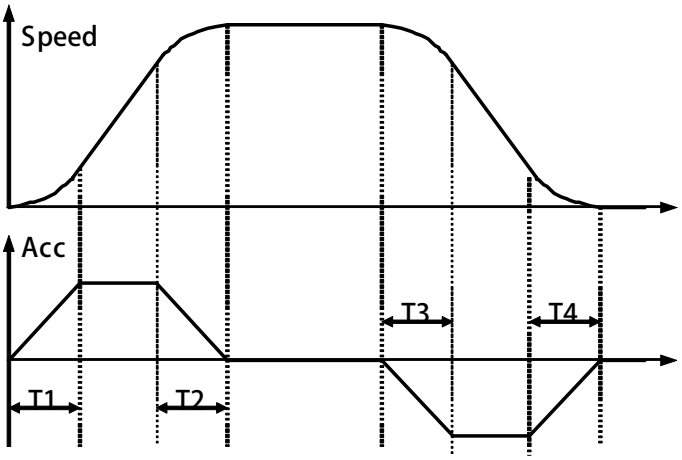
- Pr.283 ➔ VF-ACC Time (0 ~ Base Frequency-Pr.262)
  Set speed rising ramp time, calculated from 0Hz to base frequency (Pr.262). Unit precision is 0.01sec.
- Pr.284 ➔ VF-DEC Time (Base Frequency-Pr.262 ~ 0)
  Set speed falling ramp time, calculated from base frequency (Pr.262) to 0Hz. Unit precision is 0.01sec.



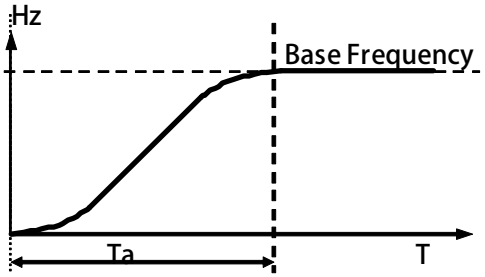
According to the above figure:
Assume the base frequency is 60Hz, Pr.283 = 8.00sec, Pr.284 = 10.00sec.
The slope of rising ramp is 60Hz/8sec; the slope of falling ramp is 60Hz/10sec.
Therefore, from 0 to 90Hz need 8+4 = 12sec; from 90Hz to 0 need 10+5 = 15sec.

- Pr.285 ➔ VF-Scurve T1 time
- Pr.286 ➔ VF-Scurve T2 time
- Pr.287 ➔ VF-Scurve T3 time
- Pr.288 ➔ VF-Scurve T4 time

The S-curve can smooth the vibration of machine at the period of motor’ s speed change. To set the s-curve time longer can get more effect of smoothing, but it causes timing extends for actual acc. time and deceleration time.



Example: Explain how the S-curve affects the Acc. and Dec. timing.



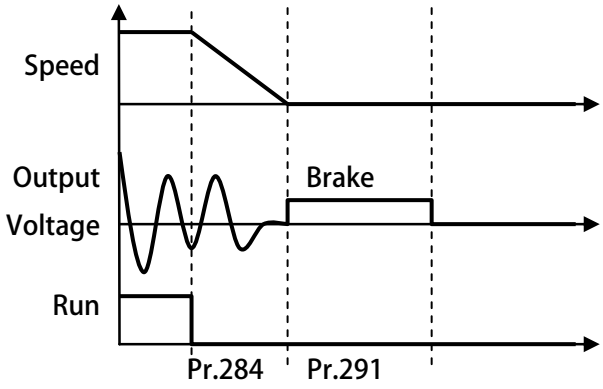
If setting Pr.283 (Acc. Time) =1.00 (Sec/Krpm), and Pr.285 (S-curve T1 Time) = 1.00sec, Pr.286 (S-curve T2 Time) = 1.00sec.

Ta (totally acc. time) = (0.5 x S-curve T1 Time) + (Acc. Time) + (0.5 x S-curveT2 Time) = 2sec.

- Pr.291 ➔ Brake Hold Time

This parameter sets the brake hold time for brake period. Refer to the figure below.

When driver decelerate to 0 speed, it will send a brake voltage to motor and hold for a period of time to make sure the motor actually stopped. This time is called Brake Hold Time.



10.11 DC-BUS Adjust Group

- Pr.131 ➔ DC Bus Measurement Adjust

  This parameter used to adjust the Pr.132 displayed DC Bus Voltage.

  【NOTE】This parameter is pre-adjust in the factory, user don't have the necessary to adjust it

  【WARNING】This parameter can be modified only by trained person, otherwise may cause damage to the driver.

  Adjust method:

  1. Set Pr.131 to be 100.
  2. Read the value of Pr.132 (DC Bus Voltage). The value is 290 for example.
  3. Check the actual input AC input power. The measured voltage is 220Vac for example.
  4. The DC power will be 220 x 1.414=311(Vdc).
  5. The adjust value is calculated by the equation 311 / 290 x 100(%) = 107(%).
  6. Set Pr.131 to be 107, then check Pr.132 will get correct voltage display for DC bus.

- Pr.132 ➔ DC Bus Voltage

  This parameter will display the measured DC bus voltage.

  The relation of input AC power and DC bus voltage is Vdc = 1.414 x Vac(input power).

- Pr.151 ➔ Over Discharge Protect Time

  This parameter can set the Over Discharge Protect Time to protect the discharge resistor. If the discharge time exceeds this setting, the driver will tip and show the *Od* alarm message.

  【NOTE】

  When Pr.132 > (Pr.130 x 1.17) the driver will start to discharge.

- Pr.159 ➔ UP Recovery

  This parameter set UP alarm recovery，switch on/off：UP recovery

Value	Description
0	Disabled UP Recovery
1	Enabled UP Recovery

10.12 Thermistor Adjust Group

- Pr.140 ➔ Heat Sink Temperature (centigrade)

  This parameter displays the temperature of the driver’ s heat sink.

- Pr.150 ➔ Over Heat Protect Temperature (centigrade)

  When the heat sink temperature (displays in Pr.140) exceeds the setting of this parameter, the driver will trip and show the *OH* alarm message.

10.13 FAN Adjust Group

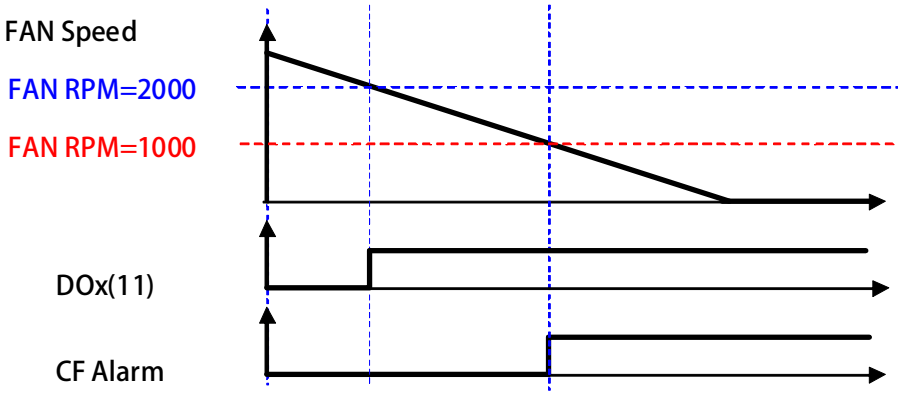
- Pr.146 ➔ FAN Control Type

Value	Description
0	According to the temperature of heat sink to control the FAN.
1	Always run.

If Pr.146 = 0, the FAN will turn to run when the temperature of heat sink exceeds 40 centigrade, and will turn off until the temperature is lower then 35 centigrade.
If Pr.146 = 1, the FAN will be on all the time.

- Pr.148 ➔ Measured FAN Speed
  This parameter displays the speed of FAN.
- Pr.149 ➔ FAN Low Speed Warning and Trip Level
  This parameter is used to set the fan speed check level. It can check if the fan speed is too low or malfunctioned.
  If Pr.148 < Pr.149, the driver will output warning signal by using digital output function 11.
  If Pr.148 < (Pr.149 x 0.5), the driver will trip and show *CF* alarm message.
  【NOTE】If set Pr.149 to be 0, the protect function will be disabled.
  【WARNING】It is important to keep the cooling fan in ordinary condition, because there is lot of heat be generated while driving the motor. If there happened the *CF* warning, must check or replace the cooling fan to keep the driver in a well cooling condition.
  If not for necessary, user should not disable this protect function.

Example:
If set Pr.149 to be 2000rpm, and set DOx(11). When fan speed is lower then 2000rpm, the output terminal will have warning signal output, when fan speed is lower then 1000rpm, the driver will trip and show *CF* alarm message.



11. Digital Input Function

【Note】Version：if function version >= version，the function can be used。

Example：CA23 → C=2012 year / A=10 month /23 day

Function	Function Description		Version	Chapter
0	No function			
6	Over Heat Protect (OH)			
7	Negative Output of Over Heat Protect (/OH)			
10	Speed Select SW0	8 Speed Select		
11	Speed Select SW1			
12	Speed Select SW2			
13	Speed Command Setting Select			
14	Slip Compensation		D722	
21	Run / Stop Enable Switch			
23	Reset			
27	Pulse-Counter-1 CLEAR to Zero			13.1
28	Pulse-Counter-2 CLEAR to Zero			
29	Pulse-Counter-3 CLEAR to Zero			
30	FAN Detector Input			
31	Pulse-Counter-1 INPUT			13.1
32	Pulse-Counter-2 INPUT			
33	Pulse-Counter-3 INPUT			
60	Timer A Enable			13.3
61	Timer B Enable			
73	Forward Run			
74	Reverse Run			
75	Change Running Direction			
76	FWD / REV Switch			
77	FWD + DIx(76)			
78	REV + DIx(76)			
80	Set Flip-Flop (1)			13.2
81	Set Flip-Flop (2)			
82	Clear Flip-Flop(1)			
83	Clear Flip-Flop(2)			
84	Set T-Type Flip-Flop (1)			
85	Set T-Type Flip-Flop (2)			
86	Set Data Flip-Flop (1)			
87	Set Data Flip-Flop (2)			
88	Set Ck Flip-Flop (1)			
89	Set Ck Flip-Flop (2)			

Function	Function Description	Version	Chapter
90	Clear the Speed Up / Down counter register to be 0 when be active.		13.5
91	Increase the Speed Up / Down Counter (Pr.106) when be active.		
92	Decrease the Speed Up / Down Counter (Pr.106) when be active.		
93	Increase the Speed Up / Down Counter by a preset value in Pr.107 every second		
94	Decrease Speed Up / Down Counter by a preset value in Pr.107 every second.		
95	Save，will save Speed Up / Down Counter value into Pr.105.		
203	Rotary Switch signal-A input.		13.6
204	Rotary Switch signal-B input.		
205	Rotary Switch signal-Store input.		
249	Emergency Stop (will cause *ES* trip)		

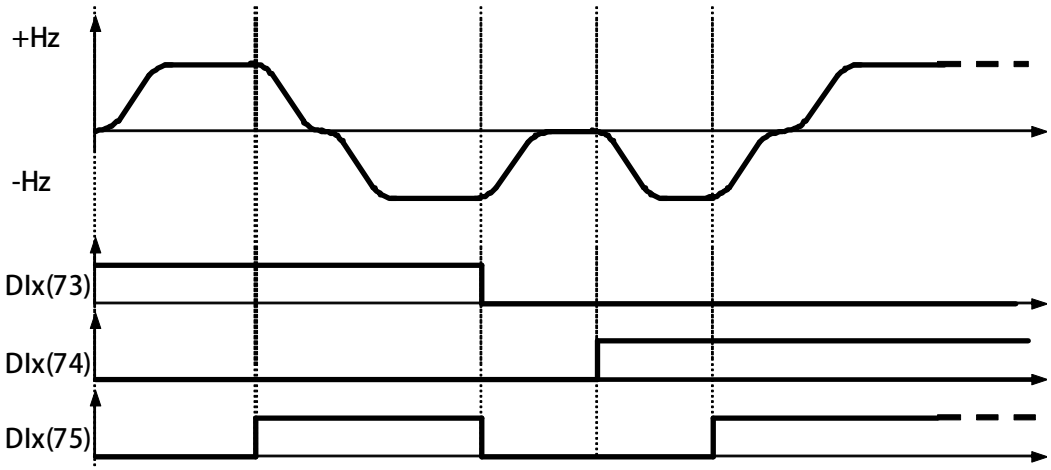
- DIx _ Select ➔ 0, No function
  When select number, the output will be OFF all the time.
- DIx _ Select ➔ 6, Over Heat Protect (OH)
  The input terminal can accept external A type output thermo-relay signal to let driver to trip and show *OH* alarm message.
- DIx _ Select ➔ 7, Negative Output of Over Heat Protect (/OH)
  The input terminal can accept external B type output thermo-relay to let driver to trip and show *OH* alarm message.
- DIx _ Select ➔ 10, Speed Select SW0
- DIx _ Select ➔ 11, Speed Select SW1
- DIx _ Select ➔ 12, Speed Select SW2
  These 3 functions are used to select the pre-set speed Pr.270 ~ Pr.277. To use the 8 sets pre set speed function, the Pr.278 must set to be 0.

Usage of SW0 ~ SW2:

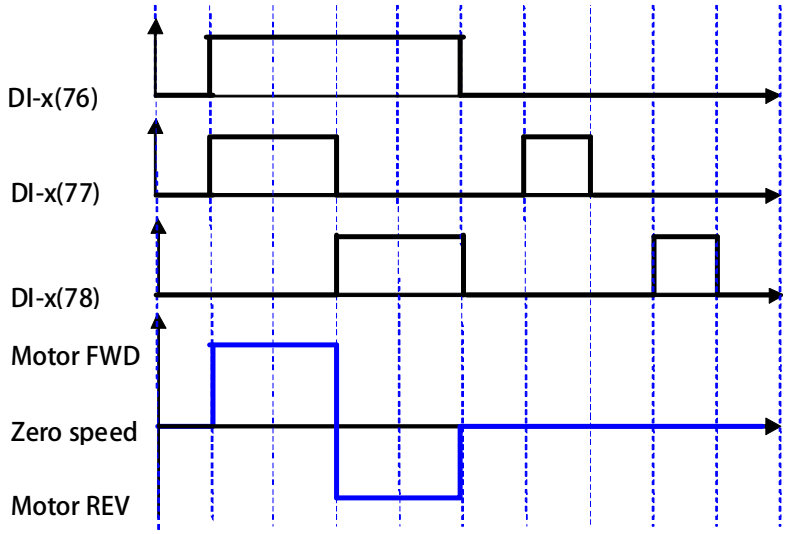
Parameter	Selected Speed	SW2 DIx(12)	SW1 DIx(11)	SW0 DIx(10)	NOTE
270	Speed Set0	0	0	0	0：DI non active 1：DI active
271	Speed Set1	0	0	1	
272	Speed Set2	0	1	0	
273	Speed Set3	0	1	1	
274	Speed Set4	1	0	0	
275	Speed Set5	1	0	1	
276	Speed Set6	1	1	0	
277	Speed Set7	1	1	1	

- DIx _ Select ➔ 13, Speed Command Setting Select
  If the input is active, the speed command is set from AI1.
  If the input is non active, the speed command is set from digital (Speed Set0 ~ 7).
- DIx_Select ➔ 14，Slip Compensation
  If the input is active，the speed command start slip-compensation。
  If the input is non active,，as normal V/F control。
  【NOTE】【Version=D722】This parameter is suitable for exceed than D722 version
- DIx _ Select ➔ 21, Run / Stop Enable Switch
  If the input is active, the Run / Stop function is enabled.
  If the input is non active, the Run / Stop function is disabled.
  【NOTE】This function is same with Pr.059 function, please refer to about Pr.059 detail.
  The priority of these two function is: DIx(21) > Pr.059.
- DIx _ Select ➔ 23, Reset
  If the input is active, the driver will be reset by this signal.
  【NOTE】This function only can be selected only by actual terminal, for virtual terminal can not select this function.

- DIx _ Select ➔ 73, Forward Run
  If the input is active, the driver will drive motor to forward direction.
- DIx _ Select ➔ 74, Reverse Run
  If the input is active, the driver will drive motor to reverse direction.
- DIx _ Select ➔ 75, Change Running Direction
  If the input is active, the driver will change the motor direction.
  The figure below shows how to use the function of 73, 74, and 75.



- DIx _ Select → 76，FWD / REV Switch
  If select this function，DIx(73) is forward and DIx(74) is not useful。
  Motor forward must set：DIx(77)+DIx(76)。
  Motor reverse must set：DIx(78)+DIx(76)。
  About function 76、77、78 activity，please refer to next。
- DIx _ Select → 77，FWD + DIx(76)
- DIx _ Select → 78，REV + DIx(76)



- DIx _ Select → 249, Emergency Stop (will cause *ES* trip)
  If the input is active, the driver will:
  - The driver will immediately trip and stop output to motor.
  - Motor will have no power and free run to stop.
  - The driver will show *ES* alarm message.

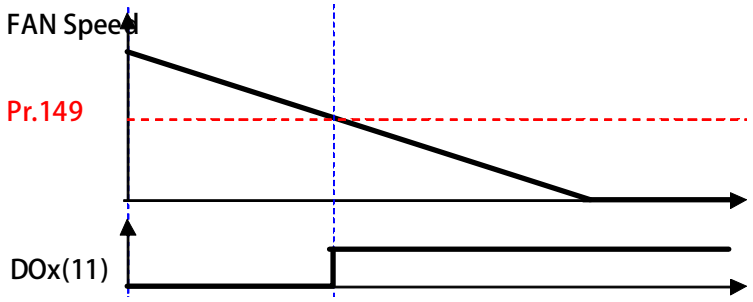
12. Digital Output Function

【Note】Version：if function version >= version，the function can be used。

Example：CA23 → C=2012 year / A=10 month /23 day

Function	Function Description	Version	Chapter
0	Always OFF		
1	Always ON		
2	In Running		
3	Over Load Pre-Alarm		
4	Alarm		
5	No Alarm		
6	Forward Run and Speed >= Pr.206 (speed compared value).		13.4
7	Reverse Run and Speed >= Pr.206 (speed compared value).		
9	SPZ (Speed Zero), Speed <= Pr.206.		
10	NSPZ (Not Speed Zero), Speed > Pr.206.		
11	Fan Speed < Pr.149		
12	SPA: Speed Arrive (Pr.19: Actual speed — Speed Cmd) <Pr.208	C514	13.4
13	SPNA: Speed Not Arrive (Pr.19: Actual speed — Speed Cmd)> = Pr.208	C514	
14	SPO (Speed Over compared value), Speed >= (Pr.207+Pr.208)		
15	SPU (Speed Under compared value), Speed<= (Pr.207-Pr.208)		
16	SPE (Speed Equal), the different between Speed and Pr.207 < Pr.208.		
27	Pulse_Frequency-1 > COMPARE-Set1		13.1
28	Pulse_Frequency-1 > COMPARE-Set2		
29	Pulse_Frequency-1 > COMPARE-Set3		
31	Pulse-Counter-1 > COMPARE-Set1		
32	Pulse-Counter-1 > COMPARE-Set2		
33	Pulse-Counter-1 > COMPARE-Set3		
80	Flip-Flop(1) Output.		13.2
81	Flip-Flop (2) Output.		
82	Flip-Flop (1) Reverse Output.		
83	Flip-Flop (2) Reverse Output.		
85	Over Torque Warning		
88	ACCing		
89	DECing		
97	ABS(AI2 Command Value) > AI2 Compare Set Value		
98	ABS(AI1 Command Value) > AI1 Compare Set Value		
104	Timer A output “Q”.		13.3
105	Timer A output “/Q”.		
106	Timer B output “Q”.		
107	Timer B output “/Q”.		

- DOx _ Select → 0，Always OFF
  The output terminal is always non active.
- DOx _ Select → 1，Always ON
  The output terminal is always active.
- DOx _ Select → 2，In Running
  If the driver is in running the terminal will be active.
  If the driver is not in running the terminal will be non active.
- DOx _ Select → 3，Over Load Pre-Alarm
  If electronic thermo accumulate to 50% of setting time, the terminal will be active.
- DOx _ Select → 4，Alarm
  In normal condition, the output terminal is non active. If there is any kind of alarm happened, the output terminal will be active。
- DOx _ Select → 5，No Alarm
  In normal condition, the output terminal is active. If there is any kind of alarm happened, the output terminal will be non active。
- DOx _ Select →11，Fan Speed < Pr.149
  If the fan speed < Pr.149, the output terminal will be active.



- DOx _ Select →85, Over Torque Warning
  If the driver’ s output torque exceeds the setting of Pr.95, the output terminal will be active.
- DOx_Select → 88，ACCing
  If select this function，when drive is accerating，output status will be active。
- DOx_Select → 89，DECing
  If select this function，when drive is decelerating，output status will be active。
- DOx_Select → 97，ABS(AI2 Command Value) > AI2 Compare Set Value
  When AI2 command value(Pr.485)> AI2 compare set value(Pr.487)，output status will be active。
- DOx_Select → 98，ABS(AI1 Command Value) > AI1 Compare Set Value
  When AI1 command value(Pr.234)> AI1 compare set value(Pr.488)，output status will be active。

13. Embedded Multi-function Module

13.1 Pulse-Couter Group

13.1.1 Pulse-Counter Parameters

- Pr.240 → PULSE_COUNTER-Mon1
- Pr.241 → PULSE_COUNTER-Mon2
- Pr.242 → PULSE_COUNTER-Mon3
  Upper parameters display each pulse-counter index value。
- Pr.243 → PULSE_FREQUENCY-Mon1
- Pr.244 → PULSE_FREQUENCY-Mon2
- Pr.245 → PULSE_FREQUENCY-Mon3
  Upper parameters display each frequence of pulse-counter。
- Pr.246 → COMPARE_SET-1
- Pr.247 → COMPARE_SET-2
- Pr.248 → COMPARE_SET-3
  Upper parameters set each compare-value of pulse-counter。

13.1.2 Pulse-Counter Digital Input

- DIx_Select → 27，Pulse-Counter-1 CLEAR to Zero
- DIx_Select → 28，Pulse-Counter-2 CLEAR to Zero
- DIx_Select → 29，Pulse-Counter-3 CLEAR to Zero
  Upper functions clear each pulse-counter result to zero。
- DIx_Select → 31，Pulse-Counter-1 INPUT
- DIx_Select → 32，Pulse-Counter-2 INPUT
- DIx_Select → 33，Pulse-Counter-3 INPUT
  When trigger each function，will add each result of pulse-counter。

13.1.3 Pulse-Counter Digital Output

- DOx_Select → 27，Pulse_Frequency-1 > COMPARE-Set1
  Active when (Pr.243：Pulse_Frequency-1)>(Pr.246：COMPARE_SET-1)。
- DOx_Select → 28，Pulse_Frequency-1 > COMPARE-Set2
  Active when (Pr.244：Pulse_Frequency-2)>(Pr.247：COMPARE_SET-2)。
- DOx_Select → 29，Pulse_Frequency-1 > COMPARE-Set3
  Active when (Pr.245：Pulse_Frequency-1)>(Pr.248：COMPARE_SET-3)。
- DOx_Select → 31，Pulse-Counter-1 > COMPARE-Set1
  Active when (Pr.240：PULSE_COUNTER-Mon1)>(Pr.246：COMPARE_SET-1)。
- DOx_Select → 32，Pulse-Counter-1 > COMPARE-Set2
  Active when (Pr.241：PULSE_COUNTER-Mon2)>(Pr.247：COMPARE_SET-2)。
- DOx_Select → 33，Pulse-Counter-1 > COMPARE-Set3
  Active when (Pr.242：PULSE_COUNTER-Mon3)>(Pr.248：COMPARE_SET-3)。

13.2 FlipFlop Group

13.3.1 FlipFlop Group Parameters

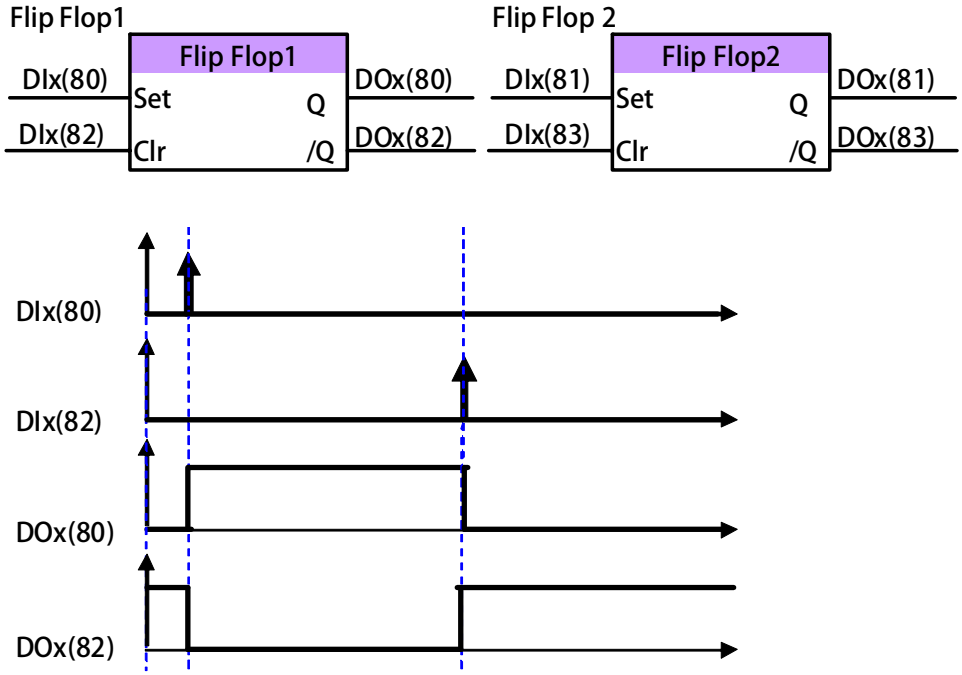
13.3.2 FlipFlop Group Digital-Input

- DIx _ Select → 80, Set Flip-Flop (1)
- DIx _ Select → 81, Set Flip-Flop (2)
- DIx _ Select → 82, Clear Flip-Flop(1)
- DIx _ Select → 83, Clear Flip-Flop(2)
- DIx _ Select → 84, Set T-Type Flip-Flop (1)
- DIx _ Select → 85, Set T-Type Flip-Flop (2)
- DIx _ Select → 86, Set Data Flip-Flop (1)
- DIx _ Select → 87, Set Data Flip-Flop (2)
- DIx _ Select → 88, Set Ck Flip-Flop (1)
- DIx _ Select → 89, Set Ck Flip-Flop (2)

13.3.3 FlipFlop Group Digital-Output

- DOx _ Select → 80, Flip-Flop(1) Output
- DOx _ Select → 82, Flip-Flop (1)Reverse Output
- DOx _ Select → 81, Flip-Flop(2) Output
- DOx _ Select → 83, Flip-Flop (2)Reverse Output

13.2.4 General Flip-Flop



The driver contains the general Flip-Flop.In each Flip-Flop needs two input,and two output

Two input set to DIx(80) and DIx(82)

Two outout set to DOx(80) and DOx(82)

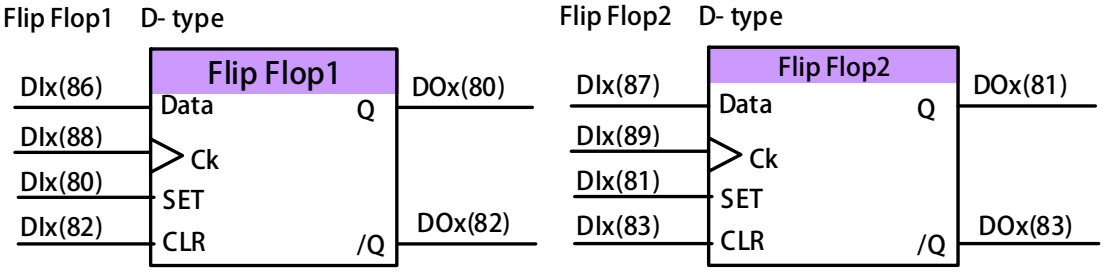
Relationship：

When trigger DIx(80)，DOx(80) output ON。

When trigger DIx(82)，DOx(80) output OFF。

※ DOx(82) opposite DOx(80) output。

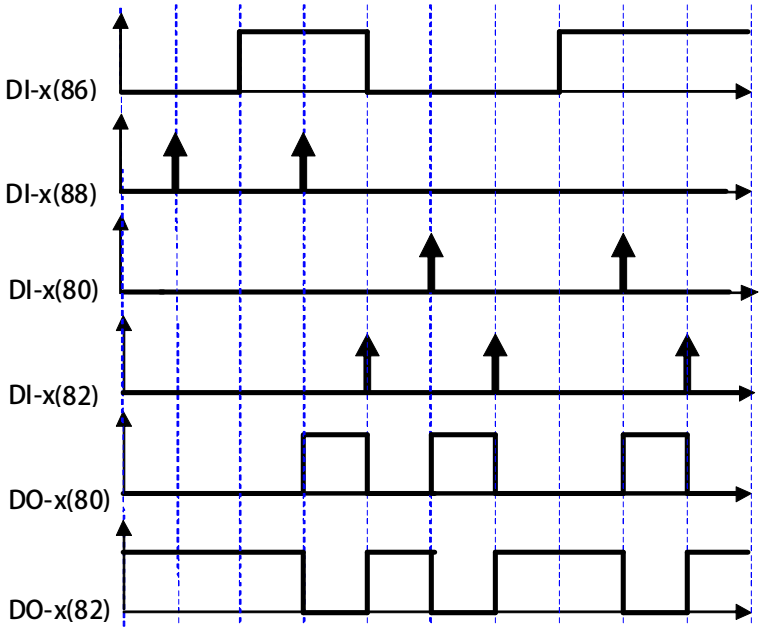
13.2.5 D-Type Flip-Flop



Truth Table:(D Type Flip/Flop)

STEP	D	CK	SET	CLR	Q	/Q
Reset	0	0	0	0	0	1
	0	↑	0	0	0	1
	1	↑	0	0	1	0
	X	X	1	0	1	0
	X	X	X	1	0	1

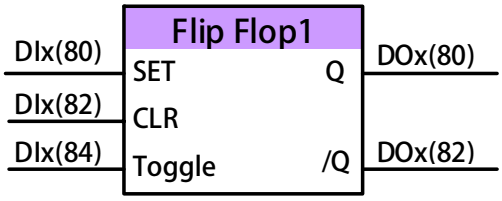
X: Don’ t Care



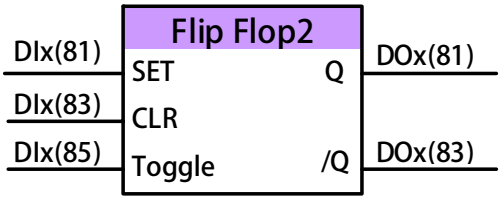
1. When trigger DIx(88)，show DIx(86) status to DOx(80) 。
2. When trigger DIx(80)，then DOx(80) output ON。
3. When trigger DIx(82)，then DOx(80) output OFF。
4. DOx(82) opposite DOx(80) output。

13.2.6 T-Type Flip-Flop

Flip Flop1 T-type

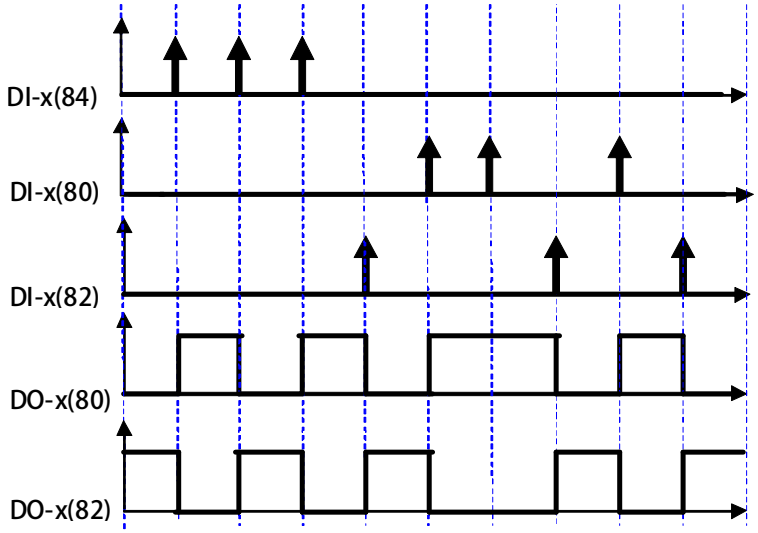


Flip Flop2 T-type



Truth Table:(T type Flip/Flop)

STEP	Toggle	SET	CLR	Q	/Q
Reset	0	0	0	0	1
	0，1，↓	↑	0，1，↓	1	0
	0，1，↓	0，1，↓	↑	0	1
	↑	0，1，↓	0，1，↓	/Q	Q



When trigger DIx(80)，DOx(80) output is ON。
When trigger DIx(82)，DOx(80) output is OFF。

1. When trigger DIx(84)，all status opposite and show to DOx(80) 。
2. When trigger DIx(80)時，then DOx(80) output ON。
3. When trigger DIx(82)時，then DOx(80) output OFF。
4. DOx(82)，opposite DOx(80) output。。

13.3 Timer Group

13.3.1 Timer Group Parameters

The drive has embedded two timer module (Timer A, Timer B); below section will describe the function and application of these two timer.

- Pr.249 → Type of Timer A

  This parameter can set the operation type of Timer A.

Value	Description
0	Timer A Delay Off Mode
1	Timer A Delay On Mode
2	Timer A Auto On/Off Mode

- Pr.250 → T1 time of Timer A.
- Pr.251 → T2 time of Timer A.

- Pr.252 → Type of Timer B.

  This parameter can set the operation type of Timer B.

Value	Description
0	Timer B Delay Off Mode
1	Timer B Delay On Mode
2	Timer B Auto On/Off Mode

- Pr.253 → T1 time of Timer B.
- Pr.254 → T2 time of Timer B.

13.3.2 Timer Group Digital-Input

- DIx _ Select → 60, TIMER-A "TRIG/START" input
- DIx _ Select → 61, TIMER-B "TRIG/START" input

13.3.3 Timer Group Digital-Output

- DOx _ Select → 104, Timer A output "Q"
- DOx _ Select → 105, Timer A output "/Q"
- DOx _ Select → 106, Timer B output "Q"
- DOx _ Select → 107, Timer B output "/Q"

Description of the usage：

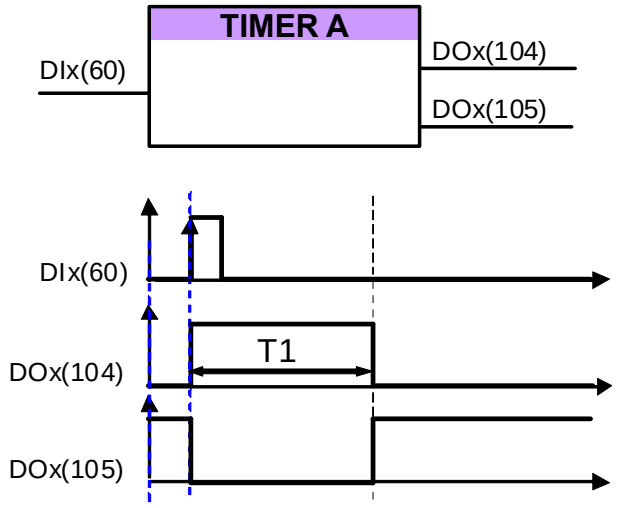
Below section will description the way to set and start the timer. All the two timers are individual and have there own parameter group for setting.

1. Select the function type of timer; for Timer A use Pr.249, for Timer B use Pr.252.
2. Define the action time of the timer; for Timer A use Pr.250 and Pr.251, for Timer B use Pr.253 and Pr.254.
3. Define a DI to be the Enable input of timer.
4. Define a DO to be the output of timer.

13.3.4 Timer Function (Delay Off Mode)

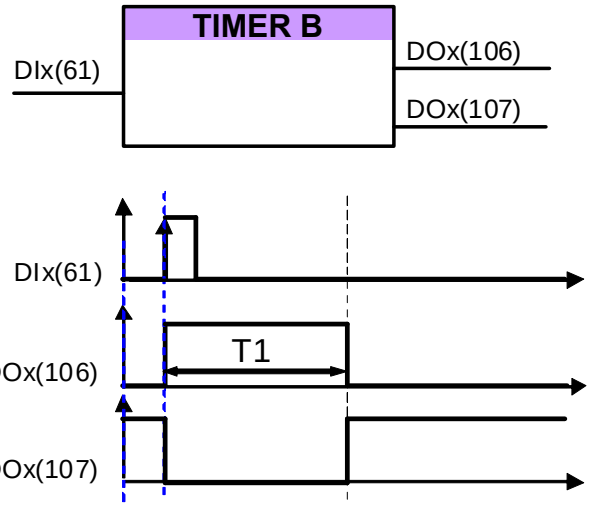
Example : Delay off Mode Timer

Pr.249 = 0: Delay Off Mode



When DIx(60) is ON, DOx(104) becomes ON and after the time of T1, it becomes OFF.
DOx(105) is opposite to DOx(104).

Pr.252 = 0: Delay Off Mode

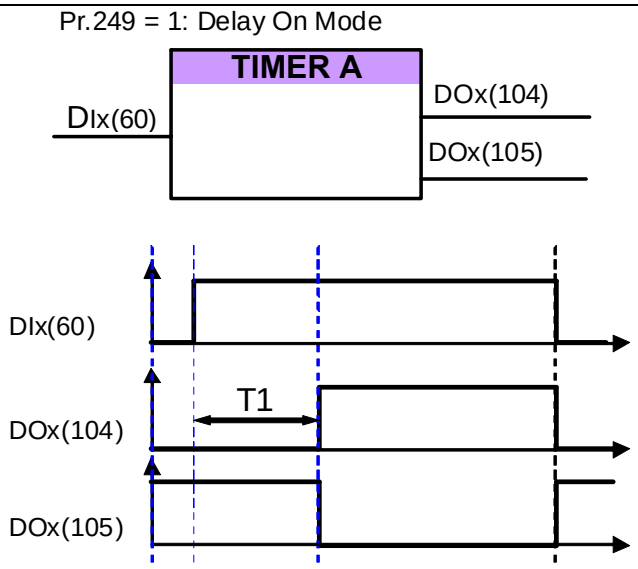


When DIx(61) is ON, DOx(106) becomes ON and after the time of T1, it becomes OFF.
DOx(107) is opposite to DOx(106).

13.3.5 Timer Function (Delay On Mode)

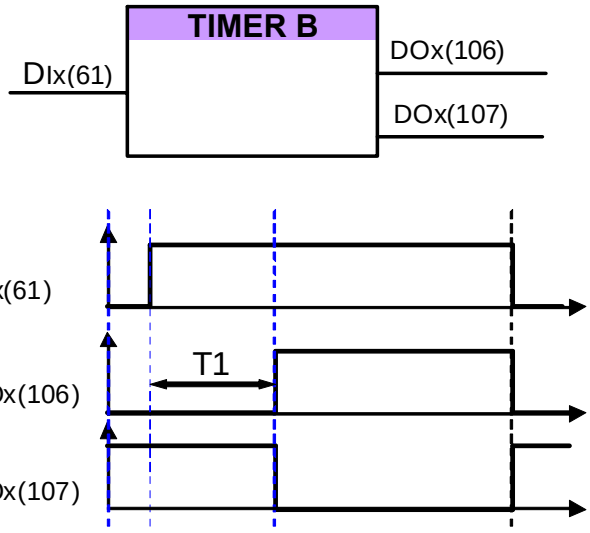
Example : Delay On Mode

Pr.249 = 1: Delay On Mode



When DIx(60) ON, DOx(104) becomes OFF, and after T1 time, it becomes ON; when DIx(60) becomes OFF, DOx(104) becomes OFF immediately.
DOx(105) is opposite to DOx(104).

Pr.252 = 1: Delay On Mode

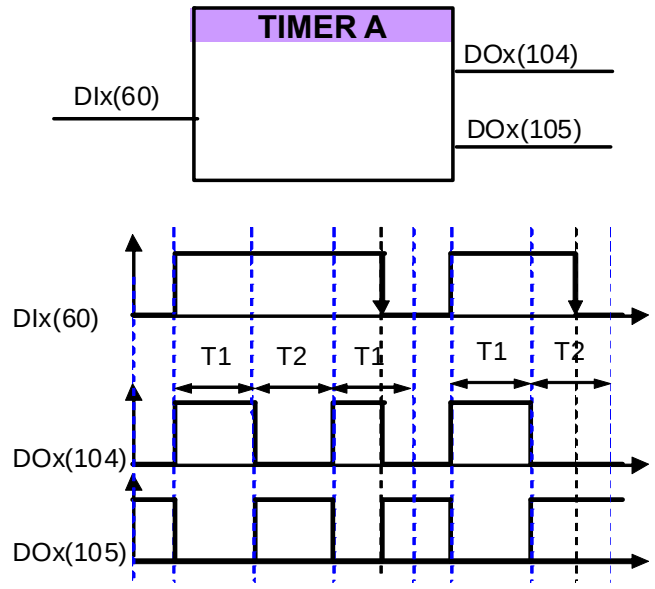


When DIx(61) ON, DOx(106) becomes OFF, and after T1 time, it becomes ON; when DIx(61) becomes OFF, DOx(106) becomes OFF immediately.
DOx(107) is opposite to DOx(106).

13.3.6 Timer Function (Auto On/Off Mode)

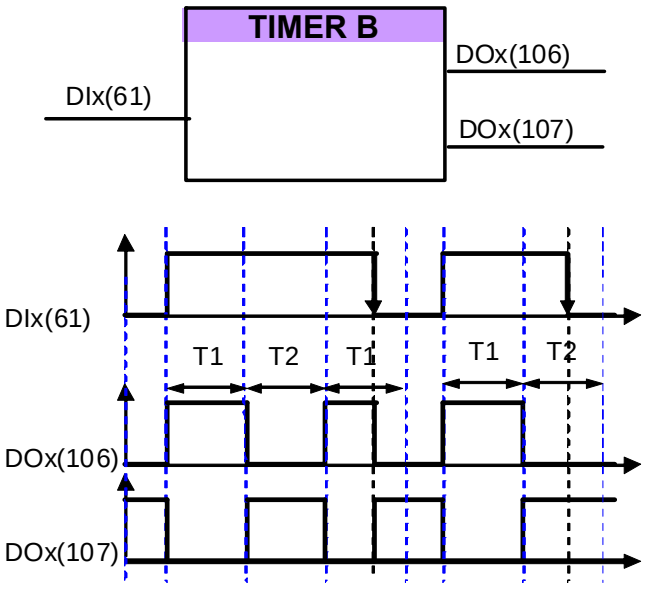
Example 3: Auto On/Off Mode

Pr.249 = 2: Auto On/Off Mode



When DIx(60) is ON, DOx(104) output ON/OFF toggled; T1 determine the ON timing, T2 determine the OFF timing. When DIx(60) becomes OFF, DOx(104) becomes OFF immediately.
DOx(105) is opposite to DOx(104).

Pr.252 = 2: Auto On/Off Mode



When DIx(61) is ON, DOx(106) output ON/OFF toggled; T1 determine the ON timing, T2 determine the OFF timing. When DIx(61) becomes OFF, DOx(106) becomes OFF immediately.
DOx(107) is opposite to DOx(106).

13.4 Speed Compare Group

13.4.1 Speed Compare Group Parameters

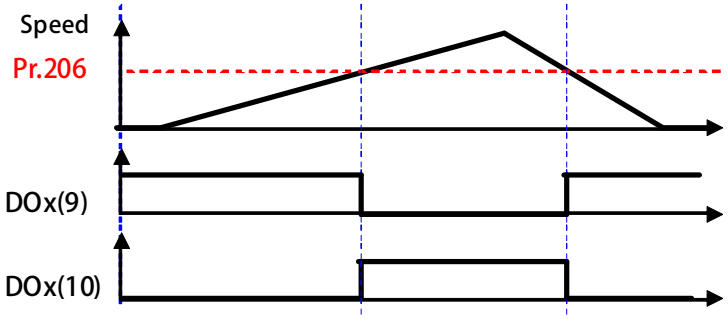
- Pr.206 ➔ Speed Compare Value
- Pr.207 ➔ Speed Arrive Setting
- Pr.208 ➔ Speed Arrive Range
- Pr.222 ➔ Speed Feedback Filter(For DOx)

  This parameter decides speed feedback filter factor，
  When filter factor larger，the speed will be stable better。
  【Note】【Version=CB16】：This parameters is suitable for exceed than CB16 version

13.4.2 Speed Compare Group Digital-Input

13.4.3 Speed Compare Group Digital-Ouput

- DOx _ Select → 6， Forward Run and Speed >= Pr.206 (speed compared value)
  If motor runs in forward direction and the speed >= Pr.206， output will be active。
  【Note】This function speed effected by Pr.222：speed feedback filter factor
- DOx _ Select → 7， Reverse Run and Speed >= Pr.206 (speed compared value)
  If motor runs in reverse direction and the speed >= Pr.206， output will be active。
  【Note】This function speed effected by Pr.222：speed feedback filter factor
- DOx _ Select → 9， SPZ (Speed Zero)， Speed <= Pr.206
  If the motor’ s speed <= Pr.206， the output terminal will be active.
  【Note】This function speed effected by Pr.222：speed feedback filter factor
- DOx _ Select → 10， NSPZ (Not Speed Zero)， Speed > Pr.206
  If the motor’ s speed > Pr.206， the output terminal will be active.
  【Note】This function speed effected by Pr.222：speed feedback filter factor



- DOx _ Select → 12，SPA: Speed Arrive (Pr.19: Actual Speed - Set speed) <Pr.208
  When the output terminal function selection mode， the function of the SPA (Speed Arrive) The terminal must start forward or reverse the state，and when the drive Pr.19: the actual speed - Set the speed <Pr.208，the terminal output ON.
- DOx _ Select → 13，SPNA: Speed Not Arrive (Pr.19: the actual speed - the speed setting)> = Pr.208
  When the output terminal function selection mode， function SPNA (Speed Not Arrive:) The terminal must start forward or reverse the state，and when the drive Pr.19: actual speed - Set the speed> = Pr.208，the terminal output ON.
- DOx _ Select → 14，SPO (Speed Over compared value)， Speed >= (Pr.207+Pr.208)
- DOx _ Select → 15，SPU (Speed Under compared value)， Speed<= (Pr.207-Pr.208)
- DOx _ Select → 16，SPE (Speed Equal)， the different between Speed and Pr.207 < Pr.208

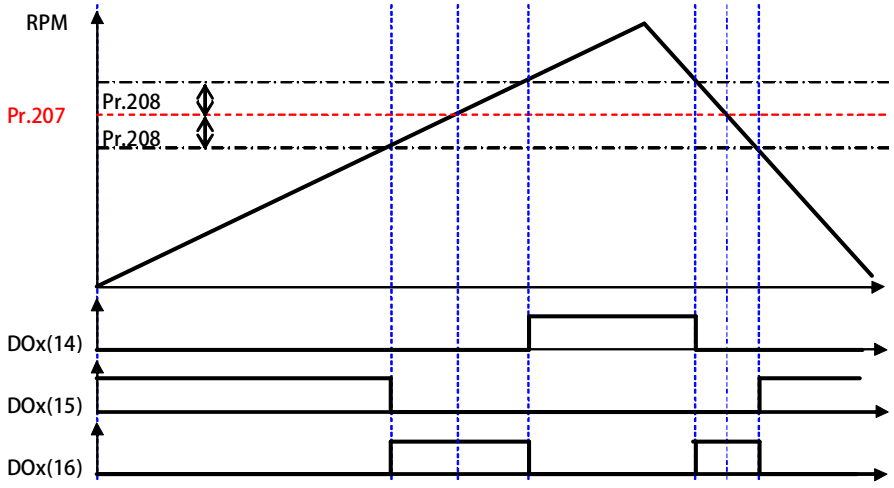
【Note】This three functions speed effected by Pr.222：speed feedback filter factor

Description: Refer to the figure below.

If the motor’s speed reaches or exceeds Pr.207+Pr.208， the output terminal DOx(14) will be active.

If the motor’s speed is equal or under “Pr.207 - Pr.208”， the output DOx(15) will be non active.

If the motor’s speed is between Pr.207-Pr.208 and Pr.207+Pr.208， the output DOx(16) will be active.



13.5 Speed Up / Down Counter

There is a embedded module called Speed Up / Down Counter; it has two types of function:

1. Counting by trigger type
2. Counting by time type

All the two types function of timer are used to be a speed command source, and can be used by selecting the Pr.278 function type 2.

13.5.1 Speed Up/Down Counter Parameters

- Pr.104 ➔ Speed Up / Down Counter start type.
  This parameter defines the start value of Speed Up / Down Counter.

Value	Description
0	After power-on or reset the Speed Up / Down Counter start from 0.
1	After power-on or reset the Speed Up / Down Counter start from the preloaded value that was set in Pr.105.

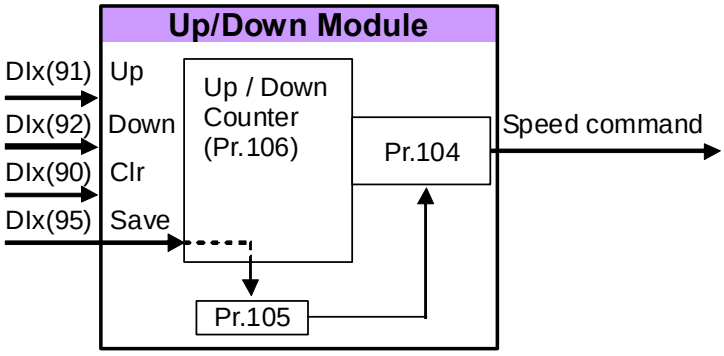
- Pr.105 ➔ Speed Up / Down Counter preload value
  If Pr.104 = 1, the Speed Up / Down Counter will preloaded a start value from Pr.105.
  If DIx(95) is trigged, the value of Speed Up / Down Counter will be stored into Pr.105.
- Pr.106 ➔ Speed Up / Down Counter change volume by trigger
  This parameter defines the change volume that will be changed for Speed Up / Down Counter when every trigger happened.
  When trigger DIx(91), the counter will increase a volume of Pr.106.
  When trigger DIx(92), the counter will decrease a volume of Pr.106.
- Pr.107 ➔ Speed Up / Down Counter change volume by time
  This parameter defines the change volume that will be changed for Speed Up / Down Counter in every second.
  When DIx(93) is ON， the counter will increase a volume of Pr.107 in every second.
  When DIx(94) is ON， the counter will decrease a volume of Pr.107 in every second.
- Pr.117 ➔ Up/Dn Data Temperary Value
  This parameter display Up/Dn Result value。

13.5.2 Speed Up/Down Counter Digital-Input

- DIx _ Select → 90，Up/Down Buffer Clear to Zero
  If input is active, clear the Speed Up / Down counter register to be 0 when be active.
- DIx _ Select → 91，Up/Down Buffer Trig. INC
  If the input is active, increase the Speed Up / Down Counter (Pr.106) when be active.
- DIx _ Select → 92，Up/Down Buffer Trig. DEC
  If the input is active, Decrease the Speed Up / Down Counter (Pr.106) when be active.
- DIx _ Select → 93，Up/Down Buffer Level-INC
  Increase the Speed Up / Down Counter by a preset value in Pr.107 every second.
- DIx _ Select → 94，Up/Down Buffer Level- DEC
  Decrease the Speed Up / Down Counter by a preset value in Pr.107 every second.
- DIx _ Select → 95，Up/Down Buffer "SAVE Buffer to Pr.105"
  Save Speed Up / Down Counter value into Pr.105.

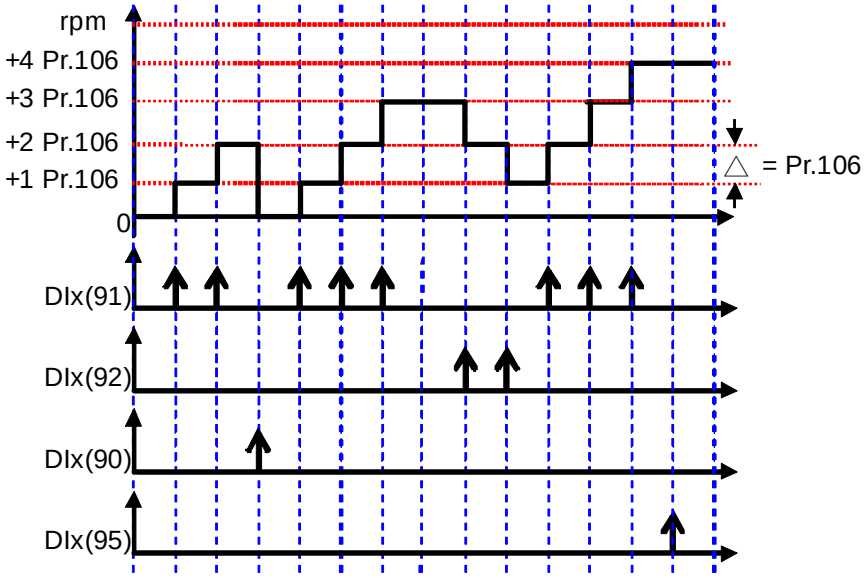
13.5.3 Speed Up/Down Counter Digital-Ouput

13.5.4 PulseType-Speed Up/Down Counter



Set all the parameters as the drawing showed in front of here. The start value of Speed Up / Down Counter can be determined by selecting the type of Pr.104 to start from 0 or preload a value from Pr.105.

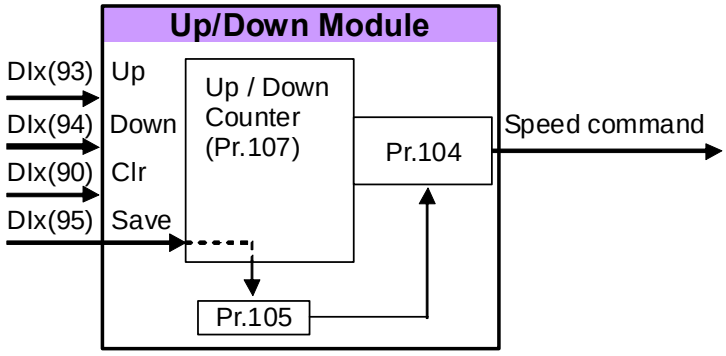
The following timing chart describes the DI and DO status of Speed Up / Down Counter.



Description:

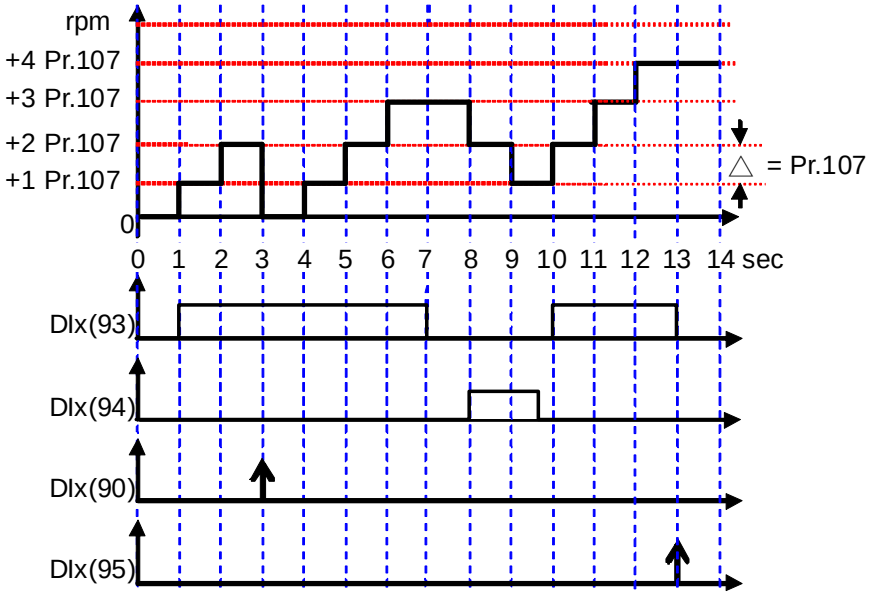
1. The start value can be determined by selecting type of Pr.104 to start from 0 or a preloaded value of Pr.105. In here, it start from 0.
2. When DIx(91) is trigged, the output of counter will increase a value of Pr.106.
3. When DIx(90) is trigged, the output of counter will be cleared to 0.
4. When DIx(92) is trigged, the output of counter will decrease a value of Pr.106.
5. When DIx(95) is trigged, the value of counter will be stored into Pr.105.

13.5.5 Level Type-Speed Up/Down Counter



Set all the parameters as the drawing showed in front of here. The start value of Speed Up / Down Counter can be determined by selecting the type of Pr.104 to start from 0 or preload a value from Pr.105.

The following timing chart describe the DI and DO status of Speed Up / Down Counter.



Description:

1. The start value can be determined by selecting type of Pr.104 to start from 0 or a preloaded value of Pr.105. In here, it start from 0.
2. When DIx(93) is trigged, the output of counter will increase a value of Pr.107 for every second.
3. When DIx(90) is trigged, the output of counter will be cleared to 0.
4. When DIx(94) is trigged, the output of counter will decrease a value of Pr.107 for every second.
5. When DIx(95) is trigged, the value of counter will be stored into Pr.105.

13.6 Rotary Switch Group

The Rotary Switch function is used to set frequency or speed of the drive.

13.6.1 Rotary Switch Group Parameters

- Pr.118 → RSW TYPE

  This parameter can define the type of the Rotary Switch. There are for types can be select.

Value	description
0	After RESET, the Pr.137(RSW data) will start from 0, and the max. value will be limited by the setting of Pr.152.
1	After RESET, the Pr.137(RSW data) will start from Pr.138, and the max. value will be limited by the setting of Pr.152.
2	After RESET, the Pr.137(RSW data) will start from 0, and the max. value will be 65535.
3	After RESET, the Pr.137(RSW data) will start from Pr.138, and the max. value will be limited 65535.

  When select 0 or 1, the speed is calculated by the equation showed below:

  Rpm = Pr.137 / Pr.152 x Pr.260

  When select 2 or 3, the speed is calculated by the equation showed below:

  Rpm = Pr.137 / 65535 x Pr.260

- Pr.137 → RSW Data

  This parameter can show the pulse count that come from the Rotary Switch A/B phase clock. The frequency of the A/B clock is multiplied by 4 times inside the drive.

  【NOTE】Because the frequency of the A/B clock, every step of the Rotary Switch will cause the record of Pr.137 to increase 4 or decrease 4 counts.

- Pr.138 → RSW Backup Memory

  This parameter defines the value that can be the default of the Pr.137 or save the Pr.137 value.

- Pr.152 → RSW Max Data Limit

  This parameter defines the max. limit of the Pr.137 value.

  【NOTE】Please refer to paragraph 0

13.6.2 Rotary Switch Group Digital-Input

- DIx _ Select → 203，Rotary Switch signal-A input.

  This function defines the terminal to be the input of Rotary Switch signal-A.

- DIx _ Select → 204，Rotary Switch signal-B input.

  This function defines the terminal to be the input of Rotary Switch signal-B.

  【NOTE】These two DI functions should be defined at the same time. The signal A and B are used to define the direction and 4-times frequency accuracy of the Rotary Switch pulse train.

- DIx _ Select → 205，Rotary Switch signal-Store input.

  This function defines the terminal to be the input of Rotary Switch pulse count store; when this function is active, the value in Pr.137 (RSW Data) will be stored into Pr.138 (RSW Backup Memory).

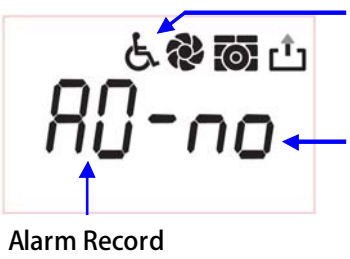
13.6.3 Rotary Switch Group Digital-Output

Example for using Rotary Switch:

1. Set the speed limit Pr.260 = 120.
2. Pr.065 = 73 → Set FWD.
3. Pr.066 = 74 → Set REV.
4. Pr.278 = 19 → Select speed command set from Rotary Switch.
5. Pr.118 = 0 → Select Rotary Switch type: Start from 0, with max. limit.
6. Set DI1(203), DI2(204), DI3(205) → Set the input definition for Rotary Switch.
7. Pr.152 = 1000 → Set max. limit value of Rotary Switch.
8. Connect the signals A, B, Store of Rotary Switch to the DIs those were defined by step 6.
9. It is necessary to reset the drive to let the changes available.
10. Start to run forward and the drive will run in the speed that set by Rotary Switch. If the Rotary Switch is see in 500, the speed will be Pr.137 / Pr.152 * Pr.260 = 60Hz.
11. Press the Store bottom, the value in Pr.137 will be stored into Pr.152.

15. Alarm Message and Maintenance

15.1 Display of Alarm Message



When alarm happened, the LCD display will show message as the figure showed in the left side. If used panel is COLOR type, the display back light will turn to red.

The items of the alarm message are Alarm Record and Alarm Message. The current alarm record is A0, and user can press the up or down keys to check the earlier records A1, A2, A3.

Every time the drive turned on, the alarm records will be shift to earlier position, and the A0 will be clear to record the current status.

The Alarm Message description will be explained in next paragraph.

15.2 Maintenance of Alarm Message

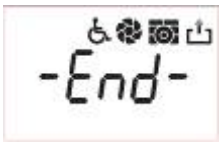
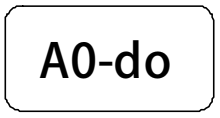
When the panel enter the alarm mode, it means that there is important message to show on the LCD display. The user should treat this condition by following the setps introduced below with serious maner. If still cannot fix the problem after these methods mentioned in here, please contact with product agency or maintain department of manufacturer. The basicaly maintenance steps are described below:

Alarm message	Description and maintenance
	*A0 — no* ➔ No Alarm When showing ***no*** presents there is no alarm. ● If the driver is in normal condition, the display will show like this way when enter alarm mode.
	*A0 — CF* ➔ FAN Alarm When showing ***CF*** presents the fan speed is too low or failed to run. ● Check if the fan is stalled by dust. ● Check the setting of Pr.149 (FAN Low Speed Warning and Trip Level) is proper or not. Normally the fan speed is in 3000~4000rpm; therefore, this parameter should set for 2000~2500rpm for proper check level. ● Set the parameter Pr.146 (FAN Control Type) = 1 to force the fan running, and check the running condition of fan to confirm the fan is in good condition or not. If the fan is out of work, replace it.
	*A0 — SE* ➔ Memory Alarm When showing ***SE*** presents the EEPROM is not in good condition. ● Contact with agency or send the driver back for maintenance.

	*A0 — ES* ➔ Emergency Stop When showing *ES* presents that there is an external signal to order the driver stop for emergency. ● Remove the input line of emergency stop signal from the driver′ s input terminal. Under safe condition, reset the driver. If the alarm message still exists, please send this driver for maintenance. ● Check the wiring condition of the emergency stop signal. Is the line broken or short with other signal? ● Check the emergency stop switch or signal generator. Is there any defect or miss? ● Is there any interference to cause the signal happened? ● If the emergency condition is indeed, contact with the system engineer to fix the condition. ● Unless the emergency condition is fixed completely, the driver shouldn′ t be operated to run the motor.

	*A0 — Od* ➔ Over Discharge When showing *Od* presents the discharge time exceeds the setting in parameter Pr.151 (Over Discharge Protect Time). ● Check the setting of Pr.151 is proper or not. If the setting is too short, it is easily to cause alarm. To set it for longer time, should consider if the resistor′ s wattage is enough or not. ● Check the load of motor. Is the inertia too large to generate great feed back energy? ● Check the input power voltage of driver. Is the voltage exceeds the rating of input? ● Check if the setting of Pr.130 (Input Power Voltage) is suitable or not. ● Check if the displayed message of Pr.132 (DC Bus Voltage) is correct or not? ● According to the result of last 3 check items to decide if there is necessary to modify the setting of Pr.131 (DC Bus Measurement Adjust).
	*A0 — OL* ➔ Motor Over Load When showing *OL* presents the motor is over load. The over load protection is executed by the internal electronic thermo relay. When the accumulate thermo time exceeds the setting value, the driver will trip and show this message. ● Check the setting of Pr.215 (Electronic Thermo Relay Time) is proper or not. ● Check the setting of Pr.210 (Motor Full Load Current Ratio) is correct or not. ● Check the setting of r Pr.211 (Motor Exciting Current Ratio) is correct or not. ● Check if the motor is stalled. ● Check if the load exceeds the rating of motor. ● Check if the variant of load exceeds the design specification.

	*A0 — OH* ➔ Heat Sink Over Heat or External Over Heat Protect When showing *OH* presents the heat sink temperature exceeds the setting of Pr.150 (Over Heat Protect Temperature) or there is an external over heat protect signal happened. ● Check if the setting of Pr.150 (Over Heat Protect Temperature) is proper or not. ● Set the Pr.146 (Fan Control Type) = 1 to check the fan function. If the fan is out of working, replace it. ● Check if the fan is stalled. ● Check if the condition of driver fit in the installation environment. ● Check if the ambient temperature exceeds the installation environment. ● The temperally variation of climate may cause ambient temperature to be high, arranging a proper cooling method to prevent over heat contition is necessary at this moment.
	*A0 — OP* ➔ Over Potential When showing *OP* presents the dc bus voltage exceeds the protect level. ● If it is caused by the regeneration when decreasing speed, apply a proper discharge resistor to discharge circuits. ● Re-calculate the value of discharge resistor to fit in the volume of regeneration energy. ● Check if the input power voltage exceeds the input rating of driver. ● Check if the setting of Pr.130 (Input Power Voltage) is correct or not. ● Check if the displayed message of Pr.132 (DC Bus Voltage) is correct or not. ● According to the result of last 3 check items to decide if there is necessary to modify the setting of Pr.131 (DC Bus Measurement Adjust).
	*A0 — UP* ➔ Under Potential When showing *UP* presents the dc bus voltage is lower the protect level. ● Check the input power system. ● Check the input power voltage fits in the rating of driver. ● Check if the setting of Pr.130 (Input AC Power Voltage) is correct or not. ● Check if the displayed message of Pr.132 (DC Bus Voltage) is correct or not.

	*A0 — OC* ➔ Over Current When showing *OC* presents the output current exceeds the rating of driver. ● Check if the type of motor fits in the driver's specification. ● Check if the rating of motor's fits in the rating of driver. ● Check if the connection of U, V, and W is properly or not. ● Check if the power lines to motor is broken or short with other lines or any defect. ● Check if the motor's wires are short or not. ● Check the settings of parameter group IMAC Motor Group are correct or not. ● If the *OC* happened in the accelerating period, try to increase the setting of Pr.283 (Acc Time). ● If the *OC* happened in the decelerating period, try to increase the setting of Pr.284 (Dec Time). ● Check if the setting of Pr.130 (Input AC Power Voltage) is correct or not. ● Check if the displayed message of Pr.132 (DC Bus Voltage) is correct or not.
	*- End -* ➔ When use C-PANEL，Auto Tuning Procedure is finished When showing *End* presents the auto tuning procedure is finished. ● This message is used to indicate procedure status and is not an alarm message.
	*- do -* ➔ When use C-PANEL，Auto Tuning Procedure finished When showing *do* presents the auto tuning procedure is finished. ● This message is used to indicate procedure status and is not an alarm message.

16. CE Certificate

16.1 EMC Certificate

SGS

Certificate No: ED/2008/50023C

VERIFICATION OF EMC COMPLIANCE

SGS-TW Reference No.	: ED/2008/50023C
Model No	: IRIS-3.5A, IRIS-05A, IRIS-07A
Product Name	: IRIS MOTOR DRIVE
Applicant	: JOINT PEER SYSTEC CORP.
Address of Applicant	: (222) 6F. , NO. 266, Sec. 3, Pei Shen Road, Shen Keng Shiang, Taipei Hsien, Taiwan
SGS approved laboratory	: SGS Taiwan
Date of Issue	: June 13, 2008
Test(s) Required	: SGS Onsite Test Standard: 2006 EN 61000-6-2: 2005, EN 61000-6-4: 2007 CISPR 11/ EN 55011: 2007, Class A

Conclusion

The equipment complies with the principal protection requirement of the directive 89/336/EEC amended by 2004/108/EC. The apparatus meets the requirements of the above standards.
*This certification is only valid for the equipment and configuration described, and in conjunction with the test data detailed above. It contains the result of the single examination of the subject being in hand and does not represent any universally valid decision concerning the quality of any other subject of the current production.

Authorized Signatory:

Jason Lin

CE

SGS TAIWAN LTD.
Jason Lin
Technical Manager

SGSPAPER
07301280

16.2 LVD Certificate

SGS

Certificate No: EZ/2008/50019C

VERIFICATION OF LVD COMPLIANCE

SGS-TW Reference No.	:	EZ/2008/50019C
Model No	:	IRIS-3.5A, IRIS-05A, IRIS-07A
Product Name	:	IRIS MOTOR DRIVE
Applicant	:	Joint Peer Systec Corp.
Address of Applicant	:	(222) 6F., No. 266, Sec. 3, Pei Shen Road, Shen Keng Shiang, Taipei Hsien, Taiwan
Report No.	:	EZ/2008/50019
Date of Issue	:	July 08, 2008
Applicable Standards	:	IEC/EN 61010-1:2001

Conclusion

Based upon a review of the Test Report, the apparatus is deemed to meet the requirements of the above standards and hence fulfill the requirements of:

Low Voltage Directive 2006/95/EC

Note: This certificate is only valid for the equipment and configuration described, and in conjunction with the test data detailed above.

Authorized Signatory:

Jason Lin

CE

SGS TAIWAN LTD.
Jason Lin
Technical Manager

17. Control Panel Description

17.1 C-Panel Operational

When power-on start or reset the panel， the key will be locked and need user to unlock it. After user left it after 10 minutes for not using， the panel will lock the keys automatically.

17.1.1 Lock and unlock

Press JPS at least 1 sec, till 4 beeps sound.
The panel will be unlocked.

- After unlock the panel， to do this proceedure again will lock the panel.
- Keep unprocees this panel for 10 minutes， the panel will lock the key function automatically.
- After unlock process，the display will show “unloc”; after lock process，display will show “loc”

17.1.2 Change mode

At any status ➔ Press Mode

By pressing this bottom， can enter these different modes sequentially:

- Monitor mode
- Parameter mode
- Alarm mode

17.1.3 Monitor mode

Select the monitoring item

When in Monitor mode ➔ Press △ or ▽

By using the up/down keys， can select the monitoring item:

- N Motor′ s speed.
- Hz The output frequency.
- A Output current.
- V Output voltage.

To run or stop the motor

When in monitor mode ➔ Press Run twice (within 0.5sec)

Will start the motor to run， or

When in monitor mode ➔ Press Reset / Stop twice (within 0.5sec)

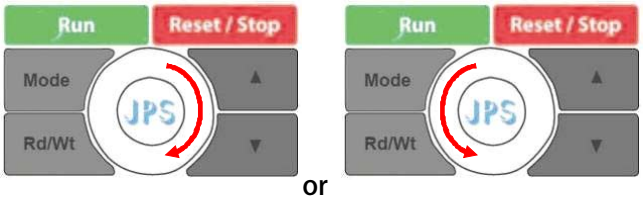
Will stop the motor.

In order to operate the run and stop function on the control panel， the condition list below should be satisfied:

- Pr.065=0 FWD terminal function: no function.
- Pr.068=73 Set the virtual input function: FWD function.
- Pr.059=1 Control panel RUN / STOP function switch: enable.

17.1.4 Use the fly wheel function in the monitor mode

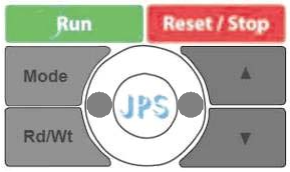
In monitor mode， can enter the fly wheel mode by touching and draw on the wheel.



If enter the fly wheel mode successfully， the icon will be showed on the display; in the mean time， the display will show the present speed， and the latest digital will flash to notice that the data is ready to be edit.

Use fly wheel and the up/down keys to edit data

- Change the edit position

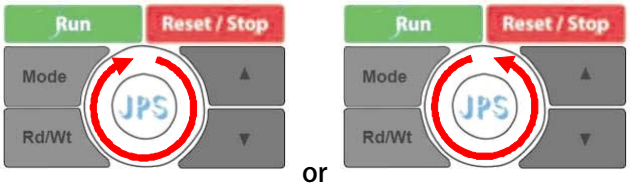
Touch the right or left side of the wheel lightly 

to change the edit position.

By using this way， can change the edit positon to save the operation time.

- Edit the value

1. Using the fly wheel to change the value



to increase or decrease the value.

2. Using up/down keys to change the value

press  or  to change the value.

Bothe of these two ways can be used to change the value.

- Write

Press 

twice within 0.5sec, the value will be written into memory.

17.1.5 Parameter mode (select， read， edit， write)

Press 

to enter parameter mode.

After enter parameter mode， LCD display will show Pr.000.

In the parameter mode should follow the steps list below to read or change the parameter’s value.

1. Select parameter.
2. Read out the value of parameter.
3. Enter edit mode to change the value， if you wish.
4. Write down the value into the parameter and save in memory.
5. Exit from edit mode to select another parameter， or exit to the top level to change to another operation mode.

Select the parameter

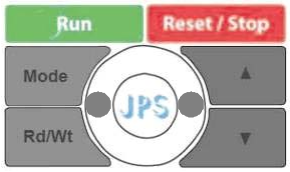
【NOTICE】All the operation described below can only work under the condition of the (parameter mode) or (edit mode).

By using the operation described below， can select parameter， read value， edit value and write the value into parameter.

1. Select parameter
   - Enter select parameter mode

Press  or  to enter select parameter mode.

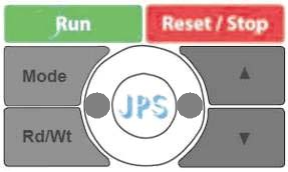
or

Touch one of the left or right side of wheel lightly. 

to enter select parameter mode.

By processes， least digital of displayed data will be flashed to indicate that is ready to be edit.

   - Change the edit position

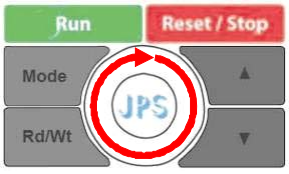
Touch the left or right 

to change the edit position.

   - Enter parameter number

Press  or  to increase or decrease value.

or

Draw on the fly wheel circularly 

to change the value.

2. Read the value of parameter

In  mode ➔ press  to read parameter value.

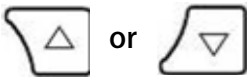
3. Edit parameter value
4. Write down the parameter value
   The proceedures of editing and writing the parameter value are same with the proceedure that are introduced in paragraph 0
5. Use fly wheel and the up/down keys to edit data.
6. Return

Press  to return to previous mode sequentially.

Alarm mode

Press  to select alarm mode.

then

In  mode ➔ Press  or

By using Up or Down keys， can show A0 ~ A3 alarm messages sequentially:

- A0 Showing the present alarm message.
- A1 Showing the alarm message previous than A0.
- A2 Showing the alarm message previous than A1.
- A3 Showing the alarm message previous than A2.

** After power on or reset， all alarm record will be shift by the sequence A0→A1→A2→A3， and the record A0 will be refresh by present status.

17.1.6 RESET Function

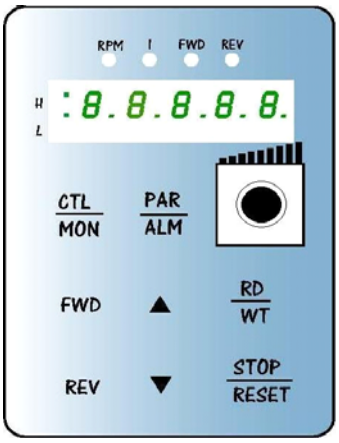
In  mode ➔ Press Reset / Stop Twice within 0.5sec.

This procedure will reset the driver and panel itself， and the effect like power-on restart.

17.2 R-PANEL Operational

There are 5 Seven-segment displays， 6 LEDs， 8 buttons， and 1 AIP on this PANEL.
All control modes will be introduced below：

17.2.1 Control Mode 【CTL MODE】



Press “CTL/MON” button to change between CTL and MON mode.
After pressing “CTL/MON” button，if neither “RPM” nor “I” LED lights up，means it’s now under “CTL MODE，” user can control the motor directly.
The function description of buttons and AIP is as below:
【AIP】: Rotate the VR to provide a voltage to CPU， the resolution is form 0 to 4095(12bits)
【FWD】: Motor RUN Forward command (DI5 ON; DI6 OFF)
【REV】: Motor RUN Reverse command (DI5 OFF; DI6 ON)
【STOP】: Motor STOP command (DI5 OFF; DI6 OFF)

17.2.2 Monitor Mode 【MON MODE】

Press “CTL/MON” button to change between CTL and MON mode.
Press down and Hold “CTL/MON” button， if "RPM" lights up， the drive is under “MON MODE，" user can monitor some status of Drive like speed “RPM，” frequency “RPM” and current “I，” and can control motor RUN Forward， Reverse， and Stop.

【Caution】:『When R-PANEL connect to: JMD-SERIES-DRIVER』

- " Neither "RPM" nor "I" light up， the drive is under “CTL MODE，” the display shows Pr.056: RPM.
- Only "RPM" light up， the drive is under “MON MODE，" the display shows Pr.056: RPM.
- Only "I" light up， the drive is under “MON MODE，” the display shows Pr.018: I_RMS (Ampere).

【Caution】:『When R-PANEL connect to: IRIS-SERIES-DRIVER』

- Neither "RPM" nor "I" light up， the drive is under “CTL MODE，” the display shows Pr.019: RPM.
- Only "RPM" light up， the drive is under “MON MODE，" the display shows Pr.019: RPM.
- Only "I" light up， the drive is under “MON MODE，” the display shows Pr.204: AMP (%).

The function description of buttons is as below:
【FWD】: Motor RUN Forward command (DI5 ON; DI6 OFF)
【REV】: Motor RUN Reverse command (DI5 OFF; DI6 ON)
【STOP】: Motor STOP command (DI5 OFF; DI6 OFF)
【▲】: Change monitor parameter.
【▼】: Change monitor parameter.

17.2.3 Parameter Editing Mode 【PAR MODE】

Press "PAR/ALM" button to change between PAR and ALM mode.

Press "PAR/ALM，" if display shows "Pr.nnn，" the drive is under "PAR MODE，" both "RPM" and "I" light up.

User can Edit or Monitor all parameters under this mode. The operate steps is as follows:

【Step1】: Press "PAR/ALM，" the display shows "Pr.nnn." (nnn means parameter number: 000~999)

【Step2】: Press ▲ or ▼ to change parameter number， press "STOP" to change the digital position.

【Step3】: Press "RD/WT" to read the value of selected parameter.

【Step4】: Press ▲ or ▼ to verify the value， press "STOP" to change the digital position.

【Step5】: Press "RD/WT" to write down the parameter.

Repeating step 1 ~ 5 to verify other parameters.

17.2.4 ALARM MODE【ALM MODE】

Press "PAR/ALM，" to change between "PAR MODE" and "ALM MODE."

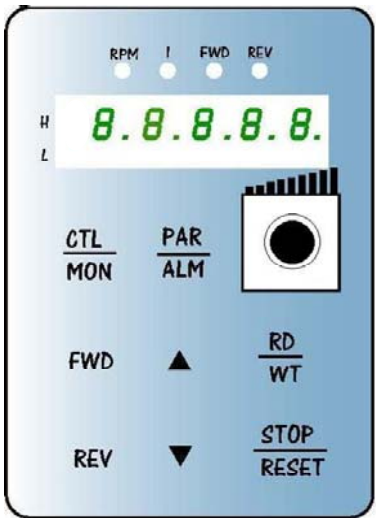
Continuously press "PAR/ALM，" if the display shows "A0-xx，" the drive is under "ALM MODE."

User can observe last four alarm record or RESET drive under this mode.

Press ▲ or ▼ to see historical alarm record.

Press "STOP/RESET，" to reset drive.

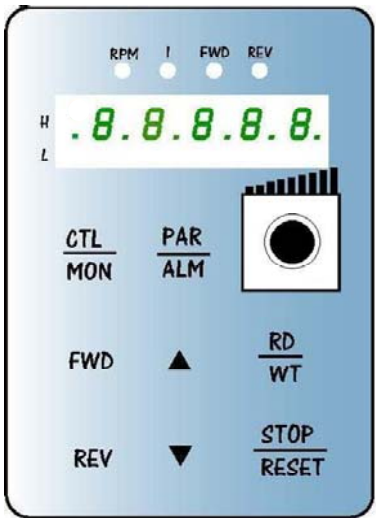
17.2.5 RD / WT【Single-Word】/【Double-Word】Parameters



【Parameters belong to Single-Word】

※ R-PANEL connect to JMD-SERVO

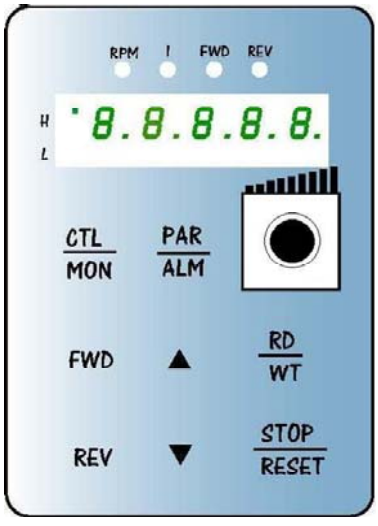
- Press "PAR/ALM" button to enter "PAR MODE," press ▲or ▼ to change parameter number.
  Press "RD/WT" button, to read parameter value.
- If the parameter is belong to 【Single Word】, the panel shows as the picture.
- Press ▲, ▼, or "STOP" button to change the value.
  The display is flashing on this time.
- After deciding the value, press "RD/WT" button to write down the value. The display stop flashing means the value written down.



【Parameters belong to Double-Word display of low word】

※R-PANEL connect to JMD-SERVO

- Press "PAR/ALM" button to enter "PAR MODE," press ▲or ▼ to change parameter number. Press "RD/WT" button, to read parameter value.
- If this parameter belongs to low word of a Double Word, the panel shows as the picture.
- To change to high word, press【FWD】.
- Press ▲, ▼, or "STOP" button to change the value.
  The display is flashing on this time.
- After deciding the value, press "RD/WT" button to write down the value. The display stop flashing means the value written down.

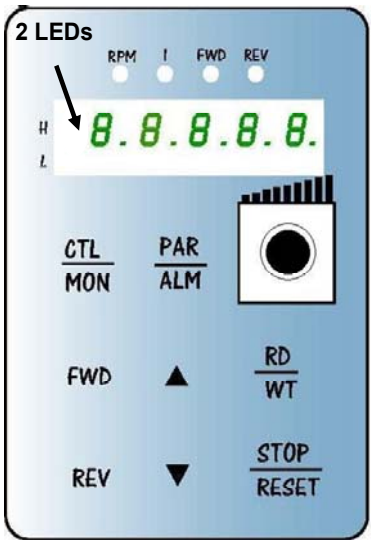


【Parameter belong to Double-Word display of high word】

※R-PANEL connect to JMD-SERVO

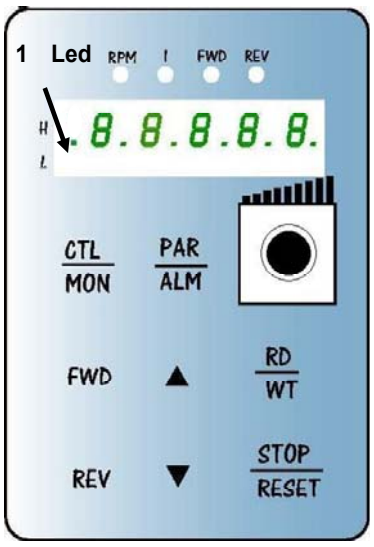
- Press "PAR/ALM" button to enter "PAR MODE," press ▲or ▼ to change parameter number. Press "RD/WT" button, to read parameter value.
- If this parameter belongs to high word of a Double Word, the panel shows as the picture.
- To change to high word, press【REV】.
- Press ▲, ▼, or "STOP" button to change the value.
  The display is flashing on this time.
- After deciding the value, press "RD/WT" button to write down the value. The display stop flashing means the value written down.
-

17.2.6 Single-Word】/【Double-Word】Negative Numbers



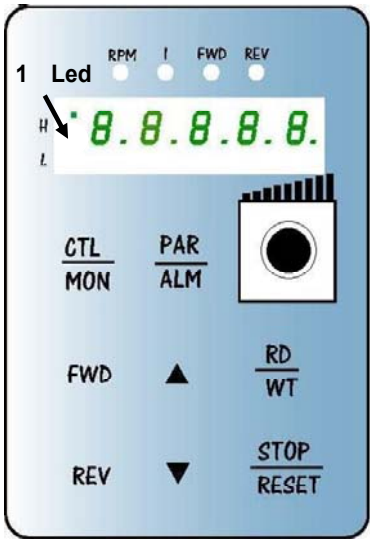
【Parameters belong to signed Single-Word】

- Refer to previous chapter, read or write parameters.
- To change between Positive and Negative, press "STOP" button for one second under "EDIT" status.
  - Only under "EDIT" status can change the sign.
  - Under this status, if the value is negative 2 LEDs flash.
  - Under this status, if the value is positive 2 LEDs lit up.
- ※ Edit status means one of the seven-segment displays flashing.
- ※ STOP button works only when parameters are sighed.
- ※ If 2 LEDs not lit up, the value is positive single word.
- ※ If 2 LEDs flashing, the value is negative single word.
- ※ Belong to【minus】【Single Word】



【Parameters belong to signed Double-Word low word】

- Refer to previous chapter, read or write parameters.
- To change between Positive and Negative, press "STOP" button for one second under "EDIT" status.
  - Only under "EDIT" status can change the sign.
  - Under this status, if the value is negative 1 LED flash.
  - Under this status, if the value is positive 1 LED lit up.
- ※ Edit status means one of the seven-segment displays flashing.
- ※ STOP button works only when parameters are sighed.
- ※ If 1 Led lit up, the value is positive.
- ※ If 1 Led flashing, the value is negative.



【Parameters belong to signed Double-Word high word】

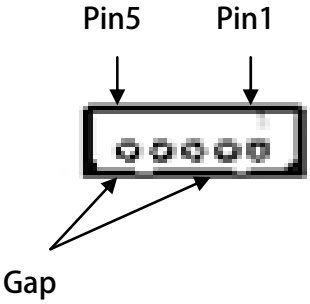
- Refer to previous chapter, read or write parameters.
- To change between Positive and Negative, press "STOP" button for one second under "EDIT" status.
  - Only under "EDIT" status can change the sign.
  - Under this status, if the value is negative 1 LED flash.
  - Under this status, if the value is positive 1 LED lit up.
- ※ Edit status means one of the seven-segment displays flashing.
- ※ STOP button works only when parameters are sighed.
- ※ If 1 Led lit up, the value is positive.
- ※ If 1 Led flashing, the value is negative.

17.2.7 Alarm Mode of R-Panel【ALM Code Description】

ALARM CODE	DESCRIPTION and TROUBLESHOOTING
A0 - no	A0 — no ➔ No Error No Error
A0 - PG	A0 — PG ➔ PG Error Motor encoder signal feedback error
A0 - CF	A0 — CF ➔ Fan Error Fan speed too slow or stopped
A0 — SE	A0 — SE ➔ Memory Error EEPROM memory error
A0 — ES	A0 — ES ➔ Emergency Stop Drive received emergency stop command form digital input or communication.
A0 — OD	A0 — Od ➔ Discharge Overtime Drive electrical discharge time over protection time.
A0 - OL	A0 — OL ➔ Over Load Drive over load time over protection time
A0 - OH	A0 — OH ➔ Over Heat Temperature of heat sink over heat
A0 - OP	A0 — OP ➔ Over Power Voltage over capacitance too high.
A0 - UP	A0 — UP ➔ Low Power Voltage over capacitance too low， please check the power source.
A0 - OC	A0 — OC ➔ Over Current Current output over protection level
A0 — Er.	A0 — Er. ➔ Communication Fail Communication between panel and drive failed

17.2.8【Definition of Cables】

JAM SC-5P Connector：



PIN1	5V
PIN2	0V
PIN3	485-A
PIN4	485-B
PIN5	X(NC)

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