AC10 series

Quick-Start Guide
IP20 0.25 - 250 HP (0.2 - 180 kW)
IP66 0.5 - 125 HP (0.4 - 90 kW)

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Introduction

This manual offers an introduction to the installation and connection for the AC10 series. Parameters setting, software, and operation are also covered in this document. For complete instructions, please refer to the Product Installation Manual, available online at www.parker.com/ssdusa/ac10

Requirements

IMPORTANT: Please read this information BEFORE installing the equipment.

WARNING – Operation of this equipment requires detailed installation and operation instructions provided in the Installation/Operation manual intended for use with this product. This information is provided on the CD ROM, floppy diskette(s), or other storage devise included in the container this device was packaged in. It should be retained with this device at all times. A hard copy of this information may be ordered from the supplier indicated on the product label.

Intended Users
This leaflet is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.
The information given is intended to highlight safety issues, EMC considerations, and to enable the user to obtain maximum benefit from the equipment.

Application Area
The equipment described is intended for industrial motor speed control utilizing AC induction motors or AC synchronous machines.

Personnel
Installation, operation and maintenance of the equipment should be carried out by competent personnel. A competent person is someone who is technically qualified and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

Product Warnings

DANGER Risk of electric shock
Attention – Hot surfaces
Caution Refer to documentation
Earth/Ground Protective Conductor Terminal

Hazards

DANGER! - Ignoring the following may result in injury

1.   This equipment can endanger life by exposure to rotating machinery and high voltages.

2.   The equipment must be permanently earthed due to the high earth leakage current, and the drive motor must be connected to an appropriate safety earth.

3.   Ensure all incoming supplies are isolated before working on the equipment. Be aware that there may be more than one supply connection to the drive.

4.   There may still be dangerous voltages present at power terminals (motor output, supply input phases, DC bus and the brake, where fitted) when the motor is at standstill or is stopped.

5.   For measurements use only a meter to IEC 61010 (CAT III or higher). Always begin using the highest range. CAT I and CAT II meters must not be used on this product.

6.   Allow at least 5 minutes (20 minutes for above 30kW) for the drive's capacitors to discharge to safe voltage levels (<50V). Use the specified meter capable of measuring up to 1000V dc & ac rms to confirm that less than 50V is present between all power terminals and earth.

7.   Unless otherwise stated, this product must NOT be dismantled. In the event of a fault the drive must be returned. Refer to "Routine Maintenance and Repair".

8.   WARNING – The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller should be examined and replaced if damaged.

Safety

Where there is conflict between EMC and Safety requirements, personnel safety shall always take precedence.

- Never perform high voltage resistance checks on the wiring without first disconnecting the drive from the circuit being tested.
- While ensuring ventilation is sufficient, provide guarding and /or additional safety systems to prevent injury or damage to equipment.
- All control and signal terminals are SELV, i.e. protected by double insulation. Ensure all external wiring is rated for the highest system voltage.
- All exposed metalwork in the Inverter is protected by basic insulation and bonded to a safety earth.
- When replacing a drive in an application and before returning to use, it is essential that all user defined parameters for the product's operation are correctly installed.
- Thermal sensors contained within the motor must have at least basic insulation.
- RCDs are not recommended for use with this product but, where their use is mandatory, only Type B RCDs should be used.
- The AC10 series is not a safety component or safety related product.

EMC

- In a domestic environment this product may cause radio interference in which case supplementary mitigation measures may be required.
- This equipment contains electrostatic discharge (ESD) sensitive parts. Observe static control precautions when handling, installing and servicing this product.
- This is a product of the restricted sales distribution class according to IEC 61800-3. It is designated as "professional equipment" as defined in EN61000-3-2. Permission of the supply authority shall be obtained before connection to the low voltage supply.

WARNING! – Control Unit Removal / Fitting
Isolate (disconnect) supply before plugging or unplugging control unit to the power stack.

CAUTION!

Application Risk

- The specifications, processes and circuitry described herein are for guidance only and may need to be adapted to the user's specific application. We can not guarantee the suitability of the equipment described in this Manual for individual applications.

Risk Assessment

Under fault conditions, power loss or unintended operating conditions, the drive may not operate as intended. In particular:

- Stored energy might not discharge to safe levels as quickly as suggested, and can still be present even though the drive appears to be switched off
- The motor's direction of rotation might not be controlled
- The motor speed might not be controlled
- The motor might be energized

A drive is a component within a drive system that may influence its operation or effects under a fault condition. Consideration must be given to:

- Stored energy
- Supply disconnects
- Sequencing logic

How To Contact Us (North America)

For Further Safety or Legal Questions, please contact:

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Fax: 704.588.4806
Info.us.ssd@parker.com
www.parker.com/ssdusa
www.parker.com/ssdusa/ac10

Before You Start

This document covers the steps necessary for a basic start up of the AC10 drive. Drive start ups should be performed by competent electrical technicians who are familiar with AC drives and their applications. For detailed installation, safety and applications refer to the Product Manual.

Ensure that all local electric codes are met while installing the drive. Check that all live parts are covered to protect against electric shock and that unexpected rotation of the motor will not result in bodily harm or injury.

This document expects that the drive is already installed in its intended location and that all relevant installation procedures have been followed.

About This QuickStart Guide

This QuickStart will:
• Familiarize you with the terminals and operation of the unit.
• Provide basic installation details and a quick set-up procedure.
• Show you how to Autotune the drive and start the motor.

This QuickStart assumes that:
• You are a competent technician with experience of installing this type of equipment.
• You are familiar with the relevant standards and Local Electric Codes (which take precedence).
• You have read and understood the Safety Information provided at the front of this QuickStart.
• You realize that this guide contains only basic information and that you may need to refer to the AC10 Product Manual to complete your installation.

Basic Drive Layout

This basic diagram shows the location of main drive components that will be referred to in this manual. The diagram is representative of the product, but some sizes may appear different than the illustration.

Keypad panel

Vent hole

Control terminal

Power terminal

Grounding plate

Heatsink

Mounting hole
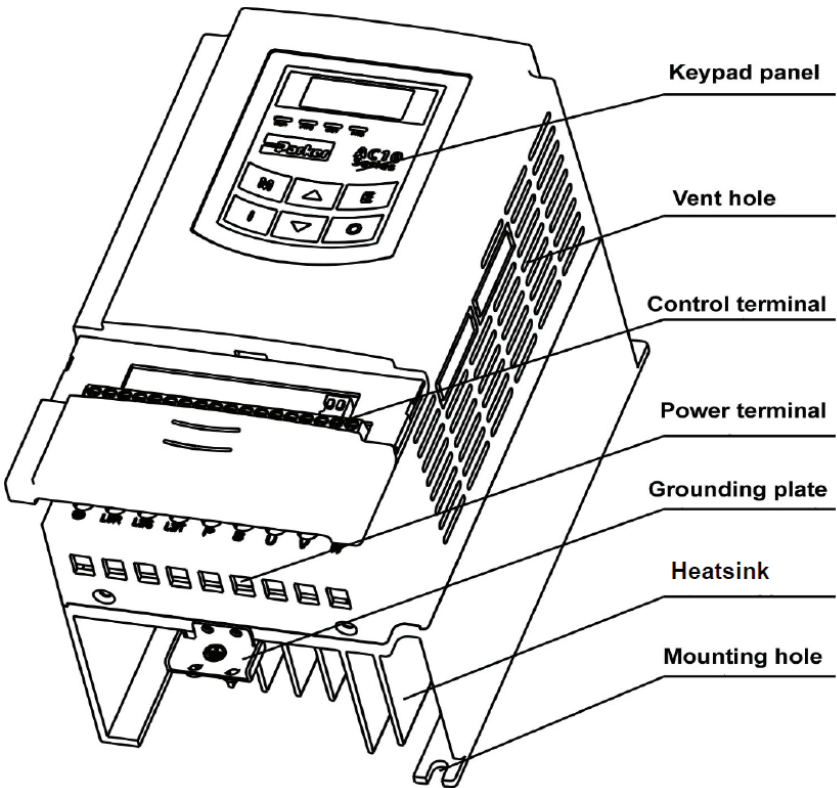
Typical IP20 AC10 Model

AC10 - IP20 Models

		1	2		3	4	5	6	7
Order example		10	G	-	1	1	-	0015	-	B	N

1	Product Family	
	10	AC10 VFD - IP20

2	Industry	
	G	General Purpose

3	Voltage	
	1	230V Single Phase
	3	230V Three Phase
	4	480V Three Phase

4, 5	Frame Size, Rated Current	
	230V Supply	
	1-0015	0.25 HP/0.2 kW
	1-0025	0.5 HP/0.4 kW
	1-0035	0.75 HP/0.55 kW
	1-0045	1 HP/0.75 kW
	2-0050	1.5 HP/1.1 kW
	2-0070	2 HP/1.5 kW
	2-0100	3 HP/2.2 kW
	3-0170	5 HP/3.7 kW
	4-0210	7.5 HP/5.5 kW
	5-0300	10 HP/7.5 kW
	5-0400	15 HP/11 kW
	6-0550	20 HP/15 kW
	480V Supply	
	1-0006	0.25 HP/0.2 kW
	1-0010	0.5 HP/0.4 kW
	1-0015	0.75 HP/0.55 kW
	2-0020	1 HP/0.75 kW
	2-0030	1.5 HP/1.1 kW
	2-0040	2 HP/1.5 kW
	2-0065	3 HP/2.2 kW
	3-0090	5 HP/4.0 kW
	3-0120	7.5 HP/5.5 kW
	4-0170	10 HP/7.5 kW
	4-0230	15 HP/11 kW
	5-0320	20 HP/15 kW
	5-0380	25 HP/18.5 kW
	5-0440	30 HP/22 kW

4, 5	Frame Size, Rated Current	
	480V Supply	
	6-0600	40 HP/30 kW
	7-0750	50 HP/37 kW
	7-0900	60 HP/45 kW
	8-1100	75 HP/55 kW
	8-1500	100 HP/75 kW
	9-1800	125 HP/90 kW
	9-2200	150 HP/110 kW
	10-2650	200 HP/132 kW
	11-3200	225 HP/160 kW
	11-3600	250 HP/180 kW

6	Braking Module	
	B	Braking Module Installed

7	EMC Filter	
	N	No Filter Installed
	F	C3 EMC Filter Installed

Nameplate Example

This example nameplate shows the product as an AC10 series IP20 2.2kW (3 HP) drive with 3-phase input.

3Ph: three-phase input; 380-480V, 50/60Hz: input voltage range and rated frequency.

3Ph: 3-phase output; 6.5A, 2.2kW: rated output current and power;

Parker	**Parker Hannifin Corporation**			
			www.parker.com	
MODEL	10G - 42 - 0065 - BF			
INPUT	3 PH	AC	380~480 V	7.5/7.0 A	50/60 Hz
OUTPUT	3 PH		0~INPUT V	6.5 A	2.2 kW
	0~590 Hz			

IP20 E142140   SW NO. 2.10   BS NO. 1.01   Made In China

AC10 - IP66 Models

		1	2		3	4		5		6	7
Order example		10	G	-	1	1	-	0015	-	B	N

1	**Product Family**	
	16	AC10 VFD - IP66
2	**Industry**	
	G	General Purpose
3	**Voltage**	
	1	230V Single Phase
	3	230V Three Phase
	4	480V Three Phase
4, 5	**Frame Size, Rated Current**	
	230V Supply	
	1-0025	0.5 HP/0.4 kW
	1-0045	1 HP/0.75 kW
	1-0070	2 HP/1.5 kW
	1-0100	3 HP/2.2 kW
	480V Supply	
	1-0020	1 HP/0.75 kW
	1-0040	2 HP/1.5 kW
	1-0065	3 HP/2.2 kW
	1-0090	5 HP/4.0 kW
	2-0120	7.5 HP/5.5 kW
	2-0170	10 HP/7.5 kW
	3-0230	15 HP/11 kW
	3-0320	20 HP/15 kW
	4-0380	25 HP/18.5 kW *
	4-0440	30 HP/22 kW *
	4-0600	40 HP/30 kW *
	5-0750	50 HP/37 kW *
	5-0900	60 HP/45 kW *
	5-1100	75 HP/55 kW *
	6-1500	100 HP/75 kW *
	6-1800	125 HP/90 kW *
6	**Braking Module**	
	B	Braking Module Installed
7	**EMC Filter**	
	N	No Filter Installed
	F	C3 EMC Filter Installed

* Not UL listed

Installation

Inverter should be installed vertically, as shown in Figure 7-1. Sufficient ventilation space should be ensured in its surrounding.

Clearance dimensions (recommended) are available from Table 7-1 Clearance Dimensions for installing of the inverter. Space between 2 drives 25mm.
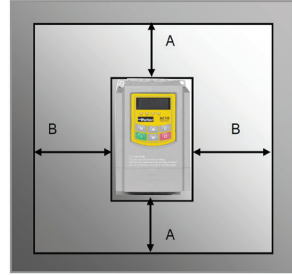
Model	Clearance Dimensions	
IP20 Plastic	A ≥150mm	B ≥50mm
IP20 Metal	A ≥200mm	B ≥100mm
IP66	A ≥150mm	B ≥12.5mm

Dimensions

IP20 Frame	Part Number	External Dimension AxBxH (H1) [mm]	Weight [lb/kg]	Mounting Size (WxL)	Mounting Bolt
1	10G-X1-XXXX-XX	80×135×138 (153)	2.76/1.25	70×128	M4
2	10G-X2-XXXX-XX	106×150×180 (195)	3.88/1.76	94×170	M4
3	10G-43-XXXX-XX	138×152 ×235 (250)	6.53/2.96	126×225	M5
4	10G-44-XXXX-XX	156×170×265 (280)	10.80/4.9	146×255	M5
5	10G-45-XXXX-XX	205×196 ×340 (355)	16.53/7.5	194×330	M5

Note: H is the size of inverter without grounding plate. H1 is the size of inverter with grounding plate.
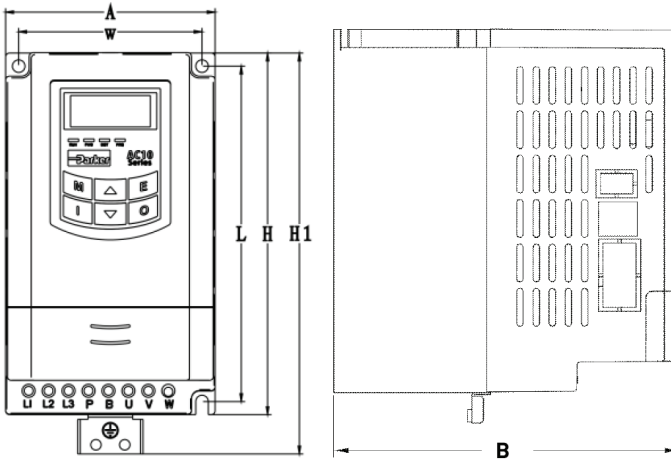
IP20 Plastic Enclosure - Frame 1-5

Dimensions

IP20 Frame	Part Number	External Dimension AxBxH (H1) [mm]	Weight [lb/kg]	Mounting Size (WxL)	Mounting Bolt
6	10G-46-XXXX-XX	265 x 235 x 435	37.48/17	235x412	M6
7	10G-47-XXXX-XX	315 x 234 x 480	55.12/25	274x465	M6
8	10G-48-XXXX-XX	360 x 265 x 555	88.19/40	320x530	M8
9	10G-49-XXXX-XX	410 x 300 x 630	121.25/55	370x600	M10
10	10G-410-XXXX-XX	516 x 326 x 765	207.24/94	360x740	M10
11	10G-411-XXXX-XX	560 x 342 x 910	264.56/120	390x882	M10

Note: H is the size of inverter without grounding plate. H1 is the size of inverter with grounding plate.
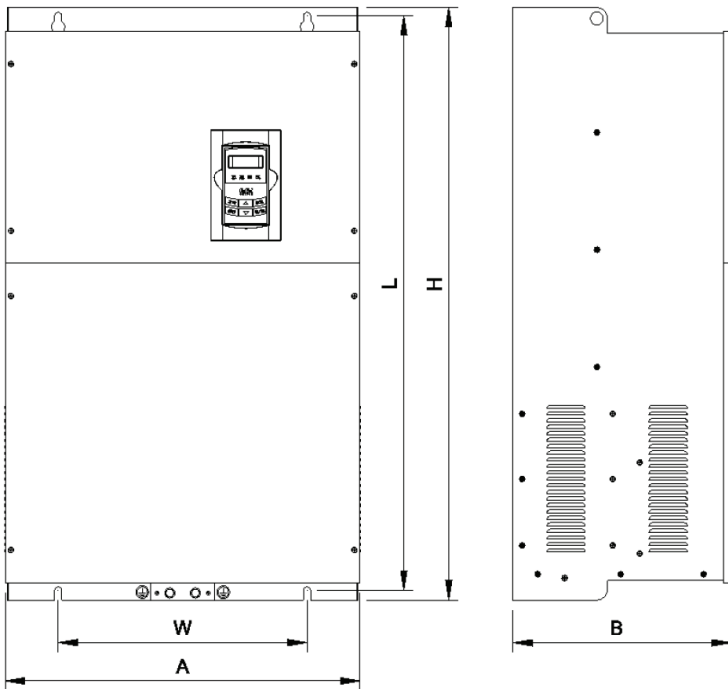
IP20 Metal Enclosure - Frame 6-11

Dimensions

IP66 Frame	Part Number	External Dimension AxBxH (H1) [mm]	Weight [lb/kg]	Mounting Size (WxL)	Mounting Bolt
1	16G-X1-XXXX-XX	200×198×412	17.6/8.0	171×398	M5
2	16G-X2-XXXX-XX	242×198×418	22.1/10.0	215×402	M6
3	16G-X3-XXXX-XX	242×228×471	28.7/13.0	210×454	M8
4	16G-X4-XXXX-XX	242x323.5x650	61.7/28.0	210×624	M8
5	16G-X5-XXXX-XX	308x378.5x680	86.0/39.0	272×648	M8
6	16G-X6-XXXX-XX	370x403.5x770	147.7/67.0	334×739	M8
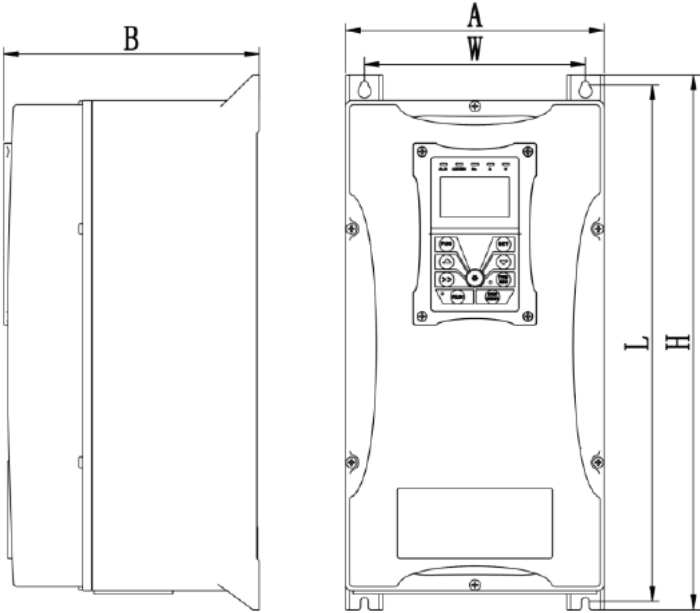
IP66 Enclosure

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Simplified Connection Diagram

Braking Resistor (Optional)
Braking Unit (Optional)

1/3 Phase Input
230/480 VAC
50/60 Hz
**

Digital Input
Terminals

Analog Inputs

2.2 kΩ/1 W

0-20 mA

Relay Output
5A/230VAC or 30VDC

Analog Output 1
0-10 V

Multifunction Output
(24 VDC)

Modbus
Communications
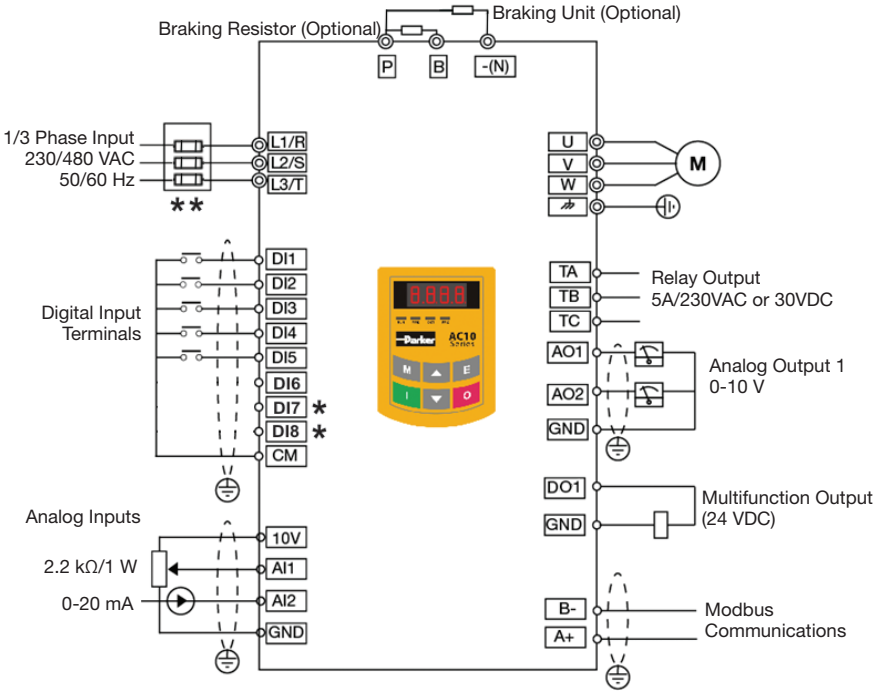
* IP66 drives have 6 digital inputs

** Refer to appendix for fuse sizing

This illustration is for reference only and may not show the connections for your specific drive. Please refer to the Product Installation Manual for detailed connection diagram.

Terminal Tightening Torques

Frame Size	Power PCB Terminal	Control PCB Terminal	Cover	Power Supply, Motor Terminal	Fan	Fan Cover
Frame 1	1.13Nm	0.6Nm	0.6Nm	1.13Nm	1.3Nm	1.3Nm
Frame 2	1.13Nm	0.6Nm	0.6Nm	1.13Nm	1.3Nm	1.3Nm
Frame 3	1.8Nm	0.6Nm	0.6Nm	1.8Nm	1.3Nm	1.3Nm
Frame 4	2.1Nm	0.6Nm	0.6Nm	2.1Nm	1.3Nm	1.3Nm
Frame 5	3.4Nm	0.6Nm	0.6Nm	3.4Nm	1.3Nm	1.3Nm
Frame 6	4.5Nm	0.6Nm	1.3Nm	4.5Nm	0.9Nm	0.9Nm
Frame 7	10 Nm	0.6Nm	1.3Nm	10 Nm	0.9Nm	0.9Nm
Frame 8	10 Nm	0.6Nm	2.4Nm	10 Nm	0.9Nm	0.9Nm
Frame 9	18 Nm	0.6Nm	2.4Nm	18 Nm	0.9Nm	0.9Nm
Frame 10	18 Nm	0.6Nm	2.4Nm	18 Nm	Big fan 1.5Nm	
Frame 11	18 Nm	0.6Nm	2.4Nm	18 Nm	Small fan 2.4Nm	

Termin	Type	Description	Function	
DO1	Output Signal	Multifunctional output terminal 1	When the token function is true, the value between this terminal and CM is 0V; when the function is false, the value is 24V.	The functions of output terminals shall be defined per manufacturer's value. Their initial state may be changed through changing function codes.
DO2 Note 1		Multifunctional output terminal 2		
TA				
TB				
TC		Relay contact	TC is a common point, TB-TC are normally closed contacts, TA-TC are normally open contacts. The contact capacity is 10A/125VAC, 5A/250VAC, 5A/30VDC. *(See note 3)*	
AO1	Analog output	Running frequency	It is connected with frequency meter, speedometer or ammeter externally, and its minus pole is connected with GND. See F423~F426 for details.	
AO2 Note 1		Current display		
10V	Analog power supply	Self contained power supply	Internal 10V self-contained power supply of the inverter provides power to the inverter. When used externally, it can only be used as the power supply for voltage control signal, with current restricted below 20mA.	
AI1	Input Signal	Voltage / Current analog input	When analog speed control is selected, the voltage or current signal is input through this terminal. The range of voltage input is 0~10V and the current input is 0~20mA, the input resistor is 500Ohm, and grounding: GND. If the input is 4~20mA, it can be realised by setting F406 to 2. The voltage or current signal can be chosen by coding switch. See Table 8-2 and Table 8- for details, the default setting of AI1 is 0~10V, and the default setting of AI2 is 0-20mA.	
AI2				
GND		Self-contained Power supply Ground	Ground terminal of external control signal (voltage control signal or current source control signal) is also the ground of 10V power supply of this inverter.	
24V	Power supply	Control power supply	Power: 24±1.5V, grounding is CM; current is restricted below 50mA for external use.	
DI1	Digital input control terminal	Jogging terminal	When this terminal is valid, the inverter will have jogging running. The jogging function of this terminal is valid under both at stopped and running status.	The functions of input terminals shall be defined per manufacturer's value. Other functions can also be defined by changing function codes.
DI2		External Coast Stop	When this terminal is valid, "ESP" malfunction signal will be displayed.	
DI3		"FWD" Terminal	When this terminal is valid, inverter will run forward.	
DI4		"REV" Terminal	When this terminal is valid, inverter will run reverse.	
DI5		Reset terminal	Make this terminal valid under fault status to reset the inverter.	
DI6 Note 1		Free stop	Make this terminal valid during running can realize free stop.	
DI7 Note 1		Run Terminal	When this terminal is in the valid state, inverter will run by the acceleration time.	
DI8 Note 1		Stop terminal	Make this terminal valid during running can realize stop by the deceleration time.	
GND Note 2	RS485 communi-cation terminals	Grounding of differential signal	Ground of differential signal	
5V Note 2		Power of differential signal	Power of differential signal	
A+ Note 2		Positive polarity of differential signal	Standard: TIA/EIA-485(RS-485) Communication protocol: Modbus Communication rate: 1200/2400/4800/9600/19200/38400/57600bps	
B- Note 2		Negative polarity of Differential signal		

Note 1: This terminal is not included in 22kW and below 22Kw inverters.
Note 2: For 30kW and above 30kW inverters, GND, 5V, A+, and B- are 4-pole terminal block. For below 30kW, there are no GND and 5V terminals.
Note 3: The contact capacity for 30kW and above 30kW inverters is 10A/125VAC, NO/NC 3A, 250VAC/30VDC.

Local Keypad (IP20 Units)

The panel covers three sections: data display section, status indicating section and keypad operating section.

LED display shows running frequency, flashing target frequency, function code, parameter value or fault code.

LEDs indicate working status. RUN while running, FWD running forward, DGT showing digit selection, and FRQ when the MMI is showing frequency.

Press M for function code, E for original parameters. ▲ and ▼ keys select function codes and parameters. Press E again to confirm. In keypad control mode, ▲ and ▼ keys control speed.

I and O keys start and stop drive. O key resets inverter in fault status.

Remote Keypad (Option)

The remote mounted keypad can be ordered as 1001-00-00. This includes the keypad, cable and mounting brackets.
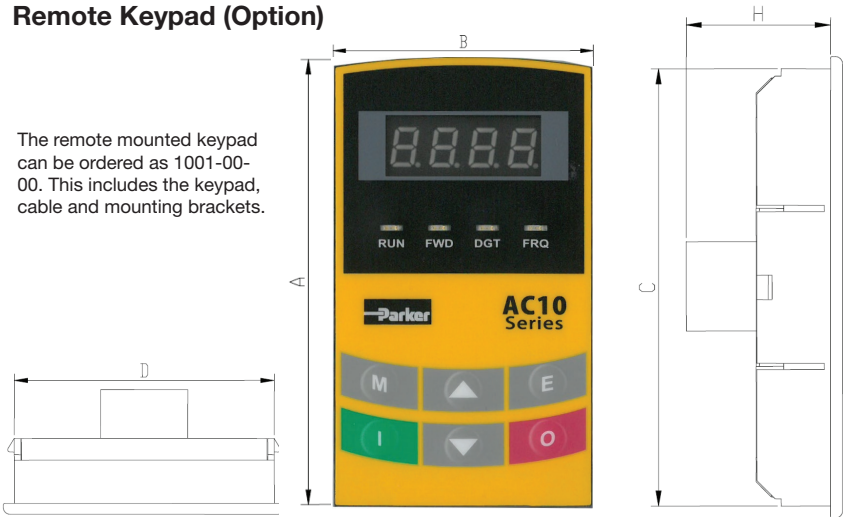
Part Number	A	B	C	D	H	Opening
1001-00-00	124mm	74mm	120mm	70mm	26mm	121mm x71mm

Menu Structure

Keys	Names	Remarks
M	Menu	To call function code and switch over display mode.
E	Enter	To call and save data.
△	Up	To increase data (speed control or setting parameters)
▽	Down	To decrease data (speed control or setting parameters)
I	Run	To start inverter
O	Stop or Reset	To stop inverter; to reset in fault status. To change function codes in a code group or between two code groups. Toggles between incrementing function code by 1 or by 100 in the interface of function code, keep pressing "O" key for 3s, inverter will be stopped. (if stop command is controlled by keypad).

Parameter Setting

The AC10 has numerous function parameters that the user can modify to effect different modes of operation. The user should be aware that if they set password valid (F107=1), the password must be entered first.

Steps	Keys	Operation	Display
1	M	Press "M" key to display function code	F100
2	△ or ▽	Press "Up" or "Down" to select required function code	F114
3	E	Read data set in the function code	5.0
4	△ or ▽	To modify data	9.0
5	M	Shows corresponding target frequency by flashing after saving the set data	50.00
	E	Displays the current function code	F114

The above-mentioned step should be operated when inverter is in stop status.

Function Codes Switchover in/between Code-Groups (IP20 Models)

The AC10 has more than 300 parameters (function codes) available to the user, divided into sections as indicated in the Function Code Partition table below

Group Name	Function Code Range	Group No.	Group Name	Function Code Range	Group No.
Basic Parameters	F100~F160	1	Timing control and protection function	F700~F770	7
Run Control Mode	F200~F280	2	Parameters of the motor	F800~F850	8
Multi-functional input/output terminal	F300~F340	3	Communication function	F900~F930	9
Analog signals and pulse of input/output	F400~F480	4	PID parameter setting	FA00~FA80	10
Multi-stage speed Parameters	F500~F580	5	Torque control	FC00~FC40	11
Subsidiary function	F600~F670	6			

As parameter setting can take time due to numerous function codes, such function is specially designed as "Function Code Switchover in a Code Group or between Two Code-Groups" so that parameters setting becomes convenient and simple.

Press "M" key so that the keypad controller will display function code. If user presses ▲ or ▼ key, the function code will circularly keep increasing or decreasing by degrees within the group; if user presses the O key again, the function code will change circularly between two code groups when operating the ▲ or ▼ key, e.g. when function code shows F111 and DGT indicator is on, press ▲/ ▼ key, function code will keep increasing or decreasing by degrees within F100 - F160; press O key again, DGT indicator will be off. When pressing ▲/ ▼ key, function codes will change circularly among the 10 code-groups, like F211, F311…FA11, F111…, Refer to illustration below (The flashing "**50.00**" is indicated the corresponding target frequency values).
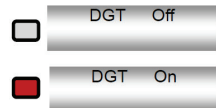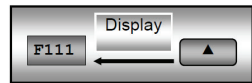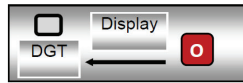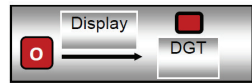
Switch over in a Code Group or between Different Code-Groups

Items and Remarks Displayed on the Panel

Items	Remarks
AErr	Analog Input has open connection
CE	Indicates Communication error
Err2	Tuning parameters are set wrong
Err3	Instantaneous Over Current
Err4	Current Sampling Fault
Err5	PID parameters are set wrong
Err6	Watchdog Fault
ESP	External coast stop terminal is closed, ESP will be displayed.
FL	indicates Flycatching fault condition
LU	indicates under-voltage for input condition
HF-0	This Item will be displayed when you press "M" in stopping status, which indicates jogging operation is valid. But HF-0 will be displayed only after you change the value of F132.
-HF-	It stands for resetting process and will display target frequency after reset.
OC	indicates over-current condition (OC)
OC1	indicates over-current condition (OC1)
OE	indicates over-voltage condition
OH	indicates heatsink over-heat condition
OH1	indicates external over-heat condition
OL1	indicates inverter over-load condition
OL2	indicates motor over-load condition
PF0	indicates phase loss for output condition
PF1	indicates phase loss for input condition
10.00	Indicating inverter's current running frequency (or rotate speed) and parameter setting values, etc.
50.00	Flashing in stopping status to display target frequency.
0.	Holding time when changing the running direction. When "Stop" or "Free Stop (Coast Stop)" command is executed, the holding time can be cancelled.
A100	Output current (100A). Keep one digit to the right of the decimal point when current is below 100A.
b*.*	PID feedback value is displayed.
F152	Function code (parameter code).
H *	Heat Sink temperature is displayed.
L***	Linear speed is displayed.
o*.*	PID given value is displayed.
u100	DC Bus voltage (100V).
U100	Output voltage (100V).

Local Keypad (IP66 Units)

The panel covers three sections: data display section, status indicating section and keypad operating section.

LEDs indicate working status. ALM is ON when fault occurs. LOC/REM is ON in the remote-controlling status. Hz is ON when frequency is shown, A is ON when current is shown, V is ON when voltage is shown

Function Code

Press **M** for function code, **E** for original parameters. **>>**, **Δ** and **∇** keys select function codes and parameters. Press **E** again to confirm. In keypad control **Δ** and **∇** keys are used for dynamic speed control. **I** and **O** keys start and stop drive. Press **O** to reset fault. Press **✳** to set Fwd/Rev jogging and select local/remote control.

Forward/Reverse Indicator

Running indicator ON when running

Keys	Names	Remarks
M	Menu	To call function code and switch over display
E	sEt	To call and save data
Δ	Up	To increase speed (speed control or setting parameters)
∇	Down	To decrease speed (speed control or setting parameters)
I	Run	To start inverter
O	Stop or reset	To stop inverter, to reset in fault status
FWD REV	Forward or reverse	Switchover between forward and reverse
>>	Shift key	Shift and displaying items switchover
*	Multi func- tional key	FWD/REV, jogging, and local/remote can be selected by multi-functional key. Please refer to F643

Parameters Setting

This inverter has numerous function parameters that the user can modify to effect different modes of operation. The user should be aware that if they set password valid (F107=1), the password must be entered first if parameters are to be set after power off or protection is effected, i.e., to call F100 as per the mode in Table 6-2 and enter the correct code. User's password is invalid before delivery, and user could set corresponding parameters without entering password.

Steps	Keys	Operation	Display
1	**M**	Press "M" key to display function code	F100
2	Δ or ∇	Press "Up" or "Down" to select required function code	F114
3	**E**	Read data set in the function code	5.0
4	Δ or ∇	To modify data	9.0
5	**E**	Shows corresponding target frequency by flashing after saving the set data	50.00
	M	Displays the current function code	F114

The above-mentioned step should be operated when inverter is in stop status.

Function Codes Switchover in/between Code-Groups (IP66 Models)

The AC10 has more than 300 parameters (function codes) available to user, divided into sections as indicated in Function Code Partition table below:

Group Name	Function Code Range	Group No.	Group Name	Function Code Range	Group No.
Basic Parameters	F100~F160	1	Timing control and protection function	F700~F770	7
Run Control Mode	F200~F280	2	Parameters of the motor	F800~F850	8
Multi-functional input/output terminal	F300~F340	3	Communication function	F900~F930	9
Analog signals and pulse of input/output	F400~F480	4	PID parameter setting	FA00~FA80	10
Multi-stage speed Parameters	F500~F580	5	Torque control	FC00~FC40	11
Subsidiary function	F600~F670	6			

As parameter setting can take time due to numerous function codes, such function is specially designed as "Function Code Switchover in a Code Group or between Two Code-Groups" so that parameters setting becomes convenient and simple.

Press "M" key so that the keypad controller will display function code. If user presses "▲" or "▼" key, the function code will circularly keep increasing or decreasing by degrees within the group; if user presses the key again, the function code will change circularly between two code groups when operating the "▲" or "▼" key.

Items and Remarks Displayed on the Panel

Items	Remarks
HF-0	This Item will be displayed when you press "M" in stopping status, which indicates jogging operation is valid. But HF-0 will be displayed only after you change the value of F132.
-HF-	It stands for resetting process and will display target frequency after reset.
OC, OC1, OE, OL1, OL2, OH, LU, PF0, PF1, CE, FL	Fault code, indicating "over-current OC", "over-current OC1", "over-voltage", "inverter over-load", "motor over-load" "over-heat", "under-voltage for input", "phase loss for output", "phase loss for input" "Communication error", "Flycatching fault" respectively.
AErr, Err5	Analog line disconnected, PID parameters are set wrong,
ESP	During two-line/three line running mode, "stop/reset" key is pressed or external coast stop terminal is closed, ESP will be displayed.
F152	Function code (parameter code).
10.00	Indicating inverter's current running frequency (or rotate speed) and parameter setting values, etc.
50.00	Flashing in stopping status to display target frequency.
0.	Holding time when changing the running direction. When "Stop" or "Free Stop" command is executed, the holding time can be cancelled.
A100、U100	Output current (100A) and output voltage (100V). Keep one digit of decimal when current is below 100A.
b*.*	PID feedback value is displayed.
o*.*	PID given value is displayed.
L***	Linear speed is displayed.
H *	Heatsink temperature is displayed.

Basic Speed Control Start Up Procedure

1. Install the drive

2. Wire power and control connections to the drive

3. Turn on power, when the drive completes its power up diagnostics, press **M** until the display reads F100

Note: To reset to factory defaults, perform steps 4 through 7, if not required skip to step 8

4. Press **△** until display reads F160

5. Press **E** to select function code F160 and display its current setting of 0

6. Press **△** to change 0 to 1

7. Press **E** to store new value and reset all drive function codes to factory default settings (note: F160 will be reset to 0)

8. Using the process described in steps 4-7, the user can set the following for the application:
> F228, Application Selection
> F106, Control mode
> F111, Max frequency
> F112 Min Frequency
> F114 Acceleration time
> F115 Deceleration time

Note for IP20 Drives: To access function codes above F160, first press **O** *1 time and the "DGT" LED will go out. Pressing* **△** *now allows the user to change Function Code groups and move from the F100 group to F200 through FC40 to access the group needed. Once the appropriate group is located, press* **O** *to light up the "DGT" LED and the Function Codes within that group can be accessed.*

Note for IP66 Drives: To set parameters access the F800 motor parameter group by pressing **>>** *1 time. The* **△** *button will now be able to change Function Code groups. Press the until the display reads F8XX. Press* **>>** *to store the value. Next, press* **△** *or* **▽** *to change F8XX to F801. Press* **E** *to select the Function Code F801 and display its current value. Use* **△** *or* **▽** *to change the setting to the Motor Rated Power, and then press* **E** *to store the new value and display F801 again. Press* **△** *to F802 and repeat these steps.*

Note: When displaying the function code value, the **O** *button on the IP20 drive, or the* **>>** *button on the IP66 drive can be pressed to move the cursor to change data values by 10's, 1's, or 0.1's for convenience.*

9. Set F118, Base Frequency to 60 hz for North America

10. Set the motor function codes by entering the data for the following:

        F801, Rated Motor Power (kW)
        F802, Rated Motor Voltage
        F803, Rated Motor Current
        F805, Base Motor RPM
        F811 Motor Rated Hz.

11. To set keypad reference to 5 hz, first press **M** until it displays the default frequency reference of 50.00 hz. Then press and hold **V** until the display reads 5 hz.

12. Check motor direction by pressing **I**. The motor should now be running at a slow speed. If the direction of rotation is incorrect, then power down the AC10 drive.

Warning: After the power has been turned off, wait at least 5 minutes. Do not touch any parts of the drive, wiring, circuit boards or other application components until all signs and indications of charging are gone.

13. After the drive has powered down, swap any two of the three output leads to the motor (U, V and W). After the wiring change, power back up and repeat steps 11 and 12 to verify correct rotation.

14. Perform motor autotuning by setting Function code F800. If the motor is uncoupled from the load, perform a rotating autotune by setting F800 to 1. This method is preferred. If the motor cannot be uncoupled from the load, perform a stationary autotune by setting F800 to 2. After you press **E** to store in the 1 or 2, then press **I** to initiate the autotuning procedure. The drive will pulse power into the motor to measure the motor's resistance and reactance. The drive will then either run the motor to measure the motor's magnetizing current (for rotating Autotune) or calculate the motor's magnetizing current without running the motor (for stationary Autotune).

15. Next set Function codes F200 for the source of your start command, F201 for the source of your stop command, and F203 your main frequency source.

Note: For setting additional function codes, please refer to the function code table in the Appendix found in the back of this Quickstart Guide or in the AC10 Product Manual.

5-1 Troubleshooting

Minimum required function code settings to run the drive and protect the motor.

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F106	Control Mode	0: Sensorless vector control (SVC); 1: Reserved; 2: VVVF 3: Vector control 1 6: PMSM sensorless vector control	2	X
F111	Max Frequency (Hz)	F113-590.0Hz	50.00	√
F112	Min Frequency (Hz)	0.00Hz-F113	0.50	√
F114	1st Acceleration Time (S)	0.1-3000	subject to inverter model	√
F115	1st Deceleration Time (S)	0.1-3000		√
F118	Base Frequency (Hz)	15.00-590.0	50.00	X
F801	Rated Motor Power	0.2-1000kW		oX
F802	Rated Motor Voltage	1-440V		oX
F803	Rated Motor Current	0.1-6500A		oX
F804	Number of Motor Poles	2-100	4	oX
F805	Base Motor RPM	1-30000		oX
F800	Motor's Parameters Selection	Setting range: 0: Invalid; 1: Rotating tuning.; 2: Stationary tuning	0	X
F200	Source of start command	0: Keypad command; 1: Terminal command; 2: Keypad+Terminal; 3:MODBUS; 4: Keypad+Terminal+MODBUS	4	X
F201	Source of stop command	0: Keypad command; 1: Terminal command; 2: Keypad+Terminal; 3:MODBUS; 4: Keypad+Terminal+MODBUS	4	X
F203	Main frequency source (X)	0: Digital setting memory; 1: External analog AI1; 2: External analog AI2; 3: Reserved; 4: Stage speed control; 5: No memory by digital setting; 6-8: Reserved; 9: PID output; 10: MODBUS	0	X

When the inverter is tripped check what the cause is and rectify as required. Take counter measures by referring to this manual in case of any malfunctions on inverter. Should it still be unsolved, contact the manufacturer. Never attempt any repairs without due authorization.

Fault	Description	Causes	Possible Solution
OC OC1	Overcurrent Overcurrent1	* Too short acceleration time * Short circuit at output side * Locked rotor with moto * Parameter tuning is not correct	* Prolong acceleration time * Ask if motor is cable broken * Check if motor overloads * Reduce VVVF compensation value * Measure parameter correctly
O.L1	Inverter Overload	* Load too heavy	* Reduce load; * Check drive ratio * Increase inverter's capacity
O.L2	Motor Overload	* Load too heavy	* Reduce load * Check drive ratio * Increase motor's capacity
O.E.	DC Over-Voltage	* Supply voltage too high * Load inertia too big * Deceleration time too short * Motor inertia rise again * Parameter of speed loop PID is set abnormally	* Check if rated voltage is input * Add braking resistance(optional) * Increase deceleration time * Set the parameter of rotary speed loop PID correctly
P.F1.	Input Phase Loss	* Phase loss with input power	* Check if power input is normal * Check if parameter setting is correct
PF0	Output Phase Loss	* Motor is broken * Motor wire is loose * Inverter is broken	* Check if wire of motor is loose * Check if motor is broken
L.U.	Under-Voltage Protection	* Low voltage on the input side	* Check if supply voltage is normal * Check if parameter setting is correct
O.H.	Heatsink Overheat	* Environment temperature too high * Poor ventilation * Fan damaged * Carrier wave frequency or compensation curve is too high	* Improve ventilation * Clean air inlet and outlet and radiator * Install as required * Change fan * Decrease carrier wave frequency or compensation curve
AErr	Line Disconnected	* Analog signal line disconnected * Signal source is broken	* Change the signal line * Change the signal source
Err1	Password is Wrong	* When password function is enabled, password is set wrong	* Set password correctly
Err2	Tuning Parameters Wrong	* Incorrect motor parameters entered	* Connect motor correctly * Enter correct motor data
Err3	Current Malfunction Before Running	* Current alarm signal exists before running	* Check if control board is properly connected to power board * Contact Parker
Err4	Current Zero Excursion Malfunction	* Flat cable is loosened * Current detector is broken	* Check the flat cable * Contact Parker
Err5	PID Parameters are set Wrong	* PID parameters are set wrong.	* Set the parameters correctly

Fault	Description	Causes	Possible Solution
CE	Communication Timeout	* Communication fault	* PC/PLC does not send command at fixed time * Check communication line for reliable connected
FL	Flycatching Fault	* Flycatching failure	* Track again * Contact manufacturer

Note: No P.F1 protection for single-phase and three-phase under 5.5kW.
Only above 22kW inverters can trip into OC2

Malfunction	Items to Be Checked	Counter Measures
Motor not Running	Wiring correct? Setting correct? Too big with load? Motor is damaged? Malfunction protection occurs?	Get connected with power Check wiring Checking malfunction Reduce load Check against Table 10-1
Wrong Direction of Motor Running	U, V, W wiring correct? Parameters setting correct?	Correct wiring Set the parameters correctly
Motor Turning but Speed Change not Possible	Wiring correct for lines with given frequency? Correct setting of running mode? Motor overloaded?	Correct wiring Correct setting; Reduce load
Motor Speed Too High or Too Low	Motor's rated value correct? Drive ratio correct? Inverter parameters are set incorrectly? Check if inverter output voltage is abnormal?	Check motor nameplate data Check the setting of drive ratio Check parameters setting Check V/HZ Characteristic value
Motor Running Unstable	Too big load? Too big with load change? Phase loss? Motor malfunction.	Reduce load; reduce load change, increase capacity Correct wiring
Power Trip	Wiring current is too high?	Check input wring Selecting matching air switch Reduce load Check inverter malfunction

14.4   North American & Canadian Compliance Information (Frame 1-5 only)

14.4.1 UL Standards
The UL/cUL mark applies to products in the United States and Canada and it means that UL has performed product testing and evaluation and determined that their stringent standards for product safety have been met. For a product to receive UL certification, all components inside that product must also receive UL certification:

14.4.2 UL Standards Compliance
This drive is tested in accordance with UL standard UL508C, File No. E142140 and complies with UL requirements. To ensure continued compliance when using this drive in combination with other equipment, meet the following conditions:

1. Do not install the drive to an area greater than pollution severity 2 (UL standard).

2. Installation and operating instructions shall be provided with each device.
The following markings shall appear in one of the following locations; shipped separately with the device; on a separable, self-adhesive permanent label that is shipped with the device; or anywhere on the device itself:

a) Designation markings for each wiring diagram

b) Markings for proper wiring connections

c) "Maximum surrounding air temperature 40°C" or equivalent

d) "Solid state motor overload protection reacts when reaches 150% of FLA" or equivalent

e) "Install device in pollution degree 2 environment." Or equivalent

f) "Suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical amperes, 480/240 volts maximum when protected by made by COOPER BUSSMANN LLC Class T Fuse." Or equivalent. Recommended input fuse selection listed below:

g) "Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes" or equivalent

h) "CAUTION – Risk of Electric Shock" should be provided, followed by instructions to discharge the Bus Capacitor or indicating the time required (5 minutes) for Bus Capacitor to discharge to a level below 50Vdc

i) "Drives have no provision for motor over temperature protection" or equivalent

j) For use in Canada only: "TRANSIENT SURGE SUPPRESSION SHALL BE INSTALLED ON THE LINE SIDE OF THIS EQUIPMENT AND SHALL BE RATED ____480/240 ___V (PHASE TO GROUND), 480/240V (PHASE TO PHASE), SUITABLE FOR OVERVOLTAGE CATEGORY _III___, AND SHALL PROVIDE PROTECTION FOR A RATED IMPULSE WITHSTAND VOLTAGE PEAK OF _ 6Kv" or equivalent

k) Field wiring terminal markings – Wiring terminals shall be marked to indicate the proper connections for power supply and load, or a wiring diagram coded to the terminal marking shall be securely attached to the device

l) "Use 60/75ºC CU wire" or equivalent

m) Required wire torque, type and range listed in drive installation manual.

Selection of Dynamic Braking Resistance and Fuses (IP20 units)

Supply	Part number	kW	Efficiency	Input Current (A) 230V	Input Current (A) 380V/460V	Input Current (A) 460V/480V	Output Current (A)	Input protection current	Min ohms	Peak A	Cont. A	Power kW	Suggested Resistor	Model	Current rating
1 ph 220V	10G-11-0015-XX	0.2		4			1.5	6	60	10	5	0.2	80	JJS-15	15A
	10G-11-0025-XX	0.37	94%	5.8			2.5	10							
	10G-11-0035-XX	0.55	94%	7.6			3.5	14							
	10G-11-0045-XX	0.75	94%	10			4.5	18.1							
	10G-12-0050-XX	1.1	94%	10.8			5	24.5							
	10G-12-0070-XX	1.5	94%	14			7	25.2							
	10G-12-0100-XX	2.2	94%	20			10	32							
3 ph 220V	10G-31-0015-XX	0.2	94%	2.5			1.5	5	60	10	5	0.2	80	JJS-15	15A
	10G-31-0025-XX	0.37	94%	3.5			2.5	8.2							
	10G-31-0035-XX	0.55	94%	4.5			3.5	10							
	10G-31-0045-XX	0.75	94%	5.4			4.5	11.5							
	10G-32-0050-XX	1.1	94%	5.8			5	18	50	15	7.5			JJS-25	25A
	10G-32-0070-XX	1.5	94%	7.8			7	18.2							
	10G-32-0100-XX	2.2	94%	11			10	21.5							
	10G-33-0170-XX	4.0	94%	18.5			17	28							
	10G-34-0210-XX	5.5	94%	22			21	33							
	10G-35-0300-XX	7.5	94%	31			30	47							
	10G-35-0400-XX	11	94%	41			40	62							
	10G-36-0550-XX	15	94%	57			55	86							
3 ph 460V	10G-41-0006-XX	0.2	94%		1.1	0.8	0.6	2.5	120	10	5	0.1	145	JJS-6	6
	10G-41-0010-XX	0.37	94%		1.5	1.2	1	5							
	10G-41-0015-XX	0.55	94%		2.1	1.8	1.5	5.5							
	10G-42-0020-XX	0.75	94%		3	2.1	2	6.5				0.15		JJS-15	15
	10G-42-0030-XX	1.1	94%		4	3.2	3	10.2							
	10G-42-0040-XX	1.5	94%		5	4.2	4	11							
	10G-42-0065-XX	2.2	94%		7.5	7.0	6.5	15							
	10G-43-0080-XX	3.7	94%		10.5	8.3	8	18	100	15	7.5	0.4	95	JJS-30	30
	10G-43-0090-XX	4	94%		11	9.2	9	21							
	10G-43-0120-XX	5.5	94%		14	11.5	12	29				0.55			
	10G-44-0170-XX	7.5	94%		18.5	16	17	34				0.75		JJS-45	45
	10G-44-0230-XX	11	97%		24	21	23	46.5	50	25	12.5	1.1	60	JJS-60	60
	10G-45-0320-XX	15	97%		36.5	27	32	80		40	20	1.5	35	JJS-80	80
	10G-45-0380-XX	18.5	97%		44	31	38	90	35	50	25	2		JJS-90	90
	10G-45-0440-XX	22	97%		51	35	44	100				2.2		JJS-100	100
	10G-46-0600-XX	30	97%		70	53	60	110	25	50	32	3	25	AJT-125	125
	10G-47-0750-XX	37	97%		80	64	75	120				4		AJT-150	150
	10G-47-0900-XX	45	97%		94	75	90	150	18	75	45	4.5	18	AJT-200	200
	10G-48-1100-XX	55	98%		120	85	110	180				5.5			
	10G-48-1500-XX	75	98%		160	115	150	240	16	100	50	7.5	16	AJT-300	300
	10G-49-1800-XX	90	98%		190	130	180	285	9	150	88	9	9	AJT-350	350
	10G-49-2200-XX	110	98%		225	170	220	340				11		AJT-400	400
	10G-410-2650-XX	132	98%		275	210	265	400	5.5	300	150	13.5	5.5	AJT-500	500
	10G-411-3200-XX	160	98%		330	250	320	500	4	400	200	16	4	AJT-600	600
	10G-411-3600-XX	180	98%		370	280	360	550				18			

Selection of Dynamic Braking Resistance and Fuses (IP66 units)

Supply	Part number	kW	Efficiency	230V	380V/460V	460V/480V	Output Current (A)	Input protection current	Min ohms	Peak A	Cont. A	Power kW	Suggested Resistor	Model	Current rating
1 ph 220V	16G-11-0025-XX	0.37	94%	5.8			2.5	10	60	10	5	0.2	80	JJS-15	15A
	16G-11-0045-XX	0.75	94%	10			4.5	18.1							
	16G-11-0070-XX	1.5	94%	14			7	25.2						JJS-25	25A
	16G-11-0100-XX	2.2	94%	20			10	32							
3 ph 220V	16G-31-0025-XX	0.37	94%	3.5			2.5	8.2	60	10	5			JJS-15	15A
	16G-31-0045-XX	0.75	94%	5.4			4.5	11.5				0.2	80		
	16G-31-0070-XX	1.5	94%	7.8			7	18.2	50	15	7.5			JJS-25	25
	16G-31-0100-XX	2.2	94%	11			10	21.5							
3 ph 460V	16G-41-0020-XX	0.75	94%		3	2.1	2	7	120	10	5	0.1	145	JJS-15	15
	16G-41-0040-XX	1.5	94%		5	4.2	4	11				0.15	95		
	16G-41-0065-XX	2.2	94%		7.5	7.0	6.5	15							
	16G-42-0090-XX	4	94%		11	9.2	9	21	100	15	7.5	0.4	95	JJS-30	30
	16G-42-0120-XX	5.5	94%		14	11.5	12	29				0.55			
	16G-42-0170-XX	7.5	94%		18.5	16	17	34				0.75		JJS-45	45
	16G-42-0230-XX	11	97%		24	21	23	47	50	25	12.5	1.1	60	JJS-60	60
	16G-43-0320-XX	15	97%		36.5	27	32	80		40	20	1.5	35	JJS-80	80
	16G-43-0380-XX*	18.5	97%		44	31	38	90	35	50	25	2	35	JJS-90	90
	16G-43-0440-XX*	22	97%		51	35	44	100				2.2		JJS-100	100
	16G-44-0600-XX*	30	97%		70	53	60	110	25		32	3	25	AJT-125	125
	16G-44-0750-XX*	37	97%		80	64	75	120				4		AJT-150	150
	16G-45-0900-XX*	45	97%		94	75	90	150	18	75	45	4.5	18	AJT-200	200
	16G-45-1100-XX*	55	98%		120	85	110	180				5.5		AJT-200	200
	16G-45-1500-XX*	75	98%		160	115	150	240	16	100	50	7.5	16	AJT-300	300
	16G-46-1800-XX*	90	98%		190	130	180	285	9	150	88	9	9	AJT-350	350

* Not UL listed

The drive is supplied with 5 Applications, Application 1 to Application 5. Please refer to following:

Application 1 is the factory default application, providing for basic speed control.
Application 2 supplies speed control using a manual or auto set-point.
Application 3 supplies speed control using preset speeds.
Application 4 supplies speed control using terminal.
Application 5 supplies speed control using PID.

Control wiring of application
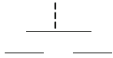
Normally open push-button
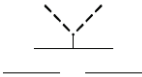
2-position switch
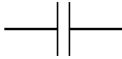
Normally open contact (relay)

The default application is 0 this gives complete access to all operating lists in this manual, to select one of the default control application macros, set parameter F228 1 – 5.

Application 1 - Basic Speed Control

Standard parameters

F228 Application
F111 Max frequency
F112 Min frequency
F114 Accel time
F115 Decel Time
F803 Motor rated current
F810 Motor rated frequency
F124 Jog setpoint
F209 Stop mode
F137 Torque compensation
F138 Linear compensation
F108 Password
F160 Reset to default values

Application 1:
Basic Speed Control

DIAGNOSTICS = F131
Frequency   Hz = 0
Analog Input   V = 4
Motor Current   A = 2
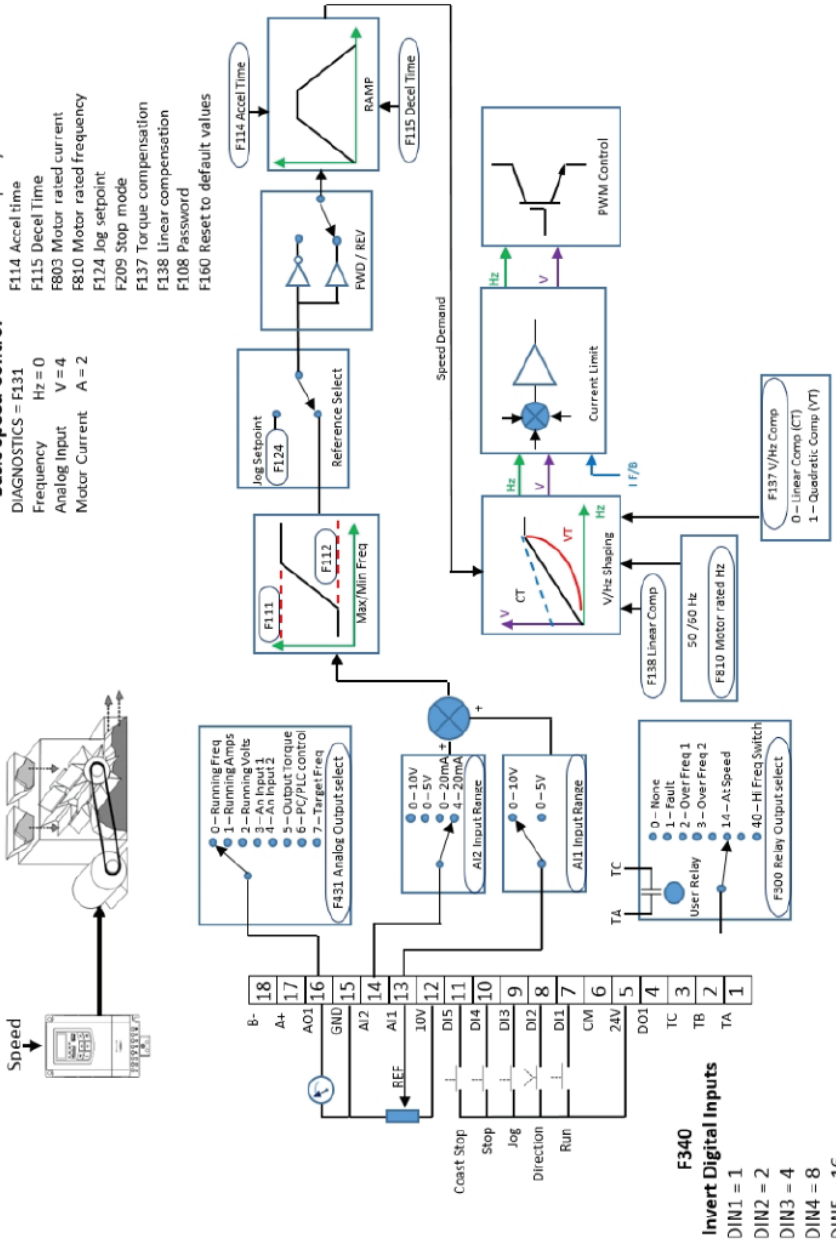
Application 2 - Auto/Manual Control

Standard parameters

F228 Application
F111 Max frequency
F112 Min frequency
F114 Accel time
F115 Decel Time
F803 Motor rated current
F810 Motor rated frequency
F124 Jog setpoint
F209 Stop mode
F137 Torque compensation
F138 Linear compensation
F108 Password
F160 Reset to default values

**Application 2:
Auto/Manual Control**

DIAGNOSTICS = F131
Frequency   Hz = 0
Analog Input   V = 4
Motor Current   A = 2

Ideal for automatic control applications
with limit switches or proximity sensors

F114 Accel Time
RAMP
F115 Decel Time

PWM Control

Sequence Logic

Coast Stop
Direction
Run Command

FWD / REV

Speed Demand

Current Limit

F137 V/Hz Comp
0 – Linear Comp (CT)
1 – Quadratic Comp (VT)

F112
F111
Max/Min Freq

V/Hz Shaping
CT
VT
F138 Linear Comp
50 /60 Hz
F810 Motor rated Hz

Reference Select

Level Sensor
Level Limit Switch

Pump

Automatic Level Control

Auto / Manual Selector
Auto Speed Reference

0 – Running Freq
1 – Running Amps
2 – Running Volts
3 – AN Input 1
4 – AN Input 2
5 – Output Torque
6 – PC/PLC control
7 – Target Freq
F451 Analog Output select

0 – 10V
0 – 5V
0 – 20mA
4 – 20mA
AI2 Inrot Range

0 – 10V
0 – 5V
AI1 Inrot Range

Run Select

0 – None
1 – Fault
2 – Over Freq 1
3 – Over Freq 2
14 – At Speed
40 – Hi Freq Switch
F300 Relay Output select

User Relay

TC
TA

Auto Speed Reference

REF

Coast Stop
Direction
Auto/Manual Select
Manual Run
Auto Run

18	B-
17	A+
16	AO1
15	GND
14	AI2
13	AI1
12	10V
11	DI5
10	DI4
9	DI3
8	DI2
7	DI1
6	CM
5	24V
4	DO1
3	TC
2	TB
1	TA

**F340
Invert Digital Inputs**

DIN1 = 1
DIN2 = 2
DIN3 = 4
DIN4 = 8
DIN5 = 16

Application 3 - Preset Speeds

Standard parameters

F228 Application
F111 Max frequency
F112 Min frequency
F114 Accel time
F115 Decel Time
F803 Motor rated current
F810 Motor rated frequency
F124 Jog setpoint
F209 Stop mode
F137 Torque compensation
F138 Linear compensation
F108 Password
F160 Reset to default values

Application 3:
Preset Speeds Control

DIAGNOSTICS = F131
Frequency   Hz = 0
Analog Input   V = 4
Motor Current A = 2

Ideal for applications requiring
multiple discrete speed levels

PRESET	A	B	C	FWD	REV
1	0V	0V	0V	549=0	549=1
2	0V	0V	24V	550=0	550=1
3	0V	24V	0V	551=0	551=1
4	0V	24V	24V	552=0	552=1
5	24V	0V	0V	553=0	553=1
6	24V	0V	24V	554=0	554=1
7	24V	24V	0V	555=0	555=1
8	24V	24V	24V	556=0	556=1

F114 Accel Time
F115 Decel Time
R-AMP
FWD / REV
F111
F112
Max/Min Freq
Speed Demand
PWM Control
Current Limit
V/Hz Shaping
CT
VT
F137 V/Hz Comp
0 – Linear Comp (CT)
1 – Quadratic Comp (VT)
F138 Linear Comp
F810 Motor Rated Hz
Sequence Logic
Coast Stop
Run Command
F209 Stop Mode

F431 Analog Output select
0 – Running Freq
1 – Running Amps
2 – Running Volts
3 – An Input 1
4 – An Input 2
5 – Output Torque
6 – PC/PLC control
7 – Target Freq

F504 Preset 1
F505 Preset 2
F506 Preset 3
F507 Preset 4
F508 Preset 5
F509 Preset 6
F510 Preset 7
F511 Preset 8

F360 Relay Output select
0 – None
1 – Fault
2 – Over Freq 1
3 – Over Freq 2
14 – At Speed
40 – Hi Freq Switch

User Relay
TC
TA

Preset Speeds

18	B-
17	A+
16	AO1
15	GND
14	AI2
13	AI1
12	10V
11	DI5
10	DI4
9	DI3
8	DI2
7	DI1
6	CM
5	24V
4	DO1
3	TC
2	TB
1	TA

REF

Coast Stop
Preset select 1
Preset select 2
Preset select 3
Run Forward

A
B
C

F340
Invert Digital Inputs

DIN1 = 1
DIN2 = 2
DIN3 = 4
DIN4 = 8
DIN5 = 16

Application 4 - Raise/Lower Trim

Standard parameters

F228 Application
F111 Max frequency
F112 Min frequency
F114 Accel time
F115 Decel Time
F803 Motor rated current
F810 Motor rated frequency
F124 Jog setpoint
F209 Stop mode
F137 Torque compensation
F138 Linear compensation
F108 Password
F160 Reset to default values

Application 4:
Raise / Lower Control

DIAGNOSTICS = F131
Frequency   Hz = 0
Analog Input   V = 4
Motor Current A = 2

Ideal for applications requiring speed
control from multiple locations

F114 Accel Time
F115 Decel Time
RAMP

FWD / REV

PWM Control

F111
F112
Max/Min Freq

Current Limit

Speed Demand

V/Hz Shaping
CT
VT
Hz
V

F158 Linear Comp
50 /60 Hz
F810 Motor rated Hz

F137 V/Hz Comp
0 – Linear Comp (CT)
1 – Quadratic Comp (VT)

I F/B

F431 Analog Output select
0 – Running Freq
1 – Running Amps
2 – Running Volts
3 – An Input 1
4 – An Input 2
5 – Output Torque
6 – PC/PLC control
7 – Target Freq

F113 Target Freq
RAISE / LOWER

F300 Relay Output select
0 – None
1 – Fault
2 – Over Freq 1
3 – Over Freq 2
14 – At Speed
40 – Hi Freq Switch

User Relay
TC
TA

SPEED
Raise/Lower

SPEED
Raise/Lower

B-	18
A+	17
AO1	16
GND	15
AI2	14
AI1	13
10V	12
DI5	11
DI4	10
DI3	9
DI2	8
DI1	7
CM	6
24V	5
DO1	4
TC	3
TB	2
TA	1

Coast Stop
Reset
Lower Speed
Raise Speed
Run Forward

F340
Invert Digital Inputs

DIN1 = 1
DIN2 = 2
DIN3 = 4
DIN4 = 8
DIN5 = 16

Application 5 - PID

Application 5:
PID Control

DIAGNOSTICS = F131
Frequency   Hz = 0
Analog Input   V = 4
Motor Current A = 2

Easy tuning for setpoint/feedback control applications regulating volume or pressure, such as air handling or pumping

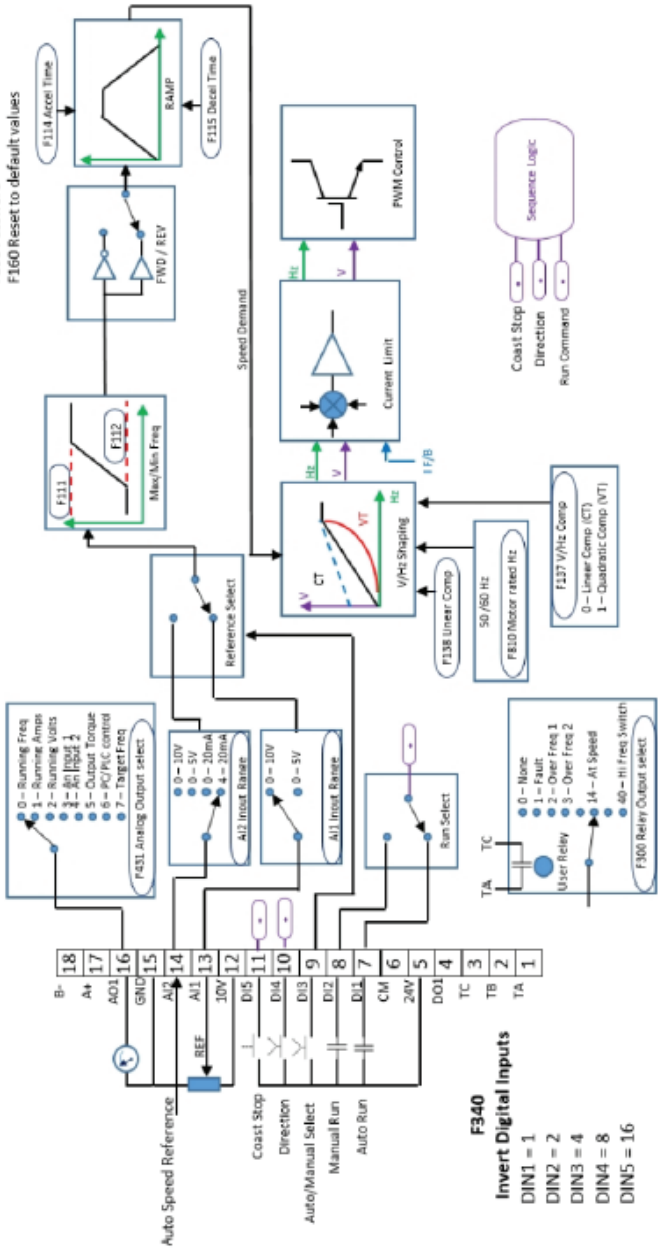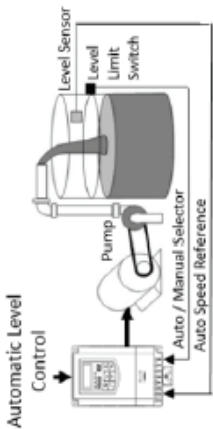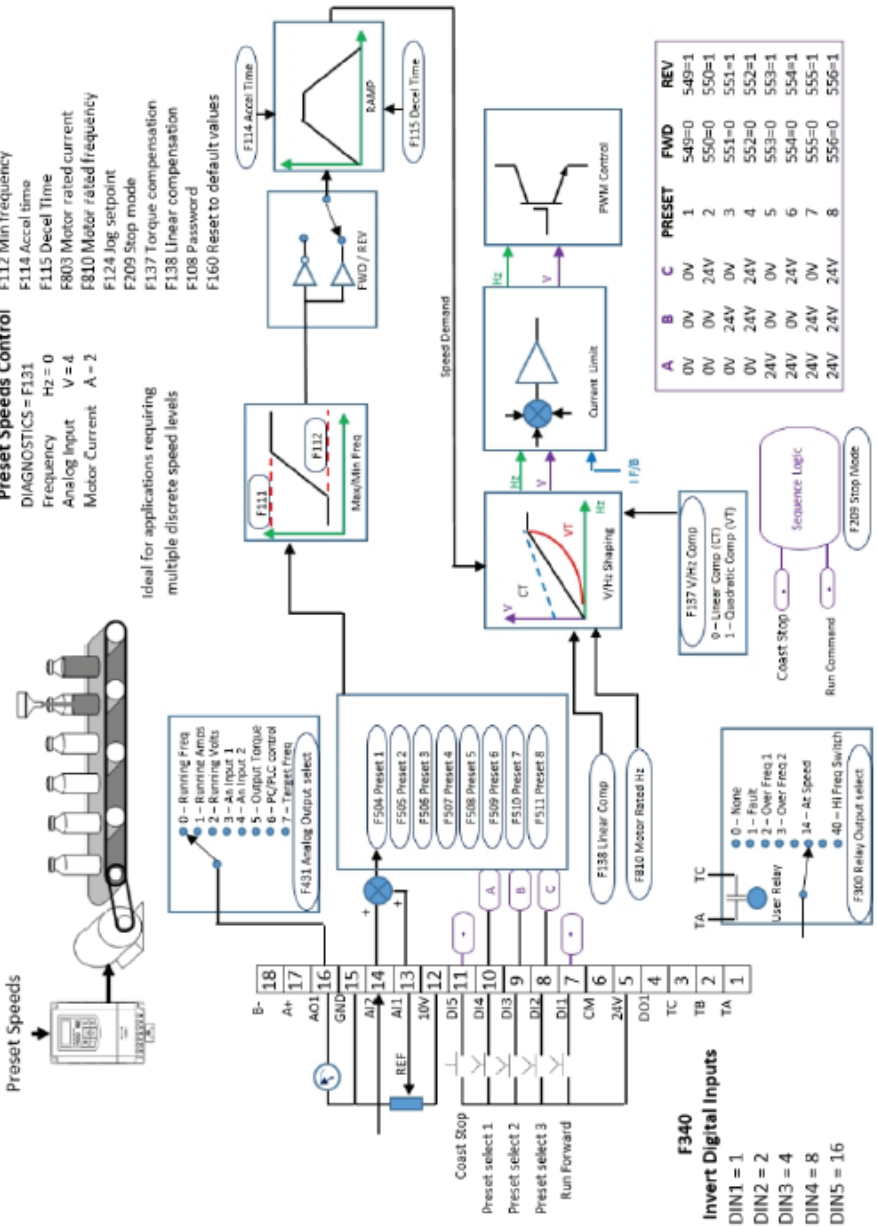**Standard parameters**

F228 Application
F111 Max frequency
F112 Min frequency
F114 Accel time
F115 Decel Time
F803 Motor rated current
F810 Motor rated frequency
F124 Jog setpoint
F209 Stop mode
F137 Torque compensation
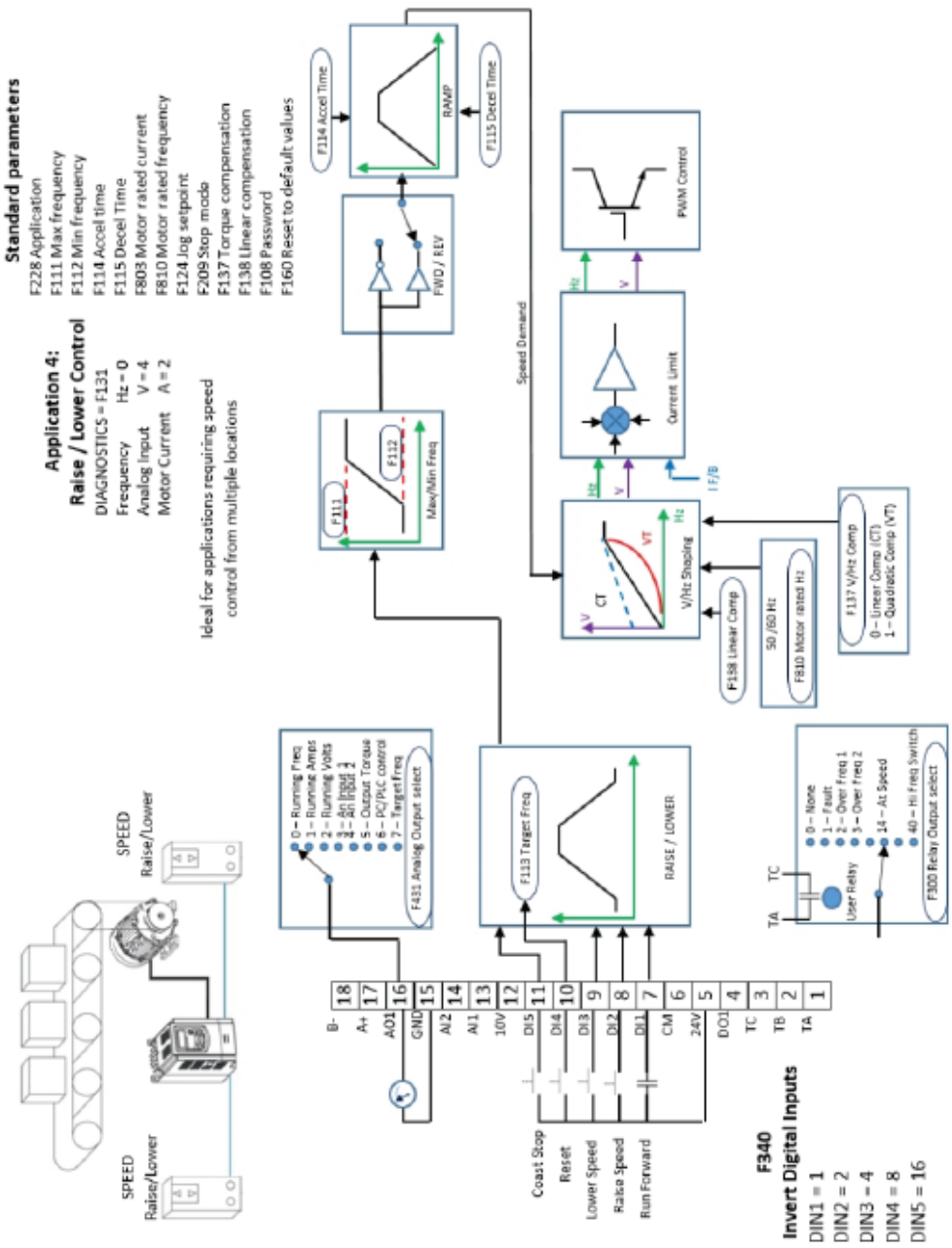F138 Linear compensation
F108 Password
F160 Reset to default values
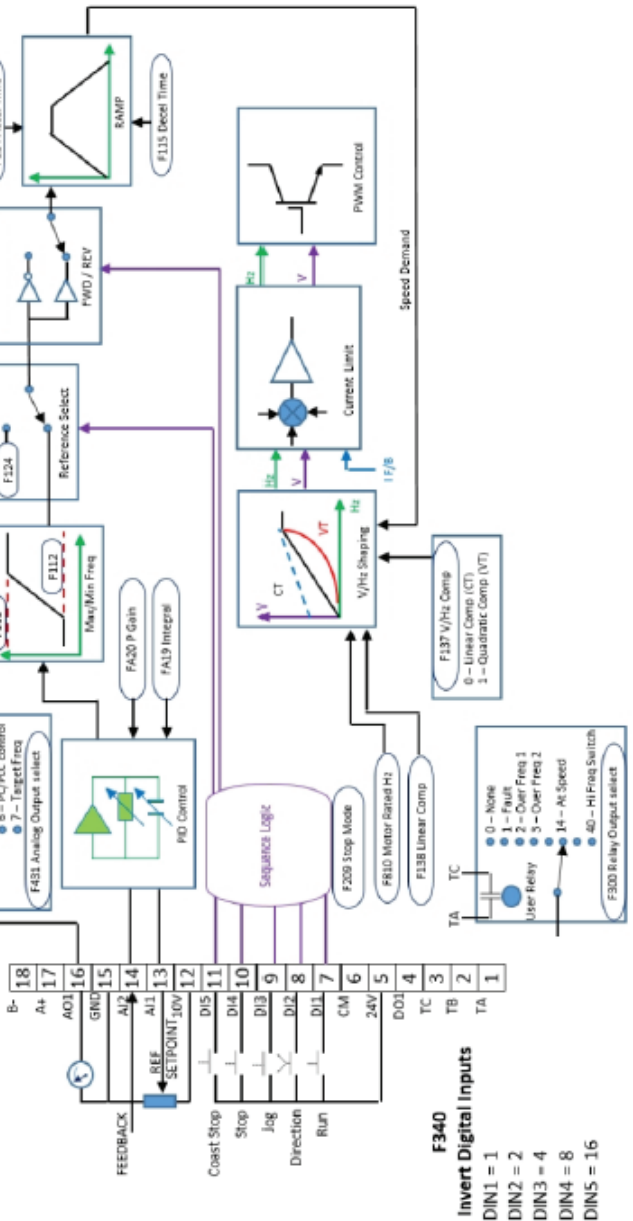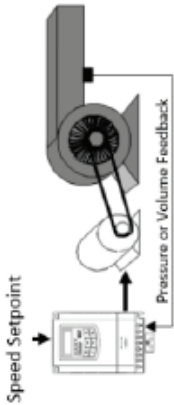
Additional Accessories and Options for your Parker AC10 Drive Include:

- Three Phase Line Reactor
- Circuit Breakers
- Fuse Kits
- Contactors
- Control Transformer
- Dynamic Braking Resistors

To purchase any of these items, please visit www.parker.com/ssdusa and click "Where to Buy".

For EMC certification information, please refer to the product manual.

Configuration and Monitoring Software

Parker Drive Basic (PDB)

PDB is a monitoring and configuration software tool provided free of charge with the AC10, and updates will be available as released on our website. Connecting to the AC10 over Modbus, Parker Drive Basic enables users to import, modify and export drive parameters as well as providing a convenient means of starting, stopping and monitoring the operation of the drive.

To download PDB software, please visit www.parker.com/ssdusa/software

DSE Lite

DSE Lite software is an easy to use configuration, commissioning and monitoring tool with graphical interface for the AC10 drive. This software allows the user to create, parameterize and configure user defined applications thanks to function blocks dedicated to speed control, winder, PID, diameter calculator, and more. While the drive is in run mode, the oscilloscope function allows "on-line" monitoring of selected parameters and can record trends.

To download DSE Lite software, please visit www.parker.com/ssdusa/software

Remote Mounting Keypad

The remote mounting keypad allows users to mount the keypad remote from the AC10 drive, such as on the door of an electrical enclosure. The remote keypad provides the same functionality as the drive mounted keypad and is connected to the drive via a 1.5 meter cable that is provided with the option.

Remote Mounting Keypad
Part Number: 1001-00-00

Cloning Module

AC10 drives may be cloned using the Parker cloning module that plugs into the side of the drive. This module allows users to copy applications between AC10 drives and upload and download parameter sets between drive and PDB or DSE Lite software.
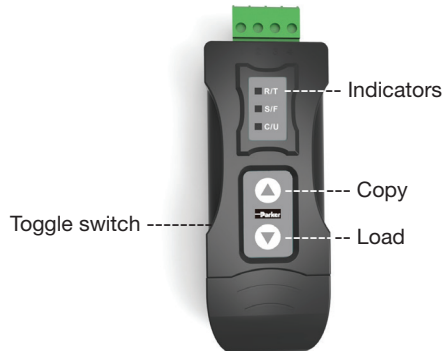
Cloning Module
Part Number: 1002-00-00

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F100	User's Password	0-9999		√
F102	Inverter's Rated Current (A)		Subject to inverter model	○ *
F103	Inverter Power (kW)		Subject to inverter model	○ *
F104	Reserved			
F105	Software Edition No.		Subject to inverter model	Δ
F106	Control Mode	Setting range: 0:Sensorless vector control (SVC); 1: Reserved; 2: VVVF 3: Vector control 1 6: PMSM sensorless vector control	2	X
F107	Password Protection	0: Disabled; 1: Enabled	0	√
F108	User's Password	0-9999	8	√
F109	Starting Frequency (Hz)	0.0-10.00Hz	0.0	√
F110	Holding Time of Starting Frequency (S)	0.0-999.9	0.0	√
F111	Max Frequency (Hz)	F113-590.0Hz	50.00	√
F112	Min Frequency (Hz)	0.00Hz-F113	0.50	√
F113	Target Frequency (Hz)	F112-F111	50.00	√
F114	1st Acceleration Time (S)	0.1-3000	Subject to inverter model	√
F115	1st Deceleration Time (S)	0.1-3000		√
F116	2nd Acceleration Time (S)	0.1-3000		√
F117	2nd Deceleration Time (S)	0.1-3000		√
F118	Base Frequency (Hz)	15.00-590.0	50.00	X
F119	Setting Accel/Decel Reference Time	0: 0~50.00Hz 1: 0~ F111	0	X
F120	Forward/Reverse Switchover Dead-Time	0.0-3000	0.0	√

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F121	Reserved			
F122	Reverse Running Forbidden	0: False; 1: True	0	X
F123	Negative Frequency is Valid in Combined Speed Control Mode.	0: False; 1: True	0	X
F124	Jogging Frequency	F112-F111	5.00Hz	√
F125	Jogging Accel Time	0.1-3000 s	Subject to inverter model	√
F126	Jogging Decel Time	0.1-3000 s		√
F127	Skip Frequency A	0.00-590.0 Hz	0.00	√
F128	Skip Width A	±2.50 Hz	0.00	√
F129	Skip Frequency B	0.00-590.0 Hz	0.00	√
F130	Skip Width B	±2.50 Hz	0.00	√
F131	Running Display Items	0: Output frequency / function code 1: Output RPM 2: Output current 4: Output voltage 8: DC Bus voltage 16: PID feedback value 32: Temperature 64: Reserved 128: Linear speed 256: PID setpoint value 512: Reserved 1024: Reserved 2048: Output power 4096: Output torque	0+1+2+4+8 =15	√
F132	Display Items for Stop Mode	0: Freq / function code 1: Keypad jogging 2: Target RPM 4: DC Bus voltage 8: PID feedback value 16: Temperature 32: Reserved 64: PID setpoint value 128: Reserved 256: Reserved 512: Setting torque	2+4=6	√
F133	Drive Ratio of Driven System	0.10-200.0	1.0	√
F134	Transmission-wheel Radius	0.001-1.000	0.001	√

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F135	Reserved			
F136	Slip Compensation	0-10	0	X
F137	Torque Compensation Mode	0: Linear comp; 1: Quadratic comp; 2: User-defined multipoint comp 3: Auto torque comp	3	X
F138	Linear Compensation	1-20	Subject to inverter model	X
F139	Quadratic Compensation	1: 1.5; 2: 1.8; 3: 1.9; 4: 2.0	1	X
F140				
F141				
F142-F152	User defined multipoint torque comp function codes, refer to Product Manual for settings	N/A	N/A	X
F153	Carrier frequency setting	Subject to inverter model	Subject to inverter model	X
F154	Automatic voltage rectification	Setting range: 0: Disabled 1: Enabled 2:Disabled during decel process	0	X
F155	Digital secondary freq setting	0-F111	0	X
F156	Digital secondary freq polarity setting	0-1	0	X
F157	Reading secondary freq			Δ
F158	Reading secondary freq polarity			Δ
F159	Random carrier-wave freq select	0: Control speed normally; 1: Random carrier-wave frequency	1	
F160	Reverting to manufacturer values (Factory Defaults)	0: Not reverting to mfr values; 1: Reverting to mfr values	0	X

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F200	Source of start command	0: Keypad command; 1: Terminal command; 2: Keypad+Terminal; 3: MODBUS; 4: Keypad+Terminal+ MODBUS	4	X
F201	Source of stop command	0: Keypad command; 1: Terminal command; 2: Keypad+Terminal; 3: MODBUS; 4: Keypad+Terminal+ MODBUS	4	X
F202	Mode of direction setting	0: Forward run locking; 1: Reverse run locking; 2: Terminal setting 3: Keypad	0	X
F203	Main frequency source (X)	0: Digital setting memory; 1: External analog AI1; 2: External analog AI2; 3: Reserved; 4: Stage speed control; 5: No memory by digital setting; 6: Reserved;; 7: Reserved; 8: Reserved; 9: PID output; 10: MODBUS	0	X
F204	Secondary frequency source (Y)	0: Digital setting memory; 1: External analog AI1; 2: External analog AI2; 3: Reserved; 4: Stage speed control; 5: PID adjusting; 6: Reserved;	0	X
F205	Reference for selecting secondary frequency source (Y) range	0: Relative to max freq; 1: Relative to main freq (X)	0	X
F206	Secondary frequency (Y) range	0-100%	100	X

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F207	Frequency source selection	0: X; 1: X+Y; 2: X or Y (terminal switchover); 3: X or X+Y (terminal switchover); 4: Combination of stage speed and analog 5: X-Y 6: Reserved;	0	X
F208	Terminal operation mode	0: No function; 1: Two-line operation mode 1; 2: Two-line operation mode 2; 3: three-line operation mode 1; 4: three-line operation mode 2; 5: start/stop controlled by direction pulse	0	X
F209	Motor stopping mode	0: stop by deceleration time; 1: free stop (coast stop)	0	X

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F210	Frequency display accuracy	0.01-2.00	0.01	√
F211	Speed of digital control	0.01-100.00Hz/s	5.00	√
F212	Direction memory	0: Disabled 1: Enabled	0	√
F213	Auto-start after repowered up	0: Disabled 1: Enabled	0	√
F214	Auto-start after reset	0: Disabled 1: Enabled	0	√
F215	Auto-start delay time	0.1-3000.0	60.0	√
F216	Auto-start restart attempts	0-5	0	√
F217	Fault reset delay	0.0-10.0	3.0	√
F218	Reserved			
F219	Write EEPROM by Modbus	1: Disabled; 0: Enabled	1	√
F220	Frequency memory after power-down	0: Disabled 1: Enabled	0	√
F221-F223	Reserved			
F224	When target frequency is lower than min frequency	0: Stop 1: run at min freq	1	√
F225-F227	Reserved			
F228	Application selection	0: Invalid 1: Basic speed control 2: auto/manual control 3: Stage speed control 4: Terminal control; 5: PID control;	No Macro selected	
F229-F230	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F300	Relay output	0: No function 1: Inverter fault 4: Free stop (coast stop)	1	√
F301	DO1 output	5: In running status 1 15: At speed	14	√
F302	DO2 output	Refer to Product manual for additional settings	5	
F303-F306	Reserved			
F307	Target frequency 1	F112-F111	10.00	√
F308	Target frequency 2	F112-F111	50.00	√
F309	Target frequency width (%)	0-100	50	√
F310	Target current (A)	0-1000	Rated current	√
F311	Target current width (%)	0-100	10	√
F312	At speed threshold (Hz)	0.00-5.00	0.00	√
F313-F315	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F316	DI1 terminal function setting	0: No function 1: Run 2: Stop 3: Multi-stage speed 1 4: Multi-stage speed 2 5: Multi-stage speed 3 6: Multi-stage speed 4 7: Reset 8: Free stop (coast stop) 9: External coast stop 10: Accel/decel hold 11: Forward run jogging 12: Reverse run jogging 13: Increase freq UP 14: Decrease freq DOWN 15: "FWD" terminal 16: "REV" terminal 17: Three-line type input "X" terminal 18: Accel/decel time switchover 1 19-58 refer to product manual for additional settings	11	√
F317	DI2 terminal function setting		9	√
F318	DI3 terminal function setting		15	√
F319	DI4 terminal function setting		16	√
F320	DI5 terminal function setting		7	
F321	DI6 terminal function setting		8	
F322	DI7 terminal function setting		0	
F323	DI8 terminal function setting		0	√
F324	Free stop (coast stop) terminal logic	0: Positive logic (low level = True); 1: Negative logic (high level = True)	0	X
F325	External coast stop terminal logic		0	X
F326	Watchdog time	0.0-3000.0	10.0	√
F327	Stop mode	0: Free stop (coast stop) 1: Decel to stop	0	X
F328	Terminal filter times	1-100	10	√
F329	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F330	Diagnostics of DIx terminal		Read-only	Δ
F331	Monitoring AI1		Read-only	Δ
F332	Monitoring AI2		Read-only	Δ
F335	Relay output simulation	Setting range: 0: Output true. 1: Output false.	0	X
F336	DO1 output simulation		0	X
F338	AO1 output simulation	Setting range: 0-4095	0	X
F339	AO2 output simulation	Setting range: 0-4095	0	X
F340	Selection of terminal negative logic	0: None 1: DI1 negative logic 2: DI2 negative logic 4: DI3 negative logic 8: DI4 negative logic 16: DI5 negative logic 32: DI6 negative logic 64: DI7 negative logic 128: DI8 negative logic	0	√

Function Code	Function Definition	Setting Range	Value	Change
F400	Lower limit of AI1 channel input	0.00-F402	0.01	√
F401	Corresponding setting for lower limit of AI1 input	0-F403	1.00	√
F402	Upper limit of AI1 channel input	F400-10.00	10.00	√
F403	Corresponding setting for upper limit of AI1 input	Max (1.00, F401) - 2.00	2.00	√
F404	AI1 channel proportional gain K1	0.0-10.0	1.0	√
F405	AI1 filtering time constant	0.01-10.0	0.10	√
F406	Lower limit of AI2 channel input	0.00-F408	0.01	√
F407	Corresponding setting for lower limit of AI2 input	0-F409	1.00	√
F408	Upper limit of AI2 channel input	F406-10.00	10.00	√
F409	Corresponding setting for upper limit of AI2 input	Max (1.00, F407) - 2.00	2.00	√
F410	AI2 channel proportional gain K2	0.0-10.0	1.0	√
F411	AI2 filtering time constant	0.01-10.0	0.10	√
F418	AI1 channel 0Hz voltage dead zone	0-0.50V (Positive-Negative)	0.00	√
F419	AI2 channel 0Hz voltage dead zone	0-0.50V (Positive-Negative)	0.00	√
F421	Keypad selection	0: Local keypad 1: Remote keypad 2: Local + remote keypad	1	√
F422	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F423	AO1 output range	0: 0-5V 1: 0-10V or 0-20mA 2: 4-20mA	1	√
F424	AO1 lowest corresponding freq	0.0-F425 Hz	0.05	√
F425	AO1 highest corresponding freq	F424-F111 Hz	50.00	√
F426	AO1 output comp	0-120	100	√
F427	AO2 output comp	0: 0-20mA 1: 4-20mA	0	√
F428	AO2 lowest corresponding freq (Hz)	0.0-F429	0.05	√
F429	AO2 highest corresponding freq (Hz)	F428-F111	50.00	√
F430	AO2 output comp (%)	0-120	100	√
F431	AO1 analog output signal selecting	0: Running frequency 1: Output current 2: Output voltage 3: Analog AI1		
F432	AO2 analog output signal selecting	4: Analog AI2 6: Output torque 7: Given by PC/PLC 8: Target frequency		
F433	Corresponding current for full range of external voltmeter	0.01-5.00 times of rated current		
F434	Corresponding current for full range of external ammeter			
F435-F436	Reserved			
F437	Analog filter width	1-100		
F438-F459	Reserved			
F460	AI1channel input mode	0: Straight line mode 1: User defined input mode		
F461	AI2 channel input mode	0: Straight line mode 1: User defined input mode		
F462-F473	AI1 and AI2 user defined input table	N/A		

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F500 - F580	Multi-Stage speed control definition table, refer to product manual	N/A	N/A	X

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F600	DC Braking Function Selection	0: Disabled; 1: Braking before starting; 2: Braking during stopping; 3: Braking during starting and stopping	0	X
F601	Initial Frequency for DC Braking	0.20-50.00	1.00	√
F602	DC Braking level before Starting (V/A)	0-100	10	√
F603	DC Braking level During Stop (V/A)	0-100	10	√
F604	Braking Lasting Time Before Starting (S)	0.00-30.00	0.50	√
F605	Braking Lasting Time During Stopping (S)	0.00-30.00	0.50	√
F606	Reserved			
F607	Stall Adjustment Function	0: Disabled; 1: Enabled 2: Reserved 3: Voltage current control 4: Voltage control 5: Current control	0	√

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F608	Stall Current Level (%)	60-200	160	√
F609	Stall Voltage Level (%)	110-200	1 phase: 130 3 phase: 140	√
F610	Stall Protection Time	0.1-3000	60.0	√
F611	Dynamic Braking Threshold (V)	200~1000	Subject to inverter model	Δ
F612	Dynamic Braking Duty Ratio (%)	0-100	80	X
F613	Flycatching	0: Invalid 1: Valid 2: Valid at first time	0	X
F614	Flycatching Rate Mode	0: Flycatching from frequency memory 1: Flycatching from max frequency 2: Flycatching from freq memory and direction memory 3: Flycatching from max freq and direction memory	0	X
F615	Flycatching Rate	1-100	20	X
F613-F621	Reserved			
F619	Flycatching (fault) Time out (S)	0-3000	60	
F620-F621	Reserved			
F622	Dynamic Braking Mode	0: Fixed duty ratio 1: Auto duty ratio	0	√
F627	Current Limiting when Flycatching	50-200	100	X
F631	VDC Adjustment Selection	0: Disabled 1: Enabled	0	√
F632	Target voltage of VDC adjustor (V)	200-800	Subject to inverter model	√o
F633-F649	Reserved			
F650	High-frequency performance	Setting range: 0: Invalid 1: Terminal enabled 2: Enabled mode 1 3: Enabled mode 2	2	Xo
F651	Switchover frequency 1	F652-150.00	100.00	√o
F652	Switchover frequency 2	0-F651	95.00	√o
F653-F670	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F700	Selection of terminal free stop mode	0: Immediate free stop (coast stop); 1: Delayed free stop (coast stop)	0	√
F701	Delay time for free stop (coast stop) and programmable terminal action	0.0-60.0s	0.0	√
F702	Fan control mode	0: Controlled by temperature 1: Run when inverter is powered on 2: Controlled by running status	2	√
F703	Reserved			
F704	Inverter Overload pre-alarm Setpoint (%)	50~100	80	X
F705	Motor Overload pre-alarm Setpoint (%)	50~100	80	X
F706	Inverter Overloading Setpoint (%)	120-190	150	X
F707	Motor Overloading Setpoint (%)	20-100	100	X
F708	Trip 1 Type (Newest)	Setting range: 2: Over current (OC) 3: Over voltage (OE) 4: Input phase loss (PF1) 5: Inverter overload (OL1) 6: Under voltage (LU)		Δ
F709	Trip 2 Type	7: Overheat (OH) 8: Motor overload (OL2) 11: External malfunction (ESP) 12: Current fault before running (Err3) 13. Studying parameters without motor (Err2)		Δ
F710	Trip 3 Type	15: Current sampling fault (Err4) 16: Over current 1 (OC1) 17: Output phase loss (PF0) 18: Analog disconnected (Aerr) 23: PID parameters set wrong (Err5) 45: Communication Timeout (CE) 46: Flycatching fault (FL) 49: Watchdog fault (Err6) 67: Overcurrent (OC2)		Δ

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F711	Trip 1 Fault Frequency			Δ
F712	Trip 1 Fault Current			Δ
F713	Trip 1 Fault DC Bus Voltage			Δ
F714	Trip 2 Fault Frequency			Δ
F715	Trip 2 Fault Current			Δ
F716	Trip 2 Fault DC Bus Voltage			Δ
F717	Trip 3 Fault Frequency			Δ
F718	Trip 3 Fault Current			Δ
F719	Trip 3 Fault DC Bus Voltage			Δ
F720	Number of Overcurrent Faults			Δ
F721	Number of Overvoltage Protection Faults			Δ
F722	Number of Overheat Protection Faults			Δ
F723	Number of Overload Protection Faults			Δ
F724	Input Phase Loss	0: Disabled; 1: Enabled	1	oX
F725	Reserved			
F726	Overheat	0: Disabled; 1: Enabled	1	oX
F727	Output Phase Loss	0: Disabled; 1: Enabled	0	o
F728	Input Phase Loss Trip Delay	0.1-60.0	0.5	√
F730	Overheat Protection Trip Delay	0.1-60.0	5.0	√
F732	Under-Voltage Threshold	0-450	Subject to inverter model	o
F737	Over-current 1 Protection	0: Disabled; 1: Enabled	0	
F738	Over-current 1 Protection Setpoint	0.50-3.00	2.50	
F739	Over-current 1 Protection Record			Δ

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F740	Reserved			
F741	Analog Disconnected Protection	0: Invalid 1: Stop and AErr displays. 2: Stop and AErr is not displayed. 3: Inverter runs at the min frequency. 4: Reserved.	0	√
F742	Threshold of Analog Disconnected Protection (%)	1-100	50	o
F745	Threshold of Pre-alarm Overheat (%)	0~100	80	o*
F747	Carrier Frequency Auto-adjusting	0: Invalid 1: Valid	1	√
F754	Zero-current Threshold (%)	0-200	5	X
F755	Duration time of zero-current	0-60	0.5	√

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F800	Motor's Parameters Selection	Setting range: 0: Invalid; 1: Rotating tuning.; 2: Stationary tuning	0	X
F801	Rated Motor Power	0.2-1000kW		oX
F802	Rated Motor Voltage	1-440V		oX
F803	Rated Motor Current	0.1-6500A		oX
F804	Number of Motor Poles	2-100	4	oX
F805	Base Motor RPM	1-30000		oX
F806	Stator Resistance Ω	0.001-65.53Ω (22kw and below) 0.1~6553mΩ (above 22kw)	Subject to inverter model	oX

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F807	Rotor Resistance Ω	0.001-65.53 Ω (22 kw and below) 0.1-6553 mΩ (above 22 kw)	Subject to inverter model	oX
F808	Leakage Inductance(mH)	0.01-655.3 mH (22kw and below) 0.001-65.53 mH (above 22kw)	Subject to inverter model	oX
F809	Mutual Inductance(mH)	0.01-655.3 mH (22kw and below) 0.001~65.53 mH (above 22kw)	Subject to inverter model	oX
F810	Motor Rated Freq	1.00-590 Hz	50.00	oX
F812	Pre-exciting Time	0.000-30.00 s	0.30	√
F813	Rotary Speed Loop KP1	0.01-20.00 (22 kw and below) 1-100 (above 22 kw)	Subject to inverter model	o√
F814	Rotary Speed Loop KI1	0.01-2.00 (22 kw and below) 0.01-10.00 (above 22 kw)	Subject to inverter model	o√
F815	Rotary Speed Loop KP2	0.01-20.00 (22 kw and below) 1-100 (above 22 kw)	Subject to inverter model	o√
F816	Rotary Speed Loop KI2	0.01-2.00 (22 kw and below) 0.01-10.00 (above 22 kw)	Subject to inverter model	o√
F817	PID Switching Frequency 1	0-F111	5.00	√
F818	PID Switching Frequency 2	F817-F111	50.00	√
F819-F860	Reserved		Subject to inverter model	√
F870	PMSM back electromotive force (mV/rpm)	0.1-999.9	Subject to inverter model	o

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F871	PMSM D-axis inductance (mH)	0.01-655.35	Subject to inverter model	o
F872	PMSM Q-axis inductance (mH)	0.01-655.35	Subject to inverter model	o
F873	PMSM stator resistance (Ω)	0.001-65.535	Subject to inverter model	o
F876	PMSM injection current without load (%)	0.0-100.0	20.0	X
F877	PMSM injection current compensation without load (%)	0.0-50.0	0.0	X
F878	PMSM cut-off point of injection current compensation without load (%)	0.0-50.0	10.0	X

Function Code	Function Definition	Setting Range	Mfr's Value	Change
F900	Communication Address	1~255: single inverter address 0: broadcast address	1	√
F901	Communication Mode	1: ASCII 2: RTU	1	o√
F902	Stop byte	1-2	2	√
F903	Parity Check	0: None 1: Odd 2: Even	0	√
F904	Baud Rate	0: 1200 1: 2400 2: 4800 3: 9600 4: 19200 5: 38400 6: 57600	3	√
F905	Communication Timeout	0.0~3000.0		
F906-F930	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
FA01	PID reference signal source	0: FA04 1: AI1 2: AI2	0	X
FA02	PID feedback signal source	1: AI1 2: AI2	0	√
FA03	Max limit of PID output (%)	FA04-100.0	10.00	√
FA04	PID Digital reference (%)	FA05-FA03	50.0	√
FA05	Min limit of PID output (%)	0.0-FA04	0.0	√
FA06	PID polarity	0: Positive feedback 1: Negative feedback	1	X
FA07	Sleep function selection	0: Enabled 1: Disabled	0	X
FA09	PID Min output frequency (Hz)	Max (F112, 0.1)-F111	5.00	√
FA10	Sleep delay time (s)	0-500.0	15.0	√
FA11	Wake delay time (s)	0.0-3000	3.0	√
FA18	Whether PID target is changed	0: Disabled 1: Enabled	1	X
FA19	Proportion Gain P	0.00~10.00	0.3	√
FA20	Integration time I (s)	0.0~100.0S	0.3	√
FA21	Differential time D (s)	0.00~10.00	0.0	√
FA22	PID sampling period (s)	0.1-10.0s	0.1	√
FA29	PID dead time (%)	0.0-10.0	2.0	√
FA58	Fire pressure target value (%)	0.0-100.0	80.0	√
FA59	Emergency fire mode	0: Disabled 1: Emergency fire mode 1 2: Emergency fire mode 2	0	√
FA60	Emergency fire mode frequency	F112-F111	50.0	√
FA61	Reserved			
FA62	When emergency fire control terminal transitions false	0: Inverter cannot be stopped manually 1: Inverter can be stopped manually	0	X
FA63-FA80	Reserved			

Function Code	Function Definition	Setting Range	Mfr's Value	Change
FC00 – FC40	Torque control Parameters, refer to product manual for details	N/A	N/A	√

X indicates that function code can only be modified in stop state.

√ indicates that function code can be modified both in stop and run state.

∆ indicates that function code can only be checked in stop or run state but cannot be modified.

o indicates that function code cannot be initialized as inverter restores manufacturer's value but can only be modified manually.

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