IKON drive

User Guide

GE200 Series AC Drive

(0.75–2.2 kW)

Preface

Thank you for purchasing the GE200 Series AC Drive developed by IKON.

As a general-purpose and high-performance current vector AC drive, it is mainly used for controlling and adjusting the speed and torque of three-phase AC asynchronous motors. Using high-performance vector control technology, the GE200 series AC drive features high torque output at a low speed, excellent dynamic characteristics, and superior overload capability. It provides user-programmable features and monitoring software, and communication bus functions and supports multiple encoder types, delivering rich and powerful combined functions and stable performance. It can be used to drive automatic manufacturing equipment in the fields of textile, papermaking, drawing, machine tools, packaging, food, fans, and water pumps.

Product appearance

■ First use

Read this user guide carefully if you use the product for the first time. For any doubt on its function or performance, contact our technicians for help.

■ Standards compliance

The following table lists the certificates and standards that the product may comply with. For details about the acquired certificates, see the certification marks on the product nameplate.

Name	Directive Name		Standard
CE certification	EMC Directive	2014/30/EU	EN 61800-3
	LVD Directive	2014/35/EU	EN 61800-5-1
	RoHS Directive	2011/65/EU	EN 50581
TUV certification	-		EN 61800-5-1
UL certification			UL61800-5-1 C22.2 No.14-13


IKON TECHNOLOGIES CO.
ACDrive
Model GE200 series
Made In China
Manufacturer
IKON TECHNOLOGIES CO.

A급기기 (업무용 방송통신기자재)
이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며,가정외의 지역에서 사용하는 것을 목적으로 합니다.

■ Adjusting Drive Parameters

The drive when it leaves the factory with default settings should enable the user toget started quickly to check on the basic mechanical running conditions. At a later time,fine tuning to optimize the operation/performance can be undertaken.

Such parameter tuning should be done by qualified personnel who have prior trainingon Servo Drives. Some parameter settings can have adverse reactions if manipulated incorrectly and care should be taken especially during the commissioning startup stages to prevent personnel from engaging the machine.

This manual provides a complete list of the parameters with functional description and care should always be taken whenever parameters are adjusted during a live running startup. Ikon Technologies Co. and Authorized Distributors can provide product training and if in doubt seek advice.

Revision History

Date	Version	Revision Description
November 2015	V0.0	First release. Related firmware version: P7-10 = U76.56 and P7-11 = U77.56
April 2016	A01	Related firmware version: P7-10 = U76.56 and P7-11 = U77.56
November 2016	A02	Modified "Approvals", the designation rule and nameplate.
November 2017	A03	◆ Added 0.4 to 15 kW models. ◆ Deleted the MDKE7 operating panel and added the MDKE9 operating panel.
May 2019	A04	◆ Changed the document structure. ◆ Added information of three-phase 200 to 240 V models in the following sections: 1.1 Nameplate and Ordering Code 1.3 Technical Specifications 1.4 Product Dimensions 2.4 Selection of Cables, Breakers and Contactors 2.5 Selection of AC Output Reactors 2.6 Selection of Braking Components 3.1.2 Backplate Mounting and Through Hole Mounting (Note: Three-phase 200 to 240 V models indicates GE200-2T0.4GB to GE200-2T55GB.) ◆ Added specifications of cables that comply with the UL certification in "Selection of Cables, Breakers and Contactors". ◆ Added the selection table of braking components in "2.6 Selection of Braking Components". ◆ Updated Inovance's logo. ◆ Modified the setting range of P3-00 and P3-01 in "Appendix A Parameter Table".
July 2020	A05	◆ Deleted the service hotline. ◆ Modified the default value of P7-05 in "Appendix A Parameter Table".

■ Acquisition

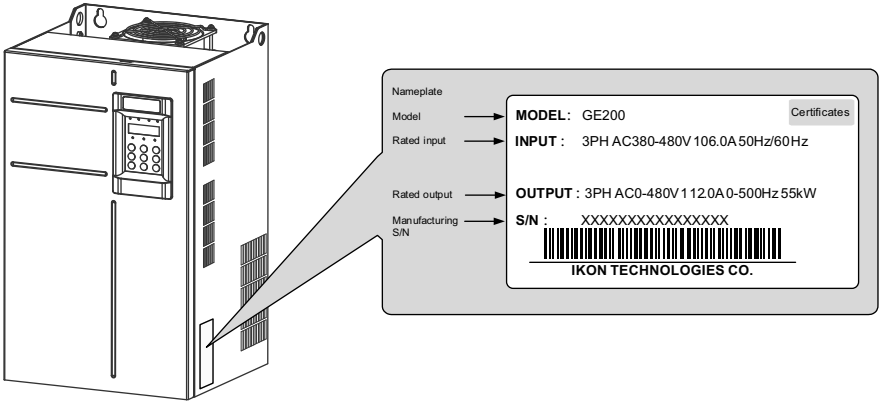
This user guide is shipped with the product. For any additional order, contact your sales representative.

This user guide briefly introduces product information, installation and wiring, troubleshooting, and routine maintenance. For more details, see 19010355 GE200 Series AC Drive Advanced User Guide.

To obtain the user guide, access Inovance's website (http://ikondrives.com), click Download, search for the user guide by its name, and download the PDF file.

1 Product Information

1.1 Nameplate and Model Number



GE200 T 55 G B

Mark	Product
GE200	AC drive series

Mark	Voltage Class
T	Three phase 380–480 V
2T	Three phase 200–240 V

Mark	Power Class (kW)
0.4	0.4
...	...
450	450

Mark	Applicable Motor Type
G	General

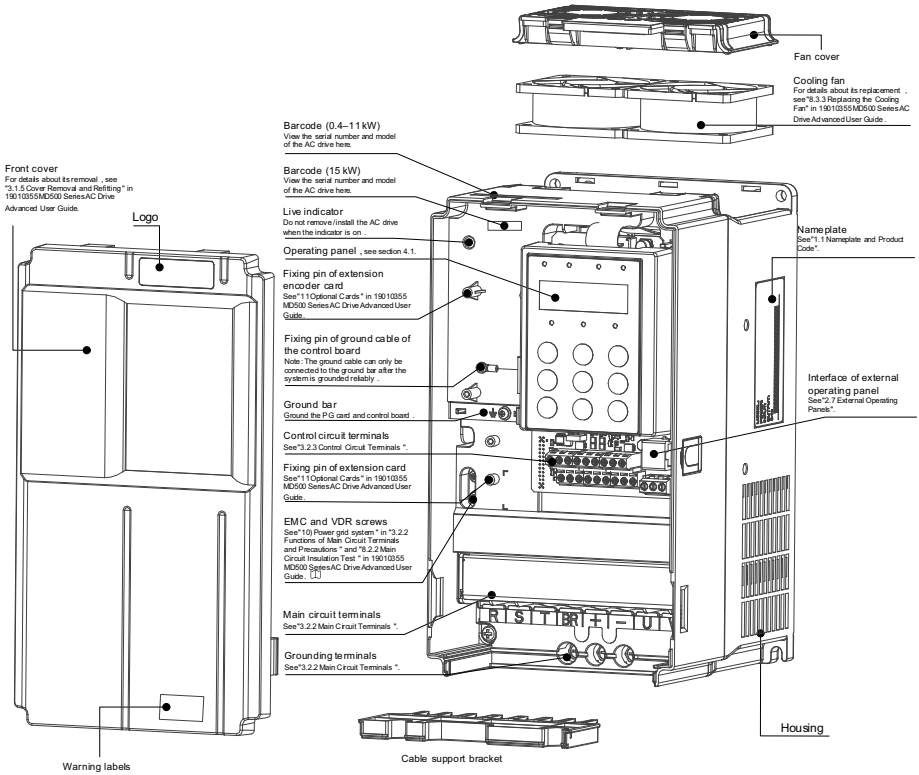
Mark	Reactor
Blank	None
-L	With the output AC reactor, applicable to GE200 G-L to GE200 G-L
-T	With the DC reactor, applicable to GE200 5G to GE200

Mark	Braking Unit
Blank	None
B	With the braking unit

Figure 1-1 Nameplate and ordering code

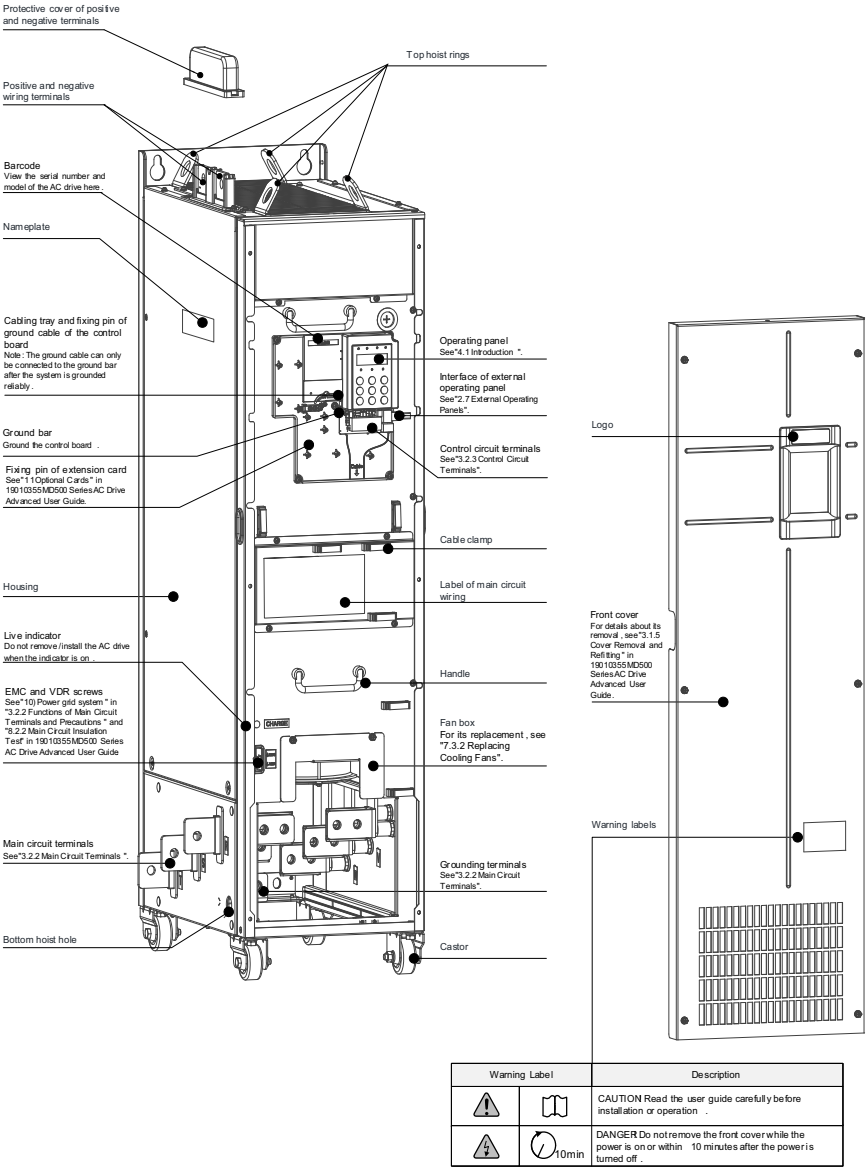
1.2 Components

The AC drive has either a plastic housing (three-phase 380 V, 0.4 to 15 kW models and three-phase 220 V, 0.4 to 7.5 kW models used as an example) or a sheet metal housing (200 to 450 kW models used as an example), depending on the voltage and power class, as shown in the following figures.



Warning Label		Description
⚠	📖	CAUTION! Read the user guide carefully before installation or operation .
⚠	10min	DANGER! Do not remove the front cover while the power is on or within 10 minutes after the power is turned off .

Figure 1-2 Product parts (GE200T0.4GB to GE200T15GB, GE200-2T0.4GB to GE200-2T7.5GB)



Warning Label	Description
	CAUTION Read the user guide carefully before installation or operation .
10min	DANGER Do not remove the front cover while the power is on or within 10 minutes after the power is turned off .

Figure 1-3 Product parts (MD500T200G to MD500T450G)

1.3 Technical Data

Table 1-1 Models and technical data (three phase 380–480 V)

Item			Specification														
GE200TXXG(B)			0.4	0.7	1.1	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37
Output	Applicable motor	(kW)	0.4	0.75	1.1	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37
		(HP)	0.5	1	1.5	2	3	4	5	7.5	10	15	20	25	30	40	50
	Rated output current (A)		1.5	2.1	3.1	3.8	5.1	7.2	9.0	13.0	17.0	25.0	32.0	37	45	60	75
	Output voltage		0 to input voltage														
	Maximum output frequency		500 Hz (editable through a parameter)														
	Carrier frequency		0.8 to 8.0 kHz (automatically adjusted according to the load characteristics)														
	Overload capacity		150% for 60s with rated current														
Input	Rated input current (A)		1.8	2.4	3.7	4.6	6.3	9.0	11.4	16.7	21.9	32.2	41.3	49.5	59	57	69
	Rated voltage/ frequency		AC: Three-phase 380 to 480 V, 50/60 Hz														
	Allowed voltage fluctuation		-15% to 10%; actual allowed range: 323 to 528 VAC														
	Allowed frequency fluctuation		±5%														
	Power capacity (kVA)		2	2.8	4.1	5	6.7	9.5	12	17.5	22.8	33.4	42.8	45	54	52	63
Thermal design	Thermal power consumption (kW)		0.039	0.046	0.057	0.068	0.081	0.109	0.138	0.201	0.24	0.355	0.454	0.478	0.551	0.694	0.815
	Air flow (CFM)		-	-	-	9	9	9	20	24	30	40	42	51.9	57.4	118.5	118.5

Item			Specification														
GE200TXXG(B)			45	55	75	90	110	132	160	200	220	250	280	315	355	400	450
Output	Applicable motor	(kW)	45	55	75	90	110	132	160	200	220	250	280	315	355	400	450
		(HP)	60	75	100	125	150	180	220	275	300	340	380	430	485	545	615
	Rated output current (A)		91	112	150	176	210	253	304	377	426	465	520	585	650	725	820
	Output voltage		0 to input voltage														
	Maximum output frequency		500 Hz (editable through a parameter)														
	Carrier frequency		0.8 to 8.0 kHz					0.8 to 6.0 kHz									
			Automatically adjusted according to the load characteristics														
	Overload capacity		150% for 60s with rated current (MD500T450G: 130% for 60s with the rated current)														
Input	Rated input current (A)		89	106	139	164	196	240	287	365	410	441	495	565	617	687	782
	Rated voltage/ frequency		AC: Three-phase 380 to 480 V, 50/60 Hz														
	Allowed voltage fluctuation		-15% to 10%; actual allowed range: 323 to 528 VAC														
	Allowed frequency fluctuation		±5%														
	Power capacity (kVA)		81	97	127	150	179	220	263	334	375	404	453	517	565	629	716

Item		Specification														
Thermal design	Thermal power consumption (kW)	1.01	1.21	1.57	1.81	2.14	2.85	3.56	4.15	4.55	5.06	5.33	5.69	6.31	6.91	7.54
	Air flow (CFM)	122.2	122.2	218.6	287.2	354.2	547	627	638.4	722.5	789.4	882	645	860	860	860

Table 1-2 Models and technical data (three phase 200–240 V)

Item			Specification															
GE200-2TXXG(B)			0.4	0.7	1.1	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Output	Applicable motor	(kW)	0.4	0.75	1.1	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
		(HP)	0.5	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75
	Rated output current (A)		2.1	3.8	5.1	7.2	9	13	25	32	45	60	75	91	112	150	176	210
	Output voltage		0 to input voltage															
	Maximum output frequency		500 Hz (editable through a parameter)															
	Carrier frequency		0.8 to 8.0 kHz (automatically adjusted according to the load characteristics)															
	Overload capacity		150% for 60s with rated current															
Input	Rated input current (A)		2.4	4.6	6.3	9	11.4	16.7	32.2	41.3	59	57	69	89	106	139	164	196
	Rated voltage/ frequency		AC: Three-phase 200 to 240 V, 50/60 Hz															
	Allowed voltage fluctuation		-15% to 10%; actual allowed range: 170 to 264 VAC															
	Allowed frequency fluctuation		±5%															
	Power capacity (kVA)		1.1	2.1	2.9	4.2	5.3	7.7	14.8	18.9	27	27	31.6	40.7	48.5	63.6	75	89.7
Thermal design	Thermal power consumption (kW)		0.037	0.054	0.065	0.087	0.11	0.16	0.28	0.36	0.44	0.55	0.65	0.8	0.97	1.26	1.45	1.71
	Air flow (CFM)		/	9	9	9	20	24	40	42	57.4	118.5	118.5	122.2	122.2	218.6	287.2	354.2

NOTE

- The technical data of GE200T18.5G(B)(-T) to GE200T22G(B)(-T) is similar to that of GE200T18.5G(B) to GE200T22G(B).
- The rated power is measured at 440 VAC input voltage.

Table 1-3 Technical specifications of the GE200 series AC drive

Item		Description	
Standard functions	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: Maximum frequency x 0.025%	
	Control mode	Sensorless vector control (SVC) Feedback vector control (FVC) Voltage/Frequency (V/F) control	
	Startup torque	0.25 Hz/150% (SVC) 0 Hz/180% (FVC)	
	Speed range	1:200 (SVC)	1:1000 (FVC)
	Speed stability accuracy	±0.5% (SVC)	±0.02% (FVC)
	Torque control accuracy	±3% (FVC); ±5% for 5 Hz above (SVC)	
	Torque boost	Automatic boost; Customized boost 0.1 % to 30.0 %	
	V/F curve	Straight-line V/F curve Multi-point V/F curve Complete V/F separation Half V/F separation	
	Ramp mode	Straight-line ramp S-curve ramp Four separate acceleration/deceleration time settings in the range of 0.0s to 6500.0s.	
	DC injection braking	DC injection braking frequency: 0 Hz to the maximum frequency DC injection braking active time: 0.0s to 36.0s. Current level of DC injection braking: 0.0% to 100.0%.	
	Jog running	Frequency range of jog running: 0.00 to 50.00 Hz Acceleration/Deceleration time of jog running: 0.0s to 6500.0s	
	Simple PLC and multi-speed running	The system implements up to 16 speeds by using the simple PLC function or control terminals.	
	Built-in PID	The system implements the proportional–integral–derivative (PID) function in the closed-loop control.	
	Automatic voltage regulation (AVR)	The system maintains a constant output voltage automatically when the grid voltage changes through the permissible range.	
	Overvoltage and overcurrent stall control	The system limits the output current and voltage automatically during operation to prevent frequent or excessive trips.	
	Overcurrent fast prevention	The function helps to avoid frequent overcurrent faults.	
	Torque limit and control	The system limits the torque automatically to prevent frequent overcurrent tripping during operation. Torque control is applied in vector control.	

Item		Description
Customized functions	Power dip ride-through	The load feedback energy compensates for any voltage reduction, allowing the AC drive to continue to operate for a short time during power dips.
	Overcurrent fast prevention	The function helps to avoid frequent overcurrent faults.
	Virtual I/O	Five groups of virtual digital inputs/outputs (DI/DO) support simple logic control.
	Timing control	Time range: 0.0 to 6500.0 minutes
	Dual-motor switchover	The AC drive can control up to two motors using two groups of motor parameters.
	Multiple field buses	The AC drive supports four field buses: Modbus, PROFIBUS-DP, CANlink, and CANopen.
	Motor overheat protection	The optional input/output (I/O) extension card allows the AI3 terminal to receive a signal from the motor temperature sensor input (PT100, PT1000) to implement motor overheat protection.
	Multiple encoder types	The AC drive supports a range of different encoder types, including the differential encoder, open-collector encoder, UVW encoder, and resolver.
	User programmable function	The optional programming card supports secondary development in a programming environment compatible with the Inovance programmable logic controller (PLC).
	Advanced commissioning software	Software in the AC drive allows users to configure some operating parameters, and provides a virtual oscilloscope display that shows system status.

Item		Description
Running	Running command	Allows different methods of switching between running commands: Operating panel; terminal I/O control; and serial communication
	Main frequency reference setting channel	Supports up to 10 frequency reference setting channels and allows different methods of switching between frequency reference setting channels: ◆ Digital setting ◆ Analog voltage reference ◆ Analog current reference ◆ Pulse reference ◆ Communication reference
	Auxiliary frequency reference setting channel	Supports up to 10 auxiliary frequency sources, and allows fine tuning of the auxiliary frequency and main & auxiliary calculation.
	Input terminals	Standard: ◆ Five digital input (DI) terminals, one of which supports up to 100 kHz high-speed pulse inputs ◆ Two analog input (AI) terminals, one of which supports only 0 to 10 V input, and the other supports 0 to 10 V and 0 to 20 mA current input Expanded capacity: ◆ Five digital input (DI) terminals ◆ One AI terminal that supports –10 to +10 V voltage input and PT100/PT1000 motor temperature sensor inputs
	Output terminals	Standard: ◆ Single high-speed pulse output terminal (open-collector) for a square-wave signal output in the frequency range of 0 to 100 kHz ◆ Single DO terminal ◆ Single relay output terminal ◆ Single analog output (AO) terminal that supports either a current output in the range 0 to 20 mA or a voltage output in the range 0 to 10 V Expanded capacity: ◆ Single digital output (DO) terminal ◆ Single relay output terminal Single analog output (AO) terminal that supports either a current output in the range 0 to 20 mA or a voltage output in the range 0 to 10 V
Display and operating panel	LED display	Shows parameters.
	LCD display	It is optional and shows parameters in Chinese or English.
	Parameter copy	The LCD operating panel can be used to copy parameters quickly.
	Key locking and function selection	Keys on the control panel can be locked partially or electronically to prevent accidental operation.

Item		Description
Protections	Phase loss protection	Input phase loss protection Output phase loss protection
	Instantaneous overcurrent protection	The AC drive stops when 250% of the rated output current is exceeded.
	Overvoltage protection	The AC drive stops when the DC voltage of the main circuit is above 820 V.
	Undervoltage protection	The AC drive stops when the DC voltage of the main circuit is below 350 V.
	Overheat protection	Protection is triggered when the inverter bridge gets overheated.
	Overload protection	The AC drive stops after running at 150% of rated current for 60 seconds.
	Overcurrent protection	The AC drive stops when 2.5 times of rated current of the AC drive is exceeded.
	Braking protection	Braking unit overload protection Braking resistor short-circuit protection
	Short-circuit protection	Output phase-to-phase short-circuit protection Output phase-to-ground short-circuit protection
Environment	Installation location	Install the AC drive where it is indoors and protected from direct sunlight, dust, corrosive or combustible gases, oil smoke, vapor, ingress of water or any other liquid, and salt.
	Altitude	Below 1000 m If the altitude exceeds 1000 m, de-rating by 1% for per 100 m increase Maximum altitude: 3000 m (Note: The maximum altitude for 0.4 to 3 kW models is 2000 m. For use at the altitude higher than 2000 m, contact the agent or Inovance.)
	Ambient temperature	-10°C to +50°C If the ambient temperature is 40°C to 50°C , de-rating by 1.5% per 1°C increase
	Humidity	Less than 95% RH non-condensing
	Vibration	Less than 5.9 m/s² (0.6 g)
	Storage temperature	-20°C to +60°C

1.4 Overall Dimensions

1.4.1 Overall Dimensions of GE200T0.4GB to GE200T160G and Ge200-2T0.4GB to GE200-2T55G

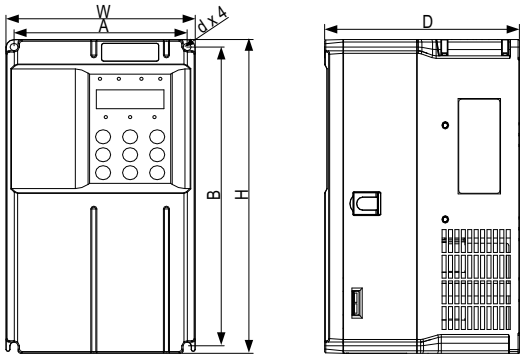


Figure 1-4 Overall and mounting dimensions of GE200T0.4GB to GE200T15GB and Ge200-2T0.4GB to GE200-2T7.5GB

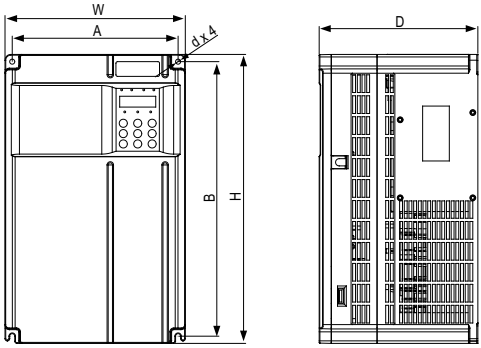


Figure 1-5 Overall and mounting dimensions of GE200T18.5G(B)to GE200T37G(B) and GE 200-2T11G(B) to GE200-2T18.5G(B)

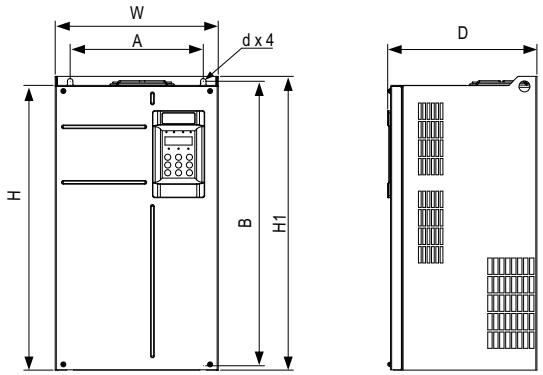


Figure 1-6 Overall and mounting dimensions of GE200T45G(B) to GE200T160G and GE 200-2T22G(B) to GE200-2T55G

Table 1-4 Mounting hole dimensions of GE200T0.4GB to GE200T160G (three phase 380–480 V)

Model	Hole Dimensions (mm)		Overall Dimensions (mm)				Hole Diameter (mm)	Weight (kg)
	A	B	H	H1	W	D	d	
GE200T0.4GB	119	189	200	-	130	152	Ø5	1.6
GE200T0.7GB								
GE200T1.1GB								
GE200T1.5GB								
GE200T2.2GB								
GE200T3.0GB								
GE200T3.7GB	119	189	200	-	130	162	Ø5	2.0
GE200T5.5GB								
GE200T7.5GB	128	238	250	-	140	170	Ø6	3.3
GE200T11GB								
GE200T15GB	166	266	280	-	180	170	Ø6	4.3
GE200T18.5G(B)	195	335	350	-	210	192	Ø6	7.6
GE200T22G(B)								
GE200T18.5G(B)-T	195	335	350	-	210	192	Ø6	10.0
GE200T22G(B)-T								
GE200T30G(B)	230	380	400	-	250	220	Ø7	17.5
GE200T37G(B)								
GE200T45G(B)	245	523	525	542	300	275	Ø10	35.0
GE200T55G(B)								
GE200T75G(B)	270	560	554	580	338	315	Ø10	51.5
GE200T90G								
GE200T110G								
GE200T132G	320	890	874		0	320	Ø10	85.0
GE200T160G								

Table 1-5 Mounting hole dimensions of GE200-2T0.4GB to GE200-2T55G (three phase 200–240 V)

Model	Hole Dimensions (mm)		Overall Dimensions (mm)				Hole Diameter (mm)	Weight (kg)
	A	B	H	H1	W	D	d	
GE200-2T0.4GB	119	189	200	-	130	152	Ø5	1.6
GE200-2T0.7GB								
GE200-2T1.1GB								
GE200-2T1.5GB								
GE200-2T2.2GB	119	189	200	-	130	162	Ø5	2.0
GE200-2T3.7GB								
GE200-2T5.5GB	128	238	250	-	140	170	Ø6	3.3
GE200-2T7.5GB	166	266	280	-	180	170	Ø6	4.3
GE200-2T11G(B)	195	335	350	-	210	192	Ø6	10.0
GE200-2T15G(B)	230	380	400	-	250	220	Ø7	17.5
GE200-2T18.5G(B)								
GE200-2T22G(B)	245	523	525	542	300	275	Ø10	35.0
GE200-2T30G(B)								
GE200-2T37G(B)	270	560	554	580	338	315	Ø10	51.5
GE200-2T45G								
GE200-2T55G								

1.4.2 Overall Dimensions of GE200T200G to GE200T450G

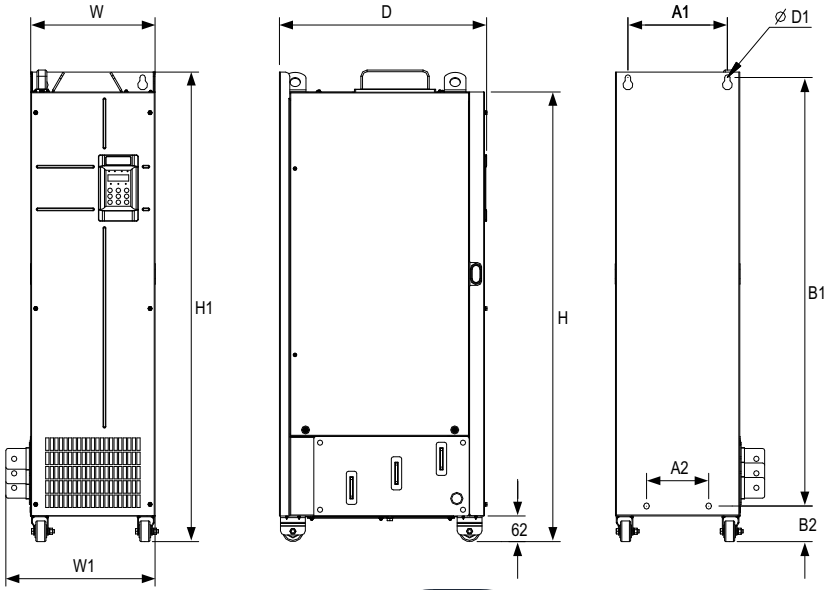


Figure 1-7 Overall and mounting dimens E200T200G to GE200T450G

Table 1-6 Mounting hole dimensions of GE200T200G to GE200T450G

Model	Hole Dimensions (mm)				Overall Dimensions (mm)					Hole Diameter (mm)	Weight (kg)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
GE200T200G	240	150	1035	86	1086	1134	300	360	500	Ø13	110
GE200T220G											
GE200T250G	225	185	1175	97	1248	1284	330	390	545	Ø13	155
GE200T280G											
GE200T315G	240	200	1280	101	1355	1405	340	400	545	Ø16	185
GE200T355G											
GE200T400G											
GE200T450G											

1.4.3 Overall Dimensions of GE200T200G-L to GE200T450G-L

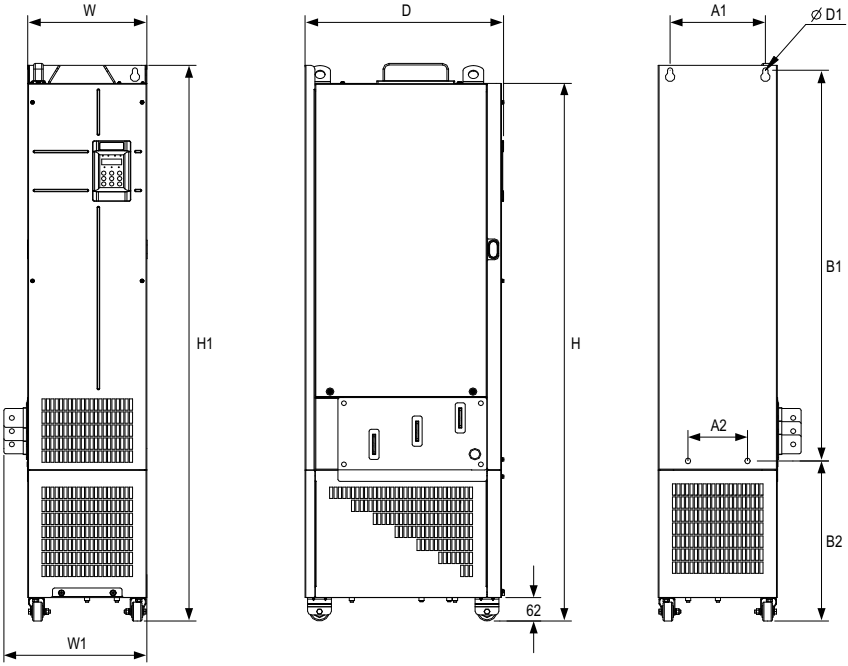


Figure 1-8 Overall and mounting dimensions of GE200T200G-L to GE200T450G-L (with the reactor base)

Table 1-7 Mounting hole dimensions of GE200T200G-L to GE200T450G-L (with the reactor base)

Model	Hole Dimensions (mm)				Overall Dimensions (mm)					Hole Diameter (mm)	Weight (kg)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
GE200T200G-L	240	150	1035	424	1424	1472	300	360	500	Ø13	160
GE200T220G-L											
GE200T250G-L	225	185	1175	435	1586	1622	330	390	545	Ø13	215
GE200T280G-L											
GE200T315G-L	240	200	1280	432	1683	1733	340	400	545	Ø16	245
GE200T355G-L											
GE200T400G-L											
GE200T450G-L											

2 System Connections

2.1 GE200 System Connection Diagram

When using the AC drive to drive asynchronous motors, a variety of electrical devices must be installed on both input and output sides to ensure system safety and stability. The following figure shows how to configure the AC drive (0.4 kW and above) to operate with the peripheral devices.

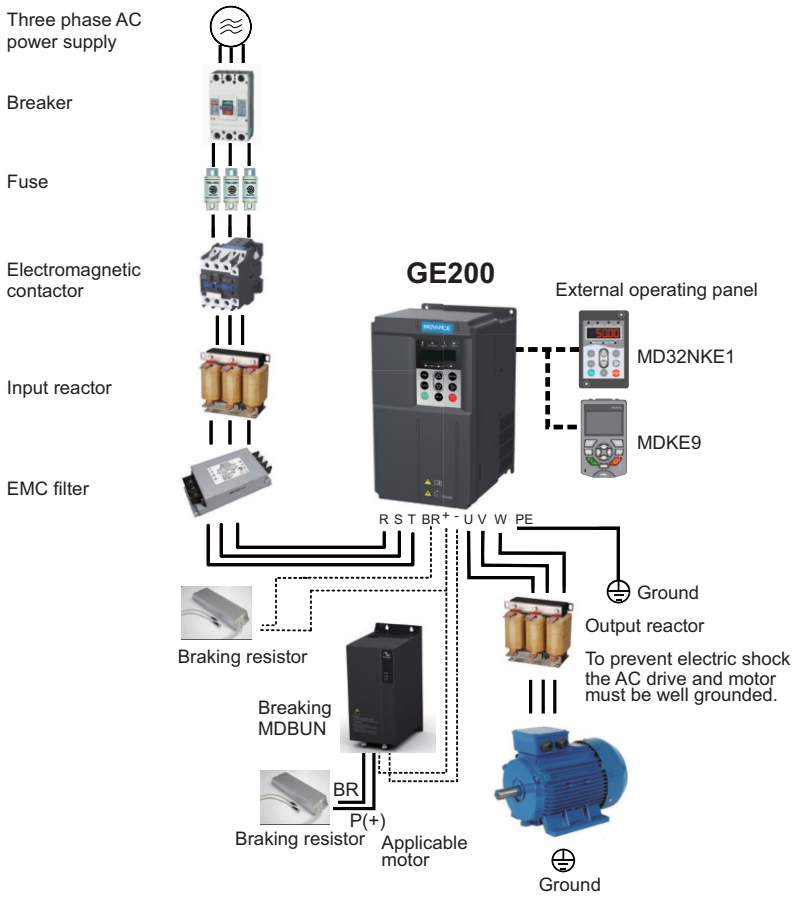


Figure 2-1 GE200 series system composition

NOTE

- The preceding figure is just a schematic system connection diagram of the GE200 series AC drive. For peripherals and options, see "9 Specifications and Model Selection" in GE200 Series AC Drive Advanced User Guide.

2.6 Selection of Braking Components

Table 2-11 Braking component selection (three phase 380–480 V)

AC Drive Model	Applicable Motor (kW)	Braking Unit		125% Braking Torque (10% ED, Max. 10s)		Remarks	Minimum Braking Resistance (Ω)
		Model	QTY	Recommended Braking Resistor	QTY		
GE200T0.4GB	0.4	Built-in		80W 1450Ω	1	AC drive models ending with letter "B"	96
GE200T0.7GB	0.75			140W 800Ω	1		96
GE200T1.1GB	1.1			220W 500Ω	1		96
GE200T1.5GB	1.5			300W 380Ω	1		96
GE200T2.2GB	2.2			440W 260Ω	1		64
GE200T3.0GB	3			600W 190Ω	1		64
GE200T3.7GB	3.7			740W 150Ω	1		32
GE200T5.5GB	5.5			1100W 100Ω	1		32
GE200T7.5GB	7.5			1500W 75Ω	1		32
GE200T11GB	11			2200W 50Ω	1		20
GE200T15GB	15			3000W 38Ω	1		20
GE200T18.5G(B)	18.5	Built-in		4000W 32Ω	1	AC drive models ending with letter "B"	24
GE200T22G(B)	22			4500W 27Ω	1		24
GE200T30G(B)	30			6000W 20Ω	1		19.2
GE200T37G(B)	37			7000W 16Ω	1		14.8
GE200T45G(B)	45			9000W 13Ω	1		12.8
GE200T55G(B)	55			11000W 10.5Ω	1		9.6
GE200T75G(B)	75			15000W 7.7Ω	1		6.8
GE200T90G	90	MDBUN-60-T	2	9000W 10.0Ω	2	Input voltage ≤ 440 VAC	9.3×2
	90	MDBUN-60-5T	2	9000W 12.8Ω	2	Input voltage > 440 VAC	10.5×2
GE200T110G	110	MDBUN-60-T	2	11000W 9.4Ω	2	Input voltage ≤ 440 VAC	9.3×2
	110	MDBUN-60-5T	2	11000W 10.5Ω	2	Input voltage > 440 VAC	10.5×2
GE200T132G	132	MDBUN-90-T	2	13000W 6.8Ω	2	Input voltage ≤ 440 VAC	6.2×2
	132	MDBUN-90-5T	2	13000W 8.8Ω	2	Input voltage > 440 VAC	7.0×2
GE200T160G	160	MDBUN-90-T	2	16000W 6.3Ω	2	Input voltage ≤ 440 VAC	6.2×2
	160	MDBUN-90-5T	2	16	2	Input voltage > 440 VAC	7.0×2

AC Drive Model	Applicable Motor (kW)	Braking Unit		125% Braking Torque (10% ED, Max. 10s)		Remarks	Minimum Braking Resistance (Ω)
		Model	QTY	Recommended Braking Resistor	QTY		
GE200T200G(-L)	200	MDBU-200-B	2	19000W 4.5Ω	2	Input voltage ≤ 440 VAC	2.5×2
	200	MDBU-200-C	2	19000W 5.8Ω	2	Input voltage > 440 VAC	3.0×2
GE200T220G(-L)	220	MDBU-200-B	2	21000W 4.1Ω	2	Input voltage ≤ 440 VAC	2.5×2
	220	MDBU-200-C	2	21000W 5.3Ω	2	Input voltage > 440 VAC	3.0×2
GE200T250G(-L)	250	MDBU-200-B	2	24000W 3.6Ω	2	Input voltage ≤ 440 VAC	2.5×2
	250	MDBU-200-C	2	24000W 4.6Ω	2	Input voltage > 440 VAC	3.0×2
GE200T280G(-L)	280	MDBU-200-B	2	27000W 3.2Ω	2	Input voltage ≤ 440 VAC	2.5×2
	280	MDBU-200-C	2	27000W 4.1Ω	2	Input voltage > 440 VAC	3.0×2
GE200T315G(-L)	315	MDBU-200-B	3	20000W 4.3Ω	3	Input voltage ≤ 440 VAC	2.5×3
	315	MDBU-200-C	3	20000W 5.5Ω	3	Input voltage > 440 VAC	3.0×3
GE200T355G(-L)	355	MDBU-200-B	3	23000W 3.8Ω	3	Input voltage ≤ 440 VAC	2.5×3
	355	MDBU-200-C	3	23000W 4.9Ω	3	Input voltage > 440 VAC	3.0×3
GE200T400G(-L)	400	MDBU-200-B	3	26000W 3.4Ω	3	Input voltage ≤ 440 VAC	2.5×3
	400	MDBU-200-C	3	26000W 4.3Ω	3	Input voltage > 440 VAC	3.0×3
GE200T450G(-L)	450	MDBU-200-B	3	29000W 3.0Ω	3	Input voltage ≤ 440 VAC	2.5×3
	450	MDBU-200-C	3	29000W 3.9Ω	3	Input voltage > 440 VAC	3.0×3

Table 2-12 Braking component selection (three phase 200–240 V)

AC Drive Model	Applicable Motor (kW)	Braking Unit		125% Braking Torque (10% ED, Max. 10s)		Remarks	Minimum Braking Resistance (Ω)
		Model	QTY	Recommended Braking Resistor	QTY		
GE200-2T0.4GB	0.4	Built-in		90W 300Ω	1	AC drive models ending with letter "B"	48
GE200-2T0.7GB	0.7			160W 170Ω	1		48
GE200-2T1.1GB	1.1			250W 110Ω	1		32
GE200-2T1.5GB	1.5			340W 80Ω	1		32
GE200-2T2.2GB	2.2			500W 55Ω	1		16
GE200-2T3.7GB	3.7			800W 33Ω	1		16
GE200-2T5.5GB	5.5			1300W 22Ω	1		10
GE200-2T7.5GB	7.5			1700W 16Ω	1		10
GE200-2T11G(B)	11	Built-in		2300W 12Ω	1	AC drive models ending with letter "B"	12
GE200-2T15G(B)	15			3000W 9Ω	1		9
GE200-2T18.5G(B)	18.5			3900W 7Ω	1		7
GE200-2T22G(B)	22			4600W 6Ω	1		6
GE200-2T30G(B)	30			5500W 5Ω	1		5
GE200-2T37G(B)	37			6800W 4Ω	1		4
GE200-2T45G	45	MDBUN-60-2T	2	5000W 5.4Ω	2	-	4.9
GE200-2T55G	55	MDBUN-60-2T	2	6000W 4.4Ω	2	-	4

NOTE

- The minimum braking resistance in the preceding table supports the operating condition with ED of 10% and the longest time for single braking of 10s.
- The default initial braking voltage for built-in braking units is 760 V and 350 V when the input voltage is 380 to 480 VAC and 200 to 240 V, respectively.
- The default initial braking voltage is 670 V for MDBUN-60-T, MDBUN-90-T, and MDBU-200-B when the input voltage is lower than or equal to 440 VAC, and 760 V for MDBUN-60-5T, MDBUN-90-5T, and MDBU-200-C when the input voltage is above 440 VAC. The resistance of the braking resistor can be adjusted with the initial braking voltage.
- The preceding table is for reference only. You can select the resistance and power of the braking resistor as required (the resistance cannot be lower than the reference value while the power may be higher than the reference value). Selection of the braking resistor model is determined by the generation power of motors and is also related to the system inertia, deceleration time and potential energy load. For systems with high inertia, and/or short deceleration time, and/or frequent braking, select a braking resistor with higher power and lower resistance.

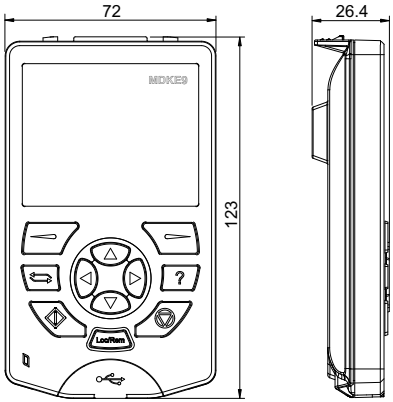


Figure 2-4 Mounting dimensions of the MDKE9 external operating panel (unit: mm)

3) MDKE9 mounting base

Before installing the MDKE9 operating panel on the cabinet door, install the CP600-BASE1 (optional) base first. The mounting dimensions are shown below.

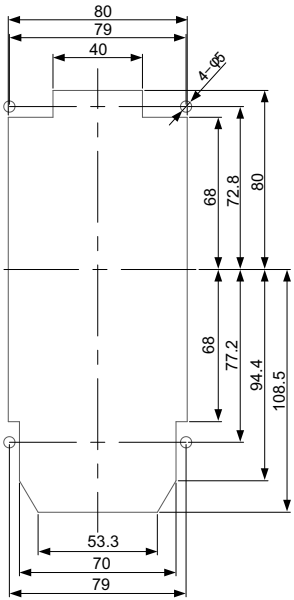


Figure 2-5 Sheet metal slot dimensions (unit: mm)

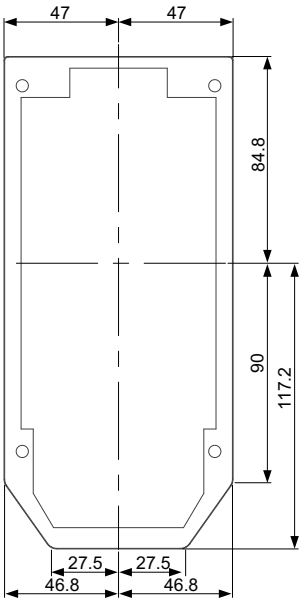


Figure 2-6 Mounting base dimension limits (unit: mm)

3.2 Wiring

3.2.1 Standard Wiring Diagram

As shown in the following figure, the wiring part marked by the double-headed arrow in 0.4 to 75 kW/0.4 to 37 kW models is different from that in 90 to 450 kW/45 to 55 kW models.

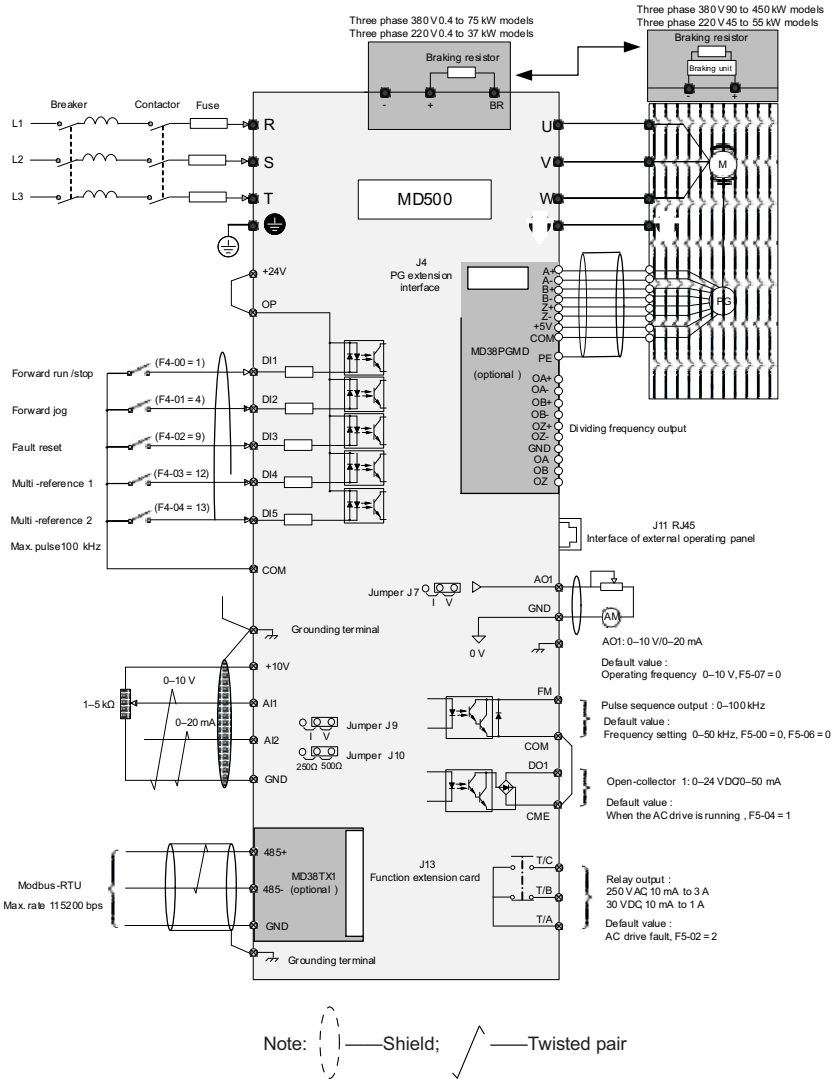


Figure 3-8 Wiring

Table 3-6 Description of control circuit terminals

Type	Terminal Mark	Terminal Name	Description
Power supply	+10 V-GND	+10 V power supply	Provides +10 V power supply to an external unit. Its maximum output current is 10 mA. Generally used to supply an external potentiometer of 1 to 5 kΩ
	+24V-COM	+24 V power supply	Provides +24 V power supply to an external unit. Generally used for power supply for DI/DO terminals and external sensors. Maximum output current: 200 mA [1]
	OP	Input terminal for external power supply	Connected to +24 V by default. When DI1 to DI5 need to be driven by external signals, OP must be disconnected from + 24 V and connected to an external power supply.
Analog input	AI1-GND	Analog input 1	Voltage range of inputs: 0 to 10 VDC Input impedance: 22 kΩ
	AI2-GND	Analog input 2	Either a voltage or current input, determined by jumper J9 Input voltage range: 0 to 10 VDC Input current range: 0 to 20 mA Input impedance: 22 kΩ (voltage input), 500 Ω or 250 Ω (current input) decided byJ10 [2]
Digital input	DI1- OP	Digital input 1	Optically-coupled isolation compatible with dual-polarity inputs Input impedance: 1.39 kΩ Voltage range for inputs: 9 to 30 V
	DI2- OP	Digital input 2	
	DI3- OP	Digital input 3	
	DI4- OP	Digital input 4	
	DI5- OP	High-speed pulse input	In addition to having the same features as DI1 to DI4, DI5 can also be used for high-speed pulse inputs. Maximum input frequency: 100 kHz Input impedance: 1.03 kΩ
Analog output	AO1-GND	Analog output 1	Either a voltage or current output, determined by jumper J7. Output voltage range: 0 to 10 V Output current range: 0 to 20 mA
Digital output	DO1-CME	Digital output 1	Optically-coupled isolation, dual-polarity open-collector output Output voltage range: 0 to 24 V Output current range: 0 to 50 mA Note that CME and COM are internally insulated, but are shorted externally by a jumper. In this case, DO1 is driven by +24 V by default. Remove the jumper link if you need to apply external power to DO1.
	FM- COM	High-speed pulse output	Controlled by F5-00 (FM terminal output selection). Maximum output frequency: 100 kHz When used as an open-collector output, the specification is the sam[illegible]O1.

Type	Terminal Mark	Terminal Name	Description
Relay output	T/A-T/B	Normally-closed (NC) terminal	Contact driving capacity: 250 VAC, 3 A, Cos Φ = 0.4 30 VDC, 1 A
	T/A-T/C	Normally-open (NO) terminal	
Auxiliary interfaces	J13	Extension card interface	Interface for the 28-core terminal and optional cards (I/O extension card, PLC card, and various bus cards)
	J4	PG card interface	The open-collector, differential, and resolver interfaces are selectable options.
	J11	External operating panel interface	Connected to an external operating panel.
Jumper [3]	J7	AO1 output selection	Either a voltage or a current output. Voltage output by default
	J9	AI2 input selection	Either a voltage or a current input. Voltage input by default
	J10	AI2 input impedance selection	Either 500 Ω or 250 Ω input. 500 Ω input by default

[1] When the ambient environment is above 23 °C , the output current must be de-rated for 1.8 mA per 1°C rise. The maximum output current is 170 mA at 40°C . When OP is shorted to 24 V, the current of the DI must also be considered.

[2] Select 500 Ω or 250 Ω input impedance according to the with-load capacity of signal source. For example, if 500 Ω is selected, the maximum output voltage of signal source cannot be smaller than 10 V so that AI2 can measure 20 mA current.

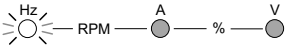
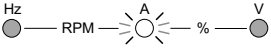
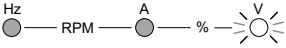
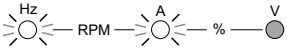
[3] For positions of jumpers J7, J9 and J10, see Figure 3-12.

Key	Name	Function
STOP RES	Stop/Reset	Stop the AC drive when the AC drive is in the RUNNING status. Perform a reset operation when the AC drive is in the FAULT status.
MF.K	Multifunction	Perform a function switchover as defined by the setting of F7-01 (MF.K key function selection).
QUICK	Menu mode selection	Switch over between menu modes as defined by the setting of FP-03 (Selection of individualized parameter display).

4.3 Indicators on the Operating Panel

 indicates that the light turns on, ● indicates that the light turns off, and  indicates that the light flashes.

Table 4-2 Indicators on the operating panel

State		Indication
RUN Running status indicators	● RUN	OFF indicates the STOP status.
	 RUN	ON indicates the RUNNING status.
LOCAL/REMOT Running command indicators	● LOCAL/ REMOT	OFF indicates under operating panel control.
	 LOCAL /REMOT	ON indicates under terminal control.
	 LOCAL /REMOT	FLASHING indicates under serial communication control.
FWD/REV Forward and reverse rotation indicators	● FWD/ REV	OFF indicates forward motor rotation.
	 FWD /REV	ON indicates reverse motor rotation.
TUNE/TC Auto-tuning, torque control and fault indicators	● TUNE/ TC	OFF indicates that the AC drive is normal.
	 TUNE / TC	ON indicates the torque control mode.
	 TUNE/TC	FLASHING SLOWLY (once a second) indicates auto-tuning status.
	 TUNE/TC	FLASHING QUICKLY (four times a second) indicates a fault condition.
		Hz for frequency
		A for current
		V for voltage
		RPM for motor speed
		entage

5 Basic Operations and Trial Run

5.1 Quick Commissioning

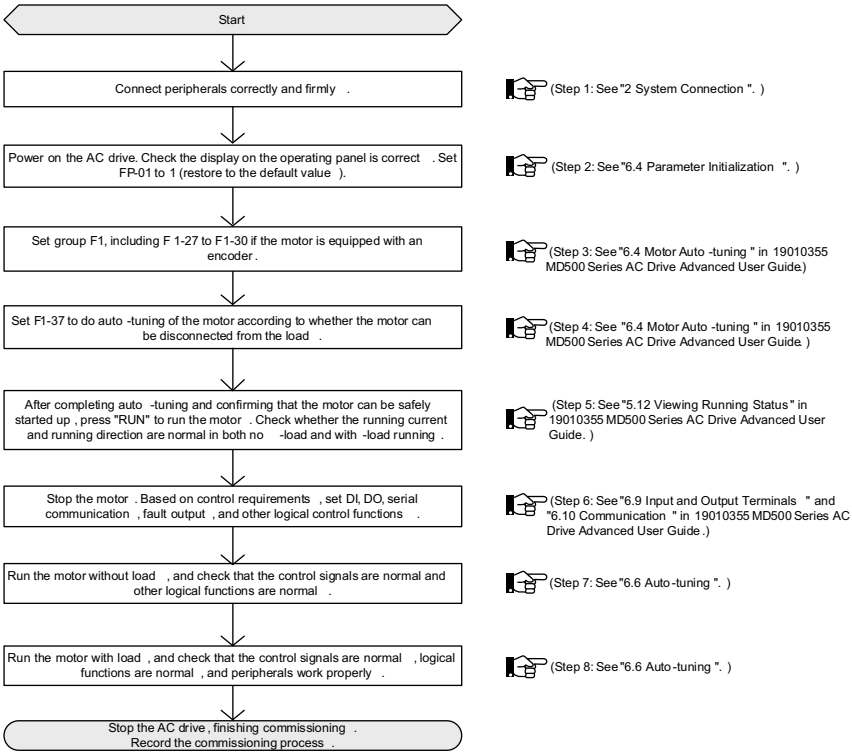


Figure 5-1 Quick commissioning

5.2 Precautions Before Power-on

Be sure to check the following items before powering on the AC drive.

Item	Description
Voltage	The voltage is AC 380 to 480 V or 220 to 240 V and 50/60 Hz.
	The input terminals R, S, and T are correctly connected.
	The AC drive is connected to the motor properly.
Connection of AC drive output terminals and motor terminals	The AC drive output terminals U, V, and W are firmly connected to the motor terminals.
Connection of terminals in the control circuit	Terminals of the control circuit are firmly connected to other control devices.
Status of control terminals	All terminals of the control circuit are OFF (the AC drive is not running).

Item	Description
Load	The motor is idle and not connected to the mechanical system.

5.3 Status Display After Power-on

The following table lists the display on the operating panel after the AC drive is powered on.

State	Display	Description
Normal		Default value 50.00 Hz is displayed.
Fault		The AC drive stops and displays an error code.

5.4 Parameter Initialization

You can restore the AC drive to factory parameters. After initialization, P-01 is automatically reset to 0.

P-01	Parameter initialization		Default	0
	Setting Range	0	No operation	
		1	Restore factory parameters except motor parameters	
		2	Clear records	
		4	Back up current user parameters	
		501	Restore user backup parameters	

1: Restore factory parameters except motor parameters

When P-01 is set to 1, most of the parameters are restored to the factory default settings. However, motor parameters, P0-22 (Frequency reference resolution), error records, P7-09 (Accumulative running time), P7-13 (Accumulative power-on time), P7-14 (Accumulative power consumption), and P7-07 (Heatsink temperature of AC drive) cannot be restored.

2: Clear records

Error records, P7-09 (Accumulative running time), P7-13 (Accumulative power-on time), and P7-14 (Accumulative power consumption) are cleared.

4: Back up current user parameters

Parameters set by the current user are backed up. Values of all the current function parameters are backed up for restoration after an error caused by parameter adjustment occurs.

501: Restore user backup parameters

Restore parameters backed up by setting P-01 to

5.5 Motor Control Modes

Parameter	Description	Scenario
P0-01: Motor control mode	P0-01 = 0: SVC	It indicates the SVC mode. It is applicable for common high-performance control scenarios in which one AC drive can drive only one motor, for example, machine tool, centrifuge, drawing machine, and injection molding machine.
	P0-01 = 1: FVC	It indicates the FVC mode. The motor must be equipped with an encoder and the AC drive must be equipped with a PG card in the same type of the encoder. It is applicable to scenarios requiring high precision speed or torque control. One AC drive can drive only one motor, for example, high-speed papermaking machine, crane, and elevator.
	P0-01 = 2: V/F control	It is applicable to scenarios having no requirement on load (fans and pumps) or using one drive to drive multiple motors.

5.6 Auto-tuning

You can obtain parameters of a controlled motor through motor auto-tuning. Motor auto-tuning methods include dynamic auto-tuning, static auto-tuning 1, and static auto-tuning 2. You can enter the motor parameters manually.

Auto-tuning Method	Application	Result
Dynamic no-load auto-tuning P1-37 = 2	It is applied to applications where motors can be disconnected from the load.	Best
Dynamic auto-tuning with load P1-37 = 2	It is applied to applications where motors cannot be disconnected from the load. The load friction force is small and the motor is appropriately idle when running at a constant speed. The effect is better with a smaller friction force.	Better
Static auto-tuning 1 P1-37 = 1	It is applied to applications where motors cannot be disconnected from the load and dynamic auto-tuning is not allowed.	Good
Static auto-tuning 2 P1-37 = 3	It is applied to applications where motors cannot be disconnected from the load and dynamic auto-tuning is not allowed. This mode is recommended for static auto-tuning. It lengthens the auto-tuning time compared to static auto-tuning 1.	Better
Manual parameter input	It is applied to applications where motors cannot be disconnected from the load. Copy parameters of motors of the same model which have been auto-tuned to F1-00 (Motor type selection) to F1-10 (No-load current).	Better

Auto-tuning methods are described below.

Motor 1 is used to describe motor auto-tuning methods. If you need to perform auto-tuning on motor 2, set F0-24 (Motor parameter group selection) to 1 (Motor parameter group 2).

Step 1: If the motor can be disconnected from the load, cut off the power, and disconnect the motor from the load to have the motor run without load.

Step 2: Power on the AC drive. Set P0-02 (Running command selection) to 0 (Serial communication) to select the operating panel as the running command.

Step 3: Input motor nameplate parameters (P1-00 to P1-05) correctly. Set the following parameters according to the motor:

Motor	Parameter
Motor 1	P1-00: Motor type selection P1-01: Rated motor power P1-02: Rated motor voltage P1-03: Rated motor current P1-04: Rated motor frequency P1-05: Rated motor speed
Motor 2	P2-00 (Motor type selection) to A2-05 (Rated motor speed) have the same definition.

If there is an encoder, set P1-27 (Encoder pulses per revolution), P1-28 (Encoder type), and P1-30 (A/B phase sequence of ABZ incremental encoder).

Step 4: For an asynchronous motor, set P1-37 (Auto-tuning selection) (A2-37 in case of Motor 2) to 2 (Asynchronous motor dynamic auto-tuning) and press ENTER. "TUNE" is displayed, as shown in the following figure:

Press RUN on the operating panel. The AC drive drives the motor to accelerate/ decelerate and run in forward/reverse direction. The RUN indicator becomes ON and auto-tuning lasts for about 2 minutes. After the preceding display disappears and the operating panel returns to normal parameter display state, auto-tuning is completed.

After auto-tuning, the following motor parameters are calculated:

Motor	Parameter
Motor 1	P1-06: Stator resistance P1-07: Rotor resistance P1-08: Leakage inductive reactance P1-09: Mutual inductive reactance P1-10: No-load current
Motor 2	A2-06 to A2-10 have the same definition.

If the motor cannot be disconnected from the load, set P1-37 (A2-37 in case of Motor 2) to 3 (Asynchronous motor complete static auto-tuning) and press RUN on the operating panel. Auto-tuning starts.

6 Troubleshooting and Solutions

6.1 Fault Codes and Solutions

Troubleshoot the faults occurred during operating the AC drive as follows.

Fault Code	Fault Name	Possible Cause	Solution
Err02	Overcurrent during acceleration	A grounding fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable, or contactor.
		The control mode is SVC or FVC but motor auto-tuning is not performed.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		The acceleration time is too short.	Increase the acceleration time.
		The overcurrent stall prevention parameters are set improperly.	Ensure that current limit is enabled (P3-19 = 1). The setting of P3-18 (Current limit level) is too large. Adjust it between 120% and 150%. The setting of P3-20 (Current limit gain) is too small. Adjust it between 20 and 40.
		Customized torque boost or V/F curve is not appropriate.	Adjust the customized torque boost or V/F curve.
		The motor is started while spinning.	Enable the flying start function or start the motor after it stops spinning.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the overcurrent level, find the interference source. If an external interference does not exist, the driver board or Hall element may be faulty.

Fault Code	Fault Name	Possible Cause	Solution
Err03	Overcurrent during deceleration	A grounding fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable, or contactor.
		The control mode is SVC or FVC but motor auto-tuning is not performed.	Set the motor parameters according to the motor nameplate and perform motor auto-tuning.
		The deceleration time is too short.	Increase the deceleration time.
		The overcurrent stall prevention parameters are set improperly.	Ensure that current limit is enabled (P3-19 = 1). The setting of P3-18 (Current limit level) is too large. Adjust it between 120% and 150%. The setting of P3-20 (Current limit gain) is too small. Adjust it between 20 and 40.
		The braking unit and braking resistor are not installed.	Install the braking unit and braking resistor.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the overcurrent level, find the interference source. If an external interference does not exist, the driver board or Hall element may be faulty.
Err04	Overcurrent at constant speed	A grounding fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable, or contactor.
		The control mode is SVC or FVC but motor auto-tuning is not performed.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		The overcurrent stall prevention parameters are set improperly.	Ensure that current limit is enabled (P3-19 = 1). The setting of P3-18 (Current limit level) is too large. Adjust it between 120% and 150%. The setting of P3-20 (Current limit gain) is too small. Adjust it between 20 and 40.
		The AC drive power class is small.	If the output current exceeds the rated motor current or rated output current of the AC drive during stable running, use an AC drive of larger power class.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the overcurrent level, find the interference source. If an external interference does not exist, the driver board or Hall element may be faulty.

Fault Code	Fault Name	Possible Cause	Solution
Err05	Overvoltage during acceleration	The input voltage is too high.	Adjust the input voltage to the normal range.
		An external force drives the motor during acceleration.	Cancel the external force or install a braking resistor.
		The overvoltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (P3-23 = 1). The setting of P3-22 (Voltage limit) is too large. Adjust it between 700 V and 770 V. The setting of P3-24 (Frequency gain for voltage limit) is too small. Adjust it between 30 and 50.
		The braking unit and braking resistor are not installed.	Install the braking unit and braking resistor.
		The acceleration time is too short.	Increase the acceleration time.
Err06	Overvoltage during deceleration	The overvoltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (P3-23 = 1). The setting of P3-22 (Voltage limit) is too large. Adjust it between 700 V and 770 V. The setting of P3-24 (Frequency gain for voltage limit) is too small. Adjust it between 30 and 50.
		An external force drives the motor during deceleration.	Cancel the external force or install a braking resistor.
		The deceleration time is too short.	Increase the deceleration time.
		The braking unit and braking resistor are not installed.	Install the braking unit and braking resistor.
Err07	Overvoltage at constant speed	The overvoltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (P3-23 = 1). The setting of P3-22 (Voltage limit) is too large. Adjust it between 700 V and 770 V. The setting of P3-24 (Frequency gain for voltage limit) is too small. Adjust it between 30 and 50. The setting of P3-26 (Frequency rise threshold during voltage limit) is too small. Adjust it between 5 Hz and 20 Hz.
		An external force drives the motor during acceleration.	Cancel the external force or install a braking resistor.
Err08	Pre-charge power fault	The bus voltage fluctuates around the undervoltage threshold continuously.	Contact the agent or Inovance.

Fault Code	Fault Name	Possible Cause	Solution
Err09	Undervoltage	An instantaneous power failure occurs.	Enable the power dip ride through function (P9-59 ≠ 0).
		The AC drive's input voltage is not within the permissible range.	Adjust the voltage to the normal range.
		The bus voltage is abnormal.	Contact the agent or Inovance.
		The rectifier bridge, pre-charge resistor, driver board, or control board are abnormal.	Contact the agent or Inovance.
Err10	AC drive overload	The load is too heavy or locked-rotor occurs on the motor.	Reduce the load or check motor and mechanical conditions.
		The AC drive power class is small.	Replace an AC drive of larger power class.
Err11	Motor overload	F9-01 (Motor overload protection gain) is set improperly.	Set P9-01 (Motor overload protection gain) correctly.
		The load is too heavy or locked-rotor occurs on the motor.	Reduce the load or check motor and mechanical conditions.
Err12	Input phase loss	Input phase loss occurs.	Eliminate faults in external circuits.
		The driver board, lightning protection board, main control board, or rectifier bridge is abnormal.	Contact the agent or Inovance.
Err13	Output phase loss	The motor is faulty.	Check and ensure that the motor is free of open circuit.
		The cable connecting the AC drive and the motor is abnormal.	Eliminate external faults.
		The AC drive's three-phase outputs are unbalanced when the motor is running.	Check whether the motor three-phase winding is normal.
		The driver board or the IGBT is abnormal.	Contact the agent or Inovance.
Err14	IGBT overheat	The ambient temperature is too high.	Lower the ambient temperature.
		The ventilation is clogged.	Clean the ventilation.
		The fan is damaged.	Replace the cooling fan.
		The thermistor of IGBT is damaged.	Replace the thermistor.
		The IGBT is damaged.	Replace the IGBT.

Fault Code	Fault Name	Possible Cause	Solution
Err15	External fault	An external fault signal is input using the DI.	Eliminate external faults, and confirm that the mechanical condition allows restart (F8-18) and reset the operation.
		An external fault signal is input using virtual I/O.	Confirm that the virtual I/O parameters in group A1 are set correctly and reset the operation.
Err16	Communication fault	The host controller is in abnormal state.	Check the cable of the host controller.
		The communication cable is abnormal.	Check the communication cables.
		The serial port communication protocol (P0-28) of the extension communication card is set improperly.	Set P0-28 (Serial port communication protocol) for the extension communication card correctly.
		Communication parameters in group Fd are set improperly.	Set communication parameters in group Fd properly.
		If the fault still exists after all the preceding checkings are done, restore the default settings.	
Err17	Contactor fault	The driver board and power supply are abnormal.	Replace the driver board or power supply board.
		The contactor is abnormal.	Replace the contactor.
		The lightning protection board is abnormal.	Replace the lightning protection board.
Err18	Current detection fault	The Hall element is abnormal.	Replace the Hall element.
		The driver board is abnormal.	Replace the driver board.
Err19	Motor auto-tuning fault	Motor parameters are not set according to the nameplate.	Set motor parameters correctly according to the nameplate.
		Motor auto-tuning times out.	Check whether the AC drive and motor are connected correctly.
		The encoder is abnormal.	Check whether F1-27 (Encoder pulses per revolution) is set correctly. Check whether signal lines of the encoder are connected correctly and securely.
Err20	Encoder fault	The encoder is not matched.	Set the encoder type correctly.
		The encoder wiring is incorrect.	Check the PG card power supply and phase sequence.
		The encoder is damaged.	Replace the encoder.
		The PG card is abnormal.	Replace the PG card.
Err21	EEPROM read-write fault	The EEPROM chip is damaged.	Replace the main control board.
Err23	Short circuit to ground	The motor is short-circuited to the ground.	Replace the cable or motor.

Fault Code	Fault Name	Possible Cause	Solution
Err26	Accumulative running time reached	The accumulative running time reached the set value.	Clear the record by parameter initialization.
Err27	User-defined fault 1	The signal of user-defined fault 1 is input through the multi-functional terminal DI.	Perform the reset operation.
		The signal of user-defined fault 1 is input through the virtual I/O.	Perform the reset operation.
Err28	User-defined fault 2	The signal of user-defined fault 2 is input through the multi-functional terminal DI.	Perform the reset operation.
		The signal of user-defined fault 2 is input through the virtual I/O.	Perform the reset operation.
Err29	Accumulative power-on time reached	The accumulative power-on time reached the set value.	Clear the record by parameter initialization.
Err30	Load loss	The operation current of the AC drive is smaller than P9-64 (Load loss detection level).	Check whether the load is disconnected or ensure that P9-64 (Load loss detection level) and P9-65 (Load loss detection time) are set based on the actual conditions.
Err31	PID Feedback loss	PID feedback is smaller than PA-26 (Detection level of PID feedback loss).	Check the PID feedback signal or set PA-26 (Detection level of PID feedback loss) correctly.
Err40	Pulse-by-pulse current limit fault	The load is too heavy or locked-rotor occurs on the motor.	Reduce the load or check motor and mechanical conditions.
		The AC drive power class is small.	Replace an AC drive of larger power class.
Err41	Motor switchover fault during running	Motor switchover is performed using a terminal during running of the AC drive.	Perform motor switchover after the AC drive stops.
Err42	Speed error	Encoder parameters are set improperly.	Set encoder parameters properly.
		Motor auto-tuning is not performed.	Perform motor auto-tuning.
		P9-69 (Detection level of speed error) and P9-70 (Detection time of speed error) are set incorrectly.	Set P9-69 (Detection level of speed error) and P9-70 (Detection time of speed error) correctly based on actual condition.

Fault Code	Fault Name	Possible Cause	Solution
Err43	Motor overspeed	Encoder parameters are set improperly.	Set encoder parameters properly.
		Motor auto-tuning is not performed.	Perform motor auto-tuning.
		F9-67 (Overspeed detection level) and F9-68 (Overspeed detection time) are set incorrectly.	Set P9-67 (Overspeed detection level) and P9-68 (Overspeed detection time) correctly based on the actual situation.
Err45	Motor overheat	Cable connection of the temperature sensor becomes loose.	Check cable connection of the temperature sensor.
		The motor temperature is too high.	Increase the carrier frequency or take other measures to cool the motor.
Err61	Braking unit overload	The resistance of braking resistor is too small.	Use a braking resistor of larger resistance.
Err62	Short-circuit of braking circuit	The braking module is abnormal.	Contact the agent or Inovance.

6.2 Common Symptoms and Solutions

No.	Fault Symptom	Possible Cause	Solution
1	There is no display upon power-on.	There is no power supply to the AC drive or the power input to the AC drive is too low.	Check the power supply.
		The switching power supply on the driver board of the AC drive is faulty.	Check the bus voltage.
		Wires between the control board and driver board and between the control board and operating panel break.	Re-connect the 8-pin wire and 40-pin wire.
		The pre-charge resistor of the AC drive is damaged.	Contact the agent or Inovance.
		The control board or the operating panel is faulty.	
		The rectifier bridge is damaged.	

No.	Fault Symptom	Possible Cause	Solution
2	"HC" is displayed upon power-on.	Cable connection between the driver board and control board is in poor contact.	Re-connect the 8-pin wire and 28-pin wire.
		Related components on the control board are damaged.	Contact the agent or Inovance.
		The motor or motor cable is short-circuited to ground.	
		The Hall element is faulty.	
		The mains voltage is too low.	
3	"Err23 " is displayed upon power-on.	The motor or the motor cable is short-circuited to the ground.	Check the insulation status of the motor and the output cable with a megger.
		The AC drive is damaged.	Contact the agent or Inovance.
4	The AC drive display is normal upon power-on, but after running the AC drive displays "HC" and stops immediately.	The cooling fan is damaged or does not rotate.	Replace the damaged fan.
		The cable of the external control terminal is short-circuited.	Eliminate the external short-circuit fault.
5	"Err14 " (IGBT overheat) is detected frequently.	The setting of carrier frequency is too high.	Reduce P0-15 (Carrier frequency).
		The cooling fan is damaged, or the ventilation is clogged.	Replace the cooling fan and clean the ventilation.
		Components (thermal coupler or others) inside the AC drive are damaged.	Contact the agent or Inovance.
6	The motor does not rotate after the AC drive runs.	Check the motor and the motor cables.	Check that cabling between the AC drive and the motor is normal.
		The motor parameters in group F1 are set improperly.	Restore the factory parameters and reset the following parameters properly: ◆ Encoder parameters ◆ Motor ratings, such as rated motor frequency and rated motor speed ◆ P0-01 (Motor 1 control mode) and P0-02 (Running command selection) ◆ P3-01 (Torque boost) in V/F control under heavy-load start
		Cable connection between the driver board and control board is in poor contact.	Re-connect wirings and ensure secure connection.
		The driver board is faulty.	Contact the agent or Inovance.

No.	Fault Symptom	Possible Cause	Solution
7	DI terminals are disabled.	The related parameters are set incorrectly.	Check and reset the parameters in group F4 again.
		The external signal is incorrect.	Re-connect the external signal cable.
		The jumper across OP and +24 V becomes loose.	Re-confirm the jumper bar across OP and +24 V.
		The control board is faulty.	Contact the agent or Inovance.
8	The motor speed does not rise in FVC control.	The encoder is faulty.	Replace the encoder and re-confirm cable connection.
		The encoder connection is incorrect or in poor contact.	Replace the PG card.
		The PG card is faulty.	Contact the agent or Inovance.
		The driver board is faulty.	
9	The AC drive detects overcurrent and overvoltage frequently.	The motor parameters in group F1 are set improperly.	Set the motor parameters in group F1 or perform motor auto-tuning again.
		The acceleration/deceleration time is improper.	Set proper acceleration/deceleration time.
		The load fluctuates.	Contact the agent or Inovance.
10	"Err17" is detected upon power-on or running.	The pre-charge contactor is not closed.	◆ Check whether the contactor cable is loose. ◆ Check whether the contactor is faulty. ◆ Check whether 24 V power supply of the contactor is faulty. ◆ Contact the agent or Inovance.
11	The brake torque of the motor is insu翻 cient when the motor is in the deceleration or decelerate to stop state.	The encoder disconnection or overvoltage stall protection takes effect.	Check the encoder wiring at FVC (F0-01 = 1). If the braking resistor has been configured, set P3-23 (Voltage limit selection) to 0 (Disabled).

7 Maintenance

7.1 Routine Maintenance

Check the following items daily to ensure normal running and prevent damage to the AC drive. Copy this checklist and sign the "Checked" column after each inspection.

Inspection Item	Inspection Points	Solutions	Checked
Motor	Inspect whether the abnormal sounds and vibration occur on the motor.	◆ Check whether the mechanical connection is normal. ◆ Check whether output phase loss occurs on the motor. ◆ Check whether retaining screws of the motor are tightened.	
Fan	Inspect whether the cooling fan of the AC drive and motor work abnormally.	◆ Check running of the cooling fan of the AC drive. ◆ Check whether the cooling fan of the motor is normal. ◆ Check whether the ventilation is clogged. ◆ Check whether the ambient temperature is within the permissible range.	
Installation environment	Inspect whether the cabinet and cable duct are abnormal.	◆ Check input and output cables for damaged insulation. ◆ Check for vibration of hanging bracket. ◆ Check whether ground bars and terminals become loose or get corroded.	
Load	Inspect whether the running current of the AC drive exceeds the rated current of the AC drive and motor for a certain period.	◆ Check whether motor parameters are set properly. ◆ Check whether the motor is overloaded. ◆ Check whether the mechanical vibration is severe (allowed range: < 1 g).	
Input voltage	Inspect whether the power voltage of the main and control circuits is within the allowed range.	◆ Check that the input voltage is within the allowed range. ◆ Check whether start of heavy load exists.	

7.2 Periodic Inspection

Inspection Item	Inspection Point	Solution	Checked
General	Inspect for wastes, dirt, and dust on the surface of the AC drive.	◆ Check whether the cabinet of the AC drive is powered off. ◆ Use a vacuum cleaner to suck up wastes and dust to prevent direct touching. ◆ Wipe stubborn stains with alcohol and wait until the alcohol evaporates.	
Cables	Inspect power cables and connections for discoloration. Inspect wiring insulation for aging or wear.	◆ Replace cracked cables. ◆ Replace damaged terminals.	
Peripheral devices such as relay and contactor	Check whether the contactor is loose or abnormal noise exists during operation. Check whether short-circuit, water stain, expansion, or cracking occurs on peripheral devices.	◆ Replace abnormal peripheral devices.	
Ventilation	Inspect whether ventilation and heatsink are clogged. Check whether the fan is damaged.	◆ Clean the ventilation. ◆ Replace the fan.	
Control circuit	Inspect for control components in poor contact. Inspect for loose terminal screws. Inspect for control cables with cracked insulation.	◆ Clear away foreign matters on the surface of control cables and terminals. ◆ Replace damaged or corroded control cables.	

7.3 Replacement of Wear Parts

7.3.1 Service Life of Wear Parts

The service life of fans and electrolytic DC bus capacitors is related to the operating environment and maintenance status. The general service life is listed as follows.

Component	Service Life [1]
Fan	≥ 5 years
Electrolytic capacitor	≥ 5 years

[1] You can determine when to replace these parts according to the actual operating time.

- Ambient temperature: 40°C
- Load rate: 80%
- Operating rate: 24 hours per day

Appendix A Parameter Table

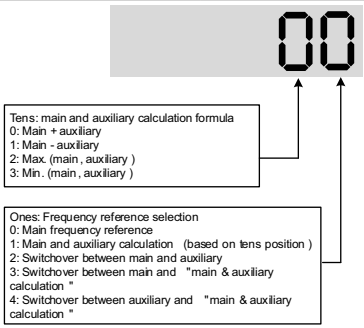
☆ : It is possible to modify the parameter with the AC drive in the Stop and in the Run status.

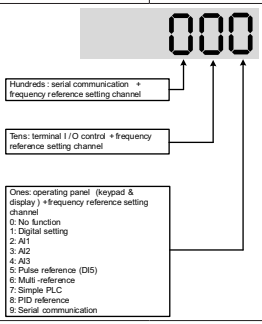
★ : It is not possible to modify the parameter with the AC drive in the Run status.

● : The parameter is the actual measured value and cannot be modified.

*: The parameter is a factory parameter and can be set only by the manufacturer.

A.1 Standard Parameter Table

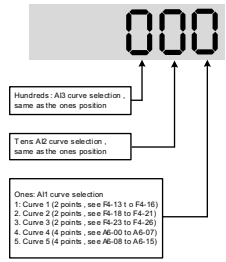
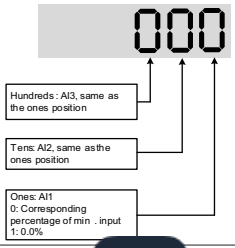
No.	Param. Name	Setting Range		Default	Change
Group P0: Standard Parameters					
P0-00	G/P type display	1: G (constant torque load)	2: P (fan and pump)	Model dependent	●
P0-01	Motor 1 control mode	0: SVC 1: FVC	2: V/F	0	★
P0-02	Running command selection	0: Operating panel 1: Terminal	2: Serial communication	0	☆
P0-03	Main frequency reference setting channel selection	0: Digital setting (revised value is cleared after power off) 1: Digital setting (revised value is not cleared after power off) 2: AI1 3: AI2	4: AI3 5: Pulse setting (DI5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Communication setting	0	★
P0-04	Auxiliary frequency reference setting channel selection	Same as F0-03 (Main frequency reference setting channel selection)		0	★
P0-05	Base value of range of auxiliary frequency reference for main and auxiliary calculation	0: Relative to maximum frequency	1: Relative to main frequency reference	0	☆
P0-06	Range of auxiliary frequency reference for main and auxiliary calculation	0% to 150%		100%	☆
P0-07	Final Frequency reference setting selection			00	☆
P0-08	Preset frequency	0.00 Hz to F0-10 (Max. frequency)		50.00 Hz	☆
P0-09	Running direction	0: Run in the default direction	1: Run in the direction reverse to the default direction	0	☆
P0-10	Max. frequency	50.00 Hz to 500.00 Hz		50.00 Hz	★

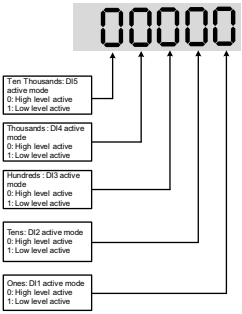
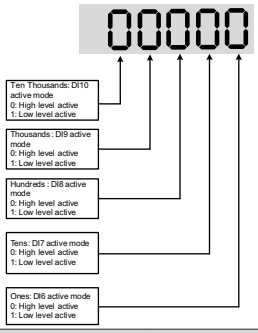
No.	Param. Name	Setting Range		Default	Change
P0-11	Setting channel of frequency upper limit	0: Set by F0-12 (Frequency reference upper limit) 1: AI1 2: AI2	3: AI3 4: Pulse reference 5: Communication reference	0	★
P0-12	Frequency reference upper limit	F0-14 (Frequency reference lower limit) to F0-10 (Max. frequency)		50.00 Hz	☆
P0-13	Frequency reference upper limit offset	0.00 Hz to F0-10 (Max. frequency)		0.00 Hz	☆
P0-14	Frequency reference lower limit	0.00 Hz to F0-12 (Frequency reference upper limit)		0.00 Hz	☆
P0-15	Carrier frequency	0.5 kHz to 16.0 kHz		Model dependent	☆
P0-16	Carrier frequency adjusted with load	0: Disabled	1: Enabled	1	☆
P0-17	Acceleration time 1	0.00s to 650.00s(F0-19 = 2) 0.0s to 6500.0s(F0-19 = 1)	0s to 65000s(F0-19 = 0)	Model dependent	☆
P0-18	Deceleration time 1	0.00s to 650.00s(F0-19 = 2) 0.0s to 6500.0s(F0-19 = 1)	0s to 65000s(F0-19 = 0)	Model dependent	☆
P0-19	Acceleration/Deceleration time unit	0: 1s 1: 0.1s	2: 0.01s	1	★
P0-21	Frequency offset of auxiliary frequency setting channel for main and auxiliary calculation	0.00 Hz to F0-10 (Max. frequency)		0.00 Hz	☆
P0-22	Frequency reference resolution	2: 0.01 Hz		2	★
P0-23	Retentive of digital setting frequency upon stop	0: Not retentive	1: Retentive	0	☆
P0-24	Motor parameter group selection	0: Motor parameter group 1	1: Motor parameter group 2	0	★
P0-25	Acceleration/Deceleration time base frequency	0: Maximum frequency (F0-10) 1: Frequency reference	2: 100 Hz	0	★
P0-26	Base frequency for UP/DOWN modification during running	0: Running frequency	1: Frequency reference	0	★
P0-27	Running command + frequency source			0000	☆
P0-28	Serial port communication protocol	0: Modbus protocol 1: PROFIBUS-DP or CANopen protocol		0	★
Group F1: Motor 1 Parameters					
P1-00	Motor type selection	0: Common asynchronous motor	1: Variable frequency asynchronous motor	0	★
P1-01	Rated motor power	0.1 kW to 1000.0 kW		Model dependent	★
P1-02	Rated motor voltage	1 V to 2000 V		Model dependent	★

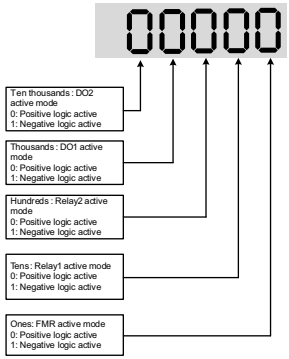
No.	Param. Name	Setting Range		Default	Change
P1-03	Rated motor current	0.01 A to 655.35 A (AC drive power ≤ 55 kW) 0.1 A to 6553.5 A (AC drive power > 55 kW)		Model dependent	★
P1-04	Rated motor frequency	0.01 Hz to max. frequency		Model dependent	★
P1-05	Rated motor speed	1 rpm to 65535 rpm		Model dependent	★
P1-06	Stator resistance	0.001 Ω to 65.535 Ω (AC drive power ≤ 55 kW) 0.0001 Ω to 6.5535 Ω (AC drive power > 55 kW)		Auto-tuning parameter	★
P1-07	Rotor resistance	0.001 Ω to 65.535 Ω (AC drive power ≤ 55 kW) 0.0001 Ω to 6.5535 Ω (AC drive power > 55 kW)		Auto-tuning parameter	★
P1-08	Leakage inductive reactance	0.01 mH to 655.35 mH (AC drive power ≤ 55 kW) 0.001 mH to 65.535 mH (AC drive power > 55 kW)		Auto-tuning parameter	★
P1-09	Mutual inductive reactance	0.1 mH to 6553.5 mH (AC drive power ≤ 55 kW) 0.01 mH to 655.35 mH (AC drive power > 55 kW)		Auto-tuning parameter	★
P1-10	No-load current	0.01 A to F1-03 (AC drive power ≤ 55 kW) 0.1 A to F1-03 (AC drive power > 55 kW)		Auto-tuning parameter	★
P1-27	Encoder pulses per revolution	1 to 65535		1024	★
P1-28	Encoder type	0: ABZ incremental encoder	2: Resolver	0	★
P1-30	A/B phase sequence of ABZ incremental encoder	0: Forward	1: Reverse	0	★
P1-34	Number of pole pairs of resolver	1 to 65535		1	★
P1-36	Encoder wire-break fault detection time	0.0s: No detection	0.1s to 10.0s	0.0s	★
P1-37	Auto-tuning selection	0: No auto-tuning 1: Asynchronous motor partial static auto-tuning	2: Asynchronous motor dynamic auto-tuning 3: Asynchronous motor complete static auto-tuning	0	★
Group P2: Vector Control Parameters of Motor 1					
P2-00	Speed loop proportional gain 1	1 to 100		30	☆
P2-01	Speed loop integral time 1	0.01s to 10.00s		0.50s	☆
P2-02	Switchover frequency 1	0.00 to F2-05		5.00 Hz	☆
P2-03	Speed loop proportional gain 2	1 to 100		20	☆
P2-04	Speed loop integral time 2	0.01s to 10.00s		1.00s	☆
P2-05	Switchover frequency 2	F2-02 (Switchover frequency 1) to maximum frequency		10.00 Hz	☆
P2-06	Vector control slip compensation gain	50% to 200%		100%	☆
P2-07	Speed feedback filter time in SVC	0.000s to 0.100s		0.015s	☆
P2-09	Torque limit source in speed control	0: F2-10 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5)	5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) The full scale of 1-7 corresponds to F2-10.	0	☆
P2-10	Digital setting of torque limit in speed control	0.0% to 200.0%		150.0%	☆
P2-11	Torque limit source in speed control (regenerative)	0: F2-10 (electrical or regenerative) 1: AI 2: AI2 3: AI3 4: Pulse reference	5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 8: F2-12 The full scale of 1-7 corresponds to F2-12.	0	☆
P2-12	Digital setting of torque limit in speed control (regenerative)	0.0% to 200.0%		150.0%	☆

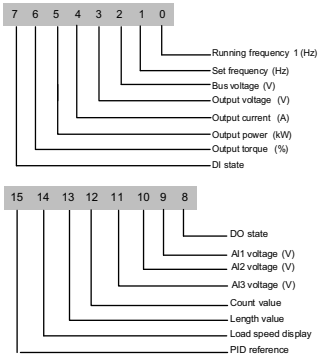
No.	Param. Name	Setting Range		Default	Change
P2-13	Excitation adjustment proportional gain	0 to 60000		2000	☆
P2-14	Excitation adjustment integral gain	0 to 60000		1300	☆
P2-15	Torque adjustment proportional gain	0 to 60000		2000	☆
P2-16	Torque adjustment integral gain	0 to 60000		1300	☆
P2-17	Speed loop integral separation selection	0: Disabled	1: Enabled	0	☆
P2-21	Max. torque coe▦ cient of field weakening area	50to200%		100%	☆
P2-22	Regenerative power limit selection	0: Disabled	1: Enabled	0	☆
P2-23	Regenerative power limit	0.0 to 200.0%		Model dependent	☆
Group P3: V/F Control Parameters					
P3-00	V/F curve setting	0, 2-9: Linear V/F 1: Multi-point V/F 10: V/F complete separation	11: V/F half separation Note: When F3-00 is set to 2 to 9, the actual linear V/F is used.	0	★
P3-01	Torque boost	0.0%: Automatic torque boost	0.1% to 30.0%	Model dependent	☆
P3-02	Cut-off frequency of torque boost	0.00 Hz to the maximum frequency		50.00 Hz	★
P3-03	Multi-point V/F frequency 1	0.00 Hz to F3-05 (Multi-point V/F frequency 2)		0.00 Hz	★
P3-04	Multi-point V/F voltage 1	0.0% to 100.0%		0.0%	★
P3-05	Multi-point V/F frequency 2	F3-03 (Multi-point V/F frequency 1) to F3-07 (Multi-point V/F frequency 3)		0.00 Hz	★
P3-06	Multi-point V/F voltage 2	0.0% to 100.0%		0.0%	★
P3-07	Multi-point V/F frequency 3	F3-05 (Multi-point V/F frequency 2) to F1-04 (rated motor frequency)		0.00 Hz	★
P3-08	Multi-point V/F voltage 3	0.0% to 100.0%		0.0%	★
P3-10	V/F over-excitation gain	0 to 200		64	☆
P3-11	V/F oscillation suppression gain	0 to 100		40	☆
P3-13	Voltage source for V/F separation	0: Set by F3-14 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Multi-reference	6: Simple PLC 7: PID reference 8: Communication reference Note: 100.0% corresponds to the rated motor voltage	0	☆
P3-14	Digital setting of voltage for V/F separation	0 V to rated motor voltage		0 V	☆
P3-15	Voltage rise time of V/F separation	0.0s to 1000.0s Note: It is the time used for the voltage increases from 0 V to the rated motor voltage.		0.0s	☆
P3-16	Voltage decline time of V/F separation	0.0s to 1000.0s Note: It is the time used for the voltage increases from 0 V to the rated motor voltage.		0.0s	☆
P3-17	Stop mode selection for V/F separation	0: Frequency and voltage declining to 0 independently	1: Frequency declining after voltage declines to 0	0	☆
P3-18	Current limit level	50% to 200%		150%	★

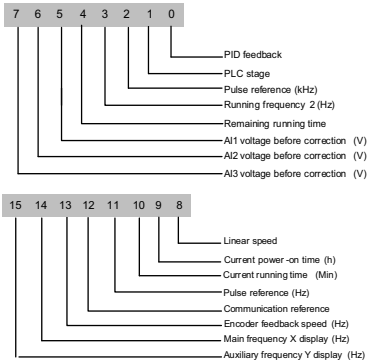
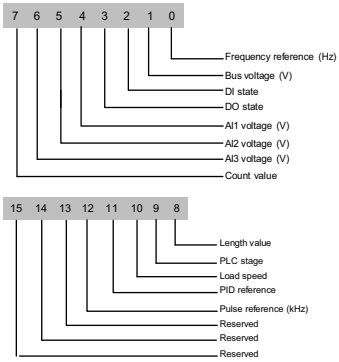
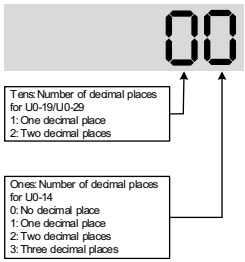
No.	Param. Name	Setting Range		Default	Change
P3-19	Current limit selection	0: Disabled	1: Enabled	1 (Enabled)	★
P3-20	Current limit gain	0 to 100		20	☆
P3-21	Compensation factor of speed multiplying current limit	50% to 200%		50%	★
P3-22	Voltage limit	Three phase 380 to 480 V models: 330.0 to 800.0 V Three phase 200 to 240 V models: 330.0 to 800.0 V		770.0 V	★
P3-23	Voltage limit selection	0: Disabled	1: Enabled	1 (Enabled)	★
P3-24	Frequency gain for voltage limit	0 to 100		30	☆
P3-25	Voltage gain for voltage limit	0 to 100		30	☆
P3-26	Frequency rise threshold during voltage limit	0 to 50 Hz		5 Hz	★
Group P4: Input Terminals					
P4-00	DI1 function selection	0: No function 1: Forward RUN (FWD) or running command 2: Reverse RUN (REV) or running direction (Note: F4-11 must be set when F4-00 is set to 1 or 2.) 3: Three-wire control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop 9: Fault reset (RESET) 10: RUN pause 11: External fault normally open (NO) input 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Terminal 1 for acceleration/deceleration time selection 17: Terminal 2 for acceleration/deceleration time selection 18: Frequency source switchover 19: UP and DOWN setting clear (terminal, operating panel) 20: Running command switchover terminal 1 21: Acceleration/Deceleration prohibited 22: PID pause 23: PLC status reset 24: Wobble pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control prohibited	30: Pulse input (enabled only for DI5) 31: Reserved 32: Immediate DC injection braking 33: External fault normally closed (NC) input 34: Frequency modification enabled 35: PID action direction reverse 36: External STOP terminal 1 37: Running command switchover terminal 2 38: PID integral disabled 39: Switchover between main frequency source and preset frequency 40: Switchover between auxiliary frequency source and preset frequency 41: Motor terminal selection 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/Torque control switchover 47: Emergency stop 48: External STOP terminal 2 49: Deceleration DC injection braking 50: Clear the current running time 51: Two-wire/Three-wire mode switchover 52: Reverse frequency forbidden 53-59: Reserved	1	★
P4-01	DI2 function selection			4	★
P4-02	DI3 function selection			9	★
P4-03	DI4 function selection			12	★
P4-04	DI5 function selection			13	★
P4-05	DI6 function selection			0	★
P4-06	DI7 function selection			0	★
P4-07	DI8 function selection			0	★
P4-08	DI9 function selection			0	★
P4-09	DI10 function selection			0	★
P4-10	DI filter time	0.000s to 1.000s		0.010s	☆
P4-11	Terminal I/O control mode	0: Two-wire control mode 1 1: Two-wire control mode 2	2: Three-wire control mode 1 3: Three-wire control mode 2	0	★
P4-12	Terminal UP/DOWN rate	0.001 Hz/s to 65.535 Hz/s		1.00 Hz/s	☆

No.	Param. Name	Setting Range	Default	Change
P4-13	AI curve 1 min. input	0.00 V to F4-15 (AI curve 1 max. input)	0.00 V	☆
P4-14	Corresponding percentage of AI curve 1 min. input	-100.0% to +100.0%	0.0%	☆
P4-15	AI curve 1 max. input	F4-13 (AI curve 1 min. input) to 10.00 V	10.00 V	☆
P4-16	Corresponding percentage of AI curve 1 max. input	-100.0% to +100.0%	100.0%	☆
P4-17	AI1 filter time	0.00s to 10.00s	0.10s	☆
P4-18	AI curve 2 min. input	0.00 V to F4-20 (AI curve 2 max. input)	0.00 V	☆
P4-19	Corresponding percentage of AI curve 2 min. input	-100.0% to +100.0%	0.0%	☆
P4-20	AI curve 2 max. input	F4-18 (AI curve 2 min. input) to 10.00 V	10.00 V	☆
P4-21	Corresponding percentage of AI curve 2 max. input	-100.0% to +100.0%	100.0%	☆
P4-22	AI2 filter time	0.00s to 10.00s	0.10s	☆
P4-23	AI3 curve min. input	-10.00 V to F4-25 (AI curve 3 max. input)	-10.00 V	☆
P4-24	Corresponding percentage of AI curve 3 min. input	-100.0% to +100.0%	-100.0%	☆
P4-25	AI curve 3 max. input	F4-23 (AI3 curve min. input) to 10.00 V	10.00 V	☆
P4-26	Corresponding percentage of AI curve 3 max. input	-100.0% to +100.0%	100.0%	☆
P4-27	AI3 filter time	0.00s to 10.00s	0.10s	☆
P4-28	Pulse min. input	0.00 kHz to F4-30 (Pulse max. input)	0.00 kHz	☆
P4-29	Corresponding percentage of pulse min. input	-100.0% to 100.0%	0.0%	☆
P4-30	Pulse max. input	F4-28 (Pulse min. input) to 100.00 kHz	50.00 kHz	☆
P4-31	Corresponding percentage of pulse max. input	-100.0% to 100.0%	100.0%	☆
P4-32	Pulse filter time	0.00s to 10.00s	0.10s	☆
P4-33	AI curve selection		321	☆
P4-34	Setting selection when AI less than min. input		000	☆
P4-35	DI1 delay	0.0s to 3600.0s	0.0s	★

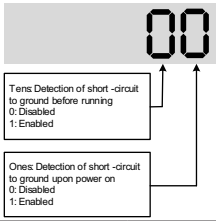
No.	Param. Name	Setting Range		Default	Change
P4-36	DI2 delay	0.0s to 3600.0s		0.0s	★
P4-37	DI3 delay	0.0s to 3600.0s		0.0s	★
P4-38	DI active mode selection 1			00000	★
P4-39	DI active mode selection 2			00000	★
Group F5: Output Terminals					
P5-00	FM terminal output mode	0: Pulse output (FMP)	1: Digital output (FMR)	0	☆
P5-01	FMR function selection (open collector output terminal)	0: No output 1: AC drive running 2: Fault output (coast to stop) 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running (no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Set count value reached 9: Designated count value reached 10: Length reached 11: PLC cycle completed 12: Accumulative running time reached 13: Frequency limited 14: Torque limited 15: Ready for RUN 16: AI1 > AI2 17: Frequency upper limit reached 18: Frequency lower limit reached (no output at stop) 19: Undervoltage status output 20: Communication setting 21: Reserved 22: Reserved	23: Zero-speed running 2 (having output at stop) 24: Accumulative power-on time reached 25: Frequency level detection FDT2 output 26: Frequency 1 reached 27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Timing duration reached 31: AI1 input limit exceeded 32: Load lost 33: Reverse running 34: Zero current status 35: IGBT temperature reached 36: Software current limit exceeded 37: Frequency lower limit reached (having output at stop) 38: Alarm output 39: Motor overheat warning 40: Current running time reached 41: Fault output (no output at	0	☆
P5-02	Control board relay function selection (T/A-T/B-T/C)			2	☆
P5-03	Extension card relay (P/A-P/B-P/C) function selection			0	☆
P5-04	DO1 function selection			1	☆
P5-05	Extension card DO2 function selection			4	☆

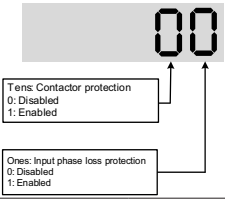
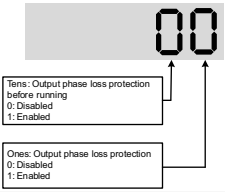
No.	Param. Name	Setting Range		Default	Change
P5-06	FMP function selection	0: Running frequency 1: Set frequency 2: Output current 3: Output torque (absolute value, proportion to motor torque) 4: Output power 5: Output voltage 6: Pulse input (100.0% corresponds to 100.0 kHz) 7: AI1 8: AI2 9: AI3 (extension card)	10: Length 11: Count value 12: Communication setting 13: Motor rotational speed 14: Output current (100.0% corresponds to 1000.0 A) 15: Output voltage (100.0% corresponds to1000.0 V) 16: Output torque (actual value, proportion to motor torque)	0	☆
P5-07	AO1 function selection			0	☆
P5-08	AO2 function selection			1	☆
P5-09	Max. FMP output frequency	0.01 kHz to 100.00 kHz		50.00 kHz	☆
P5-10	AO1 zero offset coe翻 cient	-100.0% to +100.0%		0.0%	☆
P5-11	AO1 gain	-10.00 to +10.00		1.00	☆
P5-12	AO2 zero offset coe翻 cient	-100.0% to +100.0%		0.0%	☆
P5-13	AO2 gain	-10.00 to +10.00		1.00	☆
P5-17	FMR output delay	0.0s to 3600.0s		0.0s	☆
P5-18	Relay 1 output delay	0.0s to 3600.0s		0.0s	☆
P5-19	Relay 2 output delay	0.0s to 3600.0s		0.0s	☆
P5-20	DO1 output delay	0.0s to 3600.0s		0.0s	☆
P5-21	DO2 output delay	0.0s to 3600.0s		0.0s	☆
P5-22	Active mode selection of DO output terminals			00000	☆
Group P6: Start/Stop Control					
P6-00	Start mode	0: Direct start 1: Catching a spinning motor	2: Pre-excited start (AC asynchronous drive) 3: SVC quick start	0	☆
P6-01	Flying start mode	0: From stop frequency 1: From power frequency	2: From max. frequency	0	★
P6-02	Flying start speed	1 to 100		20	☆
P6-03	Start frequency	0.00 Hz to 10.00 Hz		0.00 Hz	☆
P6-04	Start frequency holding time	0.0s to 100.0s		0.0s	★
P6-05	DC injection braking level/ Pre-excitation level	0% to 100%		50%	★
P6-06	DC injection braking active time/Pre-excitation active time	0.0s to 100.0s		0.0s	★
P6-07	Acceleration/Deceleration mode	0: Linear acceleration/deceleration	1-2: S-curve dynamic acceleration/deceleration	0	★
P6-08	Time proportion of S-curve start segment	0.0% to (100.0% - F6-09)		30.0%	★

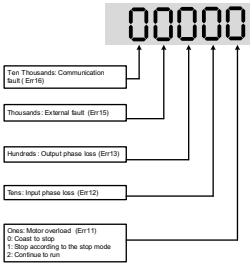
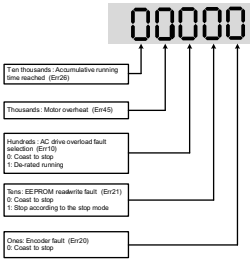
No.	Param. Name	Setting Range		Default	Change
P6-09	Time proportion of S-curve end segment	0.0% to (100.0% - F6-08)		30.0%	★
P6-10	Stop mode	0: Decelerate to stop	1: Coast to stop	0	☆
P6-11	DC injection braking start frequency	0.00 Hz to the maximum frequency		0.00 Hz	☆
P6-12	DC injection braking delay time	0.0s to 100.0s		0.0s	☆
P6-13	DC injection braking level	0% to 100%		50%	☆
P6-14	DC injection braking active time	0.0s to 100.0s		0.0s	☆
P6-15	Braking use ratio	0% to 100%		100%	☆
P6-18	Catching a spinning motor current limit	30% to 200%		Model dependent	★
P6-21	Demagnetization time (effective for SVC)	0.00s to 5.00s		Model dependent	☆
P6-23	Overexcitation selection	0: Disabled 1: Enabled during deceleration	2: Enabled in the whole process	0	☆
P6-24	Overexcitation suppression current level	0 to 150%		100%	☆
P6-25	Overexcitation gain	1.00 to 2.50		1.25	☆
		Group P7: Operating Panel and Display			
P7-00	LED default display check	0 to 1		0	☆
P7-01	MF.K key function selection	0: MF.K key disabled 1: Switchover from remote control (terminal or communication) to operating panel control	2: Switchover between forward rotation and reverse rotation 3: Forward jog 4: Reverse jog	0	★
P7-02	STOP/RESET key function	0: STOP/RESET key enabled only in operating panel control 1: STOP/RESET key enabled in any operation mode		1	☆
P7-03	LED display running parameters 1	0000 to FFFF 		1F	☆

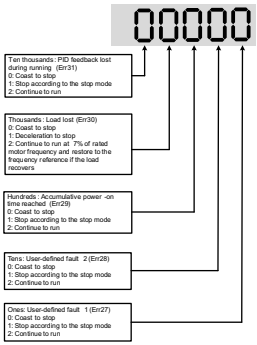
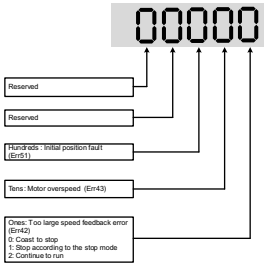
No.	Param. Name	Setting Range	Default	Change
P7-04	LED display running parameters 2	0000 to FFFF 	0	☆
P7-05	Display stop parameters	0000 to FFFF 	33	☆
P7-06	Load speed display coe翻 cient	0.0001 to 6.5000	1.0000	☆
P7-07	Heatsink temperature of IGBT	-20°C to 120°C	-	•
P7-08	Product number	-	-	•
P7-09	Accumulative running time	0h to 65535h	-	•
P7-10	Performance software version	-	-	•
P7-11	Function software version	-	-	•
P7-12	Number of decimal places for load speed display		21	☆
P7-13	Accumulative power-on time	0 to 65535h	-	•

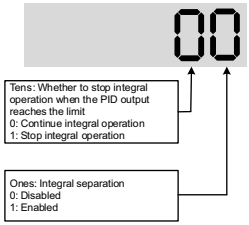
No.	Param. Name	Setting Range		Default	Change
P7-14	Accumulative power consumption	0 to 65535 kWh		-	•
Group P8: Auxiliary Functions					
P8-00	Jog frequency reference	0.00 Hz to the maximum frequency		2.00 Hz	☆
P8-01	Jog acceleration time	0.0s to 6500.0s		20.0s	☆
P8-02	Jog deceleration time	0.0s to 6500.0s		20.0s	☆
P8-03	Acceleration time 2	0.0s to 6500.0s		Model dependent	☆
P8-04	Deceleration time 2	0.0s to 6500.0s		Model dependent	☆
P8-05	Acceleration time 3	0.0s to 6500.0s		Model dependent	☆
P8-06	Deceleration time 3	0.0s to 6500.0s		Model dependent	☆
P8-07	Acceleration time 4	0.0s to 6500.0s		0.0s	☆
P8-08	Deceleration time 4	0.0s to 6500.0s		0.0s	☆
P8-09	Frequency jump 1	0.00 Hz to the maximum frequency		0.00 Hz	☆
P8-10	Frequency jump 2	0.00 Hz to the maximum frequency		0.00 Hz	☆
P8-11	Frequency jump band	0.00 Hz to the maximum frequency		0.00 Hz	☆
P8-12	Forward/Reverse run switchover dead-zone time	0.0s to 3000.0s		0.0s	☆
P8-13	Reverse RUN selection	0: Disabled	1: Enabled	0	☆
P8-14	Running mode when frequency reference lower than frequency lower limit	0: Run at frequency reference lower limit	1: Stop 2: Run at zero speed	0	☆
P8-15	Droop rate	0.00% to 100.00%		0.00%	☆
P8-16	Accumulative power-on time threshold	0 to 65000h		0h	☆
P8-17	Accumulative running time threshold	0 to 65000h		0h	☆
P8-18	Startup protection selection	0: Disabled	1: Enabled	0	☆
P8-19	Frequency detection value 1	0.00 Hz to the maximum frequency		50.00 Hz	☆
P8-20	Frequency detection hysteresis 1	0.0% to 100.0% (FDT1 level)		5.0%	☆
P8-21	Detection width of target frequency reached	0.0% to 100.0% (maximum frequency)		0.0%	☆
P8-22	Jump frequency function	0: Disabled	1: Enabled	0	☆
P8-25	Switchover frequency of acceleration time 1 and acceleration time 2	0.00 Hz to the maximum frequency		0.00 Hz	☆
P8-26	Switchover frequency of deceleration time 1 and deceleration time 2	0.00 Hz to the maximum frequency		0.00 Hz	☆
P8-27	Set highest priority to terminal JOG function	0: Disabled	1: Enabled	0	☆
P8-28	Frequency detection value 2	0.00 Hz to the maximum frequency		50.00 Hz	☆
P8-29	Frequency detection hysteresis 2	0.0% to 100.0% (FDT2 level)		5.0%	☆
P8-30	Detection of frequency 1	0.00 Hz to the maximum frequency		50.00 Hz	☆
P8-31	Detection width of frequency 1	0.0% to 100.0% (maximum frequency)		0.0%	☆
P8-32	Detection of frequency 2	0.00 Hz to the maximum frequency		50.00 Hz	☆
P8-33	Detection width of frequency 2	0.0% to 100.0% (maximum frequency)		0.0%	☆

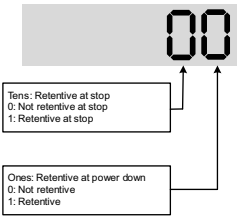
No.	Param. Name	Setting Range		Default	Change
P8-34	Zero current detection level	0.0% to 300.0% 100.0% corresponds to the rated motor current.		5.0%	☆
P8-35	Zero current detection delay	0.01s to 600.00s		0.10s	☆
P8-36	Output overcurrent threshold	0.0% (no detection)	0.1% to 300.0% (rated motor current)	200.0%	☆
P8-37	Output overcurrent detection delay	0.00s to 600.00s		0.00s	☆
P8-38	Detection level of current 1	0.0% to 300.0% (rated motor current)		100.0%	☆
P8-39	Detection width of current 1	0.0% to 300.0% (rated motor current)		0.0%	☆
P8-40	Detection level of current 2	0.0% to 300.0% (rated motor current)		100.0%	☆
P8-41	Detection width of current 2	0.0% to 300.0% (rated motor current)		0.0%	☆
P8-42	Timing function	0: Disabled	1: Enabled	0	★
P8-43	Running time setting channel	0: Set by F8-44 (Running time) 1: AI1 2: AI2	3: AI3 (100% of analog input corresponds to the value of F8-44)	0	★
P8-44	Running time	0.0 min to 6500.0 min		0.0 min	★
P8-45	AI1 input voltage lower limit	0.00 V to F8-46 (AI1 input voltage upper limit)		3.10 V	☆
P8-46	AI1 input voltage upper limit	0.00 V to F8-46 (AI1 input voltage upper limit)		6.80 V	☆
P8-47	IGBT temperature threshold	0°C to 100°C		75°C	☆
P8-48	Cooling fan working mode	0: Working during running	1: Working continuously	0	☆
P8-49	Wakeup frequency	F8-51 (Hibernating frequency) to F0-10 (Max. frequency)		0.00 Hz	☆
P8-50	Wakeup delay time	0.0s to 6500.0s		0.0s	☆
P8-51	Hibernating frequency	0.00 Hz to F8-49 (Wakeup frequency)		0.00 Hz	☆
P8-52	Hibernating delay time	0.0s to 6500.0s		0.0s	☆
P8-53	Running time threshold this time	0.0 to 6500.0 min		0.0 min	☆
P8-54	Output power correction coe翻 cient	0.00% to 200.0%		100.0%	☆
Group P9: Fault and Protection					
P9-00	Motor overload protection	0: Disabled	1: Enabled	1	☆
P9-01	Motor overload protection gain	0.20 to 10.00		1.00	☆
P9-02	Motor overload pre-warning coe翻 cient	50% to 100%		80%	☆
P9-03	Overvoltage protection gain	0 to 100		30	☆
P9-04	Overvoltage protection voltage	650 V to 800 V		770 V	☆
P9-07	Detection of short-circuit to ground			01	☆
P9-08	Braking unit applied voltage	Three phase 380 to 480 V models: 330.0 to 800.0 V Three phase 200 to 240 V mode 800.0 V		760 V	★
P9-09	Auto reset times	0 to 20		0	☆

No.	Param. Name	Setting Range	Default	Change
P9-10	Selection of DO action during auto reset	0: Not act 1: Act	0	☆
P9-11	Delay of auto reset	0.1s to 100.0s	1.0s	☆
P9-12	Input phase loss/Contactor protection		11	☆
P9-13	Output phase loss protection		01	☆
P9-14	1st fault type	0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Pre-charge power fault 9: Undervoltage 10: AC drive overload 11: Motor overload 12: Input phase loss 13: Output phase loss 14: IGBT overheat 15: External fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder/PG card fault 21: Parameter read and write fault 22: AC drive hardware fault 23: Motor short circuited to ground 24: Reserved 25: Reserved 26: Accumulative running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Accumulative power-on time reached 30: Load lost 31: PID feedback lost during running 40: Fast current limit timeout 41: Motor switchover error during running 42: Too large speed deviation 43: Motor over-speed 45: Motor overheat 51: Initial position error 55: Slave error in master-slave control	-	●
P9-15	2nd fault type		-	●
P9-16	3rd (latest) fault type		-	●
P9-17	Frequency upon 3rd (latest) fault	0.00 Hz to 655.35 Hz	0.00 Hz	●
P9-18	Current upon 3rd (latest) fault	0.00 A to 655.35 A	0.00 A	●
P9-19	Bus voltage upon 3rd (latest) fault	0.0 V to 6553.5 V	0.0 V	●
P9-20	DI state upon 3rd (latest) fault	0 to 9999	0	●
P9-21	DO state upon 3rd (latest) fault	0 to 9999	0	●
P9-22	AC drive state upon 3rd (latest) fault	0 to 65535	0	●
P9-23	Power-on time upon 3rd (latest) fault	0s to 65535s	0s	●
P9-24	Running time upon 3rd (latest) fault	0.0s to 6553.5s	0.0s	●
P9-27	Frequency upon 2nd fault	0.00 Hz to 655.35 Hz	0.00 Hz	●
P9-28	Current upon 2nd fault	0.00 A to 655.35 A	0.00 A	●

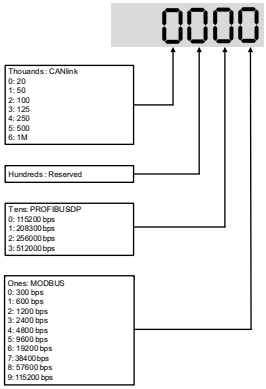
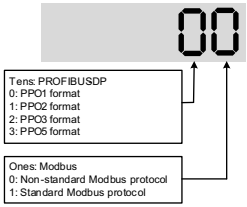
No.	Param. Name	Setting Range	Default	Change
P9-29	Bus voltage upon 2nd fault	0.0 V to 6553.5 V	0.0 V	●
P9-30	DI state upon 2nd fault	0 to 9999	0	●
P9-31	DO state upon 2nd fault	0 to 9999	0	●
P9-32	AC drive state upon 2nd fault	0 to 65535	0	●
P9-33	Power-on time upon 2nd fault	0s to 65535s	0s	●
P9-34	Running time upon 2nd fault	0.0s to 6553.5s	0.0s	●
P9-37	Frequency upon 1st fault	0.00 Hz to 655.35 Hz	0.00 Hz	●
P9-38	Current upon 1st fault	0.00 A to 655.35 A	0.00 A	●
P9-39	Bus voltage upon 1st fault	0.0 V to 6553.5 V	0.0 V	●
P9-40	DI state upon 1st fault	0 to 9999	0	●
P9-41	DO state upon 1st fault	0 to 9999	0	●
P9-42	AC drive state upon 1st fault	0 to 65535	0	●
P9-43	Power-on time upon 1st fault	0s to 65535s	0s	●
P9-44	Running time upon 1st fault	0.0s to 6553.5s	0.0s	●
P9-47	Fault protection action selection 1		00000	☆
P9-48	Fault protection action selection 2		00000	☆

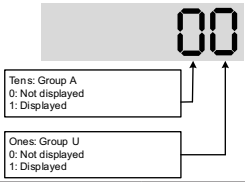
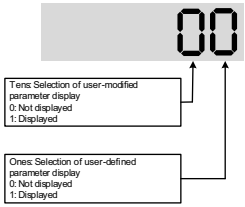
No.	Param. Name	Setting Range		Default	Change
P9-49	Fault protection action selection 3			00000	☆
P9-50	Fault protection action selection 4			00000	☆
P9-54	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Frequency reference 2: Frequency upper limit	3: Frequency lower limit 4: Backup frequency upon abnormality	0	☆
P9-55	Backup frequency upon fault	0.0% to 100.0% (100.0% corresponds to F0-10.)		100.0%	☆
P9-56	Type of motor temperature sensor	0: No temperature sensor	1: PT100 2: PT1000	0	☆
P9-57	Motor overheat protection threshold	0°C to 200°C		110°C	☆
P9-58	Motor overheat pre-warning threshold	0°C to 200°C		90°C	☆
P9-59	Power dip ride-through function selection	0: Disabled 1: Bus voltage constant control	2: Decelerate to stop	0	★
P9-60	Threshold of power dip ride-through function disabled	80% to 100%		85%	★
P9-61	Judging time of bus voltage recovering from power dip	0.0 to 100.0s		0.5S	★
P9-62	Threshold of power dip ride-through function enabled	60% to 100%		80%	★
P9-63	Load lost protection	0: Disabled	1: Enabled	0	☆
P9-64	Load lost detection level	0.0 to 100.0%		10.0%	☆
P9-65	Load lost detection time	0.0 to 60.0s		1.0s	☆
P9-67	Overspeed detection level	0.0% to 50.0% (maximum frequency)		20.0%	☆
P9-68	Overspeed detection time	0.0s: Not detected	0.1 to 60.0s	1.0s	☆
P9-69	Detection level of speed error	0.0% to 50.0% (maximum frequency)		20.0%	☆
P9-70	Detection time of speed error	0.0s: Not detected	0.1 to 60.0s	5.0s	☆

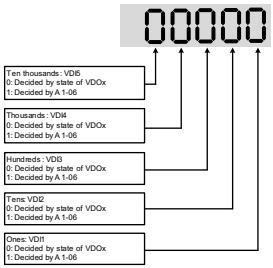
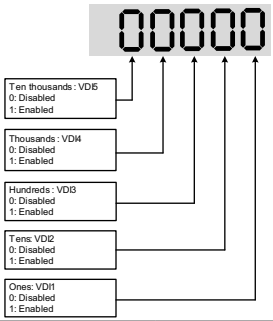
No.	Param. Name	Setting Range		Default	Change
P9-71	Power dip ride-through gain Kp	0 to 100		40	☆
P9-72	Power dip ride-through integral coe翻 cient Ki	0 to 100		30	☆
P9-73	Deceleration time of power dip ride-through	0 to 300.0s		20.0s	★
Group PA: PID Function					
PA-00	PID reference setting channel	0: Set by FA-01 (PID digital setting) 1: AI1 2: AI2	3: AI3 4: Pulse reference (DI5) 5: Communication reference 6: Multi-reference	0	☆
PA-01	PID digital setting	0.0% to 100.0%		50.0%	☆
PA-02	PID feedback setting channel	0: AI1 1: AI2 2: AI3 3: AI1-AI2 4: Pulse reference (DI5)	5: Communication reference 6: AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	0	☆
PA-03	PID operation direction	0: Forward	1: Reverse	0	☆
PA-04	PID reference and feedback range	0 to 65535		1000	☆
PA-05	Proportional gain Kp1	0.0 to 1000.0		20.0	☆
PA-06	Integral time Ti1	0.01s to 10.00s		2.00s	☆
PA-07	Differential time Td1	0.000s to 10.000s		0.000s	☆
PA-08	PID output limit in reverse direction	0.00 Hz to the maximum frequency		0.00 Hz	★
PA-09	PID error limit	0.0% to 100.0%		0.0%	☆
PA-10	PID differential limit	0.00% to 100.00%		0.10%	☆
PA-11	PID reference change time	0.00 to 650.00s		0.00s	☆
PA-12	PID feedback filter time	0.00 to 60.00s		0.00s	☆
PA-13	PID output filter time	0.00 to 60.00s		0.00s	☆
PA-14	Reserved	-		-	☆
PA-15	Proportional gain Kp2	0.0 to 1000.0		20.0	☆
PA-16	Integral time Ti2	0.01s to 10.00s		2.00s	☆
PA-17	Differential time Td2	0.000s to 10.000s		0.000s	☆
PA-18	PID parameter switchover condition	0: No switchover 1: Switchover using DI 2: Auto switchover based on PID error	3: Auto switchover based on running frequency	0	☆
PA-19	PID error 1 for auto switchover	0.0% to FA-20 (PID error 2 for auto switchover)		20.0%	☆
PA-20	PID error 2 for auto switchover	FA-19 (PID error 1 for auto switchover) to 100.0%		80.0%	☆
PA-21	PID initial value	0.0% to 100.0%		0.0%	☆
PA-22	PID initial value active time	0.00 to 650.00s		0.00s	☆
PA-23	Reserved	-		-	-
PA-24	Reserved	-		-	-
PA-25	PID integral property			00	☆
PA-26	Detection level of PID feedback loss	0.0%: No detection	to 100.0%	0.0%	☆

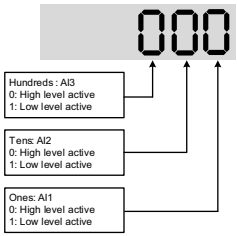
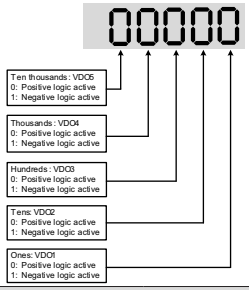
No.	Param. Name	Setting Range		Default	Change
PA-27	Detection time of PID feedback loss	0.0s to 20.0s		0.0s	☆
PA-28	Selection of PID operation at stop	0: Disabled	1: Enabled	0	☆
		Group PB: Fixed Length and Count			
PB-05	Set length	0 m to 65535 m		1000 m	☆
PB-06	Actual length	0 m to 65535 m		0 m	☆
PB-07	Number of pulses per meter	0.1 to 6553.5		100.0	☆
PB-08	Set count value	1 to 65535		1000	☆
PB-09	Designated count value	1 to 65535		1000	☆
		Group PC: Multi-Reference and Simple PLC Function			
PC-00	Reference 0	-100.0% to 100.0%		0.0%	☆
PC-01	Reference 1	-100.0% to 100.0%		0.0%	☆
PC-02	Reference 2	-100.0% to 100.0%		0.0%	☆
PC-03	Reference 3	-100.0% to 100.0%		0.0%	☆
PC-04	Reference 4	-100.0% to 100.0%		0.0%	☆
PC-05	Reference 5	-100.0% to 100.0%		0.0%	☆
PC-06	Reference 6	-100.0% to 100.0%		0.0%	☆
PC-07	Reference 7	-100.0% to 100.0%		0.0%	☆
PC-08	Reference 8	-100.0% to 100.0%		0.0%	☆
PC-09	Reference 9	-100.0% to 100.0%		0.0%	☆
PC-10	Reference 10	-100.0% to 100.0%		0.0%	☆
PC-11	Reference 11	-100.0% to 100.0%		0.0%	☆
PC-12	Reference 12	-100.0% to 100.0%		0.0%	☆
PC-13	Reference 13	-100.0% to 100.0%		0.0%	☆
PC-14	Reference 14	-100.0% to 100.0%		0.0%	☆
PC-15	Reference 15	-100.0% to 100.0%		0.0%	☆
PC-16	Simple PLC running mode	0: Stop after running one cycle 1: Keep final values after running one cycle	2: Repeat after running one cycle	0	☆
PC-17	Simple PLC retentive selection			00	☆
PC-18	Running time of simple PLC reference 0	0.0s (h) to 6553.5s (h)		0.0s (h)	☆
PC-19	Acceleration/Deceleration time of simple PLC reference 0	0 to 3		0	☆
PC-20	Running time of simple PLC reference 1	0.0s (h) to 6553.5s (h)		0.0s (h)	☆
PC-21	Acceleration/ D eceleration time of simple PLC reference 1	0 to 3		0	☆
PC-22	Running time of simple PLC reference 2	0.0s (h) to 6553.5s (h)		0.0s (h)	☆
PC-23	Acceleration/Deceleration time of simple PLC reference 2	0 to 3		0	☆
PC-24	Running time of simple PLC reference 3	0.0s (h) to 6553.5s (h)		0.0s (h)	☆

No.	Param. Name	Setting Range	Default	Change
PC-25	Acceleration/Deceleration time of simple PLC reference 3	0 to 3	0	☆
PC-26	Running time of simple PLC reference 4	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-27	Acceleration/Deceleration time of simple PLC reference 4	0 to 3	0	☆
PC-28	Running time of simple PLC reference 5	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-29	Acceleration/Deceleration time of simple PLC reference 5	0 to 3	0	☆
PC-30	Running time of simple PLC reference 6	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-31	Acceleration/Deceleration time of simple PLC reference 6	0 to 3	0	☆
PC-32	Running time of simple PLC reference 7	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-33	Acceleration/Deceleration time of simple PLC reference 7	0 to 3	0	☆
PC-34	Running time of simple PLC reference 8	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-35	Acceleration/Deceleration time of simple PLC reference 8	0 to 3	0	☆
PC-36	Running time of simple PLC reference 9	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-37	Acceleration/Deceleration time of simple PLC reference 9	0 to 3	0	☆
PC-38	Running time of simple PLC reference 10	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-39	Acceleration/Deceleration time of simple PLC reference 10	0 to 3	0	☆
PC-40	Running time of simple PLC reference 11	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-41	Acceleration/Deceleration time of simple PLC reference 11	0 to 3	0	☆
PC-42	Running time of simple PLC reference 12	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-43	Acceleration/Deceleration time of simple PLC reference 12	0 to 3	0	☆
PC-44	Running time of simple PLC reference 13	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-45	Acceleration/Deceleration time of simple PLC reference 13	0 to 3	0	☆
PC-46	Running time of simple PLC reference 14	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-47	Acceleration/Deceleration time of simple PLC reference 14	0 to 3	0	☆

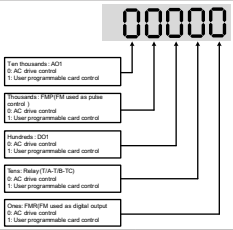
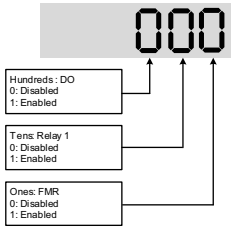
No.	Param. Name	Setting Range		Default	Change
PC-48	Running time of simple PLC reference 15	0.0s (h) to 6553.5s (h)		0.0s (h)	☆
PC-49	Acceleration/Deceleration time of simple PLC reference 15	0 to 3		0	☆
PC-50	Time unit of simple PLC running	0: s	1: h	0	☆
PC-51	Reference 0 source	0: Set by FC-00 (Reference 0) 1: AI1 2: AI2 3: AI3 4: Pulse reference	5: PID 6: Set by preset frequency (F0-08), modified using terminal UP/DOWN	0	☆
Group PD: Communication					
PD-00	Baud rate			5005	☆
PD-01	Modbus data format symbol	0: No check (8,N,2) 1: Even parity check (8,E,1) 2: Odd parity check (8,O,1)	3: No check, data format (8,N,1) (Valid for Modbus)	0	☆
PD-02	Local address	0: Broadcast address; 1 to 247 (Valid for Modbus, PROFIBUS-DP, and CANlink)		1	☆
PD-03	Modbus response delay	0 to 20 ms (Valid for Modbus)		2	☆
PD-04	Serial port communication timeout	0.0: Disabled 0.1 to 60.0s (Valid for Modbus, PROFIBUS-DP, and CANopen)		0.0	☆
PD-05	Modbus protocol selection and PROFIBUS-DP data frame			30	☆
PD-06	Current resolution read by communication	0: 0.01 A (valid when ≤ 55 kW)	1: 0.1 A	0	☆
PD-08	PROFIBUS and CANopen communication timeout time	0.0 (Invalid) 0.1 to 60.0s		0	☆

No.	Param. Name	Setting Range	Default	Change
		Group PE: User-Defined Parameters		
PE-00	User-defined parameter 0	F0-00 to FP-xx A0-00 to Ax-xx U0-00 to U0-xx U3-00 to U3-xx	U3-17	☆
PE-01	User-defined parameter 1		U3-18	☆
PE-02	User-defined parameter 2		F0.00	☆
PE-03	User-defined parameter 3		F0.00	☆
PE-04	User-defined parameter 4		F0.00	☆
PE-05	User-defined parameter 5		F0.00	☆
PE-06	User-defined parameter 6		F0.00	☆
PE-07	User-defined parameter 7		F0.00	☆
PE-08	User-defined parameter 8		F0.00	☆
PE-09	User-defined parameter 9		F0.00	☆
PE-10	User-defined parameter 10		F0.00	☆
PE-11	User-defined parameter 11		F0.00	☆
PE-12	User-defined parameter 12		F0.00	☆
PE-13	User-defined parameter 13		F0.00	☆
PE-14	User-defined parameter 14		F0.00	☆
PE-15	User-defined parameter 15		F0.00	☆
PE-16	User-defined parameter 16		F0.00	☆
PE-17	User-defined parameter 17		F0.00	☆
PE-18	User-defined parameter 18		F0.00	☆
PE-19	User-defined parameter 19		F0.00	☆
PE-20	User-defined parameter 20		U0-68	☆
PE-21	User-defined parameter 21		U0-69	☆
PE-22	User-defined parameter 22		F0.00	☆
PE-23	User-defined parameter 23		F0.00	☆
PE-24	User-defined parameter 24		F0.00	☆
PE-25	User-defined parameter 25		F0.00	☆
PE-26	User-defined parameter 26		F0.00	☆
PE-27	User-defined parameter 27		F0.00	☆
PE-28	User-defined parameter 28		F0.00	☆
PE-29	User-defined parameter 29		F0.00	☆
		Group PP: Parameter Management		
PP-00	User password	0 to 65535	0	☆
PP-01	Parameter initialization	0: No operation 01: Restore factory parameters except motor parameters 02: Clear records 04: Back up current user parameters 501: Restore user backup parameters	0	★
PP-02	Parameter display property		11	★
PP-03	Selection of individualized parameter display		00	☆
PP-04	Selection of parameter modification	0: Disabled bled	0	☆

No.	Param. Name	Setting Range		Default	Change
Group A0: Torque Control and Limit					
A0-00	Speed/Torque control selection	0: Speed control	1: Torque control	0	★
A0-01	Torque reference source in torque control	0: Set by A0-03 (Torque digital setting in torque control) 1: AI1 2: AI2 3: AI3 4: Pulse reference	5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) The full scale of 1-7 corresponds to A0-03.	0	★
A0-03	Torque digital setting in torque control	-200.0% to 200.0%		150.0%	☆
A0-05	Forward max. frequency in torque control	0.00 Hz to the maximum frequency		50.00 Hz	☆
A0-06	Reverse max. frequency in torque control	0.00 Hz to the maximum frequency		50.00 Hz	☆
A0-07	Acceleration time in torque control	0.00s to 650.00s		0.00s	☆
A0-08	Deceleration time in torque control	0.00s to 650.00s		0.00s	☆
Group A1: Virtual DI/DO					
A1-00	VDI1 function selection	0 to 59		0	★
A1-01	VDI2 function selection	0 to 59		0	★
A1-02	VDI3 function selection	0 to 59		0	★
A1-03	VDI4 function selection	0 to 59		0	★
A1-04	VDI5 function selection	0 to 59		0	★
A1-05	VDI active state setting mode			00000	★
A1-06	Selection of VDI active state			00000	★
A1-07	Function selection for AI1 used as DI	0 to 59		0	★
A1-08	Function selection for AI2 used as DI	0 to 59		0	★
A1-09	Function selection for AI3 used as DI	0 to 59		0	★

No.	Param. Name	Setting Range		Default	Change
A1-10	Active state selection for AI used as DI			000	★
A1-11	VDO1 function selection	0: Short with physical DIx internally	1 to 41: See physical DO selection in group F5	0	☆
A1-12	VDO2 function selection	0: Short with physical DIx internally	1 to 41: See physical DO selection in group F5	0	☆
A1-13	VDO3 function selection	0: Short with physical DIx internally	1 to 41: See physical DO selection in group F5	0	☆
A1-14	VDO4 function selection	0: Short with physical DIx internally	1 to 41: See physical DO selection in group F5	0	☆
A1-15	VDO5 function selection	0: Short with physical DIx internally	1 to 41: See physical DO selection in group F5	0	☆
A1-16	VDO1 output delay	0.0s to 3600.0s		0.0s	☆
A1-17	VDO2 output delay	0.0s to 3600.0s		0.0s	☆
A1-18	VDO3 output delay	0.0s to 3600.0s		0.0s	☆
A1-19	VDO4 output delay	0.0s to 3600.0s		0.0s	☆
A1-20	VDO5 output delay	0.0s to 3600.0s		0.0s	☆
A1-21	VDO active mode selection			00000	☆
Group A5: Control Optimization					
A5-00	DPWM switchover frequency upper limit	5.00 Hz to the maximum frequency		8.00 Hz	☆
A5-01	PWM modulation pattern	0: Asynchronous modulation	1: Synchronous modulation	0	☆
A5-02	Dead zone compensation mode selection	0: Disabled	1: Enabled (compensation mode 1)	1	☆
A5-03	Random PWM depth	0: Random PWM invalid	1 to 10: Random PWM	0	☆
A5-04	Overcurrent fast prevention	0: Disabled	1: Enabled	1	☆
A5-05	Voltage over modulation coe翻 cient	100% to 110%		105%	★
A5-06	Undervoltage threshold	Three phase 380 to 480 V models: 140.0 to 380.0 V Three phase 200 to 240 V models: 140.0 to 380.0 V		350 V	☆
A5-08	Low speed frequency	0.0 to 8.0 kHz		0.0	☆
A5-09	Overvoltage threshold	Three phase 380 to 480 V models: 200.0 to 820.0 V Three phase 200 to 240 V models: 200.0 to 400.0 V		Model dependent	★
A5-11	DC injection braking threshold at low speed	0.00 to 5.00 Hz		0.30 Hz	☆

Group A6: AI Curve Setting				
A6-00	AI curve 4 min. input	-10.00 V to A6-02 (AI curve 4 inflection 1 input)	0.00 V	☆
A6-01	Corresponding percentage of AI curve 4 min. input	-100.0% to +100.0%	0.0%	☆
A6-02	AI curve 4 inflection 1 input	A6-00 (AI curve 4 min. input) to A6-04 (AI curve 4 inflection 2 input)	3.00 V	☆
A6-03	Corresponding percentage of AI curve 4 inflection 1 input	-100.0% to +100.0%	30.0%	☆
A6-04	AI curve 4 inflection 2 input	A6-02 (AI curve 4 inflection 1 input) to A6-06 (AI curve 4 max. input)	6.00 V	☆
A6-05	Corresponding percentage of AI curve 4 inflection 2 input	-100.0% to +100.0%	60.0%	☆
A6-06	AI curve 4 max. input	A6-04 (AI curve 4 inflection 2 input) to +10.00 V	10.00 V	☆
A6-07	Corresponding percentage of AI curve 4 max. input	-100.0% to +100.0%	100.0%	☆
A6-08	AI curve 5 min. input	-10.00 V to A6-10 (AI curve 5 inflection 1 input)	-10.00 V	☆
A6-09	Corresponding percentage of AI curve 5 min. input	-100.0% to +100.0%	-100.0%	☆
A6-10	AI curve 5 inflection 1 input	A6-08 (AI curve 5 min. input) to A6-12 (AI curve 5 inflection 2 input)	-3.00 V	☆
A6-11	Corresponding percentage of AI curve 5 inflection 1 input	-100.0% to +100.0%	-30.0%	☆
A6-12	AI curve 5 inflection 2 input	A6-10 (AI curve 5 inflection 1 input) to A6-14 (AI curve 5 max. input)	3.00 V	☆
No.	Param. Name	Setting Range	Default	Change
A6-13	Corresponding percentage of AI curve 5 inflection 2 input	-100.0% to +100.0%	30.0%	☆
A6-14	AI curve 5 max. input	A6-12 (AI curve 5 inflection 2 input) to +10.00 V	10.00 V	☆
A6-15	Corresponding percentage of AI curve 5 max. input	-100.0% to +100.0%	100.0%	☆
A6-24	Jump point of AI1 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-25	Jump amplitude of AI1 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-26	Jump point of AI2 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-27	Jump amplitude of AI2 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-28	Jump point of AI3 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-29	Jump amplitude of AI3 input corresponding setting	0.0% to 100.0%	0.5%	☆

Group A7: User Programmable Card					
A7-00	User programmable function selection	0: Disabled	1: Enabled	0	★
A7-01	Control board output terminal control mode selection			0	★
A7-02	Programmable card AI/AO function selection	0: AI3 (voltage input), AO2 (voltage output) 1: AI3 (voltage input), AO2 (current output) 2: AI3 (current input), AO2 (voltage output) 3: AI3 (current input), AO2 (current output)	4: AI3 (PTC input), AO2 (voltage output) 5: AI3 (PTC input), AO2 (current output) 6: AI3 (PT100 input), AO2 (voltage output) 7: AI3 (PT100 input), AO2 (current output)	0	★
A7-03	FMP output	0.0% to 100.0%		0.0%	☆
A7-04	AO1 output	0.0% to 100.0%		0.0%	☆
A7-05	Selection of PLC program controlling digital output			000	☆
A7-06	Setting frequency reference using the user programmable card	-100.00% to 100.00%		0.0%	☆
No.	Param. Name	Setting Range		Default	Change
A7-07	Setting torque reference using the user programmable card	-200.0% to 200.0%		0.0%	☆
A7-08	Setting running command using the user programmable card	0: No command 1: Forward run 2: Reverse run 3: Forward jog	4: Reverse jog 5: Coast to stop 6: Decelerate to stop 7: Fault reset	0	☆
A7-09	Setting torque reference with the user programmable card	0: No fault	80 to 89: User-defined fault code	0	☆

Group AC: AI/AO Correction				
AC-00	AI1 measured voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-01	AI1 displayed voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-02	AI1 measured voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-03	AI1 displayed voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-04	AI2 measured voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-05	AI2 displayed voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-06	AI2 measured voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-07	AI2 displayed voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-08	AI3 measured voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-09	AI3 displayed voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆

No.	Param. Name	Setting Range	Default	Change
AC-10	AI3 measured voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-11	AI3 displayed voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-12	AO1 target voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-13	AO1 measured voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-14	AO1 target voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-15	AO1 measured voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-16	AO2 target voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-17	AO2 measured voltage 1	-10.00 V to +10.000 V	Factory-corrected	☆
AC-18	AO2 target voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆
AC-19	AO2 measured voltage 2	-10.00 V to +10.000 V	Factory-corrected	☆

A.2 Monitoring Parameters

No.	Param. Name	Minimum Unit	Communication Address
Group U0: Monitoring Parameters			
U0-00	Running frequency	0.01 Hz	7000H
U0-01	Frequency reference	0.01 Hz	7001H
U0-02	Bus voltage	0.1 V	7002H
U0-03	Output voltage	1 V	7003H
U0-04	Output current	0.01 A	7004H
U0-05	Output power	0.1 kW	7005H
U0-06	Output torque	0.1%	7006H
U0-07	DI state	1	7007H
U0-08	DO state	1	7008H
U0-09	AI1 voltage	0.01 V	7009H
U0-10	AI2 voltage (V)/current (mA)	0.01 V/0.01 mA	700AH
U0-11	AI3 voltage	0.01 V	700BH
U0-12	Count value	1	700CH
U0-13	Length value	1	700DH
U0-14	Load speed	1 rpm/min	700EH
U0-15	PID reference	1	700FH
U0-16	PID feedback	1	7010H
U0-17	PLC stage	1	7011H
U0-18	Pulse reference	0.01 kHz	7012H
U0-19	Feedback speed	0.01 Hz	7013H
U0-20	Remaining running time	0.1 min	7014H
U0-21	AI1 voltage before correction	0.001 V	7015H
U0-22	AI2 voltage (V)/current (mA) before correction	0.001 V/0.01 mA	7016H
U0-23	AI3 voltage before correction	0.001 V	7017H
U0-24	Motor speed	1 rpm/min	7018H
U0-25	Current power-on time	1 min	7019H
U0-26	Current running time	0.1 min	701 AH
U0-27	Pulse reference	1 Hz	701BH
U0-28	Communication reference	0.01%	701CH
U0-29	Encoder feedback speed	0.01 Hz	701DH
U0-30	Main frequency reference	0.01 Hz	701EH
U0-31	Auxiliary frequency reference	0.01 Hz	701FH
U0-32	Viewing any register address value	1	7020H
U0-34	Motor temperature	1°C	7022H
U0-35	Target torque	0.1%	7023H
U0-36	Resolver position	1	7024H
U0-37	Power factor angle	0.1°	7025H
U0-38	ABZ position	1	7026H
U0-39	Target voltage upon V/F separation	1 V	7027H
U0-40	Output voltage upon V/F separation	1 V	7028H

No.	Param. Name	Minimum Unit	Communication Address
U0-41	DI state display	1	7029H
U0-42	DO state display	1	702AH
U0-43	DI set for function state display 1 (function 01-40)	1	702BH
U0-44	DI set for function state display 2 (function 41-80)	1	702CH
U0-45	Fault information	1	702DH
U0-58	Phase Z counting	1	703AH
U0-59	Rated frequency	0.01%	703BH
U0-60	Running frequency	0.01%	703CH
U0-61	AC drive state	1	703DH
U0-62	Current fault code	1	703EH
U0-63	Sending torque value of point-to-point communication	0.01%	703FH
U0-64	Number of slaves	1	7040H
U0-65	Torque upper limit	0.1%	7041H
U0-66	Communication extension card type	100: CANOpen 200: PROFIBUS-DP 300: CANlink	7042H
U0-67	Communication extension card version	Display range	-
U0-68	AC drive state on DP card	Bit0: AC drive running status Bit1: Running direction Bit2: Whether the AC drive has a fault Bit3: Target frequency reached Bit4 to Bit7: Reserved Bit8 to Bit15: Fault code	7043H
U0-69	Speed of transmitting DP/0.01 Hz	0.00 Hz to the maximum frequency	7044H
U0-70	Motor speed of transmitting DP/ RMP	0 to rated motor speed	7045H
U0-71	Communication card current display	Display range	-
U0-72	Communication card faulty state	Display range	-
U0-73	Motor SN	0: Motor 1 1: Motor 2	7046H
U0-74	AC drive output torque	0.1%	7047H
U0-76	Low bits of accumulative power consumption	0.1°	704CH
U0-77	High bits of accumulative power consumption	1°	704DH
U0-78	Linear speed	1 m/min	704EH

Warranty Agreement

1) Ikon provides an 18-month free warranty to the equipment itself from the date of manufacturing for the failure or damage under normal use conditions.
2) Within the warranty period, maintenance will be charged for the damage caused by the following reasons:
   a. Improper use or repair/modification without prior permission
   b. Fire, flood, abnormal voltage, natural disasters and secondary disasters
   c. Hardware damage caused by dropping or transportation after procurement
   d. Operations not following the user instructions
   e. Damage out of the equipment (for example, external device factors)
3) The maintenance fee is charged according to the latest Maintenance Price List of Inovance.
4) If there is any problem during the service, contact Inovance's agent or Inovance directly.
5) Ikon reserves the rights for explanation of this agreement.

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