User Manual

OXIN DRIVE - ABO-OD500

Main Circuit Terminals and Wiring

WARNING

- Only qualified personnel familiar with AC motor drives are allowed to implement wiring. Failure to comply may result in equipment damage and/or personnel injury even death.
- Wiring should be in strict accordance with this manual, otherwise hazard of electric shock or equipment damage exists.
- Make sure input power supply has been completely disconnected before wiring operation. Failure to comply will result in personnel injury even death.
- All wiring operations and lines should comply with EMC and national and local industrial safety regulations and/or electrical codes. The conductor diameter should be in accordance with recommendations of this manual. Otherwise, hazard of equipment damage, fire, and/or personnel injury exists.
- Since leakage current of the drive may exceed 3.5mA, for safety's sake, the drive and the motor must be grounded so as to avoid hazard of electric shock.
- Be sure to perform wiring in strict accordance with the drive terminal marks. Never connect three-phase power supply to output terminals U/T1, V/T2 and W/T3. Failure to comply will result in equipment damage.

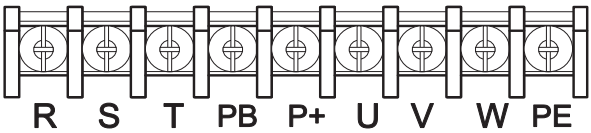
ATTENTION

- Signal wires should be away from main power lines to the best of possibility. In the event that this cannot be ensured, vertical cross arrangement should be adopted, reducing EMI interference to the signal wires as much as possible.
- In case the motor cable exceeds 100m, an appropriate output reactor should be mounted.

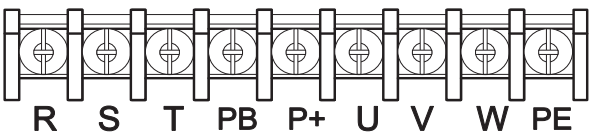
1.1 Main Circuit Terminals

Terminal marks	Designation and function of terminals
R/L、S/L2、T/L3	Single / Three-phase AC input terminals (Connect R/L1, T/L3 when use single phase input)
⊕ 、B1	Braking resistor connection terminals
U/T1、V/T2、W/T3	Three-phase AC output terminals
⏚	Ground terminal PE

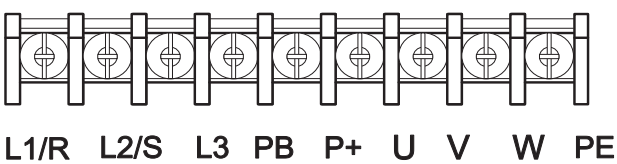
✧ Main circuit terminal of three-phase 380V frequency converter



✧ Main circuit terminal of three-phase 380V frequency converter



✧ Specification of three-phase / single-phase converter main circuit terminal 220V



1.2 Control Terminal Wiring

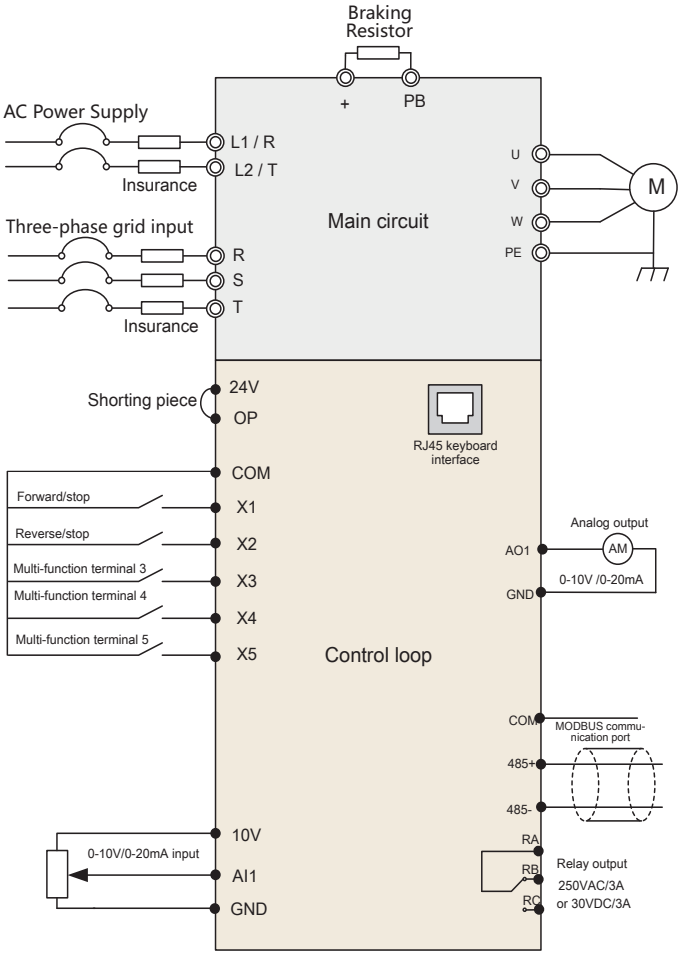
WARNING

- Only qualified personnel familiar with AC motor drives are allowed to implement wiring. Failure to comply may result in equipment damage and/or personnel injury even death.
- Wiring should be in strict accordance with this manual, otherwise hazard of electric shock or equipment damage exists.
- Make sure input power supply has been completely disconnected before wiring operation. Failure to comply will result in personnel injury even death.
- All wiring operations and lines should comply with EMC and national and local industrial safety regulations and/or electrical codes. The conductor diameter should be in accordance with recommendations of this manual. Otherwise, hazard of equipment damage, fire, and/or personnel injury exists.
- Screws or bolts for terminal wiring must be screwed tightly.
- AC 220V signal is prohibited from connecting to terminals other than control terminals RA, RB and RC.

ATTENTION

- Signal wires should be away from main power lines to the best of possibility. If this cannot be ensured, vertical cross arrangement should be adopted, reducing EMI interference to the signal wires as much as possible.
- The encoder must be provided with shielded cables whose shielded layer must be properly grounded.

1.3 Wiring Diagram

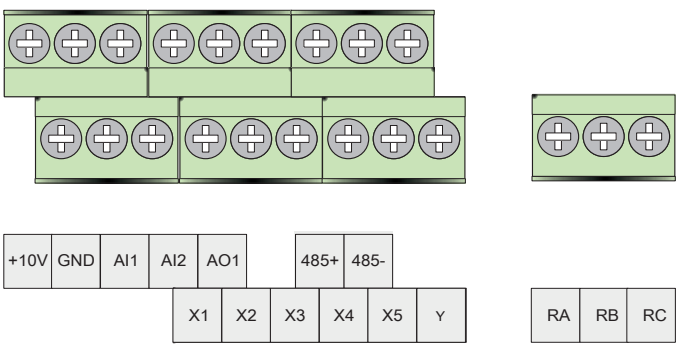


Category	Terminal	Terminal designation	Description
Analog input	0V	Analog input reference voltage	10.1V ±3%
			Maximum output current 25mA The resistance of external potentiometer should be larger than 400Ω
	GND	Analog ground	Isolated from COM interiorly
	AI1	Analog input 1	0~20mA: input impedance -500Ω, maximum input current - 25mA
			0~10V: input impedance -22kΩ, maximum input voltage -12.5V
			Switch AI1 on control board for jumping from 0~20mA and 0~10V, factory default: 0~10V
Analog output	AO1	Analog output 1	0~20mA: impedance - 200Ω~500Ω
			0~10V: impedance ⩾ 10k
			Switch AO1 on control board for jumping between 0~20mA and 0~10V, factory default: 0~10V
	GND	Analog ground	Isolated from COM interiorly
Digital input	PLC	Digital input Common terminal	Used for switching between high and low levels, short-circuited with +24V when delivery, i.e. low value of digital input valid
			External power input
	COM	+24V ground	Isolated from GND interiorly
	X1~X5	Digital input Terminals 1~5	Input: 24VDC, 5mA
			Range of frequency: 0~200Hz
			Range of voltage: 10V~30V

Category	Terminal	Terminal designation	Description
Relay output	RA/RB /RC	Control board relay output	RA-RB: NC; RA-RC: NO
			Contact capacity: 250VAC/3A, 30VDC/3A
Terminal 485 Interface	485+	485 differential signal +	Rate: 4800/9600/19200/38400/57600/115200bps
	485−	485 differential signal -	Maximum distance - 500m (standard network cable used)
	GND	485 commun-ication shield grounding	Isolated from COM interiorly
Control panel		Control panel SPI interface	Maximum communication distance is 3m when connected to Control panel
			Use standard network cable

Control Terminal Usage

✧ Lay-out of Control Terminals



Change property description

"☆": The parameter can be changed when it is running, stopped, not locked by the keyboard and parameters;

Par.	Designation	Scope	Default	Attr
Group F0: Basic function group				
F0-01	1st motor control method	2: V/F control	2	
F0-02	Run command selection	0: Operation panel 1: Terminal 2: Communication	1	☆

Par.	Designation	Scope	Default	Attr
Group F0: Basic function group				
F0-03	Main Frequency source A selection	0: Digital setting (no memory when power off) 1: Digital setting (power-down memory) 2: AI1 4: Panel potentiometer 6: Multi-segment instruction 7: Simple PLC 8: PID 9: Communication given	4	☆
F0-04	Main Frequency source B selection	The definition is the same as F0-03 (main frequency source A selection)	0	☆
F0-05	Auxiliary frequency source B reference selection	0: Relative to the maximum frequency 1: Relative to the frequency source A	1	☆
F0-06	Frequency source B range	0%~150%	100%	☆

Par.	Designation	Scope	Default	Attr
F0-07	frequency superposition selection	Ones place: frequency command selection 0: Main frequency command 1: Main and auxiliary operation results 2: Switch between main frequency command and auxiliary frequency command 3: Switch between the main frequency command and the main and auxiliary operation results 4: Switch between the auxiliary frequency command and the main and auxiliary operation results Ten's place: main and auxiliary operation relationship of frequency command 0: main + auxiliary 1: Primary-Secondary 2: the maximum value of the two 3: the minimum value of the two	0	☆
F0-08	Preset frequency	0.00 Hz ~ Maximum frequency F0-10	50.00Hz	☆
F0-09	Run direction	0: Forward 1: Reverse	0	☆
F0-10	Maximum FREQ	50.00 Hz ~3000.00Hz	50.00Hz	
F0-11	Upper limit frequency Source	0: P0-12 setting 1: Ai1 3: Panel potentiometer	0	
F0-12	Upper limit FREQ	Lower limit frequency F0-14 ~Maximum frequency F0-10	50.00Hz	☆
F0-13	Upper limit frequency offset	0.00Hz~Maximum frequency F0-10	0.00Hz	☆
F0-14	Lower limit FREQ	0.00Hz~upper limit FREQ F0-12	0.00Hz	☆
F0-15	Switching FREQ	0.75kHz~14.0kHz, factory default	Model dependent	☆

Par.	Designation	Scope	Default	Attr
F0-16	The carrier frequency is adjusted with the size of the load	0: No 1: Yes	1	☆
F0-17	Accel time 1	0.0~65000	Model dependent	☆
F0-18	Decel time 1	0.0~65000	Model dependent	☆
F0-19	Accel/Decel time resolution	1: 0.1s 2: 0.01s	1	
F0-22	frequency Command resolution	1: 0.1Hz 2: 0.01Hz	0.00Hz	☆
F0-23	Digital setting frequency stop memory selection	0: No memory 1: Memory	1	☆
F0-25	Acceleration and deceleration time reference frequency	0: Maximum frequency (F0-10) 1: Set frequency 2: 100 Hz	0	
F0-27	Running command bundled main frequency command selection	Units digit: selection of binding frequency source on operation panel 0: no binding 1: Digital setting frequency 2: AI1 4: Panel potentiometer 6: Multi-speed 7: Simple PLC 8: PID 9: Communication given Tens place: terminal binding frequency source selection Hundreds place: Communication binding frequency source selection	0	☆

Par.	Designation	Scope	Default	Attr
Group F1 Motor Parameters				
F1-00	Type of motor	0: Normal asynchronous motor	0	
F1-01	Power rating of motor	0.75kW~2.2kW	Model dependent	
F1-02	Motor rated voltage	220V~440V	Model dependent	
F1-03	Motor rated current	2.5 A~12A	Model dependent	
F1-04	Motor rated frequency	0.01Hz~upper limit frequency	Model dependent	
F1-05	Rated speed of motor	1~65535r/min	Model dependent	

Group F3 V/f Control Parameters of Motor				
F3-00	V/f curve setting	0: Line V/F 1: Multi-point V/F (F3-03 to F3-0 2: Square V/F	0	
F3-01	Torque boost	0.0%: (Automatic torque boost) 0.1%~30.0%	Model dependent	☆
F3-02	Torque boost cut-off frequency	0.00Hz~Maximum frequency	50.00Hz	
F3-03	Multipoint V/F Frequency F1	0.00Hz~F3-05	0.00Hz	
F3-04	Multipoint V/F Voltage F1	0.0%~100.0%	0.0%	
F3-05	Multipoint V/F Voltage value V1	F3-03~F3-07	0.00Hz	
F3-06	Multipoint V/F Voltage value V2	0.0%~100.0%	0.0%	
F3-07	Multipoint V/F Frequency value F3	F3-05 ~ Motor rated frequency F1-04	35.00 Hz	
F3-08	Multipoint V/F Voltage value V3	0.0%~100.0%	80.0%	

Par.	Designation	Scope	Default	Attr
F3-09	VF Differential compensation Factor	0.0%~200.0%	0.0%	☆
F3-10	VF overexcitation gain	0~200	32	☆
F3-14	AVR automatic voltage stabilization function selection	0:Invalid 1:Valid throughout 2:Invalid only when deceleration	0	☆

Par.	Designation	Scope	Default	Attr
Group F4 A Input terminals				
F4-00	Function of terminal X1	0: No function 1: Forward running FWD 2: Run REV in reverse 3: Three-wire running control 4: Forward jog (FJOG) 5: Reverse Jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free parking 9: Fault reset (RESET) 10: Run pause 11: External fault normally open input 12: Multi-segment command terminal 1 13: Multi-segment command terminal 2 14: Multi-segment command terminal 3 15: Multi-segment command terminal 4 16: Acceleration and deceleration time selection terminal 1 17: Acceleration and deceleration time selection terminal 2 18: Frequency command switching 19: UP/DOWN setting clear 20: Control command switching terminal 1 21: Acceleration and deceleration prohibition 22: PID pause 23: Simple PLC state reset 25: Counter input 26: Counter reset 32: Immediate DC braking 33: External fault normally closed input 34: Frequency modification enable 35: PID action direction is reversed 36: External parking terminal 1 37: Control command switching terminal 2 39: Switch between main frequency and preset frequency 40: Switch between auxiliary f	0	
F4-01	Function of terminal X2		4	
F4-02	Function of terminal X3		9	
F4-03	Function of terminal X4		12	
F4-04	Function of terminal		13	

Par.	Designation	Scope	Default	Attr
F4-11	Terminal command method	0: Two-wire type 1 1: Two-wire type 2 2: Three-wire type 1 3: Three-wire type 2	0	☆
F4-13	AI1 minimum input	0.00V~F4-15	0.10V	☆
F4-14	AI1 minimum input corresponding setting	-100.0%~+100.0%	0.00%	☆
F4-15	AI1 maximum input	F4-13~+10.00V	10.00V	☆
F4-16	AI1 maximum input corresponding setting	-100.0%~+100.0%	100.00%	☆
F4-17	AI1 filter time	0.00s~10.00s	0.10s	☆
F4-34	AI1 lower than minimum input setting selection	0: corresponds to the minimum input setting 1: 0.0%	0	☆

Par.	Designation	Scope	Default	Attr
F5-01	Open Collector Y output function selection (F5-00=1valid)	0: No output 1: Inverter is running 2: Fault output (fault stop) 3: Frequency level detection FDT1 output 4: Frequency reached 5: Zero speed operation (no output when stopping) 8: Set value reached 9: Specified value reached 11: PLC cycle completed 13: Frequency limit in progress 15: Ready for operation 17: Upper limit frequency reached 18: Lower limit frequency reached (operation related) 19: Undervoltage status output 20: Communication setting (address 2000H) 24: Accumulated power-on time reached 33: Reverse operation in progress 35: Module temperature reached 36: Output current over limit 37: Lower frequency limit reached (shutdown also output) 41: Fault output (undervoltage is not output) 42: Multi -stage frequency arrival output (no action at 0 stage) 45: PLC stage finished output 47: At least one multi-speed terminal is closed 48: Forward running (excluding pointing forward) 49: Reversing operation (not including point reversing) 50: Pointing operation 51: In operation (non-point-action operation)		
F5-02	Relay RA-RB-RC Function Selection			☆
F5-06	Reserved	0: Operating frequency (10V corresponds to the maximum frequency) 1: Set frequency (10V corresponds to the maximum frequency) 2: Output current (10V corresponds to 2 times the rated motor current) 3: Reserved 4: Reserved 5: Output voltage (10V corresponds to 1.2 times the rated voltage of the inverter)	0	☆
F5-07	AO1 Output Function Selection		0	☆
F5-08	Reserved		1	☆
F5-13	AO1 Maximum output voltage	0.00V~10.00V	0.00V	☆
F5-14	AO1 upper limit precent	0.00%~100.0%	100.0%	☆

Par.	Designation	Scope	Default	Attr
F5-15	AO1 Minimum output voltage	0.00V~10.00V	0.00V	☆
F5-16	AO1 Lower limit precent	0.00%~100.0%	0.0%	☆
F5-21	Lower than lower output limit selection	0 : output 1 : output ower limit	1	☆
F5-22	Digital output specified value	0 : closed 1 : opend	1	☆
F5-23	AO1 output precent specified value	0.0%~100.0%	0.0%	☆
F5-32	Digital Terminal Logic output invers	Unit Digit : Y open collector Ten bits : Relay RA RB RC 0 : No invers 1 : invers	000	

Par.	Designation	Scope	Default	Attr
F6-01	Speed tracking method	0: Direct start 1: Reserved 2: DC brake start	0	☆
F6-03	Start frequency	0.00Hz~10.00Hz	0.00Hz	☆
F6-04	Start frequency hold time	0.0s~32.000s	0.0s	
F6-05	Start DC braking current	0%~100%	50%	
F6-06	Start DC braking time	0.0s~32.000s	0.0s	
F6-10	Normal Stop mode	0: Decelerate to stop 1: Free parking	0	☆
F6-11	DC braking starting frequency at stop	0.00Hz~Maximum frequency	0.00Hz	☆
F6-12	DC braking waiting time at stop	0.0s~32.000s	0.0s	☆
F6-13	Stop DC braking current	0.0%~100.0%	50%	☆
F6-14	DC braking time at stop	0.0s~32.000s	0.0s	☆
F6-16	Continued operation enable after automatic reset	0: Not enabled 1: Enabled	1	☆
F6-18	Tap stop mode	0: Deceleration stop 1: Free stop	1	☆

Par.	Designation	Scope	Default	Attr
F7-01	QUICK key setting	0: Keypad invalid 1: Switch between the operation panel command channel and the remote command channel (terminal command channel or communication command channel) 2: Forward and reverse switching 3: Forward rotation pointing 4: Revers rotation pointing	2	
F7-02	STOP/RESET key function	0: Only in the keyboard operation mode, STOP/ RESET key stop function is effective 1: STOP/RESET key stop function is valid under any operation mode (Free stop in case of terminal or communication control) 2: Under any channel, it is valid (when the terminal or communication channel, EO37 keyboard stop fault is reported)	0	☆
F7-03	LED Operation Display Parameters	00: Operating Frequency 01: Set Frequency 02: Bus Voltage 03: output Voltage 04: output current 07: X digital input terminal status 08: Y digital output terminal status 09:AI1 Voltage 11: Reserved	0	

Par.	Designation	Scope	Default	Attr
F7-03		12: Count Value 14: Load speed Display 15: PID setting 16: PID Feedback 17: PLC Stage		☆
F7-05	LED Stop Display parameter	Same as F7-03	1	☆
F7-06	Load speed Display coefficien	0.001 ~ 32.000	1.000	☆
F7-07	Inverter module heat sink temperature	0.0C ~ 100.0C		
F7-10	Braking Voltage action point	100%-160% standard bus voltage	128%	☆
F7-11	User Password	0 ~ 32766	0	☆
F7-13	Accumulated power-up time	0h ~ 32766h	-	

Group F8 Auxiliary Function				
F8-00	Tap operation Frequency	0.00Hz~Maximum Frequency	2.00Hz	☆
F8-01	Point-Activated Accel Time	0.0s~3200.0s	20.0s	☆
F8-02	Tap Decel time	0.0s~3200.0s	20.0s	☆
F8-03	Accel time 2	0.0s~3200.0s	Model dependent	☆
F8-04	Decel time 2	0.0s~63200.0s	Model dependent	☆
F8-05	Accel time 3	0.0s~3200.0s	Model dependent	☆
F8-06	Decel time 3	0.0s~3200.0s	Model dependent	☆
F8-07	Accel time 4	0.0s~3200.0s	Model dependent	☆
F8-08	Decel time 4	0.0s~3200.0s	Model dependent	☆
F8-12	Forward and reverse dead time	0.0s~3000.0s	0.0 s	☆
F8-13	Reverse Control enabled	0: Allowed 1: Prohibited	0	☆
F8-14	set frequency is lower than the lower limit frequency operation mode	0: Run at the lower frequency limit 1: Stop 2: Running at zero speed	0	☆
F8-15	Sag control	0.0 Hz~10.00 Hz	0.00Hz	☆
F8-16	Set the cumulative power-on arrival time	0h~32000h	0h	☆
F8-18	Terminal Operation	Unit digit : Power On start Protection 0: No Protection 1: Protection Hundred Bits:normal power on after running protection 0: No Protection 1: Protection	0	☆
F8-19	Frequency detection value1 (FDT1)	0.00Hz~Maximum frequency	50.00Hz	☆
F8-20	Frequency detection hysteresis 1	0.0%~100.0% (FDT1 level)	5.00%	☆

Par.	Designation	Scope	Default	Attr
F8-21	Frequency arrival detection amplitude	0.0%~100.0% (maximum frequency)	0.00%	☆
F8-23	Fan operation mode	0: always running; 1:Fan running when inverter is runing	1	☆
F8-36	Output current overrun value	0.0% (No detection) 0.1% ~ 300.0% (Motor rated current)	200.0%	☆
F8-37	Output current overrun detection delay time	0.00 ~ 60.00 s	0.00 s	☆
F8-54	set count value	1~ 32000	1000	☆
F8-55	specify the count value	1~ 32000	1000	☆

Group F9 Fault and Protection				
F9-00	Motor overload protection selection	0: Disable 1: Allow	1	☆
F9-01	Motor overload protection Factor	20.0%~125.0%	100.0%	☆
F9-03	Overvoltage Stall Gain	0~100	0	☆
F9-04	Overvoltage stall protection voltage	115%~150%	135%	☆
F9-05	Overspeed gain	0~100	20	☆
F9-06	Overspeed Operation current	100.0%~210.0%	165.0%	☆
F9-09	Fault automatic reset times	0~20	0	☆
F9-10	Fault DO action selection during fault automatic reset	0: No action 1: Action	0	☆
F9-11	Second fault type	0.100s~32.000s	1.000s	☆
F9-14	Fault durig automatic fault reset	0: No fault 1: IGBT short-circuit fault 2: Acceleration overcurrent 3: Deceleration overcurrent 4: Constant speed overcurrent 5: Acceleration overvoltage 6: Deceleration overvoltage 7: Constant speed overvoltage 8: Stop overvoltage 9: Undervoltage 10: Inverter overload 11: Motor overload 14: Module overheating 15: External fault 16: Communication abnormality	-	
F9-15	Output terminal action selection			
F9-16	Third (last) fault type			

Par.	Designation	Scope	Default	Attr
		21: Parameter read / write abnormality 22: inverter hardware abnormality (clear latch timeout) 29: Power-up time reached 31: PID feedback too large(over-voltage)fault 37:Keyboard STOPkey stop fault 41: Automatic reset times exceeded limit		
F9-17	Frequency at the third (most recent) fault	-	-	
F9-18	Current at the third (most recent) fault	-	-	
F9-19	Busbar voltage at the third (most recent) fault	-	-	
F9-23	Accumulated Power-on time at the third (most recent) fault	-	-	
F9-27	Frequency at second fault	-	-	
F9-28	Current at the second fault	-	-	
F9-29	Busbar voltage at the second fault	-	-	
F9-33	Power-on time at the second fault	-	-	
F9-37	Frequency at first failure	-	-	
F9-38	Current at first fault	-	-	
F9-39	Busbar voltage at first fault	-	-	
F9-43	Power-up time at first fault	-	-	

Par.	Designation	Scope	Default	Attr
Group FA Process PID				
FA-00	PID setting	0: FA-01 setting 1: Ai1 2: Ai2 3: Panel potentiometer 4: Pulse setting (X6) 5: Communication given 6: Multi-segment instruction given	0	☆
FA-01	PID digital setting	0.0%~100.0%	50.0%	☆
FA-02	PID feedback	0: Ai1 1: Ai2 2: Panel potentiometer 3: AI1-AI2 4: Pulse setting (X6) 5: Communication given 6: AI1+AI2 7: MAX(|AI1|,|AI2|) 8: MIN(|AI1|,|AI2|)	0	☆
FA-03	PID action direction	0: Positive action 1: Reverse action	0	☆
FA-04	PID given feedback range	0~65535	1000	☆
FA-05	Proportional gain Kp1	0.0~1000.0	50.0	☆
FA-06	Integration time Ti1	0.01s~10.00s	2.00s	☆
FA-07	Derivative time Td1	0.000s~10.000s	0.000s	☆
FA-08	Cutoff FREQ when opposite to rotary set direction	0.00Hz~maximum FREQ	0.00Hz	
FA-09	PID offset limit	0.0%~100.0%	0.0%	☆
FA-10	PID derivative limit	0.0%~100.0%	0.10%	☆
FA-11	Filtering time of PID setting	0.00~650.00s	0.00s	☆
FA-12	Filtering time of PID feedback	0.00s~60.00s	0.00s	☆
FA-13	Filtering time of PID output	0.00s~60.00s	0.00s	☆

Par.	Designation	Scope	Default	Attr
FA-14	Reserved			
FA-15	Proportional gain Kp2	0.0~1000.0	20	☆
FA-16	Integration time Ti2	0.01s~10.00s	2.00s	☆
FA-17	Derivative time Td2	0.000s~10.000s	0.000s	☆
FA-18	PID parameter switch	0: Do not switch 1: Switch through the X terminal 2: Automatically switch according to the deviation 3: Automatically switch according to the operating frequency	0	☆
FA-19	PID parameter switching deviation 1	0.0%~PA-20	20.0%	☆
FA-20	PID parameter switching deviation 2	PA-19~100.0%	80.0%	☆
FA-21	PID initial value	0.0%~100.0%	0.0%	☆
FA-22	PID initial value holding time	0.00~650.00s	0.0s	☆
FA-23	Reserve			
FA-24	Reserve			
FA-25	PID integral properties	Units: Integral separation 0: invalid 1: Valid Tens place: whether to stop integration after the output reaches the limit value 0: Continue points 1: Stop integration	0	☆
FA-26	PID feedback loss detection value	0.0%: Not judged feedback loss 0.1%~100.0%	0.0%	☆
FA-27	PID feedback loss detection time	0.0s~20.0s	0.0s	☆
FA-28	PID shutdown operation	0: Stop and do not operate 1: Compute at stop	0	☆

Par.	Designation	Scope	Default	Attr
Group FB：Fixed length counting parameter				
FB-05	Set length	0m~65535m	1000m	☆
FB-06	Actual length	0m~65535m	0m	☆
FB-07	Pulses per meter	0.1~6553.5	100	☆
FB-08	Set count value	1~65535	1000	☆
FB-09	Specify count value	1~65535	1000	☆
Group FC Multi-segment instructions, simple PLC				
FC-00	Multiband frequency 0	-100.0%~100.0%	0.00%	☆
FC-01	Multiband frequency 1	-100.0%~100.0%	0.00%	☆
FC-02	Multiband frequency 2	-100.0%~100.0%	0.00%	☆
FC-03	Multiband frequency 3	-100.0%~100.0%	0.00%	☆
FC-04	Multiband frequency 4	-100.0%~100.0%	0.00%	☆
FC-05	Multiband frequency 5	-100.0%~100.0%	0.00%	☆
FC-06	Multiband frequency 6	-100.0%~100.0%	0.00%	☆
FC-07	Multiband frequency 7	-100.0%~100.0%	0.00%	☆
FC-08	Multiband frequency 8	-100.0%~100.0%	0.00%	☆
FC-09	Multiband frequency 9	-100.0%~100.0%	0.00%	☆
FC-10	Multiband frequency 10	-100.0%~100.0%	0.00%	☆
FC-11	Multiband frequency 11	-100.0%~100.0%	0.00%	☆
FC-12	Multiband frequency 12	-100.0%~100.0%	0.00%	☆
FC-13	Multiband frequency 13	-100.0%~100.0%	0.00%	☆
FC-14	Multiband frequency 14	-100.0%~100.0%	0.00%	☆
FC-15	Multiband frequency 15	-100.0%~100.0%	0.00%	☆
FC-16	Simple PLC operation mode	0: Stop at the end of a single operation 1: Keep the final value at the end of a single run 2: keep looping	0	☆

Par.	Designation	Scope	Default	Attr
FC-17	Simple PLC power-down memory selection	Ones place: power-down memory selection 0: no memory when power off Tens place: stop memory selection 0: no memory when stopped 1: Power-down memory 2: Stop memory	0	☆
FC-18	Simple PLC section 0 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-19	Simple PLC section 0 acceleration and deceleration time selection	0~3	0	☆
FC-20	Simple PLC section 1 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-21	Simple PLC section 1 acceleration and deceleration time selection	0~3	0	☆
FC-22	Simple PLC section 2 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-23	Simple PLC section 2 acceleration and deceleration time selection	0~3	0	☆
FC-24	Simple PLC section 3 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-25	Simple PLC section 3 acceleration and deceleration time selection	0~3	0	☆
FC-26	Simple PLC section 4 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-27	Simple PLC section 4 acceleration and deceleration time selection	0~3	0	☆
FC-28	Simple PLC section 5 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-29	Simple PLC section 5 acceleration and deceleration time selection	0~3	0	☆
FC-30	Simple PLC section 6 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-31	Simple PLC section 6 acceleration and deceleration time selection	0~3	0	☆
FC-32	Simple PLC section 7 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-33	Simple PLC section 7 acceleration and deceleration time selection	0~3	0	☆

Par.	Designation	Scope	Default	Attr
FC-34	Simple PLC section 8 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-35	Simple PLC section 8 acceleration and deceleration time selection	0~3	0	☆
FC-36	Simple PLC section 9 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-37	Simple PLC section 9 acceleration and deceleration time selection	0~3	0	☆
FC-38	Simple PLC section 10 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-39	Simple PLC section 10 acceleration and deceleration time selection	0~3	0	☆
FC-40	Simple PLC section 11 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-41	Simple PLC section 11 acceleration and deceleration time selection	0~3	0	☆
FC-42	Simple PLC section 12 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-43	Simple PLC section 12 acceleration and deceleration time selection	0~3	0	☆
FC-44	Simple PLC section 13 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-45	Simple PLC section 13 acceleration and deceleration time selection	0~3	0	☆
FC-46	Simple PLC section 14 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-47	Simple PLC section 14 acceleration and deceleration time selection	0~3	0	☆
FC-48	Simple PLC section 15 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
FC-49	Simple PLC section 15 acceleration and deceleration time selection	0~3	0	☆
FC-50	Simple PLC running time unit	0: s (seconds) 1: h (hours)	0	☆
FC-51	Simple PLC running time unit	0: Function code PC-00 given 1: Ai1 2: Ai2 3: Panel potentiometer 4: Pulse 5: PID	0	☆

Par.	Designation	Scope	Default	Attr
FC-51	Simple PLC running time unit	6: Preset frequency (A0-08) given, UP/DOWN can be modified	0	☆
Group FD MODBUS Communication Parameters				
FD-00	Communication baud rate	Ones place: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9:115200BPS Ten: reserved Hundreds: reserved Thousands: reserved	5	☆
FD-01	MODBUS data format	0: No checksum (8-N-2) 1: Even parity (8-E-1) 2: Odd parity (8-O-1) 3: No checksum (8-N-1)	1	☆
FD-02	Local address	0: broadcast address 1~247	1	☆
FD-03	MODBUS response delay	0~20ms	2	☆
FD-04	Serial communication timeout time	0.0: invalid 0.1~60.0s	0	☆
FD-05	Communication data format	Ones place: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	30	☆
FD-06	Communication read current resolution	0: 0.01A (effective when ≤55kW) 1: 0.1A	0	☆
Group FP Function code management				
FP-00	User password	0~65535	0	☆

Par.	Designation	Scope	Default	Attr
FP-01	Parameter initialization	0: No operation 01: Restore factory parameters, excluding motor parameters 02: Clear record information 04: Backup user's current parameters 05: Restore user backup parameters	0	
FP-02	Function parameter group display selection	Ones place: U group display selection 0: not displayed 1: Display Tens place: F group display selection 0: not displayed 1: Display	11	☆
FP-03	Personality parameter group display selection	Units place: User-defined parameter group display selection 0: not displayed 1: Display Tens digit: User changes parameter group display selection 0: not displayed 1: Display	0	☆
FP-04	Function code modification attribute	0: Modifiable 1: Cannot be modified	0	☆
Group A0: Torque Control Parameters				
A0-00	Speed/torque control mode selection	0: Speed control 1: Torque control	0	
A0-01	Torque setting selection in torque control mode	0: Digital setting 1 (A0-03) 1: Ai1 2: Ai2 3: Panel potentiometer 4: PULSE pulse 5: Communication given 6: MIN (AI1, Ai2) 7: MAX (AI1, Ai2) (The full scale of options 1-7 corresponds to the digital setting of A0-03)	0	
A0-03	Torque digital setting in torque control mode	-200.0%~200.0%	150.00%	☆

Par.	Designation	Scope	Default	Attr
A0-05	Torque control forward maximum frequency	0.00Hz~Maximum frequency	50.00Hz	☆
A0-06	Torque control reverse maximum frequency	0.00Hz~Maximum frequency	50.00Hz	☆
A0-07	Torque rise filter time		0.00s	☆
A0-08	Torque drop filter time		0.00s	☆
Group A5: Control optimization parameters				
A5-00	DPWM switching upper limit frequency	5.00Hz~Maximum frequency	8.00Hz	☆
A5-01	PWM modulation method	0: Asynchronous modulation 1: Synchronous modulation	0	☆
A5-02	Dead time compensation mode selection	0: no compensation 1: Compensation mode 1	1	☆
A5-03	Random PWM depth	0: Random PWM is invalid 1~10: PWM carrier frequency random depth	0	☆
A5-04	Fast current limit enable	0: Disable 1: enable	1	☆
A5-05	Maximum output voltage coefficient	100~110%	105%	
A5-06	Undervoltage point setting	210~420V	350V	☆
A5-08	low speed carrier	0.0~8.0kHz	0	☆
A5-09	Overvoltage point setting	200.0V~2500.0V	Model dependent	
A5-11	Low speed DC braking threshold	0.00~5.00Hz	0.30Hz	☆
Group U0: Basic monitoring parameters				
U0-00	Operating frequency (Hz)	0.01Hz	7000H	
U0-01	Set frequency (Hz)	0.01Hz	7001H	
U0-02	Bus voltage (V)	0.1V	7002H	
U0-03	Output voltage (V)	1V	7003H	
U0-04	Output current (A)	0.01A	7004H	
U0-05	Output torque (%)	0.1kW	7005H	

Par.	Designation	Scope	Default	Attr
U0-06	Output torque (%)	0.001	7006H	
U0-07	X input state	1	7007H	
U0-08	DO output status	1	7008H	
U0-09	Ai1 Voltage (V)	0.01V	7009H	
U0-10	Ai2 voltage (V)/current (mA)	0.01V/0.01mA	700AH	
U0-12	Count value	1	700CH	
U0-13	length value	1	700DH	
U0-14	Load speed display	1	700EH	
U0-15	PID setting	1	700FH	
U0-16	PID feedback	1	7010H	
U0-17	PLC stage	1	7011H	
U0-18	Input pulse frequency (Hz)	0.01kHz	7012H	
U0-19	Feedback speed (Hz)	0.01Hz	7013H	
U0-20	remaining running time	0.1Min	7014H	
U0-21	Ai1 voltage before correction	0.001V	7015H	
U0-22	Ai2 Voltage (V)/Current (mA) before calibration	0.001V/0.01mA	7016H	
U0-24	Line speed	1m/Min	7018H	
U0-25	Current power-on time	1Min	7019H	
U0-26	current running time	0.1Min	701AH	
U0-27	input pulse frequency	1Hz	701BH	
U0-28	Communication settings	0.0001	701CH	
U0-30	main frequency display	0.01Hz	701EH	
U0-31	Auxiliary frequency display	0.01Hz	701FH	
U0-32	View arbitrary memory address value	1	7020H	
U0-34	Motor temperature value	1℃	7022H	
U0-39	V/F separation target voltage	1V	7027H	

Par.	Designation	Scope	Default	Attr
U0-40	V/F split output voltage	1V	7028H	
U0-41	Intuitive display of X input status	1.00	7029H	
U0-42	Intuitive display of Do output status	1.00	702AH	
U0-43	X function status visual display 1 (function 01-40)	1.00	702BH	
U0-44	X function status visual display 2 (functions 41-80)	1.00	702CH	
U0-45	accident details	1.00	702DH	
U0-59	Set frequency (%)	0.00	703BH	
U0-60	Running frequency (%)	0.00	703CH	
U0-61	Inverter status	1.00	703DH	
U0-62	Current fault code	1.00	703EH	

Once drive fault occurs, please identify the causes of fault carefully and make a detailed record of fault symptom. To seek services, please contact the dealer. Parameters U1-00, U1-09 and U1-18 are used to view the records of fault 1, fault 2 and fault 3. Faults are recorded with numeric codes (1~46), while the fault information that corresponds to each numeric fault code is specified in the table below.

Table of Fault Codes

Fault Name	Operating Panel Display	Cause	Possible Solution
Overcurrent during acceleration	Err02	Ground fault or short circuit exists in the output circuit.	✧ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	✧ Set motor parameters accor-ding to motor nameplate and perform motor autotuning.
		Acceleration time is too short.	✧ Increase acceleration time.
		The overcurrent stall prevention parameters are set improperly.	✧ Ensure that current limit is enabled (F3-19=1). ✧ The setting of current limit level (F3-18) is too large. Adjust it between 120% and 150%. ✧ The setting of current limit gain (F3-20) 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 spinning motor is started.	✧ Enable the flying start function or start the motor after it stops.
		The AC drive suffers external interference.	✧ View historical fault records. If the current value is far from the overcurrent level, find interference source. If external interference does not exist, it is the driver board or hall device problem.
Overcurrent during deceleration	Err03	Gund fault or short circuit exists in the output circuit.	✧ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	✧ Set motor parameters according to motor nameplate and perform motor auto-tuning.

Fault Name	Operating Panel Display	Cause	Possible Solution
Overcurrent during deceleration		Deceleration time is too short.	✧ Increase deceleration time.
		The overcurrent stall prevention parameters are set improperly.	✧ Ensure that current limit is enabled (F3-19=1). ✧ The setting of current limit level (F3-18) is too large. Adjust it between 120% and 150%. ✧ The setting of current limit gain (F3-20) is too small. Adjust it between 20 and 40.
		Braking unit and braking resistor are not installed.	✧ Install 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 interference source. If external interference does not exist, it is the driver board or hall device problem.
Overcurrent during deceleration		Ground fault or short circuit exists in the output circuit.	✧ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	✧ Set motor parameters according to motor nameplate and perform motor auto-tuning.
		The overcurrent stall prevention parameters are set improperly.	✧ Ensure that current limit is enabled (F3-19=1). ✧ The setting of current limit level (F3-18) is too large. Adjust it between 120% and 150%. ✧ The setting of current limit gain (F3-20) is too small. Adjust it between 20 and 40.
		The AC drive power class is small.	✧ If output current exceeds rated motor current or rated output current of the AC drive during stable running, replace a 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 interference source. If external interference does not exist, it is the driver board or hall device problem.

Fault Name	Operating Panel Display	Cause	Possible Solution
Overvoltage during acceleration		Input voltage is too high.	✧ Adjust input voltage to normal range.
		An external force drives motor during acceleration.	✧ Cancel the external force or install a braking resistor.
		The overvoltage stall prevention paramet-ers are set improperly.	✧ Ensure that the voltage limit function is enabled (F3-23=1). ✧ The setting of voltage limit (F3-22) is too large. Adjust it between 770 V and 700 V. ✧ The setting of frequency gain for voltage limit (F3-24) is too small. Adjust it between 30 and 50.
		Braking unit and braking resistor are not installed.	✧ Install braking unit and braking resistor.
		Acceleration time is too short.	✧ Increase acceleration time.
Overvoltage during deceleration		The overvoltage stall prevention parameters are set improperly.	✧ Ensure that the voltage limit function is enabled (F3-23=1). ✧ The setting of voltage limit F3-22) is too large. Adjust it between 770V and 700V. ✧ The setting of frequency gain for voltage limit (F3-24) is too small. Adjust it between 30 and 50.
		An external force drives motor during deceleration.	✧ Cancel the external force or install a braking resistor.
		Deceleration time is too short.	✧ Increase deceleration time.
		Braking unit and braking resistor are not installed.	✧ Install braking unit and braking resistor.
Overvoltage at constant speed		The overvoltage stall prevention parameters are set improperly.	✧ Ensure that the voltage limit function is enabled (F3-23=1). ✧ The setting of voltage limit (F3-22) is too large. Adjust it between 770 V and 700 V. ✧ The setting of frequency gain for voltage limit (F3-24) is too small. Adjust it between 30 and 50. ✧ The setting of frequency rise threshold during voltage limit (F3-26) is too small. Adjust it between 5 Hz and 20 Hz.

Fault Name	Operating Panel Display	Cause	Possible Solution
Overvoltage at constant speed	Err07	An external force drives motor during running.	✧ Cancel the external force or install a braking resistor.
Control power fault	Err08	The input voltage exceeds the setting range.	✧ Adjust the input voltage to be within the setting range.
Undervoltage	Err09	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 normal range.
		The bus voltage is abnormal.	✧ Contact the agent or Inovance.
		The rectifier bridge, the buffer resistor, the driver board or the control board are abnormal.	✧ Contact the agent or Inovance.
AC drive overload	Err 10	Load is too heavy or lock-edrotor occurs on motor.	✧ Reduce load or check motor and mechanical conditions.
		The AC drive power class is small.	✧ Replace a drive of larger power class.
Motor overload	Err 11	F9-01 (Motor overload prote-ction gain) is set improperly.	✧ Set F9-01 correctly.
		Load is too heavy or lockedrotor occurs on motor.	✧ Reduce load or check motor and mechanical conditions.
Input phase loss	Err 12	Input phase loss occurs.	✧ Eliminate faults in external circuitry.
		Driver board, lightning prot-ection board, control board, or rectifier bridge is abnormal.	✧ Contact the agent or Inovance.
Output phase loss	Err 13	Motor winding is damaged.	✧ Check resistance between motor wires.
		The cable connecting the AC drive and the motor is abnormal.	✧ Check for wiring errors and ensure the output cable is connected properly.
		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.

Fault Name	Operating Panel Display	Cause	Possible Solution
IGBT overheat	Err 14	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.
		Thermally sensitive resistor of IGBT is damaged.	✧ Replace the damaged thermally sensitive resistor.
		The AC Drive IGBT is damaged.	✧ Replace the AC Drive IGBT.
External fault	Err 15	External fault signal is input through DI.	✧ Confirm that the mechanical condition allows restart (F8-18) and reset the operation.
		External fault signal is input through virtual I/O.	✧ Confirm that the virtual I/O parameters in group A1 are set correctly and reset the operation.
Communicati on fault	Err 16	Host controller is in abnormal state.	✧ Check the cable of host controller.
		Communication cable is abnormal.	✧ Check the communication cables.
		The serial port communica-tion protocol (F0-28) of extension communication card is set	✧ Set F0-28 of extension communication card correctly.
		Communication parameters in group Fd are set improperly.	✧ Set communication parameters in group Fd properly.
		After all the preceding checkings are done but the fault still exists, restore the default settings.	
Contactor fault	Err 17	Driver board and power supply are abnormal.	✧ Replace driver board or power supply board.
		Contactor is abnormal.	✧ Replace contactor.
		The lightning protection board is abnormal.	✧ Replace the lightning protection board.
Current detection fault	Err 18	The hall is abnormal.	✧ Replace the hall element.
		The driver board is abnormal.	✧ Replace the driver board.

Fault Name	Operating Panel Display	Cause	Possible Solution
Motor auto-tuning fault		Motor parameters are not set according to nameplate.	✧ Set motor parameters correctly according to nameplate.
		Motor auto-tuning times out.	✧ Check the cable connecting AC drive and motor.
		The encoder is abnormal.	✧ Check whether F1-27 (encoder pulses perrevolution) is set correctly. Check whether signal lines of encoder are connected correctly and securely.
Encoder fault		Encoder is not matched.	✧ Set the type of encoder correctly.
		Encoder wiring is incorrect.	✧ Check the PG card power supply and phase sequence.
		Encoder is damaged.	✧ Replace encoder.
		PG card is abnormal.	✧ Replace PG card.
EEPROM read-write fault		The EEPROM chip is damaged.	✧ Replace the main control board.
Short circuit to ground		Motor is short circuited to the ground.	✧ Replace cable or motor.
Accumulative running time reached		Accumulative running time reaches the setting value.	✧ Clear the record through parameter initialization.
User-defined Fault 1		User-defined fault 1 is input through DI.	✧ Reset the operation.
		User-defined fault 1 is input through virtual I/O.	✧ Reset the operation.
User-defined Fault 2		User-defined fault 2 is input through DI.	✧ Reset the operation.
		User-defined fault 2 is input through virtual I/O.	✧ Reset the operation.
Accumulative power-on time reached		Accumulative power-on time reaches the setting value.	✧ Clear the record through parameter initialization.
Load loss		The output current of AC drive is smaller than F9-64 (load loss detection level).	✧ Check whether load is disconnected or the setting of F9-64 and F9-65 (load lost detection time) satisfies actual running condition.

Fault Name	Operating Panel Display	Cause	Possible Solution
PID feedback lost during running Feedback loss		PID feedback is smaller than the setting value of FA-26 (detection level of PID feedback loss).	✧ Check PID feedback or set FA-26 properly.
Pulse-by-pulse current limit fault		Load is too heavy or locked-rotor occurs on motor.	✧ Reduce load or check motor and mechanical conditions.
		The AC drive power class is small.	✧ Replace a drive of larger power class.
Motor switchover fault during running Motor winding is damaged.		Motor switchover through terminal during drive running of the AC drive.	✧ Perform motor switchover after the AC drive stops.
Speed error		Encoder parameters are set improperly.	✧ Set encoder parameters properly.
		Motor auto-tuning is not performed.	✧ Perform motor auto-tuning.
		F9-69 (detection level of speed error) and P9-70 (detection time of speed error) are set incorrectly.	✧ Set F9-69 and F9-70 correctly based on actual condition.
Motor overspeed Problem		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 (Overspe-ed detection time) are set incorrectly.	✧ F9-67 and F9-68 correctly based on actual condition.
Motor overtemperature		Cable connection of temperature sensor becomes loose	✧ Check cable connection of temperature sensor.
		The motor temperature is too high.	✧ Decrease carrier frequency or take other measures to cool the motor.
Initial position angle identification fault		AC drive output phase loss	✧ Check whether the motor wiring is correct.
		The AC drive current detection fails or the hall is damaged.	✧ Check the hall.

Fault Name	Operating Panel Display	Cause	Possible Solution
Initial position angle identification fault		The motor inductance is too large.	✧ Set F9-75 to avoid this fault.
Braking unit overload		Resistance of braking resistor is too small.	✧ Replace a braking resistor of larger resistance.
Short-circuit of braking circuit		Braking module is abnormal.	✧ Contact the agent or Inovance.
Counter electromotive force identification exception warning		Related parameters are set incorrectly.	✧ Set related parameters correctly, the rated frequency and rotation speed in particular.
		F1-20 is set incorrectly.	✧ Check whether F1-20 is set to a too large or too small value.
		Counter electromotive force identification exception during dynamic identification	✧ Check whether the motor has no load during dynamic identification and whether the motor rotates at 40% of the rated rotation speed. If the motor has load and its speed is below 40% of the rated rotation speed, perform identification again after disconnecting the motor from load.
		The motor is demagnetized.	✧ Check whether the motor is demagnetized.
		Counter electromotive force is too large or too small.	✧ If yes, press STOP to reset the warning and the motor continues to run.