Instruction Manual

700 Series Medium and High Voltage Inverter

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Chapter 1: Safety Information

To ensure your personal safety and the safety of your equipment and property, please be sure to read this chapter carefully before using the variable frequency drive (VFD) and follow the instructions throughout subsequent handling, installation, operation, commissioning, and maintenance. Safety precautions in this manual are classified as "Danger" and "Warning."

1.1 Safety Definitions

This symbol indicates that failure to follow the instructions may result in death, injury, or significant property damage.

This symbol indicates that failure to follow the instructions may result in personal injury or equipment damage.

In certain situations, failure to follow the instructions—even if it involves disregarding a "Warning"—can lead to a major accident. Therefore, you must observe these important precautions under all circumstances.

1.2 Installation Precautions

◆ Install the inverter on a non-flammable surface, such as metal, to prevent fire.

◆ Keep flammable materials away from the inverter; otherwise, there is a risk of fire.

◆ Do not install the inverter in flammable or explosive environments, as this poses an explosion hazard.

◆ Do not disassemble or modify the inverter without authorization; you will be solely responsible for any consequences.

◆ Wiring must be performed by a qualified technician to avoid the risk of electric shock.

◆ Do not open the front cover or perform wiring work while the inverter is powered on.

◆The cover must be securely fastened before powering on the inverter; failure to do so poses a risk of electric shock and explosion.

◆For inverters that have been in storage for more than 2 years, gradually increase the voltage using a voltage regulator before powering on; failure to do so may result in electric shock or explosion.

◆ Do not touch the terminals with your hands while the inverter is powered on; otherwise, there is a risk of electric shock.

◆ Do not operate the inverter with wet hands; doing so poses a risk of electric shock.

◆ Wait at least ten minutes after disconnecting the power supply before performing

maintenance. Ensure the power indicator light is completely off or verify that the voltages on the positive and negative busbars (P, N) are below 25 V; failure to do so poses a risk of electric shock.

◆ Maintenance operations, such as replacing parts, must be performed by qualified technical personnel. Never leave metal objects, such as wires or screws, inside the unit, as this poses a fire hazard.

◆ After replacing the control board of the inverter, the relevant parameters must be set correctly before operation can resume.

◆ Never connect the inverter's output terminals U, V, and W to an AC power source.

▲When handling the unit, do not apply force to the control panel or cover plate; otherwise, parts of the inverter may detach, posing a risk of injury or property damage.

▲ Installation must be performed in a location capable of supporting the weight of the inverter.

▲ Avoid installing the inverter in locations where it may be exposed to splashing water, as this poses a risk of property damage.

▲ Do not allow foreign objects to fall into the inverter.

▲ The inverter's grounding terminal must be properly grounded.

▲Do not touch the heat sink with your hands while the unit is powered on or within ten minutes after powering off, to prevent burns.

▲Do not install or operate the inverter if it is damaged or if any components are missing, as this poses a risk of injury or property damage.

▲Do not install the inverter in direct sunlight, as this may result in property damage.

▲Do not short-circuit P/P(B)/N, as this poses a risk of fire and property damage.

▲ The main circuit terminals must be securely connected to the wires.

▲ Never connect control terminals other than TA, TB, and TC to a 220 V AC signal, as this may result in property damage.

1.3 Precautions for Use

Please observe the following precautions when using the inverter:

1.3.1 Regarding Motors and Mechanical Loads

Comparison with Line-Frequency Operation

The inverter is a voltage-type inverter; its output voltage is a PWM

waveform that contains a certain amount of higher-order harmonics. During operation, phenomena such as motor temperature rise and vibration may occur, which are slightly more pronounced compared to line-frequency operation.

Constant Torque Low-Frequency Operation

When this VFD drives a standard motor for prolonged low-speed, high-load operation, the motor's inherent heat dissipation efficiency decreases. The resulting increase in heat can degrade the motor's insulation performance and shorten its service life. It is recommended to use a VFD-rated motor or to derate the motor for such applications.

Motor Electronic Thermal Protection Threshold

When a compatible motor is selected, the inverter can provide thermal protection for the motor. If the motor's rated capacity does not match that of the inverter, the protection settings must be adjusted or other protective measures taken to ensure the motor's safety.

Operation Above Rated Frequency

When the output frequency of the VFD driving the motor exceeds the motor's rated frequency, be aware that motor vibration and noise will increase. Additionally, ensure that mechanical components such as the motor bearings are within their specified operating speed range.

Lubrication of Mechanical Components

This inverter drives mechanical components such as gearboxes and gears that require lubrication. During prolonged low-speed operation, reduced lubrication effectiveness may cause damage; it is recommended to consult the manual or perform maintenance in advance.

Negative Torque Loads

In applications such as lifting loads, negative torque often occurs, which can cause the inverter to trip due to overcurrent or overvoltage faults. In such cases, a four-quadrant inverter should be selected.

Mechanical Resonance Points of the Load

Within a certain output frequency range, the VFD may encounter the mechanical resonance frequency of the load. This can be avoided by setting a jump frequency.

Frequent Start-Stop Applications

For applications involving frequent start-stop cycles, control the drive's start and stop operations via external terminals or the front panel. Never use switching devices such as contactors on the drive's input side for direct, frequent start-stop operations, as this may cause equipment damage.

Motor Insulation Check Before Connecting to the Variable Frequency Drive

Before using the motor for the first time or after a prolonged period of

inactivity, perform an insulation test on the motor to prevent damage to the inverter caused by motor insulation failure.

1.3.2 Regarding the Variable Frequency Drive

Capacitors and Varistors for Power Factor Correction

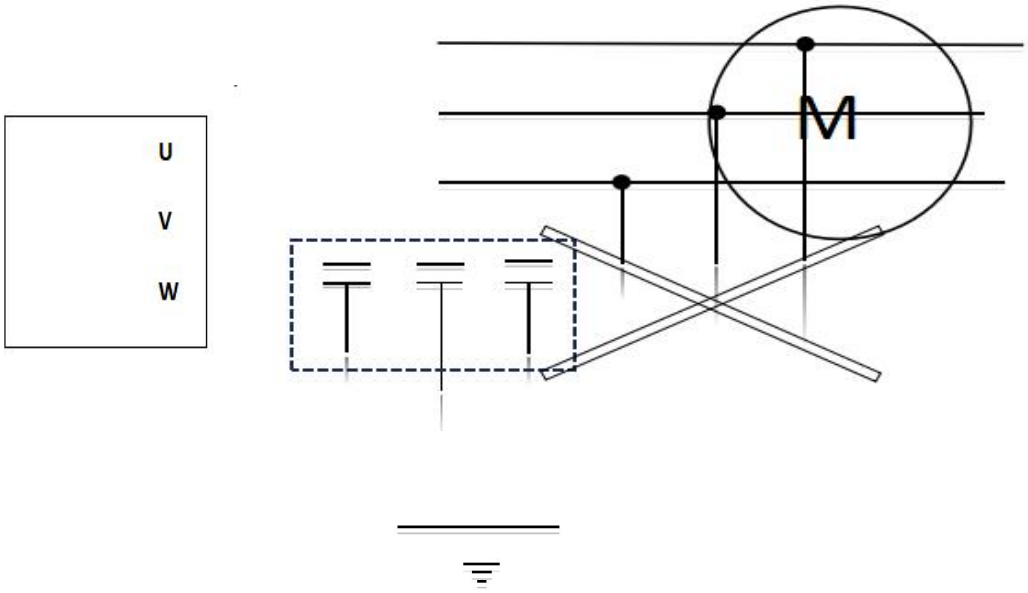


Figure 1-1: Schematic Diagram of Prohibited Capacitors at the Inverter Output

Installing Switching Devices Such as Contactors at the Variable Frequency Drive Output

If you need to install switching devices such as contactors between the inverter output and the motor, ensure that switching operations are performed when the inverter has no output; otherwise, the inverter may be damaged.

Operation Outside the Rated Voltage Range

The inverter is not suitable for use outside its operating voltage range. If necessary, use an appropriate step-up or step-down device to adjust the voltage.

Converting Three-Phase Input to Two-Phase Input

It is not recommended to convert three-phase input to two-phase operation. If conversion to two-phase input is absolutely necessary, derate the inverter accordingly.

Altitude and Derating

In areas where the altitude exceeds 1,000 meters, the thinner air reduces the inverter's heat dissipation efficiency, requiring a derating. Figure 1-2 below shows the relationship between the inverter's rated output current and altitude-based derating.

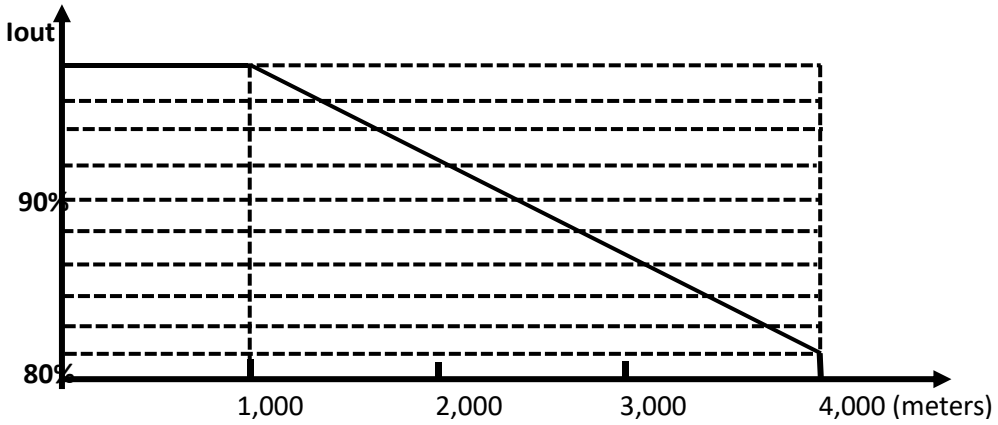


Figure 1-2: Relationship Between the Rated Output Current of a Variable Frequency Drive and Derating at Different Altitudes

AC Drive Output Reactor

When the wiring between the inverter and the motor is long, a very high dV/dt will be generated within the motor windings, which can damage the inter-turn insulation of the motor. Please use an inverter-compatible motor or install an AC output reactor on the output side.

Precautions for Disposal:

Observe the following precautions when disposing of end-of-life inverters and their components.

Capacitors: Capacitors inside the inverter may explode during incineration.

Plastics: Plastic and rubber components on the inverter may emit toxic and harmful gases when burned; exercise extreme caution during combustion.

Disposal: Please dispose of end-of-life inverters as industrial waste.

Chapter 2 Product Information

2.1 Model Description

SD 7XX-200G-T11-ASDA-A
① ② ③ ④ ⑤ ⑥

① SD	②Product	③ Power	④ Voltage Rating	⑤ Functional Differences	⑥ Model
Sunsin Technical Company	7XX Series SD710 SD720 SD750	75G: 75 kW 200G: 200 kW 315G: 315 kW 400G: 400 kW 500G: 500 kW 800G: 800 kW	T 2: Three-phase AC 220 V T 4: Three-phase AC 380 V T 5: Three-phase AC 600 V T 6: Three-phase AC 660 V T11: Three-phase AC 1140 V T23: Three-phase AC 2300 V T33: Three-phase AC 3300 V T60: Three-phase AC 6,000 V T103: Three-phase AC 10 kV	First letter: A: Air-cooled W: Water-cooled Second letter: E: Two-level S: Three-level F: Four-level W: Five-level C: Multilevel Third letter: D: Two-quadrant R: Four-quadrant Fourth letter: A: 6-pulse B: 12-pulse C: 18-pulse D: Multi-pulse	A: Type A B: Type B C: Model C D: Model D And so on

For example:

SD710-160G-T6-ASDA-A means 660V/160kW three-level/two-quadrant drive/air-cooled/integrated unit/Model A

SD720-500G-T11-ASRA-B refers to a 1140V/500kW three-level/four-quadrant drive, air-cooled, non-explosion-proof, Model B

SD750-1000G-T33-WSRA-C refers to a 3300V/1000kW three-level/four-quadrant drive, water-cooled, explosion-proof, Model C

2.2 Technical Specifications:

Function Description		Specifications
Input	Input Voltage (V)	AC 3-phase 187 V (-15%) to 242 V (+10%) Rated voltage: 220 V AC 3-phase 323 V (-15%) to 418 V (+10%) Rated voltage: 380 V AC 3-phase 510 V (-15%) to 660 V (+10%) Rated voltage: 600 V AC 3-phase 561 V (-15%) - 726 V (+10%) Rated voltage: 660 V AC 3PH 969V (-15%) to 1254V (+10%) Rated voltage: 1140V AC 3PH 1955V (-15%) - 2530V (+10%) Rated voltage: 2300V AC 3-phase 2805 V (-15%) to 3630 V (+10%) Rated voltage: 3300 V AC 3PH 5100V (-15%) - 6600V (+10%) Rated voltage: 6000V AC 3PH 8,500 V (-15%) - 11,000 V (+10%) Rated voltage: 10,000 V
	Input	50 Hz/60 Hz, permissible range 47 - 63 Hz
Output	Output Voltage	0 - Input Voltage
	Output	0 - 300 Hz
Technical Specifications Control Performance	Control Modes	Space-Vector Voltage Control Mode Sensorless Vector Control Speed-Sensor-Based Vector Control Mode
	Motor Type	Induction Motor, Permanent Magnet Synchronous Motor
	Speed	Induction Motor 1:200 (SVC), Permanent Magnet Synchronous
Technology Control Performance	Speed Control	±0.2% (PG-less vector control)
	Speed	±0.3% (PG-less vector control)
	Torque	<20 ms (PG-less vector control)
	Torque Control	<10% (PG-less vector control)
	Starting torque	Induction Motor: 0.25 Hz/150% (PG-less vector control)
		Permanent magnet synchronous motor: 2.5 Hz/150% (PG-less
	Overload Capacity	150% of rated current for 60 s
		180% of rated current for 3 s
		200% of rated current for 1 s
Operating	Frequency Setting Methods	Digital setting, analog setting, pulse frequency setting, multi-speed operation setting, simplified PLC setting, PID setting, MODBUS communication setting; supports combination of settings and switching between setting channels
	Automatic	Automatically maintains a constant output voltage when the

	Fault Protection Functions	Provides over 30 types of fault protection functions, including over current, overvoltage, under voltage, over temperature, phase loss, and overload. Records detailed operating status of the inverter at the time of a fault and features an automatic fault reset function
	Speed-Tracking Restart Function	Achieve a smooth, shock-free start for a rotating motor
Peripheral Interfaces	Terminal Analog Inputs	No more than 20 mV
	Terminal Digital Input	No more than 2 ms
	Analog Inputs	2 channels (AI1, AI2) 0-10 V/0-20 mA,
	Analog Outputs	2 channels (AO1, AO2) 0-10 V/0-20 mA
	Digital Inputs	9 multi function terminal inputs, maximum frequency 1 kHz, internal impedance: 2.4 kΩ
	Digital Output	1 Y-terminal open-collector output
	Relay Outputs	2 programmable relay outputs
		TA1 common terminal TB1 normally closed TC1 normally open
		TA1 Common TB1 Normally Closed TC2 Normally Open
		Contact Rating: 1 A/250 V AC, 1 A/30 V DC
Other	Installation Methods	Supports three installation methods: wall-mounted, floor-standing, and flange-mounted
	Operating	-20 to 50° C; derated operation above 40° C
	Mean Time	2 years (at an ambient temperature of 25° C)
	Protection	IP20
	Cooling Method	Air-cooled/Water-cooled

2.3 T2 Voltage Class Power Ammeter AC 220 V

No.	Model	Power (kW)	Rated Input	Rated Output Current (A)
1	7XX-1R5G-T2-AEDA	1.5	6	7
2	7XX-2R2G-T2-AEDA	2.2	9	10
3	7XX-3R7G-T2-AEDA	3.7	13	15
4	7XX-5R5G-T2-AEDA	5.5	18	20
5	7XX-7R5G-T2-AEDA	7.5	27	30
6	7XX-11G-T2-AEDA	11	38	42
7	7XX-15G-T2-AEDA	15	50	55
8	7XX-18R5G-T2-AEDA	18.5	63	70
9	7XX-22G-T2-AEDA	22	72	80
10	7XX-30G-T2-AEDA	30	99	110
11	7XX-37G-T2-AEDA	37	117	130
12	7XX-45G-T2-AEDA	45	144	160
13	7XX-55G-T2-AEDA	55	180	200
14	7XX-75G-T2-AEDA	75	234	260
15	7XX-90G-T2-AEDA	90	288	320
16	7XX-110G-T2-AEDA	110	342	380
17	7XX-132G-T2-AEDA	132	378	420
18	7XX-160G-T2-AEDA	160	495	550
19	7XX-185G-T2-AEDA	185	540	600
20	7XX-200G-T2-WEDA	200	594	660
21	7XX-220G-T2-WEDA	220	648	720
22	7XX-250G-T2-WEDA	250	729	810
23	7XX-280G-T2-WEDA	280	837	930
24	7XX-315G-T2-WEDA	315	900	1,000
25	7XX-350G-T2-WEDA	350	990	1,100
26	7XX-375G-T2-WEDA	375	1035	1150
27	7XX-400G-T2-WEDA	400	1080	1200
28	7XX-450G-T2-WEDA	450	1242	1380

2.4 T4 Voltage Class Power and Current Meter AC380V

No.	Model	Power (kW)	Rated Input	Rated Output Current (A)
1	7XX-2R2G-T4-AEDA	2.2	4.5	5
2	7XX-3R7G-T4-AEDA	3.7	6.6	7.3
3	7XX-5R5G-T4-AEDA	5.5	12	13
4	7XX-7R5G-T4-AEDA	7.5	15	17
5	7XX-11G-T4-AEDA	11	23	25
6	7XX-15G-T4-AEDA	15	30	33
7	7XX-18R5G-T4-AEDA	18.5	34	38
8	7XX-22G-T4-AEDA	22	41	45
9	7XX-30G-T4-AEDA	30	54	60
10	7XX-37G-T4-AEDA	37	68	75
11	7XX-45G-T4-AEDA	45	82	91
12	7XX-55G-T4-AEDA	55	100	112
13	7XX-75G-T4-AEDA	75	135	150
14	7XX-90G-T4-AEDA	90	162	180
15	7XX-110G-T4-AEDA	110	189	210
16	7XX-132G-T4-AEDA	132	225	250
17	7XX-160G-T4-AEDA	160	279	310
18	7XX-185G-T4-AEDA	185	315	350
19	7XX-200G-T4-AEDA	200	342	380
20	7XX-220G-T4-AEDA	220	373	415
21	7XX-250G-T4-AEDA	250	423	470
22	7XX-280G-T4-WEDA	280	459	510
23	7XX-315G-T4-WEDA	315	540	600
24	7XX-350G-T4-WEDA	350	594	660
25	7XX-375G-T4-WEDA	375	612	680
26	7XX-400G-T4-WEDA	400	675	750
27	7XX-450G-T4-WEDA	450	765	850
28	7XX-500G-T4-WEDA	500	810	900
29	7XX-560G-T4-WEDA	560	855	950
30	7XX-630G-T4-WEDA	630	900	1000
31	7XX-710G-T4-WEDA	710	1134	1260

2.5 T5 Voltage-Rated Power and Current Meter AC 600 V

No.	Model	Power	Rated Input	Rated Output Current (A)
1	7XX-55G-T5-AEDA	55	63	70
2	7XX-75G-T5-AEDA	75	82	90
3	7XX-90G-T5-AEDA	90	98	108
4	7XX-110G-T5-AEDA	110	120	132
5	7XX-132G-T5-AEDA	132	143	158
6	7XX-160G-T5-AEDA	160	175	192
7	7XX-185G-T5-AEDA	185	202	222
8	7XX-200G-T5-AEDA	200	218	240
9	7XX-220G-T5-AEDA	220	240	264
10	7XX-250G-T5-AEDA	250	273	300
11	7XX-280G-T5-AEDA	280	305	336
12	7XX-315G-T5-AEDA	315	343	378
13	7XX-355G-T5-AEDA	355	387	426
14	7XX-400G-T5-WEDA	400	436	480
15	7XX-450G-T5-WEDA	450	490	540
16	7XX-500G-T5-WEDA	500	545	600
17	7XX-560G-T5-WEDA	560	595	660
18	7XX-630G-T6-WEDA	630	620	690
19	7XX-710G-T5-WEDA	710	690	770
20	7XX-800G-T5-WEDA	800	785	870
21	7XX-900G-T5-WEDA	900	880	980
22	7XX-1000G-T5-WEDA	1000	980	1090
23	7XX-1100G-T5-WEDA	1100	1135	1260
24	7XX-1250G-T5-WEDA	1250	1,225	1,360
25	7XX-1400G-T5-WEDA	1400	1375	1525
26	7XX-1600G-T5-WEDA	1600	1565	1740
27	7XX-1800G-T5-WEDA	1800	1765	1960
28	7XX-2000G-T5-WEDA	2000	1980	2200

2.6 T6 Voltage Class Power Ammeter AC 660 V

No.	Model	Power	Rated Input	Rated Output Current (A)
1	7XX-22G-T6-AEDA	22	21	27
2	7XX-30G-T6-AEDA	30	29	37
3	7XX-37G-T6-AEDA	37	35	45
4	7XX-45G-T6-AEDA	45	43	55
5	7XX-55G-T6-AEDA	55	53	68
6	7XX-75G-T6-AEDA	75	69	86
7	7XX-90G-T6-AEDA	90	83	100
8	7XX-110G-T6-AEDA	110	101	120
9	7XX-132G-T6-AEDA	132	122	150
10	7XX-160G-T6-AEDA	160	147	175
11	7XX-200G-T6-AEDA	200	184	215
12	7XX-220G-T6-AEDA	220	200	230
13	7XX-250G-T6-AEDA	250	230	260
14	7XX-280G-T6-AEDA	280	260	299
15	7XX-315G-T6-AEDA	315	290	330
16	7XX-355G-T6-AEDA	355	330	374
17	7XX-400G-T6-WEDA	400	368	410
18	7XX-450G-T6-WEDA	450	407	465
19	7XX-500G-T6-WEDA	500	460	550
20	7XX-560G-T6-WEDA	560	508	600
21	7XX-630G-T6-WEDA	630	600	680
22	7XX-710G-T6-WEDA	710	640	750
23	7XX-800G-T6-WEDA	800	724	840
24	7XX-900G-T6-WEDA	900	820	945
25	7XX-1000G-T6-WEDA	1000	930	1050
26	7XX-1100G-T6-WEDA	1100	1036	1150
27	7XX-1250G-T6-WEDA	1250	1136	1250
28	7XX-1400G-T6-WEDA	1400	1288	1400
29	7XX-1600G-T6-WEDA	1600	1472	1600
30	7XX-1800G-T6-WEDA	1800	1,656	1,800
31	7XX-2000G-T6-WEDA	2000	1840	2000

2.7 T11 Voltage Class Power and Current Meter AC 1140 V

No.	Model	Power (kW)	Rated Input	Rated Output Current (A)
1	7XX-37G-T11-ASDA	37	20	25
2	7XX-45G-T11-ASDA	45	26	30
3	7XX-55G-T11-ASDA	55	34	37
4	7XX-75G-T11-ASDA	75	47	50
5	7XX-90G-T11-ASDA	90	56	59
6	7XX-110G-T11-ASDA	110	68	70
7	7XX-132G-T11-ASDA	132	82	91
8	7XX-160G-T11-ASDA	160	98	117
9	7XX-185G-T11-ASDA	185	115	125
10	7XX-200G-T11-ASDA	200	122	130
11	7XX-220G-T11-ASDA	220	136	148
12	7XX-250G-T11-ASDA	250	150	157
13	7XX-280G-T11-ASDA	280	171	181
14	7XX-315G-T11-ASDA	315	185	200
15	7XX-355G-T11-ASDA	355	214	226
16	7XX-400G-T11-ASDA	400	235	248
17	7XX-450G-T11-ASDA	450	260	281
18	7XX-500G-T11-WSDA	500	290	310
19	7XX-560G-T11-WSDA	560	320	348
20	7XX-630G-T11-WSDA	630	370	400
21	7XX-710G-T11-WSDA	710	420	450
22	7XX-800G-T11-WSDA	800	460	500
23	7XX-900G-T11-ASDA	900	510	550
24	7XX-1000G-T11-WSDA	1000	575	620
25	7XX-1250G-T11-WSDA	1250	690	750
26	7XX-1400G-T11-WSDA	1400	775	840
27	7XX-1600G-T11-WSDA	1600	885	960
28	7XX-1800G-T11-WSDA	1800	995	1080
29	7XX-2000G-T11-WSDA	2000	1100	1200

2.8 T23 Voltage-Rated Power and Current Meter AC 2300 V

No.	Model	Power	Rated Input	Rated Output Current (A)
1	7XX-37G-T23-WSDA	37	11	13
2	7XX-45G-T23-WSDA	45	13	15
3	7XX-55G-T23-WSDA	55	17	19
4	7XX-75G-T23-WSDA	75	23	25
5	7XX-90G-T23-WSDA	90	27	30
6	7XX-110G-T23-WSDA	110	32	35
7	7XX-132G-T23-WSDA	132	43	46
8	7XX-160G-T23-WSDA	160	52	58
9	7XX-200G-T23-WSDA	200	58	65
10	7XX-220G-T23-WSDA	220	68	75
11	7XX-250G-T23-WSDA	250	72	80
12	7XX-280G-T23-WSDA	280	79	90
13	7XX-315G-T23-WSDA	315	89	100
14	7XX-355G-T23-WSDA	355	98	114
15	7XX-400G-T23-WSDA	400	109	124
16	7XX-450G-T23-WSDA	450	125	140
17	7XX-500G-T23-WSDA	500	151	165
18	7XX-560G-T23-WSDA	560	159	174
19	7XX-630G-T23-WSDA	630	189	200
20	7XX-710G-T23-WSDA	710	203	225

2.9 T33 Voltage-Rated Power Current Meter AC3300V

No.	Model	Power (kW)	Rated Input	Rated Output Current (A)
1	7XX-250G-T33-WSDA	250	49	54
2	7XX-280G-T33-WSDA	280	55	60
3	7XX-315G-T33-WSDA	315	61	68
4	7XX-355G-T33-WSDA	355	69	76
5	7XX-400G-T33-WSDA	400	78	86
6	7XX-450G-T33-WSDA	450	88	97
7	7XX-500G-T33-WSDA	500	100	108
8	7XX-560G-T33-WSDA	560	109	121
9	7XX-630G-T33-WSDA	630	125	136
10	7XX-710G-T33-WSDA	710	137	153
11	7XX-855G-T33-WSDA	855	170	185
12	7XX-900G-T33-WSDA	900	175	194
13	7XX-1000G-T33-WSDA	1000	201	216
14	7XX-1120G-T33-WSDA	1120	227	242
15	7XX-1250G-T33-WSDA	1250	245	270
16	7XX-1400G-T33-WSDA	1400	275	302
17	7XX-1600G-T33-WSDA	1600	315	346
18	7XX-1800G-T33-WSDA	1800	353	389
19	7XX-2000G-T33-WSDA	2000	398	432
20	7XX-2240G-T33-WSDA	2240	453	484
21	7XX-2500G-T33-WSDA	2500	495	540
22	7XX-2800G-T33-WSDA	2,800	550	605
23	7XX-3150G-T33-WSDA	3150	625	680
24	7XX-3550G-T33-WSDA	3550	713	767
25	7XX-4000G-T33-WSDA	4000	794	864
26	7XX-4500G-T33-WSDA	4,500	895	972

3.0 T60 Voltage-Rated Power and Current Meter AC 6000 V

	Model	Power (kW)	Rated Input	Rated Output Current (A)
1	7XX-250G-T60-WSDA	250	24	27
2	7XX-315G-T60-WSDA	315	32	35
3	7XX-355G-T60-WSDA	355	35	39
4	7XX-400G-T60-WSDA	400	40	44
5	7XX-450G-T60-WSDA	450	47	50
6	7XX-500G-T60-WSDA	500	50	55
7	7XX-560G-T60-WSDA	560	57	62
8	7XX-630G-T60-WSDA	630	63	69
9	7XX-710G-T60-WSDA	710	71	78
10	7XX-800G-T60-WSDA	800	80	88
11	7XX-900G-T60-WSDA	900	92	99
12	7XX-1000G-T60-WSDA	1000	102	110
13	7XX-1250G-T60-WSDA	1250	126	137
14	7XX-1400G-T60-WSDA	1400	141	154
15	7XX-1600G-T60-WSDA	1600	161	176
16	7XX-1800G-T60-WSDA	1800	182	198
17	7XX-2000G-T60-WSDA	2000	202	220
18	7XX-2240G-T60-WSDA	2240	227	246
19	7XX-2500G-T60-WSDA	2500	253	275
20	7XX-2800G-T60-WSDA	2800	285	308
21	7XX-3150G-T60-WSDA	3150	323	350
22	7XX-3550G-T60-WSDA	3550	358	390
23	7XX-4000G-T60-WSDA	4000	405	440
24	7XX-4500G-T60-WSDA	4500	461	500

3.1 T103 Voltage-Rated Power and Current Meter AC 10,000 V

	Model	Power (kW)	Rated Input	Rated Output Current (A)
1	7XX-250G-T103-ACDD	250	13	14
2	7XX-280G-T103-ACDD	280	15	16
3	7XX-315G-T103-ACDD	315	16	18
4	7XX-355G-T103-ACDD	355	18	20
5	7XX-400G-T103-ACDD	400	21	23
6	7XX-450G-T103-ACDD	450	24	26
7	7XX-500G-T103-ACDD	500	26	29
8	7XX-560G-T103-ACDD	560	29	32
9	7XX-630G-T103-ACDD	630	32	36
10	7XX-710G-T103-ACDD	710	37	41
11	7XX-800G-T103-ACDD	800	41	46
12	7XX-900G-T103-ACDD	900	47	52
13	7XX-1000G-T103-ACDD	1000	52	58
14	7XX-1120G-T103-ACDD	1120	60	65
15	7XX-1250G-T103-ACDD	1250	65	72
16	7XX-1400G-T103-ACDD	1400	73	81
17	7XX-1600G-T103-ACDD	1600	83	92
18	7XX-1800G-T103-ACDD	1800	95	104
19	7XX-2000G-T103-ACDD	2000	105	115
20	7XX-2250G-T103-ACDD	2250	118	130
21	7XX-2500G-T103-ACDD	2500	131	144
22	7XX-2800G-T103-ACDD	2,800	147	162
23	7XX-3150G-T103-ACDD	3150	165	182
24	7XX-3500G-T103-ACDD	3500	183	202
25	7XX-4000G-T103-ACDD	4,000	210	231
20	7XX-4500G-T103-ACDD	4500	236	260
21	7XX-5000G-T103-ACDD	5,000	262	289
22	7XX-6300G-T103-ACDD	6300	331	364
23	7XX-7XX0G-T103-ACDD	7XX0	367	404
24	7XX-8000G-T103-ACDD	8000	420	462
25	7XX-10000G-T103-ACDD	10,000	525	577

Chapter 3 Installation and Wiring

3.1 Installation Environment Requirements

1. Install in an indoor location with ventilation openings or an air exchange system; generally, install vertically.
2. Ambient temperature: -20 to 50° C. If the temperature exceeds 40° C, forced cooling must be used, or the unit must be derated.
3. Avoid high-temperature and high-humidity environments as much as possible; humidity should be less than 95%, and there should be no frost or water condensation.
4. Avoid installing in locations exposed to direct sunlight.
5. Avoid installation in environments containing flammable, explosive, or corrosive gases or liquids.
6. Install in an environment free of dust, airborne fibers, and metal particles.
7. The mounting surface must be sturdy and vibration-free, or vibrations must be less than 5.9 m/s² (0.6 g).
8. Keep the unit away from sources of electromagnetic interference.

3.2 Inverter Wiring

3.2.1 Main Circuit Terminal Wiring

I. Connection of the Variable Frequency Drive to Optional Accessories

1. A clearly identifiable isolating switch or similar disconnecting device must be installed between the power grid and the drive to ensure safety during equipment maintenance.
2. A circuit breaker or fuse with overcurrent protection must be installed upstream of the inverter to prevent the failure of downstream equipment from causing the scope of the fault to expand.
3. When the VFD is used for power supply control, it must not be used to control the start and stop of the VFD itself.
4. If the power grid waveform is severely distorted, or if the mutual interference of higher-order harmonics between the power supply and the inverter still fails to meet requirements even after a DC reactor has been installed, or to improve the power factor on the inverter's input side, an AC input reactor may be added.
5. An input-side EMI filter can suppress high-frequency noise interference emitted from the inverter's power supply lines.
6. To protect the inverter, suppress higher-order harmonics, and mitigate the impact of the power supply on the inverter, install a DC reactor under the following conditions:

a. When a switch-mode reactive power compensation capacitor cabinet or a thyristor-controlled phase-controlled load is present at the same power supply

node as the inverter, reactive power transients caused by the switching of the capacitor cabinet—resulting in sudden changes in line voltage—along with harmonics and grid notches caused by the phase-controlled load, may damage the inverter's input rectifier bridge circuit.

b. When the power factor at the inverter's input must be increased to 0.93 or higher, when the unbalance of the three-phase power supply exceeds 3%, or when the inverter is connected to a high-capacity transformer, the current flowing through the inverter's input power circuit may damage the rectifier circuit. When the capacity of the inverter's power supply exceeds 550 kVA, or when the power supply capacity exceeds 10 times the inverter's capacity, a DC reactor must be installed.

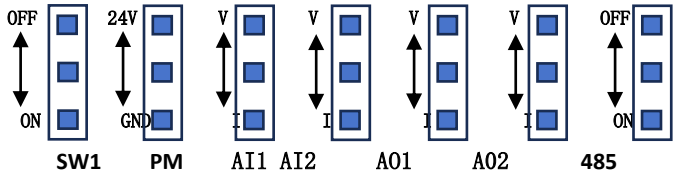
II. Main Circuit Terminal Block Description

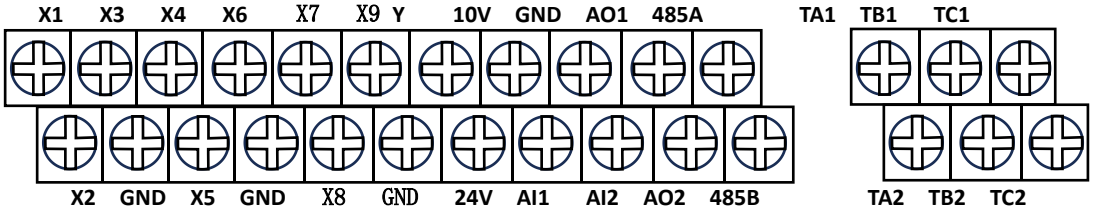
The table below lists the functions of each terminal on the main circuit terminal block:

Terminal Symbols	Function Description (Non-Explosion-Proof)
R, S, T	Connect to the three-phase AC power supply
U, V, W	Connect to a three-phase AC motor
P, P+	Positive busbar, positive busbar+ (connected to a DC reactor)
O, N	Neutral point, negative busbar (not the
PE	Ground

Terminal Symbol	Function Description (Explosion-Proof)
R, S, T	Connect to the three-phase AC power supply from the utility grid
U, V, W	Connect to a three-phase AC motor
P, P+	Positive busbar, positive busbar+ (connected to DC reactor)

3.2.2 Control Circuit Wiring (Inverter Side)





1. Control Circuit Terminal Function Description

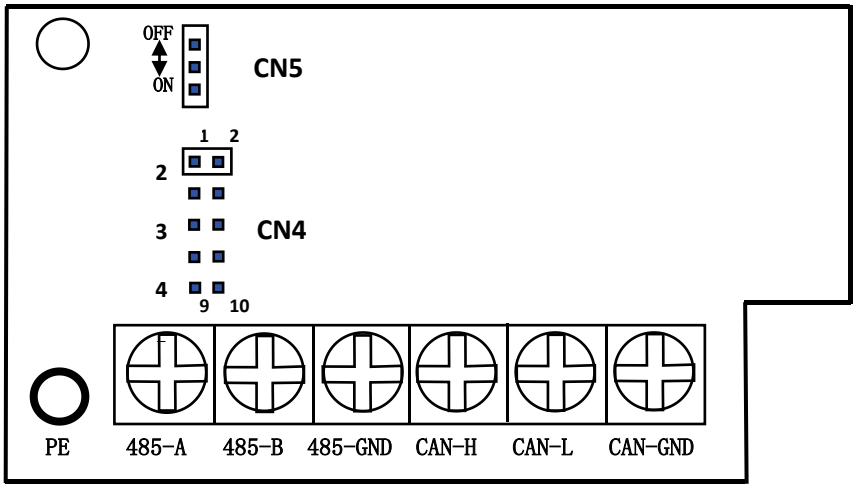
Type	Terminal	Terminal Function	Remarks
Power Output	10V	10V/10mA Power Supply	
	GND	Common terminal for power supply,	
	24V	24V/50mA power supply provided to external devices (the GND terminal	
Analog Input	AI1	Analog voltage/current signal	0 - 10V/0-
	AI2	Analog Voltage/Current Signal	0-10 V/0-20
Digital Input Control Terminals	X1	Multifunction Input Terminal 1	When PM is connected to 24V, the multifunction terminal is active when closed to GND; when PM is connected to GND, the
	X2	Multifunction Input Terminal 2	
	X3	Multifunction Input Terminal 3	
	X4	Multifunction Input Terminal 4	
	X5	Multifunction Input Terminal 5	
	X6	Multifunction Input Terminal 6	
	X7	Multifunction Input Terminal 7	
	X8	Multifunction Input Terminal 8	
	X9	Multifunction Input Terminal 9	
Analog Output	AO1	Programmable voltage output	0-10 V / 0-
	AO2	Programmable voltage output	0-10 V/0-20
OC output	Y	Programmable open-collector output set by parameter F5-27	Maximum load current 50 mA, maximum
Programmable relay output	TA1-TB1-TC1	Programmable relay outputs, configured via parameter F5-28	Contact rating:

	TA2-TB2-TC2	Programmable relay output, configured via parameter F5-29	
RS-485 communication	485A	RS485 Communication Terminal A	
	485B	RS-485 Communication Terminal B	

2. Jumper Instructions

PM Jumper	Connect to 24V; shorting the X terminal to GND enables it
AI1 Jumper	When connected to V, AI1 accepts 0 - 10 V Connect to I; AI1 accepts 0 - 20 mA
AI2 Jumper	Connect to V; AI2 accepts 0 - 10 V Connect to I; AI2 accepts 0 - 20 mA
AO1 jumper	Connect to I; AO1 outputs 0 - 20 mA When connected to V, AO1 outputs 0 - 10 V
AO2 Jumper	Set to I; AO2 outputs 0 - 20 mA Connect to V: AO1 outputs 0 - 10 V
485 Jumper	Whether the 485 impedance matching resistor is connected; ON means
SW1 Jumper	Whether the common-mode capacitance ground is connected; ON means

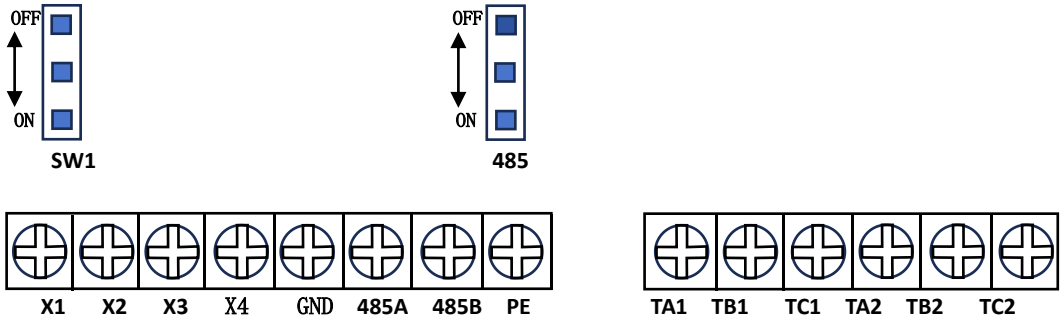
3.2.3 Communication Board Wiring



RS-485 Communication	485A 485B	RS485 Communication Terminal Blocks
PE	PE	Ground Terminal
485 GND	485 GND	485 Communication Loop Ground Terminal
CAN GND	CAN GND	CAN Communication Loop Ground Terminal

CAN Communication	CAN-H CAN-L	CAN Communication Terminal Block
Impedance Matching Resistor	CN5	Jumper Cap: Set to ON for 485 communication; connect the impedance-matching resistor (120Ω)
	CN4	Set jumper caps to 2, 3, 4, 5, or 6 for CAN communication; connect an impedance-matching resistor (120Ω) Set to 2 for two master-slave units, to 3 for three master-slave units, and so on.

3.2.4 Control Circuit Wiring (Rectifier Side)



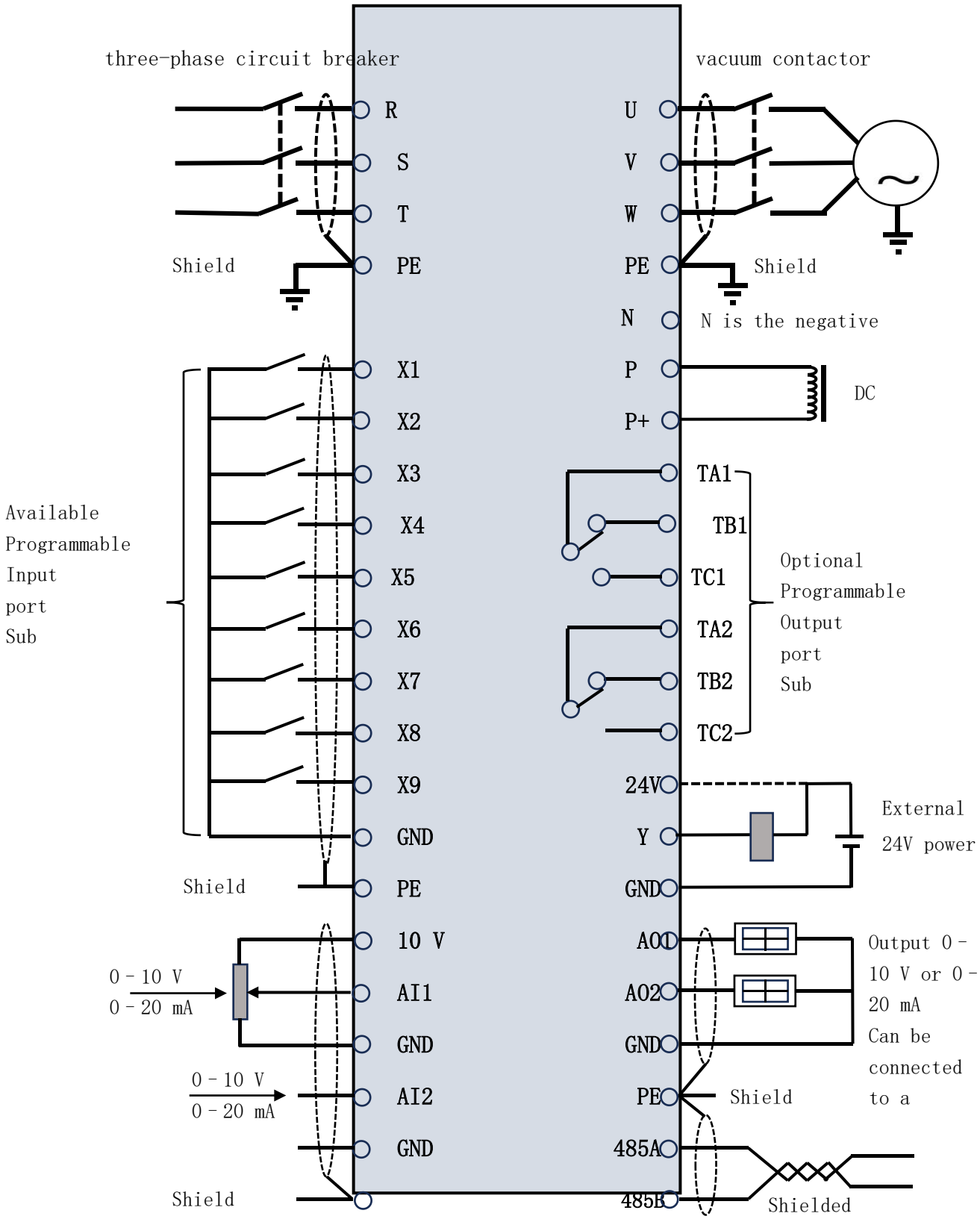
1. Jumper Instructions

485 Jumper	Whether the 485 impedance matching resistor is connected; "ON" means connected, "OFF" means not connected
SW1 Jumper	Whether the common-mode capacitance is grounded; "ON" means connected, "OFF" means not connected

2. Control Circuit Terminal Function Description

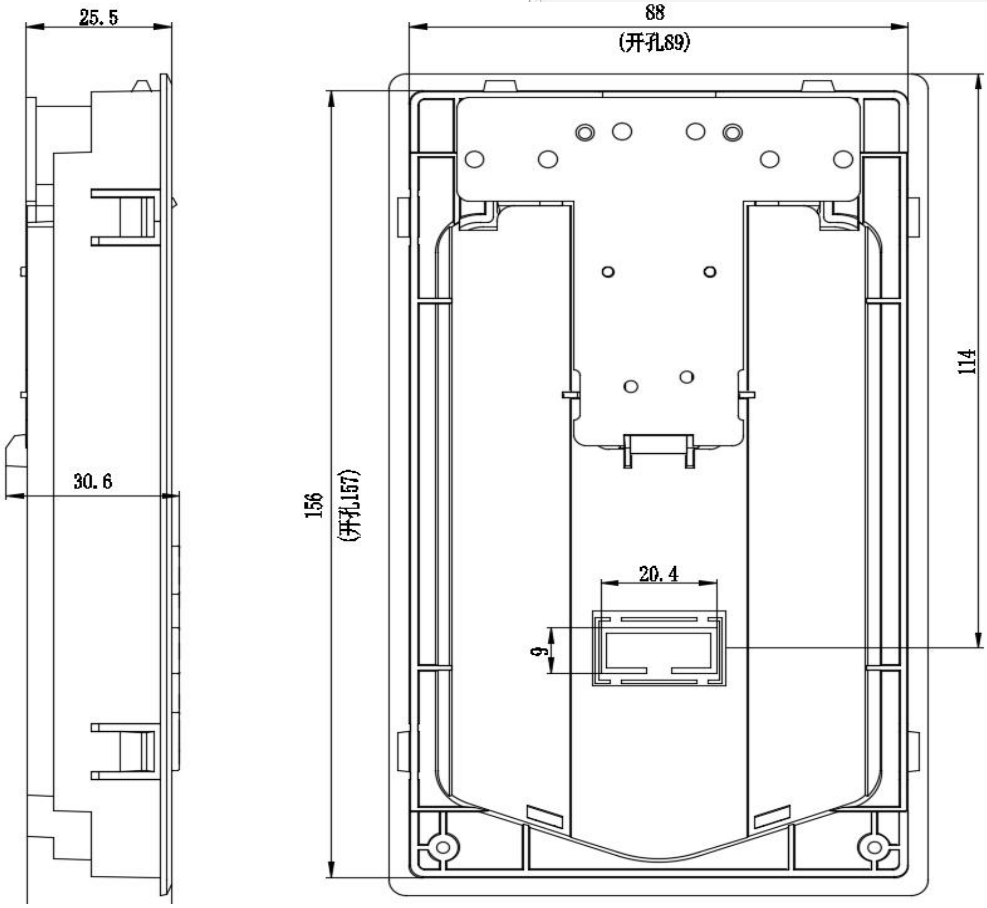
Digital Inputs Input Control Terminals	X1	Multifunction Input Terminal 1	The specific functions of the multifunction input terminals
	X2	Multifunction Input Terminal 2	
	X3	Multifunction Input Terminal 3	
	X4	Multifunction Input Terminal 4	
RS485 Communication	RS485A	RS485 Communication Terminal A	
	RS485B	RS485 Communication Terminal B	
Programmable Relay Output	TA1-TB1-TC1	Programmable relay output, set via parameter F5-28	Contact rating: resistive load AC 250 V/1 A
	TA2-TB2-TC2	Programmable relay output, set by parameter F5-29	

3.2.6 Basic Operating Wiring Diagram



Keyboard cutout dimensions:

(SOP-70: LCD keyboard; KB-10: LED display keyboard; both keyboards have the same



Chapter 4 Inverter Operation and User Manual

4.1 Explanatory Notes

Terms describing the inverter's control, operation, and status will be used frequently in subsequent chapters. Please read this chapter carefully to ensure you understand and can correctly use the features mentioned later.

4.1.1 Operation Command Channels of the Variable Frequency Drive

This refers to the physical channels through which the variable frequency drive receives operating commands such as Run, Stop, and Jog. There are three types:

Control Panel: Control is performed via the Start, Stop, and MF.K buttons on the control panel

External Terminals: Control via FWD, REV, GND, and Si (three-wire control)

Communication Interface: Start and stop control via the host computer's RS485 or CAN communication interface

The command operation channel can be selected via parameter F0-02. When using external terminals for control, the external terminal control mode must be further specified via parameter F5-15, which includes Two-Wire 1, Two-Wire 2, Three-Wire 1, and Three-Wire 2.

4.1.2 Inverter Frequency Setpoint Channels

The inverter has multiple independent frequency setpoint channels:

0/1: Set the operating frequency using the keyboard's up and down arrows

2: AI1 (0 - 10 V/0 - 20 mA)

3: AI2 (0 - 10 V/0 - 20 mA)

5: Process Closed-Loop

6: Multi-speed control

7: Basic PLC

8: UP/DW Terminal Setpoint

9: Modbus communication setpoint

10: CAN Card Input

11: Terminal Pulse Input

12: Custom Function Applications

Various frequency setpoint channels can also be combined in multiple ways to serve as the final frequency setpoint

(See the descriptions for F0-03 to F0-06 for details)

4.2 Inverter Operating States

The inverter's operating states are divided into stop, run, and fault states.

Stop State: After the inverter is powered on and initialized, if no run command is input to the inverter or a stop command is input during operation, the inverter enters the stop state.

Running State: Upon receiving a run command, the inverter enters the running state.

Fault State: If a fault occurs within the inverter or an external fault is reported to the inverter, the inverter will inhibit its output (at which point the output voltage is 0) and enter the fault state.

4.3 Control Panel Description

4.3.1 Button Function Descriptions

Button Symbol	Name	Function Description
	Menu Button	Enter or exit the menu
	Confirmation Key	Navigate through menu levels; confirm parameter settings
▲	UP Key	Increment data or function codes
▼	DW Decrease Key	Decrement data or function codes
◄ ►	Shift Key	In monitoring mode, press this key to cycle through the configured monitoring parameters; when modifying parameters, use this key to shift through the modifiable bits
Start	Run Key	In keyboard operation mode, this key is used to execute operations
MF.K	Multifunction Key	Determined by F9-10 (default is the Invert key)
Stop	Stop/Reset Key	During operation, this key can be used to stop the operation (F0－19) or to confirm ( ); in the event of a fault, it can be used to reset the fault.

4.3.2 Indicator Light Descriptions

Symbol Description	Indicator Description
HZ	Frequency unit (hertz)
A	Current unit (ampere)
V	Unit of voltage (volt)
FWD	Forward Operation Indicator
REV	Reverse operation indicator light
	A steady green light indicates operation
	A steady red light indicates a fault A flashing red light indicates a warning

4.4 Digital Display Area

5-digit LED display capable of showing various monitoring data—such as set frequency and output frequency—as well as alarm codes.

4.5 Operating Procedure

4.5.1 Function Parameter Settings

The three-level menu consists of:

1. Function Code Parameters (Level 1 Menu)
2. Function Code Labels (Second-Level Menu)
3. Function Code Setpoints (Third-Level Menu)

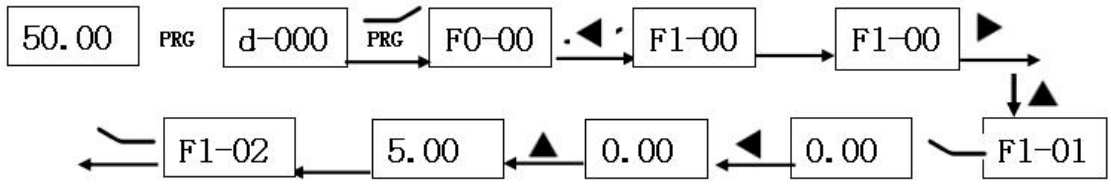
Note: When navigating the third-level menu, you can press the PRG key or the SET key to return to the second-level menu. The difference between the two is as follows: pressing the SET key saves the set parameters to the control board and then returns to the second-level menu, while pressing the PRG key returns directly to the second-level menu without saving the parameters.

4.5.2 Monitoring Parameter Query

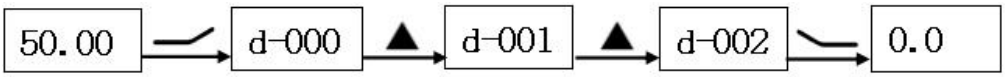
There are two scenarios for querying monitoring parameters. In one scenario, while the inverter is running, you can press the “Shift” key to cycle through the display of the user’s eight most frequently used parameters (defined by F9-20 to F9-27). In the other scenario, you can view status parameters of interest by checking the d parameters.

The LED display operation is as follows:

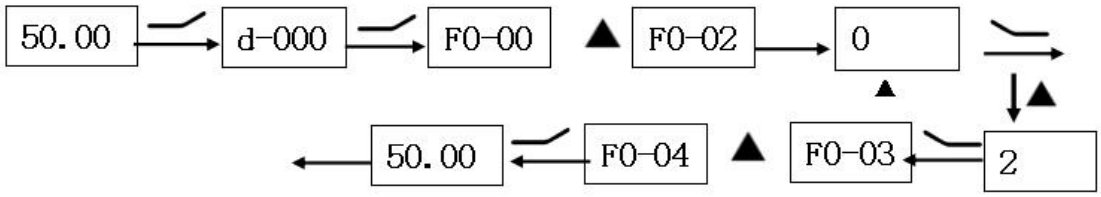
Example: To change inverter parameter F1-01 from 0.00 Hz to 5.00 Hz, as shown in the figure below:



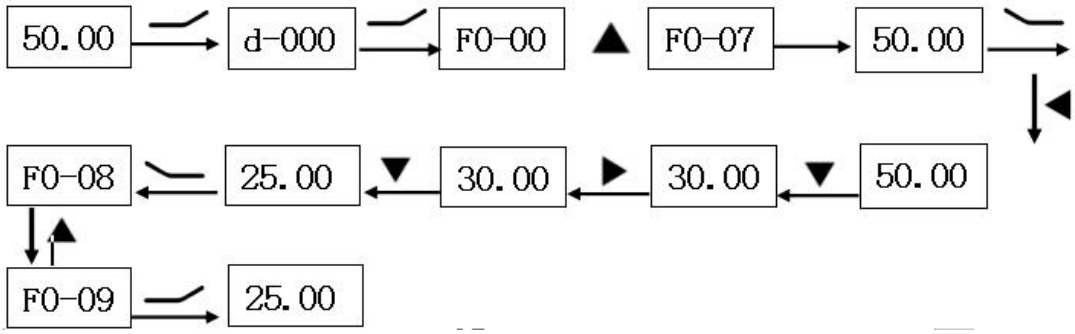
Example: View the value of D-02 (inverter output current) as shown in the figure below:



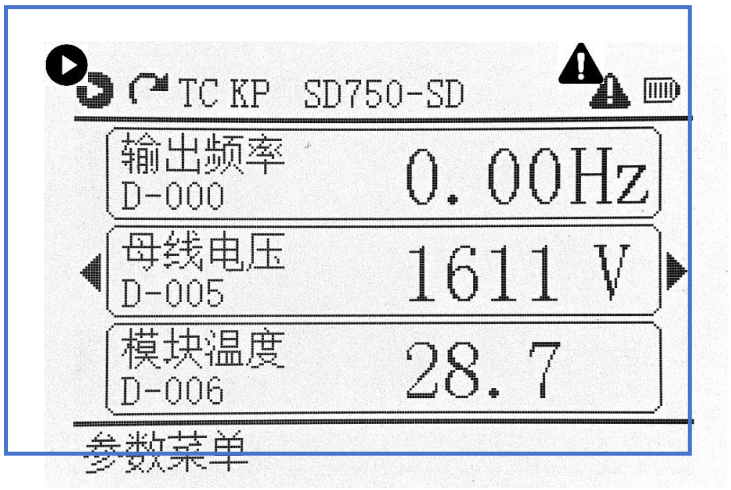
Example: To adjust the value of inverter parameter F0-02=2, as shown in the figure below:



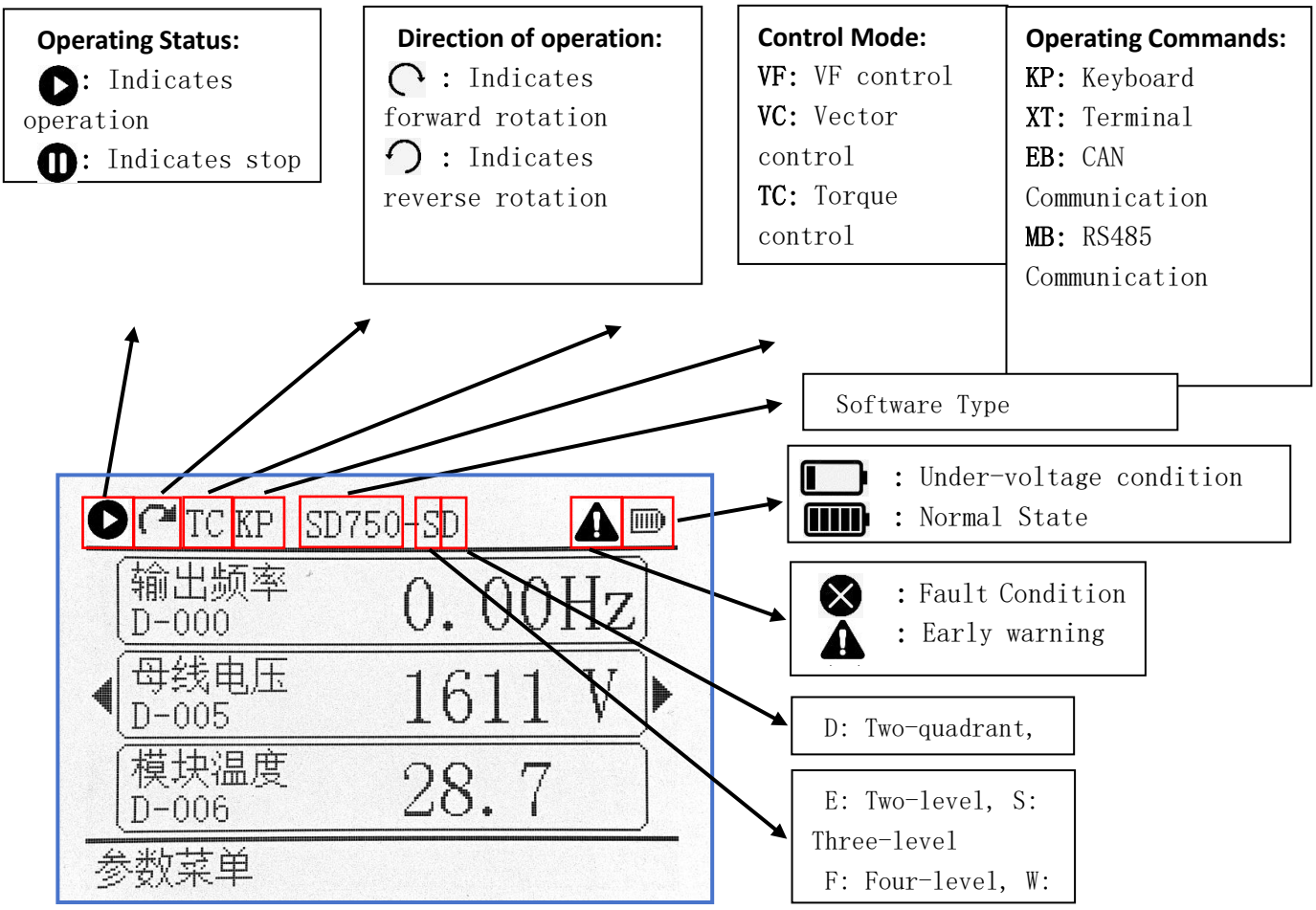
Example: To adjust the value of frequency F0-07=25 on a variable-frequency drive, as shown in the figure below:



LCD Display:



The key operations on the LCD screen are the same as those on the LED display. The following describes the information displayed on the LCD screen:



1、 Whether the LCD keyboard is running or not, pressing the left arrow ◄ or right arrow ► keys allows you to switch between and view the preset monitoring

parameters.

2、 On the parameter group and parameter setting group screens, the left ◀ and right ▶ keys move forward or backward through five parameters; on the parameter setting value screen, the left ◀ and right ▶ keys are used for shifting selection. Press and hold the ▶ key to enter the value input field, where the left ◀ and right ▶ keys are also used for shifting selection.

3、 The green light on the left side of the keypad is the operation indicator, and the red light on the right is the warning or fault indicator.

4、 In the parameter menu, press and hold the right arrow key ▶ to cycle through the displayed content.

Display of various letter combinations on the keypad:

Prompt codes	LCD Display	LED Display	Tip Name	Countermeasures
1		runF	Execution prohibited	
2		tunE	Tune Operation	
3		rJoG	Jog Operation	
4		PAuS	Pause Operation	
5		Pend	Run Pending	
6		dcb	DC Braking	
7		FYt	Speed Tracking	
8		FrdF	Forward Operation Disabled	
9		rEuF	Reverse operation prohibited	
10		PAd	Keyboard commands are enabled	
11		TERL	Terminal commands are enabled	
12		rBuS	485 command valid	
13		CArd	CAN command valid	
14		Loc	Keyboard lock is enabled	
15		ULoc	Keyboard unlocked	

16		bASE	Basic Menu	
17		Aduc	Advanced Menu	
18		cuSt	Custom Menu	
19		dEFu	Default Value Comparison Menu	
20		PASS	Password Verification Passed	
21		FAIL	Password verification failed	
22		-rST	Restoring parameters	
23		-don	Parameter macro in progress	

4.5.3 Fault Reset

When a fault occurs in the inverter, it will display the relevant fault information. The user can reset the fault using the “Stop” key on the keyboard or via the external terminal function (set in Group F5). After the fault is reset, the inverter enters standby mode. If the inverter remains in a fault state and the user does not reset it, the inverter enters a run protection state and cannot operate.

4.6 Drive Operation

4.6.1 Power-On Initialization

During the power-up process, the system first performs initialization. The DC bus voltage of the inverter rises from low to high, and the LED displays “-SSd-.” When the voltage reaches a certain value, the inverter enters standby mode, and the LED displays the set frequency while continuously flashing.

4.6.2 Drive Operation

The inverter can be started via the keypad, external terminals, or communication (see F0-02). While the inverter is in standby or running mode, the user can monitor 399 status variables (see d parameters).

4.6.3 Keypad Control (F0-02=0)

Press the “Start” key to start the drive in the forward direction; press the “Stop” key to stop the drive. Depending on the setting in F9-10, “MF.K” can function as a reverse key; pressing “MF.K” once initiates reverse operation.

4.7 Terminal Control (F0-02=1)

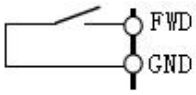
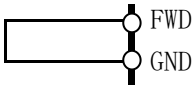
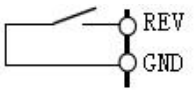
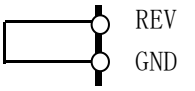
When selecting terminal control mode, choose the appropriate mode based on

actual field requirements. The inverter provides four terminal control modes, which can be selected via F5-15.

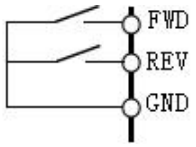
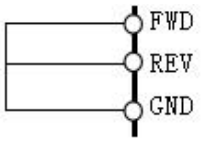
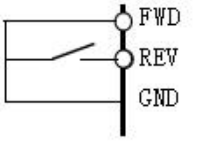
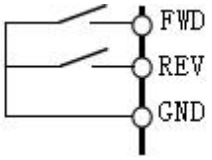
FWD is the external multifunction input terminal for selecting forward rotation; this terminal is designated as FWD.

REV selects the reverse rotation function via the external multifunction input terminal; this terminal is designated as REV.

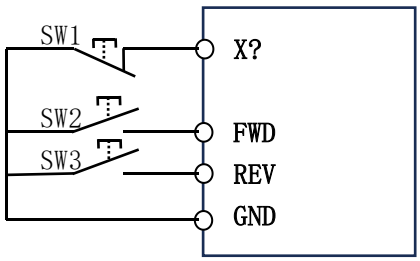
0: 2-wire 1

Command	Stop	Run	Forward command	Reverse Command
Terminal Status				

1: 2-wire system 2

Command	Stop	Run	Forward Command	Reverse Command
Terminal Status				

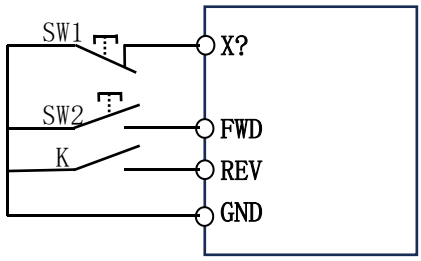
2: 3-wire system 1



3-wire system 1

Three-wire system 1: As shown in the figure above, X? is the three-wire operation control terminal, which selects any one of the input terminals X1 – X9 via parameters F5-16 to F5-24. SW1 is the inverter stop trigger switch, SW2 is the forward rotation trigger switch, and SW3 is the reverse rotation trigger switch.

3: Three-Wire System 2



3-wire system 2

Three-wire system 2 As shown in the figure above, X? is the three-wire operation control terminal, which selects any one of the input terminals X1－X9 via parameters F5-16 to F5-24. SW1 is the inverter stop trigger switch, SW2 is the start trigger switch, and K is the forward/reverse switch (closed for reverse, open for forward).

4.8. For communication control, refer to the appendix.

Inverter Function Parameter Summary Table

Note: X: Cannot be modified during operation Y: Can be modified during operation R: Read-only

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F0 Basic Parameter Group				
F0-00	Model Monitoring	0: 3-phase three-level inverter 1: 3-phase two-level inverter 2: 3-phase inverter, two-level (integrated unit) 3: 6-pulse rectification (three-level) 4: AFE Rectification (Three-Level) 5: 6-pulse rectification (two-level) 6: AFE Rectification (Two-Level) 10: 5-phase drive, three-level 11: 5-phase drive, two-level 12: 6-phase drive, three-level 13: 6-phase drive, two-level 15: 5-level inverter 16: 5-level rectification 20: High-Voltage CHB	Unit Monitoring	R
F0-01	Motor Control Mode	0: V/F Control 1: Vector VF 2: Sensorless Vector Control 1 3: Sensorless Vector Control 2 4: Sensor-based vector control 1 5: Sensor-Based Vector Control 2	3	X
F0-02	Run Command Channel	0: Keyboard control 1: Terminal control 2: CAN Communication Control 3: RS485 Communication Control	0	X
F0-03	Frequency Reference Sourc Channel A	0/1: Keyboard setpoint (F0-07) 2: AI1 setpoint 3: AI1 setpoint 4: AI3 input (reserved)	00	X

F0-04	Frequency Reference Source Channel B	5: Process closed-loop 6: Multi-speed 7: Basic PLC 8: Terminal UP/DN 9: Modbus communication setpoint 10: CAN Card Setpoint 11: Terminal Pulse Input 12: Custom Function Applications	01	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F0-05	Frequency Channel B Reference Source	0: Use the maximum output frequency as the reference source 1: Use the frequency set in A as the reference source	0	X
F0-06	Frequency Reference Source Combination Selection	0: Channel A 1: Channel B 2: Channel A + Channel B 3: Maximum value of Channel A and Channel B 4: The minimum value of Channel A and Channel B 5: Channel A - Channel B	0	X
F0-07	Keypad Digit Frequency Setting	0.00 to maximum frequency	50.00 Hz	Y
F0-08	Maximum frequency	5.00 - 300.00 Hz	50.00 Hz	X
F0-09	Lower Limit Frequency	0.00 to maximum frequency	0.00 Hz	Y
F0 - 10	Frequency below lower limit Operation Selection	0: Run at the lower limit frequency 1: Shut down 2: Sleep mode 3: Run at zero speed 4: Run at set frequency	2	X
F0-11	Sleep/Wake-up Time	0.0 - 6000.0 s	0.0	Y
F0-12	Acceleration Time 1	0.1 - 6500.0 s	Model settings	Y
F0-13		0.1 - 6500.0 s	Model	Y

	Deceleration time 1		Settings	
F0-14	Carrier frequency	300 - 3,000 Hz	Model Settings	X
F0-15	Rotation Direction Selection	0: Direction remains unchanged 1: Reverse direction 2: Reverse rotation disabled	0	X
F0 - 16	Reserved			
F0-17	Parameter Restoration	0: Do not initialize 11: Initialize all parameters (Excludes parameters not affected by factory default restoration) 12: Initialize some parameters (Excludes motor and encoder parameters) 19: Initialize all parameters (Includes parameters not affected by factory reset) 22: Clear fault logs 55: Back up parameters to the backup area 56: Restore parameters from the backup area	0	X
F0-18	Parameter Protection	0: All parameters can be modified 1: Except for parameters modified using the up and down arrow keys, modification is prohibited 2: All parameters are disabled	0	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F0-19	Keyboard Stop and Start Settings	LED Units Digit: Stop Button Function Selection 0: Non-keyboard control methods are disabled 1: Non-keyboard control stops the machine according to the stop method 2: Non-keyboard control stops the machine at will LED Units Digit: Stop Double-Click Function 0: No function 1: Free stop (all command channels) LED hundreds digit: Start button (Self-learning mode, when not controlled via the keyboard) 0: Start 1: Disabled	0x111	Y
F0 - 20	Frequency command resolution	0: 0.01 Hz 1: 0.1 Hz 2: 0.1 RPM 3: 1 RPM 4: 10 RPM	0	X
F0 - 21	Acceleration and deceleration time Reference frequency	0: Maximum frequency 1: Fixed frequency of 50 Hz 2: Set frequency	0	X
F0-22	Acceleration and deceleration time units	0:1s (0 decimal places) 1: 0.1s (1 decimal place) 2: 0.01 s (two decimal places)	1	Y
F0-23	Acceleration time 1 and Acceleration Time 2	0.00 to maximum frequency	0.00 Hz	Y

	Frequency			
F0-24	Acceleration time 2	0.01-6500.0 s	100.0	Y
F0-25	Deceleration time 2	0.01-6500.0 s	100.0	Y
F0-26	Acceleration time 3	0.01-6500.0 s	100.0	Y
F0-27	Deceleration time 3	0.01-6500.0 s	100.0	Y
F0-28	Acceleration time 4	0.01-6500.0 s	100.0	Y
F0-29	Deceleration time 4	0.01-6500.0 s	100.0	Y
F0-30	S-curve acceleration and deceleration Select	Units: Normal operation S-curve acceleration/deceleration 0: Disabled 1: Enabled Tens place: S-curve transition smoothing 0: Disabled 1: Enabled Hundreds place: Jog operation S-curve acceleration/deceleration 0: Disabled 1: Enabled	0x001	X
F0-31	S-curve acceleration start time	0.00-10.00 s	0.20 s	X
F0-32	Acceleration end S-curve time	0.00-10.00 s	0.20 s	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F0-33	Deceleration Start S-Curve Time	0.00 - 10.00 s	0.20 s	X
F0-34	Deceleration End S-Curve Time	0.00 - 10.00 s	0.20 s	X
F0-35	Jog operation frequency Setting	0.00 to maximum frequency	5.00 Hz	X
F0 - 36	Jog acceleration time	0.01 - 650.00 s	10.00 s	X
F0-37	Jog deceleration time	0.01 - 650.00 s	10.00 s	X
F0-38	Jog Interval Time	0.01 - 650.00 s	10.00 s	X
F0-39	Emergency Stop Time	0.01 - 650.00 s	10.00 s	X
F0-40	Bundled operating command frequency setting	Units: Keyboard Command Bindings Tens place: Terminal command binding Hundreds place: Communication command bundles Thousands place: Optional card command sets 0: No binding	0000	X
F0-43	Upper limit frequency setting	Lower Limit Frequency to Maximum Frequency	50.00 Hz	Y
F0-44	Upper Limit Frequency Source Selection	0: Upper limit frequency set digitally 1: AI1 setpoint 2: AI2 set 3: AI3 input 4: Set via the PUL terminal 5: Reserved 6: RS485 Communication Input	0	X

		7: Optional card		
F1 Operation Control				
F1-00	Start-up Mode	0: Start from the start frequency 1: Start with DC braking, then start from the start frequency 2: Start after speed tracking and direction determination	0	X
F1-01	Start Frequency	0.00 to upper limit frequency (digital setting)	0.50 Hz	X
F1-02	Start Frequency Hold Time	0.0 - 60.00 s	0.00 s	Y
F1-03	Pre-start Braking Current	0.0 - 150.0%	50.0%	Y
F1-04	Pre-start braking time	0.0 - 60.0 s	0.0 s	Y
F1-05	Shutdown Mode	0: Deceleration stop 1: Free stop	1	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F1-06	DC Braking on Stop Start Frequency	0.00 - 50.00 Hz	1.00 Hz	Y
F1-07	Shutdown DC Braking Current	0.0 - 150.0%	50.0%	Y
F1-08	Shutdown DC Braking Time	0.0 - 60.0 s	0.0 s	Y
F1-15	Terminal startup protection Select	LED units digit: Terminal startup upon recovery from an exception 0: Start allowed 1: Start prohibited LED tens place: Terminal jog operation upon exiting an exception Start 0: Start allowed 1: Start prohibited LED hundreds place: Terminal start when the command channel switches to the terminal 0: Start allowed 1: Start prohibited LED thousands place: Terminal start when free stop, emergency stop, or forced stop commands are active 0: Start allowed 1: Start prohibited	1111	X
F1-16	Shutdown detection frequency	0.00 to upper limit frequency (digital setting)	0.50 Hz	Y
F1-17	Deceleration Speed Detection Method	0: Detect based on speed command 1: Detect based on actual speed	1	Y
F1-18	Start-up delay time	0.0 - 60.0 s	0.3	Y
F1-19	Start-up	0.00 to upper limit frequency	0.00 Hz	

	Initial Frequency	(digital setting)		
F1-20	Forward/Reverse Dead Band Time	0.0 - 120.0 s	0.0 s	Y
F1-21	Start-Stop Interval Time Minimum value	0.000 - 60.000 s	0.100	Y
F1-22	Frequency held during shutdown	0.00 to upper limit frequency (digital setting)	0.50 Hz	Y
F1-23	Frequency hold time during shutdown	0.0 - 60.00 s	0.00 s	Y
F1-24	Frequency Direction Change Operating Direction	0: Frequency control direction is disabled 1: Frequency control direction is enabled When the frequency control direction is disabled, a setpoint frequency less than zero is treated as zero frequency	1	Y
F1-25	Power Outage Restart Action Selection	0: Disabled 1: Enabled	0	X
F1-26	Wait time after power failure and restart	0.00 - 60.00 s	0.50 s	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F1-28	Start-up Frequency Acceleration Time	0.01 - 600.00 s	1.00 s	Y
F1 - 30	Start-up pre-excitation time	0.00 - 60.00 s	0.00 s	X
F1-31	Synchronous machine short-circuit braking time	0.00 - 60.00 s	0.00 s	Y
F1-32	Forward/Reverse Switching Frequency	0.00 - Upper Limit Frequency (Digital Setting)	0.00 Hz	
F1-34	Zero-Speed Torque Hold Current	0.0 - 150.0%	60.0%	Y
F1-35	Zero-speed torque hold Time	0.0 - 6000.0 s	0	Y
F1-36	Jog Stop Mode Select	0: Decelerate to a stop only 1: As set in F1-05	0	Y
F1-40	Jump Frequency 1	0.00 to maximum frequency	0.00 Hz	Y
F1-41	Jump Frequency Amplitude	0.00 to maximum frequency	0.00 Hz	Y
F1-42	Jump Frequency 2	0.00 to maximum frequency	0.00 Hz	Y
F1-43	Jump Frequency Amplitude	0.00 to maximum frequency	0.00 Hz	Y
F1-50	Oscillation Frequency Control	0: Swing frequency control disabled 1: Swing frequency control enabled	0	Y

F1-51	Swing Frequency Amplitude Control	Units digit: Start mode (reserved) 0: Automatic 1: Manual via terminals Tens place: Swing amplitude control: 0: Relative to center frequency 1: Relative to maximum frequency Hundreds place: Preset frequency enable (reserved) 0: Disabled 1: Enabled Thousands place: Reserved	0000	X
F1-52	Oscillation Preset Frequency (Reserved)	0 to upper limit frequency	0.00 Hz	Y
F1-53	Swing Frequency Preset Wait Time (Reserved)	0.0 - 3600.0 s	0.0 s	Y
F1-54	Oscillation Frequency Amplitude	0.0 - 50.0%	10.0%	Y
F1-55	Step Frequency	0.0 - 50.0%	10.0%	Y
F1-56	Triangular Wave Rise Time	0.1 - 650.00 s	5.00 s	Y
F1-57	Triangular Wave Rise Time	0.1 - 650.00 s	5.00 s	Y
F2 Motor Parameter Group				
F2-00	Motor Type	0: Induction Motor (AM) 1: Permanent magnet synchronous motor (PM)	1	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F2-01	Motor Rated Voltage	1 - 9000 V	Model Settings	X
F2-02	Motor Rated Frequency	0.01 to maximum frequency	Model Settings	X
F2-03	Motor Rated Current	0.1 - 3000.0 A	Model Settings	X
F2-04	Motor Rated Slip Frequency	0.01 - 5.00 Hz	Model Setting	X
F2-05	Number of motor poles	1 - 400	4	X
F2-06	Motor Rated Speed	1 - 65,000 rpm	Monitoring Value	X
F2-07	Motor Power Line Phase Sequence	0: UVW normal phase sequence 1: UWV reverse phase sequence This value is not affected by the factory reset operation	0	X
F2-08	Motor Parameter Self-Tuning Selection	0: No action 1: Standstill self-learning 2: Rotational self-learning 3: Stator resistance self-learning	0	X
F2-10	Induction Motor No-Load Current	0.1 - 3000.0 A	Model Setting	X
F2-11	Stator resistance reference value	0.01 - 50.00%	Model Settings	X
F2-12	Rotor resistance normalization value	0.01 - 50.00%	Model Settings	X
F2-13	Stator Leakage Inductance Norm	0.01 - 50.00%	Model Settings	X
F2-14	Stator Inductance Normed Value	0.1 - 2000.0%	Model Settings	X

F2-15	Asynchronous Motor Stator Resistance	0.01 mΩ to 60,000 mΩ	Monitoring Value	X
F2-16	Asynchronous Motor Rotor Resistance	0.01 mΩ to 60,000 mΩ	Monitoring Value	X
F2-17	Asynchronous Motor Stator Leakage Inductance	0.001 mH to 6553.5 mH	Monitoring Value	X
F2-18	Asynchronous Motor Stator Inductance	0.01 mH to 65,535 mH	Monitoring Value	X
F2-19	Reserved			
F2-20	Normalized value of synchronous machine stator resistance	0.01 - 50.00%	Model Setting	X
F2-21	Synchronous Motor D-Axis Inductance Norm	0.01 - 200.00%	Model Settings	X
F2-22	Synchronous Motor Q-Axis Inductance Norm	0.01 - 200.00%	Model Settings	X
F2-23	Synchronous Motor Back-EMF	1 - 9,000 V	Model Settings	X
F2-24	Synchronous Motor Encoder Mounting Angle	0.0° - 360.0°	Model Configuration	X
F2-25	Synchronous Motor Stator Resistance	0.01 mΩ to 60,000 mΩ	Monitoring Value	X

F2-26	Synchronous Motor D-Axis Inductance	0.001 mH to 65,535 mH	Monitoring Value	X

Function Code	Function Code Name	Setting Range and Definitions	Factory Setting	Attribute
F2-27	Synchronous Motor Q-Axis Inductance	0.001 mH to 6553.5 mH	Monitored Value	X
F2-28	Synchronous Motor Pulse Width coefficient	0 - 3000	Model Setting	X
F2-30	Deadband Compensation Gain	0 - 200	100	X
F2-38	Maximum Output Voltage	0 - 60,000 V	Model Settings	X
F2-40	Synchronous Motor Pole Count Search Function	Units: Sensorless vector control 0: Off 1: On 2: On, only during the first startup after power-on Tens place: Inductive vector control 0: Off 1: Enabled 2: Enabled, only during the first startup after power-on Hundreds place: Non-vector control 0: Off 1: Enabled 2: Enabled, only during the first startup after power-on	0x0001	X
F2-44	Pole Search Settings	Units digit: Search for missing phase detection function 0: Enabled 1: Off Tens place: Hundreds place:	0x0001	X

F2-47	Parameter Self-Learning Frequency Setting	0.0 to 1000.0%	0.0%	X
F3 Vector Control Group				
F3-00	ASR (Speed Loop) Proportional Gain 1	1 - 30,000	4,000	Y
F3-01	ASR (Speed Loop) Integration Time 1	0.000 - 6.000 s	0.050 s	Y
F3-02	ASR switching frequency 1	0.00 to ASR switching frequency 2	5.00 Hz	Y
F3-03	ASR (Speed Loop) Proportional Gain 2	1 - 30,000	4,000	Y
F3-04	ASR (Speed Loop) Integration Time 2	0.000 - 6.000 s	0.100 s	Y
F3-05	ASR switching frequency 2	ASR switching frequency 1 to maximum frequency	10.00 Hz	Y
F3-06	Output Torque Limit	0.0 - 400.0%	150.0%	Y
F3-07	Synchronous Motor Low Frequency Inrush current	0.0 - 100.0%	30.0%	Y

Function code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F3-08	Asynchronous Motor Slip Compensation Gain	0.0 - 250.0%	100.0	Y
F3-09	Magnetic Flux Closed-Loop Proportional gain	0.0 - 200.0%	50.0%	Y
F3-10	Current Loop D-axis Proportional gain	1 - 9999	1200	Y
F3-11	Current Loop D-axis Integral Gain	1 - 8000	1,000	Y
F3-12	Current Loop Q-Axis Proportional Gain	1 - 9999	1200	Y
F3-13	Current Loop Q-Axis Integral Gain	1 - 8000	1000	Y
F3-14	Reserved			
F3-15	Vector IF Control Current	0.0 - 400.0%	60.0%	Y
F3-16	Vector IF Control Frequency Upper Limit	0.0 - 100.0%	0.0%	Y
F3-17	High-frequency Inrush	0.0 - 50.0%	10.0%	Y

	current			
F3-18	Synchronous Motor Inrush Current frequency	0.0 - 100.0%	10.0%	Y
F3-20	Weak-field control gain	0.0 - 500.0%	1.0%	Y
F3-21	Weak Magnetic Field Control Integral Gain	0.0 - 500.0%	1.0%	Y
F3-22	Magnetic Flux Control Gain	0.0 - 1000.0%	0.0%	Y
F3-23	Magnetic Flux Control Integral Gain	0.0 - 1000.0%	0.0%	Y
F3-25	Weak Magnetic Field Current Upper Limit	0.0 - 250.0%	120.0%	Y
F3-26	Vector control voltage Duty Cycle	0.0 - 120.0%	100.0%	Y
F3-27	Vector Control Output Maximum voltage	0.0 - 180.0%	135.0%	Y
F3-30	Overexcitation Braking Gain	0.0 - 500.0%	100.0%	Y
F3-31	Overexcitation Braking Limiting	0.0 - 250.0%	100.0%	Y

F3-32	Energy-saving operation	0: Off 1: On	0	X
F3-33	Energy-saving excitation operation Lower Limit	0.0 - 80.0%	50.0%	Y
F3-34	Energy-saving operation filtering Coefficient	0.000 - 6.000 s	0.010 s	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F3-40	Torque Control Selection	0: Speed Control 1: Torque control, standard torque control, for parallel operation 2: Torque control, braking torque control, Used for a test companion machine	0	X
F3-41	Digital torque setting	0.0 - 300.0%	0.0%	Y
F3-42	Torque Command Source	0: Digital setpoint F3-41 1: Analog Input AI1 2: Analog Input AI2 3: Analog Input AI3 4: Terminal pulse input 5: Process closed-loop output 6: Modbus Communication Settings 7: Expansion Communication Card Settings	0	X
F3-43	Torque Filtering Time	0.000 - 60.000 s	0.100 s	Y
F3-44	Torque setpoint ratio	0.0 - 300.0%	100.0%	Y

	Coefficient			
F3-45	Torque Limit Channel	0: Digital setpoint F3-06 1: Analog Input AI1 2: Analog Input AI2 3: Analog Input AI3 4: Terminal pulse input 5: Process closed-loop output 6: Modbus Communication Settings 7: Expansion Card Settings	0	X
F3-46	Reserved			
F3-47	Torque Limit Ratio Coefficient	0.0 - 300.0%	100.0%	Y
F3-48	Forward rotation upper limit frequency Channel	0: Digital setpoint F3-50 1: Analog input AI1 2: Analog Input AI2 3: Analog Input AI3 4: Terminal pulse input 5: Process closed-loop output 6: Modbus Communication Settings 7: Expansion Card Settings	0	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F3-49	Reverse Upper Limit Frequency Channel	0: Digital Setpoint F3-51 1: Analog input AI1 2: Analog Input AI2 3: Analog Input AI3 4: Terminal pulse input 5: Process closed-loop output 6: Modbus Communication Settings 7: Expansion Card Settings	0	X
F3-50	Forward Rotation Upper Limit Frequency	0.0 - 100.0%	100.0%	Y
F3-51	Reverse rotation upper limit frequency	0.0 - 100.0%	100.0%	Y
F3-56	Low-frequency braking torque Limiting range	0.0 - 400.0%	0.0%	Y
F3-57	Low-frequency braking torque Cutoff Frequency	0.0 - 100.0%	10.0%	Y
F4 V/F Control Group				
F4-00	VF Curve Selection	00: Linear VF curve 10: Quadratic VF curve 11: Custom VF curve 12: VF Pressure-Frequency Separation	00	X
F4-01	Torque Boost	0.0%: Automatic Torque Boost 0.1 - 30.0%	Model Settings	Y
F4-02	Torque Boost Cut-off	0.0 - 100.0%	100.0%	Y

	Frequency			
F4-03	User-defined voltage V1	0.0 - 100.0%	10.5%	Y
F4-04	User-defined frequency F1	0.00 to maximum frequency	5.00 Hz	Y
F4-05	User-defined voltage V2	0.0 - 100.0%	22.0%	Y
F4-06	User-defined frequency F2	0.00 to maximum frequency	10.00 Hz	Y
F4-07	User-defined voltage V3	0.0 - 100.0%	45.0%	Y
F4-08	User-defined frequency F3	0.00 to maximum frequency	20.00 Hz	Y
F4-09	User-defined voltage V4	0.0 - 100.0%	67.0%	Y
F4-10	User-defined frequency F4	0.00 to maximum frequency	30.00 Hz	Y
F4-11	User-defined voltage V5	0.0 - 100.0%	89.0%	Y
F4-12	User-defined frequency F5	0.00 to maximum frequency	40.00 Hz	Y
F4-13	Slip compensation gain	0.0 - 200.0%	0.0%	Y
F4-14	Slip Compensation Limit	0.0 - 300.0%	100.0%	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F4-15	Slip Compensation Filter	0.000 - 6.000 s	0.200 s	Y
F4-16	Oscillation Suppression Gain	0.0 - 900.0%	100.0%	Y
F4-17	Oscillation Suppression Filtering	0.0 - 100.0S	1.0	Y
F4-18	Overexcitation Gain	0 - 200	64	Y
F4-19	Reserved			
F4-20	Voltage between pressure and frequency Set	Units: Channel A: 0: Voltage percentage setting 1: AI1 setpoint 2: AI2 setpoint 3: AI3 setpoint (reserved) 4: Pulse setpoint from terminal PUL 5: PID Output Setpoint 6: RS485 Communication Input 7: Optional card 8: Voltage Percentage Setting + PID Tens place: Channel B: Reference (units) Hundreds place: Combination of Channels A and B 0: Channel A 1: Channel B 2: Channel A + Channel B 3: Channel A minus Channel B 4: Minimum of Channel A and Channel B 5: The maximum value of Channel A and Channel B	000	X
F4-21	Voltage-Frequency Separated Output	0.00% - 110.00%	0.00%	Y

	Digital Voltage Setting			
F4-22	Voltage-Frequency Separation Voltage Acceleration time	0.00 - 100.00 s	10.00 s	Y
F4-23	Pressure-Frequency Separation Voltage Deceleration time	0.00 - 100.00 s	10.00 s	Y
F4-24	Pressure-Frequency Separation Shutdown Mode	0: Output voltage and output frequency Acceleration and deceleration do not affect each other 1: After the output voltage drops to 0 V, the output frequency decreases.	0	Y
F4-25	Voltage Value Setting (Reserved)	0.00 - 600.00 V	0.00 V	Y
F4-31	Automatic voltage stabilization function	Units digit: Normal operation 0: No action 1: Activated Tens place: Parameter learning mode 0: Do not activate 1: Activate	00	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5	Input and Output Terminal Functions (AI, AO, X, Y)			
F5-00	AI1 Lower Limit	0.00 - 10.00	0.00	Y
F5-01	AI1 Lower Limit Corresponds to Setting	-100.00 to 100.00%	0.00%	Y
F5-02	AI1 Upper Limit	0.0 - 10.00	10.00	Y
F5-03	AI1 Upper Limit Corresponds to Setting	-100.00 to 100.00%	100.00%	Y
F5-04	AI1 Filter Time	0.000 - 6.000 s	0.010 s	Y
F5-05	AI2 Lower Limit	0.00 - 10.00	0.00	Y
F5-06	AI2 Lower Limit Corresponds to Setting	-100.00 to 100.00%	0.00%	Y
F5-07	AI2 Upper Limit	0.0 - 10.00	10.00	Y
F5-08	AI2 Upper Limit Corresponds to Setting	-100.00 to 100.00%	100.00%	Y
F5-09	AI2 Filter Time	0.000 - 6.000 s	0.010 s	Y
F5-10	AI3 Lower Limit	0.00 - 10.00	0.00	Y
F5-11	AI3 Lower Limit Corresponds to	-100.00 to 100.00%	0.00%	Y

	Setting			
F5-12	AI3 Upper Limit	0.0 - 10.00	10.00	Y
F5-13	AI3 Upper Limit Corresponds to Setting	-100.00 to 100.00%	100.00%	Y
F5-14	AI3 Filter Time	0.000 - 6.000 s	0.010 s	Y
F5-15	Terminal Start/Stop Mode Select	0: Two-wire 1 1: Two-wire 2 2: 3-wire 1 3: 3-wire system 2	1	X
F5-16	Terminal X1 Function Selection	0: No function 1: Forward operation 2: Reverse operation 3: External fault input (normally open) 4: Stop with DC braking input 5: Emergency stop (free stop) 6: External Reset Input 7: Multi-speed terminal 1 8: Multi-speed terminal 2 9: Multi-speed terminal 3 10: Multi-speed terminal 4 11: Three-wire operation control terminal	1	X
F5-17	Terminal X2 Function Selection		2	X
F5-18	Terminal X3 Function Selection		6	X
F5-19	Terminal X4 Function Selection		3	X
F5-20	Terminal X5 Function Selection		0	X
F5-21	Terminal X6 Function Selection		0	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5-22	Terminal X7 Function Selection	12: Frequency Increase Command (UP) 13: Frequency Decrease Command (DN)	0	X
F5-23	Terminal X8 Function Selection	14: Reset UP/DN Frequency 15: Acceleration/Deceleration Channel Selection 1 16: Acceleration/Deceleration Channel Selection 2 17: PLC Run/Pause 18: Clear PLC Shutdown Memory 19: Jog Forward Operation 20: Jog Reverse Operation 21: Swing Frequency Pause 22: Swing Frequency State Reset 23: PID Closed-Loop Control Pause 24: Enable internal timer 25: Reset internal timer 26: Counter trigger input 27: Counter Reset 28: Switch Frequency Setting from A to B 29: Switch frequency setting combination to A 30: Switch frequency setting combination to B 31: Acceleration/Deceleration Disabled 32: Speed Control/Torque Control Switch 33: Length Counter Input 34: Reset length counter 35: Switch command to keyboard 36: Switch command input to terminal 37: Switch command input to Modbus communication 38: Process PID Gain Switch 39: External Fault Input (Normally Closed) 40: Pulse Input (Reserved) 41: CAN Master/Slave Control	0	X
	Terminal X9 Function Selection		0	X

		Switching (Terminal active as master) 42: CAN Master/Slave Speed-Torque Control Switch (Terminal active indicates torque) 43: Buffer Contactor Feedback Input (Normally Open) 48: Run/Pause 49: External Stop (Stop according to stop mode) 50: Run Inhibit 51: Forward rotation inhibit 52: Reverse Rotation Inhibited 53: Frequency Jog 54: Emergency Stop (Deceleration Stop)		

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5-27	Y1 Output Terminal Function Selection	0: No function 1: Signal during inverter operation 2: Inverter fault 3: Frequency reached signal 4: Frequency Level Detection Signal 1 (FDT1) 5: Frequency Level Detection Signal 1 (FDT2) 6: Inverter operating at zero speed 7: Lower Frequency Limit 8: Upper frequency limit 9: Terminal preset count value triggered 10: Terminal count-to-value trigger 11: Internal timer expired 12: Timed Shutdown Time Reached 13: PLC stage completed 14: PLC cycle complete 15: Over-torque/under-torque warning detected 1 16: Ready to run 17: Target length reached 18: In Sleep Mode 19: AI input out of range 20: Module Temperature Warning Output 21: Modbus control action 22: Brake engagement output 23: Custom Alarm Output 24: Inverter Alarm 25: Undervoltage Lockout in Progress 26: Reset Command Output 27 – 32: Reserved 33: Overtorque/Undertorque Early Warning Detected 2 (Reserved) 34: Run time preset reached 35: Closed-loop pause detection	1	Y
F5-28	TA1 Relay Output Terminal Function Selection		2	X
F5-29	TA2 Relay Output Terminal Function Selection		1	X
F5-30	Y2 Output Terminal Function Selection (Reserved)		0	X

		36: Closed-loop feedback low threshold detection 37: Closed-Loop Feedback High Threshold Detection 38: Motor Reverse Indication 39: Overload warning detected 40: Underload Warning Detection 41: Current Limit Alarm Output 42: External Fault Shutdown 43: Extended Communication Card Control Actions (Reserved) 44: Servo Positioning Complete Output 45: Servo Approach Output		

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
		46: AO1 Analog Detection Action 1 47: AO1 Analog Detection Action 2 48: Comparator Action 1 49: Comparator Action 2 50 - 59: Reserved 60: High-speed pulse (HDO) output function		
F5-31	Reserved			
F5-32	AO1 Output Value Selection	0: Set frequency (10 V corresponds to the maximum output frequency) 1: Output frequency (10 V corresponds to the maximum output frequency) 2: Output Current (10 V corresponds to twice the motor's rated current) 3: Bus voltage (10V corresponds to twice the rated bus voltage) 4: Output Voltage (10 V corresponds to twice the motor's rated voltage) 5: Output Power (10 V corresponds to twice the motor's rated power) 6: Output Torque (10V corresponds to twice the motor's rated torque) 7: Analog Input AI1 (0 - 10 V corresponds to 0 - 10 V) 8: Analog Input AI2 (0 - 10 V corresponds to 0 - 10 V) 10: High-Speed Pulse Input Frequency (Relative to maximum input frequency) 11: 485 Setting Percentage (0 - 100% corresponds to 0 - 10 V) 12 - 15: Reserved 16: Process Closed-Loop Setpoint	0	Y

		(0 - 100% corresponds to 0 - 10 V) 17: Process closed-loop feedback (0 - 100% corresponds to 0 - 10 V) 18: Process closed-loop input deviation (-100% - 100% corresponds to 0 - 10 V) 19: Process Closed-Loop Output (0 - 100% corresponds to 0 - 10 V) 20: Module Temperature 1 (10 V corresponds to 100 degrees) 21: Module Temperature 2 (10 V corresponds to 100 degrees)		

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
		22: Set Torque (10 V corresponds to 2 times the rated motor torque) 23: Output Speed (10 V corresponds to maximum speed) 24: Inverter Cumulative Overload (0 - 100% corresponds to 0 - 10V) 25: Cumulative Motor Overloadxml-ph-0000@deepl.internal (0 - 100% corresponds to 0 - 10V) (0 - 100% corresponds to 0 - 10 V)		
F5-33	AO1 represents 0% Corresponding output	0.0 - 500.0%	0.0%	Y
F5-34	AO1 Output corresponding to 100% of the measured value	0.0 - 500.0%	100.0%	Y
F5-35	AO1 Output Filtering	0.000 - 6.000 s	0.010 s	Y
F5-36	AO2 Output Value Select	Same as AO1 function	1	Y
F5-37	AO2 represents 0% Corresponding Output	0.0 - 500.0%	0.0%	Y
F5-38	AO2 Output corresponding to 100% of the measured value	0.0 - 500.0%	100.0%	Y
F5-39	AO2 Output Filtering	0.000 - 6.000 s	0.010 s	Y

F5-40	HDO Maximum Output Frequency	0 - 100 kHz	10	Y
F5-50	Terminal Active State Setting	BIT0 - BIT8: X1 - X9 0: Positive logic 1: Inverted logic	000	Y
F5-51	Start-up Protection Warning Output Settings	Operational warning when free stop or emergency stop is active 0: Operation monitoring enabled 1: Continuous monitoring	0	X
F5-52	Terminal UP/DW Control Selection	0: Frequency is saved upon power loss 1: Frequency not saved upon power loss 2: Adjustable during operation; reset to zero when stopped	0	X
F5-53	Terminals UP/DW control frequency ramp-up/ramp-down rate	0.01 - 50.00 Hz/s	0.50 Hz/s	Y
F5-54	Counter Setpoint	0 - 65,000	500	Y
F5-55	Counter Maximum Value	0 - 65,000	1,000	Y
F5-56	Count Input Divider	0 - 6,000	0000	Y
F5-57	Counter Input Source	0: Standard X terminal 1: Input terminal PUL 2: Speed feedback card (PG card)	0	Y

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Attribute
F5-58	X1 Effective Detection Delay	0.000 - 60.000 s	0.010	Y
F5-59	X1 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-60	X2 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-61	X2 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-62	X3 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-63	X3 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-64	X4 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-65	X4 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-66	X5 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-67	X5 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-68	X6 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-69	X6 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-70	X7 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-71	X7 Invalid Detection	0.000 - 60.000 s	0.010	Y

	Delay			
F5-72	X8 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-73	X8 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
F5-74	Minimum PUL Input Frequency	0.00 - 100.00 kHz	0.00 kHz	Y
F5-75	PUL Minimum Frequency Corresponding setting	0.00 - 100.00%	0.00%	Y
F5-76	Maximum PUL Input Frequency	0.00 - 100.00 kHz	50.00 kHz	Y
F5-77	PUL Maximum Frequency Corresponding setting	0.00 - 100.00%	100.00%	Y
F5-78	PUL filter time	0.000 - 9.000 s	0.100 s	Y
F5-79	PUL cutoff frequency	0.000 - 1.000 kHz	0.010 kHz	Y
F5-80	Output terminal active Status Settings	BIT0 - BIT3: Y1, TA1, TA2, Y2 0: Positive logic 1: Inverted logic	0	Y
F5-81	Detection of specified frequency Detection Amplitude	0.00 - 50.00 Hz	2.50 Hz	Y
F5-82	Zero-frequency detection range	0.00 - 10.00 Hz	0.50 Hz	Y
F5-83	FDT1 Upper Level Limit	0.00 to maximum frequency	50.00 Hz	Y

F5-84	FDT1 Level Lower Limit	0.00 to maximum frequency	49.00 Hz	Y
F5-85	FDT2 Level Upper Limit	0.00 to maximum frequency	25.00 Hz	Y
F5-86	FDT2 Level Lower Limit	0.00 to maximum frequency	24.00 Hz	Y
F5-87	Analog Detection Action 1 Low Value	0.0 - 100.0%	20.0%	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5-88	Analog Detection Action 1 High Value	0.0 - 100.0%	100.0%	Y
F5-89	Simulated detection action 2 (low value)	0.0 - 100.0%	40.0%	Y
F5-90	Simulated detection action 2, high value	0.0 - 100.0%	100.0%	Y
F5-91	Simulated detection action 3 (low value)	0.0 - 100.0%	60.0%	Y
F5-92	Simulated detection action 3, high value	0.0 - 100.0%	100.0%	Y
F5-93	Custom Alarm Output Alarm Code	00: No warning 01: Overvoltage shutdown 02: Input Phase Loss 03: Output Phase Loss 04: Large Speed Deviation 05: Runaway protection 06: Reserved 07: Stall Warning 08: Invalid Run Command 09: Invalid Run Command 10: Invalid Run Command 11: Storage warning 12: 485 Communication Anomaly Warning 13: PID feedback too low 14: PID feedback too high 15: Load protection—underload 16: Load Protection—Overload 17: Continuous Current Limiting 18: Overheating warning 19: Reserved 20: Reserved	0	Y

		21: Reserved 22: Reserved 23: Buffer Contactor Fault Warning 24: Reserved 25: CAN Communication Failure		
F5-94	Y1 Output Terminal Close Delay	0.000 - 60.000 s	0.010 s	Y
F5-95	TA1 Relay Closing Delay	0.000 - 60.000 s	0.010 s	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5-96	TA2 Relay Closing Delay	0.000 - 60.000 s	0.010 s	Y
F5-97	Y2 Output Terminal Closing Delay (Reserved)	0.000 - 60.000 s	0.010 s	Y
F5-98	Y1 Output Terminal Turn-off delay	0.000 - 60.000 s	0.010 s	Y
F5 - 99	TA1 Relay Turn-off Delay	0.000 - 60.000 s	0.010 s	Y
F5-A0	TA2 Relay Turn-Off Delay	0.000 - 60.000 s	0.010 s	Y
F5-A1	Y2 Output Terminal Turn-Off Delay (Reserved)	0.000 - 60.000 s	0.010 s	Y
F5-A2	Comparator 1 Monitoring	LED units and tens digits: Set "yy" in monitoring parameter	0001	Y

	Select	number d-xyy to 00－99 LEDs for the hundreds and thousands places: Set x to 00－07 in monitoring parameter d-xyy		
F5-A3	Comparator 1 Upper Limit	0－65535	3000	Y
F5-A4	Comparator 1 Lower Limit	0－65535	1000	Y
F5-A6	Action selected Action Selection	0: Continue operation (digital terminal output only) 1: Alarm and free stop 2: Issue a warning and continue operation 3: Forced shutdown	0	Y
F5-A7	Comparator 2 Monitoring Select	LED units and tens digits: Set yy in monitoring parameter d-xyy to 00－99 LEDs for the hundreds and thousands places: Set x to 00－07 in monitoring parameter d-xyy	0003	Y
F5-A8	Comparator 2 Upper Limit	0－6553.5	2	Y
F5-A9	Comparator 2 Lower Limit	0－6553.5	1	Y
F5-b1	Action Selection When Sending CP2	0: Continue operation (digital terminal output only) 1: Alarm and free stop 2: Issue a warning and continue operation 3: Forced shutdown	0	Y
F5-b2	Virtual vX1 Terminal Function Selection	See X Terminal Functions	0	X
F5-b3	Virtual vX2 Terminal Function Selection		0	X

F5-b4	Virtual vX3 Terminal Function Selection		0	X
F5-b5	Virtual vX4 Terminal Function Selection		0	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5-b6	vX Terminal Enabled Status Source	0: Internally connected to virtual terminal vYn 1: Linked to physical terminal Xn 2: Whether the function code setting is valid (F5-b7) LED least significant digit: Virtual vX1 LED units digit: Virtual vX2 LED units digit: Virtual vX3 LED thousands place: Virtual vX4	0000	X
F5-b7	Virtual vX Terminal Function Code Setting Active State	0: Disabled; 1: Enabled Units digit: Virtual vX1 Tens place: Virtual vX2 Hundreds place: Virtual vX3 Thousands place: Virtual vX4	0000	X
F5-b8	Virtual vY1 output Select	See Y Terminal Functions	63	X
F5-b9	Virtual vY2 Output Select		63	X
F5-C0	Virtual vY3 Output Select		63	X
F5-C1	Virtual vY4 Output Select		63	X

F5-C2	vY1 Output ON Delay Time	0.000 - 60.000 s	0.010 s	Y
F5-C3	vY2 output ON Delay time	0.000 - 60.000 s	0.010 s	Y
F5-C4	vY3 output ON Delay time	0.000 - 60.000 s	0.010 s	Y
F5-C5	vY4 output ON Delay time	0.000 - 60.000 s	0.010 s	Y
F5-C6	vY1 output OFF Delay time	0.000 - 60.000 s	0.010 s	Y
F5-C7	vY2 output OFF Delay time	0.000 - 60.000 s	0.010 s	Y
F5-C8	vY3 output OFF Delay time	0.000 - 60.000 s	0.010 s	Y
F5-C9	vY4 Output OFF Delay time	0.000 - 60.000 s	0.010 s	Y

Function code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F5-d1	AI Port Digital Input Terminal Characteristic Selection	0: Low-level active 1: High level active LED units digit: AI1 LED units digit: AI2 LED units digit: Reserved LED thousands place: Reserved	0000	X
F5-d2	AI1 Terminal Function Selection (treated as X)	See X Terminal Function	00	X

F5-d3	AI1 High Level Setting	0.00 - 100.00%	70.00%	X
F5-d4	AI1 Low Level Setting	0.00 - 100.00%	30.00%	X
F5-d5	AI2 Terminal Function Selection (treated as X)	See X Terminal Function	00	X
F5-d6	AI2 High Level Setting	0.00 - 100.00%	70.00%	X
F5-d7	AI2 Low Level Setting	0.00 - 100.00%	30.00%	X
F6 PID Control Parameter Group				
F6-00	PID Controller Setpoint Source	0/1: Keyboard numeric PID setpoint F6-01 2: AI1 3: AI2 4: Reserved 5: Terminal pulse (PUL) setpoint 6: RS485 Communication Setpoint 7: Optional card 8: Terminal selection	0	Y
F6-01	Keypad Digital PID Setpoint/Feedback	0.00 - 100.0%	50	Y

F6-02	PID Controller Feedback Signal Source	0/1: Keyboard numeric PID setpoint F6-01 2: AI1 3: AI2 4: Reserved 5: Terminal pulse (PUL) feedback 6: RS485 communication feedback 7: Optional card 8: Terminal selection	2	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F6-03	PID Control Selection	LED units digit: Feedback characteristic selection 0: Positive characteristic 1: Negative characteristic LED tens digit: Reserved LED hundreds place: Reserved LED thousands place: Differential adjustment attribute 0: Apply differential control to the error 1: Differential control of feedback	0100	Y
F6-04	Proportional gain P1	0.000 – 4.000	0.100	Y
F6-05	Integration Time I1	0.0 – 600.0 s	1.0 s	Y
F6-06	Differential Gain D1	0.000 – 6.000 s	0.000 s	Y
F6-07	Proportional Gain P2	0.000 – 4.000	0.100	Y
F6-08	Integration Time I2	0.0 – 600.0 s	1.0s	Y
F6-09	Differential gain D2	0.000 – 6.000 s	0.000 s	Y

F6-10	PID Parameter Switching Condition	0: Do not switch 1: Switch using DI terminals 2: Switch based on deviation	0	Y
F6-11	PID setpoint change Time	0.00 - 60.00 s	1.00 s	Y
F6-12	Feedback Signal Low-Pass Filter Filter time	0.000 - 6.000 s	0.010 s	Y
F6-13	Feedback signal gain	0.00 - 10.00	1.00	Y
F6-14	Feedback Signal Range	0 - 100.0	100.0	Y
F6-15	PID Preset Output	0.0 - 100.0%	100.0%	Y
F6-16	PID Preset Output Operating time	0.0 - 6500.0 s	0.0 s	Y
F6-17	PID Control Deviation Limit	0.0 - 100.0%	0.0%	Y
F6-18	Low Switching Deviation Value	0.0 - 100.0%	20.0%	Y
F6-19	High switching deviation value	0.0 - 100.0%	80.0%	Y
F6-20	Differential Limiting	0.0 - 100.0%	5.0%	Y
F6-21	PID Output Upper Limit	0.0 - 100.0%	100.0%	Y
F6-22	PID Output Lower Limit	-100.0 - 100%	0.0%	Y
F6-23	PID Output Filtering Time	0.000 - 6.000 s	0.000 s	Y

F6-24	Feedback Disconnection Action Select	0: Continue PID operation without reporting a fault 1: Shut down and report a fault 2: Continue PID operation and output an alarm signal 3: Continue operating at the current frequency and output an alarm signal	0	Y

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Attribute
F6-25	Feedback Disconnection Detection Time	0.0 - 120.0 s	1.0 s	Y
F6-26	Upper limit for wire break alarm	0.0 - 150.0%	100.0%	Y
F6-27	Lower limit for wire break alarm	0.0 - 100.0%	0.0%	Y
F6-28	Sleep Mode	0: Off 1: Enabled	0	Y
F6-29	Sleep Frequency	0.00 - Maximum Frequency	10.00 Hz	Y
F6-30	Sleep Delay	0.0 - 3600.0 S	60.0	Y
F6-31	Wake-up Deviation	0.0 - 50.0%	5.0%	Y
F6-32	Wake-up delay	0.0 - 600.0 s	1.0	Y
F6-33	Reserved			
F6-34	Reserved			

F7 Multi-speed and Basic PLC Functions

F7-00	PLC Operating Mode Selection	LED units digit: Cycle mode 0: Stop after a single cycle 1: Continuous cycle 2: Hold final value after a single cycle LED tens digit: Timing unit 0: Seconds 1: Minutes 2: Hours LED hundreds digit: Power-off storage mode 0: No data retention 1: Store LED thousands place: Startup mode 0: Restart from the first stage 1: Resume operation from the stage at the time of shutdown 2: Continue running for the remaining time of the stage at the time of shutdown Continue operation	0000	Y
F7-01	PLC Multi-Speed 1	0.00 to maximum frequency	10.00 Hz	Y
F7-02	PLC Multi-Speed 2	0.00 to maximum frequency	20.00 Hz	Y
F7-03	PLC Multi-Speed 3	0.00 to maximum frequency	30.00 Hz	Y
F7-04	PLC Multi-Speed 4	0.00 to maximum frequency	40.00 Hz	Y
F7-05	PLC Multi-Speed 5	0.00 to maximum frequency	50.00 Hz	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F7-06	PLC Multi-Speed 6	0.00 to maximum frequency	40.00 Hz	Y
F7-07	PLC Multi-Speed 7	0.00 to maximum frequency	30.00 Hz	Y
F7-08	PLC Multi-Speed 8	0.00 to maximum frequency	20.00 Hz	Y
F7-09	PLC Multi-Speed 9	0.00 to maximum frequency	10.00 Hz	Y
F7-10	PLC Multi-Speed 10	0.00 to maximum frequency	20.00 Hz	Y
F7-11	PLC Multi-Speed 11	0.00 to maximum frequency	30.00 Hz	Y
F7-12	PLC Multi-Speed 12	0.00 to maximum frequency	40.00 Hz	Y
F7-13	PLC Multi-Speed 13	0.00 to maximum frequency	50.00 Hz	Y
F7-14	PLC Multi-Speed 14	0.00 to maximum frequency	40.00 Hz	Y
F7-15	PLC Multi-Speed 15	0.00 to maximum frequency	30.00 Hz	Y
F7-16	PLC Multi-Speed 16	0.00 to maximum frequency	20.00 Hz	Y
F7-17	PLC Stage 1 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y

F7-18	PLC Segment 1 Direction and Acceleration/Deceleration Time	LED units digit: Running direction for this stage (compared to the run command) 0: Same direction 1: Reverse LED tens digit: Acceleration/deceleration time for this segment 0: Acceleration/deceleration time 1 1: Acceleration/deceleration time 2 2: Acceleration/deceleration time 3 3: Acceleration/deceleration time 4	00	Y
F7-19	PLC Segment 2 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-20	PLC Segment 2 Direction and Acceleration/Deceleration Time	Same as the settings for Stage 1	00	Y
F7-21	PLC Stage 3 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-22	PLC Segment 3 Direction and Acceleration/Deceleration Time	Same as the settings for Stage 1	00	Y
F7-23	PLC Stage 4 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-24	PLC Segment 4 Direction and Acceleration/Deceleration Time	Same as the settings for Stage 1	00	Y
F7-25	PLC Segment 5 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y

F7-26	PLC Segment 5 Direction and Acceleration/Deceleration Time	Same as the settings for Stage 1	00	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F7-27	PLC Segment 6 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-28	PLC Segment 6 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-29	PLC Segment 7 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-30	PLC Section 7 Direction and Acceleration/Deceleration Times	Same as the settings for Segment 1	00	Y
F7-31	PLC Segment 8 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-32	PLC Segment 8 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-33	PLC Segment 9 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-34	PLC Segment 9 Direction and Acceleration/Deceleration	Same as the settings for the first segment	00	Y

	ion Time			
F7-35	PLC Segment 10 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-36	PLC Segment 10 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-37	PLC Segment 11 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-38	PLC Block 11 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-39	PLC Segment 12 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-40	PLC Segment 12 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-41	PLC Segment 13 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-42	PLC Block 13 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-43	PLC Segment 14 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-44	PLC Block 14 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-45	PLC Segment 15: Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-46	PLC Block	Same as the settings for the first	00	Y

	15 Direction and Acceleration/Deceleration Time	segment		

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F7-47	PLC Block 16 Run Time	0.0 - 6500.0 (s/m/h)	10.0	Y
F7-48	PLC Block 16 Direction and Acceleration/Deceleration Time	Same as the settings for the first segment	00	Y
F7-49	Reserved			
F8 Communication Parameter Group				
F8-00	Communication Baud Rate Selection (RS485 Terminal Block)	0: 300 bps (retained) 1: 600 bps (reserved) 2: 1,200 bps 3: 2,400 bps 4: 4,800 bps 5: 9,600 bps 6: 19,200 bps 7: 38,400 bps	5	Y
F8-01	Data Format	0: No parity 8-N-1 1: Odd parity 8-O-1 2: Even parity 8-E-1 3: No parity 8-N-2 4: Odd parity 8-O-2 5: Even parity 8-E-2	0	Y

F8-02	Mailing Address	1 - 247	1	Y
F8-03	Communication Response Delay	0 - 5000 ms	0.0 ms	Y
F8-04	Communication Timeout Error Time	0.1 - 100.0 s	1.0 s	Y
F8-05	Communication Protocol Selection	0: Slave 1: Master	00	Y
F8-06	Frequency Setting Gain	0.0 - 500.0%	100.0%	Y
F8-07	Modbus Transmission Response Handling	0: Write operation acknowledged 1: No response to write operation	0	Y
F8-08	Communication Disconnection Handling	0: Do not detect timeout faults 1: Detect fault and stop automatically 2: Issue a warning and continue operation 3: Shutdown warning, operational fault	0	Y

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Attribute
F8-09	Communication Operation Command/ Frequency Source Selection	Units digit: Communication command source 0: Terminal 485 is the communication command source 1: Expansion card 485 is the communication command source 2: Both Terminal 485 and Expansion 485 are communication command source Tens place: Communication frequency source 0: Terminal 485 is the communication frequency source 1: The 485 expansion card is the communication frequency source 2: Both Terminal 485 and Expansion 485 are communication frequency source	0X22	Y
F8-10	Communication baud rate selection (RS485 expansion board)	0: 300 bps (reserved) 1: 600 bps (Reserved) 2: 1200 bps 3: 2400 bps 4: 4,800 bps 5: 9,600 bps 6: 19,200 bps 7: 38,400 bps	5	Y
F8－11	Data Format	0: No parity 8-N-1 1: Odd parity 8-O-1 2: Even parity 8-E-1 3: No Parity 8-N-2 4: Odd Parity 8-O-2 5: Even parity 8-E-2	0	Y
F8-12	Mailing Address	1－247	1	Y
F8-13	Communication Response Delay	0－5000 ms	0.0 ms	Y
F8-14	Communication Timeout	0.1－100.0 s	1.0 s	Y

	Error Time			
F8-15	Communication Protocol Selection	0: Slave 1: Master	0	Y
F8-16	Frequency Setting Gain	0.0 - 500.0%	100.0%	Y
F8-17	Modbus Transmission Response Handling	0: Write operation acknowledged 1: No response to write operation	0	Y
F8-18	Communication Disconnection Handling	0: Do not detect timeout errors 1: Report a fault and stop the system 2: Issue a warning and continue operation 3: Shutdown warning, operational fault	0	Y
F8-19	Reserved			

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F8-20	Host Cycle Transmission Parameter Selection	Units, tens, hundreds, thousands 0: Invalid 1: Host operation command 2: Host setpoint frequency 3: Host output frequency 4: Host upper frequency limit 5: Host setpoint torque 6: Host output torque 7/8: Reserved 9: Host PID Setpoint A: Host PID Feedback B: Reserved C: Active current component	0x0031	Y
F8-21	Frequency setpoint Custom address	0x00 - 0xFF	0000	Y

	setting			
F8-22	Command-specified custom address settings	0x00 - 0xFF	0000	Y
F8-23	Command set to forward rotation command value	0x00 - 0xFF	01	Y
F8-24	Command value for reverse operation	0x00 - 0xFF	02	Y
F8-25	Command set to stop command value	0x00 - 0xFF	05	Y
F8-26	Command set to reset command value	0x00 - 0xFF	07	Y
F8-27	Reserved			
F8-28	Reserved			
F8-29	Host Operation Commands Select	0: Run command 1: Running status	0	Y
F8-30	Address mapping enabled	0: Disabled 1: Enabled	0	Y
F8-31	Mapped Address 1	0x0000 - 0xFFFF	0x0000	Y
F8-32	Parameter Address 1	0x0000 - 0xFFFF	0x0000	Y
F8-33	Mapped Address 2	0x0000 - 0xFFFF	0x0000	Y
F8-34	Parameter Address 2	0x0000 - 0xFFFF	0x0000	Y
F8-35	Mapped Address 3	0x0000 - 0xFFFF	0x0000	Y

F8-36	Parameter Address 3	0x0000 - 0xFFFF	0x0000	Y
F8-37	Mapped Address 4	0x0000 - 0xFFFF	0x0000	Y
F8-38	Parameter Address 4	0x0000 - 0xFFFF	0x0000	Y
F8-39	Mapped Address 5	0x0000 - 0xFFFF	0x0000	Y
F8-40	Parameter Address 5	0x0000 - 0xFFFF	0x0000	Y

Function Code	Function Code Name	Setting Range and Definitions	Factory Setting	Attribute
F8-41	Mapped Address 6	0x0000 - 0xFFFF	0x0000	Y
F8-42	Parameter Address 6	0x0000 - 0xFFFF	0x0000	Y
F8-43	Mapped Address 7	0x0000 - 0xFFFF	0x0000	Y
F8-44	Parameter Address 7	0x0000 - 0xFFFF	0x0000	Y
F8-45	Mapped Address 8	0x0000 - 0xFFFF	0x0000	Y
F8-46	Parameter Address 8	0x0000 - 0xFFFF	0x0000	Y
F8-47	Mapped Address 9	0x0000 - 0xFFFF	0x0000	Y
F8-48	Parameter Address 9	0x0000 - 0xFFFF	0x0000	Y
F8-49	Mapped address 10	0x0000 - 0xFFFF	0x0000	X
F8-50	Parameter Address 10	0x0000 - 0xFFFF	0x0000	Y
F8-51	Mapped Address 11	0x0000 - 0xFFFF	0x0000	Y
F8-52	Parameter Address 11	0x0000 - 0xFFFF	0x0000	Y
F8-53	Mapped Address 12	0x0000 - 0xFFFF	0x0000	Y
F8-54	Parameter Address 12	0x0000 - 0xFFFF	0x0000	Y

F8-55	Mapped Address 13	0x0000 - 0xFFFF	0x0000	Y
F8-56	Parameter Address 13	0x0000 - 0xFFFF	0x0000	Y
F8-57	Mapped Address 14	0x0000 - 0xFFFF	0x0000	Y
F8-58	Parameter Address 14	0x0000 - 0xFFFF	0x0000	Y
F8-59	Mapped Address 15	0x0000 - 0xFFFF	0x0000	Y
F8-60	Parameter address 15	0x0000 - 0xFFFF	0x0000	Y
F8-61	Mapped address 16	0x0000 - 0xFFFF	0x0000	Y
F8-62	Parameter Address 16	0x0000 - 0xFFFF	0x0000	Y
F9 Operator Parameter Group				
F9-00	Menu Mode	0: Standard menu 1: Advanced Menu 2: Expert Menu	1	X
F9-01	User Password	0 - 65535	00000	X
F9-02	Copy Keyboard Parameters	0: No function 1 - 10: Upload parameters to zones 1 - 10 of the keyboard; (Parameters will be overwritten if the zone is in use); 11 - 20: Download parameters from zones 1 - 10 of the keypad; 21 - 30: Download parameters from keyboard zones 1 - 10 (excluding motor parameters); 31 - 40: Download parameters from zones 1 - 10 on the keypad (parameters are not saved in the event of a power loss); 41 - 50: Upload parameters to zones 1 - 10 of the keypad; (Not used)	0	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
F9-03	Load Type Selection	0: G-type unit, general-purpose 1: P-type unit, fan, pump	0	X
F9-04	LCD Keypad Language	0: Chinese 1: English	0	Y
F9-05	Debug Parameter 1		0000	X
F9-06	Debug Parameter 2		0000	X
F9-07	Debug Parameter 3		0000	X
F9-08	Extended Menu	Units: Comparison Mode Menu Display 0: Comparison mode menu is not displayed 1: Comparison mode menu displayed	0000	X
F9-10	MFK multifunction key Select	0: Disabled 1: Keyboard reverse operation 2: Keyboard jog forward 3: Keyboard Jog Reverse 4: Free stop (all command channels)	1	Y
F9-11	Up/Down keys for quick function selection	LED units digit: Use up/down arrows to adjust the value 0: Auto 1: Custom values for F9-12 2: Disabled LED tens digit: Power-off data retention 0: Frequency is not retained after power loss 1: Frequency retained after power loss	10	Y
F9-12	Use the up and down keys to quickly change the parameter code setting	LED units and tens digits: Set yy in function parameter number Fx-yy to 00-99 LED hundreds and thousands digits: Set xx (00-15) in function parameter number Fx-yy	0000	Y

F9-13	Key Lock Selection	0: No lock 1: All keys locked 2: All keys locked except the Start/Stop key 3: All keys locked except the shift key 4: All keys locked except the MFK key	0	Y
F9-14	Keyboard Display Settings	Units digit: Forward/reverse indicator 0: Positive logic 1: Inverted logic	0	Y
F9-15	Power Display Selection	LED units digit: Power display value 0: Power display as a percentage (%) 1: Power display in kilowatts (kW)	0001	Y

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Attribute
F9-16	Power Display Coefficient	0.0-500.0%	100.0%	Y
F9-17	Speed Display Coefficient	0.0-500.0%	100.0%	Y
F9-18	Monitoring Parameter Display Filter Selection	LED units digit: Current display filtering 0-F: The higher the value, the deeper the filtering LED units digit: Frequency display filtering 0-F: The higher the value, the deeper the filtering LED hundreds digit: RPM display filtering 0-3: The higher the value, the deeper the filtering	0x002	Y
F9-19	Reserved			

F9-20	Keyboard Cycle Display Parameter 1	Monitor the setting for xxx in parameter number d-xxx	003	Y
F9-21	Keypad cycle display Parameter 2	Monitor the setting for xxx in parameter number d-xxx	001	Y
F9-22	Keypad cycle display Parameter 3	Monitor the setting for xxx in parameter number d-xxx	002	Y
F9-23	Keypad cycle display Parameter 4	Monitor the setting for xxx in parameter number d-xxx	000	Y
F9－24	Keypad cycle display Parameter 5	Monitor the setting for xxx in parameter number d-xxx	005	Y
F9-25	Keypad cycle display Parameter 6	Monitor the setting for xxx in parameter number d-xxx	006	Y
F9-26	Keypad cycle display Parameter 7	Monitor the setting for xxx in parameter number d-xxx	000	Y
F9-27	Keypad cycle display Parameter 8	Monitor the setting for xxx in parameter number d-xxx	000	Y
F9-28	Custom monitoring code 1	Set the specific monitoring index xxx in monitoring parameter d-023	0000	Y
F9-29	Custom Monitoring Code 2	Setting the specific monitoring index xxx in monitoring parameter d-024	0000	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
FA Current/Voltage Protection Control Parameter Group				
FA-00	Current Limit Value	0.0 - 300.0%	150.0%	Y
FA-01	Current Limit Gain	0.0 - 500.0%	100.0%	Y
FA-02	Bus Overvoltage Suppression Function	LED units digit: Overvoltage suppression control 0: Disabled 1: Enabled LED units digit: Over-excitation control 0: Off 1: Enable during deceleration 2: Enabled during operation	01	X
FA-03	Busbar overvoltage suppression point	0 - 10,000 V	Model Settings	X
FA-04	Bus Overvoltage Suppression Gain	0.0 - 500.0%	50.0%	Y
FA-05	Bus Undervoltage Suppression Function	0: Disabled 1: Enabled	0	Y
FA-06	Bus Undervoltage Suppression Point	0 - 9999 V	Model Setting	X
FA-07	Bus Undervoltage Suppression Gain	0.0 - 500.0%	50.0%	X

FA-20	Speed Tracking Mode	LED units digit: Search mode 0: Search from maximum frequency 1: Search from the stop frequency LED units digit: Reverse search 0: Off 1: On	0000	X
FA-21	Speed tracking range	0.00 - 60.00 s	0.50 s	X
FA-22	Speed tracking stop Delay	0.00 - 60.00 s	1.00 s	Y
FA-23	Speed-tracking current	0.0 - 400.0%	120.0%	Y
FA-24	Reserved			Y
FA-30	Carrier frequency	300 - 5000 Hz	Monitoring Value	

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
FA-31	PWM Control Mode	LED units digit: Carrier frequency is temperature-dependent 0: Temperature-independent 1: Temperature-dependent; carrier is reduced when temperature is too high LED units digit: Carrier frequency is temperature-dependent 0: Independent of output frequency 1: Depends on output frequency LED tens place: Reserved LED thousands place: PWM modulation mode 0: Uses only three-phase modulation 1: Automatic switching between two-phase and three-phase	1111	Y

		modulation		
FA-32	PWM Control Mode 2	LED units digit: PWM overmodulation control 0: Overmodulation disabled 1: Two-level overmodulation enabled 2: Three-level and two-level overmodulation enabled LED tens digit: Reserved LED units digit: Dead-zone compensation control 0: Dead-zone compensation disabled 1: Dead-time compensation enabled LED thousands place: Reserved	1102	X
FA-33	PWM Control Mode 3	LED units digit: Three-level mode 0: Optimized Mode 1 1: Optimized Mode 2 LED units digit: Reserved LED units digit: Reserved LED thousands place: Reserved	0000	X
FA-34	Start of two-phase modulation Frequency	0.0 - 100.0%	60.0%	Y
FA-35	Low-frequency carrier limit	300 - 2000 Hz	300 Hz	Y
FA-36	Low-frequency carrier function	0.00 - 300.00 Hz	8.00 Hz	Y

	Frequency			
FA-37	Low-frequency carrier function Exit Frequency	0.00 - 300.00 Hz	16.00 Hz	Y
FA-38	Busbar Midpoint Adjustment Coefficient	0 - 20.00	2.00	Y
FA-39	Retained			

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
Fb Encoder Parameter Group				
Fb-00	Speed Feedback Encoder Type	0: Rotary Transformer 1: ABZ encoder	0	X
Fb-01	Encoder Direction	0: Same Direction 1: Opposite direction	0	X
Fb-02	ABZ Encoder Z-Pulse Detection Selection	0: Off 1: On	1	X
Fb-03	ABZ Encoder Line Count	1 - 10,000	1024	X
Fb-04	Rotary Transformer Number of Pole Pairs	1 - 49	1	X
Fb-05	Encoder Gear Ratio Numerator	1 - 32,767	1	X

Fb-06	Encoder gear ratio Denominator	1 - 32,767	1	X
Fb-07	Encoder speed measurement filter time	0.00 - 10.00 ms	1.00 ms	Y
Fb-08	Encoder open-circuit detection time	0.00 - 6.000 s	0.0500 s	Y
Fb-09	Open-loop speed measurement enable	0: Disabled 1: Enable PG speed measurement in open-loop vector mode (For debugging)	0	Y
FD Protection Parameter Group				
Fd-00	Software Overcurrent Protection Threshold	0 - 300% (100% relative to the inverter's rated current)	225.0	Y
Fd-01	Current Limit Alarm Detection Time	0.0 - 60.0 s	30.0 s	X
Fd-02	Continuous Current Limiting Fault Detected	0.0 - 400.0 s	90.0 s	X
Fd-03	Output Phase Loss Protection	0: Off 1: Enable output phase loss detection	1	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
Fd-04	Output Unbalance Protection	0: Disabled 1: Protection activates and the unit stops freely 2: Alarm and continue operation	1	X
Fd-05	Current Imbalance Detection Threshold	0 - 500%	160%	X
Fd-06	Current Imbalance Detection Time	0.0 - 60.0 s	2.0 s	X
Fd-07	Vector Control Without Motor Fault Detection	0: Off 1: Enable detection	1	X
Fd-08	Motor Overload Current Coefficient	0.0 - 250.0%	100.0%	Y
Fd-09	Retention			
Fd-10	Input voltage phase loss Action	Units digit: Input phase loss action selection 0: No action 1: Protection trips and the unit stops freely 2: Issue an alarm and continue operation Tens place: Reserved Hundreds place: Detection settings 0: Detect only during operation 1: Detect during both operation and shutdown	101	X
Fd-11	Undervoltage Protection Trip	Units digit: Bus under-voltage fault trip during operation 0: Undervoltage will only trigger a shutdown action; not treated as a fault 1: Undervoltage is treated as a	01	Y

		fault and reports E.Lu 2: Undervoltage is treated as a fault and triggers an E.Lu alarm, but the terminal fault output does not activate Tens place: Auxiliary contactor re-energizes 0: The auxiliary contactor engages only once at power-up 1: The auxiliary contactor re-energizes during a fault reset operation		
Fd-12	Bus under-voltage protection setpoint	Default value and setting range determined by model T2: 180 V T3: 320 V T6: 560 V T11: 1000 V T23: 2000 V T33: 3000 V T60: 6,000 V	Model Settings	Y
Fd-14	Busbar overvoltage protection point	200 - 9000 V	Model Settings	Y

Function code	Function Code Name	Setting Range and Definitions	Factory Setting	Attribute
Fd-17	Contactor Feedback Fault Detection	0: Do not detect 1: When detection is active, issue warning A.JCi (23) 2: Issue fault signal E.JCi (13) when detection is valid	0	Y
Fd-19	Fault Simulation Input	0000 - 9999 Units and tens places: Fault main code Hundreds and thousands digits: Fault subcode	0000	Y
Fd-20	Number of automatic fault recoveries	0 - 100	0	Y

Fd-21	Fault Auto-Recovery Interval	0.1 - 100.0 s	1.0 s	Y
Fd-22	Fault Operation Indication Selection	Automatic Reset Interval Fault Indication Action Selection 0: No action 1: Activate	0	Y
Fd-25	Fan Control Selection	0: The fan runs continuously after power-up 1: ON/OFF control based on operating commands 2: ON/OFF control based on temperature	1	Y
Fd-26	Fan stop delay Time	0 - 600.00 S	30.00	Y
Fd-27	Superheat Warning Detection Level	0.0 - 85.0	80.0	Y
Fd-28	Inverter Overload Early warning detection level	0.0 - 100.0	90.0	Y
Fd-29	Retained			
Fd-30	Excessive speed deviation Protection action	LED units digit: Detection selection 0: No detection 1: Constant-speed detection only 2: Continuous detection LED tens place: Alarm selection 0: Stop operation and report a fault 1: Trigger an alarm and continue operation	00	Y
Fd-31	Excessive speed deviation Detection	0.0 - 60.0%	10.0%	Y

	threshold			
Fd-32	Excessive speed deviation Detection time	0.0 - 60.0 s	2.0 s	Y

Function code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
Fd-33	High-Speed Protection Trip	LED units digit: Detection selection 0: Do not detect 1: Constant-speed detection only 2: Continuous detection LED tens digit: Alarm selection 0: Stop operation and report a fault 1: Trigger an alarm and continue operation	02	Y
Fd-34	High-Speed Detection Threshold	0.0 - 150.0%	110.0%	Y
Fd-35	Rapid Detection Time	0.000 - 2.000 s	0.010 s	Y

Fd-40	Load Early Warning Detection Settings	LED units digit: Detection selection (Protection 1) 0: Do not detect 1: Detect excessive load 2: Detect overload only during constant-speed operation 3: Detect underload 4: Detects underload only during constant speed operation LED tens place: Alarm selection 0: Alarm, continue operation 1: Fault protection activates and the motor stops freely LED hundreds place: Detection selection (Protection 2) 0: Do not detect 1: Detect overload 2: Detects overload only during constant-speed operation 3: Detects underload 4: Detects underload only during constant speed operation LED thousands place: Alarm selection 0: Alarm, continue operation 1: Fault protection activates and the motor stops freely	0000	X
Fd-41	Load early warning detected Level 1	0.0 - 200.0%	130.0%	Y
Fd-42	Load Alert Detected Time 1	0.0 - 60.0 s	5.0 s	Y
Fd-43	Load Early Warning Detection Level 2	0.0 - 200.0%	30.0%	Y
Fd-44	Load Early Warning Detection Time 2	0.0 - 60.0 s	5.0 s	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
Fd-45	Locked-rotor Detection Action	Units digit: 0: No detection 1: If detection is valid, trigger fault A.Blo 2: Reports fault E.Blo when detection is valid Tens place: 0: Open-loop vector detection disabled 1: Open-loop vector detection enabled	2	X
Fd-46	Stall speed	0.1 - 600.0 rpm	3.0 rpm	X
Fd-47	Locked-rotor detection time	0.0 - 600.0 s	5.0 s	X
A0 CAN Communication Function				
A0-00	CAN baud rate	0:20K 1: 50K 2: 100K 3: 125K 4: 250K 5:500K 6: 1M	3	X
A0-01	CAN slave address	0 - 10	1	X
A0-02	CAN Master-Slave Control Configuration	Units digit: Reserved Tens place: Master reset, slave fault action 0: Activate 1: No action Hundreds place: Master failure causes shutdown; slave shuts down freely 0: Activate	0000	X

		1: No action		
A0-03	CAN Master-Slave Control Enable	0: Disabled 1: Enabled 2: Master-Master Speed, Slave Torque Mode 3: Master-Slave Speed Mode 4: Slave-Torque Mode (Command Follow) 5: Slave-Speed Mode (Command Follow) 6: Slave-Torque Mode (Command Not Followed) 7: Slave-Speed Mode (Command Not Followed)	0	X

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Attribute
A0-04	CAN Master/Slave Selection	0: Act as master 1: As a slave 2: Terminal selection (valid only for master)	1	X
A0-05	Slave follows master Command	0: Do not follow 1: Slave follows master in executing commands	1	X
A0-06	Slave Control Mode	0: Torque Control 1: Frequency Control 2: Terminal Switching (Torque mode is active)	0	Y
A0-07	Slave Control Gain	0.000 - 10.000	1.000	Y
A0-08	Open-Circuit Detection Action	0: Do not detect timeout faults 1: Trip and free stop 2: Issue a warning and continue operation 3: Shutdown warning, operational fault	0	X

A0-09	Line Break Detection Time	0.000 - 10.000 s	1.000	X
A0-10	Host Transmission Cycle	1 - 9999 ms	2	X
A0-11	Number of Slaves	0 - 10	1	X
A0-12	Host Operation Command Send	0: Send host operation/stop status 1: Send host operation/stop command	0	X
A0-13	Slave operation timeout Detection	0.000 - 60.000 s	1.000	X
A0-14	Speed limit increment during slave torque control	0.0 - 20.0%	5.0	Y
A0-15	Reserved			
A0-16	Reserved			
A0-17	Speed Difference Limit During Slave Torque Control	0.0 - 100.0%	10.0	Y
A0-18	Slave Operation Command Transmission delay	0.000 - 1.000 s	0.000	Y
A0 - 19	Reserved			
A0-20	Sag control frequency	0.00 - 10.00 Hz	0.00	
A0-21	Sag Control Gain	0.0 - 1000.0%	100.0%	
A0-22	Droop Control Filter	0.000 - 6.000 s	0.100	

A0-23	Drop Control Mode	0: Automatic 1: Standalone	0	
A0-24	Sag Control Function Frequency	0.0 - 100.0%	0	

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Attribute
A2 Dedicated Parameters				
A2-00	Brake Control Logic Enable	0: Disabled 1: Enabled	0	X
A2-01	Release Frequency	0.00 - 10.00 Hz	2.50	X
A2-02	Tripping Process Current Limit Range	0.0 - 200.0%	120.0	X
A2-03	Release Frequency Hold Time	0.0 - 10.0 s	1.0	X
A2-04	Brake application frequency	0.00 - 10.00 Hz	2.00	X
A2-05	Brake Frequency Hold Time	0.0 - 10.0 s	1.0	X
A2-06	Reserved			

Inverter Status Monitoring Parameter List

Monitoring Code	Content	Unit
d-000	Output Frequency (output frequency after acceleration/deceleration processing of the set frequency)	0.01 Hz
d-001	Output Voltage	1 V
d-002	Output current	0.1 A
d-003	Set Frequency	0.01 Hz
d-004	Output frequency (including slip or actual synchronous frequency)	0.01 Hz
d-005	Bus voltage	1 V
d-006	Module temperature	0.1 degrees
d-007	Process closed-loop setpoint	0.0 - 100.0
d-008	Process Closed-Loop Feedback	0.0 - 100.0
d-009	Mechanical Speed	1 RPM
d-010	Output torque	0.1%
d-011	Pulse input frequency	0.01 kHz
d-012	RS485 setting frequency	
d-013	CAN Setting Frequency	
d-014	AI1 Setting	0.1%
d-015	AI2 Setting	0.1%
d-016	X Terminal Status bit0 - bit7: Correspond to terminals X1 - X8 bit8 - bit11: Correspond to vX1 - vX4 bit12 - bit13: Correspond to vXAi1 - vXAi2	-
d-017	Y Terminal Status bit0 - bit3: Correspond to the Y1, TA1, TA2, and Y2 terminals bit4 - bit7: Correspond to vY1 - vY4	-
d-018	Single Continuous Operation Time	0.1 h
d-019	Cumulative operating time	1h
d-020	Reserved	
d-021	Internal Timer	
d-022	Control Mode 0: VF Control 1: Vector Speed Control 2: Vector Torque Control 3: Vector position control	

d-023	Custom Monitoring 1	
d-024	Custom Monitoring 2	
d-025	Output Power	0.1 kW
d-026	Power Factor	0.001
d-027	Upper Busbar Voltage	1 V
d-028	Lower Busbar Voltage	1V

Monitoring Code	Content	Unit
d-029	Phase U Current	0.1 A
d-030	V-phase current	0.1 A
d-031	Phase W current	0.1 A
d-032	Input voltage	1 V
d-033	Encoder Speed Feedback	0.01 Hz
d-034	Encoder Position Feedback	
d-035	0: 3-phase inverter, three-level 1: 3-phase two-level inverter 2: 3-phase two-level inverter (all-in-one unit) 3: 6-pulse rectification (three-level) 4: AFE Rectification (Three-Level) 5: 6-pulse rectification (two-level) 6: AFE Rectification (Two-Level) 10: 5-phase drive, three-level 11: 5-phase drive, two-level 12: 6-phase drive, three-level 13: 6-phase drive, two-level 15: 5-level inverter 16: 5-level rectification 20: High-Voltage CHB	-
d-036	Inverter Rated Power	-
d-037	AC Drive Rated Voltage	-
d-038	AC Drive Rated Current	-
d-039	Software Version Information	-
d-040	Slave 1 Output Frequency	0.01 Hz
d-041	Slave 1 Output Current	0.1 A
d-042	Slave 2 output frequency	0.01 Hz
d-043	Slave 2 output current	0.1 A
d-044	Slave 3 Output Frequency	0.01 Hz
d-045	Slave 3 output current	0.1 A
d-046	Slave 4 output frequency	0.01 Hz
d-047	Slave 4 output current	0.1 A
d-048	Slave 5 output frequency	0.01 Hz

d-049	Slave 5 output current	0.1 A
d-050	CAN Master-Slave Control Mode 0: Control disabled 1: Master-Torque Mode 2: Master - Speed Mode 3: Slave - Torque (Command Follow) 4: Slave - Speed Control (Command Follow) 5: Slave - Torque (Command Not Followed) 6: Slave - Speed Control (Command Not Followed)	——

Monitoring Code	Content	Unit
d-051	Main Fault Code (Most Recent)	—
d-052	Output Frequency at the Time of Failure	0.01 Hz
d-053	Output current during fault	0.1 A
d-054	Bus voltage during a fault	0.1 V
d-055	Input terminal status during a fault	——
d-056	Output terminal status during a fault	——
d-057	Fault Main Code (Last Two Occurrences)	——
d-058	Output Frequency at the Time of Failure	0.01 Hz
d-059	Output Current During a Fault	0.1 A
d-060	Bus voltage during a fault	0.1 V
d-061	Input terminal status during a fault	——
d-062	Output terminal status during a fault	——
d-063	Fault Main Codes (Last Three)	——
d-064	Output Frequency at the Time of the Fault	0.01 Hz
d-065	Output Current During a Fault	0.1 A
d-066	Bus voltage during a fault	0.1 V
d-067	Input terminal status during a fault	——
d-068	Output terminal status during a fault	——
d-069	Voltage Difference Between Upper and Lower Busbars	
d-070	Sag Control Adjustment Frequency	0.01 Hz
d-071	Active Current	0.1%
d-072	Reserved	
d-073	Inverter Status Units digit: Direction of rotation 0: Forward 1: Reverse Tens place: Operating status	

	0: Stopped 1: Accelerating 2: Deceleration 3: Constant speed operation Hundreds place: Inverter status bit0: 1—Power-up complete bit1: 1 - Standby ready bit2: 1 - Fault condition bit3: 1 - Alarm status Thousands place: Command channel selection 0: Keyboard 1: Terminal 2: CAN 3: 485 expansion card 4: Terminal 485	

Monitoring Code	Content	Unit
d-074	Software Subversion	
d-075	R Input Voltage	1 V
d-076	S Input Voltage	1 V
d-077	T Input Voltage	1 V
d-078	RST Voltage Detection Configuration 0: Detect output UVW 1: RST input detection	
d-079	Reserved	
d-080	Slave 6 Output Frequency	0.01 Hz
d-081	Slave 6 Output Current	0.1 A
d-082	Slave 7 Output Frequency	0.01 Hz
d-083	Slave 7 Output Current	0.1 A
d-084	Slave 8 output frequency	0.01 Hz
d-085	Slave 8 output current	0.1 A
d-086	Slave 9 output frequency	0.01 Hz
d-087	Slave 9 Output Current	0.1 A
d-088	Slave 10 Output Frequency	0.01 Hz
d-089	Slave 10 output current	0.1 A
d-090	Cumulative inverter overload	0.1%
d-091	Cumulative motor overload	0.1%
d-092	Current Fault Code When there are no faults, this value is 0. Units and tens digits: Main fault code	—

d-093	Current diagnostic information When there is no fault, this value is 0 Units and tens digits: Fault subcode Hundreds and thousands digits: Fault main code	—
d-094	Reason for last shutdown 0—No record 1-Shutdown due to fault 2-Undervoltage shutdown 3-Normal shutdown	——
d-095	Current Actual Carrier	Hz
d-098	Number of Parameters Set (Number of parameters that differ from factory defaults)	
d-099	Password Key	99999
d-100	AI1 Input Voltage	0.01 V
d-101	AI2 Input Voltage	0.01 V
d-102	Reserved	
d-103	AO1 Output	0.01 V
d-104	AO2 Output	0.01 V
d-105	Torque command	0.1%

Monitoring Code	Content	Unit
d-110	Cumulative High Electricity Consumption	10,000 kWh
d-111	Cumulative Low Electricity Usage	1 kWh
d-112	Operating time (hours)	1h
d-113	Operating time—minutes	1m
d-114	Time since power-on	0.1h
d-115	Power-on time (hours)	1h
d-116	Power-on time - minutes	1m
d-117	Fan operating time - hours	1h
d-118	Fan operating time - minutes	1m
d-120	Buffer contactor engagement count (high limit)	65536
d-121	Buffer contactor engagement count (low limit)	1
d-122	Buffer Contactor Status (1: Engaged; 0: Disengaged)	
d-123	Cooling fan operating status (1: Running; 0: Stopped)	
d-124	Buffer Contactor Feedback Status (1:	

	Engaged; 0: Not Engaged)	
d-130	Process closed-loop status	0 - 0xFFFF
d-131	Process closed-loop setpoint	0.0 - 100.0
d-132	Process closed-loop feedback	0.0 - 100.0
d-133	Process closed-loop error	-100.0 - 100.0
d-134	Process closed-loop output	-100.00 to 100.00
d-140	Terminal 485 Received Frame Count	
d-141	Terminal 485 Received Valid Frame Count	
d-142	Terminal 485 Received Frame Check Error Count	
d-143	Terminal 485 Received Serial Port Error Count	
d-147	Terminal 485 Protocol Status (0: Slave, 1: Master)	
d-148	Terminal 485 Data Reception Interval	1 ms
d-150	Extended 485 Receive Frame Count	
d-151	Extended 485 Received Valid Frame Count	
d-152	Extended 485 Received Frame Check Error Count	
d-153	Extended 485 Received Serial Error Count	
d-157	Extended 485 Protocol Status (0: Slave, 1: Master)	
d-158	Extended 485 Data Reception Interval	1 ms
d-166	Maximum phase index for module temperature 0: U maximum temperature 1: Maximum V temperature 2: Maximum W temperature	0 - 2
d-167	Module U Temperature	0.0 - 100.0
d-168	Module V Temperature	0.0 - 100.0
d-169	Module W Temperature	0.0 - 100.0
d-180	Torque Control Forward Speed Limit	0.0 - 100.0
d-181	Torque Control Reverse Speed Upper Limit	0.0 - 100.0

Monitoring code	Content	Unit
d-200	CAN Master/Slave Control Selection 0—Control disabled 1—Master—Torque Mode 2 - Master - Speed Mode 3 - Slave - Torque (Command Follow) 4 - Slave - Speed Control (Command Follow)	0 - 6

	5-Slave - Torque (Command Not Followed) 6-Slave - Speed Control (Command Not Followed)	
d-201	Master-Slave Control Operation Commands 0: Stop 1: Forward operation 2: Reverse operation	0 - 2
d-202	Frequency Command Master: Current value in use Slave: Value sent by the master	0.01 Hz
d-203	Torque command	-100.00 to 100.00%
d-204	Excitation Command	-100.00 to 100.00%
d-205	Control Mode 0: VF Control 1: Vector Speed Control 2: Vector Torque Control 3: Vector Position Control	0 - 3
d-206	CAN Frame Receive Count	
d-207	Frame reception interval	1 ms
d-208	Frame transmission time	0.1 ms
d-209	CAN processing 1 ms count	
d-220	Slave 1 Fault Code	
d-221	Slave 2 Fault Code	
d-222	Slave 3 Fault Code	
d-223	Slave 4 Fault Code	
d-224	Slave 5 Fault Code	
d-225	Slave 6 Fault Code	
d-226	Slave 7 Fault Code	
d-227	Slave 8 Fault Code	
d-228	Slave 9 Fault Code	
d-229	Slave 10 Fault Code	
d-230	Inverter Overload Percentage	0.0 - 100.0%
d-231	Current Threshold for Overload Protection	0 - 200%
d-232	Time corresponding to current overload	0.0 s
d-234	Current model	

Monitoring code	Content	Unit
d-235	Motor Overload Percentage	0.0 - 100.0%
d-236	Time corresponding to current overload	0 s
d-250	PG feedback frequency	0.00 - 600.00 Hz
d-251	Resolver Angle Feedback	0 - 4095
d-252	Z-pulse Count	
d-253	Z-pulse error	
d-254	ABZ Pulse Count	0 - 65535
d-255	Encoder Type 0: RT rotary encoder 1: ABZ optical encoder 15: Encoder not enabled	0 - 1
d - 256	Number of encoder lines	0 - 32767
d-290	Overvoltage protection point	0 - 10,000 V
d-291	Undervoltage protection point	0 - 10,000 V
d-292	Overvoltage suppression point	0 - 10,000 V
d-293	Undervoltage suppression point	0 - 10,000 V
d-294	Undervoltage cut-off voltage	0 - 10,000 V
d-295	Inverter Busbar Rated Voltage	0 - 10,000 V
d-300	Fault main code (most recent)	——
d-301	Output frequency during a fault	0.01 Hz
d-302	Output current during a fault	0.1 A
d-303	Bus voltage during a fault	0.1 V
d-304	Input terminal status during a fault	——
d-305	Output terminal status during a fault	——
d-306	Operating Status During a Fault	——
d-307	Output Voltage During a Fault	0.1V
d-308	Module Temperature During a Fault	0.1°
d-309	Fault Diagnostic Information	——
d-310	Main Fault Codes (Last Two)	——
d-311	Output Frequency at the Time of Failure	0.01 Hz
d-312	Output current during a fault	0.1 A
d-313	Bus voltage during a fault	0.1 V
d-314	Input terminal status during a fault	——
d-315	Output terminal status during a fault	——
d-316	Operating Status During a Fault	——
d-317	Output Voltage During a Fault	0.1 V
d-318	Module Temperature During a Fault	0.1°
d-319	Fault Diagnostic Information	——
d-320	Main Fault Codes (Last Three)	——
d-321	Output Frequency at the Time of Failure	0.01 Hz
d-322	Output current during a fault	0.1 A

Monitoring code	Content	Unit
d-323	Bus voltage during fault	0.1 V
d-324	Input terminal status during a fault	——
d-325	Output terminal status during a fault	——
d-326	Operating Status During a Fault	——
d-327	Output Voltage During a Fault	0.1V
d-328	Module Temperature During a Fault	0.1°
d-329	Fault Diagnostic Information	——
d-330	Diagnostic Information	——
d-331	Main Fault Code (4th Most Recent)	——
d-332	Fault Diagnostic Information	——
d-333	Main Fault Code (5th Most Recent)	——
d-335	Number of overcurrent (OC) faults	——
d-336	Number of SC (module) faults	——
d-337	Number of overvoltage (OU) faults	——
d-338	Number of Overload (OL) Faults	——
d-339	Number of OT (Over-Temperature) Faults	——
d-340	Fault Codes	See the fault code table for details
d-341	Troubleshooting Information	See the fault code table for details
d-345	Alarm Codes	See the warning code table for details
d-350	Fault Input Status 1—Active, 0—Inactive bit0: SC-U signal bit1: SC-V signal bit2: SC-W signal bit4: OC signal	
d-355	Number of fault self-resets	
d-356	Fault auto-reset failure	

List of Inverter Fault Codes

Communication Code (Main Fault Code)	Fault Display (Number)	Fault Display (Character)	Fault Name	Fault Diagnostic Information (Fault Subcode)
0	--	--	No Fault	--
1	Er.01	E.SFC	Software Overcurrent	1: Phase U Overcurrent 2: Phase V overcurrent 3: W-phase overcurrent
2	Er.02	E.oC1	Accelerated Overcurrent Fault	0: Overcurrent during shutdown 1: Overcurrent in Phase U 2: V-phase overcurrent 3: W-phase overcurrent
3	Er.03	E.oC2	Overcurrent fault during deceleration	
4	Er.04	E.oC3	Constant-Speed Overcurrent Fault	
5	Er.05	E.SC1	U Module Failure	0: Module failure during shutdown 1: Module failure during acceleration 2: Module failure during deceleration 3: Module failure during constant speed operation
6	Er.06	E.SC2	V module failure	
7	Er.07	E.SC3	W Module Failure	
8	Er.08	E.oU1	Acceleration Overvoltage Fault	1: Busbar total voltage overvoltage 2: Upper bus voltage overvoltage 3: Lower bus voltage overvoltage
9	Er.09	E.oU2	Overvoltage fault during deceleration	
10	Er.10	E.oU3	Constant-Speed Overvoltage Fault	
13	Er.13	E.JCi	Contactor Feedback Fault	The precharge contactor has not energized, or the feedback signal is interrupted.
15	Er.15	E.oL1	Inverter Overload Fault	1: G-type machine overload 2: P-type machine overload

16	Er.16	E.oL2	Motor Overload Fault	1: Standard Overload 2: Derated Overload 3: Over-rated overload
17	Er.17	E.Cur	Hall Current Detection Fault	bit0: Phase U zero-drift anomaly bit1: Phase V zero-drift anomaly bit2: Phase W zero-drift anomaly 8: Excessive three-phase sum deviation 9 - 14: Abnormal current direction in V and W phases 15: Abnormal U-phase current direction
18	Er.18	E. LU	Undervoltage Fault	1: Undervoltage fault during acceleration 2: Undervoltage fault occurs during deceleration 3: Undervoltage fault during constant speed operation
19	Er.19	E.EF1	External Fault	1: Normally open fault input terminal active 2: Normally closed fault input terminal active
21	Er.21	E.oHi	Module Overheating	0: Phase U overheat 1: V-phase overheating 2: W-phase overheat

Communication Code (Main Fault Code)	Fault Display (Number)	Fault Display (Character)	Fault Name	Fault Diagnostic Information (Fault Subcode)
22	Er.22	E.SP1	Input Phase Loss	
23	Er.23	E.SPO	Output Phase Loss	1: Phase U output phase loss fault 2: Phase V output phase loss fault 3: Phase W output phase loss fault
24	Er.24	E.EEP	EEPROM Failure	1: Write timeout 2: Read timeout
25	Er.25	E.End	Time limit reached	
26	Er.26	E.Pid	PID exception	
27	Er.27	E.485	485 Fault	0: Expansion Card 485 1: Terminal 485
28	Er.28	E.doG	Watchdog Failure	Interference or program error; contact the manufacturer
29	Er.29	E.CAN	CAN communication error	0: Slave did not receive data from the master 1 - 10: The master did not receive data from the slave 20: The slave is operating in follow mode
30	Er.30	E.SL1	CAN Slave Anomaly	1 - 10: Slave fault exception
31	Er.31	E.CPY	Parameter Copy Error	1: Copy error terminated 2: Parameter upload prohibited 3: Parameter upload error 4: Parameter download prohibited (Parameter error in the download area) 5: Parameter download error 9: Parameter upload/download

				interrupted (Communication Disconnected)
32	Er.32	E.Ld1	Load Detection 1 Fault	
33	Er.33	E.Ld2	Load detection 2 fault	
34	Er.34	E.CLE	Persistent current limiting fault	
35	Er.35	E.cP1	Comparison Fault 1	
36	Er.36	E.cP2	Comparison Error 2	
37	Er.37	E.PG	PG Encoder Fault	1: Incorrect parameter settings, such as a gear ratio exceeding the limit 2: Z-pulse error (incorrect number of wires) 3: Resolver calibration error 4: Resolver wire break 5: ABZ open circuit 6: Excessive speed error (Incorrect number of wires or wire break) 7: Z-pulse loss 12: Z-pulse fault (interference)

Communication Code (Main Fault Code)	Fault Display (Number)	Fault Display (Character)	Fault Name	Fault Diagnostic Information (Fault Subcode)
38	Er.38	E.duE	Speed Error Out of Tolerance	
39	Er.39	E.oPd	Speed Exceeded Limit	
40	Er.40	E.Tun	Motor self-learning error	
41	Er.41	E.PAR	Parameter Setting Error Fault	
42	Er.42	E.hdE	Hardware Anomaly	Hardware signal anomaly; OC and SC signals remain at fault levels 1: SC-U 2: SC-V 3: SC-W 16: OC signal Can be combined: For example, if SC-U and SC-W are both active: 1 + 4 = 5; if SC-U and OC are both active: 1 + 16 = 17
46	Er.46	E.Blo	Locked-rotor fault	Check if the load is too heavy; Abnormal encoder parameter settings in closed-loop vector control
47	Er.47	E. 47	Parameter backup error	
48	Er.48	E.PLE	Power Phase Locking Error Fault	Check the input voltage detection wiring
49	Er.49	E.nTn	Motor Did Not Self-Learn Fault	Vector control requires parameter self-learning
59	Er.59	E.SC	Short-Circuit Fault	Output Short-Circuit Fault

List of Inverter Warning Codes

Communication Codes (Main Warning Code)	Warning Display (Number)	Alert Display (Characters)	Alert Name	Alert Diagnostic Information (Alert Subcode)
1	AL.01	A.OU	Shutdown Due to Overvoltage	Check input voltage
2	AL.02	A.SP1	Input Phase Loss	Check the input voltage and power cord
3	AL.03	A.SPO	Output phase loss	Check the output voltage and power cord
4	AL.04	A.dEu	Large Speed Deviation	
5	AL.05	A.ouS	High-Speed Protection	
6	AL.06	A.brF	Reserved	
7	AL.07	A.Blo	Locked-Rotor Warning	
8	AL.08	A.RU1	Invalid Operation Command	Check whether any of the following commands are active: Free Stop, Emergency Stop, or Forced Stop
9	AL.09	A.RU2	Invalid run command	Jog start protection is active; cancel the run command and then issue the jog command again
10	AL.10	A.RU3	Run command invalid	Start protection is active; cancel the run command and then issue the run command again
11	AL.11	A.EEP	Storage alert	
12	AL.12	A.485	485 Communication Error Alert	1、 Check the communication cable and communication parameters

				2、 Interference
16	AL.16	A.oL	Load protection—overload	Fd-28 Set the overload warning threshold
17	AL.17	A.CLE	Continuous Current Limiting	
18	AL.18	A.oH	Overheating Alert	
20	AL.20	A.Pid	PID Feedback Abnormal Early Warning	
21	AL.21	A.To1	Over/Under Torque Warning 1	
22	AL.22	A.To2	Over/Under Torque Warning 2	
23	AL.23	A.Jci	Buffer Contactor Abnormal Condition Alert	
25	AL.25	A.CAN	CAN Disconnection Alert	Check CAN communication lines and parameter settings
29	AL.29	A.CP1	Comparison Warning 1	
30	AL.30	A.CP2	Comparison Warning 2	

Rectifier Function Parameter Table

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
P0 Basic Parameter Group				
P0-00	Model Monitoring	0: Three-level 1: Two-level 2: Two-level (all-in-one unit) 3: Three-level 6-pulse rectification 4: Three-level AFE rectification 5: Two-level 6-pulse rectification 6: Two-level AFE rectification	Model Monitoring	
P0-02	Operating Command Channel	0: Keyboard Control 1: Terminal control 2: CAN Communication Control 3: RS485 Communication Control	0	X
P0-14	Carrier Frequency	1000 - 6000 Hz	Model Setting	Y
P0-17	Parameter Restore	0: Do not initialize 11: Initialize used parameters 22: Clear fault logs 55: Back up parameters to the backup area 56: Restore parameters from the backup area	0	X
P0-18	Parameter Protection	0: All parameters can be modified 1: Except for parameters modified using the up and down arrow keys, modification is prohibited 2: All parameters are disabled	0	
P5 External I/O Terminal Definitions				
P5-16	Terminal X1 Function Selection	0: No function 1: Run command 3: External fault input (normally open) 5: Emergency Stop (Free Stop) 6: External reset input	1	X
P5-17	Terminal X2 Function Selection		3	X

P5-18	Terminal X3 Function Selection	35: Switch command to keyboard 36: Switch command to terminal 37: Switch command to Modbus communication 39: External Fault Input (Normally Closed) 43: Buffer contactor feedback input	6	X
P5-19	Terminal X4 Function Selection		0	X

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Property
P5-28	TA1 Relay Output Terminal Function Selection	0: No function 1: Signal during inverter operation 2: Inverter fault 20: Module Temperature Warning Output 23: Custom alarm output 24: Drive alarm 25: Undervoltage Lockout in Progress 26: Reset Command Output	2	X
P5-29	TA2 Relay Output Terminal Function Selection	Same as P5-28	1	Y
F5-50	Terminal Active State Setting	BIT0-BIT3: X1-X4 0: Positive logic 1: Inverted logic	0 00	Y
P5-58	X1 Valid Detection Delay	0.000-60.000 s	0.010	Y
P5-59	X1 Invalid Detection Delay	0.000-60.000 s	0.010	Y
P5-60	X2 Valid Detection Delay	0.000-60.000 s	0.010	Y
P5-61	X2 Invalid Detection Delay	0.000-60.000 s	0.010	Y
P5-62	X3 Valid	0.000-60.000 s	0.010	Y

	Detection Delay			
P5-63	X3 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
P5-64	X4 Valid Detection Delay	0.000 - 60.000 s	0.010	Y
P5-65	X4 Invalid Detection Delay	0.000 - 60.000 s	0.010	Y
P5-95	TA1 Relay Closing Delay	0.000 - 60.000 s	0.010 s	Y
P5-96	TA2 Relay Closing Delay	0.000 - 60.000 s	0.010 s	Y
P5-99	TA1 Relay Turn-Off Delay	0.000 - 60.000 s	0.010 s	Y
P5-A0	TA2 Relay Turn-Off Delay	0.000 - 60.000 s	0.010 s	Y
F8 Communication Parameter Group				
P8-00	Communication baud rate selection (RS485 terminal block)	0: 300 bps (Reserved) 1: 600 bps (Reserved) 2: 1200 bps 3: 2400 bps 4: 4,800 bps 5: 9,600 bps 6: 19,200 bps 7: 38,400 bps	5	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Property
P8-01	Data Format	0: No parity 8-N-1 1: Odd parity 8-O-1 2: Even parity 8-E-1 3: No parity 8-N-2 4: Odd parity 8-O-2 5: Even parity 8-E-2	0	Y
P8-02	Mailing Address	1 – 247	2	Y
P8-03	Communication response delay	0 – 5000 ms	0 ms	Y
P8-04	Communication Timeout Error Time	0.1 – 100.0 s	1.0 s	Y
P8-05	Communication Protocol Selection	0: Slave 1: Master	00	Y
P8-06	Frequency Setting Gain	0.0 – 500.0%	100.0%	Y
P8-07	Modbus Transmission Response Handling	0: Write operation acknowledged 1: No response to write operation	0	Y
P8-08	Communication Disconnection Handling	0: Do not detect timeout faults 1: Detect fault and stop automatically 2: Issue a warning and continue operation 3: Shutdown warning, operational fault	0	Y
F8-09	Communication Run Command/ Frequency Source	Units digit: Communication command source 0: Terminal 485 is the communication command source 1: Expansion card 485 is the communication command source	22	

	Selection	2: Both Terminal 485 and Expansion 485 are communication command source Tens place: Communication frequency source 0: Terminal 485 is the communication frequency source 1: The 485 expansion card is the communication frequency source 2: Both Terminal 485 and Expansion 485 are communication frequency source		
P8-10	Communication baud rate selection (RS485 expansion board)	0: 300 bps (reserved) 1: 600 bps (Reserved) 2: 1200 bps 3: 2400 bps 4: 4,800 bps 5: 9,600 bps 6: 19,200 bps 7: 38,400 bps	5	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Property
P8-11	Data Format	0: No parity 8-N-1 1: Odd parity 8-O-1 2: Even parity 8-E-1 3: No parity 8-N-2 4: Odd parity 8-O-2 5: Even parity 8-E-2	0	Y
P8-12	Mailing Address	1 - 247	2	Y
P8-13	Communication Response Delay	0 - 5000 ms	0.0 ms	Y
P8-14	Communication Timeout Fault Time	0.1 - 100.0 s	1.0 s	Y
P8-15	Communication Protocol Selection	0: Slave 1: Master	0	Y
P8-16	Frequency Setting Gain	0.0 - 500.0%	100.0%	Y
P8-17	Modbus transmission Response Handling	0: Write operation acknowledged 1: No response to write operation	0	Y
P8-18	Communication Disconnection Handling	0: Do not detect timeout faults 1: Detect fault and stop automatically 2: Issue a warning and continue operation 3: Shutdown warning, operational fault	0	Y
P9 Operator Parameter Group				

P9-00	Menu Mode	0: Standard Menu 1: Advanced Menu 2: Expert Menu	1	X
P9-01	User Password	0 - 65535	00000	X
P9-02	Copy Keyboard Parameters	0: No function 1 - 10: Upload parameters to zones 1 - 10 of the keyboard (Parameters will be overwritten if the zone is in use); 11 - 20: Download parameters from zones 1 - 10 of the keyboard; 21 - 30: Download parameters from keyboard zones 1 - 10 (excluding motor parameters); 31 - 40: Download parameters from zones 1 - 10 on the keyboard (parameters are not saved upon power loss); 41 - 50: Upload parameters to zones 1 - 10 of the keypad (not used);	0	

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Property
P9-04	LCD Keypad Language	0: Chinese 1: English	0	Y
P9-05	Debug Parameter 1		0000	
P9-11	Up/Down Keys: Quickly Change Function Selection	LED units digit: Use up/down keys to adjust the value 0: Auto 1: Custom values for F9-12 2: Disabled LED tens digit: Power-off data retention 0: Frequency is not retained after power loss 1: Frequency retained after power loss	10	Y
P9-12	Use the up and down keys to quickly change the parameter code setting	LED units and tens digits: Set yy to 00-99 in function parameter number Px-yy LED hundreds and thousands digits: Set xx to 00-15 in function parameter number Px-yy	0000	Y
P9-13	Key Lock Selection	0: No lock 1: All keys locked 2: All keys locked except the Start/Stop key 3: All keys locked except the shift key 4: All keys locked except the MFK key	0	Y
P9-15	Power Display Selection	LED units digit: Power display value 0: Power display as a percentage (%) 1: Power display in kilowatts (kW)	0001	Y
P9-16	Power Display Coefficient	0.0-500.0%	100.0%	Y

P9-18	Monitoring Parameter Display Filter Selection	LED units digit: Current display filtering 0 - F: The higher the value, the deeper the filtering LED units digit: Frequency display filtering 0 - F: The higher the value, the deeper the filtering LED hundreds place: RPM display filtering 0 - 3: The higher the value, the deeper the filtering	0x002	Y
P9-20	Keypad Cycle Display Parameter 1	Monitor the setting for xxx in parameter number d-xxx	003	Y
P9-21	Keypad cycle display Parameter 2	Monitor the setting for xxx in parameter number d-xxx	001	Y
P9-22	Keypad cycle display Parameter 3	Monitor the setting for xxx in parameter number d-xxx	002	Y

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Property
P9-23	Keypad Cycle Display Parameter 4	Monitor the setting for xxx in parameter number d-xxx	000	Y
P9-24	Keypad cycle display Parameter 5	Monitor the setting for xxx in parameter number d-xxx	005	Y
P9-25	Keypad cycle display Parameter 6	Monitor the setting for xxx in parameter number d-xxx	006	Y

P9-26	Keypad cycle display Parameter 7	Monitor the setting for xxx in parameter number d-xxx	000	Y
P9-27	Keypad cycle display Parameter 8	Monitor the setting for xxx in parameter number d-xxx	000	Y
P9-28	Custom monitoring code 1	Set the specific monitoring index xxx in monitoring parameter d-023	0000	Y
P9-29	Custom Monitoring Code 2	Setting the specific monitoring index xxx in monitoring parameter d-024	0000	Y
PD Protection Parameter Group				
Pd-00	Software overcurrent protection point	0 - 300%	225.0	Y
Pd-01	Current Limit Alarm Detected Time	0.0 - 60.0 s	30.0 s	X
Pd-02	Continuous Current Limiting Failure Detected	0.0 - 400.0 s	90.0 s	X
Pd-03	Output Phase Loss Protection	0: Off 1: On Output Phase Loss Detection	1	X
Pd-04	Output Unbalance Protection	0: Disabled 1: Protection activates and the system stops freely 2: Alarm and continue operation	1	X
Pd-10	Input Voltage Phase Loss Action	Units digit: Input phase loss action selection 0: No action 1: Protection activates and the	1	

		unit stops freely 2: Issue an alert and continue operation Tens place: Reserved Hundreds place: Detection settings 0: Detect only during operation 1: Detect during both operation and shutdown		

Function Code	Function Code Name	Setpoint Range and Definition	Factory Setting	Property
Pd-11	Undervoltage Protection Trip	Bus Undervoltage Fault Trip During Operation 0: Undervoltage will only trigger a shutdown action; it is not treated as a fault 1: Undervoltage is treated as a fault and reports E.Lu 2: Undervoltage is treated as a fault and triggers an E.Lu alarm, but the fault output terminals do not activate	1	
Pd-12	Busbar undervoltage protection setpoint	200 - 9000 V	Model Settings	
Pd-14	Busbar overvoltage protection point	200 - 9,000 V	Model Settings	
Fd-17	Contactor Feedback Fault Detection	0: Do not detect 1: When detection is active, issue a warning A.JCi (23) 2: Issue fault alert E.JCi (13) when detection is valid	0	
Pd-19	Fault Simulation Input	0000 - 9999 Units and tens places: Main fault code Hundreds and thousands digits: Fault subcode	0000	Y

Pd-20	Number of automatic fault recoveries	0－100	0	Y
Pd-21	Fault Auto-Recovery Interval	0.1－100.0 s	1.0 s	Y
Pd-22	Fault Operation Indication Selection	Automatic Reset Interval Fault Indication Action Selection 0: No action 1: Activate	0	Y
Pd-25	Fan Control Selection	0: Fan runs continuously after power-up 1: ON/OFF control based on operating commands 2: ON/OFF control based on temperature	1	Y
Pd-26	Fan stop delay Time	0－600.00 S	30.00	
Pd-27	Superheat Warning Detection Level	0.0－100.0	80.0	Y
Pd-28	Inverter Overload Early warning detection level	0.0－100.0	90.0	

Function Code	Function Code Name	Setting Range and Definition	Factory Setting	Attribute
A3 Rectification Control Parameters				
A3-00	Phase-Locked Mode	0: DQ phase-locked 1: Generalized Integral Phase Lock	0	
A3-01	DC Bus Voltage Setpoint	100.0 - 130.0%	108.0	
A3-02	Voltage Sampling Filter Time	0.0 to 200.0 ms	10.0 ms	
A3-03	Phase-Locked Loop Gain	0.01 - 500.00	10.00	
A3-04	Phase-locked integral gain	0.20 - 200.00	0.20	
A3-05	Voltage-loop proportional gain	0.000 - 60.000	1.000	
A3-06	Voltage Loop Integral Gain	0.000 - 60.000	1.000	
A3-07	Current-loop proportional gain	0.000 - 60.000	1.000	
A3-08	Generalized integration frequency	0.00 - 100.00 Hz	50.00	
A3-09	General-Purpose Integrated Phase-Locked Loop Gain	0.010 - 5.000	1.000	
A3-10	Current-loop	0.000 - 60.000	1.000	

	PR gain			
A3-11	Automatic Operation Settings (Reserved)	0: Do not start automatically 1: Automatic start	0	
A3-12	Automatic operating voltage Increment (reserved)	1.0 - 10.0%	6.0%	
A3-13	Automatic Shutdown Power (Reserved)	0.0 - 10.0%	1.0%	
A3-14	Minimum Automatic Operation Operating Time (Reserved)	1.0 - 500.0 s	5.0 s	
A3-15	Reserved			
A3-16	Given voltage change Rate	0.0 - 100.0%/ms	1.0%/ms	
A3-17	Reserved			
A3-18	Reserved			
A3-19	Reserved			
A3-20	Busbar Setpoint Mode	0: Based on rated busbar 1: Based on the current input voltage	0	
A3-21	IGBT Rectification Mode	0: 120-degree turn-on mode 1: Bus-dependent turn-on angle mode	0	

Rectification Status Monitoring Parameter List

Monitoring Code	Content	Unit
d-000	Lock-in Frequency	0.01 Hz
d-001	Output Voltage	1 V
d-002	Input current on the rectifier side	0.1 A
d-005	Bus voltage	1 V
d-006	Module temperature	0.1 degrees
d-016	X Terminal Status	-
d-018	Single Continuous Run Time	0.1h
d-019	Cumulative operating time	1h
d-025	Output Power	0.1 kW
d-026	Power Factor	0.001
d-027	Upper Busbar Voltage	1 V
d-028	Lower busbar voltage	1V
d-029	Phase R current	0.1 A
d-030	Phase S current	0.1 A
d-031	Phase T current	0.1 A
d-032	Input voltage	1 V
d-035	Series Models	-
d-036	Inverter Rated Power	-
d-037	AC Drive Rated Voltage	-
d-038	AC Drive Rated Current	-
d-039	Software Version Information	-
d-051	Main Fault Code (Most Recent)	——
d-052	Output Frequency at the Time of the Fault	0.01 Hz
d-053	Output Current During a Fault	0.1 A
d-054	Bus voltage during a fault	0.1 V
d-055	Input terminal status during a fault	——
d-056	Output terminal status during a fault	——
d-057	Fault Master Code (Last Two)	——
d-058	Output Frequency at the Time of Failure	0.01 Hz
d-059	Output Current During a Fault	0.1 A
d-060	Bus voltage during a fault	0.1 V
d-061	Input terminal status during a fault	——
d-062	Output Terminal Status During a Fault	——
d-063	Fault Main Codes (Last Three)	——
d-064	Output Frequency at the Time of the Fault	0.01 Hz
d-065	Output Current During a Fault	0.1 A

d-066	Bus voltage during a fault	0.1 V
d-067	Input terminal status during a fault	———
d-068	Output terminal status during a fault	———

Monitoring Code	Content	Unit
d-071	Active Current	0.1%
d-073	Inverter Status	
d-075	R Input Voltage	1 V
d-076	S Input Voltage	1 V
d-077	T input voltage	1 V
d-078	RST Voltage Detection Configuration (0: Detect output UVW, 1: Detect input RST)	
d-080	Input Voltage Lock-in Status 0/1: Insufficient input voltage 2: Locking in progress 3: Lock-in complete	
d-081	Input Voltage Lock-in Frequency	
d-082	Input Voltage Amplitude	
d-083	Output Voltage Capability	
d-084	Input Voltage Phase	
d-090	Cumulative Inverter Overload	0.1%
d-092	Current Fault Code	———
d-093	Current diagnostic information	———
d-094	Reason for Last Shutdown 0—No record 1-Shutdown due to fault 2-Undervoltage shutdown 3-Normal shutdown	———

List of Rectifier Fault Codes

Communication Codes (Main Fault Code)	Fault Display (Number)	Fault Display (Character)	Fault Name	Fault Diagnostic Information (Fault Subcode)
0	--	--	No Fault	--
1	Er.01	E.SFC	Software Overcurrent	1: Phase U Overcurrent 2: Phase V overcurrent 3: W-phase overcurrent
2	Er.02	E.oC1	Accelerated Overcurrent Fault	0: Overcurrent during shutdown 1: Overcurrent in Phase U 2: V-phase overcurrent 3: W-phase overcurrent
3	Er.03	E.oC2	Overcurrent fault during deceleration	
4	Er.04	E.oC3	Constant-Speed Overcurrent Fault	
5	Er.05	E.SC1	U Module Failure	0: Module failure during shutdown 1: Module failure during acceleration 2: Module failure during deceleration 3: Module failure during constant speed operation
6	Er.06	E.SC2	V module failure	
7	Er.07	E.SC3	W Module Failure	
8	Er.08	E.oU1	Acceleration Overvoltage Fault	1: Busbar total voltage overvoltage 2: Upper Busbar Overvoltage 3: Overvoltage on the lower busbar
9	Er.09	E.oU2	Overvoltage fault during deceleration	
10	Er.10	E.oU3	Constant-Speed Overvoltage Fault	
13	Er.13	E.Jci	Buffer Contactor Failure	

17	Er.17	E.Cur	Hall Current Detection Fault	bit0: Phase U zero-drift anomaly bit1: Phase V zero-drift anomaly bit2: Phase W zero-drift anomaly 8: Excessive three-phase sum deviation
18	Er.18	E. LU	Undervoltage fault	1: Undervoltage fault during acceleration 2: Undervoltage fault occurs during deceleration 3: Undervoltage fault during constant speed operation
19	Er.19	E.EF1	External Fault	1: Normally open fault input terminal active 2: Normally closed fault input terminal active
21	Er.21	E.oHi	Module Overheating	
22	Er.22	E.SP1	Input Phase Loss	
23	Er.23	E.SPO	Output phase loss	1: Phase U output phase loss fault 2: Phase V output phase loss fault 3: Phase W output phase loss fault
24	Er.24	E.EEP	EEPROM Failure	1: Write timeout 2: Read timeout
25	Er.25	E.End	Time limit reached	
27	Er.27	E.485	485 exception error	0: Expansion Card 485 1: Terminal 485
28	Er.28	E.doG	Watchdog Failure	Interference or program error; contact the manufacturer

Communication Code (Main Fault Code)	Fault Display (number)	Fault Display (Character)	Fault Name	Fault Diagnostic Information (Fault Subcode)
31	Er.31	E.CPY	Parameter Copy Exception	
34	Er.34	E.CLE	Persistent Rate-Limiting Failure	
41	Er.41	E.PAR	Parameter Setting Error Fault	
42	Er.42	E.hdE	Hardware Anomaly	Hardware signal anomaly; OC and SC signals remain at fault levels 1: SC-U 2: SC-V 3: SC-W 16: OC signal Can be combined: For example, if SC-U and SC-W are both active: 1 + 4 = 5; if SC-U and OC are both active: 1 + 16 = 17
48	Er.48	E.PLE	Power Supply Phase Locking Anomaly Fault	Check the input voltage detection wiring
59	Er.59	E.SC	Short-Circuit Fault	Output Short Circuit Fault

List of Rectifier Warning Codes

Communication Codes (Main Warning Code)	Warning Display (Number)	Warning Display (Characters)	Alert Name	Alert Diagnostic Information (Alert Subcode)
1	AL.01	A.OU	Shutdown Due to Overvoltage	Check input voltage
2	AL.02	A.P11	Input Phase Loss	
3	AL.03	A.P12	Output Phase Loss	
8	AL.08	A.RU1	Invalid Run Command	Check whether any of the following commands are active: Free Stop, Emergency Stop, or Forced Stop
10	AL.10	A.RU3	Invalid run command	Startup protection is active; cancel the run command and then issue it again
11	AL.11	A.EEP	Storage alert	
12	AL.12	A.485	485 Communication Error Alert	
18	AL.18	A.oH	Overheating Warning	
23	AL.23	A.Jci	Buffer Contactor Abnormal Condition Alert	

Appendix 1 Detailed Explanation of Rectifier Parameters

P0-00 Unit Monitoring	Setting Range: 0-1

0: Three-level
1: Two-level
2: Two-level (all-in-one unit)
3: Three-level 6-pulse rectification
4: Three-level AFE rectification
5: Two-level 6-pulse rectification
6: Two-level AFE rectification

You can check the software's program version via parameter group P0-00 and monitoring group d-35. If the program version is incorrect, abnormal operation may occur.

P0-02 Run Command Channel	Setting range: 0-3

0: Operation commands are controlled by the LED keypad
1: Operation commands are controlled by terminals
2: Operation commands are controlled via CAN communication
3: Operation commands are controlled via RS485 communication

P0-14 Carrier Frequency	Setting range: 1.0-6.0 kHz

The higher the carrier frequency, the more frequently the power devices on the rectifier side (such as IGBTs and diodes) switch, and the greater the switching losses, leading to increased overall power consumption of the inverter and reduced efficiency. High-frequency switching generates more high-frequency harmonics, which cause electromagnetic interference to external equipment through conduction or radiation, affecting the normal operation of other electronic devices. High-frequency signals may also generate larger leakage currents through the rectifier-side circuits, further exacerbating the interference.High-frequency switching on the rectifier side may cause distortion of the input current waveform, injecting more higher-order harmonics into the power grid and affecting power quality.At the same time, high-frequency dv/dt (voltage change rate) may place higher demands on the rectifier-side filtering circuit; if filtering is insufficient, it may trigger resonance issues on the grid side. A lower carrier frequency may increase harmonic currents, causing interference to the power supply system, loads, and other nearby electrical equipment. This problem is particularly pronounced in applications such as high-precision instruments and microelectronic control systems.

Generally, the default values are sufficient and do not need to be changed.

P0-17 Parameter Reset	Setting Range: 0 - 9999

0: Do not initialize; no action

11: Initialize all parameters; restore parameters to their default values according to the model

12: Partial parameter initialization (excluding motor and encoder parameters)

19: Initialize all applicable parameters (including parameters not affected by factory default restoration)

22: Clear fault logs Clear fault logs

55: Back up parameters to the backup area; back up all parameters to the backup area

56: Restore parameters from backup area; restore all parameters from the backup area

P0-18 Parameter Protection	Setting range: 0 - 2

0: All parameters can be modified

1: Modification is prohibited for all parameters except those modified using the up and down arrow keys

2: All parameters are locked

P5-16 Terminal X1 Function Selection	Setting Range: 0 - 95
P5-17 Terminal X2 Function Selection	Setting Range: 0 - 95
P5-18 Terminal X3 Function Selection	Setting Range: 0 - 95
P5-19 Terminal X4 Function Selection	Setting Range: 0 - 95

0: No function. The DI terminal has no function.

1: Run Signal Provides a run signal to the inverter.

2: Run Signal Provides a run signal to the inverter.

3: External Fault Input (Normally Open) When a valid external signal is sent to the inverter via the terminal, the inverter reports fault E.EF1.

5: Emergency Stop (Free Stop) When the terminal is active, the inverter performs a free stop.

6: External Reset Input Resets the inverter' s fault.

39: External Fault Input (Normally Open) When a valid external signal is applied to the inverter via this terminal, the inverter reports fault E.EF1.

P5-28 TA1 Relay Output Terminal Function Selection	Setting Range: 0 - 63
P5-29 TA2 Relay Output Terminal Function Selection	Setting Range: 0 - 63

0: No function—the output terminal has no function.

1: Inverter Running Signal The inverter is currently running and has an output frequency (which may be zero); an active signal is output at this time.

2: Inverter Failure—When the inverter fails and shuts down automatically, TA1/TA2 output an active signal.

20: Module Temperature Reached When the inverter detects that the temperature has reached the setpoint, TA1/TA2 output an active signal.

23: Custom Alarm Output: An active signal is output when the current alarm code matches the set value for F5-93.

24: Variable Frequency Drive Alarm: When the variable frequency drive generates a pre-alarm fault, TA1/TA2 output an active signal.

25: Undervoltage Lockout Active: When the inverter is in an undervoltage fault condition, TA1/TA2 output an active signal.

26: Reset Command Output: When the inverter receives a reset signal, TA1/TA2 output an active signal.

P5-50	Terminal Active State Setting	Setting Range: 00 - 3F

BIT0 - BIT3: X1 - X4. The ones and tens places of this parameter set the active mode for terminals X1 - X4.

0: Positive logic—DI terminals (X1 - X4) are active when connected to GND and inactive when disconnected from GND.

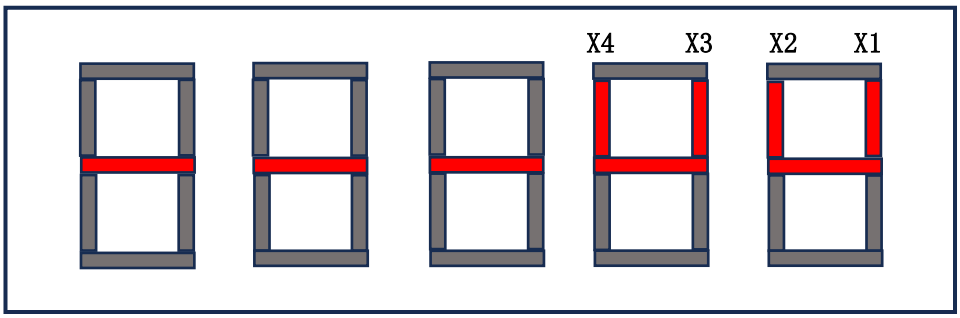
1: Inverted logic—the DI terminals (X1 - X4) are inactive when connected to GND and active when disconnected from GND.

P5-58	X1 active detection delay	Setting range: 0.000 - 60.000 s
P5-59	X1 valid detection delay	Setting range: 0.000 - 60.000 s
P5-60	X2 valid detection delay	Setting range: 0.000 - 60.000 s
P5-61	X2 Invalid Detection Delay	Setting Range: 0.000 - 60.000 s
P5-62	X3 Valid Detection Delay	Setting Range: 0.000 - 60.000S
P5-63	X3 Invalid Detection Delay	Setting Range: 0.000 - 60.000S
P5-64	X4 Valid Detection Delay	Setting Range: 0.000 - 60.000S
P5-65	X4 Invalid Detection Delay	Setting Range: 0.000 - 60.000S

Valid Detection Delay: When a valid DI signal is received from the hardware, the corresponding X terminal state changes from invalid to valid only after the set DI1 valid delay time has elapsed. Monitor parameter D-16 to view this.

Invalid Detection Delay: When a invalid DI signal is received from the hardware, the corresponding X terminal state will change from active to inactive only after the set DI1 invalid delay time has elapsed. View the terminal state in monitoring parameter D-16.

The status of the LED display's X terminals is shown in the figure below: (The horizontal bar of the LED remains lit; a lit vertical bar indicates "active," and an unlit vertical bar indicates "inactive")



P5-95	TA1 Relay Closing Delay	Setting Range: 0.000 - 60.000 s
P5-96	TA2 Relay Closing Delay	Setting Range: 0.000 - 60.000 s
P5-99	TA1 relay turn-off delay	Setting range: 0.000 - 60.000 s
P5-A0	TA2 relay turn-off delay	Setting range: 0.000 - 60.000 s

Closing Delay: When a valid DO signal is received from the software, the corresponding output terminal's state will change from inactive to active only after the set output terminal activation delay time has elapsed. Refer to monitoring parameter d-17.

Turn-off delay: When a valid DO signal is received from the software, the corresponding output terminal's state will change from active to inactive only after the set output terminal activation delay time has elapsed. View monitoring parameter d-17.

P8-00	Communication Baud Rate Selection	Setting Range: 0 - 7

0: 300 bps (Reserved)
1: 600 bps (Reserved)
2: 1200 bps
3: 2400 bps
4: 4800 bps
5: 9,600 bps
6: 19,200 bps
7: 38,400 bps

Set the data transmission rate between the host computer and the inverter. The higher the baud rate, the faster the communication speed. The RS-485 baud rates set on the host computer and the inverter must match; otherwise, communication will fail.

P8-01	Data Format	Setting Range: 0 - 5

Set the Modbus data format between the host computer and the inverter.

0: No parity (8-N-1)

The Modbus data format between the host computer and the inverter is: 8 data

bits, no parity, 1 stop bit.

1: Odd parity (8-O-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, odd parity, 1 stop bit.

2: Even parity (8-E-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, even parity, 1 stop bit.

3: No parity (8-O-2)

The Modbus data format between the host computer and the inverter is: 8 data bits, no parity, 2 stop bits.

4: Odd Parity (8-O-2)

The Modbus data format between the host computer and the frequency converter is: 8-bit data, odd parity, 2 stop bits.

5: Even Parity (8-E-2)

The Modbus data format between the host computer and the inverter is: 8-bit data, even parity, 2 stop bits.

P8-02 Communication Address	Setting Range: 1 - 247

This represents the unit's address for RS-485 communication. When the local address is set to 1 - 127, the unit's address is unique, which is the basis for point-to-point communication between the host computer and the inverter.

P8-03 Communication Response Delay	Setting Range: 0 - 5000 ms

Sets the interval between the end of data reception by the inverter and the transmission of data to the host computer. If the response delay is less than the system processing time, the response delay is determined by the system processing time; that is, data is sent to the host computer after the system has finished processing it. If the response delay is greater than the system processing time, the system waits after processing the data until the response delay time has elapsed before sending data to the host computer.

P8-04 Communication Timeout Fault Time	Setting Range: 0.1 - 100.0 s

Sets the maximum time interval between two consecutive successful RS485 communication sessions. In systems with continuous communication, this parameter can be used to monitor the communication status.

P8-05 Communication Protocol Selection	Setting Range: 0 - 1

0: Slave

1: Master

In most cases, the slave protocol is sufficient; the master protocol is used only for master-slave control or as a master function in networked control systems.

This function is currently reserved.

P8-06 Frequency Setting Gain	Setting Range: 0.0 - 500%

Communication setting for the frequency adjustment factor; when the RS485 receives a signal from the host computer, it is multiplied by P8-06 to determine the actual setpoint frequency.

P8-07 Modbus Transmission Response Processing	Setting Range: 0 - 1

0: Write operations receive a response

1: No response to write operations

When the slave receives a write operation communication frame addressed to itself, this parameter determines whether to acknowledge the successful execution of the write operation. In most cases, it is recommended to enable acknowledgment to ensure that the write operation is executed successfully.

P8-08 Communication Disconnection Handling	Setting Range: 0 - 3

0: Do not detect timeout faults

1: Report a fault and stop freely

2: Issue a warning and continue operation

3: Shutdown warning, operational fault

If no valid communication frame (with a valid local address and CRC check) is detected within the timeout period defined in P8-04, a communication break is detected; different handling methods for communication breaks can be set via this parameter.

PD-00 Software Overcurrent Protection Threshold	Setting Range: 0 - 300%

100% relative to the inverter’s rated current. Setting an appropriate current protection point can effectively protect the motor and the inverter

PD-01 Current Limit Alarm Detection Time	Setting Range: 0.0 - 60.0 s

When the current limit duration reaches this value, a current limit warning (A.CLE) is triggered.

PD-02 Continuous Current Limitation Fault Detection	Setting Range: 0.0 - 400.0 s

When the current limiting duration reaches this value, a current limiting fault (E.CLE) is reported.

PD-03 Output Phase Loss Protection	Setting Range: 0 - 1

0: Off

1: Enable output phase loss detection

PD-04 Output Imbalance Protection	Setting Range: 0 - 300%

0: Disabled

1: Protection activates and the system stops freely

2: Alarm and continue operation

PD-10 Input Voltage Phase Loss Action	Setting Range: 000 - 112

Units digit: Input phase loss action selection

0: No action

1: Protection action and uncontrolled shutdown

2: Alarm and continue operation

Tens place: Reserved

Hundreds place: Detection settings

0: Detect only during operation

1: Detect during both operation and shutdown

PD-11 Undervoltage Protection Threshold	Setting Range: 0 - 2

Bus Undervoltage Fault Trip During Operation

0: Undervoltage will only trigger a shutdown action; it is not treated as a fault

1: Undervoltage is treated as a fault and reports E.Lu

2: Undervoltage is treated as a fault and an E.Lu signal is issued, but the terminal fault output does not activate

PD-12 Bus Undervoltage Protection Threshold	Setting Range: Model-specific

The setting ranges for each voltage level are determined by the model:

T2: 180 V

T3: 320 V

T6: 560 V

T11: 1000 V

T23: 2000 V

T33: 3,000 V

T60: 6000V

PD-14 Busbar overvoltage protection setpoint:	Setting range: Model-specific

This value must be set higher than the undervoltage protection point; otherwise, it will not function. When this value is set to 0, overvoltage protection operates according to the manufacturer's default setting. This is an expert parameter and can only be modified after entering the expert parameter menu.

PD-17 Contactor Feedback Fault Detection	Setting Range: 0 - 2

0: Do not detect

1: When detection is valid, issue warning A.JCi (23)

2: Issues fault E.JCi (13) when detection is valid

Note: Detection occurs only during operation; SD7XX models feature a built-in

contactor feedback check.

PD-20	Number of Automatic Fault Resets	Setting Range: 0 - 100

During the fault self-reset period, d-355 can be used to monitor the current number of remaining self-reset attempts; d-356 monitors the fault event that triggered this self-reset.

PD-21	Fault Auto-Recovery Interval	Setting Range: 0.1 - 100.0 S

Set the fault self-recovery interval; an appropriate time ensures normal operation while also protecting the inverter.

PD-22	Fault Action Indication Selection	Setting Range: 0 - 1

Automatic Reset Interval Fault Indication Action Selection

0: No action

1: Activate

PD-25	Fan Control Selection	Setting Range: 0 - 1

0: Fan runs continuously after power-up

1: ON/OFF control based on operating commands

2: ON/OFF control based on temperature (the default internal software detection temperature is 50° C)

PD-26	Fan Stop Delay Time	Setting Range: 0 - 600.00S

This is the delay time between the inverter shutting down and the cooling fan stopping.

PD-27	Overheat Warning Detection Threshold	Setting Range: 0.0 - 85.0° C

Over-temperature warning (A.oH1) is used to indicate that necessary measures must be taken externally to prevent an over-temperature fault from occurring.

PD-28	Inverter Overload Warning Detection Level	Setting Range: 0.0 - 100.0%

Overload warning A.oL, used to signal that necessary measures must be taken externally to prevent an overload fault. A setting of 0 disables warning detection.

A3-00	Phase-Lock Mode	Setting Range: 0 - 1

0: DQ phase lock

1: Generalized Integral Phase Locking

In applications with significant harmonic distortion in the power grid, it is recommended to use generalized integral phase locking.

A3-01	DC Bus Voltage Setpoint	Setting Range: 100.0 - 130.0%

This parameter applies to AFE models. 100% is relative to the rated bus voltage or the current real-time input voltage; the specific reference value for 100% is determined by A3-20. For example:

When A3-20 is set to 0, 100% corresponds to the rated bus voltage;

When A3-20 is set to 1, 100% corresponds to the bus voltage value based on the current input voltage.

A3-02 Voltage Sampling Filter Time	Setting Range: 0.0 to 200.0 ms

When the input voltage contains significant harmonics, this value can be appropriately increased to achieve more stable input voltage sampling; however, excessive filtering may cause control response lag. In most cases, it is recommended to use the manufacturer's default value.

A3-03 Phase-Locked Loop Proportional Gain	Setting range: 0.01 - 500.00
A3-04 Phase-locked integral gain	Setting range: 0.20 - 200.00

The phase-locked loop (PLL) serves as the grid voltage phase estimation stage. This stage uses a PI controller to estimate the current grid phase information, which is then used to control the output voltage. The default gain settings are suitable for most applications. In situations where grid harmonics or distortion are severe, the proportional and integral gains can be appropriately reduced to minimize control noise.

A3-05 Voltage Loop Proportional Gain	Setting Range: 0.000 - 60.000
A3-06 Voltage Loop Integral Gain	Setting Range: 0.000 - 60.000

This parameter applies to AFE models and is used to control the bus voltage to track the setpoint voltage value A3-01.

When higher control response performance is required for bus voltage control, the proportional and integral gains can be appropriately increased.

Provided that the response performance meets the requirements of the actual application, a smoother bus voltage control effect can be achieved by reducing the proportional-integral gain.

A3-07 Current Loop Proportional Gain	Setting range: 0.000 - 60.000

This parameter applies to AFE models. It controls the proportional gain of the current inner loop. If there is significant high-frequency noise in the output current, the proportional gain can be appropriately reduced to improve performance.

A3-08 Generalized Integral Frequency	Setting range: 0.00 - 100.00 Hz

When set to 0, the center frequency is adaptive

A3-09 Generalized integral phase-locked loop gain	Setting range: 0.010 - 5.000

When the phase-locked mode is set to Generalized Integral Phase Locking, the grid frequency must be set to the Generalized Integral Frequency (A3-08). For example, for a domestic 50 Hz grid, enter 50.00 Hz.

The generalized integral phase-locked gain primarily adjusts the strength with which the generalized integral phase-locked loop extracts the integral frequency component. In situations where grid quality is poor, the gain can be appropriately increased to achieve better extraction results and ultimately obtain a more stable voltage-angle phase-locked effect.

A3-10 Current Loop PR Gain	Setting Range: 0.000 - 60.000

This parameter applies to AFE models; the PR gain for the current inner-loop control generally does not require adjustment.

A3-11 Automatic Operation Setting (Reserved)	Setting Range: 0 - 1

0: Do not start automatically

1: Automatic start

A3-12 Automatic Run Voltage Increment (Reserved)	Setting range: 1.0 - 10.0%

A3-13 Automatic Operation Shutdown Power (Reserved)	Setting Range: 0.0 - 10.0%

A3-14 Minimum Automatic Run Time (Reserved)	Setting range: 1.0 - 500.0 s

A3-16 Setpoint voltage change rate	Setting range: 0.0 - 100.0%/ms

When the A3-01 voltage setpoint value changes, the voltage setpoint will change at this rate before reaching the actual control setpoint, which serves to cushion the impact caused by setpoint changes.

A3-20 Bus Setpoint Mode	Setting range: 0 - 1

In different modes, the reference value corresponding to 100% of the setpoint voltage A3-01 varies; see the description for A3-01 for details

A3-21 IGBT Rectification Mode	Setting Range: 0 - 1

This parameter applies to 6-pulse rectifier models; when set to 0, it operates in the traditional 120-degree conduction angle mode.

When set to 1, the turn-on angle is automatically adjusted based on the bus voltage; this is primarily used to improve power consumption during non-feedback operation and to increase the bus voltage ratio.

Appendix 2 Detailed Explanation of Inverter Parameters

1. Basic Operating Parameters (F0 Parameters)

F0-00 Unit Monitoring	Setting Range: 0-1

0: Three-level
1: Two-level
2: Two-level (all-in-one unit)
3: Three-level 6-pulse rectification
4: Three-level AFE rectification
5: Two-level 6-pulse rectification
6: Two-level AFE rectification

You can check the software's program version via parameter group F0-00 and monitoring group d-35. If the program version is incorrect, the system may not operate properly.

F0-01 Motor Control Mode	Setting range: 0-5

0: V/F Control

Suitable for most applications, including situations where one inverter drives a single motor or where one inverter drives multiple motors (provided the operating conditions of the motors are consistent). It is particularly suitable for open-loop control applications operating significantly above the fundamental frequency.

1: Vector VF Control

Applies vectorization to standard VF control to improve control stability and low-frequency torque; it is insensitive to motor parameters and is suitable for induction motors.

2: Sensorless Vector Control 1

Employs a unique vector control approach. This control method offers strong versatility and good steady-state performance, though its dynamic performance is slightly inferior to Vector Control 2. It is insensitive to motor parameters and is suitable for induction motors.

3: Sensorless Vector Control 2

This method employs rotor-field-oriented vector control, offering high dynamic and static control performance. It is sensitive to motor parameters and is suitable for induction motors and permanent magnet synchronous motors.

4: Sensor-Based Vector Control 1

Sensor-based vector control achieves precise control over the magnitude and direction of motor torque by distributing the motor's current such that one portion generates the magnetic field and the other generates torque perpendicular to the magnetic field, thereby improving motor performance and operating efficiency.

5: Sensor-Based Vector Control 2

Sensor-based vector control is an advanced motor control technology that precisely controls the motor's magnetic flux and torque by detecting the position and speed of the motor rotor. This control method enables precise control of motor parameters such as speed, torque, and position, ensuring the motor maintains efficient and stable operation under various load conditions. Sensor-based vector control is suitable for applications with complex and demanding load requirements, such as electric vehicles and CNC machine tools.

F0-02	Operation Command Channel	Setting Range: 0 - 3

0: Operation commands are controlled by the LED keypad

1: Operation commands are controlled by terminals

2: Operation commands are controlled via CAN communication

3: Operation commands are controlled via RS485 communication

F0-03	Frequency Setpoint Source Channel A	Setting range: 0 - 12
F0-04	Frequency Setpoint Source Channel B	Setting range: 0 - 12

0/1: Use the up and down keys on the keyboard to set the operating frequency

In monitoring mode, you can use the up and down keys on the keyboard to change the value of parameter F0-07 and set the operating frequency. You can also enter the function parameters to modify F0-07 and change the set frequency.

2: AI1 (0 - 10 V/0 - 20 mA)

The operating frequency is set via the external analog voltage input terminal AI1 (0 - 10 V/0 - 20 mA).

3: AI2 (0 - 10 V/0 - 20 mA)

The operating frequency is set via the external analog voltage input terminal AI2 (0 - 10 V/0 - 20 mA).

4: AI3 (0 - 10 V/0 - 20 mA)

The operating frequency is set via the external analog voltage input terminal AI2 (0 - 10 V / 0 - 20 mA).

5: Process Closed-Loop PID Setpoint Frequency

The operating frequency is set by the output of the PID controller.

6: Multi-speed control

External terminals X1 - X9 can be selected as multi-speed terminals via F5-16 - F5-24. The corresponding set frequency (F7-01 - F7-16) is selected based on the status of the multi-speed terminals.

7: PLC Setpoint

When the frequency source is a simple PLC, you must configure the "Multi-Speed and PLC" parameters in Group F7 to specify the setpoint frequencies for each operating stage. For detailed PLC operating settings, refer to the description of Group F7 function codes.

8: UP/DW Terminal Setpoint

The operating frequency is set via the external control terminals UP/DW (the UP and DW control terminals are selected via parameters F5-16 to F5-24). When UP is closed to GND, the operating frequency increases; when DW is closed to GND, the operating frequency decreases.When both the UP and DW terminals are closed or open relative to GND, the operating frequency remains unchanged. The frequency increases or decreases at the rate set by parameter F5-53.

9: Frequency Set via 485 Communication

Receives frequency commands from the host computer via the 485 interface. Select this mode when the frequency is set by the host computer or when this unit is configured as a slave in interlock control.

10: Frequency Set via CAN Communication Used when a single master unit controls multiple slave units.

11: Terminal Pulse Input

12: Custom Function Application

F0-05 Frequency Channel B Reference Source	Setting range: 0 - 1

0: Use the maximum output frequency as the reference source

Using the maximum output frequency as the reference source is suitable for most applications; the frequency setpoint generation process is the same as for Channel A. Channels A and B function as two completely independent frequency setpoint sources.

1: Use the set frequency of A as the reference source

Using the set frequency of Channel A as the reference source, the set frequency of Channel A serves as the frequency setpoint corresponding to 100% setpoint of Channel B.For example, if the current setpoint frequency for Channel A is 30 Hz and Channel B is set to use the AI analog setpoint, 100% corresponds to 30 Hz. This configuration, where the Channel A setpoint serves as the reference source, is generally used in situations requiring fine-tuning of the Channel A setpoint frequency, such as when the main frequency is supplemented by PID-based fine-tuning.

F0-06 Frequency Setpoint Source Combination Selection	Setting Range: 0 - 5

0: Channel A

1: Channel B

2: Channel A + Channel B

3: Maximum value of both Channel A and Channel B

4: The minimum value of Channel A and Channel B

5: Channel A - Channel B

The system’s frequency setpoint is composed of Channel A and Channel B. This parameter allows you to specify which channel to use or to configure a combination of both channels.

F0-07 Keypad Numeric Frequency Setting	Setting Range: 0.00 to Maximum Frequency

In status monitoring mode, press the up, down, or keys on the control panel to directly modify this parameter. The keyboard-set channel is active.

F0-08	Maximum Frequency	Setting range: 5.00 - 300.00 Hz
F0-09	Lower Limit Frequency	Setting range: 0.00 to maximum frequency

The maximum frequency is the upper limit of the inverter's output frequency. For external analog setpoints, multi-speed control, and PLC-based frequency sources, the setpoint is always specified as a percentage, with the maximum frequency serving as the reference value.

F0-10	Action Selection for Frequency Below Lower Limit	Setting range: 0 - 4

0: Operate at the lower limit frequency

When the set frequency is less than the lower limit frequency, operate at the lower limit frequency

1: Stop

When the set frequency is lower than the lower limit frequency, the unit stops. After stopping, if controlled via terminal switches or communication, and a start command is received, a stop command must be confirmed before the unit can restart; if controlled via the keyboard or terminal pulse, the unit will only restart upon receiving another start trigger signal. For terminal command control, the unit will only resume operation after an invalid terminal command is followed by a valid one.

2: Sleep Mode

When the set frequency is lower than the lower limit frequency, the output is disabled, but the run command remains active. Operation resumes when the set frequency exceeds the lower limit frequency.

3: Zero-Speed Operation

When the set frequency is lower than the lower limit frequency, the drive will operate at zero speed.

4: Operation at Set Frequency

Operates at the set frequency, unaffected by the lower limit frequency.

F0-11	Sleep/Wake-up Time	Setting range: 0.0 - 6000.0 s

When the inverter is in sleep mode, it will exit sleep mode only if the set frequency remains above the lower limit frequency for the duration specified by F0-11.

F0-12	Acceleration Time 1	Setting range: 0.01 - 650.00 s
F0-13	Deceleration Time 1	Setting range: 0.01 - 650.00 s

Acceleration time refers to the time required for the output frequency to

accelerate from 0 Hz to the value specified by F0-21. Deceleration time refers to the time required for the output frequency to decelerate from F0-21 to 0 Hz.

F0-14 Carrier Frequency	Setting range: 300 - 3000 Hz

The carrier frequency of an inverter determines the number of times the power switching devices (such as IGBTs) in the inverter turn on and off; therefore, it is also referred to as the switching frequency. It primarily affects the following aspects: The power loss of the IGBT power modules is related to the carrier frequency; as the carrier frequency increases, power loss increases, and the power modules generate more heat, which is detrimental to the inverter. The carrier frequency also affects the waveform of the inverter's output secondary current: when the carrier frequency is high, the current waveform is more sinusoidal and smoother. This results in lower harmonics but relatively higher interference; the opposite is true when the carrier frequency is low. When the carrier frequency is too low, the motor's effective torque decreases, losses increase, and temperature rises; conversely, when the carrier frequency is too high, the inverter's own losses increase, the IGBT temperature rises, and the rate of change of the output voltage (dv/dt) increases, which significantly affects the motor's insulation.

The following are some effects related to the carrier amplitude:

Impact Aspects	Excessively high carrier frequency	Carrier Frequency Too Low
Current Output Waveform	More ideal waveform	Unsmooth waveform
Torque during low-frequency operation	High torque	Low torque
Motor Noise	Low noise	High noise
Losses in Main Components	Significant power loss	Low wear and tear
Heat generated by the entire unit	Significant heat generation	Minimal heat generation
Efficiency	Decreased efficiency	High efficiency
Output	Output decreases	High output
Electromagnetic interference	Significant interference	Low interference

As can be seen from the table above, a carrier frequency that is too high or too low can lead to a series of adverse effects. In practical applications, the carrier frequency should be selected and adjusted appropriately based on specific requirements and conditions, taking all relevant factors into comprehensive consideration, to achieve optimal system performance and efficiency.

F0-15 Rotation Direction Selection	Setting Range: 0 - 2

0: Same as the set direction

1: Opposite to the set direction. When this mode is selected, the actual output phase sequence of the inverter is the opposite of the set direction.

2: Reverse rotation disabled—The inverter will ignore reverse commands and operate only in the forward direction.

This parameter is used to change the inverter's current phase sequence, thereby changing the motor's direction of rotation. It is not affected by restoring the inverter to factory settings.

F0-17 Parameter Reset	Setting Range: 0 - 9999

0: Do not initialize; no action

11: Initialize selected parameters; restore parameters to their default values based on the model

12: Partial parameter initialization (excluding motor and encoder parameters)

19: Initialize all applicable parameters (including parameters not affected by factory default restoration)

22: Clear fault logs. Clear fault logs

55: Back up parameters to the backup area; back up all parameters to the backup area

56: Restore parameters from backup area; restore all parameters from the backup area

F0-18 Parameter Protection	Setting range: 0 - 2

0: All parameters can be modified

All parameters can be modified

1: Modification prohibited except for parameters changed using the up and down arrow keys

No parameters can be changed. However, if the frequency setting source F0-03 is set to 1, F0-07 can be changed using the up and down keys in monitoring mode.

2: All parameters are disabled

No parameters may be modified

F0-19 Keyboard STOP Key Setting	Setting range: 0×11

LED units digit: STOP key function selection

0: Non-keyboard control methods are disabled

1: Non-keyboard control methods stop the unit according to the stop mode

2: Non-keyboard control methods allow for free stopping

LED tens digit: STOP double-click function

0: No function

1: Free stop (all command channels)

LED hundreds digit: Start button (self-learning mode, when not using keyboard control)

0: Start

1: Disabled

F0-20 Frequency command resolution	Setting range: 0 - 4

0: 0.01 Hz

1: 0.1 Hz

2: 0.1 RPM

3: 1 RPM

4: 10 RPM

When higher frequencies or rotational speeds are required, set the resolution to the appropriate unit.

F0-21 Acceleration/Deceleration Time Reference Frequency	Setting range: 0 - 2

Used to select the reference frequency for acceleration and deceleration times, i.e., the frequency corresponding to the acceleration and deceleration times.

0: Maximum frequency

1: Fixed frequency of 50 Hz

2: Set frequency

F0-22 Acceleration/Deceleration Time Unit	Setting range: 0 - 2

0: 1 s (0 decimal places)

1: 0.1 s (1 decimal place)

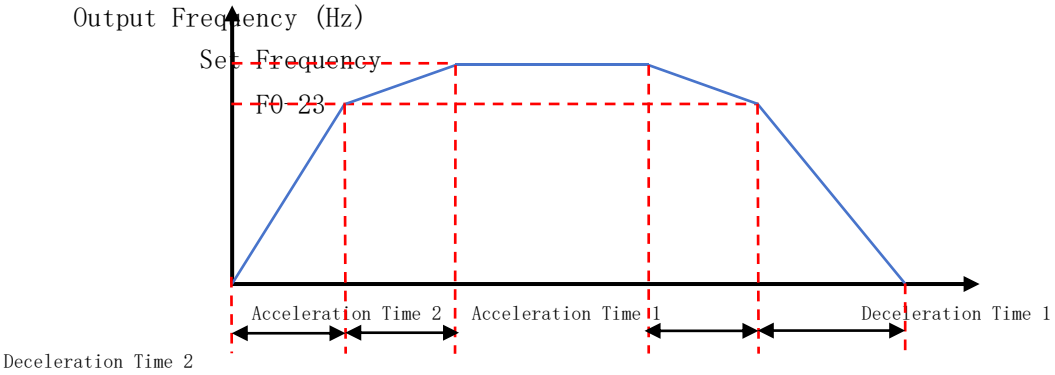
2: 0.01 s (two decimal places)

Note: Changing the acceleration/deceleration unit precision will also change the upper limit of the acceleration/deceleration time.

1 s (upper limit of 65,535 s), 0.1 s (upper limit of 65,53.5 s), 0.01 s (upper limit of 65,53.5 s)

F0-23 Switching Frequency Between Acceleration Time 1 and Acceleration Time 2 Setting Range: 0 to Maximum Frequency

If the parameter value is set to 0.00 Hz, no switching occurs; at or below this frequency, Acceleration Time 1 is selected; above this frequency, Acceleration Time 2 is selected.



Schematic Diagram of Acceleration and Deceleration Time Switching

F0-24 Acceleration Time 2	Setting range: 0.01 - 650.00 s
F0-25 Deceleration Time 2	Setting range: 0.01 - 650.00 s

This parameter specifies the second set of acceleration and deceleration times. The inverter provides four sets of acceleration and deceleration times, which the user can select via the DI terminals or by using function code F0-23 (Acceleration Time 1/2 Frequency Switching Point).

F0-26 Acceleration Time 3	Setting range: 0.01 - 650.00 s
F0-27 Deceleration Time 3	Setting range: 0.01 - 650.00 s
F0-28 Acceleration Time 4	Setting range: 0.01 - 650.00 s
F0-29 Deceleration Time 4	Setting range: 0.01 - 650.00 s

This parameter specifies the acceleration and deceleration times for the third and fourth groups. The inverter provides four sets of acceleration and deceleration times, which the user can select via the X terminals. Terminal functions 15 and 16.

Time	X Terminal 1	X Terminal 2
Acceleration/Deceleration Time 1 (F0-12/F0-13)	0	0
Acceleration/Deceleration Time 2 (F0-24/F0-25)	1	0
Acceleration/Deceleration Time 3 (F0-26/F0-27)	0	1
Acceleration/Deceleration Time 4 (F0-28/F0-29)	1	1

Terminal-Switched Acceleration/Deceleration Timing Table

F0-30 S-Curve Acceleration/Deceleration Selection	Setting Range: 000 - 111

Units digit: Standard S-curve acceleration/deceleration

0: Disabled
1: Enabled
Tens place: S-curve transition smoothing
0: Disabled
1: Enabled
Hundreds place: Jog operation with S-curve acceleration and deceleration
0: Disabled
1: Enabled

F0-31 S-curve acceleration start time	Setting range: 0.00 - 10.00 s
F0-32 S-curve time at the end of acceleration	Setting Range: 0.00 - 10.00 s
F0-33 S-curve deceleration start time	Setting range: 0.00 - 10.00 s
F0-34 S-curve deceleration end time	Setting range: 0.00 - 10.00 s

The acceleration and deceleration S-curve times are used to ensure smoother motor operation during acceleration and deceleration.

F0-35 Jog Operation Frequency Selection	Setting range: 0.00 to maximum frequency

Set the frequency range for jog operation.

F0-36 Jog Acceleration Time	Setting range: 0.01 - 650.00 s
F0-37 Jog Deceleration Time	Setting range: 0.01 - 650.00 s
F0-38 Jog Interval Time	Setting Range: 0.01 - 650.00 s
F0-39 Emergency Stop Time	Setting range: 0.01 - 650.00 s

When the jog command is active, this is the time it takes for the inverter to accelerate from 0 Hz to the jog frequency according to the jog acceleration time.
When the jog command is inactive, this is the time it takes for the inverter to decelerate from the jog frequency to 0 Hz according to the jog deceleration time.
When the X terminal receives an emergency stop command (Function 54), the required deceleration and stop time

F0-40 Run Command Bundled Set Frequency	Setting Range: 0000 - FFFF

Units digit: Keyboard command binding
Units digit: Keyboard command binding Tens digit: Terminal command binding
Units digit: Keyboard command bundleTens digit: Terminal command bundle
Thousands place: Optional card command binding
0: No bundling

F0-43 Upper Limit Frequency Digital Setting	Setting Range: 00.00 - 600.00 Hz

Digital setting for upper limit frequency; the range is from the lower limit frequency to the maximum frequency and cannot exceed the maximum frequency.

F0-43 Upper Limit Frequency Source Selection	Setting Range: 0 - 7

0: Upper limit frequency set via digital input
1: AI1 setpoint
2: AI2 input
3: AI3 input
4: Pulse input from PUL terminal
5: Reserved
6: RS485 Communication Input
7: Optional card

2. Start and Stop Parameters (F1 Parameters)

F1-00 Start-up Operation Mode	Setting Range: 0 - 2

0: Start based on start frequency

Start after speed tracking and direction determination

1: DC braking first, then start from the start frequency

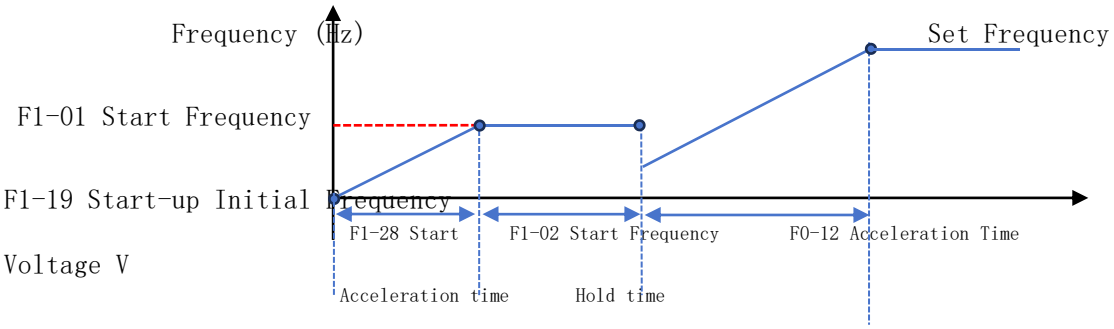
The inverter first applies a certain DC braking current to the load motor (i.e., electromagnetic braking, defined in parameters F1-03 and F1-04), and then starts; this is suitable for low-inertia loads that exhibit forward or reverse rotation when stopped.

2: Start after speed tracking and direction determination

The inverter first detects the motor's speed, then uses the detected speed as the starting point to accelerate or decelerate to the set frequency according to the acceleration and deceleration times.

F1-01 Start Frequency	Setting Range: 0.00 to Maximum Frequency
F1-02 Start Frequency Hold Time	Setting Range: 0.0 - 60.00 S

Properly setting the start frequency improves the starting torque characteristics; however, if the set value is too high, an overcurrent fault may occur. The start frequency duration refers to the duration of operation at the start frequency. If the set frequency is lower than the start frequency, the drive will first operate at the start frequency; once the start frequency duration has elapsed, it will decelerate according to the set deceleration time to reach the set frequency.



F1-03 Pre-start Braking Current	Setting Range: 0.0 - 150%
F1-04 Pre-start Braking Time	Setting Range: 0.0 - 60.0S

When the start mode is set to "brake first, then start," the DC braking function is enabled. F1-03 is the DC braking current during startup (as a percentage of the rated current), and F1-04 is the duration. During DC braking, the inverter outputs DC current. The DC braking startup process is shown in Figure 1.

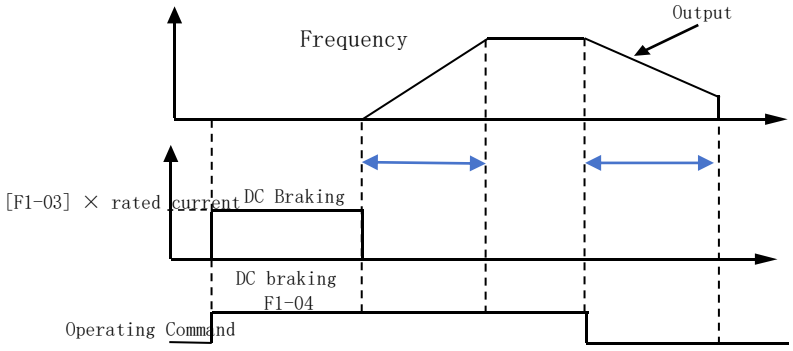


Figure 1 DC Braking Start-up

F1-05 Shutdown Mode	Setting Range: 0 - 1

0: Deceleration mode

After receiving a stop signal, the motor decelerates to a stop according to the set deceleration time.

1: Free Stop

Upon receiving a stop signal, the output is inhibited, and the motor stops by running freely.

F1-06 Stop DC Braking Start Frequency	Setting Range: 0.00 - 50.00 Hz
F1-07 Stop DC Braking Current	Setting Range: 0.0 - 150.0%
F1-08 Stop DC Braking Time	Setting Range: 0.0 - 60.0 s

These three parameters are used to define the DC braking function of the inverter during shutdown. During the shutdown process, when the inverter's output

frequency falls below the DC braking start frequency, the inverter will activate the DC braking function.

The DC braking duration refers to the length of time the DC braking function remains active. When this parameter is set to 0, the DC braking function is disabled during shutdown. During DC braking, the inverter outputs DC current. The DC braking function can provide torque at zero speed and is typically used to improve shutdown accuracy; however, it cannot be used for deceleration braking during normal operation.

The braking function can provide torque at zero speed and is typically used to improve stopping accuracy; however, it cannot be used for deceleration braking during normal operation.

F1-15 Terminal Start Protection Selection	Setting Range: 1111

LED least significant digit: Terminal start upon recovery from a fault

0: Start allowed

1: Start prohibited

LED Units Digit: Terminal start-up upon recovery from an exception

0: Start allowed

1: Start prohibited

LED Hundreds Place: Terminal Start When the Command Channel Switches to the Terminal

0: Start allowed

1: Start prohibited

LED (thousands place): Terminal startup when free stop, emergency stop, or forced stop commands are active

0: Start allowed

1: Start prohibited

Note: When the terminal run command is active (2-wire Mode 1/2-wire Mode 2), the inverter stops due to an abnormality. Once the abnormality is resolved, if the start signal is active and “Start Permitted” is set, the inverter immediately enters the running state; if the start signal is active and “Start Prohibited” is set, a stop command must be issued first, followed by a start command, before the inverter will respond to the run command and start.

F1-16 Stop Detection Frequency	Setting Range: 0.00 to Maximum

During deceleration to a stop, when the inverter’s output frequency falls below this value, it enters a free-running stop state.

F1-17 Stop Speed Detection Mode	Setting Range: 0 - 1

0: Detect based on speed command

Detect stop based on the frequency set in F1-16

1: Detect based on actual speed

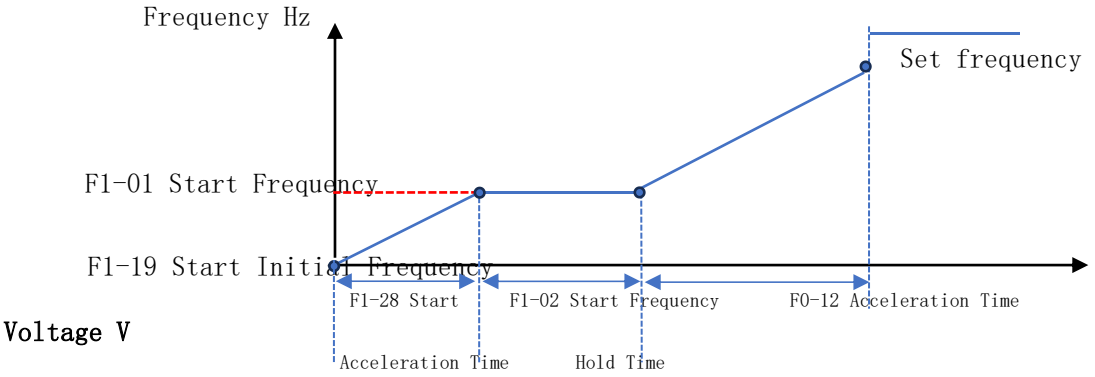
Detects stop based on the motor's actual rotational speed

F1-18 Start-up Wait Time	Setting Range: 0.00 - 60.0S

After the inverter receives a run command, it enters the run state; however, there is a delay equal to this setting before the inverter officially begins outputting voltage to control the motor. When using the run status terminal to control the output contactor, this wait time compensates for the delay caused by the contactor's engagement.

F1-19 Start-up Frequency	Setting range: 0.00 - maximum

At startup, this value is used as the initial value for the frequency ramp generator output



F1-20 Forward/Reverse Dead Band Time	Setting Range: 0 - 120.0S

The duration for which zero frequency is maintained during forward/reverse switching.

F1-21 Minimum Start-Stop Interval	Setting range: 0.000 - 60.000 s

The system will not respond to a new run command until the stop time has reached this delay.

F1-22 Frequency Hold Time During Stop	Setting Range: 0.00 to Maximum Frequency
F1-23 Frequency Hold Time During Shutdown	Setting Range: 0.00 - 60.00 s

During deceleration to a stop, the frequency drops to the value set in F1-22, remains at that level for the duration set in F1-23, and then the motor stops. This function is not effective during terminal DC braking or jog operation. When DC

braking is enabled, this function is not effective if the stop frequency hold value is lower than the DC braking frequency. If DC braking is not enabled, this function is not effective if the stop frequency hold value is lower than the stop detection frequency.

F1-24 Frequency Direction Changes Running Direction	Setting Range: 0 - 1

0: Frequency control direction is disabled

1: Frequency control direction is enabled

When frequency control direction is disabled, a setpoint frequency less than zero is treated as zero frequency.

F1-25 Power Outage Restart Behavior Selection	Setting Range: 0 - 1
F1-26 Power Outage Restart Wait Time	Setting Range: 0.00

0: Disabled

If a power failure occurs while the inverter is running, and the power failure restart function is enabled, the inverter will automatically resume operation the next time power is restored, provided no stop command is issued. This function applies to all operation command channels.

Use this function with caution to prevent personal injury or equipment damage caused by the inverter starting immediately upon power restoration.

1: Enabled

The inverter will not respond when power is lost and then restored.

F1-28 Start Frequency Acceleration Time	Setting Range: 0.01 - 600.00 s

The acceleration time required for the frequency to reach the start frequency during startup.

F1-30 Start Pre-excitation Time	Setting Range: 0.01 - 60.00 s

Only vector control of induction motors (with or without PG) supports pre-excitation; ignore for other cases.

An excessively long pre-excitation time during startup may result in failed motor startup, prolonged pre-excitation, and a drop in grid voltage. Therefore, in actual operation, the pre-excitation time must be set appropriately based on the specific equipment and operating conditions to ensure smooth motor startup and stable grid operation.

F1-31 Synchronous Motor Short-Circuit Braking Time	Setting Range: 0.01 - 60.00 s

Applicable to synchronous motors; used to bring a rotating synchronous motor to a stop while it is in free coasting mode, followed by a restart

F1-34 Zero-Speed Torque Holding Current	Setting Range: 0.0 - 150.0%
F1-35 Zero-Speed Torque Hold Time	Setting Range: 0.0 - 6000.0

When the inverter is operating at 0 Hz, it outputs the current set in F1-34 and maintains it for the duration set in F1-35 before accelerating or stopping.

F1-36 Jog Stop Mode Selection	Setting Range: 0 - 1

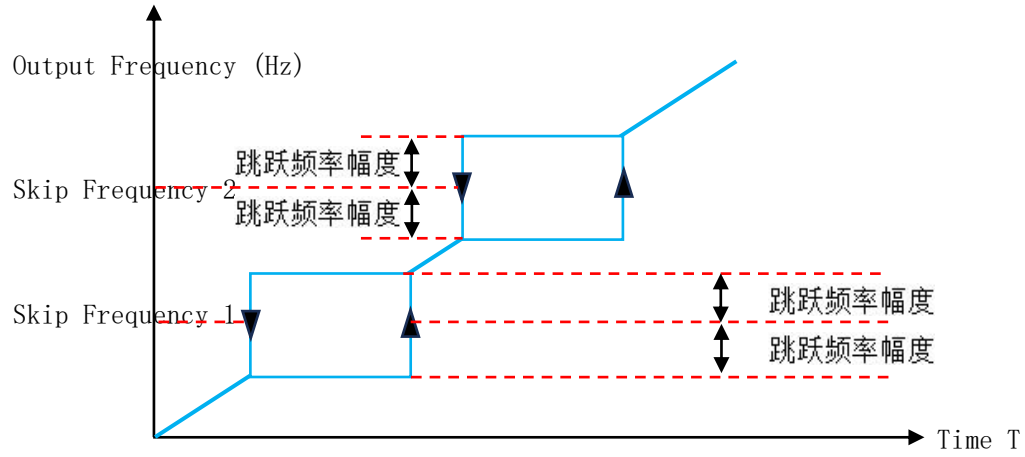
0: Decelerate to a stop only

1: As set in F1-05

In jog mode, only deceleration-to-stop is performed; DC braking is not engaged, nor is the stop-hold frequency check performed

F1-40 Jump Frequency 1	Setting Range: 0.00 - Maximum Frequency
F1-41 Jump Frequency Amplitude	Setting Range: 0.00 - Maximum Frequency
F1-42 Jump Frequency 2	Setting Range: 0.00 to Maximum Frequency
F1-43 Jump Frequency Amplitude	Setting Range: 0.00 to Maximum Frequency

When the load driven by the inverter experiences mechanical resonance at a certain frequency, this resonance point can be avoided by using a frequency jump. There are two frequency jump points to choose from; if the frequency jump range is set to 0, the frequency jump is disabled.



Schematic Diagram of Jump Frequencies

F1-50 Swing Frequency Control	Setting Range: 0 - 1

0: Swing frequency control disabled

1: Swing frequency control enabled

The swing frequency function periodically adjusts the amplitude of the specified frequency and is generally used in textile applications.

F1-51 Oscillation Amplitude Control	Setting Range: 1111

Units digit: Start mode (reserved)

0: Automatic

1: Manual via terminals

Tens place: Swing frequency amplitude control

0: Relative to center frequency

1: Relative to maximum frequency

Hundreds place: Preset frequency enable (reserved)

0: Disabled

1: Enabled

Thousands place: Reserved

Oscillation Amplitude Control:

0: Relative to center frequency (F0-07 frequency command superposition selection); this is a variable swing-width system, where the swing width varies with changes in the center frequency (set frequency);

1: Relative to maximum frequency (F0-10 maximum frequency); this is a fixed-swing-width system, where the swing width is calculated as a fixed value based on the maximum frequency.

F1-54 Swing Frequency Amplitude	Setting Range: 0.0 - 50.0%

When FB-01 is set to 0, the swing amplitude is 0, and the swing frequency has no effect.

F1-55 Step Frequency	Setting Range: 0.0 - 50.0%

Specify the swing amplitude and step frequency values. The swing frequency is constrained by the upper and lower frequency limits.

F1-56 Triangle Wave Rise Time	Setting Range: 0.01 - 650.00 S
F1-57 Triangle Wave Rise Time	Setting Range: 0.01 - 650.00 S

The rise and fall time coefficients of a triangular wave represent the ratio of the rise and fall times to the oscillation period.

3. Motor Parameters (F2 Parameters)

F2-00 Motor Type	Setting Range: 0 - 1

0: Induction Motor (AM)

1: Permanent magnet synchronous motor (PM)

F2-01 Motor Rated Voltage	Setting Range: 0 - 9000 V
F2-02 Motor Rated Frequency	Setting Range: 0.01 to Maximum Frequency
F2-03 Motor Rated Current	Setting Range: 0.1 - 3000.0 A

Set these parameters according to the motor nameplate; correct parameter

settings are essential for the motor to operate properly.

F2-04 Motor Rated Slip Frequency	Setting Range: 0.00 - 5.00 Hz

The rated slip frequency of an induction motor is generally not listed on the nameplate but can be calculated using the following formula:

(Ideal no-load speed - Rated speed) * Rated frequency / Ideal no-load speed

Ideal no-load speed = 2 × 60 × rated frequency / number of poles

F2-05 Motor Pole Count	Setting Range: 1 - 400

Set according to the motor nameplate. Number of motor poles = Number of motor pole pairs × 2

This parameter must be set to an even number. When entering the value, be sure to distinguish it from the number of pole pairs. For closed-loop vector control, the correct number of poles must be entered; otherwise, the motor will not operate normally. In VF and open-loop vector modes, entering the correct number of poles facilitates control tuning and speed monitoring.

F2-06 Motor Rated Speed	Setting Range: 0 - 65,000 rpm

This monitored value is calculated based on the motor frequency and number of poles and is used to determine whether the parameter settings are appropriate.

F2-07 Motor Power Line Phase Sequence	Setting Range: 0 - 1

0: UVW normal phase sequence

1: UWV reverse phase sequence

Using this parameter allows you to switch the motor's rotation direction, with the same effect as physically changing the VW phase sequence of the motor cables.

- Unlike F0-15, which changes the motor's rotation direction, changing this parameter does not affect the speed setpoint polarity, the direction of the run command, or the torque polarity direction
- In closed-loop vector control, after changing this parameter, the encoder direction and offset angle must be reset or relearned.

This value is not affected by a factory reset.

F2-08 Motor Parameter Autotuning Selection	Setting Range: 0 - 3

0: No action

1: Standstill self-tuning

Applicable when the motor load cannot be disconnected, making rotational tuning impossible.

2: Rotational self-learning

Applies to situations where the motor is not connected to a load and requires complete rotational tuning. If PG synchronous vector control is enabled, the system will learn the encoder's installation angle;

3: Stator Resistance Self-Learning

Learns the motor's stator resistance separately.

F2-10 Induction Motor No-Load Current	Setting Range: 0.1 - 3000.0 A

The no-load current of an induction motor refers to the current flowing through the three-phase stator windings when the motor is running without a load. This parameter can be obtained through dynamic motor parameter identification.

F2-11 Stator Resistance Normalized Value	Setting Range: 0.01 - 50.00%
F2-12 Rotor Resistance Normed Value	Setting Range: 0.01 - 50.00%
F2-13 Stator Leakage Inductance Normaled Value	Setting Range: 0.01 - 50.00%
F2-14 Normalized Stator Inductance	Setting Range: 0.1 - 2000.0%

The stator resistance of an induction motor refers to the DC resistance (phase value) of the motor's stator windings; this parameter can be obtained through motor parameter identification.

The rotor resistance of an induction motor refers to the DC resistance of the motor's rotor windings; this parameter can be obtained through motor static parameter identification or dynamic parameter identification.

The leakage inductance of an induction motor is caused by leakage flux in the motor windings. When current flows through the motor windings, it generates magnetic flux, which can be divided into two parts based on its path: main flux and leakage flux. Leakage flux can be described by a single inductance value, known as leakage inductance. This parameter can be obtained through either static or dynamic motor parameter identification.

Stator inductance refers to the inductance of the motor's stator; its magnitude is influenced by factors such as the stator's structure and the number of coil turns. This parameter can be obtained through static or dynamic parameter identification of the motor.

Note: If on-site conditions do not allow for motor tuning, you can manually enter known parameters from a similar motor.

F2-15 Induction Motor Stator Resistance	Setting Range: 0.01 mΩ to 60,000 mΩ
F2-16 Induction Motor Rotor Resistance	Setting Range: 0.01 mΩ to 60,000 mΩ
F2-17 Induction Motor Stator Leakage Inductance	
Setting Range: 0.001 mH to 6,553.5 mH	
F2-18 Induction Motor Stator Inductance	
Setting Range: 0.01 mH to 65,535 mH	

The above parameters are monitoring values calculated from nominal values. They can be compared with the design values provided by the motor manufacturer to verify whether the motor parameter learning was performed correctly.

F2-20 Synchronous Motor Stator Resistance Normalized Valu Setting Range: 0.01 - 50.00% F2-21 Synchronous Motor D-Axis Inductance Normalized Value Setting Range: 0.01 - 200.00%

The stator resistance of a synchronous motor refers to the DC resistance (per-phase value) of the motor's stator windings.

The D-axis inductance of a synchronous motor refers to the inductance value along the main pole axis (longitudinal axis) of the motor.

The Q-axis inductance of a synchronous motor refers to the inductance value of the centerline (intersecting axis) between the axes of adjacent rotor poles.

Note: The values for the above parameters can all be obtained through motor parameter identification. If on-site conditions do not allow for motor tuning, you may manually enter known parameters from a similar motor.

F2-23 Synchronous Motor Back-EMF	Setting Range: 1 - 9000 V

This parameter represents the root mean square (RMS) value of the motor's back EMF when the motor is running no-load at the rated frequency (F2-02).

F2-24 Synchronous Motor Encoder Mounting Angle	Setting Range: 0.0° - 360°

The synchronous motor encoder mounting angle refers to the angular position between the encoder shaft and the motor shaft when the encoder is mounted on the synchronous motor. A synchronous motor encoder is a device used to measure the rotational angle of a synchronous motor; it achieves angle measurement by converting mechanical displacement into an electrical signal. When installing a synchronous motor encoder, it is necessary to ensure that the encoder shaft is aligned with the motor shaft to guarantee measurement accuracy.Adjusting the mounting angle is critical to ensuring the encoder functions correctly, as it directly affects the accuracy of angle measurements. In some cases, it may be necessary to calibrate the encoder's zero angle to ensure it matches the motor's actual zero angle.

F2-25 Synchronous Motor Stator Resistance	Setting Range: 0.01 mΩ to 60,000 mΩ
F2-26 Synchronous Motor D-Axis Inductance	Setting Range: 0.001 mH to 6553.5 mH
F2-27 Synchronous Motor Q-Axis Inductance	Setting Range: 0.001 mH to 6553.5 mH

The motor parameters listed above are monitoring values calculated from normalization values. They can be compared with the design values provided by the motor manufacturer to verify whether the motor parameter learning process was successful.

F2-28 Synchronous Motor Pulse Width Coefficient	Setting Range: 0 - 3000

The synchronous motor pulse width coefficient is a key parameter for controlling the motor via PWM technology; its calculation and adjustment are crucial for optimizing motor performance.

F2-30 Dead-Time Compensation Gain	Setting Range: 0 - 200

The dead-zone compensation gain is a parameter used to adjust the inverter's output performance; it corrects deviations in output voltage and current caused by the dead zone. A dead-zone compensation coefficient of 100 corresponds to 100% compensation.

F2-40 Synchronous Motor Pole Search Function	Setting Range: 000 - 222

Units digit: Sensorless vector control

0: Off

1: Enabled

2: Enabled, only during the first startup after power-on

Tens place: Sensitive vector control

0: Off

1: Enabled

2: Enabled, only during the first startup after power-on

Hundreds place: Non-vector control

0: Off

1: Enabled

2: Enabled, only during the first startup after power-on

Note: Enabling the motor pole search function in open-loop vector control prevents the motor from starting in reverse and ensures a higher starting torque.

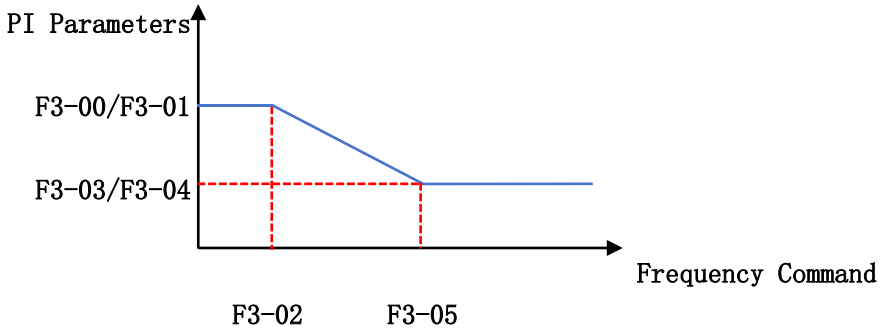
4. Vector Control and VF Control (Parameter F3)

F3-00 ASR (Speed Loop) Proportional Gain 1	Setting Range: 1 - 30000
F3-01 ASR (Speed Loop) Integral Time 1	Setting Range: 0.000 - 6.000 S
F3-02 ASR Switching Frequency 1	Setting Range: 0.00 - ASR Switching Frequency 2
F3-03 ASR (Speed Loop) Proportional Gain 2	Setting Range: 1 - 30,000
F3-04 ASR (Speed Loop) Integral Time 2	Setting Range: 0.000 - 6.000 S
F3-05 ASR Switching Frequency 2	Setting Range: 0.00 - Maximum Frequency

Parameters F3-00 and F3-01 are the PI control parameters used when the operating frequency is less than Switching Frequency 1 (F3-02). Parameters F3-03 and F3-04 are the PI control parameters used when the operating frequency is greater than Switching Frequency 2 (F3-05).The PI control parameters when the operating frequency is between Switching Frequency 1 and Switching Frequency 2 are set via a linear transition between the two sets of PI parameters. By adjusting the speed controller's proportional gain and integral time, the dynamic response characteristics of vector control can be tuned. Increasing either the proportional gain or the integral time will accelerate the dynamic response of the speed loop.

However, excessively high proportional or integral gains, or an excessively short integral time, may cause the system to oscillate.

Recommended adjustment method: If the factory default parameters do not meet requirements, fine-tune them based on the factory settings: First, increase the proportional gain to ensure the system does not oscillate; then, increase the integral gain to achieve both a fast response and minimal overshoot. Note: Incorrect PI parameter settings may result in excessive speed overshoot and may even cause an overvoltage fault during the overshoot recovery phase.



Schematic Diagram of Speed Loop PI Parameters

F3-06	Output Torque Limit	Setting Range: 0.0 - 400.0%

A setting of 100% corresponds to the rated output torque of the motor matched to the inverter.

F3-07	Synchronous Motor Low-Frequency Inrush Current	Setting Range: 0.0 - 100.0%

This parameter applies only to synchronous motors. This current refers to the no-load current at low frequencies (below the pull-in current frequency set in F3-18), with 100% corresponding to the motor's rated current.

F3-08	Induction Motor Slip Compensation Gain	Setting Range: 0.0 - 250.0%

This parameter controls the gain for slip compensation during vector control of an induction motor. 100% corresponds to the motor's rated slip value. In open-loop vector control, adjusting this value improves speed control accuracy; in closed-loop vector control, adjusting this value can, to a certain extent, adjust the magnitude of the output current.

F3-09	Closed-Loop Flux Proportional Gain	Setting Range: 0.0 - 200.0%

This parameter applies only to induction motors. If the motor lacks power under load or the load current is excessively high, this value can be appropriately increased, up to a maximum of 100%.

F3-10	Current Loop D-Axis Proportional Gain	Setting Range: 1 - 9999
F3-11	Current Loop D-Axis Integral Gain	Setting Range: 1 - 8000
F3-12	Current-loop Q-axis proportional gain	Setting range: 1 - 9999
F3-13	Current-loop Q-axis integral gain.	Setting range: 1 - 8000

Current-loop PI gain parameters: Adjusting the current-loop coefficients changes the dynamic response of the current loop. Generally, the default values are sufficient to meet requirements and do not need to be adjusted.

F3-15	Vector IF Control Current	Setting Range: 0.0 - 400.0%
F3-16	Vector IF Control Current Upper Limit	Setting Range: 0.0 - 100.0%

Applies to both synchronous and asynchronous motors. During IF control, the motor is controlled via a current closed-loop system, with the operating frequency set to the specified value. This mode is generally used in low-frequency applications requiring stable, fixed torque output; the higher the current, the greater the torque provided. However, since the output current (F3-15) remains constant, setting the current too high can cause severe motor overheating; caution is advised during use.

F3-17	Synchronous Motor High-Frequency Start-Up Current	Setting Range: 0.0 - 50.0%
F3-18	Synchronous Motor Pull-In Current Frequency	Setting Range: 0.0 - 100.0%

This parameter applies only to synchronous motors. The high-frequency inrush current of a synchronous motor refers to the no-load current at high frequencies (above the inrush current frequency set in F3-18), with 100% relative to the motor's rated current.

F3-20	Weak-field control gain	Setting Range: 0.0 - 500.0%
F3-21	Weak-field Control Integral Gain	Setting Range: 0.0 - 500.0%

Weak-field high-speed control is effective for PM and AM motors. The weak-field control gain refers to the gain coefficient used to achieve specific control objectives by adjusting the motor's magnetic field strength during the weak-field control process. Weak-field control is a method that reduces the magnetic flux inside the motor by adjusting the motor's excitation current or stator current, thereby allowing the motor to operate at speeds higher than its rated base speed.

F3-22	Flux Control Gain	Setting Range: 0.0 - 1000.0%
F3-23	Flux Control Integral Gain	Setting Range: 0.0 - 1000.0%

Both on-off and vector control are enabled: 0 disables flux closed-loop control; a value other than 0 enables flux closed-loop control. This gain function must be enabled when vector overexcitation is required

F3-25	Weak Magnetic Field Current Upper Limit	Setting Range: 0.0 - 250.0%

The upper limit of the weak-field current refers to the maximum allowable weak-field current value set to ensure system safety and stability during the motor's weak-field operation.

F3-26	Vector Control Voltage Utilization	Setting Range: 0.0 - 120.0%

Vector control voltage duty cycle refers to the ratio of the peak value of the three-phase output voltage to the DC bus voltage in vector control technology. 100% corresponds to the motor's rated voltage; this setting takes effect only when the

overmodulation function is enabled; otherwise, it has no effect.

F3-27	Maximum Vector Control Output Voltage	Setting Range: 0.0 - 180.0%

The ideal state for the inverter's output voltage is when the input and output are the same; for example, if the input is 1140 V, the output is also 1140 V. Adjusting this parameter is effective when driving a low-voltage load with a high-voltage supply; for example, when the supply voltage is 1140 V and the motor's rated voltage is 660 V.

F3-30	Over-excitation Braking Gain	Setting Range: 0.0 - 500.0%
F3-31	Over-excitation Braking Limiting	Setting Range: 0.0 - 250.0%

Over-excitation braking gain typically relates to the excitation system and protection mechanisms in power systems. The excitation system is a critical component of power systems used to regulate the excitation current of a generator, thereby controlling the generator's output voltage and reactive power.

F3-32	Energy-Saving Operation	Setting Range: 0 - 1
F3-33	Energy-Saving Operation Excitation Lower Limit	Setting Range: 0.0 - 80.0%
F3-34	Energy-Saving Operation Filter Coefficient	Setting Range: 0.000 - 6.000S

Energy-Saving Operation:

0: Off

1: Enabled

Applicable to induction motors. When energy-saving control is enabled, the system performs weak-field control based on the motor's current load. Under light load conditions, the excitation current is appropriately reduced to lower the final output current, thereby achieving energy savings. This feature is suitable for applications where the motor operates under light load for extended periods to achieve a certain level of energy savings. When this function is enabled, the output torque response will be reduced; therefore, it is not suitable for applications requiring high torque response.

F3-40	Torque Control Selection	Setting Range: 0 - 2

0: Speed Control

1: Torque control, standard torque control, used for parallel operation

2: Torque control, braking torque control, used for test-following machines

This parameter allows you to switch between speed and torque control modes. For most applications, it is recommended to use the standard torque control mode. For a test machine that tows a loading platform, the braking torque mode can be used to generate braking torque and achieve the towing and loading objective.

F3-41	Torque Digital Setting	Setting Range: 0 - 300%

In torque mode, when F3-42 is set to 0, the torque setpoint is applied.

F3-42	Torque Command Source	Setting Range: 0 - 7

0: Digital setpoint F3-41
1: Analog Input AI1
2: Analog Input AI2
3: Analog Input AI3
4: Terminal pulse input
5: Process closed-loop output
6: Modbus Communication Settings
7: Expansion Communication Card Settings

Similar to how frequency commands are set for frequency channels, torque commands also support different channel settings, with 100% corresponding to the motor's rated current.

F3-43 Torque Filtering Time	Setting Range: 0.000 - 60.000 S

The shorter the torque filtering time, the faster the response time.

F3-44 Torque Setpoint Proportional Coefficient	Setting Range: 0.0 - 300.0

If the setpoint is an analog signal, high-speed pulse, or process closed-loop output, the torque setpoint must be adjusted using the F3-44 coefficient.

F3-45 Torque Limit Channel	Setting Range: 0 - 7

0: Digital setpoint F3-06
1: Analog Input AI1
2: Analog Input AI2
3: Analog Input AI3
4: Terminal pulse input
5: Process closed-loop output
6: Modbus Communication Settings
7: Expansion Card Settings

Torque limiting supports different channel settings, with 100% corresponding to the motor's rated current.

The core function of the torque limit channel is to prevent the motor's output torque from exceeding the set threshold, thereby avoiding equipment overload, mechanical damage, or safety incidents. Properly setting the torque can protect the equipment.

F3-47 Torque Limit Proportional Coefficient	Setting Range: 0.0 - 300.0

If the limit is set to analog, high-speed pulse, or process closed-loop output, the torque limit must be adjusted using the F3-47 coefficient.

F3-48 Forward Rotation Upper Limit Frequency Channel	Setting Range: 0 - 7

0: Digital setpoint F3-50
1: Analog Input AI1

2: Analog Input AI2
3: Analog Input AI3
4: Terminal Pulse Input
5: Process Closed-Loop Output
6: Modbus Communication Settings
7: Expansion Card Settings

Channel selection for operating frequency limit in torque mode; 100% corresponds to the maximum frequency F0-08. When the output frequency reaches the forward rotation upper limit, the output torque is limited to ensure the motor operates within the upper frequency
range.

F3-49 Reverse Upper Limit Frequency Channel	Setting Range: 0 - 7

0: Digital Setpoint F3-51
1: Analog Input AI1
2: Analog Input AI2
3: Analog Input AI3
4: Terminal pulse input
5: Process closed-loop output
6: Modbus Communication Settings
7: Expansion Card Settings

Channel selection for operating frequency limit in torque mode; 100% corresponds to the maximum frequency F0-08. When the output frequency reaches the upper limit of the reverse rotation frequency, the output torque is limited to ensure the motor operates within the upper frequency limit range.

F3-50 Forward Rotation Upper Frequency Limit	Setting Range: 0.0 - 100.0

Operating speed limit in torque mode; forward rotation upper limit frequency, where 100% corresponds to the maximum output frequency.

F3-51 Reverse Upper Limit Frequency	Setting Range: 0.0 - 100.0

Operating speed limit in torque mode; reverse rotation upper limit frequency; 100% relative to maximum output frequency.

F3-56 Low-Frequency Braking Torque Limit	Setting Range: 0.0 - 400.0%

0.0%: Low-frequency braking torque limit is disabled; when a non-zero value is set, the low-frequency braking torque limit is enabled.

F3-57 Low-Frequency Braking Torque Limit Frequency	Setting Range: 0.0 - 100.0%

100% corresponds to the motor’s rated current; 0.0% disables low-frequency braking torque limiting. When set to a non-zero value, low-frequency braking torque limiting is enabled. When the motor operates at a frequency lower than F3-57 × the motor’s rated frequency, low-frequency braking torque limiting control is activated to limit the braking torque generated during low-frequency operation. In open-loop

vector control, excessive low-frequency braking torque in an induction motor may cause control instability. Limiting the output torque at low frequencies ensures operational stability.

5. VF Control Group (F4 Parameters)

F4-00 VF Curve Selection	Setting Range: 00 - 12

00: Linear VF Curve—The inverter's output voltage is proportional to the output frequency. This method is used for most loads.
(**General-purpose constant-torque linear V/f curve**)

10: Quadratic VF Curve—The inverter's output voltage follows a quadratic relationship with the output frequency; suitable for constant-power loads such as fans and pumps. (**Quadratic V/f Curve Diagram**)

11: Custom VF Curve—The relationship between the inverter's output voltage and output frequency is set according to parameters F4-03 through F4-12
(**Multi-point V/f Curve Diagram**)

12: V/f Decoupling The inverter's output frequency and output voltage are independent of each other; the output frequency is determined by the frequency source, while the output voltage is determined by a separate V/f voltage source. This is generally used in applications such as torque motor control.
(**V/f Decoupling Diagram**)

F4-01 Torque Boost	Setting Range: 0.0% - 30.0%

The torque boost function is generally used when the inverter operates at low frequencies. In V/f control mode, the inverter's output torque is proportional to frequency. At low frequencies, when the motor is running at low speeds, the torque is very low. By setting this parameter to increase the inverter's output voltage, the current increases, thereby boosting the output torque. When using this function, do not set the torque boost too high, otherwise an overload protection alarm will be triggered. VF Torque Boost: When the boost value is set to zero, it functions as automatic torque boost. Automatic torque boost is effective in vectorized VF mode; in VF mode, 0.0% corresponds to 0. Torque boost is ineffective when using custom VF curves or VF separate control.

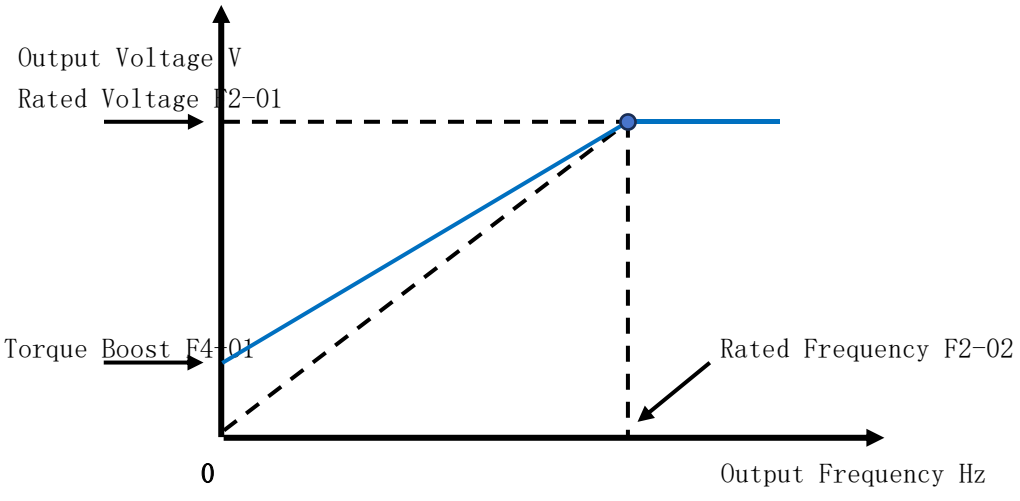
F4-02 Torque Boost Cutoff Frequency	Setting Range: 00 - 99

When the operating frequency reaches the torque boost cutoff frequency, the torque boost function is disabled.

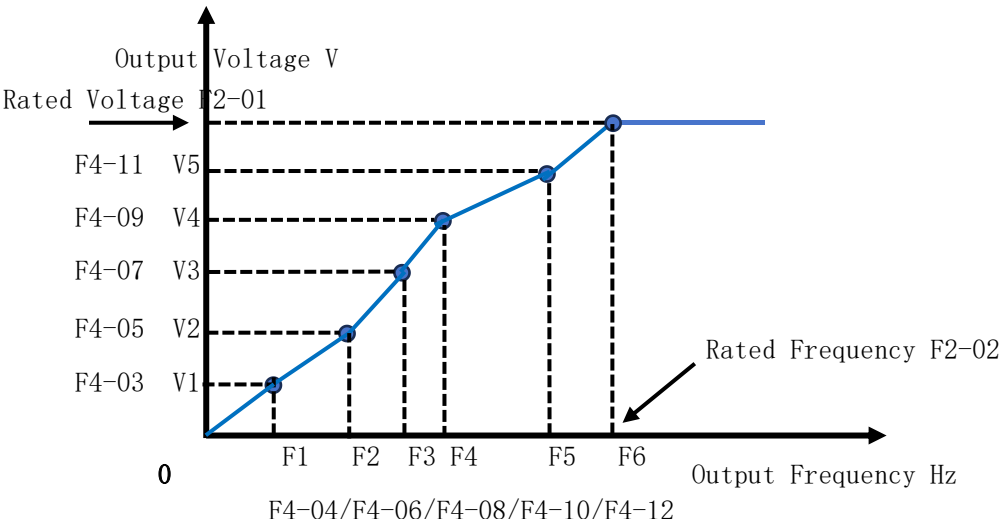
F4-03 Auto-Set Voltage V1	Setting Range: 0.0 - 100.0%
F4-04 Auto-Set Voltage V1	Setting Range: 0.0 - 100.0% F4-04
Auto-Set Voltage V1	Setting Range: 0.00 - Maximum Frequency
F4-05 Auto-Set Voltage V2	Setting Range: 0.0 - 100.0%
F4-06 User-defined frequency F2	Setting range: 0.00 to maximum frequency
F4-07 User-defined voltage V3	Setting range: 0.0 - 100.0%
F4-08 User-defined frequency F3	Setting range: 0.00 to maximum frequency
F4-09 User-defined voltage V4	Setting range: 0.0 - 100.0%
F4-10 User-defined frequency F4	Setting range: 0.00 to maximum frequency
F4-11 User-defined voltage V5	Setting range: 0.0 - 100.0%
F4-12 User-defined frequency F5	Setting range: 0.00 to maximum frequency

F4-03 to F4-12: These ten parameters define the multi-point V/f curve. The frequency points can be set within the range of 0.00 Hz to the maximum frequency, and the voltage points can be set within the range of 0.0% to 100%, corresponding to 0 V to the motor's rated voltage. The settings for the multi-point V/f curve are typically determined based on the motor's load characteristics.Be sure to set the parameters in the following order: F4-04 ≤ F4-06 ≤ F4-08 ≤ F4-10 ≤ F4-12.

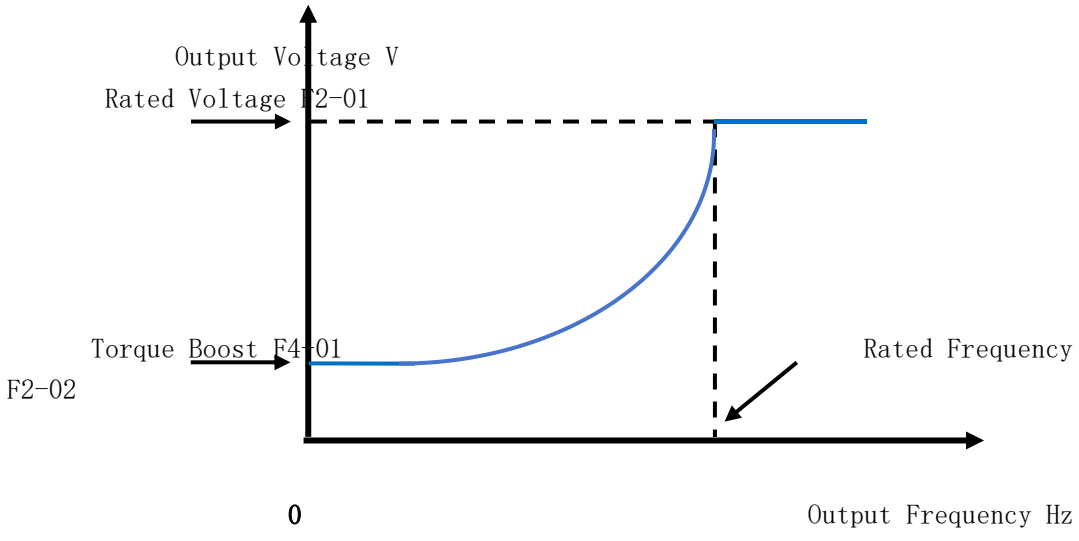
General Constant Torque Linear V/f Curve:



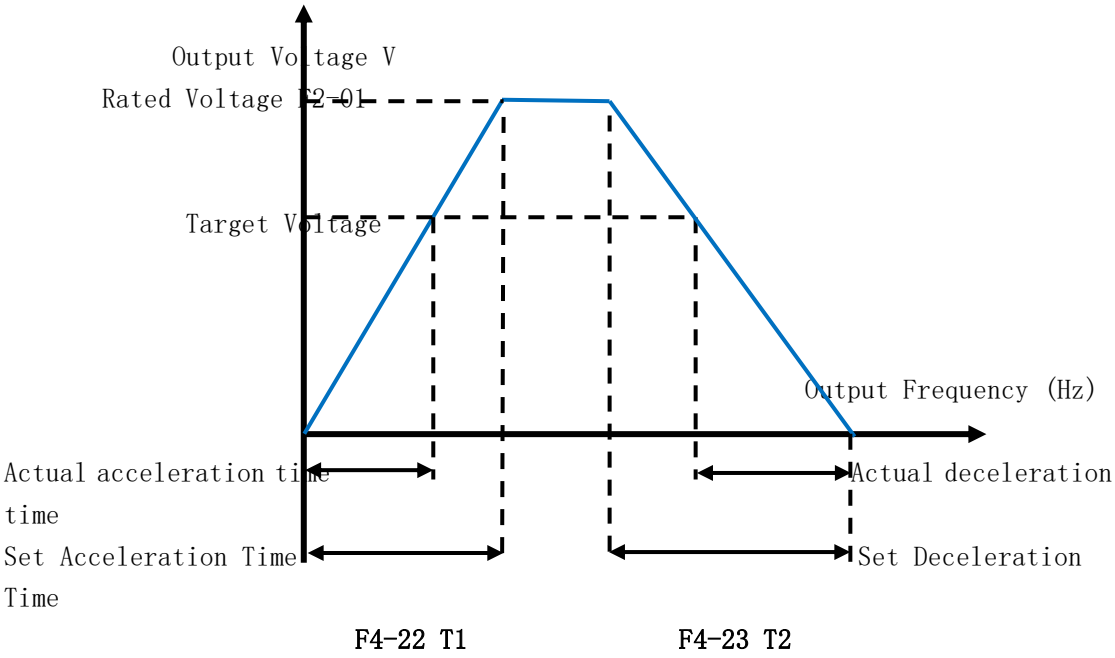
General-purpose constant torque linear V/f curve



Multi-point V/f curve chart



Square V/f Curve



V/f separation diagram

F4-13	Slip Compensation Gain	Setting Range: 0.0 - 200.0%
F4-14	Slip Compensation Limiting	Setting Range: 0.0 - 300.0%
F4-15	Slip Compensation Filter	Setting Range: 0.000 - 6.000S

In V/f mode, this increases the output frequency to compensate for the motor's reduced speed. A higher gain results in a higher compensation frequency; however, excessively high gain can cause overcompensation, leading to a speed higher than the set frequency.

Slip compensation limiting refers to the process in the inverter's slip frequency control where the stator current signal of an induction motor is converted into a slip frequency signal to achieve compensatory control of the slip frequency. The slip frequency is then limited to ensure system stability and performance. This method overcomes the drawbacks of a soft mechanical characteristic in open-loop control and improves the system's static performance.

When performing slip compensation, the motor's speed signal must be filtered to remove noise and interference. The duration of the filtering process affects the real-time response and accuracy of the speed signal, which in turn impacts the effectiveness of slip compensation. If the filtering time is too long, it may cause a delay in the speed signal, resulting in insufficiently timely slip compensation and affecting motor performance; if the filtering time is too short, it may fail to effectively remove noise, leading to a decrease in the accuracy of slip compensation.

F4-16	Oscillation Suppression Gain	Setting Range: 0.0 - 900.0%
F4-17	Oscillation Suppression Filter	Setting Range: 0.0 - 100.0 S

In V/f mode, most motors experience speed and current oscillations at low frequencies; these oscillations may cause the inverter to trip due to overcurrent. The higher the oscillation suppression gain, the stronger the suppression effect.

The oscillation suppression filter time is the adjustment time required for the filter to suppress system oscillations. It consists of overshoot time and settling time and is influenced by factors such as pole positions, zero distribution, and loop bandwidth. Parameter optimization is required to balance suppression effectiveness and response speed.

F4-18 Overexcitation Gain	Setting Range: 0.0 - 900.0%

The higher the overexcitation gain, the stronger the suppression effect. When using a braking resistor, installing a braking unit, or using an energy recovery unit, be sure to set the overexcitation gain to 0; otherwise, excessive current may occur during operation.

F4-20 Voltage-Frequency Separation Setpoint	Setting Range: 0 - 9

Units digit: Channel A:

0: Voltage percentage setting (F4-21)
1: AI1 setpoint
2: AI2 setpoint
3: AI3 setpoint (reserved)
4: PUL terminal pulse setpoint
5: PID Output Setpoint
6: RS485 Communication Input
7: Optional card
8: Voltage Percentage Setting + PID

Tens place: Channel B

0: Voltage Percentage Setting (F4-21)
1: AI1 Setpoint
2: AI2 Setpoint
3: AI3 Setpoint (Reserved)
4: Terminal pulse (PUL) setpoint
5: PID Output Setpoint
6: RS485 Communication Input
7: Optional card
8: Voltage Percentage Setting + PID

Hundreds place: Channel A and B combination

0: Channel A
1: Channel B
2: Channel A + Channel B
3: Channel A minus Channel B
4: Minimum of Channel A and Channel B

5: Maximum value of Channel A and Channel B

The channel for the target voltage when voltage and frequency are separated.

0: Digital setting (F4-21)

The V/f separation voltage is set digitally; the set value is the value of F3-14 (Digital Setting for V/f Separation Voltage).

1: AI1

The V/f separation voltage is input via the analog input terminal AI1. The AI1 terminal accepts current or voltage signals, and the corresponding frequency value is calculated based on the set AI curve.

2: AI2

The V/f separation voltage is input via the analog input terminal AI2. A current or voltage signal is applied to the AI2 terminal, and the corresponding frequency value is calculated based on the set AI curve.

F4-21 Digital setting for voltage-frequency separation output voltage Setting range: 0.00 - 110.00%

100% corresponds to the motor's rated voltage; the maximum setting is 110% of the motor's rated voltage.

F4-22 Voltage Acceleration Time for Voltage-Frequency

The voltage acceleration time for V/f separation refers to the time required for the output voltage to accelerate from 0.0% to 100% of the voltage.

F4-23 V/f Separation Voltage Deceleration Time Setting Range: 0.00 - 100.00 s

The voltage deceleration time for V/f separation refers to the time required for the output voltage to decelerate from 100% to 0.0%.

F4-24 V/f Deceleration Mode Setting Range: 0 - 1

0: Output voltage and output frequency acceleration/deceleration do not affect each other;

1: After the output voltage drops to 0 V, the output frequency then decreases. At startup, the voltage and frequency increase independently; when switching between forward and reverse rotation, the voltage drops to 0 first, followed by the frequency;

F4-25 Voltage Value Setting (Reserved) Setting Range: 0.00 - 600.00

F4-31 Automatic Voltage Stabilization Function Setting Range: 00 - 11

Units digit: Normal operation

0: Do not activate

1: Activate

Tens place: Parameter learning mode

0: Do not activate

1: Activate

F5-00	AI1 Lower Limit	Setting Range: 0.00 - 10.00
F5-01	AI1 Lower Limit Corresponding Setting	Setting Range: -100.00 to 100.00%
F5-02	AI1 Upper Limit	Setting Range: 0.00 - 10.00
F5-03	AI1 Upper Limit Corresponding Setting	Setting range: -100.00 to 100.00%
F5-04	AI1 Filter Time	Setting Range: 0.000 - 6.000 S

The two sets of points (F5-00, F5-01) and (F5-02, F5-03) can be used to determine a straight line representing the relationship between the input analog signal and the set frequency. When AI1 is used as a PID setpoint or feedback signal, it represents a percentage of a specific actual variable. If the set frequency is negative, the inverter output is inverted.To minimize the impact of analog signal fluctuations on the inverter's control, the sampled analog signal is typically filtered; this is achieved by setting F5-04.

F5-05	AI2 Lower Limit	Setting Range: 0.00 - 10.00
F5-06	AI2 Lower Limit Corresponding Setting	Setting Range: -100.00 to 100.00%
F5-07	AI2 Lower Limit	Setting Range: 0.00 - 10.00
F5-08	AI2 Upper Limit Corresponding Setting	Setting Range: -100.00 to 100.00%
F5-09	AI2 Filter Time	Setting Range: 0.000 - 6.000 S

The two points (F5-05, F5-06) and (F5-07, F5-08) can be used to determine a straight line representing the relationship between the input analog signal and the set frequency. When AI2 is used as a PID setpoint or feedback, it represents a percentage of a specific actual variable. If the set frequency is negative, the inverter output is inverted.To minimize the impact of analog signal fluctuations on the inverter's control, the sampled analog signal is typically filtered; this is achieved by setting F5-09.

F5-10	AI3 Lower Limit	Setting Range: 0.00 - 10.00
F5-11	AI3 Lower Limit Corresponding Setting	Setting Range: -100.00 to 100.00%
F5-12	AI3 Lower Limit	Setting Range: 0.00 - 10.00
F5-13	AI3 Upper Limit Corresponding Setting	Setting Range: -100.00 to 100.00%
F5-14	AI3 Filter Time	Setting Range: 0.000 - 6.000 S

The two points (F5-10, F5-11) and (F5-12, F5-13) can be used to determine a straight line representing the relationship between the input analog signal and the set frequency. When AI3 is used as a PID setpoint or feedback signal, it

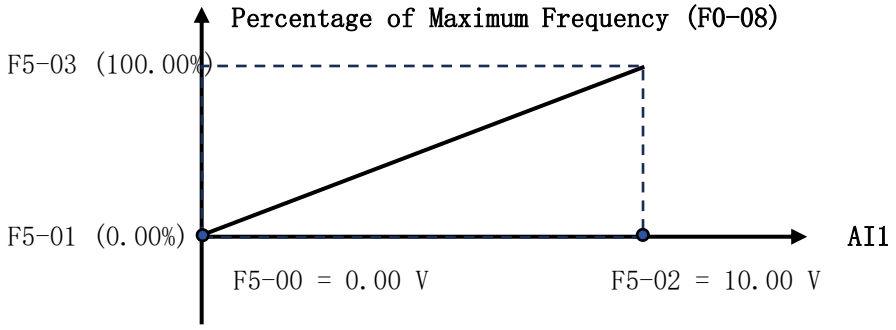
represents a percentage of a specific actual variable. If the set frequency is negative, the inverter output is inverted.To minimize the impact of analog signal fluctuations on the inverter's control, the sampled analog signal is typically filtered; this is achieved by setting parameter F5-14.

AI Curve Setting Method:

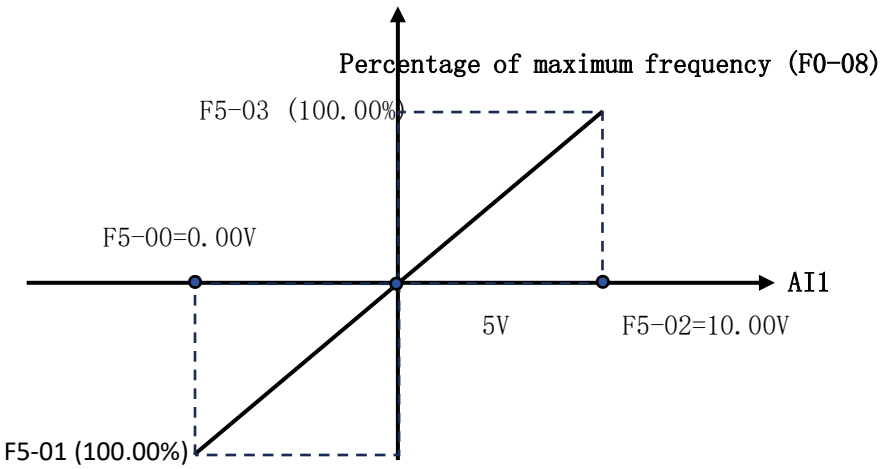
There are two types of AI curves: voltage-type (factory default; jumper set to "V") and current-type (jumper must be set to "I").

- When configuring a current-type analog input curve, 1 mA of current is equivalent to 0.5 V of voltage; that is, 20 mA corresponds to 10 V.
- When the analog input voltage exceeds the set "Maximum Input," the analog voltage is calculated based on the "Maximum Input"; similarly, when the analog input voltage is less than the set "Minimum Input," it is calculated based on the "AI Below Minimum Input Setting" configuration—either as the minimum input or 0.0%.

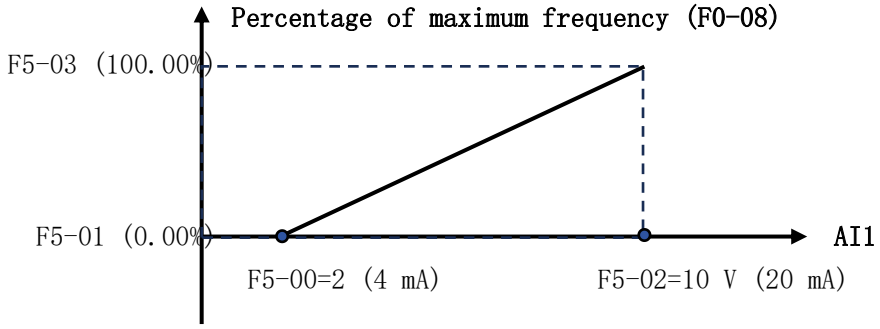
Taking the AI1 configuration as an example, the voltage-type and current-type setting curves for AI1 are shown in the figure below. When used in current mode, 4 mA to 20 mA is typically set to correspond to 0 Hz to 50 Hz or -50 Hz to +50 Hz. The relevant parameters are F5-00 to F5-04.



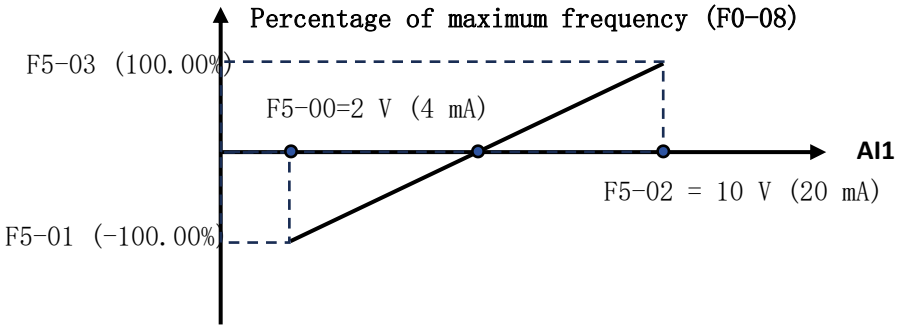
Setting when the frequency setpoint has no negative values



Setting when the frequency setpoint is negative



Settings when the frequency setpoint is not negative



Settings When the Frequency Setpoint Is Negative

F5-15 Terminal Start/Stop Mode Selection	Setting Range: 0 - 3

0: 2-wire 1

1: 2-wire 1 2: 2-wire 2

2: 3-wire system 1

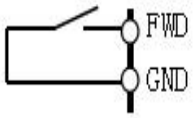
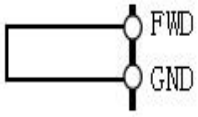
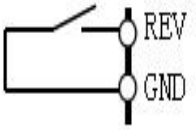
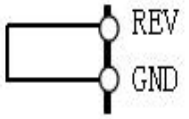
3: 3-wire system 2

This parameter is used to set the external terminal command control mode:

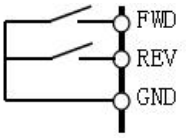
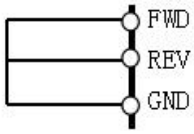
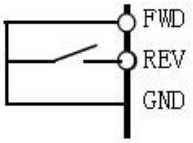
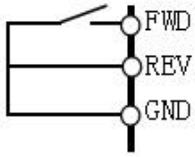
FWD selects the forward rotation function via the external terminal; this terminal is labeled FWD.

REV selects the reverse rotation function via the external terminal; this terminal is labeled REV.

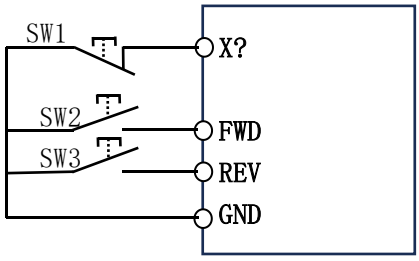
0: Two-wire system 1

Command	Stop	Run	Forward command	Reverse Command
Terminal Status				

1: 2-wire system 2

Command	Stop	Run	Forward Command	Reverse Command
Terminal Status				

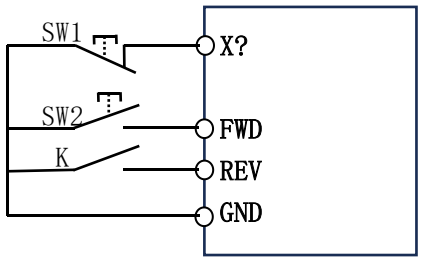
2: 3-wire system 1



3-wire system 1

Three-wire system 1: As shown in the figure above, X? is the three-wire operation control terminal, which selects any one of the input terminals X1 - X9 via parameters F5-16 to F5-24. SW1 is the inverter stop trigger switch, SW2 is the forward rotation trigger switch, and SW3 is the reverse rotation trigger switch.

3: Three-Wire System 2



3-wire system 2

3-wire system 2 As shown in the figure above, X? is the 3-wire operation control terminal; parameters F5-16 to F5-24 are used to select any one of the input terminals X1 to X9. SW1 is the inverter stop trigger switch, SW2 is the start trigger switch, and K is the forward/reverse switch (closed for reverse, open for forward).

F5-16	Terminal X1 Function Selection	Setting Range: 0 - 95
F5-17	Terminal X2 Function Selection	Setting Range: 0 - 95
F5-18	Terminal X3 Function Selection	Setting Range: 0 - 95
F5-19	Terminal X4 Function Selection	Setting Range: 0 - 95
F5-20	Terminal X5 Function Selection	Setting Range: 0 - 95
F5-21	Terminal X6 Function Selection	Setting Range: 0 - 95
F5-22	Terminal X7 Function Selection	Setting Range: 0 - 95
F5-23	Terminal X8 Function Selection	Setting Range: 0 - 95
F5-24	Terminal X9 Function Selection	Setting Range: 0 - 95

0: No function. The DI terminal has no function.

1: Forward Operation A forward operation signal is sent to the inverter; in 2-wire mode 2 (F5-15=1), this indicates forward operation, and in 2-wire mode 1 (F5-15=0), it indicates an operation command.

2: Reverse Operation Provides a reverse operation signal to the inverter; in two-wire mode 1 (F5-15=1), it indicates reverse operation, and in two-wire mode 2 (F5-15=0), it indicates a run command.

3: External Fault Input (Normally Open) When a valid external signal is applied to the inverter via the terminal, the inverter reports fault E.EF1.

4: Stop with DC Braking Input: When the terminal is active, the inverter will force a stop and enter DC braking.

5: Emergency Stop (Free Stop) When this terminal is active, the inverter performs a free stop.

6: External Reset Input Resets the inverter in the event of a fault.

7: Multi-speed Terminal 1: Allows for the setting of 16 speed stages or 16 other commands through the 16 possible states of the four multi-speed

command terminals.

8: Multi-speed Terminal 2: Allows for the setting of 16 speed stages or 16 other commands through the 16 possible states of the four multi-speed command terminals.

9: Multi-speed Terminal 3: Allows for the setting of 16 speed stages or 16 other commands through the 16 possible states of the four multi-speed command terminals.

10: Multi-speed Terminal 4: Allows for the setting of 16 speed steps or 16 other commands through the 16 possible states of the four multi-speed command terminals.

11: Three-Wire Operation Control Terminal: Confirms that the inverter's operating mode is three-wire control mode. If you wish to set operating commands via terminals, set parameter F5-15 (Terminal Command Mode) to 2 (Three-Wire Mode 1) or 3 (Three-Wire Mode 2), and configure the terminal functions accordingly.

12: Frequency Increment Command UP Executes a command to increment the frequency via the corresponding terminal signal. When the terminal is active, it is equivalent to holding down the up direction key; when inactive, it is equivalent to releasing the up direction key.

13: Frequency Decrease Command (DN) Executes a command to decrease the frequency via the corresponding terminal signal. When the terminal is active, it is equivalent to holding down the up arrow key; when inactive, it is equivalent to releasing the up arrow key.

14: UPDN Frequency Reset Selecting this function via the terminal clears the frequency value changed by the Up and Down arrow keys on the keyboard or the UP/DOWN terminal functions (12 or 13), restoring the setpoint frequency to the value configured in F0-07.

15: Acceleration/Deceleration Channel Selection 1: Selects from four acceleration and deceleration time profiles based on the four possible states of the two acceleration/deceleration selection terminals.

16: Acceleration/Deceleration Channel Selection 2: Selects from four acceleration/deceleration time profiles based on the four states of the two acceleration/deceleration selection terminals

17: PLC Operation Pause—Pauses PLC operation temporarily while maintaining the current operating frequency.

18: Clear PLC Shutdown Memory—Clears current operating data upon shutdown; restarts from the beginning upon restart.

19: Jog Forward Operation: The inverter operates in jog forward mode. The jog frequency is F0-35, and the jog acceleration/deceleration time parameters are F0-36 and F0-37.

20: Jog Reverse Operation: The inverter operates in jog reverse mode. The jog frequency is F0-35, and the jog acceleration and deceleration time parameters are F0-36 and F0-37.

21: Frequency Swing Pause: Frequency swing operation is paused, maintaining the current operating frequency.

22: Swing Frequency Reset: Swing frequency control is reset, and operation resumes.

23: PID Closed-Loop Control Pause: PID control is temporarily disabled; the inverter maintains the current output frequency and no longer performs PID regulation on the frequency source.

24: Enable Internal Timer: In timing process functions, selecting this function via the terminal starts the timer.

25: Internal Timer Reset: In timing process functions, selecting this function at the terminal resets the timer.

26: Counter Trigger Input: In counting process functions, select this function at the terminal to input counting pulses.

27: Counter Reset In timing process functions, selecting this function resets the counter.

28: Switch Frequency Setting A to B Switches from frequency source A (F0-03) to frequency source B (F0-04)

29: Frequency Setting Combination Switch to A: The frequency setting combination switches to frequency source A (F0-03).

30: Switch Frequency Setting Combination to B: The frequency setting combination switches to frequency source B (F0-04).

31: Acceleration/Deceleration Inhibit: When this terminal is active, the current output frequency is maintained.

32: Speed Control/Torque Control Switching: The inverter switches between torque control and speed control modes. When the terminal is active, the mode is torque control; when inactive, it is speed control.

33: Length Counter Input—In the counting process function, select this function via the terminal to input counting pulses.

34: Length Counter Reset: In counting process functions, this terminal selects this function to reset the counter.

35: Switch Command to Keyboard Forces the run command to keyboard control

36: Switch Command to Terminal: This run command forces control to the terminal.

37: Switch Control to Modbus Communication: A run command forces control to be handled via RS-485 communication

38: Process PID Gain Switching When the PID parameter switching condition (F6-10) is set to 1 (switch via terminal), if the terminal is inactive, PID parameters use F6-04 to F6-06; if the terminal is active
, F6-07 to F6-09 are used.

39: External Fault Input (Normally Closed) When a valid external signal is sent to the inverter via the terminal, the inverter reports

fault E.EF1.

40: Pulse Input (Reserved)

41: CAN Master/Slave Control Switching When A0-04=2 is selected, master/slave mode is switched via the terminal. When active, the inverter operates as the master.

42: CAN Master/Slave Speed-Torque Control Switching When A0-06=2 is selected, the inverter switches between torque control and speed control via the terminals. When active, it operates in torque mode.

43: Pre-charge Contactor Feedback Input—Once the drive has completed charging and the display returns to normal, if the drive does not receive a feedback signal (normally open) from the pre-charge contactor, it will report fault E.JCi.

48: Run Pause When the inverter decelerates to a stop, all operating parameters (such as PLC parameters, swing frequency parameters, and PID parameters) are saved while the terminal is active. Once the terminal becomes inactive, the inverter resumes its previously saved operating state.

49: External Stop (Stop According to Stop Mode) When an external stop command is received, the inverter stops according to the set stop mode.

50: Run Inhibited: When this terminal is active, the inverter is prohibited from running.

51: Forward Rotation Inhibited: When the terminal is active, the drive inhibits forward rotation.

52: Reverse Rotation Inhibited: When this terminal is active, the inverter is prohibited from running in reverse.

53: Frequency Jog: In jog mode, the output frequency is fine-tuned.

54: Emergency Stop (Deceleration Stop) When an external stop command is received, the inverter stops according to the emergency stop time set in F0-39.

F5-27	Y1 Output Terminal Function Selection	Setting Range: 0 - 63
F5-28	TA1 Relay Output Terminal Function Selection	Setting Range: 0 - 63
F5-29	TA2 Relay Output Terminal Function Selection	Setting Range: 0 - 63
F5-30	Y2 Output Terminal Function Selection	Setting Range: 0 - 63

0: No function. The output terminal has no function.

1: Inverter Running Signal The inverter is currently running and has an output frequency (which may be zero); at this time, an “active” signal is output.

2: Inverter Fault—When the inverter experiences a fault and stops automatically, Y1/TA1/TA2/Y2 output an “active” signal.

3: Frequency-Reached Signal—When the inverter’s operating frequency is within a certain range of the target frequency (target frequency

± the value set for F5-81), Y1/TA1/TA2/Y2 output an active signal.

4: Frequency Level Detection Signal 1 (FDT1) When the operating frequency exceeds the frequency detection value, Y1/TA1/TA2/Y2 output an active signal. When the operating frequency falls below the detection value minus the FDT hysteresis value, the active signal from Y1/TA1/TA2/Y2 is canceled. For detailed explanations, see F5-83 and F5-84.

5: Frequency Level Detection Signal 1 (FDT1) When the operating frequency exceeds the frequency detection value, Y1/TA1/TA2/Y2 output an active signal. When the operating frequency falls below the detection value minus the FDT hysteresis value, the active signal from Y1/TA1/TA2/Y2 is canceled. For detailed explanations, see F5-85 and F5-86.

6: Inverter Running at Zero Speed: An "active" signal is output when the inverter is running and the output frequency is 0. This signal is "inactive" when the inverter is in a stopped state.

7: Lower Frequency Limit When the set frequency is less than or equal to the lower frequency limit, an active signal is output.

8: Upper Frequency Limit When the set frequency is greater than or equal to the upper frequency limit, an active signal is output.

9: Terminal Preset Count Value Trigger Reserved function

10: Terminal Count-Down Trigger Reserved function

11: Internal Timer Expiration — Reserved Function

12: Timed Shutdown Time Reached Reserved Function

13: PLC Stage Completion: When the simplified PLC completes a stage of operation, Y1/TA1/TA2/Y2 output an active signal.

14: PLC cycle complete: When the simple PLC completes a cycle, Y1/TA1/TA2/Y2 output active signals.

15: Over-torque/Under-torque Early Warning Detection 1 and Load Protection Function: Used in conjunction with Fd-40~44 to detect excessive or insufficient load; an active signal is output when the specified load conditions are met.

16: Ready to Run: When the inverter is in standby mode (not in a fault or undervoltage state), an active signal is output to indicate that the external controller can now accept a run command.

17: Length Reached: In the fixed-length function, when the detected actual length is greater than or equal to the set length, Y1/TA1/TA2/Y2 output an active signal. (Reserved function)

18: In Sleep Mode: When the operating frequency falls below the lower limit, the

inverter enters sleep mode. Configured via F0-09 and F0-10, Y1/TA1/TA2/Y2 output an active signal. (Reserved function)

19: AI Input Out of Range: When the analog input exceeds the set value, Y1/TA1/TA2/Y2 output an active signal. (Reserved function)

20: Module Temperature Reached: When the inverter detects that the temperature has reached the setpoint, Y1/TA1/TA2/Y2 output active signals.

21: Modbus Control Action (Reserved Function)

22: Brake Output—Used in conjunction with Group A2 parameters

23: Custom Alarm Output: An active signal is output when the current alarm code matches the set value for F5-93.

24: Inverter Alarm—When the inverter generates a pre-warning fault, Y1/TA1/TA2/Y2 output an active signal.

25: Undervoltage Lockout: When the inverter is in an undervoltage fault condition, Y1/TA1/TA2/Y2 output an active signal.

26: Reset Command Output—When the inverter receives a reset signal, Y1/TA1/TA2/Y2 output an active signal.

33: Over-torque/Under-torque Early Warning Detection 2 and Load Protection Function: Used in conjunction with Fd-40 to 44 to detect excessive or insufficient load; an active signal is output when the specified load conditions are met.

34: Run Time Preset Reached (Reserved Function)

35: Closed-Loop Pause Detection—Outputs an active signal when PID control is in a paused state

36: Low Threshold Detection in Closed-Loop Feedback—When the PID closed-loop feedback falls below F6-27 and the duration reaches F6-25, an active signal is output

37: High-Threshold Closed-Loop Feedback Detection—When the PID closed-loop feedback exceeds F6-26 and the duration reaches F6-25, an active signal is output

38: Motor Reverse Indication Indicates the current operating direction of the inverter; an active signal is output during reverse operation

39: Overload Early Warning Detection (Reserved Function)

40: Underload Warning Detection (Reserved Function)

41: Current Limiting Alarm Output: When the inverter is in current-limiting mode and the duration reaches Fd-01, an active signal is output

42: External Fault Shutdown—Outputs a valid signal when the inverter receives an external fault input

43: Extended Communication Card Control Action (Reserved)

44: Servo Positioning Complete Output (Reserved)

45: Servo Approach Output (Reserved)

46: AO1 Analog Detection Action 1: Outputs a valid signal when the AO1 output value is within the range of F5-87 to F5-88

47: AO1 Analog Detection Action 2: When the AO1 output value is within the range

of F5-89 to F5-90, an active signal is output

48: Comparator Action 1: When Comparator 1 is active (see parameters F5-A2 to F5-A4 for details), an active signal is output

49: Comparator Action 2 When Comparator 2 is active (see parameters F5-A7 to F5-A9 for details), an active signal is output

60: High-Speed Pulse HDO Output Function (Reserved)

F5-32 AO1 Output Value Selection	Setting range: 0 - 31

0: Set frequency (10 V corresponds to the maximum output frequency)
1: Output frequency (10 V corresponds to the maximum output frequency)
2: Output current (10 V corresponds to 2 times the motor's rated current)
3: Bus voltage (10 V corresponds to twice the rated bus voltage)
4: Output Voltage (10 V corresponds to 2 times the motor's rated voltage)
5: Output Power (10V corresponds to 2 times the motor's rated power)
6: Output Torque (10V corresponds to 2 times the rated motor torque)
7: Analog Input AI1 (0 - 10V corresponds to 0 - 10V)
8: Analog Input AI2 (0 - 10V corresponds to 0 - 10V)
9: Reserved
10: High-speed pulse input frequency (relative to maximum input frequency)
11: 485 setting percentage (0 - 100% corresponds to 0 - 10 V)
12 - 15: Reserved
16: Process closed-loop setpoint (0 - 100% corresponds to 0 - 10 V)
17: Process Closed-Loop Feedback (0 - 100% corresponds to 0 - 10 V)
18: Process closed-loop input deviation (-100% - 100% corresponds to 0 - 10 V)
19: Process closed-loop output (0 - 100% corresponds to 0 - 10 V)
20: Module Temperature 1 (10 V corresponds to 100 degrees)
21: Module Temperature 2 (10 V corresponds to 100 degrees)
22: Set Torque (10 V corresponds to 2 times the rated motor torque)
23: Output Speed (10 V corresponds to maximum speed)
24: Cumulative Inverter Overload (0 - 100% corresponds to 0 - 10 V)
25: Cumulative Motor Overload (0 - 100% corresponds to 0 - 10 V)

F5-33 AO1 reference value 0% corresponds to output.	Setting range: 0.0 - 500.0%
F5-34 AO1 reference value 100% corresponds to output.	Setting range: 0.0 - 500.0%
F5-35 AO1 Output Filter	Setting Range: 0.000 - 6.000 S

These three parameters adjust the AO1 output curve to meet on-site operating conditions. The factory default is 0 - 10 V. If 0 - 20 mA is required, set the AO1 jumper on the control board from "V" to "I." If 4 - 20 mA is required, set the "Output at 0% of AO1" parameter (F5-33) to 20%.

F5-36 AO2 Output Selection	Setting Range: 0 - 31

0: Set frequency (10 V corresponds to the maximum output frequency)
1: Output frequency (10 V corresponds to the maximum output frequency)
2: Output current (10 V corresponds to twice the motor's rated current)
3: Bus voltage (10 V corresponds to 2 times the rated bus voltage)
4: Output Voltage (10 V corresponds to twice the motor's rated voltage)
5: Output Power (10V corresponds to 2 times the motor's rated power)
6: Output Torque (10V corresponds to 2 times the rated motor torque)
7: Analog Input AI1 (0-10V corresponds to 0-10V)
8: Analog Input AI2 (0-10V corresponds to 0-10V)
9: Reserved
10: High-speed pulse input frequency (relative to maximum input frequency)
11: 485 setting percentage (0-100% corresponds to 0-10 V)
12-15: Reserved
16: Process closed-loop setpoint (0-100% corresponds to 0-10 V)
17: Process Closed-Loop Feedback (0-100% corresponds to 0-10 V)
18: Process Closed-Loop Input Deviation (-100%-100% corresponds to 0-10 V)
19: Process closed-loop output (0-100% corresponds to 0-10 V)
20: Inverter temperature (10 V corresponds to 100 degrees)
21: Rectifier Temperature (10 V corresponds to 100 degrees)
22: Set Torque (10 V corresponds to 2 times the rated motor torque)
23: Output Speed (10 V corresponds to maximum speed)
24: Cumulative inverter overload (0-100% corresponds to 0-10 V)
25: Cumulative Motor Overload (0-100% corresponds to 0-10 V)

F5-37	AO2 reference value 0% corresponds to output.	Setting range: 0.0-500.0%
F5-38	AO2 reference value 100% corresponds to output.	Setting range: 0.0-500.0%
F5-39	AO1 Output Filter	Setting Range: 0.000-6.000 S

These three parameters adjust the AO2 output curve to meet on-site operating conditions. The factory default is 0-10 V. If 0-20 mA is required, set the AO2 jumper on the control board from "V" to "I." If 4-20 mA is required, set the "Output at 0% AO2" parameter (F5-37) to 20%.

F5-40	HDO Maximum Output Frequency (Reserved)	Setting Range: 0-100 kHz

F5-50	Terminal Active State Setting	Setting Range: 00-3F

BIT0-BIT8: X1-X9; the ones and tens places of this parameter set the active mode for terminals X1-X9
0: Positive logic; the DI terminals (X1-X9) are active when connected to GND and inactive when disconnected from GND.
1: Inverted logic—DI terminals (X1-X9) are inactive when connected to GND and active when disconnected from GND.

F5-51	Start-up Protection Early Warning Output Setting	Setting Range: 0 - 1

Operation warning when free stop or emergency stop is active

0: Operation monitoring enabled—When a free stop or emergency stop command is active, if an operation command is issued, warning output A.RU1 is triggered

1: Continuous monitoring When the free stop or emergency stop command is active, the warning output A.RU1 is triggered

F5-52	Terminal UP/DW Control Selection	Setting Range: 0 - 2

0: Frequency is saved upon power loss

1: Frequency is not stored upon power loss

2: Adjustable during operation; reset upon shutdown

When adjusting the frequency via the UP/DN terminals, whether the adjusted frequency is saved upon power loss or reset directly when the unit is stopped

F5-53	Terminal UP/DW Control Frequency Acceleration/Deceleration Rate
Setting Range: 0.01 - 50.00 Hz/s	

During frequency control via the UP/DW terminals, this value adjusts the speed at which the target frequency is adjusted; the higher the value, the faster the adjustment.

F5-54	Counter Setpoint	Setting Range: 0 - 65,000
F5-55	Counter Maximum Value	Setting Range: 0 - 65,000
F5-56	Counter Input Divider	Setting range: 0 - 6000
F5-57	Counter Input Source	Setting Range: 0 - 2

0: Standard X terminal

1: Input terminal PUL (reserved)

2: Speed feedback card (PG card)

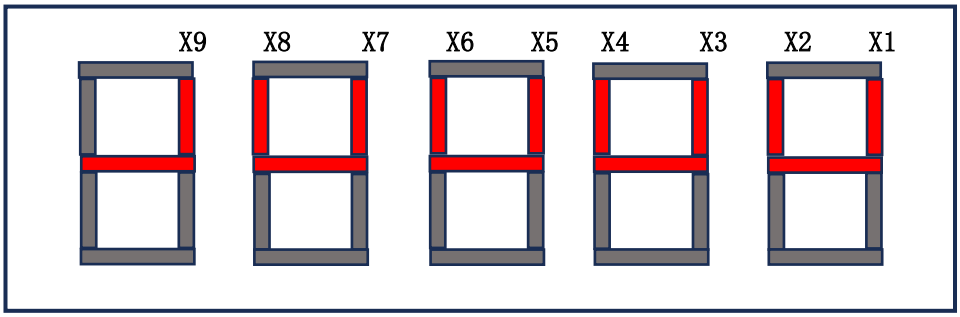
The internal counter can select different input sources, such as the standard X-terminal, function 26-terminal counter input, or pulse count from the PG card. By setting the appropriate value for F5-54 and the maximum value for F5-55, combined with terminal outputs 9 and 10, external output can be achieved;

F5-58	X1 Valid Detection Delay	Setting Range: 0.000 - 60.000 S
F5-59	X1 Valid Detection Delay	Setting Range: 0.000 - 60.000 s
F5-60	X2 Valid Detection Delay	Setting Range: 0.000 - 60.000 s
F5-61	X2 Invalid Detection Delay	Setting Range: 0.000 - 60.000 S
F5-62	X3 Valid Detection Delay	Setting Range: 0.000 - 60.000 s
F5-63	X3 Invalid Detection Delay	Setting Range: 0.000 - 60.000 s
F5-64	X4 Valid Detection Delay	Setting Range: 0.000 - 60.000 s
F5-65	X4 Invalid Detection Delay	Setting Range: 0.000 - 60.000S
F5-66	X5 Valid Detection Delay	Setting Range: 0.000 - 60.000S
F5-67	X5 Invalid Detection Delay	Setting Range: 0.000 - 60.000S
F5-68	X6 Valid Detection Delay	Setting Range: 0.000 - 60.000S
F5-69	X6 Invalid Detection Delay	Setting Range: 0.000 - 60.000S
F5-70	X7 Valid Detection Delay	Setting Range: 0.000 - 60.000S
F5-71	X7 Invalid Detection Delay	Setting Range: 0.000 - 60.000S
F5-72	X8 Valid Detection Delay	Setting Range: 0.000 - 60.000S
F5-73	X8 Invalid Detection Delay	Setting Range: 0.000 - 60.000S

Valid Detection Delay: When a valid DI signal is received from the hardware, the corresponding X terminal state changes from invalid to valid only after the set DI valid delay time has elapsed. View monitoring parameter d-16.

Invalid Detection Delay: When an invalid DI signal is received from the hardware, the corresponding X terminal state will change from active to inactive only after the set DI invalid delay time has elapsed. View the terminal status via monitoring parameter d-16.

The status of the LED display's X terminals is shown in the figure below: (The horizontal bar remains lit; a lit vertical bar indicates "active," and an unlit vertical bar indicates "inactive")



F5-74 Minimum PUL Input Frequency (Reserved)	Setting Range: 0.00 - 100.00 kHz
F5-75 Minimum PUL Frequency Setting (Reserved)	Setting range: 0.00 - 100.00%
F5-76 Maximum PUL Input Frequency (Reserved)	Setting range: 0.00 - 100.00 kHz
F5-77 Maximum PUL Frequency Corresponding Setting (Reserved) Setting range: 0.00 - 100.00%	
F5-78 PUL Filter Time (Reserved)	Setting Range: 0.000 - 9.000z
F5-79 PUL cutoff frequency (reserved)	Setting range: 0.000 - 1.000 kHz

F5-80 Output Terminal Active State Setting	Setting Range: 0 - F

BIT0 - BIT3: Y1, TA1, TA2, Y2 relays

0: Positive logic—When the function output is active, the Y terminal is closed, and the normally open terminal of the relay is closed (the normally closed terminal is open)

1: Inverted logic—When the function output is active, the Y terminal opens, and the relay's normally closed terminal closes (the normally open terminal opens)

By setting the terminal active state to inverted logic, the function of inverting the terminal output state can be achieved

F5-81 Set Threshold for Detecting Specified Frequency:	Setting Range: 0.00 - 50.00 Hz

This parameter provides a supplementary definition for the frequency-reach signal function. When the inverter's output frequency falls within the positive or negative detection range of the set frequency, the selected output terminal (Y terminal or relay) outputs an active signal.

F5-82 Zero Frequency Detection Range	Setting Range: 0.00 - 10.00 Hz

When the inverter's output frequency falls within the detection range near zero frequency, the selected output terminal (Y terminal or relay) outputs a valid signal.

F5-83 FDT1 Upper Limit	Setting Range: 0.00 to Maximum Frequency
F5-84 FDT1 Upper Limit	Setting Range: 0.00 to Maximum Frequency
F5-85 FDT2 Upper Limit	Setting Range: 0.00 to Maximum Frequency
F5-86 FDT2 Lower Limit	Setting Range: 0.00 to Maximum Frequency

These four parameters are used to set two frequency detection levels. When

the output frequency exceeds the FDT set value F5-83 (or F5-85), the selected output terminal (Y terminal or relay) outputs an active signal; when the output frequency falls below a certain value F5-84 (or F5-86), the selected output terminal (Y terminal or relay) outputs an inactive signal.

F5-87	Analog Detection Threshold 1 (Low)	Setting Range: 0.00 - 100.0%
F5-88	Analog Detection Action 1 Low Value	Setting Range: 0.00 - 100.0%
F5-89	Analog Detection Action 2 Low Value	Setting Range: 0.00 - 100.0%
F5-90	Analog Detection Action 2 Low Value	Setting Range: 0.00 - 100.0%
F5-91	Simulated Detection Action 3 Low Value	Setting Range: 0.00 - 100.0%
F5-92	Simulated Detection Action 3 Low Value	Setting Range: 0.00 - 100.0%

Simulated detection action: When the AO output value falls within the range between the low and high action values, a valid signal can be output. In conjunction with terminal output functions 46 (AO1 Simulated Detection Action 1) and 47 (AO1 Simulated Detection Action 2), this can instruct an external controller to perform the corresponding action.

F5-93	Custom Alarm Output Alarm Code	Setting Range: 0 - 20

This parameter is used in conjunction with output terminal (Y terminal or relay) function 23. When the corresponding alarm is set (see the Alarm List for details), the output terminal will output a valid signal if the inverter displays that specific alarm; other alarms will not trigger this output.

F5-94	Y1 Output Terminal Closing Delay	Setting Range: 0.000 - 60.000 S
F5-95	TA1 Relay Closing Delay	Setting Range: 0.000 - 60.000 s
F5-96	TA2 Relay Closing Delay	Setting Range: 0.000 - 60.000 s
F5-97	Y2 Output Terminal Closing Delay	Setting Range: 0.000 - 60.000 s
F5-98	Y1 Output Terminal Turn-Off Delay	Setting Range: 0.000 - 60.000S
F5-99	TA1 Relay Turn-Off Delay	Setting Range: 0.000 - 60.000 S
F5-A0	TA2 Relay Turn-Off Delay	Setting Range: 0.000 - 60.000 S
F5-A1	Y2 Output Terminal Turn-Off Delay	Setting Range: 0.000 - 60.000 s

Closing Delay: When a valid DO signal is received from the software, the corresponding output terminal's state will change from inactive to active only after the set output terminal activation delay time has elapsed. View monitoring parameter d-17.

Turn-off delay: When a valid DO signal is received from the software, the corresponding output terminal's state will change from active to inactive only after the set output terminal turn-on delay time has elapsed. View monitoring parameter d-17.

F5-A2	Comparator 1 Monitoring Selection	Setting Range: 0 - 799
F5-A3	Comparator 1 Upper Limit	Setting Range: 0 - 799
F5-A4	Comparator 1 Lower Limit	Setting Range: 0 - 65535

The internal comparator function allows for range comparison and output of monitoring parameters in Group d.

The monitoring selection corresponds to the comparator's input selection d-xxx; for example, if set to 0001, monitoring parameter d-001 is selected; if set to 0210, monitoring parameter d-210 is selected.

When the selected d-parameter falls within the comparator's upper limit, the comparator output is active. At this point, in conjunction with terminal output function 48, an external output is generated to instruct an external controller to perform corresponding actions, such as protection actions for overtemperature, overcurrent, overvoltage, or overspeed.

When the comparator input retrieves monitoring parameters from the d group, the processing is dimensionless; therefore, the upper and lower limit settings are also dimensionless. For example, for d-000, where the output frequency is 30.00 Hz and the comparator input is 3000, the upper and lower limits can be set to 4000 and 1000, respectively. In this case, if the output frequency falls within the range of 10.00 to 40.00 Hz, the comparator output is active.

F5-A6	Action Selection Upon CP1 Transmission	Setting Range: 0 - 3

0: Continue operation (digital terminal output only)
1: Alarm and free stop
2: Issue a warning and continue operation
3: Forced stop

F5-A7	Comparator 2 Monitoring Selection	Setting Range: 0 - 799
F5-A8	Comparator 2 Upper Limit	Setting Range: 0 - 65535
F5-A9	Comparator 2 Lower Limit	Setting Range: 0 - 65535

The internal comparator function allows for range comparison and output of monitoring parameters in Group d.

The monitoring selection corresponds to the comparator's input selection d-xxx; for example, if set to 0001, monitoring parameter d-001 is used; if set to 0210, monitoring parameter d-210 is used.

When the selected d-parameter falls within the comparator's upper limit, the comparator outputs a valid signal. At this point, in conjunction with terminal output function 48, an external output is generated to instruct an external controller to perform corresponding actions, such as protective measures for overtemperature, overcurrent, overvoltage, or overspeed.

When the comparator input uses monitoring parameters from group d, the values are dimensionless; therefore, the upper and lower limit settings are also dimensionless. For example, if the output frequency of d-000 is 30.00 Hz and the

comparator input is 3000, the upper and lower limits can be set to 4000 and 1000, respectively. In this case, if the output frequency falls within the range of 10.00 to 40.00 Hz, the comparator output will be active.

F5-B1	Action Selection When Sending CP2	Setting Range: 0 - 3

0: Continue operation (digital terminal output only)
1: Alarm and free stop
2: Issue a warning and continue operation
3: Forced stop

F5-B2	Virtual vX1 Terminal Function Selection	Setting Range: 0 - 95
F5-B3	Virtual Vx2 Terminal Function Selection	Setting Range: 0 - 95
F5-B4	Virtual vX3 Terminal Function Selection	Setting Range: 0 - 95
F5-B5	Virtual vX4 Terminal Function Selection	Setting Range: 0 - 95

See “Input X Terminal Functions” for details.

F5-B6	vX Terminal Active Status Source	Setting Range: 0000 - 2222

0: Internally connected to virtual vYn
1: Linked to physical terminal Xn
2: Whether the function code setting is valid (F5-B7)
LED least significant digit: Virtual vX1
LED units digit: Virtual vX1 LED tens digit: Virtual vX2
LED units digit: Virtual vX3
LED thousands place: Virtual vX4

F5-B7	Enable Virtual vX Terminal Function Code Setting	Setting Range: 0000 - 1111

0: Disabled; 1: Enabled
Units digit: Virtual vX1
Units digit: Virtual vX1 Tens digit: Virtual vX2
Hundreds place: Virtual vX3
Thousands place: Virtual vX4

Virtual vX terminals are internally generated X terminals. Unlike physical X terminals, they do not have physical input signals; however, by configuring the source of their active state—which can be selected from a physical X terminal, a virtual Y terminal, or even directly set via parameter F5-b7—they can perform the same functions as physical X terminals once a signal source is established.

F5-B8	Virtual vY1 Terminal Selection	Setting Range: 0 - 63
F5-B9	Virtual vY2 Terminal Selection	Setting Range: 0 - 63
F5-C0	Virtual vY3 Terminal Selection	Setting Range: 0 - 63
F5-C1	Virtual vY4 Terminal Selection	Setting Range: 0 - 63

Virtual vY terminals are internally simulated Y terminals. Unlike physical Y terminals, they do not have a physical output signal, but their functionality is equivalent to that of physical Y terminals. The virtual X terminal vX uses these vY signals to enable the interconnection and interaction of internal control signals, thereby performing control functions.

F5-C2	vY1 Output ON Delay Time	Setting Range: 0.000 - 60.000 S
F5-C3	vY2 Output ON Delay Time	Setting Range: 0.000 - 60.000 s
F5-C4	vY3 Output ON Delay Time	Setting Range: 0.000 - 60.000 s
F5-C5	vY4 Output ON Delay Time	Setting Range: 0.000 - 60.000 S
F5-C6	vY1 Output OFF Delay Time	Setting Range: 0.000 - 60.000 s
F5-C7	vY2 output OFF delay time	Setting range: 0.000 - 60.000 s
F5-C8	vY3 output OFF delay time	Setting range: 0.000 - 60.000 s
F5-C9	vY4 output OFF delay time	Setting range: 0.000 - 60.000S

Set the on and off times for the virtual terminal outputs.

F5-D1 AI Port Digital Input Terminal Characteristic Selection
Setting Range: 0000 - 1111

0: Low-level active
1: High level active
LED units digit: AI1
LED units digit: AI1 LED tens digit: AI2
LED units digit: Reserved
LED thousands place: Reserved

F5-D2	AI1 terminal function selection (treated as X)	Setting range: 0 - 95

See “Input X Terminal Functions” for details.

F5-D3	AI1 High Level Setting	Setting Range: 0.00 - 100.00%
F5-D4	AI1 High Level Setting	Setting Range: 0.00 - 100.00%

The AI terminals can function as X inputs by comparing their voltage to specific levels. If the current voltage at AI1 is higher than the high-level setting (F5-D3), a high level is output; if the current voltage is lower than the low-level setting (F5-D4), a low level is output; and if the voltage falls between the two, the previous level is maintained. Finally, a valid signal is output based on the level selection

set in F5-D1.

F5-D5 AI2 Terminal Function Selection (as X)	Setting Range: 0 - 95

See the "Input X Terminal Function" section for details.

F5-D6 AI2 High Level Setting	Setting Range: 0.00 - 100.00%
F5-D7 AI2 High Level Setting	Setting Range: 0.00 - 100.00%

The AI terminals can function as X inputs by comparing their voltage to specific levels. If the current voltage at AI1 is higher than the high-level setting (F5-D6), a high-level signal is output; if the current voltage is lower than the low-level setting (F5-D7), a low-level signal is output; when the voltage falls between these two levels, the previous level is maintained. Finally, the valid signal is output based on the level selection set in F5-D1.

F6-00 PID Controller Setpoint Signal Source	Setting Range: 0 - 8

0/1: Keyboard numeric PID setpoint F6-01
2: AI1
3: AI2
4: Reserved
5: Terminal pulse (PUL) setpoint (reserved)
6: RS485 Communication Setpoint - Communication Address 0x200 7: PID Setpoint
7: Optional card
8: Terminal Selection

In PID control mode, a setpoint of 100.0% corresponds to the maximum set value (corresponding to the maximum feedback value).

F6-01 Keypad Digital PID Setpoint/Feedback	Setting Range: 0.00 - 100.0%

Used to select the PID target value setpoint channel. The PID target value is a relative value; a setting of 100% corresponds to 100% of the controlled system's feedback signal. When used as feedback, this can be employed during debugging when the feedback signal is not available or not connected.

F6-02 PID Controller Feedback Signal Source	Setting Range: 0.00 - 100.0%

0/1: Keypad Numeric PID Setpoint F6-01
2: AI1
3: AI2
4: Reserved
5: Terminal pulse (PUL) feedback (reserved)
6: RS485 communication feedback—communication address 0x20 08: PID feedback
7: Optional card
8: Terminal Selection

F6-03 PID Control Selection	Setting Range: 0.00 - 100.0%

LED units digit: Feedback characteristic selection

0: Positive characteristic

1: Negative characteristic

LED units digit: Reserved

LED hundreds place: Reserved

LED hundreds place: Differential adjustment attribute

0: Apply differential control to the error

1: Apply derivative control to the feedback

Positive characteristic: If the feedback signal is less than the PID setpoint, the inverter's output frequency increases.

Negative characteristic: If the feedback signal is less than the PID setpoint, the inverter's output frequency decreases.

Use positive characteristic when the PID output needs to increase as the error increases; this characteristic is used in most cases. Use negative characteristic only when the PID output needs to decrease as the error increases.

F6-04 Proportional Gain P1	Setting Range: 0.000 - 4.000
F6-05 Integral Time I1	Setting Range: 0.0 - 600.0 S
F6-06 Derivative Gain D1	Setting Range: 0.000 - 6.000 s
F6-07 Proportional Gain P2	Setting Range: 0.000 - 4.000
F6-08 Integral Time I2	Setting Range: 0.0 - 600.0 s
F6-09 Derivative Gain D3	Setting Range: 0.000 - 6.000 s

Proportional Gain Kp: Once a deviation between the PID output and the input occurs, the PID adjusts the control output to cause the controlled variable to move in the direction of reducing the deviation. The rate at which the deviation decreases depends on the proportional coefficient Kp; the larger Kp is, the faster the deviation decreases, but this can easily cause oscillations, especially when hysteresis is significant. Reducing Kp decreases the likelihood of oscillations but slows down the response speed. (A proportional gain of 100.0 indicates that when the deviation between the PID feedback and the setpoint is 100.0%, the PID controller adjusts the output frequency command to its maximum frequency.)

Integral time Ti: Determines the strength of the PID controller's integral action. The shorter the integral time, the greater the control strength. (Integral time refers to the duration during which, when the deviation between the PID feedback value and the setpoint is 100.0%, the integral action continuously adjusts until the adjustment reaches the maximum frequency.)

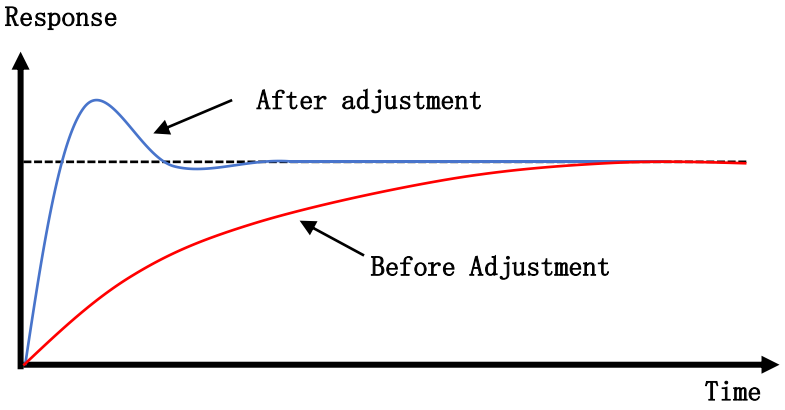
Differential time Td: Determines the intensity of the PID controller's response to changes in the error rate. The longer the differential time, the greater the control intensity. (Differential time refers to the time during which, if the feedback variable changes by 100.0%, the differential controller's adjustment

reaches its maximum frequency.)

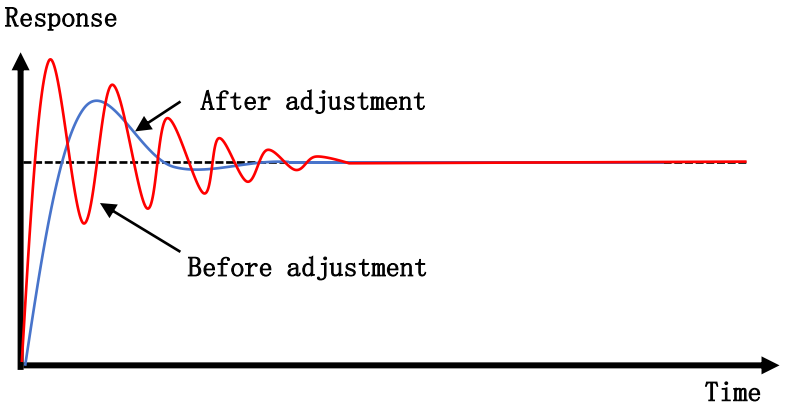
PID Tuning Methods:

This section describes general tuning guidelines for PID parameters, which can be used as a reference for tuning process closed-loop control PID parameters (**F6-04 -** F6-06, F6-07 - F6-09) and speed loop PI parameters (F3-00, F3-01, F3-03, F3-04).

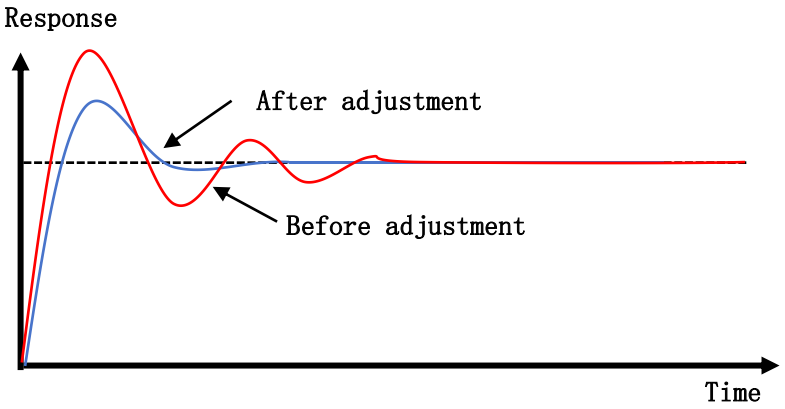
1. If the response is slow, increase Kp



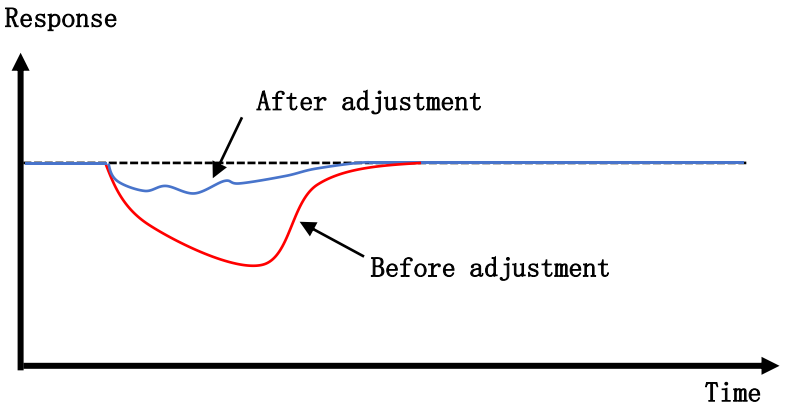
2. Rapid oscillation: Reduce Kp



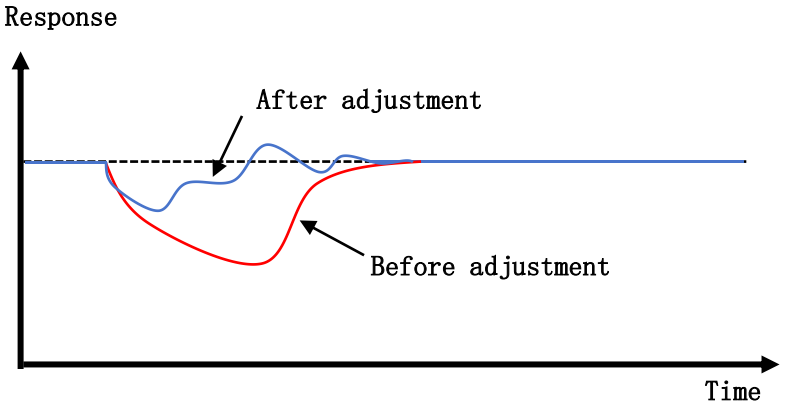
3. Large overshoot and slow fluctuations can increase Ti



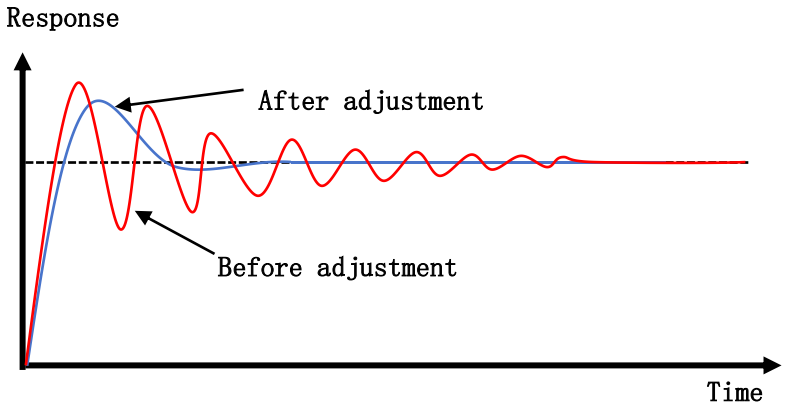
4. When the load fluctuates, the steady-state error is large and recovery is slow; increase Kp



5. If the steady-state error is large and recovery is slow during load fluctuations, reduce Ti



6. Adding an appropriate amount of differential time Td can improve system stability (avoid adding too much to prevent interference and oscillations).



F6-10 PID Parameter Switching Conditions	Setting Range: 0 - 2

0: Do not switch; PID parameters do not switch

1: Switch using DI terminal

When the PID Parameter Switching Condition (F6-03) is set to 1 (switch via DI terminal), if the terminal is inactive, the PID parameters use F6-04 to F6-06; if the terminal is active, they use F6-07 to F6-09.

2: Switch based on deviation

If the absolute value of the deviation between the setpoint and feedback is less than F6-18 (PID Deviation Low Value), PID Parameter Group 1 is selected;If the absolute value of the deviation between the setpoint and feedback is greater than F6-19 (PID Deviation Threshold - High), the PID selects Parameter Group 2; If the absolute value of the deviation between the setpoint and feedback falls between F6-18 (PID Deviation Threshold - Low) and F6-19 (PID Deviation Threshold - High), the PID parameters are determined by linear interpolation between the two parameter groups.

F6-11 PID Setpoint Change Time	Setting Range: 0.00 - 60.00 S

This refers to the time required for the PID setpoint to change from 0.0% to 100.0%.

F6-12 Feedback Signal Low-Pass Filter Time	Setting Range: 0.000 - 6.000 s

This refers to the time required for the filter to process the input signal and generate an output signal. Filtering the PID feedback signal helps reduce the

impact of disturbances on the feedback signal, but it can lead to a decrease in the response performance of the closed-loop process system.

F6-13 Feedback Signal Gain	Setting Range: 0.00 - 10.00

This parameter is used to adjust the gain of the feedback input value; after this gain adjustment, the value is used as the final feedback input for PID calculations

F6-14 Feedback Signal Range	Setting Range: 0 - 100

Dimensionless unit, used only for the current display of PID setpoint and feedback values; it corresponds to the setpoint or feedback value when the setpoint or feedback reaches 100.0%.For example: If this parameter is set to 100.0, the PID setpoint, feedback (0% - 100%), and monitoring (0.0 - 100.0) are linearly correlated; if this parameter is set to 50.0, the PID setpoint, feedback (0% - 100%), and monitoring (0.0 - 50.0) are linearly correlated.

F6-15 PID Preset Frequency Output	Setting Range: 0.0 - 100.00%
F6-16 PID Setpoint Output Run Time	Setting Range: 0.00 - 6500.0

When the inverter is configured to use PID output for frequency control, in order to achieve the desired PID control effect more quickly, it is sometimes necessary to operate at a preset frequency for a certain period of time before PID control begins. This preset frequency is determined by F6-15, and the duration is determined by F6-19.

F6-17 PID Control Deviation Limit	Setting Range: 0.0 - 100.0%

When the deviation value is within the PID deviation limit, no adjustment is necessary. This parameter helps balance the accuracy and stability of the system output.

F6-18 Low Switching Deviation Value	Setting Range: 0.0 - 100.0%
F6-19 Switching Deviation Lower Limit	Setting Range: 0.0 - 100.0%

F6-18: When the PID error is less than this value, use Gain 1.

F6-19: When the PID deviation is greater than this value, Gain 2 is used.

F6-20 Derivative Limiting	Setting range: 0.0 - 100.0%

In PID controllers, the derivative term can easily cause system oscillations; therefore, the PID derivative action is generally limited to a small range. FA-10 is used to set the range of the PID derivative output.

F6-21 PID Output Upper Limit	Setting Range: 0.0 - 100.0%
F6-22 PID Output Lower Limit	Setting Range: -100.0 to 100.0%

In practical applications, the upper limit of the PID output must be set based on the specific control object and system requirements.For example, when using a

PID control system to regulate pressure, the PID output value is converted to a frequency and sent to a variable-frequency drive to control the motor speed, thereby adjusting the system pressure. If the upper limit of the output value is set to 50, this means the output value will range from 0 to 50. Even if the calculation results in a maximum PID output value and the upper limit is set to 100, because the actual setting is 50, the final output value can only be 50.

In PID control, the output lower limit refers to the minimum value of the PID controller's output signal. This lower limit helps protect equipment by preventing it from operating at undesirably low levels or preventing the system from entering an undesirable state under certain conditions.

F6-23 PID Output Filter Time	Setting Range: 0.000 - 6.000 S

The PID output filter time is a critical parameter in a PID control system; its function is to smooth the output signal and improve system stability. In a PID control system, the output signal may exhibit fluctuations or glitches due to various factors (such as measurement noise or internal system disturbances).Setting the output filter time smooths the PID output. The longer the filter time, the smoother the output signal. When noise or interference is present in the system, these factors may cause the PID controller to overreact, thereby affecting system stability. By setting the output filter time, the impact of this noise and interference on the controller's output can be reduced, preventing the system from oscillating or becoming unstable.

F6-24 Feedback Disconnection Action Selection	Setting Range: 0 - 3

0: Continue PID operation without reporting a fault; do not perform feedback line break detection

1: Shut down and report a fault; shut down and report a fault when a break is detected

2: Continue PID operation and output an alarm signal; continue operation when a feedback line break is detected, and output an alarm signal

3: Continue operation at the current frequency and output an alarm signal. When a line break is detected, PID operation pauses but continues, and an alarm signal is output.

When feedback line break detection is enabled and active, corresponding control actions can be sent to an external controller via terminal functions 36 and 37.

F6-25 Feedback Disconnection Detection Time	Setting Range: 0.0 - 120.0 s

When the feedback signal is interrupted, the inverter will report a fault (E.PID) after the detection time set in F6-25 has elapsed.

F6-26 Feedback Open-Circuit Alarm Upper Limit	Setting Range: 0.0 - 150.0%
F6-27 Upper Limit for Open-Circuit Alarm	Setting Range: 0.0 - 100.0%

A PID open-circuit alarm typically refers to an alarm signal issued by the system in a PID control system when a sensor or actuator experiences an open-circuit

fault. The upper and lower limits refer to the specific values in this alarm mechanism; when a parameter exceeds or falls below these values, the system triggers an alarm.

F6-28 Sleep Mode Selection	Setting Range: 0 - 1

0: Off

1: Enabled

The PID sleep function is used for energy-saving control that automatically pauses operation based on output and feedback. For example, in water supply applications, when the water pressure is sufficient and the operating frequency is low, the PID directly outputs a frequency of 0. Combined with the sleep function of F0-10, this allows the inverter to automatically switch between operation and stop output, ultimately achieving automatic control and energy savings.

F6-29	Sleep Frequency	Setting Range: 0.00 - Maximum Frequency
F6-30	Sleep Delay	Setting Range: 0.0 - 3600.0 S
F6-31	Wake-up Deviation	Setting Range: 0.0 - 50.0%
F6-32	Wake-up Delay	Setting Range: 0.0 - 60.0 s

While the inverter is running, if the PID output frequency is less than or equal to the sleep frequency (F6 - 29) and the PID feedback is not less than the setpoint, the inverter will enter sleep mode after the delay time (F6-30) and decelerate to a stop.

If the inverter is in sleep mode and the current run command is active, when the feedback signal is greater than or equal to F6-31 (Wake-up Deviation, the deviation between the set pressure and the feedback pressure), and after the delay time specified by F6-32 (Wake-up Delay Time) has elapsed, the PID exits sleep mode and the inverter returns to the running state.

Note: Both sleep and wake-up require setting the wake-up deviation, wake-up time, sleep frequency, and sleep time, respectively.

F7-00 PLC Operating Mode Selection	Setting Range: 0000 - 2212

LED least significant digit: Cycle mode

0: Stop after a single cycle

1: Continuous cycle

2: Hold final value after a single cycle

LED units digit: Timing unit

0: Seconds

1: Minutes

2: Hours

LED hundreds digit: Power-off storage mode

0: No data retention

1: Store

LED thousands place: Startup mode

0: Restart from the first stage

1: Resume operation from the stage at the time of shutdown

2: Continue running for the remaining time of the stage at the time of shutdown

F7-01 PLC Multi-Speed 1	Setting Range: 0.00 to Maximum Frequency
F7-02 PLC Multi-Speed 2	Setting Range: 0.00 to Maximum Frequency
F7-03 PLC Multi-Speed 3	Setting Range: 0.00 to Maximum Frequency
F7-04 PLC Multi-Speed 4	Setting Range: 0.00 to Maximum Frequency
F7-05 PLC Multi-Speed 5	Setting Range: 0.00 to Maximum Frequency
F7-06 PLC Multi-Speed 6	Setting Range: 0.00 to Maximum Frequency
F7-07 PLC Multi-Speed 7	Setting Range: 0.00 to Maximum Frequency
F7-08 PLC Multi-Speed 8	Setting Range: 0.00 to Maximum Frequency
F7-09 PLC Multi-Speed 9	Setting Range: 0.00 to Maximum Frequency
F7-10 PLC Multi-Speed 10	Setting Range: 0.00 to Maximum Frequency
F7-11 PLC Multi-Speed 11	Setting Range: 0.00 to Maximum Frequency
F7-12 PLC Multi-Speed 12	Setting Range: 0.00 to Maximum Frequency
F7-13 PLC Multi-Speed 13	Setting Range: 0.00 to Maximum Frequency
F7-14 PLC Multi-Speed 14	Setting Range: 0.00 to Maximum Frequency
F7-15 PLC Multi-Speed 15	Setting Range: 0.00 to Maximum Frequency
F7-16 PLC Multi-Speed 16	Setting Range: 0.00 to Maximum Frequency

The frequency commands for each speed stage—F7-01 to F7-16—correspond to 16 frequency setpoints (stages 1 through 16). These setpoints are frequency values. The inverter provides 4 multi-speed command terminals that can be configured into 16 states, each corresponding to one of these 16 frequency setpoints. F7 Group Parameter Application Scenarios: When a simplified PLC is required as the master frequency, configure the F7 group parameters. In some industrial applications where AC motors only need to perform functions such as start/stop, timed segmented speed control, and simple automatic forward/reverse operation, a simplified PLC can

accomplish control functions that previously required the addition of a separate PLC. The simplified PLC is generally used in equipment for industries such as concrete mixing and industrial washing machines. Relationship between Group F7 Parameters and Other Parameters: When parameter F0-03 is set to 7 and the simplified PLC is selected as the main frequency, Group F7 parameters must be configured.

F7-17 PLC Segment 1 Run Time	Setting Range: 0.0 - 6500.0 (s/m/h)

The set time for speed operation in the first segment.

F7-18 PLC Stage 1 Direction and Acceleration/Deceleration Time Setting Range: 00 - 31

LED units digit: Running direction for this segment (compared to the run command)

0: Same direction

1: Reverse

LED units digit: Acceleration/deceleration time for this segment

0: Acceleration/Deceleration Time 1

1: Acceleration/deceleration time 2

2: Acceleration/deceleration time 3

3: Acceleration/Deceleration Time 4

F7-19 PLC Segment 2 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-20 PLC Segment 2 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-21 PLC Segment 3 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-22 PLC Stage 3 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-23 PLC Stage 4 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-24 PLC Stage 4 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-25 PLC Stage 5 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-26 PLC Stage 5 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-27 PLC Stage 6 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-28 PLC Stage 6 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-29 PLC Stage 7 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-30 PLC Stage 7 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-31 PLC Stage 8 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-32 PLC Segment 8 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-33 PLC Stage 9 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-34 PLC Block 9 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-35 PLC Segment 10 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-36 PLC Segment 10 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-37 PLC Segment 11 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-38 PLC Segment 11 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-39 PLC Stage 12 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-40 PLC Segment 12 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-41 PLC Segment 13 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-42 PLC Segment 13 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-43 PLC Stage 14 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-44 PLC Segment 14 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-45 PLC Segment 15 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-46 PLC Segment 15 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31
F7-47 PLC Block 16 Run Time Setting Range: 0.0 - 6500.0 (s/m/h)
F7-48 PLC Block 16 Direction and Acceleration/Deceleration Time
Setting Range: 00 - 31

The running time, direction, and acceleration/deceleration times for stages 2 through 16 are set in the same manner as for stage 1.

Speed Settings	Corresponding Parameters	K1	K2	K3	K4
Multi-speed 1	F7-01	0	0	0	0
Multi-speed 2	F7-02	1	0	0	0
Multi-speed 3	F7-03	0	1	0	0
Multi-speed 4	F7-04	1	1	0	0
Multi-speed 5	F7-05	0	0	1	0
Multi-speed 6	F7-06	1	0	1	0
Multi-speed 7	F7-07	0	1	1	0
Multi-speed 8	F7-08	1	1	1	0
Multi-speed 9	F7-09	0	0	0	1
Multi-speed 10	F7 - 10	1	0	0	1
Multi-speed 11	F7-11	0	1	0	1
Multi-speed 12	F7 - 12	1	1	0	1
	F7 - 13	0	0	1	1

Multi-speed 13					
Multi-speed 14	F7-14	1	0	1	1
Multi-speed 15	F7-15	0	1	1	1
Multi-speed 16	F7-16	1	1	1	1

The above is the reference table for the multi-speed function

F8-00 Communication Baud Rate Selection	Setting Range: 0 - 7

0: 300 bps (reserved)
1: 600 bps (Reserved)
2: 1200 bps
3: 2400 bps
4: 4800 bps
5: 9,600 bps
6: 19,200 bps
7: 38,400 bps

Set the data transmission rate between the host computer and the inverter. The higher the baud rate, the faster the communication speed. The RS-485 baud rates set on the host computer and the inverter must match; otherwise, communication will fail.

F8-00 Data Format	Setting Range: 0 - 5

Sets the Modbus data format between the host computer and the inverter.

0: No parity (8-N-1)

The Modbus data format between the host computer and the inverter is: 8-bit data, no parity, 1 stop bit.

1: Odd parity (8-O-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, odd parity, 1 stop bit.

2: Even parity (8-E-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, even parity, 1 stop bit.

3: No parity (8-O-2)

The Modbus data format between the host computer and the inverter is: 8 data bits, no parity, 2 stop bits.

4: Odd Parity (8-O-2)

The Modbus data format between the host computer and the inverter is: 8 data bits, odd parity, 2 stop bits.

5: Even parity (8-E-2)

The Modbus data format between the host computer and the inverter is: 8-bit data, even parity, 2 stop bits.

F8-02 Communication Address	Setting Range: 1 - 247

This represents the unit's address for RS-485 communication. When the local address is set to 1 - 127, the unit's address is unique, serving as the basis for point-to-point communication between the host computer and the inverter.

F8-03 Communication Response Delay	Setting Range: 0 - 5000 ms

Sets the interval between when the inverter finishes receiving data and when it sends data to the host computer. If the response delay is less than the system processing time, the response delay is determined by the system processing time; that is, data is sent to the host computer after the system has finished processing it. If the response delay is greater than the system processing time, the system will wait after processing the data until the response delay time has elapsed before sending data to the host computer.

F8-04 Communication Timeout Fault Time	Setting Range: 0.1 - 100.0 s

Sets the maximum time interval between two consecutive successful RS485 communication events. In systems with continuous communication, this parameter can be used to monitor the communication status.

F8-05 Communication Protocol Selection	Setting Range: 0 - 1

0: Slave

1: Master

In most cases, the slave protocol is sufficient; the master protocol is used only for master-slave control or as a master function in networked control systems. This function is currently reserved.

F8-06 Frequency Setting Gain	Setting Range: 0.0 - 500%

Communication setting for the frequency adjustment factor; when the RS485 receives a signal from the host computer, it is multiplied by F8-06 to determine the actual setpoint frequency.

F8-07 Modbus Transmission Response Processing	Setting Range: 0 - 1

0: Response to write operations

1: No response to write operations

When the slave receives a write operation communication frame addressed to itself, this parameter determines whether to acknowledge the successful execution of the write operation. In most cases, it is recommended to enable acknowledgment to ensure that the write operation is executed successfully.

F8-08 Communication Disconnection Handling	Setting Range: 0 - 3

0: Do not detect timeout errors

1: Report as a fault and stop freely

2: Issue a warning and continue operation

3: Shutdown warning, operational fault

If no valid communication frame (with a valid local address and CRC check) is detected within the timeout period defined in F8-04, a communication break is detected; different handling methods for communication breaks can be set via this parameter.

F8-09 Communication Command Frequency Source Selection	Setting Range: 00 - 22

Least significant digit: Communication command source

0: Terminal 485 is the communication command source

1: Expansion card 485 is the communication command source

2: Terminal 485 and Expansion 485 are both communication command sources

Tens place: Communication frequency source

0: Terminal 485 is the communication frequency source

1: The expansion card’s 485 port is the source of the communication frequency

2: Both Terminal 485 and Expansion 485 are communication frequency setpoint sources

When the command and frequency channels are set to 485, this parameter’s function code determines which specific 485 port is used to implement the start/stop of operating commands and frequency setpoints.

F8-10 Communication Baud Rate Selection	Setting Range: 0 - 7

0: 300 bps (Reserved)

1: 600 bps (reserved)

2: 1200 bps

3: 2400 bps

4: 4800 bps

5: 9,600 bps

6: 19,200 bps

7: 38,400 bps

Set the data transmission rate between the host computer and the inverter. The higher the baud rate, the faster the communication speed. The RS-485 baud rates set on the host computer and the inverter must match; otherwise, communication will fail.

F8-11 Data Format	Setting Range: 0 - 5

Set the Modbus data format between the host computer and the inverter.

0: No parity (8-N-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, no parity, 1 stop bit.

1: Odd parity (8-O-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, odd parity, 1 stop bit.

2: Even parity (8-E-1)

The Modbus data format between the host computer and the inverter is: 8 data bits, even parity, 1 stop bit.

3: No parity (8-O-2)

The Modbus data format between the host computer and the inverter is: 8 data bits, no parity, 2 stop bits.

4: Odd Parity (8-O-2)

The Modbus data format between the host computer and the inverter is: 8 data bits, odd parity, 2 stop bits.

5: Even Parity (8-E-2)

The Modbus data format between the host computer and the inverter is: 8-bit data, even parity, 2 stop bits.

F8-12 Communication Address	Setting Range: 1 - 247

This represents the unit’s address for RS-485 communication. When the local address is set to 1 - 127, the unit’s address is unique, serving as the basis for point-to-point communication between the host computer and the inverter.

F8-13 Communication Response Delay	Setting Range: 0 - 5000 ms

Sets the interval between the inverter finishing data reception and sending data to the host computer. If the response delay is less than the system processing time, the response delay is determined by the system processing time; that is, data is sent to the host computer after the system has finished processing the data. If the response delay is greater than the system processing time, the system will wait after processing the data until the response delay time has elapsed before sending data to the host computer.

F8-14 Communication Timeout Fault Time	Setting Range: 0.1 - 100.0 s

Sets the maximum time interval between two consecutive successful RS485 communication events. In systems with continuous communication, this parameter can be used to monitor the communication status.

F8-15 Communication Protocol Selection	Setting range: 0 - 1

0: Slave

1: Master

In most cases, the slave protocol is sufficient; the master protocol is used only for master-slave control or as a master function in other networked control systems. This function is currently reserved.

F8-16 Frequency Setting Gain	Setting range: 0.0 - 500%

Communication setting for the frequency adjustment factor; when the RS485 receives a signal from the host computer, it is multiplied by F8-16 to determine the actual setpoint frequency.

F8-17 Modbus Transmission Response Processing	Setting Range: 0 - 1

0: Write operations receive a response

1: No response to write operations

When the slave receives a write operation communication frame addressed to itself, this parameter determines whether to acknowledge the successful execution of the write operation. In most cases, it is recommended to enable acknowledgment to ensure that the write operation is executed successfully.

F8-18 Communication Disconnection Handling	Setting Range: 0 - 3

0: Do not detect timeout errors

1: Report a fault and stop freely

2: Issue a warning and continue operation

3: Shutdown warning, operational fault

If no valid communication frame (with a valid local address and CRC check) is detected within the timeout period defined in F8-04, a communication break is detected; different handling methods for communication breaks can be set via this parameter.

F8-20 Host Cyclic Transmission Parameter Selection Setting Range: 0000 - CCCC

Units, Tens, Hundreds, Thousands

0: Invalid

1: Host operation command

2: Host setpoint frequency

3: Host output frequency

4: Host upper frequency limit

5: Host setpoint torque

6: Host output torque

7: Reserved

8: Reserved

9: Host PID Setpoint
A: Host PID feedback
B: Reserved
C: Active current component

F8-21	Frequency Setpoint Custom Address Setting	Setting Range: 0000 - FFFF

Custom address setting for frequency setpoint.

F8-22	Command-Specified Custom Address Setting	Setting Range: 0000 - FFFF

Custom address setting for run command input.

F8-23	Command Set to Forward Run Command Value	Setting Range: 0000 - FFFF

Custom setting for the forward rotation command value.

F8-24	Command set to reverse operation command value	Setting range: 0000 - FFFF

Custom setting for the reverse rotation command setpoint.

F8-25	Command setpoint is the stop command value.	Setting range: 0000 - FFFF

Custom setting for the stop command value.

F8-26	Command set to reset command value	Setting range: 0000 - FFFF

Custom setting for the reset command value.

F8-29	Host Operation Command Selection	Setting Range: 0 - 1

0: Run command
1: Run command
Host protocol; function reserved.

F8-30	Enable Address Mapping	Setting Range: 0 - 1

0: Disabled
1: Enabled

F8-31	Mapped Address 1	Setting Range: 0000 - FFFF

Mapped Address 1, defines the user's original access address

F8-32	Parameter Address 1	Setting Range: 0000 - FFFF

Inverter parameter address 1: Defines the inverter's existing parameter address. By accessing the mapping address defined in F8-31, access to the parameter address defined in F8-32 can be achieved. For example, if F8-31 = 0x8000 and F8-32 = 0x0001, an access attempt to address 0x8000 will be converted to an access attempt to address
0x000

F8-33	Mapped Address 2	Setting Range: 0000 - FFFF
F8-34	Parameter Address 2	Setting Range: 0000 - FFFF
F8-35	Mapped Address 3	Setting Range: 0000 - FFFF
F8-36	Parameter Address 3	Setting Range: 0000 - FFFF
F8-37	Mapped Address 4	Setting Range: 0000 - FFFF
F8-38	Parameter Address 4	Setting Range: 0000 - FFFF
F8-39	Mapped Address 5	Setting Range: 0000 - FFFF
F8-40	Parameter Address 5	Setting Range: 0000 - FFFF
F8-41	Mapped Address 6	Setting Range: 0000 - FFFF
F8-42	Parameter Address 6	Setting Range: 0000 - FFFF
F8-43	Mapped Address 7	Setting Range: 0000 - FFFF
F8-44	Parameter Address 7	Setting Range: 0000 - FFFF
F8-45	Mapped Address 8	Setting Range: 0000 - FFFF
F8-46	Parameter Address 8	Setting Range: 0000 - FFFF
F8-47	Mapped Address 9	Setting Range: 0000 - FFFF
F8-48	Parameter Address 9	Setting Range: 0000 - FFFF
F8-49	Mapped Address 10	Setting Range: 0000 - FFFF
F8-50	Parameter Address 10	Setting Range: 0000 - FFFF
F8-51	Mapped Address 11	Setting Range: 0000 - FFFF
F8-52	Parameter Address 11	Setting Range: 0000 - FFFF
F8-53	Mapping Address 12	Setting Range: 0000 - FFFF
F8-54	Parameter Address 12	Setting Range: 0000 - FFFF
F8-55	Mapped Address 13	Setting Range: 0000 - FFFF
F8-56	Parameter Address 13	Setting Range: 0000 - FFFF
F8-57	Mapped Address 14	Setting Range: 0000 - FFFF
F8-58	Parameter Address 14	Setting Range: 0000 - FFFF
F8-59	Mapped Address 15	Setting Range: 0000 - FFFF
F8-60	Parameter Address 15	Setting Range: 0000 - FFFF
F8-61	Mapped Address 16	Setting Range: 0000 - FFFF
F8-62	Parameter Address 16	Setting Range: 0000 - FFFF

By configuring the above inverter-related parameter addresses and defining the inverter's existing parameter addresses, you can access the parameter address defined in F8-62 by accessing the mapping address defined in F8-61. For example, if F8-61 = 0x9000 and F8-62 = 0x1111, an access to address 0x9000 will be converted to an access to address 0x1111

F9-00	Menu Mode	Setting Range: 0 - 2

0: Standard Menu—Some parameters cannot be modified to protect one-time settings; for example, certain parameters in motor parameter group F2 cannot be modified.

1: Advanced Menu—All parameters can be modified.

2: Expert Menu—Some special settings can be modified.

F9-01 User Password	Setting range: 0 - 65535

After setting a non-zero value, you must enter the setting value to access the parameter settings interface.

F9-02 Keyboard Parameter Copy	Setting range: 0 - 30

0: No function

1 - 10: Upload parameters to zones 1 - 10 of the keypad (parameters will be overwritten when the zone is in use);

11 - 20: Download parameters from zones 1 - 10 of the keypad;

21 - 30: Download parameters from zones 1 - 10 of the keypad (excluding motor parameters);

31 - 40: Download parameters from zones 1 - 10 of the keypad (parameters are not saved upon power loss);

41 - 50: Upload parameters to zones 1 - 10 of the keypad (unused);

Note: Keypads with an MCU support this function.

F9-03 Load Type Selection	Setting Range: 0 - 1

0: G-type unit, general-purpose load. (Heavy-duty)

1: P-type unit, light-duty loads, such as fans and pumps.

F9-04 LCD Keyboard Language (Reserved)	Setting Range: 0 - 1

0: Chinese—Displays Chinese.

1: English—Displays English.

F9-05 Debug Parameter 1	Setting Range:

Commissioning Parameters

F9-08 Extended Menu	Setting Range: 0 - 1

Units digit: Comparison Mode menu display

0: Comparison Mode menu not displayed

1: Comparison Mode menu displayed

The Comparison Menu is a display mode that compares all user parameters against their factory default values and lists any parameters that differ from those values. This menu allows you to view all user parameters that have been modified.

This setting applies to LED keypads; for LCD keypads, the comparison mode menu automatically displays based on whether there are any parameters that differ from the factory defaults, and is not affected by this parameter.

F9-10 MFK Multifunction Key Selection	Setting Range: 0 - 4

0: Disabled
1: Keyboard reverse operation
2: Keyboard jogs forward
3: Keyboard jog reverse
4: Free stop (all command channels)

F9-11 Use the up and down keys to quickly change the function selection.
Setting range: 00 - 12

LED units digit: Use the up and down keys to adjust the value
0: Auto
1: F9 - 12 custom values
2: Disabled
LED tens digit: Power-off data retention
0: Frequency is not retained after power loss
1: Frequency is saved upon power loss

Use the up and down keys to quickly modify parameters. For example, in Auto mode, VF, or vector speed control, you can use the up and down keys to quickly modify parameters F0 - 07 on the Run/Stop monitoring screen; in Torque mode, you can use the up and down keys to quickly modify parameters F3 - 41. If the user has other needs for quick parameter modification, this can be configured via parameters F9 - 12. For example, in PID control, set bit 1 of F9 - 11 to 1; set F9 - 12 to F6 - 01. With this configuration, the F6 - 01 PID digital setpoint parameter can be quickly modified using the up and down keys on the Run/Stop monitoring screen.

F9-12 Set the parameter code for quick modification using the up and down keys
Setting range: 0000 - 1FFF

LED units and tens digits: Set yy in function parameter number Fx-yy to 00 - 99
LED units and tens digits: Set xx in function parameter number Fx-yy to 00 - 99
LED hundreds and thousands digits: Set xx in function parameter number Fx-yy to 00 - 15
Note: "0007" refers to F0-07, "1007" refers to FA-07,
10, 11, 12, 13, and 14 correspond to FA, Fb, FC, Fd, and A0.

F9-13 Keyboard Key Lock	Setting Range: 0 - 4

0: No lock
1: All keys locked
2: All keys locked except the Start/Stop key
3: All keys locked except the Shift keys
4: All keys locked except the MFK key
Note: Press SET+PRG to lock the keys; press SET+UP three times to unlock them. When

the keys are locked, "Loc" is displayed.

When the keys are unlocked, "ULoc" is displayed.

F9-14 Keypad Display Settings	Setting Range: 0 - 1

Units digit: Forward/reverse direction indicator

0: Positive logic

1: Inverted logic

Changes the operation display for forward and reverse operation indicators. To accommodate hardware differences among various keypad panels, if the forward and reverse operation lights are reversed, this parameter must be adjusted to invert the logic, ensuring the direction lights are displayed correctly.

F9-15 Power Display Selection	Setting Range: 0 - 1

LED units digit: Power display mode selection

0: Power display as a percentage (%)

1: Power display in kilowatts (kW)

F9-16 Power Display Coefficient	Setting Range: 0.0 - 500.0%

Calibrates the displayed power output value.

F9-17 Speed Display Coefficient	Setting Range: 0.0 - 500.0%

Calibrates the displayed output speed value.

F9-18 Monitoring Parameter Display Filter Selection	Setting Range: 000 - 3FF

LED units digit: Current display filtering

0 - F: The higher the value, the deeper the filtering

LED units digit: Current display filtering0 - F: The higher the value, the deeper the filtering

0 - F: The higher the value, the deeper the filtering

LED hundreds place: Speed display filtering

0 - 3: The higher the value, the deeper the filtering

F9-20 Keypad cycle display parameter 1	Setting range: 000 - 799
F9-21 Keypad Cycle Display Parameter 2	Setting Range: 000 - 799
F9-22 Keypad cyclic display parameter 3	Setting range: 000 - 799
F9-23 Keypad cyclic display parameter 4	Setting range: 000 - 799
F9-24 Keypad cyclic display parameter 5.	Setting range: 000 - 799
F9-25 Keyboard Cycle Display Parameter 6	Setting Range: 000 - 799
F9-26 Keyboard Cycle Display Parameter 7	Setting Range: 000 - 799
F9-27 Keyboard Cycle Display Parameter 8	Setting Range: 000 - 799

Set the value for xxx in the monitoring parameter number d-xxx to configure

a fixed display. During standby and operation, press the left or right keys to directly view the relevant parameters. If you switch to display the current monitoring parameter, the current monitoring parameter will remain displayed even after a power cycle; the display will not switch to Keyboard Cycle Display Parameter 1.

F9-28 Custom Monitoring Code 1	Setting Range: 0000 - 1799

Setting the specific monitoring index “xxx” for monitoring parameter d-023

F9-29 Custom Monitoring Code 2	Setting Range: 0000 - 1799

Set the specific monitoring index xxx in monitoring parameter d-024

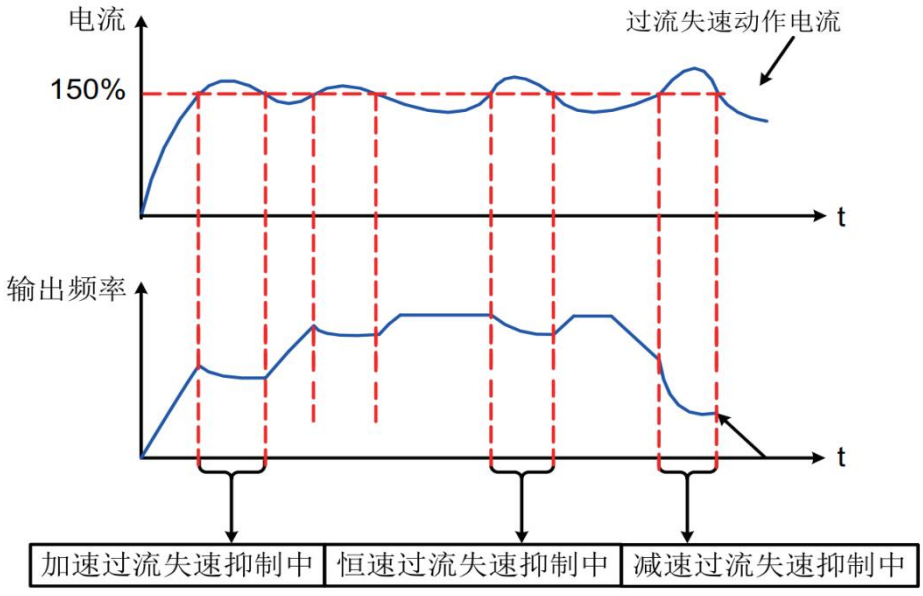
Note: For monitoring content index values in d-023/d-024, 000 is invalid; if set to 001, d-023 displays the content of d-001.

FA-00 Current Limit	Setting Range: 0.0 - 300.0%

To prevent frequent overcurrent faults, when the inverter current becomes too high, the inverter rapidly reduces the frequency to limit the current, using the inverter’s rated current as the reference.

FA-01 Current Limit Gain	Setting Range: 0.0 - 500.0%

The higher the FA-01 gain setting, the stronger the overcurrent suppression capability.



Schematic Diagram of Overcurrent Speed Reduction

FA-02 Bus Overvoltage Suppression Function	Setting Range: 00 - 21

LED units digit: Overvoltage suppression control

0: Disabled

1: Enabled

LED units digit: Over-excitation control

0: Off

1: Enable during deceleration

2: Enabled during operation

FA-03 Bus Overvoltage Suppression Point	Setting Range: Model-specific

T2: 380 V

T3: 7XXV

T6: 1100V

T11: 1900V

T23: 4000V

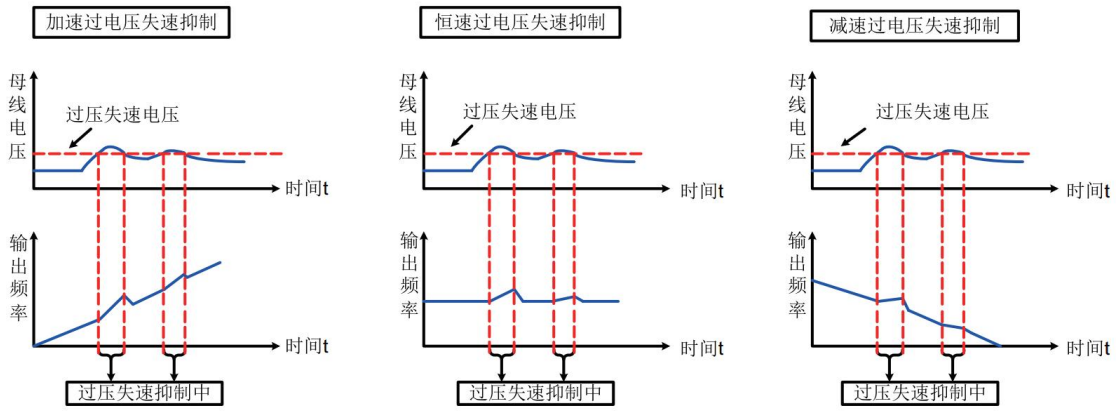
T33: 5,800 V

T60: 10,000 V

FA-04 Busbar overvoltage suppression gain	Range: 0.0 - 500.0%

The higher the FA-04 gain setting, the stronger the overvoltage suppression capability.

If the busbar voltage exceeds the overvoltage stall action voltage (FA-03), it indicates that the electromechanical system is already in power generation mode (motor speed > output frequency). Overvoltage stall will take effect, adjusting the output frequency; the actual deceleration time will automatically be extended to avoid trip protection. If the actual deceleration time does not meet requirements, the overexcitation gain can be appropriately increased.



Schematic Diagram of Overvoltage Stall Operation

FA-05 Bus Undervoltage Suppression Function	Setting Range: 0 - 1

0: Disabled

1: Enabled

Note: The undervoltage suppression setpoint must be set higher than the undervoltage protection setpoint; otherwise, the suppression function will not be triggered

FA-06	Bus Undervoltage Suppression Point	Setting Range: Model-specific

T2: 220 V

T3: 430V

T6: 7XXV

T11: 1200V

T23: 2400V

T33: 3,300 V

T60: 6800V

FA-07	Bus Undervoltage Suppression Gain	Setting Range: 0.0 - 500.0%

The higher the FA-07 gain setting, the stronger the undervoltage suppression capability.

FA-20	Speed Tracking Mode	Setting Range: 00 - 11

LED units digit: Search mode

0: Search from maximum frequency

1: Search starting from the stop frequency

LED units digit: Reverse search

0: Off

1: On

FA-21	Speed Tracking Time	Setting Range: 0.00 - 60.00 s

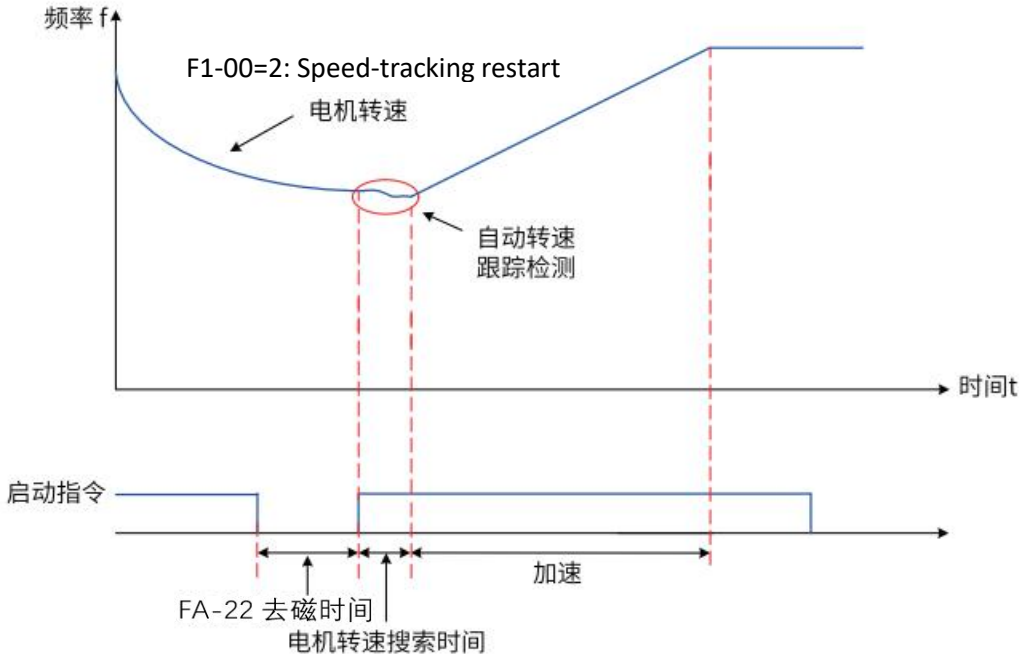
The shorter the set time, the faster the search, but the greater the likelihood of an overcurrent trip; generally, the factory default setting is sufficient.

FA-22	Speed Tracking Stop Delay	Setting Range: 0.00 - 60.00 s

Both vector and VF modes are supported; after a run command is issued, the motor will start after a delay of this duration to minimize the effects of residual magnetism.

FA-23	Speed Tracking Current	Setting Range: 0.0 - 400.0%

Valid in VF mode.



FA-30 Carrier Frequency	Setting Range: 300 - 5000 Hz

Current carrier setting monitoring value

FA-31 PWM Control Mode	Setting Range: 0000 - 1111

LED units digit: Carrier frequency is temperature-dependent

0: Not temperature-dependent

1: Temperature-dependent

LED units digit: Carrier frequency is temperature-dependent

0: Depends on output frequency

1: Independent of output frequency

LED tens place: Reserved

LED thousands place: PWM modulation mode

0: Uses only three-phase modulation

1: Automatic switching between two-phase and three-phase modulation

FA-32 PWM Control Mode 2	Setting Range: 0000 - 1111

LED least significant digit: PWM overmodulation control

0: Overmodulation disabled

1: Two-level overmodulation enabled

2: Three-level and two-level overmodulation enabled

LED units digit: Reserved

LED units digit: Dead-zone compensation control

0: Dead-zone compensation disabled

1: Dead-time compensation enabled

LED thousands place: Reserved

FA-33 PWM Control Mode 3	Setting Range: 0000 - 1111

LED units digit: Three-level mode

0 : Optimized Mode 1

1: Optimized Mode 2

LED units digit: Reserved

LED units digit: Reserved

LED thousands place: Reserved

FA-34 Two-phase modulation start frequency	Setting range: 0.0 - 100%

Relative to the motor’s rated frequency; if the frequency exceeds this value, two-phase modulation is enabled.

FA-35 Low-frequency carrier limit

Setting range: 300 - 2000 Hz

FA-36 Low-frequency carrier active frequency

Setting range: 0.00 - 300.00 Hz

FA-37 Low-Frequency Carrier Deactivation Frequency

Setting Range: 0.00 - 300.00 Hz

When the operating frequency is ≤ FA-36, use FA-35 as the carrier frequency; when the operating frequency is ≥ FA-37, use F0-14 as the carrier frequency.

FA-38 Busbar Midpoint Adjustment Coefficient	Setting Range: 0 - 20.00

During operation, if the upper and lower busbars become misaligned, increasing this coefficient allows the software to quickly adjust them to restore balance. This parameter generally does not need to be set; use the default value.

FB-00 Speed Feedback Encoder Type	Setting Range: 0 - 1

0: Rotating transformer

1: ABZ encoder

FB-01 Encoder Direction	Setting Range: 0 - 1

0: Same direction

1: Opposite Direction

FB-02 ABZ Encoder Z-Pulse Detection Selection	Setting Range: 0 - 1

0: Off

1: On

Note: Z-pulse detection must be enabled for PM motors.

FB-03 ABZ Encoder Line Count	Setting Range: 1 - 10,000

Enter the value based on the encoder nameplate.

FB-04 Number of Pole Pairs of Rotating Transformer	Setting Range: 1 - 49

Enter the value based on the encoder nameplate.

FB-05 Encoder Gear Ratio Numerator	Setting Range: 1 - 32767
FB-06 Encoder Gear Ratio Numerator	Setting Range: 1 - 32767

When the encoder is installed on the non-motor side, set the gear ratio correctly; otherwise, vector control will not be possible.

FB-07 Encoder Speed Measurement Filter Time	Setting Range: 0.00 - 10.00 ms

Setting an appropriate filter time improves system stability.

FB-08 Encoder Open-Circuit Detection Time	Setting Range: 0.100 - 60.000 S

If this value is zero, open-loop detection is disabled

FB-09 Open-Loop Speed Measurement Enable	Setting Range: 0 - 1

0: Disabled

1: Enable PG speed measurement in open-loop vector mode

FD-00 Software Overcurrent Protection Threshold	Setting Range: 0 - 300%

100% relative to the inverter's rated current. Setting an appropriate current protection point can effectively protect the motor and the inverter

FD-01 Current Limit Alarm Detection Time	Setting Range: 0.0 - 60.0 s

When the current limit duration reaches this value, a current limit warning (A.CLE) is issued.

FD-02 Continuous Current Limitation Fault Detection Setting Range: 0.0 - 400.0 s

When the current limiting duration reaches this value, a current limiting fault (E.CLE) is reported.

FD-03 Output Phase Loss Protection	Setting Range: 0 - 1

0: Off

1: Enable output phase loss detection

FD-04 Output Phase Imbalance Protection	Setting Range: 0 - 300%

0: Disabled

1: Protection trips and the system stops freely

2: Issue an alarm and continue operation

FD-05	Current Imbalance Detection Threshold	Setting Range: 0 - 500%
FD-06	Current Imbalance Detection Time	Setting Range: 0.0 - 60 s

Relative to the motor's rated current, when the three-phase output current reaches the value set in FD-05, the inverter will trigger an imbalance protection after the time set in FD-06 has elapsed.

FD-07	Vector Control No-Motor Fault Detection	Setting Range: 0 - 1

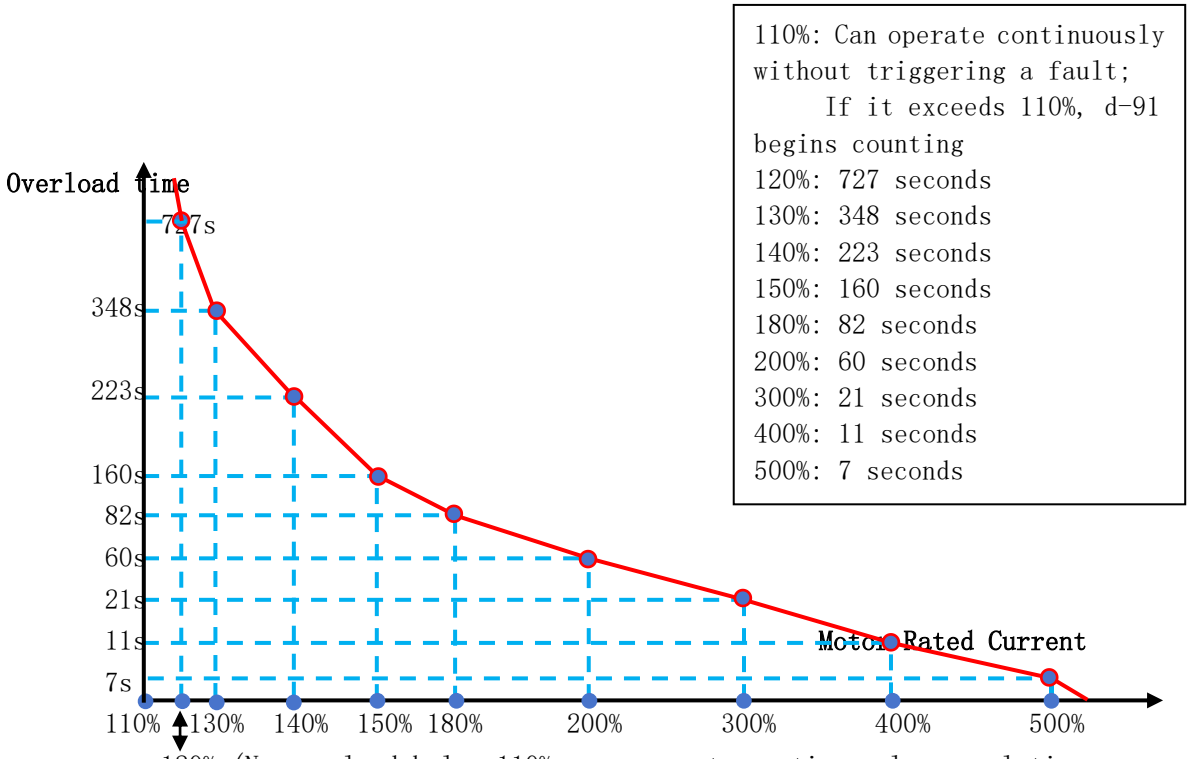
0: Off

1: Enable detection

When operating in vector control mode without a motor connected, a "missing phase" or other control anomaly fault will be reported; therefore, this fault detection must be disabled when performing motorless commissioning in vector control mode.

FD-08	Motor Overload Current Coefficient	Setting Range: 0.0 - 250%

The calculated overload current for a motor = actual current / coefficient; therefore, if this coefficient is reduced, the calculated overload current will be too high, and the overload protection will trip prematurely.



120% (No overload below 110%; can operate continuously; cumulative overload begins at 110%)

Motor Overload Protection Curve

When the operating current exceeds 110% of the motor's rated current, the motor overload counter d-91 begins counting. When the cumulative count reaches 100, the

inverter reports a motor overload fault E.oL2.

FD-10 Input Voltage Phase Loss Action	Setting Range: 000 - 112

Units digit: Input phase loss action selection

0: No action

1: Protection activates and the motor stops freely

2: Alarm and continue operation

Tens place: Reserved

Hundreds place: Detection settings

0: Detect only during operation

1: Detect during both operation and shutdown

FD-11 Undervoltage Protection Threshold	Setting Range: 0 - 2

Bus under-voltage fault trip during operation

0: Undervoltage will only trigger a shutdown action; it is not treated as a fault

1: Undervoltage is treated as a fault and reports E.Lu

2: Undervoltage is treated as a fault and an E.Lu signal is issued, but the terminal fault output does not activate

FD-12 Bus Undervoltage Protection Threshold	Setting Range: Model-specific

The setting ranges for each voltage level are determined by the model:

T 2: 180 V

T 3: 320 V

T 6: 560 V

T11: 1000 V

T23: 2000 V

T33: 3,000 V

T60: 6000V

FD-14 Busbar overvoltage protection	Setting Range: Set by model

This value must be set higher than the undervoltage protection point; otherwise, it will not function. When this value is 0, overvoltage protection operates according to the manufacturer’s default setting. This is an expert parameter and can only be modified after entering the expert parameter menu.

FD-17 Contactor Feedback Fault Detection	Setting Range: 0 - 2

0: Do not detect

1: When detection is valid, issue warning A.JCi (23)

2: Issues fault E.JCi (13) when detection is valid

Note: Detection occurs only during operation; SD7XX models feature built-in contactor feedback checks.

FD-19 Fault Simulation Input	Setting Range: 0000

Units and tens digits: Main fault code

Hundreds and thousands digits: Fault subcode

Use this function when you need to report the corresponding fault during testing.

FD-20 Number of Automatic Fault Resets	Setting Range: 0 - 100

During the fault self-reset period, use d-355 to monitor the current number of remaining self-reset attempts; use d-356 to monitor the fault event that triggered this self-reset.

FD-21 Fault Auto-Recovery Interval	Setting Range: 0.1 - 100.0 S

Set the fault self-recovery interval; an appropriate time ensures normal operation while also protecting the inverter.

FD-22 Fault Action Indication Selection	Setting Range: 0 - 1

Automatic Reset Interval Fault Indication Action Selection

0: No action

1: Activate

FD-25 Fan Control Selection	Setting Range: 0 - 1

0: Fan runs continuously after power-up

1: ON/OFF control based on operating commands

2: ON/OFF control based on temperature (the default internal software detection temperature is 50° C)

FD-26 Fan Stop Delay Time	Setting Range: 0 - 600.00S

This is the delay time between the inverter shutting down and the cooling fan stopping.

FD-27 Overheat Warning Detection Threshold	Setting Range: 0.0 - 85.0° C

Over-temperature warning (A.oH1) is used to indicate that necessary measures must be taken externally to prevent an over-temperature fault from occurring.

FD-28 Inverter Overload Warning Detection Level	Setting Range: 0.0 - 100.0

Overload warning A.oL, used to signal that necessary measures must be taken externally to prevent an overload fault. A setting of 0 disables warning detection.

FD-30 Excessive Speed Deviation Protection Trip	Setting Range: 00 - 12

LED units digit: Detection selection

0: No detection

1: Constant-speed detection only

2: Continuous detection

LED tens digit: Alarm selection

0: Stop operation and report a fault

1: Trigger alarm and continue operation

FD-31 Excessive Speed Deviation Detection Threshold
Setting Range: 0.0 - 60.0%
FD-32 Excessive Speed Deviation Detection Time
Setting Range: 0.0 - 60.0 s

Speed deviation refers to the percentage of the motor speed relative to the maximum frequency output. When the value reaches the setting in FD-31, the system will initiate the excessive speed deviation protection action after the detection time specified in FD-32 has elapsed.

FD-33 Over-speed protection action	Setting range: 00 - 12

LED units digit: Detection selection

0: Do not detect

1: Constant-speed detection only

2: Continuous detection

LED tens digit: Alarm selection

0: Stop operation and report a fault

1: Trigger an alarm and continue operation

Note: Valid in vector control mode.

FD-34 Rapid Detection Threshold	Setting Range: 0.0 - 150.0%
FD-35 High-Speed Detection Time	Setting Range: 0.000 - 2.000 S

The high-speed detection threshold is the percentage of motor speed relative to the maximum frequency output. When the value set in FD-34 is reached, the high-speed protection will be activated after the detection time set in FD-35 has elapsed.

FD-40 Load Early Warning Detection Setting	Setting Range: 0000 - 1414

LED units digit: Detection selection (Protection 1)

0: Do not detect

1: Detect excessive load

2: Detect overload only during constant speed operation

3: Detect underload

4: Detects underload only during constant speed operation

LED tens place: Alarm selection

0: Alarm, continue operation

1: Fault protection activates and the motor stops freely

LED hundreds place: Detection selection (Protection 2)

0: Do not detect

1: Detect overload

2: Detects overload only during constant-speed operation

3: Detects underload

4: Detects underload only during constant speed operation

LED thousands place: Alarm selection

0: Alarm, continue operation

1: Fault protection activates and the system stops automatically

FD-41	Load Early Warning Detection Level 1	Setting Range: 0.0 - 200.0%
FD-41	Load Early Warning Detection Time 1	Setting Range: 0.0 - 60.0 S
FD-43	Load Early Warning Detection Level 2	Setting Range: 0.0 - 200.0%
FD-44	Load Early Warning Detection Time 2	Setting Range: 0.0 - 60.0 S

The load warning detection levels are relative to the motor's rated current. When the set values for FD-41 and FD-43 are reached, the load warning detection protection action will be triggered after the detection times specified by FD-42 and FD-44 have elapsed.

FD-45	Locked-rotor detection action	Setting range: 00 - 12

Units digit:

0: Do not detect

1: Enable detection; trigger fault A.Blo when detected

2: Trigger fault E.Blo when detection is valid

Tens place:

0: Open-loop vector detection disabled

1: Open-loop vector detection enabled

FD-46	Stalled Rotor Speed	Setting Range: 0.1 - 600.0 rpm
FD-47	Stalled Rotor Detection Time	Setting Range: 0.0 - 600.0 s

When the stalled speed reaches the value set in FD-46, the stalled detection protection action will be triggered after the detection time set in FD-47 has elapsed.

A0-00	CAN Baud Rate	Setting Range: 0 - 6

0: 20K

1: 50K

2: 100K

3: 125K

4: 250K

5: 500K

6: 1M

The higher the baud rate, the better the real-time control performance; however, interference resistance and communication range decrease. Therefore, the appropriate baud rate should be selected based on actual on-site requirements.

A0-01 CAN Slave Address	Setting Range: 0 - 10

Slave station number; in multi-slave configurations, this is used to distinguish between slaves with different serial numbers. Valid slave station numbers start at 1, while 0 is the broadcast station number.

A0-02 CAN Master-Slave Control Configuration	Setting Range: 0000 - 1111

Units digit: Reserved

Units digit: ReservedTens digit: Master reset slave fault action

0: Activate

1: No action

Tens place: Master failure causes shutdown; slave shuts down freely

0: Activate

1: No action

A0-03 CAN Master-Slave Control Configuration	Setting Range: 0 - 7

0: Disabled

1: Enabled

2: Master-Master Speed, Slave Torque Mode

3: Master-Master Speed, Slave Torque Mode

4: Slave-Torque Mode (Command Follow)

5: Slave-Speed Mode (Command Follow)

6: Slave-Torque Mode (Command Not Followed)

7: Slave-Speed Mode (Command Not Followed)

Note:

Enable CAN master-slave control to achieve power-balanced operation in a multi-unit parallel configuration.

When set to 1, the relevant master-slave parameters A0-04, A0-05, A0-06, and A0-12 must be set manually.

When the master is set to 2, the slave must be used in combination with 4 or 6.

When the master is set to 3, the slave must be set to 5 or 7.

In this case, A0-04, A0-05, A0-06, and A0-12 will be set automatically.

A0-04 CAN Master/Slave Selection	Setting Range: 0 - 2

0: Operate as master

1: As a slave

2: Terminal Selection

Function 41 is configured via Terminal X to toggle between CAN master and slave modes; when the terminal is active, the device acts as a master; when inactive, it acts as a slave.

A0-05 Slave Follows Master Commands	Setting Range: 0 - 1

0: Do not follow

1: Slave follows master operation commands

When the slave is enabled and "Follow" is set, the slave's start/stop command channel is internally forced to switch to the expansion card channel, and the slave automatically follows the master's start/stop commands.

A0-06 Slave Control Mode	Setting Range: 0 - 2

0: Torque Control

1: Frequency Control

2: Terminal Switching

When the slave is enabled and torque control is selected, the slave automatically switches the control mode to torque control, and vector control is enabled.

In VF control mode, frequency control is forced internally. By setting function 42 via the X terminal, the slave can switch between frequency and torque via the terminal; when the terminal is active, torque control is enabled.

A0-07 Slave Control Gain	Setting Range: 0.000 - 10.000

When slave mode is enabled, the speed or torque commands received by the slave are adjusted by this gain.

A0-08 Open-Circuit Detection Action	Setting Range: 0 - 3

0: Do not detect timeout faults

1: Fault and free stop

2: Issue a warning and continue operation

3: Shutdown warning, operational fault

A0-09 Communication Break Detection Time	Setting Range: 0.000 - 10.000 s

Once a line break is detected, the inverter reports a fault and stops. For the master unit, a line break in any slave unit will trigger a fault shutdown; for slave units, a fault is reported if no communication with the master unit is detected within the specified time period.

A0-10 Master Transmission Cycle	Setting Range: 1 - 9999 ms

When the host setting is enabled, this specifies the cycle at which the host sends data to the slave. At lower baud rates, the system internally limits the minimum communication interval.

A0-11 Number of Slaves	Setting range: 0 - 15

This master setting is effective and is used to determine the data the master needs to transmit.

A0-12 Master Operation Command Transmission	Setting Range: 0 - 1

0: Send host run/stop status

1: Send master run/stop command

Enabled; this determines the attributes of the start/stop commands sent by the master to the slave. Generally, the operational status is sent.

A0-13 Slave Operation Timeout Detection	Setting Range: 0.000 - 60.000 s

When the slave is set to follow the master's commands, the master sends a slave run command; if the slave does not report its running status within this time, a CAN fault is reported (subcode 20—Slave Run Timeout).

A0-14 Speed Limit Increment During Slave Torque Control	Setting Range: 0.0 - 20.0%

This increment is added to the maximum frequency to limit the upper limit of the maximum operating frequency during slave torque control.

A0-17 Speed difference limit during slave torque control Setting range: 0.0 - 100.0%

Relative to the maximum frequency, this parameter limits the speed deviation range from the master during slave torque control to prevent excessive speed deviation between the master and slave. When set to 0.0, no additional speed limiting is applied; only the slave's own speed limit under torque control is enforced.

A0-18 Slave Run Command Transmission Delay	Setting Range: 0.000 - 1.000 s

The master sends the run command to the slave after the time set in A0-18 has elapsed.

A0-20 Sag Control Frequency	Setting Range: 0.00 - 10.00 Hz

Frequency adjustment for droop control; when this value is 0, droop control is disabled.

A0-21 Sag Control Gain	Setting Range: 0.0 - 1000.0%

The higher the gain, the greater the adjustment to the droop control frequency output.

A0-22 Sag Control Filter	Setting Range: 0.000 - 6.000 s

Damping control output filter time.

A0-23 Sag Control Mode	Setting Range: 0 - 1

0: Automatic

1: Standalone

In automatic mode, if master-slave communication is present, droop control is performed based on the master-slave communication data;

In standalone mode, the operating frequency is adjusted based on the unit's own load, and no communication is required to exchange operating data between the master and slave units

A0-24 Droop Control Application Frequency	Setting Range: 0.0 - 100.0%

100% is relative to the motor's rated frequency; droop control takes effect only when the frequency exceeds this value.

A2-00 Brake Control Logic Enable	Setting Range: 0 - 1

0: Disabled

1: Enabled

When the brake control logic is enabled, the brake output signal can be used to control the mechanical brake device. Otherwise, the brake output is equivalent to the "in operation" signal.

A2-01 Brake Release Frequency	Setting Range: 0.0 - 10.00 Hz

When the motor reaches this frequency, the brake is released.

A2-02 Brake Release Process Current Limit	Setting Range: 0.0 - 200%

Current limit during brake release; 100% is relative to the inverter's rated current

A2-03 Brake Release Frequency Hold Time	Setting Range: 0.0 - 10.0 s

The duration for which the release frequency is maintained; the release action occurs after this time has elapsed.

A2-04 Brake Frequency	Setting Range: 0.0 - 10.00 Hz

When the motor is stopping, once the output frequency decelerates to this frequency, the braking signal becomes active. Once the braking signal is active, the system enters a forced deceleration-to-stop state. At this point, it no longer

responds to run commands; it will only resume responding to new run commands after the inverter has fully entered the stopped state.

A2-03 Braking Frequency Hold Time	Setting Range: 0.0 - 10.0 s

Only after the brake frequency hold time has elapsed will the inverter cut off the output and enter the stop state.

Appendix 3 RS485 Communication Protocol

The inverter provides an RS485 communication interface and uses the internationally recognized Modbus communication protocol for master-slave control. Users can perform centralized monitoring via a PC or PLC (setting inverter control commands, operating frequency, modifying relevant function codes, and reading the inverter's operating status) to meet specific application requirements.

1. Protocol Content

This serial communication protocol defines the content and format of information transmitted via serial communication. This includes: the formats for master poll and broadcast frames, as well as slave response frames; the frame content organized by the master includes: slave address (or broadcast address), execution command, data, and error checksum, etc. The slave's response follows the same structure and includes: action acknowledgment, return data, and error checks. If an error occurs while the slave is receiving a frame, or if it cannot complete the action requested by the host, it will generate a fault frame as a response to the host.

2. Application Methods

The variable frequency drive features an RS-485 bus-based "single-master, multiple-slave" control network

3. Bus Structure

(1) Interface Type: RS-485 hardware interface

(2) Transmission Method: Asynchronous serial, half-duplex transmission. At any given time, only the master or the slave can transmit data, while the other receives data. During asynchronous serial communication, data is transmitted frame by frame in the form of messages.

(3) Topology

Single-master, multi-slave transmission mode. Slave addresses range from 0 to 247, with 0 serving as the broadcast address. Each slave in the network has a unique address. This is the foundation for ensuring Modbus serial communication.

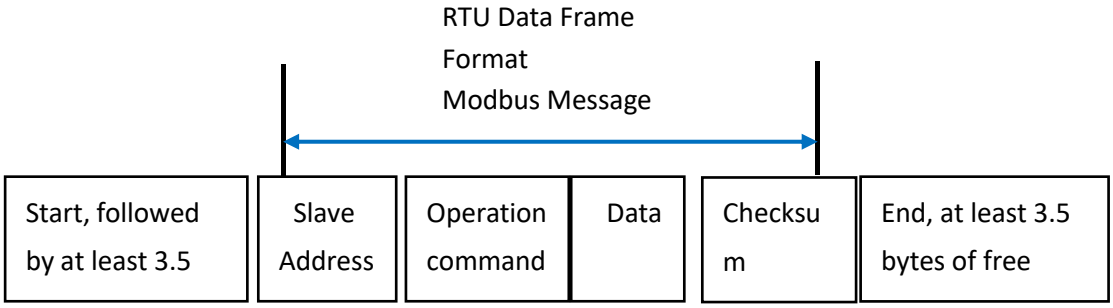
4. Protocol Description

The variable frequency drive communication protocol is an asynchronous serial master-slave communication protocol. Only one device (the master) in the network can initiate the protocol (referred to as a "query/command"). Other devices

(slaves) can only respond to the master's "query/command" by providing data or perform corresponding actions based on the master's "command/query." Here, the master refers to devices such as personal computers (PCs), industrial computers, and programmable logic controllers (PLCs), while the slave refers to variable frequency drives or other control devices with the same communication protocol. The master can communicate with a specific slave individually or broadcast information to all slaves. For individual master queries/commands, the slave must return a response; for broadcast messages sent by the master, the slave is not required to send a response back to the master.

5. Communication Frame Structure

The Modbus protocol data format for variable frequency drives uses RTU (Remote Terminal Unit) mode. A new data frame always begins with a silence period lasting at least 3.5 bytes. On a network where the transmission rate is calculated in baud, the transmission time for 3.5 bytes is easily manageable. The data fields transmitted immediately afterward are, in order: slave address, operation command code, data, and CRC check word. The bytes transmitted in each field consist of hexadecimal data 0-9, A-F. Even during the silence period, network devices continuously monitor activity on the communication bus. Upon receiving the first field (address information), each network device acknowledges that byte. Once the transmission of the last byte is complete, there is another 3.5-byte transmission pause to indicate the end of this frame, after which the transmission of a new frame begins.



The information in a frame must be transmitted as a continuous data stream. If there is a gap of more than 1.5 bytes before the entire frame transmission is complete, the receiving device will discard this incomplete information and mistakenly interpret the following byte as part of the address field of a new frame. Similarly, if the interval between the start of a new frame and the end of the previous frame is less than 3.5 bytes, the receiving device will treat it as a continuation of the previous frame. Due to frame jamming, the final CRC check value will be incorrect, resulting in a communication failure.

Standard Structure of an RTU Frame

Frame Header	3.5-byte transmission time silence
Slave Address Field	1 - 247 (0 is the broadcast address)
Execute Command (CMD)	03H: Read slave parameters 06H: Write slave parameter
Data field DATA(N-1) … DATA(0)	2*N bytes of data; this section constitutes the main content of the communication and is also the core of data exchange during communication
CRC CHK least significant bit	Checksum: CRC checksum
CRC CHK High Bits	
Frame End	3.5 bytes of silence representing the transmission

6. Command Codes and Communication Data Descriptions

6.1 Command Code

Command Code: 03H (00000011), Read N Words (maximum of 5 consecutive words);

For example: For a variable frequency drive with a slave address of 01H, if the host computer wishes to read the parameter values for F0 - 04, the frame structure is described as follows:

RTU Host Command Information

Frame Header	3.5-byte silent period for transmission
Slave Address Field	01H
Execute Command CMD	03H
Start address	F0H
Start address (low	04H
High-order byte of	00H
Lesser-order byte of	01H
CRC CHK (Lords)	F6H
CRC CHK (high byte)	CBH
Frame End	3.5-byte transmission time silence

RTU Slave Command Information

Frame Header	3.5-byte transmission time silence
Address Domain ADDR	01H

Execute Command CMD	03H
Number of bytes to read	02H
F0 - 04 High-order bits	00H
F0-04 Parameter value	01H
CRC CHK (Lords)	79H
CRC CHK (low byte)	84H
Frame End	Silence for 3.5 bytes

Command Code: 06H (00000110), writes a word to a specified parameter address. For example: Writes 20.00 (actual data written is 2000, corresponding to hexadecimal data 7D0H) to parameter F0-07 of a drive with slave address 01H.

RTU Host Command Information

Frame Header	3.5-byte transmission time silence
Slave Address Field ADDR	01H
Execute Command CMD	06H
Start address	F0H
Start address (low	07H
High-order byte of	07H
Lesser-order byte of	D0H
CRC CHK (Lords)	08H
CRC CHK high byte	A7H
Frame End	3.5 bytes of silence during transmission

RTU Slave Command Information

Frame Header	3.5-byte transmission time silence
Slave Address Field ADDR	01H
Execute Command CMD	06H
Start address	F0H
Start address (low byte)	07H
High-order byte of the	07H
Lesser-order byte of	D0H
CRC CHK (Lords)	08H
CRC CHK High Byte	A7H
Frame End	3.5 bytes of silence during transmission

There are two ways to represent the start address. For example, the parameter FX.YZ can be written as FX.YZ (high-order byte first, low-order byte second) or as 0XYZ. When the operation command is 06, the host computer uses the first address representation method, and the written data is stored in the E2PROM. Using the second address representation method only modifies the data in RAM, which reduces the number of E2PROM operations.

Whether the host computer issues a read command (03) or a write command (06), an exception may occur; in this case, the inverter will return an error code.

RTU Slave Returns Error Information

Frame Header	3.5 bytes of silence
Slave Address Field	XX
Error Message	86H
High-order bit of	00
Low-order byte of	0X
CRC CHK Low Byte	XX
CRC CHK (high byte)	XX
Frame End	3.5 bytes of silence

Explanation of error code meanings:

01H: Invalid command

02H: Invalid address

03H: Invalid data

04H: CRC error

05H: Parameter cannot be modified

6.2 Communication Frame Checksum Methods

The error checking method for frames primarily consists of two parts: byte-level bit checking (parity checking) and checking the entire frame data (CRC checking).

6.2.1 Byte Checksum

Users can select different bit-level verification methods as needed, or choose to disable verification entirely.

Meaning of Odd Parity: A single odd parity bit is appended before data transmission to indicate whether the number of “1”s in the transmitted data is odd or even. If the number is odd, the parity bit is set to “0”; otherwise, it is set to “1,” thereby maintaining the parity of the data.

Meaning of even parity: A parity bit is appended before data transmission to indicate whether the number of “1”s in the transmitted data is odd or even. If the number is even, the parity bit is set to “0”; otherwise, it is set to “1,” thereby maintaining the data’s parity. For example, consider transmitting “11001110.”the data contains 5 “1”s. If even parity is used, the parity bit is “1”; if odd parity is used, the parity bit is “0.” During data transmission, the parity bit is calculated and placed in the parity bit position of the frame. The receiving device also performs parity checking; if it finds that the parity of the received data does not match the preset value, a communication error is detected.

6.2.2 CRC Check Method—CRC (Cyclic Redundancy Check)

When using the RTU format, the frame includes a frame error detection field calculated using the CRC method. The CRC field verifies the contents of the entire frame.The CRC field consists of two bytes containing 16 bits of binary data. It is calculated by the transmitting device and added to the frame. The receiving device recalculates the CRC of the received frame and compares it with the value in the received CRC field; if they do not match, it indicates a transmission error.

The CRC is initially set to 0xFFFF, and then a procedure is called to process the bytes in the frame against the value in the current register. Only the 8-bit data portion of each byte is valid for CRC calculation; the start bit, stop bit, and parity bit are all ignored.

During CRC generation, each 8-bit byte is XORed separately with the register's contents; the result is shifted toward the least significant bit (LSB), and the most significant bit (MSB) is filled with zeros. The LSB is extracted for verification: if the LSB is 1, the byte is XORed separately with a preset value; if the LSB is 0, this step is skipped. The entire process is repeated eight times.After the last bit (the 8th bit) is processed, the next 8-bit byte is XORed individually with the register's contents. The final value in the register is the CRC value calculated after processing all bytes in the frame.

This CRC calculation method follows the international standard CRC verification rules. When developing a CRC algorithm, users can refer to the relevant standard CRC algorithms to write a CRC calculation program that truly meets the requirements.

Here is a simple CRC calculation function for users' reference (written in C):

```
unsigned int crc_cal_value(unsigned char *data_value, unsigned char
data_length)
 {
     int  i;
     unsigned int crc_value = 0xffff; while
    (data_length--)
         {
             crc_value ^= *data_value++;
             for (i = 0; i < 8; i++)
             {
             if (crc_value & 0x0001) crc_value = (crc_value >> 1) ^ 0xA001; else
            crc_value = crc_value >> 1;
             }
         }
     return(crc_value);
 }
```

In ladder logic, CKSM calculates the CRC value based on the frame content using a lookup table. This method features simple code and fast computation, but it requires a significant amount of ROM space. Use with caution in applications with limited program space.

6.3 Definition of Communication Addresses

This section defines the addresses for communication data, which are used to control the operation of the inverter, retrieve its status information, and configure its functional parameters. The addresses for function parameters have been explained earlier. For example, the FX.YZ parameter can be represented as FX YZ (high-order byte first, low-order byte last) or as 0XYZ. When the operation command is 06, the host computer uses the first address notation; data written in this way is stored in the E2PROM. Using the second address notation only modifies the data in RAM, thereby reducing the number of E2PROM operations.

6.4 Method for Converting Binary to Hexadecimal:

In a binary number, every four digits from right to left correspond to one hexadecimal digit. If the most significant digit is less than four bits, pad it with zeros. Then, convert each group of four binary digits to decimal; 0000 - 1111 corresponds to decimal 0 - 15, which in turn corresponds to hexadecimal 0 - F. Based on the correspondence between decimal and hexadecimal, convert the decimal values to their corresponding hexadecimal values. (See the table below for the correspondence.) For example, 011 1101 1111 1001 can be divided into 0011 1101 1111 1001; consulting the table below yields the hexadecimal number 3DF9.

Binary	Decimal	Hexadecimal
1111	15	F
1110	14	E
1101	13	D
1100	12	C
1011	11	B
1010	10	A
1001	9	9
1000	8	8
111	7	7
110	6	6
101	5	5
100	4	4
11	3	3

10	2	2
1	1	1
0	0	0

6.5 Interference in 485 and CAN Communications and Solutions:

Steps	Solutions
1	Add 120Ω matching resistors at both ends of the bus (included as standard on the control board and expansion board; jumper required)
2	Use shielded twisted-pair cable with the shield grounded at both ends
3	Keep communication cables at least 50 cm away from power cables; do not run them parallel to each other
4	Install magnetic rings on both ends of the communication cable and wind 2 to 3 turns of wire around each ring
5	Install ferrite rings on the inverter’s RST input and UVW output terminals, and wind 2–3 turns of wire around each ferrite ring
6	Use shielded power cables, and ensure the shielding is properly grounded

6.6 Addressing Instructions for Other Functions:

Function	Address	Data Meaning	R/W
Monitoring Parameters	1000H 1001H . . 1015H 1016H	d-00 d-01 . . d-21 d-22	R
Run command	2000H (2000H)	0000H: Stop 0001H: Forward operation 0002H: Reverse operation 0003H: Fault Reset 0004H: Free Stop (any command channel is valid) 0005H: Jog Forward Operation 0006H: Jog Reverse Operation 0007H: Run Inhibited	W
Frequency Setpoint	2001H (4000H)	Percentage of the upper limit frequency; the upper limit frequency	W
Operating Status	2002H (3000H)	0000: Not in standby (undervoltage) 0001H: Forward operation 0002H: Reverse operation 0003H: Standby 0004H: Fault	R
Fault Code	2003H (5000H)	0: No fault 1: Software overcurrent… (See	R
Warning Code	2004H	0: No warning 1: Shutdown due to overvoltage… (See	R
Torque	2005H	-300.0 to 300.0%	W
Voltage-Frequenc	2006H	0.00 - 100.0%	R/W
PID Setpoint	2007H	0.00 - 100.0%	R/W
PID Feedback	2008H	0.00 - 100.0%	R/W
Communication Upper Limit	2009H	0.00 - 300.00 Hz	R/W
Torque Control	200 AH	0.00 - 100.0%	R/W
Torque Control	200BH	0.00 - 100.0%	R/W
Reset Command Status Output	200CH	0: Reset invalid 1: Reset enabled	R

6.7 Description of Monitoring Parameter Addresses

d-000 corresponds to 1000 d-099 corresponds to 1099
d-100 corresponds to 1100 d-199 corresponds to 1199
d-200 corresponds to 1200 d-299 corresponds to 1299
d-300 corresponds to 1300 d-399 corresponds to 1399

Monitoring Parameter	Corresponding Address	Hex	Decimal	R/W Characteristics
d-00	1000	1000	4096	R
d-01	1001	1001	4097	R
:	:	:	:	:
d-98	1098	1062	4194	R
d-99	1099	1063	4195	R

Monitoring Parameters	Corresponding Address	Hex	Decimal	R/W Attributes
d-100	1100	1100	4352	R
d-101	1101	1101	4353	R
:	:	:	:	:
d-198	1198	1162	4,450	R
d-199	1199	1163	4451	R

Monitoring Parameters	Corresponding Address	Hex	Decimal	R/W Characteristics
d-200	1200	1200	4608	R
d-201	1201	1201	4609	R
:	:	:	:	:
d-298	1298	1262	4706	R
d-299	1299	1263	4707	R

Monitoring Parameters	Corresponding Address	Hex	Decimal	R/W Characteristics
d-300	1300	1300	4864	R
d-301	1301	1301	4865	R

:	:	:	:	:
d-398	1398	1362	4962	R
d-399	1399	1363	4963	R

Note: Monitoring parameters starting with d-400 and beyond follow the same pattern.

Appendix 4: Motor Self-Learning Commissioning Method

一、 There are two types of motors: asynchronous motors and permanent magnet synchronous motors.

二、 There are three types of learning methods

1、 Static self-learning (motor stationary)

2、 Dynamic self-learning; (learning while the motor is rotating)

3、 Stator resistance self-learning; (learning the motor's stator resistance)

三、 Open-loop vector self-learning debugging method:

To achieve better control performance, the motor parameters must be learned before the motor begins operation. If the motor is not connected to a load, use the dynamic learning method; if the motor is connected to a load, use static learning or learn the motor's stator resistance separately.

1. Self-learning commissioning method for induction motors (no load, static):

The motor parameters are: rated frequency 50 Hz, rated voltage 1140 V, rated current 310 A, 4-pole, 1500 rpm. Set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=3	Inductive-Free Vector Control 2	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum frequency	
5	F2-00=0	Induction Motor	
6	F2-01=1140	Motor Rated Voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-04=0.75	Motor Rated Slip Frequency	
10	F2-05=4	Number of motor poles	Check F2-06 to verify if the motor

			speed is correct
11	F2-08=1	Static Self-Learning	

After setting the above parameters, the display will show “TUNE” flashing. Press the RUN key on the keypad to start; the RUN indicator will light up, indicating entry into the learning mode. The motor will not rotate. Use the left and right arrow keys on the keypad to cycle through and view the operating data during learning. This process lasts approximately 1 minute. Once learning is complete, “50.00” will flash on the display. After learning is complete, check parameters F2-10 through F2-18 to verify that the values learned by the motor are correct.

2、 Self-Learning Debugging Method for Induction Motors (No Load, Dynamic):

The motor parameters are: rated frequency 50 Hz, rated voltage 1140 V, rated current 310 A, 4-pole, 1500 rpm. Set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=3	Inductive-Free Vector Control 2	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum frequency	
5	F2-00=0	Induction Motor	
6	F2-01=1140	Motor Rated Voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-04=0.75	Motor Rated Slip Frequency	
10	F2-05=4	Number of motor poles	Check F2-06 to verify if the motor speed is correct
11	F2-08=2	Dynamic Self-Learning	

After setting the above parameters, “TUNE” will flash on the keypad. Press the RUN key to start; the RUN indicator will light up, indicating entry into the learning state. The motor will rotate. Use the left and right arrow keys on the keypad to switch between screens and view the operating data during learning. This process lasts approximately 1 minute. Once learning is complete, “50.00” will flash on the display. After learning is complete, check parameters F2-10 through F2-18 to verify that the values learned by the motor are correct.

3、 Self-Learning Debugging Method for Synchronous Motors (No Load, Static):

The motor parameters are: rated frequency 50 Hz, rated voltage 1140 V, rated current 310 A, 4-pole, 1500 rpm. Set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=3	Inductive-Free Vector Control 2	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum frequency	
5	F2-00=1	Synchronous Motor	
6	F2-01=1140	Motor Rated Voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-05=4	Motor Pole Count	You can check whether the motor speed (F2-06) is correct. In vector mode, the correct number of poles must be entered; otherwise, the motor will not operate properly
10	F2-08=1	Static self-learning	Back EMF can be entered manually

After setting the above parameters, the display will show “TUNE” flashing. Press the RUN key on the keypad to start; the RUN indicator will light up, indicating entry into the learning state. The motor will not rotate. Use the left and right arrow keys on the keypad to switch between screens and view the operating data during

learning. This process lasts approximately 1 minute. Once learning is complete, “50.00” will flash on the display. After learning is complete, check parameters F2-20 through F2-27 to verify that the values learned by the motor are correct.

4、 Self-Learning Debugging Method for Synchronous Motors (No Load, Dynamic):

The motor parameters are: rated frequency 50 Hz, rated voltage 1140 V, rated current 310 A, 4 poles, 1500 rpm. Set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=3	Inductive-Free Vector Control 2	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum Frequency	
5	F2-00=1	Synchronous motor	
6	F2-01=1140	Motor Rated Voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-05=4	Motor Pole Count	You can check whether the motor speed (F2-06) is correct. In vector mode, the correct number of poles must be entered; otherwise, the motor will not operate properly
10	F2-08=2	Dynamic Self-Learning	Learning Back-EMF

After setting the above parameters, “TUNE” will flash on the keypad. Press the RUN key to start; the RUN indicator will light up, indicating entry into the learning state. The motor will rotate. Use the left and right arrow keys on the keypad to switch between screens and view the operating data during learning. This process lasts approximately 1 minute. Once learning is complete, “50.00” will flash on

the display. After learning is complete, check parameters F2-20 through F2-27 to verify that the values learned by the motor are correct.

四、 Closed-Loop Vector Self-Learning Debugging Method:

To achieve better and more precise control performance, use a PG card to establish a closed-loop control system. There are two types of encoders compatible with PG cards: rotary and ABZ. Select the appropriate PG card based on the encoder type.

First, perform open-loop learning to ensure everything is operating normally, then proceed with closed-loop learning.

1. Self-Learning Debugging Method for Synchronous Motors (No Load, Dynamic):

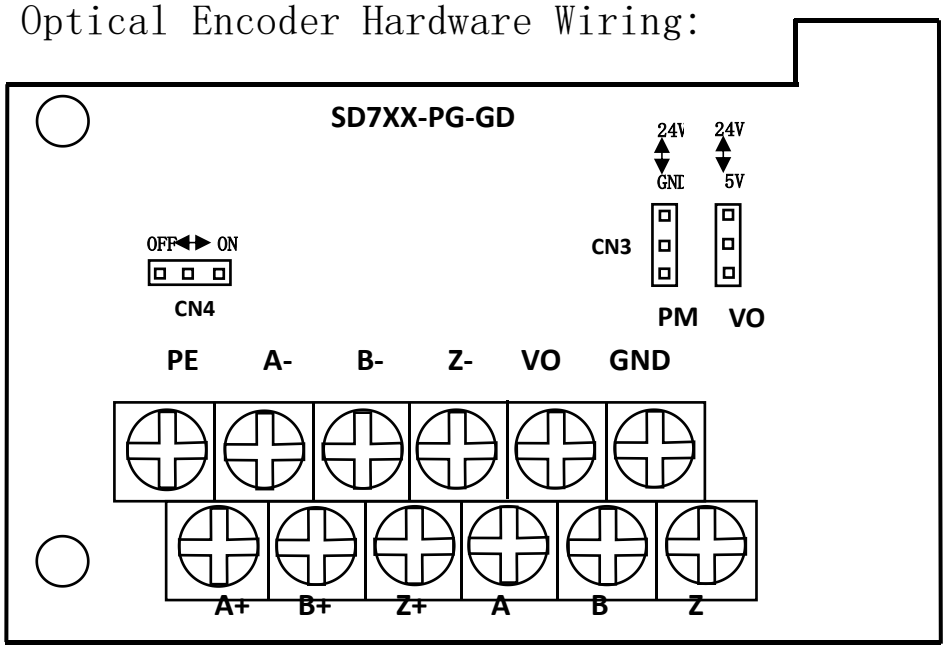
The motor parameters are: rated frequency 50 Hz, rated voltage 1140 V, rated current 310 A, 4-pole, 1500 rpm. Use **a rotary encoder** and set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=4	Vector Control with Sensor 1	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum frequency	
5	F2-00=1	Synchronous Motor	
6	F2-01=1140	Motor Rated Voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-05=4	Motor Pole Count	You can check whether the motor speed (F2-06) is correct. In vector mode, the correct number of poles must be entered; otherwise, the motor will not operate properly
10	F2-08=2	Dynamic Self-Learning	
11	Fb-00=0	Rotary Transformer	0: Rotating Transformer / 1: ABZ Encoder

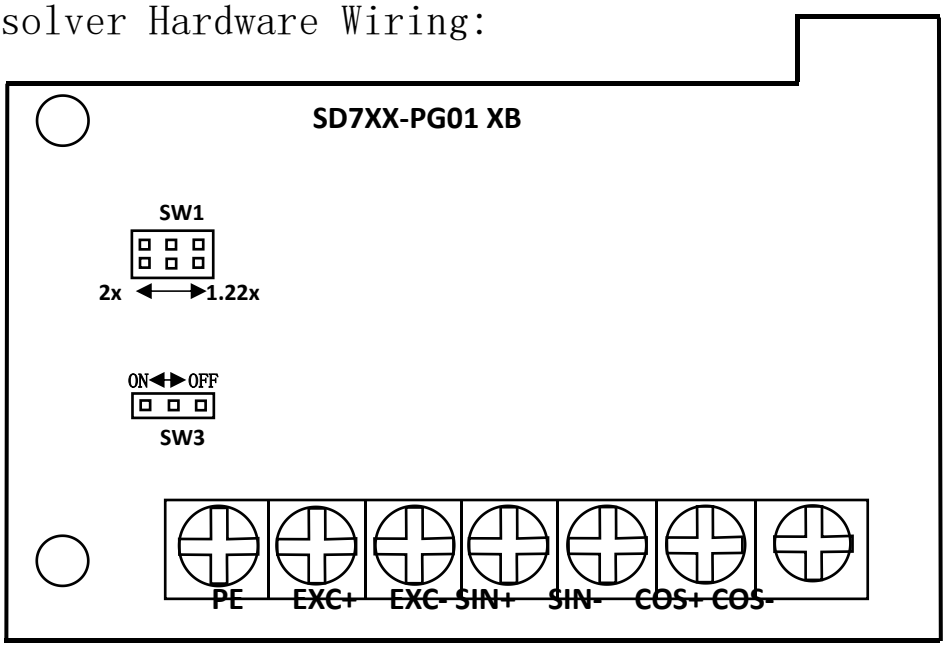
12	Fb-01=0	Direction Matches	0: Direction Matches / 1: Direction Opposite
13	Fb-04=1	Number of pole pairs in a rotary transformer	and the number of pole pairs of the motor are in an integer ratio
14	F2-24=?	Encoder Installation on a Synchronous Machine Angle	Value obtained during learning

After setting the above parameters, the display will show “TUNE” flashing. Press the RUN key on the keypad to start the process; the RUN indicator will light up, indicating entry into the learning mode. The motor will rotate. Use the left and right arrow keys on the keypad to switch between screens and view the operating data during the learning process. This will last for approximately 1 minute. Once learning is complete, “50.00” will flash on the display. After learning is complete, check parameters F2-20 through F2-27 to verify that the values learned by the motor are correct. If any fault codes appear, refer to the fault table for troubleshooting.

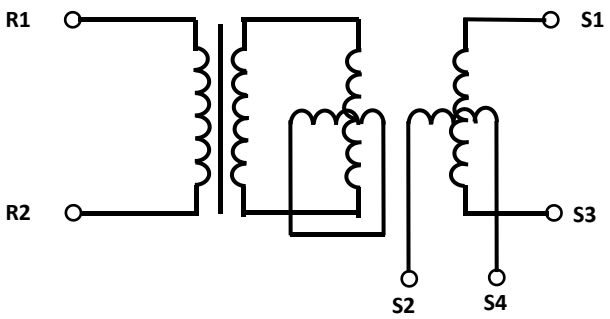
ABZ Optical Encoder Hardware Wiring:



Resolver Hardware Wiring:



引出线定义	
EXC+ 励磁正	橙
EXC- 励磁负	白
SIN+ 正弦正	黄
SIN- 正弦负	蓝
COS+ 余弦正	红
COS- 余弦负	黑



ABZ Encoder — PG Card Jumper Instructions

Operating Modes	PM	VO
A B Z	24V	24V
A+ A- / B+ B- / Z+ Z-	GND	5V
CN4	Whether the common-mode capacitor is grounded: ON means connected, OFF means not connected	Whether the common-mode capacitor is grounded: ON means connected, OFF means not connected

Resolver Encoder—PG Card Jumper Instructions

Switch	Description
SW1	Gain: Left is 2x, Right is 1.22x
SW3	Whether the common-mode capacitor is grounded: ON means grounded, OFF means not grounded

Closed-Loop Vector-Related Monitoring Parameters

Monitoring Parameters	Description	Range
d-033	Encoder Speed Feedback	0.01 Hz
d-034	Encoder Position Feedback	0.00 – 359.99 degrees
d-250	PG Feedback Frequency	0.00 – 600.00 Hz
d-251	Resolver angle feedback	0 – 4095
d-252	Number of Z-pulses detected (motor revolution count)	0 – 65,535
d-253	Cumulative Z-pulse error	0 – 65,535
d-254	ABZ Pulse Count	0 – 65535

Closed-Loop Vector PG-Related Fault Codes

Communication Code (Main Fault Code)	Fault Display (Number)	Fault Display (Character)	Fault Name	Fault Diagnostic Information (Fault Subcode)
37	Er.37	E.PG	PG Encoder Fault	3701—Parameter setting error (e.g., gear ratio out of limits)3702—Z-pulse error (incorrect number of lines)3703—Resolver Calibration Error3704—Resolver Wire Break3705-ABZ Open Circuit3706-Excessive speed error (Incorrect number of lines or line break)3707-Z Pulse Lost3712-Z Pulse Abnormal (High Interference)

2. Self-learning Commissioning Method for Synchronous Motors (No Load, Dynamic):

The motor parameters are: rated frequency 50 Hz, rated voltage 1140 V, rated current 310 A, 4-pole, 1500 rpm. An ABZ encoder is used. Set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=4	Vector Control with Sensor 1	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum frequency	
5	F2-00=1	Synchronous Motor	
6	F2-01=1140	Motor Rated Voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-05=4	Motor Pole Count	You can check whether the motor speed (F2-06) is correct. In vector mode, the correct number of poles must be entered; otherwise, the motor will not operate properly

10	F2-08=2	Dynamic Self-Learning	
11	Fb-00=1	ABZ Encoder	0: Rotary Transformer 1: ABZ encoder
12	Fb-01=0	Direction matches	0: Direction matches 1: Opposite direction
	Fb-02=1	Enabled	ABZ encoder Z-pulse detection enabled (synchronous motor must be enabled)
13	Fb-03=1024	Number of lines for ABZ encoder	Enter the actual number of lines for the encoder
14	F2-24=?	Synchronous Motor Encoder Installation Angle	Value learned

After setting the above parameters, the display will show “TUNE” flashing. Press the RUN key on the keypad to start the process; the RUN indicator will light up, indicating entry into the learning mode. The motor will rotate. Use the left and right arrow keys on the keypad to switch between screens and view the operating data during the learning process. This will last for approximately 1 minute. Once learning is complete, “50.00” will flash on the display. After learning is complete, check parameters F2-20 through F2-27 to verify that the values learned by the motor are correct. If any fault codes appear, refer to the fault table for troubleshooting.

After setting the control mode to Closed-Loop Vector and configuring the motor parameters, perform parameter auto-learning. In addition to the motor’s own electrical parameters being learned and updated, encoder-related parameters will also be updated.

If an encoder is installed and the motor wires are reversed or the motor’s direction of rotation is changed, you must perform a re-learning procedure; otherwise, the motor will not operate normally.

Parameter auto-learning fault: E.Tun-40xx, where xx indicates

No.	Fault Code	Fault Description	Solution
1	40 01	Output current exceeded limit (Generally occurs only during the learning phase of an asynchronous motor)	This is usually caused by the current Hall sensor or PWM direction being reversed or swapped Check the current sensor or PWM drive wires
2	40 02	Abnormal current direction detection Corresponds to Hall sensor fault 1715	Check the current sensor or PWM drive lines
3	40 03	Motor impedance imbalance	Motor impedance imbalance, phase loss, or current detection hardware malfunction
4	40 04	Current oscillation during rotation learning (Generally occurs only during learning with induction motors)	Increase the oscillation suppression gain under VF control F4-16
5	40 05\06 07\08	Current Exceeds Limit During Static Learning	Restart the learning process or increase the current limit control point FA-00 to 1.5 times the motor's rated current
6	40 09	Current continuously limited during dynamic learning	Check the load; during dynamic learning, the load must not exceed 30% of the rated torque; or increase the current limit value at control point FA-00 to 1.5 times the motor's rated current
7	40 10	Voltage saturation, open-circuit output Corresponds to output phase loss 2309	Check whether the motor voltage and current parameters are set correctly
8	40 11	Resistor value too high	
9	40 15\16\ 17\18\19	Abnormal parameter learning results	Restart learning or check whether the motor voltage and current parameters are set correctly

10	40 40	Learning timeout	Check whether the motor voltage and current parameters are set correctly
11	40 41\42	Parameter setting error	The carrier frequency required for motor learning exceeds the design range
12	40 45\46\47	The back-EMF learning value for the permanent magnet synchronous motor is significantly too low or too high	Ensure the load is less than 30%, then restart the learning process or check whether the motor voltage and current parameters are set correctly
13	40 48\49	The no-load current learning value for the induction motor is significantly too low or too high	Ensure the load is less than 30%, then restart the learning process Or check whether the motor voltage and current parameters are set correctly
14	40 50	During closed-loop vector dynamic learning, the PG feedback speed deviates significantly from the setpoint speed	Ensure the load is less than 30%, then restart the learning process Or check whether the encoder parameters are set correctly
15	40 51	During closed-loop vector static learning, PG feedback is not detected	Ensure the load is less than 30%, then restart the learning process Or check whether the encoder parameters or wiring are correct
16	40 52	Closed-loop vector control: PG feedback Z pulse not detected during static learning	Ensure the load is less than 30%, then restart the learning process Or check whether the encoder Z wiring is correct
No.	**Fault Code**	**Fault Description**	**Remedial Action**
17	40 53	Closed-loop vector control: Abnormal Z-pulse deviation during static learning	Restart the learning process or check if the encoder Z wiring is correct
18	40 54	Closed-loop vector control: During static learning, the PG-feedback speed is too high	Restart the learning process or increase the speed loop integral parameter (for high-inertia systems)
19	40 60	Abnormal current parameters	The difference between the motor current and the driver current is too large Learning parameter results cannot be guaranteed

20	40 61	Dynamic learning operating frequency greater than F0-08 maximum frequency	The dynamic learning frequency is typically within 60% of the motor's rated frequency; ensure that the F0-08 value is not lower than the motor's rated frequency
21	40 90	Learning process interrupted	If the stop command is pressed during the learning process, the learning is interrupted; perform the learning process again

Appendix 5: Master-Slave Control Example

In practical applications, many conveyor belt sites require master-slave control, where one master unit operates simultaneously with multiple slave units. Before implementing master-slave control, ensure that each inverter has completed standalone commissioning.

I. Standalone Commissioning

First, ensure that the RST input terminals of the inverter are securely connected to the power grid, and that the UVW output terminals are securely connected to the motor; do not reverse the input and output connections, and ensure that both the inverter and the motor are properly grounded. Then, power on the inverter. After initializing parameter F0-17=11, enter the motor nameplate parameters to perform self-learning and obtain the motor parameters, while also determining the motor's rotation direction.

1. Self-learning Commissioning Method for Synchronous Motors (No Load, Dynamic Self-learning):

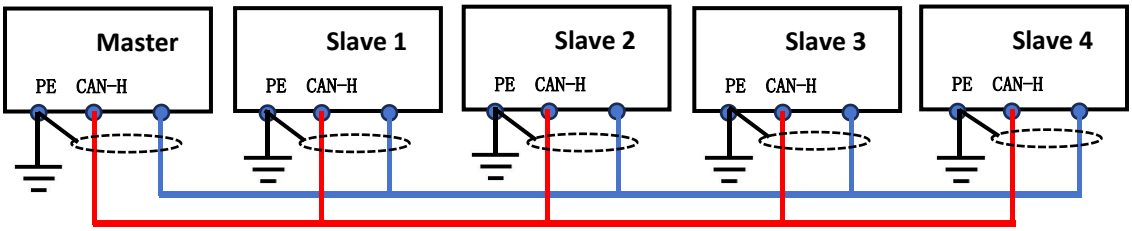
The rated frequency of the permanent magnet synchronous motor is 50 Hz, the rated voltage is 1140 V, the rated current is 310 A, 4 poles, 1500 rpm.

Set the relevant parameters as follows:

No.	Parameter	Parameter Definition	Remarks
1	F0-01=3	Inductive-Free Vector Control 2	
2	F0-02=0	Keyboard Control	
3	F0-03=0	Keyboard Input	
4	F0-08=50	Maximum frequency	
5	F2-00=1	Synchronous Motor	
6	F2-01=1140	Motor rated voltage	
7	F2-02=50	Motor Rated Frequency	
8	F2-03=310	Motor Rated Current	
9	F2-05=4	Number of motor poles	Check F2-06 to see if the motor speed is correct
10	F2-08=2	Dynamic	

		Self-Learning	

2. After setting the above parameters, the display will show “TUNE” flashing. Press the RUN key on the keypad to start the motor; the RUN indicator will light up, indicating the motor has entered the learning mode. The motor will begin rotating. Use the left and right arrow keys on the keypad to cycle through and view the operational data during the learning process. This will last for approximately 1 minute. Once learning is complete, “50.00” will flash on the display. After learning is complete, check parameters F2-20 through F2-27 to verify that the learned motor values are correct. Once the motor parameters are obtained, press the “RUN” key on the keypad to start the motor. Observe the operation, paying close attention to the motor’s rotation direction, and ensure it matches the direction of the belt drive. Only after confirming the directions match should you proceed with master-slave synchronization of multiple units. The wiring diagram is as follows:



A. Use shielded twisted-pair cable for CAN communication, with both ends of the shield grounded;

B. Connect CAN communication cables in a daisy-chain configuration; there is no need to connect a separate cable between the first and last cables;

C. CAN communication cables must not run parallel to power lines; they must be spaced at least 50 centimeters apart to improve interference resistance;

D. If interference occurs, install a ferrite bead on the CAN communication cable and wind the wire around it two to three times.

II. Multi-Drive Master-Slave Debugging (Synchronous Motors, Under Load; Master Runs in Speed Mode, Slaves Run in Torque Mode)

Taking a system with permanent magnet synchronous motors—one master and four slave units—as an example, where the master operates in speed mode and the slaves operate in torque mode, the parameter settings are as follows:

No.	Parameter	Master	Slave 1	Slave 2	Slave 3	Slave 4	Remarks
1	F0-01	3	3	3	3	3	Vector Control 2
2	F0-02	0	2	2	2	2	Run Command Channel
3	F0-03	1	10	10	10	10	Frequency

							Source Channel
4	F0-08	Set motor rated frequency					Upper Frequency Limit
5	F0-12	Master and slave settings are the same					Acceleration time
6	F0-13	Master and slave settings are the same					Deceleration time
7	F2-00	1	1	1	1	1	Synchronous Machine
8	A0-00	3	3	3	3	3	CAN Baud Rate
9	A0-01	0	1	2	3	4	Site Address
10	A0-03	1	1	1	1	1	CAN Enable
10	A0-04	0	1	1	1	1	0 Master/1 Slave
11	A0-06	1	0	0	0	0	1 Frequency / 0 Torque
12	A0-09	1	1	1	1	1	Disconnection Detection Time
13	A0-11	4	4	4	4	4	Number of Slaves

After setting the above parameters, issue the run command to the master drive to enable multi-drive operation with power balancing.

III. Master-Slave Debugging for Multi-Drive Systems (Synchronous Motors, No Load or Loose Belt; Master Runs at Speed, Slaves Run at Speed)

Taking permanent magnet synchronous motors as the drive motors, and using one master and four slave units as an example, the parameter settings for the master speed mode and slave speed mode are as follows:

No.	Parameter	Master	Slave 1	Slave 2	Slave 3	Slave 4	Notes
1	F0-01	3	3	3	3	3	Vector Control 2
2	F0-02	0	2	2	2	2	Run Command Channel
3	F0-03	1	10	10	10	10	Frequency Source Channel
4	F0-08	Set motor rated frequency					Upper Frequency Limit
5	F0-12	Master and slave settings are the same					Acceleration time
6	F0-13	Master and slave settings are the same					Deceleration time
7	F2-00	1	1	1	1	1	Synchronous Machine
8	A0-00	3	3	3	3	3	CAN Baud Rate
9	A0-01	0	1	2	3	4	Site Address
10	A0-03	1	1	1	1	1	CAN Enable

10	A0-04	0	1	1	1	1	0 Master/1 Slave
11	A0-06	1	1	1	1	1	1 Frequency / 0 Torque
12	A0-09	1	1	1	1	1	Disconnection Detection Time
13	A0-11	4	4	4	4	4	Number of Follow-on Aircraft
14	A0-20	5	5	5	5	5	Sag Control Frequency

After setting the above parameters, issue the run command to the master drive to enable multi-drive operation. In a mode where both the master and slave drives are running at the same speed, the system will adjust in real time based on the magnitude of the load current, ensuring that the output currents remain relatively balanced. If the droop control frequency cannot be adjusted properly, it can be increased appropriately.

4. Common Issues and Solutions for Master-Slave System Debugging

No.	Fault Symptom	Solution
1	CAN Communication Error Reported	1、 Check whether the master and slave parameters are set correctly 2、 Check whether the CAN communication cables are connected correctly
2	Power Imbalance	1、 Check whether the master and slave unit parameters are correct, especially the motor parameters 2、 Check for slippage between the motor and the belt 3、 Speed control mode: Is droop control enabled? 4、 Are the motors on the master and slave units the same? 5、 Are the drum diameters of the master and slave units the same? 6、 Are the acceleration and deceleration times the same for the master and slave units?
3	Interference	1、 Use shielded twisted-pair cable for the CAN communication line, with the shield grounded 2、 Route the CAN communication cables separately from the input and output power cables

		3、 Use shielded power cables, and ensure the shield is properly grounded 4、 Fit ferrite rings over the input and output power lines and wrap the wire around the ferrite rings twice 5、 Fit ferrite rings around the CAN communication cables and wrap the wires around the rings twice 6、 Reduce the baud rate

Appendix 6: PID Closed-Loop Commissioning

Enter the motor nameplate parameters into the inverter (F2-00 to F2-08). Once the learning process is complete and the inverter is operating normally in standalone mode, you may proceed with PID function debugging. The following are parameters related to PID debugging: (Select according to actual conditions)

F0-01=0/3 Control Mode
F0-02= Run Command
F0-03=5 Frequency Setpoint Mode: **PID** Closed-Loop Setpoint
F0-12= Acceleration Time
F0-13= Deceleration Time
F2-00=0/1 Motor Type (0—Induction Motor, 1—Synchronous Motor)
F5-00=2 AI1 Minimum Input (Default is 0–10 V; set the AI1 jumper to I for 0–20 mA input;
setting to 2 enables 4–20 mA input)
F6-00= Setpoint Channel Source (0/1—Keyboard, 2—AI1, 3—AI2)
F6-01= PID Setpoint Pressure
F6-02=0 PID feedback channel (0/1—keyboard, 2—AI1, 3—AI2)
F6-04= Proportional Gain (The higher the proportional gain, the faster the response)
F6-05= Integral time (the shorter the integral time, the greater the control action)

The sleep/wake-up function adjusts the following parameters:

F6-28= Sleep Mode (0-Off, 1-On)
F6-29= Sleep Frequency
F6-30= Sleep Delay Time
F6-31= Wake-up Deviation (Deviation between set pressure and feedback pressure)
F6-32= Wake-up Delay Time

The following are monitoring parameters related to PID control:

d-130	Process Closed-Loop Status	0–0xFFFF
d-131	Process closed-loop setpoint	0.0–100.0
d-132	Process closed-loop feedback	0.0–100.0
d-133	Process closed-loop error	-100.0–100.0
d-134	Process closed-loop output	-100.00 to 100.00

Appendix 7 Maintenance and Care

Due to the effects of ambient temperature, humidity, dust, vibration, and the aging of internal components, the inverter may experience potential issues during operation. To ensure long-term, stable operation of the inverter, it is necessary to perform daily and periodic maintenance and servicing.

1. Daily Inspection and Maintenance

Inspection Items	Inspection Details	Criteria
Operating Environment	1. Temperature and Humidity	1. When the temperature exceeds 40° C, the inverter cover should be opened
	2. Dust and Gases	2. No odors; no flammable or explosive gases
Cooling System	1. Installation	1. The installation environment must be
	2. Fan on the	2. The unit's fan is operating normally with
Inverter Unit	1. Vibration and	1. Vibration is stable, and the air
	2. Noise	2. No abnormal noise or odors
	3. Wires and	3. No loose fastening screws
Motor	1. Vibration and	1. Runs smoothly; temperature is normal
	2. Noise	2. No abnormal or uneven noise
Input and Output Paramete	1. Input Voltage	1. The input voltage is within the specified
	2. Output current	2. The output current is below the rated

2. Regular Maintenance

Depending on usage conditions, perform a routine inspection of the inverter every 3 or 6 months.

2.1 Inspection Items

① Check whether the screws on the control circuit terminal blocks are loose; if so, tighten them with a screwdriver.

② Check whether the screws on the main circuit terminal blocks are loose; if so, tighten them. Check the copper busbar connections for signs of overheating.

③ Check the main circuit and control circuit cables for damage, particularly for any cuts or tears in the outer sheath where it comes into contact with metal surfaces. Verify that the insulation on the main circuit power cables is intact.

④ Thoroughly clean dust from the air ducts, the unit's fan, and the circuit boards; clean more frequently in environments with high dust levels. Check the temperature and humidity inside the enclosure, and promptly replace or add desiccant as needed.

3. Inspection and Replacement of Wear-Prone Components

The main internal wear-prone components of a variable frequency drive (VFD) include the cooling fan and the electrolytic capacitors used for filtering. Their service life is closely related to the operating environment and maintenance conditions; the typical service life is

Component Name	Service Life
Cooling Fan	30,000 - 40,000 hours
Film Capacitor	100,000 hours

Users can determine the replacement interval based on operating time.

3.1 Cooling Fan

Possible causes of failure: Bearing wear, aging blades, cracks, etc. Diagnostic criteria: If abnormal noise is heard when the unit is turned on, carefully inspect the fan; if a fan failure is confirmed, replace the fan promptly.

3.2 Filter Capacitors

Possible causes of failure: high ambient temperature; excessive ripple current caused by frequent load fluctuations; aging of the electrolyte. Diagnostic criteria: measurement of capacitance; measurement of insulation resistance.

4. Storage and Warranty

4.1 Storage

If the inverter is not in use immediately after purchase or is to be stored for an extended period, observe the following precautions:

(1) Avoid storing the inverter in high-temperature, humid, or vibrating environments, or in areas with metal dust; ensure adequate ventilation.

(2) If the inverter is not used for an extended period, it should be powered on once every two years to restore the characteristics of the filter capacitors and to check the inverter's functionality. When powering on, gradually increase the voltage through an autotransformer, and ensure the power-on duration is no less than 5 hours.

4.2 Warranty

The warranty period for this inverter is 12 months (from the date of purchase). Domestic Market: The warranty covers defects in product quality for 12 months from the date of shipment; Overseas Market: No warranty is provided. The warranty coverage applies only to the inverter unit itself. Even after the warranty period expires, our company provides lifetime paid repair services. Please refer to the warranty agreement and warranty card.

Warranty Agreement

1、 The warranty period for this product is twelve months (as indicated by the barcode on the unit). During the warranty period, if the product malfunctions or is damaged under normal use as described in the user manual, our company will provide free repairs.

2、 During the warranty period, repair fees will be charged for damage caused by the following reasons:

A、 Damage caused by misuse, unauthorized repairs, or modifications;

B、 Damage caused by fire, flood, abnormal voltage, other natural disasters, or secondary disasters;

C、 Hardware damage resulting from accidental drops or transportation after purchase;

D、 Damage to the machine resulting from failure to follow the user manual provided by our company;

E、 Malfunctions or damage caused by factors unrelated to the machine (such as external devices);

3、 In the event of a product malfunction or damage, please fill out all sections of the “Product Warranty Card” accurately and in detail.

4、 Repair charges will be determined strictly in accordance with our company’s most recently updated “Repair Price List.”

5、 Replacement of this warranty card is generally not provided; please be sure to keep this card and present it to the repair technician when making a warranty claim.

6、 If you encounter any issues during the service process, please contact our authorized dealer or our company promptly.

7、 Our company reserves the right to interpret this agreement.

Customer Information

Customer Name:_____

Company Address:_____

Contact Person:_____

Phone:_____

Product Information

Product Name :_____

Product Model:_____

Product Barcode:_____

Inspector:_____ Date of Manufacture:_____

Commissioning Technicia_____ Commissioning Date:_____

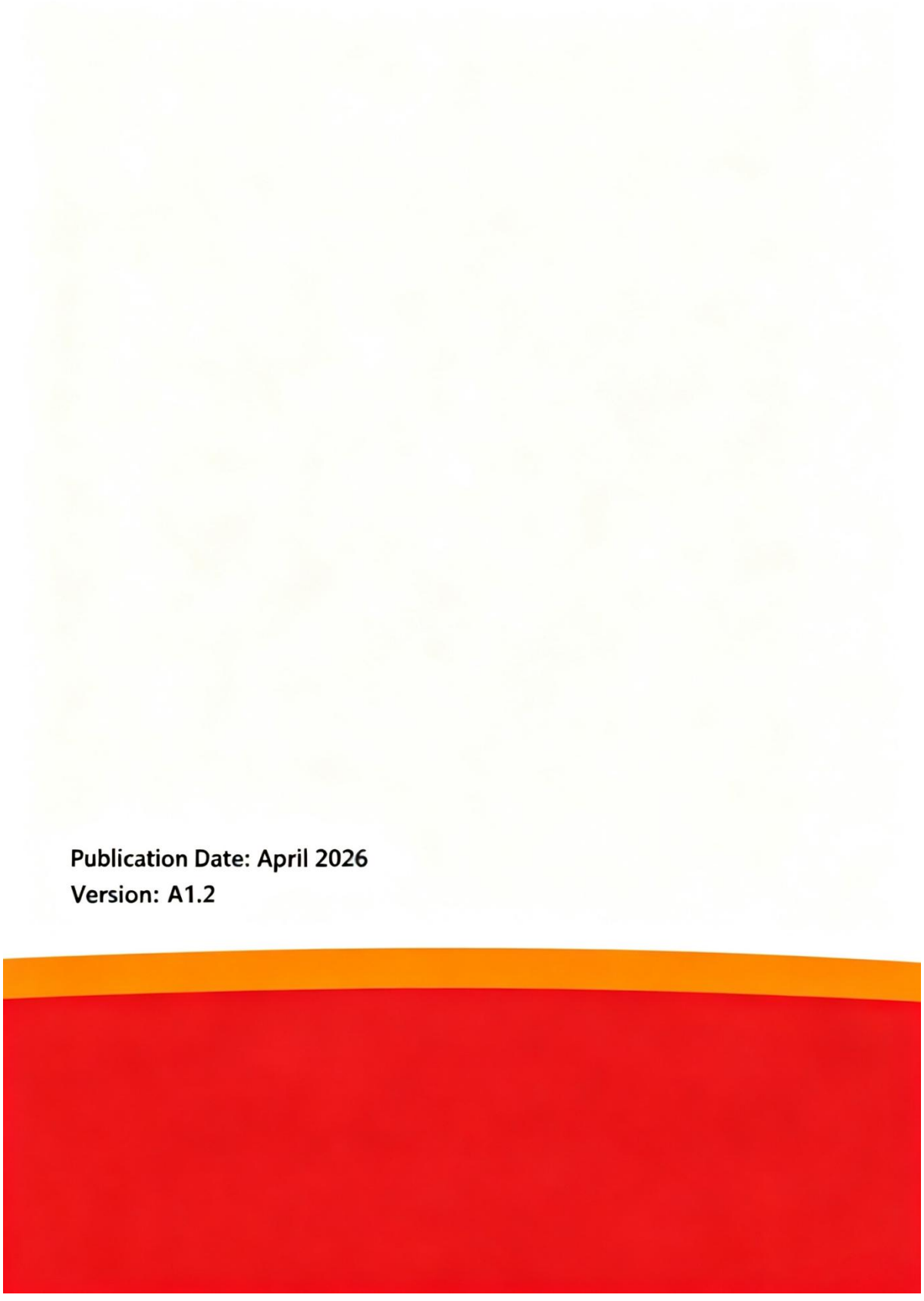
Maintenance Records

Maintenance Information:

Maintenance Information:

Maintenance Information:

Maintenance Information: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