ETAKE

ETAKE INVERTER

High Performance Sensorless Vector Control AC Drive

ED25 Series

User Manual

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قدم اول: 11 نکته ضروری که باید بدانید!

۱. جهت استپ/استارت موتور هرگز از قطع/وصل برق ورودی یا خروجی اینورتر استفاده نکنید.
۲. اگر ارتفاع محل نصب از سطح دریا بیش از 1000m است، توان اینورتر باید حداقل یک رنج بالاتر از بارِ آن باشد.
۳. اینورتر را بصورت عمودی نصب کنید و مطمئن شوید که تهویه گرما بخوبی صورت می‌گیرد.
۴. رطوبت، گردوخاک و ذرات‌شیمیایی/خورنده به دستگاه آسیب می‌زند. تمهیدات لازم را بیندیشید.
۵. فیوز تندسوز (Fast Fuse) با مشخصه aR، بهترین حفاظت برای ورودی اینورتر است.
۶. اگر نوسانات ولتاژ ورودی اینورتر بیش از 3% باشد، استفاده از چوک در ورودی اینورتر ضروریست.
۷. چنانچه طول کابل موتور بیش از 50m است، نصب چوک در خروجی اینورتر توصیه می‌گردد.
۸. استفاده از سیستم ارت استاندارد برای دستگاه توصیه می‌گردد.
۹. دقت شود اینورترِ ورودی سه‌فاز، به هیچ وجه نیازی به سیم نول ندارد.
۱۰. چنانچه بیش از یکسال دستگاه به برق وصل نشده باشد، برای استفاده باید خازن‌ها احیا گردند.
۱۱. جهت کاهش نویز روی تجهیزات جانبی از کابلهای شیلددار بین موتور و اینورتر استفاده نمایید.

قدم دوم: نصب دستگاه

همه رنج‌ها این دستگاه را می توان روی دیواره نصب کرد. البته باید توجه داشت که رنجهای زیر 4KW را میتوان بر روی ریل نیز نصب کرد. در هر حال حداقل 10cm فضای آزاد اطراف دستگاه لازم است:

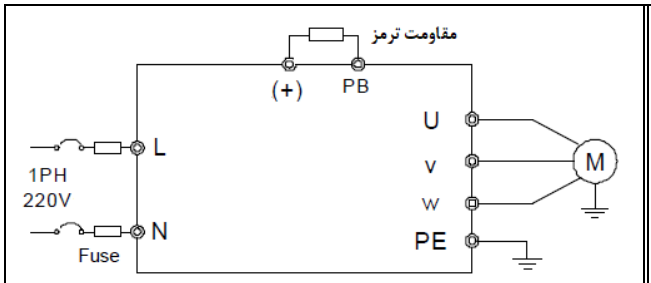
دمای محیط کاری قابل تحمل درایو، از 10c- تا 50c می باشد. اما توجه داشته باشید که در دمای بالاتر از 40c به ازای هر درجه افزایش، جریان دهی درایو 1% کاهش می یابد.

قدم سوم: اتصال کابل‌های قدرت

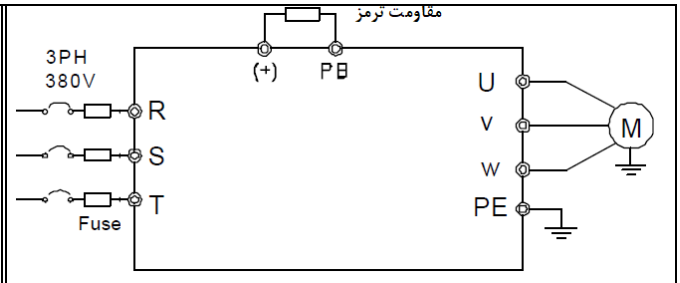
کابل برق ورودی، موتور و ... را با توجه به توضیحات جدول زیر وصل نمایید. لطفا خیلی دقت کنید!

ترمینال	رنج مربوطه	توضیحات
L , N	اینورتر ورودی تکفاز	این ترمینال‌ها برای اتصال فاز و نول ورودی است.
R, S, T	اینورتر 380v	این ترمینال‌ها برای اتصال سه‌فاز ورودی است.
U, V, W	همه رنج‌ها	این ترمینال‌ها برای اتصال به موتور سه‌فاز است.
PE	همه رنج‌ها	این ترمینال برای اتصال کابل اِرت است.
PB+	زیر 45kW[1]	برای اتصال به مقاومت ترمز (درصورت نیاز)
(+), (-)	بالای 2.2kW	ترمینال‌های باس DC
سربندی کلاف‌های موتور	اینورتر 220v	اگر ولتاژ پلاک موتور 110/220 است، موتور را بصورت ستاره و اگر 220/380 است آن را مثلث سربندی کنید.
	اینورتر 380v	اگر ولتاژ پلاک موتور 220/380 است، موتور را بصورت ستاره و اگر 380/660 است آن را مثلث سربندی کنید.

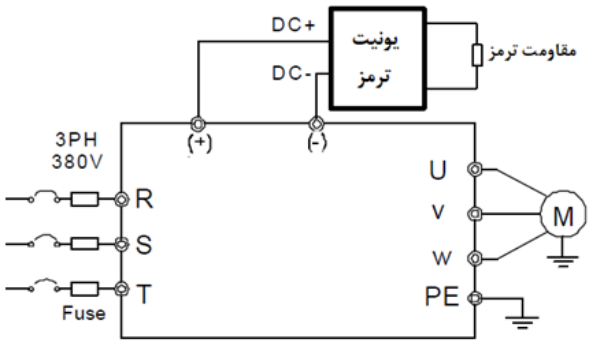
شکل زیر نحوه اتصال تجهیزات قدرت به اینورتر را نشان می دهد.



مدار قدرت درایو های تک فاز به سه فاز



مدار قدرت درایو های سه فاز با یونیت ترمز داخلی

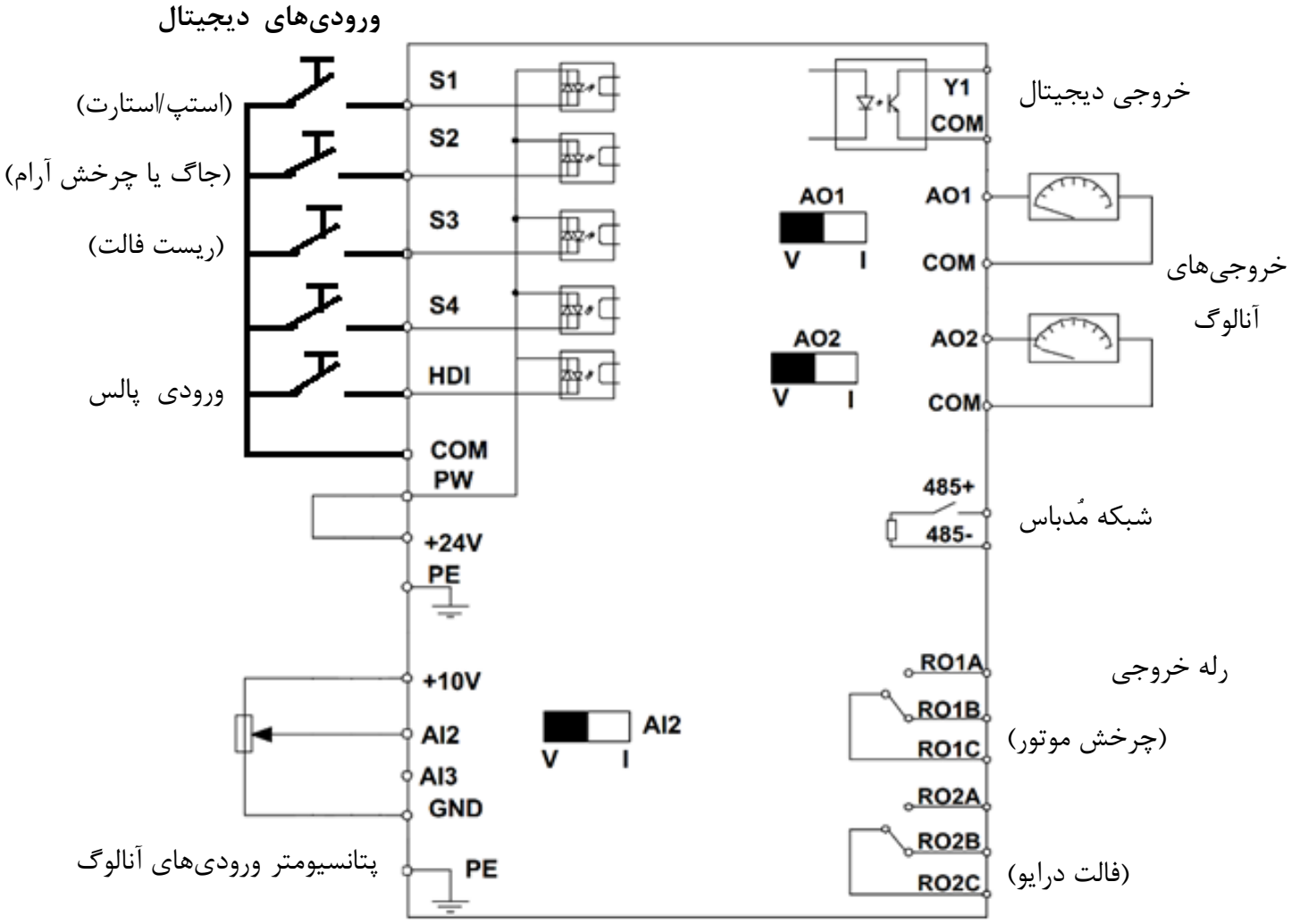


مدار قدرت درایو های سه فاز 45 KW و بالاتر به همراه یونیت ترمز خارجی

قدم چهارم: اتصالات مدار کنترل:

فرکانس دستگاه	فرکانس خروجی	0-400 Hz
حداکثر اضافه بار		150%به مدت 60 ثانیه و 180% به مدت 10 ثانیه
ورودی آنالوگ	AI2	0–10V/0–20mA تغییراز ولتاژی به جریانی با Dip Switch[2] اندازه اهمی پتاسیومتر برای ورودیAI2 بزرگتراز 5kΩ باشد.
	AI3	-10V–10V
خروجی آنالوگ	AO1, AO2	0–10V/0–20mA تغییر از ولتاژی به جریانی با Dip Switch
رله خروجی	دو رله RO1 و RO2	داری کنتاکت باز و بسته با ظرفیت 3A/AC250V و 1A/DC30V

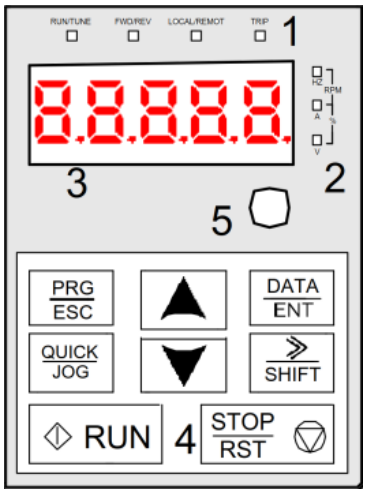
برای اتصالات مدار کنترل از دیاگرام زیر کمک بگیرید(تنظیمات پیش‌فرض با پرانتز مشخص شده‌اند)



قدم پنجم: کار با نمایشگر (کیپد)

اکنون برق ورودی دستگاه را وصل کنید. نمایشگر دستگاه و توضیحات آن به‌شرح صفحه بعد است:

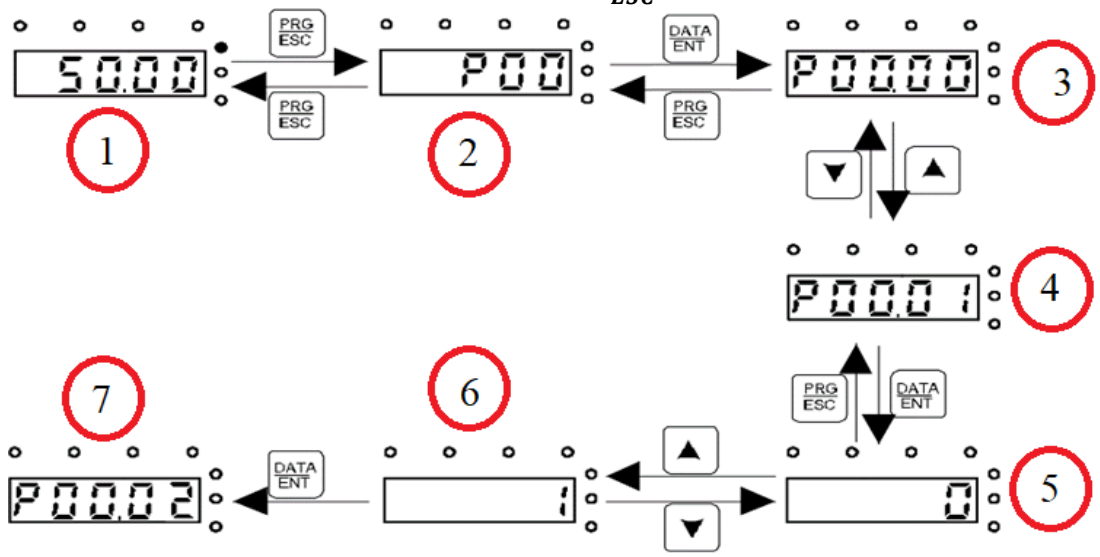
[2] در توانهای 4kw و بالاتر به جای dip switch از جامپر استفاده شده است.



آیتم	نام	توضیحات
	RUN/TUNE	روشن:کارکردِ موتور چشمک‌زن: درحال شناسایی موتور
1:	FWD/REV	نشانگر تغییر جهت چرخش (راستگرد یا چپگرد)
LEDهای وضعیت	LOCAL/REMOT	خاموش:کنترل از کیپد چشمک‌زن:کنترل از ترمینال روشن:ازمُدباس
	TRIP	روشن: در وضعیتِ فالت چشمک‌زن: در وضعیتِهشدار
2:	Hz , A , V	عدد نمایش داده شده فرکانس، جریان، ولتاژ است
LEDهای	Hz+A	عدد نمایش داده شده سرعت است (RPM)
واحد	A+V	عدد نمایش داده شده درصد است (%)
3:	نمایشگر	نمایش اعداد و پارامترها
4: دکمه‌ها	$\frac{PRG}{ESC}$	ورود/خروج از پارامتر و گروه پارامتر
	$\frac{DATA}{ENT}$	پیشروی قدم‌به‌قدم / ذخیره تغییر پارامترها
	▲▼	افزایش/کاهش اعداد و پارامتر
	$\frac{\gg}{SHIFT}$	دیدن ترتیبی پارامترهای مانیتورینگ / انتخاب رقم هنگام تغییر مقدار یک پارامتر
	RUN	استارت موتور در حالت کار از روی کیپد
	$\frac{STOP}{RST}$	استپ موتور / ریست فالت و آلارم
	$\frac{QUICK}{JOG}$	عملکرد این دکمه با پارامتر P07.02 قابل تنظیم است.
5:	ولوم کیپد	جهت تغییر دور از روی نمایشگر
6:	پورت کیپد	محل اتصال نمایشگر خارجی (آپشن)

برای یادگیری بیشتر، در شکل صفحه بعد روند تغییر پارامتر P00.01 از 0 به 1 را مشاهده نمایید:

وقتی که اینورتر برق دار می شود فرکانس رفرنس آن مطابق مرحله 1 شکل زیر، روی مانیتور چشمک میزند. اگر اینگونه نبود با فشار دادن دکمه $\frac{PRG}{ESC}$ عدد چشمک زن را بر روی مانیتور ایجاد کنید.



با فشار دادن دکمه $\frac{PRG}{ESC}$ مطابق مرحله 2 وارد گروه پارامترها شوید. با فشار دادن دکمه $\frac{DATA}{ENT}$ مطابق شکل 3 وارد زیر گروه پارامترها شوید. با استفاده از دکمه های جهت بالا و یا پایین پارامتر مد نظر خود را مطابق مرحله 4 انتخاب کنید. بعد از انتخاب پارامتر با فشار دادن دکمه $\frac{DATA}{ENT}$ مطابق مرحله 5 وارد پارامتر شوید و با استفاده از دکمه های بالا و پایین مقدار آن را همانند مرحله 6 تنظیم نمایید. در نهایت با فشار دادن دکمه $\frac{DATA}{ENT}$ مقدار تنظیمی ذخیره می شود و مانیتور پارامتر بعدی را جهت تنظیم نمایش می دهد(مرحله 7). قابل ذکر است در هر مرحله ای که باشید با فشار دادن دکمه $\frac{PRG}{ESC}$ به مرحله قبل هدایت می شوید.

قدم ششم: تنظیم پارامترهای مهم

حال باید پارامترهای درایو را بر اساس کاربری آن تنظیم گردد. در جدول زیر پارامترهای پرکاربرد درایو ارائه شده اند، در ادامه نیز چندین مثال عملی از عملکرد درایو آورده شده است که می تواند بسیاری از راه اندازی ها را پشتیبانی کند.

نکته: چنانچه درایو قبلا تنظیم شده است و می خواهید مجددا آن را تنظیم کنید پیشنهاد می شود با تنظیم P00.18=1 همه پارامترها را به تنظیمات کارخانه بازگردانید.

پارامتر	نام	توضیحات	پیش فرض
		P00: تنظیمات اصلی	
P00.00	مُد کنترل	0: وکتور کنترل1 1: وکتور کنترل2 2: کنترل V/F	2
P00.01	محل استارت	0: کیپد 1: ترمینال 2: شبکه مُدباس	0
P00.03		حداکثر فرکانسِ خروجی ممکن	50Hz
P00.04		حد بالای فرکانس کاری	50Hz
P00.05		حد پایین فرکانس کاری	0Hz

P00.06	محل اول تنظیم‌فرکانس	0: P00.10 4: ورودی پالس 7: کنترل PID	1: ولومِ کیپد 5:PLCداخلی 8:شبکه‌مُدباس	2: AI2 6: چندسرعته	3: AI3	0
P00.07	محل دوم					2
P00.09	محل نهایی تنظیم‌فرکانس	0: محل اول 2:جمع محل اول/دوم 4:بیشترینِ محل اول/دوم	1: محل دوم 3: تفریقِ محل اول/دوم 5: کمترینِ محل اول/دوم			0
P00.10	فرکانسِ کیپد	تنظیم فرکانس از کیپد				50Hz
P00.11	ACC	شتاب استارت اصلی (ACC) برحسب ثانیه				
P00.12	DEC	شتاب استپ اصلی (DEC) برحسب ثانیه				
P00.13	جهتِ چرخش	0: راستگرد	1: چپگرد	2: چپگرد ممنوع!		0
P00.15	Auto tune	0: غیرفعال	1: شناسایی‌کامل	2: شناسایی‌محدود		0
P00.18	ریستِ‌کارخانه‌ای	1: ریستِ‌تنظیمات	2: ریستِ‌اطلاعاتِ‌خطاها	3: قفل پارامترها		

P01: تنظیمات استپ/استارت

P01.00	مُد استارت	0: استارت از فرکانسP01.01 2,3: جستجویِ‌سرعت شفتِ‌چرخان(فقط بالای 2.2kW)	1: تزریق جریان DC قبل از استارت	0
P01.01		فرکانس استارت		0.5
P01.02		مدت زمان ایستادن روی فرکانس استارت (P01.01)		0s
P01.03		مقدار جریان DC قبل از شروع حرکت برای P01.00=1		0%
P01.04		مدت زمان تزریق جریان DC قبل از شروع حرکت		0s
P01.05	منحنی حرکت	0: خطی	1: Sشکل	0
P01.06 P01.07		مقدار انحنای ابتدا/انتهای منحنی حرکت به شکل S		0.1s
P01.08	روش استُپ	0: با شیب تنظیمی	1: خلاص‌کردن(Coast)	0
P01.09	فرکانس ترمز	فرکانس اعمال ترمز DC هنگام استپ		0Hz
P01.10	تاخیر ترمز	تاخیر زمانی برای اعمال ترمز DC		0s
P01.11	قدرت ترمز	شدت جریان ترمز DC (برحسب%)		0%
P01.12	مدت ترمز	مدت زمان اعمال ترمز DC		0s
P01.13	تاخیرِتغییرجهت	مدت زمان توقف قبل از تغییر جهت چرخش		0s
P01.14	فرکانسِ‌تغییرجهت	0: صفر	1: P01.01	2: باتوجه به P01.24, P01.15	1
P01.15	فرکانسِ استُپ				0.5
P01.16	مرجع P01.15	0: سرعت تنظیمی	1: سرعت واقعی (فقط مُد وکتور)		1
P01.17	تاخیر استپ	زمان تاخیر در استپ است اگر P01.16=1 باشد			0.5s
P01.18	حفاظتِ‌وصلِ‌برق	0: عدمِ‌استارت	1:استارت درصورت وجودِفرمان از ترمینال		0
P01.19		واکنش درایو به تنظیم فرکانسِ کمتر از P00.05			0

		0: ادامه کار روی P00.05 1: توقف 2: Stand-by	
P01.20		تاخیر استارت مجدد اگر فرکانس > P00.05 و P01.19=2	0s
P01.21		راه‌اندازی‌مجدد درصورت قطع/وصل برق: 0: خیر 1: بله	0
P01.22		زمان تاخیر راه‌اندازی مجدد اگر P01.21=1 باشد.	1s
P01.23		زمان تاخیر راه‌اندازی بعد از صدور فرمان استارت	0s
P01.24		زمان تاخیر در استپ است اگر P01.16=0 باشد	0s
P01.25	ولتاژِخروجیِ0Hz	0: بدون ولتاژ 1: با ولتاژ 2: جریان ترمزDC	0
		P02: پارامترهای موتور	
P02.01	توان نامی(kW)	P02.02 فرکانسِ‌نامی(Hz) P02.03 سرعتِ‌نامی(rpm)	
P02.04	ولتاژ نامی(V)	P02.05 جریان نامی(A)	
P02.26	حفاظتِ‌اضافه‌بار	0: غیرفعال 1: موتورِSelf-Cool 2: موتورِForce-Cool	2
P02.27		تنظیمِ‌حفاظتِ‌جریانی(درصدِ‌جریانِ‌واقعی‌به‌جریانِ‌نامیِ‌موتور)	100
P02.28	اصلاحِ‌نمایشِ‌توان	ضریبی جهت تغییر نمایشِ توان موتور	1
		P03: تنظیمات کنترل برداری (Vector Control)	
P03.00 P03.04	ضرایب P,I اول و دوم	ضرایب تناسبی/انتگرالی اول برای حلقه کنترل سرعت	
P03.02	فرکانسِ‌سوئیچ۱	زیر فرکانس1 فقط ضرایب اول، بالای فرکانس2 فقط ضرایب	5Hz
P03.05	فرکانسِ‌سوئیچ۲	دوم و بین این دو فرکانس ترکیب ضرایب اول/دوم	10Hz
P03.07 P03.08		ضرایب اصلاح لغزش در کنترل‌برداری(حالت موتوری/ژنراتوری)	100
P03.09 P03.10	ضرایب P,Iسوم	ضرایب PIحلقهٔ‌جریان(برای بهبود کنترل در حالت P00.00=0)	1000
P03.11	محل تنظیمِ گشتاور	0: غیرفعال 1: P03.12 2: ولومِ‌کیپد 3: AI2 4: AI3 5: ورودیِ‌پالس 6: چندگشتاوره 7: شبکه‌مُدباس	0
P03.12	تنظیم گشتاور	تنظیم گشتاور از کیپد	50%
P03.13		فیلتر زمانی مقدار P03.11	0.1s
P03.14	مرجعِ‌حداکثرفرکان سِ‌چپگرد/راستگرد	0: P03.16,03.17 1: ولومِ‌کیپد 2: AI2 3: AI3 4: ورودیِ‌پالس 5: چندفرکانسی 6: شبکه‌مُدباس	0
P03.15	کنترل گشتاور		0
P03.16		حداکثرفرکانسِ‌راستگرد در کنترلِ‌گشتاور وقتی P03.14=0	50Hz
P03.17		حداکثرفرکانسِ چپگرد در کنترلِ گشتاور وقتی P03.15=0	50Hz
P03.18	مرجعِ‌حداکثرگشتا	0: P03.20, 03.21 2: AI2 4: ورودیِ‌پالس	0
P03.19	ورِموتوری/ترمزی	1: ولومِ‌کیپد 3: AI3 5: شبکه‌مُدباس	0
P03.20		حداکثر گشتاورِ موتوری وقتی P03.18=0	180%
P03.21		حداکثر گشتاورِ ترمزی وقتی P03.19=0	180%

P03.22					ضریب تضعیف گشتاور در بالای سرعت نامی		0.3
P03.23					حداقل گشتاور در بالای سرعت نامی		20%
P03.27					نمایشِ‌سرعتِ وکتورکنترل برمبنای مقدارِ 0: واقعی 1: تنظیمی		0
P04: تنظیمات کنترل V/F							
P04.00	شکل منحنی V/F	0: خطی	1: چندنقطه	2: توانِ 1.3			0
		3: توانِ 1.7	4: توانِ 2	5: استقلال V از F			
P04.01	گشتاورِاستارت	تقویتِ گشتاور اولیه یا Boost(0% یعنی تنظیمِ‌اتوماتیک)					0%
P04.02		فرکانسِ اتمام تقویت‌گشتاور (برحسب%)					20%
P04.03 -04.08	نقاط V/F	تنظیمات تعیین نقاط V/F وقتی P04.00=1 باشد.					
P04.10 P04.11		ضریب کنترل نوسان در فرکانس های پایین/بالا					10
P04.12		تعیین مرز فرکانس مربوط به P04.10 , P04.11					30Hz
P04.26	کاهشِ‌مصرفِ‌انرژی	کاهشِ‌اتوماتیک مصرفِ‌انرژیِ پمپ‌وفن 0: غیرفعال 1: فعال					0
P05: تنظیمات ترمینال‌های ورودی							
P05.00	مُد ترمینالِ‌HDI	0: ورودیِ پالس		1: ورودیِ دیجیتال			0
P05.01	ترمینال S1	0: غیرفعال	16: سرعتِ‌اول	29: P03.11=0			1
		1: راستگرد	17: سرعتِ‌دوم	30: منعِ‌ACC/DEC			
		2: چپگرد	18: سرعتِ‌سوم	31: شمارشِ کانتر			
P05.02	ترمینال S2	3: استپِ‌لحظه‌ای	19: سرعتِ‌چهارم	33: مکثِ‌UP/Down			4
		4: جاگ‌راستگرد	20: مکثِ‌چندسرعت	34: ترمز DC			
		5: جاگ‌چپگرد	21: انتخابِ‌شتاب1	36: P00.01=0			
P05.03	ترمینال S3	6: استپِ‌خلاصی	22: انتخابِ‌شتاب2	37: P00.01=1			7
		7: ریستِ فالت	23: استپِ PLC	38: P00.01=2			
		8: مَکث	24: مکثِ PLC	39: پیش‌تحریک			
P05.04	ترمینال S4	9: فالت خارجی	25: مکثِ PID	40: ریستِ‌kWhشُمار			0
		11: کاهشِ‌سرعت	27: مکثِ‌تراورس	42: توقفِ‌اضطراری			
P05.09	ترمینال HDI اگر P05.00=1	12: حذفِ‌سرعت	28: ریستِ‌کانتر	61: تغییرِ‌P09.03			0
		13تا15: شیفت‌بین محل تنظیم فرکانس اول/دوم/نهایی					
P05.10	پُلاریتهٔ ورودیها	قطع/وصل بودن اولیه ترمینال‌های فوق (بصورت هِگز)					000
P05.11	فیلتر زمانی	فیلتر زمانی سوئیچ‌های فوق					0.01s
P05.13	چگونگی استپ/استارت	0: سوئیچِ‌راستگرد/چپگرد 1: سوئیچِ‌استارت/جهت					0
		2:پوش‌باتومِ استپ/استارت/جهت (توضیحات بیشتر در مثال2)					
		3: پوش‌باتومِ راستگرد/چپگرد/استپ					
P05.14 -05.31	تاخیر زمانی	تاخیر زمانی در عملکرد بعد از فرمان قطع/وصل ترمینالهای فوق					0s

P05.32	حدِ بالا/پایین ولتاژ ولوم	حدِ بالا/پایین ولتاژ ورودی آنالوگِ ولومِ کیپد	0v
P05.34			10v
P05.33	حدِ بالا/پایین کمیتِ مربوطه	حدِ بالا/پایین کمیتِ (فرکانس، گشتاور ...) مرتبط با ولومِ کیپد	0%
P05.35			100%
P05.37	حدِ بالا/پایین سیگنالِ AI2	حدِ بالا/پایین ولتاژ یا جریان ورودی آنالوگ AI2 (در مُد جریانی 10v=20mA)	0v
P05.39			10v
P05.38	حدِ بالا/پایین کمیتِ مربوطه	حدِ بالا/پایین کمیتِ(فرکانس، گشتاور ...) مرتبط با AI2	0%
P05.40			100%
P05.42	حدِ پایین/وسط بالایِ سیگنالِAI3	حدِ پایین/وسط/بالایِ ولتاژ ورودی آنالوگ AI3	-10v
P05.44			0v
P05.46			10v
P05.43	حدِ پایین/وسط/ بالایِ کمیتِ مربوط	حدِ پایین/وسط/بالای کمیتِ (فرکانس، گشتاور ...) مرتبط با ورودی آنالوگ AI3	-100%
P05.45			0%
P05.47			100%
P05.50	حدِ بالا/پایین فرکانسِ HDI	حدِ بالا/پایین فرکانسِ پالس ورودیHDI(برحسبkHz)	0
P05.52			50
P05.51	حدِ بالا/پایین کمیتِ مربوطه	حدِ بالا/پایین کمیتِ(فرکانس، گشتاور ...) مرتبط با ورودی پالس HDI	0%
P05.53			100%

P06: تنظیمات ترمینال‌های خروجی

P06.01	ترمینال Y1	0: غیرفعال 1:درحال‌کار 2: راستگرد	8: فرکانسِ‌نهایی 9: فرکانسِ‌صفر 10: P00.04	16 و 17: تکمیلِ مرحله/سیکلِ PLC 18: P08.25	0
P06.03	ترمینال RO1	3: چپگرد 4: جاگ 5: فالت	11: P00.05 12: آمادهٔ کار 13: پیش‌تحریک	19: P08.26 20: فالتِ خارجی 22: P08.27	1
P06.04	ترمینال RO2	6: P08.32	14: P11.09	23: خروجیِ مجازی	5
P06.05	پُلاریتهٔ‌خروجیها	NO/NC بودن ترمینال‌های فوق (بصورت هِگز)			0
P06.06 -06.13	تاخیر زمانی	تاخیر در قطع/وصل ترمینالهای فوق (ON/OFF Delay)			0s
P06.14	ترمینال AO1	0: فرکانسِ‌موتور 1: فرکانسِ‌تنظیمی 3: دورِ موتور	7: توانِ موتور 8: گشتاورِتنظیمی 9: گشتاورِموتور	12: AI3 13: ورودیِ‌پالس 14و15: ازمُدباس	0
P06.15	ترمینال AO2	4و5: جریانِ‌موتور 6: ولتاژِ موتور	10: ولومِ کیپد 11: AI2	22: جریانِ‌گشتاور 23 :فرکانسِ‌شتاب	0
P06.17	حدِ بالا/پایین کمیتِ مربوطه	حدِ بالا/پایین کمیتِ(فرکانس، گشتاور ...)مربوط به‌AO1			0%
P06.19					100%

P06.18	حدِ بالا/پایین	حدِ بالا/پایین ولتاژ یا جریان AO1 (در مُد جریانی (0.5v=1mA	0v
P06.20	سیگنالِ AO1		10v
P06.22	حدِ بالا/پایین	حدِ بالا/پایین کمیتِ(فرکانس، گشتاور ...)مربوط بهAO2	0%
P06.24	کمیتِ AO2		100%
P06.23	حدِ بالا/پایین	حدِ بالا/پایین ولتاژ یا جریان AO2 (در مُد جریانی (0.5v=1mA	0v
P06.25	سیگنالِ AO2		10v
P06.xx	فیلترِ AO1,2	فیلتر زمانی سیگنال: P06.21: AO1 P06.26: AO2	0s
		P07: پارامترهای کیپد و سیستم	
P07.00	رمز حفاظتی	پسوورد برای تنظیم پارامترها	0
P07.02	عملکرد دکمه‌ها	یکان: دکمه QUICK/JOG دهگان: قفلِ دکمه‌ها 0: غیرفعال 0: باز 1: جاگ 1: قفل 2: تغییرنمایش بکُمک SHIFT 2: فقط قفلِ دکمه PRG/ESC 3: تغییر جهت 4: ریستِ مقدارUP/Down 5: استپِ خلاصی 6: شیفتِ P00.01	01
P07.03	شیفتِ P00.01	تنظیمِ شیفت بین مقادیرِ مختلفP00.01 با QUICK/JOG	
P07.04	تنظیم STOP	امکان استپ موتور با STOP/RST در حالتهای مختلف	
P07.05 -07.07	مانیتور ترتیبی با دکمه SHIFT	انتخاب پارامترهای مختلف برای مانیتور با استفاده از فشردن متناوب دکمه SHIFT در حالت کار یا توقف	
P07.08 -07.10	ضرایب تغییر نمایش	ضرایب جهت اصلاح مقدار نمایش داده شده برای مقادیر فرکانس، سرعت دورانی و خطی	1
P07.12		نمایش دمای ماژول خروجی اینورتر (°C)	•
P07.14		نمایش ساعت کارکرد موتور	•
P07.15 P07.16		نمایش انرژی مصرفی برحسب kWh	•
P07.18 -07.20		نمایش مقادیر نامی توان/ولتاژ/جریان اینورتر	•
P07.27	فالتِ فعلی	0: عدمِفالت 1و2و3: OUt1,2,3 4و5و6: OC1,2,3	•
P07.28	1 فالت‌قبل	10: UV 7و8و9: OV1,2,3 11و12و25: OL1,2,3	•
P07.29	2 فالت‌قبل	17: EF 13و14: SPI,SPO 15و16: OH1,2 18: CE 19: ItE 20: tE 21: EEP	•
P07.30	3 فالت‌قبل	22: PIDE 23: bCE 24: END 26: PCE 27: UPE 28: DNE 32و33: ETH1,2	•
P07.31	4 فالت‌قبل	34: dEu 35: STo 36: LL	•
P07.32	5 فالت‌قبل	**توضیحات بیشتر در جدول فالت‌ها در انتهای دفترچه	•

		فالت فعلی	1 فالت‌قبل	2 فالت‌قبل	
جزئیات ثبت‌شده در لحظه وقوع فالت	فرکانس موتور	P07.33	P07.41	P07.49	•
	فرکانس شتاب	P07.34	P07.42	P07.50	•
	ولتاژ موتور	P07.35	P07.43	P07.51	•
	جریان موتور	P07.36	P07.44	P07.52	•
	ولتاژ DC-Bus	P07.37	P07.45	P07.53	•
	دمای اینورتر	P07.38	P07.46	P07.54	•
	وضعیت ترمینالهای ورودی	P07.39	P07.47	P07.55	•
	وضعیت ترمینالهای خروجی	P07.40	P07.48	P07.56	•

P08: تنظیمات پیشرفته			
P08.00 -08.05	ACC/DEC 2,3,4	شتابهای استارت/استپ 2و3و4 – قابل انتخاب با DI	
P08.06	فرکانس جاگ		5Hz
P08.09 -08.14	فرکانس پرش	فرکانسهای پرش 1تا 3 و دامنه پرش هرکدام	0Hz
P08.15 -08.18	عملکرد تراورس	تنظیمات مربوط به عملکرد Traverse	
P08.19	تعدادِ اعشار	یکان: برایِ سرعتِ‌خطی دهگان: برایِ فرکانس	00
P08.21	شتابِ‌توقفِ اضطراری	شتابِ توقف (DEC) اضطراری (۰ یعنی استپِ خلاصی)	0s
P08.25	شمارش نهایی	با رسیدن تعداد شمارش کانتر به هریک از این مقادیر یک رله برای فعال شدن قابل تنظیم است.	0
P08.26	و میانی کانتر		0
P08.27	زمانِ‌کارکردِ‌موتور	دقایق کارکرد موتور برای فعال شدن رله تنظیم‌شده	0min
P08.28	دفعاتِ‌ریستِ‌فالت	تعداد دفعات ریستِ اتوماتیک فالت و استارت مجدد	0
P08.29	تاخیر در ریست	تاخیر زمانی بین وقوع فالت تا استارت اتوماتیک	1s
P08.30	نرخِ بالانس	نرخِ واکنش به نابالانسیِ بار در سیستمِ متصل‌به چنددرایو	0Hz
P08.32	فرکانس 1و2 برای عملکرد رله	با رسیدن فرکانس موتور به این مقادیر، رله تنظیم شده مربوطه فعال می‌شود.	50Hz
P08.34			50Hz
P08.33	دامنهٔ‌تاخیر 1و2 در قطع رله‌ها	دامنه تاخیر فرکانسی برای قطع رله فعال‌شده در P08.32	5%
P08.35		دامنه تاخیر فرکانسی برای قطع رله فعال‌شده در P08.34	5%
P08.36	دامنهٔ‌عملکرد رله	دامنه فعال شدن رله در تنظیم روی فرکانس نهایی(8)	0Hz
P08.37	ترمز دینامیکی	عملکرد چاپر ترمز دینامیکی(مقاومتی): 0: غیرفعال 1: فعال	0
P08.38	ولتاژِ‌عملکردچاپر	ولتاژِعملکرد چاپر ترمز (اگر ولتاژ نُرمال است تغییر ندهید)	
P08.39	عملکردِ فن درایو	0: عملکرد بهینه 1: دائماً روشن	0
P08.42 -08.47		تنظیمات اضافی مربوط به ولومِ کیپد و UP/Down	

P09: تنظیمات کنترل PID			
P09.00	محل تنظیم Set-Point	0: P09.01 1: ولومِ‌کیپد 2: AI2 3: AI3 4: ورودیِ‌پالس 5: چندپله‌ای 6: شبکه‌مُدباس	0
P09.01		تنظیم Set-Point از کیپد وقتی P09.00=0 باشد	0%
P09.02	محل اتصال فیدبک/سنسور	0: ولومِ‌کیپد 1: AI2 2: AI3 3: چندپله‌ای 4: شبکه‌مُدباس 5: بیشترینِ AI2, AI3	0
P09.03	مشخصهٔ‌سیستم	با افزایش دور موتور، مقدار سنسور 0: زیاد 1: کم میشود	0
P09.04 -09-06	ضرایب P, I, D	ضریبP: P09.04 ضریبI: P09.05 ضریبD: P09.06	
P09.07	نمونه‌برداری	فاصله زمانی نمونه‌برداری از فیدبک/سنسور	0.1s
P09.08	اختلاف مجاز	محدودهٔ مُجاز خطا که در آن محدوده دور ثابت می‌ماند	0%
P09.09	حداکثر و	حداقل/حداکثر فرکانس مجاز در کنترل PID (برحسب %)	100
P09.10	حداقل فرکانس		0
P09.11	تشخیص قطع	اگر مقدار فیدبک کمتر از P09.11 باشد و زمانی به اندازهٔ	0%
P09.12	فیدبک/سنسور	P09.12 هم سپری شود، اعلام فالت PIDE می‌شود	1s
P09.15	شتابACC/DEC	شتاب استارت/استپ در حالت کنترل PID	0s
P09.16	فیلتر PID	فیلتر زمانی خروجی PID	0s
P10: تنظیمات PLC داخلی و عملکرد چندسرعته			
P10.00	تکرارِسیکلِPLC	0: فقط1سیکل 1:ادامهٔ‌کار در دور نهایی 2:تکرارِسیکل	0
P10.01	ذخیره وضعیت	وضعیتPLC درصورت قطع برق: 0:عدمِ‌ذخیره 1:ذخیره	0
P10.02 تا P10.33	۱۶پلهٔ‌فرکانس و زمانِ هرکدام	پارامترهایِ‌زوج(مثلاP10.06): فرکانسِ‌پله (100%...-100%) پارامترهایِ‌فرد(مثلاP10.07): زمان کارکردِ فرکانس متناظر	
P10.34 P10.35	انتخابِ شتاب ACC/DEC	انتخاب از بینِ شتاب‌های 1-4 برای 16پلهٔ سرعت فوق. پیش‌فرض ACC/DEC اصلی است (P00.11, P00.12)	
P10.36	نقطهٔ‌شروعِPLC	0: استارت از ابتدا 1: از آخرین نقطه کارکردِ قبلِ توقف	0
P10.37	واحد زمان	واحد پارامترهای زمانِ کارکرد پله‌ها: 0: ثانیه 1: دقیقه	0
P11: تنظیمات حفاظتی			
P11.00		یکان: حفاظتِ قطع‌فازِ ورودی (نرم‌افزاری) 0: غیرفعال 1: فعال دهگان: حفاظتِ قطع‌فازِ خروجی (نرم‌افزاری) 0: غیرفعال 1: فعال صدگان: حفاظتِ‌قطع‌فازِ ورودی (سخت‌افزاری) 0: غیرفعال 1: فعال	010 یا 110
P11.01	هنگام افتِ‌ولتاژ	0: تداوم کارکرد با کاهش دور مدیریت‌شده 1: اعلام فالت	0
P11.02	لحظه‌ای شبکه	شیب کاهش دور درحالت P11.01=0 (برحسب Hz/s)	10
P11.03	هنگامِ‌اضافه‌ولتاژ	0: اعلام فالت 1: مدیریت اضافه‌ولتاژ با عدمِ کاهش دور	1
P11.04	در کاهش‌دور	مقدار اضافه ولتاژ برای حالت P11.03=1 (برحسب%)	130

P11.05		برای غیرفعال کردن حفاظت جریانی (پیش‌فرض فعال است)	
P11.06	محدودیت‌جریان	محدودکردن جریانِ‌موتور با کاهش دور(هنگام کارِعادی)	160%
P11.07	شیبِ‌کاهش‌دور	یا با توقف افزایش‌دور (هنگام شتاب‌گیری-ACC)	10Hz/s
P11.09	جریانِ‌عملکردِرله	اگر جریان موتور از P11.09 بیشتر شود و مدت زمانی به	150%
P11.10	زمانِ‌تأخیرِعملکرد	اندازه P11.10 ادامه یابد، رله تنظیم‌شده عمل می‌کند	1s
P11.11	جریانِ‌عملکردِرله	اگر جریان موتور از P11.11 کمتر شود و مدت زمانی به اندازه	50%
P11.12	زمانِ‌تأخیرِعملکرد	P11.12 ادامه یابد، رله تنظیم‌شده عمل می‌کند	1s
P11.13	تنظیمِ عملکردِ رلهٔ فالت	یکان:هنگام فالتِ آندر ولتاژ 0: فعال 1: غیرفعال دهگان:هنگامِ‌ریستِ‌اتوماتیکِ فالت: 0: فعال 1: غیرفعال	00
P11.14	انحرافِ سرعت	اگر اختلاف سرعت واقعی با تنظیمی بیش از P11.14 باشد و	10%
P11.15	زمانِ‌تأخیرِعملکرد	مدت زمانی به اندازه P11.15 طول بکشد، فالت میدهد	0.5s
P11.16		یکان: کاهش اتوماتیک دور در صورت افت ولتاژ شبکه 1: غیرفعال 1: فعال دهگان: سوئیچ اتوماتیک به ACC/DEC دوم در بالای فرکانس P08.36 0: غیرفعال 1: فعال	00

P17: پارامترهای مانیتورینگ

P17.00	فرکانسِ‌تنظیمی	P17.11	ولتاژ DC-Bus	P17.22	ورودی پالس
P17.01	فرکانس موتور	P17.12	دیجیتالهای ورودی	P17.23	ست‌پوینت PID
P17.03	ولتاژ موتور	P17.13	رله‌های خروجی	P17.24	فیدبک PID
P17.04	جریان موتور	P17.18	شمارش کانتر	P17.26	کارکردِموتور(min)
P17.05	سرعت موتور	P17.19	ولومِ کیپد	P17.35	جریان ورودی
P17.08	توان موتور	P17.20	AI2	P17.37	دفعات اضافه بار
P17.09	گشتاورموتور	P17.21	AI3	P17.38	خروجی PID

توجه۱: بعد از تنظیم پارامترها جهت افزایش دقت و قدرت، Autotune مفید است. بدین منظور شفتِ موتور را آزاد کنید، سپس P00.15=1 قرار دهید (اگر شفت را نمی شود آزاد کرد، P00.15=2 قرار دهید) نهایتاً دکمه RUN را زده و منتظر بمانید تا LED چشمک‌زنِ RUN/TUNE خاموش شود.

توجه۲: بعد از Autotune به منظور اطمینان از صحت جهت چرخش موتور، دکمه QUICK/JOG را فشار دهید تا موتور به آرامی بچرخد. اگر جهت چرخش اشتباه است، جای دو فاز خروجی را جابجا کنید.

قدم هفتم: مثالهای کاربردی

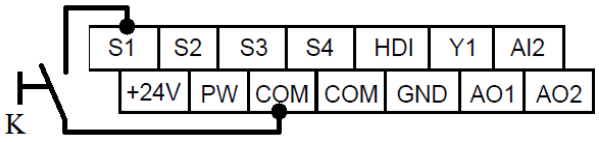
مثال1: راه اندازی یک الکتروموتور با فرکانس 40 هرتز با اینورتر الف) از روی کی پد:

P00.00=2	مد کنترل	P00.01=0	محل استارت/استپ
P00.06=0	محل تنظیم فرکانس	P00.10=40HZ	فرکانس کاری موتور
P00.11=10s	شتاب استارت	P01.08=1	روش استپ(Coast)
P02.01=...	توان نامی موتور	P02.02=...	فرکانس نامی موتور
P02.03=...	سرعت نامی موتور	P02.04=...	ولتاژ نامی موتور
P02.05=...	جریان نامی موتور		

بعد از اتصال صحیح کابلهای و تنظیمات فوق، دکمه RUN را فشار دهید تا موتور شروع به چرخش کند.

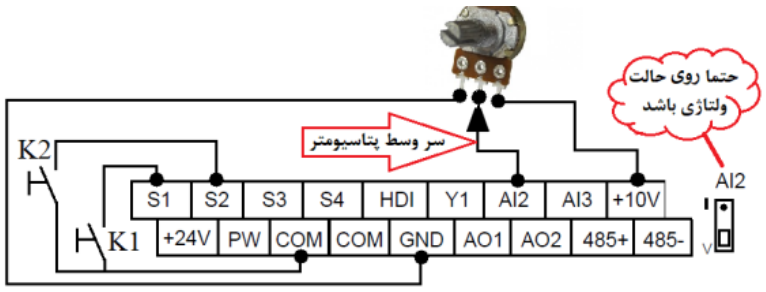
ب) از روی ترمینال

P00.01=1	محل استارت/استپ(ترمینال)
P05.01=1	ترمینال S1 (راستگرد)
با اتصال کلید K موتور شروع به چرخش می کند	



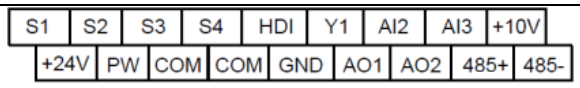
ج-) استارت الکتروموتور به صورت چپگرد/راستگرد و کنترل سرعتش با پتاسیومتر (ولوم) خارجی

P00.06=2	محل تنظیم فرکانس(AI2)
P05.01=1	ترمینال S1 (راستگرد)
P05.02=2	ترمینال S2 (چپگرد)
با وصل کلید K1 موتور راستگرد و با وصل K2 چپگرد می چرخد. سرعتش نیز باچرخاندن پتاسیومتر تغییر میکند.	



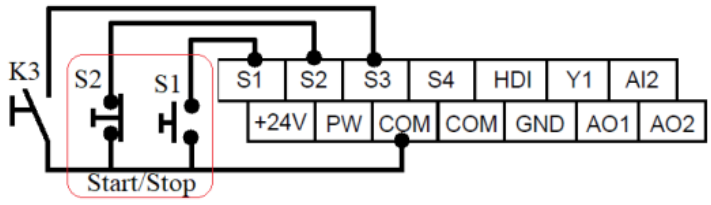
د-) کنترل درایو با یک PLC (یا HMI) از طریق شبکه مد باس

P00.06=8	محل تنظیم فرکانس (مدباس)
P00.01=2	محل استارت/استپ(مدباس)
برای تنظیم پارامترهای شبکه مدباس به دفترچه اصلی سازنده مراجعه نمایید.	



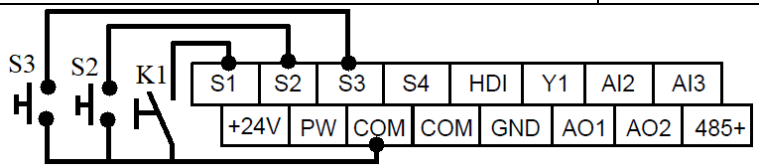
مثال2 : راه اندازی درایو با شستی استارت/استپ وکلید تغییر جهت چرخش

P00.01=1	محل استارت/استپ	P00.06=0	محل تنظیم فرکانس
P00.10=40Hz	فرکانس کاری	P00.11=3s	شتاب استارت
P00.12=3s	شتاب استپ	P02.01...05	پارامترهای نامی موتور
P05.01=1	ترمینال S1		
P05.02=3	ترمینال S2		
P05.03=2	ترمینال S3		
P05.13=2	نحواستارت/استپ		
با فشار دادن شستی S1 درایو استارت و با فشار دادن شستی S2 درایو استپ می شود. کلید K3 برای تعویض جهت می باشد.			



مثال3 : تغییر فرکانس درایو از روی ترمینالها با شستی پوش باتن(Push button)

P00.01=1	محل استارت/استپ	P00.06=0	محل تنظیم فرکانس
P00.10=...Hz	فرکانس اولیه	P00.11=3s	شتاب استارت
P00.12=3s	شتاب استپ	P02.01...05	پارامترهای نامی موتور
P05.01=1	ترمینال S1		
P05.02=10	ترمینال S2		
P05.03=11	ترمینال S3		



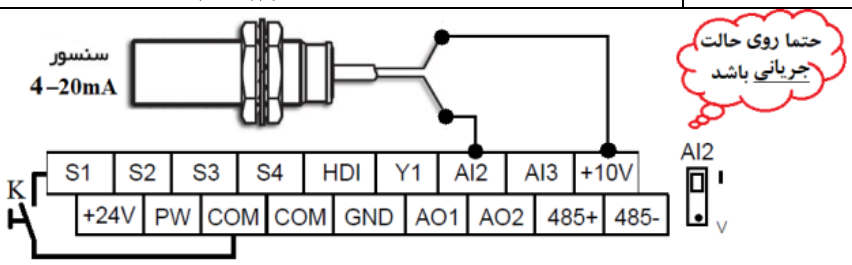
با وصل کردن کلید K1 درایو استارت می شود. فشار دادن شستی S2 فرکانس درایو را افزایش و فشار دادن شستی S3 فرکانس درایو را کاهش می دهد. از پارامتر P08.45 و P08.46 نیز برای تنظیم سرعت تغییر فرکانس(بر ثانیه) استفاده می شود.

مثال4 : تنظیم فشار آب یک مجتمع بصورت خودکار (PID)

فیدبک فشار سنسور(10bar) جریانی (4-20mA) می باشد و فشار مد نظر 4bar است.

P00.01=1	محل استارت/استپ	P00.05=35	فرکانس Sleep
P00.06=7	محل تنظیم فرکانس	P00.11=3s	شتاب استارت
P00.12=3s	شتاب استپ	P01.19=2	فعال کردن Sleep
P01.20=3s	تاخیر قبل Wakeup	P02.01...05	پارامترهای نامی موتور
P05.37=2	حداقل مقدار فیدبک (۴mA)	P09.00=0	محل Set-Point
P09.01=40%	تنظیم Set-Point	P09.02=1	محل سنسور(AI2)

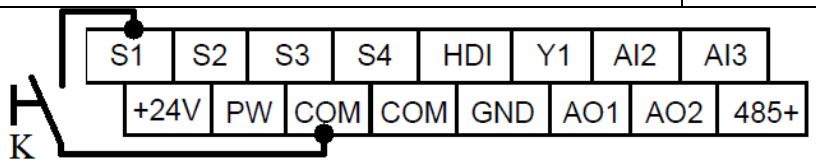
بعد از وصل کلیدK، پمپ شروع به کار می کند و سرعت آن توسط درایو به نحوی تنظیم میشود که فشار مد نظر را ایجاد کند.



مثال5 : راه اندازی یک همزن با PLC داخلی درایو

یک موتور همزن را 30 ثانیه راستگرد با سرعت 40 هرتز ، سپس 10 ثانیه متوقف و بعد از آن20 ثانیه چپگرد با فرکانس 25 هرتز می چرخاند، این روال ادامه پیدا می کند تا فرمان استارت (K) قطع شود.

P00.00=1	مد کنترل	P00.01=1	محل استارت/استپ
P00.06=5	محل تنظیم فرکانس	P00.11=3s	شتاب استارت
P00.12=3s	شتاب استپ	P02.01...05	پارامترهای نامی موتور
P05.01=1	ترمینال S1	P10.00=2	تکرار سیکل PLC
P10.02=80%	فرکانس راستگرد	P10.03=30s	مدت راستگرد
P10.04=0	فرکانس توقف		
P10.05=10s	مدت توقف		
50%-P10.06=	فرکانس چپگرد		
P10.07=20s	مدت چپگرد		



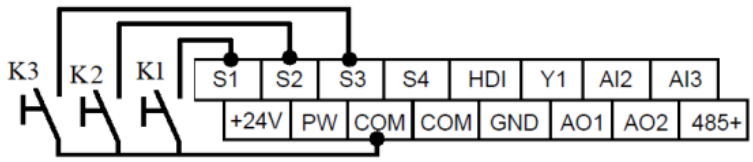
با وصل کلید K، همزن طبق روال خواسته شده شروع به کار می کند.

مثال 6 : راه اندازی موتور با سرعت های ثابت

موتور با کلید K1 روشن شده و سرعت آن به فرکانس 10 هرتز می رسد سپس با وصل کلید K2 سرعت آن 20 هرتز و یا با وصل کلید K3 سرعت آن 30 هرتز می گردد.

P00.01=1	محل استارت/استپ	P00.06=6	محل تنظیم فرکانس
P00.11=3s	شتاب استارت	P00.12=3s	شتاب استپ
P02.01...05	پارامترهای نامی موتور	P05.01=1	ترمینال S1
P05.02=16	ترمینال S2	P05.03=17	ترمینال S3
P10.02=20	فرکانس اول	P10.04=40	فرکانس دوم
P10.06=60	فرکانس سوم	ادامه مثال در صفحه بعد	

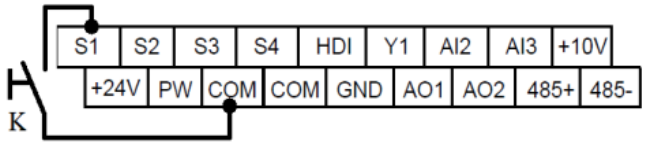
K3	K2	K1	فرکانس
قطع	قطع	وصل	P10.02=20%
قطع	وصل	وصل	P10.04=40%
وصل	قطع	وصل	P10.06=60%

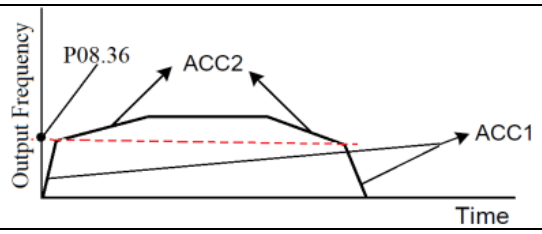


مثال 7: راه اندازی دو شتابه (پمپ کفکش یا شناور)

برای جدا شدن سریع کف گرد فرکانس پمپ شناور در 3 ثانیه اول به 30 هرتز و بعد از آن به آرامی به فرکانس نامی پمپ می رسد.

P00.00=2	مد کنترل	P00.01=1	محل استارت/استپ
P00.06=0	محل تنظیم فرکانس	P00.10=50Hz	فرکانس نهایی
P00.11=3s	شتاب استارت اولیه (ACC1)	P00.12=3s	شتاب استپ اولیه (DEC1)
P02.01...05	پارامترهای نامی موتور	P08.00=20s	شتاب استارت ثانویه (ACC2)
P08.01=20s	شتاب استپ ثانویه (DEC2)	P08.36=30Hz	فرکانس آستانه
P11.16=10	سوییچ ACC/DEC		



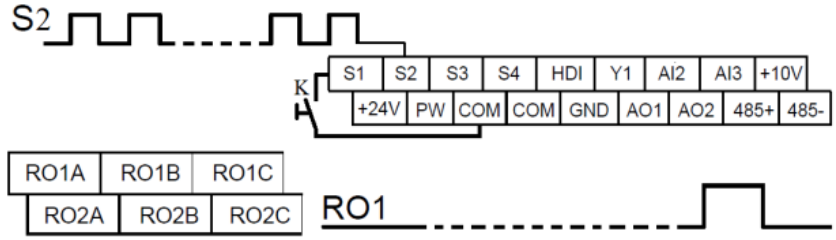


با وصل کلید K فرکانس پمپ بسرعت به پارامتر P08.36 می رسد و بعد از آن به آرامی تا سرعت نامی موتور پیش می رود. در توقف نیز فرکانس به آرامی کاهش می یابد تا به پارامتر P08.36 برسد، بعد از این پارامتر فرکانس سریع به صفر می رسد.

مثال 8: شمارش محصولات با استفاده کانتر داخلی اینورتر

از اینورتر برای کنترل نوار نقاله خط تولید استفاده می شود. در انتهای این نوار نقاله یک سنسور وجود دارد، هنگام عبور محصول از جلوی سنسور، به ازای هرمحصول یک پالس در خروجی سنسور ایجاد می شود. درایو تعداد محصولات را می شمارد. وقتی 100 عدد محصول شمارش شد یک آلارم صادر می کند.

P00.00=0	مد کنترل	P00.01=1	محل استارت/استپ
P00.06=1	محل تنظیم فرکانس	P00.11=3s	شتاب استارت
P00.12=3s	شتاب استپ	P02.01...05	پارامترهای نامی موتور
P05.01=1	ترمینال S1	P05.02=31	شمارش کانتر
P06.03=18	کامل شدن کانتر	P08.25=100	تعداد محصول



وقتی که محصولی از جلوی سنسور عبور کند پالسی به ورودی S2 ارسال می شود. اینورتر پالسها را می شمارد تا به عدد صد برسد. در این لحظه رله RO1 فعال می شود. کلید K برای استارت درایو است

قدم هشتم: خطاها و عیب‌یابی

درصورتی که خطا (فالت) رخ داده، ابتدا منشاء آن را رفع نمایید (از پارامترهای P07.56 – P07.27 کمک بگیرید) سپس با دکمه $\frac{STOP}{RST}$ خطا را پاک کنید تا دستگاه آماده استارت مجدد شود. در جدول زیر توضیحات برخی از فالت‌های رایج را ملاحظه فرمایید:

کدخطا	نام خطا	دلایل احتمالی و توضیحات
OV1	اضافه‌ولتاژ هنگام راه‌اندازی	ولتاژ ورودی نرمال نیست یا موتور در مد ژنراتوری است. (اگر ولتاژ نرمال است مقاومت ترمز اضافه کنید)
OV2	اضافه‌ولتاژ هنگام توقف	P01.08=1 قرار دهید یا P00.12 را افزایش دهید یا سیستم ترمز دینامیکی (مقاومتی) اضافه کنید.
OV3	اضافه‌ولتاژ هنگام کار	ولتاژ ورودی نرمال نیست یا موتور در مد ژنراتوری هست. اگر ولتاژ نرمال است مقاومت ترمز اضافه کنید.
OC1	اضافه‌جریان هنگام راه‌اندازی	موتور/کابل اتصالی دارد. یا بار سنگین است، P00.11 را افزایش دهید یا P00.00 را تغییر دهید. همچنین Auto tune را انجام دهید
OC2	اضافه‌جریان‌هنگام‌توقف	P01.08=1 قرار دهید یا P00.12 را افزایش دهید
OC3	اضافه‌جریان هنگام کار	موتور/کابل اتصالی دارد یا بار مشکلی دارد. اگرنه، P00.00 را تغییر دهید و Autotune را انجام دهید.
UV	افت‌ولتاژ	ولتاژ ورودی بیش از حد کم است.
OL1	اضافه‌بار موتور	بار بزرگتر از توان نامی موتور است، یا جریان موتور به درستی تنظیم نشده است تنظیمات نامی موتور و P02.27 را بررسی کنید.
OL3	آلارم اضافه‌بار	بار را با توجه به تنظیمات P11.10 - P11.08 بررسی کنید
OL2	اضافه‌بار اینورتر	عدم تناسب اینورتروبار/کثیفی هیت‌سینگ/خرابی فن/ اضافه‌گرمای محیط/عدم تهویه مناسب، زمان شتاب گیری خیلی کم.
OH1,2	گرم‌شدن اینورتر	
oUt1, 2,3	اتصال‌کوتاه در خروجی	موتور/کابل/اینورتر مشکل دارد یا بار با اینورتر متناسب نیست/ در غیر این صورت P00.11 را افزایش دهید
SPI	قطع فاز ورودی	فازهای ورودی را چک کنید
SPO	قطع فاز خروجی	فازهای خروجی و بالانس جریان‌های خروجی را چک کنید
PIDE	قطع‌بودن سنسور	اتصال سنسور(ترانسمیتر) بکمک پارامتر P17.24 چک شود
ITE	اتصال ضعیف پنل	اتصال کنترل پنل ضعیف است. برد کنترل مشکل دارد.

قدم نهم: مشخصات تجهیزات جانبی

مدل اینورتر	Rate of Breaker (A)*	Rate of contactor (A)**	***مقاومت ترمز			یونیت ترمز
			اندازه مقاومت (Ω)	توان برای بار معمولی (KW)	توان برای بار سنگین (KW)	
ED25-0R4G-S2	10	9	200	≥0.2	≥0.38	یونیت داخلی
ED25-0R7G-S2	16	12	130	≥0.2	≥0.38	
ED25-1R5G-S2	25	25	65	≥0.4	≥0.75	
ED25-2R2G-S2	40	32	50	≥0.5	≥1.1	
ED25-0R7G-4	6	9	440	≥0.2	≥0.38	
ED25-1R5G-4	10	9	220	≥0.4	≥0.75	
ED25-2R2G-4	10	9	200	≥0.5	≥1.1	
ED25-004G-4	25	25	110	≥1	≥2	
ED25-5R5G-4	32	25	80	≥1.4	≥2.8	
ED25-7R5G-4	63	50	60	≥1.9	≥3.8	
ED25-011G-4	63	50	41	≥2.8	≥5.5	
ED25-015G-4	63	50	30	≥3.8	≥7.5	
ED25-018G-4	100	65	25	≥4.5	≥9	
ED25-022G-4	100	80	20	≥5.5	≥11	
ED25-030G-4	125	95	15	≥7.5	≥15	
ED25-037G-4	160	115	13	≥9.5	≥18.5	
ED25-045G-4-B	200	170	10	≥12	≥25	
ED25-055G-4-B	200	170	8	≥14	≥30	
ED25-075G-4-B	250	205	6.5	≥20	≥40	
ED25-090G-4-B	315	245	5.4	≥24	≥48	
ED25-110G-4-B	350	300	4.5	≥29	≥60	
ED25-045G-4	200	170	10	≥12	≥25	DBU100H-110-4
ED25-055G-4	200	170	8	≥14	≥30	
ED25-075G-4	250	205	6.5	≥20	≥40	
ED25-090G-4	315	245	5.4	≥24	≥48	DBU100H-160-4
ED25-110G-4	350	300	4.5	≥29	≥60	

*توجه: برای حفاظت بهتر به جای Breaker از فیوز تند سوز (Fast fuse) aR استفاده کنید.
اینورتر می تواند کمتر**توجه: از کنتاکتور برای روشن یا خاموش کردن موتور یا اینورتر استفاده نشود.
***توانهای اعلامی پیشنهادی می باشند، در عمل توان مقاومت با توجه به بار
یا بیشتر از موارد فوق باشد.

parameters. Incorrect parameter setting may cause operation exceptions or even damage to the VFD.). When the system is not locked due to password protection, you can modify the user password, and the last value entered is the user password. If P07.00 is set to 0, the user password is canceled. If P07.00 is set to a non-zero value, the parameters are protected through the user password at power-on. When you modify function parameters through serial communication, the user password provides the same functions.

Note: The VFD automatically checks and constrains the modification of parameters, which helps prevent incorrect modifications.

P00 group Basic functions

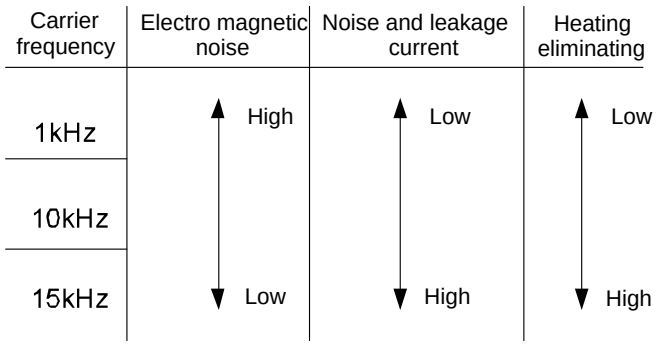
Function code	Name	Description	Default	Modify
P00.00	Speed control mode	0: SVC 0 There is no need to install encoders. Suitable in applications which need low frequency, big torque for high accuracy of rotating speed and torque control. Relative to mode 1, it is more suitable for the applications which need small power. 1: SVC 1 1 is suitable in high performance cases with the advantage of high accuracy of rotating speed and torque. It does not need to install pulse encoder. 2: SVPWM control 2 is suitable in applications which do not need high control accuracy, such as the load of fan and pump. One VFD can drive multiple motors. **Note:** Carry out motor parameter autotuning before adopting vector mode.	2	◎
P00.01	Channel of running commands	Select the channel of VFD running commands. The control command of the VFD includes: start, stop, forward/reverse rotating, jogging and fault reset. 0: Keypad (LOCAL/REMOT light off) Carry out the command control by RUN, STOP/RST on the keypad. Set the multi-	0	○

Function code	Name	Description	Default	Modify
		function key QUICK/JOG to FWD/REVC shifting function (P07.02=3) to change the running direction; press RUN and STOP/RST simultaneously in running state to make the VFD coast to stop. 1: Terminal (LOCAL/REMOT flickering) Carry out the running command control by the forward rotation, reverse rotation and forward jogging and reverse jogging of the multi-function terminals 2: Communication (LOCAL/REMOT on); The running command is controlled by the upper monitor via communication		
P00.03	Max. output frequency	The parameter is used to set the max. output frequency of the VFD. It is the basis of frequency setup and the acceleration/deceleration. Setting range: P00.04–630.00Hz	50.00Hz	◎
P00.04	Upper limit of the running frequency	The upper limit of the running frequency is the upper limit of the output frequency of the VFD which is lower than or equal to the maximum frequency. Setting range: P00.05–P00.03 (max output frequency)	50.00Hz	◎
P00.05	Lower limit of the running frequency	The lower limit of the running frequency is that of the output frequency of the VFD. The VFD runs at the lower limit frequency if the set frequency is lower than the lower limit. **Note:** Max. output frequency ≥ Upper limit frequency ≥ Lower limit frequency Setting range: 0.00Hz–P00.04 (Upper limit of the running frequency)	0.00Hz	◎
P00.06	A frequency command selection	**Note:** A frequency and B frequency cannot set as the same frequency given method. The frequency source can be set by P00.09. 0: Keypad data setting Modify the value of function code P00.10 (frequency set through keypad) to modify the	0	○
P00.07	B frequency command selection		2	○

Function code	Name	Description	Default	Modify
		frequency by the keypad. 1: Analog AI1 setting (corresponding keypad potentiometer) 2: Analog AI2 setting (corresponding terminal AI2) 3: Analog AI3 setting (corresponding terminal AI3) Set the frequency by analog input terminals. ED25 series VFDs provide 3 channels analog input terminals as the standard configuration, of which AI1 is adjusting through analog potentiometer, while AI2 is the voltage/current option (0–10V/0–20mA) which can be shifted by jumpers; while AI3 is voltage input (-10V–+10V). **Note:** when analog AI2 select 0–20 mA input, the corresponding voltage of 20mA is 10V. 100.0% of the analog input setting corresponds to the maximum frequency (function code P00.03) in forward direction and -100.0% corresponds to the maximum frequency in reverse direction (function code P00.03) 4: High-speed pulse HDI setting The frequency is set by high-speed pulse terminals. ED25 series VFDs provide 1 high speed pulse input as the standard configuration. The pulse frequency range is 0.00–50.00 kHz. 100.0% of the high speed pulse input setting corresponds to the maximum frequency in forward direction (function code P00.03) and -100.0% corresponds to the maximum frequency in reverse direction (function code P00.03). **Note:** The pulse setting can only be input by multi-function terminals HDI. Set P05.00 (HDI input selection) to high speed pulse input. 5: Simple PLC program setting The VFD runs at simple PLC program mode		

Function code	Name	Description	Default	Modify
		when P00.06=5 or P00.07=5. Set P10 (simple PLC and multi-step speed control) to select the running frequency running direction, ACC/DEC time and the keeping time of corresponding step. See the function description of P10 for detailed information. 6: Multi-step speed running setting The VFD runs at multi-step speed mode when P00.06=6 or P00.07=6. Set P05 to select the current running step, and set P10 to select the current running frequency. The multi-step speed has the priority when P00.06 or P00.07 does not equal to 6, but the setting step can only be the 1–15 step. The setting step is 1–15 if P00.06 or P00.07 equals to 6. 7: PID control setting The running mode of the VFD is process PID control when P00.06=7 or P00.07=7. It is necessary to set P09. The running frequency of the VFD is the value after PID effect. See P09 for the detailed information of the preset source, preset value and feedback source of PID. 8: Modbus communication setting The frequency is set by Modbus communication. See P14 for detailed information. 9–11: Reserved		
P00.08	B frequency command reference selection	0: Maximum output frequency, 100% of B frequency setting corresponds to the maximum output frequency 1: A frequency command, 100% of B frequency setting corresponds to the maximum output frequency. Select this setting if it needs to adjust on the base of A frequency command.	0	○

Function code	Name	Description	Default	Modify
P00.09	Combination of the setting source	0: A, the current frequency setting is A frequency command 1: B, the current frequency setting is B frequency command 2: A+B, the current frequency setting is A frequency command + B frequency command 3: A-B, the current frequency setting is A frequency command - B frequency command 4: Max (A, B): The bigger one between A frequency command and B frequency is the set frequency. 5: Min (A, B): The lower one between A frequency command and B frequency is the set frequency. **Note:** The combination manner can be shifted by P05 (terminal function)	0	○
P00.10	Frequency set through keypad	When A and B frequency commands are selected as "keypad setting", this parameter will be the initial value of VFD reference frequency. Setting range: 0.00Hz–P00.03 (max. output frequency)	50.00Hz	○
P00.11	ACC time 1	ACC time means the time needed if the VFD speeds up from 0Hz to the max one (P00.03).	Depend on model	○
P00.12	DEC time 1	DEC time means the time needed if the VFD speeds down from the max output frequency to 0Hz (P00.03). ED25 series VFDs have four groups of ACC/DEC time which can be selected by P05. The factory default ACC/DEC time of the VFD is the first group. Setting range of P00.11 and P00.12: 0.0–3600.0 s	Depend on model	○
P00.13	Running direction	0: Runs at the default direction, the VFD runs in the forward direction. FWD/REV indicator is off. 1: Runs at the opposite direction, the VFD	0	○

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>runs in the reverse direction. FWD/REV indicator is on.
Modify the function code to shift the rotation direction of the motor. This effect equals to the shifting the rotation direction by adjusting either two of the motor lines (U, V and W). The motor rotation direction can be changed by QUICK/JOG on the keypad. Refer to parameter P07.02.
Note: When the function parameter comes back to the default value, the motor's running direction will come back to the factory default state, too. In some cases it should be used with caution after commissioning if the change of rotation direction is disabled.
2: Forbid to run in reverse direction: It can be used in some special cases if the reverse running is disabled.</td><td></td><td></td></tr>
<tr><td>P00.14</td><td>Carrier frequency</td><td> 

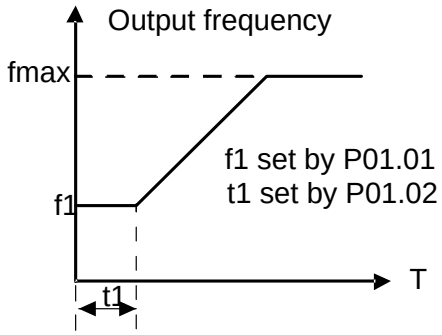
The relationship table of the motor type and carrier frequency:
<table>
<tr><th>Motor type</th><th>Factory setting of carrier frequency</th></tr>
<tr><td>0.4–11kW</td><td>8 kHz</td></tr>
<tr><td>15–55kW</td><td>4 kHz</td></tr>
<tr><td>75–110kW</td><td>2 kHz</td></tr>
</table>
The advantage of high carrier frequency: ideal current waveform, little current harmonic wave and motor noise.
The disadvantage of high carrier frequency:</td><td>Depend on model</td><td>○</td></tr>
</table>

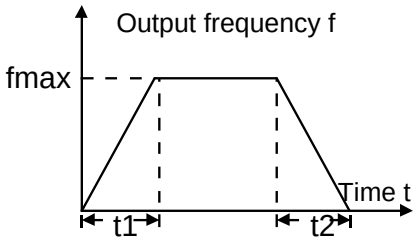
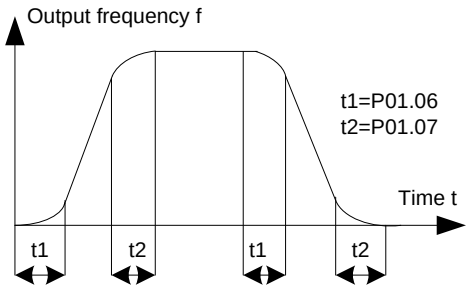
Function code	Name	Description	Default	Modify
		increasing the switch loss, increasing VFD temperature and the impact to the output capacity. The VFD needs to derate on high carrier frequency. At the same time, the leakage and electrical magnetic interference will increase. Applying low carrier frequency is contrary to the above, too low carrier frequency will cause unstable running, torque decreasing and surge. The manufacturer has set a reasonable carrier frequency when the VFD is in factory. In general, users do not need to change the parameter. When the frequency used exceeds the default carrier frequency, the VFD needs to derate 10% for each additional 1k carrier frequency. Setting range: 1.0–15.0 kHz		
P00.15	Motor parameter autotuning	0: No operation 1: Rotating autotuning Comprehensive motor parameter autotuning It is recommended to use rotating autotuning when high control accuracy is needed. 2: Static autotuning 1 (autotune totally); It is suitable in the cases when the motor cannot de-couple form the load. The autotuning for the motor parameter will impact the control accuracy. 3: Static autotuning 2 (autotune part parameters); when the current motor is motor 1, autotune P02.06, P02.07, and P02.08.	0	◎
P00.16	AVR function selection	0: Invalid 1: Valid during the whole procedure The auto-adjusting function of the VFD can cancel the impact on the output voltage of the VFD because of the bus voltage fluctuation.	1	○
P00.18	Function parameter	0–6 0: No operation	0	◎

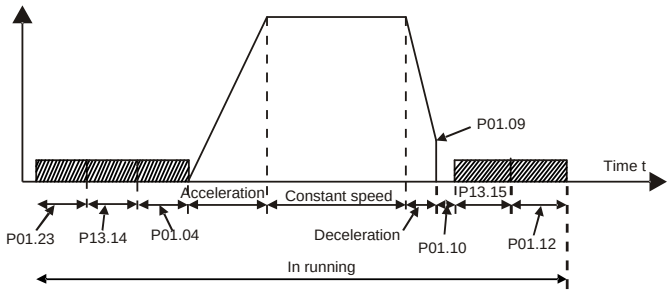
Function code	Name	Description	Default	Modify
	restore	1: Restore the default value (excluding the motor parameters) 2: Clear fault records 3: Function code locking (lock all function codes) 4: Reserved 5: Restore the default value (factory test mode) 6: Restore the default value (including the motor parameters) **Note:** ✧ After the selected operation is performed, the function code is automatically restored to 0. Restoring default values may delete the user password. Exercise caution when using this function. ✧ Restoring default values (factory test mode) will restore the parameters to the corresponding standard version. Non-professionals shall exercise caution when using this function.		

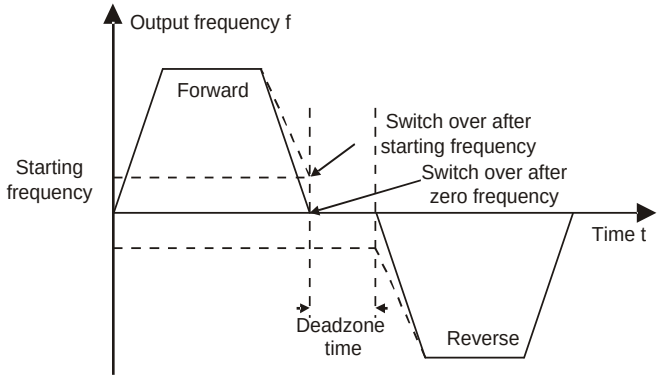
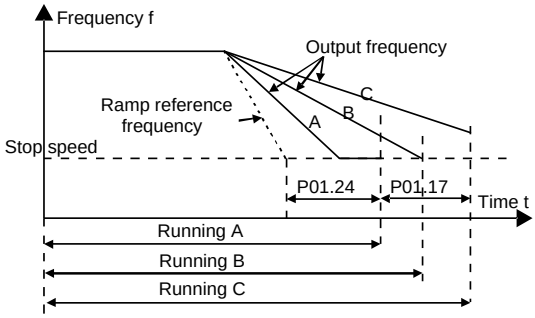
P01 group Start and stop control

Function code	Name	Description	Default	Modify
P01.00	Start mode	0: Direct start: start from the starting frequency P01.01 1: Start after DC braking: start the motor from the starting frequency after DC braking (set the parameter P01.03 and P01.04). It is suitable in the cases where reverse rotation may occur to the low inertia load during starting. 2: Speed tracking restart 1 3: Speed tracking restart 2 The direction and speed will be tracked automatically for the smoothing starting of rotating motors. It suits the application with reverse rotation when big load starting. **Note:** This function is only available for the VFDs≥4kW.	0	◎

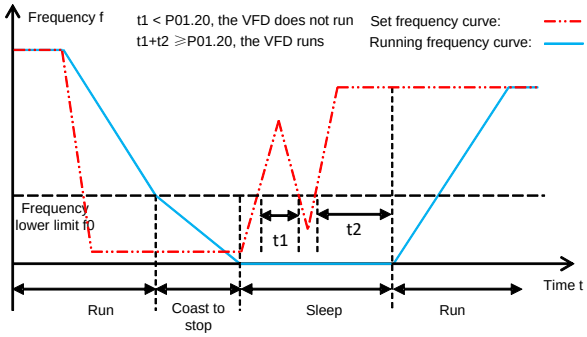
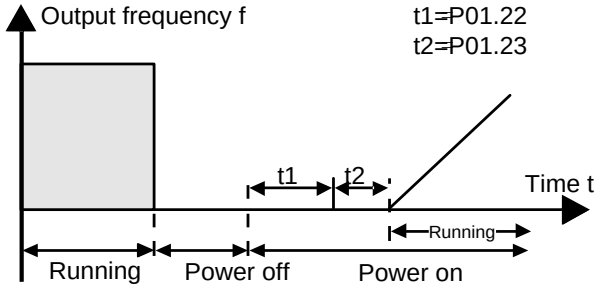
Function code	Name	Description	Default	Modify
P01.01	Starting frequency of direct start	The function code indicates the initial frequency during VFD start. See P01.02 (Starting frequency hold time) for detailed information. Setting range: 0.00–50.00Hz	0.50Hz	◎
P01.02	Starting frequency hold time	Setting a proper starting frequency can increase the torque during VFD starting. During the hold time of the starting frequency, the output frequency of the VFD is the starting frequency. And then, the VFD runs from the starting frequency to the set frequency. If the set frequency is lower than the starting frequency, the VFD stops running and keeps in the stand-by state. The starting frequency is not limited in the lower limit frequency.  Setting range: 0.0–50.0s	0.0s	◎
P01.03	Braking current before start	The VFD performs DC braking with the braking current before start and it speeds up after the DC braking time. If the DC braking time is set to 0, the DC braking is invalid. Stronger braking current indicates larger braking power. The DC braking current before start is the percentage of rated current of the VFD. Setting range of P01.03: 0.0–100.0% (rated current peak of the VFD) Setting range of P01.04: 0.00–50.00s	0.0%	◎
P01.04	Braking time before start		0.00s	◎
P01.05	ACC and DEC mode	The function code indicates that the changing mode of the frequency during start and running. 0: Linear type. The output frequency increases	0	◎

Function code	Name	Description	Default	Modify
		or decreases linearly.  1: S curve. The output frequency increases or decreases according to the S curve  The S curve is generally applied to elevator, conveyors, and other application scenarios where smoother start or stop is required.		
P01.06	ACC time of the starting step of S curve	Setting range: 0.0–50.0s **Note:** Valid when P01.05 is 1.	0.1s	◎
P01.07	DEC time of the ending step of S curve		0.1s	◎
P01.08	Stop mode	0: Decelerate to stop. After a stop command takes effect, the VFD lowers output frequency based on the DEC mode and the DEC time; after the frequency drop to 0Hz, the VFD stops. 1: Coast to stop. After a stop command takes effect, the VFD stops output immediately; and the load coasts to stop according to mechanical inertia.	0	○
P01.09	Starting	Starting frequency of DC braking for stop:	0.00Hz	○

Function code	Name	Description	Default	Modify
	frequency of DC braking for stop	During the deceleration to stop, the VFD starts DC braking for stop when running frequency reaches the starting frequency determined by P1.09.		
P01.10	Waiting time before DC braking	Waiting time before DC braking: The VFD blocks the output before starting DC braking. After this wait time, DC braking is started so as to prevent overcurrent caused by DC braking at high speed. DC braking current for stop: The value of P01.11 is the percentage of rated current of VFD. Stronger current indicates greater DC braking effect. DC braking time for stop: It indicates the hold time of DC braking. If the time is 0, DC braking is invalid, and the VFD coasts to stop.  Setting range of P01.09: 0.00Hz–P00.03 (max. output frequency) Setting range of P01.10: 0.00–50.00s Setting range of P01.11: 0.0–100.0% (rated current peak of the VFD) Setting range of P01.12: 0.00–50.00s	0.00s	○
P01.11	DC braking current for stop		0.0%	○
P01.12	DC braking time for stop		0.00s	○
P01.13	FWD/REV running deadzone time	This function code indicates the transition time specified in P01.14 during FWD/REV rotation switching. See the following figure.	0.0s	○

Function code	Name	Description	Default	Modify
		 Setting range: 0.0–3600.0s		
P01.14	FWD/REV running switching mode	Set the switching threshold of the VFD: 0: Switch at zero frequency 1: Switch at the starting frequency 2: Switch after the speed reaches the stop speed with a delay.	1	◎
P01.15	Stop speed	0.00–100.00Hz	0.50Hz	◎
P01.16	Stop speed detection mode	0: Set value of speed (the only detection mode valid in V/F mode) 1: Detection value of speed	1	◎
P01.17	Feedback speed detection time	 When P01.16=1, the actual output frequency of the VFD is less than or equal to P01.15 and is detected during the time set by P01.17, the VFD will stop; otherwise, the VFD stops in the time set by P01.24. Setting range: 0.00–100.00s (valid only when P01.16=1)	0.50s	◎

Function code	Name	Description	Default	Modify
P01.18	Terminal-based running command protection at power-on	When the channel of running commands is terminal control, the system detects the state of the running terminal during power-on. 0: The terminal running command is invalid at power-on. Even the running command is considered as valid during power-on, the VFD does not run and it keeps the protection state until the running command is canceled and enabled again. 1: The terminal running command is valid at power-on. If the running command is considered as valid during power-on, the VFD is started automatically after the initialization. **Note:** Exercise caution before using this function. Otherwise, serious result may follow.	0	○
P01.19	Action selected when running frequency less than frequency lower limit (valid when frequency lower limit greater than 0)	0x00–0x12 Ones place: Action selection 0: Run at the frequency lower limit 1: Stop 2: Sleep Tens place: Stop mode 0: Coast to stop 1: Decelerate to stop	0x00	◎
P01.20	Wake-up-from-sleep delay	This function code determines the wake-up-from-sleep delay time. When the running frequency of the VFD is lower than the lower limit, the VFD becomes standby. When the set frequency exceeds the lower limit one again and it lasts for the time set by P01.20, the VFD runs automatically.	0.0s	○

Function code	Name	Description	Default	Modify
		 Setting range: 0.0–3600.0s (valid when the ones place of P01.19=2)		
P01.21	Power-off restart selection	The function code indicates whether the VFD automatically runs after power-on. 0: Disable 1: Enable. If the restart condition is met, the VFD will run automatically after waiting for the time defined by P01.22.	0	○
P01.22	Wait time for restart after power-off	The function indicates the wait time before the automatic running of the VFD that is re-powered on.  Setting range: 0.0–3600.0s (valid when P01.21=1)	1.0s	○
P01.23	Start delay	After a VFD running command is given, the VFD is in standby state and restarts with the delay defined by P01.23 to implement brake release. Setting range: 0.0–60.0s	0.0s	○
P01.24	Delay of the stopping speed	Setting range: 0.0–100.0s	0.0s	○

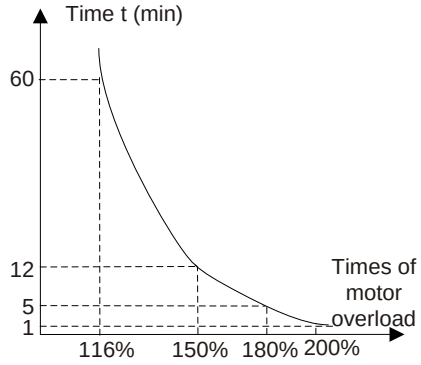
Function code	Name	Description	Default	Modify
P01.25	0Hz output	Select the 0Hz output of the VFD. 0: Output without voltage 1: Output with voltage 2: Output at the DC braking current	0	○

P02 group Motor 1 parameters

Function code	Name	Description		Default	Modify
P02.01	Rated power of asynchronous motor	0.1–3000.0kW	Parameters of the controlled asynchronous motor. To ensure the control performance, set P02.01–P02.05 correctly according to the information on the nameplate of the asynchronous motor. The ED25 series VFD provides the parameter autotuning function. Whether parameter autotuning can be performed properly depends on the settings of the motor nameplate parameters. In addition, you need to configure a motor based on the standard motor configuration of the VFD. If the power of the motor is greatly different from that of the standard motor configuration, the control performance of the VFD degrades significantly. **Note:** Resetting the rated power of the motor (P02.01) can initialize the parameters of P02.02 to P02.10.	Depend on model	◎
P02.02	Rated frequency of asynchronous motor	0.01Hz–P00.03		50.00Hz	◎
P02.03	Rated speed of asynchronous motor	1–60000 rpm		Depend on model	◎
P02.04	Rated voltage of asynchronous motor	0–1200V		Depend on model	◎
P02.05	Rated current of asynchronous motor	0.8–6000.0A		Depend on model	◎
P02.06	Stator resistor of asynchronous motor	0.001–65.535Ω	After motor parameter autotuning is properly performed, the values of P02.06 to P02.10 are	Depend on model	○

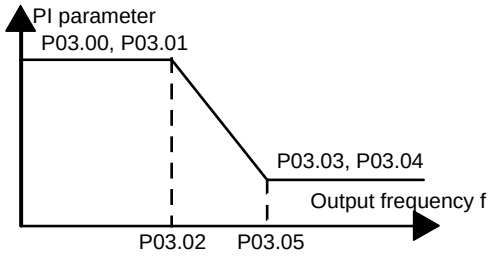
Function code	Name	Description		Default	Modify
P02.07	Rotor resistor of asynchronous motor	0.001–65.535Ω	automatically updated. These parameters are the reference parameters for high-performance vector control, directly affecting the control performance. **Note:** Do not modify these parameters unless it is necessary.	Depend on model	○
P02.08	Leakage inductance of asynchronous motor	0.1–6553.5mH		Depend on model	○
P02.09	Mutual inductance of asynchronous motor	0.1–6553.5mH		Depend on model	○
P02.10	Non-load current of asynchronous motor	0.1–6553.5A		Depend on model	○
P02.11	Magnetic saturation coefficient 1 of iron core of AM1	0.0–100.0%		80.0%	◎
P02.12	Magnetic saturation coefficient 2 of iron core of AM1	0.0–100.0%		68.0%	◎
P02.13	Magnetic saturation coefficient 3 of iron core of AM1	0.0–100.0%		57.0%	◎

Function code	Name	Description	Default	Modify
P02.14	Magnetic saturation coefficient 4 of iron core of AM1	0.0–100.0%	40.0%	◎
P02.26	Motor overload protection selection	0: No protection 1: Common motor protection (with low speed compensation). As the cooling effect of a common motor is degraded at low speed running, the corresponding electronic thermal protection value needs to be adjusted properly. The low speed compensation indicates lowering the overload protection threshold of the motor whose running frequency is lower than 30Hz. 2: Variable-frequency motor compensation (without low speed compensation). Because the heat dissipation function for a variable-frequency motor is not impacted by the rotation speed, it is not necessary to adjust the protection value at low speed running.	2	◎
P02.27	Motor overload protection coefficient	Motor overload multiples M = Iout/(In*K) In is rated motor current, Iout is VFD output current, and K is motor overload protection coefficient. A smaller value of K indicates a bigger value of M. When M=116%, protection is performed after motor overload lasts for 1 hour; when M=150%, protection is performed after motor overload lasts for 12 minutes; when M=180%, protection is performed after motor overload lasts for 5 minutes; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M≥ 400%, protection is performed immediately.	100.0%	○

Function code	Name	Description	Default	Modify
		 Setting range: 20.0%–120.0%		
P02.28	Power display calibration coefficient of motor 1	The function code can be used to adjust the power display value of motor 1. However, it does not affect the control performance of the VFD. Setting range: 0.00–3.00	1.00	○

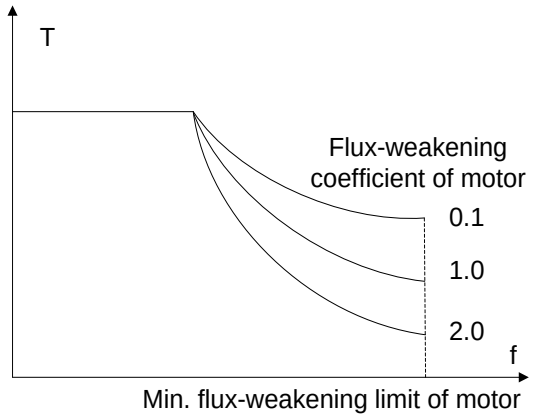
P03 group Vector control

Function code	Name	Description	Default	Modify
P03.00	Speed loop proportional gain1	The speed loop dynamic response characteristics of vector control can be adjusted by setting the proportional coefficient and integral time of speed regulator. Increase proportional gain or decrease integral time can accelerate dynamic response of speed loop, however, if the proportional gain is too large or integral time is too small, system oscillation and overshoot may occur; if proportional gain is too small, stable oscillation or speed offset may occur. The parameters P03.00–P03.05 are applicable only to vector control mode. Below the switching frequency 1 (P03.02), the speed loop PI parameters are: P03.00 and P03.01. Above the switching frequency 2 (P03.05), the speed loop PI parameters are: P03.03 and P03.04. PI parameters are obtained	20.0	○
P03.01	Speed loop integral time1		0.200s	○
P03.02	Low-point frequency for switching		5.00Hz	○
P03.03	Speed loop proportional gain 2		20.0	○
P03.04	Speed loop integral time 2		0.200s	○
P03.05	High-point frequency for switching		10.00Hz	○

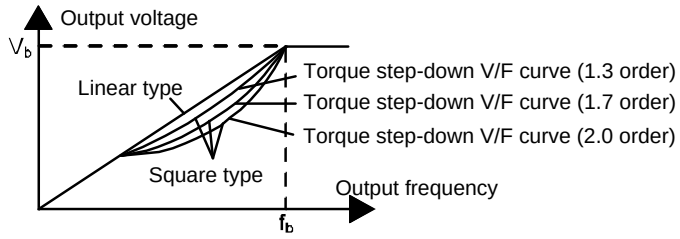
Function code	Name	Description	Default	Modify
		according to the linear change of two groups of parameters. See the following figure.  PI parameters have a close relationship with the inertia of the system. Adjust PI parameters depending on different loads to meet various demands. Setting range of P03.00 and P03.03: 0–200.0 Setting range of P03.01 and P03.04: 0.000–10.000s Setting range of P03.02:0.00Hz–P03.05 Setting range of P03.05:P03.02–P00.03 (max. output frequency)		
P03.06	Speed loop output filter	0–8 (corresponding to 0–2^8/10ms)	0	○
P03.07	Electromotion slip compensation coefficient of vector control	Slip compensation coefficient is used to adjust the slip frequency of the vector control and improve the speed control accuracy of the system. Adjusting the parameter properly can control the speed steady-state error. Setting range: 50%–200%	100%	○
P03.08	Brake slip compensation coefficient of vector control		100%	○
P03.09	Current loop percentage coefficient P	**Note**: ✧ The two function codes impact the dynamic response speed and control accuracy of the system. Generally, you do not need to modify the two function codes. ✧ The parameters P03.09 and P03.10	1000	○
P03.10	Current loop integral coefficient I		1000	○

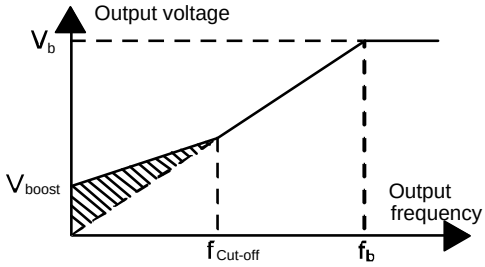
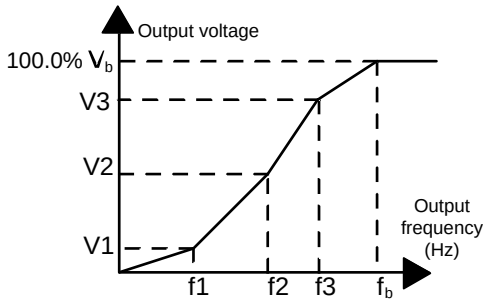
Function code	Name	Description	Default	Modify
		are applicable only to SVC 0 (P00.00=0). Setting range: 0–65535		
P03.11	Torque setting method	The function code is used to enable the torque control mode, and set the torque setting method. 0: Torque control is invalid 1: Keypad setting torque (P03.12) 2: AI1 3: AI2 4: AI3 5: Pulse frequency HDI 6: Multi-step torque 7: Modbus communication 8–10: Reserved **Note**: Setting methods 2–7, 100% corresponds to 3 times of the rated motor current.	0	○
P03.12	Torque set through keypad	Setting range: -300.0%–300.0% (of the rated motor current)	50.0%	○
P03.13	Torque reference filter time	0.000–10.000s	0.100s	○
P03.14	Setting source of forward rotation upper-limit frequency in torque control	0: Keypad (P03.16 sets the value when P03.14=1; P03.17 sets the value when P03.15=1) 1: AI1 2: AI2 3: AI3 4: Pulse frequency HDI 5: Multi-step setting 6: Modbus communication 7–9: Reserved **Note:** Setting methods 1–9, 100% corresponds to the maximum frequency.	0	○
P03.15	Setting source of reverse rotation upper-limit frequency in torque control		0	○
P03.16	Forward rotation upper-limit frequency	This function codes are used to set the frequency upper limits. 100% corresponds to the max. frequency.	50.00Hz	○

Function code	Name	Description	Default	Modify
	keypad set through keypad in torque control	P03.16 sets the value when P03.14=1; P03.17 sets the value when P03.15=1. Setting range: 0.00Hz–P00.03 (max. output frequency)		
P03.17	Reverse rotation upper-limit frequency set through keypad in torque control		50.00Hz	○
P03.18	Setting source of electromotive torque upper limit	This function codes are used to select the setting sources of electromotive and braking torque upper limits. 0: Keypad setting upper-limit frequency (P03.20 sets P03.18 and P03.21 sets P03.19) 1: AI1 2: AI2 3: AI3 4: Pulse frequency HDI 5: Modbus communication 6–8: Reserved **Note:** Setting methods 1–8, 100% corresponds to three times of the motor current.	0	○
P03.19	Setting source of braking torque upper limit		0	○
P03.20	Electromotive torque upper limit set through keypad	The function codes are used to set the torque limits. Setting range: 0.0–300.0% (of the rated motor current)	180.0%	○
P03.21	Braking torque upper limit set through keypad		180.0%	○
P03.22	Weakening coefficient in constant power zone	Used when the AM is in flux-weakening control. The function codes P03.22 and P03.23 are valid at constant power. The motor enters the flux-weakening state when the motor runs above the rated speed. Change the flux-weakening curve by modifying the flux-weakening control coefficient. The larger the coefficient,	0.3	○
P03.23	Lowest weakening point in constant power zone		20%	○

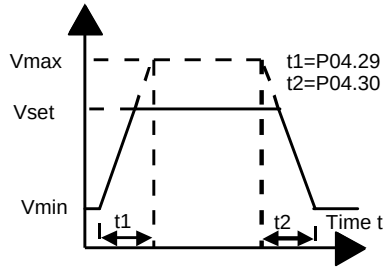
Function code	Name	Description	Default	Modify
		the steeper the curve, the smaller the coefficient, the smoother the curve.  Setting range of P03.22: 0.1–2.0 Setting range of P03.23: 10%–100%		
P03.24	Max. voltage limit	P03.24 set the max. output voltage of the VFD. Set the value according to onsite conditions Setting range: 0.0–120.0%	100.0%	◎
P03.25	Pre-exciting time	Pre-exciting is performed for the motor when the VFD starts up. A magnetic field is built up inside the motor to improve the torque performance during the start process. The setting time: 0.000–10.000s	0.300s	○
P03.26	Flux-weakening proportional gain	0–8000	1200	○
P03.27	Speed display selection in vector control	0: Display at the actual value 1: Display at the setting value	0	○
P03.28	Static friction compensation coefficient	0.0–100.0%	0.0%	○
P03.29	Dynamical friction compensation coefficient	0.0–100.0%	0.0%	○

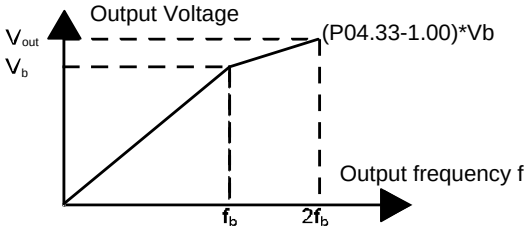
P04 group SVPWM control

Function code	Name	Description	Default	Modify
P04.00	V/F curve setting of motor 1	This group of function code defines the V/F curve of motor 1 to meet the needs of different loads. 0: Straight-line V/F curve; applicable to constant torque loads 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) Curves 2–4 are applicable to the torque loads such as fans and water pumps. You can adjust according to the characteristics of the loads to achieve best performance. 5: Customized V/F (V/F separation); in this mode, V can be separated from f and f can be adjusted through the frequency setting channel set by P00.06 or the voltage setting channel set by P04.27 to change the characteristics of the curve. **Note:** In the following figure, V_b is the motor rated voltage and f_b is the motor rated frequency. 	0	◎
P04.01	Torque boost of motor 1	In order to compensate for low-frequency torque characteristics, you can make some boost compensation for the output voltage. P04.01 is relative to the maximum output voltage V_b. P04.02 defines the percentage of cut-off frequency of manual torque boost to the rated motor frequency f_b. Torque boost can improve the low-frequency torque characteristics of SVPWM.	0.0%	○
P04.02	Torque boost cut-off of motor 1		20.0%	○

Function code	Name	Description	Default	Modify
		You need to select torque boost based on the load. For example, larger load requires larger torque boost, however, if the torque boost is too large, the motor will run at over-excitation, which may cause increased output current and motor overheating, thus decreasing the efficiency. When torque boost is set to 0.0%, the VFD is automatic torque boost. Torque boost cut-off threshold: Below this frequency threshold, the torque boost is valid, exceeding this threshold will invalidate torque boost.  Setting range of P04.01: 0.0%: (automatic) 0.1%–10.0% Setting range of P04.02: 0.0%–50.0%		
P04.03	V/F frequency point 1 of motor 1	When P04.00 =1 (multi-dot V/F curve), you can set the V//F curve through P04.03–P04.08.  The V/F curve is generally set according to the load characteristics of the motor. **Note:** V1 < V2 < V3, f1 < f2 < f3. Too high voltage for low frequency will cause motor overheat or damage and cause VFD overcurrent stall or overcurrent protection. Setting range of P04.03: 0.00Hz–P04.05	0.00Hz	○
P04.04	V/F voltage point 1 of motor 1		0.0%	○
P04.05	V/F frequency point 2 of motor 1		0.00Hz	○
P04.06	V/F voltage point 2 of motor 1		0.0%	○

Function code	Name	Description	Default	Modify
P04.07	V/F frequency point 3 of motor 1	Setting range of P04.04, P04.06 and P04.08: 0.0%–110.0% (of the rated motor voltage) Setting range of P04.05: P04.03–P04.07 Setting range of P04.07: P04.05–P02.02 (of the rated motor frequency)	0.00Hz	○
P04.08	V/F voltage point 3 of motor 1		0.0%	○
P04.09	V/F slip compensation gain of motor 1	This function code is used to compensate for the motor rotating speed change caused by load change in SVPWM control mode, and thus improve the mechanical characteristics of the motor. You need to calculate the rated slip frequency of the motor as follows: $\triangle f = f_b - nxp/60$ Of which, f_b is the rated frequency of the motor, corresponding to function code is P02.02. n is the rated rotating speed of the motor, corresponding to function code P02.03. p is the number of pole pairs of the motor. 100.0% corresponds to the rated slip frequency △f of the motor. Setting range: 0.0–200.0%	100.0%	○
P04.10	Low frequency vibration control factor of motor 1	In the SVPWM control mode, the motor, especially the large-power motor, may experience current oscillation at certain frequencies, which may cause unstable motor running, or even VFD overcurrent. You can adjust the two function codes properly to eliminate such phenomenon. Setting range of P04.10 and P04.11: 0–100 Setting range of P04.12: 0.00Hz–P00.03 (max. output frequency)	10	○
P04.11	High frequency vibration control factor of motor 1		10	○
P04.12	Vibration control threshold of motor 1		30.00Hz	○

Function code	Name	Description	Default	Modify
P04.26	Energy-saving run	0: Disable 1: Automatic energy-saving operation In light-load state, the motor can adjust the output voltage automatically to achieve energy saving.	0	◎
P04.27	Voltage Setting channel	Select the output voltage setting channel at V/F curve separation. 0: Keypad (The output voltage is determined by P04.28) 1: AI1 2: AI2 3: AI3 4: HDI 5: Multi-step speed 6: PID 7: Modbus communication 8–10: Reversed **Note:** Setting methods 1–7, 100% corresponds to the rated motor voltage.	0	○
P04.28	Voltage set through keypad	The function code is the voltage digital setting when "keypad" is selected as the voltage setting channel. Setting range: 0.0%–100.0%	100.0%	○
P04.29	Voltage increase time	Voltage increase time indicates the time needed for the VFD to accelerate from min. output voltage to the max. output voltage.	5.0s	○
P04.30	Voltage decrease time	Voltage decrease time indicates the time needed for the VFD to decelerate from max. output voltage to the min. output voltage. Setting range: 0.0–3600.0s	5.0s	○
P04.31	Max. output voltage	The function codes are used to set the upper and lower limits of output voltage.	100.0%	◎
P04.32	Min. output voltage		0.0%	◎

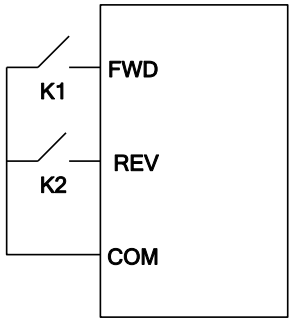
Function code	Name	Description	Default	Modify
		Setting range of P04.31: P04.32–100.0% (of the rated motor voltage) Setting range of P04.32: 0.0%–P04.31 (of the rated motor voltage)		
P04.33	Weakening coefficient in constant power zone	The function code is used to adjust the output voltage of the VFD in SVPWM mode during flux-weakening. **Note:** This parameter is invalid in the constant torque mode.  Setting range of P04.33: 1.00–1.30	1.00	○

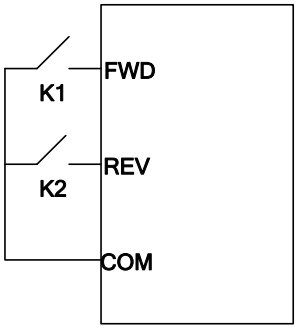
P05 group Input terminals

Function code	Name	Description	Default	Modify
P05.00	HDI input type	0: HDI is high-speed pulse input. See P05.50–P05.54. 1: HDI is digital input	0	◎
P05.01	S1 terminals function selection	**Note**: S1–S4, HDI are the upper terminals on the control board and P05.12 can be used to set the functions of S5–S8. 0: No function 1: Forward running 2: Reverse running 3: 3-wire running control 4: Forward jogging 5: Reverse jogging 6: Coast to stop 7: Fault reset 8: Running pause 9: External fault input 10: Frequency increase (UP) 11: Frequency decrease (DOWN) 12: Clear frequency increase/decrease setting	1	◎
P05.02	S2 terminals function selection		4	◎
P05.03	S3 terminals function selection		7	◎
P05.04	S4 terminals function selection		0	◎
P05.05	S5		0	◎

Function code	Name	Description	Default	Modify
	terminals function selection	13: Switch-over between setup A and setup B 14: Switch-over between combination setting and setup A		
P05.06	S6 terminals function selection	15: Switch-over between combination setting and setup B 16: Multi-step speed terminal 1 17: Multi-step speed terminal 2 18: Multi-step speed terminal 3 19: Multi-step speed terminal 4 20: Multi-step speed pause 21: ACC/DEC time selection 1 22: ACC/DEC time selection 2 23: Simple PLC stop reset 24: Simple PLC pause 25: PID control pause 26: Wobbling frequency pause (stop at the current frequency) 27: Wobbling frequency reset (return to the center frequency) 28: Counter reset 29: Torque control disabled 30: ACC/DEC disabled 31: Counter trigger 32: Reserved 33: Clear frequency increase/decrease setting temporarily 34: DC brake 35: Reserved 36: Command switches to keypad 37: Command switches to the terminals 38: Command switches to communication 39: Pre-exciting command 40: Zero out power consumption quantity 41: Maintain the power consumption quantity 42: Emergency stop 43–60: Reserved 61: PID polarity switch-over 62–63: Reserved When the terminal acts as ACC/DEC time	0	◎
P05.07	S7 terminals function selection		0	◎
P05.08	S8 terminals function selection		0	◎
P05.09	HDI terminals function selection		0	◎

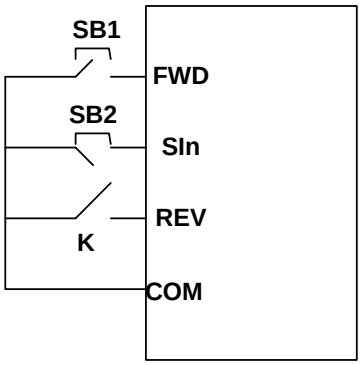
<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>selection, you need to select four groups of ACC/DEC time through state combinations of these two terminals.
<table>
<tr><th>Terminal1</th><th>Terminal2</th><th>ACC/DEC time setting</th><th>Parameters</th></tr>
<tr><td>OFF</td><td>OFF</td><td>ACC/DEC time 1</td><td>P00.11/P00.12</td></tr>
<tr><td>ON</td><td>OFF</td><td>ACC/DEC time 2</td><td>P08.00/P08.01</td></tr>
<tr><td>OFF</td><td>ON</td><td>ACC/DEC time 3</td><td>P08.02/P08.03</td></tr>
<tr><td>ON</td><td>ON</td><td>ACC/DEC time 4</td><td>P08.04/P08.05</td></tr>
</table>
Setting range of P05.01–P05.09: 0–63</td><td></td><td></td></tr>
<tr><td>P05.10</td><td>Input terminal polarity</td><td>The function code is used to set the polarity of input terminals.
When a bit is 0, the input terminal is positive.
When a bit is 1, the input terminal is negative.
<table>
<tr><td>Bit8</td><td>Bit7</td><td>Bit6</td><td>Bit5</td><td>Bit4</td></tr>
<tr><td>HDI</td><td>S8</td><td>S7</td><td>S6</td><td>S5</td></tr>
<tr><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td><td></td></tr>
<tr><td>S4</td><td>S3</td><td>S2</td><td>S1</td><td></td></tr>
</table>
Setting range: 0x000–0x1FF</td><td>0x000</td><td>○</td></tr>
<tr><td>P05.11</td><td>Digital input filter time</td><td>The function code is used to set the filter time for S1–S8 and HDI. In strong interference cases, increase the value to avoid mal-operation.
0.000–1.000s</td><td>0.010s</td><td>○</td></tr>
<tr><td>P05.12</td><td>Virtual terminal setting</td><td>0x000–0x1FF (0: Disable, 1: Enable)
Bit0: S1 virtual terminal
Bit1: S2 virtual terminal
Bit2: S3 virtual terminal
Bit3: S4 virtual terminal
Bit4: S5 virtual terminal
Bit5: S6 virtual terminal
Bit6: S7 virtual terminal
Bit7: S8 virtual terminal</td><td>0x000</td><td>◎</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>Bit8: HDI virtual terminal
Note: After a virtual terminal is enabled, you can change the state of the terminal only in communication mode with the communication address is 0x200A.</td><td></td><td></td></tr>
<tr><td>P05.13</td><td>Terminal control mode</td><td>The function code is used to set the mode of terminal control.
0: 2-wire control 1, the enabling consistent with the direction. This mode is widely used. The defined FWD/REV terminal command determines the motor rotation direction.
 

<table>
<tr><th>FWD</th><th>REV</th><th>Running command</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Stopping</td></tr>
<tr><td>ON</td><td>OFF</td><td>Forward running</td></tr>
<tr><td>OFF</td><td>ON</td><td>Reverse running</td></tr>
<tr><td>ON</td><td>ON</td><td>Hold on</td></tr>
</table>
1: 2-wire control 2, the enabling separated from the direction. In this mode, FWD is the enabling terminal. The direction depends on the defined REV state.
 

<table>
<tr><th>FWD</th><th>REV</th><th>Running command</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Stopping</td></tr>
<tr><td>ON</td><td>OFF</td><td>Forward running</td></tr>
<tr><td>OFF</td><td>ON</td><td>Stopping</td></tr>
<tr><td>ON</td><td>ON</td><td>Reverse running</td></tr>
</table>
2: 3-wire control 1; This mode defines S_{in} as the enabling terminal, and the running command is generated by FWD, while the direction is controlled by REV. During running, the S_{in} terminal needs to be closed, and terminal FWD generates a rising edge signal, then the VFD starts to run in the direction set by the state of terminal REV; the VFD needs to be stopped by disconnecting terminal S_{in}.</td><td>0</td><td>◎</td></tr>
</table>

Function code	Name	Description	Default	Modify

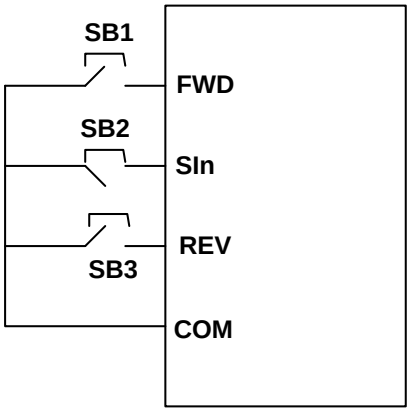


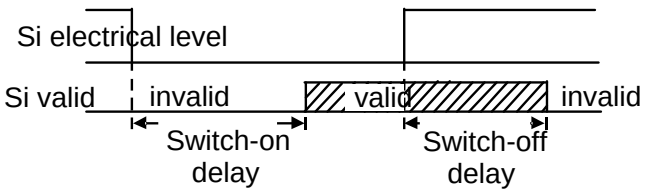
During running, the direction control is as follows:

S_{in}	REV	Previous direction	Present direction
ON	OFF→ON	Forward	Reverse
		Reverse	Forward
ON	ON→OFF	Reverse	Forward
		Forward	Reverse
ON→OFF	ON	Decelerate to stop	
	OFF		

S_{in}: 3-wire control, FWD: Forward running, REV: Reverse running

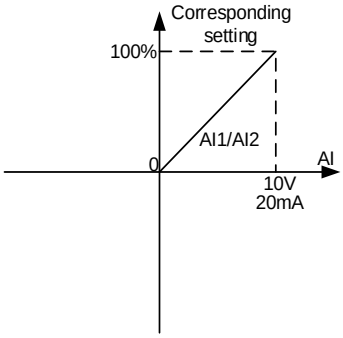
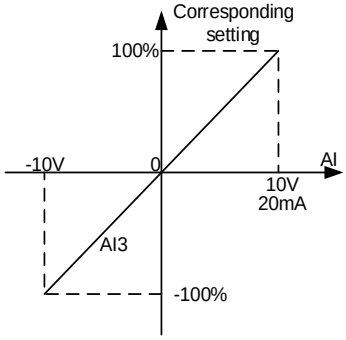
3: 3-wire control 2; This mode defines S_{in} as the enabling terminal, and the running command is generated by FWD or REV, but the direction is controlled by both FWD and REV. During running, the S_{in} terminal needs to be closed, and terminal FWD or REV generates a rising edge signal to control the running and direction of VFD; the VFD needs to be stopped by disconnecting terminal S_{in}.



<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>S_{in}</th><th>FWD</th><th>REV</th><th>Direction</th></tr>
<tr><td rowspan="2">ON</td><td rowspan="2">OFF→ON</td><td>ON</td><td>Forward</td></tr>
<tr><td>OFF</td><td>Reverse</td></tr>
<tr><td rowspan="2">ON</td><td>ON</td><td rowspan="2">OFF→ ON</td><td>Forward</td></tr>
<tr><td>OFF</td><td>Reverse</td></tr>
<tr><td>ON→</td><td>/</td><td>/</td><td rowspan="2">Decelerat e to stop</td></tr>
<tr><td>OFF</td><td>/</td><td>/</td></tr>
</table>
S_{in}: 3-wire control, FWD: Forward running, REV: Reverse running
Note: For 2-wire controlled running mode, when the FWD/REV terminal is valid, if the VFD stops due to a stop command given by another source, the VFD does not run again after the stop command disappears even if the control terminal FWD/REV is still valid. To make the VFD run, you need to trigger FWD/REV again, for example, PLC single-cycle stop, fixed-length stop, and valid STOP/RST stop during terminal control. (See P07.04).
</td><td></td><td></td></tr>
<tr><td>P05.14</td><td>S1 switch-on delay</td><td rowspan="9">The function code defines the delay time corresponding to the electrical level change when the programmable input terminals switch on to switch off.
 

Setting range: 0.000–50.000s</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.15</td><td>S1 switch-off delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.16</td><td>S2 switch-on delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.17</td><td>S2 switch-off delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.18</td><td>S3 switch-on delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.19</td><td>S3 switch-off delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.20</td><td>S4 switch-on delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.21</td><td>S4 switch-off delay</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.22</td><td>S5 switch-on delay</td><td>0.000s</td><td></td></tr>
</table>

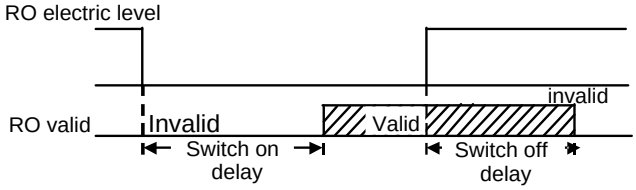
Function code	Name	Description	Default	Modify
P05.23	S5 switch-off delay		0.000s	
P05.24	S6 switch-on delay		0.000s	
P05.25	S6 switch-off delay		0.000s	
P05.26	S7 switch-on delay		0.000s	
P05.27	S7 switch-off delay		0.000s	
P05.28	S8 switch-on delay		0.000s	
P05.29	S8 switch-off delay		0.000s	
P05.30	HDI switch-on delay		0.000s	○
P05.31	HDI switch-off delay		0.000s	○
P05.32	Lower limit of AI1	AI1 is set by the analog potentiometer, AI2 is set by control terminal AI2 and AI3 is set by control terminal AI3. The function code defines the relationship between the analog input voltage and its corresponding set value. If the analog input voltage beyond the set minimum or maximum input value, the VFD will count at the minimum or maximum one. When the analog input is the current input, the corresponding voltage of 0–20 mA is 0–10V. In different cases, the corresponding rated value of 100.0% is different. See the application for detailed information. Input filter time: this parameter is used to adjust the sensitivity of the analog input. Increasing the value properly can enhance the anti-	0.00V	○
P05.33	Corresponding setting of the lower limit of AI1		0.0%	○
P05.34	Upper limit of AI1		10.00V	○
P05.35	Corresponding setting of the upper limit of AI1		100.0%	○

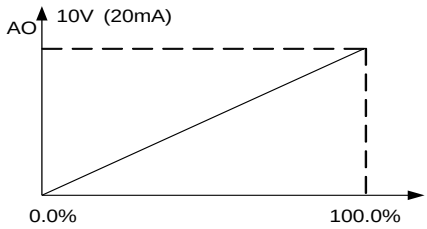
Function code	Name	Description	Default	Modify
P05.36	AI1 input filter time	interference of the analog, but weaken the sensitivity of the analog input **Note:** AI1 supports 0–10V input and AI2 supports 0–10V or 0–20 mA input, when AI2 selects 0–20 mA input, the corresponding voltage of 20 mA is 10V. AI3 can support the output of -10V–+10V. The following figure illustrates different applications:   Setting range of P05.32: 0.00V–P05.34 Setting range of P05.33 and P05.35: -100.0%–100.0% Setting range of P05.34: P05.32–10.00V Setting range of P05.36: 0.000s–10.000s Setting range of P05.37: 0.00V–P05.39 Setting range of P05.38 and P05.40: -100.0%–100.0% Setting range of P05.39: P05.37–10.00V Setting range of P05.41: 0.000s–10.000s Setting range of P05.42: -10.00V–P05.44 Setting range of P05.43, P05.45, and P05.47:	0.100s	○
P05.37	Lower limit of AI2		0.00V	○
P05.38	Corresponding setting of the lower limit of AI2		0.0%	○
P05.39	Upper limit of AI2		10.00V	○
P05.40	Corresponding setting of the upper limit of AI2		100.0%	○
P05.41	AI2 input filter time		0.100s	○
P05.42	Lower limit of AI3		-10.00V	○
P05.43	Corresponding setting of the lower limit of AI3		-100.0%	○
P05.44	Middle value of AI3		0.00V	○
P05.45	Corresponding middle setting of AI3		0.0%	○

Function code	Name	Description	Default	Modify
P05.46	Upper limit of AI3	-100.0%–+100.0% Setting range of P05.44: P05.42–P05.46 Setting range of P05.46: P05.44–10.00V Setting range of P05.48: 0.000s–10.000s	10.00V	○
P05.47	Corresponding setting of the upper limit of AI3		100.0%	○
P05.48	AI3 input filter time		0.100s	○
P05.50	Lower limit frequency of HDI	0.000 kHz–P05.52	0.000 kHz	○
P05.51	Corresponding setting of HDI low frequency setting	-100.0%–100.0%	0.0%	○
P05.52	Upper limit frequency of HDI	P05.50–50.000 kHz	50.000 kHz	○
P05.53	Corresponding setting of upper limit frequency of HDI	-100.0%–100.0%	100.0%	○
P05.54	HDI frequency input filter time	0.000s–10.000s	0.100s	○

P06 group Output terminals

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td>P06.01</td><td>Y1 output type</td><td rowspan="3">0: Invalid
1: In operation
2: Forward rotation operation
3: Reverse rotation operation
4: Jogging operation
5: The VFD fault
6: Frequency degree test FDT1
7: Frequency degree test FDT2
8: Frequency arrival
9: In zero-speed operation (output in running state)
10: Upper limit frequency arrival
11: Lower limit frequency arrival
12: Ready for operation
13: Pre-magnetizing
14: Overload pre-alarm
15: Underload pre-alarm
16: Completion of simple PLC step
17: Completion of simple PLC cycle
18: Setting count value arrival
19: Defined count value arrival
20: External fault valid
21: Zero-speed output (output in both running and stopping states)
22: Running time arrival
23: Modbus communication virtual terminals output
24–25: Reserved
26: Establishment of DC bus voltage
27–30: Reserved</td><td>0</td><td>○</td></tr>
<tr><td>P06.03</td><td>RO1 output</td><td>1</td><td>○</td></tr>
<tr><td>P06.04</td><td>RO2 output</td><td>5</td><td>○</td></tr>
<tr><td>P06.05</td><td>Output terminal polarity selection</td><td>The function code is used to set the polarity of output terminals.
When the bit is set to 0, the output terminal is positive.
When the bit is set to 1, the output terminal is negative.
<table>
<tr><th>Bit3</th><th>Bit2</th><th>Bit1</th><th>Bit0</th></tr>
<tr><td>RO2</td><td>RO1</td><td>Reserved</td><td>Y1</td></tr>
</table>
Setting range: 0x00–0x0F</td><td>0x00</td><td>○</td></tr>
</table>

Function code	Name	Description	Default	Modify
P06.06	Y1 switch-on delay	Setting range: 0.000–50.000s	0.000s	○
P06.07	Y1 switch-off delay	Setting range: 0.000–50.000s	0.000s	○
P06.10	RO1 switch-on delay	The function code defines the delay time corresponding to the electrical level changes when the programmable output terminals switch on or switch off.  Setting range : 0.000–50.000s	0.000s	○
P06.11	RO1 switch-off delay		0.000s	○
P06.12	RO2 switch-on delay		0.000s	○
P06.13	RO2 switch-off delay		0.000s	○
P06.14	AO1 output	0: Running frequency 1: Setting frequency 2: Ramp reference frequency 3: Running rotation speed (100% corresponds to the speed corresponding to max. output frequency) 4: Output current (100% corresponds to twice the VFD rated current) 5: Output current (100% corresponds to twice the motor rated current) 6: Output voltage (100% corresponds to 1.5 times the VFD rated voltage) 7: Output power (100% corresponds to twice the motor rated power) 8: Set torque (100% corresponds to twice the motor rated torque) 9: Output torque (Absolute value, 100% corresponds to twice the motor rated torque) 10: AI1 input 11: AI2 input 12: AI3 input 13: High speed pulse HDI input	0	○
P06.15	AO2 output		0	○

Function code	Name	Description	Default	Modify
		14: Value 1 set through Modbus communication 15: Value 2 set through Modbus communication 16–21: Reserved 22: Torque current (100% corresponds to triple the motor rated current) 23: Ramp reference frequency (with sign) 24–30: Reserved		
P06.17	Lower limit of AO1 output	The function codes define the relationship between the output value and analog output. When the output value exceeds the allowed range, the output uses the lower limit or upper limit. When the analog output is current output, 1 mA equals to 0.5 V. In different cases, the corresponding analog output of 100% of the output value is different.  Setting range of P06.17: -100.0%–P06.19 Setting range of P06.18: 0.00–10.00V Setting range of P06.19: P06.17–100.0% Setting range of P06.20: 0.00–10.00V Setting range of P06.21: 0.000–10.000s Setting range of P06.22: -100.0%–P06.24 Setting range of P06.23: 0.00–10.00V Setting range of P06.24: P06.22–100.0% Setting range of P06.25: 0.00–10.00V Setting range of P06.26: 0.000–10.000s	0.0%	○
P06.18	Corresponding AO1 output to the lower limit		0.00V	○
P06.19	Upper limit of AO1 output		100.0%	○
P06.20	Corresponding AO1 output to the upper limit		10.00V	○
P06.21	AO1 output filter time		0.000s	○
P06.22	Lower limit of AO2 output		0.0%	○
P06.23	Corresponding		0.00V	○

Function code	Name	Description	Default	Modify
	AO2 output to the lower limit			
P06.24	Upper limit of AO2 output		100.0%	○
P06.25	Corresponding AO2 output to the upper limit		10.00V	○
P06.26	AO2 output filter time		0.000s	○

P07 group HMI

Function code	Name	Description	Default	Modify
P07.00	User password	0–65535 When you set the function code to a non-zero number, password protection is enabled. If you set the function code to 00000, the previous user password is cleared and password protection is disabled. After the user password is set and takes effect, you cannot enter the parameter menu if you enter an incorrect password. Please remember your password and save it in a secure place. After you exit the function code editing interface, the password protection function is enabled within 1 minute. If password protection is enabled, "0.0.0.0.0" is displayed when you press the PRG/ESC key again to enter the function code editing	0	○

Function code	Name	Description	Default	Modify
		interface. You need to enter the correct user password to enter the interface. **Note:** Restoring to the default value may delete the user password. Exercise caution when using this function.		
P07.01	Parameter copy	0: No operation 1: Upload the local function parameter to the keypad 2: Download the keypad function parameter to local address (including the motor parameters) 3: Download the keypad function parameter to local address (excluding the motor parameter of P02 and P12 group) 4: Download the keypad function parameters to local address (only for the motor parameter of P02 and P12 group) **Note**: After the parameter is set to 1, 2, 3 or 4, and the operation is executed, the parameter is automatically restored to 0. The parameters uploaded or downloaded do not include those of the P29 group (factory function parameters). The function is valid only for the optional external keypad with the function of parameter copying.	0	◎
P07.02	QUICK key function selection	0x00–0x27 Ones place: Function of QUICK/JOG key 0: No function 1: Jog 2: Switch display state via shift key 3: Switch between FWD and REV rotating 4: Clear the UP/DOWN setting 5: Coast to stop 6: Switch command channels in sequence 7: Quick Commissioning mode (based on non-default parameter) Tens place: Key locking selection 0: Keys unlocked	0x01	◎

Function code	Name	Description	Default	Modify
		1: Lock all keys 2: Lock part of the keys (lock PRG/ESC key only)		
P07.03	Sequence of switching running command channels by pressing QUICK/JOG	When the one place of P07.02 =6, set the sequence of switching running command channels by pressing this key. 0: Keypad→Terminal→Communication 1: Keypad←→Terminal 2: Keypad←→Communication 3: Terminal←→Communication	0	○
P07.04	Stop function validity of STOP/RST	The function code specifies the stop function validity of STOP/RST. For fault reset, STOP/RST is valid in any conditions. 0: Valid only for keypad control 1: Valid both for keypad and terminal control 2: Valid both for keypad and communication control 3: Valid for all control modes	0	○
P07.05	Displayed parameters 1 of running state	0x0000–0xFFFF Bit0: Running frequency (Hz on) Bit1: Set frequency (Hz flickering) Bit2: Bus voltage (V on) Bit3: Output voltage (V on) Bit4: Output current (A on) Bit5: Running rotation speed (rpm on) Bit6: Output power (% on) Bit7: Output torque (% on) Bit8: PID reference (% flickering) Bit9: PID feedback (% on) Bit10: Input terminal state Bit11: Output terminal state Bit12: Torque setting (% on) Bit13: Pulse counting Bit14: Reserved Bit15: PLC and current step of multi-step speed	0x03FF	○

Function code	Name	Description	Default	Modify
P07.06	Displayed parameters 2 of running state	0x0000–0xFFFF Bit0: AI1 (V on) Bit1: AI2 (V on) Bit2: AI3 (V on) Bit3: High-speed pulse HDI frequency Bit4: Motor overload percentage (% on) Bit5: VFD overload percentage (% on) Bit6: Ramp frequency reference (Hz on) Bit7: Linear speed Bit8: AC incoming current (A on) Bit9–15: Reserved	0x0000	
P07.07	Parameter selection of the stop state	0x0000–0xFFFF Bit0: Set frequency (Hz on, frequency flickering slowly) Bit1: Bus voltage (V on) Bit2: Input terminal state Bit3: Output terminal state Bit4: PID reference (% flickering) Bit5: PID feedback (% on) Bit6: Torque reference (% flickering) Bit7: AI1 (V on) Bit8: AI2 (V on) Bit9: AI3 (V on) Bit10: High-speed pulse HDI frequency Bit11: PLC and current step of multi-step speed Bit12: Pulse counting Bit13–Bit15: Reserved	0x00FF	○
P07.08	Frequency display coefficient	0.01–10.00 Displayed frequency = Running frequency x P07.08	1.00	○
P07.09	Speed display coefficient	0.1–999.9% Mechanical rotation speed = 120 x (Displayed running frequency) xP07.09/(Number of motor poles)	100.0%	○
P07.10	Linear speed displayed coefficient	0.1–999.9% Linear speed= (Mechanical rotation speed) × P07.10	1.0%	○

Function code	Name	Description	Default	Modify
P07.11	Rectifier bridge temperature	-20.0–120.0°C	0.0°C	●
P07.12	Inverter temperature	-20.0–120.0°C	0.0°C	●
P07.13	Control board software version	1.00–655.35	Depend on model	●
P07.14	Local accumulative running time	0–65535 h	0h	●
P07.15	MSB of power consumption	The function codes are used to display the power consumption of the VFD. VFD power consumption = P07.15x1000 + P07.16 Setting range of P07.15: 0–65535kWh (x1000) Setting range of P07.16: 0.0–999.9kWh	0kWh	●
P07.16	LSB of power consumption		0.0kWh	●
P07.17	Reserved	Reserved		●
P07.18	Rated power of the VFD	0.4–3000.0kW	0.4kW	●
P07.19	Rated voltage of the VFD	50–1200V	380V	●
P07.20	Rated current of the VFD	0.1–6000.0A	0.1A	●
P07.21	Factory bar code 1	0x0000–0xFFFF	0xFFFF	●
P07.22	Factory bar code 2	0x0000–0xFFFF	0xFFFF	●
P07.23	Factory bar code 3	0x0000–0xFFFF	0xFFFF	●
P07.24	Factory bar code 4	0x0000–0xFFFF	0xFFFF	●
P07.25	Factory bar code 5	0x0000–0xFFFF	0xFFFF	●
P07.26	Factory bar code 6	0x0000–0xFFFF	0xFFFF	●
P07.27	Present fault	0: No fault	0	●

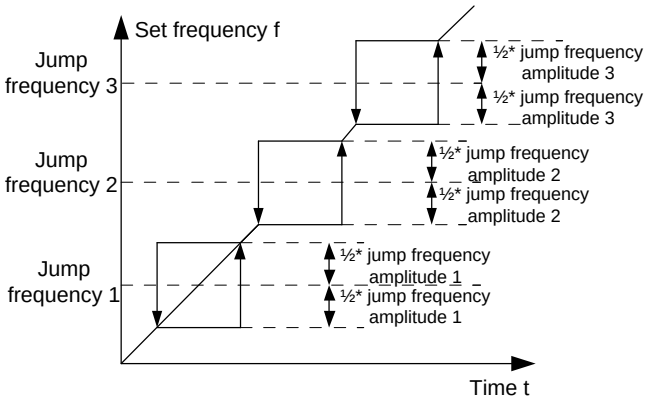
Function code	Name	Description	Default	Modify
	type	1: Inverter unit U phase protection (OUt1) 2: Inverter unit V phase protection (OUt2) 3: Inverter unit W phase protection (OUt3) 4: Overcurrent during acceleration (OC1) 5: Overcurrent during deceleration (OC2) 6: Overcurrent during constant speed running (OC3) 7: Overvoltage during acceleration (OV1) 8: Overvoltage during deceleration (OV2) 9: Overvoltage during constant speed running (OV3) 10: Bus undervoltage (UV) 11: Motor overload (OL1) 12: VFD overload (OL2) 13: Phase loss on input side(SPI) 14: Phase loss on output side (SPO) 15: Rectifier module overheat(OH1) 16: Inverter module overheat (OH2) 17: External fault (EF) 18: RS485 communication fault (CE) 19: Current detection fault (ItE) 20: Motor autotuning fault (tE) 21: EEPROM operation fault (EEP) 22: PID feedback offline fault (PIDE) 23: Braking unit fault (bCE) 24: Running time reached (END) 25: Electronic overload (OL3) 26: Keypad communication error (PCE) 27: Parameter upload error (UPE) 28: Parameter download error (DNE) 29–31: Reserved 32: To-ground short-circuit fault 1 (ETH1) 33: To-ground short-circuit fault 2 (ETH2) 34: Speed deviation fault (dEu) 35: Mal-adjustment fault (STo) 36: Underload fault (LL)		
P07.28	The last fault type		0	●
P07.29	The last but one fault type		0	●
P07.30	The last but two fault type		0	●
P07.31	The last but three fault type		0	●
P07.32	The last but four fault type		0	●
P07.33	Running frequency at present fault	0.00–630.00Hz	0.00Hz	●

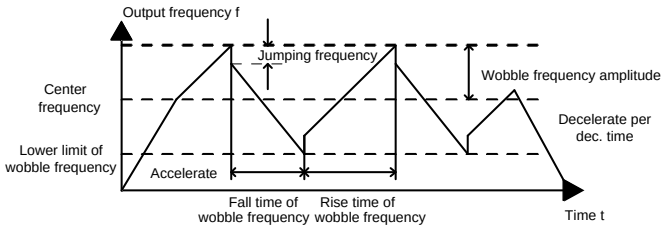
Function code	Name	Description	Default	Modify
P07.34	Ramp reference frequency at present fault	0.00–630.00Hz	0.00Hz	●
P07.35	Output voltage at present fault	0–1200V	0V	●
P07.36	Output current at present fault	0.0–6300.0A	0.0A	●
P07.37	Current bus voltage at present fault	0.0–2000.0V	0.0V	●
P07.38	Temperature at present fault	0.0–120.0°C	0.0°C	●
P07.39	Input terminal state at present fault	0x0000–0xFFFF	0x0000	●
P07.40	Output terminal state at present fault	0x0000–0xFFFF	0x0000	●
P07.41	Running frequency at the last fault	0.00–630.00Hz	0.00Hz	●
P07.42	Ramp reference frequency at the last fault	0.00–630.00Hz	0.00Hz	●
P07.43	Output voltage at last fault	0–1200V	0V	●
P07.44	Output current at last fault	0.0–6300.0A	0.0A	●
P07.45	Bus voltage at last fault	0.0–2000.0V	0.0V	●

Function code	Name	Description	Default	Modify
P07.46	Temperature at last fault	0.0–120.0°C	0.0°C	●
P07.47	Input terminal state at last fault	0x0000–0xFFFF	0x0000	●
P07.48	Output terminal state at last fault	0x0000–0xFFFF	0x0000	●
P07.49	Running frequency at the last but one faults	0.00–630.00Hz	0.00Hz	●
P07.50	Ramp reference frequency at the last but one faults	0.00–630.00Hz	0.00Hz	●
P07.51	Output voltage at the last but one faults	0–1200V	0V	●
P07.52	Output current at the last but one faults	0.0–6300.0A	0.0A	●
P07.53	Bus voltage at the last but one faults	0.0–2000.0V	0.0V	●
P07.54	Temperature at the last but one faults	0.0–120.0°C	0.0°C	●
P07.55	Input terminal state at the last but one faults	0x0000–0xFFFF	0x0000	●
P07.56	Output terminal state at the last but one faults	0x0000–0xFFFF	0x0000	●

P08 group Enhanced functions

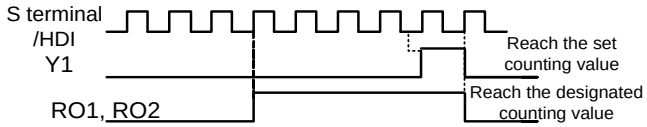
Function code	Name	Description	Default	Modify
P08.00	ACC time 2	Refer to P00.11 and P00.12 for detailed definition. The VFD has four groups of ACC/DEC time which can be selected by P5 group. The first group of ACC/DEC time is the factory default one. Setting range: 0.0–3600.0s	Depend on model	○
P08.01	DEC time 2		Depend on model	○
P08.02	ACC time 3		Depend on model	○
P08.03	DEC time 3		Depend on model	○
P08.04	ACC time 4		Depend on model	○
P08.05	DEC time 4		Depend on model	○
P08.06	Running frequency of jog	The function code is used to define the reference frequency during jogging. Setting range: 0.00Hz–P00.03 (max. output frequency)	5.00Hz	○
P08.07	ACC time for jog	ACC time for jogging means the time needed for the VFD to accelerate from 0Hz to the max. output frequency (P00.03). DEC time for jogging means the time needed for the VFD to decelerate from the max. output frequency (P00.03) to 0Hz. Setting range: 0.0–3600.0s	Depend on model	○
P08.08	DEC time for jog		Depend on model	○
P08.09	Jump frequency 1	When the set frequency is within the range of jumping frequency, the VFD runs at the boundary of jumping frequency. The VFD can avoid the mechanical resonance point by setting jumping frequencies. The VFD supports the setting of three jump frequencies. If the jump frequency points are set to 0, this function is invalid.	0.00Hz	○
P08.10	Jump frequency amplitude 1		0.00Hz	○
P08.11	Jump frequency 2		0.00Hz	○
P08.12	Jump frequency amplitude 2		0.00Hz	○

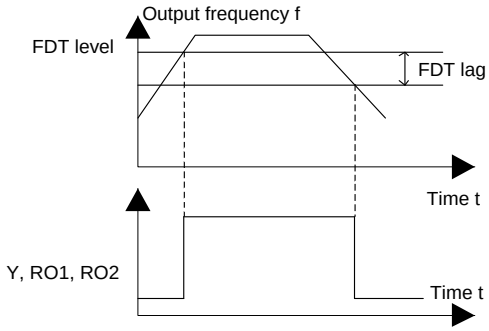
<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td>P08.13</td><td>Jump frequency 3</td><td rowspan="2"> 

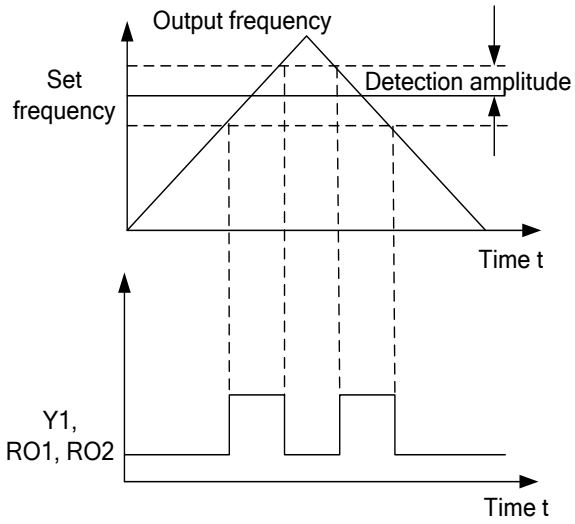
Setting range: 0.00–P00.03 (max. output frequency)</td><td>0.00Hz</td><td>○</td></tr>
<tr><td>P08.14</td><td>Jump frequency amplitude 3</td><td>0.00Hz</td><td>○</td></tr>
<tr><td>P08.15</td><td>Amplitude of wobbling frequency</td><td rowspan="4">This function applies to the industries where traverse and convolution function are required such as textile and chemical fiber.
The traverse function means that the output frequency of the VFD is fluctuated with the set frequency as its center. The route of the running frequency is illustrated as follows, of which the traverse is set by P08.15 and when P08.15 is set as 0, the traverse is 0 with no function.
 

Amplitude of wobbling frequency: The wobbling frequency running is limited by upper and low limits of the frequency.
The traverse range relative to the center frequency: traverse range AW = center frequency × traverse range P08.15.
Sudden jump frequency = Amplitude of wobbling frequency AW ×Amplitude of sudden jump frequency (P08.16), that is, the value that the sudden jump frequency corresponds to the wobbling frequency when the VFD runs at the wobbling frequency.</td><td>0.0%</td><td>○</td></tr>
<tr><td>P08.16</td><td>Amplitude of sudden jump frequency</td><td>0.0%</td><td>○</td></tr>
<tr><td>P08.17</td><td>Rise time of wobbling frequency</td><td>5.0s</td><td>○</td></tr>
<tr><td>P08.18</td><td>Fall time of wobbling frequency</td><td>5.0s</td><td>○</td></tr>
</table>

Function code	Name	Description	Default	Modify
		Rise time of wobbling frequency: Time needed for the VFD to run from the lowest point to the highest one. Fall time of wobbling frequency: The time needed for the VFD to from the highest point to the lowest one. Setting range of P08.15: 0.0–100.0% (relative to the set frequency) Setting range of P08.16: 0.0–50.0% (relative to the amplitude of wobbling frequency) Setting range of P08.17 and P08.18: 0.1–3600.0s		
P08.19	Number of decimal places of linear speed/frequency	0x00–0x13 Ones place: Linear speed displays number of decimal places 0: No decimal place 1: One 2: Two 3: Three Tens place: Frequency displays number of decimal places 0: Two 1: One	0x00	○
P08.20	Analog calibration function	0: Disable 1: Enable	1	◎
P08.21	DEC time of emergency stop	0.0–6553.5 s 0.0 indicates coast to stop.	0.0s	○
P08.22	Delay to enter the sleep state	0.0–3600.0s It indicates the delay to enter the sleep state, and it is valid only when ones place of P01.19 is set to 2.	2.0s	○
P08.24	Energy braking for stop	Setting range: 0–1 0: Disable 1: Enable	1	○

Function code	Name	Description	Default	Modify
P08.25	Set counting value	The counter works by the input terminal signals of S terminal (set as "Counter trigger") or HDI (set P05.00 to 1). When the counter achieves a fixed number, the multi-function output terminals will output the signal of "fixed counting number arrival" and the counter go on working; when the counter achieves a setting number, the multi-function output terminals will output the signal of "setting counting number arrival", the counter will clear all numbers and stop to recount before the next pulse. The setting counting value P08.26 should be no more than the setting counting value P08.25. The function is illustrated as follows.  Setting range of P08.25: P08.26–65535 Setting range of P08.26: 0–P08.25	0	○
P08.26	Designated counting value		0	○
P08.27	Setting running time	Pre-set running time of the VFD. When the accumulative running time achieves the set time, the multi-function digital output terminals will output the signal of "running time arrival". Setting range: 0–65535 min	0 m	○
P08.28	Auto fault reset count	Auto fault reset count: When the VFD uses automatic fault reset, it is used to set the number of automatic fault reset times. When the number of continuous reset times exceeds the value, the VFD reports a fault and stops. Interval time of auto fault reset: Time interval from when a fault occurred to when automatic fault reset takes effect. Setting range of P08.28: 0–10 Setting range of P08.29: 0.1–3600.0s	0	○
P08.29	Interval time of auto fault reset		1.0s	○

Function code	Name	Description	Default	Modify
P08.30	Frequency decrease ratio in drop control	The output frequency of the VFD changes as the load changes. The function code is mainly used to balance the power when several motors drive a same load. Setting range: -50.00Hz–+50.00Hz	0.00Hz	○
P08.32	FDT1 electrical level detection value	When the output frequency exceeds the corresponding frequency of FDT electrical level, the multi-function digital output terminals continuously outputs the signal of "Frequency level detect FDT". The signal is invalid only when the output frequency decreases to a value lower than the frequency corresponding to (FDT electrical level—FDT lagging detection value) The waveform diagram is as follows:  Setting range of P08.32: 0.00Hz–P00.03 (max output frequency) Setting range of P08.33 and P08.35: 0.0–100.0% Setting range of P08.34: 0.00Hz–P00.03 (max output frequency)	50.00Hz	○
P08.33	FDT1 lagging detection value		5.0%	○
P08.34	FDT2 electrical level detection value		50.00Hz	○
P08.35	FDT2 lagging detection value		5.0%	○
P08.36	Detection value for frequency being reached	When the output frequency is within the detection range, the multi-function digital output terminal outputs the signal of "Frequency reached".	0.00Hz	○

Function code	Name	Description	Default	Modify
		 Setting range: 0.00Hz–P00.03 (max output frequency)		
P08.37	Enabling energy consumption braking	The function code is used to control enabling of the brake tube action inside the VFD. 0: Disable 1: Enable **Note:** It is only applicable to VFD models that are built in braking tubes.	0	○
P08.38	Energy consumption braking threshold voltage	The function code is used to set the starting bus voltage of energy consumption braking. Adjust this value properly to achieve effective braking for the load. The default value varies depending on the voltage class. Setting range: 200.0–2000.0V	220V voltage: 380.0V 380V voltage: 700.0V	○
P08.39	Cooling fan running mode	Setting range: 0–2 0: Common running mode 1: The fan keeps running after being powered on 2: Running mode 2	0	○
P08.40	PWM selection	0x0000–0x1121 Ones place: PWM mode selection 0: PWM mode 1, 3PH modulation and 2PH modulation 1: PWM mode 2, 3PH modulation Tens place: PWM low-speed carrier limit	0x0001	◎

Function code	Name	Description	Default	Modify
		0: Low-speed carrier limit mode 1 1: Low-speed carrier limit mode 2 2: No limit Hundreds place: Reserved Thousands place: PWM loading mode selection 0: Normal loading 1: Interruptive loading		
P08.41	Overmodulation	0x00–0x11 Ones place: Whether to enable overmodulation 0: Disable overmodulation 1: Enable overmodulation Tens place: Overmodulation mode 0: Mild overmodulation 1: Deepened overmodulation	0x01	◎
P08.42	Data control set through keypad	0x0000–0x1223 Ones place: Frequency enable selection 0: Both ∧ / ∨ keys and analog potentiometer adjustments are valid 1: Only ∧/∨ keys adjustment is valid 2: Only analog potentiometer adjustments is valid 3: Neither ∧ / ∨ keys nor digital potentiometer adjustments are valid Tens place: Frequency control selection 0: Valid only when P00.06=0 or P00.07=0 1: Valid for all frequency setting manner 2: Invalid for multi-step speed when multi-step speed has the priority Hundreds place: Action selection during stopping 0: Setting is valid 1: Valid during running, cleared after stopping 2: Valid during running, cleared after receiving the stop command Thousands place: ∧/∨ keys and analog potentiometer integral function	0x0000	○

Function code	Name	Description	Default	Modify
		0: The integral function is enabled 1: The integral function is disabled		
P08.43	Integral ratio of the keypad potentiometer	0.01–10.00s	0.10s	○
P08.44	UP/DOWN terminal control setting	0x000–0x221 Ones place: Frequency setting selection 0: The setting made through UP/DOWN terminal is valid 1: The setting made through UP/DOWN terminal is invalid Tens place: Frequency control selection 0: Valid only when P00.06=0 or P00.07=0 1: Valid for all frequency setting methods 2: Invalid for multi-step speed running when multi-step speed running has the priority LED hundreds: Action selection for stop 0: Setting is valid 1: Valid during running, cleared after stop 2: Valid during running, cleared after a stop command is received	0x000	○
P08.45	Frequency increment integral rate of the UP terminal	0.01–50.00s	0.50s	○
P08.46	Frequency integral rate of the DOWN terminal	0.01–50.00s	0.50s	○
P08.47	Action selection at power-off during frequency setting	0x000–0x111 Ones place: Action selection at power-off during frequency adjusting through digitals. 0: Save the setting at power-off 1: Clear the setting at power-off Tens place: Action selection at power-off	0x000	○

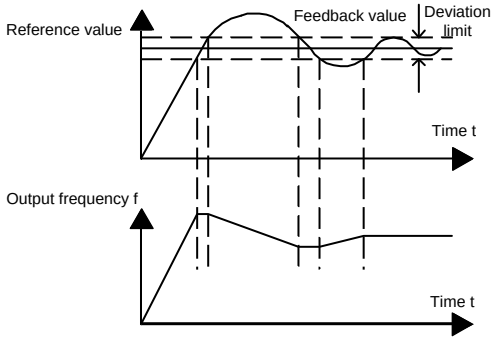
Function code	Name	Description	Default	Modify
		during frequency setting through Modbus communication 0: Save the setting at power-off 1: Clear the setting at power-off Hundreds place: Action selection at power-off during frequency setting through other communication methods 0: Save the setting at power-off 1: Clear the setting at power-off		
P08.48	MSB of initial power consumption	This parameter is used to set the initial power consumption. Initial power consumption =P08.48x1000+ P08.49 (kWh) Setting range of P08.48: 0–59999 Setting range of P08.49: 0.0–999.9	0	○
P08.49	LSB of initial power consumption		0.0	○
P08.50	Magnetic flux braking	This function code is used to enable magnetic flux braking. 0: Invalid. 100–150: A greater coefficient indicates greater braking strength. The VFD can quickly slow down the motor by increasing the magnetic flux. The energy generated by the motor during braking can be transformed into heat energy by increasing the magnetic flux. The VFD monitors the state of the motor continuously even during the magnetic flux period. So the magnetic flux can be used for motor stop, as well as for motor rotation speed change. Its other advantages include: Braking is performed immediately after the stop command is given. The braking can be started without waiting for magnetic flux weakening. The cooling is better. The current of the stator	0	○

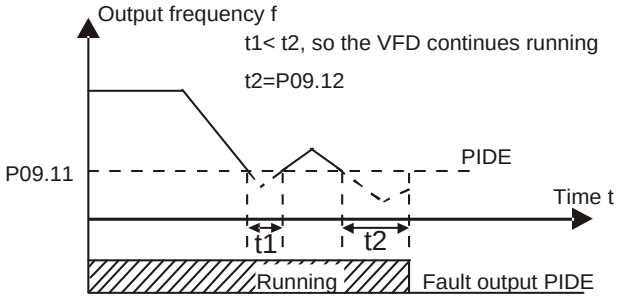
Function code	Name	Description	Default	Modify
		other than the rotor increases during magnetic flux braking, while the cooling of the stator is more effective than the rotor.		
P08.51	VFD input power factor	This function code is used to adjust the displayed current on the AC input side. Setting range: 0.00–1.00	0.56	○

P09 group PID control

Function code	Name	Description	Default	Modify
P09.00	PID reference source	When the frequency command selection (P00.06, P00.07) is 7 or the voltage setting channel selection (P04.27) is 6, the VFD is process PID controlled. The function code determines the target given channel during the PID process. 0: P09.01 1: AI1 2: AI2 3: AI3 4: High speed pulse HDI 5: Multi-step running 6: Modbus communication 7–9: Reserved The set target of process PID is a relative value, for which 100% equals to 100% of the feedback signal of the controlled system. The system always calculates a related value (0–100.0%). **Note:** Multi-step running reference can be achieved by setting P10 group parameters.	0	○
P09.01	PID value reference	The function code is mandatory when P09.00=0. The base value of the function code is the feedback of the system. Setting range: -100.0%–100.0%	0.0%	○
P09.02	PID feedback source	The function code is used to select PID feedback channel. 0: AI1 1: AI2	0	○

Function code	Name	Description	Default	Modify
		2: AI3 3: High speed HDI 4: Modbus communication 5: MAX (AI2 and AI3) 6–7: Reserved **Note:** The reference channel and feedback channel cannot be duplicate. Otherwise, effective PID control cannot be achieved.		
P09.03	PID output characteristics	0: PID output is positive. When the feedback signal is greater than the PID reference value, the output frequency of the VFD will decrease to balance the PID. Example: PID control on strain during unwinding. 1: PID output is negative. When the feedback signal is greater than the PID reference value, the output frequency of the VFD will increase to balance the PID. Example: PID control on strain during unwinding.	0	○
P09.04	Proportional gain at high frequency (Kp)	The function is applied to the proportional gain P of PID input. P determines the strength of the whole PID adjuster. The value 100 indicates that when the difference between the PID feedback value and given value is 100%, the range within which the PID regulator can regulate the output frequency command is the max. frequency (ignoring integral function and differential function). Setting range: 0.00–100.00	1.00	○
P09.05	Integral time at high frequency (Ti)	It determines the speed of integral regulation made on the deviation between PID feedback and reference by PID regulator. When the deviation between PID feedback and reference is 100%, the regulation of integral regulator (ignoring integral and differential actions), after undergoing continuous regulation during this time period, can reach max. output frequency (P00.03) or max. output voltage (P04.31). The shorter the	0.10s	○

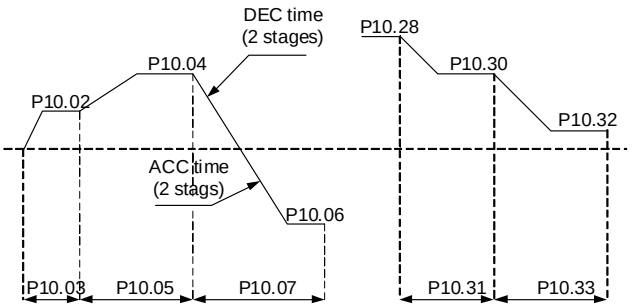
Function code	Name	Description	Default	Modify
		integral time, the stronger the regulation intensity. Setting range: 0.00–10.00s		
P09.06	Differential time at high frequency (Td)	It determines the intensity of the regulation made on the change rate of deviation between PID feedback and reference by PID regulator. If feedback changes by 100% during this period, the regulation of differential regulator (ignoring integral and differential actions) is max. output frequency (P00.03) or max. output voltage (P04.31). The longer the differential time, the stronger the regulation intensity. Setting range: 0.00–10.00s	0.00s	○
P09.07	Sampling cycle (T)	It means the sampling cycle of feedback. The regulator operates once during each sampling cycle. The larger the sampling cycle, the slower the response. Setting range: 0.001–10.000s	0.100s	○
P09.08	Limit of PID control deviation	It is the max. allowable deviation of PID system output value relative to closed-loop reference value. Within this limit, PID regulator stops regulation. Set this function code properly to regulate the precision and stability of PID system.  Setting range: 0.0–100.0%	0.0%	○
P09.09	Upper limit value of PID output	The two function codes are used to set the upper /lower limit value of PID regulator. 100.0% corresponds to max. output frequency (P00.03) or max. output voltage	100.0%	○
P09.10	Lower limit		0.0%	○

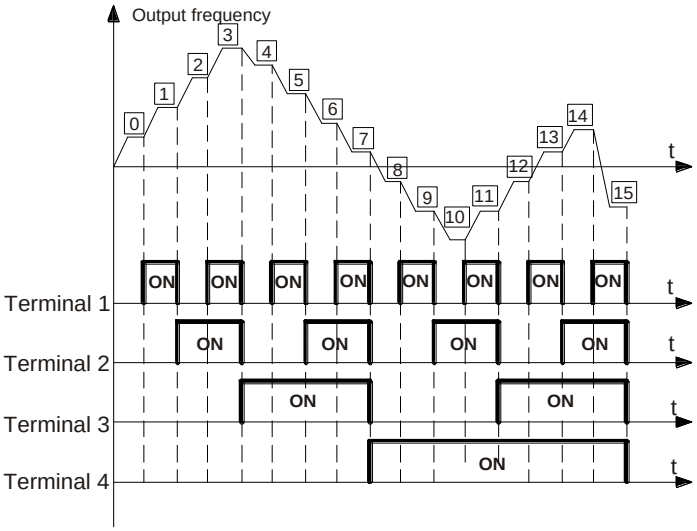
Function code	Name	Description	Default	Modify
	value of PID output	(P04.31). Setting range of P09.09: P09.10–100.0% Setting range of P09.10: -100.0%–P09.09		
P09.11	Feedback offline detection value	Set the PID feedback offline detection value, when the detection value is no more than the feedback offline detection value, and the duration exceeds the value set in P09.12, the VFD will report "PID feedback offline fault", and keypad displays PIDE.  Setting range of P09.11: 0.0–100.0% Setting range of P09.12: 0.0–3600.0s	0.0%	○
P09.12	Feedback offline detection time		1.0s	○
P09.13	PID control selection	0x0000–0x1111 Ones place: 0: Continue integral control after the frequency reaches upper/lower limit 1: Stop integral control after the frequency reaches upper/lower limit Tens place: 0: The same with the main reference direction 1: Contrary to the main reference direction Hundreds place: 0: Limit based on the max. frequency 1: Limit based on A frequency Thousands place: 0: A+B frequency, ACC/DEC of main reference A frequency source buffering is invalid 1: A+B frequency, ACC/DEC of main reference A frequency source buffering is valid, ACC and DEC are determined by P08.04 (ACC time 4)	0x0001	○
P09.14	Reserved			

Function code	Name	Description	Default	Modify
P09.15	ACC/DEC time of PID command	0.0–1000.0s	0.0s	○
P09.16	PID output filter time	0.000–10.000s	0.000s	○
P09.17	Proportional gain at low frequency (Kp)	0.00–100.00	1.00	○
P09.18	Integral time at low frequency (Ti)	0.00–10.00s	0.10s	○
P09.19	Differential time at low frequency (Td)	0.00–10.00s	0.00s	○
P09.20	Low-point frequency for switching PI parameters	0.00Hz–P09.21 When the ramp frequency is less than or equal to P09.20, the present PID parameters range from P09.17 to P09.19. When the ramp frequency is greater than or equal to P09.21, the present PI parameters range from P09.04 to P09.06. The intermediate frequency band is the linear interpolation between high and low-point frequency.	5.00Hz	○
P09.21	High-point frequency for switching PI parameters	P09.20–P00.03	10.00Hz	○

P10 group Simple PLC and multi-step speed control

Function code	Name	Description	Default	Modify
P10.00	Simple PLC mode	0: Stop after running once; the VFD stops automatically after running for one cycle, and it can be started only after receiving running	0	○

Function code	Name	Description	Default	Modify
		command. 1: Keep running in the final value after running once. The VFD keeps the running frequency and direction of the last section after a single cycle. 2: Cyclic running; the VFD enters the next cycle after completing one cycle until receiving stop command and stops.		
P10.01	Simple PLC memory selection	0: No memory after power-off 1: Memory after power-off; PLC memories its running step and frequency before power-off.	0	○
P10.02	Multi-step speed 0	100.0% of the frequency setting corresponds to max. output frequency (P00.03). When simple PLC operation is selected, it is required to set P10.02–P10.33 to determine the running frequency and running direction of each step. **Note:** The symbol of multi-step speed determines the running direction of simple PLC, and the negative value means reverse running.  Multi-step speeds are within the range of $-f_{max}$–f_{max}, and they can be set continuously. The VFD supports the setting of speeds of 16 steps, which are set by combined codes of multi-step terminals 1–4, and correspond to multi-step speed 0 to multi-step speed 15.	0.0%	○
P10.03	Running time of step 0		0.0s	○
P10.04	Multi-step speed 1		0.0%	○
P10.05	Running time of step 1		0.0s	○
P10.06	Multi-step speed 2		0.0%	○
P10.07	Running time of step 2		0.0s	○
P10.08	Multi-step speed 3		0.0%	○
P10.09	Running time of step 3		0.0s	○
P10.10	Multi-step speed 4		0.0%	○
P10.11	Running time of step 4		0.0s	○
P10.12	Multi-step speed 5		0.0%	○

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td>P10.13</td><td>Running time of step 5</td><td rowspan="16"> 

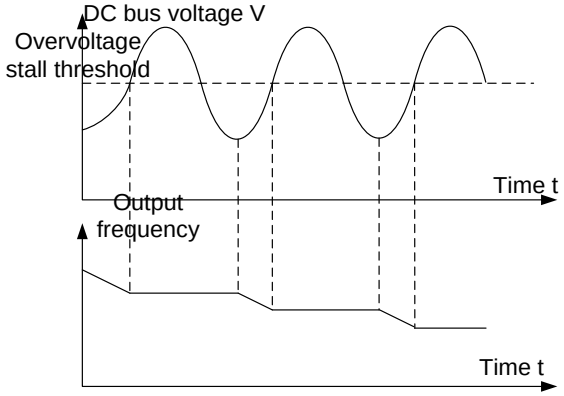
When terminal 1, terminal 2, terminal 3 and terminal 4 are OFF, the frequency input mode is set by P00.06 or P00.07. When terminal 1, terminal 2, terminal 3 and terminal 4 are not all OFF, the frequency set by multi-step speed will prevail, and the priority of multi-step setting is higher than that of the keypad, analog, high-speed pulse, PLC, and communication frequency input. A maximum of speeds of 16 steps can be set by combined codes of terminal 1, terminal 2, terminal 3, and terminal 4.
The start-up and stopping of multi-step running is determined by P00.06. The relation between terminal 1, terminal 2, terminal 3, terminal 4 and multi-step speed are as following:
<table>
<tr><td>Terminal 1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>Terminal 2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>Terminal 3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>Terminal 4</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>Step</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
</table></td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.14</td><td>Multi-step speed 6</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.15</td><td>Running time of step 6</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.16</td><td>Multi-step speed 7</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.17</td><td>Running time of step 7</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.18</td><td>Multi-step speed 8</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.19</td><td>Running time of step 8</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.20</td><td>Multi-step speed 9</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.21</td><td>Running time of step 9</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.22</td><td>Multi-step speed 10</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.23</td><td>Running time of step 10</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.24</td><td>Multi-step speed 11</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.25</td><td>Running time of step 11</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.26</td><td>Multi-step speed 12</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.27</td><td>Running time of step 12</td><td>0.0s</td><td>○</td></tr>
</table>

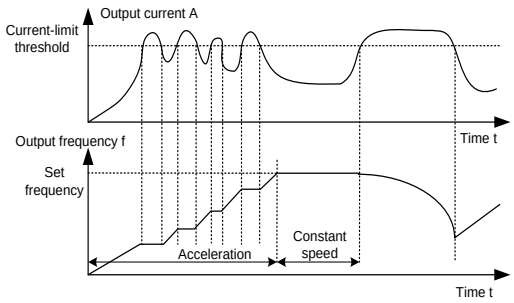
<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td>P10.28</td><td>Multi-step speed 13</td><td rowspan="6">
<table>
<tr><td>Terminal 1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>Terminal 2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>Terminal 3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>Terminal 4</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>step</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr>
</table>
Setting range of P10.(2n, 1<n<17): -100.0–100.0%
Setting range of P10.(2n+1, 1<n<17): 0.0–6553.5 s (min)</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.29</td><td>Running time of step 13</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.30</td><td>Multi-step speed 14</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.31</td><td>Running time of step 14</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.32</td><td>Multi-step speed 15</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.33</td><td>Running time of step 15</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.34</td><td>Simple PLC 0–7 step ACC/DEC time selection</td><td>Below is the detailed instruction:
<table>
<tr><th>Function code</th><th colspan="2">Binary bit</th><th>Step</th><th>ACC/DEC 1</th><th>ACC/DEC 2</th><th>ACC/DEC 3</th><th>ACC/DEC 4</th></tr>
<tr><td rowspan="8">P10.34</td><td>Bit1</td><td>Bit0</td><td>0</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit3</td><td>Bit2</td><td>1</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit5</td><td>Bit4</td><td>2</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit7</td><td>Bit6</td><td>3</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit9</td><td>Bit8</td><td>4</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit11</td><td>Bit10</td><td>5</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit13</td><td>Bit12</td><td>6</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit15</td><td>Bit14</td><td>7</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
</table></td><td>0x0000</td><td>○</td></tr>
<tr><td>P10.35</td><td>Simple PLC 8–15 step ACC/DEC time selection</td><td>
<table>
<tr><td rowspan="8">P10.35</td><td>Bit1</td><td>Bit0</td><td>8</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit3</td><td>Bit2</td><td>9</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit5</td><td>Bit4</td><td>10</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit7</td><td>Bit6</td><td>11</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit9</td><td>Bit8</td><td>12</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit11</td><td>Bit10</td><td>13</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit13</td><td>Bit12</td><td>14</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>Bit15</td><td>Bit14</td><td>15</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
</table>
Select corresponding ACC/DEC time, and then convert 16-bit binary number into decimal</td><td>0x0000</td><td>○</td></tr>
</table>

Function code	Name	Description	Default	Modify
		number, and then set corresponding function codes. Setting range: -0x0000–0xFFFF		
P10.36	PLC restart mode	0: Restart from the first step, namely if the VFD stops during running (caused by stop command, fault or power down), it will run from the first step after restart. 1: Continue running from the step frequency when interruption occurred, namely if the VFD stops during running (caused by stop command or fault), it will record the running time of current step, and enters this step automatically after restart, then continue running at the frequency defined by this step in the remaining time.	0	◎
P10.37	Multi-step time unit selection	0: Second; the running time of each step is counted in seconds; 1: Minute; the running time of each step is counted in minutes	0	◎

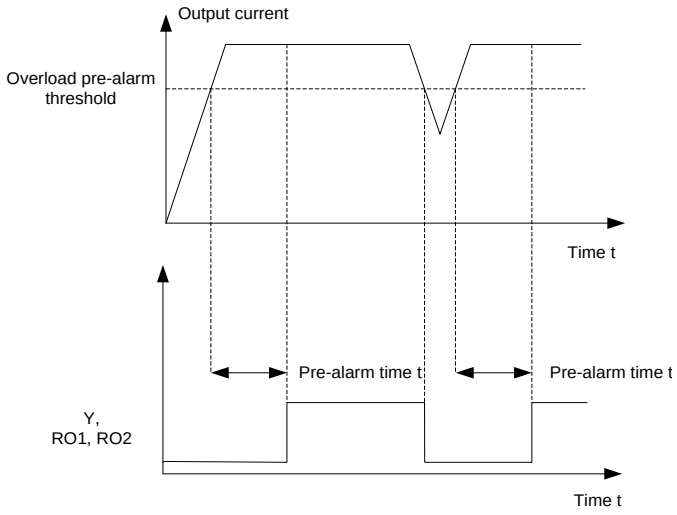
P11 group Protection parameters

Function code	Name	Description	Default	Modify
P11.00	Phase loss protection	0x000–0x111 Ones place: 0: Disable software input phase loss protection 1: Enable software input phase loss protection Tens place: 0: Disable output phase loss protection 1: Enable output phase loss protection Hundreds place: 0: Disable hardware input phase loss protection 1: Enable hardware input phase loss protection	0x010 (2.2kW and lower VFDs) 0x110 (4kW and higher VFDs)	○
P11.01	Frequency drop at transient power-off	0: Disable 1: Enable	0	○

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Default</th><th>Modify</th></tr>
<tr><td>P11.02</td><td>Frequency drop ratio at transient power-off</td><td>Setting range: 0.00Hz/s–P00.03 (max. output frequency)
After the grid powers off, the bus voltage drops to the frequency drop point at transient power-off, the VFD begins to decrease the running frequency based on P11.02, to make the motor generate power again. The returning power can maintain the bus voltage to ensure a rated running of the VFD until the VFD is powered on again.
<table><tr><th>Voltage class</th><td>220V</td><td>380V</td><td>660V</td></tr><tr><th>Frequency drop point at transient power-off</th><td>240V</td><td>460V</td><td>800V</td></tr></table>Note:
1. Adjust the parameter properly to avoid the stopping caused by VFD protection during the switching of the grid.
2. Disable the input phase loss protection before enabling this function.</td><td>10.00 Hz/s</td><td>○</td></tr>
<tr><td>P11.03</td><td>Overvoltage stall protection</td><td>0: Disable
1: Enable
 
</td><td>1</td><td>○</td></tr>
<tr><td rowspan="2">P11.04</td><td rowspan="2">Overvoltage stall protection voltage</td><td>380V: 110–150% (standard bus voltage)</td><td>130%</td><td rowspan="2">○</td></tr>
<tr><td>220V: 110–150% (standard bus voltage)</td><td>120%</td></tr>
<tr><td>P11.05</td><td>Current limit action</td><td>During the accelerating operation of the VFD, due to the large load, actual rising rate of the motor rotating speed is lower than rising rate of the output frequency. Measures shall be taken to avoid VFD tripping caused by</td><td>0x01</td><td>◎</td></tr>
</table>

Function code	Name	Description	Default	Modify
		overcurrent during acceleration. 0x00–0x11 Ones place: Current limit action setting 0: Invalid 1: Always valid Tens place: Hardware current limit overload alarm setting 0: Valid 1: Invalid		
P11.06	Automatic current limit level	Current limit protection function detects output current during running, and compares it with the current-limit level defined by P11.06, if it exceeds the current-limit level, the VFD will run at stable frequency during accelerated running, or run in decreased frequency during constant-speed running; if it exceeds the current-limit level continuously, the VFD output frequency will drop continuously until reaching lower limit frequency. When the output current is detected to be lower than the current-limit level again, it will continue accelerated running.  Setting range of P11.06: 50.0–200.0% (relative to the percentage of rated current of the VFD) Setting range of P11.07: 0.00–50.00Hz/s	160.0%	◎
P11.07	Frequency drop rate during current limit		10.00 Hz/s	◎
P11.08	Pre-alarm selection for VFD/motor OL/UL	0x0000–0x1132 Ones place: 0: Motor overload/underload pre-alarm, relative to rated motor current; 1: VFD overload/underload pre-alarm,	0x0000	○

Function code	Name	Description	Default	Modify
		relative to rated VFD current. 2: Motor output torque overload/underload pre-alarm, relative to rated motor torque Tens place: 0: The VFD continues running after overload/underload alarm; 1: The VFD continues running after underload alarm, and stops running after overload fault; 2: The VFD continues running after overload alarm, and stops running after underload fault; 3: The VFD stops running after overload/underload fault. Hundreds place: 0: Always detect 1: Detect during constant-speed running Thousands place: Overload integral function selection 0: Overload integral is invalid; 1: Overload integral is valid.		
P11.09	Overload pre-alarm detection level	Overload pre-alarm signal will be outputted if the output current of the VFD or motor is higher than overload pre-alarm detection level (P11.09), and the duration exceeds overload pre-alarm detection time (P11.10).	150%	○

Function code	Name	Description	Default	Modify
P11.10	Overload pre-alarm detection time	 Setting range of P11.09: P11.11–200% (relative value determined by ones place of P11.08) Setting range of P11.10: 0.1–3600.0s	1.0s	○
P11.11	Underload pre-alarm detection level	Underload pre-alarm signal will be outputted if the output current of the VFD or motor is lower than underload pre-alarm detection level (P11.11), and the duration exceeds underload pre-alarm detection time (P11.12). Setting range of P11.11: 0–P11.09 (relative value determined by ones place of P11.08) Setting range of P11.12: 0.1–3600.0s	50%	○
P11.12	Underload pre-alarm detection time		1.0s	○
P11.13	Fault output terminal action upon fault occurring	The function code is used to set the action of fault output terminals at undervoltage and fault reset. 0x00–0x11 Ones place: 0: Act at undervoltage 1: Do not act at undervoltage Tens place: 0: Act at fault reset 1: Do not act at fault reset	0x00	○
P11.16	Extension function selection	0x00–0x11 Ones place: Automatic frequency drop selection at voltage drop 0: Disable 1: Enable	0x00	○

Function code	Name	Description	Default	Modify
		Tens place: Second ACC/DEC time selection 0: Disable 1: Enable. When the running frequency exceeds P08.36, ACC/DEC time is switched to the second ACC/DEC time.		

P13 group Motor control

Function code	Name	Description	Default	Modify
P13.09	Frequency threshold of phase-lock loop switch-in	0.00–630.00	50.00	○
P13.13	Short-circuit braking current	When the VFD starts in direct start mode (P01.00=0), set P13.14 to a non-zero value to enter short-circuit braking. During stop, if the running frequency of VFD is lower than the starting frequency P01.09 of brake for stop, set P13.15 to a non-zero value to enter short-circuit braking for stop, and then carry out DC braking in the time set by P01.12. (Refer to the descriptions for P01.09–P01.12.) Setting range of P13.13: 0.0–150.0% (relative to the percentage of rated current of the VFD) Setting range of P13.14: 0.00–50.00s Setting range of P13.15: 0.00–50.00s	0.0%	○
P13.14	Hold time of short-circuit braking for start		0.00s	○
P13.15	Hold time of short-circuit braking for stop		0.00s	○

P14 group Serial communication

Function code	Name	Description	Default	Modify
P14.00	Local communication address	Setting range: 1–247 When the master writes the slave communication address to 0 indicating a broadcast address in a frame, all the salves on the Modbus bus receive the	1	○

Function code	Name	Description	Default	Modify
		frame but do not respond to it. Local communication address is unique in the communication network, which is the basis for point-to-point communication between the upper computer and the VFD. **Note:** The communication address of a slave cannot be set to 0.		
P14.01	Communication baud rate	The function code is used to set the data transmission speed between upper computer and the VFD. 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps 6: 57600bps **Note:** The baud rate set on the VFD must be consistent with that on the upper computer. Otherwise, the communication fails. A greater baud rate indicates faster communication.	4	○
P14.02	Data bit check	The data format set on the VFD must be consistent with that on the upper computer. Otherwise, the communication fails. 0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU 6: No check (N, 7, 1) for ASCII 7: Even check (E, 7, 1) for ASCII 8: Odd check (O, 7, 1) for ASCII 9: No check (N, 7, 2) for ASCII 10: Even check (E, 7, 2) for ASCII 11: Odd check (O, 7, 2) for ASCII	1	○

Function code	Name	Description	Default	Modify
		12: No check (N, 8, 1) for ASCII 13: Even check (E, 8, 1) for ASCII 14: Odd check (O, 8, 1) for ASCII 15: No check (N, 8, 2) for ASCII 16: Even check (E, 8, 2) for ASCII 17: Odd check (O, 8, 2) for ASCII		
P14.03	Communication response delay	0–200ms The function code indicates the communication response delay, that is, the interval from when the VFD completes receiving data to when it sends response data to the upper computer. If the response delay is shorter than the VFD processing time, the VFD sends response data to the upper computer after processing data. If the delay is longer than the VFD processing time, the VFD does not send response data to the upper computer until the delay is reached although data has been processed.	5	○
P14.04	RS485 communication timeout period	0.0 (invalid)–60.0s When the function code is set to 0.0, the communication timeout time is invalid. When the function code is set a non-zero value, the rectifier reports the "RS485 communication fault" (CE) if the communication interval exceeds the value. In general, the function code is set to 0.0. When continuous communication is required, you can set the function code to monitor communication status.	0.0s	○
P14.05	Transmission error processing	0: Report an alarm and coast to stop 1: Keep running without reporting an alarm 2: Stop in enabled stop mode without reporting an alarm (applicable only to communication mode) 3: Stop in enabled stop mode without	0	○

Function code	Name	Description	Default	Modify
		reporting an alarm (applicable to any mode)		
P14.06	Communication processing action	0x00–0x11 Ones place: 0: Respond to write operations. The VFD responds to read and write commands of the upper computer. 1: Not respond to write operations. The VFD responds only to the read commands of the upper computer. This mode can improve the communication efficiency. Tens place: Communication encryption 0: Communication password protection is invalid 1: Communication password protection is valid Hundreds place: User-defined communication command address 0: User-defined addresses specified by P14.07 and P14.08 are invalid 1: User-defined addresses specified by P14.07 and P14.08 are valid	0x000	○
P14.07	Self-defined address of the running command	0x0000–0xFFFF	0x1000	○
P14.08	Self-defined address of frequency setting	0x0000–0xFFFF	0x2000	○

P17 group Status viewing

Function code	Name	Description	Default	Modify
P17.00	Set frequency	Displays current set frequency of the VFD. Range: 0.00Hz–P00.03	0.00Hz	●
P17.01	Output frequency	Displays current output frequency of the VFD. Range: 0.00Hz–P00.03	0.00Hz	●

Function code	Name	Description	Default	Modify
P17.02	Ramp reference frequency	Displays current ramp reference frequency of the VFD. Range: 0.00Hz–P00.03	0.00Hz	●
P17.03	Output voltage	Displays current output voltage of the VFD. Range: 0–1200V	0V	●
P17.04	Output current	Displays the valid value of present output current of the VFD. Range: 0.0–5000.0A	0.0A	●
P17.05	Motor speed	Displays current motor speed. Range: 0–65535RPM	0RPM	●
P17.06	Torque current	Displays current torque current of the VFD. Range: 0.0–5000.0A	0.0A	●
P17.07	Exciting current	Displays current exciting current of the VFD. Range: 0.0–5000.0A	0.0A	●
P17.08	Motor power	Displays current motor power; 100% relative to rated motor power, positive value is motoring state, negative value is generating state. Setting range: -300.0–300.0%	0.0A	●
P17.09	Output torque	Displays current output torque of the VFD; 100% relative to rated motor torque, positive value is motoring state, negative value is generating state. Range: -250.0–250.0%	0.0%	●
P17.10	Estimated motor frequency	Displays the estimated motor rotor frequency under open-loop vector condition. Range: 0.00–P00.03	0.00Hz	●
P17.11	DC bus voltage	Displays current DC bus voltage of the VFD Range: 0.0–2000.0V	0.0V	●
P17.12	Digital input terminal state	Displays current digital input terminal state of the VFD. Range: 0x0000–0x00FF	0x0000	●
P17.13	Digital output terminal state	Displays current digital output terminal state of the VFD. Range: 0x0000–0x000F	0x0000	●

Function code	Name	Description	Default	Modify
P17.14	Digital adjustment value	Displays the regulating variable of keypad. Range : 0.00Hz–P00.03	0.00Hz	●
P17.15	Torque reference value	Relative to percentage of the rated torque of current motor, display torque reference. Setting range: -300.0%–300.0% (of the rated motor current)	0.0%	●
P17.16	Linear speed	Display current linear speed of the VFD. Range: 0–65535	0	●
P17.17	Reserved	/	/	/
P17.18	Counting value	Displays current counting value of the VFD. Range: 0–65535	0	●
P17.19	AI1 input voltage	Displays input signal of AI1. Range: 0.00–10.00V	0.00V	●
P17.20	AI2 input voltage	Displays input signal of AI2. Range: 0.00–10.00V	0.00V	●
P17.21	AI3 input voltage	Displays input signal of AI3. Range: -10.00–10.00V	0.00V	●
P17.22	HDI input frequency	Displays input frequency of HDI. Range: 0.000–50.000kHz	0.000kHz	●
P17.23	PID reference value	Displays PID reference value. Range: -100.0–100.0%	0.0%	●
P17.24	PID feedback value	Displays PID feedback value. Range: -100.0–100.0%	0.0%	●
P17.25	Motor power factor	Displays the power factor of current motor. Range: -1.00–1.00	0.00	●
P17.26	Time elapsed of this run	Displays the time elapsed of this run. Range: 0–65535 min	0m	●
P17.27	Simple PLC and current step number of multi-step speed	Display simple PLC and current step number of multi-step speed Range: 0–15	0	●
P17.28	ASR controller output	Displays the speed loop ASR controller output value under vector control mode, relative to the percentage of rated torque of the motor.	0.0%	●

Function code	Name	Description	Default	Modify
		Range: -300.0%–300.0% (rated motor current)		
P17.29–P17.31	Reserved	/	/	/
P17.32	Motor flux linkage	Displays flux linkage value of the motor. Range: 0.0%–200.0%	0.0%	●
P17.33	Exciting current reference	Displays the exciting current reference value under vector control mode. Range: -3000.0–+3000.0A	0.0A	●
P17.34	Torque current reference	Displays torque current reference value under vector control mode. Range: -3000.0–+3000.0A	0.0A	●
P17.35	AC incoming current	Displays the valid value of incoming current on AC side. Range: 0.0–5000.0A	0.0A	●
P17.36	Output torque	Displays output torque value, positive value is motoring state, and negative value is generating state. Range: -3000.0 Nm–3000.0 Nm	0.0Nm	●
P17.37	Motor overload count value	0–100 (Display the "OL1" fault when the count value is 100)	0	●
P17.38	PID output value	Displays PID output value. Range: -100.0–100.0%	0.0%	●
P17.39	Function code in parameter download error	0.00–99.99	0.00	●
P17.40	Process PID proportional gain	0.00–100.00	0.00	●
P17.41	Process PID integral time	0.00–10.00s	0.00s	●
P17.42	Process PID differential time	0.00–10.00s	0.00s	●

6.1.3.2 Electrolytic capacitor replacement

	✧ Read and follow the instructions in Chapter 1 "Safety precautions". Ignoring the instructions may cause physical injury or death, or damage to the equipment.

The electrolytic capacitor of the VFD must be replaced if it has been used for more than 35,000 hours. For details about the replacement, contact the local ETAKE office or dial our national service hotline (400-700-9997).

6.1.4 Power cable

	✧ Read and follow the instructions in Chapter 1 "Safety precautions". Ignoring the instructions may cause physical injury or death, or damage to the equipment.

1. Stop the drive and disconnect it from the power line. Wait for at least the time designated on the VFD.

2. Check the tightness of the power cable connections.

3. Restore power.

6.2 Fault handling

	✧ Only qualified electricians are allowed to maintain the VFD. Read the safety instructions in Chapter 1 "Safety precautions" before working on the VFD.

6.2.1 Indications of alarms and faults

Faults are indicated by indicators. For details, see Chapter 4 "Keypad operation". When the TRIP indicator is on, the alarm or fault code displayed on the keypad indicates that an exception occurs on the VFD. The function codes P07.27 to P07.32 record the types of the last six faults. The function codes P07.33 to P07.40, P07.41 to P07.48, and P07.49 to P07.56 record the running data of the VFD at the last three faults, respectively. You can find out causes and solutions for most of the alarms or faults based on the information provided in this chapter. If you cannot find out the causes of an alarm or fault, contact the local ETAKE office.

6.2.2 Fault reset

The VFD can be reset by pressing the keypad key STOP/RST, through digital input, or by switching the power light. When the fault has been removed, the motor can be restarted.

6.2.3 VFD faults and solutions

When a fault occurred, handle the fault as follows.

1. Check to ensure there is nothing wrong with the keypad. If not, please contact the local ETAKE office.

2. If there is nothing wrong, please check P07 and ensure the corresponding recorded fault parameters to confirm the real state when the current fault occurs by all parameters.

3. See the following table for detailed solution and check the corresponding abnormal state.

4. Eliminate the fault and ask for related help.

5. Check to eliminate the fault and carry out fault reset to run the VFD.

Note: The numbers enclosed in square brackets such as [1], [2] and [3] in the Fault type column in the following table indicate the VFD fault type codes read through communication.

Fault code	Fault type	Possible cause	Solutions
OUt1	[1] Inverter unit U phase protection	● The acceleration is too fast ● IGBT module fault ● Misacts caused by interference ● The connection of the driving wires is not good ● Grounding is not properly	● Increase ACC time ● Change the power unit ● Check the driving wires ● Inspect external equipment and eliminate interference
OUt2	[2] Inverter unit V phase protection		
OUt3	[3] Inverter unit W phase protection		
OC1	[4] Overcurrent during acceleration	● The acceleration or deceleration is too fast ● The voltage of the grid is too low ● The power of the VFD is too low ● The load transients or is abnormal ● The grounding is short circuited or the output is phase loss ● There is strong external interference ● The overvoltage stall protection is not open	● Increase the ACC time ● Check the input power ● Select the VFD with a larger power ● Check if the load is short circuited (the grounding short circuited or the wire short circuited) or the rotation is not smooth ● Check the output configuration ● Check if there is strong interference ● Check the setting of related function codes
OC2	[5] Overcurrent during deceleration		
OC3	[6] Overcurrent during constant speed running		
OV1	[7] Overvoltage during acceleration	● The input voltage is abnormal ● There is large energy feedback ● No braking components ● Braking energy is not open	● Check the input power ● Check if the DEC time of the load is too short or the VFD starts during the rotation of the motor or it needs to increase the energy consumption components
OV2	[8] Overvoltage during deceleration		
OV3	[9] Overvoltage during constant		

Fault code	Fault type	Possible cause	Solutions
	speed running		● Install the braking components ● Check the setting of related function codes
UV	[10] Bus undervoltage	● The voltage of the power supply is too low	● Check the input power of the supply line
OL1	[11] Motor overload	● The voltage of the power supply is too low ● The motor setting rated current is incorrect ● The motor stall or load transients is too strong	● Check the power of the supply line ● Reset the rated current of the motor ● Check the load and adjust the torque lift
OL2	[12] VFD overload	● The acceleration is too fast ● Reset the rotating motor ● The voltage of the power supply is too low ● The load is too heavy ● The motor power is too large, and the power of the VFD is too small	● Increase the ACC time ● Avoid the restarting after stopping ● Check the power of the supply line ● Select a VFD with bigger power ● Select a proper motor.
SPI	[13] Phase loss on input side	● Phase loss or violent fluctuation occurred to R, S, and T input	● Check input power ● Check installation distribution
SPO	[14] Phase loss on output side	● Phase loss occurred to U, V, W output (or the three phases of motor is asymmetrical)	● Check the output distribution ● Check the motor and cable
OH1	[15] Rectifier module overheat	● Air duct jam or fan damage; ● Ambient temperature is too high ● The time of overload running is too long	● Dredge the vent duct or replace the fan ● Lower the ambient temperature
OH2	[16] Inverter module overheat		
EF	[17] External fault	● SI external fault input terminals action	● Check the external device input

Fault code	Fault type	Possible cause	Solutions
CE	[18] RS485 communication fault	● The baud rate setting is incorrect ● Fault occurs to the communication wiring ● The communication address is wrong ● There is strong interference to the communication.	● Set proper baud rate ● Check the communication connection distribution ● Set proper communication address ● Chang or replace the connection distribution or improve the anti-interference capability
ItE	[19] Current detection fault	● The control panel connector is in poor contact ● An exception occurs on the magnifying circuit	● Check the connector and re-plug ● Change the main control panel
tE	[20] Motor autotuning fault	● The motor capacity does not comply with the VFD capability ● The rated parameter of the motor does not set correctly ● The offset between the parameters from autotuning and the standard parameter is huge ● Autotuning overtime	● Change the VFD mode; ● Set the rated parameter according to the motor name plate ● Empty the motor load ● Check the motor connection and set the parameter ● Check if the upper limit frequency is above 2/3 of the rated frequency.
EEP	[21] EEPROM operation fault	● Error of controlling the write and read of the parameters ● Damage to EEPROM	● Press STOP/RST to reset ● Change the main control panel
PIDE	[22] PID feedback offline fault	● PID feedback offline ● PID feedback source disappear	● Check the PID feedback signal ● Check the PID feedback source
bCE	[23] Braking unit fault	● Braking circuit fault or damage to the braking pipes ● The external braking resistor is not sufficient	● Check the braking unit, and change new braking pipe ● Increase the braking resistor

Fault code	Fault type	Possible cause	Solutions
END	[24] Running time reached	● The actual running time of the VFD is above the internal setting running time.	● Ask for the supplier and adjust the setting running time.
OL3	[25] Electronic overload	● The VFD will report overload pre-alarm according to the set value.	● Check the load and the overload pre-alarm threshold
PCE	[26] Keypad communication error	● The keypad is not in good connection or offline ● The keypad cable is too long and there is strong interference ● Part of the communication circuits of the keypad or main board have fault	● Check the keypad cable and and ensure it is normal; ● Check the environment and eliminate the interference source ● Change hardware and ask for maintenance service
UPE	[27] Parameter upload error	● The keypad is not in good connection or offline ● The keypad cable is too long and there is strong interference ● Part of the communication circuits of the keypad or main board have fault	● Check the environment and eliminate the interference source ● Change hardware and ask for maintenance service ● Change hardware and ask for maintenance service
DNE	[28] Parameter download error	● The keypad is not in good connection or offline ● The keypad cable is too long and there is strong interference ● Data storage error in keypad	● Check the environment and eliminate the interference source ● Change hardware and ask for maintenance service ● Back up data in the keypad again
ETH1	[32] To-ground short-circuit fault 1	● The output of the VFD is short circuited with the	● Check if the connection of the motor is normal or

Fault code	Fault type	Possible cause	Solutions
ETH2	[33] To-ground short-circuit fault 2	ground ● There is fault in the current detection circuit ● There is a great difference between the actual motor power setting and the VFD power	not ● Change the hall ● Change the main control panel ● Reset the correct motor parameter ● Check whether motor power parameters in P2 group is consistent with the motor power actually used
dEu	[34] Speed deviation fault	● Load is too heavy, or stall occurred	● Check the load to ensure it is proper, increase the detection time ● Check whether control parameters are set properly
STo	[35] Maladjustment fault	● Control parameters of synchronous motor are set improperly ● The parameter gained from autotuning is inaccurate ● The VFD is not connected to motor	● Check the load to ensure it is proper ● Check whether control parameters are set correctly ● Increase maladjustment detection time
LL	[36] Electronic underload fault	● The VFD will report the underload pre-alarm according to the set value	● Check the load and the underload pre-alarm point

6.2.4 Other states

Fault code	Fault type	Possible cause	Solutions
PoFF	System power off	System power off or low DC voltage	Check the grid