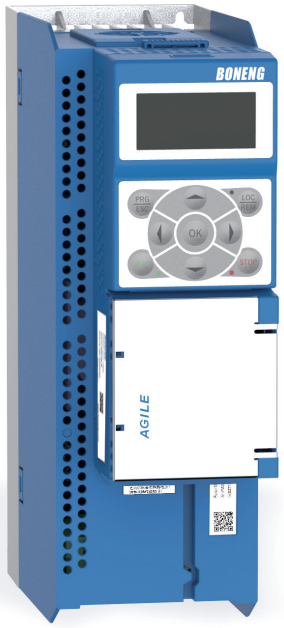
BONENG



中文

BONENG

A1变频驱动器(CM23)使用手册

A1 Series Drives (CM23) Use Manual

EN

08/2026

目录

1 基本安全说明 ---- 001
1.1 一般安全说明 ---- 001
1.2 有关电磁场 (EMF)的安全说明 ---- 006
1.3 操作静电敏感元器件 (ESD) ---- 006
1.4 工业安全 ---- 007
1.5 驱动系统(电气传动系统)的遗留风险 ---- 007
2 描述 ---- 009
2.1 驱动器结构 ---- 009
2.2 控制模块 ---- 010
2.3 功率模块 ---- 010
2.4 用于功率模块的组件 ---- 011
2.5 允许的编码器 ---- 012
2.6 驱动器的调试工具 ---- 012
3 安装 ---- 013
3.1 驱动器安装步骤 ---- 013
3.2 驱动器的EMC规范 ---- 013
3.3 安装电抗器、滤波器和制动电阻 ---- 017
3.4 安装功率模块 ---- 017
3.5 连接电源、马达和驱动器组件 ---- 019
3.6 安装控制模块 ---- 028
3.7 安装编码器 ---- 031
4 调试 ---- 032
4.1 调试指南 ---- 032
4.2 调试前的准备工作 ---- 033
4.3 恢复出厂值 ---- 034
4.4 操作面板操作与显示 ---- 035
5 扩展调试 ---- 038
5.1 驱动器功能一览 ---- 038
5.2 驱动器控制 ---- 039
5.3 设定值 ---- 056
5.4 设定值处理 ---- 059
5.5 马达控制 ---- 069
5.6 保护功能 ---- 076
5.7 应用特色功能 ---- 080
6 异常与系统信息 ---- 104
6.1 LED显示的运行状态 ---- 104
6.2 故障和警告列表 ---- 106
7 技术数据 ---- 134
7.1 控制模块的技术数据 ---- 134
7.2 功率模块的技术数据 ---- 135
7.3 特殊环境条件下的限制 ---- 143
8 参数列表 ---- 144
8.1 A组-系统状态与外设 ---- 144
8.2 B组-控制参数组 ---- 157
8.3 C组-通信参数组 ---- 186
8.4 D组-马达参数组 ---- 195
8.5 E组-故障保护与记录 ---- 199
8.6 F组-自由功能块与工艺参数组 ---- 252
8.7 P组-互联参数组 ---- 268
9 检修 ---- 295
9.1 更换驱动器组件 ---- 295
附录 ---- 298
附录A Modbus-RTU通信协议 ---- 298
售后服务 ---- 309

中文

1 基本安全说明

1.1 一般安全说明



⚠ 危险

接触带电部件和其他能源供给会引发生命危险
接触带电部件会造成人员重伤，甚至死亡。
◆ 只有专业人员才允许在电气设备上作业。
◆ 在所有作业中必须遵守本国的安全规定。
通常有六项安全步骤：
1. 做好断电的准备工作，
并通知会受断电影响的组员。
2. 断开设备电源。
- 关闭设备。
- 请等待至警告牌上说明的放电时间届满。
- 确认导线与导线之间和导线与接地线之间无电压。
- 确认辅助电压回路已断电。
- 确认马达无法运动。
3. 检查其他所有危险的能源供给，
例如：压缩空气、液压、水。
4. 断开所有危险的能源供给，
措施比如有：闭合开关、接地或短接或闭合阀门。
5. 确定能源供给不会自动接通。
6. 确保正确的设备已经完全闭锁。
结束作业后以相反的顺序恢复设备的就绪状态。



⚠ 警告

连接了不合适的电源所产生的危险电压可引发生命危险
接触带电部件可能会造成人员重伤或死亡。



⚠ 警告

接触损坏设备上的带电压部件可引发生命危险
未按规定操作设备可能会对其造成损坏。
设备损坏后，其外壳或裸露部件可能会带有危险电压，接触外壳或这些裸露部件可能会导致重伤或死亡。
◆ 在运输、存放和运行设备时应遵循技术数据中给定的限值。
◆ 不要使用已损坏的设备



⚠ 警告

电缆屏蔽层未接地可引起电击从而导致生命危险
电缆屏蔽层未接地时，电容超临界耦合可能会出现致命的接触电压。
◆ 电缆屏蔽层和未使用的功率电缆芯线（如抱闸芯线）至少有一侧通过接地的外壳接地。



⚠ 警告

未接地可引起电击从而导致生命危险
防护等级I的设备缺少安全接地连接或连接出错时，
在其裸露的部件上会留有高压，接触该部件会导致重伤或死亡。
◆ 按照规定对设备进行接地。

中文



⚠ 警告

运行时断开插接可引起电击从而导致生命危险。
运行时断开插接所产生的电弧可引起重伤或死亡。
◆ 如果没有明确说明可以在运行时断开插接，则只能在断电时才能断开连接。



⚠ 警告

外壳大小空间不足可引起火灾从而导致生命危险
明火和烟雾可引起重大人员伤亡或财产损失。
◆ 没有保护外壳的设备应安装在金属机柜中（或采取相同效果的措施进行保护），以避免设备接触明火。
◆ 确保烟雾只能经所设安全通道排出。



⚠ 警告

使用移动无线电装置或移动电话时机器的意外运动可引发生命危险
在距离本组件大约2m的范围内使用发射功率大于1W
的移动无线电设备或移动电话时，会导致设备功能故障，该故障会对设备功能安全产生影响并能导致人员伤亡或财产损失。
◆ 关闭设备附近的无线电设备或移动电话。



⚠ 警告

绝缘过载可引起火灾从而导致生命危险
在IT电网中接地会使马达绝缘增加负荷。绝缘失效可产生烟雾，引发火灾，从而造成严重人身伤害或死亡。
• 使用可以报告绝缘故障的监控设备。
• 尽快消除故障，以避免马达绝缘过载。



⚠ 警告

通风不足会引起过热、引发火灾，从而导致生命危险
通风空间不足会导致过热，产生烟雾，引发火灾
从而造成人身伤害。
这可能会造成人员重伤或死亡。此外，设备/系统故障率可能会因此升高，使用寿命缩短。
◆ 组件之间应保持规定的最小间距，以便通风。



⚠ 警告

缺少警示牌或警示牌不清晰可导致事故
缺少警示牌或警示牌不清晰可能会导致严重人身伤害或死亡。
◆ 根据文档检查警示牌的完整性。
◆ 为组件安装警示牌，必要时安装本国语言的警示牌。
◆ 替换掉不清晰的警示牌。

⚠警告

不符合规定的电压/绝缘检测可损坏设备
不符合规定的电压/绝缘检测可导致设备损坏。
◆ 进行机器/设备的电压/绝缘检测前应先断开设备，
因为所有的驱动器和马达在出厂时
都已进行过高压检测，所以无需在机器/设备内再次进行检测。

⚠警告

无效的安全功能可导致生命危险
无效的或不适合的安全功能可引起机器功能故障，可能导致重伤或死亡。
◆ 调试前请注意相关产品文档中的信息。
◆ 对整个系统和所有安全相关的组件进行安全监控，以确保安全功能。
◆ 进行适当设置，以确保所使用的安全功能是与驱动任务和自动化任务相匹配并激活的。
◆ 执行功能测试。
◆ 在确保了机器的的安全功能能正常工作后，才开始投入生产。

⚠警告

因参数设置错误或修改参数设置引起机器误操作可引发生命危险
参数设置错误可导致机器出现误操作，从而导致人员重伤或死亡。
◆ 防止恶意访问参数设置。
◆ 采取适当措施（如驻停或急停）应答可能的误操作。

1.2 有关电磁场（EMF）的安全说明

⚠警告

电磁场可引发生命危险
在电气能源技术设备例如变压器、驱动器、马达运行时会产生电磁场（EMF）。
因此可能会对设备/系统附近的人员，特别是对那些带有心脏起搏器或医疗植入体等器械的人员造成危险。
◆ 确保相关人员和设备保持一定的距离（至少为2m）。

1.3 操作静电敏感元器件（ESD）

静电敏感元器件(ESD)
是可被静电场或静电放电损坏的元器件、集成电路、电路板或设备。

⚠警告

电场或静电放电可损坏设备
电场或静电放电可能会损坏单个元件、集成电路、模块或设备，从而导致功能故障。
◆ 仅允许使用原始产品包装或其他合适的包装材料（例如：导电的泡沫橡胶或铝箔）包装、存储、运输和发运电子元件、模块和设备。
◆ 只有采取了以下接地措施之一，才允许接触元件、模块和设备：
-佩戴防静电腕带
-在带有导电地板的防静电区域中穿着防静电鞋或配带防静电接地带
◆ 电子元件、模块或设备只能放置在导电性的垫板上（带防静电垫板的工作台、导电的防静电泡沫材料、防静电包装袋、防静电运输容器）。

中文

1.4 工业安全

博能传动为其产品及解决方案提供工业安全功能，以支持工厂、解决方案、机器、设备和/或网络的安全运行。

这些功能是整个工业安全机制的重要组成部分。有鉴于此，博能传动不断对产品和解决方案进行开发和完善。博能传动强烈建议您定期了解产品更新和升级信息。

> ⚠ 警告
>
> 篡改软件会引起不安全的驱动状态从而导致危险
>
> 篡改软件（如：病毒、木马、蠕虫、恶意软件）可使设备处于不安全的运行状态，从而可能导致死亡、重伤和财产损失。
>
> ●请使用最新版软件。
>
> 相关信息和新闻请访问网址(www.boneng.com)
>
> ●根据当前技术版本，将自动化组件和驱动组件整合至设备或机器的整体工业安全机制中。
>
> 更多相关信息请访问网址 (www.boneng.com)
>
> ●在整体工业安全机制中要注意所有使用的产品。

1.5 驱动系统（电气传动系统）的遗留风险

驱动系统的控制组件和传动组件允许用于工业电网内的工业和商业场合。

在民用电网中使用时，要求采取特殊设计或附加措施。

这种组件只允许在封闭的壳体或控制柜内运行，并且必须安装保护装置和保护盖。

只有经过培训、了解并遵循组件和用户手册上指出的所有安全注意事项的专业技术人员，才可以在组件上开展工作。

机器制造商在依据相应的本地指令（比如：欧盟机械指令）对机器进行风险评估时，必须注意驱动系统的控制组件和驱动组件会产生以下遗留风险：

1. 调试、运行、维护和维修设备时，被驱动的机器部件意外运行，原因可能有：
   - 编码器、控制器、执行器和连接器中出现了硬件故障和/或软件故障
   - 控制器和传动设备的响应时间
   - 运行和/或环境条件不符合规定
   - 凝露/导电杂质
   - 参数设置、编程、布线和安装出错
   - 在控制器附近使用无线电装置/移动电话
   - 外部影响/损坏
2. 在出现故障时，驱动器内外部出现异常温度、明火以及异常亮光、噪音、杂质、气体等，原因可能有：
   - 零件失灵
   - 软件故障
   - 运行和/或环境条件不符合规定
   - 外部影响/损坏

防护等级为“开放式类型/IP20”的设备必须安装在金属机柜中（或采取相同效果的措施进行保护），以避免驱动器内外部接触明火。

3. 出现危险的接触电压，原因可能有：
   - 零件失灵
   - 静电充电感应
   - 静充电感应
   - 运行和/或环境条件不符合规定
   - 凝露/导电杂质
   - 外部影响/损坏
4. 设备运行中产生的电场、磁场和电磁场可能会损坏近距离的心脏起搏器支架、医疗植入体或其它金属物。
5. 当不按照规定操作以及/或违规处理废弃组件时，会释放破坏环境的物质并且产生辐射。

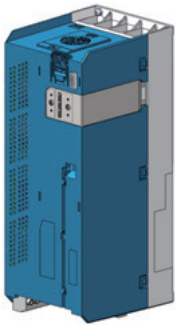
> 说明：
> 必须采取措施防止导电异物进入各组件。
> 如果安装地点排除了导电异物，则使用较低防护等级的控制柜。

其它有关驱动系统组件产生的遗留风险的信息见用户技术文档的相关章节。

2 描述

2.1 驱动器结构

驱动器的主要组件



Power Module
①



Control Module
②

每个A1系列驱动器都是由一个控制模块（Control Module，简称 CM）和一个功率模块（Power Module，简称PM）组成。

◆ 控制模块可以控制和监测功率模块以及与它相连的马达。

◆ 功率模块适用于功率范围在 0.75 kW 到 250kW 之间的马达。

可以在功率模块铭牌(①)上查阅以下数据:

◆ 名称: 例如：功率模块PM25

◆ 技术数据: 电压、电流、功率

◆ 产品编号: 例如：A1-PM25-B3B55-N

◆ 版本: 例如：…

可以在控制模块铭牌 (②)上查阅以下数据:

◆ 名称: 例如：控制模块CM23

◆ 产品编号: 例如：A1-CM23-MB-PE

◆ 版本: 例如：…

2.2 控制模块

控制模块CM23各个型号区别在于不同的现场总线和编码器类型



名称	产品编号	现场总线/编码器
CM23	A1-CM23-MB-PE	Modbus/光电
	A1-CM23-PN-PE	PROFINET/光电

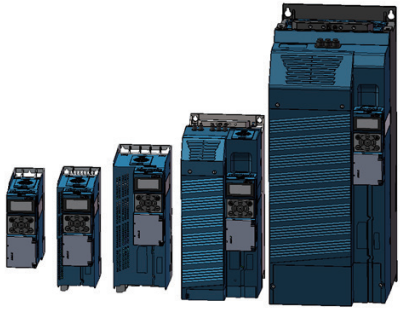
2.3 功率模块

该章节中包含有关功率模块的重要说明。

所有的功率数据都是额定功率或是低过载(LD)时的功率。

控制模块CM23可以和以下功率模块一起运行:

◆ PM25 IP20型



表格2-1 屏蔽板连接套件的产品编码

外形尺寸	产品编号
B1	A1-H06-B1
B2	
B3	A1-H06-B3
B4	A1-H06-B4
B5/6	A1-H06-B6
B7	A1-H06-B7

PM25，3 AC 400 V - 标准应用范围：
防护等级为 IP20的功率模块PM25有不带滤波器或带有内置的A级电源滤波器两种类型。PM25 通过一个外部制动电阻实现动态制动。

产品编号范围：A1-PM25-B3XXX-N(或F)

外形尺寸	B1	B2	B3	B4	B6	B7
功率范围(KW) IP20型	0.75~3.0	4~7.5	11~15	18.5~37	45~132	160~250

注：N表示无内置滤波器选件，F表示有内置滤波器选件

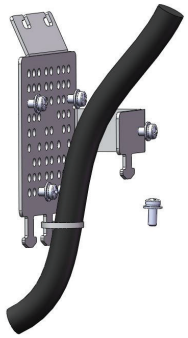
2.4 用于功率模块的组件

2.4.1 配件-功率模块

通过屏蔽连接套件可实现功率接口的屏蔽和应变释放。屏蔽连接套件由屏蔽板、扎带和螺钉组成

表格2-1 屏蔽连接套件的产品编码

外形尺寸	产品编号
B1	A1-H06-B1
B2	
B3	A1-H06-B3
B4	A1-H06-B4
B5/B6	A1-H06-B6
B7	A1-H06-B7



2.4.2 进线滤波器(用户可自配附件)
使用电源滤波器可以使驱动器达到更高的抗射频干扰级。带有集成电源滤波器的驱动器无需外部滤波器。

2.4.3 电源电抗器(用户可自配附件)
电源电抗器可提供过电压保护，抑制电网谐波，并减少整流电路换相时产生的电压缺陷。

2.4.4 输出电抗器(用户可自配附件)
输出电抗器能降低马达绕组的电压负载，并且可以通过电缆的电容性充放电降低驱动器负载。当马达电缆超出50米（屏蔽电缆）或超出100米（非屏蔽电缆）时，必须使用一个输出电抗器。

2.4.5 制动电阻(用户可自配附件))
制动电阻可以使大转动惯量的负载迅速制动。功率模块可以通过集成的制动斩波器来控制制动电阻。

2.5 允许的编码器

可将以下编码器连接到控制模块上：

编码器类型	用途
24V推挽类型编码器	用于转速控制
24V开集极型编码器	用于转速控制

2.6 驱动器的调试工具

以下工具用于调试、诊断和控制驱动器以及备份和传送驱动器设置

操作面板		产品编号
	OP25 ◆ 纯文本显示屏 ◆ 提供菜单引导和应用向导程序	A1-OP25

PC工具		
借助BONENG Drivesoft，通过USB-RS485线缆连接到键盘接口来访问驱动器工具	BONENG Drivesoft 下载地址：	www.boneng.com
	USB-RS485线缆	建议使用稳定可靠的品牌转换电缆

3 安装

3.1 驱动器安装步骤

安装驱动器前提条件

安装前请检查:

◆ 所需的驱动器组件是否齐全？

—功率模块

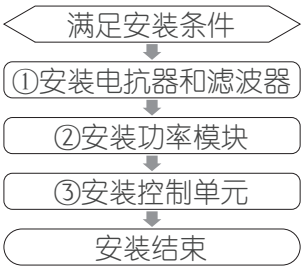
—控制模块

—附件，如电源电抗器或制动电阻

◆ 安装所需的组件、工具和零部件是否齐全？

步骤

按右箭头所示步骤安装驱动器:



您已经安装了所有组件，可以开始调试驱动器。

3.2 驱动器的EMC规范

3.2.1 驱动器的电磁兼容（EMC）安装规定

驱动器和马达的安装要电磁兼容，以确保驱动器正常运行。

在一个封闭的控制柜中安装和运行防护等级为IP20的驱动器。

防护等级为IP55的驱动器适合安装在控制柜外部。

控制柜设计和布线方式在下文简要说明。

详细信息请参见功率模块的安装指南。

驱动器本身的电磁兼容安装指南在下文说明。

3.2.2 电磁干扰（EMI）的防范措施

驱动器设计用于容易产生高电磁干扰的工业环境中。只有专业安装才能保证驱动器安全可靠、正常地运行。

控制柜设计

◆ 控制柜的所有金属件和部件都必须和控制柜框架保持良好的电气连接:

- 侧面板
- 背板
- 顶板
- 底板

可选择大面积接触框架或使用大量的螺钉多点接触框架。

◆ 接地排和EMC屏蔽排同样要大面积接触控制柜框架，以保持良好的电气连接。

◆ 安装在控制柜内的所有金属部件，例如：驱动器或电源滤波器等部件要大面积接触控制柜框架。建议将这些设备安装在一块导电性良好的裸露金属安装板上。

◆ 对于经过喷漆或氧化处理的表面，可通过以下一种方法使螺钉和表面形成电气连接:

-使用一种特殊的齿形接触垫片穿过该表面。

-直接去除接触位置上的绝缘表面。

◆ 以下组件必须配备抗干扰元件:

- 接触器
- 继电器
- 磁阀
- 马达抱闸

在交流线圈上接上RC元件或变阻器，在直流线圈上接上二极管或变阻器。

将抗干扰元件直接连接在线圈上。

布线和屏蔽

◆ 信号电缆、数据电缆必须和驱动器的所有功率电缆分开布，这其中包括：电源电缆、制动斩波器和制动电阻之间的连接电缆以及马达电缆。布线间距至少应为25cm。如果电缆无法分开布线，请使用与安装板连接良好的金属隔板。

◆ 电源和电源滤波器之间的连接电缆必须和以下电缆分开走线：

- 电源滤波器和驱动器之间的连接电缆
- 制动斩波器和制动电阻之间的连接电缆
- 马达电缆

◆ 信号电缆/数据电缆、经过滤波的电源电缆只能垂直于未经滤波的功率电缆放置。

◆ 所有连接电缆要可能短。

◆ 信号电缆/数据电缆、等电位连接导线应始终平行、相互贴近地布线。

◆ 使用屏蔽马达电缆。

◆ 屏蔽马达电缆应和马达温度传感器（PTC/KTY）的电缆分开布线。

◆ 信号电缆和数据电缆应是屏蔽电缆。

◆ 屏蔽层应在两端大面积搭接在接地的金属机壳上。

◆ 屏蔽层应尽量在电缆进入控制柜的位置附近接地。

◆ 功率电缆屏蔽层的接地应采用EMC屏蔽排。

信号电缆和数据电缆的接地则采用驱动器上配有的屏蔽元件。

◆ 不要通过中间端子中断电缆屏蔽层。

3.2.3 安装功率模块的屏蔽板

采用屏蔽板的屏蔽方式：

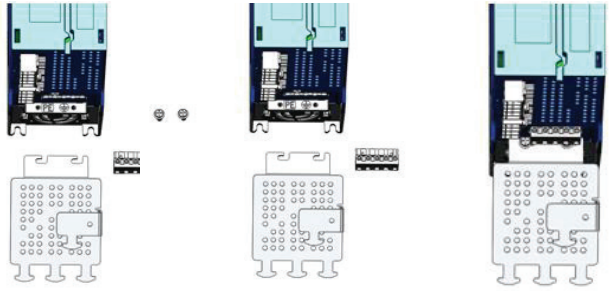
电缆屏蔽层必须通过线卡和屏蔽板大面积相连。

根据功率模块类型，屏蔽板或者包含在供货范围内，或者以屏蔽连接套件的形式作为选件提供。

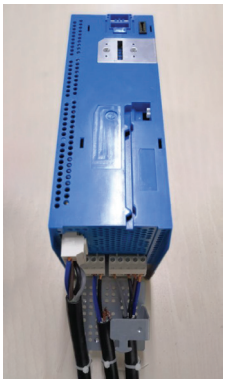
不采用屏蔽板的屏蔽方式：

◆ 不用可选的屏蔽板也可以实现符合电磁兼容规定的屏蔽。此时必须保证电缆屏蔽层和接地位大面积相连。

安装屏蔽板：PM25(以B1为例,其它类似)

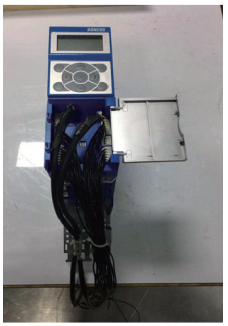


功率模块PM25的EMC规范布线示例





功率模块B1的电磁兼容布线





屏蔽板细节图

按电磁兼容的方式将编码器电缆和信号电缆连接到端子排上

请使用屏蔽电缆。

◆ 安装功率模块的屏蔽板。

◆ 将信号电缆/编码器电缆的屏蔽层搭接在功率模块的屏蔽板上。

◆ 将电缆夹安装在屏蔽板上。

◆ 另外还要将屏蔽层搭接在控制柜的屏蔽排上。

3.3 安装电抗器、滤波器和制动电阻

电抗器	电抗器的安装位置距离驱动器20cm以上
滤波器	滤波器的安装位置距离驱动器20cm以上
制动电阻	制动电阻建议额外制作一个电气柜安装

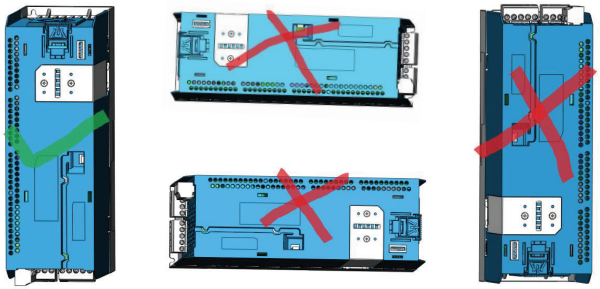
3.4 安装功率模块

安装功率模块

功率模块的正确安装需要按以下方式进行

◆ 将功率模块安装在控制柜中

◆ 垂直安装功率模块，马达和电源端子朝下



◆ 遵守下文列出的安装规定

— 与其他组件的最小间距

— 紧固件

— 紧固件的扭矩

尺寸确定　　功率模块PM25的钻孔图

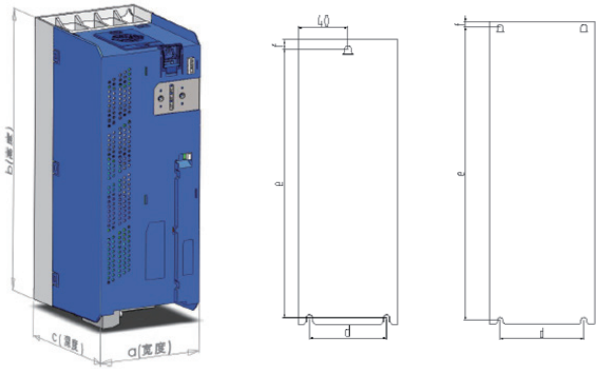


表3-1 A1系列PM25外形尺寸及钻孔尺寸

A1系列	外形尺寸(mm)			钻孔尺寸(mm)		
	a (宽度)	b (高度)	c (深度)	d	e	f
B1	80	230	165	62	218	6
B2	100	292	165	80	281	6
B3	140	355	165	120	343	6
B4	200	472	237	170	430	7
B5/6	305	757	357	273	727	14
B7	553.3	885	370	370	865	10

1）带屏蔽板连接套件：B1：+94mm；B2：+94mm；B3：+80mm；B4：+151mm；B5/6：+261mm

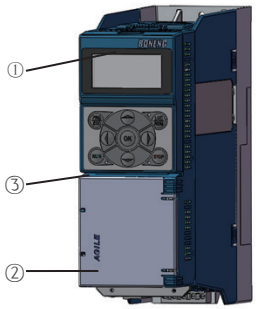
表3-2 A1系列紧固件及与其他设备之间的间距

A1系列	紧固件	紧固扭矩 (Nm)	间距 (mm)		
			上方	下方	前面
B1	M4螺钉	2.5	80	100	100
B2	M4螺钉	2.5	80	100	100
B3	M5螺钉	3.5	80	100	100
B4	M5螺钉	6.0	300	350	100
B5/6	M8螺钉	25.0	300	350	100
B7	M12螺钉	80	200	200	100

1）安装和运行时，无需保留侧间距，考虑到误差我们建议侧间距为1mm左右。

2）请为控制模块和操作面板保留足够的间距。

驱动器总深度



功率模块，外形尺寸B1…B4

① Power Module PM25
② Control Module CM23
③ Operator Panel OP25

① + ②

驱动器至少由一个功率模块和一个插入的控制模块组成：

驱动器总深度

=功率模块深度+53mm(Control Module)

① + ② + ③

插入了操作面板的驱动器：

驱动器的总深度

= 功率模块的深度 + 53 mm (Control Module+ Operator Panel OP25)

中文

3.5 连接电源、马达和驱动器组件

3.5.1 允许的电网系统

海拔要求：

电网系统的安装海拔高度被限制在4000m以下，超过1000m需要降额使用。

电源要求：

机床制造商必须确保在以额定值运行时，变压器的输入端子和驱动器之间的电压暂降小于4%。

驱动器设计用于以下符合IEC60364-1(2005)的供电系统。

TN 系统

TN系统通过一根导线将保护接地线传送到安装好的设备。

TN系统中的星点通常是接地的。此外也有带接地相线的TN系统，如带接地L1。

TN系统可以分开或组合传送中性线N和保护接地线。

驱动器在TN系统上运行

◆ 内置或带有外部电源滤波器的驱动器：
- 允许在带有接地星点的TN系统上运行
- 不允许在带有接地相线的TN系统上运行

◆ 不带电源滤波器的驱动器：
- 允许在所有≤600V的TN系统上运行

TN系统上的功率模块示例

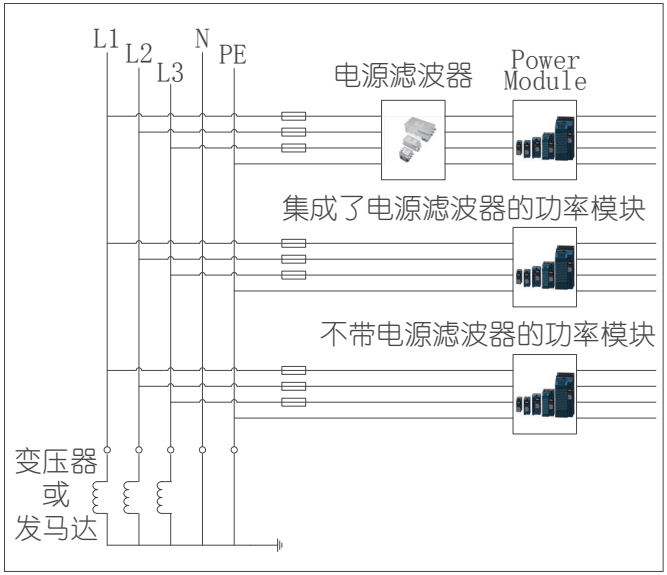


图3-1 分开传送N和PE且带有接地星点的TN系统

TT系统

在TT系统中，变压器的接地与安装都是独立进行的。有传送或不传送中性线N的两种TT系统。

驱动器在TT系统上运行

◆ 内置或带有外部电源滤波器的驱动器：
- 允许在带有接地星点的TT系统上运行
- 不允许在不带接地星点的TT系统上运行

◆ 不带电源滤波器的驱动器：
- 允许在所有TT系统上运行

TT系统上的功率模块示例

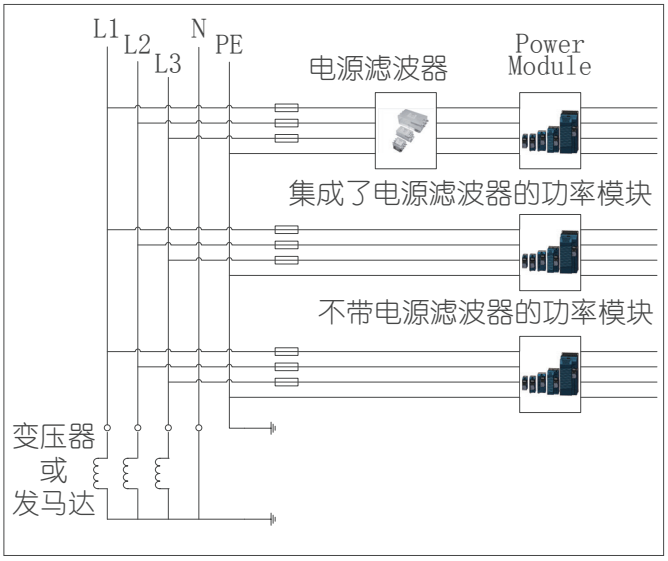


图3-2 带有中性线N传输和接地星点的TT系统

中文

IT系统

IT系统中的所有导线都与保护接地线进行了隔离或是通过一个阻抗与保护接地线相连。带或不带中性线N传输的两种IT系统。

驱动器在IT系统上运行

◆ 带内置电源滤波器的驱动器:
- 不允许在IT系统上运行

◆ 不带电源滤波器的驱动器:
- 允许在所有IT系统上运行

IT 系统上的功率模块示例:

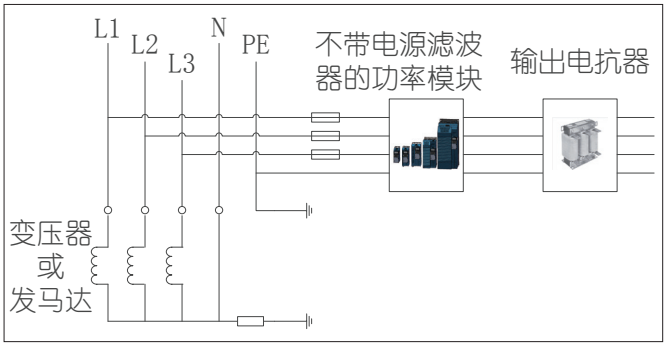


图3-3 传送中性线N且带有保护接地线阻抗的IT系统

接地时驱动器的特性:

某些情况下，驱动器在输出端接地时仍可以工作。此时，必须安装一个输出电抗器，以避免驱动器过电流跳闸或损坏马达。

中文

3.5.2 保护装置

必须按照高漏电电流（3.5 mA 以上）的相关规定，将变频器接地。如果当地和国家规范要求通过残余保护器提供上游保护，对驱动器应使用B型漏电断路器。

为避免漏电流造成意外触发漏电断路器，电源星点必须接地，且选用限制电流300mA以上，动作时间0.1s以上的漏电断路器。

按IEC61800-5-1要求，如果漏电电流超过3.5mA，则须给予特别注意。需采用以下方式之一来增强接地措施:

◆ 地线的截面积至少为10mm2(8 AWG)。

◆ 采用两条单独的并且均符合尺寸规格的接地线。

3.5.3 连接驱动器

将功率模块连接到马达和电源上

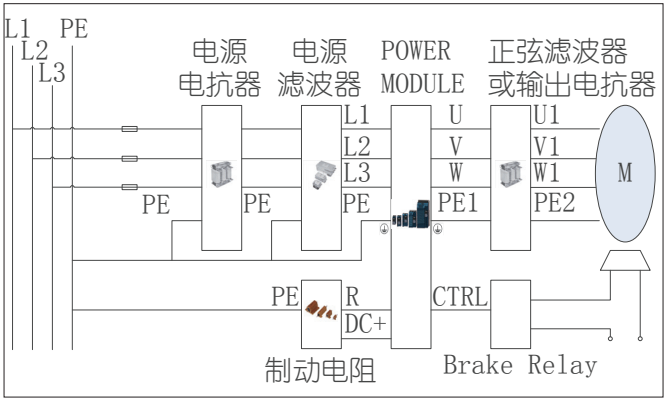


图3-4 功率模块PM25 3AC 的接线图

⚠危险

马达接口上的危险电压可引发生命危险

一旦驱动器通电，驱动器的马达接口上就可能会带有危险电压。如果马达已连到驱动器而马达接线盒打开，接触马达接口可引发电击危险。

◆ 请在接通驱动器前关上马达的接线盒。

将电源电缆连接到驱动器上

步骤/ 按如下步骤将驱动器和电源连接在一起:

1. 如果驱动器的端子上有外盖，打开外盖。
2. 将电源连接到端子L1,L2和L3上。
3. 将电源的保护接地线连接到驱动器的PE端子上。
4. 如果驱动器的端子上有外盖，合上外盖。

您已将电源电缆连接到了驱动器上。

将马达电缆连接到异步马达上

步骤/按如下步骤将马达电缆连接到异步马达上:

1. 打开马达的接线盒。
2. 采用星形接线或三角形接线连接马达。
3. 如果需要使用屏蔽马达电缆，必须进行以下操作:

- 剥除接线盒进线孔周围马达电缆的护套，使屏蔽层裸露出来。
- 通过马达接线盒上合适的电缆密封头使屏蔽层接地。

4. 连接马达的接线盒

您已成功将马达电缆连接到了异步马达上

您必须根据您的应用所需选择星形接线或三角形接线(Y/Δ)来连接马达。

示例: 驱动器和马达在400V的电源上运行

假设: 在马达铭牌上标出了230/400V Δ/Y。

情况1: 通常情况下，马达从静态上升到额定转速（即和电源频率相符的转速）。

此时，马达必须采用Y接线。

在这种情况下只有采用弱磁，马达才能超出额定转速运行，也就是说，在额定转速以上，马达可用转矩降低。

接通马达前，先检查马达的接线是否是按照您的应用所需:

马达的星形接线或三角形接线

接线的示意图:

◆ 星形接线(Y)

◆ 三角形接线(Δ)

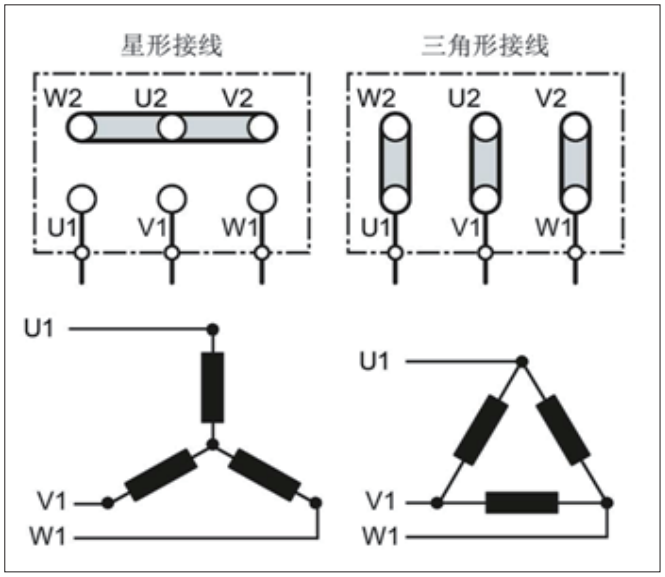


图3-5 马达的星型和三角形接法

将马达电缆连接到驱动器上

步骤/ 按如下步骤将马达电缆连接到驱动器上:

1. 如果驱动器的端子上有外盖，打开外盖。
2. 将马达连到端子U、V和W上。

请注意EMC布线规定。

3. 将马达的保护接地线连接到驱动器的PE端子上。
4. 如果驱动器的端子上有外盖，合上外盖。

您已将马达电缆连接到了驱动器上。

3.5.4 连接制动电阻

将功率模块连接到马达和电源上



⚠警告

不适当安装或不正确安装制动电阻可导致火灾，引发生命危险。

明火和烟雾可引起重大人员伤亡或财产损失。

使用不配套的制动电阻可引发明火和烟雾，从而导致人员伤亡或财产损失。

◆ 只允许使用和驱动器配套的制动电阻。

◆ 按规定安装制动电阻。

◆ 监控制动电阻的温度。



⚠小心

接触高温表面可导致烫伤。

制动电阻的温度在工作期间会急剧上升。

◆ 在运行期间请不要接触制动电阻。

步骤/ 按照以下步骤，连接制动电阻并监控制动电阻的温度：

1. 将制动电阻连到驱动器上的接线端子DC+和R2上。
2. 直接将制动电阻接到控制柜的接地排上，制动电阻不允许通过驱动器上的PE端子接地。
3. 请遵循屏蔽规定，确保符合电磁兼容要求。
4. 将制动电阻的温度监控端子连接至驱动器上空闲的数字量输入。
5. 在调试驱动器时将该数字量输入的功能定义为外部故障。

现在已成功连接了制动电阻并设置了温度监控。

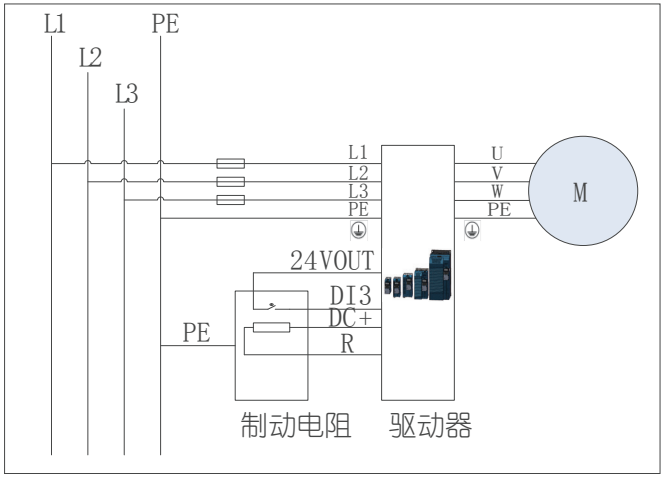
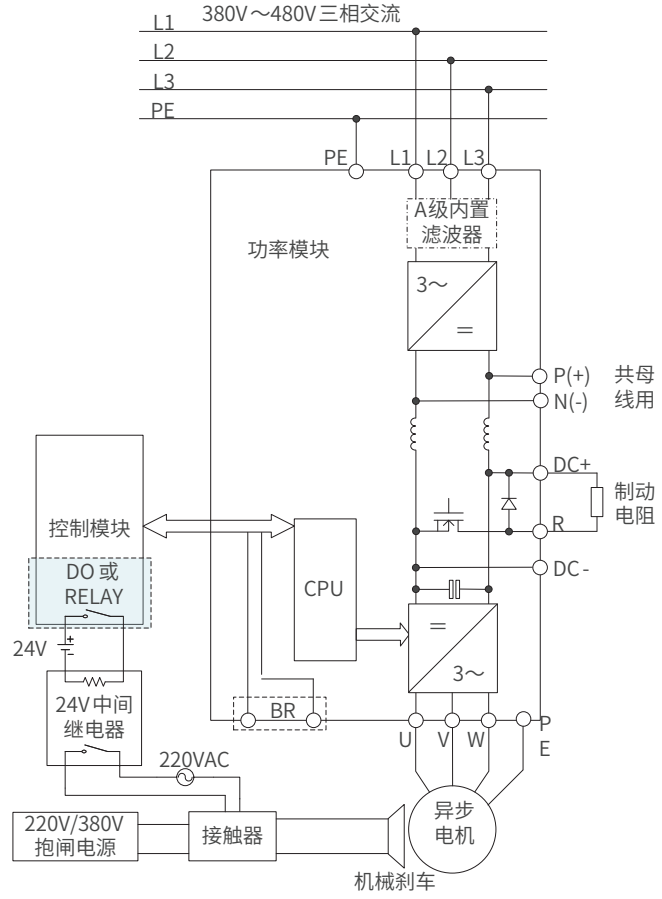


图3-6 在驱动器上直接连接制动电阻（示例：通过DI3进行温度监控）

3.5.5 PM25装配图

将功率模块连接到马达和电源上



3.6 安装控制模块

⚠警告

连接了不合适的电源所产生的危险电压可引发生命危险

在出现故障时，接触带电部件可能会造成人员重伤，甚至是死亡。

◆ 电子模块的所有的连接和端子只允许使用2类PELV电源（Protective Extra Low Voltage：保护特低压）。

3.6.1 将控制模块插入功率模块

将控制模块插入功率模块 B1..B7



取下控制模块



装入控制模块

步骤

按如下步骤将控制模块插入功率模块：

1. 将控制模块的背面凸起部分安装在功率模块对应的凹槽中。
2. 将控制模块插入功率模块，直到听到控制单元在功率模块上卡紧的声音。

您已经将控制模块插入到功率模块中。

如果要拆下控制模块，只要按住功率单元上的卡扣，取下控制模块即可。

3.6.2 接口一览

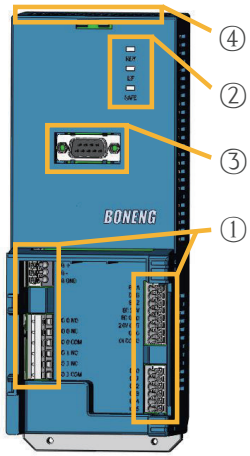
必须拆下操作面板（如果有）并打开正面门盖才可以操作控制模块正面的接口。

① 端子排
② 状态 LED



③ 操作面板接口
④ 网口端子





3.6.3 顶部正面保护盖后面的端子排

X1	
1	SG+
2	SG-
3	SG GND

支持Modbus通讯的控制模块才有此端子Modbus端子，最大支持115200bps

X2	
1	DO0NO
2	DO0NC
3	DO0COM
4	DO1NO
5	DO1NC
6	DO1COM

2路数字量输出（继电器）
最大持续2A，
支持220VAC、30VDC
抱闸等感性负载大于0.6A的，建议增加中间继电器进行控制

X3	
1	EC A
2	EC B
3	EC Z
4	EC24V
5	ECGND
6	24VOUT
7	GND
8	DICOM0

编码器支持24V单端信号输入

EC GND和GND与内部的GND联通，24V OUT和EC 24V由机器内部产生，电压为24V±10%

X4	
1	DI0
2	DI1
3	DI2
4	DI3
5	DI4
6	DI5

DI 0-DI 5是都普通共DI COM0的数字量输入，低电压<5V，高电压>11V，支持24VDC、36VAC、48VAC

3.6.4 顶部端子

支持PROFINET通讯的控制模块才有此端子。

	引脚	信号名称	信号说明
X23和X24  1-8	1	TXP	以太网发送数据 +
	2	TXN	以太网发送数据 -
	3	RXP	以太网接收数据 +
	4	预留，未占用	-
	5	预留，未占用	-
	6	RXN	以太网接收数据 -
	7	预留，未占用	-
	8	预留，未占用	-

3.7 安装编码器

用于转速控制的编码器

编码器必须安装在马达轴上。

表格3-3 允许的编码器

编码器类型	端子
24V推挽类型编码器	X3
24V开集极型编码器	X3

如果编码器支持24V输入，可以直接用端子X3提供的24V电源

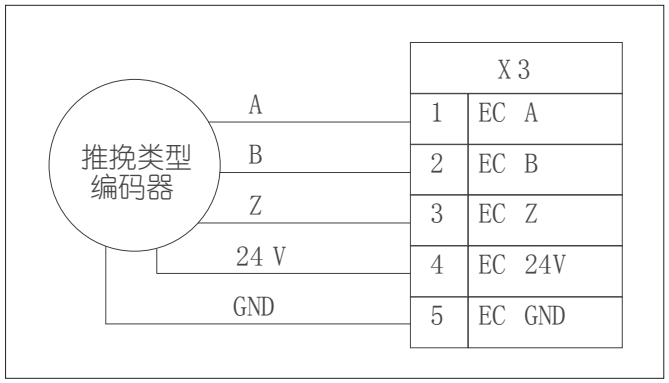


图3-7-1 24V推挽类型编码器接线示意图

如果编码器支持24V输入，可以直接用端子X3提供的24V电源

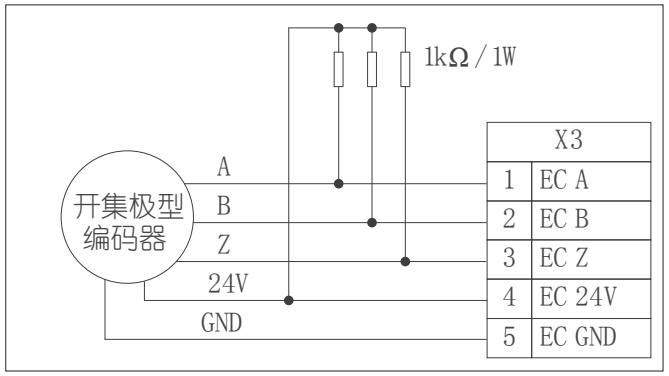


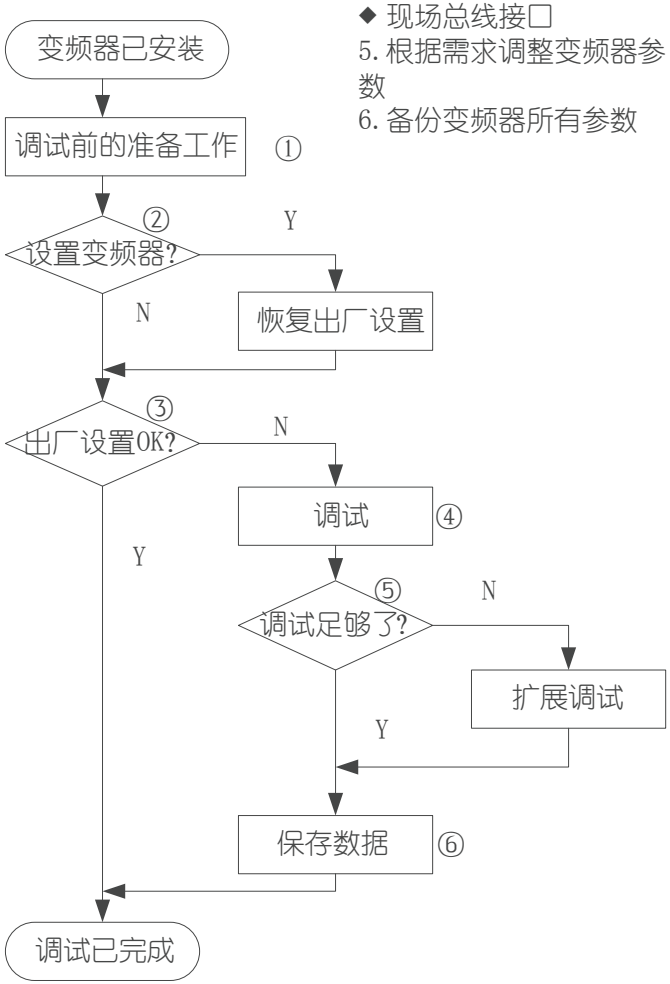
图3-7-2 24V开集极类型编码器接线示意图

说明：如果用差分信号，必须要注意只能同时使用A+, B+, Z+或者A-, B-, Z-。

4 调试

4.1 调试指南

1. 确定应用对变频器的需求
   - ◆ 输入线缆线径
   - ◆ 输出线缆线径
   - ◆ 制动电阻匹配阻值
2. 首次上电将变频器恢复为出厂值
3. 检查变频器的出厂设置是否已满足您的应用需求
4. 进行驱动调试时设置以下项目：
   - ◆ 马达控制方式
   - ◆ 输入与输出
   - ◆ 现场总线接口
5. 根据需求调整变频器参数
6. 备份变频器所有参数



4.2 调试前的准备工作

4.2.1 收集马达数据

在开始调试前，必须可以确定以下信息

◆ 驱动器上连接的是哪一种马达？

请记录下马达的产品编号以及铭牌上的数据，并将相关马达参数记录到驱动器对应的参数列表中。

◆ 如何连接马达？

注意马达的接线（星形接线[Y]或三角形接线[Δ]）。记下与接线相对应的马达数据。

4.2.2 驱动器的出厂设置

驱动器机型设置

出厂时，驱动器已经根据功率模块的额定功率进行了匹配设置。

驱动器控制

驱动器控制的出厂设置信号来源于端子，端子的出厂设置取决于控制模块的设置。

X4		自定义功能
1	DI0	正转运行
2	DI1	反转运行
3	DI2	故障复位来源2
4	DI3	……
5	DI4	……
6	DI5	……

X2		自定义功能
1	DO 0NO	抱闸打开命令状态
2	DO 0NC	
3	DO 0COM	
4	DO 1NO	……
5	DO 1NC	
6	DO 1COM	

开通和关断马达

在驱动器的出厂设置中，以5Hz的频率设定值（马达额定频率为50Hz）为例，驱动器会使马达在接通后的5秒内加速到该设定值。同样，在关闭马达后，驱动器也会使马达在5秒内减速制动。

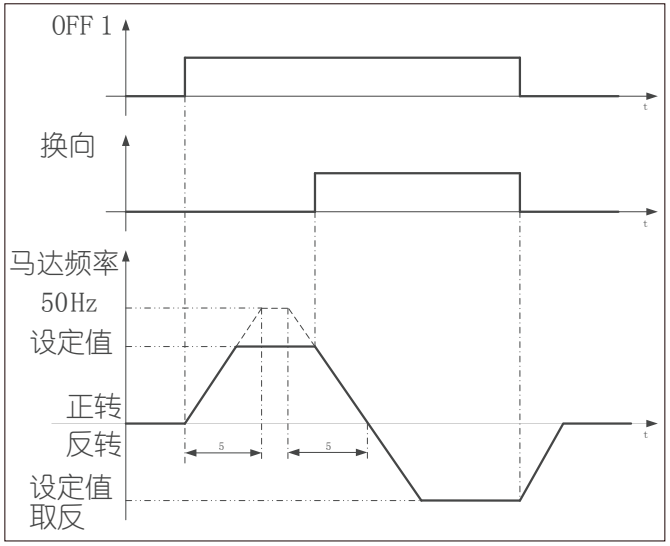


图4-1 出厂设置中马达的开通、关断和换向

4.3 恢复出厂值

有些情况会导致调试出现异常，例如：

◆ 调试期间电源中断，使调试无法结束。

◆ 调试过程中因不懂某个参数的含义而无法继续设置。

◆ 您不清楚驱动器是否已经使用过一次。

在这些情况下请将驱动器恢复到出厂设置。

表4-1 参数恢复出厂值

参数	参数名称	描述
A04.00	参数复位模式	0:无效 1:机型参数，马达参数，故障记录不复位 2:马达参数，故障记录不复位 3:全部参数复位 4:清除故障记录
A04.01	参数复位	0:取消 1:确认

机型参数：驱动器设置PM驱动模块的功率机型参数。

马达参数：驱动器驱动的马达参数。

示例：

目标需求：

机型参数、马达参数和故障记录以外的参数进行恢复出厂值操作。

步骤：

1. A04.00=1；

2. A04.01=1；

等待5S后，驱动器完成恢复出厂值操作。

4.4 操作面板操作与显示

操作与显示界面介绍

用操作面板，可对驱动器进行功能参数修改、驱动器工作状态监控和驱动器运行控制（起动、停止）等操作，其外型及功能区如下图所示：

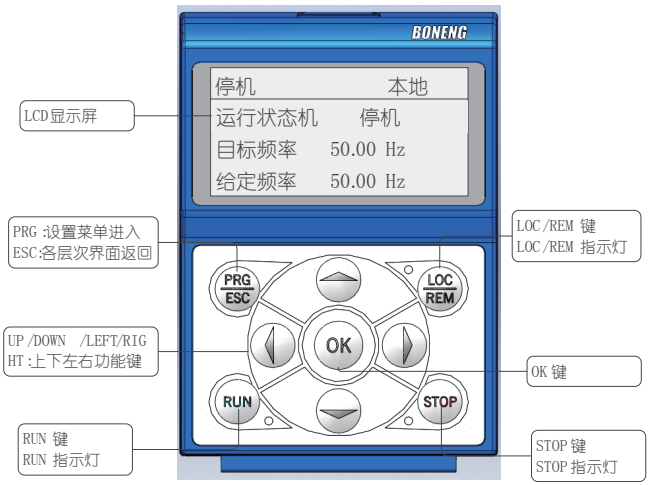


图4-2 操作面板示意图

1） 功能指示灯说明

LOC/REM指示灯：灯亮表示面板操作控制状态，灯灭表示处于远程操作控制状态。

STOP指示灯：灯亮时表示驱动器处于停机状态。

RUN指示灯：灯亮时表示驱动器处理运行状态。

2） 操作面板按键说明

按键	名称	功能
PRG/ESC	编程键/返回键	主监控界面时，按此键进入功能选择界面；其他界面，按此键返回上一级界面或状态
LOC/REM	本地/远程键	获取或放弃键盘控制权
STOP	停止键	运行状态时，按此键可用于停止运行操作；停机状态时，按此键可复位故障状态
RUN	运行键	在键盘操作方式下，用于运行操作
▲	递增键	数据或功能码的递增
▼	递减键	数据或功能码的递减
▶	右移位键	在修改参数时，可以循环向右选择参数的修改位
◀	左移位键	在修改参数时，可以循环向左选择参数的修改位
OK	确认键	逐级进入菜单画面、设定参数确认

3） LCD显示界面说明

LCD显示界面采用4行中文的显示方式，其中首行为状态显示行。无故障时，显示当前运行状态(停机/运行)，点动控制，本地/远程状态等信息。当发生故障时，首行优先显示当前故障码，如下图所示：

停机	本地
运行状态机	停机
目标频率	50.00 Hz
给定频率	50.00 Hz

图 2 正常状态LCD显示示例

故障:变频器过温1	
运行状态机	停机
目标频率	50.00 Hz
给定频率	50.00 Hz

图 3 故障状态LCD显示示例

功能码查看、修改方法说明

A1驱动器的操作面板采用多级菜单结构进行参数设置等操作，界面采用4行中文显示，非常直观且便于操作。在参数设置界面状态下，通过上下按键可以依次循环查看该组功能码。按OK键，进入参数设置界面。

举例：

将功能码B05.00从VF控制更改为SVC控制的示例，如下图所示。

参数设置的结果为以下之一：
1）修改成功
2）只读参数
3）无权限修改
4）只能停机修改

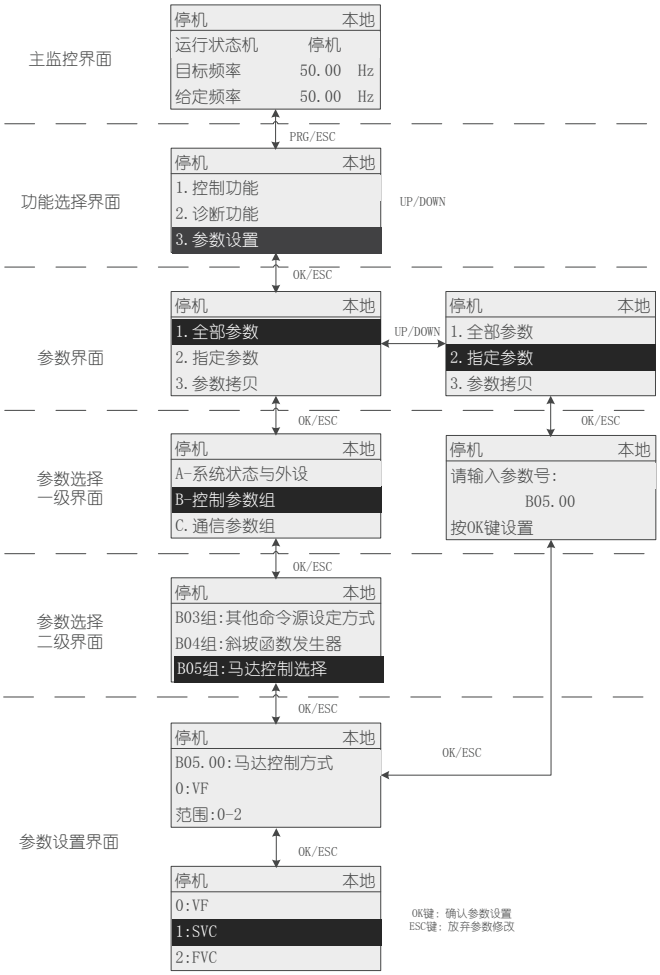


图 4-3 参数修改流程示意图

主界面监控参数选择
主界面可监控参数数量为6个，可监控参数范围是A00组的21个参数。主监控界面的监控参数，可通过设置A00.41~A00.46的参数值来选择。
举例：
需要在主监控界面第2行显示A00.14(直流母线电压)，只需修改A00.42的参数值为14即可。

5 扩展调试

5.1 驱动器功能一览

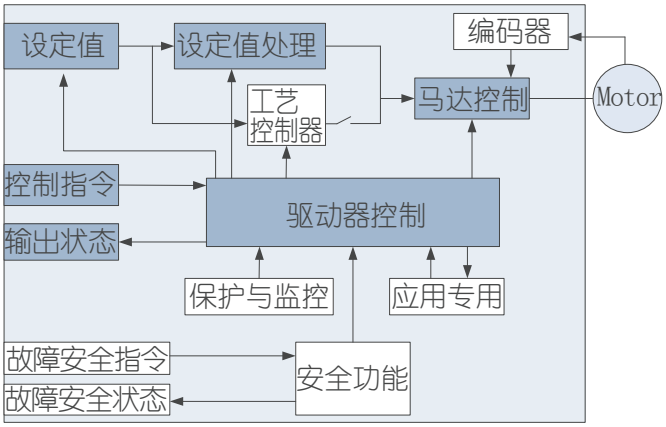


图5-1 驱动器功能一览

常用功能		特殊功能	
每一种应用下都需要使用的功能在上面的功能一览图中以深色显示。 请在基本调试期间对这些功能进行合适的设置，以便在很多应用中无需其他设置便可直接运行马达。		需要根据需求调整参数的功能在上面的功能一览图中以白色显示。	
驱动器控制	驱动器控制的权限大于所有其他功能，它定义了驱动器如何响应上级控制器指令	保护与监控	保护及监控功能可以避免损坏马达、驱动器和工作机械，如通过温度监控或转矩监控。
指令输出状态	上级控制器的指令通过数字量输入或现场总线发送给驱动器。驱动器将它的状态信息反馈给控制模块输出端或现场总线。	应用专用	应用专用功能可控制例如马达抱闸，或通过工艺控制器使能上位压力控制或温度控制。

常用功能		特殊功能	
设定值	必须确定一个设定值，比如：转速设定值	安全功能	安全功能用于对驱动器功能的安全性有高要求的应用场合。基本功能安全封锁驱动转矩。
设定值处理	设定值处理用于避免斜坡函数发生器使转速剧烈变化，并将转速制在最大值以下。		
马达控制	马达控制用于使马达跟踪转速设定值。您可以在矢量控制和V/f控制之间进行选择。		

中文

5.2 驱动器控制

5.2.1 开通和关断马达

接通电源电压后，驱动器通常都会进入“开机准备”状态。

在该状态下，驱动器会一直等待接通马达的指令：

◆ 收到OFF1-ON

指令后，驱动器会接通马达。驱动器进入“运行”状态。

◆ 发出OFF1-OFF

指令后，驱动器对马达进行制动。在马达停止后，驱动器将关闭输出。

驱动器回到“开机准备”状态。

驱动器状态及开通和关断马达的指令

除 OFF1指令外，

停止马达的指令还有：

◆ OFF2-ON（低电平）驱动器立即停止输出，不先对马达进行制动。

◆ OFF3-ON（低电平）该指令的含义是“紧急停止”。发出OFF3-ON指令后，驱动器以OFF3减速时间使马达制动。在马达停止后，驱动器将关闭输出。

该指令经常在非正常运行情况下使用，以使马达快速制动。典型应用为碰撞保护。

◆ 暂停运行-驱动器以OFF1/OFF2/OFF3的停机方式停止马达运行。

◆ 正常运行-驱动器驱动马达运行。

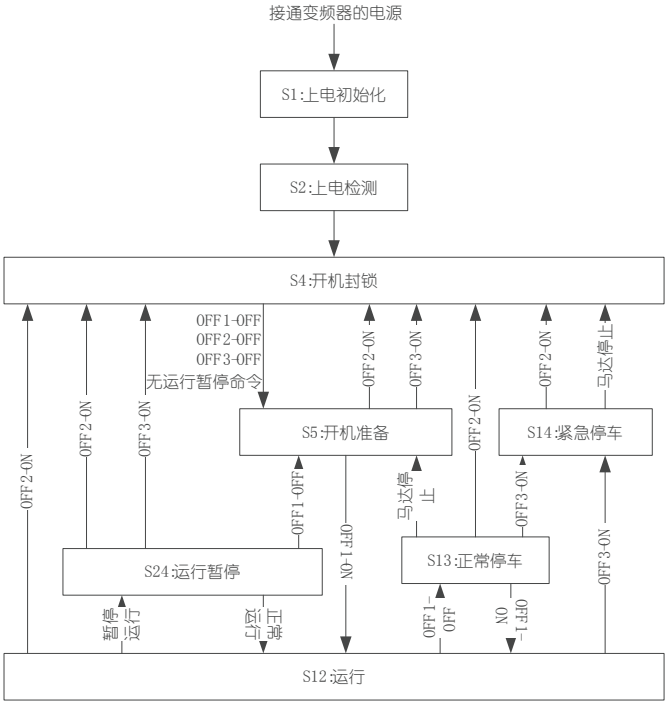


图5-2 马达开通和关断时驱动器的内部顺序控制

中文

驱动器状态	说明
S1	驱动器接通电源后的初始化状态
S2	驱动器初始化后对功率器件进行的检测状态
S4	驱动器没有满足马达运行条件时所处于的状态
S5	驱动器满足马达运行条件时的状态
S12	驱动器输出使马达运行
S13	马达已被OFF1指令关闭并在斜坡函数发生器的斜坡下降时间内制动。
S14	马达已被OFF3指令关闭并以OFF3减速时间或根据电流限值减速制动。
S24	马达运行处于暂停状态

5.2.2 调整端子排的预设置

本章节介绍如何修改驱动器各个数字量和模拟量输入/输出的功能。

5.2.2.1 数字量输入

修改数字量输入的功能

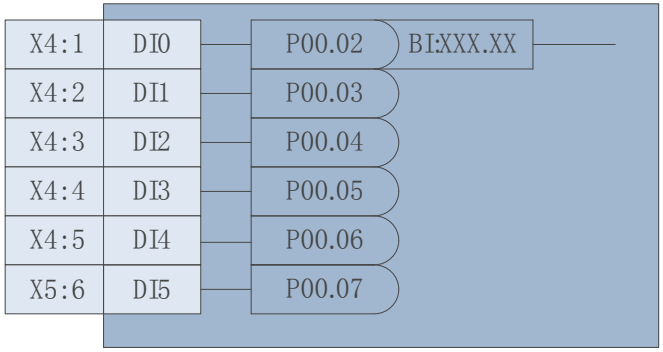


图5-3 数字量输入功能图

注:必须将DI的状态参数与选中的二进制互联输入连接在一起，才可以修改DI的功能。

表5-1 部分常用驱动器二进制互联输入参数

参数编号	参数名称	参数编号	参数名称
B00.01	自定义启停命令OFF1来源	B03.14	多段给定值选择3
B00.02	自定义启停命令OFF2来源	B03.15	多段给定值选择4
B00.13	故障复位来源2	B04.00	斜坡时间选择1
B01.03	端子控制命令1输入IN1	B04.01	斜坡时间选择2
B01.04	端子控制命令1输入IN2	B04.20	强制输出使能
B01.05	端子控制命令1输入IN3	E00.00	外部故障1来源
B03.09	电动电位器增加来源选择	E00.01	外部故障2来源
B03.10	电动电位器下降来源选择	E00.02	外部警告1来源
B03.12	多段给定值选择1	E00.03	外部警告2来源
B03.13	多段给定值选择2	F04.03	抱闸打开命令来源

示例：修改数字量输入的功能



将外部故障来源选择（E00.00）和DI0相连，以通过数字量输入DI0来触发外部故障的产生。设置E00.00=1002。

注：互联参数的代表编号的编码规则约定为参数编号+1000；即P00.02的编号为1002；P13.11的编号为2311；P15.89的编号为2589；其他互联参数类推。

5.2.2.2 数字量输出

更改数字量输出的功能

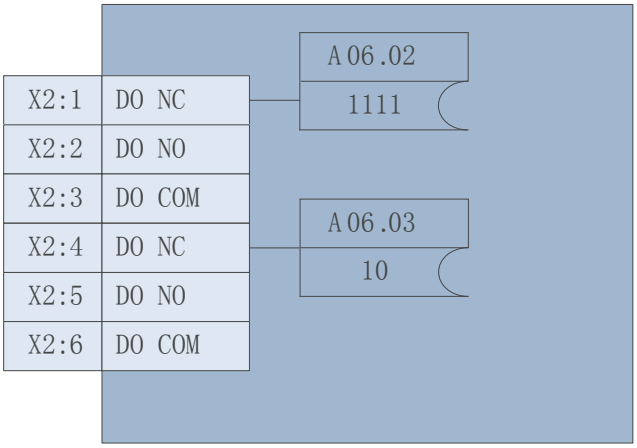


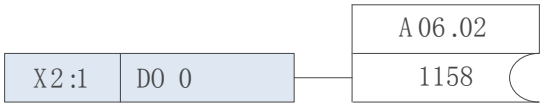
图5-4 更改数字量输出功能图

注：必须将数字量输出与选中的二进制互联输出连接在一起，才可以更改数字量输出的功能。

表格 5-2 驱动器数字量输出的功能选择表

设定值	含义	设定值	含义
0	低电平	6	速度为负向
1	高电平	7	零速运行
2	运行准备好	8	过速度
3	运行允许	9	警告
4	运行中	10	故障
5	比较值到达	其它：二进制互联参数	

示例：修改数字量输出的功能



将DO0与抱闸已打开（P01.58）互联参数相连，以通过数字量输出DO0来表征抱闸继电器当前状态；设置A06.02=1158。

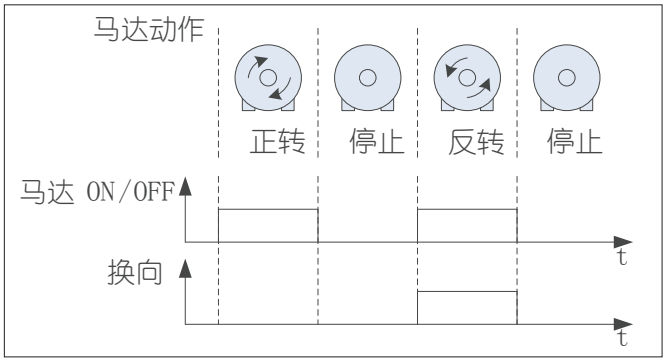
5.2.3 通过数字量输入（DI）控制驱动器

有六种通过数字量输入控制马达的方法。

单线制控制

单线制控制，输入端子仅控制马达的启停，马达的旋转方向由当前的驱动器输出端接线相序决定。

双线制控制，方法1



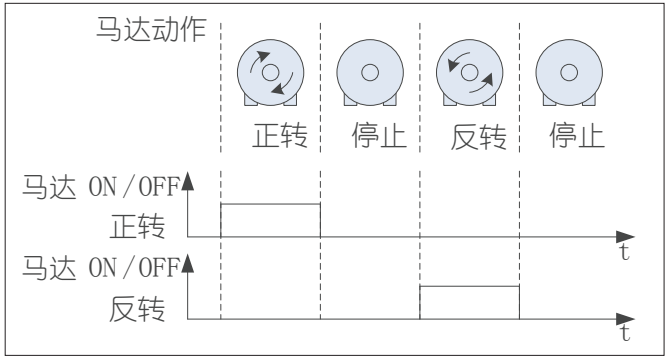
控制指令

1. 接通和关闭马达(ON/OFF1)。
2. 切换马达旋转方向（反转）。

典型应用：

传送带应用的现场控制。

双线制控制，方法2



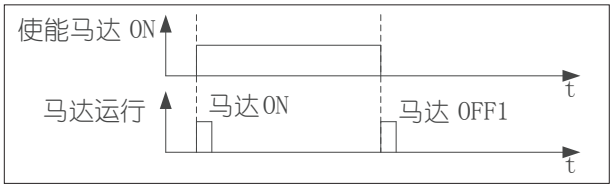
控制指令

1. 接通和关闭马达(ON/OFF1)，正转。
2. 接通和关闭马达(ON/OFF1)，反转。

典型应用

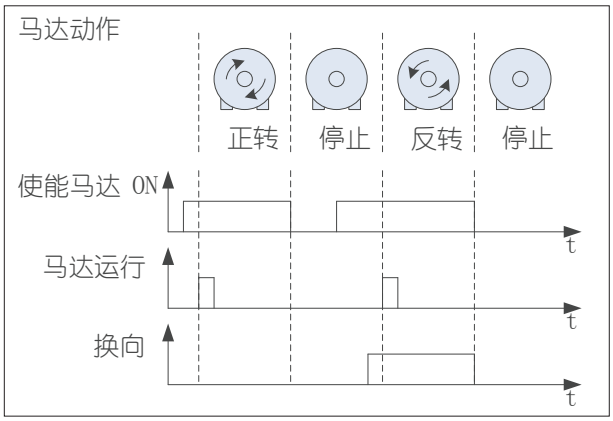
通过主开关进行控制的运行传动。

双线制控制，方法3



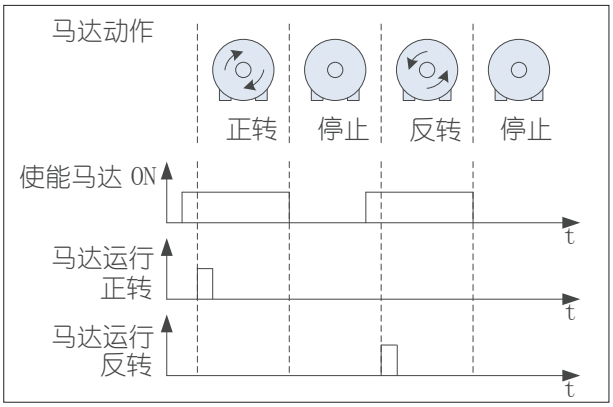
控制指令：
1. 使能马达和关闭马达(OFF1)。
2. 接通马达(ON)，马达的旋转方向由当前的驱动器输出端接线相序决定。

三线制控制，方法1



控制指令：
1. 使能马达和关闭马达(OFF1)。
2. 接通马达(ON)。
3. 切换马达旋转方向（反转）。

三线制控制，方法2



控制指令：
1. 使能马达和关闭马达(OFF1)。
2. 马达运行正转指令(ON)，正转。
3. 马达运行反转指令(ON)，反转。

典型应用：
通过主开关进行控制的运行传动。

5.2.4 双线制控制，方法1
在这种控制方法中，您通过一个控制指令(ON/OFF1)控制马达的启停，通过另一个控制指令控制马达的正转、反转。

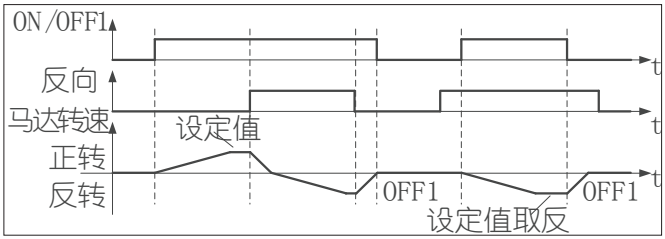


图5-9 双线制控制，方法1

表5-4 端子功能表

ON/OFF1 (IN1)	反向 (IN2)	功能
0	0	OFF1：马达停止
0	1	OFF1：马达停止
1	0	ON：马达正转
1	1	ON：马达反转

相关参数设定

参数编号	参数名称	参数说明
B01.01	端子控制命令1方式	选择端子启停有效模块1的端子控制模式，B01.01=2表示双线制控制，方法1。
B01.03	端子控制命令1输入IN1	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.04	端子控制命令1输入IN2	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。

5.2.5 双线制控制，方法2

在这种控制方法中，第一个控制指令(ON/OFF1)用于接通和关闭马达，并同时选择马达的正转。

第二个控制指令同样用于接通和关闭马达，同时选择马达的反转。

仅在马达静止时驱动器才会接收新指令。

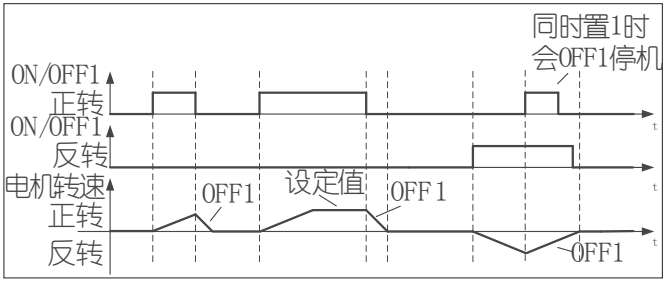


图5-10 图表说明Word中的5.2.5双线制控制，方法2

表5-5 功能表

ON/OFF1正转 (IN1)	ON/OFF1反转 (IN2)	功能
0	0	OFF1：马达停止
1	0	ON：马达正转
0	1	ON：马达反转
1	1	OFF1：马达停止

相关参数表

参数编号	参数名称	参数说明
B01.01	端子控制命令1方式	选择端子启停有效模块1的端子控制模式，B01.01=3表示双线制控制，方法2。
B01.03	端子控制命令1输入IN1	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.04	端子控制命令1输入IN2	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。

5.2.6 双线制控制，方法3

在这种控制方法中，第一个控制指令用于使能另外一个控制指令。取消使能后，马达关闭(OFF1)。

第二个控制指令的上升沿将马达运行；马达的运行方向取决于驱动器输出端的接线相序。

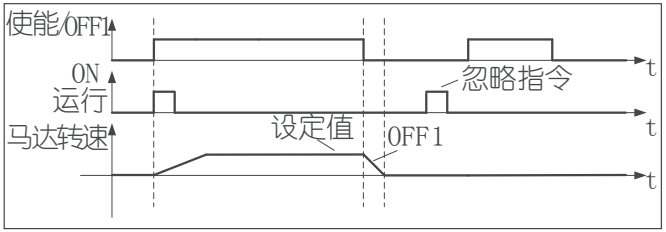


图5-11 双线制控制，方法3

表5-6 功能表

使能/OFF1 (IN2)	ON/OFF1 (IN1)	功能
0	0	OFF1：马达停止
1	0	OFF1：马达停止
0	0->1	OFF1：马达停止
1	0->1	ON：马达旋转，方向以驱动器输出接线相序为准

相关参数表

参数编号	参数名称	参数说明
B01.01	端子控制命令1方式	选择端子启停有效模块1的端子控制模式，B01.01=4表示双线制控制，方法3。
B01.03	端子控制命令1输入IN1	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.04	端子控制命令1输入IN2	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。

5.2.7 三线制控制，方法1

在这种控制方法中，第一个控制指令用于使能另外两个控制指令。

取消使能后，马达关闭(OFF1)。

第二个控制指令的上升沿接通马达(ON)。

第三个控制指令确定马达的旋转方向（换向）。

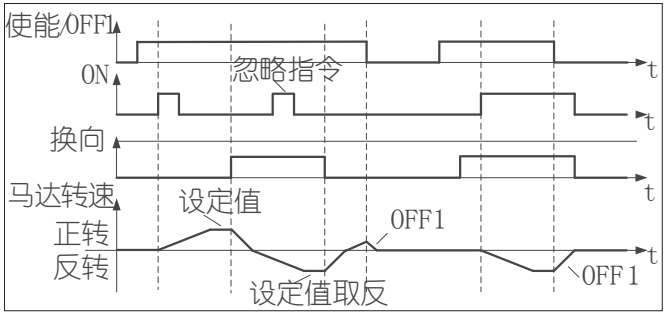


图5-12 三线制控制，方法1

表5-7 功能表

使能/OFF1 (IN2)	ON (IN1)	换向 (IN3)	功能
0	0或1	0或1	OFF1：马达停止
1	0->1	0	ON：马达正转
1	0->1	1	ON：马达反转

相关参数表

参数编号	参数名称	参数说明
B01.01	端子控制命令1方式	选择端子启停有效模块1的端子控制模式，B01.01=5表示三线制控制，方法1。
B01.03	端子控制命令1输入IN1	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.04	端子控制命令1输入IN2	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.05	端子控制命令1输入IN3	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。

5.2.8 三线制控制，方法2

在这种控制方法中，第一个控制指令用于使能另外两个控制指令。

取消使能后，马达关闭(OFF1)。

第二个控制指令的上升沿将马达切换至正转。

若马达处于未接通状态，则会接通马达。

第二个控制指令的上升沿将马达切换至反转。

若马达处于未接通状态，则会接通马达。

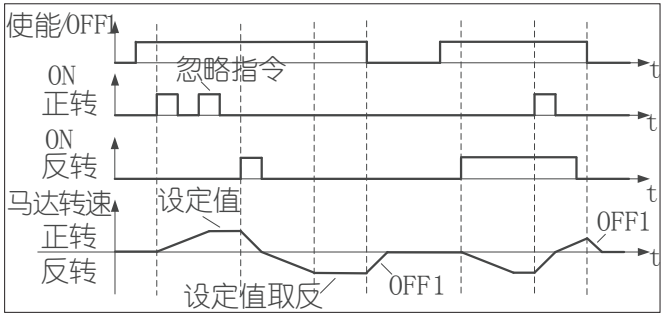


图5-13 三线制控制，方法2

表5-8 功能表

使能/OFF1 (IN3)	ON正转 (IN1)	ON反转 (IN2)	功能
0	0或1	0或1	OFF1：马达停止
1	0->1	0	ON：马达正转
1	0	0->1	ON：马达反转
1	1	1	电机不动作

相关参数表

参数编号	参数名称	参数说明
B01.01	端子控制命令1方式	选择端子启停有效模块1的端子控制模式，B01.01=6表示三线制控制，方法2。
B01.03	端子控制命令1输入IN1	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.04	端子控制命令1输入IN2	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。
B01.05	端子控制命令1输入IN3	选择端子启停有效模块1的输入端子来源选择，此参数为二进制互联参数。

5.2.9 马达点动（JOG功能）

“JOG”功能通常是用于缓慢移动一个机械部件，比如，移动传送带。
通过“JOG”功能，可以通过数字量输入来接通和关闭马达。
在接通后，马达将加速到JOG设定值。驱动器提供两个JOG设定值，
比如：马达正转设定值和反转设定值。
JOG的加减速时间和ON/OFF1指令的不同，由另外参数设定。

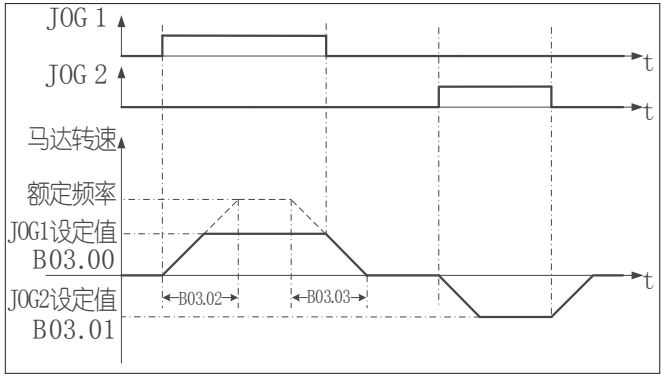


图5-14 JOG时马达的工作时序

注：在给出“JOG”控制指令前，驱动器应在开机准备状态下。
如马达已运行，“JOG”指令将不会生效。

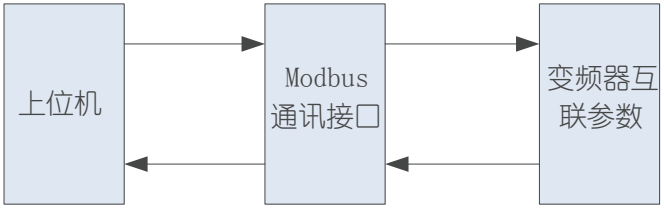
JOG设置相关参数

参数编号	参数名称	参数说明
B00.00	启停控制命令来源	选择控制命令来源模块
B00.07	自定义JOG1来源	自定义控制模块的JOG1命令来源设定
B00.08	自定义JOG2来源	自定义控制模块的JOG2命令来源设定
B01.11	端子控制模块JOG1来源	端子控制模块的JOG1命令来源设定
B01.12	端子控制模块JOG2来源	端子控制模块的JOG2命令来源设定
B03.00	JOG1给定设置	JOG1设定值来源选择
B03.01	JOG2给定设置	JOG2设定值来源选择
B03.02	JOG加速时间	JOG点动加速时间设置
B03.03	JOG减速时间	JOG点动减速时间设置

5.2.10 通信控制

目前驱动器支持Modbus通信和PROFINET通信，
PROFINET通信模块请游览官网下载相关使用手册

5.2.10.1 Modbus通信控制
Modbus具体通信协议详见附录。
Modbus通讯的具体结构如下：



Modbus通讯的通讯地址：

通讯地址	名称	定义
0xE720	Modbus通信控制命令	0：复位；1：启动；2：点动运行；3：自由停车；4：减速停车；5：故障复位；6：给定速度取反
0xE721	Modbus通信设定值1	Modbus通信设定值；设置范围：-600.0%~600.0%
0xE722	Modbus通信设定值2	Modbus通信设定值；设置范围：-600.0%~600.0%

Modbus说明：
若需使用Modbus控制电机启停和设置目标速度，需要设置以下参数：

功能码	功能码名称	设置参数
B00.00	启停控制命令来源	1:自定义控制模块
B00.01	自定义启停命令(OFF1)来源	P02.32:Modbus通讯启停命令
B00.02	自定义输出使能(OFF2)来源1	P02.34:Modbus通讯自由停车
B00.05	自定义故障复位来源1	P02.35:Modbus通讯故障复位
B00.06	自定义速度命令取反来源	P02.36:Modbus通讯给定速度取反
B02.00	速度控制主速度选择	P07.35 Modbus通讯设定值1标幺值/
		P07.36 Modbus通讯设定值2标幺值

Modbus通讯相关参数

参数标号	参数名称	参数设定范围
C02.00	Modbus波特率	0:1200bps
		1:2400bps
		2:4800bps
		3:9600bps
		4:19200bps
		5:38400bps
		6:57600bps
		7:115200bps
C02.01	Modbus数据格式	0:偶校验(8-E-1) 1:奇校验(8-O-1) 2:无校验(8-N-2) 3:无校验(8-N-1)
C02.02	Modbus本机地址	1~255
C02.03	Modbus应答延迟	0~20ms
C02.04	Modbus通讯超时	0:无效, 0.1s~60.0s
P02.32	Modbus通讯启停命令	0~1
P02.33	Modbus通讯点动启停	0~1
P02.34	Modbus通讯自由停车	0~1
P02.35	Modbus通讯故障复位	0~1
P02.36	Modbus通信给定速度取反	0~1
P07.32	Modbus控制命令	0~65535
P07.33	Modbus通讯设定值1	-32768~32767
P07.34	Modbus通讯设定值2	-32768~32767
P07.35	Modbus通讯设定值1标幺值	-32768~32767
P07.36	Modbus通讯设定值2标幺值	-32768~32767

5.2.11 控制字和状态字

控制字

位号	定义	说明
0	0=OFF1	马达按斜坡函数发生器的减速时间制动。达到静态后驱动器会关闭马达。
	0 → 1=ON	bit1，bit2，bit3均为1时，驱动器进入“运行”状态。
1	0=OFF2	马达立即关闭，惯性停车。
	1=OFF2 不生效	可以接通马达。
2	0=快速停机（OFF3）	快速停机：马达按 OFF3 减速时间制动，直到达到静态。
	1=快速停机无效（OFF3）	可以接通马达。
3	0=禁止运行	立即关闭马达
	1=使能运行	接通马达
4	0=封锁斜坡函数发生器；驱动器将斜坡函数发生器的输出设为0	驱动器将斜坡函数发生器的输出设为0
	1=不封锁斜坡函数发生器	允许斜坡函数发生器使能。
5	0=停止斜坡函数发生器	斜坡函数发生器的输出保持在当前值。
	1=使能斜坡函数发生器	斜坡函数发生器的输出跟踪设定值。
6	0=封锁设定值	马达按斜坡函数发生器减速时间制动。
	1=使能设定值	马达按加速时间升高到速度设定值。
7	0 → 1=复位故障	复位故障。如果仍存在ON指令，驱动器进入“开机封锁”状态；故障仍然存在，复位指令无效。
8	1=点动运行命令1	点动命令接通马达
9	1=点动运行命令2	点动命令接通马达
10	预留	预留

位号	定义	说明
11	1=换向	取反驱动器内的设定值。
12	1=电动电位器增加	提高保存在电动电位器中的设定值。
13	1=电动电位器减少	降低保存在电动电位器中的设定值。
14	1=产生外部故障	外部信号产生故障，驱动器停机
15	1=产生外部故障	外部信号产生故障，驱动器停机

状态字

位号	定义	说明
0	1=开机准备好	电源已接通， 驱动器处于运行前状态
1	1=运行准备	马达已经接通（ON/OFF1=1）， 当前没有故障。收到“运行使能” 指令，驱动器会接通马达
2	1=运行	驱动器处于运行状态
3	1=出现故障	在驱动器中存在故障
4	1=OFF2未激活	惯性停车功能未激活
5	1=OFF3未激活	快速停止未激活。
6	1=接通 禁止有效	当前处于开机封锁状态，只有 OFF1=0且OFF2、OFF3、运行允许 均为1的情况下，可退出当前状态
7	1=出现报警	马达保持接通状态，无需应答
8	1=转速差在 公差范围内	设定值与实际值的差 不在公差范围内
9	1=本地控制 请求控制	请求自动化系统控制驱动器
10	1=达到或超出 比较转速	转速大于或等于最大转速
11	1=达到电流限 值或转矩限值	达到或超出电流或转矩的比较值
12	1=抱闸打开	用于打开/闭合马达抱闸的信号
13	1=马达正转	驱动器内部实际值>0
14	预留	
15	1=IGBT运行	IGBT运行

5.3 设定值

5.3.1 概述

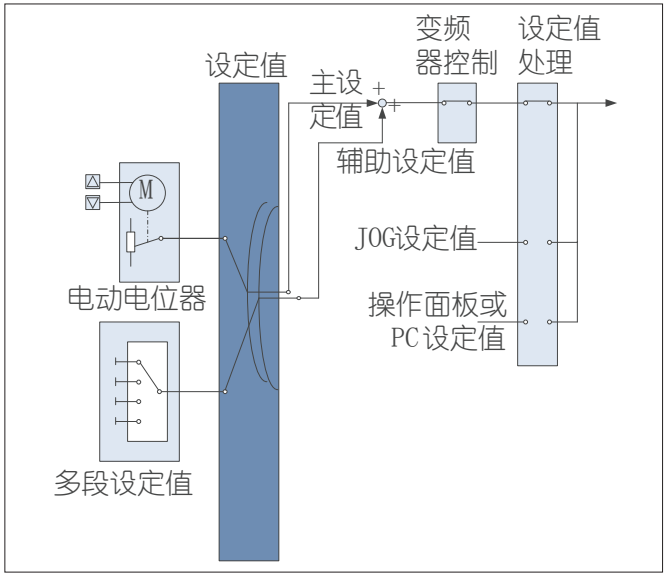


图5-15 驱动器的设定值处理

主设定值的来源可以是：

在开始调试前，必须可以确定以下信息

- 驱动器的现场总线接口
- 驱动器内模拟的电动电位器
- 驱动器内保存的固定设定值

上述来源也可以是辅助设定值或者附加设定值的来源。

在以下条件下，驱动器控制会从主设定值切换为其他设定值：

在开始调试前，必须可以确定以下信息

- 相应互联的工艺控制器激活时，工艺控制器的输出会给定马达转速。
- JOG激活时。
- 由操作面板或PC工具BonengDrivesoft控制时。

5.3.2 电动电位器设定为设定值

“电动电位器”功能用来模拟真实的电位器。电动电位器的输出值可通过控制信号“升高”和“降低”调整。

电动电位器与设定值源互联

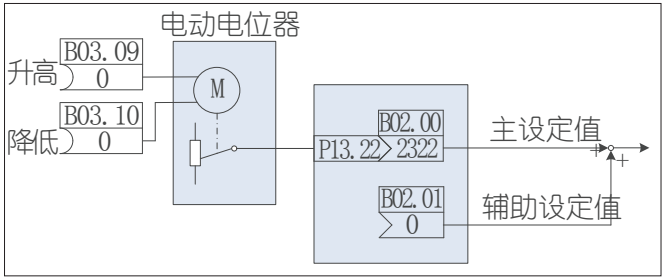


图5-17 电动电位器设定为设定值

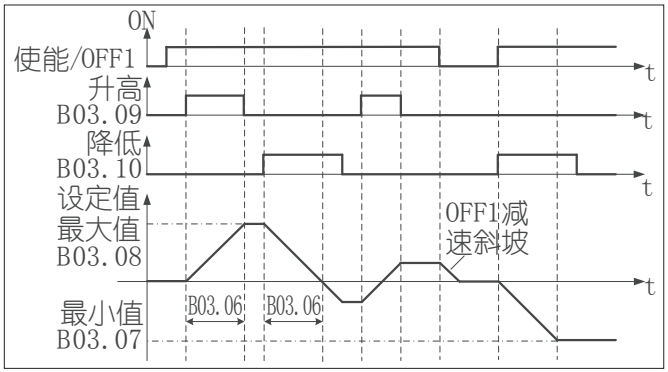


图5-18 电动电位器的功能图

表5-11 电动电位器的基本设置

参数	描述
B03.04	电动电位器功能模式选择 0:禁止 1:掉电清除 2:掉电记忆（预留）
B03.05	电动电位器初始值
B03.06	电动电位器斜坡时间
B03.07	电动电位器最小值
B03.08	电动电位器最大值
B03.09	电动电位器增加来源选择
B03.10	电动电位器下降来源选择

注:电动电位器相关参数为扩展参数，需要在功能码“A04.02 参数访问级别”选择“1:扩展参数”才会显示。

5.3.3 多段速设定为设定值

在很多应用中，只需要马达在通电后以固定转速运转，或在不同的固定转速之间来回切换，示例：输送带在接通后只使用两个不同的速度运行。

固定转速与主设定值互联

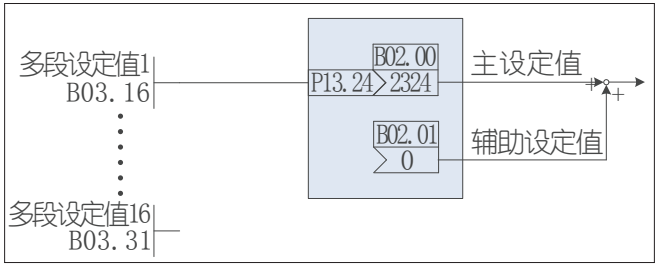


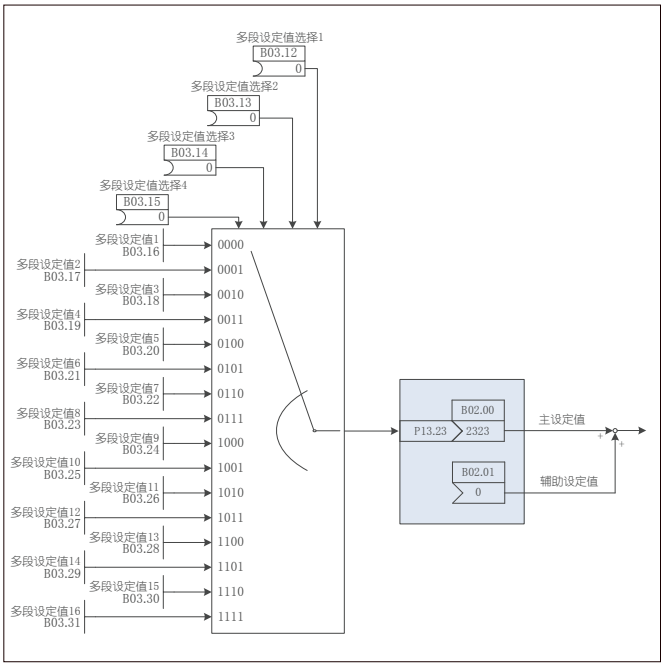
图5-19 电动电位器设定为设定值

表5-12 固定转速设定设定值

参数	注释
B02.00=2324 (P13.24)	速度来源主设定值选择 主设定值与多段设定值1互联

二进制选择多段设定值

设置16个不同的固定设定值。通过四个选择位的不同组合，您可以准确地从16个中选择一个固定设定值。



用于设置多段设定值的相关参数

参数	描述
B03.11	多段给定值 只读参数，显示当前多段设定的输出值
B03.12	多段给定值选择1
B03.13	多段给定值选择2
B03.14	多段给定值选择3
B03.15	多段给定值选择4
B03.16	多段设定值1
B03.17	多段设定值2
B03.18	多段设定值3
B03.19	多段设定值4
B03.20	多段设定值5
B03.21	多段设定值6
B03.22	多段设定值7
B03.23	多段设定值8
B03.24	多段设定值9
B03.25	多段设定值10
B03.26	多段设定值11
B03.27	多段设定值12
B03.28	多段设定值13
B03.29	多段设定值14
B03.30	多段设定值15
B03.31	多段设定值16

5.4 设定值处理

5.4.1 设定值处理一览

◆ 取反设定值，以切换马达旋转方向（反转）。

◆ 禁止正/负旋转方向，例如：在输送带、电泵或风机应用中。

◆ 抑制带，用于抑制机械谐振作用。
转速为0时，抑制带会在接通马达后对最小转速进行作用。

◆ 设置最大转速限制，以保护马达和机械装置。

◆ 设置斜坡函数发生器，以控制马达的加速和减速过程，输出理想扭矩。

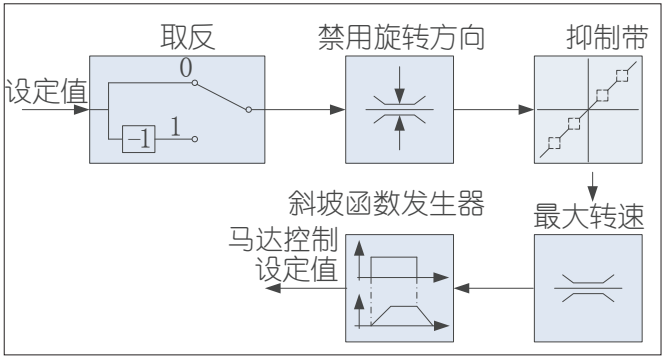
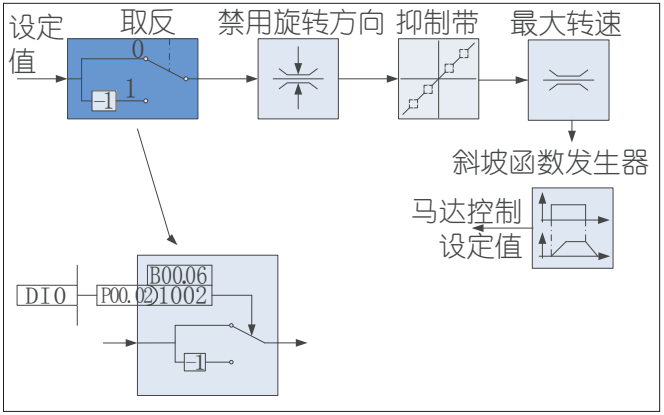


图5-20 驱动器内的设定值处理

5.4.2 取反设定值

设定值处理可以对设定值进行以下修改：
驱动器上可通过位切换设定值符号。
示例中展示的是通过数字量输入取反设定值。



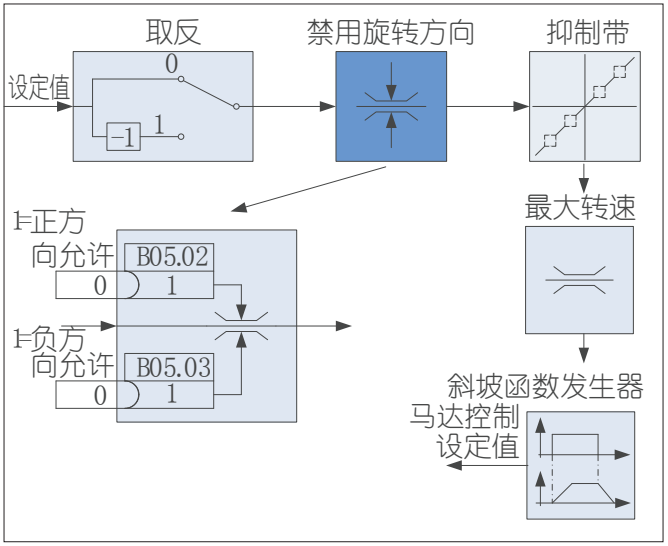
将参数B00.06和一个二进制信号（如数字量输入0）互联，以通过数字量输入DI0取反设定值。

表5-13 取反设定值的示例

参数	描述
B00.06=1002 (P00.02)	设定值取反 数字量输入0=0：设定值保持不变。 数字量输入0=1：驱动器对设定值取反。
B00.06=1201 (P02.01)	通过过程数据1的bit1位取反设定值

5.4.3 禁止旋转方向

在驱动器出厂设置中，马达的正负旋转方向都已使能。



如需禁用旋转方向，应将相应的参数设为0。

表5-14 设置旋转方向禁止的示例

参数	描述
B05.02=0	正方向允许选择 禁止马达正方向旋转
B05.03=1003 (P00.03)	负方向允许选择 数字量输入1=0：负旋转方向已禁止。 数字量输入1=1：负旋转方向已使能。

5.4.4 抑制带和最小转速

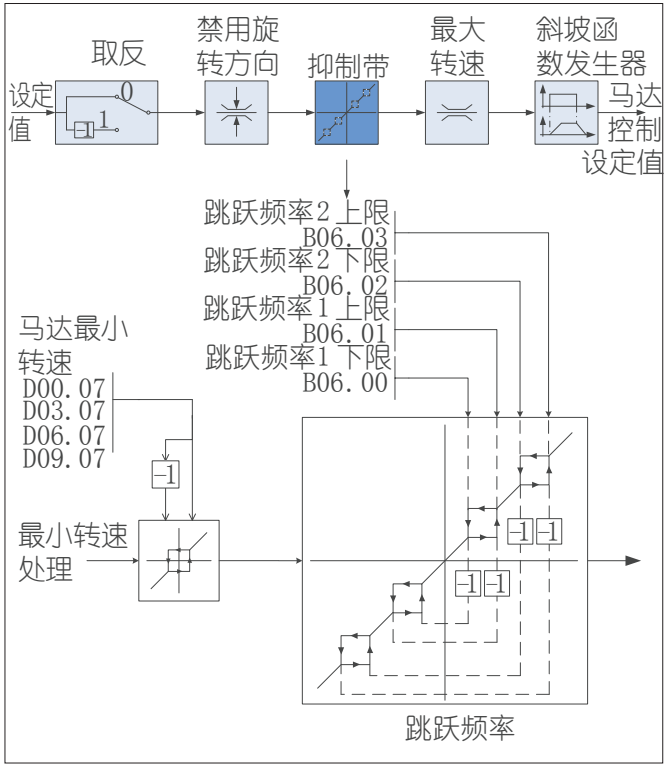
抑制带

驱动器有四个抑制带，防止马达长期在某个转速范围内运行。

最小转速

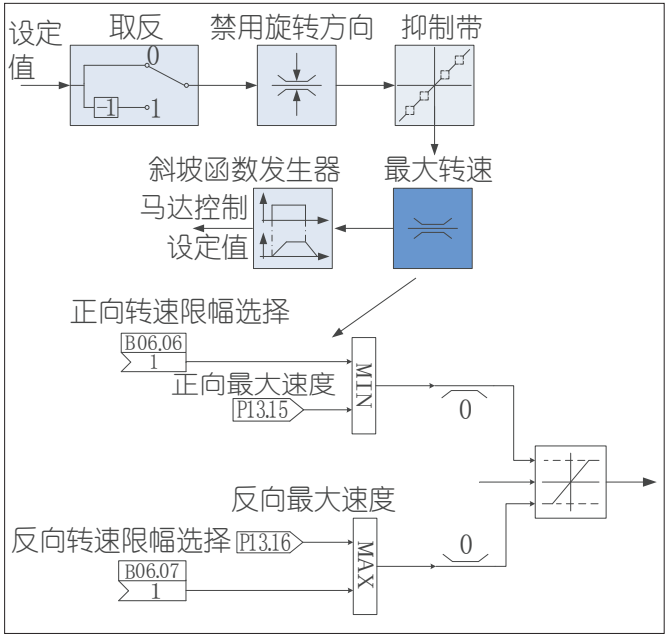
设置最小转速后，驱动器可防止马达长期以低于最小转速的转速运行。

只有在马达的加速或减速过程中，驱动器才允许马达转速（绝对值）短时间低于最小转速。



5.4.5 最大转速

最大转速可以限制两个旋转方向的转速设定值。



一旦超出该值，驱动器便输出报警或故障信息。

当需要依方向而定来限制转速时，可以确定每个方向的最大转速。

表5-15 用于限制转速的参数

参数	参数名称
B06.04	正向极限速度数字设定
B06.05	反向极限速度数字设定
B06.06	正向转速限幅选择
B06.07	反向转速限幅选择
D00.06	马达最大转速
D03.06	马达最大转速
D06.06	马达最大转速
D09.06	马达最大转速

注：D06.06与D09.06为扩展参数，需要在功能码“A04.02 参数访问级别”选择“1:扩展参数”才会

5.4.6 斜坡函数发生器

设定值通道中的斜坡函数发生器用于限制转速设定值的变化速率（加速）。减慢的加速会使得马达加速转矩降低。

这样马达就可以减负且生产设备也得到了保护。

◆ 简单斜坡函数发生器

简单斜坡函数发生器限制加速度，但不限制加速度的变化（急动度）。

◆ 扩展斜坡函数发生器

扩展斜坡函数发生器不仅限制加速度，而且还通过设定值圆整对加速度的变化（急动度）进行限制。如此一来便不会突然形成马达转矩。

简单斜坡函数发生器

简单斜坡函数发生器是指加减速过程中不采用S曲线（圆弧）时间。

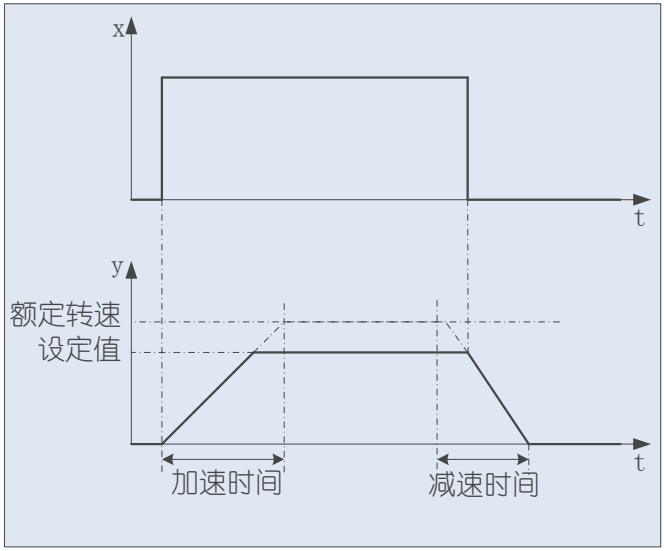
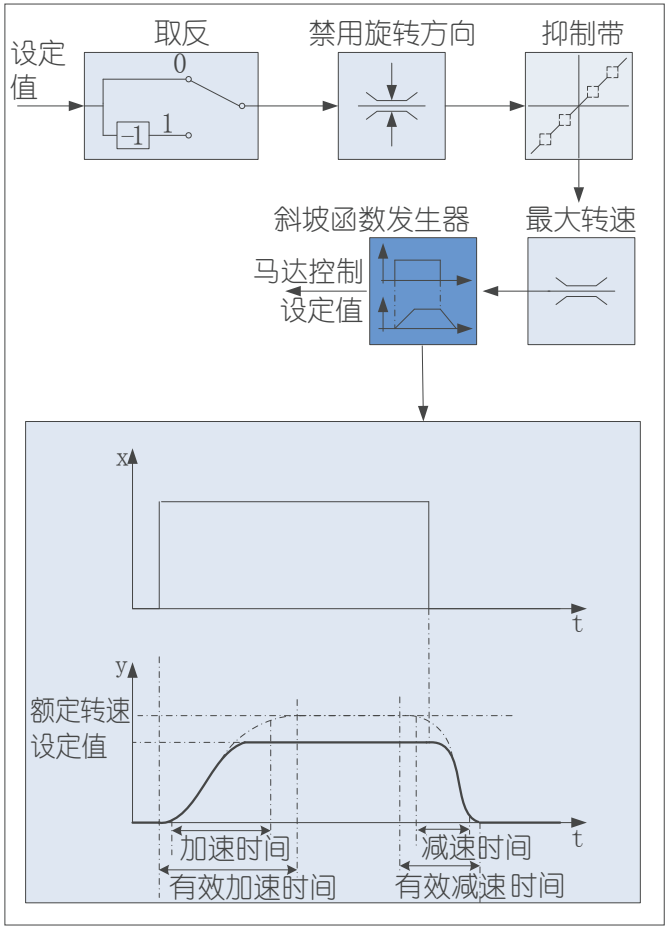


表5-16 简单斜坡函数发生器的参数设置

参数	参数说明	参数名称
B04.02	斜坡加速时间1	指马达从零加速到额定转速的时间，单位为s
B04.03	斜坡减速时间1	指马达从额定转速下降到零的时间，单位为s
B04.04	斜坡加速时间2	指马达从零加速到额定转速的时间，单位为s
B04.05	斜坡减速时间2	指马达从额定转速下降到零的时间，单位为s
B04.06	斜坡加速时间3	指马达从零加速到额定转速的时间，单位为s
B04.07	斜坡减速时间3	指马达从额定转速下降到零的时间，单位为s
B04.08	斜坡加速时间4	指马达从零加速到额定转速的时间，单位为s
B04.09	斜坡减速时间4	指马达从额定转速下降到零的时间，单位为s
B05.33	OFF3停机时间	急停功能（OFF3）具有一个单独的减速时间。

扩展斜坡函数发生器

扩展斜坡函数发生器的加速时间和减速时间是可以单独设置的。这两个时间只和实际应用紧密相关，可以是几百毫秒（如输送带传动），也可以是几分钟（如离心机）



起始段S曲线和结束段S曲线可以实现平滑加速和减速。

◆ 有效的加速时间=B04.02+0.5×(B04.10+B04.11)。

◆ 有效的减速时间=B04.03+0.5×(B04.10+B04.11)。

注：S曲线时间与设定频率无关

参数	参数说明	参数名称
B04.02	斜坡加速时间1	指马达从零加速到额定转速的时间，单位为s
B04.03	斜坡减速时间1	指马达从额定转速下降到零的时间，单位为s
B04.04	斜坡加速时间2	指马达从零加速到额定转速的时间，单位为s
B04.05	斜坡减速时间2	指马达从额定转速下降到零的时间，单位为s
B04.06	斜坡加速时间3	指马达从零加速到额定转速的时间，单位为s
B04.07	斜坡减速时间3	指马达从额定转速下降到零的时间，单位为s
B04.08	斜坡加速时间4	指马达从零加速到额定转速的时间，单位为s
B04.09	斜坡减速时间4	指马达从额定转速下降到零的时间，单位为s
B04.10	S曲线开始时间1	扩展斜坡函数发生器的起始段S曲线时间。 该值对加速和减速过程都有效。
B04.11	S曲线结束时间1	扩展斜坡函数发生器的结束段S曲线时间。 该值对加速和减速过程都有效。
B04.12	S曲线开始时间2	扩展斜坡函数发生器的起始段S曲线时间。 该值对加速和减速过程都有效。
B04.13	S曲线结束时间2	扩展斜坡函数发生器的结束段S曲线时间。 该值对加速和减速过程都有效。
B04.14	S曲线开始时间3	扩展斜坡函数发生器的起始段S曲线时间。 该值对加速和减速过程都有效。
B04.15	S曲线结束时间3	扩展斜坡函数发生器的结束段S曲线时间。 该值对加速和减速过程都有效。
B04.16	S曲线开始时间4	扩展斜坡函数发生器的起始段S曲线时间。 该值对加速和减速过程都有效。
B04.17	S曲线结束时间4	扩展斜坡函数发生器的结束段S曲线时间。 该值对加速和减速过程都有效。

设置扩展斜坡函数发生器

按如下步骤设置扩展斜坡函数发生器：

1. 给出一个尽可能大的转速设定值。
2. 接通马达。
3. 检查马达的运转情况。

-如果马达加速过慢，请缩短加速时间。

过短的加速时间会导致马达在加速时达到电流限值且暂时无法再跟踪转速设定值。此时，驱动器会超出所设时间。

-如果马达加速过快，延长加速时间。

-如果加速过急，延长起始段圆弧时间。

-我们建议将结束段圆弧时间设为和起始段圆弧时间相同的值。

4. 关闭马达。
5. 检查马达的运转情况。

-如果马达减速过慢，缩短减速时间。

最小的有效减速时间取决于具体应用。

当减速时间过短时，驱动器会超出马达的电流限值，驱动器内的直流母线电压会变得过高，幅度取决于所用的功率模块型号。

实际制动时间会超出所设的减速时间或驱动器在制动时发生故障，具体取决于驱动器的设置。

-马达制动过快或制动时驱动器发生故障，则需延长减速时间。

6. 重复第1到第5步，直到获得符合马达或设备要求的驱动特性。

5.5 马达控制

驱动器有以下三种转速控制方式，可根据不同应用场合的实际需求选择

功能码	参数名称	出厂值	设定范围	描述
B05.00	马达控制方式	0	0~2	0：VF 1：SVC（不带编码器的矢量控制） 2：FVC（带编码器的矢量控制）

VF:给定频率指令后，驱动器根据VF特性曲线控制输出电压，控制马达运行。由于没有速度反馈调节，转速控制精度不够高，VF控制适用于风机、水泵等通用性负载，或一台驱动器带多台马达，或驱动器功率与马达功率差异较大的应用场合。在对转速精度有较高要求的应用场合，可选择矢量控制方式。

SVC：即不带编码器的开环矢量控制，适用于通常的高性能控制场合，原则上一台驱动器只能驱动一台马达，如机床、离心机等负载；

FVC:即带编码器的闭环矢量控制，适用于有高精度速度或转矩控制需求的场合，原则上一台驱动器只能驱动一台马达，如电梯、起重机械等负载。

*注： SVC/FVC方式下，一台驱动器驱动多台马达的话，马达参数必须一致且刚性连接。

5.5.1 马达参数辨识

不论选择哪种马达控制方式，在运转马达前，都必须按马达铭牌准确设置马达基本参数。（以马达0为例，下同）

功能码	参数名称	出厂值	设定范围	描述
D00.00	马达类型选择	0	0~1	0：异步马达 1：永磁同步马达
D00.01	马达额定功率	3.7	0.00~655.35kW	马达铭牌参数
D00.02	马达额定电压	380	0~1500V	
D00.03	马达额定电流	9.00	0.00~655.35A	
D00.04	马达额定频率	50.0	0.0~600.00Hz	
D00.05	马达额定转速	1440	0~65535rpm	
D00.09	马达极对数	2	0~64	驱动器自动计算马达的极对数

选择马达控制方式为矢量控制时，需要准确的马达参数，为了获得更好的马达控制性能，需对被控马达进行参数辨识。

功能码	参数名称	出厂值	设定范围	描述
B00.21	辨别请求	0	0~12	0:无 1:异步机简易静态辨识 2:异步机静态完整辨识 3:异步机动态完整辨识 4:预留 5:预留 6:预留 7:预留 8:预留 9:预留 10:预留 11:同步机不带编码器辨识 12:同步机带编码器辨识

三种参数辨识模式的区别如下表所示，请根据实际应用场合选择：

模式	使用条件	辨识参数	描述
异步马达简易静态辨识	马达无法运转	定子电阻	
异步马达静态完整辨识	马达无法运转	定子电阻 转子电阻 漏感 互感 空载电流	
异步马达动态完整辨识	马达可以运行		辨识前请确保马达与负载机械分离，运行无危险；若马达连接负载，辨识结果可能会不够准确

马达参数辨识步骤如下：

1、根据当前马达选择，正确设置D组马达基本参数；

2、根据驱动器控制模式、系统机械状态等条件选择参数辨识模式；

3、按下RUN即开始参数辨识，如过程中想终止辨识请按STOP键，辨识结束后面板将显示STOP状态。

辨识结束后，以下参数辨识结果将自动保存。在知道马达准确参数的前提下可以不进行辨识，手动输入参数。

功能码	参数名称	出厂值	设定范围	描述
D01.00	异步马达定子电阻	1.667	0.000~65.535ohm	参数辨识或手动输入
D01.01	异步马达转子电阻	1.500	0.000~65.535ohm	
D01.02	异步马达漏感抗	6.540	0.00~655.35mH	
D01.03	异步马达互感抗	173.4	0.00~655.35mH	

5.5.2 V/F控制

5.5.2.1 V/F曲线

驱动器可根据不同的负载特性选择V/F特性曲线，以下参数仅在控制模式为VF时有效。

功能码	参数名称	出厂值	设定范围	描述
B07.01	VF曲线选择	0	0~3	0:直线VF 1:多点VF 2:平方VF 3:1.5次方VF

0：直线VF，适用于转矩不依赖于转速的场合，如普通恒转矩负载

1：多点VF，适用于脱水机、离心机等特殊负载

2：平方VF，适用于所需转矩随着转速升高而升高的场合，如风机、水泵等离心负载

3：1.5次VF，介于直线VF与平方VF曲线之间

VF曲线如图所示。

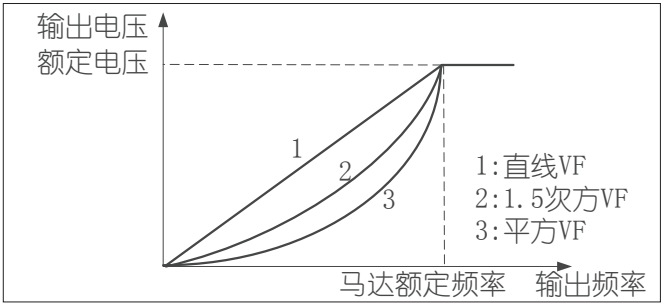


图5-21 VF曲线

多点VF曲线由参数B07.02~B07.07定义，设定曲线时必须满足：频率点设置B07.02<B07.04<B07.06，电压点设置B07.03<B07.05<B07.07。参数设定值应根据负载特性确定，否则可能无法正常运行。低频时电压设定过高可能会导致马达过热甚至烧毁，驱动器可能会报过流故障。

功能码	参数名称	出厂值	设定范围	描述
B07.02	多点VF曲线频率点1	2	0.0~B07.04	选择多点VF的频率点
B07.03	多点VF曲线电压点1	20	0.0~B07.05	选择多点VF的电压点

功能码	参数名称	出厂值	设定范围	描述
B07.04	多点VF曲线频率点2	20	0.0~B07.06	选择多点VF的频率点
B07.05	多点VF曲线电压点2	152	0.0~B07.07	选择多点VF的电压点
B07.06	多点VF曲线频率点3	40	0.0~D00.04	选择多点VF的频率点
B07.07	多点VF曲线电压点3	304	380	选择多点VF的电压点

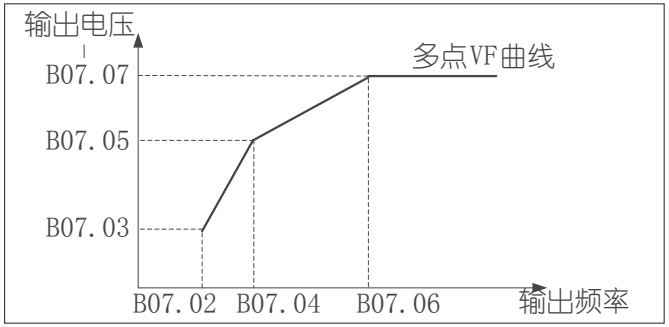


图5-22 多点VF曲线

VF电压分离：频率和输出电压之间的关系不是在驱动器内计算得出，输出电压由用户独立设定。适用于感应加热、逆变电源、力矩马达控制等应用场合。

功能码	参数名称	出厂值	设定范围	描述
B07.08	VF分离电压给定	0	0~12	0:0 1:100.0% 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:保留 9:预留 10:预留 其它:模拟量互联参数
B07.09	VF分离电压变化时间	10	0.0s~1000.0s	选择 VF分离电压的变化时间

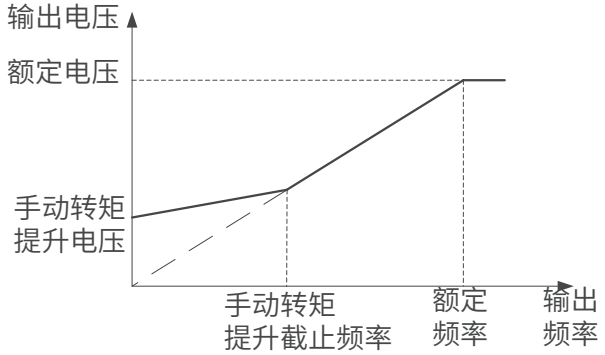
5.5.2.2 转矩提升

转矩提升：补偿VF控制低频转矩特性，通过增大驱动器输出电压提升输出转矩。

当负载较大起动力矩不够时，可适当增大转矩提升B07.15的值，负载较小时，可适当减小。该参数不宜设置过大，否则容易导致马达过热或驱动器过流故障，建议设置时以1%为步进值逐步增加，设置后运行马达查看参数A00.08（输出电流），该值不宜超过D00.03（马达额定电流）。

功能码	参数名称	出厂值	设定范围	描述
B07.15	VF手动转矩提升	1	0%~50%	提升电压为马达额定电压的百分比
B07.16	VF转矩提升截止频率	50	0.00~50.00	频率设定大于该值后，转矩提升无效

注：多点VF、VF分离、参数辨识、转速追踪状态下，转矩提升无效。



5.5.2.3 振荡抑制

VF振荡抑制功能默认关闭，只有马达VF运行存在明显振荡时，才需要开启。振荡抑制增益越大，抑制效果越明显，但该值过大可能会对正常运行造成不利影响，应在能有效抑制振荡的数值范围内，尽量选取较小的值。

功能码	参数名称	出厂值	描述
B07.20	VF振荡抑制模式	1	0:无效 1:有效
B07.21	VF振荡抑制增益	10	

5.5.3 矢量控制

矢量控制的性能易受马达参数的影响，获取准确的马达参数是实现高性能矢量控制的关键。为了获得良好的驱动性能和运行效率，必须先对被控马达进行参数辨识，在知道准确马达参数的前提下可以手动输入。不准确的马达参数可能导致马达无法正常运行。

选择控制方式为FVC（B05.00=2）时，必须正确设置编码器相关参数，否则马达无法正常运行。

功能码	参数名称	出厂值	设定范围	描述
D02.00	编码器类型	0	0~2	0:无效类型 1:普通ABZ编码器
D02.01	输入AB相序	0	0~1	0：正向 1：反向
D02.05	编码器分辨率(脉冲数/转速)	1024	0~65535	ABZ编码器脉冲数必须正确设置
D02.13	速度反馈PG断线检测时间	500	0~5000ms	驱动器检测到编码器断线且持续时间超过该值后，报编码器故障

连接好编码器后，先设置马达控制方式B05.00 = 1，以中速运行马达，检查参数A00.06(马达速度)与A00.05(给定转速)的绝对值和符号是否一致。如果绝对值不相等，请检查编码器连接与相关参数设置；如果符号不一致，请将D02.01（输入AB相序）取反。确保编码器反馈信号正确后，方可设置B05.00=2运行马达。

5.6 保护功能

5.6.1 过电流保护

在矢量控制中，马达电流始终保持在设置的转矩限值范围内。

如果使用V/F控制，则无法设置转矩限值。V/F控制通过限制输出频率和马达电压防止马达过载（Imax控制器）。

Imax控制器

矢量控制时，马达电流受转矩限幅的限制，VF控制时，驱动器通过调节输出频率来限制电流。若马达加速过程中，电流超过设定阈值，Imax控制器生效，自动降低输出频率，使电流维持在设定值左右，实际加速时间延长。若马达减速过程中生效，则提高输出频率，实际减速时间延长。过程如下图所示:

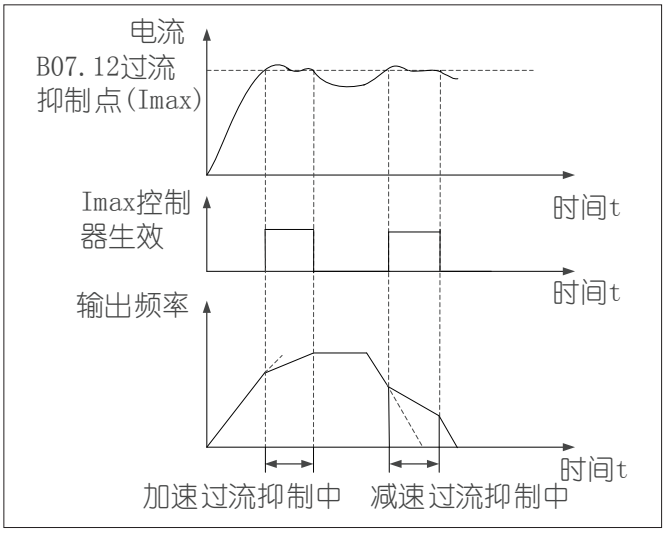


图5-23 过流抑制过程示意图

设置

如果马达在达到电流限值时容易振动，或会由于过电流而跳闸，必须修改Imax控制器的出厂设置。

表5-18　Imax 控制器的参数

功能码	参数名称	出厂值	描述
B07.10	过流抑制使能(Imax)	1	0：无效 1：有效
B07.11	过流抑制调频增益(Imax)	30%	调频增益越大，频率调节越快，实际加减速时间越短
B07.12	过流抑制点(Imax)	150%	Imax控制开始动作电流点，驱动器额定电流的百分比

注：如果打开该功能仍然容易触发过流故障，可适当减小\B07.12（过流抑制点(max)）或增大B07.11（过流抑制调频增益(Imax)）。

5.6.2　直流母线电压过压抑制

◆ 马达如何引起过电压？

当异步马达被相连的负载驱动时，马达作为发电马达工作，发电马达将机械能转换为电能。电能又返回到驱动器中。如果驱动器不能将电能传输至制动电阻，则驱动器中的直流母线电压Vdc会升高。

过高的直流母线电压不仅会损坏驱动器，还会损坏马达。在它达到危险水平前，驱动器会关闭相连马达，并发出故障信息“直流过压”。

◆ 马达和驱动器的过电压保护

只要应用允许，Vdc_max控制器就会避免直流母线电压过高。Vdc_max控制器会延长马达停车时间，使马达只向驱动器反馈少量电能，而这些电能又能以驱动器损耗的形式完全消耗掉。

马达运行在发电状态时，电能回馈至直流母线侧，母线电压上升，如果驱动器未接制动电阻，母线电压升高至过压点后，将触发过压故障。过压抑制功能则可以尽可能避免母线电压过高。

马达急减速时，母线电压迅速上升，超过设定阈值后，Vdc_max控制器生效。矢量控制时，通过限制输出转矩最大值，调节输出频率；VF控制时，直接调节输出频率，延长实际减速时间，减少回馈至母线的电能，使母线电压维持在设定值左右。过程如下图所示：

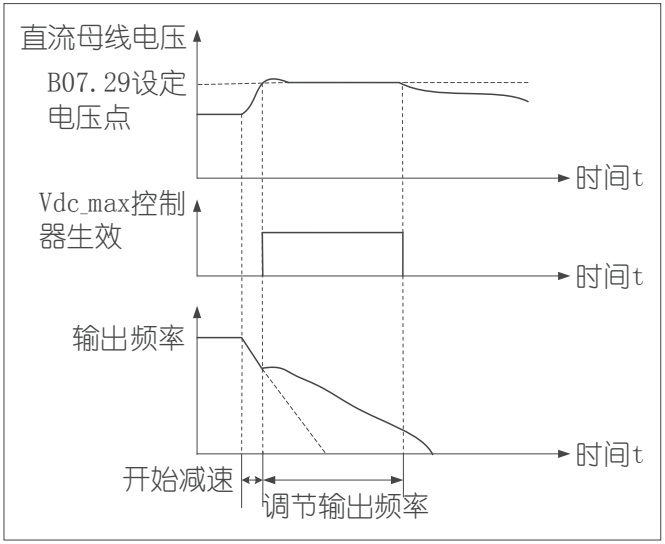


表5-19　Vdc_max控制器参数

功能码	参数名称	出厂值	描述
B07.28	过压抑制使能(Vdc_max)	1	0：禁止 1：使能
B07.29	过压抑制调压增益(Vdc_max)	125%	Vdc_max控制开始动作电压点，基准母线电压的百分比

注：

1）如果打开该功能仍然容易触发过压故障，可适当减小\B07.29（过压抑制调压增益(Vdc_max)）。

2）Vdc_max控制器不适合用于马达长时间输出再生电能的应用。例如：起重机应用或者大型摆动物体的制动。

5.6.3　直流母线电压欠压抑制

驱动器带大惯量负载运行时，如果出现母线电压骤降或电源掉电的情况，母线电压降低至欠压点后，将触发欠压故障导致马达自由停车。由于负载惯量较大，电压恢复正常后，马达可能仍在高速运行，立即启动容易造成过流故障。

欠压抑制功能能够利用负载动能尽可能使驱动器继续工作，控制马达有规律地降频运行。当母线电压降低到设定阈值后，Vdc_min控制器生效，驱动器自动降低输出频率，使马达处于发电状态，电能回馈至直流母线侧，使母线电压维持在设定值左右。电源正常后，驱动器恢复掉电之前的运行状态。过程如下图所示：

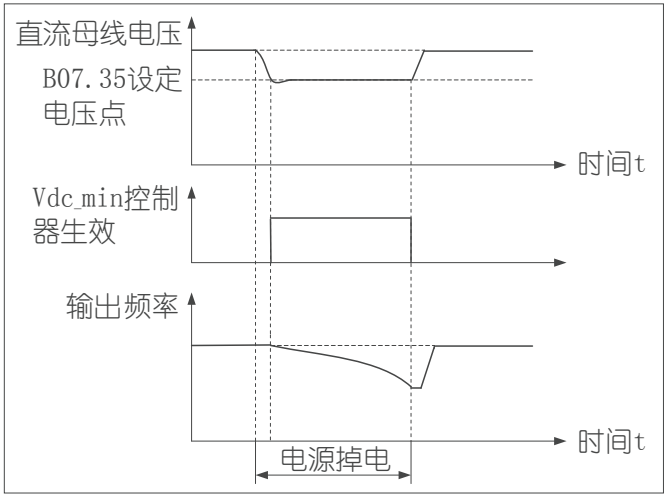


图5-24 欠压抑制过程示意图

表5-20　Vdc_min控制器参数

功能码	参数名称	出厂值	描述
B07.34	欠压抑制使能(Vdc_min)	0	0：禁止 1：使能
B07.35	欠压抑制调压增益(Vdc_min)	85%	Vdc_min控制开始动作电压点，基准母线电压的百分比

注：
如果打开该功能仍然容易触发欠压故障，可适当增大B07.35（欠压抑制调压增益(Vdc_min)）。

5.7 应用特色功能

5.7.1　直流制动

直流制动：驱动器输出直流电使马达制动停机，比正常减速停机时间短。直流制动将马达制动能量转化为热能，可避免马达将制动能量回馈至驱动器，驱动器不必处理再生功率，适用于不向电网回馈能量的应用场合，如离心机、锯床、磨床、输送带等。

直流制动分为以下两种情况：

1.　停机时直流制动

马达惯量较大时，减速停机过程中会因惯性而旋转。当停机时直流制动时间（B05.11）大于0时，停机直流制动功能开启，马达开始减速停机后，当马达转速低于停机直流制动起始速度（B05.12）时，驱动器将开始直流制动，按照B05.11设定的时间，输出设定的直流制动电流（B05.09），马达制动减速为0。停机直流制动过程如图5-25所示。

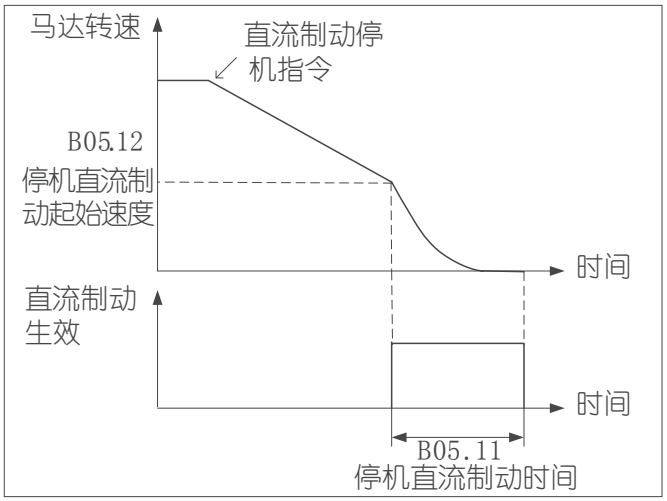


图5-25 停机时直流制动过程示意图

2. 启动时直流制动

如果想要启动马达时马达因受外力或惯性原因处于自由旋转状态，选择直接启动（B05.04=0）方式可能会导致驱动器过压或者过流故障，此时可以选择直流制动启动（B05.04=3）或者转速追踪启动（B05.04=2）。设置启动时直流制动时间（B05.10），马达将会先制动减速为0，再重新启动运行至指定频率。启动直流制动过程如图5-32所示。

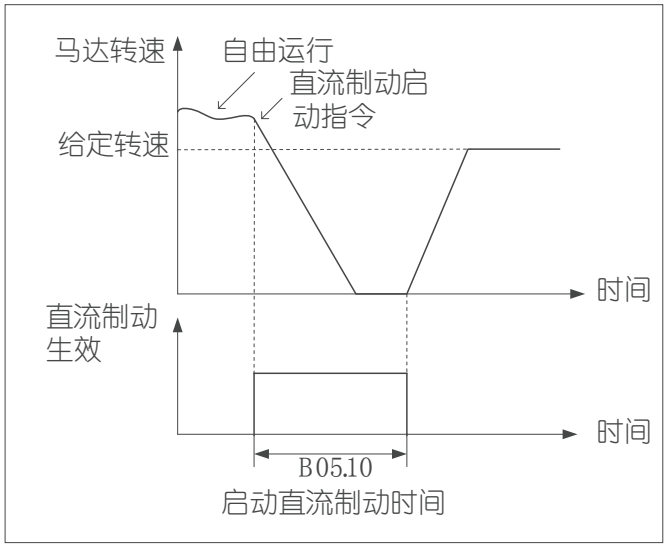


图5-26 启动时直流制动过程示意图

功能码	参数名称	出厂值	设定范围	描述
B05.04	马达启动方式	0	0~3	0：直接启动 1：预励磁启动 2：转速追踪启动 3：直流制动启动
B05.09	直流制动电流	50	0.0%~100.0%	直流制动时的制动电流设置 100.0%对应马达额定电流
B05.10	启动时直流制动时间	0	0.0s~100.0s	启动时直流制动时间设置 0为无直流制动启动
B05.11	停机时直流制动时间	0	0.0s~100.0s	停机时直流制动时间设置 0为停机时无直流制动过程
B05.12	停机直流制动起始速度	0	0~3000rpm	停机直流制动的起始速度

注：

◆ 直流制动功能仅在异步马达上可用。

◆ 直流制动可以在运行过程中切换。

◆ 直流制动会使马达剧烈受热，制动特性不明确，没有恒定的制动力矩，在静止状态下没有制动力矩，制动能量转化为热量消耗，电网掉电时不能使用。

◆ 马达若长时间或经常以直流制动方式制动，会造成马达过热，可能会导致马达损坏。请在使用时检查马达温度，如果马达温度过高，应给马达更长的冷却时间或者选用其他制动方式。

5.7.2 转速追踪

驱动器驱动马达起动时，马达可能由于某些原因处于旋转状态，比如风力作用下风机自转、停机后大惯量负载带动马达旋转。如果驱动器直接从0Hz开始启动，由于输出频率和马达实际频率相差过大，极容易导致过流故障。转速追踪功能可检测出马达实际转速，从当前转速开始运行，避免起动时过流。

驱动器接收到运行命令后，判断马达旋转方向，向马达注入电流(转速追踪电流设定值)，从设置的起始频率开始向下搜索，起始频率为停机频率时，搜索速度最快。搜索到当前马达转速后，经过切换等待时间，马达将平滑地过渡到正常运行模式，到达设定频率。

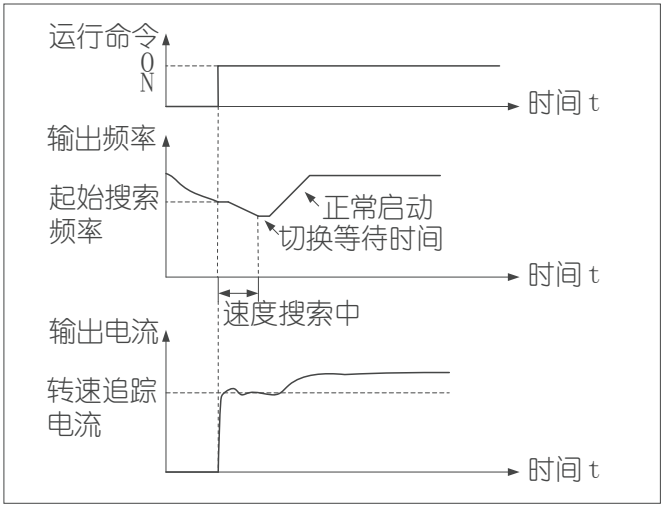


图5-27 转速追踪过程示意图

表5-21 转速追踪相关参数设置

功能码	参数名称	出厂值	描述
B05.13	转速追踪模式	0	0:从停机频率开始搜索 1:从额定频率开始搜索 2:从最大频率开始搜索
B05.14	转速追踪速度搜索时间	25.0s	频率从50Hz减至0Hz的时间
B05.15	转速追踪电流百分比	50%	速度搜索电流， 马达额定电流的百分比
B05.16	转速追踪最小频率限制	2Hz	低于该频率直接启动， 转速追踪不动作
B05.17	转速追踪切换等待时间	250ms	转速追踪模式切换为正常运行模式的等待时间

注:
若搜索时间过长，请适当减小搜索时间。
若搜索过程中出现过流或过压故障，请适当增大搜索时间。

5.7.3 马达抱闸

马达抱闸将关闭的马达保持该位置。设置正确时，在驱动器打开抱闸前，马达会产生电气抱闸转矩。驱动器在马达静止时才会闭合抱闸。

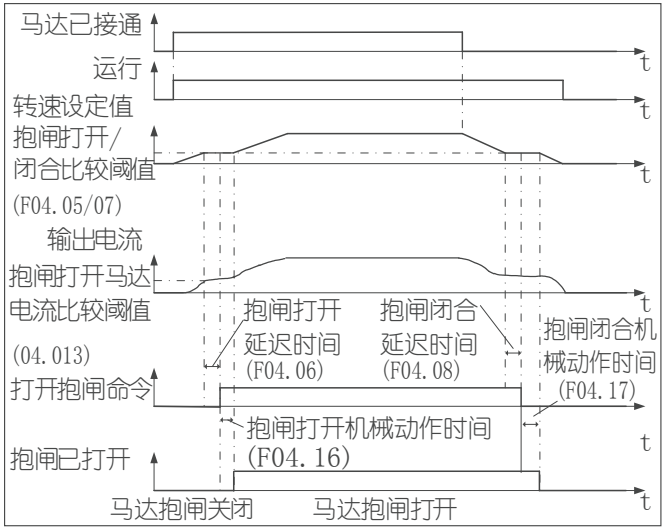


图5-28 马达抱闸打开时序图

ON 指令之后的功能：

1. 收到 ON 指令，驱动器发出OFF1-ON的运行命令。
2. 驱动器转速设定值大于抱闸打开比较阈值（F04.05）并且当前输出电流大于抱闸打开马达电流比较阈值（F04.13），驱动器发出打开抱闸的指令。
3. 马达一直保持抱闸打开时的转速，直到抱闸打开机械动作时间（F04.16）结束。
4. 驱动器使马达加速至转速设定值。

OFF1 或 OFF3 指令后的功能：

1. 收到 OFF1 或 OFF3 指令，驱动器会使马达制动直至静止。
2. 制动时，驱动器转速设定值小于抱闸闭合转速阈值（F04.07）时，驱动器发出关闭抱闸的指令。
3. 马达一直保持抱闸关闭时的转速，直到抱闸闭合机械动作时间（F04.17）结束。
4. 驱动器会关闭马达。

OFF2 指令后的功能

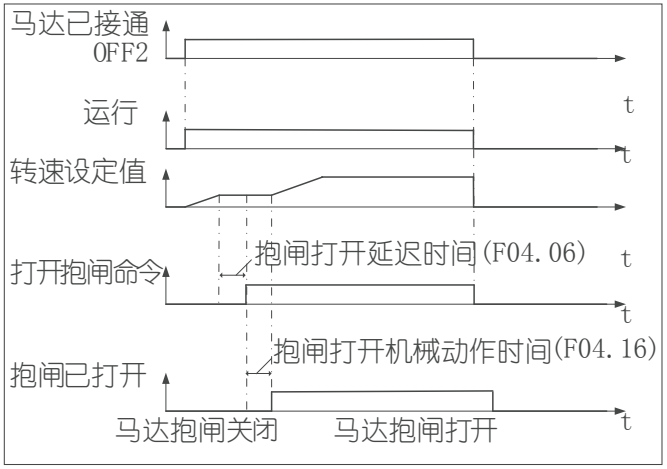


图5-29 发出OFF2指令后马达抱闸的控制方式

发出 OFF2 指令后，不管马达转速如何，会直接给出闭合抱闸指令。

再启动抱闸控制功能：

当打开再启动抱闸控制功能时，当启动马达在抱闸打开后给定反向运行命令，那么马达将会在抱闸关闭后再等待一段时间再启动马达，等待时间由再启动等待时间（F04.19）决定。这样可以防止正反转切换时会报矢量失速问题。

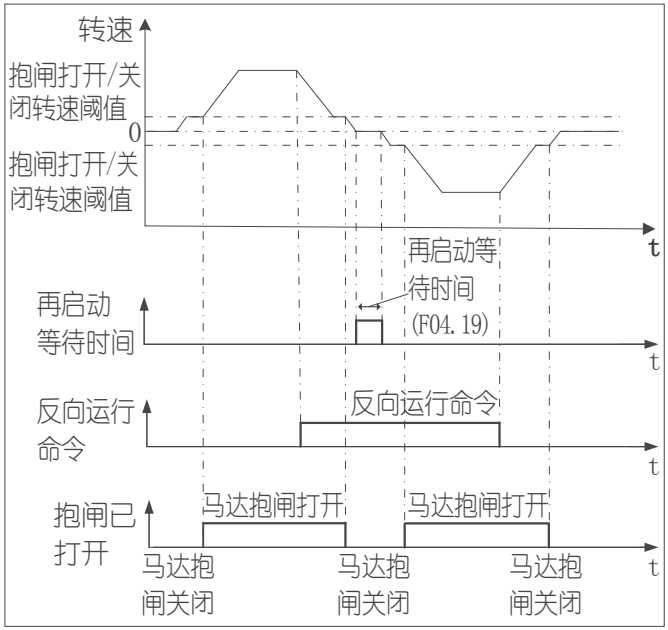


图5-30 抱闸打开判断功能图

调试马达抱闸

注意：

负载掉落可引发生命危险

“马达抱闸”功能设置错误时，在诸如起重机、吊车或升降机的应用中可能会因负载掉落而引发生命危险。

- 通过以下措施，在调试“马达抱闸”前确保负载安全：
  - 将负载降至地面
  - 封锁危险区域

步骤

按如下步骤调试“抱闸控制”功能：

1.设置F04.00=1或2（抱闸功能选择）

“抱闸控制”使能。

F04.00=1抱闸控制有效，不检测抱闸继电器是否吸合。

F04.00=2抱闸控制有效，并且系统同时检测抱闸继电器是否吸合

2.设置F04.03（抱闸打开命令来源）

选择抱闸打开的命令，通常设置F04.03=1102（P01.02运行标志）。

3.设置F04.04（抱闸打开比较值来源）

选择抱闸打开的判断参数，通常设置F04.04=2311（P13.11 CM给定速度）。

4.设置F04.05（抱闸打开比较阈值）

选择抱闸打开的比较阈值，需要根据实际现场的应用需求设置。

5.设置F04.13（抱闸打开马达电流比较阈值）

选择抱闸打开时输出电流的判断阈值，该参数用于保证抱闸打开时马达保证一定的输出转矩；出厂设置F04.13 =50%，基本可以满足大部分现场应用。

6.设置F04.07（抱闸闭合转速阈值）

用于设置抱闸闭合时的转速判断阈值，需要根据实际现场的应用需求设置。

7.设置F04.12（抱闸闭合比较值来源）

选择抱闸闭合的判断参数，通常设置F04.12=2311（P13.11 CM给定速度）。

以上步骤1~5是抱闸打开的设置过程，步骤6~7是抱闸闭合的设置过程。

8.设置F04.18（再启动抱闸控制）

F04.18=0再启动抱闸控制功能关闭。

F04.18=1再启动控制抱闸功能打开，可根据实际应用选择，默认为打开。再启动控制抱闸的作用是当速度反向或者停机再启动时防止产生矢量失速故障。

9.设置F04.19（再启动等待时间）

设置F4.19可以调节当F04.18=1时（再启动控制抱闸动作）抱闸启动等待时间。

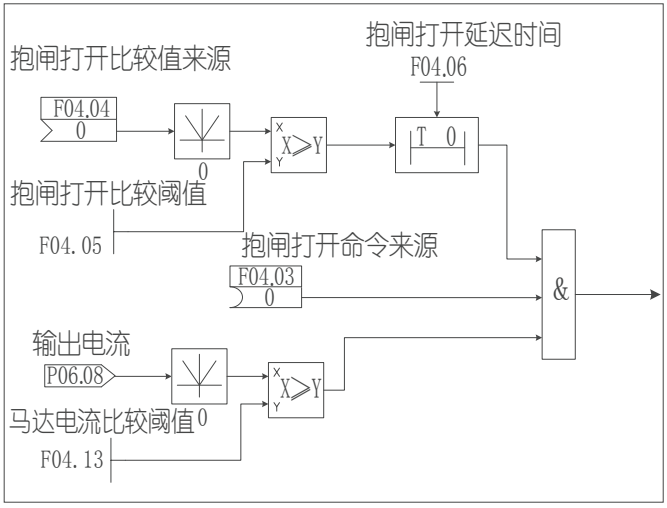


图5-31 抱闸打开判断功能图

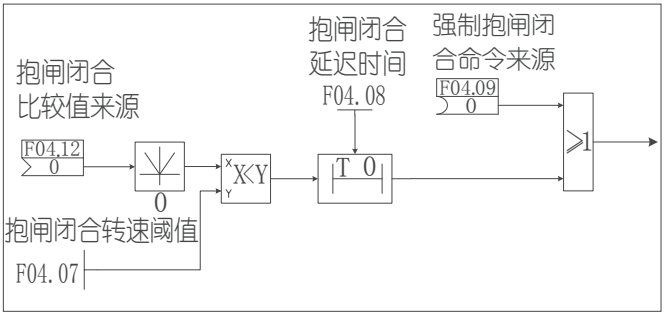


图5-32 抱闸闭合判断功能图

抱闸参数表： 表5-22 抱闸控制设置参数

参数	参数名称	描述
F04.00	抱闸功能选择	抱闸使能设置
F04.03	抱闸打开命令来源	抱闸打开命令选择
F04.04	抱闸打开比较值来源	抱闸打开判断值的选择
F04.05	抱闸打开比较阈值	抱闸打开的比较阈值
F04.06	抱闸打开延迟时间	抱闸打开命令的延迟时间
F04.07	抱闸闭合转速阈值	抱闸闭合的比较阈值
F04.08	抱闸闭合延迟时间	抱闸闭合命令的延迟时间
F04.10	抱闸打开反馈点来源	抱闸打开的反馈值来源
F04.12	抱闸闭合比较值来源	抱闸闭合判断值的选择
F04.13	抱闸打开马达电流比较阈值	抱闸打开的输出电流判断阈值
F04.16	抱闸打开机械动作时间	设置抱闸打开的RFG暂停时间
F04.17	抱闸闭合机械动作时间	设置抱闸闭合的RFG暂停时间
F04.18	再启动抱闸控制	设置是否打开再启动功能
F04.19	再启动等待时间	设置再启动功能等到时间

注：
“F04.03/F04.04/F04.09/F04.12”为扩展参数，需要在功能码“A04.02 参数访问级别”选择“1:扩展参数”才会显示。

5.7.4 自动重启

自动重启包含了两种功能：
◆ 驱动器自动复位故障信息
◆ 故障复位后，驱动器自动重启马达

设置故障自动复位
故障自动复位功能的实现由以下方面决定：
故障自复位次数重置时间：一定时间内的故障自动复位处理，开始计时取决于自动复位故障使能后的第一次发生故障的时间。
故障自复位间隔时间：两次故障复位命令之间的最小间隔时间。

故障自复位最大允许次数：在故障自复位次数重置时间，最多产生故障复位命令的次数，超过这个次数后，将不再产生故障复位命令，除非故障复位重置时间结束。

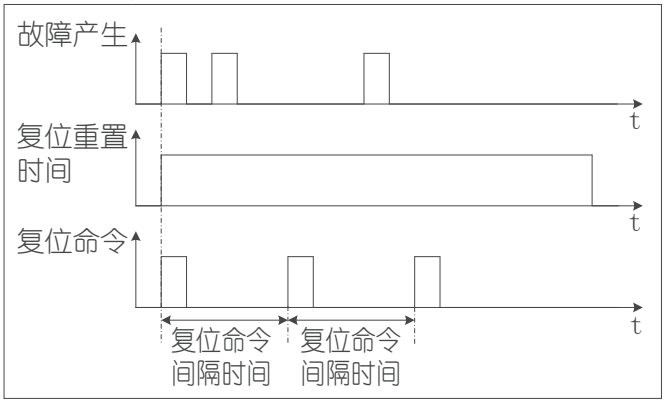


图5-32 故障自动复位命令时序图

注：参数E00.14、E00.15可以设定故障自动复位功能使能后的不可复位的故障。

表5-23 故障自动复位相关参数

参数	参数名称
E00.10	故障自动复位功能
E00.11	故障自复位次数重置时间
E00.12	故障自复位间隔时间
E00.13	故障自复位最大允许次数
E00.14	不自可复位异常码1
E00.15	不自可复位异常码2

设定自动重启
自动重启是在故障自动复位后生效的，如果在出现故障后马达可能会长时间旋转，您还必须另外启用“转速追踪”功能，参见5.7.2。

表5-24 自动重启设置参数

参数	参数名称	描述
E00.23	自动复位后重启功能	使能自动重启功能
E00.25	允许重启的异常码1	设置特殊处理的故障
E00.26	允许重启的异常码2	设置特殊处理的故障

5.7.5 自由功能块

5.7.5.1 概述

使用自由功能块可以在驱动器内建立可配置的信号互联。

驱动器主要提供以下自由功能块：

◆ 逻辑运算模块：AND（与）、OR（或）、XOR（异或）、NOT（非）

◆ 算数运算模块：ADD（加法器）、SUB（减法器）、MUL（乘法器）、DIV（除法器）、AVA（绝对值）、NCM（比较器）

◆ 时间继电器RLY

◆ 限制器LVM

◆ 低通滤波器LPF

◆ 位转字模块

◆ 字转位模块

驱动器中自由功能块的数量有一定限制。 每个功能块只能用一次。

驱动器有 3个加法器。

示例：如果已经配置了三个加法器，则无法再添加更多的加法器。

注：

与模块和或模块ABCD的输入3/4、非模块的EFGH输入、异或模块的BCD、加法模块ABCD的输入3/4、乘法模块AB的输入3/4、限制模块AB为扩展参数，需要在功能码“A04.02 参数访问级别”选择“1:扩展参数”才会显示。

5.7.5.2 自由功能块列表

与模块

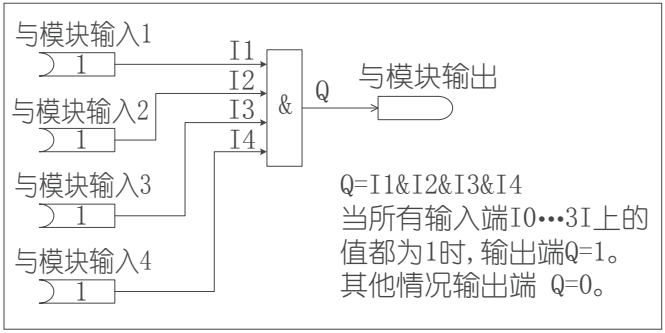


表5-25 与模块设置参数

	AND A	AND B	AND C	AND D
I1	F00.00	F00.05	F00.10	F00.15
I2	F00.01	F00.06	F00.11	F00.16
I3	F00.02	F00.07	F00.12	F00.17
I4	F00.03	F00.08	F00.13	F00.18
Q	P03.00	P03.01	P03.02	P03.03

或模块

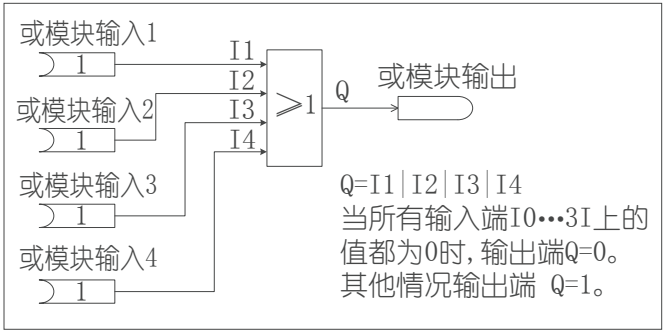


表5-26 或模块设置参数

	OR A	OR B	OR C	OR D
I1	F00.36	F00.41	F00.46	F00.51
I2	F00.37	F00.42	F00.47	F00.52
I3	F00.38	F00.43	F00.48	F00.53
I4	F00.39	F00.44	F00.49	F00.54
Q	P03.12	P03.13	P03.14	P03.15

非模块

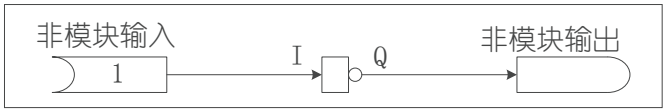


表5-27 非模块设置参数

	NOT A	NOT B	NOT C	NOT D	NOT E	NOT F	NOT G	NOT H
I	F00.20	F00.22	F00.24	F00.26	F00.28	F00.30	F00.32	F00.34
Q	P03.04	P03.05	P03.06	P03.07	P03.08	P03.09	P03.10	P03.11

异或模块

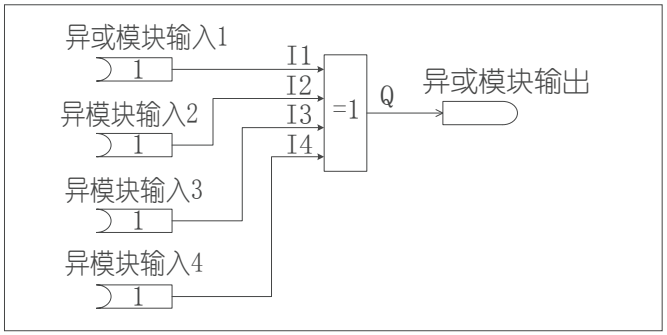


表5-28 真值表

I0	I1	I2	I3	Q
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

表5-29 异或模块设置参数

	XOR A	XOR B	XOR C	XOR D
I1	F00.56	F00.61	F00.66	F00.71
I2	F00.57	F00.62	F00.67	F00.72
I3	F00.58	F00.63	F00.68	F00.73
I4	F00.59	F00.64	F00.69	F00.74
Q	P03.16	P03.17	P03.18	P03.19

算术运算模块-加法器

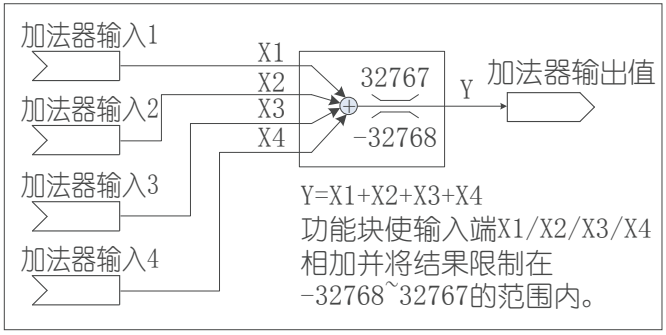


表5-30 加法器设置参数

	ADD A	ADD B	ADD C
X1	F01.00	F01.05	F01.10
X2	F01.01	F01.06	F01.11
X3	F01.02	F00.07	F01.12
X4	F01.03	F01.08	F01.13
Y	P08.00	P08.01	P08.02

算术运算模块-减法器

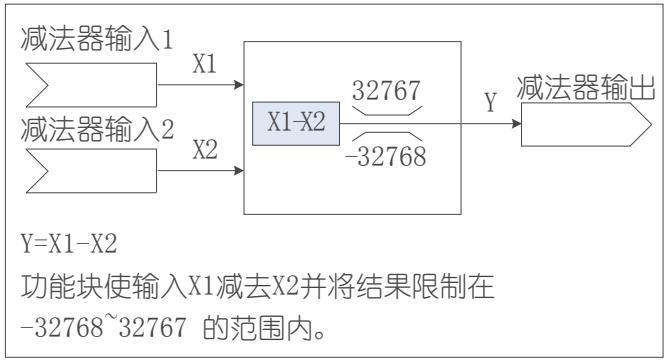


表5-31 减法器设置参数

	SUB A	SUB B
X1	F01.15	F01.18
X2	F01.16	F01.19
Y	P08.04	P08.05

算术运算模块-乘法器

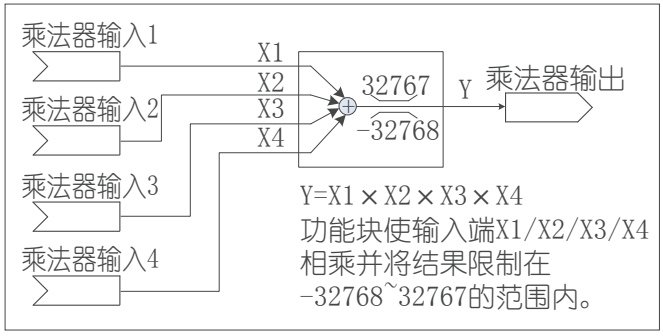


表5-32 乘法器设置参数

	MUL A	MUL B
X1	F01.21	F01.26
X2	F01.22	F01.27
X3	F01.23	F01.28
X4	F01.24	F01.29
Y	P08.08	P08.09

算术运算模块-除法器

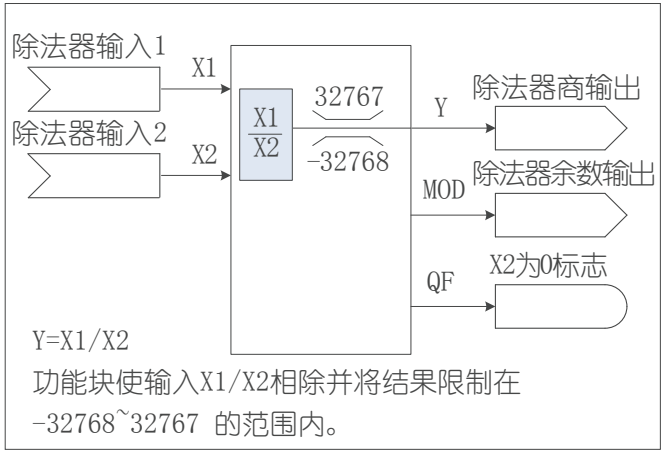


表5-33 除法器设置参数

	MUL A	MUL B
X1	F01.31	F01.34
X2	F01.32	F01.35
Y	P08.13	P08.16
MOD	P08.14	P08.17
QF	P03.30	P03.31

算术运算模块-比较器

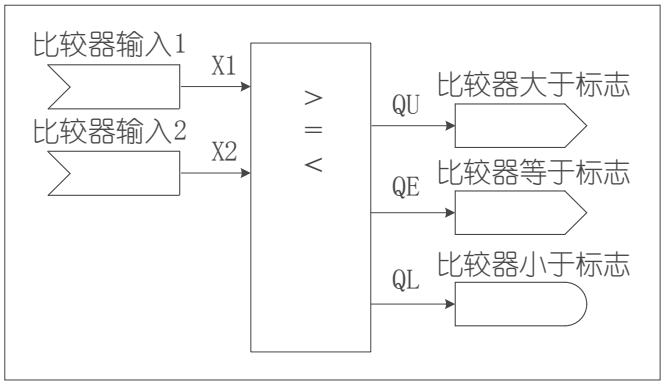


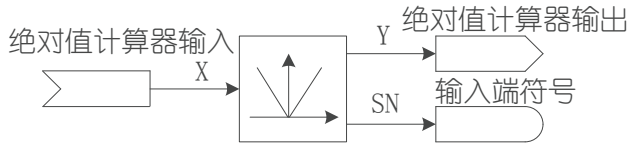
表5-34 功能表

输入端比较	QU	QE	QL
X1＞X2	1	0	0
X1＝X2	0	1	0
X1＜X2	0	0	1

表5-35 比较器设置参数

	NCM A	NCM B
X1	F01.41	F01.44
X2	F01.42	F01.45
QU	P03.24	P03.27
QE	P03.25	P03.28
QL	P03.26	P03.29

算术运算模块-绝对值计算器



Y=abs(X)
该功能块用于计算输入端X上的值的绝对值。
当X<0时，变频器会设置SN=1。

表5-36 绝对值计算器设置参数

	AVA A	AVA B
X	F01.37	F01.39
Y	P08.24	P08.25
SN	P03.32	P03.33

时间继电器

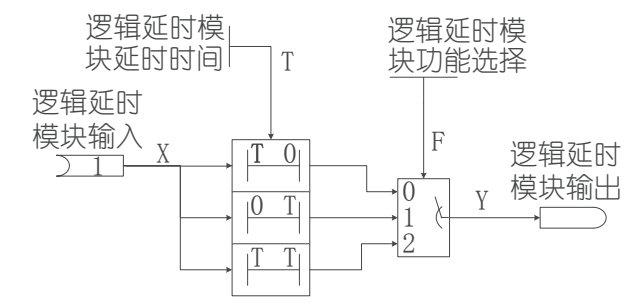
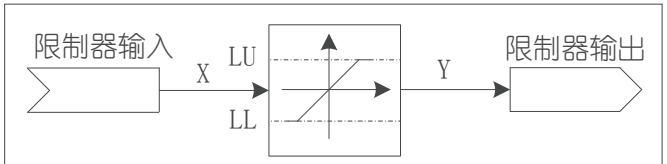


表5-37 时间继电器设置参数

	RLY A	RLY B	RLY C	RLY D
I1	F00.76	F00.79	F00.82	F00.85
I2	F00.77	F00.80	F00.83	F00.86
I3	F00.78	F00.81	F00.84	F00.87
Q	P03.20	P03.21	P03.22	P03.23

限制器模块



Y=LU，当X≥LU时
Y=X，当LL＜X＜LU时
Y=LL，当X≤LL时
功能块将输出Y限制在LU~LL的范围内。

表5-38 限制器模块设置参数

	LIM A	LIM B
X	F01.47	F01.51
LU	F01.48	F01.52
LL	F01.49	F01.53
Y	P08.28	P08.29

低通滤波器

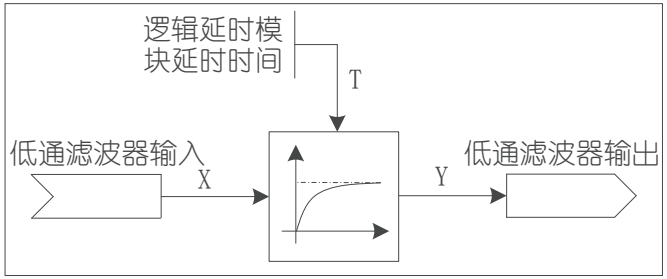


表5-39 低通滤波器模块设置参数

	LPF A	LPF B
X	F01.55	F01.58
T	F01.56	F01.59
Y	P08.32	P08.33

自定义数据

当需要自定义数据时，在F01.81~84输入数值，将会在P11.03/04/07/08显示。

表5-40 功能表

输入	输出
F01.81	P11.03
F01.82	P11.04
F01.83	P11.07
F01.84	P11.08

5.7.6 平稳起升功能

在起吊重物的时候如果重物在离地的瞬间速度过快会使塔臂上下抖动，影响塔机的安全稳定性。使用平稳起升功能可以改善这种情况。开启平稳起升功能之后，当负载增加之后（即重物离地的瞬间）快速降低转速，使提升重物的绳索张紧，并以一个低速提升重物，当重物离开地面稳定之后再自动加速上升。

此功能只适用于闭环矢量控制和开环矢量控制模式。

需要设置的参数如下：

功能码	参数名称	出厂值	描述
F08.50	平稳起升功能使能	0	0:无效 1:有效
F08.51	松绳转矩	25.0%	松绳状态的负载转矩占额定转矩的百分比
F08.52	松绳检测时间	0.80	检测判断为松绳的时间
F08.53	加载转矩增加值	10.0	加载状态下的负载转矩相比松绳转矩增加的值
F08.54	加载检测时间	0.10	检测判断加载状态的时间
F08.55	加载转矩波动阈值	10.0%	完全加载时输出转矩的波动范围占额定转矩的百分比
F08.56	加载稳定时间	1.00	完全加载之后输出转矩在F08.55波动范围内的持续时间
F08.57	快速减速时间	0.50	加载状态下的快速减速时间
F08.58	紧绳维持速度	10.0%	加载状态下的低速值占额定频率的百分比

注意：

起升方向要与速度给定正转方向一致。

5.7.7 平稳回转功能

当塔机进行回转操作的时候为了能够让回转平稳减少摇晃，可以开启平稳回转功能。

需要设置的参数如下：

功能码	参数名称	出厂值	描述
F08.61	平稳回转功能使能	0	0:无效 1:有效
F08.62	回转臂长	32~100m	
F08.63	加速增益	0~100	
F08.64	减速增益	0~100	

5.7.8防摇摆功能

一.功能描述

A1-CM23防摇摆功能可减少负载发生不必要的摆动。该功能通过调整提供的速度给定值来降低负载摆动。它使起重机操作员更好地控制起重机，通过更高速度和更短加速和减速时间来减少工作时间，提高生产效率。

此功能无需任何额外防摇摆传感器（开环）即可工作。

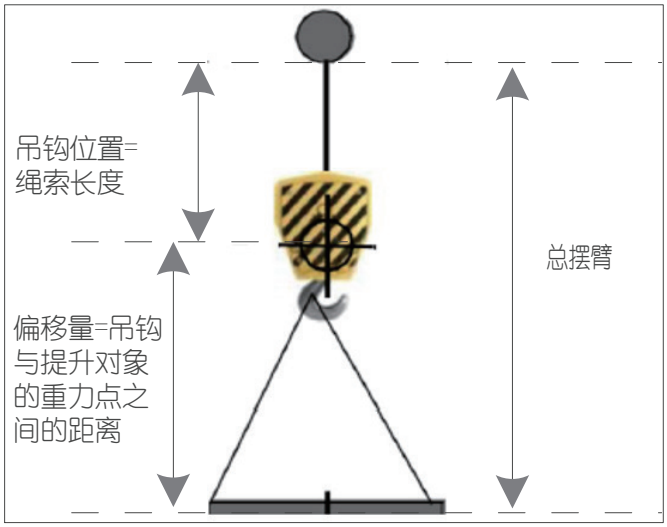
此功能需要知道总摆臂长度才能定义摆动的时间常数（τ），此时间常数可控制小车及大车加速和减速，抑制负载的摇摆振动。由于没有针对实际负载摆动的反馈信号，无法做到闭环控制，所以防摇摆功能无法补偿外部干扰对负载所造成的影响，例如风或非直接提升，或实际摆动行为与变频器摆动模型行为之间的区别（在启动期间设置错误或者启动前负载已经发生摆动）。

总摆臂长度是绳索长度和偏移量的总和。如下图所示。

• 绳索长度基于起重机位置。此值从起重机变频器（带编码器）给出。

• 摆臂偏移量是吊钩与提升对象的重心点之间的距离。它可随负载类型不同而有所不同。

注意：防摇控制的精度与已知真实摆臂长度的精度一样高。



二.相关参数设置

1.提升机构驱动器配置

提升机构驱动器主要用于计算摆长，通过编码器实时计算当前摆长。提升机构驱动器的防摇摆需要更改的参数如下：

功能码	功能码名称
F08.00	自动防摇摆功能使能
F08.01	自动防摇摆功能使能
F08.03	自动防摇摆最小摆长
F08.04	允许防摇摆最小转速
F08.17	提升摆长来源选择
F08.19	摆长偏移值
F08.25	摆长计数复位使能
F08.26	摆长比例系数
F08.29	提升反馈脉冲反向

对于提升机构驱动器，需将F08.00和F08.01均置为1且F08.03设置为100.00m和F08.04设置为100%，提升机构才仅用于计算摆长，对摆长的设置、复位等操作也会有效。

（1）摆长为设置值

F08.21实际摆长=F08.18摆长设定值+F08.19摆长偏移

（2）摆长为互联参数

将F08.17与P09.25功能码互联，可以根据提升机构旋转圈数，获取当前摆长值。

（3）F08.25摆长计数复位使能和F08.29提升反馈脉冲反向

计算摆长首先需要将吊钩升至最高处，此时将F08.25摆长计数复位使能设置为允许，F08.27/28提升编码器计数值将会清零，此时认为是摆长为0，此时向下运行，观察F08.27、F08.28提升编码器计数值变化，若计数值减少，则将F08.29 提升反馈脉冲反向设置为允许。

摆长值计算过程为：

提升机构旋转圈数=(F08.27*65535+F08.28)*/编码器分辨率

F08.21实际摆长=（提升机构旋转圈数 *F08.26 摆长比例系数）/1000+F08.19摆长偏移量。

由于CM23没有模拟量输入输出功能，所以可以采用定摆长，即将F08.21实际摆长输入到大小车驱动器的F08.18摆长设定值中，或者采用PLC等方式将进行实时修改。

2.大车和小车变频器的相关参数设置

防摇摆功能中防摇摆动作主要是由大车变频器和小车变频器来实现，由于大车变频器和小车变频器的处理方式和防摇摆相关的参数设置相同，因此在此只描述其中一台变频器的防摇摆参数设置。

功能码	参数名称
F08.00	防摇摆功能使能
F08.06	防摇摆斜坡时间
F08.17	提升摆长来源选择
F08.19	摆长偏移值
F08.20	提升最大摆长
F08.21	实际摆长
F08.22	摇摆周期

其中：

F08.00（防摇摆功能使能）：行走变频器中需要设置F08.00=1；该参数用来选择防摇摆功能是否使能，要想使用防摇摆功能，两台行走变频器中F08.00 必须设置为1。

F08.06（防摇摆斜坡时间）：该参数用来在F08.00=1（允许防摇摆功能）情况下的斜坡时间，该参数需要在实际使用过程中调试，通常在最大摆长不超过10m的情况下，采用默认值即可。

F08.17（提升摆长来源选择）：参数用来选择当前摆长值的来源，如果F08.17选择0：设定值有效(F08.18)那么就可以通过设置F08.18摆长设定值更改摆长；摆长也可以通过模拟量进行传递，因此可以关联模拟量互联参数，可以通过PLC等方式进行实时计算摆长。

F08.19（摆长偏移值）：由于实际应用过程中，提升物体的体积和大小不同，无法每次准确设定该参数值，因此该参数的设定请参考现场常用的提升物体；该参数的误差（1m 内）在实际摇摆周期影响不太大。当然参数越准确，防摇摆的实际效果越好。

F08.20（提升最大摆长）：该参数用来设置当前起重机系统中的提升最大摆长，该参数行走变频器中的设置值必须与提升变频器的设置值相同。

匀速段运行时间为F08.22摇摆周期的一半。

3.防摇摆功能的相关参数

功能码	功能码名称	参数说明
P01.86	防摇摆使能标志	显示是否使能防摇摆功能
P01.87	防摇摆速度锁存标志	显示防摇摆功能的锁存标志位
P09.25	摆长长度	通过提升编码器计算的摆长

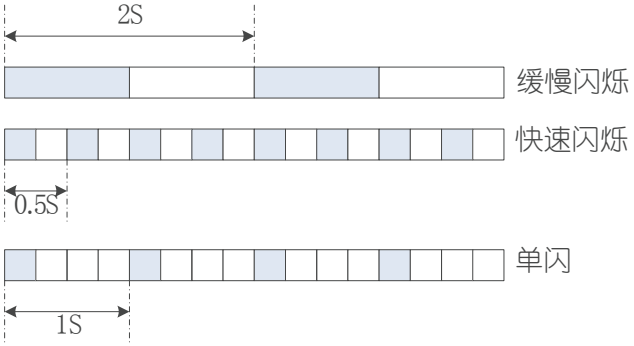
6 异常与系统信息

6.1 LED显示的运行状态

在接通电源后，LED RDY (Ready)会常亮。 一旦 LED RDY变为红色或绿色，它显示的便是驱动器的状态。LED灯分为RDY(Ready)灯和COM(Communication)灯，RDY灯用于显示驱动器的状态和升级状态，COM灯用于显示是否在存在通信。

LED的信号状态

状态除了“亮起”和“熄灭”外，LED还有三种不同的闪烁频率：



LED点亮状态说明	
1	亮
2	灭
3	缓慢闪烁（2S周期）
4	快速闪烁（0.5S周期）
5	单闪（1S周期）

表6-1 驱动器的LED信号状态

LED				说明
RDY(绿)	RDY(红)	COM(绿)	COM(红)	
亮	灭			驱动器运行
缓慢闪烁	灭			开机准备
快速闪烁	灭			开机封锁状态
灭	亮			故障
亮	亮			故障停机
亮	缓慢闪烁			CM/PM升级
快速闪烁	快速闪烁			升级成功
灭	缓慢闪烁			升级失败
		缓慢闪烁	灭	Modbus通信连接
		灭	灭	Modbus通信断线
		亮	灭	PROFINET 过程数据通信
		灭	快速闪烁	PROFINET 烧录模式
		红绿交替快速闪烁		PROFINET DCP请求
		单闪	灭	PROFINET AR 建立
		灭	单闪	PROFINET通信错误

中文

6.2 故障报警及对策

1. 过流

故障子码	子码含义
1	U相过流
2	V相过流
3	UV两相过流
4	W相硬件过流
5	UW两相过流
6	VW两相过流
7	UVW三相过流
8	制动管硬件过流
9	U相VCE短路
10	V相VCE短路
11	UV两相VCE短路
12	W相VCE短路
13	UW两相VCE短路
14	VW两相VCE短路
15	过流异常
16	过流异常

过流故障排查方法：

可能原因	检测方法	处理措施
电机参数设置不正确，矢量控制未进行参数辨识	确认D00组电机参数是否与电机铭牌一致；再次进行参数辨识，记录D01组电机参数，对比差异	重新设置参数，参数辨识后运行
加速时间太短	若增长加速时间B04.02，故障消失，则是加速时间过短	适当增长加速时间

中文

可能原因	检测方法	处理措施
电机相间短路或对地短路	拆掉电机电缆，设置控制方式VF（B05.00=0），关闭输出缺相检测（B06.37=0），运行	若不再报过流，则继续检查电机原因；若继续报过流，则排查驱动器硬件
	测量电机相间绝缘和对地绝缘，可测量线间电阻和对地电阻	若对地电阻为零或很小，请联系电机厂家检查电机问题；线间电阻主要测量三相阻值是否接近
	检查电机线缆	若存在电机线缆破损或短接情况，需分开短接的线缆，并保证可靠绝缘
电机未停稳就再次起动	观察运行前电机是否已停止转动；确认停机方式是否为自由停机（B05.32=0）	等电机完全停止后再起动；设置为减速停机（B05.32=1）
子码8代表制动电阻异常	驱动器断电，确认制动电阻连接是否正确；测量DC+ 和R之间的电阻，与手册推荐值对比确认	安装合适的制动电阻
驱动器整流桥/逆变IGBT 损坏	断电后使用万用表检测驱动器主功率器件	联系厂家更换驱动器
PM 异常	更换PM 。判断更换前后能否排除故障	更换PM
烧录新软件后未回复出厂值		恢复出厂值，重新设定参数

2. 直流过压

故障子码	子码含义
1	检测到母线电压超过阈值

过压故障排查方法：

可能原因	检测方法	处理措施
电机参数设置不正确，矢量控制未进行参数辨识	确认D00 组电机参数是否与电机铭牌一致；再次进行参数辨识，记录D01 组电机参数，对比前后两次的差异	重新设置参数，参数辨识后运行
减速时间太短	若增长减速时间B04.03，观察是否过压	若不再过压，适当增大B04.03；如果不能增大减速时间,可配置制动电阻
加速时间太短	观察是否是电机加速完成即将进入恒速时报过压；增大加速时间	增大加速时间B04.02；配置制动电阻
制动电阻异常	驱动器断电，确认制动电阻连接是否正确；测量DC+ 和R之间的电阻，与手册推荐值对比确认	安装合适的制动电阻
输入电源异常	测量驱动器输入端L1、L2、L3三相电压，检查电压值是否偏高，三相是否平衡	排查输入电源的问题
电压检测问题	测量实际母线电压，与驱动器显示值对比，检查母线电压采样增益（A03.03）	修改A03.03，对电压进行校准；若无法校准，则可能驱动器内部检测模块异常，请联系售后或厂家，寻求技术支持
驱动器容量偏小	确认驱动器功率与电机功率，与选型手册对比	更换大功率驱动器

3. 直流欠压

故障子码	子码含义
1	运行中检测到母线电压低于阈值(A03.21)

欠压故障排查方法：

可能原因	检测方法	处理措施
输入电源电压偏低	用万用表测量输入电源电压是否在允许范围内，测量母线电压是否低于欠压点	确认电源范围，确认输入端接线牢固可靠
检测阈值设置错误	检查欠压点（A03.21）设置是否正确，出厂默认100%，即350V	正确设置 A03.21
电压检测问题	测量实际母线电压，与驱动器显示值对比，检查母线电压采样增益（A03.03）	修改A03.03，对电压进行校准；若无法校准，则可能驱动器内部检测模块异常，请联系售后或厂家，寻求技术支持
接触器未吸合	确认上电有没有接触器吸合的声音	若接触器 不吸合，更换PM 确认

5. 驱动器过载

故障子码	子码含义
1	检测到电流值大于驱动器额定电流（A02.06）超出过载允许时间

过载故障排查方法：

可能原因	检测方法	处理措施
电流检测异常	使用钳流表测量实际电流，确认驱动器显示电流是否与实际电流一致，检查电流采样增益（A03.01）	电流检测系数正常情况下应为 100%±5%左右，若明显偏离，检查机型（A03.00）设置是否与铭牌一致；若电流无法校准，驱动器内部检测模块异常，请联系厂家
电机参数设置不正确，矢量控制未进行参数辨识	确认D00 组电机参数是否与电机铭牌一致；再次进行参数辨识，记录 D01 组电机参数，对比差异	重新设置参数，参数辨识后运行
电机堵转	检查电机与机械设备之间是否抱死（抱闸，刹车等情况）	排除机械堵转
驱动器设置载波频率高于默认频率	检查载波频率（A03.08）是否大于出厂值，并导致变频器降额	降低载波频率，或更换更大功率驱动器
电机未停稳就再次起动	观察运行前电机是否已停止转动；确认停机方式是否为自由停机(B05.32=0)	等电机完全停止后再起动；设置为减速停机(B05.32=1)
VF 控制下转矩提升值设置不合适	确认转矩提升值（B07.15），可改小后重新调试	适当减小\B07.15
电机接法错误	打开电机确认星三角接法	查看电机铭牌，确认接法

可能原因	检测方法	处理措施
负载特性	了解应用负载特性	根据负载情况采取相应措施，使起动时负载不至于过大
负载过重，驱动器容量小	对比正常运行电流和驱动器额定电流，若确认驱动器容量是否偏小	更换大容量驱动器

6. 马达过载

故障子码	子码含义
1	检测到电流值大于马达额定电流（D00.03）超出过载允许时间

马达过载故障排查方法：

可能原因	检测方法	处理措施
电流检测异常	使用钳流表测量实际电流，确认驱动器显示电流是否与实际电流一致，检查电流采样增益（A03.01）	电流检测系数正常情况下应为 100%±5% 左右，若明显偏离，检查机型（A03.00）设置是否与铭牌一致；若电流无法校准，驱动器内部检测模块异常，请联系厂家
马达电流设置过小	检查马达额定电流（D00.03）是否与铭牌一致	正确设置 D00.03
矢量控制未进行参数辨识	再次进行参数辨识，记录D01 组电机参数，对比差异	重新设置参数，参数辨识后运行
电机堵转	检查电机与机械设备之间是否抱死（抱闸，刹车等情况）	排除机械堵转
电机未停稳就再次起动	观察运行前电机是否已停止转动；确认停机方式是否为自由停机(B05.32=0)	等电机完全停止后再起动；设置为减速停机(B05.32=1)

可能原因	检测方法	处理措施
VF 控制下转矩提升值设置不合适	确认B07.15值，可改小后重新调试	减小B07.15
电机接法错误	打开电机确认星三角接法	查看电机铭牌，确认接法
负载特性	了解应用负载特性	根据负载情况采取相应措施，使起动时负载不至于过大

7. 输入缺相

故障子码	子码含义
1	检测到母线电压异常波动输入端缺相

马达过载故障排查方法：

可能原因	检测方法	处理措施
输入端接线问题	检查输入 L1L2L3 端子有无松动、线缆是否断线	确保输入接线正确可靠
输入端电压异常	排查现场配电问题，测量电源电压是否三相平衡、稳定	确保输入电源稳定

8. 输出缺相

故障子码	子码含义
1	U 相输出缺相
2	V 相输出缺相
3	W 相输出缺相
4	FVC 控制输出缺相
5	三相输出严重不平衡
6	定子电阻辨识输出缺相
7	SVC 控制输出缺相

输出缺相故障排查方法：

可能原因	检测方法	处理措施
驱动器输出端接线断开	断电，拔下驱动器动力线端子，用万用表测量驱动器端子侧三相相间电阻值，看是否存在不平衡或电阻很大的情况	确认输出端子接紧；确认电机电缆没有断开
电流检测异常	使用钳流表测量实际电流，确认驱动器显示电流是否与实际电流一致，检查电流采样增益（A03.01）	电流检测系数正常情况下应为 100%±5% 左右，若明显偏离，检查机型（A03.00）设置是否与铭牌一致；若电流无法校准，驱动器内部检测模块异常，请联系厂家
电机损坏	测量电机绕组间是否存在开路情况	请联系电机厂家，更换电机
PM 异常	更换新的 PM 确认	更新PM

9. 变频器过温

故障子码	子码含义
1	检测到驱动器（37Kw 及以下机型）IGBT 温度超过阈值
2	检测到驱动器（37Kw 以上机型）IGBT -U 相温度超过阈值
3	检测到驱动器（37Kw 以上机型）IGBT -V 相温度超过阈值
4	检测到驱动器（37Kw 以上机型）IGBT -W 相温度超过阈值

10Hz以下超过85度报过温，12Hz以上超过100度报过温。如果先高速运行温度超过85度，降速到低速后，如果温度继续增长就报过温，否则不报。

可能原因	检测方法	处理措施
风扇异常	1、检查风扇是否有异物卡住不转 2、查看风扇调速使能是否打开（B06.48）	清除异物，关闭风扇调速功能（B06.48=0），风扇仍然不转，联系厂家更换风扇
机型参数设置错误	查看机型值是否与铭牌对应	更改正确的机型值
风道堵塞	检查散热器风道中是否有灰尘、棉絮等异物堵塞	清理风道
现场环境温度偏高	测量驱动器运行时配电柜的环境温度，若超过 40度，说明配电柜散热不好	可适当降低驱动器载波频率，打开配电柜门散热，增大配电柜进出风口风量
PM 异常	更换PM 确认	更换PM

11. 电流零漂错误

故障子码	子码含义
1	U 相电流零漂偏大
2	V 相电流零漂偏大
3	W 相电流零漂偏大

电流零飘错误排查方法：

可能原因	检测方法	处理措施
电流检测异常	使用钳流表测量实际电流，确认驱动器显示电流是否与实际电流一致，检查电流采样增益（A03.01）	电流检测系数正常情况下应为 100%±5%左右，若明显偏离，检查机型（A03.00）设置是否与铭牌一致；若电流无法校准，驱动器内部检测模块异常，请联系厂家
PM 异常	重新上电，若继续报故障，更换PM确认	更换PM

12. 对地短路故障

故障子码	子码含义
1	对地短路时 U 相过流
2	对地短路时 V 相过流
4	对地短路时 W 相过流
5	对地短路电流超过阈值
6	对地短路时过压

对地短路故障排查方法：

可能原因	检测方法	处理措施
驱动器异常	断开驱动器端电机线缆，重新上电，如果还是报此故障，说明驱动器异常；如果不再报故障，则继续查找电机和线缆问题	更换驱动器
电机线缆破损	观察电机线缆、接线端子是否有破损	更换线缆
电机绝缘损坏或内部短路	用万用表测量电机三相相间电阻和对机壳电阻值	若电阻为零或很小，则是电机异常，请更换电机

13. 马达调谐故障

故障子码	子码含义
1	动态调谐异常
2	静态调谐失败
3	同步机磁极位置辨识调压模式超时
4	编码器异常
5	Z 信号错误
6	接收不到 z信号

马达调谐故障排除方法：

可能原因	检测方法	处理措施
马达参数设置错误	确认D00 组电机参数是否与电机铭牌一致	设置正确参数
输出端连接异常	检查马达接线，检查端子是否接触不良	保证输出端接线可靠
子码4-6表示编码器信号异常	检查D02 组编码器参数设置是否正确；检查编码器接线是否正确	保证编码器接线和参数正确
PM 异常	更换PM 。判断更换前后能否排除故障	更换PM

14. 编码器异常

故障子码	子码含义
1	动态调谐异常闭环动态调谐时编码器未接
2	闭环动态调谐时编码器测速不吻合
3	闭环运行时编码器断线
9	ABZ 中A 相断线
10	ABZ 中B 相断线
11	ABZ 中AB 相断线
12	ABZ 中Z 相断线
13	ABZ 中AZ 相断线
14	ABZ 中BZ 相断线
15	ABZ 全部断线

编码器异常故障排查方法：

可能原因	检测方法	处理措施
编码器反馈异常	检查D02 组编码器参数设置是否正确；检查编码器线缆连接是否正确；检查编码器安装是否正确	确认编码器参数设置正确，线缆连接正确
编码器信号干扰	检查编码器线缆连接	规范走线，使用带屏蔽层的线缆，编码器屏蔽层接地
电机参数设置错误	检查D00 组电机参数是否与铭牌一致，确认电机级数D00.09	正确设置电机参数
子码3可能因为电机堵转	确认运行后电机是否转起来	排除堵转情况

15. 矢量失速报警

故障子码	子码含义
1	速度在外力作用下被反向 ， 超过设定时间 （B06.59）
2	反馈速度与设定速度偏差 （B06.61）过大， 超过设定时间 （B06.60）

矢量失速报警故障排查方法：

可能原因	检测方法	处理措施
电机参数设置不正确，矢量控制未进行参数辨识	确认D00 组电机参数是否与电机铭牌一致； 再次进行参数辨识， 记录 D01 组电机参数，对比差异	重新设置参数，参数辨识后运行
FVC 控制时，编码器反馈错误	确认D02 组编码器参数是否设置正确， 编码器接线是否正确	重新设置编码器相关参数
负载原因	负载惯量太大， 需要调整速度环参 数; 负载太重无法带动， 如起重出现真实遛钩等	确认负载特性，调整B08组参数； 根据负载情况考虑是否需要更换大功率电机
检测参数设置不当	检查B06.59, B06.60, B06.61， 可适当增大检测时间， 观察是否报故障	正确设置检测参数

16. FPGA读写错误

故障子码	子码含义
1	FPGA 数据读写错误

矢量失速报警故障排查方法：

可能原因	检测方法	处理措施
上电初始化时 FPGA 读写错误	掉电重启， 如果继续报故障， 更换 PM 确认	更换PM

17. 驱动电源故障

故障子码	子码含义
1	驱动电源故障
3	对地短路检测时驱动电源故障

驱动电源故障排查方法：

可能原因	检测方法	处理措施
驱动电源电路异常	更换PM 确认	更换PM

18. 一级电源故障

故障子码	子码含义
1	24V 一级电源电压偏低

一级电源故障排查方法：

可能原因	检测方法	处理措施
一级电源电路异常	更换PM 确认	更换PM

19. CM与PM通信异常

故障子码	子码含义
1	CM 无应答
2	CM 无应答
3	CM 无应答
4	CM 无应答

CM与PM通讯异常故障排查方法：

可能原因	检测方法	处理措施
CM 与PM 未正常连接	检查CM 锁扣是否锁紧	确保CM 与PM 可靠连接
CM 异常	更换CM 确认	更换CM
PM 异常	更换PM 确认	更换PM

20.PM-EEPROM故障

故障子码	子码含义
1	写参数个数超限
2	读参数个数超限
3	单次读超时
4	单次写超时
5	读地址越界
6	写地址越界

PM-EEPROM故障排查方法：

可能原因	检测方法	处理措施
EEPROM 存储异常	重新上电	若重新上电仍报故障，联系厂家更换PM

21.PM机型设置错误

故障子码	子码含义
1	机型设置小于最小值
3	机型设置大于最大值

PM机型设置错误故障排查方法：

可能原因	检测方法	处理措施
机型参数设置错误	检查机型参数是否与铭牌一致	正确设置机型
PM 异常	更换PM 。判断更换前后能否排除故障	更换PM

22.逐波限流故障

故障子码	子码含义
1	U 相逐波限流故障
2	V 相逐波限流故障
3	W 相逐波限流故障
16	异常故障

逐波限流故障排查方法：

可能原因	检测方法	处理措施
加速时间太短	若增长加速时间B04.02，故障消失，则是加速时间过短	增长加速时间
电机参数设置不正确，矢量控制未进行参数辨识	确认D00 组电机参数是否与电机铭牌一致；再次进行参数辨识，记录 D01 组电机参数，对比差异	重新设置参数，参数辨识后运行
电机相间短路或对地短路	拆掉电机电缆，设置控制方式 VF（B05.00=0），关闭输出缺相检测（B06.37=0），运行	若不再报过流，则继续检查电机原因；若继续报过流，则排查驱动器硬件
	测量电机相间绝缘和对地绝缘，可测量线间电阻和对地电阻	若对地电阻为零或很小，请联系电机厂家检查电机问题；线间电阻主要测量三相阻值是否接近
	检查电机线缆	若存在电机线缆破损或短接情况，需分开短接线缆，并保证可靠绝缘
PM 异常	替换法，更换PM。判断更换前后能否排除故障	更换PM

23. 整流桥过热

故障子码	子码含义
1	整流桥温度超过 90°（仅 18.5Kw 及以上机型检测 ）

整流桥过热故障排查方法：

可能原因	检测方法	处理措施
风扇异常	1、检查风扇是否有异物卡住不转 2、查看风扇调速使能是否打开（B06.48）	清除异物，关闭风扇调速功能（B06.48=0），风扇仍然不转，联系厂家更换风扇
机型参数设置错误	查看机型值是否与铭牌对应	更改正确的机型值
风道堵塞	检查散热器风道中是否有灰尘 、棉絮等异物堵塞	清理风道
现场环境温度偏高	测量驱动器运行时配电柜的环境温度，若超过 40度，说明配电柜散热不好	可适当降低驱动器载波频率，打开配电柜门散热，增大配电柜进出风口风量
PM 异常	更换PM 确认	更换PM

25. 制动管过热

故障子码	子码含义
1	制动管温度超过 85°（仅45Kw 及以上机型检测 ）

制动管过热故障排查方法：

可能原因	检测方法	处理措施
制动电阻异常	驱动器断电，确认制动电阻连接是否正确；测量DC+ 和R 之间的电阻，与手册推荐值对比确认	安装合适的制动电阻
风扇异常	1、检查风扇是否有异物卡住不转 2、查看风扇调速使能是否打开（B06.48）	清除异物，关闭风扇调速功能（B06.48=0），风扇仍然不转，联系厂家更换风扇
机型参数设置错误	查看机型值是否与铭牌对应	更改正确的机型值
风道堵塞	检查散热器风道中是否有灰尘 、棉絮等异物堵塞	清理风道
现场环境温度偏高	测量驱动器运行时配电柜的环境温度，若超过 40度，说明配电柜散热不好	可适当降低驱动器载波频率，打开配电柜门散热，增大配电柜进出风口风量
PM 异常	更换PM 确认	更换PM

33. 驱动器预过载

驱动器过载前警告，处理方法参考5驱动器过载故障。

34. 马达预过载

马达过载前警告，处理方法参考6马达过载故障。

35.通信异常

故障子码	产生原因	处理措施
1	通过博能上位机控制驱动器运行时 CM 模块与上位机通信中断	① 检查 RS485 转 USB线缆/USB 线缆是否断开或者损坏
		② 换根 RS485 转 USB线缆/USB 线缆重新连接看是否能够通讯上
		③若更换RS485转USB线缆/USB 线缆仍然通讯不上则联系售后或厂家寻求技术支持
2	OP键盘获取本地控制权后 CM 模块与 OP 键盘通信中断	①检查 CM模块与OP键盘是否松动， 重新拔插后是否能够通讯上
		②若是采用延长线连接的OP键盘， 检查延长线是否松动或损坏
		③更换 OP键盘或者CM模块看是否能够通讯上 ，若更换后能够正常通讯则说明其中一个损坏 ，则联系售后或厂家寻求技术支持
3	Modbus 控制时在功能码 C02.04 设置的时间内没有进行交互	①检查 Modbus 线缆是否断开或者损坏
		② 检查相应 PLC等控制器程序是否正确 ，交互间隔是否在功能码 C02.04设置的时间内
		③联系售后或厂家寻求技术支持

故障子码	产生原因	处理措施
5	Canopen 通信断线	①检查主站是否关闭
		②检查通信线缆是否断开或损坏， 接头是否松动 。
		③检查通信线缆与强电之间走线距离 ， 需要间隔50cm左右走线 ， 驱动器设备需要正常接地
		④检查通信线缆线长是否超过波特率支持最大长度， 可降低波特率尝试 ，并检查通信线缆阻值是否为60Ω， 终端电阻是否正常连接
		⑤联系售后或厂家寻求技术支持
7	PROFINET 通信断线	①检查是否由于之前 PLC断电导致
		②检查网线是否断开或损坏， 网线接头是否松动 ，推荐使用标准 PROFINET 网线， 带屏蔽层 ， 并保证驱动器正常接地 ， 电机动力线屏蔽层连接驱动器
		③ 检查 PLC 支持最大 PROFINET 从站数量 ， 根据从站数量调整合适的通信周期
		④在使用 IRT模式的情况下， 需确保 IRT设备优先连接 PLC， RT设备连接至 IRT设备后端 ， 并使用支持IRT模式的交换机
		⑤联系售后或厂家寻求技术支持

中文

37. 马达速度超限

故障子码	产生原因	处理措施
1	马达运行速度超过最大转速限制，并且超速 B06.28 设定值且保持 B06.29 设定时间	① 检查 B06.28/B06.29 参数是否设置过于小，导致检测过于灵敏
		②检查是否有外部设备带着马达旋转
		③联系售后或厂家寻求技术支持

38. 马达速度偏差大

故障子码	产生原因	处理措施
1	马达实际运行速度与设定值相差范围超过 B06.30 设置值且保	① 检查 B06.30/B06.31 参数是否设置过于小，导致检测过于灵敏
		②检查是否有外部设备带着马达旋转
		③联系售后或厂家寻求技术支持

39. 重新上电

故障子码	产生原因	处理措施
1	PN通讯相关参数更改	①重新上电
2	设备允许最大时间到	①联系设备或驱动器厂家

40. PID反馈丢失

故障子码	产生原因	处理措施
1	PID 反馈数据丢失	①检查 PID 反馈输入信号
		②联系售后或厂家寻求技术支持

41. 外部故障

故障子码	产生原因	处理措施
1	外部故障有输入信号	①检查外部输入信号
2	外部故障有输入信号	①检查外部输入信号

42. 外部警告

故障子码	产生原因	处理措施
1	外部警告有输入信号	①检查外部输入信号
2	外部警告有输入信号	①检查外部输入信号

43. 预驱动失败

故障子码	产生原因	处理措施
1	运行命令产生时没有检测到母线电压	①检查外部电压供电是否正常
		②联系售后或厂家寻求技术支持

44. CM芯片识别异常

故障子码	产生原因	处理措施
1	ARM 芯片类型识别错误	①重新上电看是否正常
		②联系售后或厂家寻求技术支持
2	ARM 芯片主频配置失败	①重新上电看是否正常
		②联系售后或厂家寻求技术支持

45. 抱闸控制异常

故障子码	产生原因	处理措施
1	F04.00 选择了有抱闸带反馈信息，在打开抱闸过程中 F04.10 抱闸打开反馈信号为低电平	①若没有接抱闸反馈电路则 F04.00 选择抱闸不带反馈信息
		②接了抱闸反馈电路则检查电路是否接错，抱闸是否正常
		③联系售后或厂家寻求技术支持
2	F04.00 选择了有抱闸带反馈信息，在关闭抱闸过程中 F04.10 抱闸打开反馈信号为高电平	①若没有接抱闸反馈电路则 F04.00 选择抱闸不带反馈信息
		②接了抱闸反馈电路则检查电路是否接错，抱闸是否正常
		③联系售后或厂家寻求技术支持

46. 控制板电压异常

故障子码	产生原因	处理措施
1	PM 的 24V 供电电源电压过高	①测量 PM 的 24V 供电电压是否超过 30V
		②联系售后或厂家寻求技术支持
2	CM 板子上的外部 24V 电源供电电压过高	①检测外部供电电压是否超过 30V
		②联系售后或厂家寻求技术支持
3	PM 或者外部 24V 电源供电电压过低	①检测 PM 的 24V 或者外部 24V 电源电压是否低于 17V
		②联系售后或厂家寻求技术支持
4	3.3V 电压过高	①联系售后或厂家寻求技术支持
5	3.3V 电压过低	①联系售后或厂家寻求技术支持
6	抱闸继电器短路，通过的电流大于 F04.15 设置值	①检测抱闸继电器电路

47. 马达温度异常

故障子码	产生原因	处理措施
1	马达温度过高	①检查马达温度是否正常
		②检查 B06.40 设置的马达温度过温保护值是否合理
		③检查热敏电阻是否正常
		④检查驱动器端子上温度传感器接口接线是否正常
		⑤联系售后或厂家寻求技术支持

48. 马达温度警告

故障子码	产生原因	处理措施
1	马达温度大于 B06.41 设置的马达温度过温警告值	①检查马达温度是否正常
		②检查 B06.41 设置的马达温度过温警告值是否合理
		③检查热敏电阻是否正常
		④检查驱动器端子上温度传感器接口接线是否正常
		⑤联系售后或厂家寻求技术支持

49. AI断线故障

故障子码	产生原因	处理措施
1	当 AI0 类型选择 4~20ma 时电流小于 A07.20 设置值且保持 A07.22 断线检测延时时间	①检查 AI0 电路是否正确
		②检查是否有外部电流输入
		③检查 A07.20 设置值是否正确
		④联系售后或厂家寻求技术支持
2	当 AI0 类型选择 4~20ma 时电流小于 A07.21 设置值且保持 A07.23 断线检测延时时间	①检查 AI1 电路是否正确
		②检查是否有外部电流输入
		③检查 A07.21 设置值是否正确
		④联系售后或厂家寻求技术支持

50. 电容侧风扇故障

故障子码	产生原因	处理措施
1	电容侧风扇故障	①检测电容侧风扇是否正常运行
		②联系售后或厂家寻求技术支持

51. ROM故障

故障子码	产生原因	处理措施
1	上电自检EEPROM所存参数值不在设定范围内	①联系售后或厂家寻求技术支持
4	写EEPROM次数超过1000	①恢复故障即可
5	字库版本不正确	①烧录正确的字库

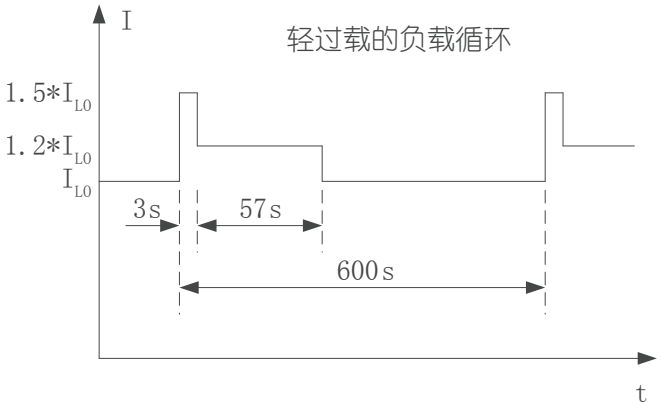
7 技术数据

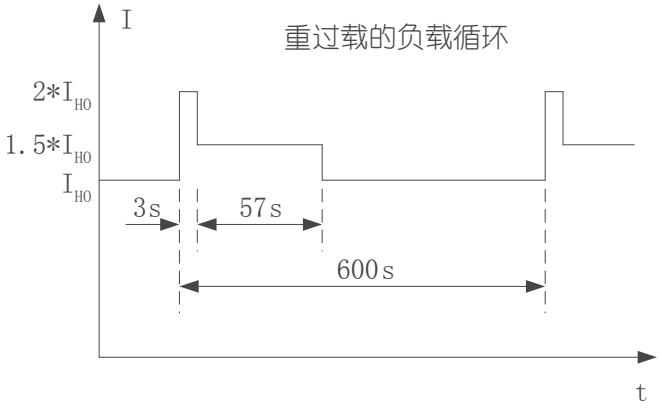
7.1 控制模块的技术数据

功能	技术数据	
总线接口	A1-CM23-MB-PE	•支持Modbus RTU通讯 •波特率：最大115200bps
工作电源	功率模块供电	•24V/0.6A
输出电源	+24V输出	•电压范围：DC 18V ••• 26.8V •最大电流：200mA
	编码器电源	•电压范围：DC 18V ••• 26.8V •最大电流：200mA
数字量输入	6个 (DI0 ~ DI5)	•共公共端子DICOM0 •电气隔离 •支持Source和Sink模式 •电压：DC 24V、AC 36V、AC48V • "1"信号电压：>11V • "0"信号电压：<5V • 24V典型电流：4mA •响应时间：6ms(含软件滤波)
数字量输出	2个继电器 (DO0 ~DO1)	•电压：DC 24V、AC 220V •连续电流：2A •切换电流：2A •触点类型：1常开1常闭
编码器信号输入	增量式ABZ编码器	•支持24V的单端信号 •输入频率：最大200kHz •电缆长度： 24V开集极类型50m 24V推挽类型100m
指示灯	2个双色指示灯	• RDY指示灯：红绿双色 • BF指示灯：红绿双色
	1个单色指示灯	• SAFE指示灯：黄色
键盘接口	支持OP25	•可直接安装或外引安装
工作温度	-10℃••• +50℃	
存储温度	-40℃••• +70℃	
相对空气湿度	<95%	不允许有凝露
污染	符合IEC 61800-5-1	适用于污染等级2的环境
电磁兼容性	符合IEC 61800-3	

7.2 功率模块的技术数据

驱动器的典型负载循环





7.2.1 PM25的通用技术数据

特性	数据
电源电压	3AC 380V ~ 480V ±10%
输出电压	3AC 0V ~ 输出电压(最大)
输入频率	50Hz ~ 60Hz ±3Hz
输出频率	0Hz ~ 600Hz，取决于控制方式
电源阻抗	Uk≥1 %，在更低值条件下建议使用电源电抗器或更高一级功率的功率模块
启动电流	< 轻载基本负载输入电流
脉冲频率	◆ 4kHz（出厂设置）
	◆ 2kHz ~ 8kHz可调整
额定短路电流	◆ ≤ 65kA rms
	◆ 采用熔断器加以保护时的短路电流
电磁兼容性	内置滤波器的驱动器适用于C2类环境
符合IEC/EN 61800-3	
制动方法	制动制动、复合制动、采用集成制动斩波器的电阻制动
防护等级	IP20，需要在控制柜中安装
符合EN60529	
环境温度	◆ 无降容的轻载基本负载功率：-10℃ ~ +40℃
	◆ 无降容的重载基本负载功率：-10℃ ~ +50℃
	◆ 有降容的轻载/重载基本负载功率：-10℃ ~ +50℃
存放温度	-40℃ ~ +70℃
符合60721-3-3	
冷却风介质	干净、干燥的空气
相对空气湿度	< 95%，不允许有凝露
污染	适用于污染等级 2 的环境
符合EN61800-5-1	
安装海拔	◆ 无降容：1000m以下
	◆ 有降容：1000m ~ 4000m

7.2.2 PM25的功率技术数据

进线电压380…480V 3AC

进线电压380…480V 3AC			
技术参数		A1-PM25-B3A75	A1-PM25-B3B15
额定输出功率	基于(LD)kW	-	1.5
	基于(HD)kW	0.75	1.1
额定输入电流	带进线电抗器A	2.3	4.3
	不带进线电抗器A	2.6	4.9
额定输出电流	基于(LD)A	-	4.1
	基于(HD)A	2.2	3.1
额定的载波频率kHz		4	4
效率 η		＞0.95	＞0.95
功率损失kW		0.1	0.1
噪声水平dB(A)		＜40	＜40
制动电阻连接电缆的最大长度m		15	15
进线电源连接	L1、L2、L3	螺钉端子	螺钉端子
	电缆截面积mm^2	1…2.5	1…2.5
马达连接	U、V、W	螺钉端子	螺钉端子
	电缆截面积mm^2	1…2.5	1…2.5
直流母线连接（制动电阻的连接）	DC+、DC-、R	螺钉端子	螺钉端子
	电缆截面积mm^2	1…2.5	1…2.5
PE连接		外壳上的M4螺钉	
最大马达电缆长度	屏蔽电缆m	50	50
	非屏蔽电缆m	100	100
防护等级		IP20	IP20
安装尺寸	宽（W）mm	80	80
	高（H）mm	230	230
	深（D）mm	165	165
外形尺寸		B1	B1
大约重量kg		2	2

A1-PM25-B3B22	A1-PM25-B3B30	A1-PM25-B3B40	A1-PM25-B3B55	A1-PM25-B3B75
2.2	3	4	5.5	7.5
1.5	2.2	3	4	5.5
6.1	8	10.4	15.3	18.7
7.6	10.2	13.4	17.2	21.9
5.9	7.7	10.2	13.2	18
4.1	5.9	7.7	10.2	13.2
4	4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95	＞0.95
0.11	0.14	0.16	0.18	0.24
＜40	＜40	＜50	＜50	＜50
15	15	15	15	15
螺钉端子	螺钉端子	螺钉端子	螺钉端子	螺钉端子
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
螺钉端子	螺钉端子	螺钉端子	螺钉端子	螺钉端子
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
螺钉端子	螺钉端子	螺钉端子	螺钉端子	螺钉端子
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
外壳上的M4螺钉		外壳上的M5螺钉		
50	50	50	50	50
100	100	100	100	100
IP20	IP20	IP20	IP20	IP20
80	80	100	100	100
230	230	270	270	270
165	165	165	165	165
B1	B1	B2	B2	B2
2	2	4	4	4

进线电压380…480V 3AC			
技术参数		A1-PM25-B3C11	A1-PM25-B3C11
额定输出功率	基于(LD)kW	11	15
	基于(HD)kW	7.5	11
额定输入电流	带进线电抗器A	26	33
	不带进线电抗器A	32	39
额定输出电流	基于(LD)A	26	32
	基于(HD)A	18	26
额定的载波频率kHz		4	4
效率 η		＞0.95	＞0.95
噪声水平dB(A)		＜50	＜50
制动电阻连接电缆的最大长度m		15	15
进线电源连接	L1、L2、L3	螺钉端子	螺钉端子
	电缆截面积mm^2	4…10	4…10
马达连接	U、V、W	螺钉端子	螺钉端子
	电缆截面积mm^2	4…10	4…10
直流母线连接（制动电阻的连接）	DC+、DC-、R	螺钉端子	螺钉端子
	电缆截面积mm^2	4…10	4…10
PE连接		外壳上的M5螺钉	
最大马达电缆长度	屏蔽电缆m	50	50
	非屏蔽电缆m	100	100
防护等级		IP20	IP20
安装尺寸	宽（W）mm	140	140
	高（H）mm	355	355
	深（D）mm	165	165
外形尺寸		B3	B3
大约重量kg		7	7

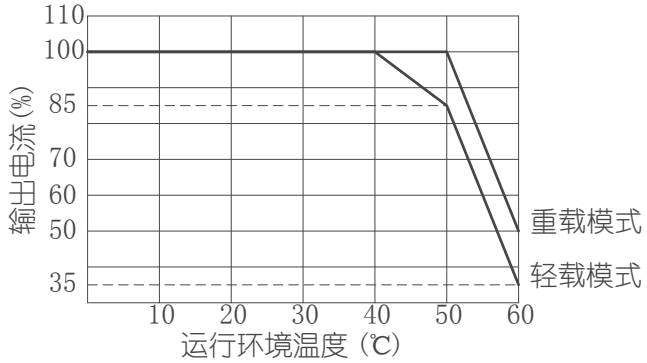
A1-PM25-B3C18	A1-PM25-B3C22	A1-PM25-B3C30	A1-PM25-B3C37
18.5	22	30	37
15	18.5	22	30
39	46	63	78
46	53	73	88
38	45	60	75
32	38	45	69
4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95
＜50	＜50	＜50	＜50
15	15	15	15
螺钉端子	螺钉端子	螺钉端子	螺钉端子
6…25	6…25	6…25	6…25
螺钉端子	螺钉端子	螺钉端子	螺钉端子
6…25	6…25	6…25	6…25
螺钉端子	螺钉端子	螺钉端子	螺钉端子
6…25	6…25	6…25	6…25
外壳上的M4螺钉		外壳上的M5螺钉	
50	50	50	50
100	100	100	100
IP20	IP20	IP20	IP20
200	200	200	200
472	472	472	472
237	237	237	237
B4	B4	B4	B4
16	16	16	16

PM25功率模块进线电压380…480V 3AC			
技术参数		A1-PM25-B3C45	A1-PM25-B3C55
额定输出功率	基于(LD)kW	45	55
	基于(HD)kW	37	45
额定输入电流	带进线电抗器A	86	104
	不带进线电抗器A	78	94
额定输出电流	基于(LD)A	90	110
	基于(HD)A	75	90
额定的载波频率kHz		4	4
效率 η		＞0.95	＞0.95
功率损失kW		1.3	1.67
冷却风量要求 m^3/s		0.083	0.083
噪声水平dB(A)		＜40	＜40
24V DC输出电源（控制单元用）		1	1
制动电阻连接电缆的最大长度m		15	15
进线电源连接	L1、L2、L3	电缆终端	电缆终端
	电缆截面积mm^2	35…2x120	35…2x120
马达连接	U、V、W	电缆终端	电缆终端
	电缆截面积mm^2	35…2x120	35…2x120
直流母线连接（制动电阻的连接）	DC+、DC-、R	螺钉端子	螺钉端子
	电缆截面积mm^2	25…70	25…70
PE连接		电缆终端	电缆终端
最大马达电缆长度	屏蔽电缆m	50	50
	非屏蔽电缆m	100	100
防护等级		IP20	IP20
安装尺寸	宽（W）mm	305	305
	高（H）mm	750	750
	深（D）mm	357	357
外形尺寸		B6	B6
大约重量kg		65	65

A1-PM25-B3C75	A1-PM25-B3C90	A1-PM25-B3D11	A1-PM25-B3D13
75	90	110	132
55	75	90	110
140	172	198	242
117	154	189	218
145	178	205	250
110	145	178	205
4	4	2	2
＞0.95	＞0.95	＞0.95	＞0.95
1.93	2.48	2.3	3.02
0.153	0.153	0.153	0.153
＜75	＜75	＜75	＜75
1	1	1	1
15	15	15	15
电缆终端	电缆终端	电缆终端	电缆终端
35…2x120	35…2x120	35…2x120	35…2x120
电缆终端	电缆终端	电缆终端	电缆终端
35…2x120	35…2x120	35…2x120	35…2x120
螺钉端子	螺钉端子	螺钉端子	螺钉端子
25…70	25…70	25…70	25…70
电缆终端	电缆终端	电缆终端	电缆终端
50	50	50	50
100	100	100	100
IP20	IP20	IP20	IP20
305	305	305	305
750	750	750	750
357	357	357	357
B6	B6	B6	B6
65	65	65	65

7.3 特殊环境条件下的限制

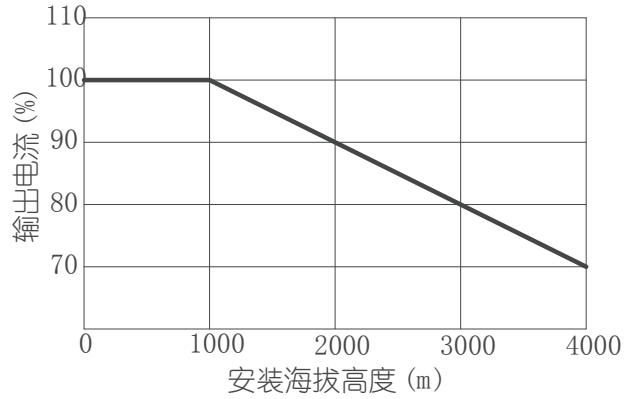
工作环境温度与电流降容的函数关系



控制模块和操作面板可以限制功率模块允许的最大工作环境温度。

安装海拔高度与电流降容的函数关系

由于海拔高度超过1000m时空气的冷却性能较低，因此，必须降低驱动器输出电流。



安装海拔高度与允许的电源的函数关系

◆ 安装海拔高度为2000米以下

- 连接至每个允许用于驱动器的电网系统。

◆ 安装海拔高度为2000m至4000m

- 只能连接在带有接地星点的TN系统上。
- 不允许连接带有接地外导体的TN系统。
- 可通过一个隔离变压器为TN系统提供接地星点。
- 不可以降低相间电压。

8 参数列表

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.00	当前状态机	S0:未初始化 S1:初始化 S2:上电检测 S3:故障 S4:开机封锁 S5:开机准备 S6:预驱动 S7:运行准备 S8:去磁等待 S9:运行前检测 S10:预励磁 S11:速度搜索 S12:运行 S13:OFF1停机 S14:OFF3停机 S15:启动直流制动 S16:自检准备 S17:自检 S18:辨识准备 S19:辨识 S20:恢复出厂值 S21:参数下载 S22:点动运行 S23:点动停机 S24:运行允许停机 S25:停机直流制动 S26:停机直流制动等待 S27:故障停机 S28:马达参数计算 S29:速度转矩控制切换 S30:退热等待	0	0	65535	0x2000

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.01	目标频率	-300.00~300.00Hz	0.00	-300.00	300.00	0x2001
A00.02	给定频率	-300.00~300.00Hz	0.00	-300.00	300.00	0x2002
A00.03	马达频率	-300.00~300.00Hz	0.00	-300.00	300.00	0x2003
A00.04	目标速度	-18000~18000rpm	0	-18000	18000	0x2004
A00.05	给定速度	-18000~18000rpm	0	-18000	18000	0x2005
A00.06	马达转速	-18000~18000rpm	0	-18000	18000	0x2006
A00.07	输出电压	0~1000V	0	0	1000	0x2007
A00.08	输出电流	0~655.35A	0.00	0.00	655.35	0x2008
A00.09	输出功率	0~655.67kw	0.00	-327.68	327.67	0x2009
A00.10	给定转矩	-300.0~300.0%	0.0	-300.0	300.0	0x200a
A00.11	输出转矩	-300.0~300.0%	0.0	-300.0	300.0	0x200b
A00.14	直流母线电压	0~1000.0V	0.0	0.0	1000.0	0x200e
A00.15	散热器温度	-40~150°	0	-40	150	0x200f
A00.16	DI状态	0~65535	0x00	0x00	0xFFFF	0x2010

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.17	DO状态	0~65535	0x00	0x00	0xFFFF	0x2011
A00.18	整流桥温度	-40~150°	0	-40	150	0x2012
A00.19	同步频率	-327.68~327.67Hz	0.00	-327.68	327.67	0x2013
A00.20	编码器频率	-327.68~327.67Hz	0.00	-327.68	327.67	0x2014
A00.22	制动管温度	-40~150℃	0	-40	150	0x2016
A00.41	开机显示选择1	0:当前状态机 1:目标频率 2:给定频率 3:马达频率 4:目标速度 5:给定速度 6:马达转速 7:输出电压 8:输出电流 9:输出功率 10:给定转矩 11:输出转矩 12:系统预约 13:系统预约 14:直流母线电压 15:散热器温度 16:DI状态 17:DO状态 18:整流桥温度 19:同步频率 20:编码器频率	1	0	20	0x2029

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.42	开机显示选择2	0:当前状态机 1:目标频率 2:给定频率 3:马达频率 4:目标速度 5:给定速度 6:马达转速 7:输出电压 8:输出电流 9:输出功率 10:给定转矩 11:输出转矩 12:系统预约 13:系统预约 14:直流母线电压 15:散热器温度 16:DI状态 17:DO状态 18:整流桥温度 19:同步频率 20:编码器频率	3	0	20	0x202a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.43	开机显示选择3	0:当前状态机 1:目标频率 2:给定频率 3:马达频率 4:目标速度 5:给定速度 6:马达转速 7:输出电压 8:输出电流 9:输出功率 10:给定转矩 11:输出转矩 12:系统预约 13:系统预约 14:直流母线电压 15:散热器温度 16:DI状态 17:DO状态 18:整流桥温度 19:同步频率 20:编码器频率	8	0	20	0x202b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.44	开机显示选择4	0:当前状态机 1:目标频率 2:给定频率 3:马达频率 4:目标速度 5:给定速度 6:马达转速 7:输出电压 8:输出电流 9:输出功率 10:给定转矩 11:输出转矩 12:系统预约 13:系统预约 14:直流母线电压 15:散热器温度 16:DI状态 17:DO状态 18:整流桥温度 19:同步频率 20:编码器频率	11	0	20	0x202c

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.45	开机显示选择5	0:当前状态机 1:目标频率 2:给定频率 3:马达频率 4:目标速度 5:给定速度 6:马达转速 7:输出电压 8:输出电流 9:输出功率 10:给定转矩 11:输出转矩 12:系统预约 13:系统预约 14:直流母线电压 15:散热器温度 16:DI状态 17:DO状态 18:整流桥温度 19:同步频率 20:编码器频率	14	0	20	0x202d

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A00组:状态监视与设置						
A00.46	开机显示选择6	0:当前状态机 1:目标频率 2:给定频率 3:马达频率 4:目标速度 5:给定速度 6:马达转速 7:输出电压 8:输出电流 9:输出功率 10:给定转矩 11:输出转矩 12:系统预约 13:系统预约 14:直流母线电压 15:散热器温度 16:DI状态 17:DO状态 18:整流桥温度 19:同步频率 20:编码器频率	9	0	20	0x202e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A02组:变频器信息与设置						
A02.00	CM-ARM软件版本号	0.00~655.35	0.00	0.00	655.35	0x2200
A02.01	CM-FPGA版本号	0.00~655.35	0.00	0.00	655.35	0x2201
A02.02	PM-DSP软件版本号	0.00~655.35	0.00	0.00	655.35	0x2202
A02.03	PM-FPGA版本号	0.00~655.35	0.00	0.00	655.35	0x2203
A02.04	PM功率单元额定功率	0.00~655.35	0.00	0.00	655.35	0x2204
A02.06	PM功率单元额定电流	0.00~655.35	0.00	0.00	655.35	0x2206
A02.07	功能码版本号	0.00~655.35	0.00	0.00	655.35	0x2207
A02.08	CM版本发布时间	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2208
A03组:PM功率单元保护与设置						
A03.08	载波频率设定	0:1KHz 1:2KHz 2:4KHz 3:6KHz 4:8KHz	2	0	4	0x2308
A03.09	负载模式选择	0:轻载 1:重载	0	0	1	0x2309
A03.13	DPWM切换频率	0.0Hz~ 600.0Hz	8.00	1.00	60.00	0x230d
A03.16	死区补偿使能	0:禁止 1:死区补偿方法1 2:死区补偿方法2	1	0	2	0x2310
A03.19	输入缺相检测	0:禁止 1:允许	0	0	1	0x2313
A03.20	制动电阻动作点	600.0~ 800.0V	700.0	600.0	800.0	0x2314
A03.21	软件欠压点	60.0%~ 150.0%	100	60	150	0x2315

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A04组:系统应用与环境设定						
A04.00	参数复位模式	0:无效 1:机型参数,马达参数,故障记录不复位 2:马达参数,故障记录不复位 3:全部参数复位 4:清除故障记录	0	0	4	0x2400
A04.01	参数复位	0:取消 1:确认	0	0	1	0x2401
A04.02	参数访问级别	0:标准参数 1:扩展参数 2:专家参数 3:厂家参数	0	0	3	0x2402
A04.03	厂家密码	0~65535	0	0	65535	0x2403
A04.05	马达选择来源0	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x2405
A04.10	键盘控制权禁止	0:禁止无效 1:禁止有效	0	0	1	0x240a
A04.11	用户密码	0~65535	0	0	65535	0x240b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A04组:系统应用与环境设定						
A04.12	行业模式选择	0:未启用行业模式 1:塔机闭环起升模式 2:塔机开环起升模式 3:塔机回转模式 4:塔机变幅模式 5:行车闭环起升模式 6:行车开环起升模式 7:行车水平行走模式	0	0	7	0x240c
A04.13	行业模式选择确认	0:无效 1:确认	0	0	1	0x240d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A05组:数字量输入						
A05.00	DI物理状态值	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2500
A05.02	DI处理后状态值	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2502
A05.04	DI强制选择	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2504
A05.06	DI强制数据	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2506
A05.08	DI0开通延时	0.00~655.35S	0.00	0.00	655.35	0x2508
A05.09	DI0关断延时	0.00~655.35S	0.00	0.00	655.35	0x2509
A05.10	DI1开通延时	0.00~655.35S	0.00	0.00	655.35	0x250a
A05.11	DI1关断延时	0.00~655.35S	0.00	0.00	655.35	0x250b
A05.12	DI2开通延时	0.00~655.35S	0.00	0.00	655.35	0x250c
A05.13	DI2关断延时	0.00~655.35S	0.00	0.00	655.35	0x250d
A05.14	DI3开通延时	0.00~655.35S	0.00	0.00	655.35	0x250e
A05.15	DI3关断延时	0.00~655.35S	0.00	0.00	655.35	0x250f
A05.16	DI4开通延时	0.00~655.35S	0.00	0.00	655.35	0x2510
A05.17	DI4关断延时	0.00~655.35S	0.00	0.00	655.35	0x2511
A05.18	DI5开通延时	0.00~655.35S	0.00	0.00	655.35	0x2512
A05.19	DI5关断延时	0.00~655.35S	0.00	0.00	655.35	0x2513

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
A06组:数字量输出						
A06.00	DO信号源状态值	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2600
A06.01	DO处理后状态值	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2601
A06.02	DO0的输出功能选择	0:低电平 1:高电平 2:运行准备好 3:运行允许 4:运行中 5:比较值到达 6:速度反向 7:零速运行 8:过速度 9:警告 10:故障 其它:二进制互联参数	1111	0	10	0x2602
A06.03	DO1的输出功能选择	0:低电平 1:高电平 2:运行准备好 3:运行允许 4:运行中 5:比较值到达 6:速度反向 7:零速运行 8:过速度 9:警告 10:故障 其它:二进制互联参数	10	0	10	0x2603
A06.09	DO0开通延时	0.00~655.35S	0.00	0.00	655.35	0x2609
A06.10	DO0关断延时	0.00~655.35S	0.00	0.00	655.35	0x260a
A06.11	DO1开通延时	0.00~655.35S	0.00	0.00	655.35	0x260b
A06.12	DO1关断延时	0.00~655.35S	0.00	0.00	655.35	0x260c

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B00组:系统控制命令设置						
B00.00	启停控制命令来源	0:端子控制模块 1:自定义控制模块	0	0	1	0x3000
B00.01	自定义启停命令(OFF1)来源	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3001
B00.02	自定义输出使能(OFF2)来源1	0:有效 1:无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3002

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B00组:系统控制命令设置						
B00.03	自定义快速停机(OFF3)来源1	0:有效 1:无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3003
B00.04	自定义运行允许来源	0:运行不允许 1:运行允许 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3004
B00.05	自定义故障复位来源1	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3005

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B00组:系统控制命令设置						
B00.06	自定义速度命令取反来源	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3006
B00.07	自定义JOG1来源	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3007
B00.08	自定义JOG2来源	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3008

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B00组:系统控制命令设置						
B00.09	输出使能(OFF2)来源2	0:有效 1:无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3009
B00.11	快速停机(OFF3)来源2	0:有效 1:无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x300b
B00.13	故障复位来源2	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	4	0	10	0x300d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B00组:系统控制命令设置						
B00.15	斜坡函数发生器(RFG)禁止来源	0:RFG禁止有效 1:RFG禁止无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x300f
B00.16	斜坡函数发生器(RFG)暂停来源	0:RFG暂停有效 1:RFG暂停无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3010

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B00组:系统控制命令设置						
B00.17	斜坡函数发生器(RFG)给定置0来源	0:RFG给定置0有效 1:RFG给定置0无效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3011
B00.21	辨识请求	0:无 1:异步机简易静态辨识 2:异步机静态完整辨识 3:异步机动态完整辨识 4:预留 5:预留 6:预留 7:预留 8:预留 9:预留 10:预留 11:同步机不带编码器辨识 12:同步机带编码器辨识	0	0	12	0x3015
B00.23	OFF1停机方式	0:自由停机 1:减速停机	1	0	1	0x3017
B00.24	OFF3停机时间	0.0~1000.0S	1.0	0.0	1000.0	0x3018

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B01组:端子控制模块						
B01.01	端子控制命令1方式	0:无效 1:IN1启动 2:IN1启动,IN2方向 3:IN1正向启动,IN2反向启动 4:IN1P启动,IN2停止 5:IN1P启动,IN2停止，IN3方向 6:IN1P正向启动，IN2P反向启动，IN3停止	3	0	6	0x3101
B01.03	端子控制命令1输入IN1	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	2	0	10	0x3103

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B01组:端子控制模块						
B01.04	端子控制命令1输入IN2	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	3	0	10	0x3104
B01.05	端子控制命令1输入IN3	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3105
B01.11	端子控制模块JOG1来源	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x310b

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B01组:端子控制模块						
B01.12	端子控制模块JOG2来源	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x310c
B02组:速度与转矩给定值设置						
B02.00	速度控制主速度选择	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位器 8:预留 9:总线适配器A-PZD2 10:预留 其它:模拟量互联参数	1	0	10	0x3200

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B02组:速度与转矩给定值设置						
B02.01	速度控制辅速度选择	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位器 8:预留 9:总线适配器A-PZD2 10:预留 其它:模拟量互联参数	0	0	10	0x3201
B02.02	附加速度给定选择	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:总线适配器A-PZD2 10:预留 其它:模拟量互联参数	0	0	10	0x3202

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B02组:速度与转矩给定值设置						
B02.03	转矩控制转矩设定选择	0:0 1:多段设定值2 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	0	0	10	0x3203
B02.04	转矩控制转矩给定斜坡时间	0~10.00S	0.00	0.00	10.00	0x3204
B02.05	转矩控制转矩给定滤波时间	0~10.00S	0.00	0.00	10.00	0x3205
B02.06	转矩控制正向速度限制来源	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位器 8:预留 9:预留 10:预留 其它:模拟量互联参数	2101	0	10	0x3206

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B02组:速度与转矩给定值设置						
B02.07	转矩控制反向速度限制来源	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位器 8:预留 9:预留 10:预留 其它:模拟量互联参数	2105	0	10	0x3207
B02.08	转矩控制速度限制值斜坡时间	0~10.00S	0.00	0.00	10.00	0x3208
B02.09	附加转矩给定选择	0:0 1:数字设定 其它:模拟量互联参数	0	0	1	0x3209
B02.10	附加转矩给定数字设定	-200.0~200.0%	0.0	-200.0	200.0	0x320a

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B03组:其他命令源设定方式						
B03.00	JOG1给定设置	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	1	0	10	0x3300
B03.01	JOG2给定设置	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	2328	0	10	0x3301
B03.02	JOG加速时间	0.0~1000.0S	10.0	0.0	1000.0	0x3302
B03.03	JOG减速时间	0.0~1000.0S	10.0	0.0	1000.0	0x3303
B03.11	多段给定值	-600.0 ~600.0%	0.0	-600.0	600.0	0x330b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B03组:其他命令源设定方式						
B03.12	多段给定值选择1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	5	0	10	0x330c
B03.13	多段给定值选择2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	6	0	10	0x330d
B03.14	多段给定值选择3	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x330e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B03组:其他命令源设定方式						
B03.15	多段给定值选择4	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x330f
B03.16	多段设定值1	-600.0 ~600.0%	10.0	-600.0	600.0	0x3310
B03.17	多段设定值2	-600.0 ~600.0%	40.0	-600.0	600.0	0x3311
B03.18	多段设定值3	-600.0 ~600.0%	70.0	-600.0	600.0	0x3312
B03.19	多段设定值4	-600.0 ~600.0%	100.0	-600.0	600.0	0x3313
B03.20	多段设定值5	-600.0 ~600.0%	-10.0	-600.0	600.0	0x3314
B03.21	多段设定值6	-600.0 ~600.0%	-40.0	-600.0	600.0	0x3315
B03.22	多段设定值7	-600.0 ~600.0%	-70.0	-600.0	600.0	0x3316
B03.23	多段设定值8	-600.0 ~600.0%	-100.0	-600.0	600.0	0x3317

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B03组:其他命令源设定方式						
B03.24	多段设定值9	-600.0 ~600.0%	0.0	-600.0	600.0	0x3318
B03.25	多段设定值10	-600.0 ~600.0%	0.0	-600.0	600.0	0x3319
B03.26	多段设定值11	-600.0 ~600.0%	0.0	-600.0	600.0	0x331a
B03.27	多段设定值12	-600.0 ~600.0%	0.0	-600.0	600.0	0x331b
B03.28	多段设定值13	-600.0 ~600.0%	0.0	-600.0	600.0	0x331c
B03.29	多段设定值14	-600.0 ~600.0%	0.0	-600.0	600.0	0x331d
B03.30	多段设定值15	-600.0 ~600.0%	0.0	-600.0	600.0	0x331e
B03.31	多段设定值16	-600.0 ~600.0%	0.0	-600.0	600.0	0x331f

中文

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B04组:斜坡函数发生器						
B04.00	斜坡时间选择1	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3400
B04.01	斜坡时间选择2	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3401
B04.02	斜坡加速时间1	0.0~1000.0S	5.0	0.0	1000.0	0x3402
B04.03	斜坡减速时间1	0.0~1000.0S	5.0	0.0	1000.0	0x3403
B04.04	斜坡加速时间2	0.0~1000.0S	5.0	0.0	1000.0	0x3404
B04.05	斜坡减速时间2	0.0~1000.0S	5.0	0.0	1000.0	0x3405
B04.06	斜坡加速时间3	0.0~1000.0S	5.0	0.0	1000.0	0x3406
B04.07	斜坡减速时间3	0.0~1000.0S	5.0	0.0	1000.0	0x3407

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B04组:斜坡函数发生器						
B04.08	斜坡加速时间4	0.0~1000.0S	5.0	0.0	1000.0	0x3408
B04.09	斜坡减速时间4	0.0~1000.0S	5.0	0.0	1000.0	0x3409
B04.10	S曲线开始时间1	0.00~20.00S	0.00	0.00	20.00	0x340a
B04.11	S曲线结束时间1	0.00~20.00S	0.00	0.00	20.00	0x340b
B04.12	S曲线开始时间2	0.00~20.00S	0.00	0.00	20.00	0x340c
B04.13	S曲线结束时间2	0.00~20.00S	0.00	0.00	20.00	0x340d
B04.14	S曲线开始时间3	0.00~20.00S	0.00	0.00	20.00	0x340e
B04.15	S曲线结束时间3	0.00~20.00S	0.00	0.00	20.00	0x340f
B04.16	S曲线开始时间4	0.00~20.00S	0.00	0.00	20.00	0x3410
B04.17	S曲线结束时间4	0.00~20.00S	0.00	0.00	20.00	0x3411
B04.22	RFG启动延时时间	0.0~1000.0S	0.0	0.0	1000.0	0x3416
B04.40	斜坡加速时间来源	0:斜坡时间设定值 其他:模拟量互联参数	0	0	0	0x3428
B04.41	斜坡减速时间来源	0:斜坡时间设定值 其他:模拟量互联参数	0	0	0	0x3429

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B05组:马达控制选择						
B05.00	马达控制方式	0:VF 1:SVC 2:FVC	0	0	2	0x3500
B05.01	系统控制模式	0:速度控制 1:转矩控制	0	0	1	0x3501
B05.02	正速度允许	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3502
B05.03	负速度允许	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	1	0	10	0x3503
B05.04	马达启动方式	0:直接启动 1:预励磁启动 2:转速追踪启动 3:直流制动启动	0	0	3	0x3504

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B05组:马达控制选择						
B05.06	预励磁时间设定	0.00~100.00S	0.00	0.00	100.00	0x3506
B05.09	直流制动电流	0.0%~100.0% 100.0%对应马达额定电流	50.0	0.0	100.0	0x3509
B05.10	启动时直流制动时间	0.00s~ 100.00s	0.00	0.00	100.00	0x350a
B05.11	停机时直流制动时间	0.00s~ 100.00s	0.00	0.00	100.00	0x350b
B05.12	停机直流制动起始速度	0~3000rpm	0	0	3000	0x350c
B05.13	转速追踪模式	0:从停机频率开始搜索 1:从额定频率开始搜索 2:从最大频率开始搜索	0	0	2	0x350d
B05.14	转速追踪速度搜索时间	0.0~120.0S	25.0	0.0	120.0	0x350e
B05.15	转速追踪电流百分比	0~100%	50	0	100	0x350f
B05.16	转速追踪最小频率限制	0.00~50.00Hz	2.00	0.00	50.00	0x3510
B05.17	转速追踪切换等待时间	0~60000ms	250	0	60000	0x3511

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B05组:马达控制选择						
B05.18	系统控制模式切换指令来源	0:无效 1:有效 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x3512
B05.29	零速判断值	0~10.00rpm	0.00	0.00	10.00	0x351d
B05.30	零速停机延迟时间	0.00~100.00S	0.00	0.00	100.00	0x351e
B05.32	OFF1停机方式	0:自由停机 1:减速停机	1	0	1	0x3520
B05.33	OFF3停机时间	0.0~1000.0S	1.0	0.0	1000.0	0x3521

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B06组:马达控制限制及保护						
B06.04	正向极限速度数字设定	0.0%~300.0%	100.0	0.0	300.0	0x3604
B06.05	反向极限速度数字设定	-300.0%~0.0%	-100.0	-300.0	0.0	0x3605
B06.06	正向转速限幅选择	0:数字设定值(B06.04) 1:300.0% 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	1	0	10	0x3606
B06.07	反向转速限幅选择	0:数字设定值(B06.05) 1:-300.0% 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	1	0	10	0x3607
B06.08	转矩上极限给定数字设定	0.0%~400.0%	200.0	0.0	200.0	0x3608

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B06组:马达控制限制及保护						
B06.09	转矩下极限给定数字设定	-400.0%~0.0%	-200.0	-200.0	0.0	0x3609
B06.10	转矩上极限给定选择	0:0 1:200.0% 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	1	0	10	0x360a
B06.11	转矩下极限给定选择	0:0 1:-200.0% 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	1	0	10	0x360b
B06.12	矢量控制转矩限幅	0.0%~200.0%	180.0	0.0	200.0	0x360c
B06.13	抱闸打开前转矩限幅	0.0%~200.0%	180.0	0.0	200.0	0x360d
B06.14	正反转速度死区时间	0.0~3000.0s	0.0	0.0	3000.0	0x360e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B06组:马达控制限制及保护						
B06.15	转矩限制到达范围	0.0%~100.0%	5.0	0.0	100.0	0x360f
B06.16	矢量控制转矩限幅来源	0:矢量控制转矩限幅设定值(B06.12) 其它:模拟量互联参数	0	0	0	0x3610
B06.25	马达过载软件保护选择	0:禁止 1:允许	0	0	1	0x3619
B06.26	马达过载软件保护增益	20~1000%	100	20	1000	0x361a
B06.27	马达过载预警系数	50%~100%	80	50	100	0x361b
B06.28	速度超限检测阈值	0.0%~50.0% 100.0%相对马达额定转速	20.0	0.0	50.0	0x361c
B06.29	速度超限检测时间	0.0S:不检测 0.1S~ 60.0S	5.0	0.0	60.0	0x361d
B06.32	速度到达检测值	0.0%~600.0% 100.0%相对马达额定转速	100.0	B06.33	600.0	0x3620
B06.33	速度到达滞环宽度	0.0%~B06.32 100.0%相对马达额定转速	3.0	0.0	B06.32	0x3621
B06.34	速度到达检测时间	0.0:不检测 0.1s~600.0s	3.0	0.0	600.0	0x3622
B06.37	输出缺相检测	0:禁止 1:允许	1	0	1	0x3625
B06.48	风扇随温调速功能使能	0:禁止 1:使能	0	0	1	0x3630

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B06组:马达控制限制及保护						
B06.59	矢量失速1检测时间	0~5000ms	500	0	5000	0x363b
B06.60	矢量失速2检测时间	0~5000ms	500	0	5000	0x363c
B06.61	矢量失速2检测系数	0~100%	20	0	100	0x363d
B06.62	异步机SVC控制模式	0:控制模式1 1:控制模式2 2:控制模式3	0	0	2	0x363e
B06.63	同步机SVC控制模式	0:控制模式1 1:控制模式2 2:控制模式3	0	0	2	0x363f
B06.64	矢量控制滑差补偿系数	50~200%	100	50	200	0x3640
B07组:VF控制						
B07.01	VF曲线选择	0:直线VF 1:多点VF 2:平方V/F 3:1.5次V/F	0	0	3	0x3701
B07.02	多点VF曲线频率点1	0.0~B07.04	2.00	0.00	B07.04	0x3702
B07.03	多点VF曲线电压点1	0.0~B07.05	20	0	B07.05	0x3703
B07.04	多点VF曲线频率点2	B07.02~ B07.06	20.00	B07.02	B07.06	0x3704
B07.05	多点VF曲线电压点2	B07.03~ B07.07	152	B07.03	B07.07	0x3705
B07.06	多点VF曲线频率点3	B07.04~ D00.04	40.00	B07.04	D00.04	0x3706

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B07组:VF控制						
B07.07	多点VF曲线电压点3	B07.05~ 380.0	304	B07.05	D00.02	0x3707
B07.10	过流抑制使能(Imax)	0:无效 1:有效	1	0	1	0x370a
B07.11	过流抑制调频增益(Imax)	0~100	30	0	100	0x370b
B07.12	过流抑制点(Imax)	0~200	150	0	200	0x370c
B07.15	VF手动转矩提升	0%~50%	1.0	0.0	50.0	0x370f
B07.16	VF转矩提升截止频率	0.00~50.00	50.00	0.00	100.00	0x3710
B07.17	VF转差补偿系数	0.0%~300.0%	0.0	0.0	300.0	0x3711
B07.20	VF振荡抑制模式	0:无效 1:有效	1	0	1	0x3714
B07.21	VF振荡抑制增益	0~500%	10	0	500	0x3715
B07.28	过压抑制使能(Vdc_max)	0:禁止 1:使能	0	0	1	0x371c
B07.29	过压抑制调压增益(Vdc_max)	115~150V	125	115	150	0x371d
B07.34	欠压抑制使能(Vdc_min)	0:禁止 1:使能	0	0	1	0x3722
B07.35	欠压抑制调压增益(Vdc_min)	65~100	85	65	100	0x3723

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B08组:速度调节器						
B08.02	速度环Kp低速	0.00~20.00	10.0	0.0	100.0	0x3802
B08.03	速度环Ti低速	1~65535ms	1.00	0.10	10.00	0x3803
B08.04	速度环Kp高速	0.00~20.00	10.0	0.0	100.0	0x3804
B08.05	速度环Ti高速	1~65535ms	2.00	0.10	10.00	0x3805
B08.11	速度环切换低频频率	0.00~50.00Hz	5.00	0.00	B08.12	0x380b
B08.12	速度环切换高频频率	0.00~50.00Hz	10.00	B08.11	40.00	0x380c
B08.25	编码器反馈速度滤波时间	0~1000ms	5	0	1000	0x3819
B08.26	估计速度环滤波时间	0~65535	35	0	1000	0x381a
B09组:电流调节器						
B09.04	电流环比例系数	1%~1000%	100	1	1000	0x3904
B09.05	电流环积分系数	1%~1000%	100	1	1000	0x3905

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B10组:同步机控制参数						
B10.00	同步机磁极位置辨识方法	0:方法0 1:方法1 2:方法2 3:方法3 4:方法4	1	0	4	0x3a00
B10.01	同步机磁极位置辨识电流	0~200	50	0	200	0x3a01
B10.07	同步机低速励磁电流	0~65535	3.0	0.0	6553.5	0x3a07
B10.08	同步机IF/VF选择	0~65535	0	0	65535	0x3a08
B10.09	磁链幅值补偿系数	0~65535	100	0	65535	0x3a09
B10.12	SVC截止频率	0~65535	100	0	65535	0x3a0c
B10.13	IF电流幅值	0~65535	60	0	65535	0x3a0d
B10.14	反电势系数	0~65535	30	0	65535	0x3a0e
B10.15	速度系数	0~65535	40	0	65535	0x3a0f
B10.16	滤波系数	0~65535	100	0	65535	0x3a10
B10.18	SVC速度滤波系数	0~65535	100	0	65535	0x3a12

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
B11组:马达模型及其它						
B11.51	监控通道1	0~65535	207	0	65535	0x3b33
B11.52	监控通道2	0~65535	209	0	65535	0x3b34
B11.53	监控通道3	0~65535	210	0	65535	0x3b35
B11.54	监控通道4	0~65535	211	0	65535	0x3b36
B11.56	重载限速电动频率上限	0~65535	1200	0	65535	0x3b38
B11.57	重载限速发电频率上限	0~65535	800	0	65535	0x3b39
B11.75	重载限速使能	0~65535	0	0	65535	0x3b4b
B11.78	性能调试参数	0~65535	0	0	65535	0x3b4e
B11.93	CM与PM交互数据监控选择0	0~511	0	0	511	0x3b5d
B11.94	CM与PM交互数据监控选择1	0~511	0	0	511	0x3b5e
B11.95	CM与PM交互数据监控选择2	0~511	0	0	511	0x3b5f
B11.96	CM与PM交互数据监控选择3	0~511	0	0	511	0x3b60

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C00组:现场总线适配器A						
C00.00	总线适配器配套总线类型	0:无 1:Modbus 2:PROFINET	0	0	2	0x4000
C00.01	通讯故障后的数据处理方式	0:数据保持 1:数据清零 (预留)	0	0	1	0x4001
C00.02	PZD输出1	0:0 其他:模拟量互联参数	0	0	0	0x4002
C00.03	PZD输出2	0:0 其他:模拟量互联参数	0	0	0	0x4003
C00.04	PZD输出3	0:0 其他:模拟量互联参数	0	0	0	0x4004
C00.05	PZD输出4	0:0 其他:模拟量互联参数	0	0	0	0x4005
C00.06	PZD输出5	0:0 其他:模拟量互联参数	0	0	0	0x4006
C00.07	PZD输出6	0:0 其他:模拟量互联参数	0	0	0	0x4007
C00.08	PZD输出7	0:0 其他:模拟量互联参数	0	0	0	0x4008
C00.09	PZD输出8	0:0 其他:模拟量互联参数	0	0	0	0x4009
C00.10	PZD输出9	0:0 其他:模拟量互联参数	0	0	0	0x400a
C00.11	PZD输出10	0:0 其他:模拟量互联参数	0	0	0	0x400b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C00组:现场总线适配器A						
C00.12	PZD输出11	0:0 其他:模拟量互联参数	0	0	0	0x400c
C00.13	PZD输出12	0:0 其他:模拟量互联参数	0	0	0	0x400d
C00.14	PZD输出13	0:0 其他:模拟量互联参数	0	0	0	0x400e
C00.15	PZD输出14	0:0 其他:模拟量互联参数	0	0	0	0x400f
C00.16	PZD输出15	0:0 其他:模拟量互联参数	0	0	0	0x4010
C00.17	PZD输出16	0:0 其他:模拟量互联参数	0	0	0	0x4011
C00.18	PZD输出1通讯基值	0~65535	0	0	65535	0x4012
C00.19	PZD输出2通讯基值	0~65535	0	0	65535	0x4013
C00.20	PZD输出3通讯基值	0~65535	0	0	65535	0x4014
C00.21	PZD输出4通讯基值	0~65535	0	0	65535	0x4015
C00.22	PZD输出5通讯基值	0~65535	0	0	65535	0x4016
C00.23	PZD输出6通讯基值	0~65535	0	0	65535	0x4017
C00.24	PZD输出7通讯基值	0~65535	0	0	65535	0x4018
C00.25	PZD输出8通讯基值	0~65535	0	0	65535	0x4019
C00.26	PZD输出9通讯基值	0~65535	0	0	65535	0x401a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C00组:现场总线适配器A						
C00.27	PZD输出10通讯基值	0~65535	0	0	65535	0x401b
C00.28	PZD输出11通讯基值	0~65535	0	0	65535	0x401c
C00.29	PZD输出12通讯基值	0~65535	0	0	65535	0x401d
C00.30	PZD输出13通讯基值	0~65535	0	0	65535	0x401e
C00.31	PZD输出14通讯基值	0~65535	0	0	65535	0x401f
C00.32	PZD输出15通讯基值	0~65535	0	0	65535	0x4020
C00.33	PZD输出16通讯基值	0~65535	0	0	65535	0x4021
C00.34	PZD输入1通讯基值	0~65535	0	0	65535	0x4022
C00.35	PZD输入2通讯基值	0~65535	0	0	65535	0x4023
C00.36	PZD输入3通讯基值	0~65535	0	0	65535	0x4024
C00.37	PZD输入4通讯基值	0~65535	0	0	65535	0x4025
C00.38	PZD输入5通讯基值	0~65535	0	0	65535	0x4026
C00.39	PZD输入6通讯基值	0~65535	0	0	65535	0x4027
C00.40	PZD输入7通讯基值	0~65535	0	0	65535	0x4028
C00.41	PZD输入8通讯基值	0~65535	0	0	65535	0x4029

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C00组:现场总线适配器A						
C00.42	PZD输入9通讯基值	0~65535	0	0	65535	0x402a
C00.43	PZD输入10通讯基值	0~65535	0	0	65535	0x402b
C00.44	PZD输入11通讯基值	0~65535	0	0	65535	0x402c
C00.45	PZD输入12通讯基值	0~65535	0	0	65535	0x402d
C00.46	PZD输入13通讯基值	0~65535	0	0	65535	0x402e
C00.47	PZD输入14通讯基值	0~65535	0	0	65535	0x402f
C00.48	PZD输入15通讯基值	0~65535	0	0	65535	0x4030
C00.49	PZD输入16通讯基值	0~65535	0	0	65535	0x4031
C00.50	PZD输出1数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4032
C00.51	PZD输出2数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4033
C00.52	PZD输出3数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4034
C00.53	PZD输出4数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4035
C00.54	PZD输出5数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4036
C00.55	PZD输出6数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4037
C00.56	PZD输出7数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4038

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C00组:现场总线适配器A						
C00.57	PZD输出8数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4039
C00.58	PZD输出9数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x403a
C00.59	PZD输出10数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x403b
C00.60	PZD输出11数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x403c
C00.61	PZD输出12数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x403d
C00.62	PZD输出13数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x403e
C00.63	PZD输出14数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x403f
C00.64	PZD输出15数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4040
C00.65	PZD输出16数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4041
C00.66	PZD输入1数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4042
C00.67	PZD输入2数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4043
C00.68	PZD输入3数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4044
C00.69	PZD输入4数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4045
C00.70	PZD输入5数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4046
C00.71	PZD输入6数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4047

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C00组:现场总线适配器A						
C00.72	PZD输入7数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4048
C00.73	PZD输入8数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4049
C00.74	PZD输入9数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x404a
C00.75	PZD输入10数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x404b
C00.76	PZD输入11数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x404c
C00.77	PZD输入12数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x404d
C00.78	PZD输入13数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x404e
C00.79	PZD输入14数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x404f
C00.80	PZD输入15数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4050
C00.81	PZD输入16数据显示	0~0xFFFF	0x00	0x00	0xFFFF	0x4051

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C02组:Modbus通讯设置						
C02.00	Modbus波特率	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps 6:57600bps 7:115200bps	7	0	7	0x4200
C02.01	Modbus数据格式	0:偶校验（8-E-1） 1:奇校验（8-O-1） 2:无校验（8-N-2） 3:无校验（8-N-1）	3	0	3	0x4201
C02.02	Modbus本机地址	1~255	1	1	255	0x4202
C02.03	Modbus应答延迟	0~20ms	0	0	20	0x4203
C02.04	Modbus通讯超时	0:无效， 0.1s~60.0s	0.0	0.0	60.0	0x4204
C02.05	Modbus通讯基值	0~65535	1000	0	65535	0x4205
C02.06	Modbus通讯设定值单位选择	0:百分比 1:频率	0	0	1	0x4206

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C03组:PROFINET通讯设置						
C03.00	报文类型	0:报文无效 1:标准报文1,PZD-2/2 2:西门子报文352,PZD-6/6 3:博能自由报文,PZD-4/4 4:博能自由报文,PZD-8/8 5:博能自由报文,PZD-12/12 6:博能自由报文,PZD-16/16	0	0	6	0x4300
C03.01	通信状态	0:未建立通信 1:AR建立 2:过程数据通信 3:烧录中 4:AR建立错误 5:正在恢复通信参数	0	0	5	0x4301
C03.03	诊断信息有效	0:无效 1:有效	1	0	1	0x4303
C03.04	软件版本号	0~65535	0	0	65535	0x4304
C03.05	通信错误代码	0~65535	0	0	100	0x4305
C03.06	通信周期	0~512	0	0	512	0x4306
C03.07	SendClock	0~512	0	0	512	0x4307
C03.08	RedRatio	0~512	0	0	512	0x4308
C03.10	特殊功能选择	0:无效 1:烧录模式 2:通信参数恢复出厂	0	0	2	0x430a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
C03组:PROFINET通讯设置						
C03.13	1和352报文模式	0:标准报文 1:自定义报文	0	0	1	0x430d
C03.17	实际IP地址1	0~255	0	0	255	0x4311
C03.18	实际IP地址2	0~255	0	0	255	0x4312
C03.19	实际IP地址3	0~255	0	0	255	0x4313
C03.20	实际IP地址4	0~255	0	0	255	0x4314
C03.21	实际子网掩码1	0~255	0	0	255	0x4315
C03.22	实际子网掩码2	0~255	0	0	255	0x4316
C03.23	实际子网掩码3	0~255	0	0	255	0x4317
C03.24	实际子网掩码4	0~255	0	0	255	0x4318
C03.25	实际网关地址1	0~255	0	0	255	0x4319
C03.26	实际网关地址2	0~255	0	0	255	0x431a
C03.27	实际网关地址3	0~255	0	0	255	0x431b
C03.28	实际网关地址4	0~255	0	0	255	0x431c
C03.29	实际MAC地址1	0~65535	0x00	0x00	0xFFFF	0x431d
C03.30	实际MAC地址2	0~65535	0x00	0x00	0xFFFF	0x431e
C03.31	实际MAC地址3	0~65535	0x00	0x00	0xFFFF	0x431f
C03.36	1和352速度基值	0~65535	16384	0	65535	0x4324

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
D00组:马达0基本参数						
D00.00	马达类型选择	0:感应马达 1:永磁同步马达	0	0	1	0x5000
D00.01	马达额定功率	0.00~655.35 kW	1.50	0.00	655.35	0x5001
D00.02	马达额定电压	0~1500V	380	0	1500	0x5002
D00.03	马达额定电流	0.00~655.35A	3.72	0.00	655.35	0x5003
D00.04	马达额定频率	0.0~600.00Hz	50.00	0.00	600.00	0x5004
D00.05	马达额定转速	0~65535rpm	1390	0	65535	0x5005
D00.06	马达最大转速	0.0%~600.0%额定转速	100.0	D00.07	300.0	0x5006
D00.07	马达最小转速	0.0%~600.0%额定转速	0.0	0.0	D00.06	0x5007
D00.09	马达极对数	0:自动计算 1~64:手动设定	2	1	64	0x5009
D00.16	马达控制方式	0:VF 1:SVC 2:FVC	0	0	2	0x5010

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
D01组:马达0辨识参数						
D01.00	异步马达定子电阻	0.000~65.535 ohm	5.050	0.000	65.535	0x5100
D01.01	异步马达转子电阻	0.000~65.535 ohm	2.954	0.000	65.535	0x5101
D01.02	异步马达漏感抗	0.000~655.35 mH	24.78	0.00	655.35	0x5102
D01.03	异步马达互感抗	0.00~6553.5 mH	284.9	0.0	6553.5	0x5103
D01.04	异步马达空载电流	0.0~655.35A	2.45	0.00	655.35	0x5104
D01.10	同步马达定子电阻	0.000~65.535 ohm	1.667	0.000	65.535	0x510a
D01.11	同步马达D轴电感	0.00~655.35 mH	20.00	0.00	655.35	0x510b
D01.12	同步马达Q轴电感	0.00~655.35 mH	20.00	0.00	655.35	0x510c
D01.13	同步马达反电动势	0.0~6553.5V	300	0	65535	0x510d
D02组:马达0编码器参数						
D02.00	编码器类型	0:无效类型 1:普通ABZ编码器	1	0	1	0x5200
D02.01	输入AB相序	0:正向 1:反向	0	0	1	0x5201
D02.05	编码器分辨率（脉冲数/转数）	0~65535	1024	0	65535	0x5205
D02.13	速度反馈PG断线检测时间	0~5000ms	500	0	5000	0x520d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
D03组:马达1基本参数						
D03.00	马达类型选择	0:感应马达 1:永磁同步马达	0	0	1	0x5300
D03.01	马达额定功率	0.00~655.35 kW	1.50	0.00	655.35	0x5301
D03.02	马达额定电压	0~1500V	380	0	1500	0x5302
D03.03	马达额定电流	0.0~6553.5A	3.72	0.00	655.35	0x5303
D03.04	马达额定频率	0.0~600.00Hz	50.00	0.00	600.00	0x5304
D03.05	马达额定转速	0~65535rpm	1390	0	65535	0x5305
D03.06	马达最大转速	0.0%~600.0%额定转速	100.0	D03.07	300.0	0x5306
D03.07	马达最小转速	0.0%~600.0%额定转速	0.0	0.0	D03.06	0x5307
D03.09	马达极对数	0:自动计算 1~64:手动设定	2	1	64	0x5309
D03.16	马达控制方式	0:VF 1:SVC 2:FVC	0	0	2	0x5310

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
D04组:马达1辨识参数						
D04.00	异步马达定子电阻	0.000~65.535 ohm	5.050	0.000	65.535	0x5400
D04.01	异步马达转子电阻	0.000~65.535 ohm	2.954	0.000	65.535	0x5401
D04.02	异步马达漏感抗	0.000~655.35 mH	24.78	0.00	655.35	0x5402
D04.03	异步马达互感抗	0.00~6553.5 mH	284.9	0.0	6553.5	0x5403
D04.04	异步马达空载电流	0.0~655.35A	2.45	0.00	655.35	0x5404
D04.10	同步马达定子电阻	0.000~65.535 ohm	1.667	0.000	65.535	0x540a
D04.11	同步马达D轴电感	0.00~655.35 mH	20.00	0.00	655.35	0x540b
D04.12	同步马达Q轴电感	0.00~655.35 mH	20.00	0.00	655.35	0x540c
D04.13	同步马达反电动势	0.0~6553.5V	300	0	65535	0x540d
D05组:马达1编码器参数						
D05.00	编码器类型	0:无效类型 1:普通ABZ编码器	1	0	1	0x5500
D05.01	输入AB相序	0:正向 1:反向	0	0	1	0x5501
D05.05	编码器分辨率（脉冲数/转数）	0~65535	1024	0	65535	0x5505
D05.13	速度反馈PG断线检测时间	0~5000ms	500	0	5000	0x550d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.00	外部故障1来源	0:无效 1:预留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x6000
E00.01	外部故障2来源	0:无效 1:预留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x6001
E00.02	外部警告1来源	0:无效 1:预留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x6002

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.03	外部警告2来源	0:无效 1:预留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x6003
E00.10	故障自动复位功能	0:无效 1:有效	0	0	1	0x600a
E00.11	故障自复位次数重置时间	0.0~3600.0s	180.0	0.0	3600.0	0x600b
E00.12	故障自复位间隔时间	0.0~600.0s	30.0	0.0	600.0	0x600c
E00.13	故障自复位最大允许次数	0~5	5	0	5	0x600d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.14	不可自复位异常码1	0:无效 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障	0	0	65535	0x600e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.14	不可自复位异常码1	23:整流桥过热 24:STO故障 25:性能预留 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常	0	0	65535	0x600e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.14	不可自复位异常码1	48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x600e
E00.15	不可自复位异常码2	0:无效 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常	0	0	65535	0x600f

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.15	不可自复位异常码2	20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:性能预留 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常	0	0	65535	0x600f

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.15	不可自复位异常码2	45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x600f
E00.23	自动复位后重启功能	0:无效 1:有效	0	0	1	0x6017
E00.25	允许重启的异常码1	0:无效 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警	0	0	65535	0x6019

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.25	允许重启的异常码1	16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大	0	0	65535	0x6019

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.25	允许重启的异常码1	39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6019
E00.26	允许重启的异常码2	0:无效 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障	0	0	65535	0x601a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.26	允许重启的异常码2	13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常	0	0	65535	0x601a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.26	允许重启的异常码2	36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x601a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.36	异常1动作级别对应的异常码	0:无效 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障	0	0	65535	0x6024

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.36	异常1动作级别对应的异常码	23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常	0	0	65535	0x6024

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.36	异常1动作级别对应的异常码	48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6024
E00.37	异常1动作级别配置	0:自由停机(OFF2) 1:紧急停机(OFF3) 2:OFF1方式停机 3:警告(不停机) 4:无响应	0	0	4	0x6025
E00.38	异常2动作级别对应的异常码	0:无效 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警	0	0	65535	0x6026

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.38	异常2动作级别对应的异常码	16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大	0	0	65535	0x6026

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E00组:故障处理配置						
E00.38	异常2动作级别对应的异常码	39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6026
E00.39	异常2动作级别配置	0:自由停机(OFF2) 1:紧急停机(OFF3) 2:OFF1方式停机 3:警告(不停机) 4:无响应	0	0	4	0x6027

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E01组:最新故障及故障数据记录						
E01.00	故障码1	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障	0	0	65535	0x6100

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E01组:最新故障及故障数据记录						
E01.00	故障码1	23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常	0	0	65535	0x6100

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E01组:最新故障及故障数据记录						
E01.00	故障码1	48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6100
E01.01	故障码1子码	1~16	0	0	16	0x6101
E01.02	故障码2	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障	0	0	65535	0x6102

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E01组:最新故障及故障数据记录						
E01.02	故障码2	19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告	0	0	65535	0x6102

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E01组:最新故障及故障数据记录						
E01.02	故障码2	43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6102
E01.03	故障码2子码	1~16	0	0	16	0x6103
E01.10	故障温度	0-65535	0	0	65535	0x610a
E01.11	故障PM控制字	0~65535	0x00	0x00	0xFFFF	0x610b
E01.12	故障速度	-300.00~300.00Hz	0.00	-300.00	300.00	0x610c
E01.13	故障电流	0.0~655.35A	0.00	0.00	655.35	0x610d
E01.14	故障母线电压	0.0~800.0V	0.0	0.0	800.0	0x610e
E01.15	故障时给定速度	-300.0%~300.0%	0.00	-30.00	30.00	0x610f
E01.18	故障前运行时间-时	0~65535	0	0	65535	0x6112
E01.19	故障前运行时间-秒	0~65535	0	0	60	0x6113

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E01组:最新故障及故障数据记录						
E01.20	故障前累计运行时间-时	0~65535	0	0	65535	0x6114
E01.21	故障前累计运行时间-秒	0~65535	0	0	60	0x6115
E01.22	故障输出电压	0~6553.5V	0	0	65535	0x6116
E02组:前一次故障及故障数据记录						
E02.00	故障码1	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障	0	0	65535	0x6200

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E02组:前一次故障及故障数据记录						
E02.00	故障码1	19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败	0	0	65535	0x6200

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E02组:前一次故障及故障数据记录						
E02.00	故障码1	44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6200
E02.01	故障码1子码	1~16	0	0	16	0x6201
E02.02	故障码2	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常	0	0	65535	0x6202

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E02组:前一次故障及故障数据记录						
E02.02	故障码2	15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限	0	0	65535	0x6202

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E02组:前一次故障及故障数据记录						
E02.02	故障码2	38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6202
E02.03	故障码2子码	1~16	0	0	16	0x6203
E02.10	故障温度	0-65535	0	0	65535	0x620a
E02.11	故障PM控制字	0~65535	0x00	0x00	0x10	0x620b
E02.12	故障速度	-300.00~300.00Hz	0.00	-300.00	300.00	0x620c
E02.13	故障电流	0.0~655.35A	0.00	0.00	655.35	0x620d
E02.14	故障母线电压	0.0~800.0V	0.0	0.0	800.0	0x620e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E02组:前一次故障及故障数据记录						
E02.15	故障时给定速度	-300.0%~300.0%	0.00	-30.00	30.00	0x620f
E02.18	故障前运行时间-时	0~65535	0	0	65535	0x6212
E02.19	故障前运行时间-秒	0~65535	0	0	60	0x6213
E02.20	故障前累计运行时间-时	0~65535	0	0	65535	0x6214
E02.21	故障前累计运行时间-秒	0~65535	0	0	60	0x6215
E02.22	故障输出电压	0~65535V	0	0	65535	0x6216
E03组:前两次故障及故障数据记录						
E03.00	故障码1	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障	0	0	65535	0x6300

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E03组:前两次故障及故障数据记录						
E03.00	故障码1	14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常	0	0	65535	0x6300

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E03组:前两次故障及故障数据记录						
E03.00	故障码1	37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6300
E03.01	故障码1子码	1~16	0	0	16	0x6301

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E03组:前两次故障及故障数据记录						
E03.02	故障码2	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障	0	0	65535	0x6302

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E03组:前两次故障及故障数据记录						
E03.02	故障码2	23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常	0	0	65535	0x6302

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E03组:前两次故障及故障数据记录						
E03.02	故障码2	47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6302
E03.03	故障码2子码	1~16	0	0	16	0x6303
E03.10	故障温度	0-65535	0	0	65535	0x630a
E03.11	故障PM控制字	0~65535	0x00	0x00	0xFFFF	0x630b
E03.12	故障速度	-300.00~300.00Hz	0.00	-300.00	300.00	0x630c
E03.13	故障电流	0.0~655.35A	0.00	0.00	655.35	0x630d
E03.14	故障母线电压	0.0~800.0V	0.0	0.0	800.0	0x630e
E03.15	故障时给定速度	-300.0%~300.0%	0.00	-30.00	30.00	0x630f
E03.18	故障前运行时间-时	0~65535	0	0	65535	0x6312
E03.19	故障前运行时间-秒	0~65535	0	0	60	0x6313
E03.20	故障前累计运行时间-时	0~65535	0	0	65535	0x6314
E03.21	故障前累计运行时间-秒	0~65535	0	0	60	0x6315
E03.22	故障输出电压	0~65535V	0	0	65535	0x6316

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E04组:前三次故障及故障数据记录						
E04.00	故障码1	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障	0	0	65535	0x6400

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E04组:前三次故障及故障数据记录						
E04.00	故障码1	23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常	0	0	65535	0x6400

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E04组:前三次故障及故障数据记录						
E04.00	故障码1	47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6400
E04.01	故障码1子码	1~16	0	0	16	0x6401
E04.02	故障码2	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障	0	0	65535	0x6402

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E04组:前三次故障及故障数据记录						
E04.02	故障码2	18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障	0	0	65535	0x6402

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E04组:前三次故障及故障数据记录						
E04.02	故障码2	42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6402
E04.03	故障码2子码	1~16	0	0	16	0x6403
E04.10	故障温度	0-65535	0	0	65535	0x640a
E04.11	故障PM控制字	0~65535	0x00	0x00	0xFFFF	0x640b
E04.12	故障速度	-300.00~300.00Hz	0.00	-300.00	300.00	0x640c
E04.13	故障电流	0.0~655.35A	0.00	0.00	655.35	0x640d
E04.14	故障母线电压	0.0~800.0V	0.0	0.0	800.0	0x640e
E04.15	故障时给定速度	-300.0%~300.0%	0.00	-30.00	30.00	0x640f
E04.18	故障前运行时间-时	0~65535	0	0	65535	0x6412

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E04组:前三次故障及故障数据记录						
E04.19	故障前运行时间-秒	0~65535	0	0	60	0x6413
E04.20	故障前累计运行时间-时	0~65535	0	0	65535	0x6414
E04.21	故障前累计运行时间-秒	0~65535	0	0	60	0x6415
E04.22	故障输出电压	0~65535V	0	0	65535	0x6416
E05组:前四次故障及故障数据记录						
E05.00	故障码1	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误	0	0	65535	0x6500

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E05组:前四次故障及故障数据记录						
E05.00	故障码1	17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电	0	0	65535	0x6500

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E05组:前四次故障及故障数据记录						
E05.00	故障码1	40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6500
E05.01	故障码1子码	1~16	0	0	16	0x6501
E05.02	故障码2	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误	0	0	65535	0x6502

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E05组:前四次故障及故障数据记录						
E05.02	故障码2	12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载	0	0	65535	0x6502

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E05组:前四次故障及故障数据记录						
E05.02	故障码2	34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6502
E05.03	故障码2子码	1~16	0	0	16	0x6503
E05.10	故障温度	0-65535	0	0	65535	0x650a
E05.11	故障PM控制字	0~65535	0x00	0x00	0xFFFF	0x650b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E05组:前四次故障及故障数据记录						
E05.12	故障速度	-300.00~300.00Hz	0.00	-300.00	300.00	0x650c
E05.13	故障电流	0.0~655.35A	0.00	0.00	655.35	0x650d
E05.14	故障母线电压	0.0~800.0V	0.0	0.0	800.0	0x650e
E05.15	故障时给定速度	-300.0%~300.0%	0.00	-30.00	30.00	0x650f
E05.18	故障前运行时间-时	0~65535	0	0	65535	0x6512
E05.19	故障前运行时间-秒	0~65535	0	0	60	0x6513
E05.20	故障前累计运行时间-时	0~65535	0	0	65535	0x6514
E05.21	故障前累计运行时间-秒	0~65535	0	0	60	0x6515
E05.22	故障输出电压	0~65535V	0	0	65535	0x6516

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E06组:前五次故障及故障数据记录						
E06.00	故障码1	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障	0	0	65535	0x6600

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E06组:前五次故障及故障数据记录						
E06.00	故障码1	23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常	0	0	65535	0x6600

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E06组:前五次故障及故障数据记录						
E06.00	故障码1	47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6600
E06.01	故障码1子码	1~16	0	0	16	0x6601
E06.02	故障码2	0:无故障 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障	0	0	65535	0x6602

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E06组:前五次故障及故障数据记录						
E06.02	故障码2	18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失	0	0	65535	0x6602

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E06组:前五次故障及故障数据记录						
E06.02	故障码2	41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6602
E06.03	故障码2子码	1~16	0	0	16	0x6603
E06.10	故障温度	0-65535	0	0	65535	0x660a
E06.11	故障PM控制字	0~65535	0x00	0x00	0xFFFF	0x660b
E06.12	故障速度	-300.00~300.00Hz	0.00	-300.00	300.00	0x660c
E06.13	故障电流	0.0~655.35A	0.00	0.00	655.35	0x660d
E06.14	故障母线电压	0.0~800.0V	0.0	0.0	800.0	0x660e
E06.15	故障时给定速度	-300.0%~300.0%	0.00	-30.00	30.00	0x660f
E06.18	故障前运行时间-时	0~65535	0	0	65535	0x6612

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E06组:前五次故障及故障数据记录						
E06.19	故障前运行时间-秒	0~65535	0	0	60	0x6613
E06.20	故障前累计运行时间-时	0~65535	0	0	65535	0x6614
E06.21	故障前累计运行时间-秒	0~65535	0	0	60	0x6615
E06.22	故障输出电压	0~65535V	0	0	65535	0x6616
E07组:最新警告异常码记录						
E07.00	警告码1	0:无警告 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误 12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误	0	0	65535	0x6700

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E07组:最新警告异常码记录						
E07.00	警告码1	17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载 34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电	0	0	65535	0x6700

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E07组:最新警告异常码记录						
E07.00	警告码1	40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6700
E07.01	警告码1子码	1~16	0	0	16	0x6701
E07.02	警告码2	0:无警告 1:过流 2:直流过压 3:直流欠压 4:速度搜索失败 5:驱动器过载 6:马达过载 7:输入缺相 8:输出缺相 9:变频器过温 10:PWM发波异常 11:电流零漂错误	0	0	65535	0x6702

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E07组:最新警告异常码记录						
E07.02	警告码2	12:对地短路故障 13:马达调谐故障 14:编码器异常 15:矢量失速报警 16:FPGA读写错误 17:驱动电源故障 18:一级电源故障 19:CM与PM通信异常 20:PM-EEPROM故障 21:PM机型设置错误 22:逐波限流故障 23:整流桥过热 24:STO故障 25:制动管过热 26:性能预留 27:性能预留 28:性能预留 29:性能预留 30:性能预留 31:性能预留 32:性能预留 33:驱动器预过载	0	0	65535	0x6702

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
E07组:最新警告异常码记录						
E07.02	警告码2	34:马达预过载 35:通信异常 36:参数设置异常 37:马达速度超限 38:马达速度偏差大 39:重新上电 40:PID反馈丢失 41:外部故障 42:外部警告 43:预驱动失败 44:CM芯片识别异常 45:抱闸控制异常 46:控制板电压异常 47:马达温度异常 48:马达温度警告 49:预留 50:电容侧风扇故障 51:ROM故障	0	0	65535	0x6702
E07.03	警告码2子码	1~16	0	0	16	0x6703

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F00组:逻辑运算模块						
F00.00	与模块A输入1	1:无效 其它:二进制互联参数	0	0	0	0x7000
F00.01	与模块A输入2	1:无效 其它:二进制互联参数	0	0	0	0x7001
F00.05	与模块B输入1	1:无效 其它:二进制互联参数	0	0	0	0x7005
F00.06	与模块B输入2	1:无效 其它:二进制互联参数	0	0	0	0x7006
F00.10	与模块C输入1	1:无效 其它:二进制互联参数	0	0	0	0x700a
F00.11	与模块C输入2	1:无效 其它:二进制互联参数	0	0	0	0x700b
F00.15	与模块D输入1	1:无效 其它:二进制互联参数	0	0	0	0x700f
F00.16	与模块D输入2	1:无效 其它:二进制互联参数	0	0	0	0x7010
F00.20	非模块A输入	0:无效 其它:二进制互联参数	0	0	0	0x7014
F00.22	非模块B输入	0:无效 其它:二进制互联参数	0	0	0	0x7016
F00.24	非模块C输入	0:无效 其它:二进制互联参数	0	0	0	0x7018
F00.26	非模块D输入	0:无效 其它:二进制互联参数	0	0	0	0x701a
F00.36	或模块A输入1	0:无效 其它:二进制互联参数	0	0	0	0x7024

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F00组:逻辑运算模块						
F00.37	或模块A输入2	0:无效 其它:二进制互联参数	0	0	0	0x7025
F00.41	或模块B输入1	0:无效 其它:二进制互联参数	0	0	0	0x7029
F00.42	或模块B输入2	0:无效 其它:二进制互联参数	0	0	0	0x702a
F00.46	或模块C输入1	0:无效 其它:二进制互联参数	0	0	0	0x702e
F00.47	或模块C输入2	0:无效 其它:二进制互联参数	0	0	0	0x702f
F00.51	或模块D输入1	0:无效 其它:二进制互联参数	0	0	0	0x7033
F00.52	或模块D输入2	0:无效 其它:二进制互联参数	0	0	0	0x7034
F00.56	异或模块A输入1	0:无效 其它:二进制互联参数	0	0	0	0x7038
F00.57	异或模块A输入2	0:无效 其它:二进制互联参数	0	0	0	0x7039
F00.76	延时模块A输入	0:无效 其它:二进制互联参数	0	0	0	0x704c
F00.77	延时模块A功能选择	0:开通延时 1:关断延时 2:双向延时	0	0	2	0x704d
F00.78	延时模块A延迟时间	0~10000ms	0	0	10000	0x704e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F00组:逻辑运算模块						
F00.79	延时模块B输入	0:无效 其它:二进制互联参数	0	0	0	0x704f
F00.80	延时模块B功能选择	0:开通延时 1:关断延时 2:双向延时	0	0	2	0x7050
F00.81	延时模块B延迟时间	0~10000ms	0	0	10000	0x7051
F00.82	延时模块C输入	0:无效 其它:二进制互联参数	0	0	0	0x7052
F00.83	延时模块C功能选择	0:开通延时 1:关断延时 2:双向延时	0	0	2	0x7053
F00.84	延时模块C延迟时间	0~10000ms	0	0	10000	0x7054
F00.85	延时模块D输入	0:无效 其它:二进制互联参数	0	0	0	0x7055
F00.86	延时模块D功能选择	0:开通延时 1:关断延时 2:双向延时	0	0	2	0x7056
F00.87	延时模块D延迟时间	0~10000ms	0	0	10000	0x7057

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F01组:算术运算模块						
F01.00	加法模块A输入1	0:0 其它:模拟量互联参数	0	0	0	0x7100
F01.01	加法模块A输入2	0:0 其它:模拟量互联参数	0	0	0	0x7101
F01.05	加法模块B输入1	0:0 其它:模拟量互联参数	0	0	0	0x7105
F01.06	加法模块B输入2	0:0 其它:模拟量互联参数	0	0	0	0x7106
F01.10	加法模块C输入1	0:0 其它:模拟量互联参数	0	0	0	0x710a
F01.11	加法模块C输入2	0:0 其它:模拟量互联参数	0	0	0	0x710b
F01.15	减法模块A输入1	0:0 其它:模拟量互联参数	0	0	0	0x710f
F01.16	减法模块A输入2	0:0 其它:模拟量互联参数	0	0	0	0x7110
F01.18	减法模块B输入1	0:0 其它:模拟量互联参数	0	0	0	0x7112
F01.19	减法模块B输入2	0:0 其它:模拟量互联参数	0	0	0	0x7113
F01.21	乘法模块A输入1	1:1 其它:模拟量互联参数	0	0	0	0x7115
F01.22	乘法模块A输入2	1:1 其它:模拟量互联参数	0	0	0	0x7116

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F01组:算术运算模块						
F01.26	乘法模块B输入1	1:1 其它:模拟量互联参数	0	0	0	0x711a
F01.27	乘法模块B输入2	1:1 其它:模拟量互联参数	0	0	0	0x711b
F01.31	除法模块A除数输入	1:1 其它:模拟量互联参数	0	0	0	0x711f
F01.32	除法模块A被除数输入	1:1 其它:模拟量互联参数	0	0	0	0x7120
F01.34	除法模块B除数输入	1:1 其它:模拟量互联参数	0	0	0	0x7122
F01.35	除法模块B被除数输入	1:1 其它:模拟量互联参数	0	0	0	0x7123
F01.37	绝对值模块A输入	0:0 其它:模拟量互联参数	0	0	0	0x7125
F01.39	绝对值模块B输入	0:0 其它:模拟量互联参数	0	0	0	0x7127
F01.41	比较模块A输入1	0:0 其它:模拟量互联参数	0	0	0	0x7129
F01.42	比较模块A输入2	0:0 其它:模拟量互联参数	0	0	0	0x712a
F01.44	比较模块B输入1	0:0 其它:模拟量互联参数	0	0	0	0x712c
F01.45	比较模块B输入2	0:0 其它:模拟量互联参数	0	0	0	0x712d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F01组:算术运算模块						
F01.55	一阶低通滤波模块A输入	0:0 其它:模拟量互联参数	0	0	0	0x7137
F01.56	一阶低通滤波模块A滤波时间	0~20000ms	0	0	20000	0x7138
F01.58	一阶低通滤波模块B输入	0:0 其它:模拟量互联参数	0	0	0	0x713a
F01.59	一阶低通滤波模块B滤波时间	0~20000ms	0	0	20000	0x713b
F01.61	数据选择器A命令来源1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x713d
F01.62	数据选择器A命令来源2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x713e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F01组:算术运算模块						
F01.63	数据选择器A数据来源1	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	0	0	10	0x713f
F01.64	数据选择器A数据来源2	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	0	0	10	0x7140

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F01组:算术运算模块						
F01.65	数据选择器A数据来源3	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	0	0	10	0x7141
F01.66	数据选择器A数据来源4	0:0 1:多段设定值1 2:预留 3:预留 4:预留 5:预留 6:多段值给定 7:电动电位计 8:预留 9:预留 10:预留 其它:模拟量互联参数	0	0	10	0x7142
F01.73	比较模块C输入1	0:0 其它:模拟量互联参数	0	0	0	0x7149
F01.74	比较模块C输入2	0:0 其它:模拟量互联参数	0	0	0	0x714a
F01.76	比较模块D输入1	0:0 其它:模拟量互联参数	0	0	0	0x714c

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F01组:算术运算模块						
F01.77	比较模块D输入2	0:0 其它:模拟量互联参数	0	0	0	0x714d
F01.81	自定义数据输入1	0	0	-32768	32767	0x7151
F01.82	自定义数据输入2	0	0	-32768	32767	0x7152
F01.83	自定义数据输入3	0	0	-32768	32767	0x7153
F01.84	自定义数据输入4	0	0	-32768	32767	0x7154
F02组:字位转换模块						
F02.00	字转位功能A输入选择	0:0 其它:模拟量互联参数	0	0	0	0x7200
F02.02	字转位功能B输入选择	0:0 其它:模拟量互联参数	0	0	0	0x7202
F02.08	位转字功能A-Bit00选择	0:0 其它:二进制互联参数	0	0	0	0x7208
F02.09	位转字功能A-Bit01选择	0:0 其它:二进制互联参数	0	0	0	0x7209
F02.10	位转字功能A-Bit02选择	0:0 其它:二进制互联参数	0	0	0	0x720a
F02.11	位转字功能A-Bit03选择	0:0 其它:二进制互联参数	0	0	0	0x720b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F02组:字位转换模块						
F02.12	位转字功能A-Bit04选择	0:0 其它:二进制互联参数	0	0	0	0x720c
F02.13	位转字功能A-Bit05选择	0:0 其它:二进制互联参数	0	0	0	0x720d
F02.14	位转字功能A-Bit06选择	0:0 其它:二进制互联参数	0	0	0	0x720e
F02.15	位转字功能A-Bit07选择	0:0 其它:二进制互联参数	0	0	0	0x720f
F02.16	位转字功能A-Bit08选择	0:0 其它:二进制互联参数	0	0	0	0x7210
F02.17	位转字功能A-Bit09选择	0:0 其它:二进制互联参数	0	0	0	0x7211
F02.18	位转字功能A-Bit10选择	0:0 其它:二进制互联参数	0	0	0	0x7212
F02.19	位转字功能A-Bit11选择	0:0 其它:二进制互联参数	0	0	0	0x7213
F02.20	位转字功能A-Bit12选择	0:0 其它:二进制互联参数	0	0	0	0x7214

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F02组:字位转换模块						
F02.21	位转字功能A-Bit13选择	0:0 其它:二进制互联参数	0	0	0	0x7215
F02.22	位转字功能A-Bit14选择	0:0 其它:二进制互联参数	0	0	0	0x7216
F02.23	位转字功能A-Bit15选择	0:0 其它:二进制互联参数	0	0	0	0x7217
F02.25	位转字功能B-Bit00选择	0:0 其它:二进制互联参数	0	0	0	0x7219
F02.26	位转字功能B-Bit01选择	0:0 其它:二进制互联参数	0	0	0	0x721a
F02.27	位转字功能B-Bit02选择	0:0 其它:二进制互联参数	0	0	0	0x721b
F02.28	位转字功能B-Bit03选择	0:0 其它:二进制互联参数	0	0	0	0x721c
F02.29	位转字功能B-Bit04选择	0:0 其它:二进制互联参数	0	0	0	0x721d
F02.30	位转字功能B-Bit05选择	0:0 其它:二进制互联参数	0	0	0	0x721e

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F02组:字位转换模块						
F02.31	位转字功能B-Bit06选择	0:0 其它:二进制互联参数	0	0	0	0x721f
F02.32	位转字功能B-Bit07选择	0:0 其它:二进制互联参数	0	0	0	0x7220
F02.33	位转字功能B-Bit08选择	0:0 其它:二进制互联参数	0	0	0	0x7221
F02.34	位转字功能B-Bit09选择	0:0 其它:二进制互联参数	0	0	0	0x7222
F02.35	位转字功能B-Bit10选择	0:0 其它:二进制互联参数	0	0	0	0x7223
F02.36	位转字功能B-Bit11选择	0:0 其它:二进制互联参数	0	0	0	0x7224
F02.37	位转字功能B-Bit12择选	0:0 其它:二进制互联参数	0	0	0	0x7225
F02.38	位转字功能B-Bit13择选	0:0 其它:二进制互联参数	0	0	0	0x7226
F02.39	位转字功能B-Bit14择选	0:0 其它:二进制互联参数	0	0	0	0x7227
F02.40	位转字功能B-Bit15择选	0:0 其它:二进制互联参数	0	0	0	0x7228

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F04组:抱闸控制						
F04.00	抱闸功能选择	0:无抱闸 1:有抱闸不带检测信息 2:有抱闸带检测信息	0	0	2	0x7400
F04.05	抱闸打开比较阈值	0.0~200.0%	4.0	0.0	200.0	0x7405
F04.06	抱闸打开延迟时间	0.00~10.00s	0.00	0.00	10.00	0x7406
F04.07	抱闸闭合转速阈值	1.0~200.0%	4.0	1.0	200.0	0x7407
F04.08	抱闸闭合延迟时间	0.00~10.00s	0.50	0.00	10.00	0x7408
F04.10	抱闸打开反馈点来源	0:无效 1:保留 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:预留 9:预留 10:预留 其它:二进制互联参数	0	0	10	0x740a
F04.13	抱闸打开马达电流比较阈值	0.0~200.0%	50.0	0.0	200.0	0x740d
F04.16	抱闸打开机械动作时间	0.00~10.00S	0.50	0.00	10.00	0x7410
F04.17	抱闸闭合机械动作时间	0.00~10.00S	0.50	0.00	10.00	0x7411
F04.18	再启动抱闸控制	0:抱闸不动作 1:抱闸动作	1	0	1	0x7412
F04.19	再启动等待时间	0.00~10.00s	0.50	0.00	10.00	0x7413

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F08组:起升控制模块						
F08.00	防摇摆功能使能	0:禁止 1:允许 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:预留 其它:二进制互联参数	0	0	10	0x7800
F08.01	自动防摇摆功能使能	0:禁止自动防摇摆功能 1:允许自动防摇摆功能	0	0	1	0x7801
F08.02	自动防摇摆最大摆长	0.10m~100.00m	100.00	0.10	100.00	0x7802
F08.03	自动防摇摆最小摆长	0.10m~100.00m	0.10	0.10	100.00	0x7803
F08.04	允许防摇摆最小转速	0.0%~100.0%	0.0	0.0	100.0	0x7804
F08.06	防摇摆斜坡时间	0.0s~1000.0s	3.0	0.0	1000.0	0x7806
F08.07	防摇调整速度差值	0	20.0	0.0	100.0	0x7807
F08.08	目标频率变化滤波时间	0	0.00	0.00	10.00	0x7808

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F08组:起升控制模块						
F08.17	提升摆长来源选择	0:设定值有效(F08.18) 1:保留 2:保留 3:保留 4:保留 5:保留 6:保留 7:保留 8:保留 9:保留 10:保留 其它:模拟量互联参数	0	0	10	0x7811
F08.18	摆长设定值	1.00m~90.00m	9.00	1.00	90.00	0x7812
F08.19	摆长偏移值	0.00m~10.00m	0.00	0.00	10.00	0x7813
F08.20	提升最大摆长	1.00m~100.00m	100.00	1.00	100.00	0x7814
F08.21	实际摆长	1.00m~100.00m	1.00	1.00	100.00	0x7815
F08.22	摇摆周期	0.0s~20.0s	0.0	0.0	20.0	0x7816
F08.25	摆长计数复位使能	0:禁止 1:允许	0	0	1	0x7819
F08.26	摆长比例系数	0.1mm~6000.0mm	0.30	0.01	600.00	0x781a
F08.27	提升编码器计数高	0~65535	0	0	65535	0x781b
F08.28	提升编码器计数低	0~65535	0	0	65535	0x781c
F08.29	提升反馈脉冲反向	0:禁止 1:允许	0	0	1	0x781d
F08.50	平稳起升功能使能	0:无效 1:有效	0	0	1	0x7832
F08.51	松绳转矩	0.0~100.0	25.0	0.0	100.0	0x7833

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F08组:起升控制模块						
F08.52	松绳检测时间	0.00~100.00	0.80	0.00	100.00	0x7834
F08.53	加载转矩增加值	0.0~100.0	10.0	0.0	100.0	0x7835
F08.54	加载检测时间	0~10.00	0.10	0.00	10.00	0x7836
F08.55	加载转矩波动阈值	0.0~100.0	10.0	0.0	100.0	0x7837
F08.56	加载稳定时间	0.00~100.00	0.50	0.00	100.00	0x7838
F08.57	快速减速时间	0.00~100.00	0.50	0.00	100.00	0x7839
F08.58	紧绳维持速度	0.0~100.0	10.0	0.0	100.0	0x783a
F08.59	加载转矩变化率	0.0~100.0	2.0	0.0	100.0	0x783b
F08.61	平稳回转功能使能	0:无效 1:有效	0	0	1	0x783d
F08.62	回转臂长	32.0~100.0m	60.0	32.0	100.0	0x783e
F08.63	加速增益	0.0~100.0	45.0	0.0	100.0	0x783f
F08.64	减速增益	0.0~100.0	45.0	0.0	100.0	0x7840

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P00组:硬件状态（二进制互联）						
P00.00	逻辑0	0	0	0	0	0xe000
P00.01	逻辑1	1	1	1	1	0xe001
P00.02	多功能数字输入DI0	0~1	0	0	1	0xe002
P00.03	多功能数字输入DI1	0~1	0	0	1	0xe003
P00.04	多功能数字输入DI2	0~1	0	0	1	0xe004
P00.05	多功能数字输入DI3	0~1	0	0	1	0xe005
P00.06	多功能数字输入DI4	0~1	0	0	1	0xe006
P00.07	多功能数字输入DI5	0~1	0	0	1	0xe007
P00.23	多功能数字输入DI0取反	0~1	0	0	1	0xe017
P00.24	多功能数字输入DI1取反	0~1	0	0	1	0xe018
P00.25	多功能数字输入DI2取反	0~1	0	0	1	0xe019
P00.26	多功能数字输入DI3取反	0~1	0	0	1	0xe01a
P00.27	多功能数字输入DI4取反	0~1	0	0	1	0xe01b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P00组:硬件状态（二进制互联）						
P00.28	多功能数字输入DI5取反	0~1	0	0	1	0xe01c
P00.50	多功能数字输出DO0	0~1	0	0	1	0xe032
P00.51	多功能数字输出DO1	0~1	0	0	1	0xe033
P00.57	多功能数字输出DO0取反	0~1	0	0	1	0xe039
P00.58	多功能数字输出DO1取反	0~1	0	0	1	0xe03a
P01组:系统控制字与状态（二进制互联）						
P01.00	开机准备好	0~1	0	0	1	0xe100
P01.01	运行准备好	0~1	0	0	1	0xe101
P01.02	运行	0~1	0	0	1	0xe102
P01.03	故障状态	0~1	0	0	1	0xe103
P01.04	输出使能(OFF2)	0~1	0	0	1	0xe104
P01.05	快速停机(OFF3)无效	0~1	0	0	1	0xe105
P01.06	开机封锁	0~1	0	0	1	0xe106
P01.07	警告状态	0~1	0	0	1	0xe107
P01.08	转速输出偏差过大	0~1	0	0	1	0xe108
P01.09	速度到达	0~1	0	0	1	0xe109

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P01组:系统控制字与状态（二进制互联）						
P01.10	转矩/电流达限幅	0~1	0	0	1	0xe10a
P01.11	抱闸打开命令状态	0~1	0	0	1	0xe10b
P01.12	速度正向	0~1	0	0	1	0xe10c
P01.14	点动运行有效	0~1	0	0	1	0xe10e
P01.15	预励磁启动	0~1	0	0	1	0xe10f
P01.16	开启直流制动	0~1	0	0	1	0xe110
P01.18	转矩控制有效	0~1	0	0	1	0xe112
P01.35	预励磁完成	0~1	0	0	1	0xe123
P01.36	直流制动结束	0~1	0	0	1	0xe124
P01.41	RFG输出禁止	0~1	0	0	1	0xe129
P01.42	RFG暂停	0~1	0	0	1	0xe12a
P01.43	RFG输入禁止	0~1	0	0	1	0xe12b
P01.44	RFG加速	0~1	0	0	1	0xe12c
P01.45	RFG减速	0~1	0	0	1	0xe12d
P01.46	RFG恒速	0~1	0	0	1	0xe12e
P01.57	电机超速	0~1	0	0	1	0xe139
P01.58	抱闸已打开	0~1	0	0	1	0xe13a
P01.59	抱闸已闭合	0~1	0	0	1	0xe13b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P01组:系统控制字与状态（二进制互联）						
P01.60	抱闸无法打开	0~1	0	0	1	0xe13c
P01.61	抱闸无法闭合	0~1	0	0	1	0xe13d
P01.62	马达预过载状态	0~1	0	0	1	0xe13e
P01.63	零速给定运行	0~1	0	0	1	0xe13f
P01.64	直流母线带电标志	0~1	0	0	1	0xe140
P01.65	马达速度为零	0~1	0	0	1	0xe141
P01.73	马达过温保护标志	0~1	0	0	1	0xe149
P01.74	马达过温警告标志	0~1	0	0	1	0xe14a
P01.75	马达选择bit0	0~1	0	0	1	0xe14b
P01.76	马达选择bit1	0~1	0	0	1	0xe14c
P01.77	斜坡时间选择1	0~1	0	0	1	0xe14d
P01.78	斜坡时间选择2	0~1	0	0	1	0xe14e
P01.79	多段速给定选择1	0~1	0	0	1	0xe14f
P01.80	多段速给定选择2	0~1	0	0	1	0xe150
P01.81	多段速给定选择3	0~1	0	0	1	0xe151
P01.82	多段速给定选择4	0~1	0	0	1	0xe152
P01.85	RFG运行标志	0~1	0	0	0	0xe155
P01.86	防摇摆使能标志	0~1	0	0	0	0xe156
P01.87	防摇摆速度锁存标志	0~1	0	0	0	0xe157

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P02组:FBA与故障标志（二进制互联）						
P02.00	总线适配器A输入.PZD1.0	0~1	0	0	1	0xe200
P02.01	总线适配器A输入.PZD1.1	0~1	0	0	1	0xe201
P02.02	总线适配器A输入.PZD1.2	0~1	0	0	1	0xe202
P02.03	总线适配器A输入.PZD1.3	0~1	0	0	1	0xe203
P02.04	总线适配器A输入.PZD1.4	0~1	0	0	1	0xe204
P02.05	总线适配器A输入.PZD1.5	0~1	0	0	1	0xe205
P02.06	总线适配器A输入.PZD1.6	0~1	0	0	1	0xe206
P02.07	总线适配器A输入.PZD1.7	0~1	0	0	1	0xe207
P02.08	总线适配器A输入.PZD1.8	0~1	0	0	1	0xe208

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P02组:FBA与故障标志（二进制互联）						
P02.09	总线适配器A输入.PZD1.9	0~1	0	0	1	0xe209
P02.10	总线适配器A输入.PZD1.10	0~1	0	0	1	0xe20a
P02.11	总线适配器A输入.PZD1.11	0~1	0	0	1	0xe20b
P02.12	总线适配器A输入.PZD1.12	0~1	0	0	1	0xe20c
P02.13	总线适配器A输入.PZD1.13	0~1	0	0	1	0xe20d
P02.14	总线适配器A输入.PZD1.14	0~1	0	0	1	0xe20e
P02.15	总线适配器A输入.PZD1.15	0~1	0	0	1	0xe20f
P02.32	Modbus通讯启停命令	0~1	0	0	1	0xe220
P02.33	Modbus通讯点动启停	0~1	0	0	1	0xe221
P02.34	Modbus通讯自由停车	0~1	0	0	1	0xe222

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P02组:FBA与故障标志（二进制互联）						
P02.35	Modbus通讯故障复位	0~1	0	0	1	0xe223
P02.36	Modbus通讯给定速度取反	0~1	0	0	1	0xe224
P03组:逻辑算术模块（二进制互联）						
P03.00	逻辑与模块A输出	0~1	0	0	1	0xe300
P03.01	逻辑与模块B输出	0~1	0	0	1	0xe301
P03.02	逻辑与模块C输出	0~1	0	0	1	0xe302
P03.03	逻辑与模块D输出	0~1	0	0	1	0xe303
P03.04	逻辑非模块A输出	0~1	0	0	1	0xe304
P03.05	逻辑非模块B输出	0~1	0	0	1	0xe305
P03.06	逻辑非模块C输出	0~1	0	0	1	0xe306
P03.07	逻辑非模块D输出	0~1	0	0	1	0xe307
P03.12	逻辑或模块A输出	0~1	0	0	1	0xe30c
P03.13	逻辑或模块B输出	0~1	0	0	1	0xe30d
P03.14	逻辑或模块C输出	0~1	0	0	1	0xe30e
P03.15	逻辑或模块D输出	0~1	0	0	1	0xe30f
P03.16	逻辑异或模块A输出	0~1	0	0	1	0xe310
P03.20	逻辑延时模块A输出	0~1	0	0	1	0xe314

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P03组:逻辑算术模块（二进制互联）						
P03.21	逻辑延时模块B输出	0~1	0	0	1	0xe315
P03.22	逻辑延时模块C输出	0~1	0	0	1	0xe316
P03.23	逻辑延时模块D输出	0~1	0	0	1	0xe317
P03.24	比较模块A大于标志	0~1	0	0	1	0xe318
P03.25	比较模块A等于标志	0~1	0	0	1	0xe319
P03.26	比较模块A小于标志	0~1	0	0	1	0xe31a
P03.27	比较模块B大于标志	0~1	0	0	1	0xe31b
P03.28	比较模块B等于标志	0~1	0	0	1	0xe31c
P03.29	比较模块B小于标志	0~1	0	0	1	0xe31d
P03.30	除法模块A被除数为0	0~1	0	0	1	0xe31e
P03.31	除法模块B被除数为0	0~1	0	0	1	0xe31f
P03.32	绝对值模块A输入量符号	0~1	0	0	1	0xe320

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P03组:逻辑算术模块（二进制互联）						
P03.33	绝对值模块B输入量符号	0~1	0	0	1	0xe321
P03.34	绝对值模块A溢出标志	0~1	0	0	1	0xe322
P03.35	绝对值模块B溢出标志	0~1	0	0	1	0xe323
P03.36	加法模块A溢出标志	0~1	0	0	1	0xe324
P03.37	加法模块B溢出标志	0~1	0	0	1	0xe325
P03.38	加法模块C溢出标志	0~1	0	0	1	0xe326
P03.39	减法模块A溢出标志	0~1	0	0	1	0xe327
P03.40	减法模块B溢出标志	0~1	0	0	1	0xe328
P03.41	乘法模块A溢出标志	0~1	0	0	1	0xe329
P03.42	乘法模块B溢出标志	0~1	0	0	1	0xe32a
P03.43	除法法模块A溢出标志	0~1	0	0	1	0xe32b
P03.44	除法法模块B溢出标志	0	0	0	0	0xe32c

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P03组:逻辑算术模块（二进制互联）						
P03.47	比较模块C大于标志	0	0	0	0	0xe32f
P03.48	比较模块C等于标志	0	0	0	0	0xe330
P03.49	比较模块C小于标志	0	0	0	0	0xe331
P03.50	比较模块D大于标志	0~1	0	0	1	0xe332
P03.51	比较模块D等于标志	0~1	0	0	1	0xe333
P03.52	比较模块D小于标志	0~1	0	0	1	0xe334
P04组:字位转换模块（二进制互联）						
P04.00	字转位功能A输出bit0	0~1	0	0	1	0xe400
P04.01	字转位功能A输出bit1	0~1	0	0	1	0xe401
P04.02	字转位功能A输出bit2	0~1	0	0	1	0xe402
P04.03	字转位功能A输出bit3	0~1	0	0	1	0xe403
P04.04	字转位功能A输出bit4	0~1	0	0	1	0xe404
P04.05	字转位功能A输出bit5	0~1	0	0	1	0xe405

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P04组:字位转换模块（二进制互联）						
P04.06	字转位功能A输出bit6	0~1	0	0	1	0xe406
P04.07	字转位功能A输出bit7	0~1	0	0	1	0xe407
P04.08	字转位功能A输出bit8	0~1	0	0	1	0xe408
P04.09	字转位功能A输出bit9	0~1	0	0	1	0xe409
P04.10	字转位功能A输出bit10	0~1	0	0	1	0xe40a
P04.11	字转位功能A输出bit11	0~1	0	0	1	0xe40b
P04.12	字转位功能A输出bit12	0~1	0	0	1	0xe40c
P04.13	字转位功能A输出bit13	0~1	0	0	1	0xe40d
P04.14	字转位功能A输出bit14	0~1	0	0	1	0xe40e
P04.15	字转位功能A输出bit15	0~1	0	0	1	0xe40f
P04.16	字转位功能B输出bit0	0~1	0	0	1	0xe410
P04.17	字转位功能B输出bit1	0~1	0	0	1	0xe411

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P04组:字位转换模块（二进制互联）						
P04.18	字转位功能B输出bit2	0~1	0	0	1	0xe412
P04.19	字转位功能B输出bit3	0~1	0	0	1	0xe413
P04.20	字转位功能B输出bit4	0~1	0	0	1	0xe414
P04.21	字转位功能B输出bit5	0~1	0	0	1	0xe415
P04.22	字转位功能B输出bit6	0~1	0	0	1	0xe416
P04.23	字转位功能B输出bit7	0~1	0	0	1	0xe417
P04.24	字转位功能B输出bit8	0~1	0	0	1	0xe418
P04.25	字转位功能B输出bit9	0~1	0	0	1	0xe419
P04.26	字转位功能B输出bit10	0~1	0	0	1	0xe41a
P04.27	字转位功能B输出bit11	0~1	0	0	1	0xe41b
P04.28	字转位功能B输出bit12	0~1	0	0	1	0xe41c
P04.29	字转位功能B输出bit13	0~1	0	0	1	0xe41d

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P04组:字位转换模块（二进制互联）						
P04.30	字转位功能B输出bit14	0~1	0	0	1	0xe41e
P04.31	字转位功能B输出bit15	0~1	0	0	1	0xe41f
P05组:预留						
P06组:运行状态与外设（模拟量互联）						
P06.00	当前状态机	-32768~32767	0	-32768	32767	0xe600
P06.01	目标频率	-32768~32767	0	-32768	32767	0xe601
P06.02	给定频率	-32768~32767	0	-32768	32767	0xe602
P06.03	输出频率	-32768~32767	0	-32768	32767	0xe603
P06.04	目标速度	-32768~32767	0	-32768	32767	0xe604
P06.05	给定速度	-32768~32767	0	-32768	32767	0xe605
P06.06	马达转速	-32768~32767	0	-32768	32767	0xe606
P06.07	输出电压	-32768~32767	0	-32768	32767	0xe607
P06.08	输出电流	-32768~32767	0	-32768	32767	0xe608

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P06组:运行状态与外设（模拟量互联）						
P06.00	当前状态机	-32768~32767	0	-32768	32767	0xe600
P06.01	目标频率	-32768~32767	0	-32768	32767	0xe601
P06.02	给定频率	-32768~32767	0	-32768	32767	0xe602
P06.03	输出频率	-32768~32767	0	-32768	32767	0xe603
P06.04	目标速度	-32768~32767	0	-32768	32767	0xe604
P06.05	给定速度	-32768~32767	0	-32768	32767	0xe605
P06.06	马达转速	-32768~32767	0	-32768	32767	0xe606
P06.07	输出电压	-32768~32767	0	-32768	32767	0xe607
P06.08	输出电流	-32768~32767	0	-32768	32767	0xe608
P06.09	输出功率	-32768~32767	0	-32768	32767	0xe609
P06.10	转矩模式转矩设定值	-32768~32767	0	-32768	32767	0xe60a
P06.11	输出转矩	-32768~32767	0	-32768	32767	0xe60b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P06组:运行状态与外设（模拟量互联）						
P06.14	直流母线电压	-32768~32767	0	-32768	32767	0xe60e
P06.15	散热器温度	-32768~32767	0	-32768	32767	0xe60f
P06.16	编码器反馈频率	-32768~32767	0	-32768	32767	0xe610
P06.17	VF分离电压给定	-32768~32767	0	-32768	32767	0xe611
P06.19	Panel给定值	-32768~32767	0	-32768	32767	0xe613
P06.20	PC给定值	-32768~32767	0	-32768	32767	0xe614
P06.36	DI输入的物理状态	-32768~32767	0	-32768	32767	0xe624

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P07组:通信（模拟量互联）						
P07.00	总线适配器A输入.PZD1	0~65535	0	0	65535	0xe700
P07.01	总线适配器A输入.PZD2	0~65535	0	0	65535	0xe701
P07.02	总线适配器A输入.PZD3	0~65535	0	0	65535	0xe702
P07.03	总线适配器A输入.PZD4	0~65535	0	0	65535	0xe703
P07.04	总线适配器A输入.PZD5	0~65535	0	0	65535	0xe704
P07.05	总线适配器A输入.PZD6	0~65535	0	0	65535	0xe705
P07.06	总线适配器A输入.PZD7	0~65535	0	0	65535	0xe706
P07.07	总线适配器A输入.PZD8	0~65535	0	0	65535	0xe707
P07.08	总线适配器A输入.PZD9	0~65535	0	0	65535	0xe708
P07.09	总线适配器A输入.PZD10	0~65535	0	0	65535	0xe709
P07.10	总线适配器A输入.PZD11	0~65535	0	0	65535	0xe70a
P07.11	总线适配器A输入.PZD12	0~65535	0	0	65535	0xe70b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P07组:通信（模拟量互联）						
P07.12	总线适配器A输入.PZD13	0~65535	0	0	65535	0xe70c
P07.13	总线适配器A输入.PZD14	0~65535	0	0	65535	0xe70d
P07.14	总线适配器A输入.PZD15	0~65535	0	0	65535	0xe70e
P07.15	总线适配器A输入.PZD16	0~65535	0	0	65535	0xe70f
P07.32	Modbus控制命令	0~65535	0	0	65535	0xe720
P07.33	Modbus通讯设定值1	-32768~32767	0	-32768	32767	0xe721
P07.34	Modbus通讯设定值2	-32768~32767	0	-32768	32767	0xe722
P07.35	Modbus通讯设定值1标幺值	-32768~32767	0	-32768	32767	0xe723
P07.36	Modbus通讯设定值2标幺值	-32768~32767	0	-32768	32767	0xe724

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P08组:逻辑算术模块（模拟量互联）						
P08.00	加法模块A输出	-32768~32767	0	-32768	32767	0xe800
P08.01	加法模块B输出	-32768~32767	0	-32768	32767	0xe801
P08.02	加法模块C输出	-32768~32767	0	-32768	32767	0xe802
P08.04	减法模块A输出	-32768~32767	0	-32768	32767	0xe804
P08.05	减法模块B输出	-32768~32767	0	-32768	32767	0xe805
P08.08	乘法模块A输出	-32768~32767	0	-32768	32767	0xe808
P08.09	乘法模块B输出	-32768~32767	0	-32768	32767	0xe809
P08.12	除法模块A输出	-32768~32767	0	-32768	32767	0xe80c
P08.14	除法模块A余数	-32768~32767	0	-32768	32767	0xe80e
P08.15	除法模块B输出	-32768~32767	0	-32768	32767	0xe80f
P08.17	除法模块B余数	-32768~32767	0	-32768	32767	0xe811
P08.24	绝对值模块A输出	-32768~32767	0	-32768	32767	0xe818

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P08组:逻辑算术模块（模拟量互联）						
P08.25	绝对值模块B输出	-32768~32767	0	-32768	32767	0xe819
P08.32	一阶低通滤波模块A输出	-32768~32767	0	-32768	32767	0xe820
P08.33	一阶低通滤波模块B输出	-32768~32767	0	-32768	32767	0xe821
P08.36	位转字模块A输出	-32768~32767	0	-32768	32767	0xe824
P08.37	位转字模块B输出	-32768~32767	0	-32768	32767	0xe825
P08.41	数据选择器A输出	-32768~32767	0	-32768	32767	0xe829
P09组:工艺应用（模拟量互联）						
P09.25	摆长长度	0	0	0	0	0xe919
P10组:性能内部变量（模拟量互联）						
P10.00	M轴给定电流	-32768~32767	0	-32768	32767	0xea00
P10.01	M轴反馈电流	-32768~32767	0	-32768	32767	0xea01
P10.02	T轴给定电流	-32768~32767	0	-32768	32767	0xea02
P10.03	T轴反馈电流	-32768~32767	0	-32768	32767	0xea03
P10.04	给定频率	-32768~32767	0	-32768	32767	0xea04

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P10组:性能内部变量（模拟量互联）						
P10.05	反馈频率	-32768~32767	0	-32768	32767	0xea05
P10.06	同步频率	-32768~32767	0	-32768	32767	0xea06
P10.07	编码器频率	-32768~32767	0	-32768	32767	0xea07
P10.10	M轴给定电压	-32768~32767	0	-32768	32767	0xea0a
P10.11	T轴给定电压	-32768~32767	0	-32768	32767	0xea0b
P10.19	CRC校验计数	-32768~32767	0	-32768	32767	0xea13
P10.26	监控通道1	-32768~32767	0	-32768	32767	0xea1a
P10.27	监控通道2	-32768~32767	0	-32768	32767	0xea1b
P10.28	监控通道3	-32768~32767	0	-32768	32767	0xea1c
P10.29	监控通道4	-32768~32767	0	-32768	32767	0xea1d
P10.32	状态机	-32768~32767	0	-32768	32767	0xea20
P10.33	U相电流	-32768~32767	0	-32768	32767	0xea21
P10.34	V相电流	-32768~32767	0	-32768	32767	0xea22

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P11组:功能内部变量（模拟量互联）						
P11.00	固定值0%	-32768~32767	0	-32768	32767	0xeb00
P11.01	固定值100%	-32768~32767	0	-32768	32767	0xeb01
P11.02	固定值200%	-32768~32767	0	-32768	32767	0xeb02
P11.03	自定义数据输出1	-32768~32767	0	-32768	32767	0xeb03
P11.04	自定义数据输出2	-32768~32767	0	-32768	32767	0xeb04
P11.05	固定值-100%	-32768~32767	0	-32768	32767	0xeb05
P11.06	固定值-200%	-32768~32767	0	-32768	32767	0xeb06
P11.07	自定义数据输出3	-32768~32767	0	-32768	32767	0xeb07
P11.08	自定义数据输出4	-32768~32767	0	-32768	32767	0xeb08
P11.09	CM交互数据监控值0	0~65535	0	0	65535	0xeb09
P11.10	CM交互数据监控值1	0~65535	0	0	65535	0xeb0a
P11.11	CM交互数据监控值2	0~65535	0	0	65535	0xeb0b

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P11组:功能内部变量（模拟量互联）						
P11.12	CM交互数据监控值3	0~65535	0	0	65535	0xeb0c
P11.13	CM与PM通信握手值监控	0~65535	0	0	65535	0xeb0d
P11.18	FPGA接收误码计数器	0~65535	0	0	65535	0xeb12
P11.19	FPGA发送无响应计数器	0~65535	0	0	65535	0xeb13
P11.38	异常起动监控值	0~65535	0	0	65535	0xeb26
P11.55	CM监控变量5(KB错误计数器)	0~65535	0	0	65535	0xeb37
P11.57	ROM数据错误地址	0~65535	0x00	0x00	0xFFFF	0xeb39
P11.58	ROM数据错误值	0~65535	0	0	65535	0xeb3a

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P12组:系统控制与状态（模拟量互联）						
P12.00	当前状态机	0~65535	0	0	65535	0xec00
P12.01	当前马达	0~65535	0	0	65535	0xec01
P12.02	当前RFG	0~65535	0	0	65535	0xec02
P12.03	当前报警代码	0~65535	0	0	65535	0xec03
P12.04	当前报警子码	0~65535	0	0	65535	0xec04
P12.05	控制字1	0~65535	0	0	65535	0xec05
P12.06	控制字2	0~65535	0	0	65535	0xec06
P12.07	状态字1	0~65535	0	0	65535	0xec07
P12.08	状态字2	0~65535	0	0	65535	0xec08
P12.09	端子启停控制字	0~65535	0	0	65535	0xec09
P12.10	OP启停控制字	0~65535	0	0	65535	0xec0a
P12.11	PC启停控制字	0~65535	0	0	65535	0xec0b
P12.12	自定义启停控制字	0~65535	0	0	65535	0xec0c
P12.13	Panel给定值	-32768~32767	0	-32768	32767	0xec0d
P12.14	PC给定值	-32768~32767	0	-32768	32767	0xec0e
P12.16	DI状态	0~65535	0	0	65535	0xec10
P12.17	DO状态	0~65535	0	0	65535	0xec11

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P12组:系统控制与状态（模拟量互联）						
P12.31	PM24V电压	0~65535	0	0	65535	0xec1f
P12.45	本次上电时长-时	0~65535	0	0	65535	0xec2d
P12.46	本次上电时长-秒	0~59	0	0	59	0xec2e
P12.47	本次运行时长-时	0~65535	0	0	65535	0xec2f
P12.48	本次运行时长-秒	0~59	0	0	59	0xec30
P12.49	累计运行时间-时	0~65535	0	0	65535	0xec31
P12.50	累计运行时间-秒	0~59	0	0	59	0xec32
P13组:系统给定与反馈（模拟量互联）						
P13.00	马达实际速度	-32768~32767	0	-32768	32767	0xed00
P13.02	主速度给定	-32768~32767	0	-32768	32767	0xed02
P13.03	辅速度给定	-32768~32767	0	-32768	32767	0xed03
P13.04	正反转限制前速度给定	-32768~32767	0	-32768	32767	0xed04
P13.05	限幅前速度给定	-32768~32767	0	-32768	32767	0xed05
P13.06	限幅后速度给定	-32768~32767	0	-32768	32767	0xed06
P13.07	最小速度限制后速度给定	-32768~32767	0	-32768	32767	0xed07

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P13组:系统给定与反馈（模拟量互联）						
P13.08	RFG输入速度给定	-32768~32767	0	-32768	32767	0xed08
P13.09	RFG输出速度给定	-32768~32767	0	-32768	32767	0xed09
P13.10	附加速度给定	-32768~32767	0	-32768	32767	0xed0a
P13.11	功能最终给定速度	-32768~32767	0	-32768	32767	0xed0b
P13.12	RFG模块输入值	-32768~32767	0	-32768	32767	0xed0c
P13.15	正向速度限制值	-32768~32767	0	-32768	32767	0xed0f
P13.16	负向速度限制值	-32768~32767	0	-32768	32767	0xed10
P13.17	编码器反馈速度	-32768~32767	0	-32768	32767	0xed11
P13.22	电动电位器输出	-32768~32767	0	-32768	32767	0xed16
P13.23	多段给定选择输出	-32768~32767	0	-32768	32767	0xed17
P13.24	多段给定值1	-32768~32767	0	-32768	32767	0xed18
P13.25	多段给定值2	-32768~32767	0	-32768	32767	0xed19

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P13组:系统给定与反馈（模拟量互联）						
P13.26	多段给定值3	-32768~32767	0	-32768	32767	0xed1a
P13.27	多段给定值4	-32768~32767	0	-32768	32767	0xed1b
P13.28	多段给定值5	-32768~32767	0	-32768	32767	0xed1c
P13.29	多段给定值6	-32768~32767	0	-32768	32767	0xed1d
P13.30	多段给定值7	-32768~32767	0	-32768	32767	0xed1e
P13.31	多段给定值8	-32768~32767	0	-32768	32767	0xed1f
P13.32	多段给定值9	-32768~32767	0	-32768	32767	0xed20
P13.33	多段给定值10	-32768~32767	0	-32768	32767	0xed21
P13.34	多段给定值11	-32768~32767	0	-32768	32767	0xed22
P13.35	多段给定值12	-32768~32767	0	-32768	32767	0xed23
P13.36	多段给定值13	-32768~32767	0	-32768	32767	0xed24
P13.37	多段给定值14	-32768~32767	0	-32768	32767	0xed25

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
P13组:系统给定与反馈（模拟量互联）						
P13.38	多段给定值15	-32768~32767	0	-32768	32767	0xed26
P13.39	多段给定值16	-32768~32767	0	-32768	32767	0xed27
P13.40	RFG加速度	-32768~32767	0	-32768	32767	0xed28
P13.41	转矩给定值	-32768~32767	0	-32768	32767	0xed29
P13.42	附加转矩给定值	-32768~32767	0	-32768	32767	0xed2a
P13.43	转矩控制速度上限值	-32768~32767	0	-32768	32767	0xed2b
P13.44	转矩控制速度下限值	-32768~32767	0	-32768	32767	0xed2c

9 检修

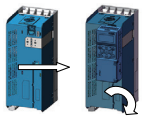
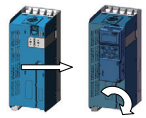
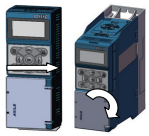
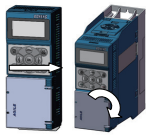
9.1 更换驱动器组

9.1.1 驱动器部件的更换

允许更换的组件

在出现持续的功能故障后，必须更换驱动器的功率模块或控制模块。驱动器的功率模块和控制模块可以单独更换。

可在下列情况中更换驱动器：

更换功率模块		更换控制模块	
备件： •型号相同 •功率相同	备件： •型号相同 •相同的外形尺寸 •功率更大	备件： •型号相同 •固件版本相同	备件： •型号相同 •固件版本更高 （例如通过固件版本V4.3更换V4.2）
x kW x kW 	y kW > x kW 	Firmwa Firmwa -re A -re A 	Firmwa Firmwa -re A -re A 
	功率模块和马达必须配套，也就是说：马达和功率模块的额定功率之比必须大于1/8。	更换控制模块后必须将驱动器恢复为出厂设置。	

⚠ 警告

驱动器工作异常可导致人员受伤。

更换不同类型的驱动器可能会导致工作异常。

如果驱动器更换不符合上表要求，必须在更换后重试新驱动器。

9.1.2 在安全功能已使能时更换功率模块



⚠ 注意

调换马达的连接电缆可导致马达损坏

调换马达电缆的两个相位会使马达反向旋转。

马达反向旋转可导致机器或设备损坏。

•按正确的顺序连接马达电缆的三个相位。

•在更换功率模块后检查马达的旋转方向。

步骤

➡ 按如下步骤更换功率模块：

1. 断开功率模块的主电源。
   如果控制模块采用外部 24 V 电源，可不关闭该电源。
2. 拔出功率模块上的连接电缆。
3. 从功率模块上取出 CM模块。
4. 更换功率模块。
5. 将CM模块插入新的功率模块。
6. 在新的功率模块上接好连接电缆。
7. 重新接通主电源，必要时还要接通控制模块的24V电源。

■ 您已成功更换了功率模块。

9.1.3 更换安全功能未使能的功率模块



⚠危险

驱动器端子上的危险电压可引发生命危险
断开电源后请至少等待5分钟，
直到驱动器中的电容器放电到安全电压水平。
•在拔出连接电缆前，再次核实驱动器接口上的电压。

步骤

➡ 按照以下步骤更换功率模块：

1. 断开功率模块的主电源。
如果控制模块采用外部24V电源，
可不关闭该电源。
2. 拔出功率模块上的连接电缆。
3. 从功率模块上取出控制模块。
4. 换入新的功率模块。
5. 将控制模块插入新的功率模块。
6. 在新的功率模块上接好连接电缆。

注意

调换马达的连接电缆可导致马达损坏
调换马达电缆的两个相位会使马达反向旋转。
•按正确的顺序连接马达电缆的三个相位。
•在更换功率模块后检查马达的旋转方向。

7. 重新接通主电源，必要时还要接通控制模块的24V电源。

■ 您已成功更换了功率模块。

中文

附录

附录A Modbus-RTU通信协议

A1驱动器使用标准RS485通讯接口，采用MODBUS通讯协议，支持驱动器与上位机或PLC进行串行通讯。A1驱动器的通讯协议包含三个层次：物理层、数据链路层和应用层。物理层和数据链路层采用了基于RS485的Modbus协议，应用层包含了控制A1驱动器运行、停止、参数读写等各种操作方法。

Modbus 协议为主从式协议。主机和从机之间的通讯有两类：主机请求，从机应答；主机广播，从机不应答。任何时候总线上只有一个设备在进行发送。主机对从机进行轮询，从机在未获得主机的命令情况下不能发送报文。主机在通讯不正确时可重复发命令，如果在给定的时间内没有收到回应，则认为所轮询的从机丢失。如果从机不能执行某一报文，则向主机发送一个异常信息。从机之间不能直接通讯，必须通过主机的软件，读出一个从机的数据，再发送到另一个从机。从机地址的范围：0 至247，地址0的报文为广播报文。

RTU数据帧

每个字节的数据格式和发送顺序：1个起始位＋7/8个数据位（低位先发送）＋1 个奇偶校验位或无校验位＋1 个或 2 个停止位。

起始位	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	校验位	停止位

10bit字符帧

起始位	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	校验位	停止位

11bit字符帧

中文

使用RTU模式，消息发送至少要以3.5个字符时间的停顿间隔开始。在网络波特率下多样的字符时间，这是最容易实现的(如下图的T1-T2-T3-T4所示)。传输的第一个域是设备地址。可以使用的传输字符是十六进制的0...9,A...F。网络设备不断侦测网络总线，包括停顿间隔时间内。当第一个域（地址域）接收到，每个设备都进行解码以判断是否发往自己的。在最后一个传输字符之后，一个至少3.5个字符时间的停顿标定了消息的结束。一个新的消息可在此停顿后开始。
整个消息帧必须作为一连续的流转输。如果在帧完成之前有超过1.5个字符时间的停顿时间，接收设备将刷新不完整的消息并假定下一字节是一个新消息的地址域。同样地，如果一个新消息在小于3.5个字符时间内接着前个消息开始，接收的设备将认为它是前一消息的延续。这将导致一个错误，因为在最后的CRC域的值不可能是正确的。

起始至少 3.5 个字 符的空闲	从机 地址	功能码	数据	校验	起始至少 3.5 个字 符的空闲

RTU帧格式:

帧头START	3.5个字符时间
从机地址ADR	通讯地址：1~247
命令码CMD	03:读从机参数；06:写从机参数
数据内容DATA(N-1)	资料内容: 功能码参数地址，功能码参数个数，功能码参数值等。
数据内容DATA(N-2)	
……	
数据内容DATA0	
CRC CHK低位	检测值:CRC值。
CRC CHK高位	
END	3.5个字符时间

A1 驱动器支持 RTU（远程终端单元）模式的 Modbus 协议。
驱动器支持的 Modbus 功能码如下:
命令码及通讯数据描述:

CMD	含义	广播	最多寄存器个数
03H	读多个寄存器	否	30
06H	写单个寄存器	是	1
10H	写多个寄存器	是	27

命令码：03H
命令码03H（0000 0011），读取N个字（Word，16bit数据），最多可以连续读取16个字。
例如：从机地址为0x55的驱动器，读取马达目标速度，给定速度，当前马达转速，modbus逻辑起始地址为0x2004，读取连续3个字，则该帧的结构描述如下:
主机发送:

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x03
地址高位	0x20
地址低位	0x04
读取字节高位	0x00
读取字节低位	0x03
CRC低位	0x42
CRC高位	0x1E

从机正常回应:

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x03
返回数据字节数	0x06
第一个数据高位	0x05
第一个数据低位	0xDC
第二个数据高位	0x00
第二个数据低位	0x00
…	
第N个数据高位	0x00
第N个数据低位	0x00
CRC低位	0x30
CRC高位	0x3E

驱动器回应马达目标速度0x05DC(1500rpm)，给定速度0x0000，当前马达转速0x0000

从机异常响应:

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x03
故障代码	0x02
CRC低位	0xE2
CRC高位	0x17

命令码: 06H

命令码06H (0000 0110), 写一个字 (Word)

例如: 从机地址为0x55的驱动器, 将驱动器的目标速度设置为100%, 即modbus逻辑地址0xE721写0x03E8, 则该帧的结构描述如下:

RTU 主机命令信息

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x06
地址高位	0xE7
地址低位	0x21
数据高位	0x03
数据低位	0xE8
CRC低位	0xE2
CRC高位	0x1E

从机正常回应

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x06
地址高位	0xE7
地址低位	0x21
数据高位	0x03
数据低位	0xE8
CRC低位	0xE2
CRC高位	0x1E

从机异常响应:

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x86
故障代码	0x03
CRC低位	0x43
CRC高位	0xB1

命令码: 10H

命令码10H (0001 0000), 写N个字 (Word)

例如: 从机地址为0x55的驱动器, 将0x3500地址写3个数据。

则该帧的结构描述如下:

RTU 主机命令信息

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x10
地址高位	0x35
地址低位	0x00
写的字节数高位	0x00
写的字节数低位	0x03
写字节总数	0x06
第一个数据高位	0x00
第一个数据低位	0x01
……	……
第N个数据高位	
第N个数据低位	
CRC低位	0x4A
CRC高位	0x12

从机正常回应

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x90
地址高位	0x35
地址低位	0x00
数据高位	0x00
数据低位	0x03
CRC低位	0x4A
CRC高位	0x12

从机异常响应:

START	T1-T2-T3-T4
从机地址	0x55
Modbus功能码	0x90
故障代码	0x03
CRC低位	0x43
CRC高位	0xB1

异常码

代码	名称	含义
1	非法功能码	接收到不支持的功能码
2	非法地址	请求的寄存器地址不合法，或者寄存器地址和请求读数据个数组合是非法的
3	非法数据值	接收的数据域包含至少一个非法的数据值
4	非法请求数据个数	请求数据的个数大于最大个数
5	只读	只读
6	只能停机修改	只能停机修改

通讯帧错误校验

使用 RTU 帧格式，帧包括了基于 CRC 方法计算的帧错误检测域。CRC 域检测了整个帧的内容。CRC 域是两个字节，包含 1位的二进制值。它由传输设备计算后加入到帧中。接收设备重新计算收到帧的 CRC，前与接收到的 CRC域中的值比较，如果两个CRC值不相等，则说明传输有错误。CRC是先存入 0xFFFF，然后调用一个过程将帧中连续的6个以上字节与当前寄存器中的值进行处理。仅每个字符中的 8Bit 数据对 CRC 有效，起始位和停止位以及奇偶校验位均无效。CRC 产生过程中，每个 8 位字符都单独和寄存器内容相异或（XOR），结果向最低有效位方向移动，最高有效位以0填充。LSB被提取出来检测，如果 LSB为1，寄存器单独和预置的值相异或，如果LSB 为 0，则不进行。整个过程要重复 8 次。

在最后一位（第 8 位）完成后，下一个 8位字节又单独和寄存器的当前值相异或。最终寄存器中的值，是帧中所有的字节都执行之后的CRC 值。例如，要传输“11001110”，数据中含 5 个“1”，如果用偶校验，其偶校验位为“1”，如果用奇校验，其奇校验位为“ 0 ”，传输数据时，奇偶校验位经过计算放在帧的校验位的位置，接收设备也要进行奇偶校验，如果发现接受的数据的奇偶性与预置的不一致，就认为通讯发生了错误。CRC 的这种计算方法，采用的是国际标准的 CRC 校验法则，用户在编辑CRC 算法时，可以参考相关标准的 CRC 算法，编写出真正符合要求的 CRC 计算程序。

标准：CRC-16/MODBUS

多项式：x16+x15+x2+1(0x8501)

CRC初始值：0xFFFF

现在提供一个 CRC 计算的简单函数给用户参考（用 C 语言编程）：

```
unsigned int crc_cal_value(unsigned char
*data_value,unsigned char data_length)
{
int i;
unsigned int crc_value=0xffff;
  while(data_length--)
{
crc_value^=*data_value++;
for(i=0;i<8;i++)
{
if(crc_value&0x0001)
crc_value=(crc_value>>1)^0xa001;
else
{
crc_value=crc_value>>1;
}
}
}
returncrc_value;
}
```


Modbus通信参数地址

控制命令输入到驱动器：（只写）

命令字地址	命令功能
0xE720	0000：复位
	0001：运行
	0002：点动运行
	0003：自由停车
	0004：减速停机
	0005：故障复位
	0006：给定速度取反
0xE721	Modbus通讯设定值1
0xE722	Modbus通讯设定值2

注：通讯设定值的取值范围为-600.0%~600.0%，当输入“0003:自由停车”命令后，需要输入“0000:复位”命令进行复位，否则驱动器将一直处于开机封锁的状态。

功能参数的参数地址表如下：

驱动器参数编号	Modbus 通信地址
A组	
A00.00 - A00.99	0x2000
A02.00 - A02.99	0x2100
A03.00 - A03.99	0x2200
A04.00 - A04.99	0x2300
A05.00 - A05.99	0x2400
A06.00 - A06.99	0x2500
B组	
B00.00 - B00.99	0x3000
B01.00 - B01.99	0x3100
B02.00 - B02.99	0x3200
B03.00 - B03.99	0x3300
B04.00 - B04.99	0x3400
B05.00 - B05.99	0x3500
B06.00 - B06.99	0x3600
B0700 - B07.99	0x3700
B08.00 - B08.99	0x3800
B09.00 - B09.99	0x3900
B10.00 - B10.99	0x3A00
B11.00 - B11.99	0x3B00
C组	
C00.00 - C00.99	0X4000
C01.00 - C01.99	0X4100
C02.00 - C02.99	0X4200
C03.00 - C03.99	0X4300
D组	
D00.00 - D00.99	0X5000
D01.00 - D01.99	0X5100
D02.00 - D02.99	0X5200
D03.00 - D03.99	0X5300
D04.00 - D04.99	0X5400
D05.00 - D05.99	0X5500
D06.00 - D06.99	0X5600
D07.00 - D07.99	0X5700
D08.00 - D09.99	0X5800
D09.00 - D09.99	0X5900
D10.00 - D10.99	0X5A00
D11.00 - D11.99	0X5B00

驱动器参数编号	Modbus 通信地址
E组	
E00.00 - E00.99	0X6000
E01.00 - E01.99	0X6100
E02.00 - E02.99	0X6200
E03.00 - E03.99	0X6300
E04.00 - E04.99	0X6400
E05.00 - E05.99	0X6500
E06.00 - E06.99	0X6600
E07.00 - E07.99	0X6700
F组	
F00.00 - F00.99	0X7000
F01.00 - F01.99	0X7100
F02.00 - F02.99	0X7200
F03.00 - F03.99	0X7300
F04.00 - F04.99	0X7400
F05.00 - F05.99	0X7500
F06.00 - F06.99	0X7600
F07.00 - F07.99	0X7700
F08.00 - F08.99	0X7800
P组	
P00.00 - P00.99	0XE000
P01.00 - P01.99	0XE100
P02.00 - P02.99	0XE200
P03.00 - P03.99	0XE300
P04.00 - P04.99	0XE400
P05.00 - P05.99	0XE500
P06.00 - P06.99	0XE600
P07.00 - P07.99	0XE700
P08.00 - P09.99	0XE800
P09.00 - P09.99	0XE900
P10.00 - P10.99	0XEA00
P11.00 - P11.99	0XEB00
P12.00 - P12.99	0XEC00
P13.00 - P13.99	0XED00

中文

售后服务

售后服务请按以下步骤提交售后流程。

→ 登录“www.boneng.com”

→ 点击“服务”和“售后服务”



→ 登录系统



其他地区
控制器/驱动器 ： 0512-66182005
马达/齿轮马达/齿轮箱 ： 0512-66189918

博能传动（沈阳）有限公司
控制器/驱动器 ： 024-31271571
马达/齿轮马达/齿轮箱 ： 024-31292571

博能传动（天津）有限公司
控制器/驱动器 ： 022-86928559
马达/齿轮马达/齿轮箱 ： 022-26929558

博能传动（开封）有限公司
控制器/驱动器 ： 0371-23335230
马达/齿轮马达/齿轮箱 ： 0371-23277771

博能传动（潍坊）有限公司
控制器/驱动器 ： 0536-4699687
马达/齿轮马达/齿轮箱 ： 0536-4699667

博能传动（长沙）有限公司
控制器/驱动器 ： 0731-88386958
马达/齿轮马达/齿轮箱 ： 0731-88380725

博能传动设备（成都）有限公司
控制器/驱动器 ： 028-87740066
马达/齿轮马达/齿轮箱 ： 028-87740066

博能传动（肇庆）有限公司
控制器/驱动器 ： 0757-86719757
马达/齿轮马达/齿轮箱 ： 0758-2699830

博能传动（苏州）有限公司
控制器/驱动器 苏南区：0512-66182005
马达/齿轮马达/齿轮箱 苏南区：0512-66189918
控制器/驱动器 浙沪区：0512-66182005
马达/齿轮马达/齿轮箱 浙沪区：0512-66189918
控制器/驱动器 苏皖区：0512-66182005
马达/齿轮马达/齿轮箱 苏皖区：025-52171612

博能传动（美国）有限公司
技术支持/调试/售后服务：
1250 E 222nd Euclid, OH 44117,United Staes
Email: America@boneng.com
Tel: 1-216-618-3099/1-216-618-0138

博能传动（印度）有限公司
技术支持/调试/售后服务：
Plot No. E-10/3,MIDC sinnar(Malegaon)Industrial Area, Nashik, 422123, Maharashtra, India.
Email:india@boneng.com
Tel: +91-11-4507 6293/+91-22-2781 3385

Contents

1 Fundamental safety instructions ---- 311
1.1 General safety instructions ---- 311
1.2 Safety instructions of electro magnetic fields(EMF) ---- 317
1.3 Operating electrostatic sensitive device(ESD) ---- 317
1.4 Industrial security ---- 318
1.5 Residual risks of power drive systems ---- 319
2 Description ---- 321
2.1 Structure of the inverter ---- 321
2.2 Control Module ---- 322
2.3 Power Module ---- 322
2.4 Components for power module ---- 323
2.5 Encoder ---- 324
2.6 The Drive's Debug tool ---- 324
3 Installing ---- 325
3.1 Installing conditions ---- 325
3.2 Installing preconditions ---- 325
3.3 The installation of Reactor, filter,braking resistor ---- 325
3.4 Mounting the Power Modules ---- 330
3.5 Connecting the power source,motor and drive components ---- 332
3.6 Mounting the Control Module ---- 341
3.7 Mounting the Encoder ---- 344
4 Debugging ---- 345
4.1 Debugging guide ---- 345
4.2 Preparations for debugging ---- 346
4.3 Reseting factory settings ---- 347
4.4 Operation and display of operation panel ---- 349
5 Expanding debugging ---- 353
5.1 Drive's functions layout ---- 353
5.2 The control of drive ---- 355
5.3 Setting value ---- 376
5.4 Setting value processing ---- 381
5.5 Motor control ---- 392
5.6 Defensive function ---- 403
5.7 Application features ---- 408
6 Fault and system information ---- 438
6.1 Operational status display by LED ---- 438
6.2 Fault and warning list ---- 440
7 Technical data ---- 492
7.1 Technical data of the Control Module ---- 492
7.2 Technical data of the Power Module ---- 494
7.3 Restrictions for special ambient conditions ---- 509
8 Parameter list ---- 511
9 Check and repair ---- 756
9.1 Replacing device of the drive ---- 756
Appendix ---- 759
Appendix A Modbus-RTU communication protocol ---- 759
After-sale service ---- 771

EN

1 Fundamental safety instructions

1.1 General safety instructions



⚠ DANGER

Contacting with charged parts and other energy supplies will cause life danger
Contacting with charged parts can cause serious injury or even death of personnel
◆ Only professionals are allowed to work on electrical equipment.
◆ All operations must comply with national safety regulations.
There are usually six security steps:
1.Prepare for power failure and notify team members affected by power failure.
2. Disconnect the power supply of the device
- Close device.
- Please wait until the discharge time specified on the warning board expires.
- Confirm that there is no voltage between the wire or between the wire and the ground wire
- Confirm that the auxiliary voltage circuit is power off
- Confirm that the motor cannot start.
3. Check all other dangerous energy sources, such as compressed air, hydraulic systems and water.
4. Disconnect all dangerous energy supplies, such as closed switch, ground connection, short connection and closed value
5. Make sure that the energy supply will not be connected automatically.
6. Make sure that the correct device is completely locked.
Restore the ready status of the device in reverse order after the job is completed.



⚠ WARNING

Dangerous voltage generated by connecting inappropriate power supply can cause life danger.
Contact with charged parts may cause serious injury or death of personnel.



⚠ WARNING

Contact with the charged parts on the damaged equipment can cause life danger
Improper handling may cause damage to equipment.
For damaged devices, dangerous voltages may be present at the enclosure or at the exposed components which can result in death or serious injury when the enclosure or the components get touched.
◆ The limits given in technical data shall be followed when transporting, storing and operating equipment.
◆ Do not use any damaged devices.



⚠ WARNING

Cable shielding without grounding can cause electric shock and thus lead to life danger
When the cable shielding layer is not grounded, the capacitor supercritical coupling may cause fatal contact voltage
◆ Cable shielding layer and unused power cable core wire (such as lock core wire) have at least one side of shell grounded.

EN

EN

⚠ WARNING

Electric shock may occur when not grounded which can cause life danger.
There will be high pressure on the bare parts of devices with Protection Lever I when lack of secure grounding or connection error which can cause serious injury or death when be touched.
◆ Grounding the device in compliance with applicable regulations.

⚠ WARNING

Disconnection of plug during operation may cause electric shock, which may lead to life danger.
The arc generated by disconnection of plug during operation may cause serious injury or death.
◆ If it is not specified that the plug can be disconnected during operation, the connection can only be disconnected when the power is off.

⚠ WARNING

Insufficient space of the shell can cause fire,which can lead to life danger.
Open fire and smoke can cause heavy casualties or property losses.
◆ Equipment without protective shell should be installed in metal cabinet (or take the same effort to protect) to avoid equipment contacting with open fire.
◆ Make sure that the smoke can only be discharged through the safety channel.

EN

⚠ WARNING

Accidental movement of the machine when using a mobile radio or mobile phone can cause life danger.
When the mobile radio equipment or mobile phone with transmission power greater than 1W is used within a distance of about 2m from the module, it will lead to the functional failure of the equipment, which will affect the functional safety of the equipment and lead to casualties or property losses.
◆ Turn off the radio or mobile phone near the device.

⚠ WARNING

Insulation overload can cause fire, which can cause life danger.
In IT network, grounding will make motor insulation increase load. Insulation failure can produce smoke and cause fire, resulting in serious personal injury or death.
◆ Use monitoring equipment that can report insulation faults.
◆ Eliminate the fault as soon as possible to avoid motor insulation overload.

⚠ WARNING

Insufficient ventilation will lead to overheating and fire, which will cause life danger.
Insufficient ventilation space will lead to overheating, smoke, fire and personal injury. This may cause serious injury or death. In addition, the failure rate of equipment/system may increase and the service life may be shortened.
◆ The specified minimum spacing between components shall be maintained for ventilation.

EN



⚠ WARNING

Lack of warning signs for unclear warning signs can lead to accidents.
Lack of warning signs or unclear warning signs may lead to serious personal injury or death.
◆ Check the integrity of the warning signs according to the documents.
◆ Install warning signs for the components, and install warning signs in the native language if necessary
◆ Replace the unclear warning signs.



⚠ WARNING

Failure to comply with the specified voltage/insulation test can damage the equipment.
Failure to comply with the specified voltage/insulation test can lead to equipment damage.
◆ Disconnect the equipment before voltage/insulation test of the machine/equipment, as all drives and motors have been tested for high pressure from factory, so there is no need to test again in the machine/equipment.

EN



⚠ WARNING

Invalid safety function can lead to life-threatening.
Invalid or unsuitable safety functions can cause functional failure of the machine,
which may lead to serious injury or death.
◆ Please pay attention to the information in the relevant product documentation before debugging.
◆ Monitor the whole system and all safety related components to ensure the safety function.
◆ Make appropriate settings to ensure that the security functions used are matched and activated with drive tasks and automation tasks.
◆ Perform function test.
◆ After ensuring the normal operation of the machine's security function, it was put into production.



⚠ WARNING

Machine misoperations caused by incorrect parameter settings or modification of parameter settings may cause life danger.
Wrong parameter setting can lead to incorrect operation of the machine, resulting in serious injury or death.
◆ Prevent malicious access to parameter settings.
◆ Take appropriate measures (such as parking or emergency stop) to respond to possible incorrect operation.

EN

1.2 Safety instructions on electromagnetic fields(EMF)



⚠ WARNING

Electromagnetic fields can cause life danger.
Electromagnetic fields(EMF) will be generated when electrical energy technology equipment such as transformer, driver and motor are running.
Therefore, it may cause danger to people near the equipment/system, especially those with pacemakers or medical implants.
◆ Ensure that there is a certain distance (at least 2m) between relevant personnel and equipment.

1.3 Operating electrostatic sensitive devices(ESD)

Electrostatic Sensitive Devices
It can be damaged by electrostatic field or electrostatic discharge components, integrated circuits, circuit boards or equipments.



⚠ WARNING

Electric field or electrostatic discharge can damage the equipment.
Electric field or electrostatic discharge may damage individual components, integrated circuits, modules or equipment, resulting in functional failure.
◆ Only use original product packaging or other suitable packaging materials (such as: conductive foam rubber or aluminum foil) to pack, store, transport and ship electronic components, modules and equipment.
◆ Only when one of the following grounding measures is taken, can contact components, modules and equipment be allowed:
-Wear static-free wrist strap
-Wear anti-static shoes or anti-static grounding strip in the anti-static area with conductive floor
◆ Electronic components, modules or equipment can only be placed on conductive backing plates (with anti-static backing plates, conductive static-free foam, anti-static packaging bags, anti-static transport containers).

1.4 Industrial safety

Boneng Transmission provides industrial safety functions for its products and solutions to support the safe operation of plants, solutions, machines, equipment and/or networks.
These functions are an important part of the whole industrial safety mechanism. In view of this, Boneng Transmission continues to develop and improve its products and solutions. Boneng Transmission strongly recommends that you regularly learn about product updates and upgrades.



⚠ WARNING

Tampering with software can cause unsafe driving state, which leads to danger.
Tampering with software (such as Virus, Trojans, Worms, Malicious software) can make the device in an unsafe running state, which may lead to death, serious injury and property loss.
◆ Please use the latest version of the software.
For information and news, please visit the website (www.boneng.com).
◆ According to the current technology version, the automation components and drive components are integrated into the overall industrial safety mechanism of the equipment or machine.
For more information, please visit the website (www.boneng.com).
◆ Pay attention to all products used in the overall industrial safety mechanism.

1.5 Legacy risks of drive system (electric drive system)

The control and drive components of the drive system are allowed to be used in industrial and commercial applications within the industrial power grid.
When used in civil power grid, special design or additional measures are required.
This assembly is only allowed to operate in a closed enclosure or control cabinet and must be fitted with protective devices and covers.
Only professional and technical personnel who have been trained, understood and followed all the safety precautions indicated in the component and user manual can work on the component.
When the machine manufacturer carries out the risk assessment of the machine according to the corresponding local directives (such as: European Union machinery directive), it must pay attention to the following residual risks caused by the control components and drive components of the drive system:

1. When debugging, operating, maintaining and repairing the equipment, the driven machine parts run unexpectedly. The possible reasons are as follows:
-Hardware and / or software failures in encoders, controllers, actuators, and connectors
-Response time of controller and transmission equipment
-Operation and / or environmental conditions are not as specified
-Condensation / conductive impurities
-Error in parameter setting, programming, wiring and installation
-Use of radio / mobile phones near controllers
-External influence / damage

2. In case of failure, abnormal temperature, open fire, abnormal light, noise, impurity and
gas appear inside and outside the driver, which may be caused by:
-Part failure
-A software failure
-Operation and/or environmental conditions are not as specified
-External influence/damage
The equipment with the protection level of "open type/IP20" must be installed in the metal cabinet (or take the same measures for protection) to avoid the internal and external contact with open fire.

3. Dangerous contact voltage may be caused by:
-Part failure
-Electrostatic charge induction
-Static charge induction
-Operation and / or environmental conditions are not as specified
-Condensation / conductive impurities
-External influence / damage

4.The electric field, magnetic field and electromagnetic field generated during the operation of the equipment may damage the close cardiac pacemaker bracket, medical implant or other metal objects.

5. When the waste components are not operated in accordance with the regulations or disposed in violation of the regulations, the substances damaging the environment will be released and radiation will be produced.

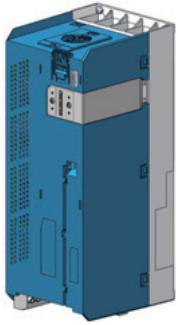
explain:
Measures must be taken to prevent conductive foreign matter from entering the components.
If conductive foreign matters are excluded from the installation site, the control cabinet with lower protection level shall be used.

Other information about the legacy risks generated by the components of the drive system can be found in the relevant sections of the user's technical documentation.

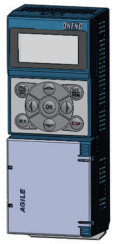
2 Description

2.1 Drive structure

Main components of the drive



Power Module ①



Control Module ②

Each A1 series drive is composed of a Control Module (CM) and a Power Module (PM).

◆ The control module can control and monitor the power module and the motor connected with it.

◆ The power module is suitable for motors with a power range of 0.75 kW to 250 kW.

The following data can be found on the Power Module nameplate (①)

◆ Name: for example: Power Module PM25

◆ Technical data: voltage, current, power

◆ Product number: for example: A1-PM25-B3B55-N

◆ Version: for example: ……

The following data can be found on the Control Module nameplate (②):

◆ Name: for example: Control Module CM23

◆ Product number: for example: A1-CM23-MB-PE

◆ Version: for example: ……

EN

2.2 Control Module

The difference between each model of control module CM23 lies in different field bus and encoder types.			
	Name	Identification of product	Field bus/Encoder
	CM23	A1-CM23-MB-PE	Modbus/Photoelectric
		A1-CM23-PN-PE	PROFINET/-Photoelectric

2.3 Power Module

This chapter contains important descriptions of Power Modules.

All power data are rated power or low overload (LD) power.

The Control Module CM23 can operate with the following power modules:

◆ PM25 IP20 type

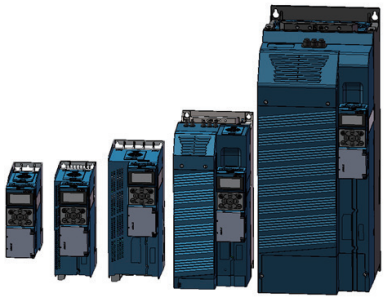


Table 2-1 Product code of shielding plate connection kit

Boundary dimension	Identification of product
B1	A1-H06-B1
B2	
B3	A1-H06-B3
B4	A1-H06-B4
B5/6	A1-H06-B6
B7	A1-H06-B7

PM25, 3 AC 400 V-Standard application scope:

The power module PM25 with IP20 protection level has two types: without filter or with built-in A-level power filter. PM25 realizes dynamic braking through an external braking resistor.

EN

Product number range: A1-PM25-B3XXX-N (or F)

Boundary dimension	B1	B2	B3	B4	B6	B7
Power range (KW) IP20 type	0.75~3.0	4~7.5	11~15	18.5~37	45~132	160~250

Note: N indicates that there is no built-in filter option, and F indicates that there is a built-in filter option.

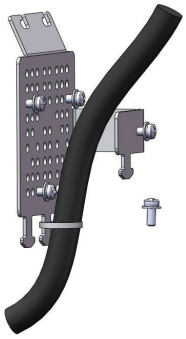
2.4 Components for Power Modules

2.4.1 Accessories-Power Module

Shielding and strain release of power interface can be realized by shielding connection kit.
The shielding connection kit is composed of shielding plate, tie and screw.

Table 2-1 Product code of the shielded connection suite

Boundary dimension	Identification of product
B1	A1-H06-B1
B2	
B3	A1-H06-B3
B4	A1-H06-B4
B5/B6	A1-H06-B6
B7	A1-H06-B7



2.4.2 Incoming filter (users can customize accessories)

The use of power filter can make the drive achieve higher anti-RF interference level. The drive with integrated power filter does not need external filter.

2.4.3 Power reactor (users can customize accessories)

Power reactor can provide over-voltage protection, suppress grid harmonics, and reduce the voltage defects caused by commutation of rectifier circuit.

2.4.4 Output reactor (users can customize accessories)

The output reactor can reduce the voltage load of the motor winding, and the load of the driver can be reduced by the capacitive charge and discharge of the cable. When the motor cable exceeds 50m (shielded cable) or 100m (unshielded cable), an output reactor must be used.

2.4.5 Brake resistor (users can customize accessories)

The braking resistance can make the load with large moment of inertia brake rapidly. The Power Module can control the brake resistance through the integrated brake chopper.

2.5 Allowed encoders

The following encoders can be connected to the Control Module:

Encoder type	Application
24V push-pull encoder	used for speed control
24V open-set pole encoder	used for speed control

2.6 Debugging tools of driver

The following tools are used to debug, diagnose, and control drive, as well as backup and transfer drive settings.

Operation panel		Product number
	OP25 ◆ plain text display ◆ provide menu guidance and application wizard	A1-OP25

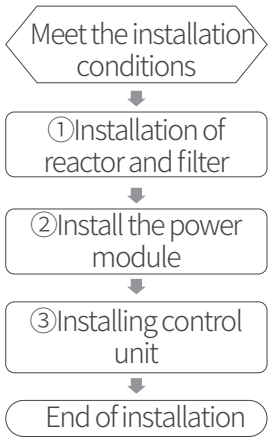
PC Tool		
With the help of Boneng Drive-soft, usb-RS485 cable is connected to the keyboard interface to access the driver tool.	Boneng Drive-soft Download address	www.boneng.com
	USB-RS485 cable	It is recommended to use stable and reliable brand conversion cable.

3 Install

3.1 Drive installation steps

Prerequisites for installing drive

Please check before installation:
◆ Are the required drive components complete?
-Power Module
-Control Module
-Accessories, such as power reactor or brake resistor
◆ Install the required components
Are tools and parts complete?
Step
Install the drive as shown by the right arrow:
You have installed all the components and are ready to start.



3.2 EMC specification for drive

3.2.1 Electromagnetic compatibility (EMC) installation regulations of drive

The installation of the drive and motor should be electromagnetic compatible to ensure the normal operation of the drive. Install and operate IP20 drive in a closed control cabinet. IP55 drive are suitable for installation outside the control cabinet.
The design and wiring mode of the control cabinet are briefly described below.
Please refer to the power module installation guide for details.
The EMC installation guide of the drive itself is described below.

3.2.2 Electromagnetic interference (EMI) prevention measures

The drive is designed to be used in industrial environment with high EMI. Only professional installation can ensure the safe, reliable and normal operation of the drive.
Control cabinet design
◆ All metal parts and components of the control cabinet must keep good electrical connection with the control cabinet frame
-Side panel
-Backplane
-roof
-floor
Large area contact frame or multi-point contact frame with a large number of screws can be selected.
◆ The grounding bar and EMC shielding bar should also contact the control cabinet frame in a large area to maintain good electrical connection.
◆ All metal parts installed in the control cabinet, such as drive or power filter, should contact the control cabinet frame in a large area. It is recommended that these devices be mounted on a bare metal mounting plate with good conductivity.
◆ For painted or oxidized surfaces, an electrical connection can be made between the screw and the surface by one of the following methods:
-A special toothed contact gasket is used to pass through the surface.
-Directly remove the insulating surface at the contact position.
◆ The following components must be equipped with anti-interference elements:
-Contactor
-Relay
-Magnetic valve
-Motor brake
Connect RC element or rheostat to AC coil and diode or rheostat to DC coil.
Connect the anti-interference element directly to the coil.

EN

Wiring and shielding

◆ Signal cable and data cable must be separated from all power cables of the drive, including power cable, connecting cable between brake chopper and brake resistor and motor cable. The wiring spacing shall be at least 25cm. If the cable cannot be routed separately, use a metal partition with a good connection to the mounting plate.

◆ The connecting cable between power supply and power filter must be separated from the following cables:

-Connecting cable between power filter and drive.

-Connecting cable between brake chopper and brake resistor.

-Motor cable.

◆ Signal cable/data cable and filtered power cable can only be placed perpendicular to unfiltered power cable.

◆ All connecting cables shall be short as possible.

◆ signal cable / data cable and equipotential bonding conductor shall be parallel and close to each other all the time.

◆ Use shielded motor cable.

◆ The shielded motor cable should be separated from the motor temperature sensor (PTC / KTY) cable.

◆ signal cable and data cable shall be shielded cable.

◆ the shielding layer shall be lapped on the grounded metal shell in large area at both ends.

◆ The shielding layer shall be grounded near the position where the cable enters the control cabinet as far as possible.

◆ The grounding of power cable shielding layer shall adopt EMC shielding bar.

The signal cable and data cable are grounded by the shielding element on the drive.

◆ Do not interrupt the cable shield through the intermediate terminal.

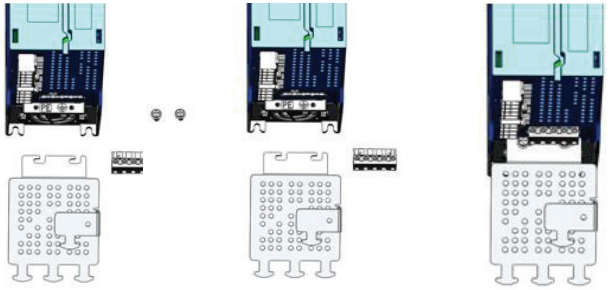
3.2.3 Shield board for power module installation

The shielding method of shielding plate is adopted: The cable shielding layer must be connected with the shielding board in a large area through the line card. According to the type of power module, the shield board is either included in the scope of supply or provided as an option in the form of shield connection kit.

Shielding mode without shielding plate:

◆ No optional shielding board is needed to realize the shielding in accordance with EMC regulations. At this time, it must be ensured that the cable shielding layer is connected with the grounding position in a large area.

Installation of shield board: PM25 (take B1 as an example, other similar)



EMC standard wiring example of Power Module PM25





EMC wiring of Power Module B1





Connect the encoder cable and signal cable to the terminal block in the way of electromagnetic compatibility Please use shielded cable.

◆ Install the shield board of power module.
◆ lap the shielding layer of signal cable / encoder cable on the shielding plate of Power Module.
◆ Install the cable clamp on the shield.
◆ In addition, the shielding layer shall be lapped on the shielding row of the control cabinet.

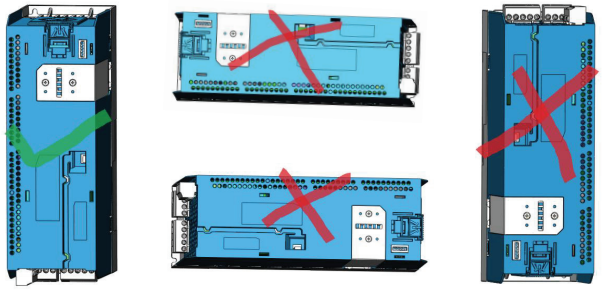
3.3 Installation of reactor, filter and braking resistor

Reactor	The installation position of the reactor is more than 20cm away from the drive.
Filter	The installation position of the filter is more than 20cm away from the drive.
Brake resistor	It is recommended to make an additional electrical cabinet for brake resistor installation.

3.4 Installation of Power Module

Installation of Power Module
The correct installation of the Power Module needs to be carried out in the following way.

◆ Install the Power Module in the control cabinet.
◆ Install the Power Module vertically with the motor and power terminal facing down.



◆ Comply with the installation regulations listed below
- Minimum distance from other components
- Fastener
- Torque of fasteners

EN

EN

Size determination



Drilling diagram of Power Module PM25

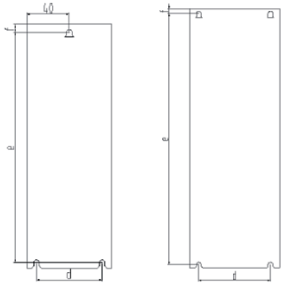


Table 3-1 Overall dimensions and drilling dimensions of A1 series PM25

A1 series	Overall dimensions			drilling dimensions		
	a (width)	b (height)	c (depth)	d	e	f
B1	80	230	165	62	218	6
B2	100	292	165	80	281	6
B3	140	355	165	120	343	6
B4	200	472	237	170	430	7
B5/6	305	757	357	273	727	14
B7	553.3	885	370	370	865	10

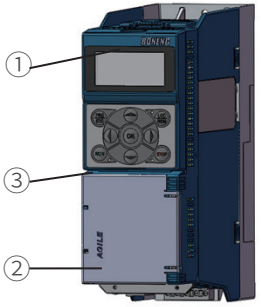
1) Connection Kit with shield plateB1：+94mm；
B2：+94mm；B3：+80mm；
B4：+151mm；B5/6：+261mm

Table 3-2 Spacing between A1 series fasteners and other equipment

A1 series	fastener	tightening torque(Nm)	space between(mm)		
			Upper	Below	Front
B1	M4 screw	2.5	80	100	100
B2	M4 screw	2.5	80	100	100
B3	M5 screw	3.5	80	100	100
B4	M5 screw	6.0	300	350	100
B5/6	M8 screw	25.0	300	350	100
B7	M12 screw	80	200	200	100

1) In installation and operation, there is no need to keep the side spacing. Considering the error, we suggest that the side spacing should be about 1 mm.
2) Please keep enough space between Control Module and operation panel.

Total drive depth



Power Module, dimensions B1...B4

① Power Module	PM25
② Control Module	CM23
③ Operator Panel	OP25

① + ②
The drive is composed of at least one Power Module and one inserted Control Module.
Total drive depth
=Power Module depth + 53mm (Control Module)

① + ② + ③
Drive with operation panel inserted:
Total depth of drive
=Depth of power module + 53 mm

3.5 Connecting power supply, motor and drive components

3.5.1 Permitted grid system

Altitude requirements:
The installation altitude of the power grid system is limited below 4000m, and it needs to be derated when it exceeds 1000m.
Power requirements:
The machine tool manufacturer must ensure that the voltage sag between the input terminal of the transformer and the drive is less than 4% when operating at rated value.
The drive is designed for the following power supply systems in accordance with IEC60364-1(2005).
TN System
TN system transmits the protective grounding wire to the installed equipment through a wire.
The star point in TN system is usually grounded. In addition, there are also TN systems with grounding phase lines, such as L1 with grounding.
TN system can transmit neutral line N and protective earth wire separately or in combination.

The drive runs on TN system
◆ drive with built-in or external power filter:
-It is allowed to operate on TN system with grounding star point
-It is not allowed to operate on TN system with grounding phase line
◆ drive without power filter:
-It is allowed to operate on all TN systems ⩽ 600V

Example of Power Module on TN System

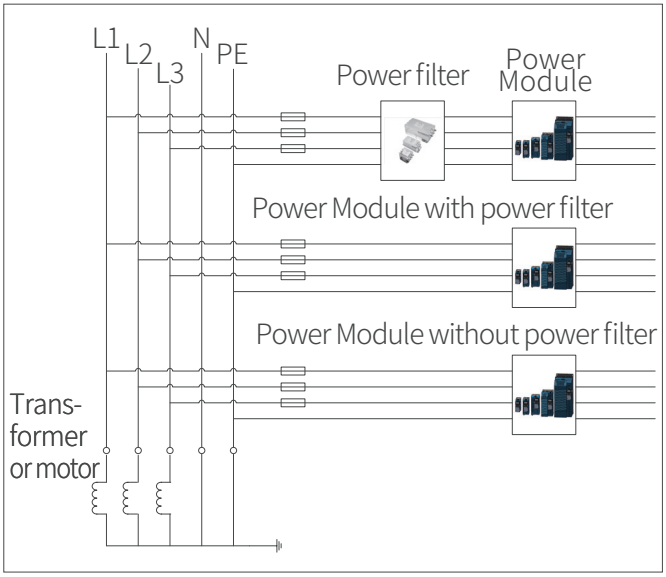


Figure 3-1 TN system with separate transmission of N and PE and grounding star point.

TT system
In TT system, the grounding and installation of transformer are independent.
There are two TT systems with or without neutral N.

Drive running on TT system
◆ drive with built-in or external power filter:
-It is allowed to operate on TT system with grounding star point.
-It is not allowed to operate on TT system without grounding star.
◆ drive without power filter:
-Allow to run on all TT systems.

Example of Power Module on TN System

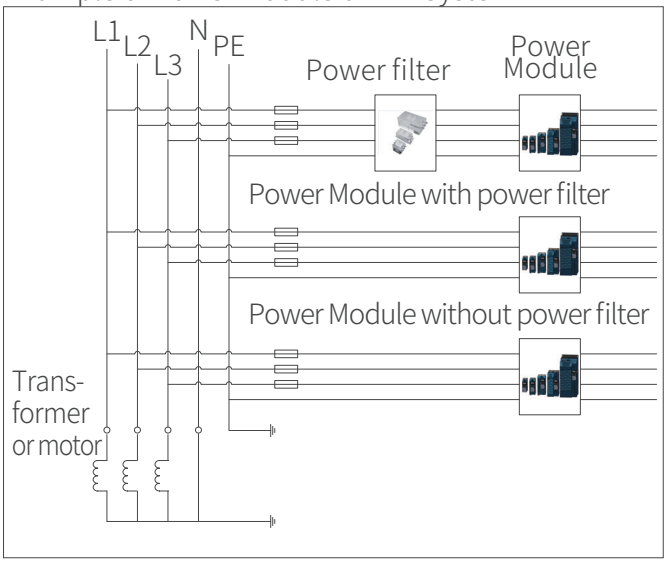


Figure 3-2 TT system with neutral N transmission and grounded star point.

IT system
All wires in IT system are isolated from the protective earth wire or connected to the protective earth wire through an impedance. Two IT systems with or without neutral
N transmission.

Drive run on IT systems
◆ drive with built-in power filter:
-Not allowed to run on IT systems
◆ drive without power filter:
-Allow to run on all IT systems

EN

Example of Power Module on TN System

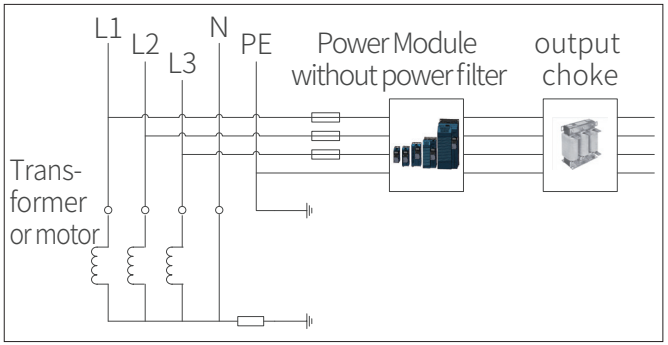


Figure 3-3 IT system with transmission neutral N and impedance of protective earth wire.

Characteristics of the drive when grounded:
In some cases, the drive can still work when the output is grounded.
At this time, an output reactor must be installed to avoid over-current trip of the drive or damage to the motor.

3.5.2 Protection device

The inverter must be grounded according to the relevant provisions of high leakage current (above 3.5 mA). If local and national codes require upstream protection via residual protectors, type B residual current circuit breakers shall be used for drives.
In order to avoid accidental triggering of residual current circuit breaker caused by leakage current, the star point of power supply must be grounded, and the residual current circuit breaker with limiting current of more than 300mA and action time of more than 0.1s shall be selected.

According to the requirements of IEC61800-5-1, special attention should be paid if the leakage current exceeds 3.5mA.
One of the following ways should be adopted to enhance the grounding measures:
◆ The cross-sectional area of the ground wire shall be at least 10mm（8 AWG）.
◆ Use two separate grounding wires that meet the size specifications.

3.5.3 Connecting drive

Connect the power module to the motor and power supply.

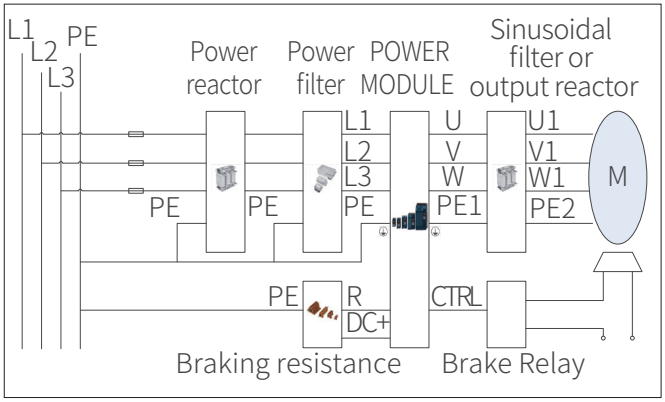


Figure 3-4 Power Module PM25 3AC wiring diagram

⚠ DANGER

Dangerous voltage on motor interface can cause life-threatening.
Once the driver is powered on, there may be dangerous voltage on the motor interface of the drive. If the motor is connected to the drive and the motor junction box is open, touching the motor interface can cause an electric shock hazard.
◆ Please turn off the terminal box of the motor before connecting the drive.

Connect the power cable to the drive

Step / connect the drive and power supply as follows:
1. If there is a cover on the terminal of the drive, open the cover.
2. Connect the power supply to terminals L1, L2 and L3.
3. Connect the protective grounding wire of the power supply to the PE terminal of the drive.
4. If there is a cover on the terminal of the drive, close the cover.
You have connected the power cable to the drive.

EN

Connect the motor cable to the asynchronous motor
Step / connect the motor cable to the asynchronous motor as follows:
1. Open the motor terminal box.
2. Use star connection or triangle connection to connect the motor.
3. If shielded motor cable is needed, the following operations must be carried out:
-Peel off the sheath of the motor cable around the inlet hole of the junction box to expose the shielding layer.
-Ground the shield through a suitable cable gland on the motor junction box.
4. Connect the terminal box of the motor
You have successfully connected the motor cable to the asynchronous motor

You must choose star connection or triangle connection(Y/△) to connect the motor according to your application.
Example: drive and motor running on 400V power supply
Assumption: 230/400V △/Y is marked on the motor nameplate.
Case 1: normally, the motor rises from static state to rated speed
(the speed corresponding to the power frequency).
At this time, the motor must use Y wiring.
In this case, only by using flux weakening, the motor can run beyond the rated speed, that is to say, the available torque of the motor can be reduced above the rated speed.
Before connecting the motor, check whether the wiring of the motor is in accordance with the requirements of your application

Star connection or triangle connection of motor
Schematic diagram of wiring
- Star connection (Y)
- Delta connection (△)

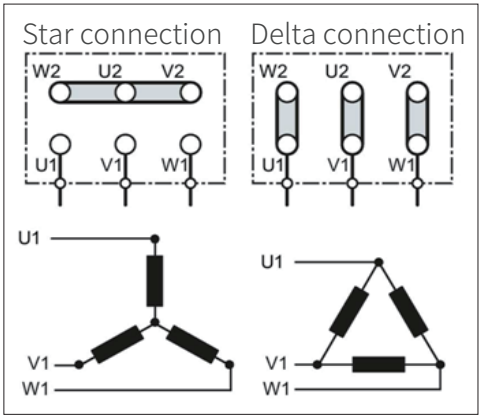


Figure 3-5 star and triangle connection of motor

Connect the motor cable to the drive
Step/connect the motor cable to the drive as follows:
1. If there is a cover on the terminal of the drive, open the cover.
2. Connect the motor to terminals U, V and W.
Please note the EMC Wiring Regulations.
3. Connect the protective grounding wire of the motor to the PE terminal of the drive.
4. If there is a cover on the terminal of the drive, close the cover.
You have connected the motor cable to the drive.

3.5.3 Connecting brake resistor

Connect the Power Module to the motor and power supply.

⚠ WARNING

Improper or incorrect installation of the brake resistor can lead to fire and life-threatening.
Open fire and smoke can cause heavy casualties or property losses.
The use of mismatched brake resistor can cause open fire and smoke, resulting in casualties or financial losses.

- Only the brake resistor matched with the drive is allowed to be used.
- Install the brake resistor as required.
- Monitor the temperature of the brake resistor.

⚠ Be Careful

Contact with hot surfaces can cause burns.
The temperature of the brake resistor will rise sharply during operation.

- Please do not touch the brake resistor during operation.

Step / connect the brake resistor and monitor the temperature of the brake resistor according to the following steps:

1. Connect the brake resistor to the terminals DC+ and R2 on the drive.
2. Connect the brake resistor directly to the grounding bar of the control cabinet, and the brake resistor is not allowed to be grounded through the PE terminal on the drive.
3. Please follow the shielding regulations to ensure that the electromagnetic compatibility requirements are met.
4. Connect the temperature monitoring terminal of the brake resistor to the idle digital input on the drive.
5. When debugging the drive, the function of the digital input is defined as an external fault.

Now the brake resistor has been successfully connected and the temperature monitoring has been set.

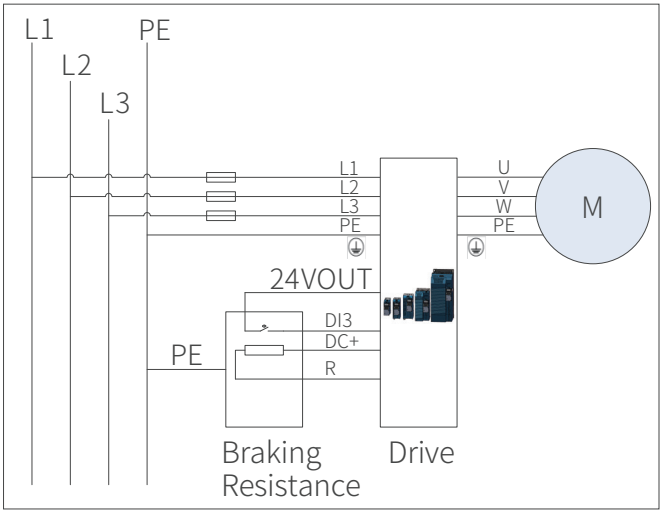
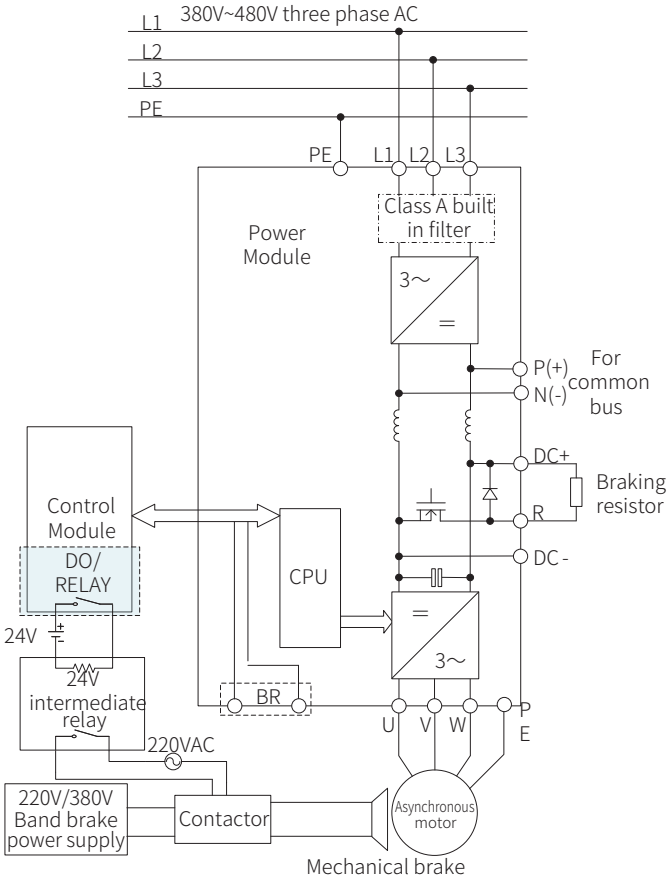


Figure 3-6 Connecting the brake resistor directly to the driver (example: temperature monitoring through DI3)

3.5.4 PM25 assembly drawing



3.6 Installation of Control Module

⚠ WARNING

The dangerous voltage generated by improper power supply can cause life danger.
In case of failure, contacting live parts may cause serious injury or even death.
◆ All connections and terminals of electronic module are only allowed to use class 2 PELV power supply (Protective Extra Low Voltage).

3.6.1 Insert the Control Module into the Power Module

Insert the Control Module into the Power Module B1.. B7



Remove the Control Module



Load the Control Module

Step

Insert the Control Module into the Power Module as follows:

1. Install the convex part on the back of the Control Module in the corresponding groove of the Power Module.
2. Insert the Control Module into the Power Module until the sound of the control unit clamping on the Power Module is heard.

You have inserted the Control Module into the Power Module.

If you want to remove the Control Module, just press and hold the clip on the power unit and remove the Control Module.

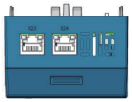
3.6.2 Interface list

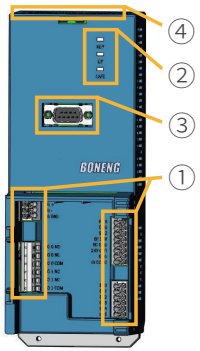
It is necessary to remove the operation panel (if any) and open the front door cover to operate the interface on the front of the Control Module.

① Terminal block
② Status LED



③ Operation panel interface
④ Ethernet terminal





EN

3.6.3 Terminal block behind the top front protective cover

X1	
1	SG+
2	SG-
3	SG GND

Only support the modbus control module,
Modbus terminal, maximum support 115200bps

X2	
1	DO0NO
2	DO0NC
3	DO0COM
4	DO1NO
5	DO1NC
6	DO1COM

2-channel digital output (relay) with maximum duration of 2A, supporting 220 VAC and 30 VDC
If the inductive load such as brake is greater than 0.6A, it is recommended to add an intermediate relay for control

X3	
1	EC A
2	EC B
3	EC Z
4	EC24V
5	ECGND
6	24VOUT
7	GND
8	DI COM0

The encoder supports 24 V single ended signal input

EC GND and GND are connected with internal GND, 24V OUT and EC 24v are generated by the machine, and the voltage is 24V±10%

X4	
1	DI 0
2	DI 1
3	DI 2
4	DI 3
5	DI 4
6	DI 5

DI 0-DI 5 is a common digital input of DI COM0, low voltage＜5V，high voltage＞11V，support 24VDC, 36VAC, 48VAC

3.6.4 Top terminal
This terminal is only available in control modules that support PROFINET communication.

X23 and X24	pinout	signal name	signal description
1 - 8	1	TXP	Ethernet sending data+
	2	TXN	Ethernet sending data-
	3	RXP	Ethernet receiving data+
	4	Reserved,unoccupied	—
	5	Reserved,unoccupied	—
	6	RXN	Ethernet receiving data-
	7	Reserved,unoccupied	—
	8	Reserved,unoccupied	—

3.7 Installation of encoder
The encoder for speed control
The encoder must be mounted on the motor shaft.
Table 3-3 allowed encoders

Type of encoder	terminal
24V push pull encoder	X3
24V open collector encoder	X3

If the encoder supports 24V input, the 24V power supply provided by terminal X3 can be used directly.

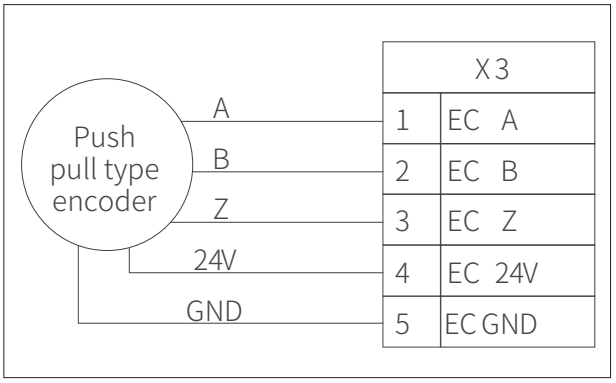


Figure 3-7-1 24V push pull encoder wiring diagram

If the encoder supports 24V input, it can directly use the 24V power supply provided by terminal X3

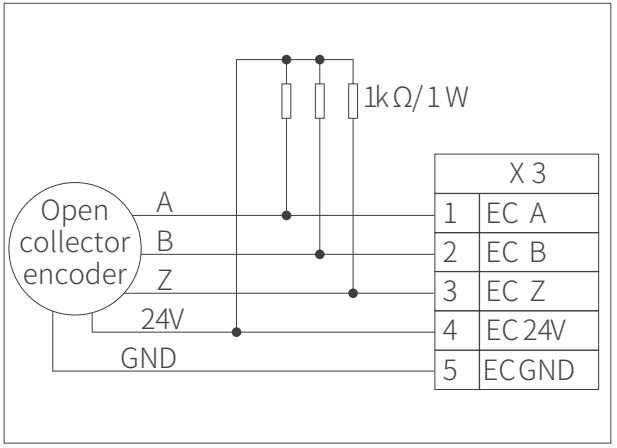


Figure 3-7-2 24V open collector encoder wiring diagram

Note: if different signal is used, it must be noted that only A+，B+，Z+or A-，B-，Z- can be used at the same time.

EN

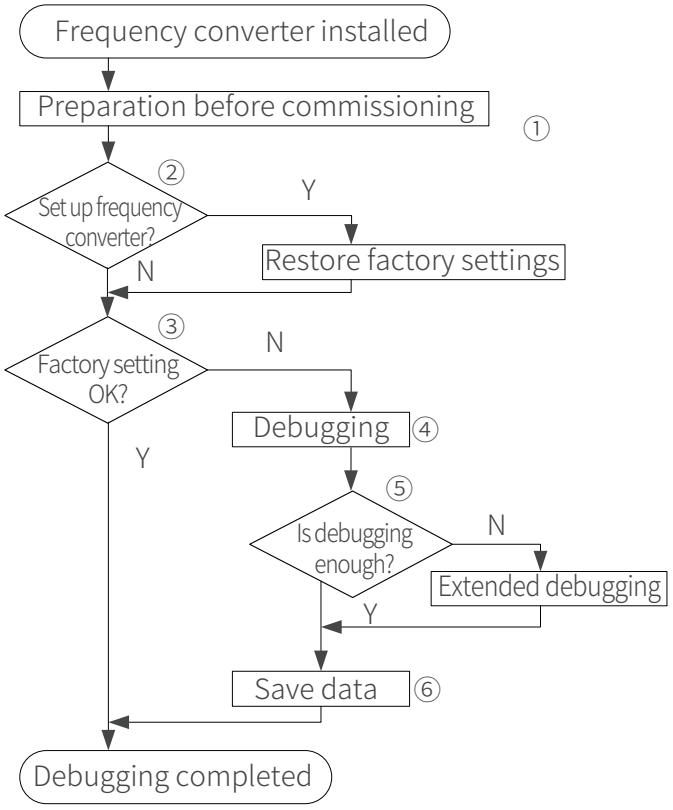
4 Commissioning

4.1 Commissioning Guide

1.Determine the application requirements for frequency converter
- ◆ Input cable diameter
- ◆ Output cable diameter
- ◆ Matching value of braking resistance

2.Power on the inverter for the first time to restore the factory value.
3.Check whether the factory settings of the inverter have met your application requirements.
4.Set the following items during driver debugging:
- ◆ Motor control mode
- ◆ Input and output
- ◆ Field bus interface

5.Adjust the inverter parameters according to the demand.
6.Backup all parameters of frequency converter.



4.2 Preparation before commissioning

4.2.1 Collect motor data

Before you start debugging, you must be able to determine the following information
- ◆ What kind of motor is connected to the drive?

Please record the product number of the motor and the data on the nameplate, and record the relevant motor parameters in the corresponding parameter list of the driver.
- ◆ How to connect the motor?

Pay attention to the motor wiring (Star [Y] or delta [△]). Write down the motor data corresponding to the wiring.

4.2.2 Factory settings of drive

Drive model settings
At the factory, the drive has been set according to the rated power of the Power Module.Drive control
The factory setting signal of the drive control comes from the terminal, and the factory setting of the terminal depends on the setting of the Control Module.

X4		Custom function
1	DI0	Forward running
2	DI1	Reverse operation
3	DI2	Fault reset source2
4	DI3	.....
5	DI4	.....
6	DI5	.....

X2		Custom function
1	DO0 NO	Brake open command status
2	DO0 NC	
3	DO0 COM	
4	DO1 NO	.....
5	DO1 NC	
6	DO1 COM	

Turn on and off the motor
In the factory settings of the drive, take the frequency setting value of 5Hz (the rated frequency of the motor is 50Hz) as an example, the drive will make the motor accelerate to the setting value within 5 seconds after being turned on. Similarly, after turning off the motor, the drive will slow down and brake the motor in 5 seconds.

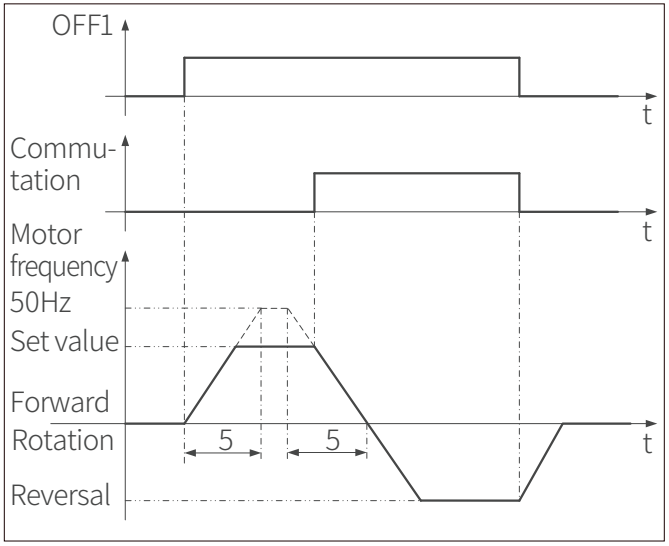


Figure 4-1 Opening, closing and reversing of motor in factory settings.

4.3 Restore factory value

Some situations can cause debugging exceptions, such as:
◆ power supply is interrupted during the commissioning, which makes the commissioning unable to end.
◆ In the process of debugging, the setting cannot be continued because the meaning of a parameter is not understood.
◆ You don't know if the drive has been used once.
In these cases, restore the drive to factory settings.

Table 4-1 Parameter recovery factory value

Parameter	Parameter name	Description
A04.00	Parameter reset mode	0: Invalid 1: Model parameters, motor parameters, fault records not reset 2: Motor parameters, fault records not reset 3: Reset all parameters 4: Clear fault records
A04.01	Parameter reset	0: Cancel 1: Confirm

Model parameters: the drive sets the power model parameters of PM drive module.
Motor parameters: motor parameters driven by drive.

Example:
Target requirements:
Restore factory values for parameters other than model parameters, motor parameters and fault records

Steps:
1.A04.00=1;
2.A04.01=1;
After waiting for 5S, the drive completes the operation of restoring the factory value.

4.4 Operation and display of operation panel

Introduction of operation and display interface
With the operation panel, you can modify the functional parameters of the drive, monitor the working state of the drive and control the operation (start, stop) of the drive which appearance and functional area are shown in the figure below:

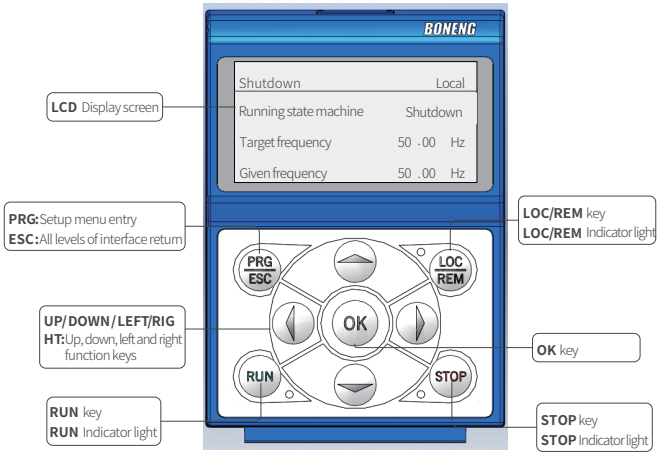


Figure 4-2 Schematic diagram of operation panel

1) Function indicator description
LOC / REM indicator light: the light on indicates the panel operation control status, and the light off indicates the remote operation control status.
Stop indicator light: when the light is on, it indicates that the drive is in shutdown state.
Run indicator light: when the light is on, it indicates that the drive is processing the running state.

2) Operation panel key description

Key	Name	Function
PRG/ ESC	PRG/ ESC key	In the main monitoring interface, press this key to enter the function selection interface; For other interfaces, press this key to return to the upper level interface or status
LOC/REM	LOC/REM key	Gets or relinquishes keyboard control
STOP	Stop key	In the running state, pressing this key can be used to stop the operation; Press this key to reset the fault state when the machine is stopped
RUN	Run key	In keyboard operation mode, it is used for operation
▲	Descending key	Increment of data or function code
▼	Descend-ing key	Decrement of data or function code
▶	right shift key	When modifying a parameter, you can cycle right to select the modification bit of the parameter
◀	left shift key	When modifying a parameter, you can cycle to the left to select the modification bit of the parameter
OK	OK key	Enter the menu screen step by step and confirm the setting parameters

3) LCD display interface description
LCD display interface adopts 4 lines of Chinese display mode, in which the first line displays the status line. When there is no fault, display the current operation status (shutdown operation), inching control, local/remote status and other information. When a fault occurs, the first line will display the current fault code first, as shown in the figure below:

Shutdown	Local
Running state machine	Shutdown
Target frequency	50.00 Hz
Given frequency	50.00 Hz

Figure 2 example of LCD display in normal state

Fault: converter overtemperature1	
Running state machine	Shutdown
Target frequency	50.00 Hz
Given frequency	50.00 Hz

Figure 3 example of LCD display of fault status

How to view and modify function code
The operation panel of A1 drive adopts multi-level menu structure for parameter setting and other operations. The interface adopts 4 lines of Chinese display, which is very intuitive and easy to operate.
In the state of parameter setting interface, you can view this group of function codes in turn by pressing the up and down buttons.
Press OK to enter the parameter setting interface.
Give an example:
An example of changing function code B05.00 from VF control to SVC control is shown in the figure below.
The result of parameter setting is one of the following:
1) Modified successfully
2) Read only parameter
3) No permission to modify
4) It can only be stopped for modification

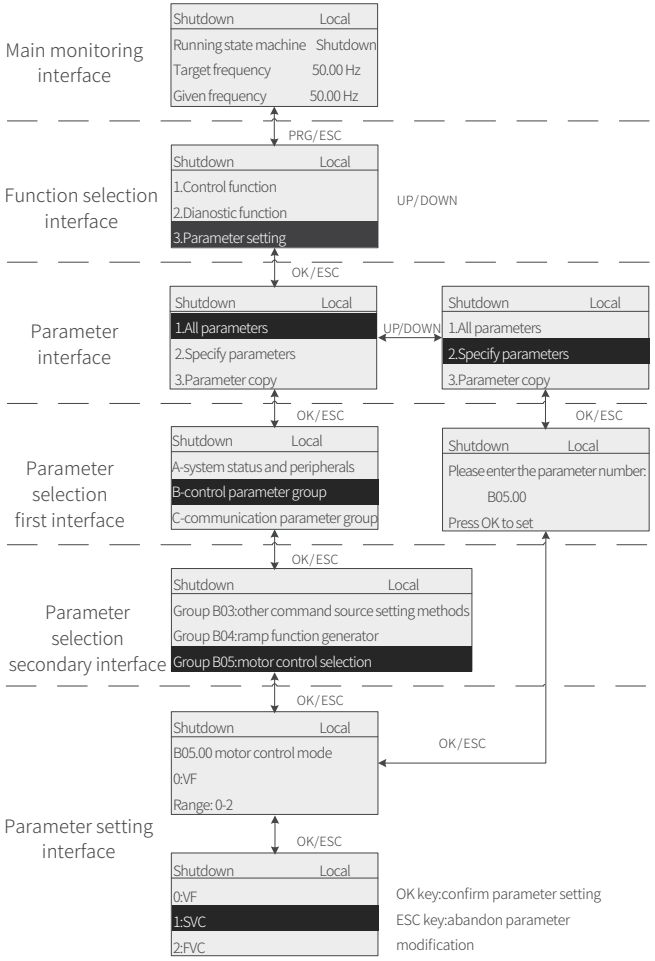


Figure 4-3 Schematic diagram of parameter modification process

Main interface monitoring parameter selection
The number of parameters that can be monitored in the main interface is 6, and the monitored parameter range is 21 parameters of group A00. The monitoring parameters of the main monitoring interface can be selected by setting the parameter values of A00.41-A00.46.
For example:
A00.14 (DC bus voltage) needs to be displayed on the second line of the main monitoring interface. Just change the parameter value of A00.42 to 14.

5 Extended debugging

5.1 Drive function list

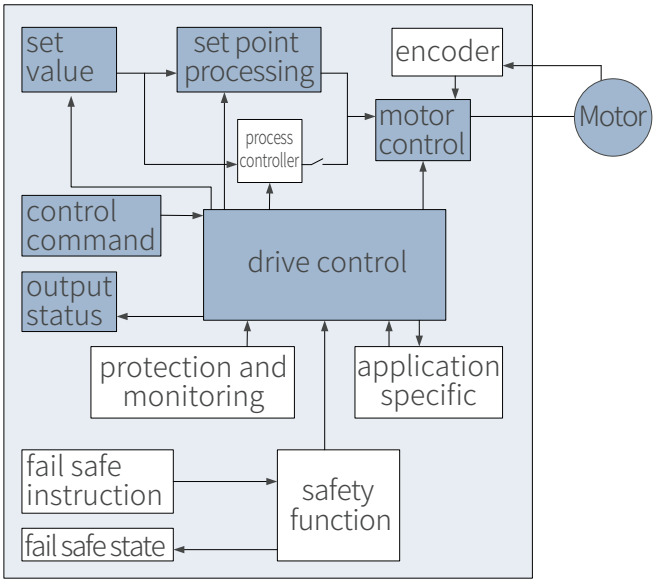


Figure 5-1 List of drive functions

Common functions	Special functions
The functions that need to be used in each application are shown in dark color in the function list above. Please display these functions in white during basic debugging, so that you can run the motor directly without other settings in many applications.	The functions that need to adjust parameters according to the requirements are shown in white in the above function diagram.

Drive control	Drive control has more authority than all other functions. It defines how to respond to the instructions of the superior monitoring controller.	Protection and monitoring	The protection and monitoring function can avoid damaging the motor, drive and working machinery, such as through temperature monitoring or torque monitoring.
Command output status	The command of the upper controller is sent to the driver through digital input or field-bus. The drive feeds back its status information to the output of control module or field-bus.	Application specific	The application of special functions can control, such as motor holding brake, or enable upper pressure control or temperature control through public controller.
Set value	A set value must be determined, such as: the speed set value	Safety function	The security function is used in the application where the security of the drive function is highly required. The basic function is to safely block the driving torque.
Set point processing	Set value processing is used to avoid sharp change of speed caused by ramp function generator and control the speed below the maximum value.		
Motor control	The motor control is used to make the motor track the speed setting. You can choose between vector control and V / f control.		

5.2 Drive control

5.2.1 Turn on and turn off the motor

After the power supply voltage is turned on, the drive will normally enter the "power on Preparation" state. In this state, the drive will always wait for the command to turn on the motor

◆ OFF1-ON received

After the command, the drive will turn on the motor. The drive enters the "running" state.

◆ Send OFF1-OFF

After command, the drive brakes the motor. After the motor stops, the drive will turn off the output. The drive returns to the "power on ready" state.

Drive status and command to turn motor on and off

Except for the OFF1 instruction,

The command to stop the motor is as follows:

◆ OFF2-ON (low level) drive stops output immediately without braking the motor first.

◆ OFF3-ON (low level) this instruction means "emergency stop". After the OFF3-on command is issued, the drive makes the motor brake with OFF3 deceleration time. After the motor stops, the drive will turn off the output. This command is often used in abnormal operation to make the motor brake quickly. The typical application is collision protection.

◆ Stop operation - the drive stops the motor in the stop mode of OFF1 / OFF2 / OFF3.

◆ Normal operation - the drive drives the motor.

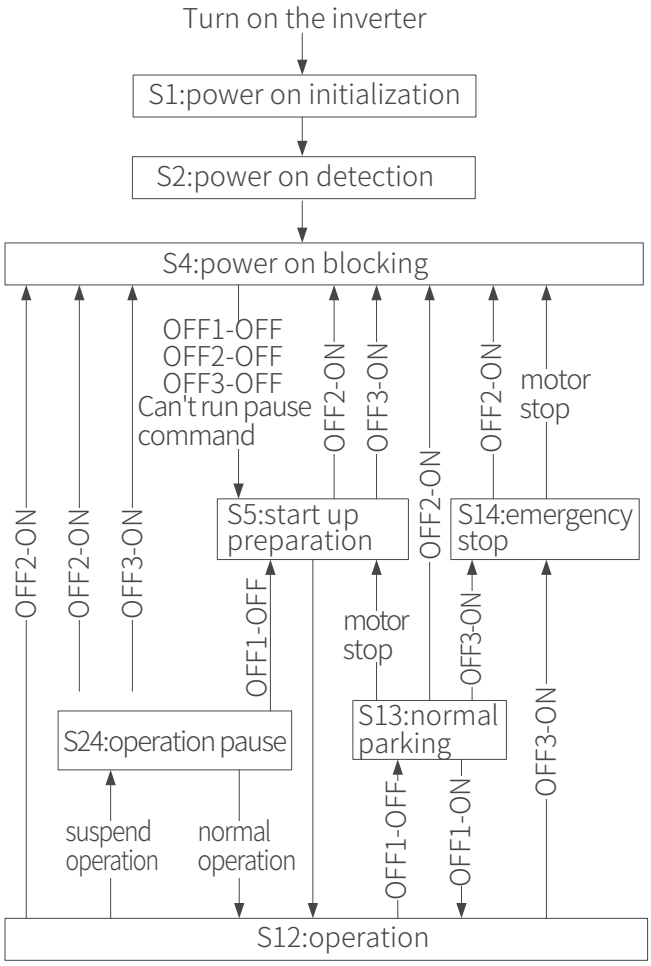


Figure 5-2 Internal sequence control of the drive when the motor is turned on and off

Drive status	Instruction
S1	The initialization state of the drive after it is powered on.
S2	The detection status of power devices after drive initialization.
S4	The state in which the drive does not meet the motor operating conditions.
S5	The state of the drive when it meets the operating conditions of the motor.
S12	The output of the drive makes the motor run.
S13	The motor has been shut down by OFF1 command and braked during the ramp down time of ramp function generator.
S14	The motor has been shut down by OFF3 command and decelerated and braked by of 3 deceleration time or according to current limit
S24	The motor operation is suspended.

5.2.2 Adjust the preset of terminal block

This chapter describes how to modify the functions of each digital and analog input / output of the drive.

5.2.2.1 Digital input

Modify the function of digital input

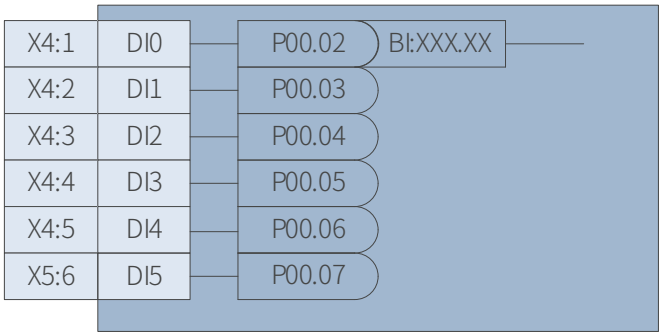


Figure 5-3 Digital input function diagram

Note: the status parameter of DI must be connected with the selected binary interconnection input to modify the function of DI.

Figure 5-1 Binary interconnection input parameters of some common drives

Parameter number	Name	Parameter number	Name
B00.01	Custom start/ stop CMD (OFF1) SRC	B03.14	Multisegment given value SEL3
B00.02	Custom Enable (OFF2) SRC 1	B03.15	Multisegment given value SEL 4
B00.13	Fault reset source2	B04.00	Ramp time selection Bit0
B01.03	Terminal Ctrl command 1 input 1	B04.01	Ramp time selection Bit1
B01.04	Terminal Ctrl command 1 input 2	B04.20	RFG forced output enable
B01.05	Terminal Ctrl command 1 input 3	E00.00	External fault 1 source
B03.09	Electric POT adds source SEL	E00.01	External fault 2 source
B03.10	SEL of drop SRC of ELEC POT	E00.02	External warning 1 source
B03.12	Multisegment given value SEL 1	E00.03	External warning 1 source
B03.13	Multisegment given value SEL 2	F04.03	Brake open command source

EN

Example:modify the function of digital input



The external fault source selection (E00.00) is connected with DI0 to trigger the external fault through digital input DI0. Set E00.00=1002.

Note:The coding rule of the representative number of interconnection parameters is agreed as parameter number +1000; that is, the number of P00.02 is 1002; The number of P13.11 is 2311 and the number of P15.89 is 2589; Other interconnection parameters and so on.

5.2.2.2 Digital output

Change the function of digital output

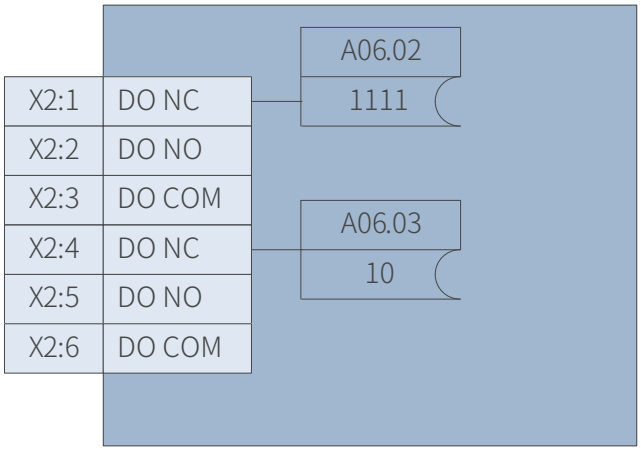


Figure 5-4 function diagram of changing digital output

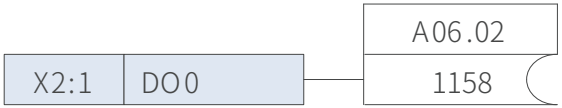
Note:The digital output must be connected with the selected binary interconnection output to change the function of the digital output.

EN

Table 5-2 Function selection table of digital output of drive.

Set value	Meaning	Set value	Meaning
0	low level	6	the velocity negative
1	high lever	7	zero speed operation
2	Ready for operation	8	over speed
3	operation allowed	9	warning
4	in operation	10	fault
5	comparison value arrived	other:binary interconnection parameters	

Example:modify the function of digital output



The DO0 is connected with the interconnection parameter of holding brake opened (P01.58) to represent the current state of holding brake relay by digital output DO0;Setting A06.02=1158.

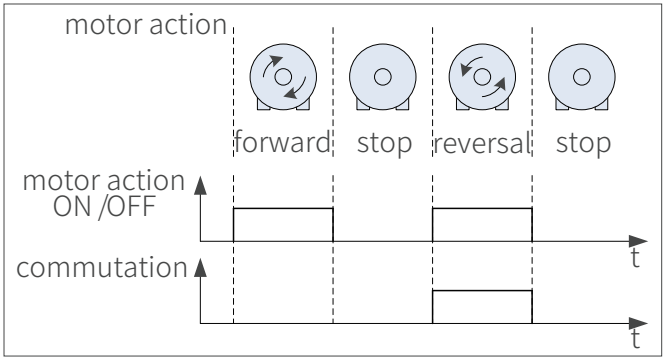
5.2.3 Control drive by digital input (DI)

There are six ways to control the motor by digital input.

Single line control

Single wire control, the input terminal only controls the start and stop of the motor, the rotation direction of the motor is determined by the current driver output terminal wiring phase sequence.

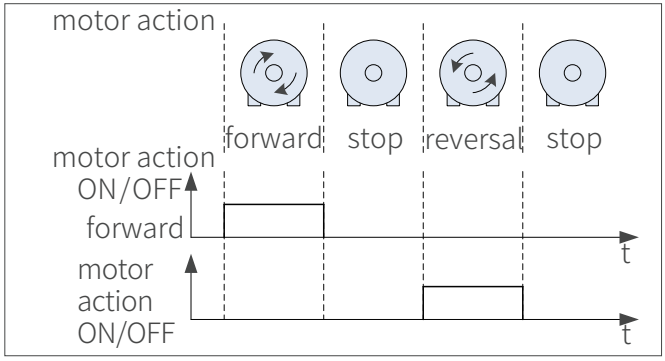
Two wire control, method 1



EN

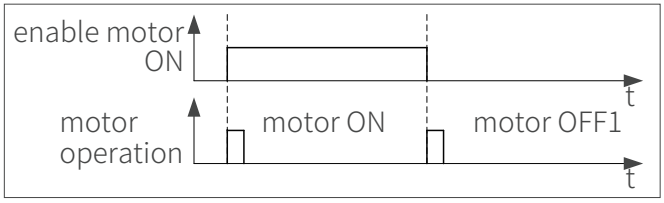
Control command
1. Turn on and off the motor (ON / OFF1).
2. Switch the motor rotation direction (reverse).
Typical applications:
Field control of conveyor application.

Two wire control, method 2



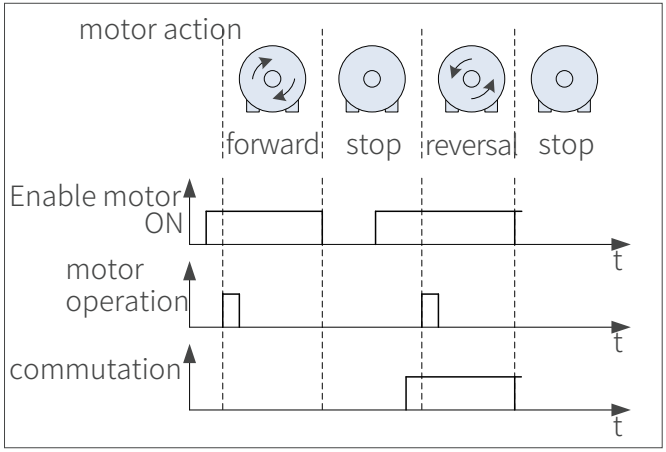
Control command
1. Turn on and off the motor (ON / OFF1) and turn forward.
2. Turn on and off the motor (ON / OFF1) and reverse.
Typical applications
Through the main switch to control the operation of transmission.

Two wire control, method 3



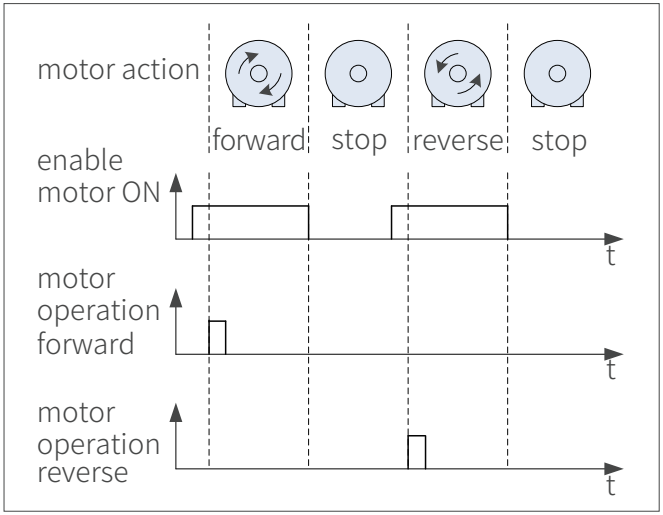
Control command
1.Enable motor and disable motor (OFF).
2.Turn on the motor(ON), and the rotation direction of the motor is determined by the current phase sequence of the output terminal wiring of the drive.

Three wire control, method 1



Control command:
1.Enable motor and close motor(OFF1)
2.Turn on the motor.
3.Switch the motor rotation direction(reverse).

Three wire control, method 2



Control command:
1.Enable motor and disable motor(OFF).
2.Motor running forward command (ON), forward.
3.Motor operation reverse command(ON),reverse.
Typical applications
Through the main switch to control the operation of transmission.

EN

5.2.4 Two wire control, method 1

In this control method, you control the start and stop of the motor by one control command (ON/OFF), and control the forward and reverse rotation of the motor by another control command.

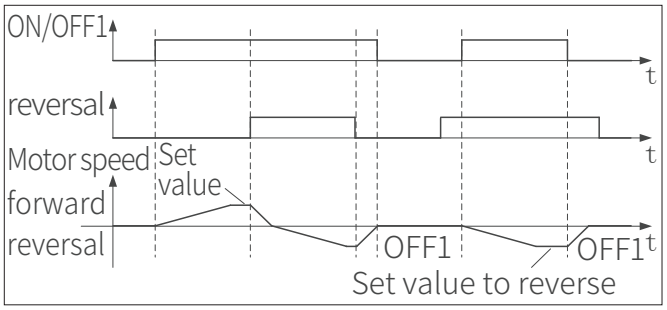


Figure 5-9 Two wire control, method 1

Table 5-4 Terminal function list

ON/OFF1 (IN1)	Reverse (IN2)	Function
0	0	OFF1: Motor stops
0	1	OFF1: Motor stops
1	0	ON: Motor forward
1	1	ON: Motor reverses

Related parameter setting

Parameter number	Parameter name	Parameter description
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01 = 2 means two-wire control, method 1.
B01.03	Terminal control command 1 input in1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input in2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.

5.2.5 Two wire control, method 2

In this control method, the first control command (ON / OFF1) is used to turn on and off the motor, and select the forward rotation of the motor at the same time.
The second control command is also used to turn the motor on and off while selecting the reverse direction of the motor.
The drive receives new commands only when the motor is stationary.

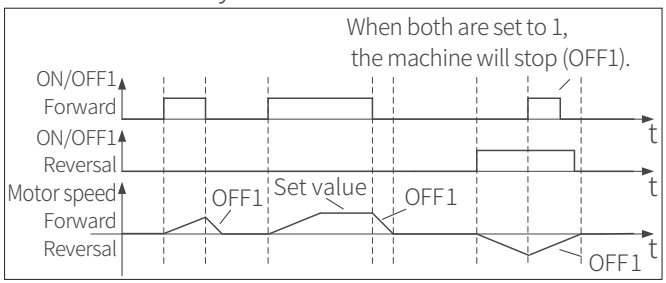


Figure 5-10 Two wire control, method 2

Table 5-5 function list

ON/OFF1 Forward (IN1)	ON/OFF1 Reversal (IN2)	Function
0	0	OFF1: Motor stops
1	0	ON: Motor forward
0	1	ON: Motor reverses
1	1	OFF1: Motor stops

Related parameter table

Parameter number	Parameter name	Parameter description
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01 = 3 means two-wire control, method 2.
B01.03	Terminal control command 1 input in1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input in2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.

EN

5.2.6 Two-wire control, method 3

In this control method, the first control command is used to enable another control command. After the enable is canceled, the motor is shut down (OFF 1). The rising edge of the second control finger moves the motor. The running direction of the motor depends on the line searching phase sequence at the output end of the drive.

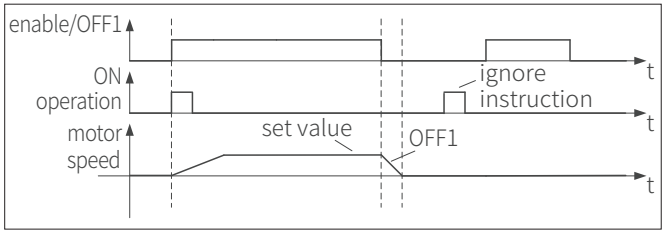


Figure 5-11 Two wire control, method 3

Figure 5-6 function table

Enable/OFF1(IN2)	ON/OFF1(IN1)	Function
0	0	OFF1: Motor stops
1	0	OFF1: Motor stops
0	0->1	OFF1: Motor stops
1	0->1	ON: Motor rotates, with the direction determined by the phase sequence of the driver output wiring

Related parameter table

Parameter number	Parameter name	Parameter description
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01 = 4 means two-wire control, method 3.
B01.03	Terminal control command 1 input in1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input in2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.

5.2.7 Three wire control, method 1

In this control method, the first control instruction is used to enable the other two control instructions. After disable, the motor turns off(OFF1).
The rising edge of the second control command turns on the motor(ON).
The third control command determines the direction of rotation(commutation) of the motor.

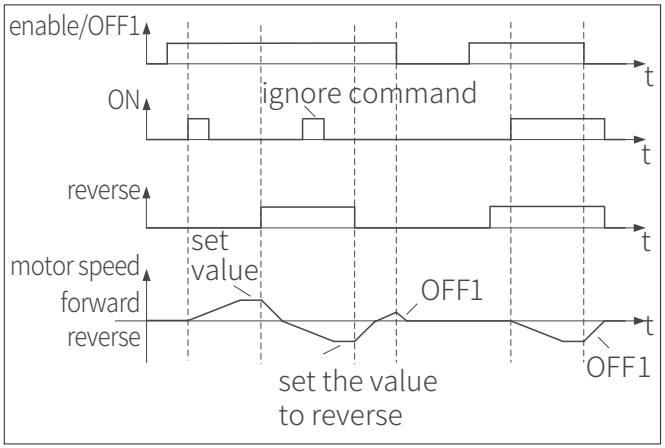


Figure 5-12 Three wire control, method 1

Figure 5-7 function table

Enable/OFF1 (IN2)	ON (IN1)	Reverse Direction	Function
0	0 or 1	0 or 1	OFF1:motor stop
1	0->1	0	ON: Motor forward
1	0->1	1	ON: Motor reverses

EN

Relative parameters

Parameter number	Parameter name	Parameter description
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01=5 means three-wire control, method 1.
B01.03	Terminal control command 1 input IN1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input IN2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.05	Terminal control command 1 input IN3	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.

5.2.8 Three wire control, method 2

In this control method, the first control instruction is used to enable the other two control instructions. After disable, the motor turns off(OFF1).
The rising edge of the second control command switches the motor to forward.
If the motor is not switched on, the motor is switched on.
The rising edge of the second control command switches the motor to reverse.
If the motor is not switched on, the motor is switched on.

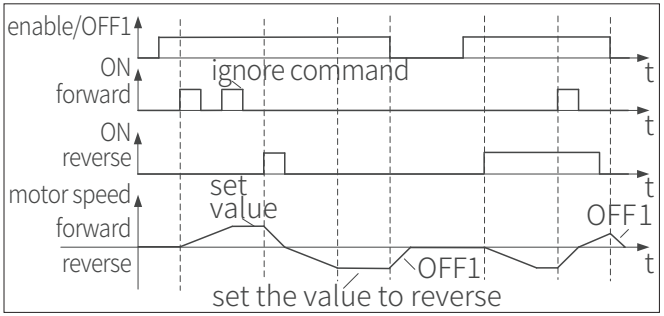


Figure 5-13 Three wire control, method 2

Figure 5-8 function table

Enable/OFF1 (IN3)	ON Forward (IN1)	ON Reversal (IN2)	Function
0	0 or 1	0 or 1	OFF1:motor stop
1	0->1	0	ON: Motor forward
1	0	0->1	ON: Motor reverses
1	1	1	Motor does not move

Relative parameters

Parameter number	Parameter name	Parameter description
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01=6 means three-wire control, method 2.
B01.03	Terminal control command 1 input IN1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input IN2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.05	Terminal control command 1 input IN3	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.

5.2.9 Motor inching (JOG function)

The "JOG" function is usually used to slowly move a mechanical part, such as a moving conveyor belt.
Through the "JOG" function, the motor can be turned on and off by digital input.
When on, the motor will accelerate to the JOG setting.
The drive provides two JOG settings,
For example: motor forward setting and reverse setting.
The acceleration and deceleration time of jog is different from that of ON/OFF1 command, which is set by another parameter.

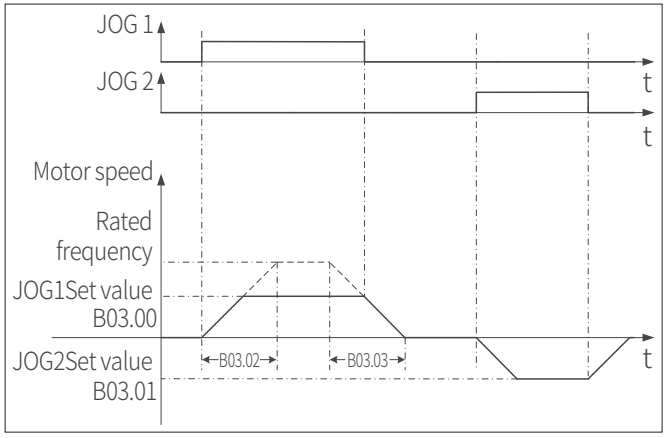


Figure 5-14 Working sequence of motor in JOG

Note: before giving the "JOG" control command, the driver should be in the state of power on preparation.
If the motor is running, the "JOG" command will not take effect.

JOG setting related parameters

Parameter number	Parameter name	Parameter description
B00.00	source of start stop control command	select control command source module
B00.07	custom JOG1 source	define the source setting of JOG1 command of control module
B00.08	custom JOG2 source	define the source setting of JOG2 command of control module
B01.11	terminal control module JOG1 source	JOG1 command source setting of terminal control module
B01.12	terminal control module JOG2 source	JOG2 command source setting of terminal control module
B03.00	given setting of JOG1	source selection of JOG1 setting value
B03.01	given setting of JOG2	source selection of JOG2 setting value
B03.02	JOG acceleration time	JOG acceleration time setting
B03.03	JOG deceleration time	JOG deceleration time setting

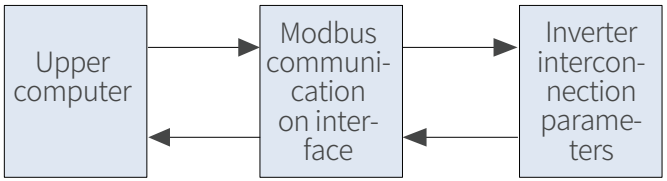
5.2.10 Communication control

Currently the drive supports Modbus communication and PROFINET communication. For PROFINET communication module, please visit the official website to download the relevant instructions

5.2.10.1 Modbus communication control

The specific Modbus communication protocol is shown in the appendix.

The specific structure of Modbus communication is as follows:



Modbus communication address:

postal address	name	definition
0xE720	Modbus communica-tioncontrol command	0: Reset; 1: Start; 2: Jog operation; 3: Free stop; 4: Deceleration stop; 5: Fault reset; 6: Reverse the given speed
0xE721	Modbus communica-tion set point 1	Modbus communication setting value;setting range:-600.0%~600.0%
0xE722	Modbus communica-tion set point 2	Modbus communication setting value;setting range:-600.0%~600.0%

To use Modbus to control motor start/stop and set target speed, the following parameters need to be set:

Function Code	name	Set parameters
B00.00	Start-stop Ctrl command source	1:Custom control module
B00.01	Custom start/stop CMD (OFF1) SRC	P02.32: Modbus COMM start-stop command
B00.02	Custom Enable (OFF2) SRC 1	P02.34: Modbus COMM free parking
B00.05	Custom fault reset source1	P02.35: Modbus COMM fault reset
B00.06	Custom speedcom-mand negate SRC	P02.36: Modbus COMM given speed reverse
B02.00	Speed control main speed SEL	P07.35 Modbus COMM set-ting value 1 P.U / P07.36 Modbus COMM set-ting value 2 P.U

Modbus communication related parameters

Parameter label	Parameter name	Parameter setting range
C02.00	Modbus baud rate	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps 6:57600bps 7:115200bps
C02.01	Modbus data format	0:even check (8-E-1) 1:odd check (8-O-1) 2:no check (8-N-2) 3:no check (8-N-1)
C02.02	Modbus local address	1~255
C02.03	Modbus response delay	0~20ms
C02.04	Modbus communication timeout	0:invalid 0.1s~60.0s
P02.32	Modbus communication start stop command	0~1
P02.33	Modbus communication inching start stop	0~1
P02.34	Modbus communication free stop	0~1
P02.35	Modbus communication fault reset	0~1
P02.36	Modbus COMM given speed reverse	0~1
P07.32	Modbus control command	P07.32
P07.33	Modbus communication set point 1	-32768~32767
P07.34	Modbus communication set point 2	-32768~32767
P07.35	Modbus communication set value 1 standard value	-32768~32767
P07.36	Modbus communication set value 2 standard value	-32768~32767

EN

5.2.11 Control word and status word

Control word

Bit number	Definition	Instruction
0	0 = OFF1	The motor brakes according to the deceleration time of the ramp function generator. When the static state is reached, the drive will shut down the motor.
	0 → 1 = ON	When bit1，bit2，bit3 are all 1, the drive will enter the "running" state.
1	0 = OFF2	The motor shut down immediately and the inertia stop.
	1=OFF2 invalid	The motor can be switched on.
2	0=fast stop(OFF3)	Quick stop: the moor stops according to the deceleration time of OFF3 until it reaches the static state.
	1=fast stop invalid(OFF3)	To turn on the motor.
3	0=disable	Turn off the motor immediately
	1=enable	Turn on the motor
4	0=block ramp function generator;The driver sets the output of the ramp function generator to 0	The drivers sets the output of the ramp function generator to 0
	1=ramp of function generator not blocked	The ramp function generator is allowed to be enabled.
5	0=stop ramp function generator	The output of the ramp function generator remains at the current value.
	1=enable ramp function generator	The output of the ramp function generator tracks the set value.
6	0=blocking setting value	The motor brakes according to the deceleration time of the ramp function generator.
	1=enable setting value	The motor rises to the speed setting value according to the acceleration time.
7	0→1=reset fault	Reset fault. If the ON command still exists, the drive will enter the "power on blocking" state; The fault still exists and the reset command is invalid.
8	1=inching operation command1	The inching command turns on the motor
9	1=inching operation command2	The inching command turns on the motor
10	reserve	reserve
11	1=commutation	Reverse the set value in the drive.
12	1=electric potentiometer increased	Increase the set value stored in the electric potentiometer.
13	1=electric potentiometer reduced	Reduce the set value stored in the electric potentiometer.
14	1=external fault	External signer failure, drive shutdown
15	1=external fault	External signer failure, drive shutdown

EN

EN

Status word

bit	Define	explanation
0	1= Ready to start	Power is on, drive is in pre-run state
1	1= Preparing to run	The motor is on (ON/OFF1=1), no faults are present. The drive will turn on the motor upon receiving the "Run Enable" command.
2	1=Run	The drive is in run state
3	1= Fault	There is a fault in the drive
4	1= OFF2 not activated	The inertia stop function is not activated
5	1= OFF3 not activated	Quick stop not activated
6	1= Connection prohibition is effective	The system is currently in the power-on blocking state. You can exit the current state only when OFF1=0 and OFF2, OFF3, and operation permission are all 1.
7	1= Alarm occurs	The motor remains on, no response is required
8	1= Speed deviation is not within tolerance range	The difference between the set value and the actual value is not within the tolerance range
9	1= Local control request control	Request automation system to control the drive
10	1= Reach or exceed the comparative speed	The speed is greater than or equal to the maximum speed
11	1= Current limit or torque limit reached	The comparison value for current or torque is reached or exceeded
12	1= Brake open	Signal for opening/closing the motor holding brake
13	1= Motor forward	Actual value inside the driver>0
14	Reserve	
15	1= IGBT Operation	IGBT Operation

5.3 Setting value

5.3.1 Summarize

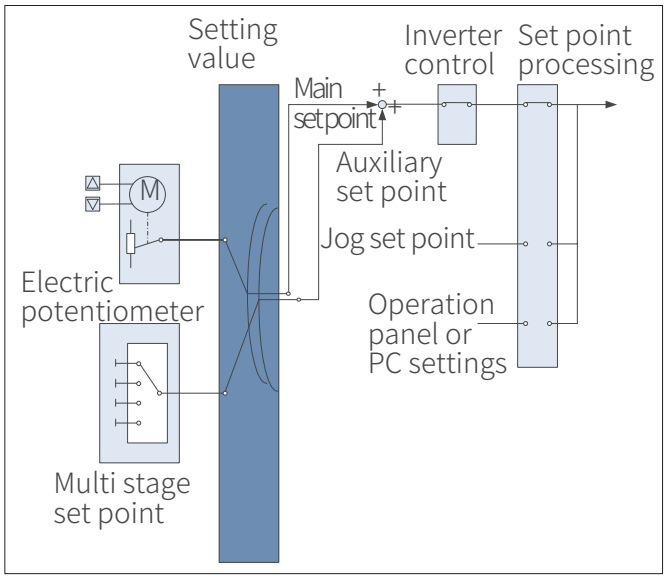


Figure 5-15 Setting value processing of drive

The source of the main setting value can be:
Before you start debugging, you must be able to determine the following information:
◆ Field bus interface of drive
◆ Analog electric potentiometer in the drive
◆ Fixed set value stored in the drive
The above source can also be the source of auxiliary set value or additional set value.

The drive control switches from the master setting to another setting under the following conditions:
Before you start debugging, you must be able to determine the following information:
◆ When the corresponding interconnected process controller is activated, the output of the process controller will give the motor speed.
◆ When JOG is activated.
◆ When controlled by operation panel or PC tool BonengDrivesoft.

5.3.2 Setting electric potentiometer to set value

The "electric potentiometer" function is used to simulate a real potentiometer. The output value of potentiometer can be adjusted by the control signal "up" and "down".
The electric potentiometer is interconnected with the set point source.

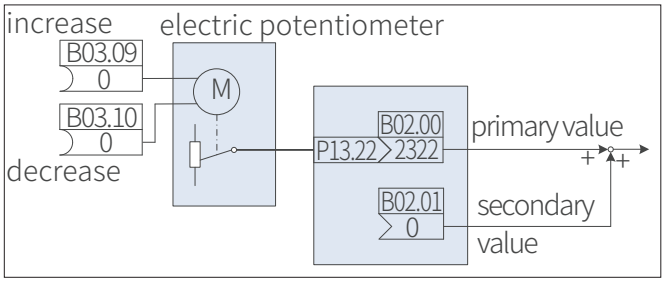


Figure 5-17 setting electric potentiometer to set value

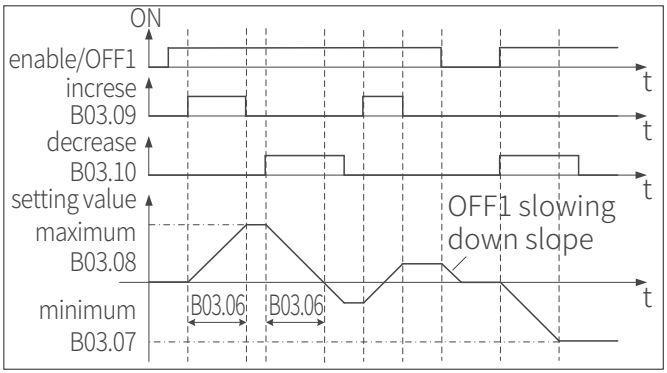


Figure 5-18 Function diagram of electric potentiometer

Table 5-11 Basic setting of electric potentiometer

parameters	Description
B03.04	Function mode selection of electric potentiometer 0: Prohibited 1: Power outage clearing 2: Power failure memory (reserved)
B03.05	Initial value of electric potentiometer
B03.06	Slope time of electric potentiometer
B03.07	Minimum value of electric potentiometer
B03.08	Maximum value of electric potentiometer
B03.09	Source selection of electric potentiometer
B03.10	Selection of descent source of electric potentiometer

Note: The parameters related to the motor potentiometer are extended parameters, which will be displayed only when "1: Extended parameters" is selected in the function code "A04.02 Parameter access level".

5.3.3 Setting the multi-stage speed to the set value

In many applications, the motor only needs to run at a fixed speed after power on, or switch back and forth between different fixed speeds. For example, the conveyor belt only runs at two different speeds after power on.
The fixed speed is interconnected with the main set value

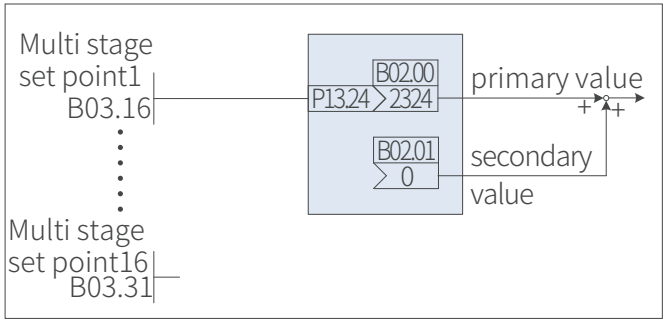


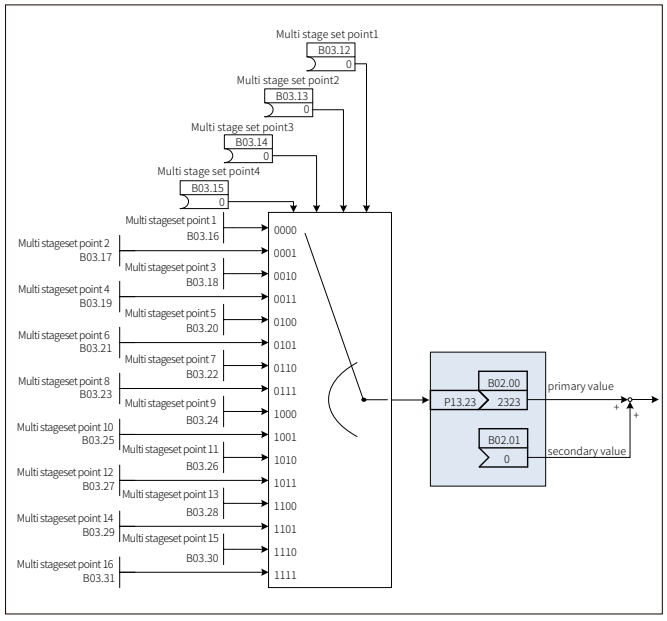
Figure 5-19 Setting electric potentiometer to set value

Table 5-12 Fixed speed setting values

parameter	notes
B02.00=2324 (P13.24)	Speed source master set point selection The primary value is interconnected with the multi-stage set point 1

Binary select multi segment set point

Set 16 different fixed settings. Through different combinations of four selection bits, you can accurately select a fixed setting value from 16.



Related parameters for setting multi segment setting values

parameter	description
B03.11	multi segment given only parameter, display the output value of current multi segment setting.
B03.12	multi segment set point selection 1
B03.13	multi segment set point selection 2
B03.14	multi segment set point selection 3
B03.15	multi segment set point selection 4
B03.16	Multi stage set point 1
B03.17	Multi stage set point 2
B03.18	Multi stage set point 3
B03.19	Multi stage set point 4
B03.20	Multi stage set point 5
B03.21	Multi stage set point 6
B03.22	Multi stage set point 7
B03.23	Multi stage set point 8
B03.24	Multi stage set point 9
B03.25	Multi stage set point 10
B03.26	Multi stage set point 11
B03.27	Multi stage set point 12
B03.28	Multi stage set point 13
B03.29	Multi stage set point 14
B03.30	Multi stage set point 15
B03.31	Multi stage set point 16

5.4 Set value processing

5.4.1 Set point processing

◆ Reverse the setting value to switch the motor rotation direction (reverse).

◆ positive / negative rotation direction is prohibited, for example, in conveyor belt, electric pump or fan applications.

◆ Suppression band for suppressing mechanical resonance.

When the speed is 0, the inhibition band will act on the minimum speed after the motor is turned on.

◆ Set the maximum speed limit to protect the motor and mechanism.

◆ The ramp function generator is set to control the acceleration and deceleration process of the motor and output the ideal torque.

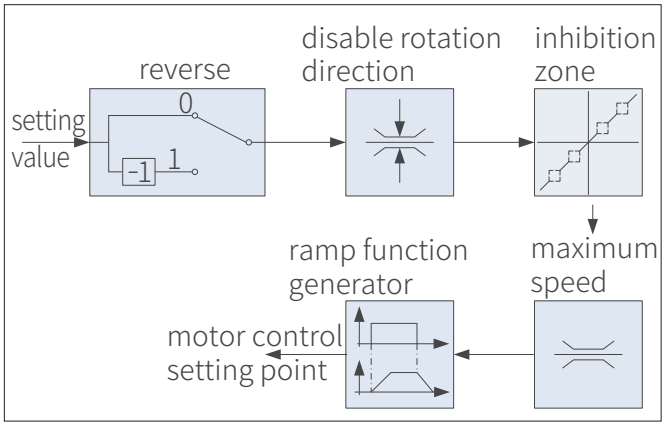


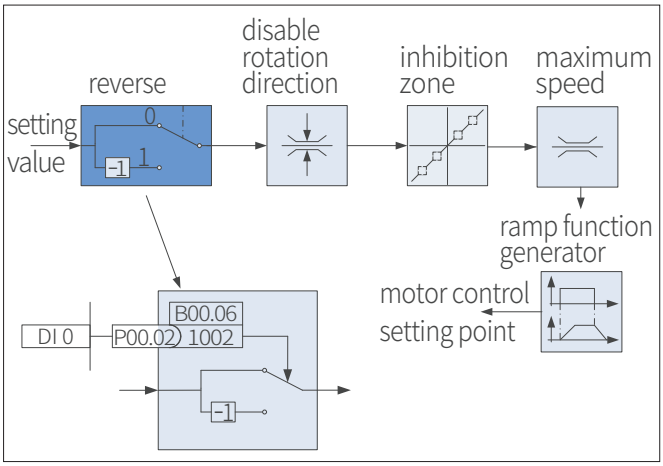
Figure 5-20 Set point processing in drive

5.4.2 Reverse setting value

Setting value processing can modify the set value as follows:

The set value symbol can be switched by bit on the drive.

The example shows that the set value is reversed by digital input.



The parameter B00.06 is interconnected with two binary signals (such as digital input 0),

The set value is inversed by digital input DI0.

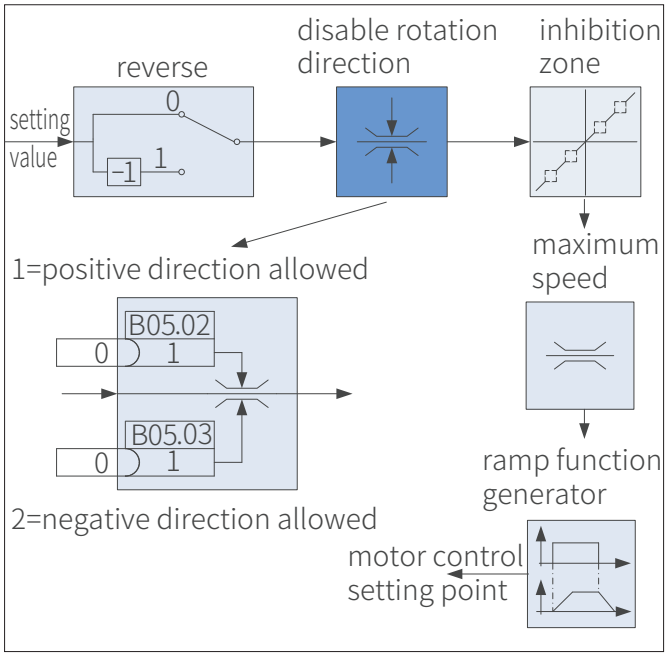
Table 5-13 Example of negating a set value

Parameter	Description
B00.06 = 1002 (P00.02)	reverse the setting value Digital input 0=0: set value remains unchanged. Digital input 0=1: the driver reverses the set value.
B00.06 = 1201 (P02.01)	Reverse the set value by Bit1 bit of process data1.

EN

5.4.3 No rotation direction

In the factory settings of the driver, the positive and negative rotation directions of the motor are enabled.



To disable the rotation direction, set the corresponding parameter to 0.

Table 5-14 Examples of setting rotation direction prohibition.

Parameter	Description
B05.02=0	The positive direction allows the selection. Prohibit the motor from rotating in the positive direction.
B05.03=1003 (P00.03)	Negative direction allows the selection Digital input 1=0: negative rotation direction is disable. Digital input 1=1: negative rotation direction enabled.

5.4.4 Suppression band and minimum speed

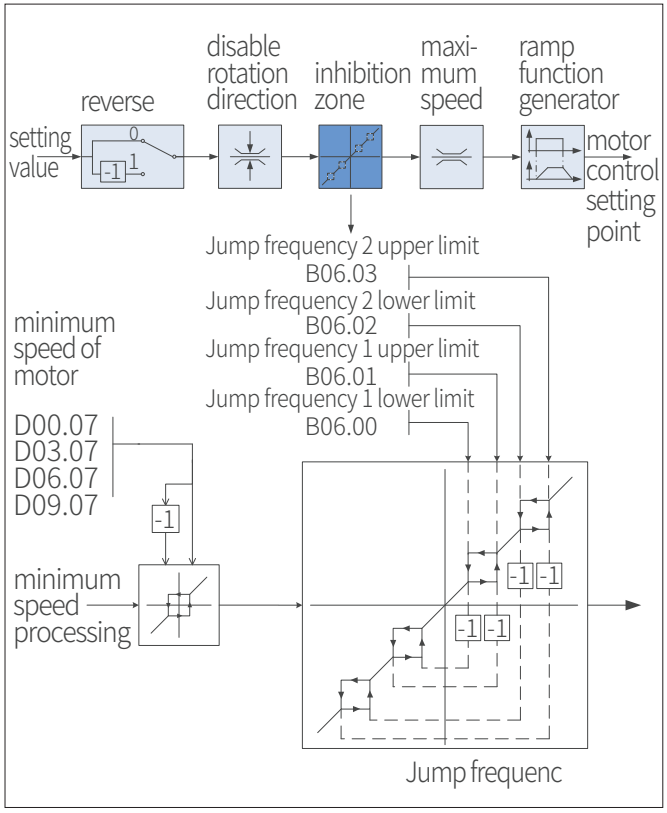
Inhibitory band

The drive has four restraining bands to prevent the motor from running in a certain speed range for a long time.

Minimum speed

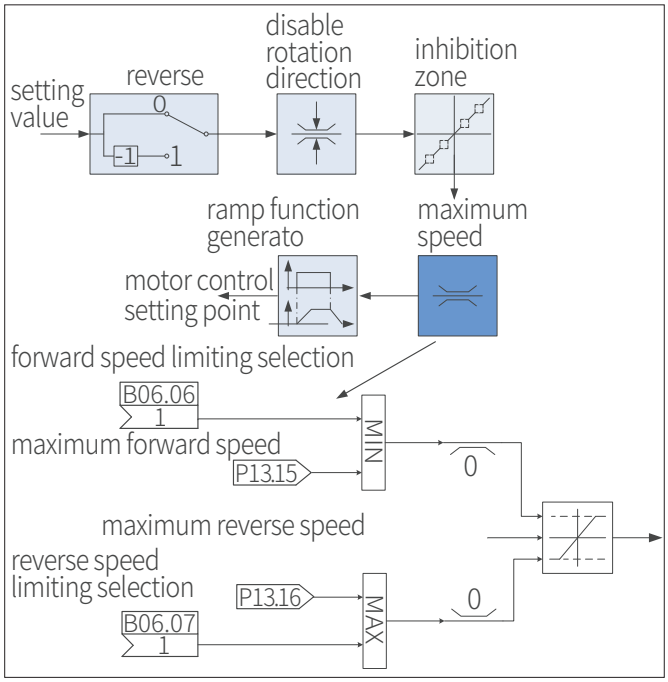
After setting the minimum speed, the drive can prevent the motor from running at a speed lower than the minimum speed for a long time.

Only in the process of motor acceleration or deceleration, the drive allows the motor speed (absolute value) to be lower than the minimum speed for a short time.



5.4.5 Maximum speed

The maximum speed limits the speed settings in both directions of rotation.



Once the value is exceeded, the drive will output alarm or fault information.

When it is necessary to limit the speed according to the direction, the maximum speed in each direction can be determined.

Table 5-15 Parameters for limiting speed

parameter	parameter name
B06.04	Forward limit speed digital SET
B06.05	Reverse limit speed digital SET
B06.06	forward speed limiting selection
B06.07	reverse speed limiting selection
D00.06	maximum speed of motor
D03.06	maximum speed of motor
D06.06	maximum speed of motor
D09.06	maximum speed of motor

Note: D06.06 and D09.06 are extended parameters, which will be displayed only when "1: Extended parameters" is selected in the function code "A04.02 Parameter access level".

5.4.6 Ramp function generator

The ramp function generator in the set point channel is used to limit the rate of change (acceleration) of the speed set point.

Slow acceleration will reduce the motor acceleration torque.

In this way, the motor load can be reduced and the production equipment can be protected.

◆ Simple ramp function generator

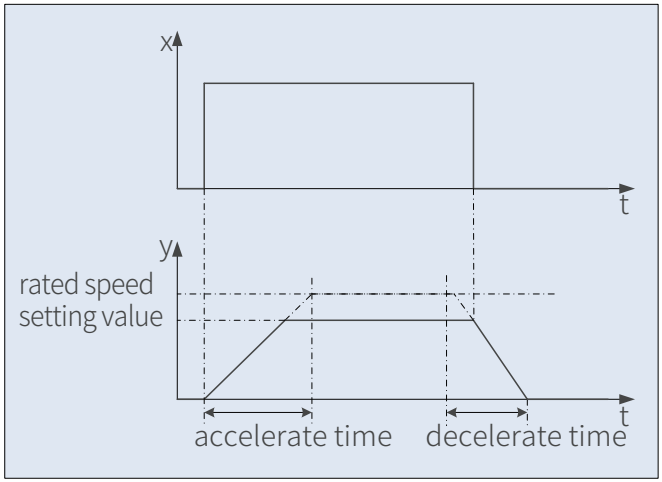
The simple ramp function generator limits the acceleration, but does not limit the change of acceleration (jerk).

◆ Extended ramp function generator

The extended ramp function generator not only limits the acceleration, but also limits the change of acceleration (jerk) by rounding the set value. In this way, there is no sudden motor torque.

Simple ramp function generator

Simple ramp function generator means that s curve (ARC) time is not used in acceleration and deceleration process.



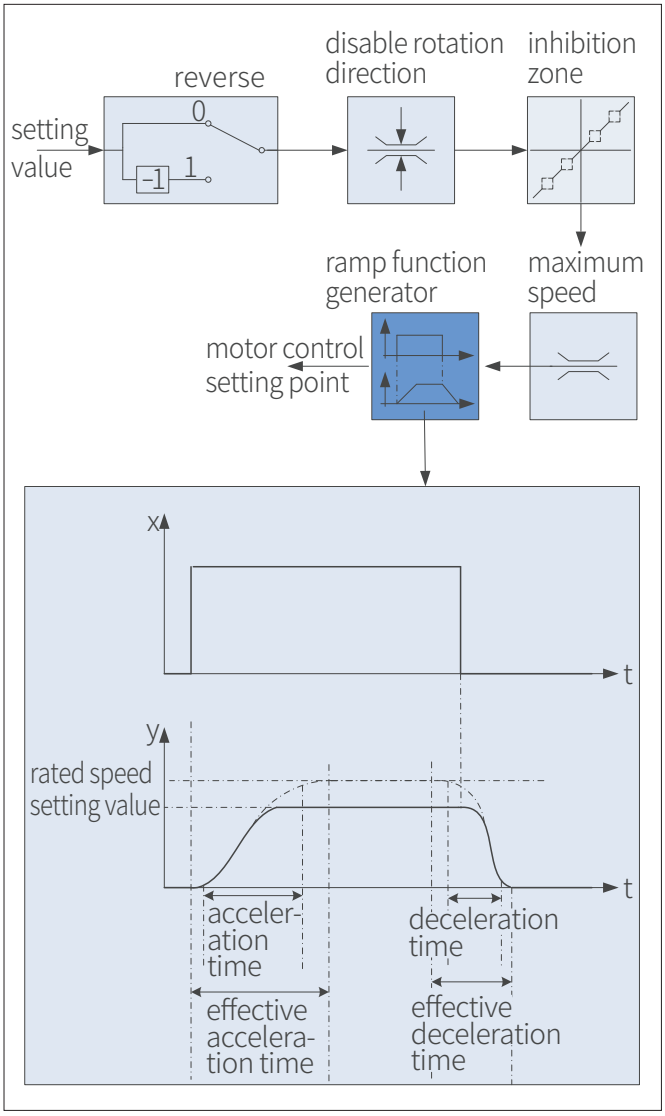
EN

Table 5-16 Parameter setting of simple ramp function generator

Parameter	Parameter instruction	parameter name
B04.02	RFG ramp-up time setpoint 1	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.03	RFG ramp-down time setpoint 1	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.04	RFG ramp-up time setpoint 2	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.05	RFG ramp-down time setpoint 2	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.06	RFG ramp-up time setpoint 3	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.07	RFG ramp-down time	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.08	setpoint 3 RFG ramp-up time setpoint 4	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.09	RFG ramp-down time setpoint 4	The e-stop function (OFF3) has a separate deceleration time.
B05.33	OFF3 down-time	The e-stop function (OFF3) has a separate deceleration time.

Extended ramp function generator

The acceleration time and deceleration time of extended ramp function generator can be set separately. These two times are only closely related to practical application,which can be hundreds of milliseconds (such as conveyor belt transmission) or a few minutes (such as centrifuge).



Smooth acceleration and deceleration can be achieved by the S-curve at the beginning and S-curve at the end.

◆ Effective acceleration time=B04.02+0.5x (B04.10+B04.11)

◆ Effective deceleration time=B04.03+0.5x (B04.10+B04.11)

Note: S curve time is independent of the set frequency

Table 5-17 Parameter setting of simple ramp function generator

Parameter	Parameter Instruction	Parameter Name
B04.02	RFG ramp-up time setpoint 1	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.03	RFG ramp-down time setpoint 1	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.04	RFG ramp-up time setpoint 2	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.05	RFG ramp-down time setpoint 2	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.06	RFG ramp-up time setpoint 3	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.07	RFG ramp-down time setpoint 3	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.08	RFG ramp-up time setpoint 4	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.09	RFG ramp-down time setpoint 4	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.10	RFG initial rounding-off time 1	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.11	RFG final rounding-off time 1	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.

Parameter	Parameter Instruction	Parameter Name
B04.12	RFG ramp-up time setpoint 2	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.13	RFG ramp-down time setpoint 2	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.14	RFG ramp-up time setpoint 3	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.15	RFG ramp-down time setpoint 3	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.16	RFG ramp-up time setpoint 4	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.17	RFG ramp-down time setpoint 4	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.

EN

Set the extended ramp function generator as follows:
1. Give a maximum speed setting.
2. Turn on the motor.
3. Check the operation of the motor.
-If the motor accelerates too slowly, shorten the acceleration time.
Too short acceleration time will cause the motor to reach the current limit during acceleration and temporarily unable to track the speed setting. At this time, the drive will exceed the set time.
-If the motor accelerates too fast, extend the acceleration time.
-If the acceleration is too fast, extend the starting arc time.
-We suggest that the end segment arc time be set to the same value as the start segment arc time.
4. Turn off the motor.
5. Check the operation of the motor.
-If the motor decelerates too slowly, shorten the deceleration time.
The minimum effective deceleration time depends on the application.
When the deceleration time is too short, the drive will exceed the motor current limit, and the DC bus voltage in the drive will become too high, depending on the type of power module used.
The actual braking time will exceed the set deceleration time or the drive will fail during braking, depending on the setting of the drive.
-If the motor brakes too fast or the drive fails during braking, the deceleration time should be extended.
6. Repeat steps 1 to 5 until the drive characteristics meet the motor or equipment requirements.

5.5 Motor Control

The drive has the following three speed control modes, which can be selected according to the actual needs of different applications

Parameter	Parameter name	Factory value	Setting range	Description
B05.00	motor control mode	0	0~2	0:VF 1:SVC (Vector control without encoder) 2:FVC (Vector control with encoder)

VF: After the given frequency command, the drive controls the output voltage according to the VF characteristic curve to control the motor operation. Because there is no speed feedback regulation and the speed control accuracy is not high enough, VF control is suitable for general loads such as fans and water pumps, or one drive with multiple motors, or applications with large difference between drive power and motor power. The vector control mode can be selected in the application of high speed accuracy.

SVC: Open loop vector control without encoder, which is suitable for high performance control occasions. In principle, one drive can only drive one motor, such as machine tool, centrifuge and other loads;
FVC: closed loop vector control with encoder, which is suitable for high-precision speed or torque control. In principle, one drive can only drive one motor, such as elevator, lifting machinery and other loads.

Note: in SVC / FVC mode, if one drive drives multiple motors, the motor parameters must be consistent and rigidly connected.

5.5.1 Parameter identification of motor

No matter which motor control mode is selected, the basic parameters of the motor must be set accurately according to the motor label before running the motor. (take motor 0 as an example,the same below)

Function code	Parameter name	Factory value	Setting range	Description
D00.00	motor type selection	0	0~1	0:asynchronous motor 1:permanent magnet synchronous motor
D00.01	rated power of motor	3.7	0.00~655.35kW	motor name plate parameters
D00.02	rated voltage of motor	380	0~1500	
D00.03	rated current of motor	9.00	0.00~655.35A	
D00.04	rated frequency of motor	50.0	0.0~600.00Hz	
D00.05	rated speed of motor	1440	0~65535 rpm	
D00.09	madder pole logarithm	2	0~64	The driver automatically calculates the number of pole pairs of the motor

When choosing the motor control mode as vector control, accurate motor parameters are needed. In order to obtain better motor control performance, parameter identification of controlled motor is needed.

Function code	Parameter name	Factory value	Setting range	Description
B00.21	Identify requests	0	0~12	0:None 1:Simple static identification of asynchronous machine 2:Static integrity identification of asynchronous machine 3:Dynamic integrity identification of asynchronous machine 4:Reserved 5:Reserved 6:Reserved 7:Reserved 8:Reserved 9:Reserved 10:Reserved 11:Synchronous machine without encoder 12:Synchronous machine with encoder identification

The differences of the three parameter identification modes are shown in the table below, please select according to the actual application situation:

Pattern	Service conditions	Service conditions	Description
Simple static identification of asynchronous motor	motor can not run	stator resistance	
Static complete identification of asynchronous motor	motor can not run	rotor resistance leakage inductance mutual inductance no load current	
Dynamic integrity identification of asynchronous motor	The motor can run		Before identification, please ensure that the motor and the load are mechanically separated, and the operation is not dangerous; If the motor is connected to the load, the identification result may not be accurate enough.

The steps of motor parameter identification are as follows:
1:According to the current motor selection, set the basic parameters of group D motor.
2:The parameter identification mode is selected according to the control mode of the driver and the mechanical state of the system.
3:Press run to start parameter identification,if you want to terminate the identification, press stop. After identification, the panel will display stop status.
After identification, the identification results of the following parameters will be saved automatically. On the premise of knowing the accurate parameters of the motor, the parameters can be input manually without identification.

Function code	Parameter name	Factory value	Setting range	Description
D01.00	Stator resistance of asynchronous motor	1.667	0.000~65.535ohm	Parameters identification or manual input
D01.01	Asynchronous motor rotor resistance	1.500	0.000~65.535ohm	
D01.02	Leakage inductance of asynchronous motor	6.540	0.00~655.35mH	
D01.03	Mutual inductance of asynchronous motor	173.4	0.00~655.35mH	

5.5.2 V/F control

5.5.2.1 V/F curve

The drive can select V/F characteristic curve according to different load characteristics and the following parameters are only valid when the control mode is VF.

Function code	Parameter name	Factory value	Setting range	Description
B07.01	curve selection of VF	0	0~3	0:Linear of VF 1:Multi-point of VF 2:Square of VF 3:1.5 power of VF

0:Linear VF, suitable for torque independent of speed occasions, such as ordinary constant torque load.
1:Multi-point VF, suitable for special loads such as dehydrator and centrifuge.
2:Square VF, suitable for the occasion where the required torque increase with the increase of speed, such as fan, pump and centrifugal load.
3:VF of degree 1.5 is between VF of straight line and VF of square curve.

The VF curve is shown in the figure.

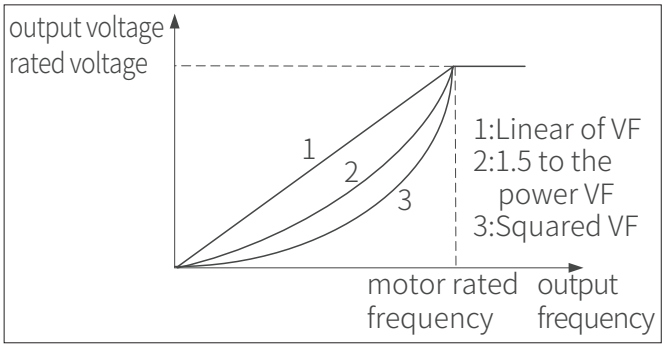


Figure 5-21 VF curve

The point VF curve is defined by parameters B07.02~B07.07. When setting the curve, it must meet the following requirements: frequency point setting B07.02＜B07.04＜B07.06，voltage point setting B07.03＜B07.05＜B07.07. The parameter setting value should be determined according to the load characteristics, otherwise it may not work normally. If the voltage is set too high at low frequency, the motor may overheat or even burn out, and the drive may report over-current fault.

Function code	Parameter name	Factory value	Setting range	Description
B07.02	Voltage point 1 of multi-point VF curve	2	0.0~B07.04	select voltage point of multi-point VF
B07.03	Voltage point 1 of multi-point VF curve	20	0.0~B07.05	
B07.04	Voltage point 2 of multi-point VF curve	20	0.0~B07.06	
B07.05	Voltage point 2 of multi-point VF curve	152	0.0~B07.07	
B07.06	Voltage point 3 of multi-point VF curve	40	0.0~D00.04	
B07.07	Voltage point 3 of multi-point VF curve	304	380	

EN

EN

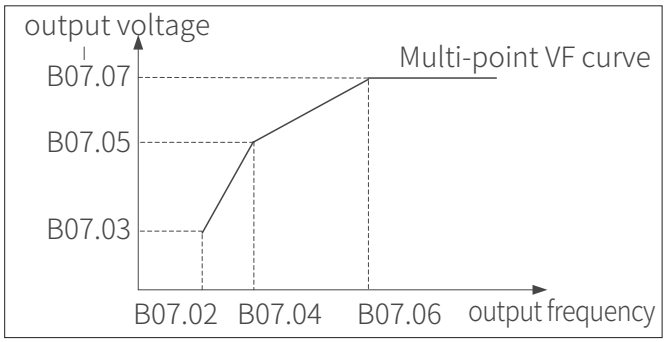


Figure 5-22 Multi-point VF curve

VF voltage separation: the relationship between frequency and output voltage is not calculated in the drive, and the output voltage is set independently by the user. Suitable for induction heating, inverter power supply, torque motor control and other applications.

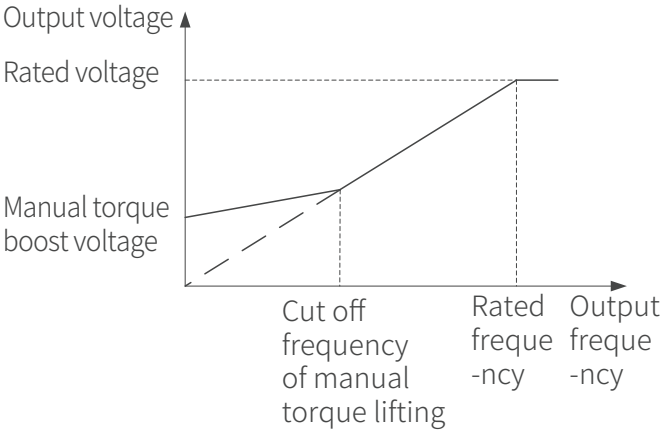
Function code	Parameter name	Factory value	Setting range	Description
B07.08	VF separation voltage setting	0	0~12	0:0 1:100.0% 2:reserved 3:reserved 4:reserved 5:reserved 6:multi segment value setting 7:electric potentiometer 8:reserved 9:reserved 10:reserved others:analog interconnection parameters
B07.09	VF separation voltage change time	10	0.0s ~1000.0s	VF separation voltage change time

5.5.2.2 Torque increase

Torque boost: compensation VF control low frequency torque characteristics, increase the output voltage of the drive to enhance the output torque. When the load is large and the starting torque is not enough, the value of torque increase B07.15 can be increased appropriately. When the load is small, the value can be reduced appropriately. This parameter should not be set too large, otherwise it is easy to cause motor overheating or drive over-current fault. It is recommended to gradually increase 1% step value when setting. After setting, run the motor to check the parameter A00.08 (output current), which should not exceed D00.03 (motor rated current).

Function code	Parameter name	Factory value	Setting range	Description
B07.15	VF manual torque boost	1	0%~50%	The lift voltage is a percentage of the rated voltage of the motor
B07.16	Cut off frequency of VF torque increase	50	0.00~ 50.00	When the frequency setting is greater than this value, the torque increase is invalid

Note: under the condition of multi-point VF, VF separation, parameter identification and speed tracking, the torque increase is invalid.



5.5.2.3 Oscillation suppression

The VF oscillation suppression function is off by default. It needs to be turned on only when there is obvious oscillation in the motor VF operation. The larger the oscillation suppression gain is, the more obvious the suppression effect is. However, if the value is too large, it may cause adverse effects on the normal operation. Therefore, the smaller value should be selected as far as possible within the range of values that can effectively suppress the oscillation.

Function code	Parameter name	Factory value	Description
B07.20	VF oscillation suppression mode	1	0:invalid 1:valid
B07.21	VF oscillation suppression gain	10	

5.5.3 Vector Control

The performance of vector control is easily affected by the motor parameters and obtaining accurate motor parameters is the key to achieve high performance vector control. In order to obtain good driving performance and operation efficiency, the parameters of the controlled motor must be identified first, which can be manually input on the premise of knowing the accurate motor parameters. Inaccurate motor parameters may cause the motor not to operate properly.

When FVC (B05.00 = 2) is selected as the control mode, the relevant parameters of encoder must be set correctly, otherwise the motor cannot operate normally.

Function code	Parameter name	Factory value	Setting range	Description
D02.00	Encoder type	0	0~2	0:invalid type 1:common ABZ encoder
D02.01	input AB phase sequence	0	0~1	0:forward 1:reverse
D02.05	encoder resolution (number of pulses/ speed)	1024	0~65535	The pulse number of ABZ encoder must be set correctly
D02.13	speed feedback PG disconnection detection time	500	0~5000ms	When the drive detects encoder disconnection and the holding time exceeds this value, encoder fault will be reported

After connecting the encoder, set the motor control mode B05.00 = 1, run the motor at medium speed, and check whether the absolute value and symbol of parameter A00.06 (motor speed) and A00.05 (given speed) are consistent. If the absolute value is not equal, please check the encoder connection and related parameter settings; If the symbols are inconsistent, reverse D02.01 (input AB phase sequence). Ensure that the feedback signal of encoder is correct before setting B05.00 = 2 to run the motor.

5.6 Protection Function

5.6.1 Over current protection

In vector control, the motor current is always kept within the set torque limit.
If V/F control is used, the torque limit cannot be set. V/F control prevents motor overload by limiting output frequency and motor voltage (Imax controller).

IMAX controller
In vector control, the motor current is limited by torque limiting. In VF control, the drive limits the current by adjusting the output frequency. If the current exceeds the set threshold in the process of motor acceleration, the Imax controller will take effect and automatically reduce the output frequency to maintain the current around the set value, thus prolonging the actual acceleration time. If the motor takes effect during deceleration, the output frequency will be increased and the actual deceleration time will be prolonged. The process is shown in the figure below:

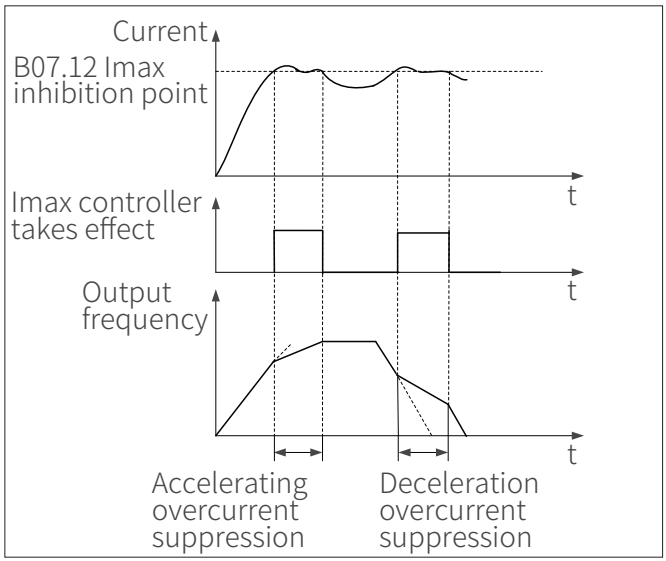


Figure 5-23 schematic diagram of over current suppression process

Setting
If the motor is easy to vibrate when it reaches the current limit or trip due to over-current, the factory setting of Imax controller must be modified.

Table 5-18 parameters of Imax controller

Function code	Name	Factory value	Description
B07.10	Imax control enablation	1	0: Invalid 1: Valid
B07.11	Imax controlling FM gain	30%	The larger the frequency modulation gain, the faster the frequency adjustment ,and the shorter the actual acceleration and deceleration time.
B07.12	Imax inhibition point	150%	Imax control starts the action current point, the percentage of the drive rated current

Note: if the function is still easy to trigger over-current fault, B07,12 (Imax suppression point) can be appropriately reduced or B07.11 (Imax control frequency modulation gain) can be increased.

5.6.2 DC bus voltage over-voltage suppression

◆ How does the motor cause over-voltage?
When an asynchronous motor is driven by a connected load, the motor works as a generator motor, and the generator motor convert mechanical energy into electrical energy. The power returns to the drive. If the drive cannot transfer power to the brake resistor, the DC bus voltage VDC in the driver will increase.
Too high DC bus voltage will damage not only the drive, but also the motor. Before it reaches the dangerous level, the driver will shut down the connected motor and send out the fault message "DC over-voltage".

◆ Over voltage protection of motor and drive
As long as the application allows, Vdc_max controller will avoid the DC bus voltage is too high. The max controller will extend the stopping time of the motor, so that the motor can only feed back a small amount of electric energy to the drive, which can be completely consumed in the form of drive loss.

When the motor is in the power generation state, the electric energy is fed back to the DC bus side, and the bus voltage rises. If the drive is not connected with the brake resistor, the bus voltage rises to the over-voltage point, which will trigger the over-voltage fault. The over-voltage suppression function can avoid the bus voltage too high as far as possible.

When the motor decelerates rapidly, the bus voltage rises rapidly. When the bus voltage exceeds the set threshold, Vdc_max controller is in effect. In vector control, the output frequency is adjusted by limiting the maximum output torque; In VF control, the output frequency is directly adjusted to extend the actual deceleration time, reduce the electric energy fed back to the bus, and maintain the bus voltage at the set value. The process is shown in the figure below:

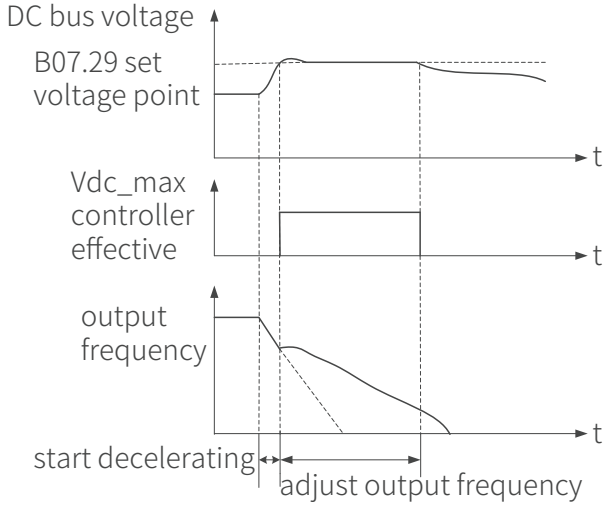


Table 5-19 parameters of VDC_max controller

Function code	Name	Factory value	Description
B07.28	Vdc_max control switch	0	0:forbid 1:enable
B07.29	Vdc_max voltage margin	125%	The percentage of reference bus voltage and the starting point of operation controlled by VDC_max

Note:
1) If it is still easy to trigger over-voltage fault by turning on this function, B07.29 can be reduced appropriately (Vdc_max voltage margin).
2) The Vdc_max controller is not suitable for the application of motor long time output regenerative power. For example:crane application or large swing object braking.

5.6.3 DC bus voltage under-voltage suppression

When the drive operates with a large inertia load, if the bus voltage drops suddenly or the power supply loses power, the under voltage fault will be triggered after the bus voltage drops to the under voltage point, which will cause the motor to stop freely. Due to the large inertia of the load, the motor may still be running at high speed after the voltage returns to normal, and it is easy to cause over-current fault when starting immediately.

Under voltage suppression function can make use of the kinetic energy of the load to make the drive continue to work as far as possible, and control the motor to reduce the frequency regularly. When the bus voltage is reduced to the set threshold, the DC voltage will decrease. When the Vdc_min controller takes effect, the drive automatically reduces the output frequency to make the motor in the power generation state, and the electric energy is fed back to the DC bus side to maintain the bus voltage around the set value. After the power supply is normal, the drive will return to the running state before power down. The process is shown in the figure below:

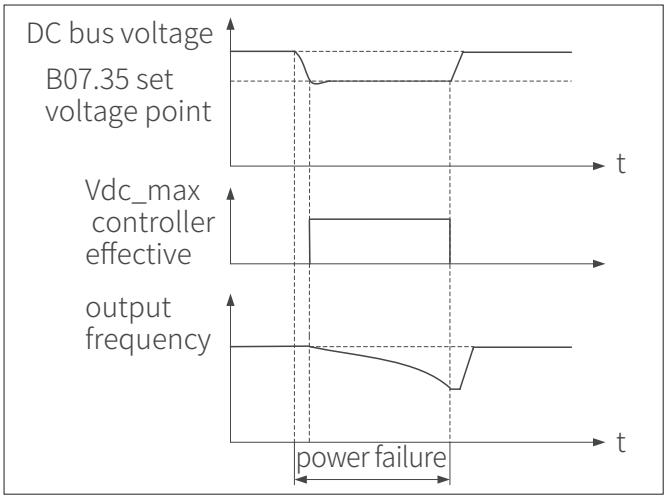


Table 5-24 schematic diagram of under voltage suppression process

Table 5-20 Vdc_min controller parameters

Function code	Parameter name	Factory value	Description
B07.34	Vdc_min control switch	0	0:Forbidden 1:Enable
B07.35	Vdc_min of Volt gain COEF	85%	The percentage of reference bus voltage and the starting point of operation controlled by VDC_min.

Note:
If it is still easy to trigger under-voltage fault by opening this function, increase B07.35 appropriately. (Vdc_min voltage regulation gain coefficient)

5.7 Application features

5.7.1 DC braking

DC braking: the driver outputs DC to stop the motor braking, which is shorter than the normal deceleration shutdown time. DC braking converts the braking energy of motor into heat energy, which can avoid the motor feeding back the braking energy to the drive. The drive does not have to deal with the regenerative power. It is suitable for applications that do not feed back energy to the power grid, such as centrifuges, sawing machines, grinding machines, conveyor belts, etc.

DC braking is divided into the following two situations:

1. DC braking during shutdown

When the motor inertia is large, it will rotate due to inertia during deceleration and shutdown. When the DC braking time (B05.11) is greater than 0 during shutdown, the DC braking function will be turned on and the motor will start to decelerate. After shutdown, when the motor speed is lower than the starting speed of DC braking (B05.12), the drive will start DC braking. According to the time set in B05.11, the set DC braking current (B05.09) will be output and the motor braking decelerates to 0. The process of DC braking is shown in figure 5-25.

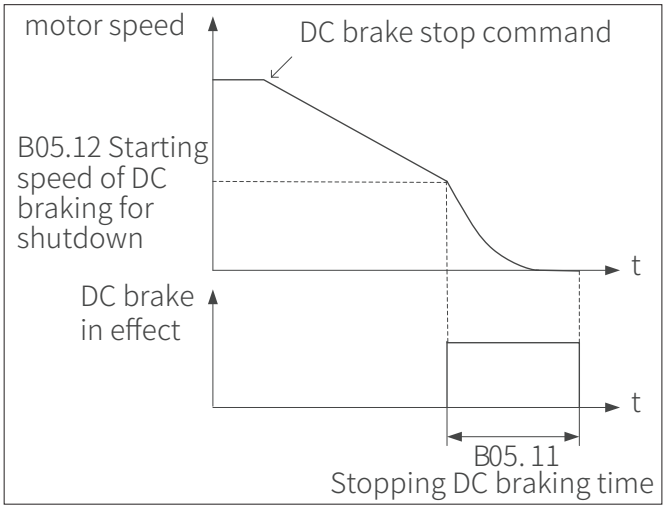


Figure 5-25 schematic diagram of DC braking process during shutdown

2. DC braking when starting

If the motor is in free rotation due to external force or inertia when it wants to start, direct start (B05.04 = 0) may cause over-voltage or over-current fault of the drive. At this time, DC braking start (B05.04 = 3) or speed tracking start (B05.04 = 2) can be selected. Set the starting DC braking time (B05.10), the motor will first brake and decelerate to 0, and then restart to run to the specified frequency. The process of starting DC braking is shown in figure 5-26.

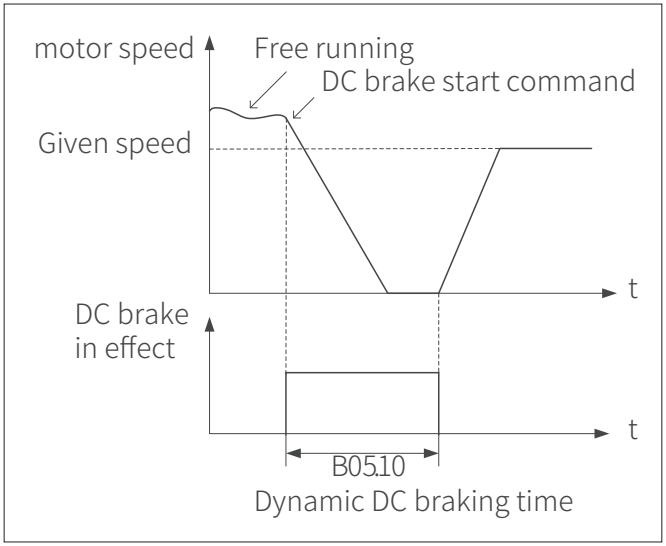


Figure 5-26 schematic diagram of DC braking process when starting

Function code	Parameter name	Factory value	Setting range	Description
B05.04	motor starting mode	0	0~3	0: start directly 1: pre-excitation start 2: speed tracking start 3: DC brake start
B05.09	DC braking current	50.0	0.0% ~100.0%	braking current setting during DC braking 100% corresponding to motor rated current
B05.10	DC braking time at startup	0	0.00s ~100.00s	setting of DC braking time at startup 0 means starting without DC braking
B05.11	DC braking time during shutdown	0	0.00s ~100.00s	setting of DC braking time during shutdown 0 is no DC braking process during shutdown
B05.12	DC braking INIT speed at stop	0	0~3000 rpm	starting speed of DC braking for shutdown

Notes:

◆ The DC braking function is only available on the asynchronous motor.

◆ DC braking can be switched during operation.

◆ The DC braking will make the motor heated violently, the braking characteristics are not clear, there is no constant braking torque, there is no braking torque in the static state, the braking energy is converted into heat consumption, and it can not be used when the power grid is powered down.

◆ If the motor is braked by DC braking for a long time or often, the motor will overheat and may be damaged. Please check the motor temperature when using. If the motor temperature is too high, give the motor a longer cooling time or choose other braking methods.

5.7.2 Speed tracking

When the drive drives the motor to start, the motor may be in the rotating state for some reasons, such as the fan rotation under the action of wind, and the large inertia load drives the motor to rotate after shutdown. If the drive starts directly from 0Hz, it is easy to cause over-current fault due to the large difference between the output frequency and the actual frequency of the motor. The speed tracking function can detect the actual speed of the motor and run from the current speed to avoid over-current during starting.

After receiving the operation command, the driver judges the rotation direction of the motor, injects current into the motor (the set value of speed tracking current), and searches down from the set starting frequency. When the starting frequency is the stop frequency, the search speed is the fastest. After searching the current motor speed, after the switching waiting time, the motor will smoothly transition to the normal operation mode and reach the set frequency.

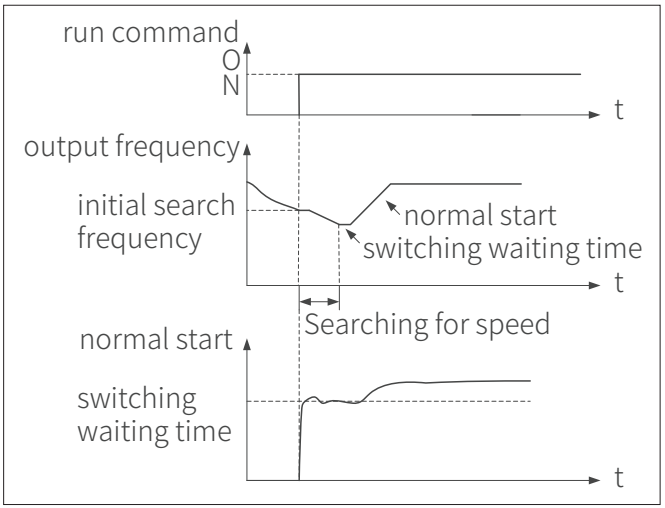


Figure 5-27 schematic diagram of speed tracking process

Table 5-21 parameter setting of speed tracking

Function code	Name	Factory value	Description
B05.13	speed tracking mode	0	0:Search from shutdown frequency 1:Search from rated frequency 2:Search from maximum frequency
B05.14	Speed tracking search time	25.0s	Time for frequency reduction from 50Hz to 0Hz
B05.15	Speed tracking CUR percentage	50%	speed search current percentage of motor rated current
B05.16	Speed tracking MIN-FRQ limit	2Hz	start directly below this frequency speed tracking does not work
B05.17	Speed tracking switching time	250ms	waiting time for speed tracking mode to switch to normal operation mode.

Note: if the search time is too long, please reduce the search time appropriately. If there is over current or over voltage fault in the search process, please increase the search time appropriately.

EN

5.7.3 Motor holding brake

The motor holding brake holds the closed motor in this position. When set correctly, the motor generates an electrical holding torque before the drive opens the brake. The drive does not close the brake until the motor is stationary.

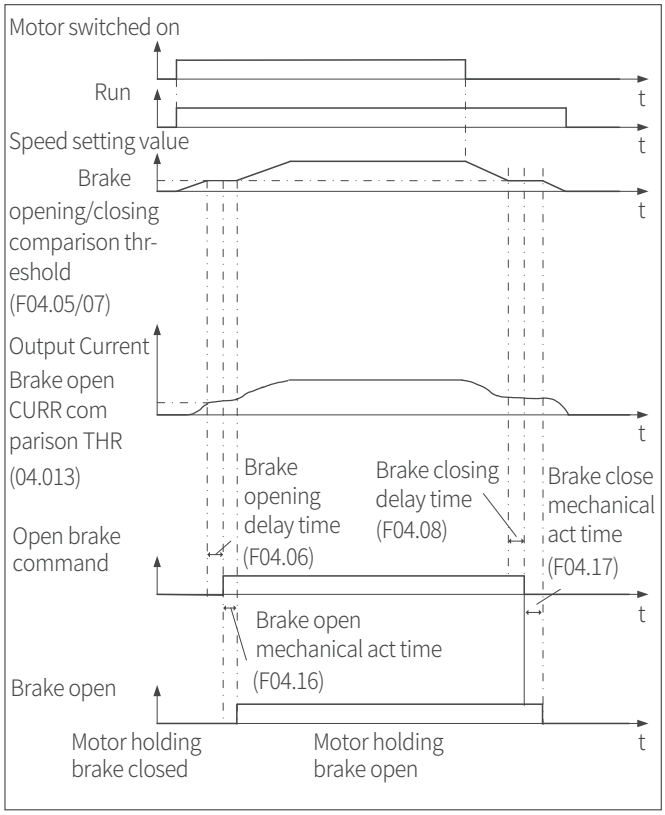


Figure 5-28 Motor brake opening timing diagram

Function after ON instruction:
1. After receiving the ON command, the driver issues an OFF1-ON operation command.
2. When the drive speed setting value is greater than the brake opening comparison threshold (F04.05) and the current output current is greater than the brake opening motor current comparison threshold (F04.13), the drive issues a command to open the brake.
3. The motor maintains the speed when the brake is opened until the brake opening mechanical action time (F04.16) ends.
4. The driver accelerates the motor to the speed setting value.

Function after OFF1 or OFF3 command:
1. Upon receiving the OFF1 or OFF3 command, the driver brakes the motor until it stops.
2. During braking, when the driver speed setting value is less than the brake closing speed threshold (F04.07), the driver issues a command to close the brake.
3. The motor maintains the speed when the brake is closed until the brake closing mechanical action time (F04.17) ends.
4. The driver turns off the motor.

Function after OFF2 command

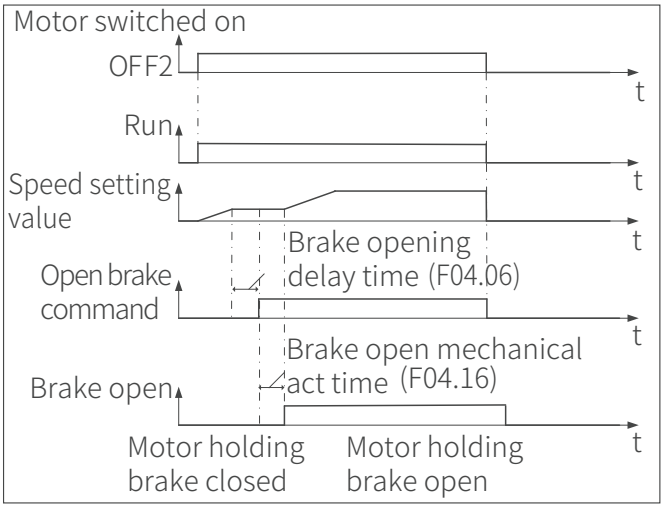


Figure 5-29 Motor brake control method after issuing OFF2 command

After issuing the OFF2 command, the brake closing command will be issued directly regardless of the motor speed.

Restart the brake control function:
When the restart brake control function is turned on, when the start motor is given a reverse run command after the brake is opened, the motor will wait for a period of time after the brake is closed before starting the motor. The waiting time is determined by the restart waiting time (F04.19). This can prevent the vector stall problem from being reported when switching between forward and reverse directions.

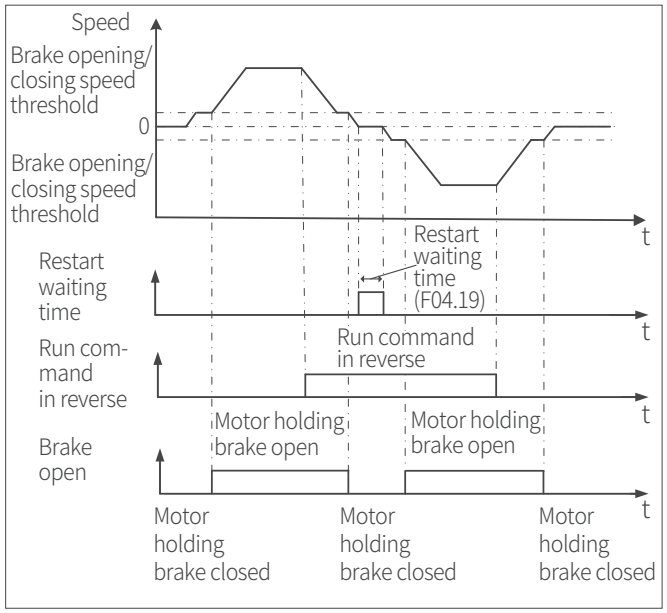


Figure 5-30 Opening the restart brake function

Debugging the motor holding brake
Note:
Danger to life due to falling loads
If the "Motor holding brake" function is incorrectly set, there can be a risk of life due to falling loads in applications such as cranes, hoists or lifts.
• Before commissioning the "Motor holding brake", ensure that the load is secured by the following measures:
– Lower the load to the ground
– Seal off the danger zone

Step
To commission the "brake control" function, follow the steps below:
1.Set F04.00 = 1 or 2 (Holding brake FUNC select)
"Brake control" enable.
F04.00=1 Brake control is valid, and the brake relay is not detected to be energized.
F04.00=2 Brake control is effective, and the system also detects whether the brake relay is energized.
2.Set F04.03 (Brake open command source)
Select the brake opening command, usually set F04.03 = 1102 (P01.02 running flag)。
3.Set F04.04 (Brake open comparison source)
Select the judgment parameter for brake opening, usually set F04.04=2311 (P13.11 CM given speed).
4.Set F04.05 (Brake open comparison THR)
Select the comparison threshold for brake opening, which needs to be set according to the actual application requirements on site.
5.Set F04.13 (Brake open CURR comparison THR)
Select the judgment threshold of the output current when the brake is opened. This parameter is used to ensure that the motor has a certain output torque when the brake is opened; the factory setting F04.13 = 50%, which can basically meet most field applications.
6.Set F04.07 (Brake closing speed THR)
It is used to set the speed judgment threshold when the brake is closed. It needs to be set according to the actual application requirements on site.
7.Set F04.12 (Brake close comparison source)
Select the judgment parameter for brake closing, usually set F04.12=2311 (P13.11 CM given speed).
The above steps 1~5 are the setting process of brake opening, and steps 6~7 are the setting process of brake closing.

8.Set F04.18 (Restart brake control)
When F04.18=0, the brake control function is turned off when restarting.
F04.18=1 restart control brake function is turned on, which can be selected according to the actual application, and the default is turned on. The function of the restart control brake is to prevent vector stall fault when the speed is reversed or the machine is restarted after stopping.
9.Set F04.19 (Restart waiting time)
Setting F4.19 can adjust the brake start waiting time when F04.18=1 (restart control brake action).

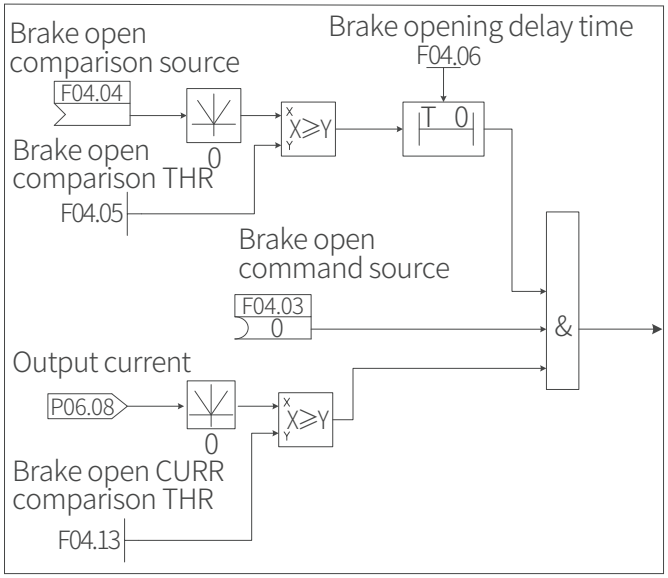


Figure 5-31 Brake opening judgment function diagram

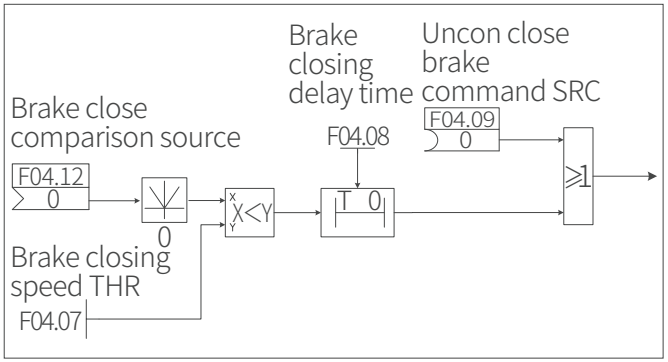


Figure 5-32 Brake closing judgment function diagram

Table 5-22 Brake control setting parameters:

Function code	Name	Description
F04.00	Holding brake FUNC select	Brake enable setting
F04.03	Brake open command source	Brake open command selection
F04.04	Brake open comparison source	Brake open judgment value selection
F04.05	Brake open comparison THR	Brake open comparison threshold
F04.06	Brake opening delay time	Brake open command delay time
F04.07	Brake closing speed THR	Brake close comparison threshold
F04.08	Brake closing delay time	Brake close command delay time
F04.10	Brake open feedback point SRC	Brake open feedback value source
F04.12	Brake close comparison source	Brake close judgment value selection
F04.13	Brake open CURR comparison THR	Brake open output current judgment threshold
F04.16	Brake open mechanical act time	Set brake open RFG pause time
F04.17	Brake close mechanical act time	Set brake closed RFG pause time
F04.18	Restart brake control	Set whether to open the restart function
F04.19	Restart waiting time	Set the restart function wait time

Note: "F04.03/F04.04/F04.09/F04.12" are extended parameters, which will be displayed only when "1: Extended parameters" is selected in the function code "A04.02 Parameter access level".

5.7.4 Automatic restart

Automatic restart includes two functions:

◆ Automatic reset fault information of drive

◆ After fault reset, the drive will restart the motor automatically

Set fault auto reset

The realization of automatic fault reset function is determined by the following aspects:

Fault reset times reset time: automatic fault reset processing within a certain period of time. The start time depends on the first fault time after the automatic reset fault is enabled.

Fault reset interval: the minimum interval between two fault reset commands.

Max num of fault resets allowed: the maximum number of times a fault reset command is generated within the fault reset time. After this number of times, no fault reset command will be generated unless the fault reset time is over.

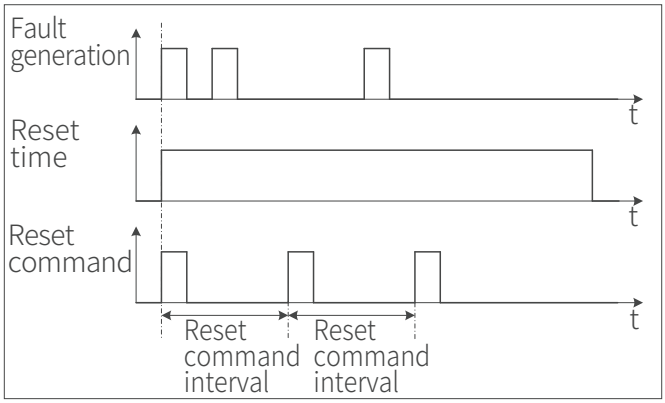


Figure 5-32 fault automatic reset command sequence diagram

Note: parameter E00.14、E00.15 can be used to set the non reset faults after the automatic reset function is enabled.

Table 5-23 parameters related to automatic fault reset

parameter	parameter name
E00.10	Automatic fault reset function
E00.11	Fault reset times reset time
E00.12	Fault reset interval time
E00.13	Max num of fault resets allowed
E00.14	Non-resettable EXC code 1
E00.15	Non-resettable EXC code 2

Set auto restart

Automatic restart takes effect after the fault is reset automatically. If the motor may rotate for a long time after the fault occurs, you must also enable the "speed tracking" function, see 5.7.2.

Table 5-24 setting parameters of automatic restart

Parameter	Parameter name	Description
E00.23	reset and restart function	E00.23 the enable auto restart function
E00.25	Allow restart exception code 1	E00.25 set up special handing faults
E00.26	Allow restart exception code 1	E00.26 set up special handing faults

5.7.5 Free function block

5.7.5.1 General

Using free function block, configurable signal interconnection can be established in the drive.
The drive mainly provides the following free function blocks:

- ◆ Logic operation module: AND, OR, XOR, NOT
- ◆ Arithmetic module: ADD (adder), SUB (subtracter), MUL (multiplier), DIV (divider), AVA (absolute value), NCM (comparator)
- ◆ Time relay RLY
- ◆ Limiter LVM
- ◆ Low pass filter PF
- ◆ Bit to word module
- ◆ Word transposition module

The number of free function blocks in the drive is limited. Each function block can only be used once. The drive has three adders.
Example: if three adders have been configured, no more adders can be added.

Note: Input 3/4 of AND module and OR module ABCD, EFGH input of NOT module, BCD of XOR module, input 3/4 of addition module ABCD, input 3/4 of multiplication module AB, and limit module AB are extended parameters, which will be displayed only when "1: Extended Parameters" is selected in function code "A04.02 Parameter Access Level".

5.7.5.2 Free function block list

and module

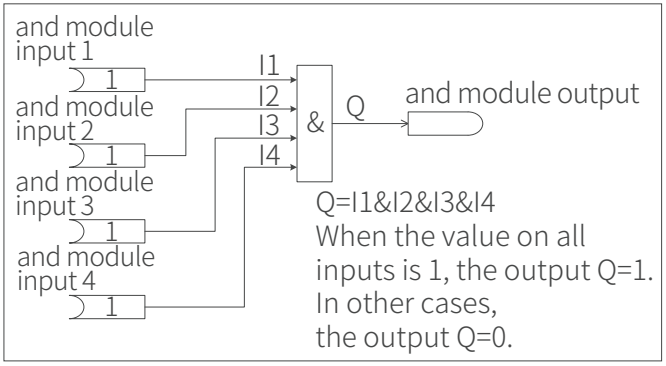


Figure 5-25 and module setting parameters

	AND A	AND B	AND C	AND D
I1	F00.00	F00.05	F00.10	F00.15
I2	F00.01	F00.06	F00.11	F00.16
I3	F00.02	F00.07	F00.12	F00.17
I4	F00.03	F00.08	F00.13	F00.18
Q	P03.00	P03.01	P03.02	P03.03

or module

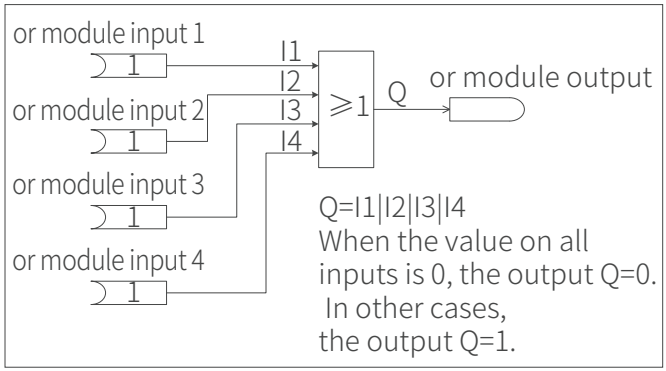


Table 5-26 or module setting parameters

	OR A	OR B	OR C	OR D
I1	F00.36	F00.41	F00.46	F00.51
I2	F00.37	F00.42	F00.47	F00.52
I3	F00.38	F00.43	F00.48	F00.53
I4	F00.39	F00.44	F00.49	F00.54
Q	P03.12	P03.13	P03.14	P03.15

non module

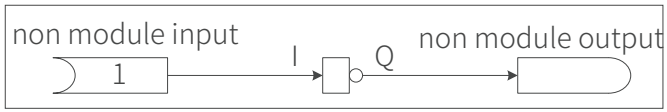


Table 5-27 non module setting parameters

	NOT A	NOT B	NOT C	NOT D	NOT E	NOT F	NOT G	NOT H
I	F00.20	F00.22	F00.24	F00.26	F00.28	F00.30	F00.32	F00.34
Q	P03.04	P03.05	P03.06	P03.07	P03.08	P03.09	P03.10	P03.11

XOR module

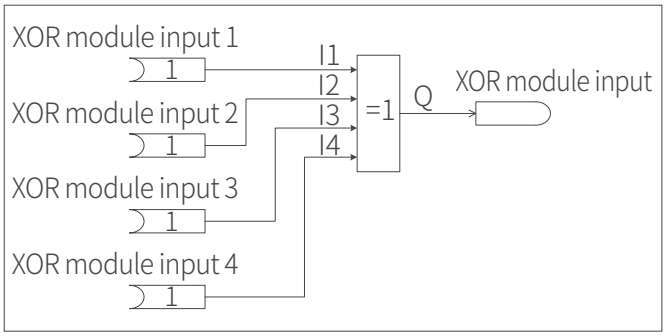


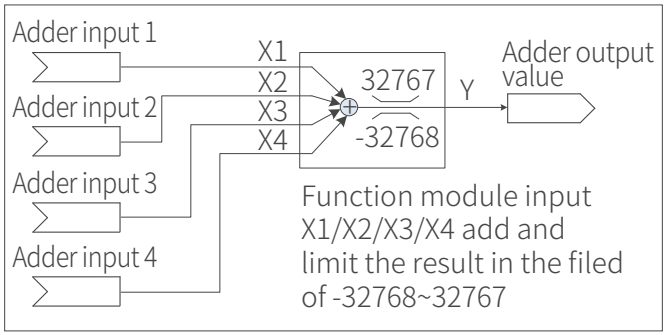
Table 5-28 truth table

I0	I1	I2	I3	Q
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

Table 5-29 XOR module setting parameters

	XOR A	XOR B	XOR C	XOR D
I1	F00.56	F00.61	F00.66	F00.71
I2	F00.57	F00.62	F00.67	F00.72
I3	F00.58	F00.63	F00.68	F00.73
I4	F00.59	F00.64	F00.69	F00.74
Q	P03.16	P03.17	P03.18	P03.19

Arithmetic module-adder

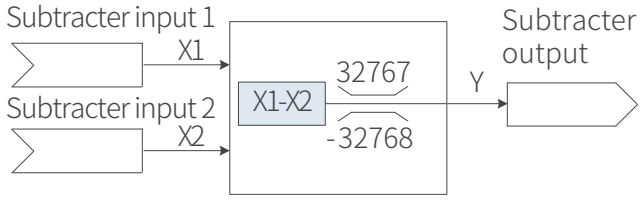


EN

Table 5-30 Adder setting parameters

	ADD A	ADD B	ADD C
X1	F01.00	F01.05	F01.10
X2	F01.01	F01.06	F01.11
X3	F01.02	F00.07	F01.12
X4	F01.03	F01.08	F01.13
Y	P08.00	P08.01	P08.02

Arithmetic module-subtractor



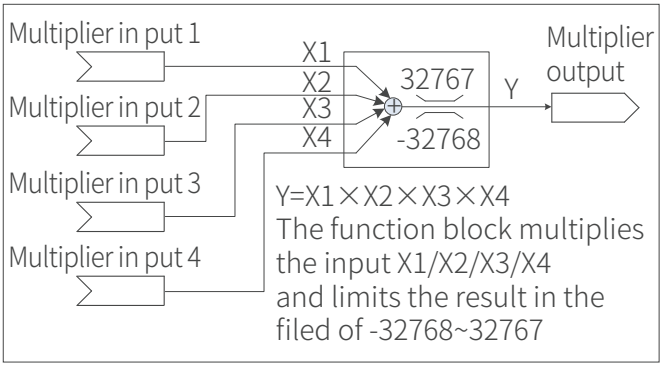
Y=X1-X2

Function block inputs X1-X2 and limits the result in the filed of -32768~32767

Table 5-31 Subtractor setting parameters

	SUB A	SUB B
X1	F01.15	F01.18
X2	F01.16	F01.19
Y	P08.04	P08.05

Arithmetic module multiplier



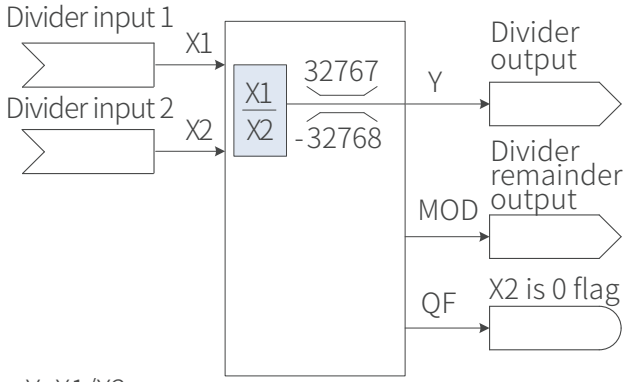
Y=X1×X2×X3×X4

The function block multiplies the input X1/X2/X3/X4 and limits the result in the filed of -32768~32767

Table 5-32 multiplier setting parameters

	MUL A	MUL B
X1	F01.21	F01.26
X2	F01.22	F01.27
X3	F01.23	F01.28
X4	F01.24	F01.29
Y	P08.08	P08.09

Arithmetic operation module-divider



Y=X1/X2

The function block draws the input X1/X2 and makes the result in the filed of -32768~32767

Table 5-33 divider setting parameters

	MUL A	MUL B
X1	F01.31	F01.34
X2	F01.32	F01.35
Y	P08.13	P08.16
MOD	P08.14	P08.17
QF	P03.30	P03.31

EN

EN

Arithmetic module comparator

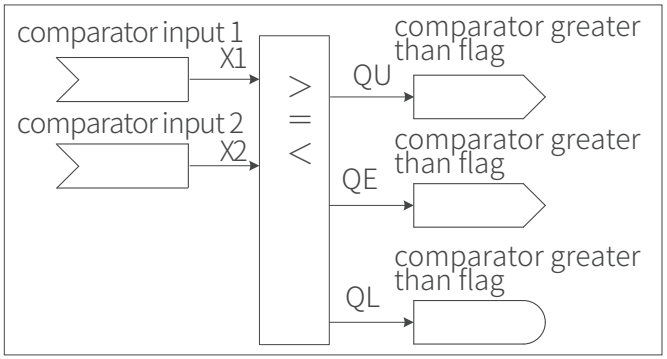


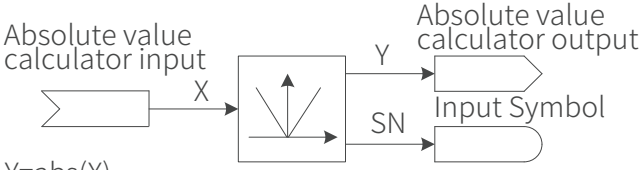
Table 5-34 function list

input comparison	QU	QE	QL
X1＞X2	1	0	0
X1＝X2	0	1	0
X1＜X2	0	0	1

Table 5-35 comparator setting parameters

	NCM A	NCM B
X1	F01.41	F01.44
X2	F01.42	F01.45
QU	P03.24	P03.27
QE	P03.25	P03.28
QL	P03.26	P03.29

Arithmetic operation module-absolute value calculator



Y=abs(X)

This function block is used to calculate the absolute value of the value on the input. When x ＜0, the inverter will set SN=1.

Table 5-36 absolute value calculator setting parameters

	AVA A	AVA B
X	F01.37	F01.39
Y	P08.24	P08.25
SN	P03.32	P03.33

Time relay

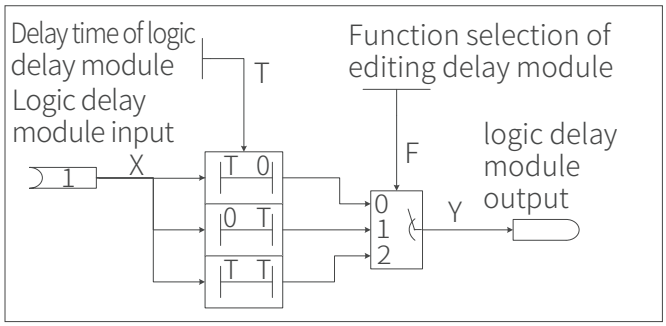


Table 5-37 setting parameters of time relay

	RLY A	RLY B	RLY C	RLY D
I1	F00.76	F00.79	F00.82	F00.85
I2	F00.77	F00.80	F00.83	F00.86
I3	F00.78	F00.81	F00.84	F00.87
Q	P03.20	P03.21	P03.22	P03.23

Limiter module

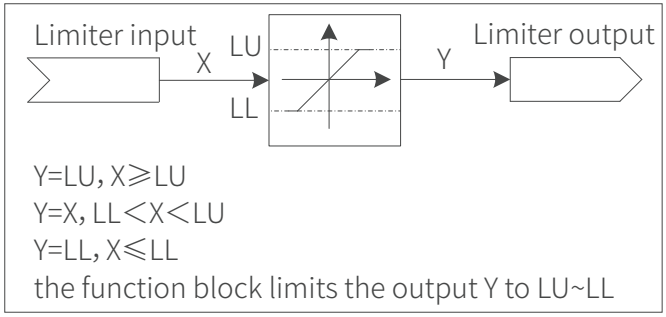


Table 5-38 limiter module setting parameters

	LIM A	LIM B
X	F01.47	F01.51
LU	F01.48	F01.52
LL	F01.49	F01.53
Y	P08.28	P08.29

EN

low pass filter

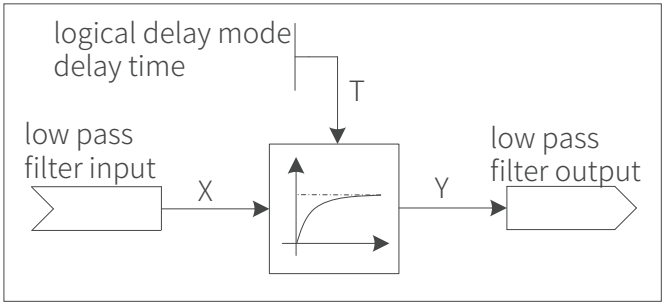


Table 5-39 setting parameters of low pass filter module

	LPF A	LPF B
X	F01.55	F01.58
T	F01.56	F01.59
Y	P08.32	P08.33

When custom data needs to be set, entering values in F01.81~84 will display them in P11.03/04/07/08..

Table 5-40 Function Table

Input	Output
F01.81	P11.03
F01.82	P11.04
F01.83	P11.07
F01.84	P11.08

5.7.6 Smooth lifting function

When lifting a heavy object, if the speed of the heavy object is too fast at the moment when it is off the ground, the tower arm will shake up and down, affecting the safety and stability of the tower crane. This situation can be improved by using the stable lifting function. After the stable lifting function is turned on, when the load increase (for the moment when the heavy object is off the ground) quickly reduce the rotating speed to tension the rope for lifting the heavy object, and lift the heavy at a low speed. When the heavy object is stable off the ground, it will automatically accelerate the rise.

This function is only applicable to closed-loop vector and open-loop vector control mode.

The parameters which need to be set are as follows:

Function code	Parameter name	Factory default	Description
F08.50	Enable smooth lifting function	0	0:Invalid 1:Effective
F08.51	Loose rope torque	25.0%	Percentage of load torque of slack rope torque in rated torque.
F08.52	Loose rope detection time	0.80	Time of rope loosening determined by detection.
F08.53	Added value of loading torque	10.0	The increase of load torque under loading compared with slack rope torque.
F08.54	Load detection time	0.10	Time to detect and judge the loading status
F08.55	Load torque fluctuation value	10.0%	Fluctuation range of fully loaded output torque as a percentage of rated torque.
F08.56	Load stabilization time	1.00	Holding time of output torque within the fluctuation range of F08.55 after full loading.
F08.57	Fast deceleration speed	0.50	Fast deceleration time under loading
F08.58	Rope tightening maintain speed	10.0%	Percentage of low speed value in loaded state in fixed frequency.

Attention:

The lifting direction shall be consistent with the forward rotation direction given by the speed.

EN

5.7.7 Smooth rotation function

When the tower crane rotates, in order to make the rotation stable and reduce shaking, the stable rotation function can be turned on. The parameters which need to be set are as follows:

Function code	Parameter name	Factory value	Description
F08.61	Smooth swing function enable	0	0:invalid 1:valid
F08.62	Swing arm length	32~100m	
F08.63	Acceleration gain	0~100	
F08.64	Deceleration gain	0~100	

5.7.8 Anti-sway function

1. Functional Description

The A1-CM23 anti-sway function reduces unwanted swaying of the load. The function reduces load swaying by adjusting the speed reference provided. It gives the crane operator better control of the crane, reduces working time and increases productivity through higher speeds and shorter acceleration and deceleration times.

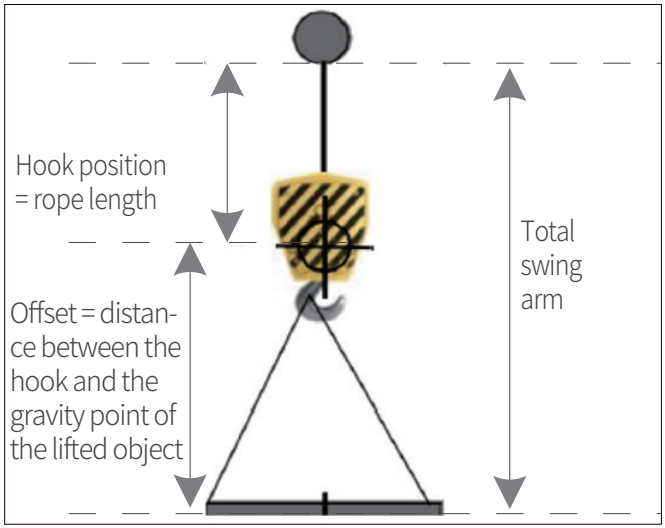
This function works without any additional anti-sway sensors (open loop). The function requires the total swing arm length to define the swing time constant (τ), which controls the acceleration and deceleration of the trolley and the carriage to suppress the swaying vibrations of the load. Since there is no feedback signal for the actual load sway, closed loop control is not possible, so the anti-sway function cannot compensate for the influence of external disturbances on the load, such as wind or indirect lifting, or the difference between the actual sway behavior and the behavior of the inverter sway model (wrong setting during startup or the load has already swayed before startup).

The total swing arm length is the sum of the rope length and the offset. This is shown in the figure below.

• The rope length is based on the crane position. This value is given from the crane inverter (with encoder).

• The swing arm offset is the distance between the hook and the center of gravity of the lifted object. It can vary depending on the type of load.

NOTE: The accuracy of the anti-sway control is only as good as the accuracy with which the true swing arm length is known.



2. Related parameter settings

• Lifting mechanism drive configuration

The lifting mechanism driver is mainly used to calculate the pendulum length, and the encoder calculates the current pendulum length in real time. The parameters that need to be changed for the anti-sway of the lifting mechanism driver are as follows:

Function code	Name
F08.00	Anti sway function enable
F08.01	Automatic anti sway FUNC enable
F08.03	Min length of auto-anti swing
F08.04	Allow minimum anti roll speed
F08.17	SRC SEL of lifting swing length
F08.19	Swing length offset value
F08.25	Swing length count reset enable
F08.26	Swing Length proportional COEF
F08.29	Lift feedback pulse reverse

For the lifting mechanism driver, both F08.00 and F08.01 need to be set to 1, F08.03 to 100.00m, and F08.04 to 100%. The lifting mechanism is only used to calculate the pendulum length, and the setting and resetting of the pendulum length will also be effective.

（1）The pendulum length is the set value

F08.21 Actual pendulum length =F08.18 Swing length offset value +F08.19 Swing length offset value

The pendulum length is the interconnection parameter

By interconnecting F08.17 and P09.25 function codes, you can obtain the current pendulum length value according to the number of revolutions of the lifting mechanism.

（2）F08.25 Swing length count reset enable and F08.29 Lift feedback pulse reverse

To calculate the pendulum length, you first need to raise the hook to the highest point. At this time, set F08.25 pendulum length count reset enable to allow, and the F08.27/28 lifting encoder count value will be cleared. At this time, it is considered that the pendulum length is 0. At this time, run downward and observe the changes in the F08.27 and F08.28 lifting encoder count values. If the count value decreases, set F08.29 lifting feedback pulse reverse to allow.

The calculation process of the pendulum length is:

Lifting mechanism rotation number = (F08.27*65535+F08.28)*/encoder resolution

F08.21 Actual pendulum length = (number of revolutions of the lifting mechanism * F08.26 pendulum length proportional coefficient) / 1000 + F08.19 pendulum length offset.

Since CM23 does not have analog input and output functions, a fixed pendulum length can be used, that is, the actual pendulum length of F08.21 is input into the pendulum length setting value of F08.18 of the large and small car drivers, or PLC and other methods can be used to make real-time modifications.

2. Related parameter settings of the inverters for large and small vehicles

The anti-sway action in the anti-sway function is mainly realized by the trolley inverter and the car inverter. Since the processing methods and anti-sway related parameter settings of the trolley inverter and the car inverter are the same, only the anti-sway parameter settings of one of the inverters are described here.

The anti-sway parameter settings of the travel inverter are as follows:

Function code	Name
F08.00	Anti sway function enable
F08.06	Anti sway slope time
F08.17	SRC SEL of lifting swing length
F08.19	Swing length offset value
F08.20	Lift the maximum swing length
F08.21	Actual pendulum length
F08.22	Rolling period

F08.00 (Anti sway function enable): F08.00 needs to be set to 1 in the travel inverter; this parameter is used to select whether the anti-sway function is enabled. To use the anti-sway function, F08.00 must be set to 1 in both travel inverters.

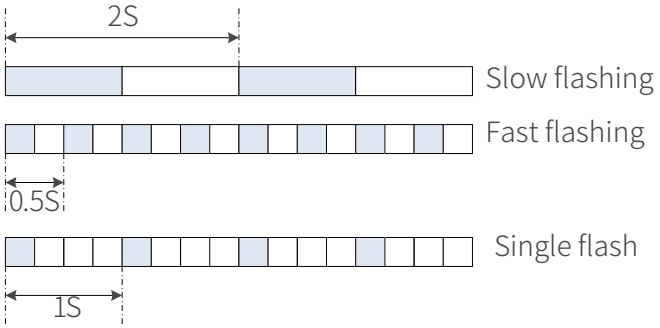
F08.06 (Anti sway slope time): This parameter is used for the slope time when F08.00=1 (Anti sway function enable). This parameter needs to be debugged during actual use. Usually, when the maximum swing length does not exceed 10m, the default value can be used.
F08.17 (SRC SEL of lifting swing length): The parameter is used to select the source of the current swing length value. If F08.17 selects 0: the set value is valid (F08.18), then the swing length can be changed by setting the F08.18 swing length set value; the swing length can also be transmitted through analog quantity, so it can be associated with analog quantity interconnection parameters, and the swing length can be calculated in real time through PLC and other methods.
F08.19 (Swing length offset value): Due to the different volumes and sizes of lifting objects in actual applications, it is impossible to accurately set this parameter value every time. Therefore, please refer to the commonly used lifting objects on site for the setting of this parameter; the error of this parameter (within 1m) does not have much impact on the actual swing cycle. Of course, the more accurate the parameter, the better the actual effect of anti-sway.
F08.20 (Lift the maximum swing length): This parameter is used to set the maximum swing length of the current crane system. The setting value of this parameter in the travel inverter must be the same as the setting value of the lifting inverter.
The running time of the uniform speed section is half of the swing cycle of F08.22.
3. Parameters related to anti-sway function

Function code	Name	Parameter Description
P01.86	Anti sway enabling sign	Displays whether the anti-sway function is enabled
P01.87	Anti sway speed latch	Displays the latch flag of the anti-sway function
P09.25	Pendulum length	The swing length calculated by the lifting encoder

6. Exception and system information

6.1 LED display of operating status

After turning on the power, the LED RDY (Ready) will remain on. Once the LED RDY turns red or green, it displays the status of the driver.
LED lights are divided into RDY (Ready) lights and COM (Communication) lights. RDY lights are used to display the status and upgrade status of the driver, while COM lights are used to display whether communication is present.
Signal status of LED
In addition to "on" and "off", the LED also has three different flashing frequencies:



LED lighting status description	
1	Bright
2	Extinguish
3	Slow flashing (2S cycle)
4	Fast flashing (0.5S cycle)
5	Single flash (1s cycle)

Table 6-1 LED signal status of driver

LED				illustrate
RDY (Green)	RDY(Red)	COM(Green)	COM(Red)	
bright	extinguish			Drive operation
Slow flashing	extinguish			Preparation for startup
Fast flashing	extinguish			Power on blocking status
extinguish	bright			fault
bright	bright			Fault shutdown
bright	Slow flashing			CM/PM Upgrade
Fast flashing	Fast flashing			Upgrade Successful
extinguish	Slow flashing			Upgrade failed
		Slow flashing	extinguish	Modbus communication connection
		extinguish	extinguish	Modbus communication disconnection
		bright	extinguish	PROFINET process data communication
		extinguish	Fast flashing	PROFINET burning mode
		Red green alternating fast flashing		PROFINET DCP request
		Single flash	extinguish	PROFINET AR establishment
		extinguish	Single flash	PROFINET communication error

EN

6.2 Fault alarm and countermeasures

1.OverCUR

Fault subcode	Subcode meaning
1	U phase overcurrent
2	V phase overcurrent
3	UV two-phase overcurrent
4	W phase hardware overcurrent
5	UW two-phase overcurrent
6	VW two-phase overcurrent
7	UVW three-phase overcurrent
8	Brake pipe hardware overcurrent
9	U phase VCE short circuit
10	V phase VCE short circuit
11	UV two-phase VCE short circuit
12	W phase VCE short circuit
13	UW two-phase VCE short circuit
14	VW two-phase VCE short circuit
15	Overcurrent abnormality
16	Overcurrent abnormality

Overcurrent fault troubleshooting method:

Possible reasons	Detection Methods	Treatment measures
The motor parameters are incorrectly set, and the vector control has not performed parameter identification	Confirm whether the motor parameters of group D00 are consistent with the motor nameplate; perform parameter identification again, record the motor parameters of group D01, and compare the differences	Reset parameters and run after parameter identification

EN

Possible reasons	Detection Methods	Treatment measures
The acceleration time is too short	If the acceleration time B04.02 is increased and the fault disappears, the acceleration time is too short	Appropriate growth acceleration time
The motor is short-circuited between phases or short-circuited to the ground	Remove the motor cable, set the control mode VF (B05.00=0), turn off the output phase loss detection (B06.37=0), and run	If the overcurrent is no longer reported, continue to check the motor cause; if the overcurrent is still reported, check the drive
The motor is restarted before it stops	Measure the insulation between the motor phases and the insulation to the ground. You can measure the line resistance and the resistance to the ground	If the resistance to ground is zero or very small, please contact the motor manufacturer to check the motor problem; the line resistance mainly measures whether the three-phase

Possible reasons	Detection Methods	Treatment measures
	Check the motor cable	If the motor cable is damaged or short-circuited, the short-circuited cable needs to be separated and reliable insulation is ensured
Possible reasons	Observe whether the motor has stopped rotating before running; confirm whether the stop mode is free stop (B05.32=0)	Wait until the motor stops completely before restarting; set to deceleration stop (B05.32=1)
The motor parameters are incorrectly set, and the vector control has not performed parameter identification	Power off the drive and confirm whether the brake resistor is connected correctly; measure the resistance between DC+ and R and compare it with the recommended value in the manual	Install a suitable brake resistor

Possible reasons	Detection Methods	Treatment measures
Driver rectifier bridge/inverter IGBT damage	After power off, use a multimeter to detect the main power components of the driver	Contact the manufacturer to replace the driver
PM abnormality	Replace PM. Determine whether the fault can be eliminated before and after replacement	Replace PM
Failed to restore to factory settings after burning new software	/	Restore factory values and reset parameters

2.DC overVolt

Fault subcode	Subcode meaning
1	The bus voltage is detected to exceed the threshold

Overvoltage troubleshooting method:

Possible reasons	Detection Methods	Treatment measures
The motor parameters are incorrectly set and the vector control has not been parameter identified.	Confirm whether the motor parameters of group D00 are consistent with the motor nameplate; perform parameter identification again, record the motor parameters of group D01, and compare the differences between the two times	Reset parameters and run after parameter identification
Deceleration time is too short	If the deceleration time B04.03 is increased, check whether there is overvoltage	If there is no overvoltage, increase B04.03 appropriately; if the deceleration time cannot be increased, configure a brake resistor

Possible reasons	Detection Methods	Treatment measures
Acceleration time is too short	Observe whether the motor is over-voltage when it is about to enter constant speed after accelerating; increase the acceleration time	Increase acceleration time B04.02; configure brake resistor
Braking resistor abnormality	Power off the drive and confirm whether the brake resistor is connected correctly; measure the resistance between DC+ and R and compare it with the recommended value in the manual	Install a suitable brake resistor
Input power abnormality	Measure the three-phase voltage of the driver input terminals L1, L2, and L3 to check whether the voltage value is too high and whether the three phases are balanced	Troubleshoot input power issues

Possible reasons	Detection Methods	Treatment measures
Voltage detection problem	Measure the actual bus voltage, compare it with the drive display value, and check the bus voltage sampling gain (A03.03)	Modify A03.03 and calibrate the voltage. If the voltage cannot be calibrated, the internal detection module of the driver may be abnormal. Please contact after-sales service or the manufacturer for technical support.
Small drive capacity	Confirm the drive power and motor power and compare with the selection manual	Replacement of high power driver

3.DC underVolt

Fault subcode	Subcode meaning
1	The bus voltage is detected to be lower than the threshold value during operation (A03.21)

Undervoltage Fault Detection Method：

Possible reasons	Detection Methods	Treatment measures
Input power voltage is too low	Use a multimeter to measure whether the input power voltage is within the allowable range and whether the bus voltage is lower than the undervoltage point.	Confirm the power supply range and confirm that the input terminal wiring is firm and reliable.
Detection threshold setting error	Check whether the undervoltage point (A03.21) is set correctly. The factory default is 100%, i.e. 350V	Correctly set A03.21
Voltage detection problem	Measure the actual bus voltage, compare it with the drive display value, and check the bus voltage sampling gain (A03.03)	Modify A03.03 and calibrate the voltage. If the voltage cannot be calibrated, the internal detection module of the driver may be abnormal. Please contact after-sales service or the manufacturer for technical support.
Contactor not energized	Check whether there is a sound of contactor closing when power is turned on	If the contactor does not close, replace PM to confirm

EN

5.Drive overload

Fault subcode	Subcode meaning
1	The current detected is greater than the drive rated current (A02.06) and exceeds the overload allowable time

Undervoltage Fault Detection Method：

Possible reasons	Detection Methods	Treatment measures
Current detection abnormal-ity	Use a clamp meter to measure the actual current, confirm whether the current displayed by the driver is consistent with the actual current, and check the current sampling gain (A03.01)	The current detection coefficient should be around 100%±5% under normal circumstances. If it deviates significantly, check whether the model (A03.00) setting is consistent with the nameplate; if the current cannot be calibrated, the internal detection module of the driver is abnormal, please contact the manufacturer

Possible reasons	Detection Methods	Treatment measures
The motor parameters are incorrectly set and the vector control has not been parameter identified.	Confirm whether the motor parameters of group D00 are consistent with the motor nameplate; perform parameter identification again, record the motor parameters of group D01, and compare the differences	Reset parameters and run after parameter identification
Motor stall	Check whether the motor and mechanical equipment are locked (brake, brake, etc.)	Eliminate mechanical stalling
The drive sets the carrier frequency higher than the default frequency	Check whether the carrier frequency (A03.08) is greater than the factory value and causes the inverter to be derated	Reduce the carrier frequency or replace with a higher power driver
The motor restarts before it stops	Observe whether the motor has stopped rotating before operation; confirm whether the stop mode is free stop (B05.32=0)	Wait until the motor stops completely before restarting; set to deceleration stop (B05.32=1)

EN

Possible reasons	Detection Methods	Treatment measures
Inappropriate torque boost value setting under VF control	Confirm the torque boost value (B07.15), which can be reduced and re-debugged	Appropriately reduce B07.15
Motor connection error	Turn on the motor and confirm the star-delta connection	Check the motor nameplate and confirm the connection method
Load characteristics	Understand application load characteristics	Take appropriate measures according to the load conditions to ensure that the load is not too large during startup.
The load is too heavy and the drive capacity is small	Compare the normal operating current and the rated current of the driver to determine whether the driver capacity is too small	Replacing a large capacity drive

6.Motor overload

Fault subcode	Subcode meaning
1	The current value detected is greater than the motor rated current (D00.03) and exceeds the overload allowable time

Motor overload troubleshooting method:

Possible reasons	Detection Methods	Treatment measures
Current detection abnormality	Use a clamp meter to measure the actual current, confirm whether the current displayed by the driver is consistent with the actual current, and check the current sampling gain (A03.01)	The current detection coefficient should be around 100%±5% under normal circumstances. If it deviates significantly, check whether the model (A03.00) setting is consistent with the nameplate; if the current cannot be calibrated, the internal detection module of the driver is abnormal, please contact the manufacturer

Possible reasons	Detection Methods	Treatment measures
The motor current setting is too small	Check whether the motor rated current (D00.03) is consistent with the nameplate	Correctly set D00.03
Vector control without parameter identification	Perform parameter identification again, record the motor parameters of group D01, and compare the differences	Reset parameters and run after parameter identification
Motor stall	Check whether the motor and mechanical equipment are locked (brake, brake, etc.)	Eliminate mechanical stalling
The motor restarts before it stops	Observe whether the motor has stopped rotating before operation; confirm whether the stop mode is free stop (B05.32=0)	Wait until the motor stops completely before restarting; set to deceleration stop (B05.32=1)
Inappropriate torque boost value setting under VF control	Confirm the value of B07.15, you can reduce it and debug it again	Reduce B07.15

Possible reasons	Detection Methods	Treatment measures
Motor connection error	Turn on the motor and confirm the star-delta connection	Check the motor nameplate and confirm the connection method
Load characteristics	Understand application load characteristics	Take appropriate measures according to the load conditions to ensure that the load is not too large during startup.

7.Input phase loss

Fault subcode	Subcode meaning
1	Abnormal bus voltage fluctuation is detected, and the input end is missing a phase

Input phase loss fault troubleshooting method:

Possible reasons	Detection Methods	Treatment measures
Input terminal wiring problem	Check whether the input L1L2L3 terminals are loose or the cables are broken	Ensure that the input wiring is correct and reliable
Abnormal input voltage	Check the on-site power distribution problem and measure whether the three-phase power supply voltage is balanced and stable	Ensure input power is stable

8.Output phase loss

Fault subcode	Subcode meaning
1	U phase output phase loss
2	V phase output phase loss
3	W phase output phase loss
4	FVC control output phase loss
5	Three-phase output is seriously unbalanced
6	Stator resistance identification output phase loss
7	SVC control output phase loss

Output phase loss fault troubleshooting method:

Possible reasons	Detection Methods	Treatment measures
The driver output terminal wiring is disconnected	Cut off the power, unplug the drive power line terminal, and use a multimeter to measure the three-phase phase-to-phase resistance value on the drive terminal side to see if there is any imbalance or large resistance	Make sure the output terminals are connected tightly; make sure the motor cables are not disconnected

Possible reasons	Detection Methods	Treatment measures
Current detection abnormality	Use a clamp meter to measure the actual current, confirm whether the current displayed by the driver is consistent with the actual current, and check the current sampling gain (A03.01)	The current detection coefficient should be around 100%±5% under normal circumstances. If it deviates significantly, check whether the model (A03.00) setting is consistent with the nameplate; if the current cannot be calibrated, the internal detection module of the driver is abnormal, please contact the manufacturer
Motor damage	Measure whether there is an open circuit between motor windings	Please contact the motor manufacturer to replace the motor
PM Abnormal	Replace with new PM confirmation	Update PM

9.Over-TEMP

Fault subcode	Subcode meaning
1	The IGBT temperature of the driver (37Kw and below) exceeds the threshold
2	The driver (37Kw and above models) IGBT-U phase temperature exceeds the threshold
3	The driver (37Kw and above models) IGBT-V phase temperature exceeds the threshold
4	The driver (37Kw and above models) IGBT-W phase temperature exceeds the threshold

If the temperature exceeds 85 degrees below 10Hz, an over-temperature alarm will be issued; if the temperature exceeds 100 degrees above 12Hz, an over-temperature alarm will be issued. If the temperature exceeds 85 degrees at high speed, and then the speed is reduced to low speed, if the temperature continues to rise, an over-temperature alarm will be issued, otherwise no alarm will be issued.

Possible reasons	Detection Methods	Treatment measures
Fan abnormality	1. Check if the fan is stuck by foreign objects and does not rotate. 2. Check if the fan speed control function is turned on (B06.48)	Remove foreign matter and turn off the fan speed control function (B06.48=0). If the fan still does not rotate, contact the manufacturer to replace the fan
Model parameter setting error	Check whether the model value corresponds to the nameplate	Change the correct model value
Air duct blockage	Check whether there is dust, cotton wool or other foreign objects blocking the radiator air duct	Clean the air duct
On-site ambient temperature is too high	Measure the ambient temperature of the power distribution cabinet when the drive is running. If it exceeds 40 degrees, it means that the heat dissipation of the power distribution cabinet is not good	The drive carrier frequency can be appropriately reduced, the distribution cabinet door can be opened for heat dissipation, and the air volume at the inlet and outlet of the distribution cabinet can be increased
PM abnormality	Replace PM Confirmation	Replace PM

11.CUR zero drift error

Fault subcode	Subcode meaning
1	U phase current zero drift is too large
2	V phase current zero drift is too large
3	W phase current zero drift is too large

Current zero drift error troubleshooting method:

Possible reasons	Detection Methods	Treatment measures
Current detection abnormal-ity	Use a clamp meter to measure the actual current, confirm whether the current displayed by the driver is consistent with the actual current, and check the current sampling gain (A03.01)	The current detection coefficient should be around 100%±5% under normal circumstances. If it deviates significantly, check whether the model (A03.00) setting is consistent with the nameplate; if the current cannot be calibrated, the internal detection module of the driver is abnormal, please contact the manufacturer
PM abnormal-ity	Re-power on. If the fault continues, replace the PM to confirm	Replace PM

12.Short circuit to ground fault

Fault subcode	Subcode meaning
1	U phase overcurrent when short circuit to ground
2	V phase overcurrent when short circuit to ground
4	W phase overcurrent when short circuit to ground
5	The short-circuit current to ground exceeds the threshold
6	Overvoltage when short circuit to ground

Troubleshooting method for short circuit to ground:

Possible causes	Detection Methods	Treatment measures
Drive abnormal-ity	Disconnect the motor cable at the driver end and power on again. If the fault is still reported, it means the driver is abnormal. If the fault is no longer reported, continue to look for problems with the motor and cable	Replacing the drive

Possible causes	Detection Methods	Treatment measures
Motor cable damaged	Check whether the motor cables and terminals are damaged	Replace the cable
Motor insulation damage or internal short circuit	Use a multimeter to measure the three-phase interphase resistance and the resistance to the casing of the motor	If the resistance is zero or very small, the motor is abnormal. Please replace the motor

13.Motor tuning fault

Fault subcode	Subcode meaning
1	Dynamic tuning abnormality
2	Static tuning failure
3	Synchronous machine magnetic pole position identification voltage regulation mode timeout
4	Encoder abnormality
5	Z signal error
6	Unable to receive Z signal

Motor tuning troubleshooting methods:

Possible causes	Detection Methods	Treatment measures
Motor parameter setting error	Check whether the motor parameters of group D00 are consistent with the motor nameplate	Set the correct parameters

Possible causes	Detection Methods	Treatment measures
Output terminal connecti-on abnormal-ity	Check the motor wiring and whether the terminals are in poor contact	Ensure reliable output terminal wiring
Subcode 4-6 indicates encoder signal abnormal-ity	Check whether the encoder parameters of group D02 are set correctly; check whether the encoder wiring is correct	Ensure encoder wiring and parameters are correct
PM Abnormal	Replace PM. Determine whether the fault can be eliminated before and after replacement	Replace PM

14.Encoder ABN

Fault subcode	Subcode meaning
1	Dynamic tuning abnormality Encoder is not connected during closed loop dynamic tuning
2	Encoder speed measurement does not match during closed-loop dynamic tuning
3	Encoder disconnection during closed-loop operation
9	Phase A in ABZ is broken
10	Phase B in ABZ is broken
11	Phase AB in ABZ is broken
12	Phase Z in ABZ is broken
13	Phase AZ in ABZ is broken
14	Phase BZ in ABZ is broken
15	All ABZ is broken

Encoder abnormality troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Encoder feedback abnormal-ity	Check whether the encoder parameters of group D02 are set correctly; check whether the encoder cable is connected correctly; check whether the encoder is installed correctly	Confirm that the encoder parameters are set correctly and the cables are connected correctly
Encoder signal interferen-ce	Check encoder cable connection	Standardize the wiring, use shielded cables, and ground the encoder shield
Motor parameter setting error	Check whether the motor parameters of group D00 are consistent with the nameplate and confirm the motor level D00.09	Correctly set the motor parameters
Subcode 3 may be due to motor stall	Confirm whether the motor rotates after operation	Eliminate stalling

15.Vector stall alarm

Fault subcode	Subcode meaning
1	The speed is reversed by external force and exceeds the set time (B06.59)
2	The deviation between feedback speed and set speed (B06.61) is too large and exceeds the set time (B06.60)

Vector stall alarm troubleshooting method:

Possible causes	Detection Methods	Treatment measures
The motor parameters are incorrectly set and the vector control has not been parameter identified.	Confirm whether the motor parameters of group D00 are consistent with the motor nameplate; perform parameter identification again, record the motor parameters of group D01, and compare the differences	Reset parameters and run after parameter identification
Encoder feedback error during FVC control	Check whether the encoder parameters of group D02 are set correctly and whether the encoder wiring is correct	Reset encoder related parameters
Load reason	The load inertia is too large, and the speed loop parameters need to be adjusted;	Confirm the load characteristics and adjust the parameters of group B08; consider whether it is necessary to replace the high-power motor according to the load conditions.
	The load is too heavy to drive, such as the actual hook walking during lifting, etc	
Improper detection parameter settings	Check B06.59, B06.60, B06.61, and appropriately increase the detection time to see if a fault is reported	Correctly set the detection parameters

16.FPGA read/write error

Fault subcode	Subcode meaning
1	FPGA data read and write errors

FPGA read and write error troubleshooting method:

Possible causes	Detection Methods	Treatment measures
FPGA read and write errors during power-on initialization	Power off and restart. If the fault continues to be reported, replace the PM to confirm	Replace PM

17.Drive power fault

Fault subcode	Subcode meaning
1	Driver power failure
3	Driver power failure during short circuit detection

Driving power supply troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Driving power circuit abnormality	Replace PM Confirmation	Replace PM

18.Primary power fault

Fault subcode	Subcode meaning
1	24V primary power supply voltage is too low

First-level power supply troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Primary power circuit abnormal-ity	Replace PM Confirmation	Replace PM

19.ABN COMM between CM and PM

Fault subcode	Subcode meaning
1	CM no response
2	CM no response
3	CM no response
4	CM no response

Troubleshooting methods for abnormal communi-cation between CM and PM:

Possible causes	Detection Methods	Treatment measures
CM and PM are not connected properly	Check whether the CM lock is locked.	Ensure reliable connection between CM and PM
CM Abnormal	Replace CM Confirmation	Replace CM
PM Abnormal	Replace PM Confirmation	Replace PM

20.PM-EEPROM fault

Fault subcode	Subcode meaning
1	Write parameter number exceeds limit
2	Read parameter number exceeds limit
3	Single read timeout
4	Single write timeout
5	Read address out of bounds
6	Write address out of bounds

PM-EEPROM troubleshooting method:

Possible causes	Detection Methods	Treatment measures
EEPROM storage abnormal-ity	Restart the power supply	If the fault still occurs after power-on, contact the manufacturer to replace PM

21.PM model-set error

Fault subcode	Subcode meaning
1	The model setting is less than the minimum value
3	The model setting is greater than the maximum value

EN

PM model setting error troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Model parameter setting error	Check whether the model parameters are consistent with the nameplate	Correctly set the model
PM Abnormal	Replace PM. Determine whether the fault can be eliminated before and after replacement	Replace PM

22.Wave by wave CUR-limit fault

Fault subcode	Subcode meaning
1	U phase wave-by-wave current limiting fault
2	V phase wave-by-wave current limiting fault
3	W phase wave-by-wave current limiting fault
16	Abnormal fault

Wave-by-wave current limiting fault troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Acceleration time is too short	If the acceleration time B04.02 is increased and the fault disappears, the acceleration time is too short	Growth acceleration time

Possible causes	Detection Methods	Treatment measures
The motor parameters are incorrectly set and the vector control has not been parameter identified.	Confirm whether the motor parameters of group D00 are consistent with the motor nameplate; perform parameter identification again, record the motor parameters of group D01, and compare the differences	Reset parameters and run after parameter identification
The motor is short-circuited between phases or short-circuited to ground	Remove the motor cable, set the control mode to VF (B05.00=0), turn off the output phase loss detection (B06.37=0), and run	If the overcurrent is no longer reported, continue to check the motor cause; if the overcurrent is still reported, check the drive hardware

Possible causes	Detection Methods	Treatment measures
The motor is short-circuited between phases or short-circuited to ground	Measure the insulation between phases and to the ground of the motor, and can measure the line resistance and to the ground resistance	If the resistance to ground is zero or very small, please contact the motor manufacturer to check the motor problem; the line resistance mainly measures whether the three-phase resistance is close to
	Check the motor cables	If the motor cable is damaged or short-circuited, separate the short-circuited cables and ensure reliable insulation.
PM Abnormal	Replacement method: Replace the PM. Determine whether the fault can be eliminated before and after replacement	Replace PM

23.Rectifier bridge overheat

Fault subcode	Subcode meaning
1	The rectifier bridge temperature exceeds 90° (only 18.5Kw and above models are tested)

Rectifier bridge overheating troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Fan abnormal-ity	1. Check if the fan is stuck by foreign objects and does not rotate. 2. Check if the fan speed control function is turned on (B06.48)	Remove foreign matter and turn off the fan speed control function (B06.48=0). If the fan still does not rotate, contact the manufacturer to replace the fan
Model parameter setting error	Check whether the model value corresponds to the nameplate	Change the correct model value
Air duct blockage	Check whether there is dust, cotton wool or other foreign objects blocking the radiator air duct	Clean the air duct

Possible causes	Detection Methods	Treatment measures
The ambient temperature on site is too high	Measure the ambient temperature of the power distribution cabinet when the drive is running. If it exceeds 40 degrees, it means that the heat dissipation of the power distribution cabinet is not good	The drive carrier frequency can be appropriately reduced, the distribution cabinet door can be opened for heat dissipation, and the air volume at the inlet and outlet of the distribution cabinet can be increased
PM Abnormal	Replace PM Confirmation	Replace PM

25.Brake pipe overheat

Fault subcode	Subcode meaning
1	The brake pipe temperature exceeds 85° (only tested for 45Kw and above models)

Brake pipe overheating troubleshooting method:

Possible causes	Detection Methods	Treatment measures
Braking resistor abnormality	Power off the drive and confirm whether the brake resistor is connected correctly; measure the resistance between DC+ and R and compare it with the recommended value in the manual.	Install a suitable brake resistor
Fan abnormality	1. Check if the fan is stuck by foreign objects and does not rotate. 2. Check if the fan speed control function is turned on (B06.48).	Remove foreign matter and turn off the fan speed control function (B06.48=0). If the fan still does not rotate, contact the manufacturer to replace the fan.
Model parameter setting error	Check whether the model value corresponds to the nameplate	Change the correct model value
Air duct blockage	Check whether there is dust, cotton wool or other foreign objects blocking the radiator air duct.	Clean the air duct

Possible causes	Detection Methods	Treatment measures
The ambient temperature on site is too high	Measure the ambient temperature of the power distribution cabinet when the drive is running. If it exceeds 40 degrees, it means that the heat dissipation of the power distribution cabinet is not good.	The drive carrier frequency can be appropriately reduced, the distribution cabinet door can be opened for heat dissipation, and the air volume at the inlet and outlet of the distribution cabinet can be increased.
PM Abnormal	Replace PM Confirmation	Replace PM

33.Drive pre overload

34.Warning before the drive is overloaded. For handling methods, refer to 5 Drive overload faultMotor pre overload
Warning before motor overload, for handling method, refer to 6 Motor overload fault.

Brake pipe overheating troubleshooting method:

Fault subcode	Subcode meaning	Treatment measures
1	When the driver is controlled by the Boneng host computer, the communication between the CM module and the host computer is interrupted	① Check if the RS485 to USB cable/USB cable is disconnected or damaged
		② Replace the RS485 to USB cable/USB cable and reconnect to see if communication is possible
		③ If communication still fails after replacing the RS485 to USB cable/USB cable, contact after-sales service or the manufacturer for technical support
2	After the OP keyboard acquires local control, the communication between the CM module and the OP keyboard is interrupted	① Check if the CM module and OP keyboard are loose, and see if they can communicate after re-plugging
		② If the OP keyboard is connected with an extension cable, check if the extension cable is loose or damaged

Fault subcode	Subcode meaning	Treatment measures
2	After the OP keyboard acquires local control, the communication between the CM module and the OP keyboard is interrupted	③ Replace the OP keyboard or CM module to see if they can communicate. If they can communicate normally after replacement, it means that one of them is damaged, so contact after-sales or the manufacturer for technical support
3	No interaction is performed within the time set by function code C02.04 during Modbus control	① Check if the Modbus cable is disconnected or damaged
		② Check if the corresponding PLC and other controller programs are correct, and whether the interaction interval is within the time set by function code C02.04
		③ Contact after-sales service or the manufacturer for technical support

Fault subcode	Subcode meaning	Treatment measures
5	Canopen communicati-on disconnection	① Check if the master station is closed
		② Check if the communication cable is disconnected or damaged, and if the connector is loose ③ Check the distance between the communication cable and the strong power supply. The cable should be routed at an interval of about 50cm, and the driver equipment should be properly grounded

Fault subcode	Subcode meaning	Treatment measures
5	Canopen communicati-on disconnection	④ Check if the length of the communication cable exceeds the maximum length supported by the baud rate. You can try to lower the baud rate, and check if the resistance of the communication cable is 60 Ω and whether the terminal resistance is connected normally
		⑤ Contact after-sales service or the manufacturer for technical support
7	PROFINET communicati-on disconnection	① Check if it is caused by the previous PLC power outage

Fault subcode	Subcode meaning	Treatment measures
7	PROFINET communicati-on disconnection	② Check if the network cable is disconnected or damaged, and if the network cable connector is loose. It is recommended to use a standard PROFINET network cable with a shielding layer, and ensure that the driver is properly grounded, and the shielding layer of the motor power line is connected to the driver
		③ Check the maximum number of PROFINET slaves supported by the PLC, and adjust the appropriate communication cycle according to the number of slaves

Fault subcode	Subcode meaning	Treatment measures
7	PROFINET communicati-on disconnection	④ When using the IRT mode, ensure that the IRT device is connected to the PLC first, the RT device is connected to the back end of the IRT device, and use a switch that supports the IRT mode
		⑤ Contact after-sales or the manufacturer for technical support

37.Motor speeding

Fault subcode	Subcode meaning	Treatment measures
1	The motor running speed exceeds the maximum speed limit, and exceeds the setting value of B06.28 and maintains the setting time of B06.29	① Check whether the B06.28/B06.29 parameters are set too small, resulting in overly sensitive detection
		② Check whether there is an external device rotating the motor
		③ Contact after-sales service or the manufacturer for technical support

38.Large motor speed DEV

Fault subcode	Subcode meaning	Treatment measures
1	The actual running speed of the motor differs from the set value by more than the setting value of B06.30 and the setting time of B06.31 is maintained.	① Check whether the B06.30/B06.31 parameters are set too small, resulting in overly sensitive detection
		② Check whether there is an external device rotating the motor
		③ Contact after-sales service or the manufacturer for technical support

39.Power on again/39_

Fault subcode	Subcode meaning	Treatment measures
1	PN communica-tion related par-ameters have been changed	①Re-power on
2	The maximum time allowed by the device has expired	①Contact the device or driver manufacturer

EN

40.PID FDBK lost

Fault subcode	Subcode meaning	Treatment measures
1	PID feedback data lost	① Check the PID feedback input signal
		② Contact after-sales service or the manufacturer for technical support

41.EXT fault

Fault subcode	Subcode meaning	Treatment measures
1	External fault has input signal	① Check external input signal
2	External fault has input signal	① Check external input signal

42.EXT warning

Fault subcode	Subcode meaning	Treatment measures
1	External warning has input signal	① Check external input signal
2	External warning has input signal	① Check external input signal

43.Pre drive failed

Fault subcode	Subcode meaning	Treatment measures
1	No bus voltage was detected when the run command was generated	① Check whether the external voltage supply is normal
		② Contact after-sales service or the manufacturer for technical support

44.MCU recognition exceptio

Fault subcode	Subcode meaning	Treatment measures
1	ARM chip type identification error	① Re-power on to see if it is normal
		② Contact after-sales service or the manufacturer for technical support
2	ARM chip main frequency configuration failed	① Re-power on to see if it is normal
		② Contact after-sales service or the manufacturer for technical support

45.Abn holding brake Ctrl

Fault subcode	Subcode meaning	Treatment measures
1	F04.00 selects brake with feedback information. During the brake opening process, F04.10 brake opening feedback signal is low level.	① If the brake feedback circuit is not connected, F04.00 selects the brake without feedback information
		② If the brake feedback circuit is connected, check whether the circuit is connected incorrectly and whether the brake is normal
		② Contact after-sales service or the manufacturer for technical support

Fault subcode	Subcode meaning	Treatment measures
2	F04.00 selects brake with feedback information. During the process of closing the brake, F04.10 brake opening feedback signal is high level.	① If the brake feedback circuit is not connected, F04.00 selects the brake without feedback information
		② If the brake feedback circuit is connected, check whether the circuit is connected incorrectly and whether the brake is normal
		② Contact after-sales service or the manufacturer for technical support

46.Abn Ctrl board Volt

Fault subcode	Subcode meaning	Treatment measures
1	The PM's 24V power supply voltage is too high	①Measure whether the 24V power supply voltage of PM exceeds 30V
		②Contact after-sales service or manufacturer for technical support

Fault subcode	Subcode meaning	Treatment measures
2	The external 24V power supply voltage on the CM board is too high	① Check whether the external power supply voltage exceeds 30V
		② Contact after-sales service or the manufacturer for technical support
3	PM or external 24V power supply voltage is too low	① Check if the PM's 24V or external 24V power supply voltage is lower than 17V
		② Contact after-sales service or the manufacturer for technical support
4	3.3V voltage is too high	①Contact after-sales service or manufacturer for technical support
5	3.3V voltage is too low	①Contact after-sales service or manufacturer for technical support
6	The brake relay is short-circuited and the current passing through is greater than the setting value of F04.15	① Check the brake relay circuit

47.Abn motor TEMP

Fault subcode	Subcode meaning	Treatment measures
1	Motor temperature is too high	① Check whether the motor temperature is normal
		② Check whether the motor temperature over-temperature protection value set in B06.40 is reasonable
		③ Check whether the thermistor is normal
		④ Check whether the temperature sensor interface wiring on the driver terminal is normal
		⑤ Contact after-sales or manufacturer for technical support

48.Motor TEMP warning

Fault subcode	Subcode meaning	Treatment measures
1	The motor temperature is greater than the motor temperature over-temperature warning value set in B06.41	① Check whether the motor temperature is normal
		② Check whether the motor temperature over-temperature warning value set in B06.41 is reasonable
		③ Check whether the thermistor is normal
		④ Check whether the temperature sensor interface wiring on the driver terminal is normal
		⑤ Contact after-sales or manufacturer for technical support

49.AI DIS-CONN fault

Fault subcode	Subcode meaning	Treatment measures
1	When AI0 type is selected as 4~20ma, the current is less than the setting value of A07.20 and the disconnection detection delay time of A07.22 is maintained.	① Check if the AI0 circuit is correct
		② Check if there is external current input
		③ Check if the A07.20 setting value is correct
		④ Contact after-sales service or manufacturer for technical support
2	When AI0 type is selected as 4~20ma, the current is less than the setting value of A07.21 and the disconnection detection delay time of A07.23 is maintained.	① Check if the AI1 circuit is correct
		② Check if there is external current input
		③ Check if the A07.21 setting value is correct
		④ Contact after-sales service or manufacturer for technical support

50.Cap side fan fault

Fault subcode	Subcode meaning	Treatment measures
1	Fan failure on capacitor side	① Check whether the fan on the capacitor side is operating normally
		② Contact after-sales service or the manufacturer for technical support

51.ROM fault

Fault subcode	Subcode meaning	Treatment measures
1	The parameter value stored in the EEPROM after power-on self-test is not within the set range	①Contact after-sales service or manufacturer for technical support
4	Write EEPROM times more than 1000	①Restore the fault
5	Incorrect font version	① Burn the correct font library

7 Technical data

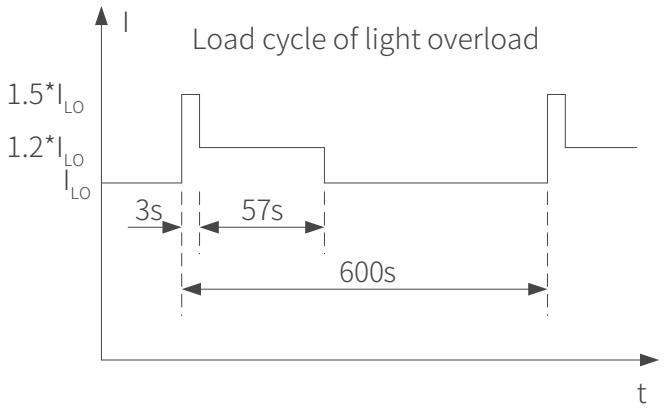
7.1 Technical data of control module

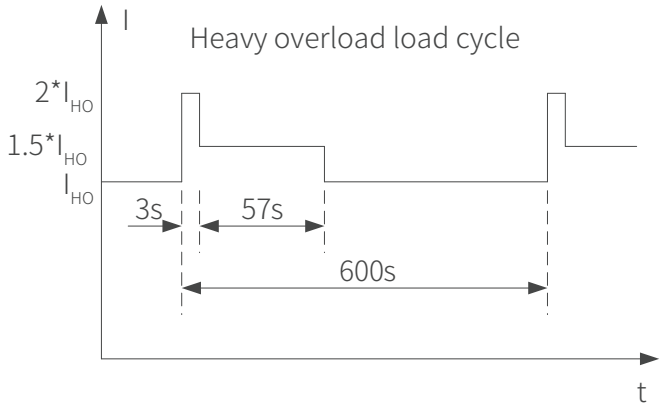
function	technical fata	
bus interface	A1-CM23 -MB-PE	◆support Modbus RTU communication ◆baud rate: 115200bps maximum
working power supply	power module power supply	24V/0.6A
output power supply	+24V output	◆voltage range: DC 18V···26.8V ◆maximum current: 200mA
	encoder power supply	◆voltage range: DC 18V···26.8V ◆maximum current: 200mA
digital input	six (DI0 ~ DI5)	◆common terminal DICOMO ◆electrical isolation ◆support Source and Sink mode ◆voltage: DC24V AC36V AC48V ◆signal voltage "1": ＞11V ◆signal voltage "0": ＜5V ◆24V typical current: 4mA ◆response time: 6ms (including software filtering)

function	technical fata	
digital output	2 relays (DO0~DO1)	◆voltage: DC 24V、AC 220V ◆continuous current: 2A ◆switching current: 2A ◆contact type: 1 normally open 1 normally closed
encoder signal input	incremental ABZ encoder	◆support 24V single ended signal ◆input frequency: maximum 200kHz ◆cable length: 24V open collector type 50m 24V push-pull type 100m
indicator light	two two color indicator lights	◆RDY indicator: red and green ◆BF indicator: red and green
	1 single color indicator light	◆SAFE indicator: yellow
keyboard interface	support for OP25	◆it can be installed directly or externally
working temperature	-10°C… +50°C	
storage temperature	-40°C… +70°C	
relative air humidity	<95%	condensation is not allowed
pollution	comply IEC 61800-5-1	applicable to environment with pollution level 2
electromagnetic compatibility	comply IEC 61800-3	

7.2 Technical data of Power Module

Typical load cycles for drive





EN

7.2.1 General technical data of PM25

Characteristic	Data
supply voltage	3AC 380V ~ 480V ±10%
output voltage	3AC 0V ~ output voltage (the maximum)
input frequency	50Hz ~ 60Hz ±3Hz
output frequency	0Hz ~ 600Hz，depending on the contral mode
source impedance	Uk ⩾ 1%, it is recommended to use power reactor or higher power under the conditionof lower value
starting current	＜ light load basic load input current
pulse frequency	◆ 4kHz factory setting ◆ 2kHz~8kHz adjustable
rated short circuit current	◆ ⩽ 65kA rms ◆ The drive with built-in filter is suitable for class C2 environment
electromagnetic compatibility	The drive with built-in filter is suitable for class C2 environment

Characteristic	Data
according with IEC/EN 61800-3	
braking method	braking、compound braking and resistance braking with integrated brake chopper
protection level	IP20 witch needs to be installed in the control cabinet
according with EN60529	
ambient temperature	◆ Basic load power of light load without capacity reduction：-10°C~+40°C ◆ Basic load power of heavy load without capacity reduction：-10°C~+50°C ◆ Basic load power of light or heavy load with capacity reduction：-10°C~+50°C
storage temperature	-40°C ~ +70°C
according with 60721-3-3	
cooling air medium	clean、dry air
relative air humidity	＜95%, condensation is nor allowed
pollution	applicable to environment with pollution level 2
according with EN61800-5-1	
installation altitude	◆ without capacity reduction: below 1000m ◆ with capacity reduction: 1000m~4000m

EN

EN

7.2.2 PM25 power technical data
Incoming line voltage 380···480V 3AC

Incoming line voltage 380···480V 3AC			
technical parameter		A1-PM25-B3A75	A1-PM25-B3B15
rated output power	based on (LD) kW	-	1.5
	based on (HD) kW	0.75	1.1
rated input current	reactor A with incoming line	2.3	4.3
	reactor A without incoming line	2.6	4.9
rated output current	based on (LD) A	-	4.1
	based on (HD) A	2.2	3.1
rated carrier frequency kHz		4	4
efficiency η		＞0.95	＞0.95
power loss kW		0.1	0.1
noise level dB(A)		＜40	＜40
maximum length of brake resistance connecting cable m		15	15
incoming power connection	L1、L2、L3	screw terminal	screw terminal
	cross sectional area of cable mm²	1…2.5	1…2.5
motor connection	U、V、W	screw terminal	screw terminal
	cross sectional area of cable mm²	1…2.5	1…2.5

A1-PM25-B3B22	A1-PM25-B3B30	A1-PM25-B3B40	A1-PM25-B3B55	A1-PM25-B3B75
2.2	3	4	5.5	7.5
1.5	2.2	3	4	5.5
6.1	8	10.4	15.3	18.7
7.6	10.2	13.4	17.2	21.9
5.9	7.7	10.2	13.2	18
4.1	5.9	7.7	10.2	13.2
4	4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95	＞0.95
0.11	0.14	0.16	0.18	0.24
＜40	＜40	＜50	＜50	＜50
15	15	15	15	15
screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6

EN

EN

Incoming line voltage 380···480V 3AC			
technical parameter		A1-PM25-B3A75	A1-PM25-B3B15
DC bus connection (connection of brake resistor)	DC+、DC-、R	screw terminal	screw terminal
	cross sectional area of cable mm^2	1…2.5	1…2.5
PE connection		M4 screw on housing	M4 screw on housing
maximum motor cable length	shielded cable m	50	50
	unshielded cable m	100	100
degree of protection		IP20	IP20
installation dimension	width （W） mm	80	80
	height （H） mm	230	230
	depth （D） mm	165	165
overall dimension		B1	B1
approximate weight kg		2	2

A1-PM25-B3B22	A1-PM25-B3B30	A1-PM25-B3B40	A1-PM25-B3B55	A1-PM25-B3B75
screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
M4 screw on housing	M4 screw on housing	M4 screw on housing	M4 screw on housing	M4 screw on housing
50	50	50	50	50
100	100	100	100	100
IP20	IP20	IP20	IP20	IP20
80	80	100	100	100
230	230	270	270	270
165	165	165	165	165
B1	B1	B2	B2	B2
2	2	4	4	4

Incoming line voltage 380···480V 3AC			
technical parameter		A1-PM25-B3C11	A1-PM25-B3C15
rated output power	based on (LD) kW	11	15
	based on (HD) kW	7.5	11
rated input current	reactor A with incoming line	26	33
	reactor A without incoming line	32	39
rated output current	based on (LD) A	26	32
	based on (HD) A	18	26
rated carrier frequency kHz		4	4
efficiency η		＞0.95	＞0.95
noise level dB(A)		＜50	＜50
maximum length of brake resistance connecting cable m		15	15
incoming power connection	L1、L2、L3	screw terminal	screw terminal
	cross sectional area of cable mm^2	4…10	4…10
motor connection	U、V、W	screw terminal	screw terminal
	cross sectional area of cable mm^2	4…10	4…10

A1-PM25-B3C18	A1-PM25-B3C22	A1-PM25-B3C30	A1-PM25-B3C37
18.5	22	30	37
15	18.5	22	30
39	46	63	78
46	53	73	88
38	45	60	75
32	38	45	69
4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95
＜50	＜50	＜50	＜50
15	15	15	15
screw terminal	screw terminal	screw terminal	screw terminal
6…25	6…25	6…25	6…25
screw terminal	screw terminal	screw terminal	screw terminal
6…25	6…25	6…25	6…25

Incoming line voltage 380···480V 3AC			
technical parameter		A1-PM25 -B3C11	A1-PM25 -B3C15
DC bus connection (connection of brake resistor)	DC+、DC-、R	screw terminal	screw terminal
	cross sectional area of cable mm^2	4…10	4…10
PE connection		M4 screw on housing	M4 screw on housing
maximum motor cable length	shielded cable m	50	50
	unshielded cable m	100	100
degree of protection		IP20	IP20
installation dimension	width （W） mm	140	140
	height （H） mm	355	355
	depth （D） mm	165	165
overall dimension		B3	B3
approximate weight kg		7	7

A1-PM25 -B3C18	A1-PM25 -B3C22	A1-PM25 -B3C30	A1-PM25 -B3C37
screw terminal	screw terminal	screw terminal	screw terminal
6…25	6…25	6…25	6…25
M4 screw on housing	M4 screw on housing	M4 screw on housing	M4 screw on housing
50	50	50	50
100	100	100	100
IP20	IP20	IP20	IP20
200	200	200	200
472	472	472	472
237	237	237	237
B4	B4	B4	B4
16	16	16	16

PM 25 power module incoming line voltage 380···480V 3AC			
technical parameter		A1-PM25 -B3C45	A1-PM25 -B3C55
rated output power	based on (LD) kW	45	55
	based on (HD) kW	37	45
rated input current	reactor A with incoming line	86	104
	reactor A without incoming line	78	94
rated output current	based on (LD) A	90	110
	based on (HD) A	75	90
rated carrier frequency kHz		4	4
efficiency η		＞0.95	＞0.95
power loss kW		1.3	1.67
cooling air volume requirement Mm/s		0.083	0.083
noise level dB(A)		＜75	＜75
24V DC output power supply (for control unit)		1	1
maximum length of brake resistance connecting cable m		15	15
incoming power connection	L1、L2、L3	cable termination	cable termination
	cross sectional area of cable mm^2	35…2x120	35…2x120
motor connection	U、V、W	cable termination	cable termination
	cross sectional area of cable mm^2	35…2x120	35…2x120

A1-PM25 -B3C75	A1-PM25 -B3C90	A1-PM25 -B3D11	A1-PM25 -B3D13
75	90	110	132
55	75	90	110
140	172	198	242
117	154	189	218
145	178	205	250
110	145	178	205
4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95
1.93	2.48	2.3	3.02
0.153	0.153	0.153	0.153
＜75	＜75	＜75	＜75
1	1	1	1
15	15	15	15
cable termination	cable termination	cable termination	cable termination
35…2x120	35…2x120	35…2x120	35…2x120
cable termination	cable termination	cable termination	cable termination
35…2x120	35…2x120	35…2x120	35…2x120

EN

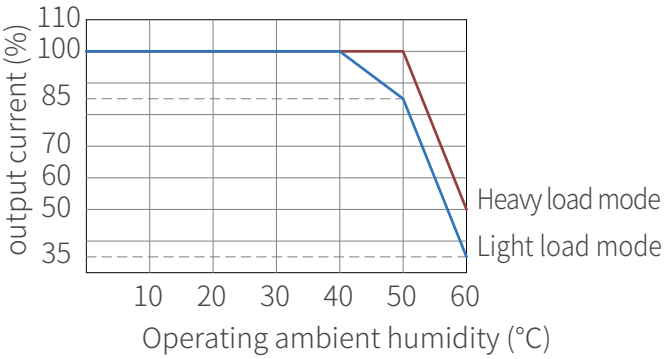
EN

PM 25 power module incoming line voltage 380 · · · 480V 3AC			
technical parameter		A1-PM25 -B3C45	A1-PM25 -B3C55
DC bus connection (connection of brake resistor)	DC+、DC-、R	screw terminal	screw terminal
	cross sectional area of cable mm^2	25…70	25…70
PE connection		cable termination	cable termination
maximum motor cable length	shielded cable m	50	50
	unshielded cable m	100	100
degree of protection		IP20	IP20
installation dimension	width （W） mm	305	305
	height （H） mm	750	750
	depth （D） mm	357	357
overall dimension		B6	B6
approximate weight kg		65	65

A1-PM25 -B3C75	A1-PM25 -B3C90	A1-PM25 -B3D11	A1-PM25 -B3D13
screw terminal	screw terminal	screw terminal	screw terminal
25…70	25…70	25…70	25…70
cable termination	cable termination	cable termination	cable termination
50	50	50	50
100	100	100	100
IP20	IP20	IP20	IP20
305	305	305	305
750	750	750	750
357	357	357	357
B6	B6	B6	B6
65	65	65	65

7.3 Restrictions under special environmental conditions

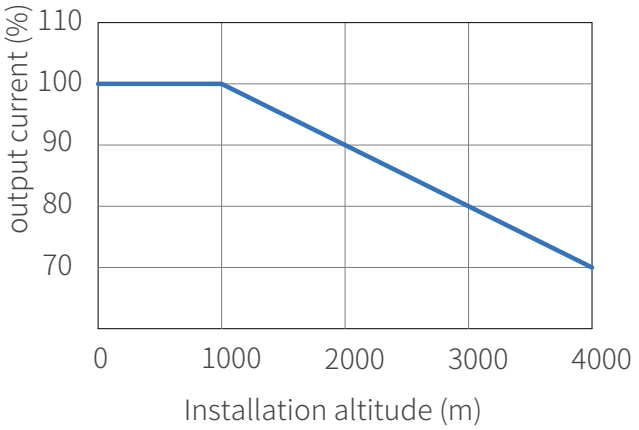
Functional relationship between operating ambient temperature and current reduction.



The control module and operation panel can limit the maximum allowable working environment temperature of the power module.

Functional relationship between installation altitude and current derating

Because the cooling performance of the air is low when thealtitude exceeds 1000m, the output current of the drive must be reduced.



The installation altitude is a function of the allowable power supply.

◆ The installation altitude is below 2000 meters.
-Connect to each grid system allowed for the drive.
◆ The installation altitude is 2000m to 4000m.
- It can only be connected to TN system with grounding star point.
- It is not allowed to connect TN system with grounding outer conductor.
- The TN system can be provided with a grounding star point through an isolation transformer.
- Do not reduce the phase to phase voltage.

EN

EN

8 Parameter list

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.00	Current state machine	S0:Uninitialized S1:Initialization S2:Power on detection S3:Fault S4:Power on blocking S5:Startup preparation S6:Pre drive S7:Preparation for operation S8:Demagnetization waiting S9:Pre operation detection S10:Pre excitation S11:Speed search S12:Operation S13:Off1 shutdown S14:Off3 shutdown S15:Start DC braking	0	0	65535	0x2000

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.00	Current state machine	S16:Self inspection preparation S17:Self inspection S18:Identification preparation S19:Identification S20:Restore factory value S21:Parameter Download S22:Inching operation S23:Inching shutdown S24:Allowable shutdown during operation S25:Shutdown DC braking S26:Shutdown DC braking waiting S27:Fault shutdown S28:Motor parameter calculation	0	0	65535	0x2000

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.00	Current state machine	S29:Speed torque control switching S30:Fever abatement waiting	0	0	65535	0x2000
A00.01	Target Frequency	-300.00~300.00 Hz	0.00	-300.00	300.00	0x2001
A00.02	Given Frequency	-300.00~300.00 Hz	0.00	-300.00	300.00	0x2002
A00.03	Motor Frequency	-300.00~300.00 Hz	0.00	-300.00	300.00	0x2003
A00.04	Target speed	-18000~18000rpm	0	-18000	18000	0x2004
A00.05	Given speed	-18000~18000rpm	0	-18000	18000	0x2005
A00.06	Motor speed	-18000~18000rpm	0	-18000	18000	0x2006
A00.07	Output voltage	0~1000V	0	0	1000	0x2007
A00.08	Output current	0~655.35A	0.00	0.00	655.35	0x2008
A00.09	Output power	0~655.67kw	0.00	-327.68	327.67	0x2009

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.10	Given torque	-300.0~300.0%	0.0	-300.0	300.0	0x200a
A00.11	Output torque	-300.0~300.0%	0.0	-300.0	300.0	0x200b
A00.14	DC bus voltage	0~1000.0V	0.0	0.0	1000.0	0x200e
A00.15	Radiator temperature	-40~150°	0	-40	150	0x200f
A00.16	DI status	0~65535	0x00	0x00	0xFFFF	0x2010
A00.17	DO status	0~65535	0x00	0x00	0xFFFF	0x2011
A00.18	Rectifier bridge temperature	-40~150°	0	-40	150	0x2012
A00.19	Synchronization frequency	-327.68~327.67 Hz	0.00	-327.68	327.67	0x2013
A00.20	Encoder frequency	-327.68~327.67 Hz	0.00	-327.68	327.67	0x2014
A00.22	Brake tube temperature	-40~150°C	0	-40	150	0x2016

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.41	Power on display selection 1	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature	1	0	20	0x2029

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.41	Power on display selection 1	16:DI status 17:DO status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	1	0	20	0x2029
A00.42	Power on display selection 2	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque	3	0	20	0x202a

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.42	Power on display selection 2	11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:DI status 17:DO status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	3	0	20	0x202a
A00.43	Power on display selection 3	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed	8	0	20	0x202b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.43	Power on display selection 3	6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:DI status 17:DO status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	8	0	20	0x202b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.44	Power on display selection 4	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature	11	0	20	0x202c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.44	Power on display selection 4	16:DI status 17:DO status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	11	0	20	0x202c
A00.45	Power on display selection 5	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque	14	0	20	0x202d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.45	Power on display selection 5	11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:DI status 17:DO status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	14	0	20	0x202d
A00.46	Power on display selection 6	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed	9	0	20	0x202e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A00:Status monitoring and setting						
A00.46	Power on display selection 6	6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:DI status 17:DO status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	9	0	20	0x202e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A02:Drive Information and Set						
A02.00	CM-ARM Software Version number	0.00~655.35	0.00	0.00	655.35	0x2200
A02.01	CM-FPGA Version Number	0.00~655.35	0.00	0.00	655.35	0x2201
A02.02	PM-DSP Software Version number	0.00~655.35	0.00	0.00	655.35	0x2202
A02.03	PM-FPGA Version Number	0.00~655.35	0.00	0.00	655.35	0x2203
A02.04	Rated power of PM power unit	0.00~655.35	0.00	0.00	655.35	0x2204
A02.06	Rated current of PM power unit	0.00~655.35	0.00	0.00	655.35	0x2206
A02.07	Function code version number	0.00~655.35	0.00	0.00	655.35	0x2207
A02.08	CM version release time	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2208

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A03:PM power Protect and Set						
A03.08	Carrier frequency setting	0:1KHz 1:2KHz 2:4KHz 3:6KHz 4:8KHz	2	0	4	0x2308
A03.09	Load mode selection	0:Light load 1:Overload	0	0	1	0x2309
A03.13	DPWM switching frequency	0.0Hz~ 600.0Hz	8.00	1.00	60.00	0x230d
A03.16	Dead time compensation enable	0:Forbid 1:Dead-time COMP method1 2:Dead-time COMP method2	1	0	2	0x2310
A03.19	Input phase loss detection	0:Forbidden 1:Allow	0	0	1	0x2313
A03.20	Braking resistance action point	600.0~ 800.0V	700.0	600.0	800.0	0x2314
A03.21	Software under-voltage point	60.0%~ 150.0%	100	60	150	0x2315

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A04:System and Environment Set						
A04.00	Parameter reset mode	0:Invalid 1:Model PARAM,motor PARAM and fault records are not reset 2:Motor PARAM and fault records are not reset 3:Reset All Parameters 4:Clear fault record	0	0	4	0x2400
A04.01	Parameter reset	0:Cancel 1:Confirm	0	0	1	0x2401
A04.02	Parameter access level	0:Standard parameter 1:Extended parameters 2:Expert parameters 3:Manufacturer parameters	0	0	3	0x2402
A04.03	Manufacturer password	0~65535	0	0	65535	0x2403

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A04:System and Environment Set						
A04.05	Motor selection source 0	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:binary interconnection parameters	0	0	10	0x2405
A04.10	Disable control of panel	0:Prohibition invalid 1:Prohibition valid	0	0	1	0x240a
A04.11	User password	0~65535	0	0	65535	0x240b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A04:System and Environment Set						
A04.12	Industry mode selection	0:Industry mode is not enabled 1:Closed loop lifting mode of tower crane 2:Open loop lifting mode of tower crane 3:Tower crane rotation mode 4:Tower crane luffing mode 5:Driving closed-loop lifting mode 6:Open loop lifting mode of traveling crane 7:Driving horizontal walking mode	0	0	7	0x240c
A04.13	CFM of industry mode SEL	0:Invalid 1:Confirm	0	0	1	0x240d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A05:Digital Input						
A05.00	DI physical state value	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2500
A05.02	DI state value after treatment	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2502
A05.04	DI forced selection	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2504
A05.06	DI mandatory data	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2506
A05.08	DI0 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2508
A05.09	DI0 off delay	0.00~655.35S	0.00	0.00	655.35	0x2509
A05.10	DI1 opening delay	0.00~655.35S	0.00	0.00	655.35	0x250a
A05.11	DI1 off delay	0.00~655.35S	0.00	0.00	655.35	0x250b
A05.12	DI2 opening delay	0.00~655.35S	0.00	0.00	655.35	0x250c
A05.13	DI2 off delay	0.00~655.35S	0.00	0.00	655.35	0x250d
A05.14	DI3 opening delay	0.00~655.35S	0.00	0.00	655.35	0x250e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A05:Digital Input						
A05.15	DI3 off delay	0.00~655.35S	0.00	0.00	655.35	0x250f
A05.16	DI4 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2510
A05.17	DI4 off delay	0.00~655.35S	0.00	0.00	655.35	0x2511
A05.18	DI5 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2512
A05.19	DI5 off delay	0.00~655.35S	0.00	0.00	655.35	0x2513
A06:Digital Output						
A06.00	DO signal source state value	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2600
A06.01	State VAL after DO proces-sing	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2601

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A06:Digital Output						
A06.02	Output FUNC SEL of DO0	0:Low level 1:High level 2:Ready for operation 3:Operation permission 4:In operation 5:Comparison value reached 6:Speed reversal 7:Zero speed operation 8:Overspeed 9:Warning 10:Malfunction Others:Binary interconnection of parameters	1111	0	10	0x2602

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
A06:Digital Output						
A06.03	Output FUNC SEL of DO1	0:Low level 1:High level 2:Ready for operation 3:Operation permission 4:In operation 5:Comparison value reached 6:Speed reversal 7:Zero speed operation 8:Overspeed 9:Warning 10:Malfunction Others:Binary interconnection of parameters	10	0	10	0x2603
A06.09	DO0 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2609
A06.10	DO0 off delay	0.00~655.35S	0.00	0.00	655.35	0x260a
A06.11	DO1 opening delay	0.00~655.35S	0.00	0.00	655.35	0x260b
A06.12	DO1 off delay	0.00~655.35S	0.00	0.00	655.35	0x260c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.00	Start-stop Ctrl command source	0:Terminal control module 1:Custom control module	0	0	1	0x3000
B00.01	Custom start/stop CMD (OFF1) SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3001
B00.02	Custom Enable (OFF2) SRC 1	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3002

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.03	Custom Quick stop (OFF3) SRC 1	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3003
B00.04	Custom run allowed source	0:Run not allowed 1:Run allowed 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x3004

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.05	Custom fault reset source1	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3005
B00.06	Custom speed command negate SRC	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3006

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.07	Custom JOG1 source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3007
B00.08	Custom JOG2 source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3008

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.09	Output enable (OFF2) source 2	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3009
B00.11	Rapid shutdown (OFF3) source 2	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x300b

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.13	Fault reset source2	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	4	0	10	0x300d
B00.15	RFG inhibit source	0:RFG prohibition is valid 1:RFG prohibition is invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x300f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.16	RFG pause source	0:RFG suspension is valid 1:RFG suspension is invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x3010

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.17	RFG sets the position to 0 SRC	0:RFG given set to 0 is valid 1:RFG given set to 0 is invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x3011

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.21	Identification request	0:None 1:Simple static identification of asynchronous machine 2:Static integrity identification of asynchronous machine 3:Dynamic integrity identification of asynchronous machine 4:Reserved 5:Reserved 6:Reserved 7:Reserved 8:Reserved 9:Reserved 10:Reserved 11:Synchronous machine without encoder 12:Synchronous machine with encoder	0	0	12	0x3015

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B00:System Ctrl and Set						
B00.23	OFF1 shutdown mode	0:Free shutdown 1:Deceleration shutdown	1	0	1	0x3017
B00.24	OFF3 downtime	0.0~1000.0S	1.0	0.0	1000.0	0x3018
B01:Terminal Control Module						
B01.01	Terminal control command 1 mode	0:Invalid 1:IN1 start 2:IN1 start, IN2 direction 3:IN1 forward start, IN2 reverse start 4:IN1P start, IN2 stop 5:IN1P start, IN2 stop, IN3 direction 6:IN1P forward start, IN2P reverse start, IN3 stop	3	0	6	0x3101

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B01:Terminal Control Module						
B01.03	Terminal Ctrl command 1 input 1	0:Invalid 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	2	0	10	0x3103
B01.04	Terminal Ctrl command 1 input 2	0:Invalid 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	3	0	10	0x3104

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B01:Terminal Control Module						
B01.05	Terminal Ctrl command 1 input 3	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3105
B01.11	Terminal Ctrl module JOG1 SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x310b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B01:Terminal Control Module						
B01.12	Terminal Ctrl module JOG2 SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x310c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.00	Speed control main speed SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Bus adapter A-PZD2 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3200

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.01	Speed Ctrl AUX speed SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Bus adapter A-PZD2 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3201

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.02	Additional speed setting SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Bus adapter A-PZD2 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3202

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.03	Torque Ctrl torque setting SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3203
B02.04	Torque Ctrl ramp time	0~10.00S	0.00	0.00	10.00	0x3204
B02.05	Torque Ctrl filtering time	0~10.00S	0.00	0.00	10.00	0x3205

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.06	Torque Ctrl forward speed limit	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	2101	0	10	0x3206

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.07	Torque Ctrl reverse speed limit	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	2105	0	10	0x3207
B02.08	Torque Ctrl the speed ramp time	0~10.00S	0.00	0.00	10.00	0x3208

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B02:Speed and torque setting						
B02.09	Additional torque setting SEL	0:0 1:Digital setting Other:Analog interconnection parameters	0	0	1	0x3209
B02.10	Additional torque digital set	-400.0~400.0%	0.0	-200.0	200.0	0x320a
B03:Others of Command SRC Set						
B03.00	JOG1 given settings	0:0 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3300

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B03:Others of Command SRC Set						
B03.01	JOG2 given settings	0:0 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	2328	0	10	0x3301
B03.02	JOG acceleration time	0.0~1000.0S	10.0	0.0	1000.0	0x3302
B03.03	JOG deceleration time	0.0~1000.0S	10.0	0.0	1000.0	0x3303
B03.11	Multisegment given value	-600.0~600.0%	0.0	-600.0	600.0	0x330b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B03:Others of Command SRC Set						
B03.12	Multisegment given value SEL 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	5	0	10	0x330c
B03.13	Multisegment given value SEL 2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	6	0	10	0x330d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B03:Others of Command SRC Set						
B03.14	Multisegment given value SEL 3	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330e
B03.15	Multisegment given value SEL 4	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B03:Others of Command SRC Set						
B03.16	Multisegment set point 1	-600.0~600.0%	10.0	-600.0	600.0	0x3310
B03.17	Multisegment set point 2	-600.0~600.0%	40.0	-600.0	600.0	0x3311
B03.18	Multisegment set point 3	-600.0~600.0%	70.0	-600.0	600.0	0x3312
B03.19	Multisegment set point 4	-600.0~600.0%	100.0	-600.0	600.0	0x3313
B03.20	Multisegment set point 5	-600.0~600.0%	-10.0	-600.0	600.0	0x3314
B03.21	Multisegment set point 6	-600.0~600.0%	-40.0	-600.0	600.0	0x3315
B03.22	Multisegment set point 7	-600.0~600.0%	-70.0	-600.0	600.0	0x3316
B03.23	Multisegment set point 8	-600.0~600.0%	-100.0	-600.0	600.0	0x3317
B03.24	Multisegment set point 9	-600.0~600.0%	0.0	-600.0	600.0	0x3318
B03.25	Multisegment set point 10	-600.0~600.0%	0.0	-600.0	600.0	0x3319
B03.26	Multisegment set point 11	-600.0~600.0%	0.0	-600.0	600.0	0x331a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B03:Others of Command SRC Set						
B03.27	Multisegment set point 12	-600.0~600.0%	0.0	-600.0	600.0	0x331b
B03.28	Multisegment set point 13	-600.0~600.0%	0.0	-600.0	600.0	0x331c
B03.29	Multisegment set point 14	-600.0~600.0%	0.0	-600.0	600.0	0x331d
B03.30	Multisegment set point 15	-600.0~600.0%	0.0	-600.0	600.0	0x331e
B03.31	Multisegment set point 16	-600.0~600.0%	0.0	-600.0	600.0	0x331f
B04:Ramp Function Generator						
B04.00	Ramp time selection Bit0	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3400

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B04:Ramp Function Generator						
B04.01	Ramp time selection Bit1	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3401
B04.02	RFG ramp-up time setpoint 1	0.0~1000.0S	5.0	0.0	1000.0	0x3402
B04.03	RFG ramp-down time setpoint 1	0.0~1000.0S	5.0	0.0	1000.0	0x3402
B04.04	RFG ramp-up time setpoint 2	0.0~1000.0S	5.0	0.0	1000.0	0x3404

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B04:Ramp Function Generator						
B04.05	RFG ramp-down time setpoint 2	0.0~1000.0S	5.0	0.0	1000.0	0x3405
B04.06	RFG ramp-up time setpoint 3	0.0~1000.0S	5.0	0.0	1000.0	0x3406
B04.07	RFG ramp-down time setpoint 3	0.0~1000.0S	5.0	0.0	1000.0	0x3407
B04.08	RFG ramp-up time setpoint 4	0.0~1000.0S	5.0	0.0	1000.0	0x3408
B04.09	RFG ramp-down time setpoint 4	0.0~1000.0S	5.0	0.0	1000.0	0x3409

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B04:Ramp Function Generator						
B04.10	RFG initial rounding-off time 1	0.00~20.00S	0.00	0.00	20.00	0x340a
B04.11	RFG final rounding-off time 1	0.00~20.00S	0.00	0.00	20.00	0x340b
B04.12	RFG initial rounding-off time 2	0.00~20.00S	0.00	0.00	20.00	0x340c
B04.13	RFG final rounding-off time 2	0.00~20.00S	0.00	0.00	20.00	0x340d
B04.14	RFG initial rounding-off time 3	0.00~20.00S	0.00	0.00	20.00	0x340e
B04.15	RFG final rounding-off time 3	0.00~20.00S	0.00	0.00	20.00	0x340f

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B04:Ramp Function Generator						
B04.16	RFG initial rounding-off time 4	0.00~20.00S	0.00	0.00	20.00	0x3410
B04.17	RFG final rounding-off time 4	0.00~20.00S	0.00	0.00	20.00	0x3411
B04.22	RFG start delay time	0.0~1000.0S	0.0	0.0	1000.0	0x3416
B04.40	Source of acceleration time	0:Ramp time setting value Others:Analog interconnection parameters	0	0	0	0x3428
B04.41	Source of deceleration time	0:Ramp time setting value Others:Analog interconnection parameters	0	0	0	0x3429

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B05:Motor Control Selection						
B05.00	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x3500
B05.01	System control mode	0:Speed control 1:Torque control	0	0	1	0x3501
B05.02	Positive speed allowed	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3502

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B05:Motor Control Selection						
B05.03	Negative speed allowed	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3503
B05.04	Motor starting mode	0:Start directly 1:Pre excitation start 2:Speed tracking start 3:DC brake start	0	0	3	0x3504
B05.06	Pre excitation time setting	0.00~100.00S	0.00	0.00	100.00	0x3506

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B05:Motor Control Selection						
B05.09	DC braking current	0.0%~100.0% 100.0% corresponding motor rated CUR	50.0	0.0	100.0	0x3509
B05.10	DC braking time at start-up	0.00s~100.00s	0.00	0.00	100.00	0x350a
B05.11	DC braking time during shutdown	0.00s~100.00s	0.00	0.00	100.00	0x350b
B05.12	DC braking INIT speed at stop	0～3000rpm	0	0	3000	0x350c
B05.13	Speed tracking mode	0:Search from shutdown frequency 1:Search from rated frequency 2:Search from maximum frequency	0	0	2	0x350d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B05:Motor Control Selection						
B05.14	Speed tracking search time	0.0~120.0S	25.0	0.0	120.0	0x350e
B05.15	Speed tracking CUR percentage	0~100%	50	0	100	0x350f
B05.16	Speed tracking MIN-FRQ limit	0.00~50.00Hz	2.00	0.00	50.00	0x3510
B05.17	Speed tracking switching time	0~60000ms	250	0	60000	0x3511
B05.18	System control mode SWIT source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3512

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B05:Motor Control Selection						
B05.29	Zero speed judgement value	0~10.00rpm	0.00	0.00	10.00	0x351d
B05.30	Zero speed shutdown delay time	0.00~100.00S	0.00	0.00	100.00	0x351e
B05.32	OFF1 shutdownmode	0:Free shutdown 1:Deceleration shutdown	1	0	1	0x3520
B05.33	OFF3 downtime	0.0~1000.0S	1.0	0.0	1000.0	0x3521
B06:Motor Limit and Protection						
B06.04	Forward limit speed digital SET	0.0%~300.0%	100.0	0.0	300.0	0x3604
B06.05	Reverse limit speed digital SET	-300.0%~0.0%	-100.0	-300.0	0.0	0x3605

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.06	SEL of forward speed limit	0:Digital setting value (B06.04) 1:300.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3606

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.07	SEL of reverse speed limit	0:Digital setting value (B06.05) 1:-300.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3607
B06.08	Torque upper limit setting	0.0%~400.0%	200.0	0.0	200.0	0x3608

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.09	Torque lower limit setting	-400.0%~0.0%	-200.0	-200.0	0.0	0x3609
B06.10	Selection of torque upper limit	0:0 1:200.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x360a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.11	Selection of torque lower limit	0:0 1:-200.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x360b
B06.12	Vector control torque limit	0.0%~200.0%	180.0	0.0	200.0	0x360c
B06.13	Torque limit before brake open	0.0%~200.0%	180.0	0.0	200.0	0x360d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.14	Dead time of FWD and REV speed	0.0~3000.0s	0.0	0.0	3000.0	0x360e
B06.15	Torque limit reaching range	0.0%~100.0%	5.0	0.0	100.0	0x360f
B06.16	Vector Ctrl torque limit source	0: Vector control torque limiting set value (B06.12) Others:Analog interconnection parameters	0	0	0	0x3610
B06.25	Motor overload PROT FUNC	0:Forbidden 1:Allow	0	0	1	0x3619
B06.26	Motor overload PROT FUNC gain	20~1000%	100	20	1000	0x361a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.27	Motor overload warning factor	50%~100%	80	50	100	0x361b
B06.28	Overspeed detection threshold	0.0%~50.0% 100.0% relative to motor rated speed	20.0	0.0	50.0	0x361c
B06.29	Overspeed detection time	0.0:Non-detection 0.1S~60.0S	5.0	0.0	60.0	0x361d
B06.32	Speed reaches detection value	0.0%~ 600.0% 100.0% relative to motor rated speed	100.0	B06.33	600.0	0x3620
B06.33	Reach hysteresis width in speed	0.0%~ B06.32 100.0% relative to motor rated speed	3.0	0.0	B06.32	0x3621
B06.34	Speed Reaching Detection Time	0.0:Non-detection 0.1s~600.0s	3.0	0.0	600.0	0x3622

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.37	Outpue phase loss detection	0:Forbidden 1:Allow	1	0	1	0x3625
B06.48	Fan variable TEMP FUNC enable	0:Forbidden 1:Enable	0	0	1	0x3630
B06.59	Vector stall 1 detection time	0~5000ms	500	0	5000	0x363b
B06.60	Vector stall 2 detection time	0~5000ms	500	0	5000	0x363c
B06.61	Vector stall detection COEF 2	0~100%	20	0	100	0x363d
B06.62	IM SVC control mode	0:Control Mode 1 1:Control Mode 2 2:Control Mode 3	0	0	2	0x363e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B06:Motor Limit and Protection						
B06.63	PMSM SVC control mode	0:Control Mode 1 1:Control Mode 2 2:Control Mode 3	0	0	2	0x363f
B06.64	Vector Ctrl slip COMP COEF	50~200%	100	50	200	0x3640
B07:VF Control						
B07.01	VF curve selection	0:Line VF 1:Multipoint VF 2:Square V/F 3:1.5 power V/F	0	0	3	0x3701
B07.02	Multipoint VF curve: FRQ point 1	0.0~B07.04	2.00	0.00	B07.04	0x3702
B07.03	Multipoint VF curve:Volt point1	0.0~B07.05	20	0	B07.05	0x3703
B07.04	Multipoint VF curve: FRQ point 2	B07.02~ B07.06	20.00	B07.02	B07.06	0x3704

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B07:VF Control						
B07.05	Multipoint VF curve:Volt point2	B07.03~ B07.07	152	B07.03	B07.07	0x3705
B07.06	Multipoint VF curve: FRQ point 3	B07.04~ D00.04	40.00	B07.04	D00.04	0x3706
B07.07	Multipoint VF curve:Volt point3	B07.05~ 380.0	304	B07.05	D00.02	0x3707
B07.10	Imax control enablation	0:Invalid 1:Valid	1	0	1	0x370a
B07.11	Imax controlling FM gain	0~100	30	0	100	0x370b
B07.12	Imax inhibition point	0~200	150	0	200	0x370c
B07.15	VF manual torque boost	0%~50%	1.0	0.0	50.0	0x370f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B07:VF Control						
B07.16	VF torque lifting cut-off FRQ	0.00~50.00	50.00	0.00	100.00	0x3710
B07.17	VF slip compensation COEF	0.0%~300.0%	0.0	0.0	300.0	0x3711
B07.20	VF oscillation suppression mode	0:Invalid 1:Valid	1	0	1	0x3714
B07.21	VF oscillation suppression gain	0~500%	10	0	500	0x3715
B07.28	Vdc_max control switch	0:Forbidden 1:Enable	0	0	1	0x371c
B07.29	Vdc_ Max voltage margin	20.0~300.0V	125	115	150	0x371d
B07.34	Vdc_min control switch	0:Forbidden 1:Enable	0	0	1	0x3722
B07.35	Vdc_min of Volt gain COEF	65~100	85	65	100	0x3723

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B08:Speed Regulator						
B08.02	Speed loop low speed Kp	0.00~20.00	10.0	0.0	100.0	0x3802
B08.03	Speed loop low speed Ti	1~65535ms	1.00	0.10	10.00	0x3803
B08.04	Speed loop high speed Kp	0.00~20.00	10.0	0.0	100.0	0x3804
B08.05	Speed loop high speed Ti	1~65535ms	2.00	0.10	10.00	0x3805
B08.11	Speed loop switch: low FRQ	0.00~50.00Hz	5.00	0.00	B08.12	0x380b
B08.12	Speed loop switch:high FRQ	0.00~50.00Hz	10.00	B08.11	40.00	0x380c
B08.25	Encoder FDBK speed filter time	0~1000ms	5	0	1000	0x3819
B08.26	EST speed loop filter time	0~65535	35	0	1000	0x381a

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B09:Current Regulator						
B09.04	Proportional COEF of current	1%~1000%	100	1	1000	0x3904
B09.05	Intergral COEF of current	1%~1000%	100	1	1000	0x3905
B10:PMSM Ctrl Parameters						
B10.00	Magnetic pole POS ID method	0:Method 0 1:Method 1 2:Method 2 3:Method 3 4:Method 4	1	0	4	0x3a00
B10.01	PMSM: pole position ID current	0~200	50	0	200	0x3a01
B10.07	PMSM Low Speed Excitation CUR	0~65535	3.0	0.0	6553.5	0x3a07
B10.08	Synchronizer IF/VF selection	0~65535	0	0	65535	0x3a08
B10.09	Flux amplitude COMP COEF	0~65535	100	0	65535	0x3a09

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B10:PMSM Ctrl Parameters						
B10.12	SVC cut-off frequency	0~65535	100	0	65535	0x3a0c
B10.13	IF current amplitude	0~65535	60	0	65535	0x3a0d
B10.14	Back EMF coefficient	0~65535	30	0	65535	0x3a0e
B10.15	Speed coefficient	0~65535	40	0	65535	0x3a0f
B10.16	Filter coefficient	0~65535	100	0	65535	0x3a10
B10.18	SVC speed filter coefficient	0~65535	100	0	65535	0x3a12

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B11:Motor Model and Others						
B11.51	Monitoring channel 1	0~65535	207	0	65535	0x3b33
B11.52	Monitoring channel 2	0~65535	209	0	65535	0x3b34
B11.53	Monitoring channel 3	0~65535	210	0	65535	0x3b35
B11.54	Monitoring channel 4	0~65535	211	0	65535	0x3b36
B11.56	Heavy load: freq-lmt-motoring	0~65535	1200	0	65535	0x3b38
B11.57	Heavy load: freq-lmt-regenerate	0~65535	800	0	65535	0x3b39
B11.75	Heavy load speed limit enable	0~65535	0	0	65535	0x3b4b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
B11:Motor Model and Others						
B11.78	PERF Commissioning Parameters	0~65535	0	0	65535	0x3b4e
B11.93	Interactive data monitor SEL 0	0~511	0	0	511	0x3b5d
B11.94	Interactive data monitor SEL 1	0~511	0	0	511	0x3b5e
B11.95	Interactive data monitor SEL 2	0~511	0	0	511	0x3b5f
B11.96	Interactive data monitor SEL 3	0~511	0	0	511	0x3b60

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.00	Bus type for bus adapter	0:No 1:Modbus 2:PROFINET	0	0	2	0x4000
C00.01	Data handling after COMM fault	0:Keep data 1:Data clear(RESV)	0	0	1	0x4001
C00.02	PZD output 1	0:0 Others: Analog interconnection parameters	0	0	0	0x4002
C00.03	PZD output 2	0:0 Others: Analog interconnection parameters	0	0	0	0x4003
C00.04	PZD output 3	0:0 Others: Analog interconnection parameters	0	0	0	0x4004
C00.05	PZD output 4	0:0 Others: Analog interconnection parameters	0	0	0	0x4005

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.06	PZD output 5	0:0 Others: Analog interconnection parameters	0	0	0	0x4006
C00.07	PZD output 6	0:0 Others: Analog interconnection parameters	0	0	0	0x4007
C00.08	PZD output 7	0:0 Others: Analog interconnection parameters	0	0	0	0x4008
C00.09	PZD output 8	0:0 Others: Analog interconnection parameters	0	0	0	0x4009
C00.10	PZD output 9	0:0 Others: Analog interconnection parameters	0	0	0	0x400a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.11	PZD output 10	0:0 Others: Analog interconnection parameters	0	0	0	0x400b
C00.12	PZD output 11	0:0 Others: Analog interconnection parameters	0	0	0	0x400c
C00.13	PZD output 12	0:0 Others: Analog interconnection parameters	0	0	0	0x400d
C00.14	PZD output 13	0:0 Others: Analog interconnection parameters	0	0	0	0x400e
C00.15	PZD output 14	0:0 Others: Analog interconnection parameters	0	0	0	0x400f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.16	PZD output 15	0:0 Others: Analog interconnection parameters	0	0	0	0x4010
C00.17	PZD output 16	0:0 Others: Analog interconnection parameters	0	0	0	0x4011
C00.18	PZD output 1 COMM base value	0~65535	0	0	65535	0x4012
C00.19	PZD output 2 COMM base value	0~65535	0	0	65535	0x4013
C00.20	PZD output 3 COMM base value	0~65535	0	0	65535	0x4014

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.21	PZD output 4 COMM base value	0~65535	0	0	65535	0x4015
C00.22	PZD output 5 COMM base value	0~65535	0	0	65535	0x4016
C00.23	PZD output 6 COMM base value	0~65535	0	0	65535	0x4017
C00.24	PZD output 7 COMM base value	0~65535	0	0	65535	0x4018
C00.25	PZD output 8 COMM base value	0~65535	0	0	65535	0x4019
C00.26	PZD output 9 COMM base value	0~65535	0	0	65535	0x401a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.27	PZD output 10 COMM base value	0~65535	0	0	65535	0x401b
C00.28	PZD output 11 COMM base value	0~65535	0	0	65535	0x401c
C00.29	PZD output 12 COMM base value	0~65535	0	0	65535	0x401d
C00.30	PZD output 13 COMM base value	0~65535	0	0	65535	0x401e
C00.31	PZD output 14 COMM base value	0~65535	0	0	65535	0x401f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.32	PZD output 15 COMM base value	0~65535	0	0	65535	0x4020
C00.33	PZD output 16 COMM base value	0~65535	0	0	65535	0x4021
C00.34	PZD input1 COMM base value	0~65535	0	0	65535	0x4022
C00.35	PZD input2 COMM base value	0~65535	0	0	65535	0x4023
C00.36	PZD input3 COMM base value	0~65535	0	0	65535	0x4024

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.37	PZD input 4 COMM base value	0~65535	0	0	65535	0x4025
C00.38	PZD input 5 COMM base value	0~65535	0	0	65535	0x4026
C00.39	PZD input 6 COMM base value	0~65535	0	0	65535	0x4027
C00.40	PZD input 7 COMM base value	0~65535	0	0	65535	0x4028
C00.41	PZD input 8 COMM base value	0~65535	0	0	65535	0x4029
C00.42	PZD input 9 COMM base value	0~65535	0	0	65535	0x402a

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.43	PZD input 10 COMM base value	0~65535	0	0	65535	0x402b
C00.44	PZD input 11 COMM base value	0~65535	0	0	65535	0x402c
C00.45	PZD input 12 COMM base value	0~65535	0	0	65535	0x402d
C00.46	PZD input 13 COMM base value	0~65535	0	0	65535	0x402e
C00.47	PZD input 14 COMM base value	0~65535	0	0	65535	0x402f
C00.48	PZD input 15 COMM base value	0~65535	0	0	65535	0x4030

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.49	PZD input 16 COMM base value	0~65535	0	0	65535	0x4031
C00.50	PZD output 1 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4032
C00.51	PZD output 2 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4033
C00.52	PZD output 3 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4034
C00.53	PZD output 4 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4035
C00.54	PZD output 5 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4036

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.55	PZD output 6 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4037
C00.56	PZD output 7 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4038
C00.57	PZD output 8 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4039
C00.58	PZD output 9 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403a
C00.59	PZD output 10 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403b
C00.60	PZD output 11 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.61	PZD output 12 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403d
C00.62	PZD output 13 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403e
C00.63	PZD output 14 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403f
C00.64	PZD output 15 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4040
C00.65	PZD output 16 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4041
C00.66	PZD input 1 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4042

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.67	PZD input 2 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4043
C00.68	PZD input 3 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4044
C00.69	PZD input 4 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4045
C00.70	PZD input 5 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4046
C00.71	PZD input 6 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4047
C00.72	PZD input 7 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4048

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.73	PZD input 8 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4049
C00.74	PZD input 9 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404a
C00.75	PZD input 10 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404b
C00.76	PZD input 11 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404c
C00.77	PZD input 12 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404d
C00.78	PZD input 13 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C00:Fieldbus Adapter A						
C00.79	PZD input 14 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404f
C00.80	PZD input 15 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4050
C00.81	PZD input 16 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4051
C02:Modbus COMM SET						
C02.00	Modbus baud rate	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps 6:57600bps 7:115200bps	7	0	7	0x4200
C02.01	Modbus data format	0:Even check(8-E-1) 1:Odd check(8-O-1) 2:No check (8-N-2) 3:No check (8-N-1)	3	0	3	0x4201

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C02:Modbus COMM SET						
C02.02	Modbus local address	1~255	1	1	255	0x4202
C02.03	Modbus response delay	0~20ms	0	0	20	0x4203
C02.04	Modbus communication timeout	0:Invalid, 0.1s~60.0s	0.0	0.0	60.0	0x4204
C02.05	Modbus communication base value	0~65535	1000	0	65535	0x4205
C02.06	Modbus COMM setpoint unit SEL	0:Percentage 1:Frequency	0	0	1	0x4206

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C03:PROFINET COMM SET						
C03.00	Telegram type	0:The telegram is invalid 1:Standard telegram 1, PZD-2/2 2:Siemens telegram 352,PZD-6/6 3:Boneng Free telegram,PZD-4/4 4:Boneng Free telegram,PZD-8/8 5:Boneng Free telegram,PZD-12/12 6:Boneng Free telegram,PZD-16/16	0	0	6	0x4300

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C03:PROFINET COMM SET						
C03.01	Communication status	0:Communication not established 1:AR establishment 2:Process data communication 3:Burning 4:AR establishment error 5:Recovering communication parameters	0	0	5	0x4301
C03.03	Diagnostic information is valid	0:Invalid 1:Valid	1	0	1	0x4303
C03.04	Software version number	0~65535	0	0	65535	0x4304
C03.05	Communication error code	0~65535	0	0	100	0x4305

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C03:PROFINET COMM SET						
C03.06	Communication Cycle	0~512	0	0	512	0x4306
C03.07	SendClock	0~512	0	0	512	0x4307
C03.08	RedRatio	0~512	0	0	512	0x4308
C03.10	Special function selection	0:Invalid 1:Burning mode 2:The communication parameters are restored to the factory	0	0	2	0x430a
C03.13	1 and 352 telegram mode	0:Standard mode 1:Free mode	0	0	1	0x430d
C03.17	Actual IP address 1	0~255	0	0	255	0x4311
C03.18	Actual IP address 2	0~255	0	0	255	0x4312

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C03:PROFINET COMM SET						
C03.19	Actual IP address 3	0~255	0	0	255	0x4313
C03.20	Actual IP address 4	0~255	0	0	255	0x4314
C03.21	Actual subnet mask 1	0~255	0	0	255	0x4315
C03.22	Actual subnet mask 2	0~255	0	0	255	0x4316
C03.23	Actual subnet mask 3	0~255	0	0	255	0x4317
C03.24	Actual subnet mask 4	0~255	0	0	255	0x4318
C03.25	Actual gateway address 1	0~255	0	0	255	0x4319
C03.26	Actual gateway address 2	0~255	0	0	255	0x431a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
C03:PROFINET COMM SET						
C03.27	Actual gateway address 3	0~255	0	0	255	0x431b
C03.28	Actual gateway address 4	0~255	0	0	255	0x431c
C03.29	Actual MAC address 1	0~65535	0x00	0x00	0xFFFF	0x431d
C03.30	Actual MAC address 2	0~65535	0x00	0x00	0xFFFF	0x431e
C03.31	Actual MAC address 3	0~65535	0x00	0x00	0xFFFF	0x431f
C03.36	1 and 352 speed base value	0~65535	16384	0	65535	0x4324

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
D00:Motor 0 Basic PARAMs						
D00.00	Motor type seletion	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5000
D00.01	Motor rated power	0.00~655.35kW	1.50	0.00	655.35	0x5001
D00.02	Motor rated voltage	0~1500V	380	0	1500	0x5002
D00.03	Motor rated current	0.00~655.35A	3.72	0.00	655.35	0x5003
D00.04	Motor rated frequency	0.0~600.00Hz	50.00	0.00	600.00	0x5004
D00.05	Motor rated speed	0~65535rpm	1390	0	65535	0x5005
D00.06	Maximum motor speed	0.0%~600.0% Rated speed	100.0	D00.07	300.0	0x5006
D00.07	Minimum motor speed	0.0%~600.0% Rated speed	0.0	0.0	D00.06	0x5007
D00.09	Motor polar logarithm	0:Automatic calculation 1~64:manual setting	2	1	64	0x5009
D00.16	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x5010

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
D01:Motor 0 Identified PARAMs						
D01.00	IM stator resistance	0.000~65.535ohm	5.050	0.00	65.535	0x5100
D01.01	IM rotor resistance	0.000~65.535ohm	2.954	0.00	65.535	0x5101
D01.02	IM leakage inductance	0.000~655.35mH	24.78	0.00	655.35	0x5102
D01.03	IM mutual inductance	0.00~6553.5mH	284.9	0.0	6553.5	0x5103
D01.04	IM no-load CUR	0.0~655.35A	2.45	0.00	655.35	0x5104
D01.10	PMSM stator resistance	0.000~65.535ohm	1.667	0.00	65.535	0x510a
D01.11	PMSM D-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x510b
D01.12	PMSM Q-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x510c
D01.13	PMSM back EMF coefficient	0.0~6553.5V	300	0	65535	0x510d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
D02:Motor 0 Encoder PARAMs						
D02.00	Encoder type	0:Invalid type 1:Normal ABZ encoder	1	0	1	0x5200
D02.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5201
D02.05	Encoder RES(pulses/revolutions)	0~65535	1024	0	65535	0x5205
D02.13	Speed FDBK PG break test time	0~5000ms	500	0	5000	0x520d

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
D03:Motor 1 Basic PARAMs						
D03.00	SEL of motor types	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5300
D03.01	Motor rated power	0.00~655.35kW	1.50	0.00	655.35	0x5301
D03.02	Motor rated voltage	0~1500V	380	0	1500	0x5302
D03.03	Motor rated CUR	0.0~6553.5A	3.72	0.00	655.35	0x5303
D03.04	Motor rated FREQ	0.0~600.00Hz	50.00	0.00	600.00	0x5304
D03.05	Motor rated speed	0~65535rpm	1390	0	65535	0x5305
D03.06	Motor max speed	0.0%~600.0% Rated speed	100.0	D03.07	300.0	0x5306
D03.07	Motor min speed	0.0%~600.0% Rated speed	0.0	0.0	D03.06	0x5307
D03.09	Motor pole pair	0:AUTO calculation 1~64:Manual	2	1	64	0x5309
D03.16	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x5310

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
D04:Motor 1 Identified PARAMs						
D04.00	IM stator resistance	0.000~65.535 ohm	5.050	0.000	65.535	0x5400
D04.01	IM rotor resistance	0.000~65.535 ohm	2.954	0.000	65.535	0x5401
D04.02	IM leakage inductance	0.000~655.35 mH	24.78	0.00	655.35	0x5402
D04.03	IM mutual inductance	0.00~6553.5mH	284.9	0.0	6553.5	0x5403
D04.04	IM no-load CUR	0.0~655.35A	2.45	0.00	655.35	0x5404
D04.10	PMSM stator resistance	0.000~65.535 ohm	1.667	0.000	65.535	0x540a
D04.11	PMSM D-axis inductance	0.00~655.35 mH	20.00	0.00	655.35	0x540b
D04.12	PMSM Q-axis inductance	0.00~655.35 mH	20.00	0.00	655.35	0x540c
D04.13	PMSM back EMF coefficient	0.0~6553.5V	300	0	65535	0x540d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
D05:Motor 1 Encoder PARAMs						
D05.00	Encoder type	0:Invalid type 1:Normal ABZ encoder	1	0	1	0x5500
D05.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5501
D05.05	Encoder RES(pulses/revolutions)	0~65535	1024	0	65535	0x5505
D05.13	Speed FDBK PG break test time	0~5000ms	500	0	5000	0x550d
E00:Fault handling configuration						
E00.00	External fault 1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6000

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.01	External fault 2 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6001
E00.02	External warning 1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6002

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.03	External warning 1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6003
E00.10	Automatic fault reset function	0:Invalid 1:Valid	0	0	1	0x600a
E00.11	Fault reset times reset time	0.0~3600.0s	180.0	0.0	3600.0	0x600b
E00.12	Fault reset interval	0.0~600.0s	30.0	0.0	600.0	0x600c
E00.13	Max num of fault resets allowed	0~5	5	0	5	0x600d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.14	Non-resettable EXC code 1	0:Invalid 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x600e

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.14	Non-resettable EXC code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload 34:Motor pre-overload	0	0	65535	0x600e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.14	Non-resettable EXC code 1	35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning	0	0	65535	0x600e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.14	Non-resettable EXC code 1	49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x600e
E00.15	Non-resettable EXC code 2	0:Invalid 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN	0	0	65535	0x600f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.15	Non-resettable EXC code 2	15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV	0	0	65535	0x600f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.15	Non-resettable EXC code 2	31:REV 32:REV 33:Drive pre-overload 34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt	0	0	65535	0x600f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.15	Non-resettable EXC code 2	47:Abn motor TEMP 48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x600f
E00.23	Restart FUNC after AUTO reset	0:Invalid 1:Valid	0	0	1	0x6017
E00.25	Allow restart exception code 1	0:Invalid 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC	0	0	65535	0x6019

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.25	Allow restart exception code 1	11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat	0	0	65535	0x6019

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.25	Allow restart exception code 1	24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning	0	0	65535	0x6019

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.25	Allow restart exception code 1	43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6019
E00.26	Allow restart exception code 2	0:Invalid 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload	0	0	65535	0x601a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.26	Allow restart exception code 2	7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 14:Motor tuning fault 4:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault	0	0	65535	0x601a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.26	Allow restart exception code	21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV	0	0	65535	0x601a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.26	Allow restart exception code 2	39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x601a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.36	EXC level MOD EXC code 1	0:Invalid 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6024

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.36	EXC level MOD EXC code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload	0	0	65535	0x6024

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.36	EXC level MOD EXC code 1	34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6024

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.36	EXC level MOD EXC code 1	48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6024
E00.37	EXC level of EXC code 1	0: Free shutdown (OFF2) 1: Emergency stop (OFF3) 2: OFF mode shutdown 3: Warning (no shutdown) 4: No response	0	0	4	0x6025

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.38	EXC level MOD EXC code 2	0:Invalid 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6026

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.38	EXC level MOD EXC code 2	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload	0	0	65535	0x6026

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.38	EXC level MOD EXC code 2	34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6026

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E00:Fault handling configuration						
E00.38	EXC level MOD EXC code 2	48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6026
E00.39	EXC level of EXC code 2	0: Free shutdown (OFF2) 1: Emergency stop (OFF3) 2: OFF mode shutdown 3: Warning (no shutdown) 4: No response	0	0	4	0x6027

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6100

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.00	Fault code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload	0	0	65535	0x6100

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.00	Fault code 1	34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6100

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.00	Fault code 1	48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6100
E01.01	Fault code 1 subcode	1~16	0	0	16	0x6101
E01.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error	0	0	65535	0x6102

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.02	Fault code 2	12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault	0	0	65535	0x6102

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.02	Fault code 2	25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload 34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed	0	0	65535	0x6102

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.02	Fault code 2	44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6102
E01.03	Fault code 2 subcode	1~16	0	0	16	0x6103
E01.10	Fault temper-ature	0~65535	0	0	65535	0x610a
E01.11	PM-control word record	0~65535	0x00	0x00	0xFFFF	0x610b
E01.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x610c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E01:Latest Faults and Records						
E01.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x610d
E01.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x610e
E01.15	Fault given speed	-300.0%~300.0%	0.00	-30.00	30.00	0x610f
E01.18	Run time before fail - hour	0~65535	0	0	65535	0x6112
E01.19	Run time before fail-second	0~65535	0	0	60	0x6113
E01.20	AMU run time before fail - hour	0~65535	0	0	65535	0x6114
E01.21	AMU run time before fail-second	0~65535	0	0	60	0x6115
E01.22	Fault output voltage	0~65535V	0	0	65535	0x6116

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6200

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.00	Fault code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload	0	0	65535	0x6200

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.00	Fault code 1	34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6200

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.00	Fault code 1	48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6200
E02.01	Fault code 1 subcode	1~16	0	0	16	0x6201
E02.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error	0	0	65535	0x6202

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.02	Fault code 2	12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault	0	0	65535	0x6202

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.02	Fault code 2	25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed	0	0	65535	0x6202

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.02	Fault code 2	44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6202
E02.03	Fault code 2 subcode	1~16	0	0	16	0x6203
E02.10	Fault temperature	0~65535	0	0	65535	0x620a
E02.11	PM-control word record	0~65535	0x00	0x00	0x10	0x620b
E02.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x620c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E02:Previous Faults and Records						
E02.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x620d
E02.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x620e
E02.15	Fault given speed	-300.0%~300.0%	0.00	-30.00	30.00	0x620f
E02.18	Run time before fail - hour	0~65535	0	0	65535	0x6212
E02.19	Run time before fail-second	0~65535	0	0	60	0x6213
E02.20	AMU run time before fail - hour	0~65535	0	0	65535	0x6214
E02.21	AMU run time before fail-second	0~65535	0	0	60	0x6215
E02.22	Fault output voltage	0~65535V	0	0	65535	0x6216

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6300

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.00	Fault code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload	0	0	65535	0x6300

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.00	Fault code 1	34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6300

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.00	Fault code 1	48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6300
E03.01	Fault code 1 subcode	1~16	0	0	16	0x6301
E03.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error	0	0	65535	0x6302

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.02	Fault code 2	12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault	0	0	65535	0x6302

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.02	Fault code 2	25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed	0	0	65535	0x6302

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.02	Fault code 2	44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6302
E03.03	Fault code 2 subcode	1~16	0	0	16	0x6303
E03.10	Fault temperature	0~65535	0	0	65535	0x630a
E03.11	PM-control word record	0~65535	0x00	0x00	0xFFFF	0x630b
E03.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x630c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E03:Pre-2 Faults and Records						
E03.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x630d
E03.14	Fault DC-link voltage	0.0~800.0V	0.0	0.0	800.0	0x630e
E03.15	Fault given speed	-300.0%~300.0%	0.00	-30.00	30.00	0x630f
E03.18	Run time before fail - hour	0~65535	0	0	65535	0x6312
E03.19	Run time before fail-second	0~65535	0	0	60	0x6313
E03.20	AMU run time before fail - hour	0~65535	0	0	65535	0x6314
E03.21	AMU run time before fail-second	0~65535	0	0	60	0x6315
E03.22	Fault output voltage	0~65535V	0	0	65535	0x6316

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6400

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.00	Fault code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload	0	0	65535	0x6400

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.00	Fault code 1	34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6400

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.00	Fault code 1	48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6400
E04.01	Fault code 1 subcode	1~16	0	0	16	0x6401
E04.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error	0	0	65535	0x6402

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.02	Fault code 2	12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault	0	0	65535	0x6402

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.02	Fault code 2	25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload 34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed	0	0	65535	0x6402

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.02	Fault code 2	44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6402
E04.03	Fault code 2 subcode	1~16	0	0	16	0x6403
E04.10	Fault temperature	0~65535	0	0	65535	0x640a
E04.11	PM-control word record	0~65535	0x00	0x00	0xFFFF	0x640b
E04.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x640c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E04:Pre-3 Faults and Records						
E04.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x640d
E04.14	Fault DC-link voltage	0.0~800.0V	0.0	0.0	800.0	0x640e
E04.15	Fault given speed	-300.0%~300.0%	0.00	-30.00	30.00	0x640f
E04.18	Run time before fail - hour	0~65535	0	0	65535	0x6412
E04.19	Run time before fail-second	0~65535	0	0	60	0x6413
E04.20	AMU run time before fail - hour	0~65535	0	0	65535	0x6414
E04.21	AMU run time before fail-second	0~65535	0	0	60	0x6415
E04.22	Fault output voltage	0~65535V	0	0	65535	0x6416

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6500

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.00	Fault code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload	0	0	65535	0x6500

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.00	Fault code 1	34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP	0	0	65535	0x6500

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.00	Fault code 1	48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6500
E05.01	Fault code 1 subcode	1~16	0	0	16	0x6501
E05.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error	0	0	65535	0x6502

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.02	Fault code 2	12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault	0	0	65535	0x6502

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.02	Fault code 2	25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed	0	0	65535	0x6502

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.02	Fault code 2	44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6502
E05.03	Fault code 2 subcode	1~16	0	0	16	0x6503
E05.10	Fault temperature	0~65535	0	0	65535	0x650a
E05.11	PM-control word record	0~65535	0x00	0x00	0xFFFF	0x650b
E05.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x650c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E05:Pre-4 Faults and Records						
E05.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x650d
E05.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x650e
E05.15	Fault given speed	-300.0%~300.0%	0.00	-30.00	30.00	0x650f
E05.18	Run time before fail - hour	0~65535	0	0	65535	0x6512
E05.19	Run time before fail-second	0~65535	0	0	60	0x6513
E05.20	AMU run time before fail - hour	0~65535	0	0	65535	0x6514
E05.21	AMU run time before fail-second	0~65535	0	0	60	0x6515
E05.22	Fault output voltage	0~65535V	0	0	65535	0x6516

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6600

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.00	Fault code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre-overload 34:Motor pre-overload	0	0	65535	0x6600

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.00	Fault code 1	35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning	0	0	65535	0x6600

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.00	Fault code 1	49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6600
E06.01	Fault code 1 subcode	1~16	0	0	16	0x6601
E06.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault	0	0	65535	0x6602

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.02	Fault code 2	13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV	0	0	65535	0x6602

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.02	Fault code 2	27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception	0	0	65535	0x6602

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.02	Fault code 2	45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6602
E06.03	Fault code 2 subcode	1~16	0	0	16	0x6603
E06.10	Fault temperature	0~65535	0	0	65535	0x660a
E06.11	PM-control word record	0~65535	0x00	0x00	0xFFFF	0x660b
E06.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x660c
E06.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x660d
E06.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x660e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E06:Pre-5 Faults and Records						
E06.15	Fault given speed	-300.0%~300.0%	0.00	-30.00	30.00	0x660f
E06.18	Run time before fail - hour	0~65535	0	0	65535	0x6612
E06.19	Run time before fail-second	0~65535	0	0	60	0x6613
E06.20	AMU run time before fail - hour	0~65535	0	0	65535	0x6614
E06.21	AMU run time before fail-second	0~65535	0	0	60	0x6615
E06.22	Fault output voltage	0~65535V	0	0	65535	0x6616

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.00	Warning code 1	0:No warning 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error	0	0	65535	0x6700

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.00	Warning code 1	17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV 30:REV 31:REV 32:REV 33:Drive pre overload 34:Motor pre overload	0	0	65535	0x6700

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.00	Warning code 1	35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl 46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning	0	0	65535	0x6700

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.00	Warning code 1	49:AI DIS-CONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6700
E07.01	Warning code 1 subcode	1~16	0	0	16	0x6701
E07.02	Warning code 2	0:No warning 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Speed search failed 5:Drive overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault	0	0	65535	0x6702

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.02	Warning code 2	14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave CUR-limit fault 23:Rectifier bridge overheat 24:STO fault 25:Brake pipe overheat 26:REV 27:REV 28:REV 29:REV	0	0	65535	0x6702

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.02	Warning code 2	30:REV 31:REV 32:REV 33:Drive pre-overload 34:Motor pre-overload 35:ABN COMM 36:ABN PARAM setting 37:Motor speeding 38:Large motor speed DEV 39:Power on again 40:PID FDBK lost 41:EXT fault 42:EXT warning 43:Pre drive failed 44:MCU recognition exception 45:Abn holding brake Ctrl	0	0	65535	0x6702

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
E07:Lastest Warning Code Record						
E07.02	Warning code 2	46:Abn Ctrl board Volt 47:Abn motor TEMP 48:Motor TEMP warning 49:AI DISCONN fault 50:Cap side fan fault 51:ROM fault	0	0	65535	0x6702
E07.03	Warning code 2 subcode	1~16	0	0	16	0x6703
F00:Logic Operation Module						
F00.00	"AND" module A Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7000
F00.01	"AND" module A Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7001
F00.05	"AND" module B Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7005

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F00:Logic Operation Module						
F00.06	"AND" module B Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7006
F00.10	"AND" module C Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700a
F00.11	"AND" module C Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700b
F00.15	"AND" module D Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700f
F00.16	"AND" module D Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7010

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F00:Logic Operation Module						
F00.20	"NOT" module A Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7014
F00.22	"NOT" module B Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7016
F00.24	"NOT" module C Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7018
F00.26	"NOT" module D Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701a
F00.36	"OR" module A Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7024

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F00:Logic Operation Module						
F00.37	"OR" module A Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7025
F00.41	"OR" module B Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7029
F00.42	"OR" module B Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702a
F00.46	"OR" module C Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702e
F00.47	"OR" module C Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F00:Logic Operation Module						
F00.51	"OR" module D Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7033
F00.52	"OR" module D Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7034
F00.56	"XOR" module A Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7038
F00.57	"XOR" module A Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7039
F00.76	LDM A Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x704c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F00:Logic Operation Module						
F00.77	LDM A FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x704d
F00.78	LDM A delay time	0~10000ms	0	0	10000	0x704e
F00.79	LDM B Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x704f
F00.80	LDM B FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7050
F00.81	LDM B delay time	0~10000ms	0	0	10000	0x7051
F00.82	LDM C Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7052
F00.83	LDM C FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7053
F00.84	LDM C delay time	0~10000ms	0	0	10000	0x7054

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F00:Logic Operation Module						
F00.85	LDM D Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7055
F00.86	LDM D FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7056
F00.87	LDM D delay time	0~10000ms	0	0	10000	0x7057
F01:Arthmetic Operation Module						
F01.00	ADD module A Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7100
F01.01	ADD module A Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7101
F01.05	ADD module B Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7105

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.06	ADD module B Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7106
F01.10	ADD module C Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x710a
F01.11	ADD module C Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x710b
F01.15	SUB module A input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x710f
F01.16	SUB module A input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7110

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.18	SUB module B input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7112
F01.19	SUB module B input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7113
F01.21	MUL module A Input 1	1:1 Others:Analog interconnection parameters	0	0	0	0x7115
F01.22	MUL module A Input 2	1:1 Others:Analog interconnection parameters	0	0	0	0x7116
F01.26	MUL module B Input 1	1:1 Others:Analog interconnection parameters	0	0	0	0x711a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.27	MUL module B Input 2	1:1 Others:Analog interconnection parameters	0	0	0	0x711b
F01.31	DIV module A dividor input	1:1 Others:Analog interconnection parameters	0	0	0	0x711f
F01.32	DIV module A dividend input	1:1 Others:Analog interconnection parameters	0	0	0	0x7120
F01.34	DIV module B dividor input	1:1 Others:Analog interconnection parameters	0	0	0	0x7122
F01.35	DIV module B dividend input	1:1 Others:Analog interconnection parameters	0	0	0	0x7123

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.37	AVA module A Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7125
F01.39	AVA module B Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7127
F01.41	NCM module A Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7129
F01.42	NCM module A Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x712a
F01.44	NCM module B Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x712c

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.45	NCM module B Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x712d
F01.55	FOLPF module A Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7137
F01.56	FOLPF module A FLT	0~20000ms	0	0	20000	0x7138
F01.58	FOLPF module B Input	0:0 Others:Analog interconnection parameters	0	0	0	0x713a
F01.59	FOLPF module B FLT	0~20000ms	0	0	20000	0x713b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.61	Data selector A command SRC 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x713d
F01.62	Data selector A command SRC 2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x713e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.63	Data selector A data source 1	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x713f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.64	Data selector A data source 2	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7140

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.65	Data selector A data source 3	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7141

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.66	Data selector A data source 4	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7142
F01.73	Compare module C input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7149

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F01:Arthmetic Operation Module						
F01.74	Compare module C input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x714a
F01.76	Compare module D input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x714c
F01.77	Compare module D input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x714d
F01.81	Custom data input 1	0	0	-32768	32767	0x7151
F01.82	Custom data input 2	0	0	-32768	32767	0x7152
F01.83	Custom data input 3	0	0	-32768	32767	0x7153
F01.84	Custom data input 4	0	0	-32768	32767	0x7154

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit Conversion Module						
F02.00	WTB FUNC A Input selection	0:0 Others:Analog interconnection parameters	0	0	0	0x7200
F02.02	WTB FUNC B Input selection	0:0 Others:Analog interconnection parameters	0	0	0	0x7202
F02.08	BTW FUNC A-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7208
F02.09	BTW FUNC A-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7209
F02.10	BTW FUNC A-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit Conversion Module						
F02.11	BTW FUNC A-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720b
F02.12	BTW FUNC A-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720c
F02.13	BTW FUNC A-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720d
F02.14	BTW FUNC A-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720e
F02.15	BTW FUNC A-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit Conversion Module						
F02.16	BTW FUNC A-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7210
F02.17	BTW FUNC A-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7211
F02.18	BTW FUNC A-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7212
F02.19	BTW FUNC A-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7213
F02.20	BTW FUNC A-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7214

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit						
F02.21	BTW FUNC A-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7215
F02.22	BTW FUNC A-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7216
F02.23	BTW FUNC A-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7217
F02.25	BTW FUNC B-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7219
F02.26	BTW FUNC B-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit						
F02.27	BTW FUNC B-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721b
F02.28	BTW FUNC B-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721c
F02.29	BTW FUNC B-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721d
F02.30	BTW FUNC B-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721e
F02.31	BTW FUNC B-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit						
F02.32	BTW FUNC B-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7220
F02.33	BTW FUNC B-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7221
F02.34	BTW FUNC B-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7222
F02.35	BTW FUNC B-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7223
F02.36	BTW FUNC B-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7224

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F02:Word Bit Conversion Module						
F02.37	BTW FUNC B-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7225
F02.38	BTW FUNC B-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7226
F02.39	BTW FUNC B-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7227
F02.40	BTW FUNC B-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7228

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F04:Holding Brake Control						
F04.00	Holding brake FUNC select	0:No holding brake 1:Band brake without detection information 2:Band brake detection information	0	0	2	0x7400
F04.05	Brake open comparison THR	0.0~200.0%	4.0	0.0	200.0	0x7405
F04.06	Brake opening delay time	0.00~10.00s	0.00	0.00	10.00	0x7406
F04.07	Brake closing speed THR	1.0~200.0%	4.0	1.0	200.0	0x7407
F04.08	Brake closing delay time	0.00~10.00s	0.50	0.00	10.00	0x7408

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F04:Holding Brake Control						
F04.10	Brake open feedback point SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x740a
F04.13	Brake open CURR comparison THR	0.0~200.0%	50.0	0.0	200.0	0x740d
F04.16	Brake open mechanical act time	0.00~10.00S	0.50	0.00	10.00	0x7410
F04.17	Brake close mechanical act time	0.00~10.00S	0.50	0.00	10.00	0x7411

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F04:Holding Brake Control						
F04.18	Restart brake control	0:No brake action 1:Brake action	1	0	1	0x7412
F04.19	Restart waiting time	0.00~10.00s	0.50	0.00	10.00	0x7413
F08:Lifting Control Module						
F08.00	Anti sway function enable	0:Forbid 1:Allow 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserved Others:Binary interconnection parameters	0	0	10	0x7800
F08.01	Automatic anti sway FUNC enable	0:Prohibit automatic anti-sway function 1:Allow automatic anti-sway function	0	0	1	0x7801

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F08:Lifting Control Module						
F08.02	Max length of auto-anti swing	0.10m~100.00m	100.00	0.10	100.00	0x7802
F08.03	Min length of auto-anti swing	0.10m~100.00m	0.10	0.10	100.00	0x7803
F08.04	Allow minimum anti roll speed	0.0%~100.0%	0.0	0.0	100.0	0x7804
F08.06	Anti sway slope time	0.0s~1000.0s	3.0	0.0	1000.0	0x7806
F08.07	Anti swing speed difference	0	20.0	0.0	100.0	0x7807
F08.08	Target FRQchange filtering time	0	0.00	0.00	10.00	0x7808

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F08:Lifting Control Module						
F08.17	SRC SEL of lifting swing length	0:Valid setpoint (F08.18) 1:Reserved 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Reserved 7:Reserved 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7811
F08.18	Swing length setting value	1.00m~90.00m	9.00	1.00	90.00	0x7812
F08.19	Swing length offset value	0.00m~10.00m	0.00	0.00	10.00	0x7813
F08.20	Lift the maximum swing length	1.00m~100.00m	100.00	1.00	100.00	0x7814
F08.21	Actual pendulum length	1.00m~100.00m	1.00	1.00	100.00	0x7815

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F08:Lifting Control Module						
F08.22	Rolling period	0.0s~20.0s	0.0	0.0	20.0	0x7816
F08.25	Swing length count reset enable	0:Forbid 1:Allow	0	0	1	0x7819
F08.26	Swing Length proportional COEF	0.1mm~6000.0mm	0.30	0.01	600.00	0x781a
F08.27	Lift encoder count high	0~65535	0	0	65535	0x781b
F08.28	Lift encoder count low	0~65535	0	0	65535	0x781c
F08.29	Lift feedback pulse reverse	0:Forbid 1:Allow	0	0	1	0x781d
F08.50	Enable the smooth lifting FUNC	0:Invalid 1:Valid	0	0	1	0x7832
F08.51	Slack torque	0.0~100.0	25.0	0.0	100.0	0x7833

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F08:Lifting Control Module						
F08.52	Slack detection time	0.00~100.00	0.80	0.00	100.00	0x7834
F08.53	Added value of loading torque	0.0~100.0	10.0	0.0	100.0	0x7835
F08.54	Load detection time	0~10.00	0.10	0.00	10.00	0x7836
F08.55	Load torque fluctuationTHR	0.0~100.0	10.0	0.0	100.0	0x7837
F08.56	Load stabilization time	0.00~100.00	0.50	0.00	100.00	0x7838
F08.57	Fast deceleration time	0.00~100.00	0.50	0.00	100.00	0x7839
F08.58	Tight rope to maintain speed	0.0~100.0	10.0	0.0	100.0	0x783a
F08.59	Loading torque change rate	0.0~100.0	2.0	0.0	100.0	0x783b
F08.61	Smooth swing FUNC enable	0:Invalid 1:Valid	0	0	1	0x783d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
F08:Lifting Control Module						
F08.62	Swing arm length	32.0~100.0m	60.0	32.0	100.0	0x783e
F08.63	Acceleration gain	0.0~100.0	45.0	0.0	100.0	0x783f
F08.64	Deceleration gain	0.0~100.0	45.0	0.0	100.0	0x7840
P00:Hardware Status(Binary connect)						
P00.00	Logic 0	0	0	0	0	0xe000
P00.01	Logic 1	1	1	1	1	0xe001
P00.02	Multifunctional DI0	0~1	0	0	1	0xe002
P00.03	Multifunctional DI1	0~1	0	0	1	0xe003
P00.04	Multifunctional DI2	0~1	0	0	1	0xe004
P00.05	Multifunctional DI3	0~1	0	0	1	0xe005
P00.06	Multifunctional DI4	0~1	0	0	1	0xe006
P00.07	Multifunctional DI5	0~1	0	0	1	0xe007
P00.23	Digital input DI0 inversion	0~1	0	0	1	0xe017

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P00:Hardware Status(Binary connect)						
P00.24	Digital input DI1 inversion	0~1	0	0	1	0xe018
P00.25	Digital input DI2 inversion	0~1	0	0	1	0xe019
P00.26	Digital input DI3 inversion	0~1	0	0	1	0xe01a
P00.27	Digital input DI4 inversion	0~1	0	0	1	0xe01b
P00.28	Digital input DI5 inversion	0~1	0	0	1	0xe01c
P00.50	Multi-FUNC digital output DO0	0~1	0	0	1	0xe032
P00.51	Multi-FUNC digital output DO1	0~1	0	0	1	0xe033
P00.57	Digital output DO0 inversion	0~1	0	0	1	0xe039
P00.58	Digital output DO1 inversion	0~1	0	0	1	0xe03a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P01:System Ctrl Words and State(Binary connect)						
P01.00	Ready for startup	0~1	0	0	1	0xe100
P01.01	Ready for run	0~1	0	0	1	0xe101
P01.02	Run	0~1	0	0	1	0xe102
P01.03	Fault Status	0~1	0	0	1	0xe103
P01.04	Output enable (OFF2)	0~1	0	0	1	0xe104
P01.05	Rapid shutdown (OFF3) invalid	0~1	0	0	1	0xe105
P01.06	Boot block	0~1	0	0	1	0xe106
P01.07	Warning status	0~1	0	0	1	0xe107
P01.08	Speed output bias too large	0~1	0	0	1	0xe108
P01.09	Speed arrival	0~1	0	0	1	0xe109
P01.10	Torque/ current reach limit	0~1	0	0	1	0xe10a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P01:System Ctrl Words and State(Binary connect)						
P01.11	Brake open command status	0~1	0	0	1	0xe10b
P01.12	Positive speed	0~1	0	0	1	0xe10c
P01.14	Jog operation valid	0~1	0	0	1	0xe10e
P01.15	Pre-excitation start	0~1	0	0	1	0xe10f
P01.16	Open DC brake	0~1	0	0	1	0xe110
P01.18	Torque control in effect	0~1	0	0	1	0xe112
P01.35	Preexcitation complete	0~1	0	0	1	0xe123
P01.36	DC brake end	0~1	0	0	1	0xe124
P01.41	RFG output inhibit	0~1	0	0	1	0xe129
P01.42	RFG pause	0~1	0	0	1	0xe12a
P01.43	RFG input inhibit	0~1	0	0	1	0xe12b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P01:System Ctrl Words and State(Binary connect)						
P01.44	RFG acceleration	0~1	0	0	1	0xe12c
P01.45	RFG deceleration	0~1	0	0	1	0xe12d
P01.46	RFG constant speed	0~1	0	0	1	0xe12e
P01.57	Motor overspeed	0~1	0	0	1	0xe139
P01.58	Holding brake opened	0~1	0	0	1	0xe13a
P01.59	Holding brake closed	0~1	0	0	1	0xe13b
P01.60	Holding brake can not be opened	0~1	0	0	1	0xe13c
P01.61	Holding brake can not be closed	0~1	0	0	1	0xe13d
P01.62	Motor pre-overload state	0~1	0	0	1	0xe13e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P01:System Ctrl Words and State(Binary connect)						
P01.63	Zero speed given operation	0~1	0	0	1	0xe13f
P01.64	DC bus live mark	0~1	0	0	1	0xe140
P01.65	Motor speed is zero	0~1	0	0	1	0xe141
P01.73	Motor over TEMP protection mark	0~1	0	0	1	0xe149
P01.74	Motor over TEMP warning sign	0~1	0	0	1	0xe14a
P01.75	Motor selection bit0	0~1	0	0	1	0xe14b
P01.76	Motor selection bit1	0~1	0	0	1	0xe14c
P01.77	RFG ramp time selection Bit 0	0~1	0	0	1	0xe14d

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P01:System Ctrl Words and State(Binary connect)						
P01.78	RFG ramp time selection Bit 1	0~1	0	0	1	0xe14e
P01.79	Speed setpoint selection Bit 0	0~1	0	0	1	0xe14f
P01.80	Speed setpoint selection Bit 1	0~1	0	0	1	0xe150
P01.81	Speed setpoint selection Bit 2	0~1	0	0	1	0xe151
P01.82	Speed setpoint selection Bit 3	0~1	0	0	1	0xe152
P01.85	RFG operation flag	0~1	0	0	0	0xe155
P01.86	Anti sway enabling sign	0~1	0	0	0	0xe156
P01.87	Anti sway speed latch flag	0~1	0	0	0	0xe157

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P02:FBA and Fault Flag(Binary connect)						
P02.00	Bus adapter A input PZD1.0	0~1	0	0	1	0xe200
P02.01	Bus adapter A input PZD1.1	0~1	0	0	1	0xe201
P02.02	Bus adapter A input PZD1.2	0~1	0	0	1	0xe202
P02.03	Bus adapter A input PZD1.3	0~1	0	0	1	0xe203
P02.04	Bus adapter A input PZD1.4	0~1	0	0	1	0xe204
P02.05	Bus adapter A input PZD1.5	0~1	0	0	1	0xe205
P02.06	Bus adapter A input PZD1.6	0~1	0	0	1	0xe206
P02.07	Bus adapter A input PZD1.7	0~1	0	0	1	0xe207

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P02:FBA and Fault Flag(Binary connect)						
P02.08	Bus adapter A input PZD1.8	0~1	0	0	1	0xe208
P02.09	Bus adapter A input PZD1.9	0~1	0	0	1	0xe209
P02.10	Bus adapter A input PZD1.10	0~1	0	0	1	0xe20a
P02.11	Bus adapter A input PZD1.11	0~1	0	0	1	0xe20b
P02.12	Bus adapter A input PZD1.12	0~1	0	0	1	0xe20c
P02.13	Bus adapter A input PZD1.13	0~1	0	0	1	0xe20d
P02.14	Bus adapter A input PZD1.14	0~1	0	0	1	0xe20e
P02.15	Bus adapter A input PZD1.15	0~1	0	0	1	0xe20f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P02:FBA and Fault Flag(Binary connect)						
P02.32	Modbus COMM start-stop command	0~1	0	0	1	0xe220
P02.33	Modbus COMM inching start stop	0~1	0	0	1	0xe221
P02.34	Modbus COMM free parking	0~1	0	0	1	0xe222
P02.35	Modbus COMM fault reset	0~1	0	0	1	0xe223
P02.36	Modbus COMM given speed reverse	0~1	0	0	1	0xe224
P03:Logic arithmetic module(Binary connect)						
P03.00	Logic "AND" module A output	0~1	0	0	1	0xe300
P03.01	Logic "AND" module B output	0~1	0	0	1	0xe301

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P03:Logic arithmetic module(Binary connect)						
P03.02	Logic "AND" module C output	0~1	0	0	1	0xe302
P03.03	Logic "AND" module D output	0~1	0	0	1	0xe303
P03.04	Logic "NOT" module A output	0~1	0	0	1	0xe304
P03.05	Logic "NOT" module B output	0~1	0	0	1	0xe305
P03.06	Logic "NOT" module C output	0~1	0	0	1	0xe306
P03.07	Logic "NOT" module D output	0~1	0	0	1	0xe307
P03.12	Logic "OR" module A output	0~1	0	0	1	0xe30c
P03.13	Logic "OR" module B output	0~1	0	0	1	0xe30d

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P03:Logic arithmetic module(Binary connect)						
P03.14	Logic "OR" module C output	0~1	0	0	1	0xe30e
P03.15	Logic "OR" module D output	0~1	0	0	1	0xe30f
P03.16	Logic "XOR" module A output	0~1	0	0	1	0xe310
P03.20	Logic delay module A output	0~1	0	0	1	0xe314
P03.21	Logic delay module B output	0~1	0	0	1	0xe315
P03.22	Logic delay module C output	0~1	0	0	1	0xe316
P03.23	Logic delay module D output	0~1	0	0	1	0xe317
P03.24	Comparison module A larger flag	0~1	0	0	1	0xe318

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P03:Logic arithmetic module(Binary connect)						
P03.25	Comparison module A equals flag	0~1	0	0	1	0xe319
P03.26	Comparison module A less flag	0~1	0	0	1	0xe31a
P03.27	Comparison module B larger flag	0~1	0	0	1	0xe31b
P03.28	Comparison module B equals flag	0~1	0	0	1	0xe31c
P03.29	Comparison module B less flag	0~1	0	0	1	0xe31d
P03.30	Division A dividend equals 0	0~1	0	0	1	0xe31e
P03.31	Division B dividend equals 0	0~1	0	0	1	0xe31f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P03:Logic arithmetic module(Binary connect)						
P03.32	Symbol of ABS module A input	0~1	0	0	1	0xe320
P03.33	Symbol of ABS module B input	0~1	0	0	1	0xe321
P03.34	Overflow flag:absolute value A	0~1	0	0	1	0xe322
P03.35	Overflow flag:absolute value B	0~1	0	0	1	0xe323
P03.36	Overflow flag:addition A	0~1	0	0	1	0xe324
P03.37	Overflow flag:addition B	0~1	0	0	1	0xe325
P03.38	Overflow flag:addition C	0~1	0	0	1	0xe326
P03.39	Overflow flag:substraction A	0~1	0	0	1	0xe327
P03.40	Overflow flag:substraction B	0~1	0	0	1	0xe328

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P03:Logic arithmetic module(Binary connect)						
P03.41	Overflow flag:multiplication A	0~1	0	0	1	0xe329
P03.42	Overflow flag:multiplication B	0~1	0	0	1	0xe32a
P03.43	Overflow flag:divide module A	0~1	0	0	1	0xe32b
P03.44	Overflow flag:divide module B	0~1	0	0	0	0xe32c
P03.47	Comparison module C larger flag	0~1	0	0	0	0xe32f
P03.48	Comparison module C equals flag	0~1	0	0	0	0xe330
P03.49	Comparison module C less flag	0~1	0	0	0	0xe331

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P03:Logic arithmetic module(Binary connect)						
P03.50	Comparison module D larger flag	0~1	0	0	1	0xe332
P03.51	Comparison module D equals flag	0~1	0	0	1	0xe333
P03.52	Comparison module D less flag	0~1	0	0	1	0xe334
P04:Word Bit Conversion Module(Binary connect)						
P04.00	WTB function A output bit0	0~1	0	0	1	0xe400
P04.01	WTB function A output bit1	0~1	0	0	1	0xe401
P04.02	WTB function A output bit2	0~1	0	0	1	0xe402
P04.03	WTB function A output bit3	0~1	0	0	1	0xe403

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P04:Word Bit Conversion Module(Binary connect)						
P04.04	WTB function A output bit4	0~1	0	0	1	0xe404
P04.05	WTB function A output bit5	0~1	0	0	1	0xe405
P04.06	WTB function A output bit6	0~1	0	0	1	0xe406
P04.07	WTB function A output bit7	0~1	0	0	1	0xe407
P04.08	WTB function A output bit8	0~1	0	0	1	0xe408
P04.09	WTB function A output bit9	0~1	0	0	1	0xe409
P04.10	WTB function A output bit10	0~1	0	0	1	0xe40a
P04.11	WTB function A output bit11	0~1	0	0	1	0xe40b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P04:Word Bit Conversion Module(Binary connect)						
P04.12	WTB function A output bit12	0~1	0	0	1	0xe40c
P04.13	WTB function A output bit13		0	0	1	0xe40d
P04.14	WTB function A output bit14	0~1	0	0	1	0xe40e
P04.15	WTB function A output bit15	0~1	0	0	1	0xe40f
P04.16	WTB function B output bit0	0~1	0	0	1	0xe410
P04.17	WTB function B output bit1	0~1	0	0	1	0xe411
P04.18	WTB function B output bit2	0~1	0	0	1	0xe412
P04.19	WTB function B output bit3	0~1	0	0	1	0xe413

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P04:Word Bit Conversion Module(Binary connect)						
P04.20	WTB function B output bit4	0~1	0	0	1	0xe414
P04.21	WTB function B output bit5	0~1	0	0	1	0xe415
P04.22	WTB function B output bit6	0~1	0	0	1	0xe416
P04.23	WTB function B output bit7	0~1	0	0	1	0xe417
P04.24	WTB function B output bit8	0~1	0	0	1	0xe418
P04.25	WTB function B output bit9	0~1	0	0	1	0xe419
P04.26	WTB function B output bit10	0~1	0	0	1	0xe41a
P04.27	WTB function B output bit11	0~1	0	0	1	0xe41b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P04:Word Bit Conversion Module(Binary connect)						
P04.28	WTB function B output bit12	0~1	0	0	1	0xe41c
P04.29	WTB function B output bit13	0~1	0	0	1	0xe41d
P04.30	WTB function B output bit14	0~1	0	0	1	0xe41e
P04.31	WTB function B output bit15	0~1	0	0	1	0xe41f
P05: (Reserved)						
P06:State and Peripheral(Analog connect)						
P06.00	Current state machine	0~65535	0	-32768	32767	0xe600
P06.01	Target frequency	0~65535	0	-32768	32767	0xe601
P06.02	Given frequency	0~65535	0	-32768	32767	0xe602
P06.03	Output frequency	0~65535	0	-32768	32767	0xe603

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P06:State and Peripheral(Analog connect)						
P06.04	Target speed	0~65535	0	-32768	32767	0xe604
P06.05	Given speed	0~65535	0	-32768	32767	0xe605
P06.06	Motor speed	0~65535	0	-32768	32767	0xe606
P06.07	Output voltage	0~65535	0	-32768	32767	0xe607
P06.08	Output current	0~65535	0	-32768	32767	0xe608
P06.09	Output power	0~65535	0	-32768	32767	0xe609
P06.10	Torque mode torque setpoint	0~65535	0	-32768	32767	0xe60a
P06.11	Output torque	0~65535	0	-32768	32767	0xe60b
P06.14	DC-link voltage	0~65535	0	-32768	32767	0xe60e
P06.15	Raduiator temperature	0~65535	0	-32768	32767	0xe60f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P06:State and Peripheral(Analog connect)						
P06.16	Encoder feedback frequency	0~65535	0	-32768	32767	0xe610
P06.17	VF separation voltage give	0~65535	0	-32768	32767	0xe611
P06.19	Panel given value	0~65535	0	-32768	32767	0xe613
P06.20	PC given value	0~65535	0	-32768	32767	0xe614
P06.36	Physical state of the DI input	0~0xFFFF	0	-32768	32767	0xe624
P07:Communication(Analog connect)						
P07.00	Bus adapter A input.PZD1	0~65535	0	0	65535	0xe700
P07.01	Bus adapter A input.PZD2	0~65535	0	0	65535	0xe701

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P07:Communication(Analog connect)						
P07.02	Bus adapter A input.PZD3	0~65535	0	0	65535	0xe702
P07.03	Bus adapter A input.PZD4	0~65535	0	0	65535	0xe703
P07.04	Bus adapter A input.PZD5	0~65535	0	0	65535	0xe704
P07.05	Bus adapter A input.PZD6	0~65535	0	0	65535	0xe705
P07.06	Bus adapter A input.PZD7	0~65535	0	0	65535	0xe706
P07.07	Bus adapter A input.PZD8	0~65535	0	0	65535	0xe707

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P07:Communication(Analog connect)						
P07.08	Bus adapter A input.PZD9	0~65535	0	0	65535	0xe708
P07.09	Bus adapter A input.PZD10	0~65535	0	0	65535	0xe709
P07.10	Bus adapter A input.PZD11	0~65535	0	0	65535	0xe70a
P07.11	Bus adapter A input.PZD12	0~65535	0	0	65535	0xe70b
P07.12	Bus adapter A input.PZD13	0~65535	0	0	65535	0xe70c
P07.13	Bus adapter A input.PZD14	0~65535	0	0	65535	0xe70d

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P07:Communication(Analog connect)						
P07.14	Bus adapter A input.PZD15	0~65535	0	0	65535	0xe70e
P07.15	Bus adapter A input.PZD16	0~65535	0	0	65535	0xe70f
P07.32	Modbus control command	0	0	0	65535	0xe720
P07.33	Modbus COMM setting value 1	0	0	-32768	32767	0xe721
P07.34	Modbus COMM setting value 1	0	0	-32768	32767	0xe722
P07.35	Modbus COMM setting value 1 P.U	0	0	-32768	32767	0xe723
P07.36	Modbus COMM setting value 1 P.U	0	0	-32768	32767	0xe724

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P08:Word Bit Conversion Module(Analog connect)						
P08.00	ADD module A output	0~65535	0	-32768	32767	0xe800
P08.01	ADD module B output	0~65535	0	-32768	32767	0xe801
P08.02	ADD module C output	0~65535	0	-32768	32767	0xe802
P08.04	SUB module A output	0~65535	0	-32768	32767	0xe804
P08.05	SUB module B output	0~65535	0	-32768	32767	0xe805
P08.08	MUL module A output	0~65535	0	-32768	32767	0xe808
P08.09	MUL module B output	0~65535	0	-32768	32767	0xe809
P08.12	DIV module A output	0~65535	0	-32768	32767	0xe80c
P08.14	DIV module A remainder	0~65535	0	-32768	32767	0xe80e
P08.15	DIV module B output	0~65535	0	-32768	32767	0xe80f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P08:Word Bit Conversion Module(Analog connect)						
P08.17	DIV module B remainder	0~65535	0	-32768	32767	0xe811
P08.24	AVA module A output	0~65535	0	-32768	32767	0xe818
P08.25	AVA module B output	0~65535	0	-32768	32767	0xe819
P08.32	FOLPF module A output	0~65535	0	-32768	32767	0xe820
P08.33	FOLPF module B output	0~65535	0	-32768	32767	0xe821
P08.36	BTW function A output	0~65535	0	-32768	32767	0xe824
P08.37	BTW function A output	0~65535	0	-32768	32767	0xe825
P08.41	Data selector A output	0~65535	0	-32768	32767	0xe829
P09:Technoology Utilization(Analog connect)						
P09.25	Pendulum length	0~65535	0	0	0	0xe919

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P10:PM Internal Variables(Analog connect)						
P10.00	Given current of Axis M	0~65535	0	-32768	32767	0xea00
P10.01	Feedback current of Axis M	0~65535	0	-32768	32767	0xea01
P10.02	Given current of Axis T	0~65535	0	-32768	32767	0xea02
P10.03	Feedback current of Axis T	0~65535	0	-32768	32767	0xea03
P10.04	Given frequency	0~65535	0	-32768	32767	0xea04
P10.05	Feedback frequency	0~65535	0	-32768	32767	0xea05
P10.06	Synchronous frequency	0~65535	0	-32768	32767	0xea06
P10.07	Encoder frequency	0~65535	0	-32768	32767	0xea07
P10.10	Given voltage of Axis M	0~65535	0	-32768	32767	0xea0a
P10.11	Given voltage of Axis T	0~65535	0	-32768	32767	0xea0b

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P10:PM Internal Variables(Analog connect)						
P10.19	CRC check count	0~65535	0	-32768	32767	0xea13
P10.26	Monitoring channel 1	0~65535	0	-32768	32767	0xea1a
P10.27	Monitoring channel 2	0~65535	0	-32768	32767	0xea1b
P10.28	Monitoring channel 3	0~65535	0	-32768	32767	0xea1c
P10.29	Monitoring channel 4	0~65535	0	-32768	32767	0xea1d
P10.32	State machine	0~65535	0	-32768	32767	0xea20
P10.33	U phase current	0~65535	0	-32768	32767	0xea21
P10.34	V phase current	0~65535	0	-32768	32767	0xea22

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P11:CM Internal Variables(Analog connect)						
P11.00	Fixed value 0%	0~65535	0	-32768	32767	0xeb00
P11.01	Fixed value 100%	0~65535	0	-32768	32767	0xeb01
P11.02	Fixed value 200%	0~65535	0	-32768	32767	0xeb02
P11.03	Fixed value 400%	0~65535	0	-32768	32767	0xeb03
P11.04	Fixed value 600%	0~65535	0	-32768	32767	0xeb04
P11.05	Fixed value -100%	0~65535	0	-32768	32767	0xeb05
P11.06	Fixed value -200%	0~65535	0	-32768	32767	0xeb06
P11.07	Fixed value -400%	0~65535	0	-32768	32767	0xeb07
P11.08	Fixed value -600%	0~65535	0	-32768	32767	0xeb08
P11.09	CM interactive data monitor 0	0~65535	0	0	65535	0xeb09

EN

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P11:CM Internal Variables(Analog connect)						
P11.10	CM interactive data monitor 1	0~65535	0	0	65535	0xeb0a
P11.11	CM interactive data monitor 2	0~65535	0	0	65535	0xeb0b
P11.12	CM interactive data monitor 3	0~65535	0	0	65535	0xeb0c
P11.13	CM and PM handshake monitor	0~65535	0	0	65535	0xeb0d
P11.18	FPGA receive error countor	0~65535	0	0	65535	0xeb12
P11.19	FPGA send non-response counter	0~65535	0	0	65535	0xeb13
P11.38	Abnormal start monitoring value	0~65535	0	0	65535	0xeb26

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P11:CM Internal Variables(Analog connect)						
P11.55	CM monitor 5(KB error counter)	0~65535	0	0	65535	0xeb37
P11.57	ROM data error address	0~65535	0x00	0x00	0xFFFF	0xeb39
P11.58	ROM data error value	0~65535	0	0	65535	0xeb3a
P12:System Control and State(Analog connect)						
P12.00	Current state machine	0~65535	0	0	65535	0xec00
P12.01	Current motor	0~65535	0	0	65535	0xec01
P12.02	Current RFG	0~65535	0	0	65535	0xec02
P12.03	Current alarm code	0~65535	0	0	65535	0xec03
P12.04	Current alarm subcode	0~65535	0	0	65535	0xec04
P12.05	Control word 1	0~65535	0	0	65535	0xec05
P12.06	Control word 2	0~65535	0	0	65535	0xec06
P12.07	State word 1	0~65535	0	0	65535	0xec07

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P12:System Control and State(Analog connect)						
P12.08	State word 2	0~65535	0	0	65535	0xec08
P12.09	Terminal start-stop Ctrl word	0~65535	0	0	65535	0xec09
P12.10	OP start-stop control word	0~65535	0	0	65535	0xec0a
P12.11	PC start-stop control word	0~65535	0	0	65535	0xec0b
P12.12	Custom start-stop control word	0~65535	0	0	65535	0xec0c
P12.13	Panel given value	0~65535	0	-32768	32767	0xec0d
P12.14	PC given value	0~65535	0	-32768	32767	0xec0e
P12.16	DI state	0~65535	0	0	65535	0xec10
P12.17	DO state	0~65535	0	0	65535	0xec11
P12.31	PM 24V voltage	0~65535	0	0	65535	0xec1f

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P12:System Control and State(Analog connect)						
P12.45	power-on duration - hour	0~65535	0	0	65535	0xec2d
P12.46	Power-on duration - second	0~59	0	0	59	0xec2e
P12.47	Run duration - hour	0~65535	0	0	65535	0xec2f
P12.48	Run duration - second	0~59	0	0	59	0xec30
P12.49	Cumulative run-time - hour	0~65535	0	0	65535	0xec31
P12.50	Cumulative run-time - second	0~59	0	0	59	0xec32
P13:System Setting and Feedback(Analog connect)						
P13.00	Motor actual speed	0~65535	0	-32768	32767	0xed00
P13.02	Main speed given	0~65535	0	-32768	32767	0xed02
P13.03	Auxiliary speed given	0~65535	0	-32768	32767	0xed03

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P13:System Setting and Feedback(Analog connect)						
P13.04	SET speed before FWD/REV limit	0~65535	0	-32768	32767	0xed04
P13.05	Speed given before limiting	0~65535	0	-32768	32767	0xed05
P13.06	Speed given after limiting	0~65535	0	-32768	32767	0xed06
P13.07	Speed given after minimum limit	0~65535	0	-32768	32767	0xed07
P13.08	RFG input speed given	0~65535	0	-32768	32767	0xed08
P13.09	RFG output speed given	0~65535	0	-32768	32767	0xed09
P13.10	Additional speed given	0~65535	0	-32768	32767	0xed0a

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P13:System Setting and Feedback(Analog connect)						
P13.11	function final given speed	0~65535	0	-32768	32767	0xed0b
P13.12	RFG module input value	0~65535	0	-32768	32767	0xed0c
P13.15	Forward speed limit value	0~65535	0	-32768	32767	0xed0f
P13.16	Negative speed limit value	0~65535	0	-32768	32767	0xed10
P13.17	Encoder feedback speed	0~65535	0	-32768	32767	0xed11
P13.22	Motorized potentiometer output	0~65535	0	-32768	32767	0xed16
P13.23	Multi segment given SEL output	0~65535	0	-32768	32767	0xed17

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P13:System Setting and Feedback(Analog connect)						
P13.24	Multi segment setting value 1	0~65535	0	-32768	32767	0xed18
P13.25	Multi segment setting value 2	0~65535	0	-32768	32767	0xed19
P13.26	Multi segment setting value 3	0~65535	0	-32768	32767	0xed1a
P13.27	Multi segment setting value 4	0~65535	0	-32768	32767	0xed1b
P13.28	Multi segment setting value 5	0~65535	0	-32768	32767	0xed1c
P13.29	Multi segment setting value 6	0~65535	0	-32768	32767	0xed1d
P13.30	Multi segment setting value 7	0~65535	0	-32768	32767	0xed1e

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P13:System Setting and Feedback(Analog connect)						
P13.31	Multi segment setting value 8	0~65535	0	-32768	32767	0xed1f
P13.32	Multi segment setting value 9	0~65535	0	-32768	32767	0xed20
P13.33	Multi segment setting value 10	0~65535	0	-32768	32767	0xed21
P13.34	Multi segment setting value 11	0~65535	0	-32768	32767	0xed22
P13.35	Multi segment setting value 12	0~65535	0	-32768	32767	0xed23
P13.36	Multi segment setting value 13	0~65535	0	-32768	32767	0xed24
P13.37	Multi segment setting value 14	0~65535	0	-32768	32767	0xed25

Function code	Name	Range	Factory value	Lower limit	Upper limit	Communication address
P13:System Setting and Feedback(Analog connect)						
P13.38	Multi segment setting value 15	0~65535	0	-32768	32767	0xed26
P13.39	Multi segment setting value 16	0~65535	0	-32768	32767	0xed27
P13.40	RFG acceleration	0~65535	0	-32768	32767	0xed28
P13.41	Torque setting value	0~65535	0	-32768	32767	0xed29
P13.42	Additional torque: setting value	0~65535	0	-32768	32767	0xed2a
P13.43	Torque Ctrl speed:upper limit	0~65535	0	-32768	32767	0xed2b
P13.44	Torque Ctrl speed:lower limit	0~65535	0	-32768	32767	0xed2c

EN

9 Maintenance

9.1 Replacing the drive pack

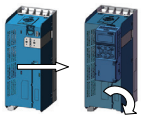
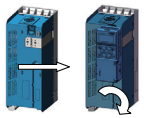
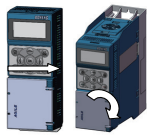
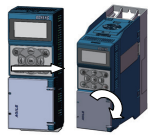
9.1.1 Replacement of drive components

Components allowed to be replaced

After a continuous functional failure, the power module or control module of the drive must be replaced.

The power module and control module of the driver can be replaced separately.

The drive can be replaced when:

<table>
<tr><td colspan="2">replace the power module</td><td colspan="2">replace the control module</td></tr>
<tr><td>spare parts:
•same model
•same power</td><td>spare parts:
•same model
•same overall dimension
•more power</td><td>spare parts:
•same model
•same firmware version</td><td>spare parts:
•same model
•firmware version higher (for example, replacing V4.2 with firmware version v4.3)</td></tr>
<tr><td>x kW x kW
</td><td>y kW > x kW
</td><td>Firmwa -reA Firmwa -reA
</td><td>Firmwa -reA Firmwa -reA
</td></tr>
<tr><td></td><td>The power module and motor module must be matched. That is: the rated power of motor and power module must be greater than 1/8</td><td colspan="2">After replacing the control module, the drive must be restored to the factory setting.</td></tr>
</table>

EN

⚠ Warning

Abnormal operation of the drive may cause personal injury.
Replacing different types of drives may cause abnormal operation.
If the drive replacement does not meet the requirements of the above table,you must retry the new drive after the replacement.

9.1.2 Replace the power module when the safety function has been enabled

Be careful
Replacing the connecting cables of the motor can cause damage
to the motor.

Changing the two phases of the motor cable will cause the motor to rotate in the opposite direction.
Reverse rotation of the motor can cause damage to the machine or equipment.
Connect the three phases of the motor cables in the correct order.
Check the rotation direction of the motor after replacing the power module.

➡ Step
Replace the power module as follows:
1. Disconnect the main power supply of the power module.
If the control module uses an external 24V power supply, the power supply may not be turned off.
2. Pull out the connecting cable on the power module.
3. Remove the CM module from the power module.
4. Replace the power module.
5. Insert the CM module into the new power module.
6. Connect the connecting cable on the new power module.
7. Reconnect the main power supply, and connect the 24V power supply
of the control module if necessary.

■ You have successfully replaced the power module.

9.1.3 Replace the power module whose safety function is no enabled

DANGER
Dangerous voltage on the drive terminals can cause life-threatening.
Please wait at least 5 minutes after power off, Until the capacitor in the drive discharges to a safe voltage level.
•Verify the voltage at the drive interface again before unplugging the connecting cable.

➡ Step
Replace the power module as follows:
1. Disconnect the main power supply of the power module.
If the control module adopts external 24V power supply, the power supply
may not be turned off.
2. Pull out the connecting cable on the power module.
3. Remove the control module from the power module.
4. Replace with a new power module.
5. Insert the control module into the new power module.
6. Connect the connecting cable on the new power module.

Be careful
Replacing the connecting cables of the motor can cause damage to the motor

Changing the two phases of the motor cable will cause the motor to rotate in the opposite direction.
•Connect the three phases of the motor cables in the correct order.
•Check the rotation direction of the motor after replacing the power module.

■ 7. Reconnect the main power supply, and connect the 24V power supply of the control module if necessary.
You have successfully replaced the power module.

EN

Appendix

Appendix a Modbus-RTU communication protocol

A1 drive uses standard RS485 communication interface and MODBUS communication protocol to support serial communication between drive and host computer or PLC. The communication protocol of A1 drive includes three layers: physical layer, data link layer and application layer. Modbus protocol based on RS485 is adopted in physical layer and data link layer, and various operation methods such as controlling A1 drive to run, stop, read and write parameters are included in application layer.

Modbus protocol is a master-slave protocol. There are two kinds of communication between master and slave: master requests and slave answers; Host broadcast, slave does not respond. Only one device on the bus is sending at any time. The host polls the slave, and the slave cannot send messages without obtaining the command from the host. If the host does not receive a response within a given time, it is considered that the polling slave is lost. If the slave cannot execute a message, an exception message is sent to the host. There is no direct communication between the slave computers, so the data of one slave computer must be read out through the software of the host computer, and then sent to another slave computer. Slave address range: 0 to 247, address 0 message is broadcast message.

RTU data frame

Data format and sending order of each byte: 1 start bit + 7/8 data bits (low bit first) + 1 parity bit or no parity bit + 1 or 2 stop bits.

start bit	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	parity bit	stop bits

10bit Character frame

start bit	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	parity bit	stop bits

11bit Character frame

In RTU mode, message sending should start with a pause interval of at least 3.5 characters. In the network baud rate, multiple character times are the easiest to achieve (as shown in T1-T2-T3-T4 in the figure below). The first domain of transmission is the device address. The transmission characters that can be used are hexadecimal 0... 9, A... F. Network devices constantly detect the network bus, including the pause interval. When the first domain (address domain) receives it, each device decodes it to determine whether it is sent to its own. After the last transmitted character, a pause of at least 3.5 characters marks the end of the message. A new message can start after this pause.

The whole message frame must be transmitted as a continuous stream. If there is a pause time of more than 1.5 characters before the frame is completed, the receiving device will refresh the incomplete message and assume that the next byte is the address field of a new message. Similarly, if a new message starts with the previous message in less than 3.5 characters, the receiving device will consider it as a continuation of the previous message. This will result in one error, because the value in the last CRC field cannot be correct.

start idle time of at least 3 characters	slave address	function code	data	check	start idle time of at least 3 characters

RTU frame format:

Frame header start	3.5 character time
Slave address ADR	mailing address: 1~247
Command code CMD	03: reader slave parameters; 06: write slave parameters
Data (N-1)	Data content: function code parameter address, function code parameter number, function code parameter value,etc.
Data (N-2)	
……	
Data content	
CRC CHK low	Detection value: CRC value
CRC CHK high	
END	3.5 character time

A1 drive supports the MODBUS protocol of RTU mode. The MODBUS function codes supported by the drive are as follows:
Command code and communication data description:

CMD	Meaning	Radio broadcast	Maximum number registers
03H	Read multiple registers	No	30
06H	Write single register	Yes	1
10H	Write multiple register	Yes	27

Command code:03H

Command code 03H(00000011), read N words(Word, 16bit data), can read up to 16 words.
For example: if the drive with slave address of 0x55 reads motor target speed, given speed, current motor speed, MODBUS logic starting address of 0x2004 and reads three consecutive words, the frame structure is described as follows:

Host send:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x03
address high bit	0x20
address low bit	0x04
read byte high	0x00
read byte low	0x03
CRC low	0x42
CRC high	0x1E

Slave normal response：

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x03
number of data bytes returned	0x06
High bit of the first data	0x05
Low bit of the first data	0xDC
High bit of the second data	0x00
The second data low	0x00
…	
Nth data high	0x00
Nth data low	0x00
CRC low	0x30
CRC high	0x3E

The drive responds to the motor target speed 0x05DC (1500rpm), the given speed 0x0000, and the current motor speed 0x0000
Slave abnormal response:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x03
error code	0x02
CRC low	0xE2
CRC high	0x17

Command code:06H

Command code 06H(00000110), write a word(Word) For example, if the salve address is 0x55 and the target speed of the driver is set to 100%, that is, MODBUS logical address 0xE721 is written to 0x03E8, the frame structure is described as follow:

RTU host command information

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x06
address high bit	0xE7
address low bit	0x21
Data high	0x03
Data low	0xE8
CRC low	0xE2
CRC high	0x1E

EN

Slave normal response

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x06
address high bit	0xE7
address low bit	0x21
Data high	0x03
Data low	0xE8
CRC low	0xE2
CRC high	0x1E

Slave abnormal response:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x86
error code	0x03
CRC low	0x43
CRC high	0xB1

EN

Command code: 10th

Command code 10H(00010000), write N words (Word)

For example:if the slave address is Ox55, write 3 pieces of data to the address of Ox3500. The structure of the frame is described as follows:

RTU host command information

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x10
Address high	0x35
Address low	0x00
Bytes written high	0x00
Bytes written low	0x03
Total number of bytes written	0x06
First data high	0x00
First data low	0x01
……	……
Nth data high	
Nth data low	
CRC low	0x4A
CRC high	0x12

Slave normal response

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x90
Address high	0x35
Address low	0x00
data high	0x00
data low	0x03
CRC low	0x4A
CRC high	0x12

EN

Slave abnormal response

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x90
error code	0x03
CRC low	0x43
CRC high	0xB1

Abnormal code

Code	name	meaning
1	illegal function code	an unsupported function code was received
2	illegal address	the request register address is illegal, or the combination of register address and the number of requested data is illegal
3	illegal data value	the received data field contains at least one illegal data value
4	number of illegal request data	the number of requested data is greater than the maximum number
5	read-only	read-only
6	it can only be stopped for modification	it can only be stopped for modification

EN

Communication frame error check

Using RTU frame format, the frame includes the frame error detection domain based on CRC method. CRC domain detects the content of the whole frame. The CRC field is two bytes, containing a 1-bit binary value. It is calculated by the transmission device and added to the frame. The receiving device recalculates the CRC of the received frame and compares it with the value in the received CRC field. If the two CRC values are not equal, it indicates that there is an error in the transmission. CRC is stored in 0xFFF first and then invoked a process to process more than 6 consecutive bytes in the frame and the values in the current register. Only 8bit data in each character is valid for CRC, and start bit, stop bit and parity bit are invalid. In the process of CRC generation, each 8-bit character is different from or (XOR) in the register content, and the result moves to the least significant bit direction, and the most significant bit is filled with 0. LSB is extracted to detect. If LSB is 1, the register is different from the preset value or if LSB is 0, it is not detected. The whole process is repeated eight times.

After the last bit (the 8th bit) is completed, the next 8-bit byte is different from or different from the current value of the register. The value in the final register is the CRC value after all the bytes in the frame are executed. For example, to transmit "11001110", the data contains five "1s". If even check is used, the even check bit is "1". If odd check is used, the odd check bit is "0". When transmitting data, the parity check bit is calculated and placed in the position of the check bit of the frame, and the receiving device also performs parity check. If the parity of the received data is inconsistent with the preset value, the receiving device will also perform parity check, I think there's something wrong with the communication. This calculation method of CRC adopts the international standard CRC check rule. When editing CRC algorithm, users can refer to the relevant standard CRC algorithm to write a CRC calculation program that really meets the requirements.

Standard : CRC-16/MODBUS
Polynomial : x16+x15+x2+1(0x8501)
CRC initial value : 0xFFFF

Now a simple function of CRC calculation is provided for user's reference (program in C language)

```
unsigned int crc_cal_value(unsigned char
*data_value,unsigned char data_length)
{
int i;
unsigned int crc_value=0xffff;
    while(data_length--)
{
crc_value^=*data_value++;
for(i=0;i<8;i++)
{
if(crc_value&0x0001)
crc_value=(crc_value>>1)^0xa001;
else
{
crc_value=crc_value>>1;
}
}
}
returncrc_value;
}
```

Modbus communication parameter address control command input to drive:(write only)

command word address	command function
0xE720	0000:Reset
	0001:running
	0002:inching operation
	0003:free parking
	0004:deceleration shutdown
	0005:fault reset
	0006: Invert given speed
0xE721	Modbus communication set point1
0xE722	Modbus communication set point2

Note: the value range of communication setting value is -600.0%~600.0%

When entering the "0003: free parking" command,You need to enter the "0000: reset" command to reset,Otherwise, the drive will remain in a power-on blocked state.

EN

The parameter address table of function parameters is as follows:

Drive parameter number	Modbus communication address
Group A	
A00.00 – A00.99	0x2000
A02.00 – A02.99	0x2100
A03.00 – A03.99	0x2200
A04.00 – A04.99	0x2300
A05.00 – A05.99	0x2400
A06.00 – A06.99	0x2500
Group B	
B00.00 – B00.99	0x3000
B01.00 – B01.99	0x3100
B02.00 – B02.99	0x3200
B03.00 – B03.99	0x3300
B04.00 – B04.99	0x3400
B05.00 – B05.99	0x3500
B06.00 – B06.99	0x3600
B0700 – B07.99	0x3700
B08.00 – B08.99	0x3800
B09.00 – B09.99	0x3900
B10.00 – B10.99	0x3A00
B11.00 – B11.99	0x3B00
Group C	
C00.00 – C00.99	0X4000
C01.00 – C01.99	0X4100
C02.00 – C02.99	0X4200
C03.00 – C03.99	0X4300
Group D	
D00.00 – D00.99	0X5000
D01.00 – D01.99	0X5100
D02.00 – D02.99	0X5200
D03.00 – D03.99	0X5300
D04.00 – D04.99	0X5400
D05.00 – D05.99	0X5500
D06.00 – D06.99	0X5600
D07.00 – D07.99	0X5700
D08.00 – D09.99	0X5800
D09.00 – D09.99	0X5900
D10.00 – D10.99	0X5A00
D11.00 – D11.99	0X5B00

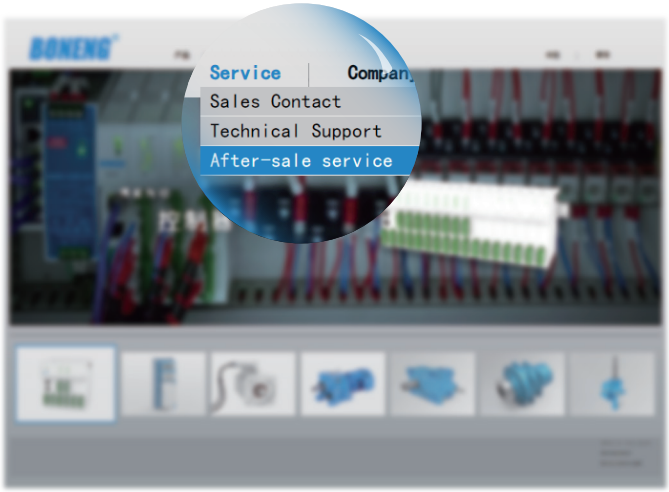
Drive parameter number	Modbus communication address
Group E	
E00.00 – E00.99	0X6000
E01.00 – E01.99	0X6100
E02.00 – E02.99	0X6200
E03.00 – E03.99	0X6300
E04.00 – E04.99	0X6400
E05.00 – E05.99	0X6500
E06.00 – E06.99	0X6600
E07.00 – E07.99	0X6700
Group F	
F00.00 – F00.99	0X7000
F01.00 – F01.99	0X7100
F02.00 – F02.99	0X7200
F03.00 – F03.99	0X7300
F04.00 – F04.99	0X7400
F05.00 – F05.99	0X7500
F06.00 – F06.99	0X7600
F07.00 – F07.99	0X7700
F08.00 – F08.99	0X7800
Group P	
P00.00 – P00.99	0XE000
P01.00 – P01.99	0XE100
P02.00 – P02.99	0XE200
P03.00 – P03.99	0XE300
P04.00 – P04.99	0XE400
P05.00 – P05.99	0XE500
P06.00 – P06.99	0XE600
P07.00 – P07.99	0XE700
P08.00 – P09.99	0XE800
P09.00 – P09.99	0XE900
P10.00 – P10.99	0XEA00
P11.00 – P11.99	0XEB00
P12.00 – P12.99	0XEC00
P13.00 – P13.99	0XED00

After-sale service

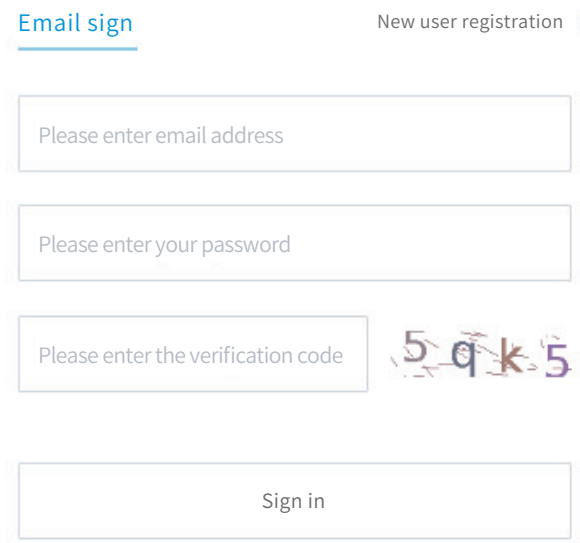
After-sales Service Please follow the steps below to submit the after-sales process.

→ Login “www.boneng.com”

→ Click “Service” and “After-sale Service”



→ Login system



Other District
Controller/Drive : 0512-66182005
Motor/Gear motor/Gearbox : 0512-66189918

BONENG TRANSMISSION(SHEN YANG)CO.,LTD
Controller/Drive : 024-31271571
Motor/Gear motor/Gearbox : 024-31292571

BONENG TRANSMISSION(TIAN JIN)CO.,LTD
Controller/Drive : 022-86928559
Motor/Gear motor/Gearbox : 022-26929558

BONENG TRANSMISSION(KAIFENG)CO.,LTD
Controller/Drive : 0371-23335230
Motor/Gear motor/Gearbox : 0371-23277771

BONENG TRANSMISSION(WEIFANG)CO.,LTD
Controller/Drive : 0536-4699687
Motor/Gear motor/Gearbox : 0536-4699667

BONENG TRANSMISSION(CHANGSHA)CO.,LTD
Controller/Drive : 0731-88386958
Motor/Gear motor/Gearbox : 0731-88380725

BONENG TRANSMISSION EQUIPMENT (CHENGDU)CO.,LTD
Controller/Drive : 028-87740066
Motor/Gear motor/Gearbox : 028-87740066

BONENG TRANSMISSION(ZHAOQING)CO.,LTD
Controller/Drive : 0757-86719757
Motor/Gear motor/Gearbox : 0758-2699830

BONENG TRANSMISSION(SUZHOU)CO.,LTD
Controller/Drive Southern Jiangsu : 0512-66182005
Motor/Gear motor/Gearbox Southern Jiangsu : 0512-66189918
Controller/Drive Zhejiang-Shanghai : 0512-66182005
Motor/Gear motor/Gearbox Zhejiang-Shanghai : 0512-66189918
Controller/Drive Jiangsu-Anhui District : 0512-66182005
Motor/Gear motor/Gearbox Jiangsu-Anhui : 025-52171612

BONENG TRANSMISSION(USA/Canada)CO.,LTD
Technical Support/Debugging/After-Sales Service:
1250 E 222nd Euclid, OH 44117,United Staes
Email: America@boneng.com
Office Tel: 1-216-618-3099 / 1-216-618-0138

BONENG TRANSMISSION(India)CO.,LTD
Technical Support/Debugging/After-Sales Service:
Plot No. E-10/3, MIDC sinnar (Malegaon) Industrial Area, Nashik, 422123, Maharashtra, India.
Email:india@boneng.com
Tel: +91-22-2781 3385 / +91-11- 4507 6293

EN