

BONENG

A1 驱动器 CM22

A1-Series Drive CM22

快速调试手册

QUICK COMMISSIONING
MANUAL



CONTACT US

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中文

EN

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前言

欢迎使用博能驱动器！

在安装使用前请务必认真阅读本说明书，以便正确安全地使用驱动器。

更多详细资料，请访问博能传动官方网站：
博能传动（www.boneng.com）。



扫码了解产品详情



扫码下载产品使用手册

博能传动官方网站

A1驱动器-CM22
使用手册

1.技术参数

功能		技术数据
总线接口	A1-CM22-MB-PE	· 支持Modbus RTU通讯 · 波特率:最大 115200bps
工作电源	功率模块供电	· 由功率模块提供, 24V/0. 6A
	端子24VIN供电	· 端子24V IN和GND供电, 电压:18~30Vdc; · 最大工作电流: 1A
输出电源	数字输入端子电源	· 电压范围:DC 18V ... 30V · 最大电流:200mA
	模拟输入端子电源	· 电压:10V · 最大电流:40mA
	编码器电源	· 电压:DC 24V
		· 最大电流:350mA
输出电源	5个(DI0~DI4)	· 公共端子 DICOM
		· 电气隔离
		· 支持双向输入
		· 支持Source和Sink模式
		· 电压:DC 24V
		· "1"信号电压:>11V
		· "0"信号电压:<5V
数字量输出	1 个继电器 (DO0)	· 最大 30Vdc, 0. 5A.
		· 触点类型:1 常开 1 常闭
模拟量输入	2 通道 (AI0, AI1)	· 差分输入;
		· 电压型支持 -10V...+10V、0V ... 10V;
		· 电流型支持0mA ... 20mA, 内阻 500ohm;
模拟量输出	1 个通道	· 通过拨码开关切换类型
		· 支持 0V ... 10V;
编码器信号输入	ABZ 增量式编码器	· 参考电位为 DGND
		· HTL;
编码器信号输入	ABZ 增量式编码器	· 输入频率:最大 200kHz

功能	技术数据	
		· 电缆长度: 24V 开集电极类型 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 · COM 指示灯:红绿双色
键盘接口	支持 OP25	· 可直接安装或外引安装 · 可通过 RS485 转 USB 线缆连接 PC
工作温度	-20℃ ~+50℃	
相对空气湿度	<95%	不允许有凝露

备注：更多详细说明参见官网详细使用手册。

2.驱动器配线

2.1 驱动器接口一览

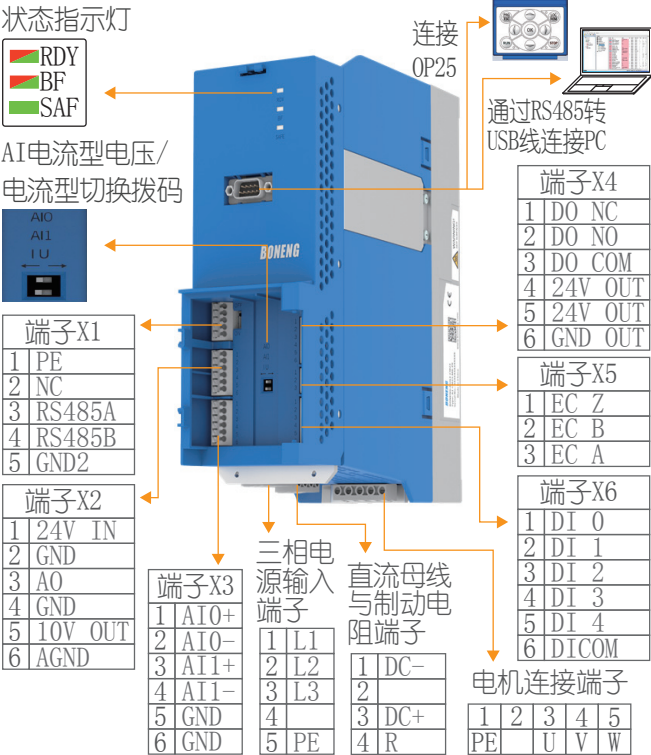
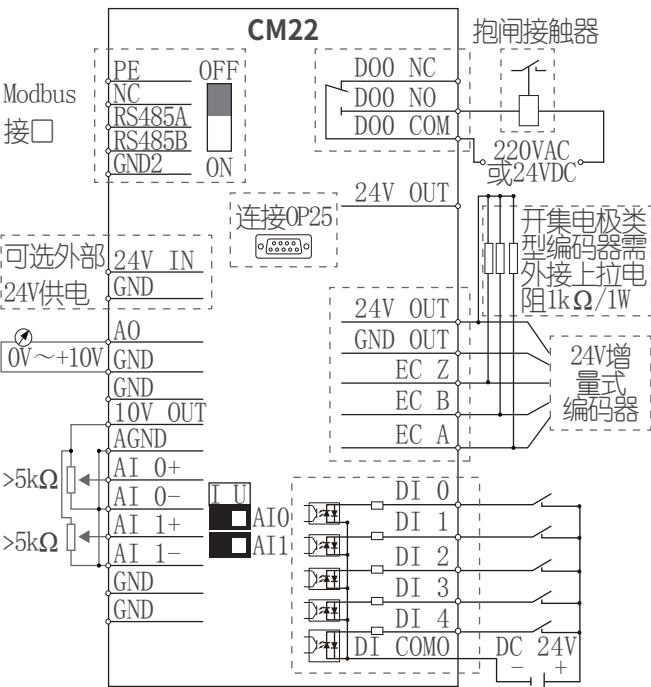


表 1. 功率单元端子名称与功能描述

端子编号	端子名称	说 明
电源输入端子	L1, L2, L3	三相电源输入端子，参考驱动器功率模块（PM25，PM26）铭牌电压输入要求。
	PE	三相电源接地保护。
直流母线及制动电阻端子	DC+, DC-	直流母线端子（小功率机型共直流母线使用）。
	DC+, R	制动电阻接入端子，需外接能量泄放电阻时，将电阻接于DC+ 和 R之间。
电机连接端子	U, V, W	连接电机 U, V, W 相。
	PE	连接电机接地线。

2.2 控制模块端子配线

在控制模块安装配线前，请先根据功率模块说明书，安装功率模块并进行配线。

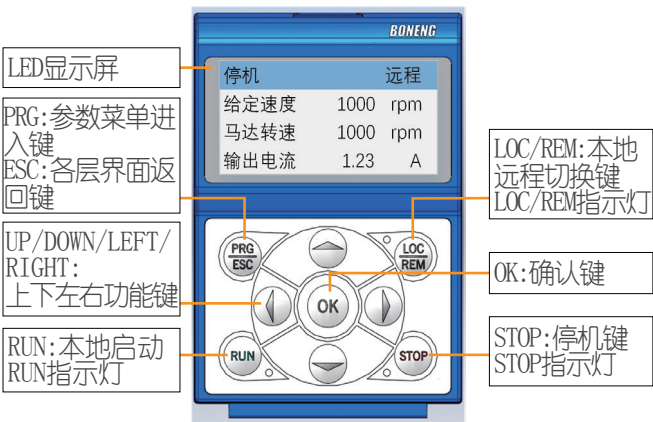


注：编码器如果为差分类型，只能同时使用 A+, B+, Z+或 A-, B-, Z-，不可混用。

3. 驱动器操作说明

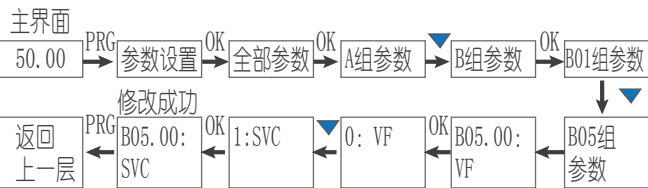
3.1 OP25 操作说明

请将 OP25 安装在对应 CM 模块上进行参数调试



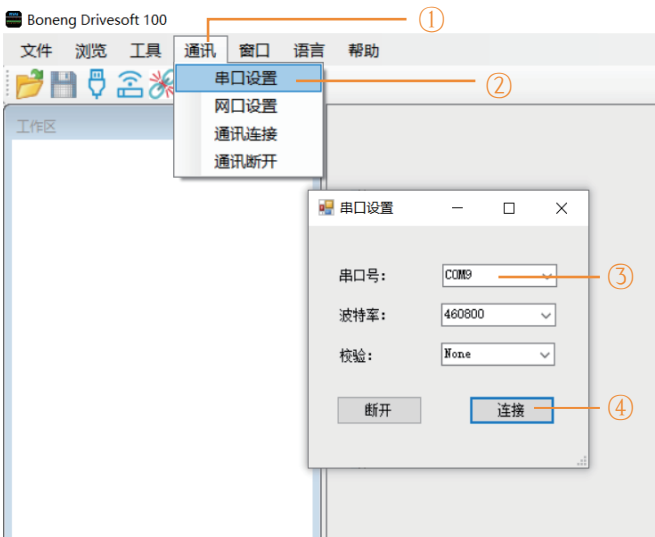
按键	按键名称	功 能
PRG/ESC	编程/返回	主监控界面时，按此键进入功能选择界面；其他界面，按此键返回上一级界面或状态
LOC/REM	本地/远程	获取或放弃键盘控制权
STOP	停止键	运行状态时，按此键可用于停止运行操作；停机状态时，按此键可复位故障状态
RUN	运行键	在键盘操作方式下，用于运行操作
▲	递增键	数据或功能码的递增
▼	递减键	数据或功能码的递减
▶	右移位键	在修改参数时，可以循环向右选择参数的修改位
◀	左移位键	在修改参数时，可以循环向左选择参数的修改位
OK	确认键	逐级进入菜单画面、设定参数确认

例:用OP25将驱动器从VF控制改为SVC控制



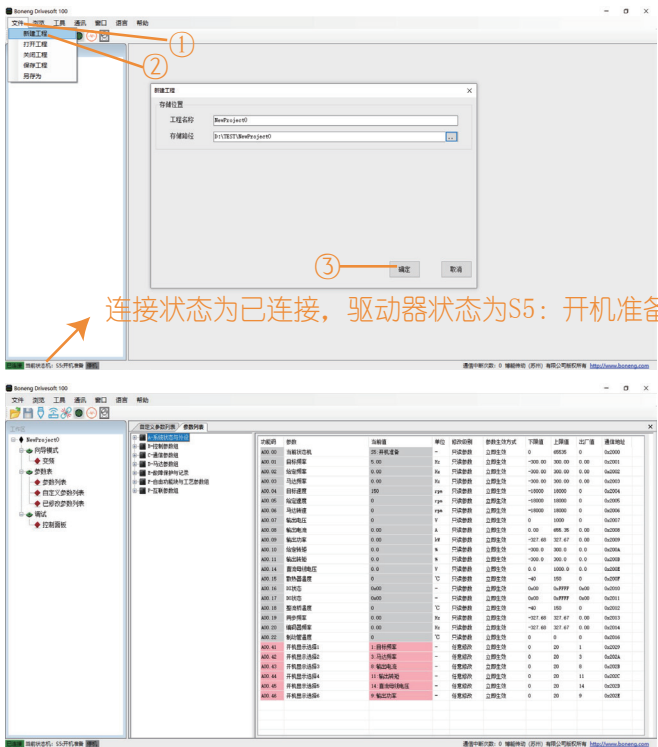
3.2 调试软件 Boneng Drivesoft 100 操作说明

- 1. 请使用标准 RS485 转 USB 线缆连接变频驱动器与 PC，确保 PC 端已安装好博能驱动器上位机软件 Boneng Drivesoft 100。
- 2. 在PC端打开博能上位机软件 Boneng Drivesoft 100，并完成其与驱动器的通讯连接：菜单 一> 通讯 一> 串口设置 一> 串口号，选择对应的串口号 一> 连接，如下图所示。



驱动器与上位机软件 Boneng Drivesoft 的通讯连接

- 3. 在上位机软件 Boneng Drivesoft 100 中建立工程：文件 一> 新建工程 一> 确定。



上位机软件中建立工程并查看参数

4. 快速启动（试运转）



注意：

◆ 试运转前请务必知悉各个变频驱动器单元操作的安全与注意事项。

4.1 调试前准备

使用上位机对博能 A1 变频驱动器带马达进行试运转前需要准备以下设备：

- 博能 A1 变频驱动器一套；
- 变频驱动器电源线缆及开关若干；

- 一条 RS485 转 USB 线缆；
 - PC 以及博能上位机软件 Boneng Drivesoft 100。
- 请按照接线图连接好变频器驱动器、马达，并连接好驱动器与 PC。

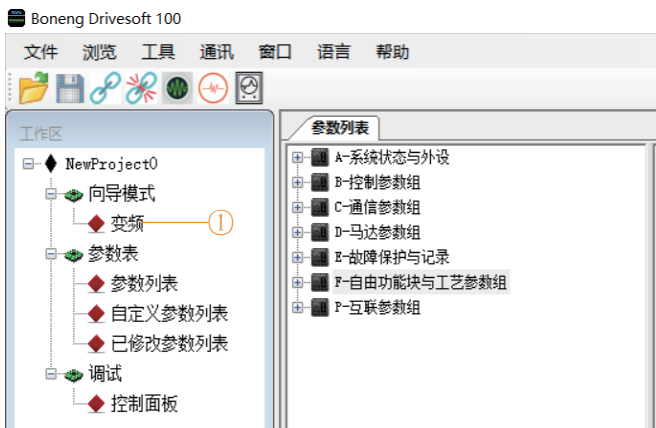
4.2 试运转前检查和注意事项

- 马达与外部机械装置
- 试运转前请检查马达的安装，务必确保马达安装固定稳定安全可靠。试运转前请务必将马达的输出轴与后级负载分离。
- 安装与配线检查
 - a. 请确保 A1 系列变频驱动器的 CM 模块与 PM 模块的连接可靠，确认 PM 模块上的卡扣已正确弹出。
 - b. 送电前请根据驱动器铭牌确认驱动器的供电电源电压是否和其额定工作电压匹配。
 - c. 请确保动力线缆及 PE 信号都已正确接在驱动器上，检查电机铭牌确定电机侧按铭牌上的接法正确连接。
 - d. 请确保变频驱动器的接地保护线缆可靠接地，以防触电。
- 电机制动器接线检查
 - a. 试运转前请检查马达抱闸的配线是否正确。

4.3 使用 BonengDriveSoft 100 调试

以下是使用博能驱动器上位机软件Boneng Drivesoft 100 的向导进行电机试运转的步骤：

- 步骤 1. 在上位机软件 Boneng Drivesoft 100 中建立工程（参见章节 3.2），可实时显示当前参数。
- 步骤 2. 选择向导模式，在向导中进行参数更改，如下图所示。



步骤 3. （可选项）参数恢复出厂设置：在向导中选择【参数复位模式 (A04.00)】选择【3:全部参数复位】，然后点击【开始复位】，如下图所示。



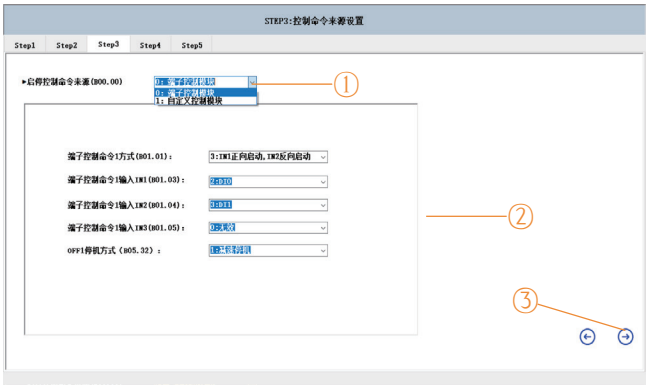
步骤 4. 设置、检查电机参数：根据电机铭牌设置马达参数，如下图所示。



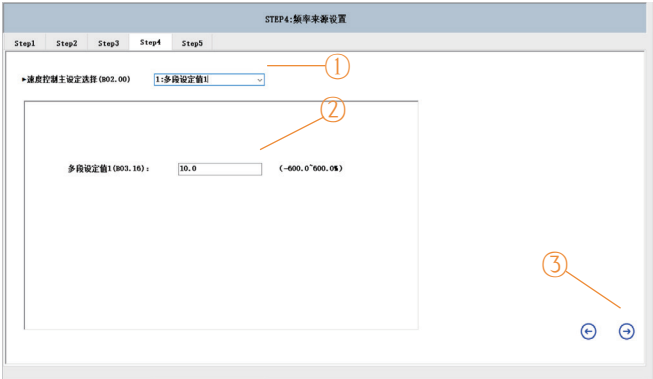
步骤 5. 马达控制方式及斜坡时间设置：在参数 B05.00，选择需要的电机控制方式，如：【0:VF】，【1:SVC】，【2:FVC】。并在参数 B04.02 和参数 B04.03 中（默认使用斜坡 1 加减速时间），设置需要的加减速时间，如下图所示。



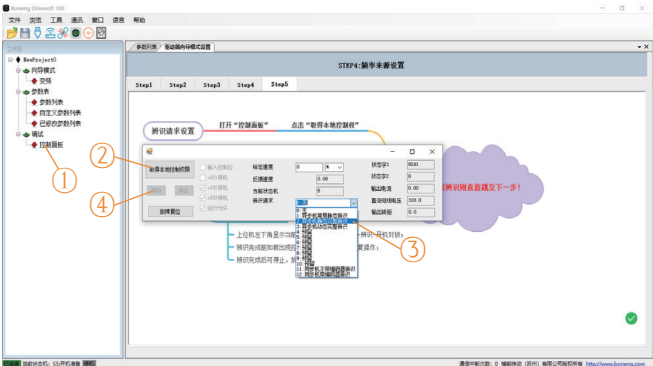
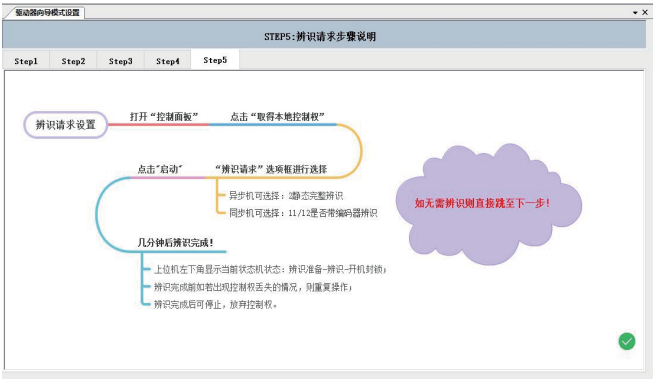
步骤 6. 默认的启停控制命令来源是端子控制。DI0 控制正向运行，DI1 控制反向运行。OFF1 停机方式为减速停机。连接好相应的 DI 端子，DI0 置 1 的时候电机正向运行，DI1 置 1 的时候电机反向运行，DI 输入为 0 时电机减速停机。也可修改参数 B01.01，选择想要的端子控制命令方式。并连接好对应的 DI 端子。



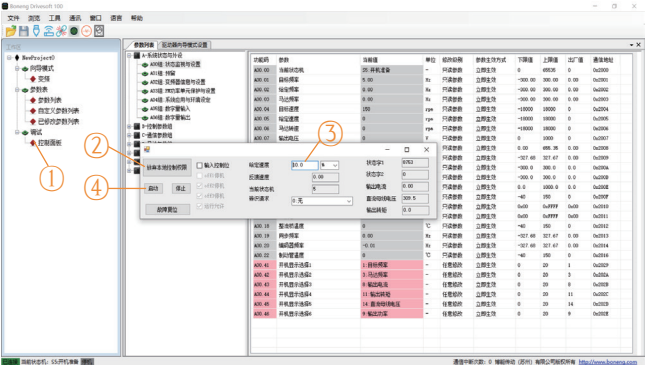
步骤 7. 通过参数 B03.16 设置目标速度。



步骤 8. 使用上位机控制面板进马达辨识制：控制面板 → 获取本地控制权限 → 选择辨识类型 → 启动，如下图所示，辨识完成后【当前状态机】会变成【开机封锁】，此时点击停止即可。



步骤 9. 编码器方向检查：（若使用 FVC 模式，需要执行本步骤，VF 和 SVC 无需执行本操作。）先设置模式为VF模式，运行电机（设置参数B05.00 = 【0:VF】），使用上位机控制面板运行电机：控制面板一>获取本地控制权限一>设置给定速度一> 启动，通过上位机控制面板 启动 驱动器，并在给定速度框中给定运行速度，例如 [10%]，确认），查看速度给定值（P13.11）与编码器速度反馈值（P13.17）的符号，其符号应当一致；若不一致，请检查驱动器动力输出相序与电机UVW 线相序是否匹配或可将编码器的 AB 输入相序取反（设置参数 D02.01 = 【1:反向】）。



5. 常用参数

5.1 常用设置参数

功能码序号	功能码名称	功能码说明
A04.00	参数复位模式	3：全部参数复位，需要通过 A04.01 确认后才可复位参数
A04.01	参数复位	0：取消 1：确认
D00.01	马达额定功率	按电机铭牌设置
D00.02	马达额定电压	
D00.03	马达额定电流	
D00.04	马达额定频率	
D00.05	马达额定转速	
B05.00	马达控制方式	0：VF 1：SVC 2：FVC
B00.21	辨识请求	B05.00 设置为 1 或 2 时需要辨识。异步机辨识步骤：按 LOC/REM键设为本地模式，B00.21 设为 2，然后按 RUN 键启动，等驱动器辨识停止后按STOP键，再按 LOC/REM键切换到远程即可。
B01.01	端子控制命令 1 方式	端子启停命令，详见操作手册
B01.03	端子控制命令 1 输入 IN1	
B01.04	端子控制命令 1 输入 IN2	
B01.05	端子控制命令 1 输入 IN3	
B02.00	速度控制主速度选择	
B03 组	多段速设置	多段速控制，详见使用手册
B04.02	斜坡加速时间 1	加速时间
B04.03	斜坡减速时间 1	减速时间

功能码序号	功能码名称	功能码说明
B00.23	OFF1停机方式	0: 自由停机 1: 减速停机
F04.00	抱闸功能选择	0: 不使用抱闸功能, 1: 使用抱闸功能。通常用于提升设备时需要使用此抱闸功能, 若通过 D0 端子控制抱闸, 将 D0 功能设为 P01.11 即可。
A06 组	数字量输出	可设置 D0 输出端子功能, 详见使用手册
A07 组	模拟量输入	模拟量输入设置, 详见使用手册
A08 组	模拟量输出	模拟量输出设置, 详见使用手册
C02 组	Modbus 通讯设置	Modbus 通信设置, 详见使用手册

5.2 常用监控参数

功能序号	功能码名称	功能码说明
A00.00	当前状态机	驱动器当前状态。
A00.05	给定速度	速度控制模式下, 实时速度给定值; [rpm]。
A00.06	马达转速	实时速度反馈, [rpm]。
A00.08	输出电流	实时输出电流。
A00.09	输出功率	实时输出功率。
P00 组	硬件状态	显示 DI, D0, DIO 等硬件接口物理状态。
P12.13	Panel 给定值	速度控制模式下通过 OP 给定的目标速度值。单位为 0.1%。
P12.14	PC 给定值	速度控制模式下通过 PC 上位机给定的目标速度值。单位由上位机控制面板选择。
P12.16	DI 状态	DI 实时状态。
P12.17	D0 状态	D0 实时状态。
P13.00	马达实际速度	马达实时速度反馈值; 4096 对应 100%额定转速。

功能序号	功能码名称	功能码说明
P13.11	功能最终设定速度	速度控制模式下最终速度指令值; 4096 对应 100%额定转速。
P13.02 P13.11	-	速度控制模式下速度给定监控数据。
E00~ E07组	-	显示故障记录与相关信息。

6. 驱动器故障说明

故障码	故障名称	子码	子码含义	解决措施
1	过流	1	U 相过流	1. 确认 D00 组电机参数与电机铭牌一致。 2. 排除动力线破损问题; 3. 检查线缆是否短路; 4. 适当增加加减速时间; 5. VF 控制下减小 VF 转矩提升量; 6. 请确认电机停止稳定后再启动; 7. 减小或取消负载排查问题; 8. 对于异步电机矢量控制下请确认是否进行过正确的参数辨识操作; 9. 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; 10. 更换 PM。 11. 恢复出厂值, 重新设定参数。 12. 联系售后或厂家, 寻求技术支持。
		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	

故障码	故障名称	子码	子码含义	解决措施
2	直流过压	1	快速检测中 母线电压过压	1. 请检查输入电源是否在合理范围，确认输入端接线可靠 2. 请增加加减速时间 3. 加装制动电阻或制动单元 4. 重新设置参数，参数辨识后运行 5. 确认驱动器功率与马达功率匹配 6. 检查编码器是否损坏 7. 联系售后或厂家，寻求技术支持
3	直流欠压	1	直流欠压	1. 请检查输入电源是否在合理范围，确认输入端接线可靠 2. 请确认电网是否瞬间断电 3. 正确设置 A03. 21 软件欠压点 4. 更换 PM 5. 联系售后或厂家，寻求技术支持
5	驱动器过载	1	驱动器过载	1. 请确认驱动器选型是否合适，A03. 00设置与铭牌一致 2. VF 控制下减小 VF 转矩提升量 3. 矢量控制下减小转矩限值 4. 请确认负载是否过重，或者抱闸等锁死情况 5. 矢量控制时请确认是否进行正确的参数自学习操作

故障码	故障名称	子码	子码含义	解决措施
				6. 带编码器应用下，请确认编码器方向及参数设定是否正确 7. 重新设置参数，参数辨识后运行 8. 降低载波频率，或更换更大功率驱动器 9. 等电机完全停止后再启动； 10. 联系售后或厂家，寻求技术支持
6	马达过载	1	马达过载	1. 请确认电机负载是否过大 2. 矢量控制时请确认是否进行过电机参数自学习 3. 带编码器应用下，请确认编码器方向及参数设定是否正确 4. 请确认负载是否过重，或者抱闸等锁死情况 5. 请确认D00 组参数是否与电机铭牌参数一致 6. 联系售后或厂家，寻求技术支持
7	输入缺相	1	输入缺相检测	1. 请检查动力输入电缆是否接触良好 2. 确保输入电源稳定 3. 联系售后或厂家，寻求技术支持
8	输出缺相	1	U 相输出缺相	1. 请检查对应的输出电缆是否接线正确及接触良好 2. 请确认电机是否运行平稳
		2	V 相输出缺相	
		3	W 相输出缺相	

故障码	故障名称	子码	子码含义	解决措施
		4	FVC 控制输出缺相	3. D00 组参数按马达铭牌参数设置, A03.00设置与铭牌一致 4. 更换 PM 5. 联系售后或厂家, 寻求技术支持
		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	
9	驱动器过温	1	检测到驱动器 (37Kw及以下机型) IGBT温度超过阈值	1. 请确认环境温度是否过高 2. 请检查散热器风扇是否正常运转 3. 请检查散热器风道是否堵塞 4. 更换 PM 5. 机型 A03.00 参数设置与铭牌一致 6. 联系售后或厂家, 寻求技术支持
		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	
11	电流零漂错误	1	U 相零漂偏大	1. 检查机型 (A03.00) 设置是否与铭牌一致 2. PM 异常, 更换 PM, 或联系售后或厂家, 寻求技术支持
		2	V 相零漂偏大	
		3	W 相零漂偏大	

故障码	故障名称	子码	子码含义	解决措施
12	对地短路故障	1	对地短路时 U 相过流	1. 请检查相应输出相是否对地短接 2. 检查电机线缆是否破损 3. 更换电机或更换驱动器 4. 联系售后或厂家, 寻求技术支持
		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	
13	马达调谐故障	1	异步马达动态调谐异常	1. 确认D00 组电机参数是否与电机铭牌一致 2. 确认输出端接线可靠 3. 确认编码器接线及其参数正确 4. 更换 PM 5. 联系售后或厂家, 寻求技术支持
		2	异步马达静态调谐异常	
		3	同步马达调谐异常	
		4	编码器调谐异常 (测速异常)	
		5	编码器调谐异常 (编码器信号干扰严重)	
		6	编码器调谐异常 (编码器Z 信号异常)	
14	编码器异常	1	闭环动态调谐时编码器未接	1. 规范走线, 使用带屏蔽层的线缆, 编码器屏蔽层接地 2. 请确认编码器接线是否可靠 3. 请检查编码器相关参数是否设置正确
		2	动态闭环调谐时编码器测速不吻合	
		3	闭环运行时编码器断线	

故障码	故障名称	子码	子码含义	解决措施
		4	编码器Z 信号异常	4. 请检查编码器电源是否正确 5. 检查D00 组电机参数是否与铭牌一致, 确认电机级数 D00.09 6. 确认运行后电机是否转起来, 排出堵转的情况 7. 联系售后或厂家, 寻求技术支持
		9	增量编码器 A 相断线	
		10	增量编码器 B 相断线	
		11	增量编码器 AB 相断线	
		12	增量编码器 Z 相断线	
		13	增量编码器 AZ 相断线	
		14	增量编码器 BZ 相断线	
		15	增量编码器 ABZ 相断线	
15	矢量失速报警	1	速度在外力作用下被反向, 超过设定时间 (B06.59)	1. 请确认电机铭牌参数设置是否正确, 进行参数辨识 2. 请确认是否做过电机参数自学习操作 3. 确认D02 组编码器参数是否设置正确, 编码器接线是否正确 4. 请检查和失速相关的参数设置是否合理 5. 联系售后或厂家, 寻求技术支持
		2	反馈速度与设定速度偏差 (B06.61) 过大, 超过设定时间 (B06.60)	
16	FPGA读写错误	1	初始化中FPGA读写错误	1. PM异常, 断电重启, 如果继续存在则联系售后或厂家, 寻求技术支持
17	驱动电源故障	1	驱动电源电压偏低	1. 联系售后或厂家, 寻求技术支持 2. 更换 PM

故障码	故障名称	子码	子码含义	解决措施
		3	对地短路检测时驱动电源故障	
18	一级电源故障	1	24V 一级电源电压偏低	1. 联系售后或厂家, 寻求技术支持 2. 更换 PM
19	CM 与 PM 通信异常	1	CM 无应答	1. 请确认 CM 的锁扣是否锁紧, 确保CM 与 PM可靠连接。 2. 更换CM 或 PM, 判断更换前后能否排除故障 3. 联系售后或厂家, 寻求技术支持
		2	CM 无应答	
		3	CM 无应答	
		4	CM 无应答	
20	PM-EEPROM故障	1	EEPROM写入数据溢出	1. 联系售后或厂家, 寻求技术支持
		2	EEPROM读取数据溢出	
		3	EEPROM读取数据超时	
		4	EEPROM写入数据超时	
		5	EEPROM读取地址越界	
		6	EEPROM写入地址越界	
21	PM机型设置错误	1	PM机型当前设置值小于正常值	1. 重新烧录 PM 程序 2. 重新设置机型至正常值 3. 联系售后或厂家寻求技术支持
		3	PM机型当前设置值大于正常值	
22	逐波限流故障	1	U 相电流异常	1. 增长加速时间 2. 重新设置参数, 参数辨识后运行 3. 更换电机, 排出电机故障
		2	V 相电流异常	

故障码	故障名称	子码	子码含义	解决措施
		3	W 相电流异常	障
		16	逐波限流中断异常	4. 更换 PM。 5. 联系售后或厂家，寻求技术支持
23	整流桥过热	1	整流桥温度超过 90° (仅18.5Kw及以上机型检测)	1. 清理风扇中异物，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。 2. 查看机型值是否与铭牌对应 3. 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 4. 联系售后或厂家，寻求技术支持
25	制动管过热	1	制动管温度超过 85℃ (仅45Kw及以上机型检测)	1. 请确认环境温度是否过高 2. 请检查散热器风扇是否正常运转 3. 请检查散热器风道是否堵塞 4. 安装合适的制动电阻 5. 联系售后或厂家，寻求技术支持
33	驱动器预过载	1	驱动器过载预警告	1. 请确认是否开启驱动器预过载功能 2. 处理方法参考“5：驱动器过载”故障。 3. 联系售后或厂家，寻求技术支持
34	马达预过载	1	马达过载预警告	1. 请确认是否开启驱动器预过载功能 2. 处理方法参考“6：马达过载”故障。

故障码	故障名称	子码	子码含义	解决措施
				3. 联系售后或厂家，寻求技术支持
		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
35	通信异常	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

故障码	故障名称	子码	子码含义	解决措施
37	马达速度超限	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	1	马达实际运行速度与设定值相差范围超过 B06. 30设置值且保持 B06. 31设定时间	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	故障 39	2	最大允许运行时间到	1. 联系设备或驱动器厂家
40	PID 反馈丢失	1	PID 反馈采样值丢失	1. 检查PID反馈输入的信号 2. 联系售后或厂家，寻求技术支持
41	外部故障	1	产生外部故障 1	1. 检查外部输入信号 2. 联系售后或厂家，寻求技术支持
		2	产生外部故障 2	
42	外部警告	1	产生外部警告 1	1. 检查外部输入信号 2. 联系售后或厂家，寻求技术支持
		2	产生外部警告 2	
43	预驱动失败	1	运行命令产生时没有母线电压	1. 检查外部供电电压是否异常 2. 联系售后或厂家，寻求技术支持
44	控制板异常	1	ARM 芯片类型识别错误	1. 新上电看是否正常

故障码	故障名称	子码	子码含义	解决措施
		2	RM芯片主频配置失败	2. 联系售后或厂家，寻求技术支持
45	抱闸控制异常	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	
46	控制板电压异常	1	PM24V 电源电压过大	1. 检查PM 的 24V 供电电压是否异常 2. 联系售后或厂家，寻求技术支持
		2	外部24V 电源电压过大	1. 检查外部24V 供电电压是否异常 2. 联系售后或厂家，寻求技术支持
		3	PM24v 或外部24V 电源电压过低	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. 确认抱闸继电器的阻抗是否大于 450Ω？ 2. 确认抱闸继电器是否短路？ 3. 联系售后或厂家，寻求技术支持
49	AI断线故障	1	当AI0 类型选择 4~20 ma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 AI 电路是否正确 2. 检查是否有外部电流输入 3. 检查A07.20/21 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 4~20 ma时电流小于A07.21设置值且保持A07.23断线检测延时时间	
50	电容侧风扇故障	1	电容侧风扇断线	1. 检查电容侧风扇接线是否中断 2. 电容侧风扇损坏，联系厂家更换 3. 联系售后或厂家，寻求技术支持
51	ROM 故障 (CM-EEPROM故障)	1	上电自检EEPROM中所存参数值不在设定范围内	1. 参数恢复出厂值后再次上电 2. 联系售后或厂家，寻求技术支持
		5	字库版本不正确	1. 烧录正确的字库 2. 联系售后或厂家，寻求技术支持

7. 马达制动器参数（仅适用于博能异步马达）

制动器型号	BN05	BN06	BN10	BN14	BN16	BN18	BN20	BN25	BN30
制动力矩 (N.m)	2	4	16	60	80	150	300	600	1000
制动器功率 (W)	13	20	30	50	55	85	100	110	200
额定间隙 (mm)	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6
最大间隙 (mm)	0.5	0.5	0.5	0.75	0.75	1	1	1.25	1.5
交流制动电压 (AC-V)	230 or 400	230 or 400	230 or 400	230 or 400	400	400	400	400	400
直流制动电压 (DC-V)	103 or 180	103 or 180	103 or 180	103 or 180	180	180	180	180	180
适配马达机座号	63	71	80 or 90	100 or 112	132	160	180	200 or 225	250 or 280
制动吸合时间 (ms)	40	40	70	190	200	260	340	390	420
慢速制动释放时间 (ms)	300	300	450	570	600	780	1650	2000	3000
快速制动释放时间 (ms)	30	30	45	57	60	78	165	230	380

8. 马达常见故障排查与维修方法

故障现象		可能原因	处理方法
1	不能起动	a. 定子绕组有一相开路	检查定子绕组，查出断路处，加以修复
		b. 定子绕组匝间及相间短路	测量定子绕组每相电阻和各相空载电流是否平衡，查出所在处，加包绝缘
		c. 定子接线错误	按铭牌上规定的接法和接线图，查出定子绕组的接线，纠正错误联接

故障现象		可能原因	处理方法
		d. 负载或传动机械有故障	把马达和负载分开，如马达能正常起动，应检查被拖动机械，消除障碍
		e. 变频器参数设置不当	检查变频器参数，进行调整（变频马达）
		f. 制动器未动作	检查制动器及其电器（制动马达）
2	变频马达起动后转速低于额定转速	a. 变频器的输出频率与输出电压设定不当	按使用要求重新设定
		b. 负载过重	检查负载传动装置是否正常
3	马达有异常噪声或振动过大	a. 机械摩擦（包括定转子相擦）	检查转动部分与静止部分间隙，找出相擦原因，进行校正
		b. 缺相运行	断电，再合闸，如不能起动，则可能有一相断电，检查电源或马达并加以修复
		c. 轴承缺油或损坏	清洗轴承，加新油，或更换新轴承
		d. 马达接线错误	查明原因，加以更正
		e. 修理后转子平衡被破坏	重新校动平衡
		f. 轴身弯曲，变形	校直，必要时须更换转轴
		g. 联轴器俩连接松动	查清松动处，把螺栓拧紧
		h. 安装基础不平衡或有缺陷	检查基础固定情况，加以纠正
4	马达温升过高	a. 过载	用电磁式电流表测量定子电流或检查变频器面板上的电流显示值（变频马达），发现过载时，应减轻负载

故障现象		可能原因	处理方法
		b. 缺相运行	检查马达定子接线或变频器接线（变频马达），并加以修复
		c. 马达接法错误	△接法马达误接成Y 接工作或相反，必须立即断电改接
		d. 定子绕组接地或匝间或相间短路	检查找出短路和通地的部分，进行修复
		e. 定、转子相擦	检查轴承装配有无松动，定子和转子装配有无不良情况，加以修复
		f. 通风不畅	检查风机和风叶有否损坏，风道有否阻塞。风机或风叶损坏应予以修复或更换。风道阻塞应移开妨碍通风的物件，清除风道污垢、灰尘及杂物，使空气流通
		g. 变频器的V/f 参数设置不当，使马达低速轻载时出现过激励，电流大于额定值	调整 V/f 的参数设置(变频马达)
		h. 利用变频器的直流制动功能对马达进行制动时，制动电流太大	调整直流制动电流的设置，根据制动频繁程度，一般设置在额定电流的 100%~150%。（变频马达）
		i. 制动器动作迟缓	检查制动器气隙和直流励磁电压(制动马达)
5	轴承过热	a. 轴承损坏	更换轴承
		b. 轴承润滑脂过多、过少或有杂质	调整或更换润滑脂

故障现象		可能原因	处理方法
		c. 轴承与轴、轴承与端盖配合过松或过紧	修整到合适的配合
		d. 马达两侧端盖或轴承盖没有装配好（不平行）	将两侧端盖或轴承盖止口装平，旋转螺栓
		e. 轴伸端油封安装不良	调整到合适的安装状态
6	马达外壳带电	a. 接地不良	检查接地螺栓，接地线同机壳接触是否紧密
		b. 绕组受潮，绝缘电阻过低	绕组干燥处理
		c. 绝缘损坏，定子线圈碰铁芯	予以修复
		d. 接线板有污垢	清理接线板
		e. 引出线绝缘磨破	破损处用绝缘材料包扎
7	马达在负载时不能起动	a. 定子绕组有匝间短路	检查各相电阻和各相电流
		b. 过载	检查马达负载电流
8	三相电流不平衡	a. 匝间短路	修理绕组
		b. 接线错误	改正接线
		c. 三相电源电压不平	改善供电质量
9	保险丝熔断	a. 两相间短路	修理绕组
		b. 负载过大	减小负载
		c. 电压过低	升高电压
10	绝缘电阻低或击穿	a. 绝缘老化或损伤	检修绝缘
		b. 不清洁	用干燥的压缩空气吹净内部
		c. 绕组或接线板受潮	拆开烘干或处理后再用

故障现象		可能原因	处理方法
11	制动马达 制动失灵	d. 马达过热	拆开检修防止继续过热
		a. 摩擦片磨损较大	调整气隙
		b. 弹簧失效	调换弹簧
		c. 动作迟缓	调整气隙，检查励磁电压
		d. 整流器损坏	调换整流器
	e. 制动线路故障	正确排除制动线路故障	

**注意:**

- ◆ 用户想获得更详细的资料，请与本公司联系。
- ◆ 无需通知，本公司保留对马达使用维护说明书的修改权。

9.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

邮箱登录

新用户注册

0589

登录

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

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Introduction

Welcome to use BONENG Drive!

Before installation and use, please make sure to carefully read this manual to ensure the correct and safe use of the drive.

For more detailed information, please visit the BONENG Transmission official website: [BONENG \(www.boneng.com\)](http://www.boneng.com).



Scan code for product details

BONENG Transmiss
-ion Official Website



Scan the code to download the product manual

A1-Series Drive
CM22 User Manual

1. Technical Parameters

function		Technical data
Bus interface	A1-CM22-MB-PE	• Supports Modbus RTU communication • Baud rate: Maximum 115200 bps
Power Supply	Power Module Supply	• Provided by the power module, 24V/0.6A
	24V IN power supply from the terminal	• The terminal 24V IN and GND power supply, voltage: 18~30 Vdc; • Maximum operating current: 1A
	Encoder power	• Voltage range: DC 18V-0V • Maximum current: 200mA
Output power supply	Digital input terminal power	• Voltage: 10V; • Maximum current: 40mA
	Analog input terminal power	• Voltage: DC 24V • Maximum current: 350mA
	Encoder power	• Common terminal DICOM • Electrical isolation • Supports bidirectional input • Supports Source and Sink modes • Voltage: DC 24V • "1" signal voltage: >11V • "0" signal voltage: <5V • Typical current at 4V: 4mA • Response time: 6ms (including software filtering)
Digital output	1 relay (DO0)	• Maximum 30Vdc, 0.5A • Contact type: 1 normally open, 1 normally closed
Analog input	2 channels (AI0, AI1)	• Differential input • Voltage type supports -10V ... +10V, 0V ... 10V • Current type supports 0mA ... 20mA, internal resistance 500 ohm • Switch type via DIP switch

function		Technical data
Analog output	1 channel	• Supports 0V ... 10V • Reference potential is DGND
Encoder signal input	ABZ incremental encoder	• HTL; • Input frequency: maximum 200kHz • Cable length: 50m for 24V open collector type • 24V push-pull type 100m
Indicator light	2 bi-color indicator lights	• RDY indicator light: red and green bi-color • COM indicator light: red and green bi-color
Keyboard interface	Supports OP25	• Can be directly installed or externally mounted with cables • Can be connected to a PC via an RS485 to USB cable
Operating temperature	-20 °C ~ +50 °C	
Relative humidity	< 95%	No condensation allowed

Note: For more detailed instructions, refer to the official website user manual.

2. Driver wiring

2.1 Overview of the drive interfaces

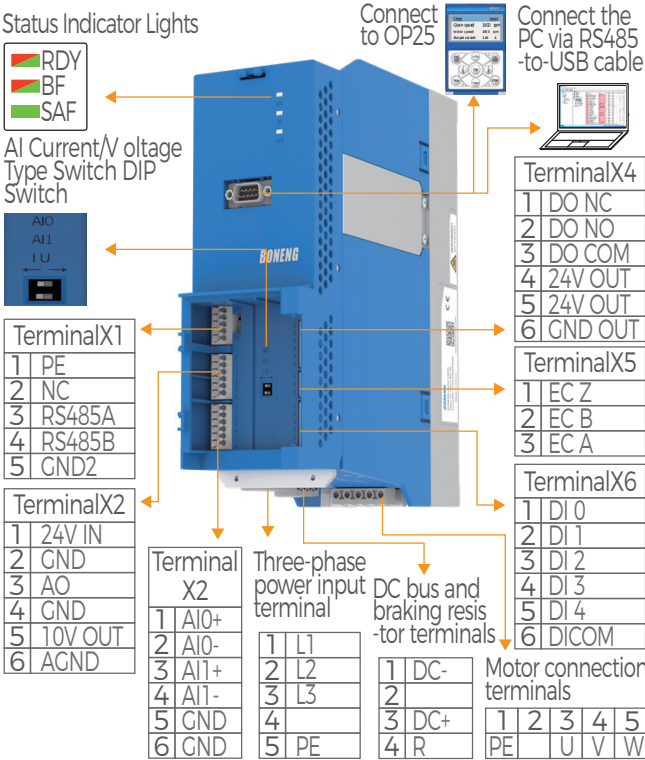


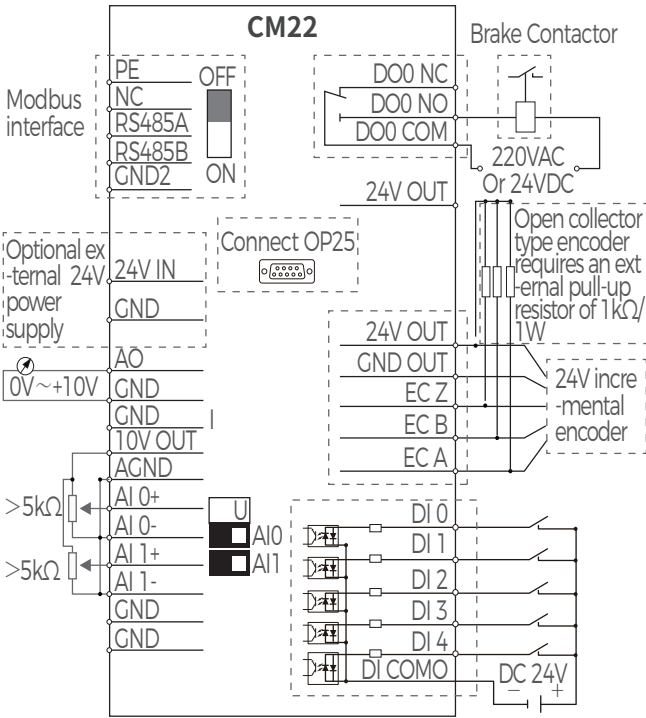
Table 1. Power unit terminal names and function descriptions

Terminal number	Terminal name	Description
Power input terminal	L1, L2, L3	Three-phase power input terminal, refer to the voltage input requirements on the nameplate of the drive power module (PM25, PM26)
	PE	Three-phase power grounding protection
DC bus and braking resistor terminals	DC+, DC-	DC bus terminal (shared DC bus for low-power models)
	DC+, R	Braking resistor connection terminal. When external energy dissipation resistors are required, connect the resistor between DC+ and R

Terminal number	Terminal name	Description
Motor connection terminals	U, V, W	Connect the motor phases U, V, W
	PE	Connect the motor ground wire

2.2 Control module terminal wiring

Before installing and wiring the control module, please first install the power module and perform the wiring according to the power module manual.

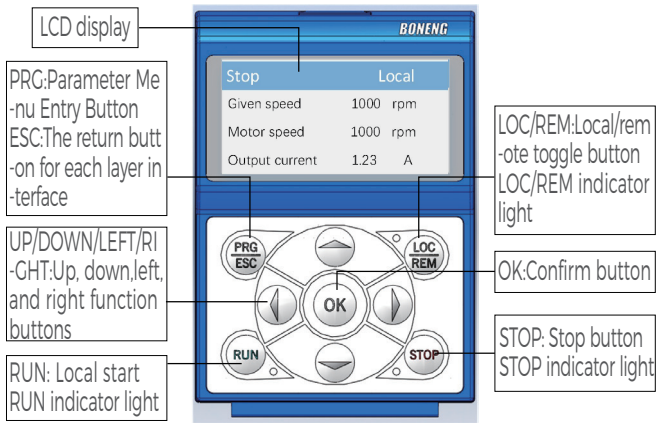


Note: For differential encoders, you can only use A+, B+, Z+ or A-, B-, Z- at the same time, and they must not be mixed.

3. Driver operation instructions

3.1 OP25 operation instructions

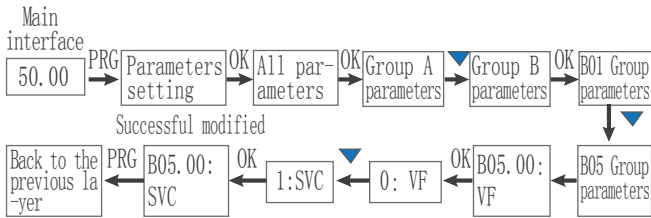
Please install the OP25 on the corresponding CM module for parameter debugging.



Button	Button name	Function
PRG/ESC	Program/Escape	In the main monitoring interface, press this button to enter the function selection interface; in other interfaces, press this button to return to the previous interface or status.
LOC/REM	Local/Remote	Acquire or release keyboard control
STOP	Stop button	In the running state, press this button to stop the operation; in the stopped state, press this button to reset the fault status
RUN	Run button	In the keyboard operation way, it is used for running operations
▲	Increment button	Increment of data or function code
▼	Decrement button	Decrement of data or function code
▶	Right shift button	When modifying parameters, you can cyclically select the modification bit to the right

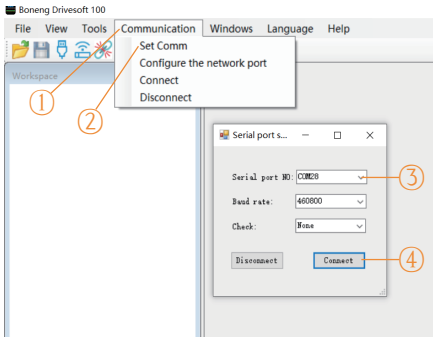
Button	Button name	Function
◀	Left shift button	When modifying parameters, you can cyclically select the modification bit to the left
OK	Confirm button	Enter menu screens step by step and confirm parameter settings

Example: Use OP25 to change the driver control from VF control to SVC control



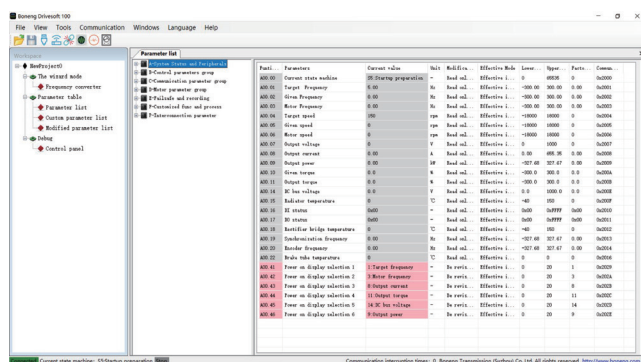
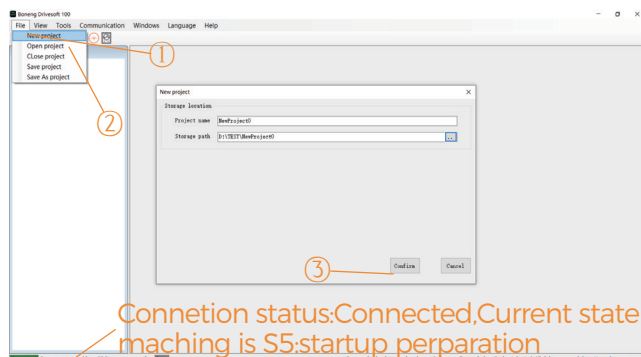
3.2 Debugging software Boneng Drivesoft 100 operation instructions

1. Please use a standard RS485 to USB cable to connect the inverter drive to the PC, and ensure that the PC has installed the Boneng Drivesoft 100 upper computer software.
2. Open the Boneng Drivesoft 100 upper computer software on the PC, and complete the communication connection with the drive: Menu -> Communication -> Set Comm -> Configure the network port -> Connect, as shown in the figure below.



Communication connection between the drive and the upper computer software Boneng Drivesoft

3. Create a project in the upper computer software
Boneng Drivesoft 100: File -> New project -> OK.



Create a project in the upper-level software and view the parameters

4. Quick start (trial operation)



Note:

- ◆ Before trial operation, please be sure to familiarize yourself with the safety precautions and important considerations for each inverter drive unit.

4.1 Preparation before debugging

Before performing a trial operation on the Boneng A1 inverter with a motor using the upper computer, the following equipment needs to be prepared:

- One set of Boneng A1 inverter
- Several inverter power cables and switches

- One RS485 to USB cable
- A PC and Boneng upper computer software
Boneng Drivesoft 100

Please connect the inverter, motor, and the drive to the PC according to the wiring diagram.

4.2 Inspection and precautions before trial operation

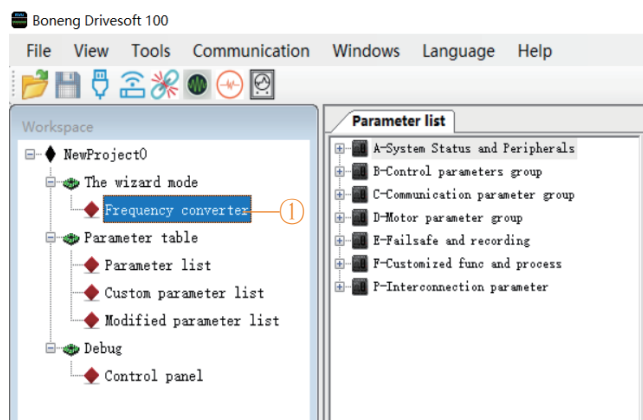
- Motor and external mechanical devices
 - Before the trial operation, please check the motor installation to ensure it is securely and stably fixed and reliable. Before the trial operation, make sure to disconnect the motor output shaft from the downstream load.
- Installation and wiring inspection
 - a. Please ensure the CM module of the A1 series inverter is securely connected to the PM module and confirm that the clips on the PM module have popped out correctly.
 - b. Before powering on, confirm whether the power supply voltage of the inverter matches its rated operating voltage according to the inverter's nameplate.
 - c. Ensure that the power cables and PE signal are correctly connected to the inverter, and check the motor nameplate to confirm that the motor side is correctly wired according to the connection method specified on the nameplate.
 - d. Ensure the grounding protection cable of the inverter is securely grounded to prevent electric shock.
- Motor brake connection inspection
 - a. Before the trial operation, please check whether the motor brake wiring is correct.

4.3 Debugging with Boneng DriveSoft 100

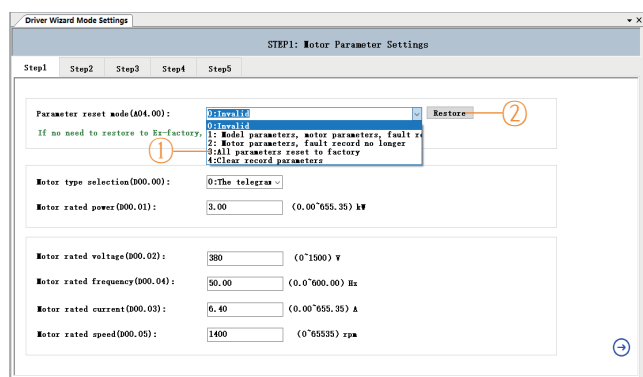
The following are the steps for performing a motor trial operation using the Boneng DriveSoft 100 upper computer software wizard:

Step1. Create a project in the upper computer software Boneng DriveSoft 100 (refer to Section 3.2), which allows real-time display of current parameters.

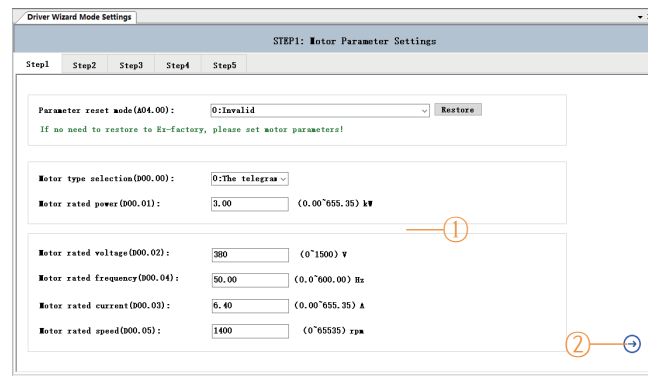
Step2. Select the wizard mode to make parameter changes within the wizard, as shown in the figure below.



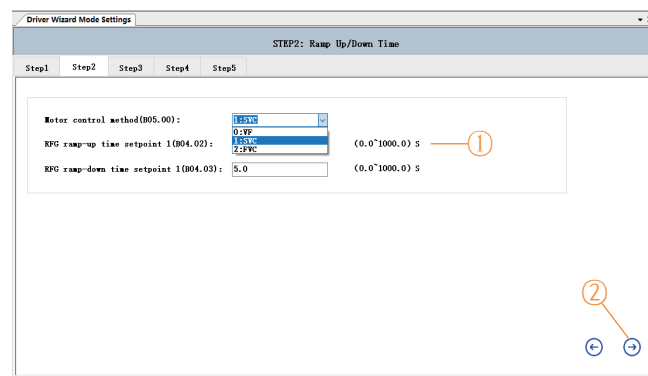
Step3. (Optional) Restore parameters to factory settings: In the wizard, select 【Parameter Reset Mode (A04.00)】, choose 【3: Reset All Parameters】, and then click 【Start Reset】, as shown in the figure below.



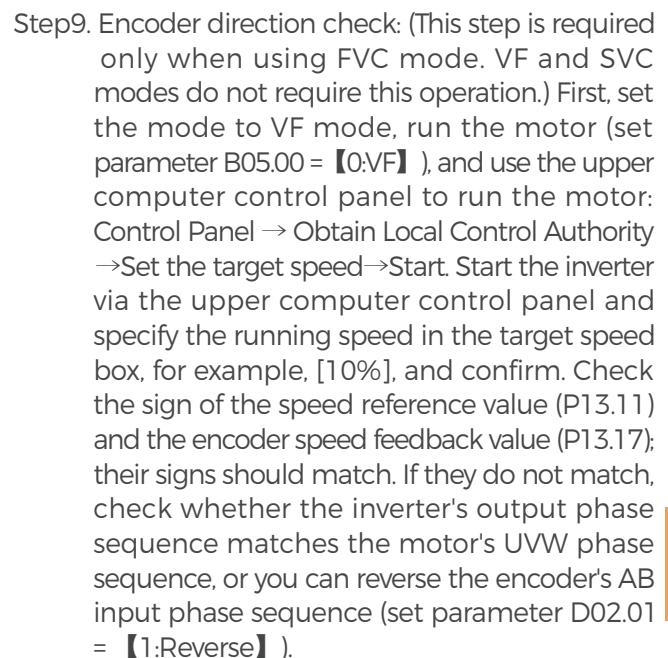
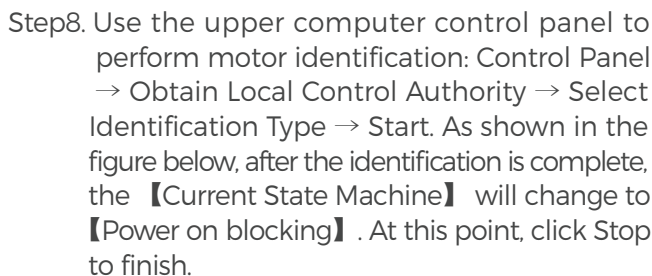
Step4. Set and check motor parameters: Configure motor parameters according to the motor nameplate, as shown in the figure below.



Step5. Motor control mode and ramp time settings: In parameter B05.00, select the desired motor control mode, such as: 【0:VF】 , 【1:SVC】 , 【2:FVC】 . Set the required acceleration and deceleration times in parameters B04.02 and B04.03 (defaulting to Ramp 1 acceleration and deceleration time), as shown in the figure below



Step6. The default start/stop control command source is terminal control. DI0 controls forward operation, DI1 controls reverse operation, and the OFF1 stop mode is deceleration stop. Connect the corresponding DI terminals. When DI0 is set to 1, the motor runs forward; when DI1 is set to 1, the motor runs in reverse. When the DI input is 0, the motor decelerates to stop. You can also modify parameter B01.01 to select the desired terminal control command mode and connect the corresponding DI terminals.



5. Common Parameters

5.1 Commonly Used Setting Parameters

Function Code	Function Code Name	Function Code Description
A04.00	Parameter reset mode	3: Reset all parameters. You need to confirm via A04.01 before resetting the parameters.
A04.01	Parameter reset	0: Cancel 1: Confirm
D00.01	Motor rated power	Set according to the motor nameplate
D00.02	Motor rated voltage	
D00.03	Motor rated current	
D00.04	Motor rated frequency	
D00.05	Motor rated speed	
B05.00	Motor control mode	0:VF 1:SVC 2:FVC
B00.21	Identification request	When B05.00 is set to 1 or 2, identification is required. The identification steps for an asynchronous motor are as follows: Press the LOC/REM button to set to local mode, set B00.21 to 2, then press the RUN button to start. After the inverter completes the identification, press the STOP button, then press the LOC/REM button to switch to remote mode.
B01.01	Terminal control command 1 mode	Terminal start/stop command. See the operation manual for details
B01.03	Terminal Ctrl command 1 input 1	
B01.04	Terminal Ctrl command 1 input 2	
B01.05	Terminal Ctrl command 1 input 3	
B02.00	Speed control main	Frequency setting source, refer to the operation manual

Function Code	Function Code Name	Function Code Description
Group B03	Multi-speed Setting	Multi-speed control, see the user manual for details
B04.02	RFG ramp-up time setpoint 1	Acceleration time
B04.03	RFG ramp-down time setpoint 1	Deceleration time
B00.23	OFF1 shutdown mode	0: Free stop 1: Deceleration stop
F04.00	Holding brake FUNC select	0: Do not use brake function, 1: Use brake function. This brake function is typically required for lifting equipment. If the brake is controlled via the DO terminal, set the DO function to P01.11.
Group A06	Digital Output	The DO output terminal function can be set, see the user manual for details.
Group A07	Analog Input	Analog input settings, refer to the user manual for details.
Group A08	Analog Output	Analog output settings, refer to the user manual for details.
Group C02	Modbus Communication	Modbus communication settings, refer to the user manual for details.

5.2 Commonly Used Monitoring Parameters

Function Code Number	Function Code Name	Function Code Description
A00.00	Current state machine	The current status of the drive.
A00.05	Given speed	In speed control mode, real-time speed given value; [rpm].
A00.06	Motor speed	Real-time speed feedback; [rpm].
A00.08	Output current	Real-time output current.
A00.09	Output power	Real-time output power.
Group P00	Hardware Status	Display the physical status of hardware interfaces such as DI, DO, DIO, etc.
P12.13	Panel given value	The target speed value given by OP in speed control mode. The unit is 0.1%.

Function Code Number	Function Code Name	Function Code Description
P12.14	PC given value	The target speed value given by the PC host computer in speed control mode. The unit is selected by the host computer control panel.
P12.16	DI state	DI real-time status.
P12.17	DO state	DO real-time status.
P13.00	Motor actual speed	Real-time motor speed feedback value; 4096 corresponds to 100% rated speed.
P13.11	Function final given speed	Final speed command value in speed control mode; 4096 corresponds to 100% rated speed.
P13.02 P13.11	-	Speed given monitoring data in speed control mode.
Group E00~E07	-	Display fault records and related information.

6. Drive Fault Descriptions

Fault Code	Fault name	Subcode	Subcode meaning	Solution
1	OverCUR	1	U phase overcurrent	1. Confirm that the motor parameters in Group D00 match the motor nameplate 2. Check for any damage to the power lines 3. Inspect cables for short circuits 4. Increase acceleration and deceleration times as needed 5. Reduce VF torque boost in VF control mode
		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	UWV three-phase overcurrent	
		8	Brake pipe hardware overcurrent	

Fault Code	Fault name	Subcode	Subcode meaning	Solution
		9	U phase VCE short circuit	6. Ensure the motor has completely stopped before restarting
		10	V phase VCE short circuit	7. Reduce or remove the load to identify issues
		11	UV two-phase VCE short circuit	8. For asynchronous motor vector control, confirm that proper parameter identification has been performed
		12	W phase VCE short circuit	9. Sub-code 8 indicates a brake resistor abnormality. Power off the drive and confirm the brake resistor connection is correct. Measure the resistance between DC+ and R, and compare it with the recommended value in the manual
		13	UW two-phase VCE short circuit	10. Replace the PM
		14	VW two-phase VCE short circuit	11. Restore factory settings and reconfigure the parameters
		15	Overcurrent abnormality	12. Contact after-sales support or the manufacturer for technical assistance
	DC overvoltage	1	The bus voltage is detected to exceed the threshold	1. Please check if the input power supply is within a reasonable range and ensure reliable input terminal connections
				2. Increase acceleration and deceleration time 3. Install a braking resistor or braking unit 4. Reset parameters and perform parameter identification

Fault Code	Fault name	Subcode	Subcode meaning	Solution
				-cation before running 5. Verify that the inverter power matches the motor power 6. Check if the encoder is damaged 7. Contact after-sales service or the manufacturer for technical support
3	DC under-voltage	1	The bus voltage is detected to be lower than the threshold value during operation	1. Please check if the input power supply is within a reasonable range and ensure reliable input terminal connections 2. Please confirm whether there is a momentary power outage in the power grid 3. Correctly set the A03.21 software undervoltage point 4. Replace the PM 5. Contact after-sales service or the manufacturer for technical support
5	Drive overload	1	The current detected is greater than the drive rated current (A02.06) and exceeds the overload allowable time	1. Please confirm whether the selected drive model is appropriate and that A03.00 is set consistently with the nameplate 2. Reduce the VF torque boost under VF control 3. Decrease the torque limit value under vector control 4. Check whether the load is too heavy or if there is a locked condition such as a brake

Fault Code	Fault name	Subcode	Subcode meaning	Solution
				5. Confirm proper parameter auto-tuning operation under vector control 6. For applications with an encoder, verify the encoder direction and parameter settings 7. Reset parameters and perform parameter identification before operation 8. Lower the carrier frequency or replace with a higher-power drive 9. Ensure the motor has completely stopped before restarting 10. Contact after-sales service or the manufacturer for technical support
6	Motor overload	1	The current value detected is greater than the motor rated current (D00.03) and exceeds the overload allowable time	1. Please confirm whether the motor load is excessive 2. Confirm whether motor parameter auto-tuning has been performed under vector control 3. For encoder applications, verify the encoder direction and parameter settings 4. Check whether the load is too heavy or if there is a locked condition such as a brake 5. Confirm whether the parameters in Group D00 match the motor nameplate parameters 6. Contact after-sales service or the manufacturer for technical support

Fault Code	Fault name	Subcode	Subcode meaning	Solution
7	Input phase loss	1	Abnormal bus voltage fluctuation is detected, and the input end is missing a phase	1. Please check whether the power input cable is properly connected 2. Ensure the input power supply is stable 3. Contact after-sales service or the manufacturer for technical support
8	Output phase loss	1	U phase output phase loss	1. Please check whether the corresponding output cable is correctly connected and properly secured 2. Confirm whether the motor is operating smoothly 3. Set the D00 group parameters according to the motor nameplate, and ensure A03.00 matches the nameplate 4. Replace the PM 5. Contact after-sales service or the manufacturer for technical support
		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	
9	Over-TEMP	1	The IGBT temperature of the driver (37Kw and below) exceeds the threshold The driver (37Kw and above models) IGBT-U phase temperature exceeds the threshold	1. Please confirm whether the ambient temperature is too high 2. Check if the radiator fan is functioning properly 3. Inspect whether the radiator air duct is blocked 4. Replace the PM 5. Ensure the A03.00 parameter matches the nameplate for the model 6. Contact after-sales service or the manufacturer for technical support
		2	The driver (37Kw and above models) IGBT-V phase temperature exceeds the threshold	

Fault Code	Fault name	Subcode	Subcode meaning	Solution
		3	The IGBT temperature of the driver (37Kw and below) exceeds the threshold The driver (37Kw and above models) IGBT-U phase temperature exceeds the threshold	
		4	The driver (37Kw and above models) IGBT-V phase temperature exceeds the threshold	
11	CUR zero drift error	1	U phase current zero drift is too large	1. Verify that the model (A03.00) settings match the nameplate 2. If the PM is faulty, replace the PM or contact after-sales service or the manufacturer for technical support
		2	V phase current zero drift is too large	
		3	W phase current zero drift is too large	
12	Short circuit to ground fault	1	U phase overcurrent when short circuit to ground	1. Please check if the corresponding output phase is shorted to ground 2. Check if the motor cable is damaged 3. Replace the motor or replace the inverter 4. Contact after-sales service or the manufacturer for technical support
		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	

Fault Code	Fault name	Subcode	Subcode meaning	Solution
13	Motor tuning fault	1	Dynamic tuning abnormality	1. Confirm if the D00 group motor parameters are consistent with the motor nameplate 2. Confirm the reliability of the output terminal wiring 3. Confirm the encoder wiring and its parameters are correct 4. Replace the PM 5. Contact after-sales service or the manufacturer for technical support
		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	
14	Encoder ABN	1	Dynamic tuning abnormality Encoder is not connected during closed-loop dynamic tuning	1. Route the cables properly, use shielded cables, and ground the encoder shield 2. Confirm the reliability of the encoder wiring 3. Check if the encoder-related parameters are set correctly 4. Check if the encoder power supply is selected correctly 5. Check if the D00 group motor parameters are consistent with the nameplate, and confirm the motor pole number(D00.09) 6. Confirm if the motor starts running after operation, and eliminate any locking situations 7. Contact after-sales service or the manufacturer for technical support
			Encoder speed measurement does not match during closed-loop dynamic tuning	
		2	Encoder disconnection during closed-loop operation	
		4	Phase A in ABZ is broken	
		9	Phase B in ABZ is broken	
		10	Phase AB in ABZ is broken	
		11	Phase Z in ABZ is broken	
		12	Phase AZ in ABZ is broken	

Fault Code	Fault name	Subcode	Subcode meaning	Solution
		13	Phase BZ in ABZ is broken	
		14	All ABZ is broken	
		15	Dynamic tuning abnormality Encoder is not connected during closed-loop dynamic tuning	
15	Vector stall alarm	1	The speed is reversed by external force and exceeds the set time (B06.59)	1. Confirm if the motor nameplate parameters are set correctly and perform parameter identification 2. Confirm if the motor parameter self-learning operation has been performed 3. Check if the D02 group encoder parameters are set correctly and the encoder wiring is correct 4. Check if the parameters related to stall are set reasonably 5. Contact after-sales service or the manufacturer for technical support
		2	The deviation between feedback speed and set speed (B06.61) is too large and exceeds the set time (B06.60)	
16	FPGA read/write error	1	FPGA data read and write errors	1. PM abnormal, power off and restart. If the issue persists, contact after-sales service or the manufacturer for technical support
17	Drive power fault	1	Driver power failure	1. Contact after-sales service or the manufacturer for technical support 2. Replace the PM
		3	Driver power failure during short circuit detection	

Fault Code	Fault name	Subcode	Subcode meaning	Solution
18	Primary power fault	1	24V primary power supply voltage is too low	1. Contact after-sales service or the manufacturer for technical support 2. Replace the PM
19	ABN COMM between CM and PM	1	CM no response	1. Please confirm if the lock of the CM is properly secured to ensure reliable connection between the CM and PM 2. Replace the CM or PM, check if the issue is resolved after replacement 3. Contact after-sales service or the manufacturer for technical support
		2	CM no response	
		3	CM no response	
		4	CM no response	
20	PM-EEPROM fault	1	Write parameter number exceeds limit	1. Contact after-sales service or the manufacturer for technical support
		2	Read parameter number exceeds limit	
		3	Single read time-out	
		4	Single write time-out	
		5	Read address out of bounds	
		6	Write address out of bounds	
21	PM model set error	1	The model setting is less than the minimum value	1. Re-burn the PM program 2. Re-set the correct PM power unit model 3. Contact after-sales service or manufacturer for technical support
		3	The model setting is greater than the minimum value	
22	Wave by wave CUR-limit fault	1	U phase wave-by-wave current limiting fault	1. Increase the acceleration time 2. Reset parameters and run after parameter ide

Fault Code	Fault name	Subcode	Subcode meaning	Solution
		2	V phase wave-by-wave current limiting fault	1. Identification 3. Replace the motor to eliminate motor failure 4. Replace the PM 5. Contact after-sales or the manufacturer for technical support
		3	W phase wave-by-wave current limiting fault	
		16	Abnormal fault	
23	Rectifier bridge overheat	1	The rectifier bridge temperature exceeds 90° (only 18.5Kw and above models are tested)	1. Remove foreign objects from the fan, turn off the fan speed control function (B06.48=0), and if the fan still does not turn, contact the manufacturer to replace the fan. 2. Check if the model value matches the nameplate. 3. Reduce the carrier frequency of the inverter if necessary, open the distribution cabinet door for better ventilation, and increase the airflow at the intake and exhaust vents of the distribution cabinet. 4. Contact after-sales or the manufacturer for technical support.
25	Brake pipe overheat	1	The brake pipe temperature exceeds 85° (only tested for 45Kw and above models)	1. Please check if the ambient temperature is too high. 2. Please check if the radiator fan is operating properly. 3. Please check if the radiator or airflow path is blocked. 4. Install an appropriate braking resistor. 5. Contact after-sales or the manufacturer for technical support.

Fault Code	Fault name	Subcode	Subcode meaning	Solution
33	Drive pre overload	1	Drive overload warning	1. Please confirm whether the driver overload protection function is enabled. 2. Refer to the solution for "5: Drive overload" fault. 3. Contact after-sales or the manufacturer for technical support.
34	Motor pre overload	1	Motor overload warning	1. Please confirm whether the driver overload protection function is enabled. 2. Refer to the solution for "6: Motor overload" fault. 3. Contact after-sales or the manufacturer for technical support.
35	ABN COMM	1	When the driver is controlled by the Boneng host computer, the communication between the CM module and the host computer is interrupted After the OP keyboard acquires local control, the communication between the CM module and the OP keyboard 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	1. Check if the CM module and OP keyboard are loose, and see if they can communicate after replugging

Fault Code	Fault name	Subcode	Subcode meaning	Solution
			OP keyboard is interrupted	2. If the OP keyboard is connected with an extension cable, check if the extension cable is loose or damaged 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
37	Motor speeding	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

Fault Code	Fault name	Subcode	Subcode meaning	Solution
38	Large motor speed DEV	1	The actual running speed of the motor differs from the set value by more than the setting value of B0630 and the setting time of B0631 is maintained.	1.Check whether the B06.30/B0631 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	Fault 39	2	The maximum time allowed by the device has expired	1. Contact equipment manufacturer
40	PID FDBK lost	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	1	Generate External Fault 1	1. Check external input signal
		2	Generate External Fault 2	
42	EXT warning	1	Generate External Warning 1	
		2	Generate External Warning 2	
43	Pre drive failed	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 exception	1	ARM chip type identification error	1.Re-power on to see if it is normal
		2	ARM chip main frequency configuration failed	2.Contact after-sales service or the manufacturer for technical support

Fault Code	Fault name	Subcode	Subcode meaning	Solution
45	Abnormal braking Ctrl	1	F04.00 selects brake with feedback information. During the braking 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	F04.00 selects brake with feedback information. During the process of closing the brake, F04.10 brake opening feedback signal is high level.	3.Contact after-sales service or the manufacturer for technical support
46	Abnormal Control Voltage	1	The PM's 24V power supply voltage is too high	1.Measure whether the 24V power supply voltage of PM exceeds 30V 2.Contact after-sales service or manufacturer for technical support
		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	1.Contact after-sales service or manufacturer for technical support

Fault Code	Fault name	Subcode	Subcode meaning	Solution
		5	3.3V voltage is too low	1.Contact 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 if the impedance of the brake relay is greater than 450Ω 2.Check if the brake relay is short-circuited 3.Contact after-sales service or the manufacturer for technical support
49	AI DIS-CONN fault	1	When AI0 type is selected as 4~20 ma, 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 the manufacturer for technical support
		2	When AI0 type is selected as 4~20 ma, 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 the manufacturer for technical support
50	Cap side fan fault	1	Fan failure on capacitor side	1.Check whether the fan on the capacitor side is operating normally 2.The fan on the capacitor side is damaged, contact the manufacturer for replacement 3.Contact after-sales service or the manufacturer for technical support

Fault Code	Fault name	Subcode	Subcode meaning	Solution
51	ROM fault	1	The parameter value stored in the EEPROM after power-on self-test is not within the set range	1.Restore the parameters to factory values and then power on again 2.Contact after-sales service or manufacturer for technical support
		5	Incorrect font version	1.Burn the correct font library 2.Contact after-sales service or manufacturer for technical support

7. Motor brake parameters (applicable only to Boneng asynchronous motors)

Brake Model	BN05	BN06	BN10	BN14	BN16	BN18	BN20	BN25	BN30
Braking Torque (N.m)	2	4	16	60	80	150	300	600	1000
Brake Power (W)	13	20	30	50	55	85	100	110	200
Rated Clearance (mm)	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6
Maximum Clearance (mm)	0.5	0.5	0.5	0.75	0.75	1	1	1.25	1.5
AC Brake Voltage (AC-V)	230or 400	230or 400	230or 400	230or 400	400	400	400	400	400
DC Brake Voltage (DC-V)	103or 180	103or 180	103or 180	103or 180	180	180	180	180	180
Compatible Motor Frame Size	63	71	80-90	100-112	132	160	180	200-225	250-280
Brake Engage Time (ms)	40	40	70	190	200	260	340	390	420
Slow Brake Release Time (ms)	300	300	450	570	600	780	1650	2000	3000
Fast Brake Release Time (ms)	30	30	45	57	60	78	165	230	380

8. Common Motor Fault Troubleshooting and Repair Methods

Fault Symptoms		Possible Causes	Solutions
1	Cannot start	a. One phase of the stator winding is open	Check the stator winding, locate the open circuit, and repair it.
		b. Short circuit between turns or phases in the stator winding	Measure the resistance of each phase of the stator winding and check if the no-load current of each phase is balanced. Locate the problem area and insulate it
		c. Incorrect stator wiring	Check the stator winding connections according to the wiring diagram and the connections specified on the nameplate. Correct any incorrect connections
		d. Fault in the load or transmission mechanism	Disconnect the motor from the load. If the motor starts normally, check the driven machinery and eliminate any obstacles
		e. Incorrect inverter parameter settings	Check the inverter parameters and make adjustments (for variable frequency motor)
		f. The brake is not acting	Check the brake and its electrical components (for brake motor)
2	The speed of the variable frequency motor is lower than the rated speed after starting	a. Incorrect setting of the output frequency and output voltage of the inverter	Reset according to the usage requirements
		b. Overload	Check if the load transmission mechanism is functioning properly
3	The motor makes abnormal noise or vibrates too much	a. Mechanical friction (including stator and rotor rubbing)	Check the clearance between rotating and stationary parts, identify the cause of contact, and make corrections

Fault Symptoms		Possible Causes	Solutions
		b. Phase loss operation	Disconnect the power and then reconnect. If the motor still cannot start, there may be a phase loss. Check the power supply or motor and repair as necessary
		c. Insufficient lubrication or damaged bearing	Clean the bearing, add fresh oil, or replace the bearing
		d. Motor wiring error	Identify the cause and correct it
		e. Rotor balance is damaged after repair	Rebalance the rotor
		f. Shaft bending or distortion	Straighten the shaft, and replace it if necessary
		g. Coupling connection is loose	Identify the loose parts and tighten the bolts
		h. The installation foundation is unbalanced or defective	Check the foundation fixation and make corrections
4	Motor temperature is too high	a. Overload	Use an electromagnetic ammeter to measure the stator current or check the current display on the inverter panel (for variable frequency motor). If overload is detected, reduce the load
		b. Phase loss operation	Check the motor stator wiring or inverter wiring (for variable frequency motor) and repair it
		c. Incorrect motor connection	If a delta-connected motor is mistakenly wired as star or vice versa, power must be immediately disconnected and the wiring corrected

Fault Symptoms	Possible Causes	Solutions
	d. Stator winding grounding or short circuit between turns or phases	Check and locate the short circuit or grounding parts, and repair them
	e. Stator and rotor rubbing	Check if the bearing assembly is loose, and if there are any issues with the stator and rotor assembly. Repair as needed
	f. Poor ventilation	Check if the fan and fan blades are damaged, and if the air duct is blocked. Damaged fans or fan blades should be repaired or replaced. Blocked air ducts should have obstructions removed, and dirt, dust, and debris should be cleared to ensure proper airflow
	g. Incorrect V/f parameter settings of the inverter, causing over-excitation at low speed and light load, with current exceeding the rated value	Adjust the V/f parameter settings (for variable frequency motor)
	h. When using the inverter's DC braking function to brake the motor, the braking current is too high	Adjust the DC braking current settings according to the frequency of braking, generally set between 100% and 150% of the rated current (for variable frequency motor)
	i. Brake action is slow	Check the brake air gap and DC excitation voltage (for brake motor)

Fault Symptoms	Possible Causes	Solutions
5 Bearing overheating	a. Bearing damage	Replace the bearing
	b. Excessive, insufficient, or contaminated bearing lubricant	Adjust or replace the lubricant
	c. Bearing and shaft, or bearing and endcap fit too loose or too tight	Refit to the appropriate fit
	d. Motor side end caps or bearing caps are not properly assembled (not parallel)	Install the stoppers of the end covers or bearing covers on both sides flat, and rotate the bolts
	e. Poor installation of the shaft extension oil seal	Adjust to the proper installation condition
6 Motor casing electrified	a. Poor grounding	Check the grounding bolts and whether the grounding wire is tightly connected to the casing
	b. Winding moisture, insulation resistance too low	Dry the windings
	c. Insulation damage, stator coil touching the iron core	Repair it
	d. Dirt on the terminal block	Clean the terminal block
	e. Insulation of the lead-out conductors worn out	Wrap the damaged area with insulating material
7 The motor cannot start with load	a. Stator winding has turn-to-turn short circuit	Check the resistance and current of each phase
	b. Overload	Check the motor load current

Fault Symptoms	Possible Causes	Solutions
8 Three-phase current imbalance	a. Turn-to-turn short circuit	Repair the winding
	b. Wiring error	Correct the wiring
	c. Three-phase power supply voltage imbalance	Improve the power supply quality
9 Fuse blown	a. Short circuit between two phases	Repair the winding
	b. Load too large	Reduce the load
	c. Voltage too low	Increase the voltage
10 Low insulation resistance or breakdown	a. Insulation aging or damage	Inspect the insulation
	b. Not clean	Blow the interior clean with dry compressed air
	c. Windings or terminal block dampened	Disassemble and dry or process before use
	d. Motor overheating	Disassemble for inspection to prevent further overheating
11 Braking failure of the motor brake	a. Friction plate is heavily worn	Adjust the air gap
	b. Spring failure	Replace the spring
	c. Slow action	Adjust the air gap and check the excitation voltage
	d. Rectifier damage	Replace the rectifier
	e. Brake circuit failure	Correctly eliminate brake circuit faults



Note:

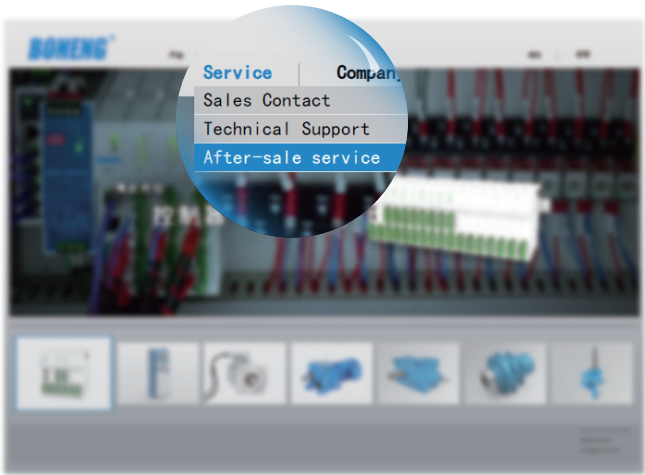
- ◆ Users who wish to obtain more detailed information, please contact our company.
- ◆ No notification is required. Our company reserves the right to modify the motor usage and maintenance manual.

9.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

[Email sign](#)

[New user registration](#)

Please enter email address

Please enter your password

Please enter the verification code



Sign in

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

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