BONENG

AX 驱动器 CM55

AX-Series Drive CM55

快速调试手册

QUICK COMMISSIONING MANUAL

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）。

博能传动官方网站

MX伺服马达-
AX驱动器使用手册

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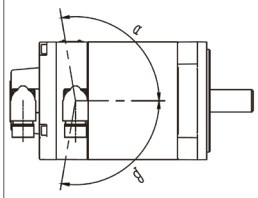
1. 伺服马达电气连接注意事项

a. 马达动力线和编码器线缆使用航空插头与马达连接，在安装时，请务必对准连接头上的标记；对准后的连接头在拧紧时，顺滑无卡顿现象；若有卡顿，应检查是否对准，不可强行拧紧，以免损坏插针。

b. 安装完好的接头，公头应完全压过绿色密封圈。

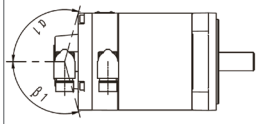
c. 马达上的功率连接器和信号连接器可以在一定范围内旋转，旋转时确保勿超过允许角度。

d. 动力线连接器旋转范围：



马达机座号	角度α_1	角度β_1
MX028	135°	140°
MX036	135°	140°
MX048	135°	140°
MX063	135°	140°
MX080	135°	200°
MX100	135°	200°

e. 编码器线连接器旋转范围：



马达机座号	角度α_1	角度β_1
MX028	140°	135°
MX036	140°	135°
MX048	143°	135°
MX063	105°	110°
MX080	100°	100°
MX100	95°	95°

触电危险！

- 务必确保在驱动器及马达断电状态下拆装连接线缆。
- 请遵守电气设备工作规范，只允许由专业人员安装驱动器和连接器。
- 马达含有静电元器件，请采取防静电措施。

2. 伺服马达制动器参数

制动器型号	BN 028	BN 036	BN 048	BN 063	BN 080	BN 100
静摩擦力矩(N·m)	≥1.9	≥2.4	≥3.8	≥10	≥22	≥60
制动器功率(W)	8.76	6.74	13.4	14	19	25
转动惯量(kg.cm2)	0.09	0.11	0.39	0.78	2.55	14.7
工作电压(Vdc)	24± 10%	24± 10%	24± 10%	24± 10%	24± 10%	24± 10%
工作温度(℃)	-15 ~120	-15 ~120	-15 ~120	-15 ~120	-15 ~120	-15 ~120
制动吸合时间(ms)	≤20	≤20	≤30	≤25	≤30	≤50
制动释放时间(ms)	≤35	≤80	≤50	≤90	≤100	≤220
紧急制动次数(次)	2000	2000	2000	500	2000	500
每小时最大紧急制动次数(次/小时)	20	20	20	20	20	20
最大紧急制动转速(rpm)	6000	6000	6000	3000	3000	3000
适配马达机座号	028	036	048	063/ 080S	080M/ 100S	100M/ 100L

3. 伺服马达常见故障排查与维修方法

常见故障	原因	维修方法
马达无法起动	过载堵转	降低负载
	驱动器故障报错	检查动力线和信号线连接/检查驱动器参数设置
马达加速缓慢	过载	降低负载
	驱动器参数设置不合理	检查驱动器参数设置
	动力线中某一相在接通后断开	检查驱动器和动力线连接以及航插连接/检查绕组电阻
	定子绕组中出线匝间短路或相间短路	确定绕组电阻和绝缘电阻，并联系厂家进行维修
起动时发出隆隆声	动力线的某一相在接通后断开	检查驱动器和动力线连接以及航插连接/检查绕组电阻
	定子绕组中出线匝间短路或相间短路	确定绕组电阻和绝缘电阻，并联系厂家进行维修
运行时发出隆隆声	过载	降低负载
	动力线的某一相在接通后断开	检查驱动器和动力线连接以及航插连接/检查绕组电阻
	定子绕组中出线匝间短路或相间短路	确定绕组电阻和绝缘电阻，并联系厂家进行维修
空载运行时马达过热	冷却风的通风被异物阻挡	清除阻碍物，保证冷却风自由通畅
负载运行时马达过热	过载	降低负载
	动力线的某一相在接通后断开	检查驱动器和动力线连接以及航插连接/检查绕组电阻
	冷却风的通风被异物阻挡	清除阻碍物，保证冷却风自由通畅
运行不平稳	马达动力电缆和信号电缆屏蔽不充分	检查屏蔽和接地情况/检查周围附近是否存在干扰源
	线路中有虚接	重新锁紧动力及信号航插/检查驱动器和动力及信号电缆连接
刺耳的摩擦声，运行噪音	驱动器增益设置不合理	重新合理设置驱动器的增益
	旋转部件打滑	确定原因，修整部件
	电机内部有异物	联系厂商修理
	轴承损坏	联系厂商修理
径向振动	转子失衡	拆开转子，重新平衡转子
	转子不圆，轴弯曲	联系厂商修理
	校准不佳	校准设备，联查联轴器
	相连设备失衡	重新平衡相连设备
	齿轮箱运行不平稳	使齿轮箱正常运行
轴向振动	校准不佳	校准设备，联查联轴器
	相连设备失衡	重新平衡相连设备
	齿轮箱运行不平稳	使齿轮箱正常运行

4. 驱动器技术参数

功能		技术数据
工作电源	功率模块供电	数字量输入/输出端子作为输出使用时需外接24V电源
	24V IN	电压范围：DC 20.8 … 28.8V，最大电流：2.6A
输出电源	24V OUT	电压范围：DC 18V … 26.8V，最大电流：200mA
	10V OUT	电压范围：DC 9.5V … 10.5V，最大电流：40mA
	DB15接口编码器电源	电压：DC 5V或DC 24V，最大电流：350mA
	RJ45接口编码器电源	电压：DC 5V，最大电流：200mA
数字量输入	11个（DI0~DI10）	DI1、DI3、DI5、DI7为非共公共端子类型
		DI0、DI2、DI4、DI6共公共端子DICOM0
		DI8、DI9、DI10共公共端子DICOM1
		支持Source和Sink模式
		电压：DC 24V、AC 36V,24V典型电流:4mA
		"1"信号电压：>11V，"0"信号电压：<5V
		响应时间：6ms（含软件滤波）
数字量输出	1个继电器（DO0）	电压：DC 24V、AC 220V
		连续电流：2A（感性负载：0.6A），切换电流：2A
		触点类型：1常开1常闭

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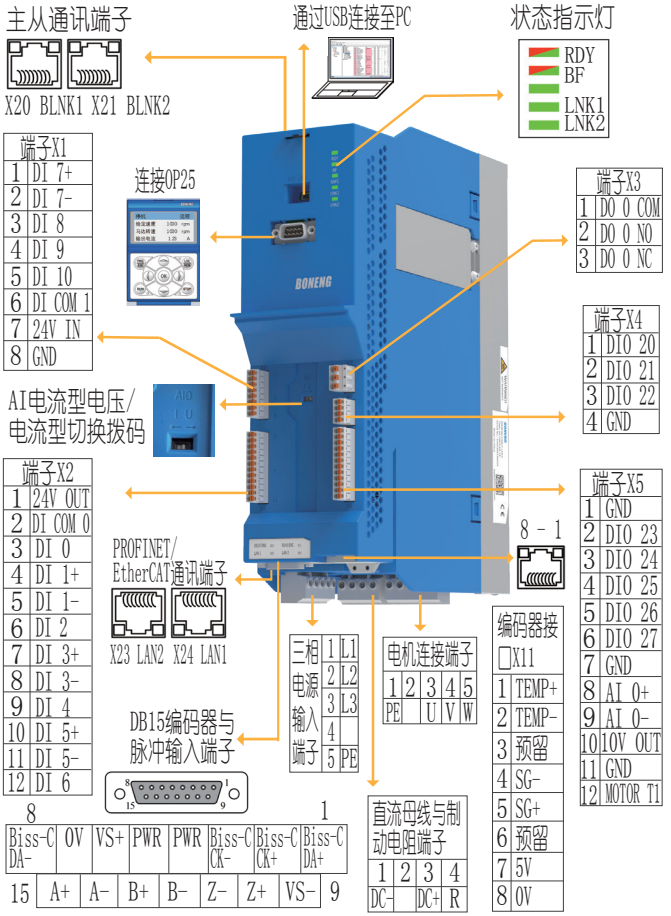
功能		技术数据
数字量输入/输出	8个（DI020~DI027）	电压：最大DC 30V
		电流：输出最大200mA，24V输入典型4mA
		频率：最大100Hz
		输入"1"信号电压：>15V，输入"0"信号电压：<5V
		非电气隔离
		外部供电端子需接24V
模拟量输入	1个（AI0）	差分输入，拨码开关切换电压和电流模式
		电压型支持-10V … +10V、0V … 10V
		电流型支持0mA … 20mA、4mA … 20mA
		电流型内阻250Ω
		精度：±1%
温度传感器	2个	分别位于端子X10和X11
		支持KTY84-130、PTC
编码器信号输入	1个ABZ编码器接口	支持24V的单端信号、5V和24V差分类型的ABZ类信号
		输入频率：最大250kHz
		断线侦测：仅支持差分类型
		最大长度：5V差分类型100m 24V开集极类型50m 24V推挽类型100m 24V差分类型300m
	1个BISS-C编码器接口	波特率：最大4Mbps
		最大长度：50m
	1个RS485编码器接口	波特率：最大2.5Mbps
		最大长度： 20m
调试接口	1个Mini-B	USB 2.0

备注：更多详细说明参见官网详细使用手册。

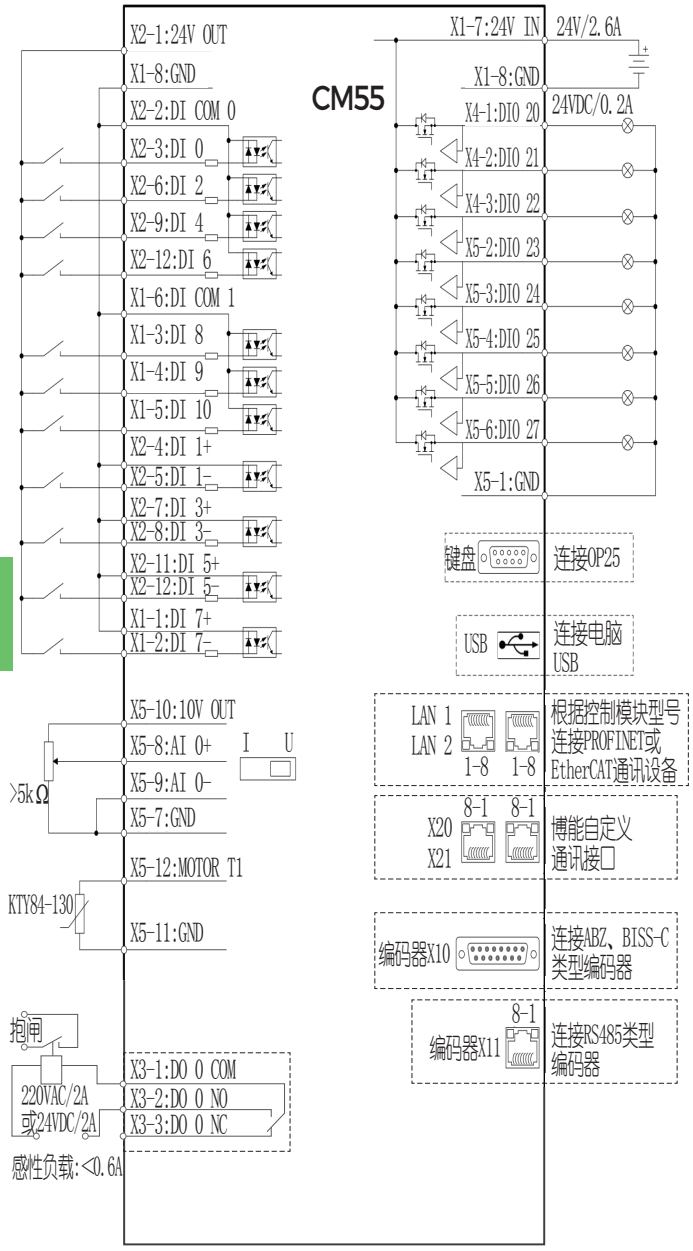
5. 驱动器配线

5.1 驱动器接口一览



端子编号	端子名称	说明
电源输入端子接口	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。

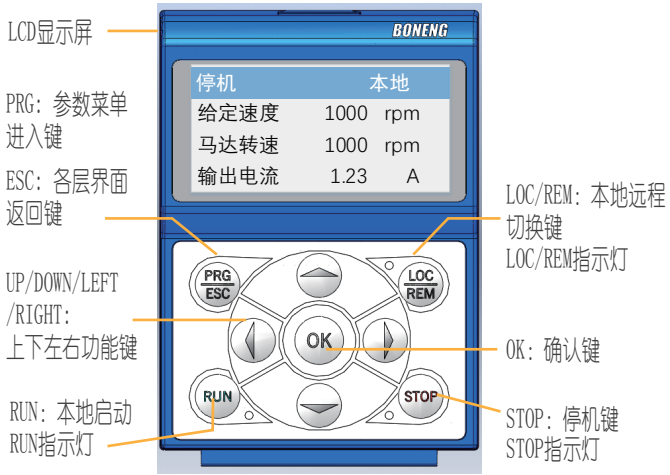
5.2 控制模块端子配线



6. 驱动器操作说明

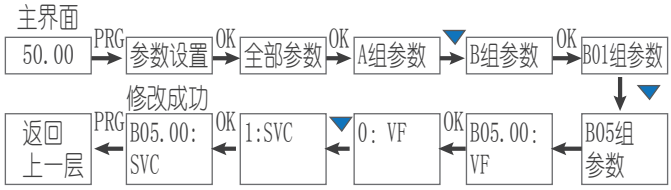
6.1 OP25操作说明

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

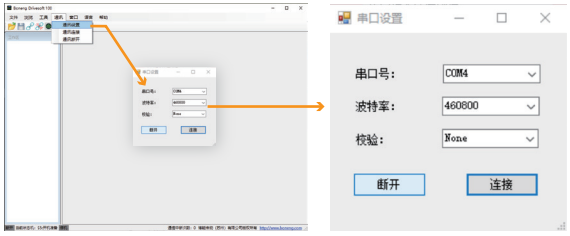
例：用OP25将驱动器从VF控制改为SVC控制



6.2 调试软件 Boneng Drivesoft 100 操作说明

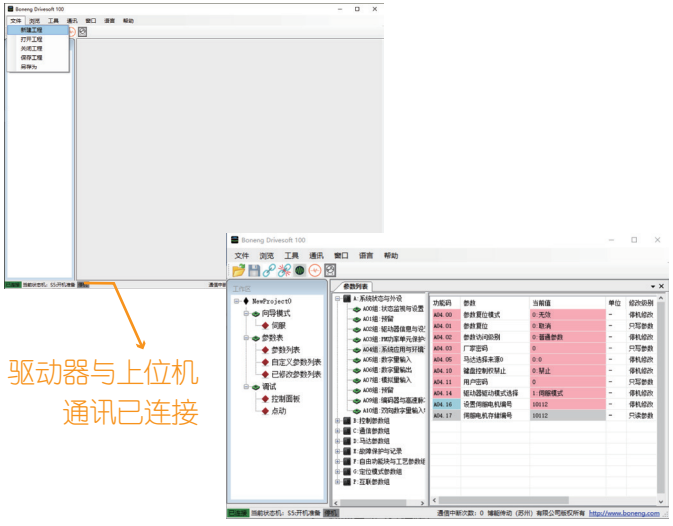
1. 请使用标准 USB 线缆连接伺服驱动器与 PC，确保 PC 端已安装好博能驱动器上位机软件 Boneng Drivesoft 100。

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 -> 通讯 -> 通讯设置 -> 串口号，选择对应的串口号 -> 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 -> 新建工程 ->确定 。



上位机软件中建立工程并查看参数

7. 快速启动（试运转）

注意:

- 试运转前请务必知悉各个伺服单元操作的安全与注意事项。

7.1 调试前准备

使用上位机对博能AX伺服驱动器带伺服电机进行试运转前需要准备以下设备：

- 博能MX-AX伺服一套；
- 伺服驱动器电源线缆及开关若干；
- 一端为 miniUSB公口 （B型插头）的USB数据线一条；
- PC及博能上位机软件Boneng Drivesoft 100。

请按照接线图连接好伺服驱动器、伺服电机以及编码器线缆，并连接好伺服驱动器与PC。

7.2 试运转前检查和注意事项

- 伺服电机与外部机械装置

  试运转前请检查伺服电机的安装，务必确保伺服电机安装固定稳定安全可靠。试运转前请务必将伺服电机的输出轴与后级负载分离。

- 安装与配线检查

  a. 请确保AX系列伺服驱动器的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. 请确保驱动器与伺服电机的功率匹配。例如电机功率和驱动器功率不可相差太多，否则不保证运行正常。

  c. 送电前请根据驱动器铭牌确认伺服驱动器的供电电源电压是否和伺服单元的额定工作电压匹配。

  d. 请确保伺服的动力线缆及信号线缆可靠连接，动力线缆的屏蔽层和PE信号都已正确接在驱动器上。

e. 请确保伺服驱动器的接地保护线缆可靠接地，以防触电。

f. 切勿将原厂线缆切断后再延长，否则容易产生干扰，甚至损坏。

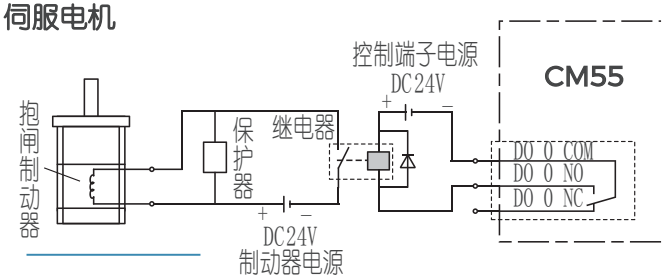
◆ 电机制动器接线检查

a. 试运转前请检查伺服电机抱闸的配线是否正确，伺服电机端的抱闸输入信号有正负极性，请勿接反，接反后制动器将无法正常打开。

b. 请为电机抱闸提供单独的供电电源，请勿使用伺服驱动器的24V端子输出电源作为电机的抱闸电源，同样不可使用同一开关电源为驱动器端子与电机抱闸共同供电，否则可能引起干扰问题。

使用伺服驱动器的DO端子控制伺服电机抱闸，请按下图所示方法接线。

伺服电机



伺服电机抱闸制动器接线示意图

注意:

- 继电器应按图示安装保护装置；
- 若使用PM的抱闸输出端口接继电器的控制段子，则无需再外接控制端子电源。
- 部分控制模块（例如CM51等）不支持使用PM抱闸控制接口，详见使用手册。

7.3 使用 BonengDriveSoft 100 调试

以下是使用博能驱动器上位机软件 Boneng Drivesoft 100 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6.2），可实时显示当前参数。

◆ 步骤2：

（可选项）参数恢复出厂设置：A04.00 =【3:全部参数恢复出厂】➡A04.01 = 【1:确认】➡等待参数恢复完成（看调试软件左下角状态机）。

◆ 步骤3：

设置驱动模式：A04.14 =【1: 伺服模式】（驱动器提示重新上电）。

◆ 步骤4：

设置、检查电机参数：若驱动博能伺服电机，检查A04.17与电机铭牌上的马达ID是否一致[①]；若驱动普通三相异步电机则需要根据电机铭牌设置马达参数（D00组：马达基本参数，D02组：编码器相关参数），并通过设置B00.21后启动以执行马达参数辨识。

◆ 步骤5：

驱动器重新上电，检查电机参数（D00~D02组参数）是否与电机铭牌一致。

◆ 步骤6：

编码器方向检查：VF模式下运行电机（设置参数

① 旧版本软件（CM55-PN_v5.10或CM55-EC_v6.10及以下）需要在A04.16中手动设置马达ID号后电机参数方可自动更新，马达ID见电机铭牌；新版本软件可自动读取马达ID及马达参数。

B05.00 =【0:VF】，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伺服电机UVW线相序是否匹配。

- 步骤7：
  完成步骤6后，停机，修改参数 B05.00 = 【2:FVC】。
- 步骤8：
  使用上位机点动面板进行速度点动控制：获取本地控制权限 —> 设置JOG方式为速度点动 —> 设置点动目标速度—>按 启动 按钮电机轴开始加速到目标速度，松开 启动 按钮，轴减速停止。

速度点动界面　　位置点动界面

若运行速度控制，到此试运转完成；若运行位置控制，继续执行步骤9及后续步骤。

- 步骤9：
  设置电子齿轮比参数G00.04=【10000】（该参数为试运转测试用，实际使用时应根据电机轴后级传动比例计算后设置）。
- 步骤10：
  修改控制模式为【2：位置控制】（或手动更改参数 B05.01 =【2:位置控制】）②。
- 步骤11：
  使用上位机点动面板进行位置点动控制：获取本地控制权限➡设置JOG方式为位置点动 ➡ 设置位置点动运动参数（若电机输出轴与减速机连接，应根据减速机速比设置位移量和最大速度）➡ 伺服使能 ➡ 点按启动按钮触发位置点动，电机轴开始运转，直到位置指令完成，轴减速停止。可再次点按启动按钮，轴再次运动目标位置后停止 ➡ 去使能，停机。

② 位置控制模式下支持速度点动和位置点动，速度控制模式下仅支持速度点动。

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8 常用参数

8.1 常用设置参数

功能序号	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	参数复位确认	0：取消　1：确认（**需等参数复位完成之后方可重新设置驱动器参数**）
D00.01 D00.02 D00.03 D00.04 D00.05	马达额定功率 马达额定电压 马达额定电流 马达额定频率 马达额定转速	应与电机铭牌参数一致。
B05.00	马达控制方式	0：VF　1：SVC　2：FVC
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DO端子控制抱闸，将DO功能设为P01.11即可。
A06组	数字量输出	可设置DO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。
B00.00	启停控制命令来源	若设置B00.00=【0：端子控制模块】，请在B01组设置端子相关参数；若设置B00.00=【1：自定义控制模块】，请在B00组设置端子相关参数。使用Profinet通讯或EtherCAT通讯时，通讯建立时会自动设置相关参数。
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	
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，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。**仅适用于异步电机，博能伺服电机无需进行马达参数辨识。**
B00.23	OFF1停机方式	0：自由停机　1：减速停机
速度控制模式 B02.00	速度控制主设定选择	频率给定来源，详见操作手册。
速度控制模式 B03组	多段速设置	多段速控制，详见使用手册。
速度控制模式 B04.02~B04.09	斜坡加减速时间	速度控制加减速时间设置与选择。同一时刻仅一组有效。
速度控制模式 B04.40	斜坡加速时间来源	选择速度控制模式下加减速时间来源，可设置为由B04.00~B04.09参数设定的加减速时间，也可通过互联参数选择上位控制器下发的时间。
速度控制模式 B04.41	斜坡减速时间来源	
位置控制参数 D02.18	绝对值编码器类型	编码器线带电池盒时选【1：多圈绝对值编码器】；否则选【0：单圈绝对值编码器】。
位置控制参数 G00.04	马达旋转一圈的位置指令数	第一组电子齿轮比，G00.04≠0时，电子齿轮比为 编码器分辨率/G00.04。
位置控制参数 G00.06	电子齿轮比1（分子）	第二组电子齿轮比，当G00.04=0时，该组电子齿轮比生效，电子齿轮比为G00.06/G00.08。
位置控制参数 G00.08	电子齿轮比1（分母）	
位置控制参数 G00.22	马达旋转方向选择	设置给正指令时马达旋转方向。
位置控制参数 G00.53	原点开关来源选择	设置原点开关连接的DI端子。应根据原点开关物理连接情况选择；高电平有效。
位置控制参数 G00.55	正限位命令来源选择	设置限位开关连接的DI端子。应根据限位开关的物理连接情况设选择；高电平有效。
位置控制参数 G00.56	负限位命令来源选择	
位置控制参数 G01.13	负载转动惯量比	设置负载与电机转子惯量比值。应该设置为实际比值。
位置控制参数 G02.01	刚性等级选择	设置机械系统的刚性等级。该参数影响位置、速度环增益，会影响系统动态响应性能，应与物理系统相匹配。
位置控制参数 G03.03	位置偏差过大故障值（圈）	当位置偏差超过该阈值，驱动器报故障【52：位置偏差过大】。该参数为电机侧圈数。

8.2 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	位置、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，DO，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	DO状态	DO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。
P13.01	马达最终设定速度	位置、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。
P14.04, P14.06	绝对位置累计值（Pel）	两个32位有符号数据，分别表示实时位置值，编码器单位。
P14.20	位置指令（指令单位）	实时位置指令，指令单位，32位有符号数。
P14.22	位置反馈（指令单位）	实时位置反馈，指令单位，32位有符号数。
P14.66	位置目标设定值	目标位置，指令单位，32位有符号数。
P14.84	DB15脉冲输入计数	DB15接口脉冲输入计数累加值,32位有符号数。
P15.25, P15.26	DB15脉冲输入计数（p）	DB15接口脉冲输入计数累加值;两个16位数据,组合后与P14.84相等;低16位无符号,高16位有符号;可用于互联。
E00~ E07组	-	显示故障记录与相关信息。

中文

9. 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	a. 确认D00组电机参数与电机铭牌一致。 b. 排除动力线破损问题； c. 检查线缆是否短路； d. 适当增加加减速时间； e. VF控制下减小VF转矩提升量； f. 请确认电机停止稳定后再启动； g. 减小或取消负载排查问题； h. 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； i. 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； j. 更换PM。 k. 恢复出厂值，重新设定参数。 l. 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	
2	直流过压	1	快速检测中母线电压过压	a. 请检查输入电源是否在合理范围，确认输入端接线可靠 b. 请增加加减速时间 c. 加装制动电阻或制动单元 d. 重新设置参数，参数辨识后运行 e. 确认驱动器功率与马达功率匹配 f. 检查编码器是否损坏 g. 联系售后或厂家，寻求技术支持
3	直流欠压	1	直流欠压	a. 请检查输入电源是否在合理范围，确认输入端接线可靠 b. 请确认电网是否瞬间断电 c. 正确设置A03.21软件欠压点 d. 更换PM e. 联系售后或厂家，寻求技术支持

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故障码	故障名称	子码	子码含义	解决措施
4	速度搜索失败	1	速度搜索参数设置不当	a. 修改转速追踪模式（B05.13）为从最大频率开始搜索或增大搜索时间（B05.14）
				b. 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	a. 请确认驱动器选型是否合适，A03.00设置与铭牌一致
				b. VF控制下减小VF转矩提升量
				c. 矢量控制下减小转矩限幅值
				d. 请确认负载是否过重，或者抱闸等锁死情况
				e. 矢量控制时请确认是否进行正确的参数自学习操作
				f. 带编码器应用下，请确认编码器方向及参数设定是否正确
				g. 重新设置参数，参数辨识后运行
				h. 降低载波频率，或更换更大功率驱动器
				i. 等电机完全停止后再起动；
				j. 联系售后或厂家，寻求技术支持
6	马达过载	1	马达过载	a. 请确认电机负载是否过大
				b. 矢量控制时请确认是否进行过电机参数自学习
				c. 带编码器应用下，请确认编码器方向及参数设定是否正确
				d. 请确认负载是否过重，或者抱闸等锁死情况
				e. 请确认D00组参数是否与电机铭牌参数一致
				f. 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	a. 请检查动力输入电缆是否接触良好
				b. 确保输入电源稳定
				c. 联系售后或厂家，寻求技术支持

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故障码	故障名称	子码	子码含义	解决措施
8	输出缺相	1	U相输出缺相	a. 请检查对应的输出电缆是否接线正确及接触良好 b. 请确认电机是否运行平稳 c. D00组参数按马达铭牌参数设置，A03.00设置与铭牌一致 d. 更换PM e. 联系售后或厂家，寻求技术支持
		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	UVW三相输出缺相	
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	a. 请确认环境温度是否过高 b. 请检查散热器风扇是否正常运转 c. 请检查散热器风道是否堵塞 d. 更换PM e. 机型A03.00参数设置与铭牌一致 f. 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	
10	PWM发波异常	1	U相发波异常	a. 重新断电上电，如果持续存在，则联系售后或厂家，寻求技术支持
		2	V相发波异常	
		4	W相发波异常	
11	电流零漂错误	1	U相零漂偏大	a. 检查机型（A03.00）设置是否与铭牌一致 b. 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	

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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	a. 请检查相应输出相是否对地短接 b. 检查电机线缆是否破损 c. 更换电机或更换驱动器 d. 联系售后或厂家，寻求技术支持
		2	对地短路时V相过流	
		3	对地短路时W相过流	
		4	对地短路电流超过阈值	
		5	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	a. 请确确认D00组电机参数是否与电机铭牌一致 b. 确认输出端接线可靠 c. 确认编码器接线及其参数正确 d. 更换PM e. 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	a. 规范走线，使用带屏蔽层的线缆，编码器屏蔽层接地 b. 请确认编码器接线是否可靠 c. 请检查编码器相关参数是否设置正确 d. 请检查编码器电源是否选择正确 e. 检查D00组电机参数是否与铭牌一致，确认电机级数D00.09 f. 确认运行后电机是否转起来，排出堵转的情况 g. 联系售后或厂家，寻求技术支持
		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	
		4	编码器Z信号异常	
		9	增量编码器A相断线	

故障码	故障名称	子码	子码含义	解决措施
14	编码器异常	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	
		16	通讯编码器通讯异常	
15	矢量失速报警	1	速度在外力作用下被反向	a. 请确认电机铭牌参数设置是否正确，进行参数辨识 b. 请确认是否做过电机参数自学习操作 c. 确认D02组编码器参数是否设置正确，编码器接线是否正确 d. 请检查和失速相关的参数设置是否合理 e. 联系售后或厂家，寻求技术支持
		2	速度偏差过大	
16	FPGA读写错误	1	初始化中FPGA读写错误	a. 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	a. 联系售后或厂家，寻求技术支持 b. 更换PM
		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	a. 联系售后或厂家，寻求技术支持 b. 更换PM

故障码	故障名称	子码	子码含义	解决措施
19	CM与PM通信异常	1	CM无应答	a. 请确认CM的锁扣是否锁紧，确保CM与PM可靠连接。 b. 更换CM或PM，判断更换前后能否排除故障 c. 联系售后或厂家，寻求技术支持
		2	CM无应答	
		3	通讯数据异常	
		4	初始化异常	
20	PM-EEPRO-M故障	1	EEPROM写入数据溢出	a. 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	a. 重新烧录PM程序 b. 重新设置机型至正常值 c. 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	a. 增长加速时间 b. 重新设置参数，参数辨识后运行 c. 更换电机，排出电机故障 d. 更换PM。 e. 联系售后或厂家，寻求技术支持
		2	V相电流异常	
		3	W相电流异常	
		16	逐波限流中断异常	
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）	a. 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。 b. 查看机型值是否与铭牌对应 c. 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 d. 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
24	STO故障	1	STO1为低电平	a. 请检查STO1或STO2开关是否触发 b. 请检查STO1和STO2接线是否可靠 c. 请检查STO1和STO2的电源是否正常 d. 联系售后或厂家，寻求技术支持
		2	STO2为低电平	
		3	STO1端子和STO2端子均为低电平	
25	制动管过热	1	制动管温度超过85℃（仅45Kw及以上机型检测）	a. 请确认环境温度是否过高 b. 请检查散热器风扇是否正常运转 c. 请检查散热器风道是否堵塞 d. 安装合适的制动电阻 e. 联系售后或厂家，寻求技术支持
26	伺服初始位置错误	1	UVW 编码器初始位置检测错误	a. 使用带屏蔽层的线缆，编码器屏蔽层接地；重新连接或更换编码器线缆 b. 确认编码器参数设置是否设置正确 c. 辨识零点，保证伺服零点位置正确；按照正确电机相序接线； d. 联系售后或厂家，寻求技术支持
		2	绝对值编码器通讯异常	
		3	绝度值编码器初始位置未校正	
		4	绝对值编码器初始位置检测超时	
		5	绝对值编码器零点矫正数据读写错误	
		6	绝对值编码器初始位置矫正失败	
		7	绝对值编码器数据读取错误	
		8	换相角偏差过大	
		9	换向角错误	
33	驱动器预过载	1	驱动器过载预警告	a. 请确认是否开启驱动器预过载功能 b. 处理方法参考"5:驱动器过载"故障。 c. 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
34	马达预过载	1	马达过载预警告	a. 请确认是否开启驱动器预过载功能 b. 处理方法参考"6:马达过载"故障。 c. 联系售后或厂家，寻求技术支持
35	通信异常	1	上位机控制驱动器运行时CM模块与上位机通信中断	a. 重新连接或更换连接线 b. 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	a. 检查操作面板与驱动器的通信线缆是否连接异常 b. 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	a. 检查Modbus线缆是否断开或者损坏 b. 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 c. 联系售后或厂家，寻求技术支持
		5	Canopen通信断线	a. 检查主站是否关闭 b. 通讯线是否损坏、是否过长；与干扰源过近。 c. 联系售后或厂家，寻求技术支持
		6	DriveLink通讯故障	a. 接收数据超时 b. 节点设置冲突 c. 联系售后或厂家，寻求技术支持
		7	PROFINET通信断线	a. PLC断电或连接线损坏。 b. 调节合适的通讯周期。 c. 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。 d. 联系售后或厂家，寻求技术支持

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故障码	故障名称	子码	子码含义	解决措施
35	通信异常	10	EtherCAT通讯异常	a. 连上PLC后查看C06.06查看提示信息；根据提示信息联系售后或厂家。 b. 联系售后或厂家，寻求技术支持
37	马达速度超限	1	马达转速超出最大转速限制	a. 请检查和马达超速相关的参数设置是否合理。 b. 检查是否有外部设备带着马达旋转的情况。 c. 联系售后或厂家，寻求技术支持
38	马达速度偏差大	1	马达转速与给定转速偏差过大	a. 请检查和马达速度偏差过大相关的参数设置是否合理。 b. 是否负载过重，抱闸是否及时打开。 c. 联系售后或厂家，寻求技术支持。
39	重新上电	1	驱动器部分参数修改需要重新上电	a. 驱动器重新上电。
40	PID反馈丢失	1	PID反馈采样值丢失	a. 检查PID反馈输入的信号 b. 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	a. 检查外部输入信号 b. 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	
		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	a. 检查外部供电电压是否异常 b. 联系售后或厂家，寻求技术支持
44	控制板异常	1	CM芯片类型识别异常	a. 控制模块硬件异常，更换控制模块 b. IO板与控制板不匹配或连接异常。 c. 联系售后或厂家，寻求技术支持
		2	配置时钟失败	
		3	控制模块IO板与主控板不匹配	

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故障码	故障名称	子码	子码含义	解决措施
45	抱闸控制异常	1	抱闸打开异常	a. 检查外部继电器是否异常 b. 检查抱闸接线是否正常，抱闸相关参数是否设置正确。 c. 联系售后或厂家，寻求技术支持
		2	抱闸关闭异常	
46	控制板电压异常	1	PM24V电源电压过大	a. 检查PM的24V供电电压是否异常 b. 联系售后或厂家，寻求技术支持
		2	外部24V电源电压过大	a. 检查外部24V供电电压是否异常 b. 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	a. 检测PM的24V或者外部24V电源电压是否低于17V b. 联系售后或厂家，寻求技术支持
		4	3.3V电压过高	a. 联系售后或厂家寻求技术支持
		5	3.3V电压过低	a. 联系售后或厂家寻求技术支持
		6	抱闸继电器短路	a. 确认抱闸继电器的阻抗是否大于450Ω？ b. 确认抱闸继电器是否短路？ c. 联系售后或厂家，寻求技术支持
47	马达温度异常	1	马达温度过温	a. 减轻马达负载，减少马达自身发热。 b. 检查环境温度 c. 检查温度传感器的布线和连接。 d. 联系售后或厂家，寻求技术支持
		2	马达温度过低	a. 马达所在环境温度低于-40℃ b. 温度传感器短接 c. 联系售后或厂家，寻求技术支持
48	马达温度警告	1	马达温度过高警告	a. 马达温度是否正常。 b. 检查B06.41设置的马达温度过温警告值是否合理。 c. 联系售后或厂家，寻求技术支持
49	AI断线故障	1	AI1 4~20mA输入断线	a. 检查AI电路是否正确 b. 检查是否有外部电流输入 c. 检查A07.20设置值是否正确 d. 联系售后或厂家寻求技术支持
		2	AI2 4~20mA输入断线	

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故障码	故障名称	子码	子码含义	解决措施
50	电容侧风扇故障	1	电容侧风扇断线	a. 检查电容侧风扇接线是否中断 b. 电容侧风扇损坏，联系厂家更换 c. 联系售后或厂家，寻求技术支持
51	外部故障	1	上电自检EEPROM中所存参数值不在设定范围内	a. 参数恢复出厂值后再次上电 b. 联系售后或厂家，寻求技术支持
		2	ARM与EEPROM交互超时	a. 联系售后或厂家寻求技术支持
		3	升级后，EEPROM写入默认值，回读校验出现错误。	a. 可重新上电，若还故障，则是EEPROM元件存在问题 b. 联系售后或厂家，寻求技术支持
		4	写EEPROM次数超过1000	a. 恢复故障即可 b. 联系售后或厂家，寻求技术支持
		5	字库版本不正确	a. 烧录正确的字库 b. 联系售后或厂家，寻求技术支持
52	位置偏差过大	1	马达给定指令与电机编码器反馈指令偏差过大	a. 减小目标速度、增大加减速时间，速度转矩限制是否过小 b. 检查马达所带负载是否过大 c. 确认运行时电机抱闸是否已经打开 d. 进行电机参数辨识，获取更准确的电机参数 e. 联系售后或厂家，寻求技术支持。
53	全闭环位置偏差过大	1	马达给定指令与负载编码器反馈指令偏差过大	a. 检查马达所带负载是否过大，两个编码器方向是否一致。 b. 负载端编码器安装是否牢固 c. 联系售后或厂家，寻求技术支持。

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故障码	故障名称	子码	子码含义	解决措施
54	到达正向极限位置	1	正向限位开关已激活	a. 检查是否到达正向限位；若到达限位可向相反方向运行； b. 检查驱动器G00组相关参数设置是否正确； c. 检查驱动器DI端子接线是否正常； d. 联系售后或厂家，寻求技术支持
55	到达负向极限位置	1	负向限位开关已激活	
56	定位中使能丢失	1	马达运行位置指令时驱动器去使能	a. 确保马达执行位置指令过程中驱动器为使能状态。 b. 联系售后或厂家，寻求技术支持
57	电机参数错误	1	电机储存的电机编号不正确	a. 将功能码A04.16设置为正确的电机编后，进行零点校正。 b. 联系售后或厂家，寻求技术支持。
		2	马达储存的编号中左数第4、5位错误	
		3	马达储存的编号中第3位错误	
		4	马达储存的编号中左数第2位错误	
		5	马达储存的编号中左数第1位错误	
58	固定挡块在监视窗口外	1	轴位置脱离监控窗口(G03.40)	a. 确定转矩限幅是否符合要求 b. 确定G03.40监控窗口设定值是否过小 c. 联系售后或厂家，寻求技术支持。
59	未到达固定停止点	1	给定位置指令已经运行完，但未找到固定停止点	a. 确定固定停止点在给定位置指令运行范围内。 b. 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
60	原点回归错误	1	原点回归超时。原点回归时，在G00.49设置的最大回原时间内未找到原点信号。	a. 检查原点开关信号是否正常； b. 增大原点回归搜索速度(G00.46，G00.47)。 c. 检查限定查找原点时间G00.49设置值是否合理 d. 联系售后或厂家，寻求技术支持
62	制动电阻过热	1	制动电阻过热	a. 联系售后或厂家，寻求技术支持
63	编码器电池电压低(警告)	1	编码器电池电压低于报警阈值(3.2V)	a. 检查确保电池盒中电池接线可靠。 b. 确保电池盒中电池电压有效 c. 联系售后或厂家，寻求技术支持
64	编码器电池失效	1	编码器电池电压低于故障阈值(3.0V)	a. 检查接线或更换电池。 b. BISS-C编码器执行故障复位操作 c. RS485编码器，将D02.21置1后，重新上电 d. 联系售后或厂家，寻求技术支持
65	编码器多圈数据溢出	1	编码器多圈数据溢出	a. 手动将多圈计数值清零(D02.21置1)，重新上电。 b. 联系售后或厂家，寻求技术支持
		2	多圈编码器主电源和备份电源均断电后，重新上电。	a. 执行故障复位操作，复位后多圈值恢复为初始值(0或±1) b. 联系售后或厂家，寻求技术支持
66	参考点未设置	1	在绝对模式下未设定原点	a. 在绝对模式下进行回原操作，确定原点 b. 联系售后或厂家，寻求技术支持

售后服务

售后服务请按以下步骤提交售后流程。

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Introduction

Welcome to Boneng Drive!

Please read this manual carefully before installation and use so that the driver can be used correctly and safely.

For more details, please visit Boneng Transmission official website:
BONENG (www.boneng.com).

Scan code for product details

BONENG Transmiss -ion Official Website

Scan code for product details

Mx Servo Motor-Ax Servo Drives Product Details

EN

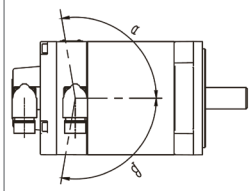
1. Motor Connections

a. The motor power cable and encoder cable are connected to the motor using aviation plugs. Be sure to align the marks on the connectors when installing. Once aligned, the connectors should rotate smoothly without any jamming; otherwise, check if the markings are aligned, rather than forcibly screwed on, as that could damage the pins.

b. For well-installed fittings, the male should be completely pressed through the green seal.

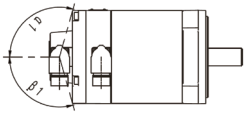
c. The power connector and signal connector on the motor can rotate within a certain range, ensuring that the allowed angle is not exceeded during rotation.

d. The power line connector rotation range is as follows:



Motor Size	Angle α_1	Angle β_1
MX028	135°	140°
MX036	135°	140°
MX048	135°	140°
MX063	135°	140°
MX080	135°	200°
MX100	135°	200°

e. Encoder cable connector rotation range:



Motor Size	Angle α_1	Angle β_1
MX028	140°	135°
MX036	140°	135°
MX048	143°	135°
MX063	105°	110°
MX080	100°	100°
MX100	95°	95°

DANGER!

- Always make sure to disassemble and assemble the connecting cables when the drive and motor are powered off.
- Please adhere to the electrical equipment operating specifications, and only allow professional personnel to install drivers and connectors.
- Always connect the frame ground terminals of the Servo Drive and the Servomotor to 100Ω or less.

2. Parameters for servo motor brake

Brake model	BN 028	BN 036	BN 048	BN 063	BN 080	BN 100
Static friction -al(N.m)	≥1.9	≥2.4	≥3.8	≥10	≥22	≥60
Brake power (W)	8.76	6.74	13.4	14	19	25
Inertia(kgcm²)	0.09	0.11	0.39	0.78	2.55	14.7
Operating Vo -ltage (Vdc)	24± 10%	24± 10%	24± 10%	24± 10%	24± 10%	24± 10%
Operating te- mperature(℃)	-15 ~120	-15 ~120	-15 ~120	-15 ~120	-15 ~120	-15 ~120
Braking time (ms)	≤20	≤20	≤30	≤25	≤30	≤50
Release time (ms)	≤35	≤80	≤50	≤90	≤100	≤220
emergency b -raking Endu- rance (times)	2000	2000	2000	500	2000	500
Max. frequen -cy of emerg- ency braking (times/h)	20	20	20	20	20	20
Max. braking speed (rpm)	6000	6000	6000	3000	3000	3000
Matched mo- tor size	028	036	048	063/ 080S	080M/ 100S	100M/ 100L

3. Servo motor troubleshooting and maintenance

Problems	Cause	Measures
Motor can not rotate	Overload/stalled	Reduce the load.
	At least one fault occur in the servo drive.	Check the servo drive to eliminate the faults.
Motor ramp-up slowly	Overload	Reduce the load.
	Motor parameters error in servo drive.	Ensure that right motor parameters are set.
	There is a loose connection in the motor power supply.	Check the connection between the motor and servo drive.
	Inter-turn short circuit or interphase short circuit in the stator winding.	Measure the winding resistance and insulation resistance, and contact the manufacturer for repair.
Rumble when ramping	One phase of the power line is disconnected after being switched on.	Check driver and power line connections as well as jack connections/check winding resistance
	Inter-turn short circuit or interphase short circuit in the stator winding.	Determine winding resistance and insulation resistance, and contact the manufacturer for repair
Rumble when rotating	Overload	Reduce the load.
	One phase of the power line is disconnected after being switched on.	Check the connection between the motor and servo drive.
	Inter-turn short circuit or interphase short circuit in the stator winding.	Determine winding resistance and insulation resistance, and contact the manufacturer for repair
Motor overheat when load-free rotating	The ventilation duct does not ventilate smoothly.	Remove obstructions and ensure that the cooling air is unobstructed.

Problems	Cause	Measures
Motor overheat when full-load rotating	Overload	Reduce the load.
	One phase of the power line is disconnected after being switched on.	Check the connection between the motor and servo drive.
	The ventilation duct does not ventilate smoothly	Remove obstructions and ensure that the cooling air is unobstructed.
Rotate not smooth	The motor power cable and signal cable are not fully shielded.	Check shielding and grounding, Check for interference sources in the vicinity.
	There is a loose connection in the motor power supply.	Check the connection between the motor and servo drive.
	The control gain para-meters not match the mechanism.	Optimize the control gain parameters.
Piercing grinding sounds, running noisy	Rotating parts slip	Check the mechanism and troubleshooting.
	Foreign objects inside the motor.	Contact manufacturer for repair.
	Bearing failure.	Contact manufacturer for repair.
Radial vibration	Rotor unbalance.	Disassemble the rotor and rebalance the rotor.
	Rotor not round, shaft bent.	Contact manufacturer for repair.
	Poor of calibration.	Calibrate equipment, check couplings.
	Unbalance of connected equipment	Rebalance the connected devices
	The gear box is not running smoothly	Make the gearbox work properly
Axial vibration	Poor of calibration.	Calibrate equipment, check couplings
	Unbalance of connec-ted equipment	Rebalance the connected devices
	The gear box is not running smoothly	Make the gearbox work properly

4. Technical data of Control Module

Functions		Technical data
Bus interface	AX-CM55-PA-PE	• PROFINET、DriveLink supported • RJ45 interface
	AX-CM55-EA-PE	• EtherCAT、DriveLink supported • RJ45 interface
Power supply	Power module supply	• Powered by power module; • When digital input/output terminals are used as outputs, they require 24V power supply from external terminals
	External terminal supply	• Voltage range: DC 20.8 ~ 28.8V; • Max current: 2.6A
Power output	+24V output	• Voltage range: DC 18V ~ 26.8V; • Max current: 200mA.
	+10V output	• Voltage range: DC 9.5V ~ 10.5V; • Max current: 40mA
	DB15 encoder power supply	• Voltage: DC 5V or DC 24V; • Max current: 350mA
	RJ45 encoder power supply	• Voltage: DC 5V; • Max current: 200mA
Digital input	11 channels (DI0 ~ DI10)	• DI1, DI3, DI5, DI7 are differential inputs, the rest are single inputs; • DI0, DI2, DI4, DI6 shared terminal DICOM0; DI8, DI9, DI10 shared terminal DICOM1; Electrical isolation; Supports both Source and Sink modes; Voltage: DC 24V, AC 36V; "1" signal voltage: >11V; "0" signal voltage: <5V; 24V type current: 4mA; Response time: 6ms (with software filter)
Digital output	1 relay (DO0)	Voltage: DC 24V, AC 220V; Continuous current: 2A (Inductive load: 0.6A); Switching current: 2A; Contact type: 1 NO and 1 NC;

Functions		Technical data
Digital input/ output	8 channels (DIO20 ~ DIO27)	• Voltage: Max DC 30V; • current: Max output 200mA, 24V typical input 4mA; • Max frequency:100HZ; • Input "1" signal voltage: >15V; Input "0" signal voltage: <5V; • Non-electrical isolation; • External terminal require 24V power supply.
Analog input	1 channel (AI0)	• Differential input; • DIP switch for switching between voltage and current modes; • Voltage input range: -10V~ +10V, 0V ~ 10V; • Current input range: 0mA ~ 20mA, 4mA ~ 20mA; • Input resistance for current type: 250Ω; • Response time: 2ms (with software filter); • Accuracy±1%.
Temperature sensor	2 channels	• Located at terminals X5 and X11; • Support KTY84-130, PTC;
Encoder signal input	ABZ	• Supports 24V single-ended signals, differential signals 5V & 24V; • Frequency: Max frequency 250kHz; • Line break detection: Only supported for differential types; • Max cable length: 5V differential type: 100m; 24V open collector type: 50m; 24V push-pull type: 100m; 24V differential type: 300m.
	BISS-C	• Max cable length: 50m
	RS485	• Max cable length: 20m
USB interface	1 Mini-B	• USB 2.0;
Keyboard interface	Support OP25	• Direct installation or external installation

Note: Refer to our official website for more information.

5. Servo drive wiring

5.1 Overview of the AX-servo drive

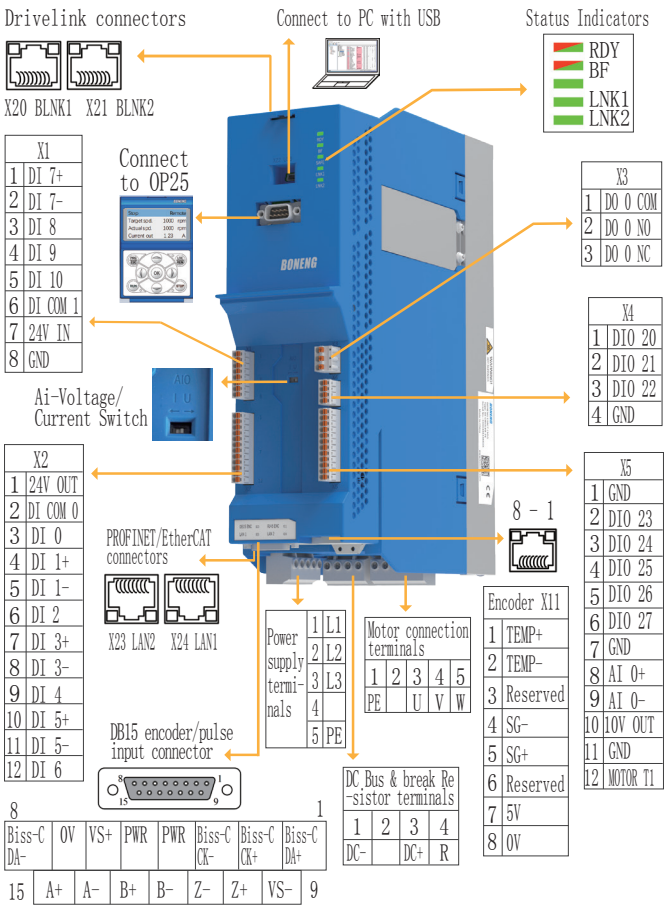
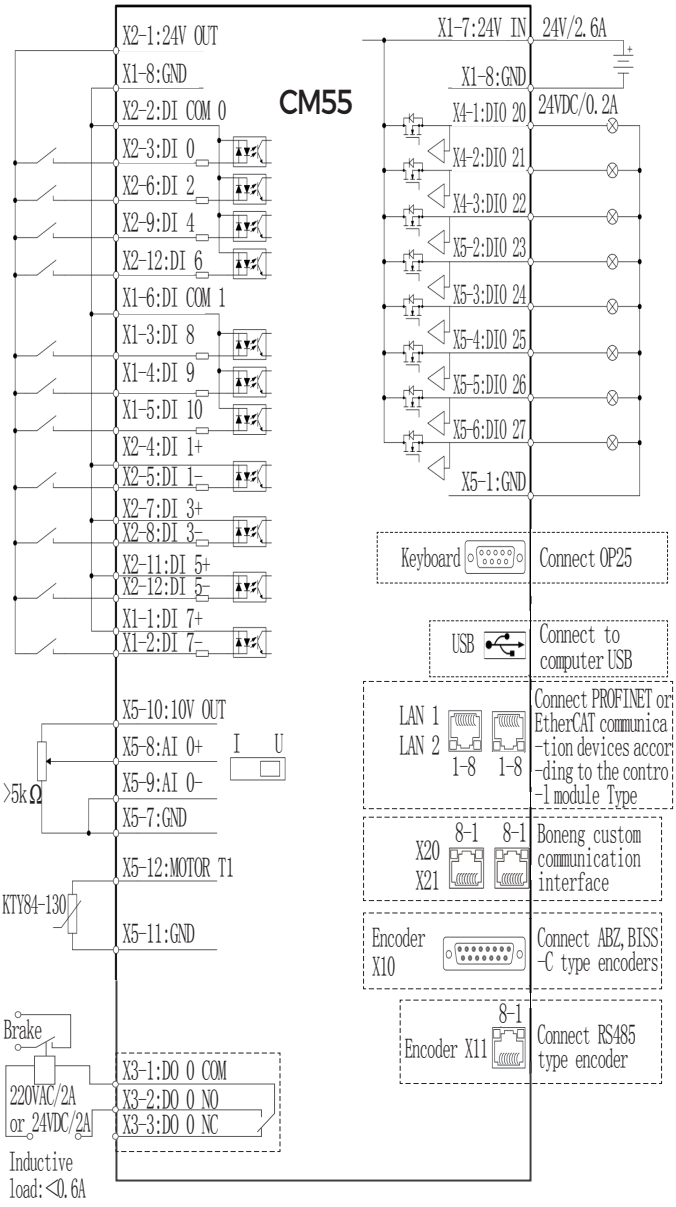


Table1. Power Module (PM) terminals name and function description

Terminal Nme	Terminal label	Description
Main circuit Power supp -ly terminals	L1, L2, L3	3-phase 380~480VAC main circuit power supply, refer to Power Module (PM25, PM26) user manuals/product label.
	PE	Ground terminal. Ground to 100Ω or less.
DC bus & Ext-ernal Regene -ration Resist-or connection terminals	DC+, DC-	DC bus terminals (used for common DC bus connection).
	DC+, R	If there is high regenerative energy, connect an External Regeneration Resistor between DC+ and R.
Motor conne-ction termina -ls	U, V, W	Output terminals to the Motor.
	PE	Ground terminal, connect to motor ground and cable-shield.

5.2 Control module wiring



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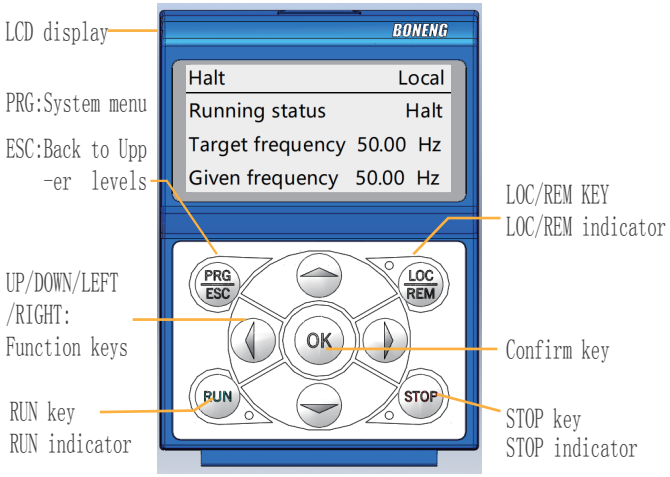
6. Operation guide

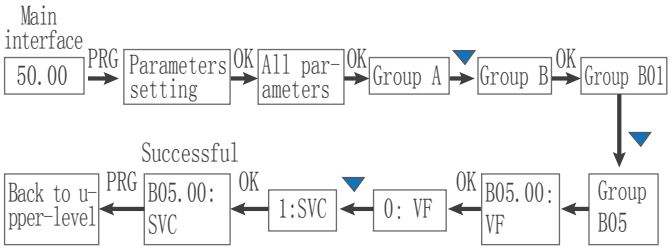
6.1 Operation guide for OP25

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



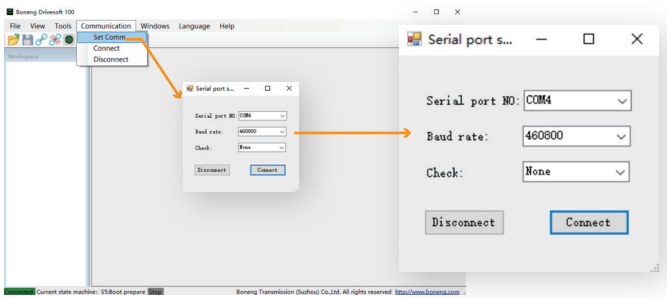
Key	Function description
PRG/ESC	In the startup page, press this key to enter the function list page; in other pages, use this key to escape to previous menu.
LOC/REM	Switch between Local (Keyboard control) and Remote mode.
STOP	While the drive is running, press this key to stop it; otherwise, acknowledge/reset the fault.
RUN	In Local mode (keyboard control), press RUN key to run drive.
▲	- Navigates to the next item; - Increases a value.
▼	- Navigates to the previous item; - Decreases a value.
▶	Moves the cursor to next right digit for single digit editing, including the digit of positive/negative sign.
◀	Moves the cursor to next left digit for single digit editing, including the digit of positive/negative sign.
OK	- Confirms selection or input; - Enters sub menu.

Eg: Change the motor control mode form VF to SVC through the OP25:



6.2 Operation guide for software Boneng Drivesoft 100

1. Please connect the drive and PC with a standard USB cable, and ensure that you have installed the software Boneng Drivesoft 100.
2. Run software Boneng Drivesoft 100 in your PC, and establish an online connection to the drive unit: on the menu bar: Communication -> Set Comm -> Serial port No, select the serial port number -> Connect , as follow:



Establish online connect between the drive and the software Boneng Drivesoft 100

3. Create new project in Boneng Drivesoft 100: File -> New project -> Confirm.

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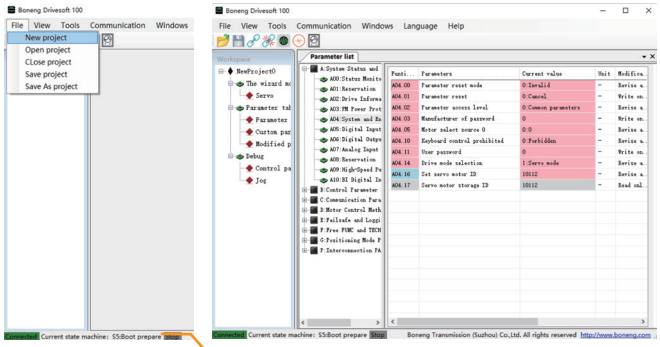

Create a new project in Boneng Drivesoft 100 and configure parameters

7. Commissioning a drive

WARNING:

- Be sure to be aware of all the safety precautions for the operation of each servo module.

7.1 Requirements for commissioning

The following requirements must be fulfilled for commissioning a AX-series Servo drive system:

- A set of Completely wired-up AX-series servo drive;
- A standard USB cable (with mini-USB interface);
- A PC with Boneng Drivesoft 100 installed.

Please connect the servo drive, servo motor and encoder cables according to the wiring diagram, and connect the servo drive to the PC.

7.2 Safety instructions for commissioning

- Servo motor and external mechanical transmission device:
  Before the commissioning, please check the installation of the servo motor and ensure that it is securely and reliably fixed.
  Before the trial operation, please make sure to separate the output shaft of the servo motor from the load.
- Installation and wiring inspection:
  a. Please ensure that the connection between the CM module and the PM module is reliable, and confirm that the latch on the PM module has popped out correctly.
  b. Please ensure that the power of the driver matches that of the servo motor. For example, the power of the motor and the power of the driver should not differ significantly; otherwise, normal operation cannot be guaranteed.
  c. Before supplying power, please confirm whether the power supply voltage of the servo drive matches the rated operating voltage of the servo unit according to the drive nameplate.
  d. Please ensure that the power cables and signal cables of the servo are reliably connected, and that the shielding layer of the power cables and the PE signal are correctly connected to the driver.
  e. Please ensure that the grounding protection cable of the servo drive is reliably grounded to prevent electric shock.
  f. Do not modify the original factory cables without authorization, as it may cause interference and even damage the driver.
- Inspection of the electric brake wiring:

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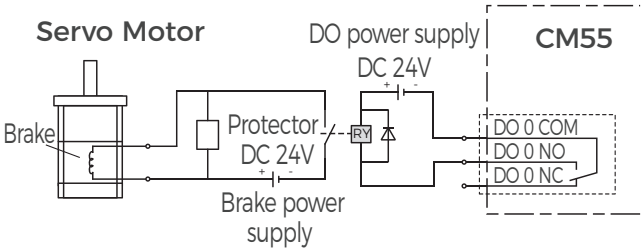
a. Before trial operation, please check whether the wiring of the servo motor brake is correct. The input signal of the brake at the servo motor end has positive and negative polarity; please do not connect it incorrectly, as the brake will not open properly.
b. Please provide a separate power supply for the motor brake and do not use the 24V terminal output of the servo driver as the power supply for the motor brake. Similarly, do not use the same power supply to power both the driver terminals and the motor brake, as this may cause interference issues.

To control the servo motor brake using the DO terminal of the servo driver, please connect the wiring as shown in the figure below.



Schematic diagram of servo motor brake wiring

WARNING:

- The relay should be installed with Surge Protective Devices.
- The brake control port of the PM is an active output, there is no need for an external power supply.
- Some control modules (CM51 etc.) do not support the use of PM brake control interfaces, see the user manual for details.

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7.3 Commissioning with BonengDriveSoft 100

To run AX-series drive with the Boneng Drivesoft 100, proceed as follows:

- Step 1:
  Create a new project in Boneng Drivesoft 100 （Refer to Chp.6.2）, the current value of parameters are displayed in real time.
- Step 2:
  (Optional) Reset all parameters to default: A04.00 =【3: All parameters】➡ A04.01 =【1: Confirm】➡ wait for parameters reset complete (Check the state machine in the lower left corner of the debugging software).
- Step 3:
  Configurate Drive mode: A04.14 =【1: Servo mode】(the drive will prompt power reset.).
- Step 4:
  Configurate and check motor parameters: if a BONENG MX-series servo motor is driven, check whether the motor ID (value of A04.17) is the same as the Motor Nameplate[①]. If driving a standard three-phase asynchronous motor, set the motor parameters(Group-D00: basic motor parameters, Group-D02: encoder-related parameters) according to the Motor Nameplate, and then start after setting B00.21 to perform motor parameter identification.
- Step 5:
  Reset drive power supply. And check whether

① For the previous version of software (CM55-PN_v5.10 or CM55-EC_v6.10 and earlier), the motor parameters can be automatically updated after the motor ID number is manually set in A04.16, and the motor ID is shown on the motor nameplate. And this is not required for the new version。

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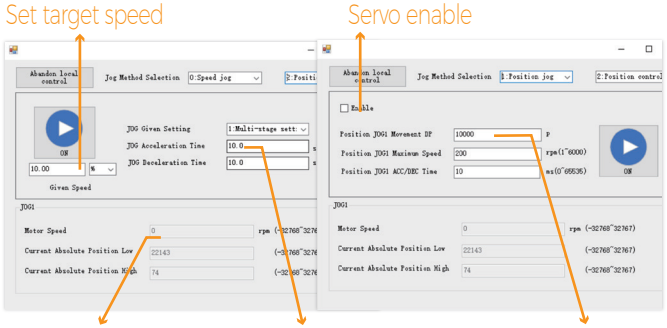
the motor parameters (D00~D02 group parameters) are consistent with the Motor Nameplate.

- Step 6:
  Check encoder direction: Rotate motor throu -gh the drive in VF mode (In Boneng Drivesost 100, set B05.00 = 【0: VF】, start the drive through the control panel and give the target speed in the Given Speed box, for example: [10%], Confirm), Check the sign of the given speed value (P13.11) and the encoder speed feedback value (P13.17), which should be the same, if not, check whether the phase sequence of the power take-off of the drive matches the phase sequence of the UVW line of the servo motor.
- Step 7:
  After step 6, Stop the drive, and change the value of B05.00 to 【2: FVC】.
- Step 8:
  Perform speed jog with the JOG Panel in Boneng Drivesoft 100: Get local control authorization➡set jog-mode to Speed Jog➡ set target jog speed➡Press start to run speed jog, and release to stop speed jog.



Speed JOG window Position JOG window

If speed control is required, the trial operation will be completed by this point; If you want to run position control, proceed to step 9 and subsequent steps.

- Step 9:
  Set mechanical transmission parameters: G00.04 = 【10000】(The value 10000 is set only for trial operation, and the parameters should be set according to the actual mechanical transmission ratio when practical application).
- Step 10:
  Change control mode to 【2: Position control】(or set B05.01 = 【2: Position control】 manually)②.
- Step 11:
  Step11.Perform position jog with the JOG Panel in Boneng Drivesoft 100: Get local control authorization ➡set jog-mode to Position Jog➡set motion profile for position jog (If the output shaft of the motor is connected to the reducer, the displacement and maximum speed should be set according to the speed ratio of the reducer.) ➡ Activate the check box "Enable", the drive become running ➡ Click start to trigger position jog. The motor start to rotate according to the motion profile, and ramp to standstill after position reached. ➡ uncheck the check box "Enable" to switch-off the drive.

② Speed jog and position jog are supported in position control mode, and only speed jog is supported in speed control mode.

8. Frequently used parameters

The frequently used setting parameters and monitoring parameters of the drive are listed below; for other detailed parameters, please connect to the drive to view, or refer to the drive's user manual.

8.1 Changeable parameters

Function Code	Name	Description
A04.00	Parameter reset mode	3: All parameters reset. Reset performs only after confirming A04.01.
A04.01	Parameters reset	0: cancel 1: Confirm (Wait for reset complete before change other parameters.)
D00.01	Rated motor power	Should be same as the motor nameplate.
D00.02	Rated motor voltage	
D00.03	Rated motor current	
D00.04	Rated motor frequency	
D00.05	Rated motor speed	
B05.00	Motor control mode	0: VF 1: SVC 2: FVC
F04.00	Braking function select	0: no brake, 1: Brake without status detection. (Use the drive' s DO to control the brake by setting DO source to P01.11).
Group A06	Digital output	Settings for the Digital Output. Refer to the user manual for details.
Group A07	Analog input	Settings for the Analog Inputs. Refer to the user manual for details.
B00.00	Start/stop select	If set B00.00=【0: Switch control】, set terminal parameters in group B01. If B00.00= [1: Custom control module] is set, set terminal parameters in group B00. When using Profinet or EtherCAT communication, the relevant parameters are automatically set when the communication is established.

Function Code		Name	Description
B01.01		Switch control 1 mode	Start/Stop the drive the switches. Refer to the user manual for details.
B01.03		Switch control 1 IN1	
B01.04		Switch control 1 IN2	
B01.05		Switch control 1 IN3	
B00.23		OFF1 Stop mode	0: Coast to stop 1: Ramp to stop
Speed control	B02.00	Speed control Main speed SEL	Settings for target speed. Refer to the user manual for details.
	Group B03	Multi-speed setting	Settings foe multiple target speeds. Refer to the user manual for details.
	B04.02 ~ B04.09	Ramp acceleration and deceleration time	Speed control acceleration and deceleration time setting. Only one group is valid at a time.
	B04.40	Slope acceleration time source	Select the source of acceleration and deceleration time in speed control mode, which can be set as the constant value (B04.00~B04.09), or the upper controller (through the interconnection parameters).
	B04.41	Slope deceleration time source	
Position control	D02.18	Absolute encoder type	When a battery is connected with the encoder line, select [1: multi-circle absolute encoder]; Otherwise select [0: single-turn absolute encoder].
	G00.04	Number of POS COMD for turn COMD	The first available Electronic-Gear. Valid for G00.04≠0, and the final Electronic-Gear is: Encoder Resolution/G00.04.
	G00.06	E-Gear ratio 1 (Num)	The second available Electronic-Gear. Valid for G00.04=0, and the final Electronic-Gear is: G00.06/G00.08.
	G00.08	E-Gear ratio 1 (Den)	
	G00.22	Motor rotation direction SEL	Set the direction of motor rotation when giving positive command.

Function Code		Name	Description
Position control	G00.53	Home switch SRC SEL	Select the DI terminal connected to the home switch. It should be selected according to the physical connection of the home switch; High level active.
	G00.55	Positive limit COMD SRC SEL	Select the DI terminal connected to the limit switch. The limit switch should be selected according to the physical connection; High level active.
	G00.56	Negative limit COMD SRC SEL	
	G01.13	Load moment of inertia r-atio	Set the ratio of load to motor rotor inertia. Should be set to the actual ratio.
	G02.01	Rigidity grad-e selection	Set the rigidity level of the mechanical system. This parameter affects the position, velocity loop gain, and the dynamic response performance of the system, and should be matched with the physical system.
	G03.03	Position error fault value(r)	When the position deviation this threshold, the driver reports a fault [52: POS Dev too large]. This parameter is the number of circles on the motor side.

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8.2 Monitoring parameters

Function Code	Name	Description
A00.00	Current state machine	Current status of the drive.
A00.05	Given speed	The real-time speed reference value in the position and speed control mode. [rpm].
A00.06	Motor rotatin-g speed	Actual speed, [rpm].
A00.08	Output current	Actual output current.
A00.09	Output power	Actual output power.
Group P00	Hardware st-ate	Physical status of DI, DO, and DIO.
P12.13	Panel given v-alue	Target speed value given by OP in speed c-ontrol mode, with the unit 0.1%

Function Code	Name	Description
P12.14	PC given value	Target speed value given by Boneng Drive-soft 100 in speed control mode. The unit is selected by the control panel in Boneng Drivesoft 100.
P12.16	DI state	Actual status of DI.
P12.17	DO state	Actual status of DO.
P13.00	Motor actual speed	Actual speed of motor, the value 4096 corresponds to 100% of rated speed.
P13.01	Motor final s-et speed	Final speed reference value in position and speed control mode; 4096 corresponds to 100% of the rated speed.
P13.02 ~P13.11	-	Speed set monitoring data in speed control mode.
P14.04, P14.06	Cumulative absolute posit-ion (Pe1)	Actual position (two 32-bit signed data), corresponding to motor encoder.
P14.20	Position setp-oint（Instruc-tion unit)	Position command in user length unit (32-bit signed data).
P14.22 P14.66	Position feed-back（Instr-uction unit)	Actual position in user length unit (32-bit signed data).
P14.84	Target position	Target position in user length unit (32-bit signed data).
P15.25,	Pulse input c-ount(DB15)	Accumulated counter value of the pulses from the DB15 interface.
P15.26	DB15 Pulse I-nput Count (p)	Accumulated counter value of the pulses from the DB15 interface. Originally come from P14.84, and equal to P14.84 when combined. The low 16 bits are unsigned, the high 16 bits are signed; Can be used for interconnection.
Group E00~E07	-	Fault configure and record.

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9. Faults and alarms

Fault Code	Fault name	Sub-code	Meaning	Measures
1	Over current	1	U-phase over current	a. Confirm that D00 motor parameters are consistent with motor nameplate. b. Eliminate the problem of power line damage; c. Check whether the cable is short-circuited. d. Increase the acceleration and deceleration time appropriately; e. Reduce VF torque increase under VF control; f. Please confirm that the motor stops and stabilizes before starting; g. Reduce or cancel the load to troubleshoot problems; h. For induction motor vector control, please confirm whether the correct parameter identification operation has been carried out; i. Sub-code 8 indicates that the brake resistance is abnormal and the driver is powered off. Confirm whether the brake resistance is connected correctly. Measure the resistance between DC+ and R and compare with the recommended value in the manual. j. Replace the PM. k. Restore factory defaults and reset parameters. l. Contact the manufacturer for technical support.
		2	V-phase over current	
		3	U & V-phase over current	
		4	W phase hardware over current	
		5	U & W-phase over current	
		6	V & W-phase over current	
		7	UVW three-phase over current	
		8	Brake hose hardware over current	
		9	U-phase VCE short-circuit	
		10	V-phase VCE short-circuit	
		11	U & V-phase VCE short circuit	
		12	W phase VCE short circuit	
		13	U & W-phase VCE short circuit	
		14	V & W-phase VCE short circuit	
		15	Over current anomaly	
		16	Over current anomaly	

Fault Code	Fault name	Sub-code	Meaning	Measures
2	DC bus Over Voltage	1	Rapid detection of DC bus voltage overvoltage	a. Check whether the input power supply is within a reasonable range and that the input cable is reliably connected. b. Please increase the acceleration and deceleration time. c. Install brake resistance or brake unit d. Reset parameters and run after parameter identification. e. 5.Check that the driver power matches the motor power. f. Check whether the encoder is damaged. g. Contact the manufacturer for technical support.
3	DC bus undervoltage	1	DC bus undervoltage	a. Check whether the input power supply is within a reasonable range and that the input cable is reliably connected. b. Check whether the power grid is powered off immediately. c. Set the A03.21 software under-voltage value correctly. d. Replace the Power Module. e. Contact the manufacturer for technical support.
4	Speed match fail	1	Speed search parameters are improperly set.	a. . Modify speed tracking mode (B05.13) to search from maximum frequency or increase search time (B05.14) b. Contact the manufacturer for technical support
5	Driver overload	1	Driver overload	a. Ensure that the driver type is appropriate and the A03.00 is consistent with the nameplate.

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Fault Code	Fault name	Sub-code	Meaning	Measures
5	Driver o-verload	1	Driver overload	b.Reduce VF torque lift under VF control. c.Reduce the torque limiting value under vector control. d.Please confirm whether the load is too heavy, or lock the brake. e.Check whether the correct parameter self-learning operation is performed during vector control. f. With the encoder application, please confirm that the encoder direction and parameter Settings are correct. g.Reset parameters and run after parameter identification. h.Reduce the carrier frequency, or replace more powerful drivers. i. Wait for the motor to stop completely before starting. j. Contact the manufacturer for technical support.
6	Motor o-verload	1	Motor overload	a. Please confirm whether the motor load is too large. b. When vector control, please confirm whether the motor parameter self-learning has been carried out. c. With the encoder application, please confirm that the encoder direction and parameter Settings are correct. d. Please confirm whether the load is too heavy, or lock the brake. e. Please confirm whether the motor nameplate parameters are set correctly.

Fault Code	Fault name	Sub-code	Meaning	Measures
				f. Contact the manufacturer for technical support.
7	Input p-hase loss	1	Input phase mi-ssing detection	a. Check whether the power input cable is in good contact. b. Ensure that the input power supply is stable. c. Contact the manufacturer for technical support.
8	Output phase lo-ss	1	U phase output missing phase	a. Check whether the corresponding output cable is connected correctly and in good contact. b. Please confirm whether the motor is running smoothly. c. Set D00 parameters according to the motor nameplate parameters, A03.00 set the same as the nameplate. d. Replace the PM. e. Contact the manufacturer for technical support.
		2	V phase output missing phase	
		3	W phase outpu-t missing phase	
		4	FVC control out-put out of pha-se	
		5	The three-phas-e output is seri-ously unbalanc-ed	
		6	Stator resistanc-e identification output phase d-eficiency	
		7	UVW three-ph-ase output ph-ase missing	
9	Driver o-ver heat	1	The IGBT temp-erature of the d-river (37Kw an-d below) excee-ds the threshold.	a. Check whether the ambient temperature is too high. b. Check whether the radiator fan works properly. c. Check whether the radiator air duct is blocked. d. Replace the PM. e. Model A03.00 Parameter Settings are consistent with the nameplate. f. Contact the manufacturer for technical support.
		2	The IGBT-U ph-ase temperatu-re of the driver (37Kw or highe-r) exceeds the threshold.	

Fault Code	Fault name	Sub-code	Meaning	Measures
9	Driver o-verload	3	The IGBT-V phase temperature of the driver (37Kw or higher) exceeds the threshold.	
		4	The IGBT-V phase temperature of the driver (37Kw or higher) exceeds the threshold.	
10	PWM wave warn	1	U-phase wave is abnormal	a. Power off and power on the device again. If the fault persists, contact the manufacturer for technical support.
		2	W-phase wave is abnormal	
		4	V-phase wave is abnormal	
11	Zero-Cross-sing Err	1	U phase zero drift is large	a. Check whether the model (A03.00) Settings are consistent with the nameplate. b. If the PM is abnormal, replace the PM, or contact the manufacturer for technical support.
		2	V phase zero drift is large	
		3	W phase zero-drift is large	
12	Ground short	1	U phase overcurrent in short circuit to ground.	a. Check whether the corresponding output phase is short-circuited to ground. b. Check whether the motor cable is damaged. c. Replace the motor or the driver. d. Contact the manufacturer for technical support.
		2	V phase overcurrent in short circuit to ground.	
		4	W phase overcurrent in short circuit to ground.	
		5	The short-circuit current to the ground exceeds the threshold. Procedure.	

Fault Code	Fault name	Sub-code	Meaning	Measures
		6	Overvoltage during short circuit to ground.	
13	Motor tune fault	1	The asynchronous motor dynamic tuning is abnormal.	a. Confirm whether the parameters of the D00 motor are consistent with the motor nameplate. b. Ensure that cables to the output terminal are reliable. c. Ensure that the encoder cables and parameters are correct. d. Replace the PM. e. Contact the manufacturer for technical support.
		2	The asynchronous motor static tuning is abnormal.	
		3	Synchronous motor tuning is abnormal	
		4	Encoder tuning anomaly (Detecting velocity anomaly).	
		5	Abnormal encoder tuning (serious encoder signal interference).	
		6	Abnormal encoder tuning (abnormal encoder Z signal).	
14	Encoder fault	1	The encoder is not connected during closed-loop dynamic tuning.	
		2	The speed measurement of the encoder does not match during dynamic closed-loop tuning	

Fault Code	Fault name	Sub-code	Meaning	Measures
14	Encoder fault	3	The encoder is disconnected d-uring closed lo-op operation	a. Use cables with a shielded layer and ground the shielded layer of the encoder. b. Check whether the cable connection to the encoder is reliable. c. Check whether encoder parameters are set correctly. d. Check whether the encoder power supply is correct. e. Check whether the parameters of the D00 motor are consistent with the nameplate, and confirm the motor series D00.09. f. Confirm whether the motor turns up after operation and discharge the blocked rotation. g. Contact the manufacturer for technical support.
		4	The encoder Z signal is abnormal	
		9	Incremental encoder A phase break	
		10	Incremental encoder B phase break	
		11	Incremental encoder ABZ phase break	
		12	Incremental encoder Z phase break	
		13	Incremental encoder AZ phase break	
		14	Incremental encoder BZ phase break	
		15	Incremental encoder ABZ phase break	
		16	The communication encoder is abnormal	
15	Vector stall fault	1	The velocity is reversed by an external force.	a. Check whether the motor nameplate parameter Settings are correct; b. Check whether the motor parameter self-learning operation has been done; c. Check whether the stall parameters are properly set;
		2	Excessive velocity deviation	

Fault Code	Fault name	Sub-code	Meaning	Measures
				d. Contact the manufacturer for technical support.
16	FPGA read/write Err	1	An FPGA read/write error occurred during initialization.	a. If the PM is abnormal, power off and restart. If the PM persists, contact the manufacturer for technical support
17	Driver power fault	1	The drive voltage is low.	a. Contact the manufacturer for technical support b. Replace the PM.
		3	The driving power supply is faulty during short-circuit detection to ground	
18	Primary power fault	1	24V primary supply voltage is low	a. Contact the manufacturer for technical support b. Replace the PM
19	CM-PM Comm fault	1	CM no response	a. Check whether the CM latch is tightly locked; b. Replace the CM or PM to locate the problem; c. Contact the manufacturer for technical support.
		2	CM no response	
		3	Communication data exception	
		4	Initialization exception	
20	PM-EEPROM fault	1	EEPROM write data overflow	a. Contact the manufacturer for technical support.
		2	EEPROM read data overflow	
		3	Data read from the EEPROM timed out	
		4	Data written to the EEPROM timed out	
		5	The EEPROM read address is out of bounds	
		6	The EEPROM write address is out of bounds	

Fault Code	Fault name	Sub-code	Meaning	Measures
21	PM model error	1	The current setting value of the PM model is less than the minimum value	a. Re-burn the PM program b. Reset the model to the normal value c. Contact the manufacturer for technical support
		3	The current setting value of the PM model is less than the maximum value	
22	CBC current clamping error	1	The U phase current is abnormal	a. Increase the value of acceleration time; b. Reset parameters and run after parameters are identified. c. Replace the motor and discharge the motor fault 4. Replace the Power Module. d. Contact the manufacturer for technical support.
		2	The V phase current is abnormal	
		3	The W phase current is abnormal	
		16	There is a problem with CBC interrupt.	
23	Bridge overheat	1	Reduce output power	a. Clean foreign bodies in the fan and disable the fan speed control function (B06.48=0). If the fan still does not rotate, contact the manufacturer to replace the fan. b. Check whether the model value corresponds to the nameplate c. The carrier frequency of the driver can be properly reduced, the heat dissipation of the PDC door can be opened, and the air volume of the inlet and outlet of the PDC can be increased d. Contact the manufacturer for technical support.

Fault Code	Fault name	Sub-code	Meaning	Measures
24	STO fault	1	STO1 is low level.	a. STO triggered. b. STO wire disconnected
		2	STO2 is low level.	
		3	Both the STO1 and STO2 are low level.	
25	Brake coil overheat	1	The driver brake tube temperature is too high	a. Check whether the ambient temperature is too high b. Check whether the radiator fan works properly c. Check whether the radiator air duct is blocked d. Install a suitable brake resistance e. Contact the manufacturer for technical support
26	Servo initial position Error	1	UVW encoder initial position detection error	a. Use a cable with a shielded layer and ground the shielded layer of the encoder. Reconnect or replace the encoder cable b. Check whether the encoder parameter Settings are correct c. Identify the zero point to ensure the correct servo zero position; Wiring according to correct motor phase sequence; d. Contact the manufacturer for technical support
		2	Absolute value encoder communication is abnormal	
		3	Absolute pair value encoder initial position is not corrected	
		4	Absolute value encoder initial position detection timeout	
		5	Absolute encoder zero corrects data read/write errors	
		6	Absolute encoder initial position correction failed	

Fault Code	Fault name	Sub-code	Meaning	Measures
26	Servo ini-tial posi-tion Err-or	7	Absolute value encoder data r-ead error	
		8	The commutati-on Angle devia-tion is too large	
		9	Wrong commu-tation Angle	
33	Drive pre-overload	1	Drive overload warning	a. Check whether the drive pre-overload function is enabled b. Troubleshoot the fault by referring to fault "5: Drive Overload ". c. Contact the manufacturer for technical support
34	Motor p-reoverlo-ad	1	Motor overload warning	a. Check whether the drive pre-overload function is enabled b. Handling method refer to "6: motor overload "fault. c. Contact the manufacturer for technical support
35	Commu-nication fault	1	Communicatio-n between CM module and h-ost computer is interrupted wh-en host comp-uter control dri-ver is running.	a. Reconnect or replace the cable b. Contact the manufacturer for technical support
		2	After the OP ke-yboard obtain-s the local cont-rol, the comm-unication betw-een the CM m odule and the OP keyboard is nterrupted.	a. Check the communication cable between the operation panel and the driver. b. Contact the manufacturer for technical support

Fault Code	Fault name	Sub-code	Meaning	Measures
35	Commu-nication fault	3	After the OP k-eyboard obtai-ns the local co-ntrol, the com-munication b-etween the CM module and th-e OP keyboar-d is interrupted	a. Check whether the Modbus cable is disconnected or damaged b. Check whether the corre-sponding PLC and other controller programs are correct and whether the interaction interval is within the time set by function code C02.04 c. Contact the manufacturer for technical support
		5	Canopen com-munication is disconnected	a. Check whether the primary station is closed b. Whether the communica-tion line is damaged or too long; Too close to an interfer-ence source. c. Contact the manufacturer for technical support
		6	DriveLink com-munication fail-ed	a. Receiving data times out b. Node Settings conflict c. Contact the manufacturer for technical support
		7	The PROFINET communicatio-n is disconnec-ted	a. The PLC is powered off or the connection cable is damaged. b. Adjust the appropriate com-munication cycle. c. When the IRT mode is used, ensure that the IRT device is preferentially connected to the PLC, the RT device is connect-ed to the back end of the IRT device, and the switch that supports the IRT mode is used. d. Contact the manufacturer for technical support
		10	The EtherCAT communicatio-n is abnormal	a. Connect to the PLC and view the C06.06 to view the prompt. Contact the customer

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Fault Code	Fault name	Sub-code	Meaning	Measures
35		10		or manufacturer as prompted. b. Contact the manufacturer for technical support
37	Motor speed over limit	1	Motor speed exceeds maximum speed limit	a. Check whether the parameters related to motor overspeed are set properly. b. Check whether an external device rotates with a motor. c. Contact the manufacturer for technical support
38	Motor speed Dev large	1	The motor speed deviates too much from the set speed	a. Check whether the parameter Settings related to the motor speed deviation are reasonable. b. Whether the load is too heavy, and whether the lock is opened in time. c. Contact the manufacturer for technical support.
39	Power reset	1	The drive needs to be powered off and restarted.	a. Power off the drive and then power it on
40	PID feedback loss	1	The PID feedback sampling value is lost	a. Check the PID feedback signal; b. Contact the manufacturer for technical support.
41	Extern Fault	1	External fault 1 occurs	a. Check the external input signal.
		2	External fault 2 occurs	
42	Extern Fault	1	External warning 1 occurs	
		2	External warning 2 occurs	
43	Pre-drive failure	1	Check failure before running.	a. Check whether the external power supply voltage is abnormal; b. Contact the manufacturer for technical support.

Fault Code	Fault name	Sub-code	Meaning	Measures
44	Control board anomaly	1	The CM-MPU is abnormal identified.	a. If the controller module is faulty, replace the controller module b. The I/O board does not match the controller board or the connection is abnormal. c. Contact the manufacturer for technical support
		2	Clock configuration failure.	
		3	The I/O board of the controller module is incompatible with the main control board.	
45	Brake control fault	1	The brake is open abnormally	a. Check the external relay. b. Check the cable to the brake; c. Check the parameters corresponding to brake (group-F04). d. Contact the manufacturer for technical support.
		1	The brake is closed abnormally	
46	The voltage of the control board is abnormal	1	The PM-24V power supply voltage is too high	a. Check the 24 V power supply on the Power Module and/or the X1 terminal. b. Contact the manufacturer for technical support.
		2	The external 24 V power supply voltage is too high	
		3	The PM24v or external 24V supply voltage is too low	
		4	3.3V overvoltage	a. Contact the manufacturer for technical support.
		5	3.3V undervoltage	
		6	Lock relay short circuit	a. Check whether the impedance of the lock relay is greater than 450Ω. b. Check whether the lock relay is short-circuited. c. Contact the manufacturer for technical support

Fault Code	Fault name	Sub-code	Meaning	Measures
47	Motor ov-erheat	1	The motor temperature is too hot.	a. Reduce the motor load and reduce the motor's own heat. b. Check the ambient temperature. c. Check the cabling and connections of the temperature sensor. d. Contact the manufacturer for technical support
		2	Temperature wi-re abnormal.	a. The ambient temperature of the motor is lower than -40 ° C b. The temperature sensor is short circuited. c. Contact the manufacturer for technical support.
48	Motor ov-erheat w-arn	1	The temperatur-e of the motor is higher than t-he value set in B06.41.	a. Check whether the motor temperature is normal. b. Check whether the motor temperature overtemperature warning value set on B06.41 is reasonable. c. Contact the manufacturer for technical support.
49	Analog I-nput dis-connect	1	The 4 to 20mA input is disconnected in the AI 1 terminal.	a. Check whether the AI circuit is correct; b. Check whether an external current is input; c. Check whether the value of A07.20 is correct; d. Contact the manufacturer for technical support.
		2	The 4 to 20mA input is disconnected in the AI2 terminal.	
50	Cap fan f-ault	1	he fan on the c-apacitor side is disconnected	a. Check whether cables to the capacitor fan are disconnected b. Contact the manufacturer to replace the capacitor fan c. Contact the manufacturer for technical support
51		1		a. After the parameters are restored to factory defaults, power on the device again.

Fault Code	Fault name	Sub-code	Meaning	Measures
51	ROM fau-lt (CM-E-EPROM fault)	2	The interaction between ARM and EEPROM t-imes out	a. Contact the manufacturer for technical support.
		3	After the upgr-ade, the defaul-t value of the EEPROM is wri-tten into the E-EPROM.	a. It can be powered on again. If the fault persists, there is a problem with the EEPROM component. b. Contact the manufacturer for technical support.
		4	Write EEPROM for more than 1000 times	a. Rectify the fault; b. Contact the manufacturer for technical support.
		5	The font versio-n is incorrect	a. Load the correct font library; b. Contact the manufacturer for technical support
52	POS Dev too large	1	The motor given instruction devi-ates too much f-rom the load e-ncoder feedbac-k instruction	a. Reduce the target speed, increase the acceleration and deceleration time, and whether the speed torque limit is too small b. Check whether the load carried by the motor is too large. c. Confirm whether the motor lock has been opened during operation d. Identify motor parameters to obtain more accurate motor parameters e. Contact the manufacturer for technical support.
53	Full clos-ed-loop POS Dev too large	1	The load enco-der feedback i-nstruction de-viates too muc-h from the giv-en instruction.	a. Check whether the load carried by the motor is too large and whether the direction of the two encoders is consistent; b. Whether the encoder at the load end is securely installed; c. Contact the manufacturer for

Fault Code	Fault name	Sub-code	Meaning	Measures
53		1		technical support.
54	Reach P-limit	1	The positive dir-ection limit sw-itch is activate-d.	a. Check whether the positive/negative direction limit has been reached. If the limit is reached, it can run in the opposite direction; b. Check whether the parameters of the drive G00 group are correctly set. c. Check whether the DI terminal of the driver is connected properly.
55	Reach N-limit	1	The negative di-rection limit s-witch is activat-ed.	
56	Drive dis-abled w-hile posi-tioning	1	Drive disabled while positioni-ng.	a. Ensure that the drive is enabled when the motor executes the position command. b. Contact the manufacturer for technical support
57	Analog I-nput dis-connect	1	Motor The mo-tor number st-ored is incorr-ect,The fourth and fifth digits from the left of the motor stor-age number a-re incorrect	a. Set function code A04.16 to the motor and perform zero correction. b. Contact the manufacturer for technical support.
		2	The third digit of the motor's stored numbe-r is incorrect. The second di-git from the le-ft of the moto-r storage num-ber is incorre-ct.	
		3	The first digit f-rom the left o-f the motor st	

Fault Code	Fault name	Sub-code	Meaning	Measures
57	ROM fau-lt (CM-E-EPROM fault)	3	-orage number is incorrect. Mo-tor The motor number stored is incorrect	a. Set function code A04.16 to the motor and perform zero correction. b. Contact the manufacturer for technical support.
		4	The fourth and fifth digits from the left of the motor storage number are in-correct	
		5	The third digit of the motor's stored number is incorrect	
58	Fixed sto-p outsid-e of mo-nitor wi-ndow	1	Axis position o-ut of monitori-ng window (G03.40)	a. Determine whether the torque limiting meets the requirements; b. Check whether the G03.40 monitoring window setting is too small; c. Contact the manufacturer for technical support.
59	Fixed sto-p not re-ach	1	The given posi-tion instructio-n has finished running, but n-o fixed stop p-oint has been f-ound	a. Make sure that the fixed stop point is within the operating range of the given position instruction; b. Contact the manufacturer for technical support.
60	Homing error	1	Homing proce-ss timeout. D-uring the hom-ing process, t-he home sign-al is not found within the ma-ximum return time set in G0 0.49.	a. Check whether the origin switch signal is normal; b. Increase the origin regression search speed (G00.46, G00.47). c. Check whether the search origin time G00.49 is set properly; d. Contact the manufacturer for technical support.

Fault Code	Fault name	Sub-code	Meaning	Measures
62	Brake resistor overheated	1	The braking resistor is overheated.	a. .Re-match the Braking Resistor.
63	Encoder battery warning	1	The external encoder battery voltage is too low (RS485: 3.2V; BISS-C: 3.2V).	a. Replace the encoder battery with a new one.
64	Encoder battery error	1	The external encoder battery voltage is too low(RS485: 3.0V; BISS-C: 3.0V)	a. .Replace with a new battery for the encoder. b. Check encoder wiring and external battery. c. RS485: Set D02.21 to 1 to reset multi-turn data and all error, and reset drive power, and then performHoming procedure.
65	Encoder Multiturn overflow	1	The encoder multi-turn counter is overflowed.	a. Set D02.21 to 1 to reset multi-turn data and all error, and reset drive power.
		2	The main power and battery supply have been both reset at the same time.	a. Perform acknowledge fault, and then performHoming procedure.
66	Reference point not set	1	Perform absolute positioning without the reference point set.	a. Perform Homing procedure, and then absolute positioning.

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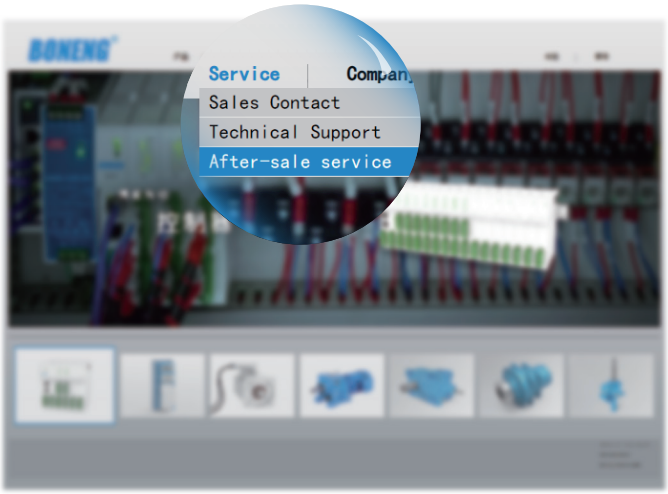

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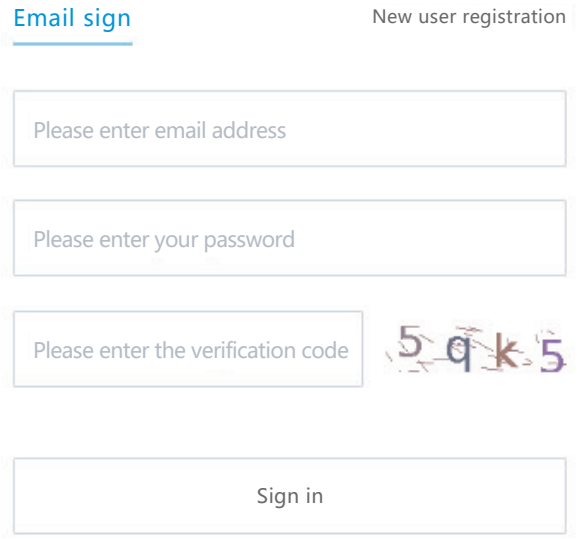

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