

SA710P 水泵行业专用变频器

Inverter for Pump Industry



操作手册 Operation Guide

感谢您使用 SA710P 产品，在产品使用前，请认真阅读本指南。

Thank you for using the SA710P series products. Please read this guide carefully before using the products.

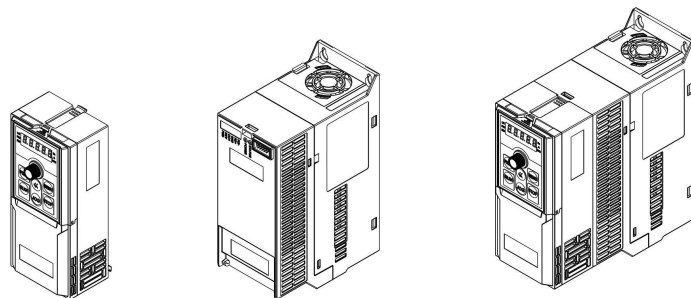
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中文

1. 概述

- SA710P 包含控制单元 CU0P 和功率单元 PU0P；
- 键盘控制功能说明，请参考键盘快速指南；
- 产品出厂前均经过严格检测和包装，如果发现产品损坏，型号不对，缺少配件等异常情况，请通知本公司人员。

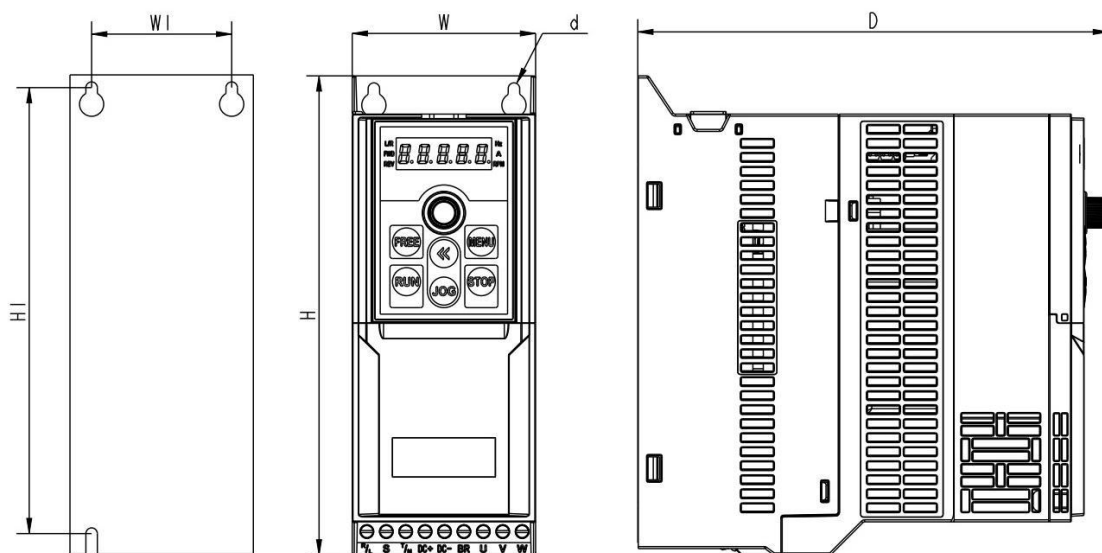


控制单元 CU0P + 功率单元 PU0P = SA710P 变频器

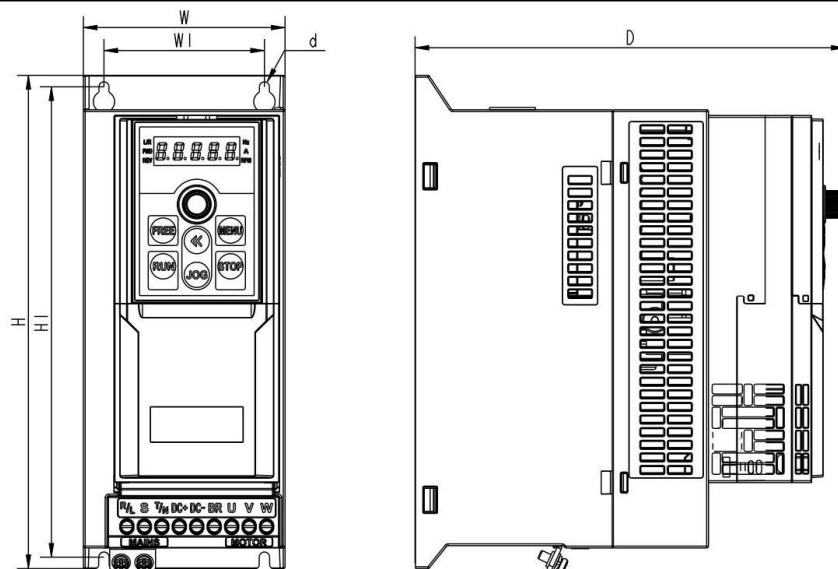
2. 安全事项

- 在操作本产品前，请详细阅读并注意相关安全信息，并由专业人士安装，调试，检修，保养。
- 操作配线时，请务必确认电源是关闭状态。
- 切断电源后，功率单元内仍可能有高压。请勿接触内部电路及电路端子，否则可能有触电风险，至少等待 4 分钟（22kW 及以下），15 分钟（30kW 及以上）后才可以操作。
- 上电过程中绝不能插拔产品的任何连接器，否则可能会造成产品损坏和人员伤亡。
- 产品接地端子请务必正确接地。
- 主回路端子必须正确接线，R、S、T 或 R/L、S、T/N 为电源输入端子，绝不能与 U、V、W 混用，否则上电时会造成产品损坏。
- 产品及配件安装场合应远离火源发热体及易燃物。
- 电机自学习仅允许电机功率等级比变频器额定功率高一档或小两挡，如果电机功率等级和变频额定功率相差太大，可能会导致控制性能下降或者电机烧毁。
- 电机自学习请首先按电机铭牌正确设置电机参数，然后再设置 P01.13=1 或者 2 开始自学习，如果没有正确设置电机参数就开始自学习，可能会导致电机烧毁。
- 使用产品前请拔掉 CU0P 内部电池绝缘片，详细拆装方式见第七章 7.1。

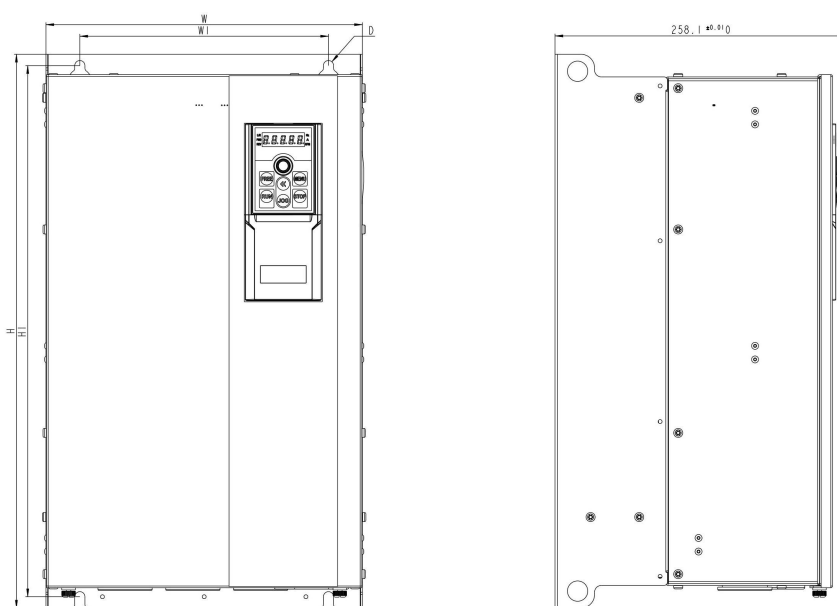
3. SA710P 外形尺寸



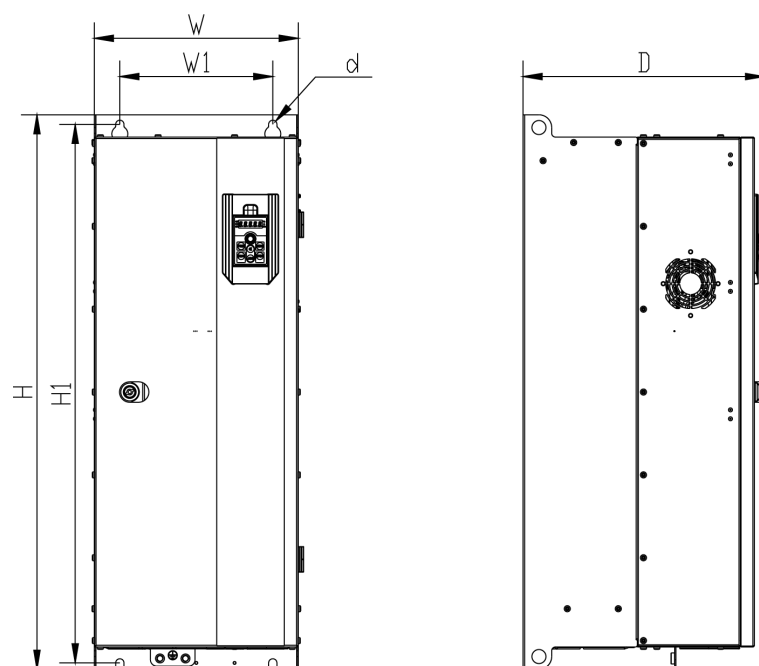
D1 机壳尺寸



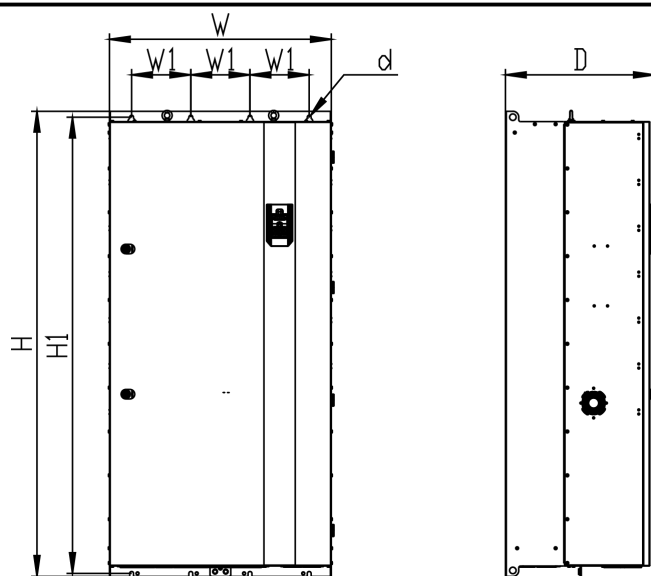
D2-D4 机壳尺寸



D5-D6 机壳尺寸



D7-D9 机壳尺寸



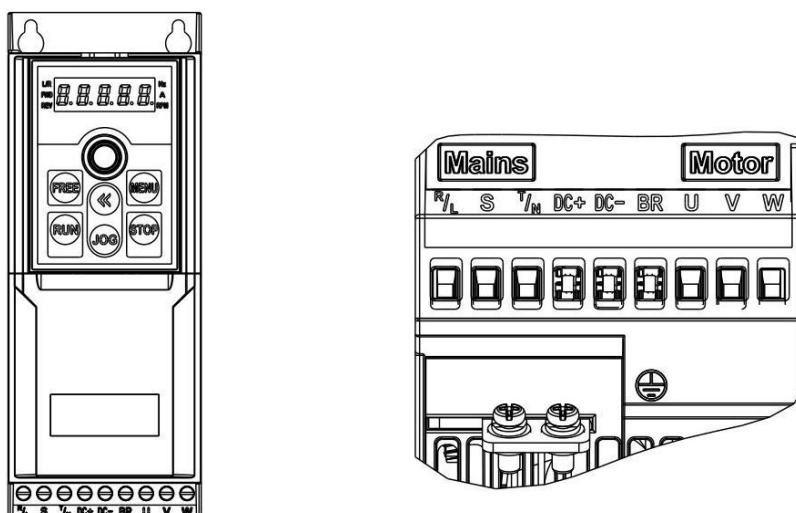
D10 机壳尺寸

机壳	功率及电压等级	尺寸(mm)					
		W	H	D	W1	H1	d
D1	3×380-480V 0.75-2.2kW	72	188	185	55	175	4.5
D2	4.0kW	88	215	188	70	205	4.5
D3	5.5-7.5kW	100	250	194	80	240	4.5
D4	11-22kW	170	370	212	145	355	6.5
D5	30-55kW	280	490	258	220	470	9
D6	75-110kW	330	620	278	270	600	9
D7	132-185kW	320	870	380	240	845	13
D8	200-355kW	500	1070	410	380	1040	13
D9	415-450kW	650	1220	430	480	1190	13
D10	500-630kW	750	1570	505	3*200	1540	13

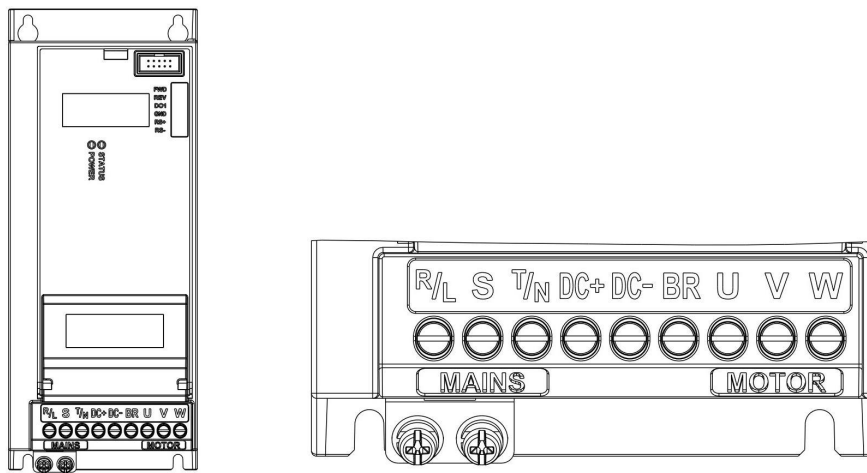
4. 主回路端子和控制端子

4.1. 主回路端子

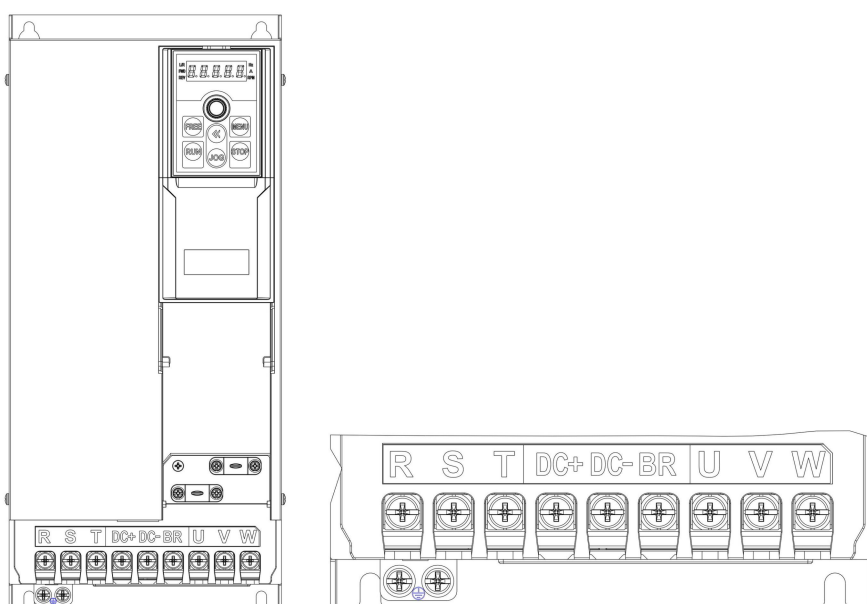
- 主回路端子接线步骤说明:
- 将电机地线, 电源地线接到接地端子上
- 将电机三相连接到 U V W 端子上
- 如果需要接制动电阻, 请将制动电阻连接到 DC+ BR 端子上
- 将主电源线接到输入端子 R/L S T/N 端子上



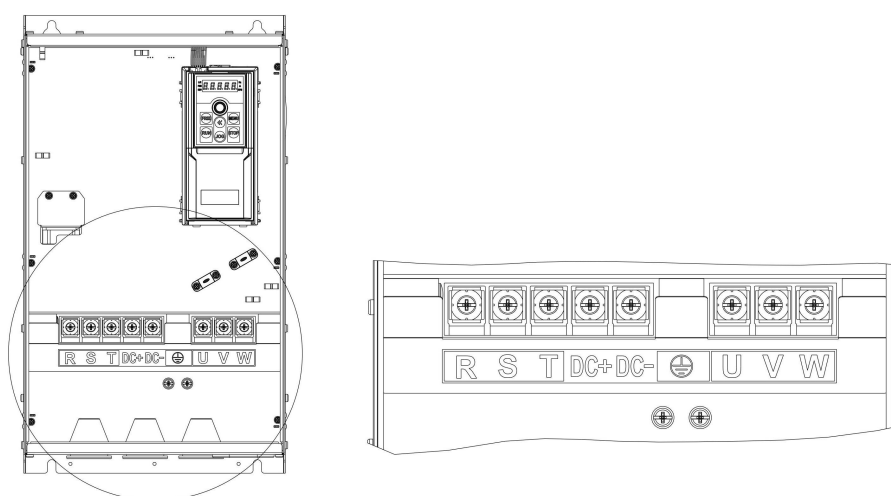
0.75-2.2kW 主回路端子示意图



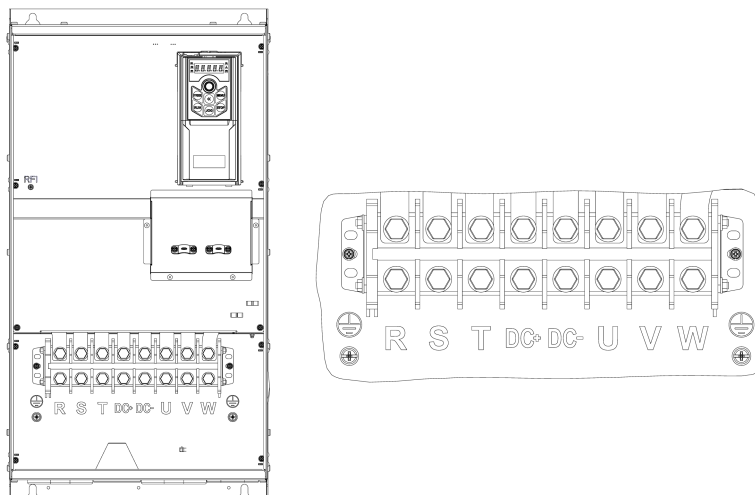
4.0-7.5kW 主回路端子示意图



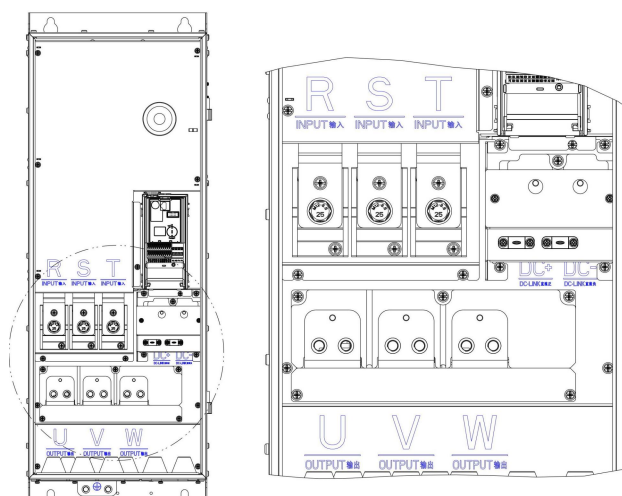
11-22kW 主回路端子示意图



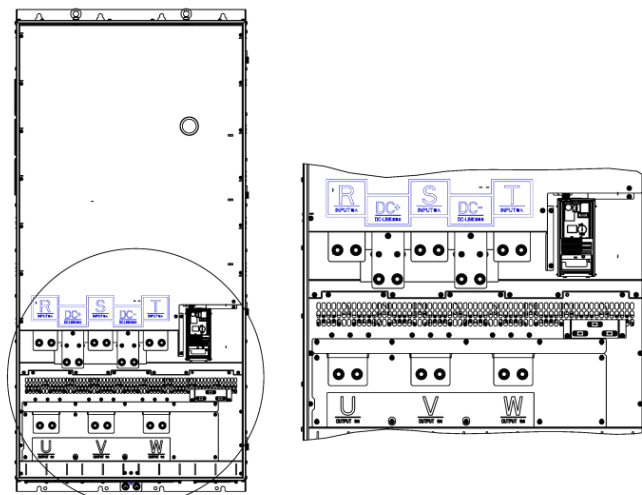
30-55kW 主回路端子示意图



75kW-110kW 主回路端子示意图



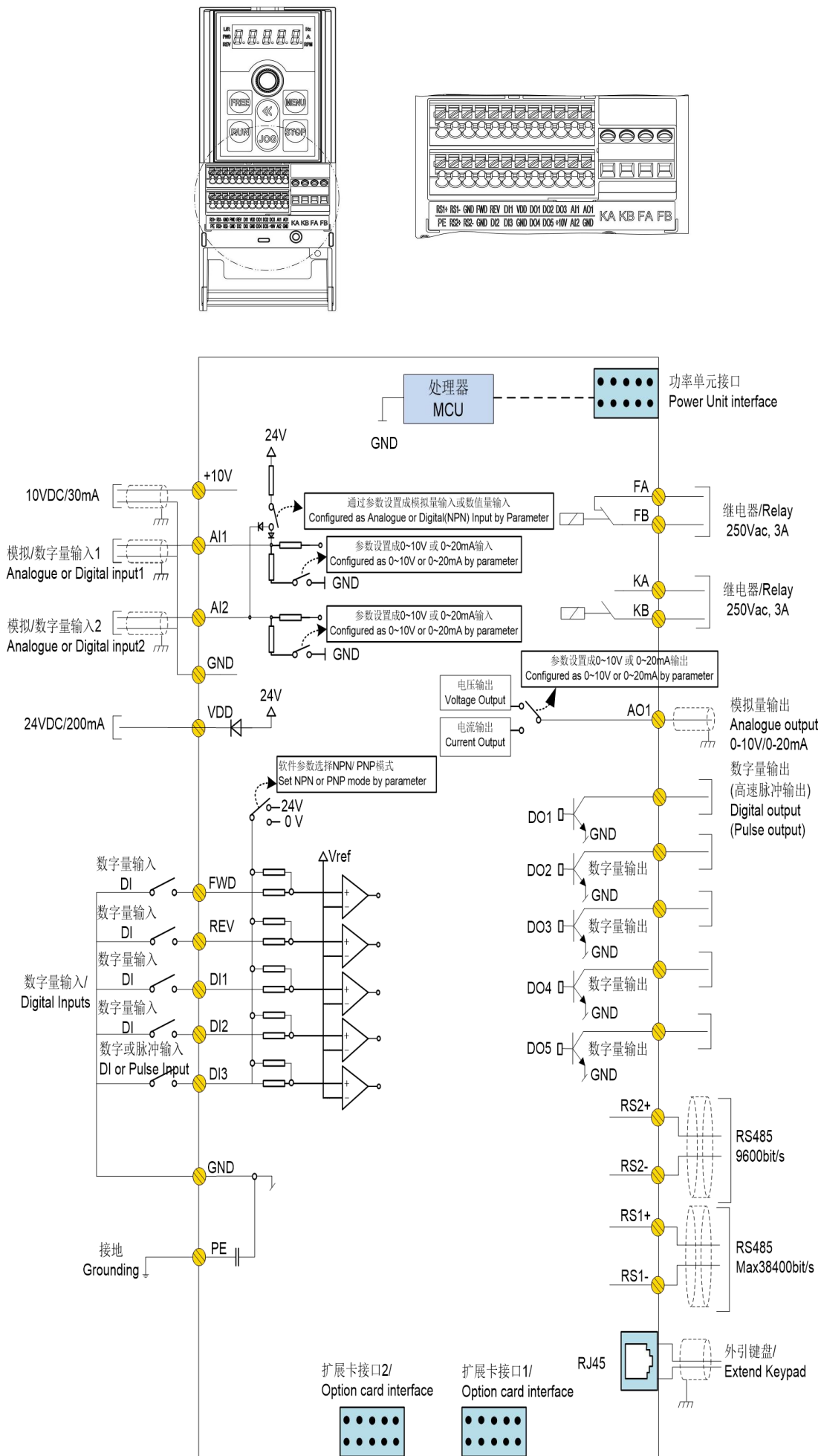
132-450kW 主回路端子示意图



500-630kW 主回路端子示意图

端子功能	端子标记		
电源输入端	0.37-7.5kW R/L、S、T/N	11-22kW R、S、T	30-630kW R、S、T
电源输出端 连接至电动机	U、V、W	U、V、W	U、V、W
直流母线电压正负端	DC+、DC-	DC+、DC-	DC+、DC-
制动电阻连接端子	DC+、BR	DC+、BR	-
接地端子	⊕	⊕	⊕
注:DC+、DC-、BR 为直流母线和制动; U、 V、 W 为电源输出;			

4.2. SA710P 控制端子



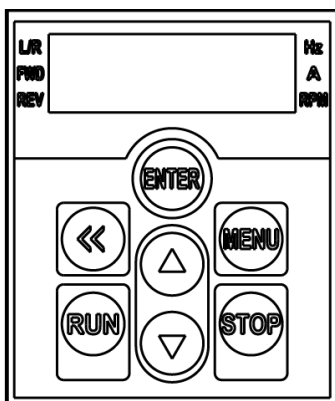
端子名	说明	规格
FWD,REV, DI1,DI2,DI3	数字量输入端子	输入类型:NPN 模式和 PNP 模式 输入电压:0~30V; 输入阻抗:3.6kΩ; DI3 可配置为脉冲输入, 脉冲输入范围:0.00~100.00kHz;
DI3	脉冲输入端子	频率范围:0.00~100.00kHz; 电源范围:24V±20%; 占空比范围:40%~60%;
DO1,DO2,DO3, DO4,DO5	数字量输出端子	OC 门输出; 输出电流范围:0~40mA; 输出电压范围:0~30V;
DO1	脉冲输出端子	作为脉冲输出时: 负载能力:阻性负载>1kΩ, 容性负载 <10nf; 脉冲频率范围:0.00~100.00kHz; 占空比范围:40%~60%;
RS1+, RS1-	RS485 通讯	最大通讯速率 38400bit/s;
RS2+, RS2-	RS485 通讯	用于多泵联机 通讯速率 9600bit/s;
FA-FB (继电器 1) KA-KB (继电器 2)	继电器输出	阻性负载:250VAC 3A/30VDC 3A; 感性负载:250VAC 0.2A/24VDC 0.1A (cosφ=0.4);
AI1, AI2	模拟量数字量输入	可通过参数选择为模拟量电压输入、模拟量电流输入或者数字量输入: 1、作为模拟量电压输入: 输入阻抗 10kΩ; 输入电压范围:0~10V; 2、作为模拟量电流输入: 输入阻抗 ≤500Ω; 输入电流范围:0~20mA; 3、作为数字量输入: a)输入类型:NPN;PNP; b)输入阻抗:10KΩ; c)电压范围:0-30V
AO1	模拟量输出	可通过参数配置 0~10V 电压输出或者 0~20mA 电流输出 输出范围:0~20mA or 0~10V; 负载能力 电压输出时:负载阻抗大于 500Ω 电流输出时, 负载阻抗小于 500Ω;
VDD	24V 电源	最大输出电流 200mA
+10V	10V 电源	最大负载 30mA
GND	信号地	
PE	大地	
扩展卡接口 1,2	用于外接扩展卡, 位于控制单元底部	
外引键盘接口	用于外引控制键盘, 位于控制单元中部	

5. 选项卡

SA710P 可同时支持 2 张不同类型选项卡, 支持多种 PG 类卡、IO 类卡, 以及多种通讯总线类选项卡。

6. 键盘操作与显示

SA710P 全系列支持键盘可插拔, 可支持的键盘类型有 KP01 等; 键盘操作界面和按键定义如下:



按键	名称	功能
FREE	用户自定义键	用户可通过参数自定义该键功能。（可通过设置参数 P06.32=1，FREE 键反转功能）
<<	数值移位键	用于在停机显示界面和运行显示界面下，可循环选择显示参数；在修改参数时，可以选择参数的修改位；
MENU	菜单键	用于菜单进入或退出
RUN	运行键	启动产品运行，默认只在本地模式有效
JOG	点动键	用于本地模式下控制产品点动运行
STOP	停止复位键	用于本地模式下停止产品运行或在故障时复位产品；
	增量式电位器	顺时针旋转电位器增加数值；逆时针旋转电位器减少数值；按下电位器确认参数编号选择并进入参数值显示/修改或确认参数值并返回参数编号选择菜单；

如果需要切换远程/本地模式，请同时按住数字移位键和菜单键并保持 3 秒以上；或者设置 P06.31=0 进入远程模式，P06.31=1 进入本地模式。

操作指示灯说明:L/R 指示灯:常亮表示远程（REMOTE）模式；闪烁表示本地模式（LOCAL）；FWD、REV 指示灯。

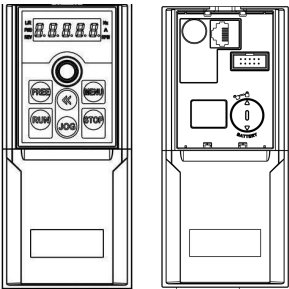
FWD	REV	状态
亮	灭	正转运行
灭	亮	反转运行
灭	灭	停止

Hz、A 指示灯：用于指示产品显示数据的意义。

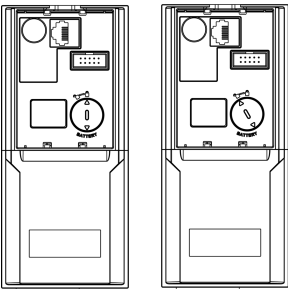
7. CU0P 电池的使用及更换

7.1. 电池的使用

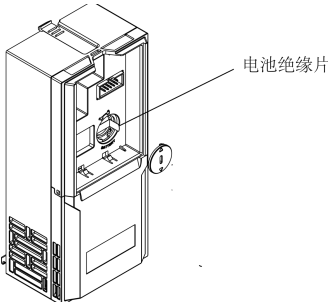
使用产品前请先拔掉 CU0P 内部电池槽的绝缘片步骤如下:



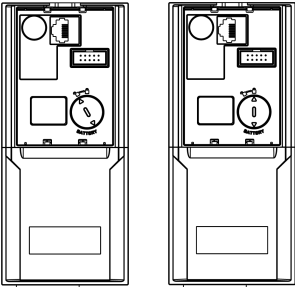
第 1 步:取下 KP01



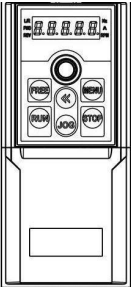
第 2 步:使用一字螺丝刀逆时针旋转电池盖至图示锁扣位置取下电池盖



第 3 步:拔掉绝缘片



第 4 步:将电池盖按照图示放于产品孔内，使用一字螺丝刀，顺时针旋转至竖直方向



第 5 步:组装 KP01

7.2. 电池的更换

参考 7.1 电池的使用步骤，在第 3 步取下电池，更换电池即可，电池型号为 CR220。

8. 基础应用指南

8.1. 键盘控制

- 1) 确认变频器处于本地工作模式（L/R 灯闪烁），否则通过设置参数 P06.31=1 切换到本地模式；
- 2) 调节增量式电位器即可调节输出频率，默认情况下每按一次，频率增加或减速 0.1Hz；
- 3) 按 RUN 键即可启动变频器，启动后仍可通过调节增量式电位器设定频率
- 4) 按下键盘上的“STOP”键停止变频器；
- 5) RUN 键反转启动功能:设置 P00.15=1,P03.68=-100,通过调节增量式电位器设定频率为负数，按 RUN 键反转运行；

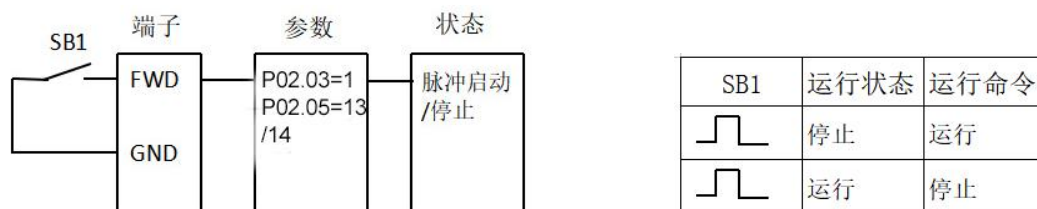
8.2. 外部端子控制

首先确认变频器工作在远程模式（L/R 灯常亮），否则可通过设置参数 P06.31=0 切换到远程模式。机器出厂时默认为远程模式。默认参数下控制方式:

8.2.1. 启停控制方式

● 单线制脉冲启动

数字量输入端子设置为自动脉冲启动有效，FWD 端子功能设置为脉冲正/反转，可以实现单线脉冲启停控制。具体接线，方式如下:



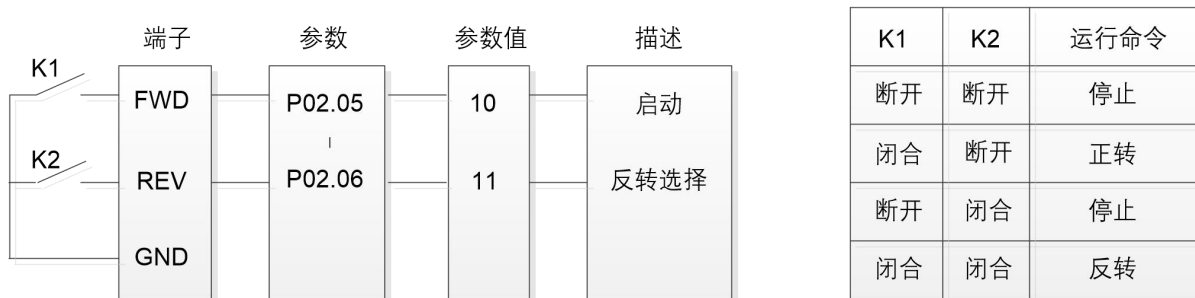
● 两线制 1(出厂默认)

数字量输入端子 FWD 功能出厂默认为正转启动功能，数字量输入端子 REV 功能出厂默认为反转运行功能。接线与参数如下:



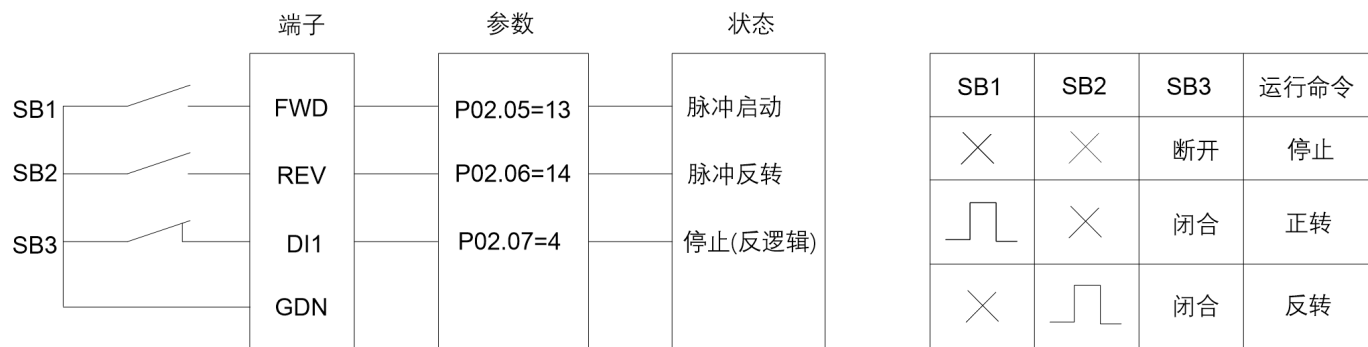
● 两线制 2:

此模式端子 FWD 为运行使能端子，而端子 REV 决定电机的运转方向。接线与参数如下:



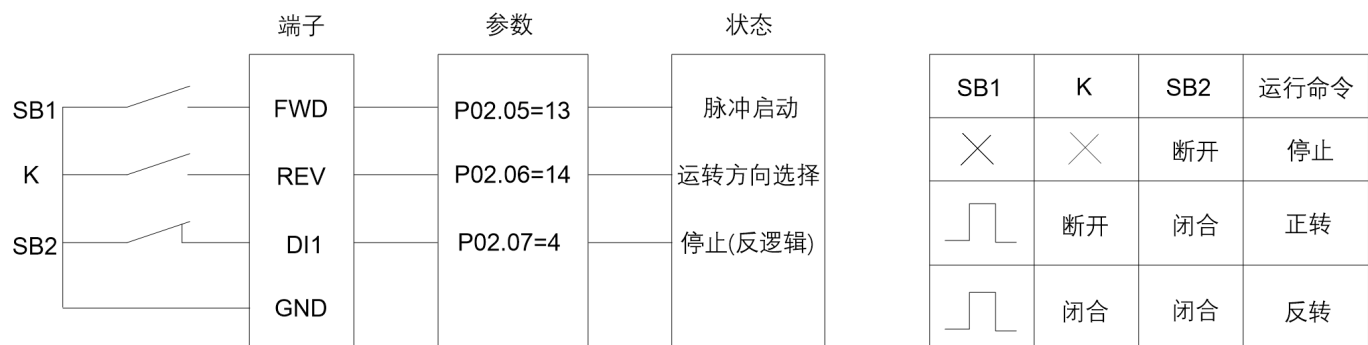
● 三线制模式 1

由端子 FWD, REV 来决定电机的正反转。需要运行时必须先闭合 DI1 端子，FWD,REV 上的脉冲来实现电机反转控制，停车则通过断开 DI1 端子来实现。接线方式如下图:



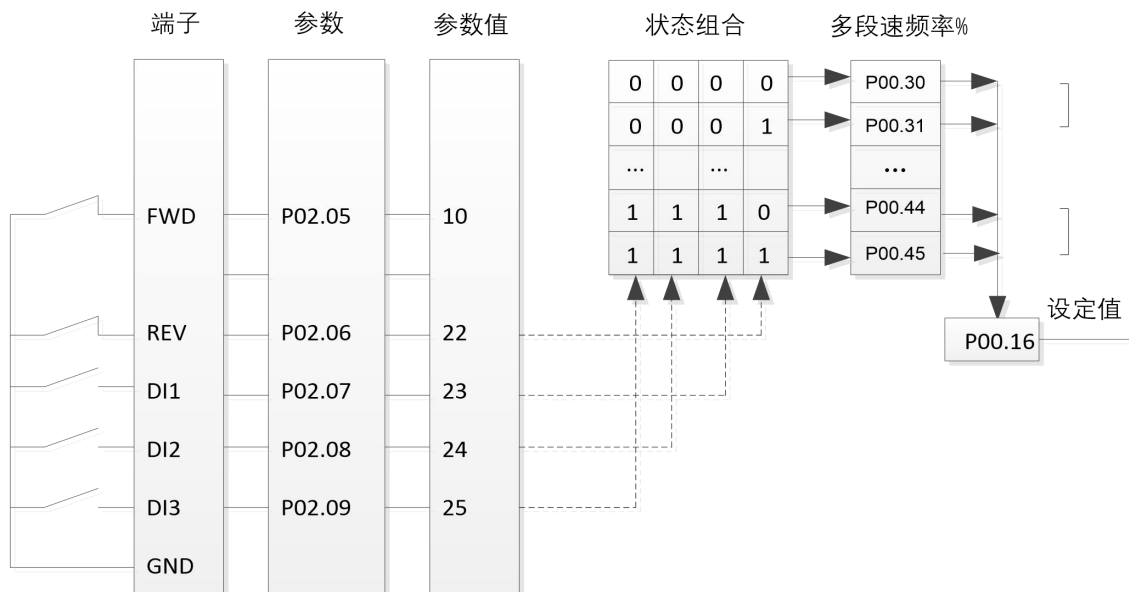
• 三线制模式 2:

端子 DI1 为运行使能端子，启动命令由 FWD 给出，电机运转方向由 REV 的状态决定。需要运行时，必须先闭合 DI1 端子，由端子 FWD 上的脉冲产生电机运行信号，端子 REV 的状态控制电机运转方向，停车则通过断开 DI1 端子实现。接线方式如下图:



8.2.2. 目标值设定

- 在远程模式下，设定值来源出厂默认为模拟量 AI1 和通讯给定都有效。给模拟量 AI1 端子接 0~10V 电压即可调节设定频率；或者通过 Modbus 通信调节设定频率。
- 脉冲给定:把主设定源设置成脉冲给定(P00.11 = 5)，DI3 功能设置成脉冲输入(P02.09 = 40)后，通过给 DI3 施加不同频率的脉冲信号来调节设定值。
- 端控多段速控制，以 16 段运行频率举例，通过 4 个 DI 输入信号的组合来选择。将 DI 端口对应的参数设置为 22 ~ 25（多段指令端子 1~4），而所需的多段频率则通过参数 P00.30~P00.45 数组来设置。例如设置 REV~DI3 作为多段速选择的信号输入端，并由之依次组成 4 位二进制数，按状态组合值，挑选多段速频率。当(DI3,DI2, DI1, REV) = (0, 0, 0, 1) 时，形成的状态组合数为 1，此时挑选 P00.31 设置的多段指令百分比，由 $P00.31 \times P00.16$ 计算得到设定值。例如 $P00.31 = 20.00\%$ ， $P00.16 = 50.000$ ，则设定值为 10.00。最多可以设置 4 个 DI 端口作为多段速频率输入端，也允许少于 4 个 DI 端口进行多段速频率给定的情况，对于缺少的设置位，按状态 0 计算。如下图所示:

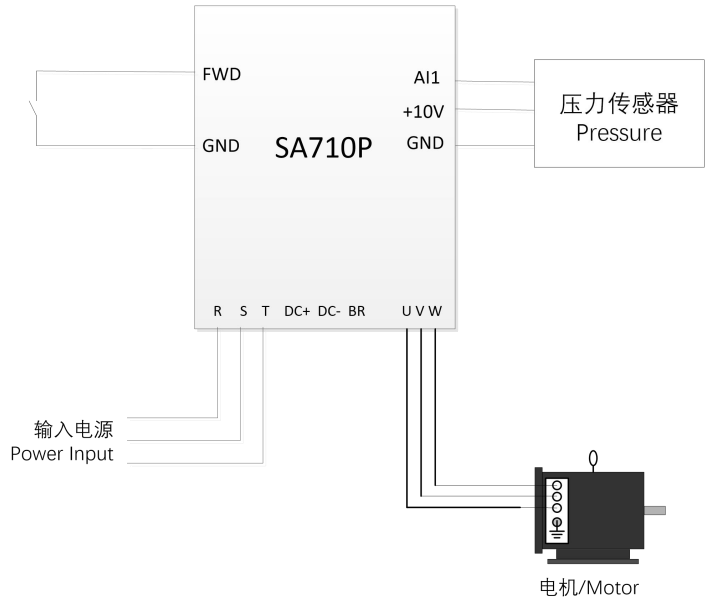


8.3. 过程 PID 应用功能

只有在远程模式下才能开启过程 PID 控制。

- 1) 设置参数 P00.11=21（设置主设定值来源为过程 PID）开启过程 PID 控制。
- 2) 通过参数 P04.00（默认为无效）选择过程 PID 反馈源，例如:若过程 PID 反馈源是端子 AI1,则 P04.00 设置为 1，可通过 P03.00 选择 AI1 信号类型为电压输入或者电流输入。
- 3) 通过参数 P04.01（默认为无效）选择过程 PID 给定源，例如:若过程 PID 给定源是多段速，则 P04.01 设置为 11，给定值通过参数 P00.30 设置，100%对应最大量程。
- 4) 通过参数 P04.04 选择过程 PID 正反逻辑（根据现场工艺选择正反逻辑，默认为正逻辑）
- 5) 参数 P04.07 为过程 PID 比例增益，参数 P04.08 过程 PID 积分时间，这两个参数主要是调节 PID 的响应快慢，可根据现场工艺需求调节。

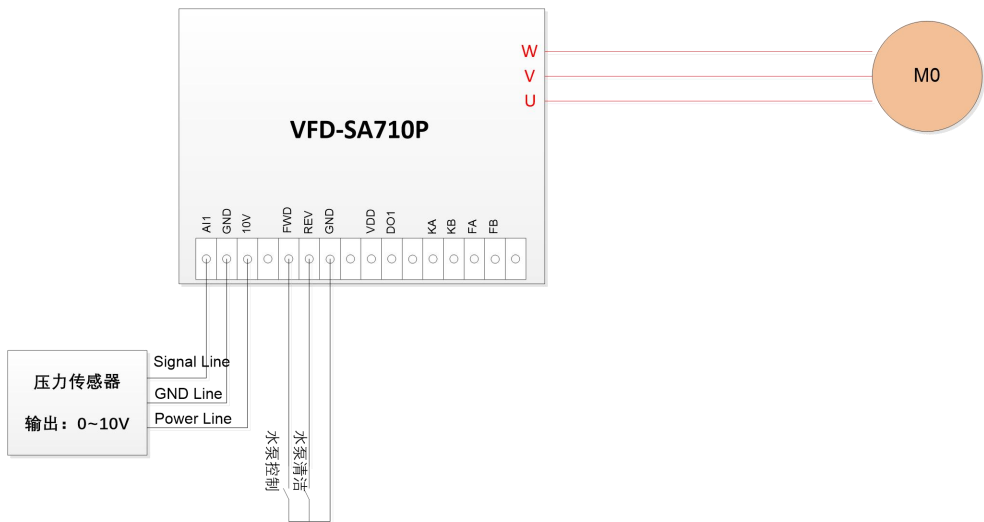
电气原理图参考如下:



8.4. 水泵典型应用

8.4.1. 单泵控制

单泵控制电气图如下所示:



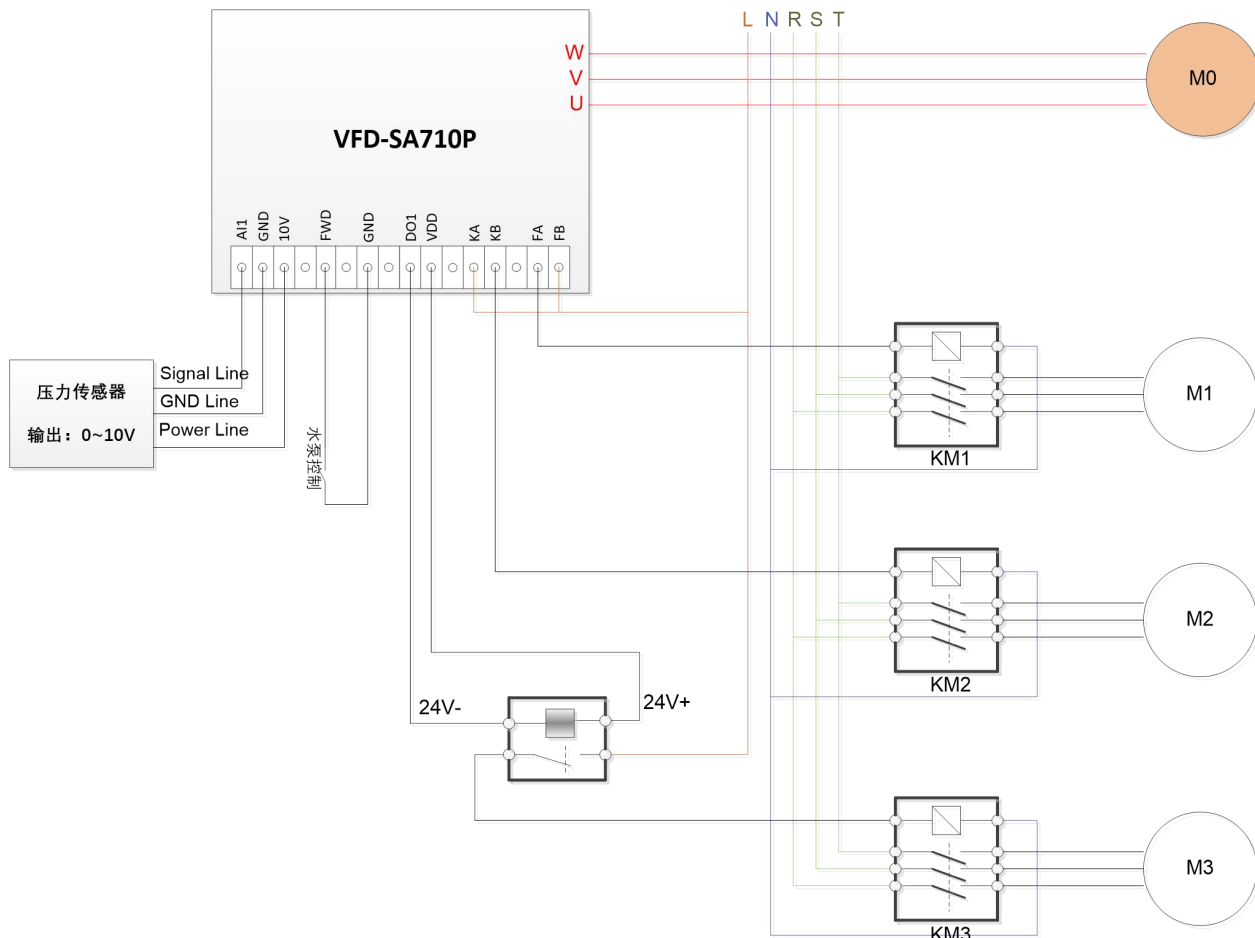
设置相关参数如下:

- 1) 设置 P00.03（应用宏）= 1（水泵控制）；
- 2) 设置 P20.00（水泵控制模式）= 0（压力控制模式）；
- 3) 根据压力传感器规格设置 AI1 相关参数（P03.03~P03.04, P03.07~P03.08）；
- 4) 根据需求设置 P00.30（多段指令 0）；
- 5) 设置 P20.73（多泵循环运行模式）=0（无功能）；

- 6) 设置 P20.40 (联机运行选择) = 0 (无效) ;
- 7) 设置 P02.06 (REV 输入功能选择) = 65 (水泵清洁) ;
- 8) 根据需求设置休眠、唤醒、水管填充、水泵清洁、PID 反馈丢失等参数;
- 9) 通过 FWD 端子启动水泵压力控制;
- 10) 通过 REV 端子启动水泵清洁;

8.4.2. 定量控制

以连接电机数量等于 3 为例，电气图如下所示：



设置以下参数:

- 1) P00.03 (应用宏) = 1 (水泵控制) ;
- 2) P20.00 (水泵控制模式) = 0 (压力控制模式) ;
- 3) 根据压力传感器规格设置 AI1 相关参数 (P03.03~P03.04, P03.07~P03.08) ;
- 4) 根据需要设置 P00.30 (多段指令 0) ;
- 5) P20.40 (联机运行选择) = 0 (无效) ;
- 6) P20.73 (多泵循环运行模式) = 1 (定量控制) ;
- 7) P20.81 (连接电机数量) = 3;
- 8) P02-28 (继电器 1 输出功能选择) = 64 (电机 1 输出), P02-31 (继电器 2 输出功能选择) = 65 (电机 2 输出), P02.22 (DO1 输出功能选择) = 66 (电机 3 输出) ;
- 9) 根据需求设置加减电机和轮询相关参数;
- 10) 根据需求设置休眠、唤醒、水管填充、水泵清洁、PID 反馈丢失等参数;
- 11) 通过 FWD 端子启动水泵压力控制;

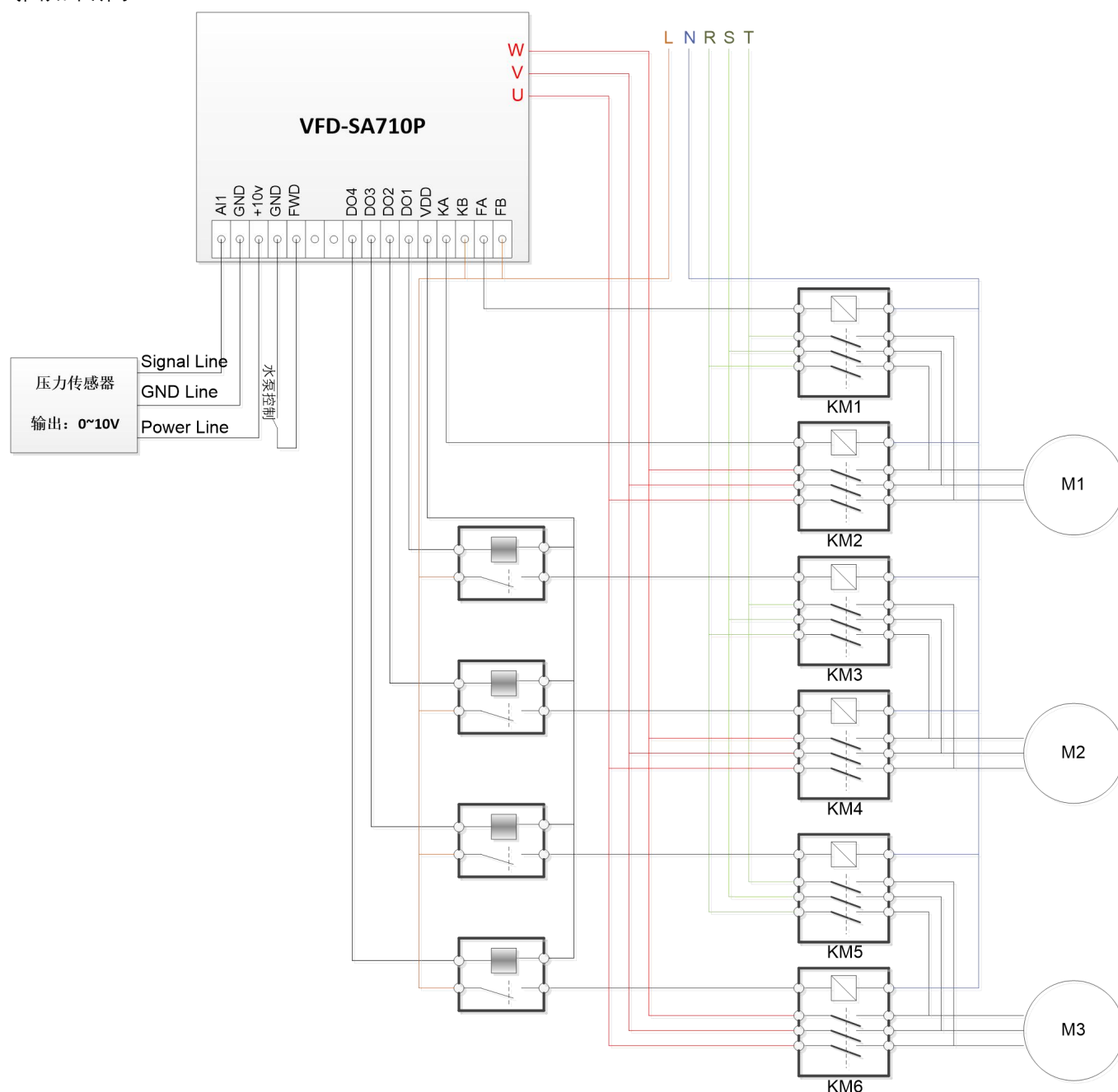
8.4.3. 定量循环

以连接电机数量为 3 为例，设置以下相关参数:

- 1) 设置 P00.03 (应用宏) = 1 (水泵控制) ;
- 2) 设置 P20.00 (水泵控制模式) = 0 (压力控制模式) ;
- 3) 根据压力传感器规格设置 AI1 相关参数 (P03.03~P03.04, P03.07~P03.08) ;

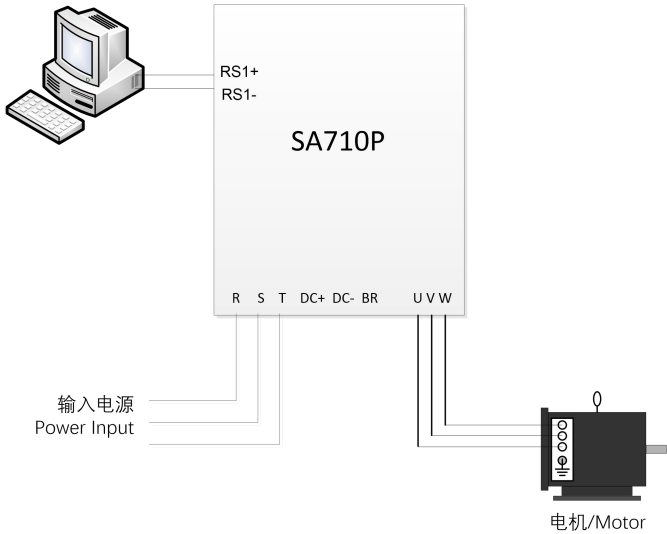
- 4) 根据需求设置 P00.30 (多段指令 0) ;
- 5) 设置 P20.40 (联机运行选择) = 0 (无效) ;
- 6) 设置 P20.73 (多泵循环运行模式) = 2 (定量循环);
- 7) 设置 P20.81 (连接电机数量) = 3;
- 8) 设置 P02-28 (继电器 1 输出功能选择) = 64 (电机 1 输出), P02-31 (继电器 2 输出功能选择) = 65 (电机 2 输出), P02.22 (DO1 输出功能选择) = 66 (电机 3 输出), P02.23 (DO2 输出功能选择) = 67 (电机 4 输出), P02.24 (DO3 输出功能选择) = 68 (电机 5 输出), P02.25 (DO4 输出功能选择) = 69 (电机 6 输出);
- 9) 根据需求设置加减电机和轮询相关参数;
- 10) 根据需求设置休眠、唤醒、水管填充、PID 反馈丢失等参数;
- 11) 通过 FWD 端子启动水泵压力控制。

电气图如下所示:



位	说明
位 7~0 (启停控制等)	0x00: 无功能 (保持原状态不变) 0x01: 正转运行 0x02: 反转运行 0x03: 点动正转运行 0x04: 点动反转运行 0x05: 停止 0x06: 自由停车 0x07: 故障复位 0x08: 清除命令 (清除所有运行及停止指令)
位 11~8 (多段速选择)	0000B: P00.30 (预置设定值 0) 0001B: P00.31 (预置设定值 1) ... 1111B: P00.45 (预置设定值 15)
位 13~12 (加减速时间选择)	00B: 加减速 1 01B: 加减速 2 10B: 加减速 3 11B: 加减速 4
位 14	保留
位 15	1B 使能 Bit8~13 0B 禁能 Bit8~13

*寄存器 10000 运行频率说明
 使用通讯控制变频器时, 可以通过写寄存器 10000 直接设置运行频率。该寄存器数值范围为 0.00~P05.08, 单位 0.01Hz。
 通信控制电气原理图参考如下:



8.6. 参数恢复出厂值

设置参数 P07.00=9;
 变频器断电等键盘显示完全熄灭后再重新上电, 键盘显示 A.01;
 按 STOP 键清除 A.01 故障即完成参数初始化;

8.7. 故障复位

对于非锁定型故障, 直接按下 STOP 键后复位当前故障。
 对于锁定行故障:需对变频器先执行下电再上电操作后, 然后按下键盘 STOP 键复位当前故障;

8.8. 电机参数自学习

确保变频器处于停止状态且电机处于静止状态;
 按电机铭牌数据设置电机参数;
 设置参数 P01.13 = 1 或者 2;
 键盘交替显示“PUSH”、“ RUN”, 按下“RUN”键, 开始电机自学习, 屏幕显示“ -At-”;
 等待键盘交替显示“PUSH”、“ Ent”时, 按下“ENTER”键 (CU0B:按增量式电位器), 电机自学习完成。

9. 功率单元故障代码

警告	故障	错误	故障名称	故障原因	处理对策
	A.01		参数恢复出厂值	用户执行参数恢复出厂值操作	按“STOP”复位即可
	A.02*		产品内部故障	硬件故障	寻求技术支持
u.03	A.03*		功率单元和控制单元通信失败	功率单元和控制单元接触不良	1.下电，重新拔插控制单元 2.寻求技术支持
	A.04*		power 板 24V 电源异常	硬件故障	寻求技术支持
	A.05*		IGBT 驱动电压故障	硬件故障	寻求技术支持
u.07	A.07*		风机故障	1.风机灰尘太多 2.风机老化	1.清理风机 2.更换风机
u.08			风机 2 异常	1.风机灰尘太多 2.风机老化	1.清理风机 2.更换风机
	A.16*		输出短路	电机或输出接线端子发生短路	检查电机接线、检查电机线及电机的绝缘情况
u.17	A.17*		接地故障	1.电机线对地漏电 2.电机对地绝缘问题	1.检查电缆或电机绕组对地的绝缘情况 2.更换电缆或电机
u.19	A.19*		制动电阻短路	制动电阻短路，导致制动功能无效	更换制动电阻，此故障只存在于 22kW 及以下机型
u.20	A.20*		制动单元短路	制动晶体管短路，导致制动功能无效	机器返修,此故障只存在于 22kW 及以下机型
u.21	A.21*		制动电阻开路	制动电阻未连接或未工作	检查制动电阻的连接或更换合适阻值的电阻;此故障只存在于 22kW 及以下机型
u.23	A.23		欠压过流报警	当瞬时母线电压低于欠压门限，且在 1s 内出现过流报警	因为电压过低导致过电流，检查电网电压是否瞬间掉落
u.24			欠压	瞬时停电或输入电压低且负载重	确保电网电压正常
u.25	A.25		欠压过载	输入电压长时间偏低	检查电网电压是否正常且负载重
u.26	A.26*		输入缺相	1.三相输入电源不正常 2.硬件异常	1.检查输入电源线的连接 2.寻求技术支持
u.27	A.27		借能运行失败	产品输入电源异常，具体请参考借能运行相关参数描述 (P7.26~P7.28)	1.检查输入电源是否正常 2.检查借能运行的电压阈值设置是否正常
	A.28*		电机缺相	1.电机三相不平衡 2.电机接线松动	1.检查电机接线 2.检查电机
	A.29*				
	A.30*				
u.36	A.36		过压	1.减速时间过短 2.负载惯性太大 3.负载波动太大 4.设备在运行过程中存在外力拖动电机运行 5.输入电压过高 6.参数设置不合理	1.取消外动力或加装制动电阻 2.检测输入电压 3.调整相关参数或寻求技术支持
u.37	A.37		IGBT 温度过高	1.风道堵塞 2.风扇工作异常	1.清理风道 2.更换风
u.38	A.38		IGBT U 相温度传故障		寻求技术支持
u.39	A.39		IGBT V 相温度传故障		
u.40	A.40		IGBT W 相温度传故障		
u.41	A.41		整流桥温度过高	1.风道堵塞 2.风扇工作异常	1.清理风道 2.更换风扇
u.42	A.42		整流桥温度传感器故障		寻求技术支持
u.43	A.43		Power 板温度过高	1.风道堵塞 2.风扇工作异常	1.清理风道 2.更换风扇

警告	故障	错误	故障名称	故障原因	处理对策
u.45	A.45		过流	1.加减速时间太短 2.VF 控制时 VF 曲线设置过高 3.矢量控制时负载补偿、滑差补偿设置过大 4.输入电压低 5.设备在运行中负载突变过大 6.对正在旋转的电机进行启动 7.产品输出回路存在接地或短路	1.选择更大功率产品 2.选择转速追踪启动或等电机停止后再启动 3.调整参数或寻求技术支持
u.46	A.46		产品过载	1.VF 控制时 VF 曲线设置过高 2.矢量控制时负载补偿、滑差补偿设置过大 3.负载过重 4.电机参数设置不当	1.选择更大功率产品 2.按照电机铭牌正确设置 3.调整参数或寻求技术支持
u.48	A.48		电机温度过高	1.温度传感器型号不对 2.温度传感器线松动 3.普通电机长期低速重负载运行 4.查看过载原因	1.检查温度传感器接线 2.选择正确的温度传感器 3.请选用变频电机或加强电机散热
u.49	A.49		电机过载	1. VF 控制时 VF 曲线设置过高 2.矢量控制时负载补偿、滑差补偿设置过大 3.电机参数设置不当 4.电机堵转或负载突变过大 5.负载过重	1.按照电机铭牌正确设置 2.选择更大功率电机 3.检查电机是否存在堵转等异常
u.50	A.50		电流极限	输出电流超过参数 P05.07 的设定值	正确设置电机参数或按 A.45 过电流对策处理
u.51	A.51		过转矩	输出转矩超过参数 P05.04、P05.05 的设定值	正确设置电机参数或按 A.45 过电流对策处理
u.57	A.57		模拟量故障	模拟量输入端子 AI1 或 AI2 上的信号中断, 详见参数 P03.48, P03.49 说明	1.检查端子 AI1 或 AI2 的接线 2.检查信号是否正常
u.61	A.61		速度闭环模式下编码器丢失	1.编码器接线错误 2.编码器参数设置错误 3.加减速时间不合理	1.检查编码器接线是否正确 2.检查编码器参数 P02.70,P02.71 参数设置是否正确 3.合理设置加减速时间
u.62	A.62		通讯控制字超时	1.上位机工作不正常 2.通讯接线不正常 3.通讯参数设置不正确 4.通讯干扰	1.检查上位机程序 2.检查通讯连接线 3.正确设置通讯参数 4.使用屏蔽线或寻求技术支持
u.63	A.63		现场总线通讯掉线	1.主站工作不正常 2.通讯接线不正常 3.通讯参数设置不正确 4.通讯干扰	1.检查主站组态和程序 2.检查通讯连接线 3.正确设置通讯参数 4.使用屏蔽线 5.寻求技术支持
u.66			电机丢失	1.电机线没有接好 2.产品功率远大于电机功率	1.检查电机接线 2.产品功率应和电机功率匹配
	A.69		机械制动电流过低	机械制动参数设置不合理	按实际情况正确设置参数
u.75			产品定时停止时间到达	产品设置了定时停止功能	请联系厂家
u.76	A.76		外部故障	使用了数字量输入功能选择选项外部故障输入	检查外部故障输入源
		Er.90	CU 通信失败	1.CU 与 PU 连接松动 2.硬件故障	1.下电, 重新拔插控制单元 2.寻求技术支持
		Er.93	参数在当前模式下不可更改	1.面板修改参数被锁定 2.参数值超出范围	1.解锁面板 2.合理设置参数值

警告	故障	错误	故障名称	故障原因	处理对策
		Err	参数在当前模式下不可更改	运行中不可更改的参数	停机后再设置该参数
	A.99		电机自学习失败		正确设置电机参数
	A.160		干抽	1.水位异常 2.压力传感器接线松动 3.P20.28~P20.30 设置不当	1.检查水泵水位是否充足 2.检查压力传感器接线 3.根据实际情况合理设置 P20.28~P20.30
u.161	A.161		PID 反馈丢失	1.压力传感器接线松动 2.P20.07~P20.08 设置不当	1.检查压力传感器接线 2.根据实际情况合理设置 P20.07~P20.08
	A.162		高水压	1.压力传感器反馈信号异常 2.P20.03(高压故障阈值)设定太小	1.检测压力传感器接线 2.增大 P20.03(高压故障阈值)
	A.163		低水压	1.压力传感器接线松动 2.P20.04~P20.05 设置不当	1.检查压力传感器接线 2.根据实际情况合理设置 P20.04~P20.05
	A.164		水管破裂	1.管路发生破裂 2.P20.58~P20.59 设置不当	1.检查管路 2.根据实际情况合理设置 P20.58~P20.59
u.165			联机断线	1.RS485 接线松动 2.主机参数 (P20.40~P20.41) 设置不当	1.检查通讯连接线 2.检查主机参数 P20.40~P20.41 设置是否正确
	A.166		联机错误	多台从机被设置为备用主机 (P20.42=1)	检查从机 P20.42 的值

10. 参数说明

第 0 组参数：基本控制模式及控制指令

参数号	名称	设定范围	单位	出厂值
P00.01	运行模式	0: 无编码器速度控制 1: 有编码器速度控制 2: 无编码器转矩控制 3: 有编码器转矩控制		0
*P00.02	控制模式	0: VF 控制 1: 矢量控制 1 2: 矢量控制 2		1
P00.03	应用宏	0: 无效 1: 水泵控制		0
*P00.04	负载类型	0: 恒转矩 1: 变转矩 9: 自动能量优化		0
*P00.05	电机运转方向限制	0: 顺时针 1: 逆时针 2: 双向		2
*P00.09	电机反转方向选择	0: 无效 1: 反转选择有效		0
P00.10	设定值来源选择	0: 主设定值来源, 参考 P00.11 1: 多段指令优先 2: 主设定值来源和辅设定值来源计算的结果, 计算方法参考 P00.14 3: 主设定值来源和辅设定值来源之间进行切换 4: 主设定值来源和主设定值来源/辅设定值来源计算结果切换 5: 辅设定值来源和主设定值来源/辅设定值来源计算结果切换		2

参数号	名称	设定范围	单位	出厂值
P00.11	主设定值来源	0: 无效		1
P00.12	辅设定值来源	1: 端子 AI1		20
P00.13	转矩设定值来源	2: 端子 AI2 5: 脉冲输入 1 10: 多段指令 0 + UP/DOWN 11: 多段指令 20: 通讯给定 21: 过程 PID 30: 面板指令设定值		1
P00.14	主/辅设定值来源计算方式	0: 主设定值来源 + 辅设定值来源 1: 主设定值来源 - 辅设定值来源 2: 两者最大 3: 两者最小		0
P00.15	设定值范围	0: 0~P00.16; 1: -P00.16~P00.16		0
P00.16	速度设定基准值	0.0~590.0		50.0
P00.17	控制命令来源	0: 端子或通讯控制 1: 端子 2: 通讯控制		0
P00.18	通讯控制来源端口	0: 无效 1: 本地 RS485 2: 扩展卡通讯总线 1		1
P00.29	控制命令来源切换选择	0: 无效 1: 控制命令来源切换有效		0
P00.30	多段指令值 0	-100.00~100.00	%	0.00
P00.31	多段指令值 1	-100.00~100.00	%	0.00
P00.32	多段指令值 2	-100.00~100.00	%	0.00
P00.33	多段指令值 3	-100.00~100.00	%	0.00
P00.34	多段指令值 4	-100.00~100.00	%	0.00
P00.35	多段指令值 5	-100.00~100.00	%	0.00
P00.36	多段指令值 6	-100.00~100.00	%	0.00
P00.37	多段指令值 7	-100.00~100.00	%	0.00
P00.38	多段指令值 8	-100.00~100.00	%	0.00
P00.39	多段指令值 9	-100.00~100.00	%	0.00
P00.40	多段指令值 10	-100.00~100.00	%	0.00
P00.41	多段指令值 11	-100.00~100.00	%	0.00
P00.42	多段指令值 12	-100.00~100.00	%	0.00
P00.43	多段指令值 13	-100.00~100.00	%	0.00
P00.44	多段指令值 14	-100.00~100.00	%	0.00
P00.45	多段指令值 15	-100.00~100.00	%	0.00
P00.46	UP/DOWN 步长	0.01~50.00		0.10
P00.47	UP/DOWN 记忆选择	0: 不记忆 1: 停机记忆 2: 断电记忆		0
P00.48	点动频率	0.0~400.0	Hz	5.0
P00.49	加减速时间精度	0: 0.1s 1: 0.01s		1
P00.50	加减速 1 类型	0: 直线 1: S 曲线		0

参数号	名称	设定范围	单位	出厂值
P00.51	加减速 1 加速时间	0.01~655.35S	s	*
P00.52	加减速 1 减速时间	0.01~655.35S	s	*
P00.53	加减速 2 类型	0: 直线 1: S 曲线		0
P00.54	加减速 2 加速时间	0.01~655.35S	s	*
P00.55	加减速 2 减速时间	0.01~655.35S	s	*
P00.56	加减速 3 类型	0: 直线 1: S 曲线		0
P00.57	加减速 3 加速时间	0.01~655.35S	s	*
P00.58	加减速 3 减速时间	0.01~655.35S	s	*
P00.59	加减速 4 类型	0: 直线 1: S 曲线		0
P00.60	加减速 4 加速时间	0.01~655.35S	s	*
P00.61	加减速 4 减速时间	0.01~655.35S	s	*
P00.62	点动加减速时间	0.01~655.35S	s	*
P00.63	S 曲线加速起始段时间	0.01~655.35S	s	*
P00.64	S 曲线加速结束段时间	0.01~655.35S	s	*
P00.65	S 曲线减速起始段时间	0.01~655.35S	s	*
P00.66	S 曲线减速结束段时间	0.01~655.35S	s	*
P00.80	本机地址	1~127		1
P00.81	通讯波特率	0: 2400 1: 4800 2: 9600 3: 19200 4: 38400 5~9: 保留		2
P00.82	通讯数据格式	0: 偶校验 (1 个停止位) 1: 奇校验 (1 个停止位) 2: 无校验 (1 个停止位) 3: 无校验 (2 个停止位)		0
P00.83	最小应答延时	0.000~0.500	s	0.002
P00.84	最大应答延时	0.010~10.000	s	5.000
P00.85	报文响应方式	0: 回复 1: 仅回复异常报文 2: 不回复		0
P00.86	通讯设置参数保存方式	0: 参数下电不保存 1: 参数下电保存		0
P00.87	RS485 终端电阻使能	0: 无效 1: 有效		0
P00.88	通讯中断时间	0.01~650.00	s	1.00
P00.89	上位机通讯中断动作	0: 无效 2: 停机 3: 点动频率运行 4: 以速度上限运行 5: 报故障并跳脱停机 6: 警告		0
P00.90	复位通讯中断	0: 无效 1: 复位通讯中断		0

第 1 组参数：电机控制与基本参数				
参数号	名称	设定范围	单位	出厂值
P01.00	载波频率	2~16: 2~16 kHz		*
*P01.01	电网类型	2~122		*
*P01.02	电机类型	0: 异步电机 1: 表贴式同步电机 SPM (隐极) 2: 非饱和内嵌式同步电机 IPM (凸极) 3: 饱和内嵌式同步电机 IPM (凸级)		0
*P01.03	电机额定功率	取决于电机数据	kW	*
*P01.04	电机额定电压	50~1000	V	*
*P01.05	电机额定频率	20~400	Hz	*
*P01.06	电机额定电流	取决于电机数据	A	*
*P01.07	电机额定转速	100~24000	rpm	*
*P01.08	电机额定转矩	0.1~6553.5	N·m	*
*P01.13	电机参数自学习	0: 无效 1: 静态简易自学习 2: 静态完全自学习		0
*P01.14	定子电阻	取决于电机型号	Ω	*
*P01.15	转子电阻	取决于电机型号	Ω	*
*P01.16	定子漏电抗	取决于电机型号	Ω	*
*P01.17	电机主电抗	取决于电机型号	Ω	*
*P01.18	同步电机 D 轴电感	取决于电机型号	mH	*
*P01.19	同步电机 Q 轴电感	取决于电机型号	mH	*
*P01.20	同步电机 D 轴饱和电感	取决于电机型号	mH	*
*P01.21	同步电机 Q 轴饱和电感	取决于电机型号	mH	*
*P01.22	同步电机 D 轴饱和电感对应电流值	20~200	%	100
*P01.23	同步电机 Q 轴饱和电感对应电流值	20~200	%	100
*P01.24	电机极数	2~100	P	4
*P01.25	额定转速时电机 EMF	0~9000	V	*
*P01.26	电机电缆长度	0~150	m	10
*P01.27	系统惯量	0~655.35	kg·m ²	*
P01.32	低速负载补偿	0~199	%	100
P01.33	高速负载补偿	0~199	%	100
P01.34	电机零速励磁电流	0~300	%	100
P01.35	正常励磁电流频率	0.0~10.0	Hz	0.0
P01.36	同步电机低速最小电流	0~120	%	80
P01.37	转差补偿	-400~399	%	*
P01.38	转差补偿时间常数	0.05~5.00	s	*
P01.39	共振衰减	0~3000	%	*
P01.40	共振衰减时间常数	0.005~0.050	s	0.005
P01.41	同步电机阻尼系数	0~250	%	120
P01.42	同步电机低速段阻尼滤波时间	0.01~20.00	s	0.8
P01.43	同步电机高速段阻尼滤波时间	0.01~20.00	s	0.8
P01.44	同步电机电流滤波时间	0.001~1.000	s	0.5
P01.45	转矩模式零速最小转矩	-100~100	%	5
P01.46	转矩模式最小转矩截止频率	0.1~50.0	Hz	3.0
P01.53/ P01.55/ P01.57/ P01.59/ P01.61	V/F 曲线-V	0.0~999.9	V	*

参数号	名称	设定范围	单位	出厂值
P01.54/ P01.56/ P01.58/ P01.60/ P01.62	V/F 曲线-F	0.0~590.0	Hz	*
P01.63	同步电机启动方式	0: 初始位置检测启动 (IPD) 1: 直流对磁启动 (Parking)		1
*P01.64	异步电机启动方式	0: 直接启动 1: 频率跟踪启动		0
P01.67	最小有效频率设定	0.00~50.00	Hz	0.00
P01.68	异步电机低速跳频频率	0.0~20.0	Hz	0.0
P01.70	启动延迟时间	0.0~10.0	s	0.0
P01.71	启动延迟功能	0: 自由旋转 1: 直流夹持		0
P01.72	启动直流夹持电流	0~150	%	50
P01.79	转矩控制下停车方式	0: 转矩模式停车 1: 速度模式停车		0
P01.80	停止功能	0: 自由停车 1: 直流夹持		0
P01.81	停止功能最低启用频率	0.0~400.0	Hz	0.0
P01.82	直流制动电流	0~150	%	50
P01.83	直流制动时间	0.0~60.0	s	2
P01.84	直流制动切入频率	0.0~400.0	Hz	0.0
P01.85	电机降磁速率	0~100	%	100
P01.86	同步电机对磁启动电流	0~150	%	80
P01.87	同步电机对磁启动时间	0.1~60.0	s	3.0
P01.91	制动功能	0: 无效 1: 电阻制动 2: 交流制动		0
P01.92	交流制动最大电流	0~150	%	100
P01.93	交流制动增益	1.0~2.0		1.4
P01.94	制动功能门限电压	取决于电网	V	*
P01.95	制动电阻值	5~65535	Ω	*
P01.97	机械制动电流	0.00~1200.00	A	0.00
P01.98	机械制动频率	0.0~400.0	Hz	0.0

第 2 组参数：数字量端子功能				
参数号	名称	设定范围	单位	出厂值
P02.00	数字量输入端子反逻辑功能选择	0~65535		0
P02.01	数字量/继电器输出反逻辑功能选择	0~65535		0
P02.02	数字量输入端子模式选择	0: NPN 1: PNP		0
P02.03	端子脉冲启停功能使能	0: 无效 1: 有效		0
P02.04	数字量输入滤波时间	2~16	ms	4
P02.05	FWD 输入功能选择	0: 无效 1: 复位		10
P02.06	REV 输入功能选择	2: 自由运转停车 (反逻辑) 3: 复位自由运转停车 (反逻辑)		12
P02.07	DI1 输入功能选择	4: 停止 (反逻辑)		22

P02.08	DI2 输入功能选择	10: 启动		23
P02.09	DI3 输入功能选择	11: 运转方向选择 12: 反转启动 13: 脉冲启动 14: 脉冲反转 15: 点动正转 16: 点动反转 17: 脉冲停止 20: 禁止正转运行 21: 禁止反转运行 22: 多段指令端子 1 23: 多段指令端子 2 24: 多段指令端子 3 25: 多段指令端子 4 26: 加减速端子 1 27: 加减速端子 2 30: UP; 31: DOWN 32: 计数器 A 34: 复位计数器 A 35: 计数器 B 37: 复位计数器 B 40: 脉冲输入 41: 设定值来源切换 42: 速度控制/转矩控制切换 50: 外部故障输入 51: PID 暂停 64: 水泵控制 65: 水泵清洁 66: 启动火灾模式 (包含 RUN 命令) 67: 启动火灾模式 (无 RUN 命令)		24
P02.21	外部故障时动作	0: 无效 2: 停机并警告 3: 以点动频率运行并警告 4: 以速度上限运行并警告 5: 故障并减速停机 6: 仅警告 7: 故障并自由运转停机 8: 动作与 7 相同但仅运行中有效		0
P02.22	DO1 输出功能选择	0: 无效 1: 准备就绪		0
P02.23	DO2 输出功能选择	2: 远程控制就绪 3: 就绪 - 未运行		0
P02.24	DO3 输出功能选择	4: 运行 5: 运行 - 无警告		0
P02.25	DO4 输出功能选择	6: 在电流范围内运行 7: 在设定频率运行		0
P02.26	DO5 输出功能选择	8: 反转运行 10: 故障 11: 警告或故障		0
P02.28	继电器 1 输出功能选择	12: 过热警告 13: 就绪 14: 远程控制就绪		10

P02.31	继电器 2 输出功能选择	15: 通讯正常 16: 通讯控制字 Bit11 17: 通讯控制字 Bit12 20: 超出电流范围 21: 低于电流下限 22: 高于电流上限 23: 超出频率范围 24: 低于频率下限 25: 高于频率上限 26: 超出反馈范围 27: 低于反馈下限 28: 高于反馈上限 29: 超出设定值范围 30: 低于设定值下限 31: 高于设定值上限 40: 本地模式 41: 远程模式 42: 机械制动 43: 外部故障 44: 偏心警告 47: 计数器 A 48: 计数器 B 49: 通讯扩展卡正常 64: 电机 1 输出 65: 电机 2 输出 66: 电机 3 输出 67: 电机 4 输出 68: 电机 5 输出 69: 电机 6 输出 70: 电机 7 输出 71: 电机 8 输出 72: 水泵清洁 73: 水管填充 74: 进入睡眠 75: 火灾模式旁路		0
P02.29	继电器 1 输出开通延时	0.00~600.00	s	0.00
P02.30	继电器 1 输出关断延时	0.00~600.00	s	0.00
P02.32	继电器 2 输出开通延时	0.00~600.00	s	0.00
P02.33	继电器 2 输出关断延时	0.00~600.00	s	0.00
P02.46	计数器保存选择	0: 计数器 A/B 均不保存 1: 计数器 A 保存 2: 计数器 B 保存 3: 计数器 A/B 均保存		0
P02.47	计数器 A 预设阈值	0~65535		65535
P02.48	计数器 B 预设阈值	0~65535		65535
P02.50	脉冲输入 1 最小输入频率	0.00~P02.51	kHz	0.00
P02.51	脉冲输入 1 最大输入频率	P02.50~100.00	kHz	50.00
P02.52	脉冲输入 1 最小输入对应设定	-200.00~200.00	%	0.00
P02.53	脉冲输入 1 最大输入对应设定	-200.00~200.00	%	100.00
P02.54	脉冲输入 1 滤波时间	1~1000	ms	100

参数号	名称	设定范围	单位	出厂值
P02.60	脉冲输出 1 端子输出功能选择	0: 数字输出 1: 输出频率 2: 输出电流 3: 输出功率 4: 电机转速 5: 输出电压 10: 设定值 11: 反馈值 13: 通讯设定值 14: 脉冲输入 1 输入值 15: AI1 模拟量值 16: AI2 模拟量值 20: 直流母线电压 30: 输出转矩		0
P02.61	脉冲最小输出频率	0.00~P02.62	kHz	0.00
P02.62	脉冲最大输出频率	P02.61~100.00	kHz	50.00
P02.63	脉冲最小输出比例	0.00~200.00	%	0.00
P02.64	脉冲最大输出比例	0.00~200.00	%	100.00
P02.70	编码器分辨率	1~32767		1024
P02.71	编码器旋转方向	0: 顺时针 1: 逆时针		0
P02.72	编码器分频输出系数	1~255		1

第 3 组参数：模拟量端子功能

参数号	名称	设定范围	单位	出厂值
P03.00	AI1 输入信号类型	0: 电压信号 1: 电流信号		0
P03.01	AI1 滤波时间	0.00~10.00	s	0.01
P03.02	AI1 零点死区	0.00~20.00	V/mA	0.00
P03.03	AI1 最小输入电压	0.00~P03.04	V	0.00
P03.04	AI1 最大输入电压	P03.03~10.00	V	10.00
P03.05	AI1 最小输入电流	0.00~ P03.06	mA	0.00
P03.06	AI1 最大输入电流	P03.05~20.00	mA	20.00
P03.07	AI1 最小输入对应设定值	-200.00~200.00	%	0.00
P03.08	AI1 最大输入对应设定值	-200.00~200.00	%	100.00
P03.09	AI2 输入信号类型	0: 电压信号 1: 电流信号		1
P03.10	AI2 滤波时间	0.00~10.00	s	0.01
P03.11	AI2 零点死区	0.00~20.00	V/mA	0.00
P03.12	AI2 最小输入电压	0.00~P03.13	V	0.00
P03.13	AI2 最大输入电压	P03.12~10.00	V	10.00
P03.14	AI2 最小输入电流	0.00~P03.15	mA	0.00
P03.15	AI2 最大输入电流	P03.14~20.00	mA	20.00
P03.16	AI2 最小输入对应设定值	-200.00~200.00	%	0.00
P03.17	AI2 最大输入对应设定值	-200.00~200.00	%	100.00
P03.48	模拟量输入信号中断检测时间	1~99	s	10
P03.49	模拟量输入信号中断动作	0: 无效 2: 停机 3: 以点动频率运行 4: 以上限速度运行 5: 故障并跳脱停机		0

参数号	名称	设定范围	单位	出厂值
P03.50	AO1 输出信号类型	0: 0~20mA 1: 4~20mA 3: 0~10V		3
P03.51	AO1 输出功能选择	0: 无 1: 输出频率 2: 输出电流 3: 输出功率 4: 电机转速 5: 输出电压 10: 设定值 11: 反馈值 13: 通讯设定值 14: 脉冲输入 1 输入值 15: AI1 模拟量值 16: AI2 模拟量值 20: 直流母线电压 30: 输出转矩		0
P03.52	AO1 最小输出比例	0.00~200.00	%	0.00
P03.53	AO1 最大输出比例	0.00~200.00	%	100.00
P03.54	AO1 最小输出	0.00~P03.55		0.00/4.00
P03.55	AO1 最大输出	P03.54~10.00/20.00		10.00/ 20.00
P03.68	键盘最小设定值	-200.00~200.00	%	0.00
P03.69	键盘最大设定值	-200.00~200.00	%	100.00
P03.90	模拟量端子使能成数字量	0: 作为模拟量输入使用 1: 作为数字量输入使用		0
P03.91	AI1 用作数值量输入时的功能	同 P02.05		0
P03.92	AI2 用作数值量输入时的功能	同 P02.05		0

第 4 组参数：过程 PID 及其他控制器				
参数号	名称	设定范围	单位	出厂值
P04.00	过程 PID 反馈源	0: 无效 1: 端子 AI1 2: 端子 AI2 5: 脉冲输入 1 20: 通讯给定		0
P04.01	过程 PID 给定源	0: 无效 1: 端子 AI1 2: 端子 AI2 5: 脉冲输入 1 10: 多段指令 0 + UP/DOWN 11: 多段指令 20: 通讯给定 30: 面板		0
P04.02	过程 PID 基准值	0.1~3000.0		50.0
P04.04	过程 PID 正/反逻辑控制	0: 正方向 1: 反方向		0
P04.05	过程 PID 抗饱和积分	0: 无效 1: 有效		1
P04.06	过程 PID 启动频率	0.0~200.0	Hz	0.0
P04.07	过程 PID 比例增益	0.00~10.00		0.01
P04.08	过程 PID 积分时间	0.01~655.35	s	655.35
P04.09	过程 PID 微分时间	0.00~10.00	s	0.00
P04.13	过程 PID 微分极限	1.0~50.0		5.0

参数号	名称	设定范围	单位	出厂值
P04.14	容差控制极限	0.0~200.0	%	0.1
P04.15	过程 PID 偏差控制方式	0: 方式 0 1: 方式 1 2: 方式 2		0
P04.18	过程 PID 输出下限	-100.00~100.00	%	0.00
P04.19	过程 PID 输出上限	-100.00~100.00	%	100.00
P04.22	过程 PID 积分下限	-100.00~100.00	%	0.00
P04.23	过程 PID 积分上限	-100.00~100.00	%	100.00
P04.30	速度 PID 比例增益	0.000~1.000		0.010
P04.31	速度 PID 积分时间	2.0~2000.0	ms	8.0
P04.32	速度 PID 微分时间	0.0~200.0	s	30.0
P04.33	速度 PID 微分极限	1.000~20.000		5.000
P04.34	速度 PID 滤波时间	1.0~100.0		10.0
P04.40	转矩控制器比例增益	0~500	%	100
P04.41	转矩控制器积分时间	0.002~2.000	s	0.020
P04.51	同步电机电流控制器前馈增益	0~400	%	100
P04.52	电流控制器比例	0~500	%	100
P04.53	电流控制器积分	0.000~2.000	s	0.020
P04.54	电流极限控制器滤波时间	0.1~100.0	ms	*
P04.61	Isd 带宽	10~200	Hz	30
P04.62	Isd 阻尼	1~200		100
P04.63	Isd 补偿系数	0.1~1.0		0.5
P04.64	Isq 控制器带宽	0.01~1.00	Hz	0.03
P04.65	Isq 控制器阻尼	1~200		1

第 5 组参数：保护限制及故障检测				
参数号	名称	设定范围	单位	出厂值
*P05.02	电机速度下限	0.0~590.0	Hz	0.0
*P05.03	电机速度上限	0.0~590.0	Hz	65.0
P05.04	电动时转矩极限	0~1000	%	160
P05.05	发电时转矩极限	0~1000	%	160
P05.06	转矩模式下速度上限源选择	0~30		0
P05.07	电机电流上限	0~300	%	120
*P05.08	最大输出频率	0.0~590.0	Hz	65.0
P05.09	低电流警告阈值	0.00~P09.16	A	0.0
P05.10	高电流警告阈值	0.00~P09.16	A	*
P05.11	低速警告阈值	0.0~590.0	Hz	0.0
P05.12	高速警告阈值	0.1~590.0	Hz	65.0
P05.13	设定值过低警告阈值	-200.00~200.00	%	0.00
P05.14	设定值过高警告阈值	-200.00~200.00	%	100.00
P05.15	反馈过低警告阈值	-200.00~200.00	%	0.00
P05.16	反馈过高警告阈值	-200.00~200.00	%	100.00
*P05.17	电机缺相检测	0: 关闭 1: 低敏感检出 2: 高敏感检出		1
P05.18	电机电流/转矩上限警告选择	0: 关闭 1: 开启		1
P05.19	电机速度反馈中断响应功能	0: 无效 3: 点动运行 4: 速度上限运行 5: 故障且跳脱停机 11: 开环运行		5

参数号	名称	设定范围	单位	出厂值
P05.20	电机速度反馈中断检测阈值	1 ~ 6000	RPM	300
P05.21	电机速度反馈中断检测时间	0.00 ~ 60.00	S	2
P05.22	与控制单元 CU 通讯中断时间阈值	0.10 ~ 60.00	S	1.00
P05.23	与控制单元 CU 通讯中断响应功能	0: 无效 2: 停机 3: 点动运行 4: 速度上限运行 5: 报故障并跳脱停机 6: 警告		5
P05.26	电机热保护动作	0: 无效 1: ETR 警告 2: ETR 报故障 3: 自冷电机 ETR 警告 4: 自冷电机 ETR 报故障		0
P05.27	电机过载保护时间	0.1~60.0	min	2.0
P05.28	电机过载保护系数	100~160	%	150
P05.29	输入缺相时动作	0: 无效 1: 警告 2: 故障并停机（满载） 3: 故障并停机（中载） 4: 故障并停机（轻载）		3
P05.30	锁定型故障锁定功能	0: 不锁定，跳脱锁定型故障可不下电复位 1: 锁定，跳脱锁定型故障需下电复位		1
P05.31	电流极限保护时间	0~60	s	60
P05.32	转矩极限保护时间	0~60	s	60
P05.33	变频器报警时动作方式	0: 直接故障并跳脱停机 1: 电机重新捕捉运行		1
P05.34	警告时电机重新捕捉方式	0: 电机速度和角度追踪 1: 直接捕捉		0
P05.60	掉载检测功能选择	0: 无效 1: 有效		0
P05.61	掉载检测阈值	0.1~200.0%	%	5
P05.62	掉载检测滤波时间	0.1~600.0	S	1

第 6 组参数：键盘操作与显示

参数号	名称	设定范围	单位	出厂值
P06.03	自定义物理量最小值	0.0~6553.5		0.0
P06.04	自定义物理量最大值	0.0~6553.5		100.0
P06.05	面板显示选项	0~8191		0
P06.31	远程/本地模式选择	0: 远程模式 1: 本地模式		0
P06.32	FREE 键功能选择	0: 无效 1: 反转运行		0
P06.34	面板修改参数锁定	0: 无效 1: 有效		0
P06.35	面板调节频率步长设定	0: 0.1 1: 1.0 2: 10	Hz	1
P06.50	电机转速速比	0.01~655.35		1.00
*P06.51	电流显示补偿	0.01~655.35		1
*P06.52	功率显示补偿	0.01~655.35		1

第 7 组参数：辅助功能及特殊控制				
参数号	名称	设定范围	单位	出厂值
P07.00	特殊操作	0: 无效; 9: 恢复出厂值		0
P07.01	上电功能选择	0: 以断电前的指令运行 (本地模式) 1: 不启动, 断电前的指令被保存 (本地模式) 2: 不启动, 断电前的指令不保存 (本地模式) 3: 启动, 断电前指令被保存		1
*P07.10	最小载波频率	2-16	kHz	2
*P07.11	过调制系数	90.0~105.5	%	100.0
*P07.12	直流母线电压 PWM 补偿方式	0: 平均电压补偿 2: 纹波电压补偿		0
P07.13	VF 下直流电压 PWM 补偿功能	0: 关闭 1: 开启		1
P07.14	死区补偿调整系数	0~200	%	100
P07.17	最大死区补偿频率	20~590	Hz	*
P07.26	主电源跌落时动作	0~6		0
P07.27	主电源跌落功能触发阈值	100~220/380	V	*
P07.28	动能回馈控制增益	0 ~ 500	%	100
P07.35	复位次数自动清零间隔时间	0~6000	min	0
P07.36	故障自动复位次数	0 ~ 11		0
P07.37	故障自动复位时间	0~600	s	10
*P07.38	变转矩功能	40-90	%	90
*P07.39	自动能耗最优控制(AEO)时最小磁通	40~75	%	66
P07.40	PM 励磁调节系数	-400 ~ 400	%	10
P07.41	散热风扇控制方式选择	0; 运行启动 4: 根据变频器温度控制风扇启停 5: 上电启动		0
P07.46	过压控制门限电压	取决于电网	V	*
P07.47	过压控制方式	0: 无效 1: 模式 1 2: 模式 2		*
P07.48	过压控制积分时间	0.01~0.10	s	*
P07.49	过压控制比例增益	0~200	%	*
P07.50	回避频率起点 1	0.0 ~ 590.0	Hz	0.0
P07.51	回避频率终点 1	0.0 ~ 590.0	Hz	0.0
P07.52	回避频率起点 2	0.0 ~ 590.0	Hz	0.0
P07.53	回避频率终点 2	0.0 ~ 590.0	Hz	0.0
P07.54	回避频率起点 3	0.0 ~ 590.0	Hz	0.0
P07.55	回避频率终点 3	0.0 ~ 590.0	Hz	0.0
P07.60	停电再启动延时时间	0.0~3600.0	s	0.0

第 8 组参数：基本信息与信息记录				
参数号	名称	设定范围	单位	出厂值
P08.00	软件版本号			
P08.01	CU 软件版本号			
P08.30	上电天数	0~9999	d	
P08.31	运行小时数	0~60000	h	
P08.32	累计耗电量	0~65535	kWh	
P08.33	变频器上电次数	0~65535		
P08.34	变频器过热次数	0~65535		

参数号	名称	设定范围	单位	出厂值
P08.35	变频器过压次数	0~65535		
P08.36	复位耗电量	0: 不复位; 1: 复位		0
P08.37	复位运行小时数	0: 不复位; 1: 复位		0
P08.40 ~ P08.49	历史故障记录			
P08.50 ~ P08.59	历史警告记录			

第 9 组参数：运行状态监控

参数号	名称	设定范围	单位	出厂值
P09.00	通讯控制字	0~65535		
P09.01	通讯状态字	0~65535		
P09.02	设定值	-4999.0~4999.0		
P09.04	电机转速	0~9999	rpm	
P09.05	输出功率	0.000~1000.000	kW	
P09.06	输出电压	0.0~6553.5	V	
P09.07	输出频率	0.0~590.0	Hz	
P09.08	输出电流	0.00~655.35	A	
P09.09	输出转矩	-200.0~200.0	%	
P09.10	电机热负载	0~100	%	
P09.11	直流母线电压	0~65535	V	
P09.12	目标转矩值	0.0~6553.5	Nm	
P09.13	变频器温度	-128~127	°C	
P09.14	变频器热负载	0~255	%	
P09.15	变频器额定电流	0.0~6553.5	A	
P09.16	变频器最大电流	0.0~6553.5	A	
P09.19	PID 参考值	-200.0~200.0	%	
P09.20	PID 反馈值	-200.00~200.00	%	
P09.21	PID 输出值	-200.0~200.0	%	
P09.22	数字量输入端子状态	0~65535		
P09.23	AI1 接收信号类型	0: 0~10V; 1: 0~20mA		
P09.24	AI1 输入值	0.00-20.00	V/mA	
P09.25	AI2 接收信号类型	0: 0~10V; 1: 0~20mA		
P09.26	AI2 输入值	0.00-20.00	V/mA	
P09.34	脉冲输入设定值	-200.0~200.0	%	
P09.35	脉冲输入 1 输入值	0.00~100.00	KHZ	
P09.37	编码器输入值			
P09.38	数字量输出端子状态	0~255		
P09.39	继电器输出状态	0~65535		
P09.40	AO1 输出值	0.00-20.00	V/mA	
P09.43	脉冲输出 1 输出值	0.00~100.00	kHz	
P09.45	计数器 A 计数值	0~65535		
P09.46	计数器 B 计数值	0~65535		
P09.47	本地总线设定值	-32768~32767		
P09.48	自定义物理量	0~6553.5		

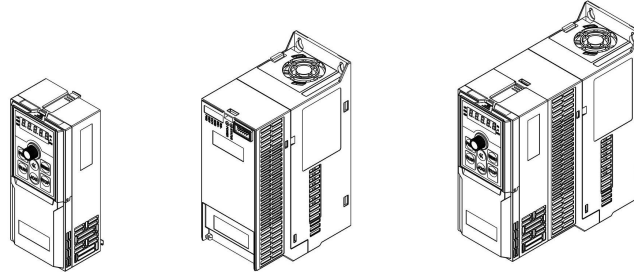
第 20 组参数：水泵控制应用				
参数号	名称	设定范围	单位	出厂值
P20.00	水泵控制模式	0: 压力控制模式		0
P20.01	下限运行频率	0.00~P20.02	%	40.00
P20.02	上限运行频率	P20.01~100.00	%	100.00
P20.03	高压故障阈值	0.00~150.00	%	100.00
P20.04	低压故障阈值	0.00~80.00	%	0.00
P20.05	低压故障延时时间	0.0~60.0	s	10.0
P20.06	流量反馈源	0: 无效 1: 端子 AI1 2: 端子 AI2		0
P20.07	PID 反馈丢失检测值	0.00~5.00	%	0.00
P20.08	PID 反馈丢失检测时间	0.0~100.0	s	20.0
P20.16	PID 反馈丢失时动作	0: 报故障并跳脱停机 1: 以 P00.45 设定的频率运行		0
P20.17	火灾模式运行方向	0: FWD 1: REV		0
P20.22	水管填充选择	0: 无效 1: 有效		0
P20.23	水管填充频率	0.00~100.00	%	60.00
P20.24	水管填充频率持续时间	0.0~6000.0	s	10.0
P20.25	水管填充截止检测水平	0.00~100.00	%	30.00
P20.26	压力段数选择	0~4		0
P20.27	干抽保护功能	0: 无效 1: 有效		0
P20.28	干抽保护检测阈值	0.00~10.00	%	4.00
P20.29	干抽保护检测频率	0.00~100.00	%	96.00
P20.30	干抽保护检测电流	0.0~100.0	%	40.0
P20.34	止回阀频率 1	0.00~P20.01（下限运行频率）	%	0.00
P20.35	止回阀频率 2	P20.01（下限运行频率）~100.00	%	40.00
P20.36	显示星期	1~7		
P20.37	显示时间	0.00~23.59		
P20.40	联机运行选择	0: 无效 1: 有效		0
P20.41	联机地址	1: 主机地址 2~5: 1#~4#从机地址		2
P20.42	备用主机功能选择	0: 无效 1: 有效		0
P20.43	断线频率	0.00~100.00	%	90.00
P20.45	年份设定	2023~2099		2023
P20.46	日期设定	1.01~12.31		1.01
P20.47	时间设定	0.00~23.59		0.00
P20.48	定时启停功能选择	0: 无效 1: 有效		0
P20.49	指定工作日	0~127		0
P20.50	定时启动时间	0.00~23.59		0.00
P20.51	定时停机时间	0.00~23.59		0.00
P20.52	摩擦水头损失补偿选择	0: 无效 1: 有效		0
P20.53	系统额定流量	10.00~100.00	%	80.00
P20.54	额定流量下摩擦水头损失	P20.55~100.00	%	15.00
P20.55	静态摩擦水头损失	0.00~P20.54	%	0.00
P20.57	流量	0.00~100.00	%	

参数号	名称	设定范围	单位	出厂值
P20.58	水管破裂检测时间	0~1000	s	0
P20.59	水管破裂检测阈值	P20.28~40.00	%	10.00
P20.60	休眠功能使能选择	0: 关闭 1: 开启		0
P20.61	休眠频率阈值	0.00~100.00	%	2.00
P20.62	休眠压力阈值	0.00~100.00	%	2.00
P20.63	休眠检测时间	0.0~300.0	s	10.0
P20.64	最小休眠时间	0.0~1800.0	s	300.0
P20.65	唤醒压力阈值	0.00~100.00	%	10.00
P20.66	唤醒检测时间	0.0~60.0	s	1.0
P20.67	水泵清洁正转频率	0.00~100.00	%	90.00
P20.68	水泵清洁反转频率	0.00~100.00	%	60.00
P20.69	水泵清洁正转时间	1.0~1000.0	s	5.0
P20.70	水泵清洁反转时间	1.0~1000.0	s	5.0
P20.71	水泵清洁正反转间隔	1.0~1000.0	s	1.0
P20.72	水泵清洁循环次数	1~100		1
P20.73	多泵循环运行模式	0: 无功能 1: 定量控制 2: 定量循环		0
P20.74	加电机运行频率	P20.76~100.00	%	100.00
P20.75	加电机压力容差	0.00~30.00	%	10.00
P20.76	减电机运行频率	0.00~P20.74	%	40.00
P20.77	减电机压力容差	-10.00~30.00	%	10.00
P20.78	加减电机延迟时间	0~3600	s	10
P20.79	接触器合闸时间	0.1~9.9	s	0.5
P20.80	接触器分闸时间	0.1~9.9	s	0.5
P20.81	连接电机数量	1~8		1
P20.82	电机禁止选择	0~255		0
P20.83	轮询周期	0.0~240.0	h	0.0
P20.84	电机运行时间清除	0: 无功能 x: 清除电机 x 累计运行时间 (x=1~8) 10: 清除全部电机累计运行时间		0
P20.87	T1 开始时间	0.00~23.59		0.00
P20.88	T2 开始时间	0.00~23.59		0.00
P20.89	T3 开始时间	0.00~23.59		0.00
P20.90	T4 开始时间	0.00~23.59		0.00
P20.91	水泵清洁剩余次数	0~100		
P20.92	电机 1 运行时间纪录	0~65535	h	
P20.93	电机 2 运行时间纪录	0~65535	h	
P20.94	电机 3 运行时间纪录	0~65535	h	
P20.95	电机 4 运行时间纪录	0~65535	h	
P20.96	电机 5 运行时间纪录	0~65535	h	
P20.97	电机 6 运行时间纪录	0~65535	h	
P20.98	电机 7 运行时间纪录	0~65535	h	
P20.99	电机 8 运行时间纪录	0~65535	h	

ENGLISH

1. Summary

- The SA710P contains the control unit CU0P and the power unit PU0P.
- For keyboard control function description, please refer to or keyboard quick guide.
- The products are strictly tested and packaged before leaving the factory, if any abnormalities such as damage, wrong type and lack of accessories, please contact with our sales.

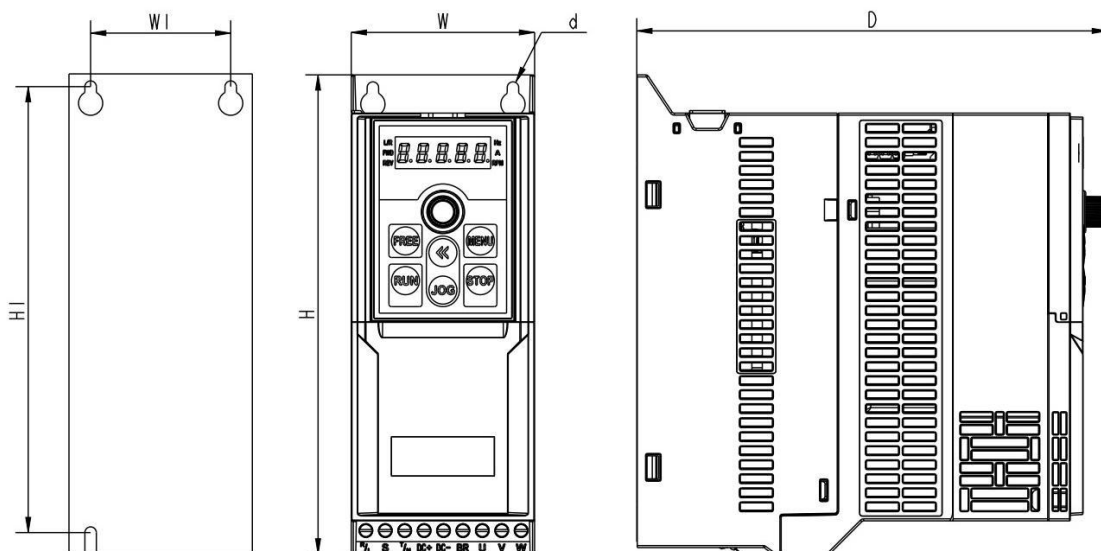


Control Unit (CU0P) + Power Unit (PU0P) = SA710P Frequency Inverter

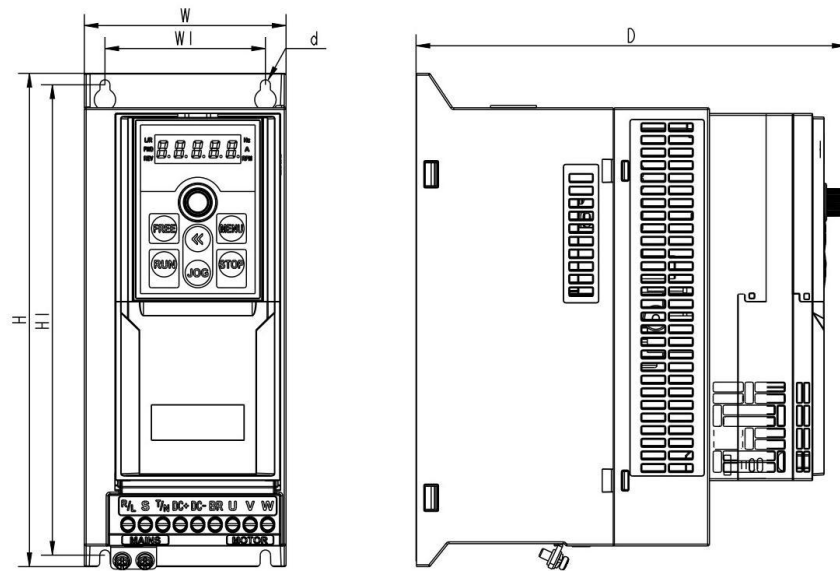
2. Safety information

- Before operating this product, please read and pay attention to the relevant safety information, and install, debug, repair and maintain by professionals.
- When operating the wiring, please make sure that the power is off.
- After turning off the power, there may still be high voltage inside the power unit. Do not touch the internal circuit and the main circuit terminals. Otherwise, there may be a risk of electric shock. Wait at least 4 minutes ($\leq 22\text{kW}$) and 15 minutes ($\geq 30\text{kW}$) before operating.
- Never plug or remove any connector of the product when the product is powered, doing so may lead to product damage or humane injury or death.
- The grounding terminal of product must be properly grounded.
- The main circuit terminals must be correctly wired. R, S, and T or R/L, S, T/N are power input terminals. Never mix them with U, V, and W. Otherwise, the product will be damaged when power on.
- Products and accessories should be installed away from fire source and flammable materials.
- the motor power is only allowed to be one level higher or two levels lower than the rated power of the inverter. Otherwise it may result in reduced control performance or motor burnout.
- Please set the motor parameters correctly according to the motor nameplate, then set P01.13 = 1 or 2 to start self-learning. Otherwise may cause the motor to burn out.
- Please unplug the CU0P internal battery insulating sheet before using the product, and see Chapter 7.1 for detailed disassembly and assembly methods.

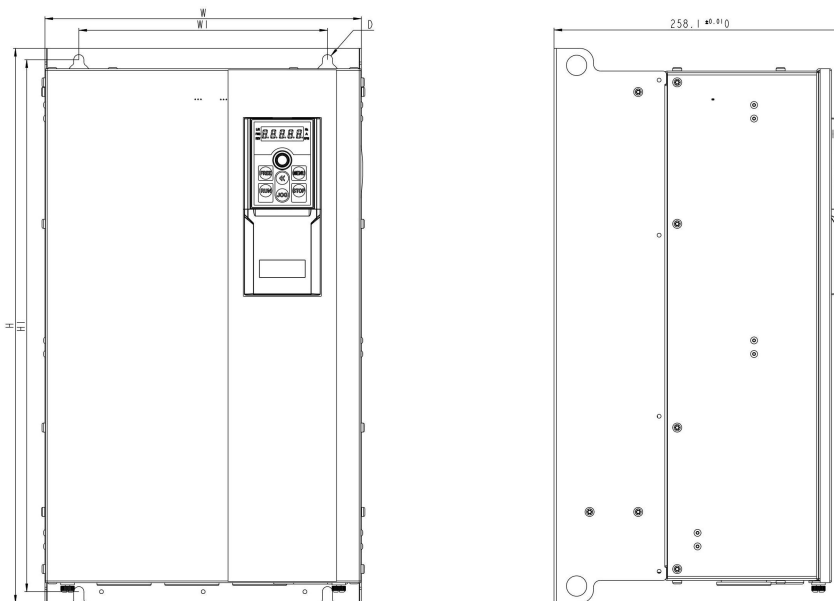
3. SA710P Size



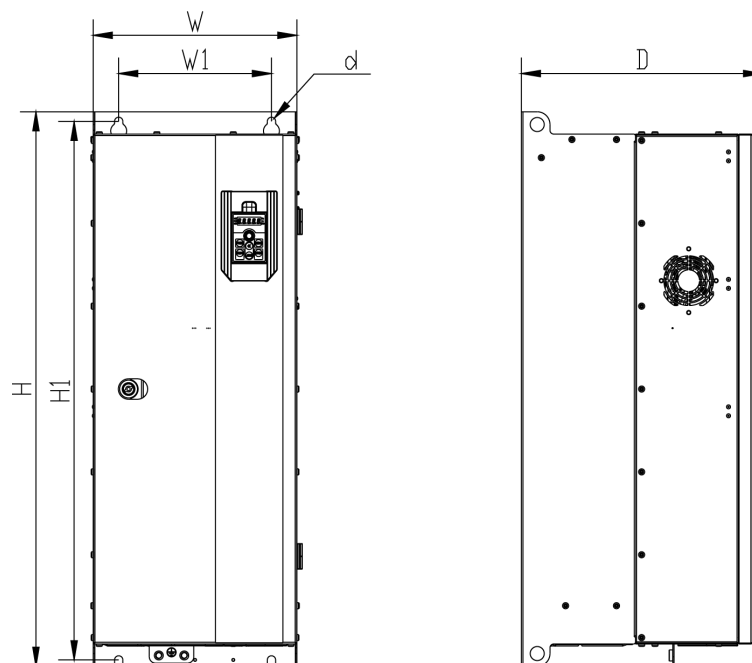
D1 Size



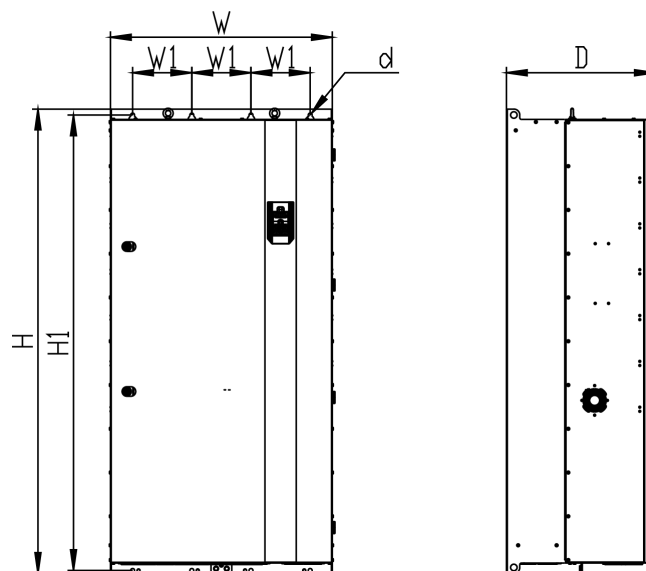
D2-D4 Size



D5-D6 Size



D7-D9 Size



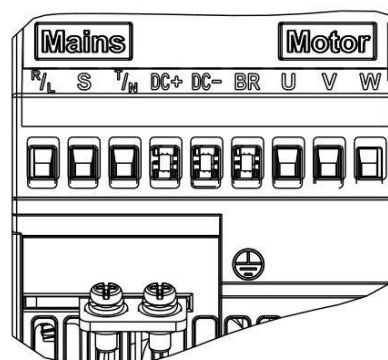
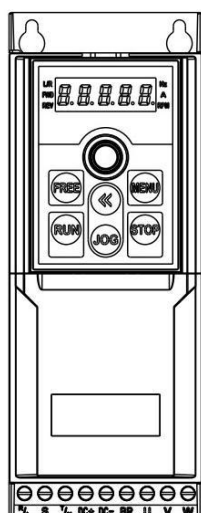
D10 Size

Frame	Rated Power(Heavy Load Model)	Dimensions (mm)					
		W	H	D	W1	H1	d
	3×380-480V						
D1	0.75-2.2kW	72	188	185	55	175	4.5
D2	4.0kW	88	215	188	70	205	4.5
D3	5.5-7.5kW	100	250	194	80	240	4.5
D4	11-22kW	170	370	212	145	355	6.5
D5	30-55kW	280	490	258	220	470	9
D6	75-110kW	330	620	278	270	600	9
D7	132-185kW	320	870	380	240	845	13
D8	200-355kW	500	1070	410	380	1040	13
D9	415-450kW	650	1220	430	480	1190	13
D10	500-630kW	750	1570	505	3*200	1540	13

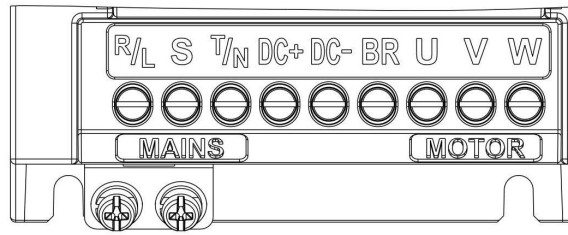
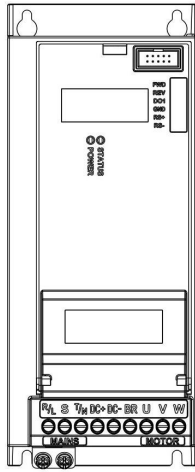
4. Main Circuit Terminals and Control Terminals

4.1. Main circuit terminals

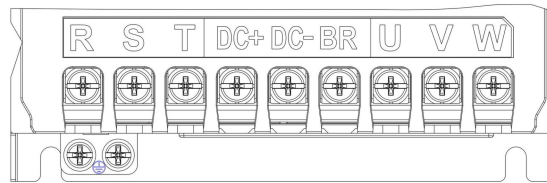
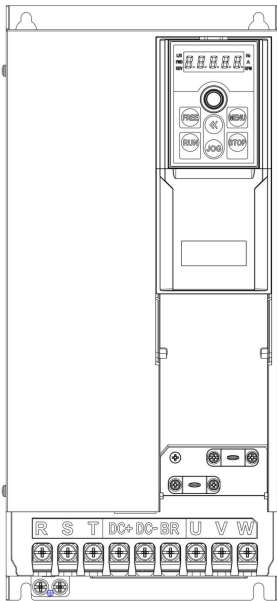
- Main circuit terminals wiring steps::
- Connect the motor ground wire and power ground wire to the ground terminal
- Connect the three-phase of motor to the U, V, W terminals
- If you need to connect the braking resistor, please connect the braking resistor to the DC+ and BR terminals.
- Connect the main power cable to the input terminals R, S, T terminals .



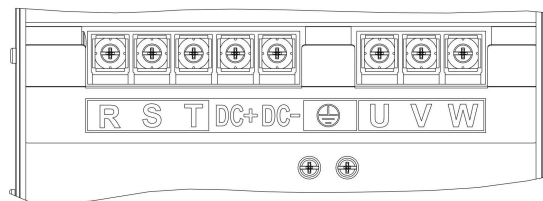
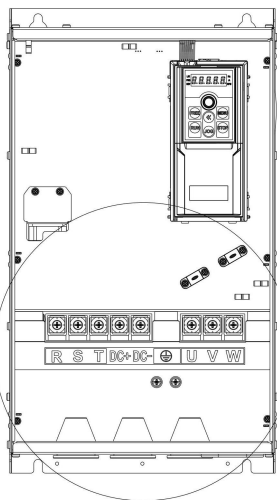
0.75-2.2kW



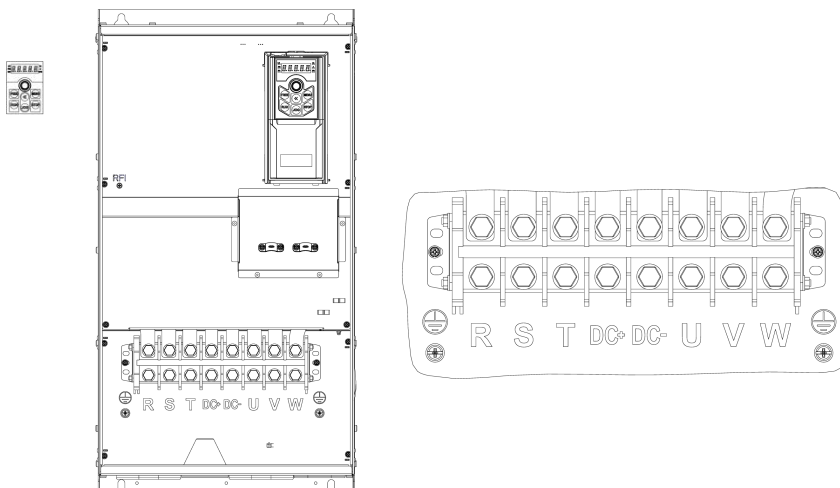
4.0-7.5kW



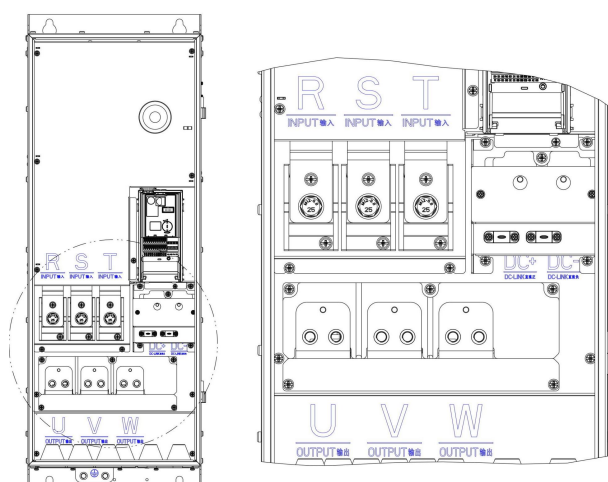
11-22kW



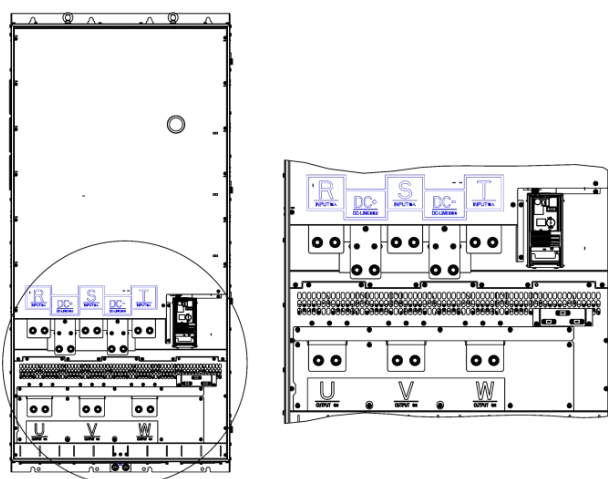
30-55kW



75kW-110kW



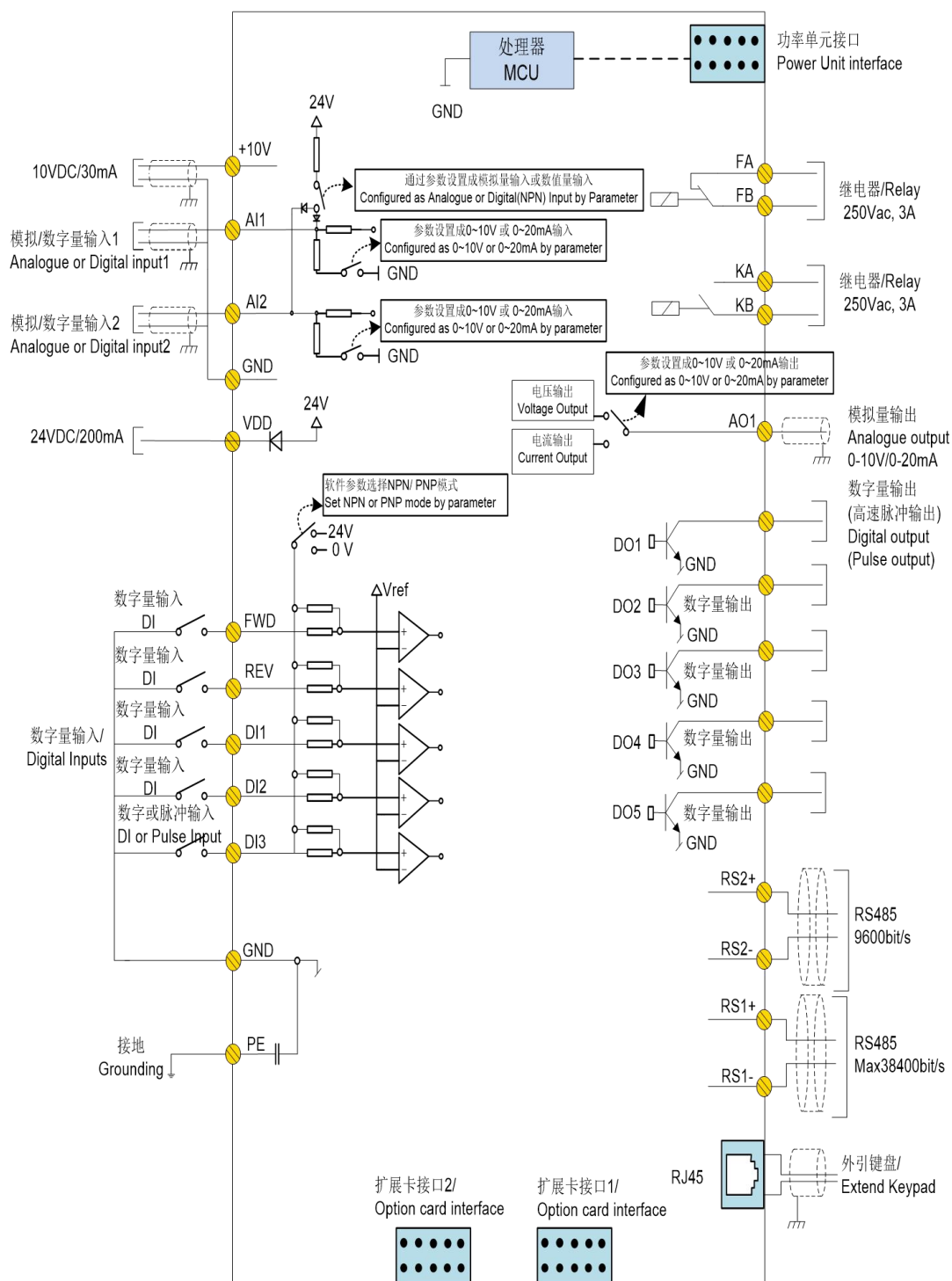
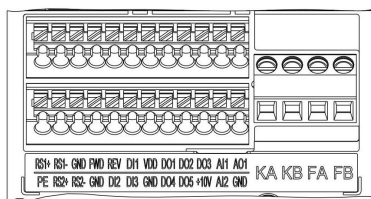
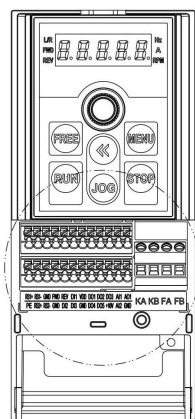
132kW-450kW



500kW-630kW

Terminal Functions	Terminal Name		
	0.75-7.5kW	11-22kW	30-630kW
Terminals for power inputs from grid	R/L、S、T/N	R、S、T	R、S、T
Terminals for Power output to motor	U、V、W	U、V、W	U、V、W
Terminals for DC link supply or Load sharing	DC+、DC-	DC+、DC-	DC+、DC-
Terminals for Brake resistor	DC+、BR	DC+、BR	-
For ground connection	⊕	⊕	⊕
Note:DC+、DC- and BR are DC-link and braking, U and V 、W are power out put.			

4.2. Unit terminals of SA710P



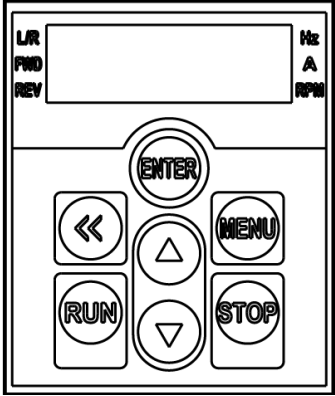
Name	Function	Specification
FWD,REV, DI1, DI2, DI3	Digital inputs	Input type:NPN; PNP; Input Voltage:0~30V; Input Impedance:3.6kΩ; DI3 can be configured as pulse input
DI3	Pulse Input	Frequency Range:0.00~100.00kHz; Power Supply Range:24V ±20%; Duty Cycle Range:40%~60%;
DO1,DO2,DO3,DO4,DO5	Digital Output	Output type:Open Collector; Output Current:0~40mA; Output Voltage:0~30V;
DO1	Pulse Output	Can be configured as pulse output: Load Capacity:Resistive>1kΩ, capacitive <10nf; Frequency Range:0.00~100.00kHz; Duty Cycle Range:40%~60%;
RS1+, RS1-	RS485 Communication	Max Baud Rate:38400bit/s; Configurable termination resistor, open in default
RS2+, RS2-	RS485 Communication	For multi-pump connection Baud Rate:9600bit/s;
FA-FB(Relay1) KA-KB(Relay2)	Relay Output	Resistive Load:250VAC 3A/30VDC 3A; Inductive Load:250VAC 0.2A/24VDC 0.1A (cosφ=0.4);
AI1, AI2	Analogue Inputs	Configurable as analogue voltage inputs, analogue current inputs as well as digital inputs. 1.As Analogue Voltage Inputs: Input Impedance:10kΩ; Input Voltage Range:0~10V; 2.As Analogue Current Inputs: Input Impedance:≤500Ω; Input Current Range:0~20mA; 3.As Digital Inputs: a) Input Type:NPN; PNP b) Input Impedance:10kΩ; c) Input Voltage Range:0-30V
AO1	Analogue Output	Configurable as analogue voltage output or current output Output Range:0~10V or 0~20mA; Load Capacity: As Voltage Output:Impedance > 500Ω; As Current Output:Impedance < 500Ω;
VDD	24V Power Supply	Max 200mA
+10V	10V signal power supply	Max 30mA
GND	Signal Ground	
PE	Safety Ground	
Connector for Option Card 1,2	Support one option card of different types, at the bottom of the Control Unit	
Connect for External Keypad	RJ45 for external keypad, at the middle of the Control Unit	

5. Option cards

The SA710P can support two different types of tabs at the same time, supporting a variety of PG class cards, IO class cards, and a variety of communication bus class tabs.

6. Keypad operation and display

SA710P support pluggable keypad, such as KP01 can be supported; Operation interface and keys definition as below.



Key Name	Function
FREE	Customer can define the function by parameter (now this key is invalid, please refer update description in the future).
<<	In home display, Press to switch the physical variables shown; in parameter number selection, Press to switch the digit place of the parameter number to be modified; in parameter value modification, Press to switch the digit place of parameter value to be modified
MENU	Press to enter the menu for parameter setup or exit the menu
RUN	Press to control the product run when product is in Local Mode.
JOG	Press to control the product run with jog speed when product is in Local Mode.
STOP	Press to control the product stop when product is in Local Mode or reset the fault (if there is alarm)
	Clockwise rotation to increase the numerical value of parameter or parameter number Anticlockwise rotation to decrease the numerical value of parameter or parameter number Press to confirm the parameter number selection and enter the parameter value displaying/modification, or Press to confirm the parameter value and back to the Parameter number selection menu.

If you need to switch the remote/local mode, press and hold the number shift key and the menu key at the same time for more than 3 seconds; Or set P6.31=0 to enter remote mode and P6.31=1 to enter local mode.

L/R Light:to indicate the mode of the product, always On - Remote Mode, Flashing - Local Mode

FWD、REV Lights:

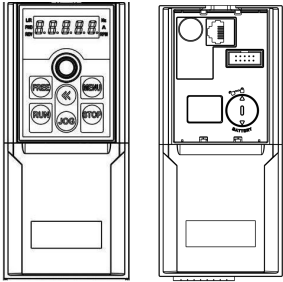
FWD	REV	Status
On	Off	Running in Forward Direction
Off	On	Running in Reverse Direction
Off	Off	Stopped

Hz、A Lights:To indicate the physical meaning and units of the data displayed.

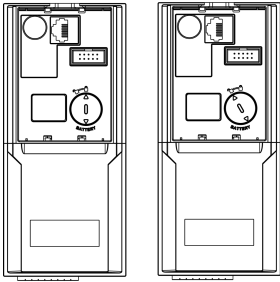
7. Use and Replacement of Battery

7.1. Use of the Battery

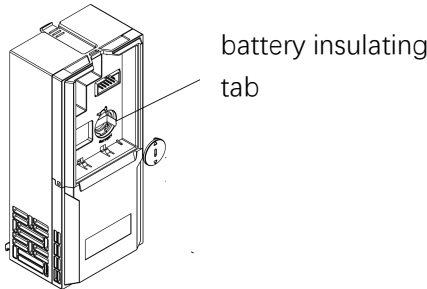
Please remove the battery insulating tab inside CU0P before use, and the steps are as follows:



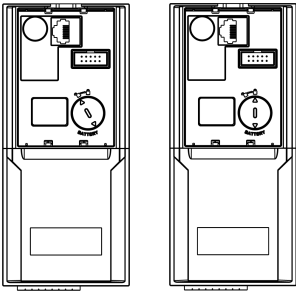
Step 1:Take down the KP01



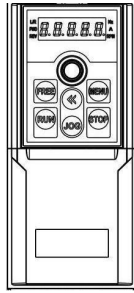
Step 2:Remove the battery cover anticlockwise



Step 3:Remove the battery insulating tab



Step 4: Install the battery cover back



Step 5: Mounting KP01

7.2. Replace the battery

Refer to the steps of 7.1 battery, remove the battery in step 3, replace the battery, and the battery model is CR220.

8. Basic Application Guide

8.1. Control with Keypad

- Ensure the product is working in Local Mode (L/R light flashing), or by setting parameter P6.31=1 to switch to Local Mode.
- Rotation  to adjust the output frequency. By default, each time you press it, the frequency increases or decelerates 0.1Hz.
- Press the "RUN" key to start the inverter, and adjust the setting frequency by rotation .
- Press the "STOP" key to stop the inverter.
- Set "RUN" key to reserve start function: Set P00.15=1, P03.68=100, set reference value to negative due to turn the potentiometer counterclockwise, then the drive "RUN" reserve after press "RUN" key.

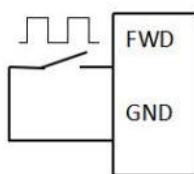
8.2. Control with Terminals

First ensure the product is working in Remote Mode (L/R light always ON). If not, switch the product to the Remote Mode by setting parameter P6.31=0. The product is default in Remote Mode.

8.2.1. Start-stop control

- Single-wire pulse start/stop

Enable the Pulse Auto Start/Stop Function by set P02.03=1 first then define a terminal function to Pulse Run (DI function 13 or 14). With below wiring, the single wire pulse start/stop function can be achieved.



Wiring

Parameter	Value
P02.03	1
P02.05	13 or 14

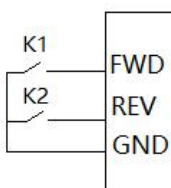
Parameters

Input	Status	Command
	Stopped	Start
	Running	Stop

Actions

- Two-wires mode 1 (factory default)

The DI terminal FWD is default to forward run function, and the DI terminal REV is default to reverse run function. You can achieve the two wires start/stop function by Wiring and parameters set as below.



Wiring

Parameter	Value
P02.05	10
P02.06	12

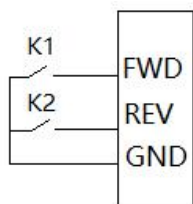
Parameters

K1	K2	Command
Open	Open	Stop
Close	Open	Forward Run
Open	Close	Reverse Run
Close	Close	Stop

Actions

- Two-wires mode 2

In this mode, the FWD terminal is to start/stop the motor, the REV terminal is to control the running direction. The function can work with Wiring and parameters set as below.



Wiring

Parameter	Value
P02.05	10
P02.06	11

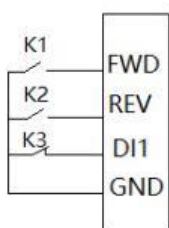
Parameters

K1	K2	Command
Open	Open	Stop
Close	Open	Forward Run
Open	Close	Stop
Close	Close	Reverse Run

Actions

- Three-wire mode 1

The DI terminals FWD and REV are used to start the motor by pulse for different direction, the DI1 terminal is used to stop the motor. The function can be achieved by wiring and parameter set as below.



Wiring

Parameter	Value	Function
P02.05	13	Pulse forward run
P02.06	14	Pulse reverse run
P02.07	4	Stop

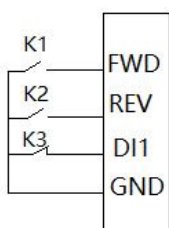
Parameters

K1	K2	K3	Command
X	X	Open	Stop
Pulse	X	Close	Forward Run
X	Pulse	Close	Reverse Run

Actions

- Three-wires mode 2

The DI terminal FWD is used to start the motor by pulse, DI terminal REV is used to control the motor direction, DI terminal DI1 is used to stop the motor. The function can be achieved by wiring and parameters set as below.



Wiring

Parameter	Value	Function
P02.05	13	Pulse forward run
P02.06	11	Motor direction
P02.07	4	Stop

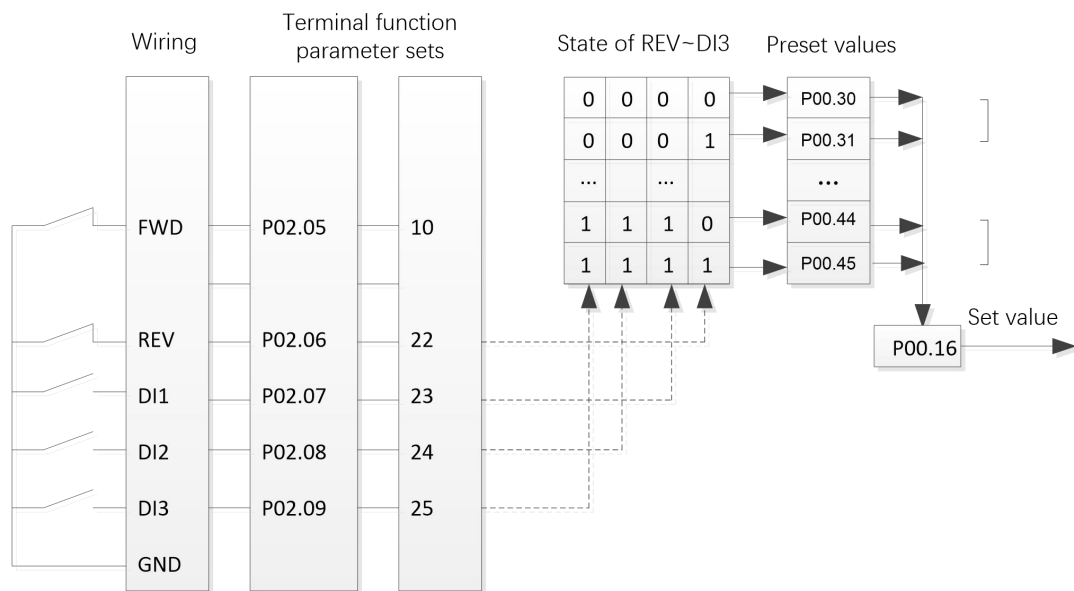
Parameters

K1	K2	K3	Command
X	X	Open	Stop
Pulse	Open	Close	Forward Run
Pulse	Close	Close	Reverse Run

Actions

8.2.2. Target Speed Set

- In remote mode, both analogue input AI1 and bus communication are default for speed set. By applying an 0 ~ 10V on terminal AI1 and/or controlling command from the bus communication can adjust the speed set. Please refer to the appendix A for more details about bus communication control.
- Use pulse input for speed set: Define the main speed set source as pulse input (P00.11 = 5), and define the terminal function of DI3 to pulse input (P02.09 = 40), then you can adjust the speed set by applying different frequency of pulse on DI3. Using pulse input for speed set has the advantages of good accuracy and robust to EMC noise.
- Multi preset value control by DI terminal function. In some application, the motor only needs to run at several fixed speed. You can use DI terminal function to control the motor speed at different preset value. Below is an example of 16 preset speed controlled by 4 DI terminals.

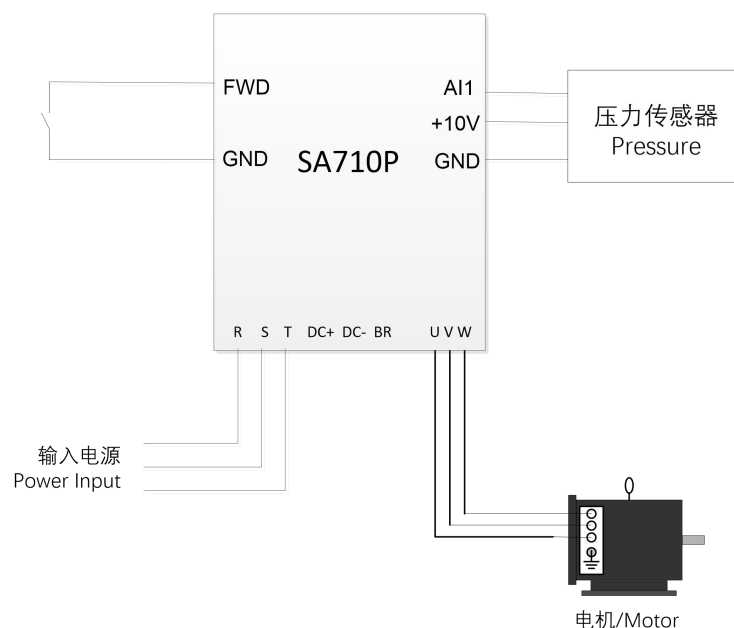


In the figure above, the function of REV-DI3 is set as multi speed set selection. The speed set is calculated according to the selected preset value in % by the states of 4 DIs, e.g., if state REV~DI3 is 1111, then the 16th value preset in parameter P00.45 is selected. The speed set is the product of the selected preset value time P00.16. Please be noted that, maximal 4 DIs used for selecting the preset value. Less than 4 DI can also be used to select preset value. In this case, the state of the missing terminal can be treated as 0.

8.3. Application of Process PID Control

Process PID control is used to control a target, e.g., temperature, pressure etc., with close loop function by controlling the error between the set value and feedback value. It only works in remote mode.

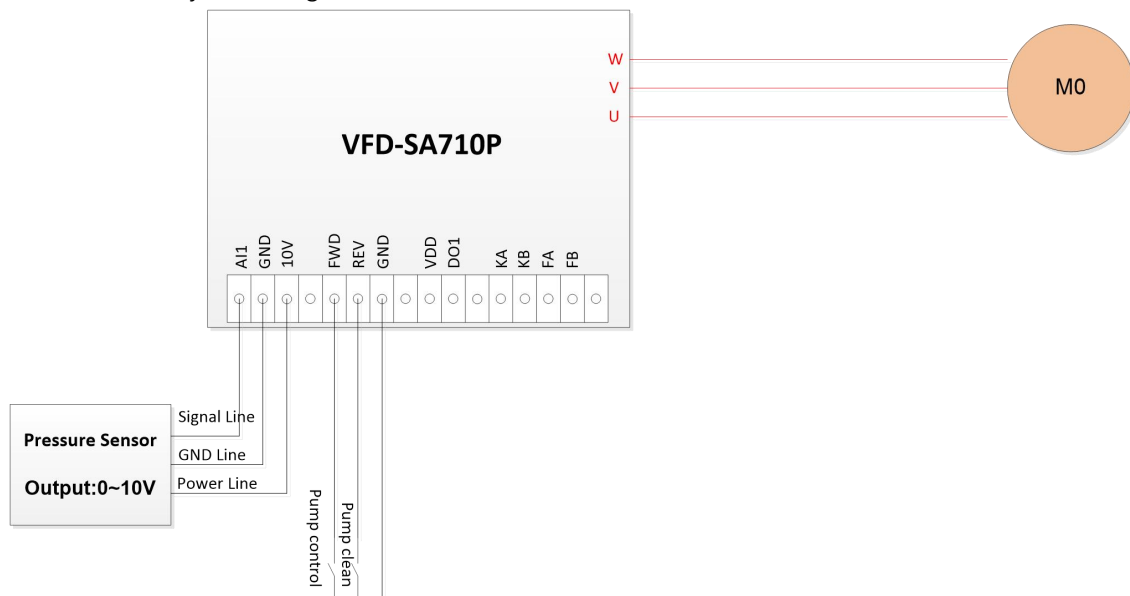
- Set parameter P00.11=21 (main speed set source is assigned to process PID) to enable the process PID control
- Select the process PID feedback source by parameter P04.00 (default is invalid). For example, if the process PID feedback source is terminal AI1, then P04.00 is set to 1. P03.00 can be used to define the signal on AI1 as voltage or current input
- Select the set value source of the process PID by parameter P04.01 (default is invalid). For example, if P04.01 = 11, the PID control set value source is assigned to DI terminal selected preset value.
- Select close loop control logic by parameter P04.04, positive or negative according to the application demands. The default set is positive close loop.
- P04.07 and P04.08 can be used to adjust the control response of the PID process, P04.07 for proportional gain and P04.08 for integration time.
- A simple example of wiring for Process PID control is shown as below. In this set up, the AI1 is the feedback.



8.4. Typical Application Functions of Pump

8.4.1. Single Pump Control

In this mode, the electrical system diagram shown as below.

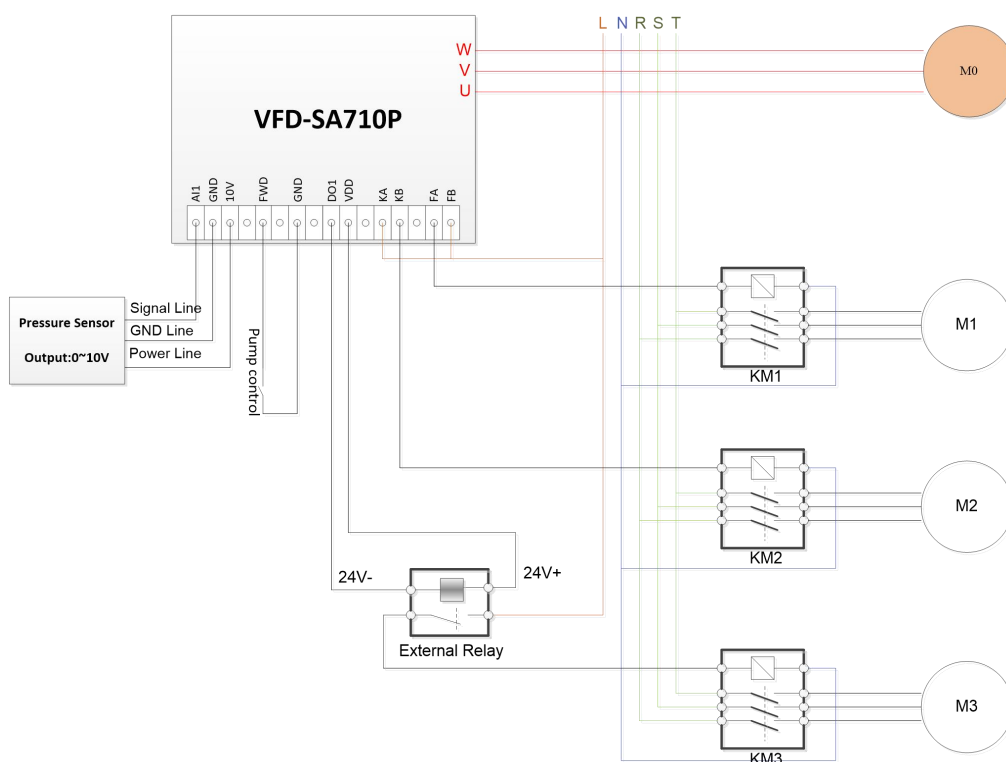


Please set related parameters as below:

- 1) Set P00.03 (Application Macro) to 1 (Pump Application).
- 2) Set P20.00 (Pump control mode) to 0 (Pressure mode).
- 3) Set terminal AI1 related parameters(P03.03~P03.04, P03.07~P03.08) according to pressure sensor specifications.
- 4) Set the value of P00.30 (Multi Preset Value 0) according to request.
- 5) Set P20.73 (Multi-pumps circulation control mode) to 0 (None).
- 6) Set P20.40 (Networking activation mode) to 0 (Inactive).
- 7) Set P02.06 (REV Input Function Selection) to 65 (Pump clean).
- 8) Set the value of parameters relative to sleep, wake up, pipe fill, pump clean, PID feedback loss and so on according to your needs Through multi-functional terminal FWD start pump pressure control.
- 9) Through multi-functional terminal REV start pump clean.

8.4.2. Fixed Amount Control With PID

In this mode, the electrical system diagram(take connect 3 motors additionally, for example) shown as below.

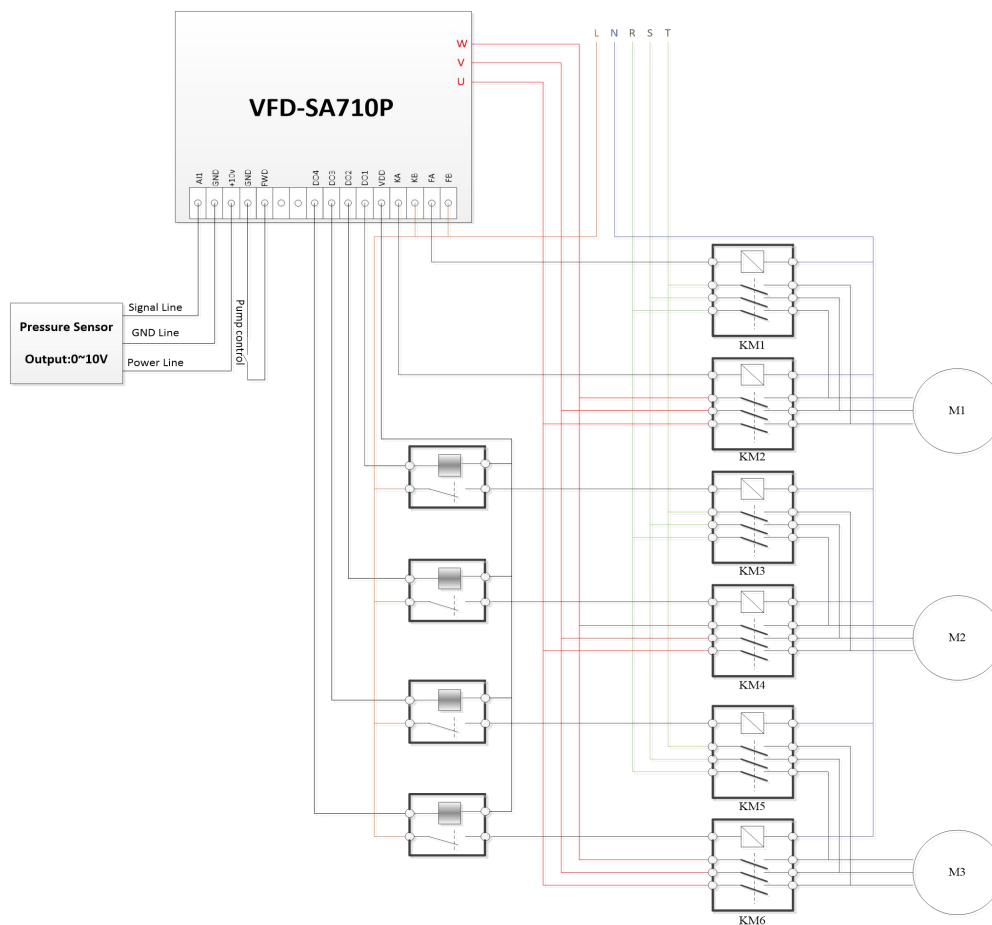


Please set related parameters as below:

- 1) Set P00.03 (Application Macro) to 1 (Pump Application).
- 2) Set P20.00 (Pump control mode) to 0 (Pressure mode).
- 3) Set terminal AI1 related parameters(P03.03~P03.04, P03.07~P03.08) according to pressure sensor specifications.
- 4) Set the value of P00.30 (Multi Preset Value 0) according to request.
- 5) Set P20.40 (Networking activation mode) to 0 (Inactive).
- 6) Set P20.73 (Multi-pumps circulation control mode) to 1 (Fixed amount control with PID).
- 7) Set P20.81 (Number of motors) to 3.
- 8) Set P02-28 (Relay Output Function Selection-RL1) to 64 (Motor 1 output), P02-31 (Relay Output Function Selection-RL2) to 65 (Motor 2 output), P02.22 (DO Function Selection-Terminal DO1) to 66 (Motor 3 output).
- 9) Set the value of parameters relative to add motor, subtract motor and poll according to your needs
- 10) Set the value of parameters relative to sleep, wake up, pipe fill, PID feedback loss and so on according to your needs
- 11) Through multi-functional terminal FWD start pump pressure control.

8.4.3. Fixed Circulation Control With PID

In this mode, the electrical system diagram(take connect 3 motors, for example) shown as below.



Please set related parameters as below:

- 1) Set P00.03 (Application Macro) to 1 (Pump Application).
- 2) Set P20.00 (Pump control mode) to 0 (Pressure mode).
- 3) Set terminal AI1 related parameters(P03.03~P03.04, P03.07~P03.08) according to pressure sensor specifications.
- 4) Set the value of P00.30 (Multi Preset Value 0) according to request.
- 5) Set P20.40 (Networking activation mode) to 0 (Inactive).
- 6) Set P20.73 (Multi-pumps circulation control mode) to 2 (Fixed circulation control with PID).
- 7) Set P20.81 (Number of motors) to 3.
- 8) Set P02-28 (Relay Output Function Selection-RL1) to 64 (Motor 1 output), P02-31 (Relay Output Function Selection-RL2) to 65 (Motor 2 output), P02.22 (DO Function Selection-Terminal DO1) to 66 (Motor 3 output), P02.23 (DO Function Selection-Terminal DO2) to 67 (Motor 4 output), P02.24 (DO Function Selection-Terminal DO3) to 68 (Motor 5 output), P02.25 (DO Function Selection-Terminal DO4) to 69 (Motor 6 output).
- 9) Set the value of parameters relative to add motor, subtract motor and poll according to your need and combine with the function introduction given in Chapter 2.4.12.

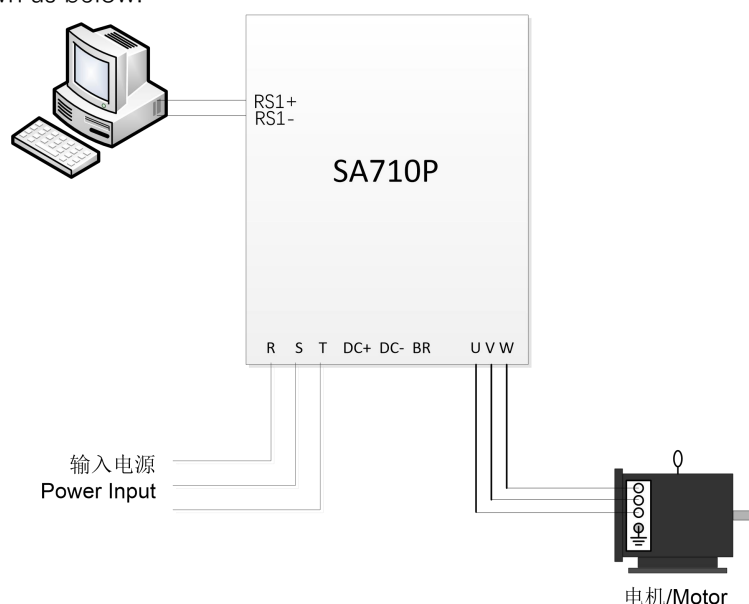
- 10) Set the value of parameters relative to sleep, wake up, pipe fill, PID feedback loss and so on according to your needs
- 11) Through multi-functional terminal FWD start pump pressure control.

8.5. Simple instruction for using Modbus communication

Only in remote mode, the frequency converter can be controlled through Modbus communication. Below are the key points to use the Modbus communication control.

- 1) First, please check the parameters P00.80~P 0-82 to be consistent with the communication settings of host computer. P00.80 is the slave address of the frequency converter (default value is 1). Parameter P00.81 is the communication baud rate (default value is 9600). P00.82 is the communication data format, which defaults to even-check bits and one stop bit. These three parameters can also be changed according to the communication parameters of the host computer. The communication parameters of the host computer and the frequency converter must be set to the same.
- 2) Writing command in register address 9999 to start/stop the frequency converter, and writing value in register address 10000 to control the output frequency of the converter. Please refer to Appendix A for the detailed instructions.

A typical wiring set up is shown as below:



8.6. Reset the parameters to Factory Defaults

Set parameter P07.00 = 9;

Power down the product fully and power on again, the keypad shows A.01

Press the “STOP” key to clear the A.01, then the parameters are reset to factory defaults except for the parameter group 8 and group 9.

8.7. Reset the Faults (Alarms)

For non-locked faults, press “STOP” key to reset the fault.

For locked faults:

If parameter P05.30 = 0, press “STOP” to reset the fault;

If parameter P05.30 = 1, you need to power off and power on the product first, then press “STOP” key to reset the fault.

You can also set a DI terminal function to reset fault (set one of the parameters from P02.05 to P02.09 equals 1), and use DI signal to reset the fault.

8.8. Motor Parameters Auto Tuning

Ensure that the frequency converter is stopped and the motor is stationary;

Set motor parameters according to motor nameplate;

Set parameter P01.13 = 1 or 2;

When keyboard alternately displays PUSH and RUN, press RUN key to start motor parameter auto tuning.

During tuning, the keyboard displays '-At-'. Do not do any operation during the parameter tuning;

Wait until keyboard alternately displays “PUSH” and “Ent”, then press ENTER (CU0B:Press incremental potentiometer) and finish the motor parameter auto tuning process.

9. List of Faults					
Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
	A.01		Factory Reset	Parameters reset to factory defaults without confirmation	Press "STOP "key to Confirm
	A.02*		Internal Fault		Contact our local support
u.03	A.03*		PU CU communication time out	PU Failed to communicate with CU	1.Power off, then confirm the installation between PU and CU 2.Contact our local support
	A.04*		Power Board 24V Error	Internal Hardware fault	1.Confirm no problem in external load to 24V 2.Contact our local support
	A.05*		Gate drive voltage fault	Internal Hardware fault	
u.07	A.07*		Fan Fault	Too much dust on the fan or the fan is aged	Clean or replace the fan
u.08			Fan2 Fault	Too much dust on the fan or the fan is aged	Clean or replace the fan
	A.16*		Short Circuit	Short circuit between phases of motor	Check the motor cable and motor insulation status
u.17	A.17*		Earth fault	Flashover or short circuit between output phases and ground	1.Check cable or motor phase to ground insulation status 2.Replace cable or motor
u.19	A.19*		Brake resistor short-circuit	Brake resistor is short circuit (22kW and below)	Check the wire of brake resistor or Replace Brake resistor
u.20	A.20*		Brake transistor short-circuit	Brake transistor is damaged (22kW and below)	Contact our local support to repair
u.21	A.21*		Brake Detect	Brake resistor is not connected or working.	Check the Brake resistor or replace suitable Brake resistor
u.23	A.23		Over Current at low voltage	Over current due to that power supply voltage dips too much	Check the Power supply
u.24			Under Voltage	Power supply voltage dips too much, or high load to too low power supply voltage	Check the Power supply
u.25	A.25		Overload at low voltage	High load at continuous low power supply voltage	Check the Power supply
u.26	A.26*		Mains Phase Loss	Missing phase on supply side	Check the Power supply
u.27	A.27		KEB fault	KEB function triggered but failed to hold the DC voltage at power supply voltage drop, due to too less inertia or too long time for power supply voltage drop.	1.Check the Power supply 2.Set suitable KEB Threshold voltage
	A.28*		Motor phase U missing	1.Motor phase imbalance 2.Motor cable loose	Check the motor phase cable and motor.
	A.29*		Motor phase V missing		
	A.30*		Motor phase W missing		
u.36	A.36		Over Voltage	1.The input voltage is too high; 2.The motor works in generator mode; 3.The deceleration time is too short; 4.The braking unit and braking resistor are not installed.	1.Check the power supply 2.Use brake resistor or energy feedback unit to consume or use up the generate energy 3.Adjust relative parameters to avoid the motor working in generator mode

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.37	A.37		IGBT Over Temperature	Too high load or the cooling condition beyond the specification	1.Check the load 2.Check the cooling condition, include to clean the airduct or replace the fan
u.38	A.38		IGBT Temperature Sensor Error U		Contact our local support to repair
u.39	A.39		IGBT Temperature Sensor Error V		
u.40	A.40		IGBT Temperature Sensor Error W		
u.41	A.41		Rectifier Temperature High	Too high load or the cooling condition beyond the specification	1.Check the load 2.Check the cooling condition, include to clean the airduct or replace the fan
u.42	A.42		Rectifier Temperature Sensor Error		Contact our local support to repair
u.43	A.43		Power Board Over Temperature	Too high load or too high ambient temperature	1.Check the load 2.Check the cooling condition, include to clean the airduct or replace the fan
u.45	A.45		Over Current	1.Motor parameters and/or motor control parameters are not set appropriately 2.The power size of inverter is too small comparing to the motor or the load 3.The power supply voltage is too low; 4. The inverter failed to catch a spinning motor at fly	1.Adjust relevant parameters 2.Select inverter with higher power rating 3.Check the power supply voltage 4.Contact our local support
u.46	A.46		Drive Overload	1.Too heavy load or too low power supply voltage 2.The power size of inverter is too small comparing to the motor or the load 3.Motor parameters and/or motor control parameters are not set appropriately;	1.Correctly set relevant parameters especially the motor parameters 2.Select inverter with high power rating. 3.Contact the local distributor
u.48	A.48		Motor Over Temperature	1.Too heavy load on the motor 2.Cooling condition for the motor is not good enough 3.Thermistor for motor temperature sensing is not used correctly	1.Check selection /installation of the thermistor for motor temperature sensing 2.Check the cooling conditions for motor 3.Check the load versus rated power of the motor
u.49	A.49		Motor Overload	1.Motor parameters and/or motor control parameters are not set appropriately; 2.Too heavy load on the motor	1.Correctly set relevant parameters especially the motor parameters 2.Check the load versus rated power of the motor

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.50	A.50		Current Limit	Current exceeds the parameter set max. current (P05.07) due to: 1.Too heavy load comparing to the power size of the inverter 2.Too fast ramp with inertia 3.Too low power supply voltage 4.Motor parameters and/or motor control parameters are not set appropriately;	Adjust P05.07 or try A.45 solution
u.51	A.51		Torque Limit	Torque exceeds the parameter set max. torque (P05.04/P05.05).	Adjust P05.04/P05.05 or try A.45 solution
u.57	A.57		Analogue input terminals Error	1.Wire connection problem 2.The parameters for AI1/AI2 live zero are not correctly set	1.Check the wire connection 2.Adjust the relevant parameter setup
u.62	A.62		Communication Timeout	Drive communication timeout (with external controller PC/PLC/HMI etc.) 1.External controller abnormal 2.Communication line connection problem 3.Communication Parameters(P00.8X) incorrect. 4.EMC problem.	1.Check external controller PC, PLC, HMI etc. 2.Check communication line connection 3.Correctly set communication parameters(P00.8X) 4.Wiring the communication cables correctly, including shielding and grounding 5.Contact our local support or Company
u.63	A.63		Field bus Communication Timeout	Drive field bus communication timeout (with external controller PC/PLC/HMI etc.) 1.External controller abnormal 2.Communication line connection problem 3.Communication Parameters incorrect. 4.EMC problem.	1.Check external controller PC, PLC, HMI etc. 2.Check field bus communication line connection 3.Correctly set communication parameters 4.Wiring the communication cables correctly, including shielding and grounding 5.Contact our local support or Company
u.66			Motor Loss	Motor cable connection or motor problems;	Check motor cable or motor phase
	A.69		Mechanic Brake Current Low	Actual motor current cannot exceed release brake current (P01.97~P01.98) within start delay time.	Correctly set mechanical brake parameters(P01.97~P01.98)
u.75			Drive License Timeout	Drive License Timeout function activated	Contact our local support
u.76	A.76		External alarm	DI terminals select external alarm function	Check external alarm source

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
		Er.90	CU communication Timeout	CU Failed to communicate with PU	1.Power off, then confirm the installation between PU and CU 2.Contact our local support
		Er.93	Parameter change disabled	1.They keypad was locked when changing the parameters 2.Parameters over the range	1.Deblock the keypad 2.Set the parameters correctly
		Err	Parameter change disabled	The parameter cannot be changed when Drive running	Change the parameter after Drive stop
	A.99		AMA Error	Failed to finish the motor parameter auto tuning	Correctly set motor parameters according to motor nameplate
	A.160		Dry run	1.Water level abnormal. 2.Pressure sensor loosely connected. 3.Incorrect setting of P20.28~P20.30	1.Check that the pump is well primed. 2.Check the wiring of the pressure sensor 3.Set the P20.28~P20.30 correctly based on actual conditions
u.161	A.161		PID feedback loss	1.Pressure sensor loosely connected. 2.Incorrect setting of P20.07~P20.08	1. Check the wiring of the pressure sensor 2. Set the P20.07~P20.08 correctly based on actual conditions
	A.162		High outlet pressure	1.Pressure sensor feedback signal abnormal. 2.Excessively low value of P20.03 (Detection level of over pressure).	1.Check the wiring of the pressure sensor 2.Adjust the P20.03 based on actual conditions
	A.163		Low outlet pressure	1.Pressure sensor loosely connected. 2. Incorrect setting of P20.04~P20.05	1.Check the wiring of the pressure sensor 2.Set the P20.04~P20.05 correctly based on actual conditions
	A.164		Pipe rupture	1.Pipe rupture occurs. 2. Incorrect setting of P20.58~P20.59	1.Verify that there is no air leak in the suction line 2.Set the P20.58~P20.59 correctly based on actual conditions
u.165			Networking communication interruption	1.Pipe rupture occurs. 2. Incorrect setting of P20.40~P20.41(Master)	1.Ensure proper wiring of the RS485 communication cable 2.Set the P20.40~P20.41 correctly(Master)
	A.166		Networking Mistake	More than one slave become backup master(P20.42=1)	Verify that only one slave can be set to backup master (P20.42=1)

10. List of Parameters

Parameter Group 0:General Control Mode and Commands

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P00.01	Control Mode	0:Speed Mode Speed Sensor less 1:Speed Mode with Speed Sensor 2:Torque Mode Speed Sensor less 3:Torque Mode with Speed Sensor		0
*P00.02	Motor Control Principle	0:V/F 1:Vector Control 1 2:Vector Control 2		1
P00.03	Macro-program	0:Invalid; 1:Pump Control		0
*P00.04	Torque Characteristics	0:CT; 1:VT; 9:AEO		0
*P00.05	Motor Speed Direction	0:Clockwise 1:Anticlockwise 2:Bidirectional		2
*P00.09	Selection of reverse direction of motor	0:Invalid; 1:Reverse selection is valid		0
P00.10	Speed Set Source Selection	0:Main set source 1:Multi preset value with priority 2:Calculation of main set source and additional set source. 3:Switchover between main set source and additional set source. 4:Switchover between main set source and the calculation of main set source and additional set source 5:Switchover between additional set source and the calculation of main set source and additional set source Selecting 4 or 5 works similar as selecting 3		0
P00.11	Main Set Source	0:No function; 1:Terminal AI1 2:Terminal AI2 5:Pulse input, use pulse input as set source 10:Multi preset value 0 + Up/Down 11:Multi preset values 20:Communication 21:Process PID 30:Keypad		1
P00.12	Additional Set Source	Same as P00.11		20
P00.13	Torque Set Source for Torque Mode	Same as P00.11		1
P00.14	Set Value Calculation from Main and Additional Source	0:Main Set Source + Additional Set Source 1:Main Set Source - Additional Set Source 2:Maximal Value of Main and Additional Set Source 3:Minimal Value of Main and Additional Set Source		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P00.15	Speed Set Range	0:0~P00.16; 1:-P00.16~P00.16		0
P00.16	Base Value for Speed Set	0.0~590.0		50.0
P00.17	Control Site	0:Terminal or Bus Communication 1:Terminal 2:Bus Communication		0
P00.18	Selection of Communication Control Source	0:Null 1:Local RS485 2:Bus from Option Card		1
P00.29	Control command source switch selection	0:Invalid 1:Control command source switch is valid		0
P00.30	0 Multi Preset Values	-100.00~100.00	%	0.00
P00.31	1 Multi Preset Values	-100.00~100.00	%	0.00
P00.32	2 Multi Preset Values	-100.00~100.00	%	0.00
P00.33	3 Multi Preset Values	-100.00~100.00	%	0.00
P00.34	4 Multi Preset Values	-100.00~100.00	%	0.00
P00.35	5 Multi Preset Values	-100.00~100.00	%	0.00
P00.36	6 Multi Preset Values	-100.00~100.00	%	0.00
P00.37	7 Multi Preset Values	-100.00~100.00	%	0.00
P00.38	8 Multi Preset Values	-100.00~100.00	%	0.00
P00.39	9 Multi Preset Values	-100.00~100.00	%	0.00
P00.40	10 Multi Preset Values	-100.00~100.00	%	0.00
P00.41	11 Multi Preset Values	-100.00~100.00	%	0.00
P00.42	12 Multi Preset Values	-100.00~100.00	%	0.00
P00.43	13 Multi Preset Values	-100.00~100.00	%	0.00
P00.44	14 Multi Preset Values	-100.00~100.00	%	0.00
P00.45	15 Multi Preset Values	-100.00~100.00	%	0.00
P00.46	UP/DOWN Step Value	0.01~50.00		0.10
P00.47	Save Up/Down Set Value	0:Not Save 1:Save when Stop 2:Save when Power Down		0
P00.48	Jog Speed	0.0~400.0	Hz	5.0
P00.49	Ramp Time Resolution	0:0.1s 1:0.01s		1
P00.50	Ramp 1 Type	0:Linear; 1:S ramp		0
P00.51	Ramp 1 Ramp Up Time	0.01~655.35S	s	*
P00.52	Ramp 1 Ramp Down Time	0.01~655.35S	s	*
P00.53	Ramp 2 Type	0:Linear; 1:S ramp		0
P00.54	Ramp 2 Ramp Up Time	0.01~655.35S	s	*
P00.55	Ramp 2 Ramp Down Time	0.01~655.35S	s	*
P00.56	Ramp 3 Type	0:Linear 1:S ramp		0
P00.57	Ramp 3 Ramp Up Time	0.01~655.35S	s	*
P00.58	Ramp 3 Ramp Down Time	0.01~655.35S	s	*
P00.59	Ramp 4 Type	0:Linear; 1:S ramp		0
P00.60	Ramp 4 Ramp Up Time	0.01~655.35S	s	*

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P00.61	Ramp 4 Ramp Down Time	0.01~655.35S	s	*
P00.62	Jog Ramp Time	0.01~655.35S	s	*
P00.63	S Ramp Up Initiate Period	0.01~655.35S	s	*
P00.64	S Ramp Up Termination Period	0.01~655.35S	s	*
P00.65	S Ramp Down Initiate Period	0.01~655.35S	s	*
P00.66	S Ramp Down Termination Period	0.01~655.35S	s	*
P00.80	Local Address	1~127		1
P00.81	Baud Rate	0:2400 1:4800 2:9600 3:19200 4:38400 5~9:Reserved		2
P00.82	Communication Data Format (Parity/Stop Bits)	0:Even parity (1 stop bit) 1:Odd parity (1 stop bit) 2:No parity (1 stop bit) 3:No parity (2 stop bit)		0
P00.83	Min. Communication Response Delay	0.000~0.500	s	0.002
P00.84	Max. Communication Response Delay	0.010~10.000	s	5.000
P00.85	Message Response	0:Normal Responses 1:Only Response Exceptional Message 2:Not Response		0
P00.86	Parameter (Set by Communication) Saving at Power Down	0:Not Save Parameter at Power Down 1:Save Parameter at Power Down		0
P00.87	Communication terminal resistance selection	0:Open 1:Close		0
P00.88	Communication Timeout Time	0.01~650.00	s	1.00
P00.89	Communication Timeout Response Function	0:No Function 2:Stop Motor 3:Jogging 4:Run with Max Frequency P05.03 5:Alarm Fault and Trip to stop 6:Warning		0
P00.90	Reset Communication Timeout	0:No Action 1:Reset the Timeout		0

Parameter Group 1:Basics for Inverter and Motor Control				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P01.00	Switching Frequency	2~16:2~16 kHz		*
*P01.01	Grid Type	2~122		*
*P01.02	Motor Type	0:Induction Motor 1:SPM 2:IPM without Saturation 3:IPM with Saturation		0
*P01.03	Rated Motor Power	0.12~450	kW	*
*P01.04	Rated Motor Voltage	50~1000	V	*
*P01.05	Rated Motor Frequency	20~400	Hz	*
*P01.06	Rated Motor Current	0.1~1200	A	*

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
*P01.07	Rated Motor Speed	100~24000	rpm	*
*P01.08	Rated Motor Torque	0.1~6553.5	N·m	*
*P01.13	Autotuning for Motor Parameters	0:No Function 1:Simple Static Motor Auto Tuning 2:Complete Static Motor Auto Tuning		0
*P01.14	Stator Resistance (Rs)	0.001~65.535	Ω	*
*P01.15	Rotor Resistance (Rr)	0.001~65.535	Ω	*
*P01.16	Stator Leakage Reactance (X1)	0.001~65.535	Ω	*
*P01.17	Main Reactance (Xh)	0.01~655.35	Ω	*
*P01.18	Ld, PM D-axis Inductance	0.01~655.35	mH	*
*P01.19	Lq, PM Q-axis Inductance	0.01~655.35	mH	*
*P01.20	Ld-s, PM D-axis Inductance Saturated	0.01~655.35	mH	*
*P01.21	Lq-s, PM Q-axis Inductance Saturated	0.01~655.35	mH	*
*P01.22	Saturation Current at D-axis for Ld-s	20~200	%	100
*P01.23	Saturation Current at Q-axis for Lq-s	20~200	%	100
*P01.24	Number of Motor Poles	2~100	P	4
*P01.25	BEMF at Rated Speed for PM	0~9000	V	*
*P01.26	Motor Cable Length	0~150	m	10
*P01.27	System Inertia	0.00~655.35	kg·m ²	*
P01.32	Load Compensation Gain for Low Speed	0~199	%	100
P01.33	Load Compensation Gain for High Speed	0~199	%	100
P01.34	Motor Magnet Current at 0 Speed	0~300	%	100
P01.35	Cut in Speed for Normal Magnet Current	0.0~10.0	Hz	0.0
P01.36	Min Motor Current at Low Speed	0~120	%	80
P01.37	Slip Compensation Gain	-400~399	%	*
P01.38	Slip Compensation Time Constant	0.05~5.00	s	*
P01.39	Resonance Damping Gain	0~3000	%	*
P01.40	Time Constant for Resonance Damping Filter	0.005~0.050	s	0.005
P01.41	Damping Coefficient for PM	0~250	%	120
P01.42	Damping Time Constant for Low Speed range (PM)	0.01~20.00	s	0.8
P01.43	Damping Time Constant for High Speed range (PM)	0.01~20.00	s	0.8
P01.44	Time Constant for Current Filter (PM)	0.001~1.000	s	0.5
P01.45	Min Torque at Torque Mode Start	-100~100	%	5
P01.46	Min Torque Cut Out Speed at Torque Mode Start	0.1~50.0	Hz	3.0
P01.53/ P01.55/ P01.57/ P01.59/ P01.61	Voltage for V/F curve points	0.0~999.9	V	*
P01.54/ P01.56/ P01.58/ P01.60/ P01.62	Frequency for V/F curve Points	0.0~590.0	Hz	*

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P01.63	PM Start Method	0:Initial Position Detection (IPD); 1:Parking		1
*P01.64	IM Start Method	0:Direct Start; 1:Fly start		0
P01.67	Min Valid Speed Set	0.00~50.00	Hz	0.00
P01.68	Bypass Range for IM Low Speed	0.0~20.0	Hz	0.0
P01.70	Delay Time at Start	0.0~10.0	s	0.0
P01.71	Delay Function at Start	0:Free Coast; 1:DC Hold		0
P01.72	DC Hold Current	0~150	%	50
P01.79	Stop Method at Torque Control Mode	0:Stop with Torque Mode 1:Stop with Speed Mode		0
P01.80	Function at Stop	0:Free Coast; 1:DC hold		0
P01.81	Cut in Speed for Function at Stop	0.0~400.0	Hz	0.0
P01.82	DC Brake Current (IM)	0~150	%	50
P01.83	DC Brake Time (IM)	0.0~60.0	s	2
P01.84	DC Brake Cut in Speed (IM)	0.0~400.0	Hz	0.0
P01.85	Demagnetizing Rate at DC Cut in	0~100	%	100
P01.86	Parking Current (PM Start)	0~150	%	80
P01.87	Parking Time (PM Start)	0.1~60.0	s	3.0
P01.91	Brake Function	0:No Function; 1:Resistor Brake; 2:AC Brake		0
P01.92	Max AC Brake Current	0~150	%	100
P01.93	AC Brake Gain	1.0~2.0		1.4
P01.94	Threshold Voltage for Brake Function	Grid Dependent	V	*
P01.95	Resistor Brake Resistance	5~65535	Ω	*
P01.97	Mechanical braking current.	0.00~1200.00	A	0.00
P01.98	Mechanical braking frequency	0.0~400.0	Hz	0.0

Parameter Group 2:Digital Terminal Functions				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P02.00	DI Positive-Negative Logic Selection	0~65535		0
P02.01	DO/Relay Positive-Negative Logic Selection	0~65535		0
P02.02	DI Input Mode	0:NPN Input 1:PNP Input		0
P02.03	Terminal pulse start-stop function enables	0:Invalid. 1:Effective		0
P02.04	DI Filter time	2~16	ms	4
P02.05	FWD Input Function Selection	0:No Function; 1:Reset 2:Coast to Stop (Negative Logic) 3:Coast to Stop and Reset(Negative Logic) 4:Stop (Negative Logic)		10
P02.06	REV Input Function Selection			12
P02.07	DI Function Selection - Terminal D1			22
P02.08	DI Function Selection - Terminal D2			23

P02.09	DI Function Selection - Terminal D3	10:Run 11:Forward/Reverse Selection 12:Run in Reverse Direction 13:Latched run forward 14:Latched run reverse 15:Forward Jog 16:Reverse Jog 17:Latched stop 20:Forbid Forward 21:Forbid Reverse 22:Preset Value Command Bit 1 23:Preset Value Command Bit 2 24:Preset Value Command Bit 3 25:Preset Value Command Bit 4 26:Ramp Time Selection Bit 1 27:Ramp Time Selection Bit 2 30:Speed UP 31:Speed DOWN 32:Counter A 34:Reset Counter A 35:Counter B 37:Reset Counter B 40:Pulse Input 41:Switch Set Source 42:Switch Speed Mode/Torque Mode 50:External Fault Input 51:Freeze PID output 64:Pump Control 65:Pump Clean 66:Enable fire mode with run command 67:Enable fire mode without run command		24
P02.21	Action for DI as External Fault Input	0:No Action 2:Stop and Warning 3:Jog and Warning 4:Run to Max Speed P05.03 and Warning 5:Alarm Fault and Trip to stop 6:Warning 7:Failure and free operation and shutdown 8:Only running input is valid (output action is consistent with option 7)		0
P02.22	DO Function Selection - Terminal DO1	0:No operation 1:Drive ready 2:Remote control ready 3:Drive ready/stop 4:Drive running, the drive is running 5:Drive running/No warning, the drive is running and no warning is present 6:Run in current range 7:Run on reference 8:Reverse 10: Alarm 11: Alarm or warning 12: Thermal warning		0
P02.23	DO Function Selection - Terminal DO2			0
P02.24	DO Function Selection - Terminal DO3			0
P02.25	DO Function Selection - Terminal DO4			0
P02.26	DO Function Selection - Terminal DO5			0
P02.28	Relay Output Function Selection - RL1			10

P02.31	Relay Output Function Selection - RL2	13: Ready 14: Remote ready 15: Bus OK 20: Out of current range 21: Below current low 22: Above current high 23: Out of frequency range 24: Below frequency low 25: Above frequency high 26: Out of feedback range 27: Below feedback low 28: Above feedback high 29: Out of reference range 30: Below reference low 31: Above reference high 40: Drive in Local mode; 41: Drive in Remote mode 42: Mech. brake control 43: External alarm 44: Unbalance warning 47: Counter A 48: Counter B 49: Communication Expansion Card OK 64: Motor1 output 65: Motor2 output 66: Motor3 output 67: Motor4 output 68: Motor5 output 69: Motor6 output 70: Motor7 output 71: Motor8 output 72: Pump clean 73: Pipe fill 74: Sleep 75: Bypass in fire mode		0
P02.29	Relay on Delay Time - RL1	0.00~600.00	s	0.00
P02.30	Relay off Delay Time - RL1	0.00~600.00	s	0.00
P02.32	Relay on Delay Time - RL2	0.00~600.00	s	0.00
P02.33	Relay off Delay Time - RL2	0.00~600.00	s	0.00
P02.46	Save DI Counter Value at Power down	0: Save None 1: Save Counter A 2: Save Counter B 3: Save Both Counter A and B		0
P02.47	Counter A Preset threshold	0~65535		65535
P02.48	Counter B Preset threshold	0~65535		65535
P02.50	Min Frequency for Pulse Input 1	0.00~P02.51	kHz	0.00
P02.51	Max Frequency for Pulse Input 1	P02.50~100.00	kHz	50.00
P02.52	Set Value/Feedback Value Versus Min Frequency for Pulse Input 1	-200.00~200.00	%	0.00
P02.53	Set Value/Feedback Value Versus Max Frequency for Pulse Input 1	-200.00~200.00	%	100.00
P02.54	Pulse input 1 Filter Time	1~1000	ms	100

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P02.60	Pulse output 1 function selection	0:Digital output 1:Output frequency 2:Output current 3:Output Power 4:Motor Speed 5:Output voltage 10:Set Value 11:Feedback 13:Set Value from Bus 14:Pulse input 1 input frequency 15:Terminal AI1 input value 16:Terminal AI2 input value 20:DC link voltage 30:Output Torque		0
P02.61	Min Frequency for Pulse Output 1	0.00~P02.62	kHz	0.00
P02.62	Max Frequency for Pulse Output 1	P02.61~100.00	kHz	50.00
P02.63	Function Value Versus Min Frequency for Pulse Output 1	0.00~200.00	%	0.00
P02.64	Function Value Versus Max Frequency for Pulse Output 1	0.00~200.00	%	100.00
P02.70	Encoder Resolution	1~32767		1024
P02.71	Encoder Rotation Direction	0:Forward 1:Reverse		0
P02.72	Encoder Dividing Frequency Output Factor	1~255		1

Parameter Group 3:Analogue Terminal Functions				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P03.00	Signal Type - Terminal AI1	0:Analogue Voltage 1:Analogue Current		0
P03.01	Terminal AI1 Filter Time	0.00~10.00	s	0.01
P03.02	Zero Voltage Dead Band - Terminal AI1	0.00~20.00	V/mA	0.00
P03.03	Min Input Voltage - Terminal AI1	0.00~P03.04	V	0.00
P03.04	Max Input Voltage - Terminal AI1	P03.03~10.00	V	10.00
P03.05	Min Input Current - Terminal AI1	0.00~ P03.06	mA	0.00
P03.06	Max Input Current - Terminal AI1	P03.05~20.00	mA	20.00
P03.07	Set Value/Feedback Value Versus Min Input -Terminal AI1	-200.00~200.00	%	0.00
P03.08	Set Value/Feedback Value Versus Max Input -Terminal AI1	-200.00~200.00	%	100.00
P03.09	Signal Type - Terminal AI2	0:Analogue Voltage; 1:Analogue Current		1
P03.10	Terminal AI2 Filter Time	0.00~10.00	s	0.01
P03.11	Zero Voltage Dead Band - Terminal AI2	0.00~20.00	V/mA	0.00
P03.12	Min Input Voltage - Terminal AI2	0.00~P03.13	V	0.00
P03.13	Max Input Voltage - Terminal AI2	P03.12~10.00	V	10.00
P03.14	Min Input Current - Terminal AI2	P03.15~19.99	mA	0.00
P03.15	Max Input Current - Terminal AI2	P03.14~20.00	mA	20.00

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P03.16	Set Value/Feedback Value Versus Min Input - Terminal AI2	-200.00~200.00	%	0.00
P03.17	Set Value/Feedback Value Versus Max Input - Terminal AI2	-200.00~200.00	%	100.00
P03.48	Analogue Live Zero Timeout Time	1~99	s	10
P03.49	Live Zero Timeout Function	0:No Action 2:Stop and Warning 3:Jog and Warning 4:Run at Max Speed P05.03 and Warning 5:Alarm Fault and Trip to stop		0
P03.50	Signal Type - Terminal AO1	0:0~20mA 1:4~20mA 3:0~10V		3
P03.51	Output Function Selection- AO1	0:No function 1:Output frequency 2:Output current 3:Output Power 4:Motor Speed 5:Output voltage 10:Set Value 11:Feedback 13:Set Value from Bus 14:Pulse input 1 input frequency 15:Terminal AI1 input value 16:Terminal AI2 input value 20:DC link voltage 30:Output Torque		0
P03.52	Value Versus Min Output - AO1	0.00~200.00	%	0.00
P03.53	Value Versus Max Output - AO1	0.00~200.00	%	100.00
P03.54	Min Output Voltage/Current - AO1	0.00~P03.55		0.00 /4.00
P03.55	Max Output Voltage/Current - AO1	P03.54~10.00/20.00		10.00 /20.00
P03.68	Min Set Value from Keypad	-200.00~200.00	%	0.00
P03.69	Max Set Value from Keypad	-200.00~200.00	%	100.00
P03.90	Enable Analogue Input as Digital Input	0:Keep as Analogue Inputs 1:Enable Analogue Inputs as Digital Inputs		0
P03.91	Function Selection for AI1 as DI	Same as P02.05		0
P03.92	Function Selection for AI2 as DI	Same as P02.05		0

Parameter Group 4:Process PID and Other Controllers				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P04.00	Process PID Feedback Source	0:No Function 1:Terminal AI1 2:Terminal AI2 5:Pulse Input 1 20:Bus Communication		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P04.01	Process PID Set Source	0:No Function 1:Terminal AI1 2:Terminal AI2 5:Pulse Input 11 10:Preset Value 0 + UP/DOWN 11:Multi Preset Value 20:Bus Communication 30:Keypad		0
P04.02	Fiducial Value for Process PID Set/Feedback	0.1~3000.0		50.0
P04.04	Process PID Control Logic:Positive/Negative	0:Positive 1:Negative		0
P04.05	Process PID Anti Windup	0:Disable 1:Enable		1
P04.06	Cut-in Frequency for Process PID Speed Mode	0.0~200.0	Hz	0.0
P04.07	Proportional Gain - Process PID 1	0.0~10.00		0.01
P04.08	Integral Time - Process PID 1	0.01~655.35	s	655.35
P04.09	Differentiating Time - Process PID 1	0.00~10.00	s	0.00
P04.13	Process PID Differential Limit	1.0~50.0		5.0
P04.14	Error Tolerance Limit to Enable Process PID	0.0~200.0	%	0.1
P04.15	Process PID Out/In Mode to Error Tolerance	0~2		0
P04.18	Process PID Output Low Limit	-100.00~100.00	%	0.00
P04.19	Process PID Output High Limit	-100.00~100.00	%	100.00
P04.22	Process PID Integral Output Low Limit	-100.00~100.00	%	0.00
P04.23	Process PID Integral Output High Limit	-100.00~100.00	%	100.00
P04.30	Speed PID Proportional Gain	0.000~1.000		0.010
P04.31	Speed PID Integral Time	2.0~2000.0	ms	8.0
P04.32	Speed PID Differencing Time	0.0~200.0	s	30.0
P04.33	Speed PID Differential Limit	1.000~20.000		5.000
P04.34	Speed PID Speed Signal Filter Time	1.0~100.0		10.0
P04.40	Torque PI Proportional Gain	0~500	%	100
P04.41	Torque PI Integration Time	0.002~2.000	s	0.020
P04.51	PM Current Limit Controller Feedforward Gain	0~400	%	100
P04.52	Proportional Gain - Current Limit Controller	0~500	%	100
P04.53	Integration Time - Current Limit Controller	0.000~2.000	s	0.020
P04.54	Filter Time - Current Limit Control	2.0~100.0	ms	*
P04.61	Isd PI Control Bandwidth	10~200	Hz	30
P04.62	Isd PI Control Damping Coefficient	1~200		100
P04.63	Isd Load Compensation Coefficient	0.1~1.0		0.5
P04.64	Isq PI Control Bandwidth	0.01~1.00	Hz	0.03
P04.65	Isq PI Control Damping Coefficient	1~200		1

Parameter Group 5:Limitation, Protection and Failure Detection				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
*P05.02	Motor Low Speed Limit	0.0~590.0	Hz	0.0
*P05.03	Motor High Speed Limit	0.0~590.0	Hz	65.0
P05.04	Torque Limit at Motor Mode	0~1000	%	160
P05.05	Torque Limit at Generator Mode	0~1000	%	160
P05.06	Source Selection for Speed Limit at Torque Mode	0:No Function 1:Input From Terminal AI1 2:Input From Terminal AI1 5:Pulse Input 1 10:Preset Value 0 + UP/DOWN 11:Preset Value 20:Bus Communication 30:Keypad		0
P05.07	Max Current Limit	0~300	%	120
*P05.08	Max Output Frequency Limit	0.0~590.0	Hz	65.0
P05.09	Threshold for Low Current Warning	0.00~P09.16	A	0.0
P05.10	Threshold for High Current Warning	0.00~P09.16	A	*
P05.11	Threshold for Low Speed Warning	0.0~590.0	Hz	0.0
P05.12	Threshold for High Speed Warning	0.1~590.0	Hz	65.0
P05.13	Threshold for Low Set Value Warning	-200.00~200.00	%	0.00
P05.14	Threshold for High Set Value Warning	-200.00~200.00	%	100.00
P05.15	Threshold for Low Feedback Warning	-200.00~200.00	%	0.00
P05.16	Threshold for High Feedback Warning	-200.00~200.00	%	100.00
*P05.17	Enable Motor Phase Loss Protection	0:Off 1:Low sensitivity detection 2:High sensitivity detection		1
P05.18	Enable Current Limit/Torque Limit Warning	0:Disable 1:Enable		1
P05.19	Motor Speed Feedback Loss Function	0:No Function 3:Jog and Warning 4:Run to Max Speed P05.03 and Warning 5:Alarm Fault and Trip to stop 11:Switch to Speed Sensor less Mode		5
P05.20	Speed Error for Speed Feedback Loss Detection	1 ~ 6000	rpm	300
P05.21	Time for Speed Feedback Loss Detection	0.00 ~ 60.00	s	2
P05.22	Threshold for Communication with CU Timeout	0.10~60.00	s	1.00
P05.23	Communication with CU Timeout Function	0:No Function 2:Stop and Warning 3:Jog and Warning 4:Run to Max Speed P05.03 and Warning 5:Alarm Fault and Trip to stop 6:Warning		5
P05.26	Motor Thermal Protection Function	0:No Function 1:ETR Warning 2:ETR Alarm Fault 3:ETR Warning for Self-cooled Motor 4:ETR Alarm Fault for Self-cooled Motor		0
P05.27	Motor Overload Protection Time	0.1~60.0	min	2.0
P05.28	Threshold for Motor Overload Protection	100~160	%	150

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P05.29	Function at Mains Phase Loss	0:No Action 1:Only Warning 2:Trip to stop and Alarm Fault (Heavy Load) 3:Trip to stop and Alarm Fault (Mid Load) 4: Trip to stop and Alarm Fault (Light Load)		3
P05.30	Alarm/Fault Lock Handling	0:Not Lock, Alarm/Fault Resettable without Re-Power On 1:Lock, Alarm/Fault Lock Resettable only after Re-Power On		1
P05.31	Delay Time to Alarm Current Limit Fault	0~60	s	60
P05.32	Delay Time to Alarm Torque Limit Fault	0~60	s	60
P05.33	Action at Warning	0:Trip to stop and Alarm Fault directly 1:Warning and Re-catch Motor after Failure Disappear		1
P05.34	Method to Re-catch Motor at Warning	0:Speed Track (IM/PM) and Angle Track (Fly start) 1:Direct Re-catch		0
P05.60	Selection of unloading detection function	0:invalid 1:valid		0
P05.61	Unloading detection threshold	0.1~200.0%	%	5
P05.62	Off-load detection filtering time	0.1~600.0	S	1

Parameter Group 6:Keypad Operation and Display

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P06.03	Customer Defined Value for 0 Speed	0.0~6553.5		0.0
P06.04	Customer Defined Value for Max Speed	0.0~6553.5		100.0
P06.05	Keypad Display Option	0~8191		0
P06.31	Local / Remote Mode Selection	0:Remote Mode 1:Local Mode		0
P06.32	Free key function Selection	0:Disabled 1:Reverse RUN		0
P06.34	Lock Keypad for Parameter Edit	0:Disabled 1:Enabled and Lock		0
P06.35	Panel adjustment frequency step setting	0:0.1 1:1.0 2:10	Hz	1
P06.50	Motor speed ratio	0.01~655.35		1.00
*P06.51	Current display compensation.	0.01~655.35		1
*P06.52	Power display compensation	0.01~655.35		1

Parameter Group 7:Auxiliary and Special Functions

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P07.00	Special Operation Function	0:No Function 9:Reset Parameters to Factory Defaults		0
P07.01	Function at Re-Power (for Local Mode Only)	0:Resume with Set Value as Set before Re-power 1:Not Run, but Keep Set Value as Set before Re-power 2:Not Run and Clear Set Value 3:Start, instructions are saved before power off		1

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
*P07.10	Min Switch Frequency	2~16:2~16 kHz	kHz	2
*P07.11	Over Modulation Coefficient	90.0~105.5	%	100.0
*P07.12	DC-Link Voltage PWM Compensation Function	0:Compensate Average DC Voltage 2:Compensate DC Ripple Voltage		0
P07.13	DC-link Voltage PWM Compensation Disable at VF control	0:Disable 1:Enable		1
P07.14	Dead Time Compensation Adjustment Coefficient	0~200	%	100
P07.17	Max Speed for Dead Time Compensation	20~590	Hz	*
P07.26	Function at Mains Voltage Sag	0:No Function 1:Passive Ramp Down 2:Passive Ramp Down, Trip 3:Coast and Fly start 4:KEB Control 5:KEB Control, Trip 6:Trip to stop and Alarm		0
P07.27	Threshold Triggering Mains Voltage Sag Function	100~220/380	V	*
P07.28	KEB Control Gain	0 ~ 500	%	100
P07.35	Interval time between automatic zero clearance of reset times	0 ~ 6000	min	0
P07.36	Fault reset mode	0:Reset by Command 1~10:Auto Reset for 1~10 Times 11:Auto Reset for Unlimited Times		0
P07.37	Alarm Auto Reset Waiting Time	0~600	s	10
*P07.38	VT Function Level	40~90	%	90
*P07.39	Min Magnetron at AEO	40~75	%	66
P07.40	Magnetron Optimization Factor (PM)	-400~400	%	10
P07.41	Function selection of cooling fan	0:Run start 4:Start the fan according to the temperature of the frequency converter 5:Power-on start		0
P07.46	Threshold Voltage for OVC Function	Grid Voltage Dependent	V	*
P07.47	OVC Function	0:Disable 1:Enable with Mode 1 2:Enable with Mode 2		*
P07.48	OVC Integral Time	0.01~0.10	s	*
P07.49	OVC Proportional Gain	0~200	%	*
P07.50	Bypass Speed Start 1	0.0~590.0	Hz	0.0
P07.51	Bypass Speed End 1	0.0~590.0	Hz	0.0
P07.52	Bypass Speed Start 2	0.0~590.0	Hz	0.0
P07.53	Bypass Speed End 2	0.0~590.0	Hz	0.0
P07.54	Bypass Speed Start 3	0.0~590.0	Hz	0.0
P07.55	Bypass Speed End 3	0.0~590.0	Hz	0.0
P07.60	Power outage restart delay time	0.0~3600.0	s	0.0

Parameter Group 8:Basic and Running Information				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P08.00	PU SW Version			
P08.01	CU SW Version			
P08.30	Total Days with Power On	0~9999	d	
P08.31	Total Running Hours	0~60000	h	
P08.32	Total Energy Consumed (kWh)	0~65535	kWh	
P08.33	Number of Power Ups	0~65535		
P08.34	Number of Over-Temperatures	0~65535		
P08.35	Number of Over-Voltages	0~65535		
P08.36	Reset Consumed Energy Counter	0:Not Reset 1:Reset		0
P08.37	Reset Running Hours Counter	0:Not Reset 1:Reset		0
P08.40~ P08.49	Alarm Log			
P08.50~ P08.59	Warnings Log			

Parameter Group 9:Real Time Running Status Monitoring				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P09.00	Control Word	0~65535		
P09.01	Status Word	0~65535		
P09.02	Set Value	-4999.0~4999.0		
P09.04	Motor Speed	0~24000	rpm	
P09.05	Output Power	0.000~655.35	kW	
P09.06	Output Voltage	0.0~6553.5	V	
P09.07	Output Frequency	0.0~590.0	Hz	
P09.08	Output Current	0.00~655.35	A	
P09.09	Output Torque	-200.0~200.0	%	
P09.10	Motor Thermal Load Status	0~100	%	
P09.11	DC Link Voltage	0~65535	V	
P09.13	Heatsink or IGBT Temperature	-128~127	°C	
P09.14	Inverter Thermal Load Status	0~255	%	
P09.15	Nominal Inverter Current	0.0~6553.5	A	
P09.16	Max Inverter Current	0.0~6553.5	A	
P09.19	PID Set Value	-200.0~200.0	%	
P09.20	PID Feedback Value	-200.0~200.0		
P09.21	PID Output	-200.0~200.0	%	
P09.22	Digital Input	0~65535		
P09.23	AI1 Analogue Input Type	0:0~10V 1:0~20mA		
P09.24	AI1 Input Value	0.00-20.00	V/mA	
P09.25	AI2 Analogue Input Type	0:0~10V 1:0~20mA		
P09.26	AI2 Input Value	0.00-20.00	V/mA	
P09.34	Set Value by Pulse Input	-200.0~200.0	%	

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P09.35	Frequency of Pulse Input	0.00~100.00	KHZ	
P09.37	Speed Feedback from Encoder		Rps	
P09.38	DO Output Status	0~255		
P09.39	Relay Output Status	0~65535		
P09.40	AO1 Output	0.00-20.00	V/mA	
P09.43	Pulse Output Frequency	0.00~100.00	kHz	
P09.45	Counter A Value	0~65535		
P09.46	Counter B Value	0~65535		
P09.47	Set Value from Bus Communication	-32768~32767		
P09.48	Variable Defined by Customer	0~6553.5		

Parameter Group 20:Pump application				
Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P20.00	pump control mode	0:Pressure control mode		0
P20.01	minimum output frequency	0.00~P20.02	%	40.00
P20.02	maximum output frequency	P20.01~100.00	%	100.00
P20.03	Detection level of over pressure	0.00~150.00	%	100.00
P20.04	Detection level of under pressure	0.00~80.00	%	0.00
P20.05	Detection time of under pressure	0.0~60.0	s	10.0
P20.06	Flow feedback source	0:No Function 1:Terminal AI1 2:Terminal AI2		0
P20.07	Detection level of PID feedback loss	0.00~5.00	%	0.00
P20.08	Detection time of PID feedback loss	0.0~100.0	s	20.0
P20.16	PID feedback loss response action	0:Alarm fault and trip to stop 1:warning and run according to P00.45		0
P20.17	Fire mode direction	0:Forward run 1:Reverse run		0
P20.22	Pipe fill activation mode	0:Inactive 1:Active		0
P20.23	Pipe fill frequency	0.00~100.00	%	60.00
P20.24	Pipe fill time	0.0~6000.0	s	10.0
P20.25	Pipe fill pressure	0.00~100.00	%	30.00
P20.26	Number of Multi-PID Reference	0~4		0
P20.27	Dry run detect activation mode	0:Inactive 1:Active		0
P20.28	Detection pressure of dry run	0.00~100.00	%	4.00
P20.29	Detection frequency of dry run	0.00~100.00	%	96.00
P20.30	Detection current of dry run	0.0~100.0	%	40.0
P20.34	Check valve frequency 1	0.00~P20.01	%	0.00
P20.35	Check valve frequency 2	P20.01~100.00	%	40.00
P20.36	Display Week	1~7		
P20.37	Display Time	0.00~23.59		
P20.40	Networking activation mode	0:Inactive 1:Active		0
P20.41	Networking address	1:Master address 2~5:1#~4# slave address		2

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P20.42	Backup Master activation mode	0:Inactive 1:Active		0
P20.43	Offline frequency	0.00~100.00	%	90.00
P20.45	Year Setting	2023~2099		2023
P20.46	Date Setting	1.01~12.31		1.01
P20.47	Time Setting	0.00~23.59		0.00
P20.48	Timed start-stop activation mode	0:Inactive 1:Active		0
P20.49	Designated working day	0~127		0
P20.50	Timed start time	0.00~23.59		0.00
P20.51	Timed stop time	0.00~23.59		0.00
P20.52	Friction loss compensation activation mode	0:Inactive 1:Active		0
P20.53	Nominal flow of system	10.00~100.00	%	80.00
P20.54	Losses at nominal flow of system	P20.55~100.00	%	15.00
P20.55	Static losses	0.00~P20.54	%	0.00
P20.57	Flow	0.00~100.00	%	
P20.58	Detection time of pipe rupture	0~1000	s	0
P20.59	Detection level of pipe rupture	P20.28~40.00	%	10.00
P20.60	Sleep enable selection	0:disable 1:enable		0
P20.61	Sleep frequency threshold	0.00~100.00	%	2
P20.62	Sleep pressure threshold	0.00~100.00	%	2
P20.63	Sleep detection time	0.0~300.0	S	10
P20.64	minimum sleep time	0.0~1800.0	S	300
P20.65	wake up pressure threshold	0.00~100.00	%	10
P20.66	wake up detection time	0.0~60.0	S	1
P20.67	Pump clean forward frequency	0.00~100.00	%	90.00
P20.68	Pump clean reverse frequency	0.00~100.00	%	60.00
P20.69	Pump clean forward running time threshold	1.0~1000.0	s	5.0
P20.70	Pump clean reverse running time threshold	1.0~1000.0	s	5.0
P20.71	Pump clean pause time threshold	1.0~1000.0	s	1.0
P20.72	Pump clean times	1~100		1
P20.73	Multi-pumps circulation control mode	0:None 1:Fixed amount control with PID 2:Fixed circulation control with PID		0
P20.74	Frequency threshold of add motor	P20.76~100.00	%	100.00
P20.75	Pressure threshold of add motor	0.00~30.00	%	10.00
P20.76	Frequency threshold of subtract motor	0.00~P20.74	%	40.00
P20.77	Pressure threshold of subtract motor	-10.00~30.00	%	10.00
P20.78	Add or subtract motor delay	0~3600	s	5
P20.79	Contactor close time	0.1~9.9	s	0.5
P20.80	Contactor open time	0.1~9.9	s	0.5
P20.81	Number of motors	1~8		1
P20.82	Motor forbidden selection	0~255		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
P20.83	Poll cycle	0.0~240.0	h	0.0
P20.84	motor running time clear selection	0:None X:Clear motor x accumulative running time (x=1~8). 10:Clear all motor accumulative running time.		0
P20.87	T1 Start Time	0.00~23.59		0.00
P20.88	T2 Start Time	0.00~23.59		0.00
P20.89	T3 Start Time	0.00~23.59		0.00
P20.90	T4 Start Time	0.00~23.59		0.00
P20.91	Remaining times of pump clean	0~100		
P20.92	Accumulative running time of Motor 1	0~65535	h	
P20.93	Accumulative running time of Motor 2	0~65535	h	
P20.94	Accumulative running time of Motor 3	0~65535	h	
P20.95	Accumulative running time of Motor 4	0~65535	h	
P20.96	Accumulative running time of Motor 5	0~65535	h	
P20.97	Accumulative running time of Motor 6	0~65535	h	
P20.98	Accumulative running time of Motor 7	0~65535	h	
P20.99	Accumulative running time of Motor 8	0~65535	h	

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