

Goodrive350A 系列高性能通用变频器

快速使用指南

本指南简要介绍了 Goodrive350A 系列高性能通用变频器的外围接线、端子、键盘、快速运行、常用功能参数设置、常见故障及对策。
按产品服务热线 400-700-9997 或访问 www.invt.com.cn 获取更多信息和资源下载。保修条款详见完整版电子说明书。



警告

本指南仅包含基本的安装调试信息。若不遵守相关文档中的安全说明和安装调试说明，可能导致设备损坏、人身伤害、甚至人员死亡等事故。
只有培训合格的专业人员才允许进行相关操作。

危险

禁止在电源接通的情况下进行接线。检查或更换器件等作业。进行这些作业时，须确认所有输入电源已断开，并等待不少于变频器上标注的时间或者确认直流母线电压低于 36V。

箱体	至少等待时间
E1-E11	5 分钟
E12-E13	15 分钟
E14	25 分钟

1 外围接线

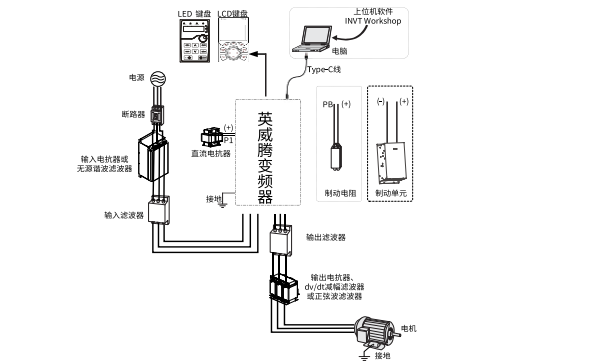


图 2-1 变频器典型接线图

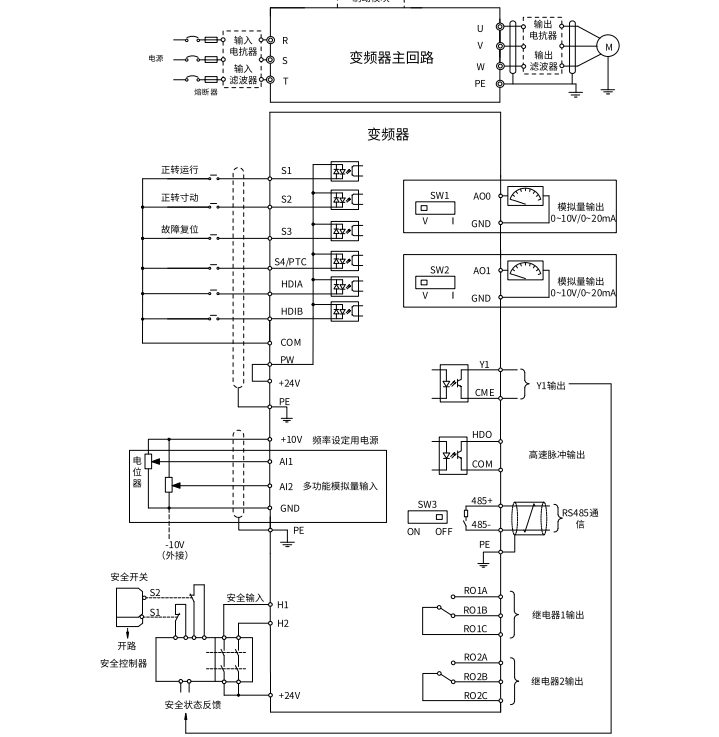


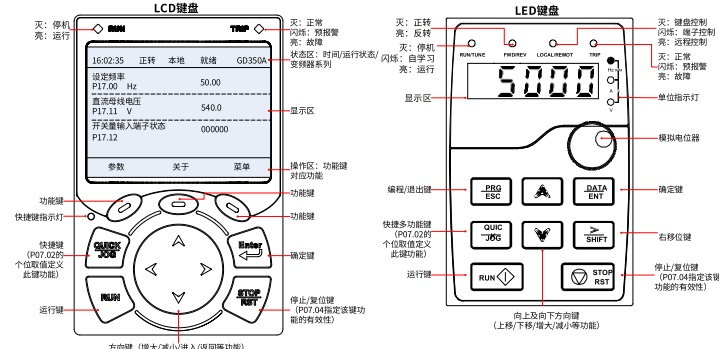
表 2-1 变频器端子说明

端子	说明
主回路端子	
R, S, T (L1, L2)	三相（或单相）交流输入端子，与电网连接

端子	说明
U, V, W	三相交流输出端子，一般接电机
P1	P1、(+)/外接直流抗器端子
(+)	(+)/(+)外接制动单元端子
(-) PB	PB、(-)/外接制动电阻端子
PE	PE 端子，每台机器 PE 端子必须可靠接地
控制回路端子	
+10V	本机提供 10V 电源
AI1	模拟量输入；默认为电压输入，通过跳线设置为电流输入
AI2	电压输入范围：AI1 0-10V/0-20mA, AI2 10-10V
支持 S 端子模式	支持 S 端子模式：3V 以下为低电平，7-10V 为高电平
GND	+10V 的参考地
A00	输出范围：0-10V/0-20mA
电压或电流输出由继电器开关 SW1 设定	
A01	输出范围：0-10V/0-20mA
电压或电流输出由继电器开关 SW2 设定	
RO1	继电器输出；RO1A 常开，RO1B 常闭，RO1C 公共端
触点容量：3A/AC 250V, 1A/DC 30V	
RO2A	RO2 继电器输出，RO2A 常开，RO2B 常闭，RO2C 公共端
触点容量：3A/AC 250V, 1A/DC 30V	
COM	+24V 的参考地
CME	开路集电极输出的公共端，出厂时与 COM 短接
Y1	开关容量：50mA/30V；输出频率范围：0-1kHz
485+	485 差分信号通讯接口，标准 485 通讯接口请使用屏蔽双绞线，485 通讯的 120Ω 终端电阻通过过压保护开关 SW3 选择接入
PE	接地端子
PW	开关量的外部电源输入端子
NPN 模式下，将 PW 与 +24V 短接；PNP 模式下，将 PW 与 COM 短接	
+24V	变频器提供用户电源，最大输出电流 200mA
S1	开关量输入端子
S2	最大输入频率：1kHz；内部阻抗：3.3kΩ；可接受 12~30V 电压输入；全部为双向
S3	输入端子，支持 NPN 和 PNP 接法；全部为可编程数字量输入端子，用户可通过功能码设定控制功能；S4 配置为 PTC 过温保护功能，设置功能码 P05.04 及按动开关打到 PTC 位置，过温阻值 3.7kΩ，恢复阻值 2.0kΩ以下（仅支持 NPN 模式）；S 端子输入支持边沿触发和电平触发
HDIA	除有 S1~S4 功能外，还可作为高频脉冲输入通道；最大输入频率：50kHz；占空比：30%~70%；支持 24V 电源的正交编码器输入，具有测速功能
HDIB	+24V-H11 STO 输入 1 安全转矩停止 (STO) 冗余输入，外接常闭触点，触点断开时 STO 动作，变频器停止输出
+24V-H2	STO 输入 2
Type-C	Type-C 接口通过线接直接连接电脑端，Workshop 软件时，无论变频器主电源是否上电，均可实现软件升级、参数调试以及参数的批量上传和下载；变频器主电源上电时，可以控制变频器运行、监控变频器运行参数
键盘接口	键盘接口可用来外接引键盘，但本机键盘和外引键盘只能同时使用一个。

3 键盘

GD350A 系列产品标配 LCD 键盘，支持选配 LED 键盘。



4 快速运行

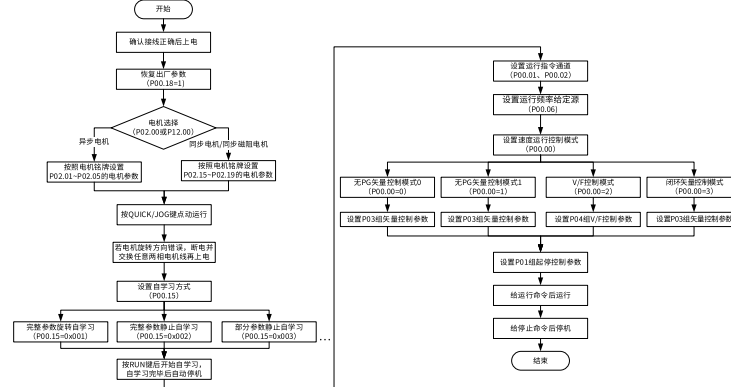
4.1 上电前检查

- 请确认所有的端子已正确紧固连接。
- 请确认电机与变频器功率匹配。

4.2 首次上电操作

接线及电源检查确认无误后，合上变频器输入侧交流电源的空气开关，给变频器加电，LCD 键盘界面会进入引导设置，请根据界面引导进行设置。

快速运行操作如下图所示：



5 常用功能参数设置

下述功能参数表仅列出部分常见功能参数，并进行了简要描述、列举典型取值。

“○”：表示该参数的设定值在变频器处于待机、运行状态中，均可更改；

“□”：表示该参数的设定值在变频器处于运行状态时，不可更改；

“●”：表示该参数的数值是实际检测记录值，不能更改。

变频器已对各参数的修改属性作了自动检查约束，可帮助用户避免误修改。

功能码	名称	详细说明	缺省值	更改
P00.00	速度控制模式	0: 无 PG 无速度控制模式 0 1: 无 PG 无速度控制模式 1 2: V/F 控制模式 3: 闭环矢量控制模式	机型确定	○
P00.01	运行指令通道	1: 端子运行指令通道 2: 通讯运行指令通道	0	○
P00.03	最大输出频率	P00.04~P00.03 (最大输出频率)	50.00Hz	○
P00.04	运行频率上限	0.00Hz~P00.04 (运行频率上限)	50.00Hz	○
P00.05	运行频率下限	0.00Hz~P00.04 (运行频率上限)	0	○
P00.06	A 频率指令选择	0: 键盘数字选择 1: 模拟量 AI1 设定 2: 模拟量 AI2 设定 3: 模拟量 AI3 设定 4: 高速脉冲 HDIA 设定 5: 简易 PLC 程序设定 6: 多段速运行设定 7: PID 控制设定	0	○
P00.07	B 频率指令选择	0: 以以太网通讯设定 11: 高速脉冲 HDIB 设定 12: 脉冲串 AB 设定 13: EtherCAT/PROFINET/EtherNet IP 通讯设定 14: PLC 可编程卡设定 15: 模拟量 AI5 设定 16: 模拟量 AI6 设定 17: 模拟量 AI7 设定 18: 预留	18	○
P00.10	键盘设定频率	0.00Hz~P00.03 (最大输出频率)	50.00Hz	○
P00.11	加速时间 1	0.0~3600.0s	20.0s	○
P00.12	减速时间 1	0.0~3600.0s	20.0s	○
P00.13	运行方向选择	0: 默认方向运行 1: 相反方向运行 2: 禁止反转运行	0	○
P00.15	电机参数自学习	0x000~0x234 个位：电机基本参数自学习 0: 无操作 1: 完整参数旋转自学习 2: 完整参数静止自学习 3: 部分参数静止自学习 4: 变频器参数自学习 十位：初始磁极角自学习 0: 无操作 1: 旋转自学习 2: 静止自学习 3: 旋转自学习 2 百位：系统惯量自学习 0: 无操作 1: 模式 1 2: 模式 2	0x000	○
P00.16	AVR 功能选择	0: 无效 1: 全程有效	1	○
P00.17	变频器类型	0: G 型机 1: P 型机	0	○
P00.18	功能参数恢复	0: 无操作 1: 恢复出厂值（不包括电机参数） 2: 清除故障记录 3~4: 保留 5: 恢复出厂值（厂家测试模式）	0	○

功能码	名称	详细说明	缺省值	更改
P01.00	启动运行方式	0: 直接启动 1: 先直溜启动再启动 2: 转速跟踪再启动（有源磁） 3: 转速跟踪再启动（无源磁） 4: 转速跟踪再启动（软件）	0	○
P01.08	停机方式选择	0: 减速停车 1: 自由停车	0	○
P01.09	停机制动开始频率	0.00Hz~P00.03 (最大输出频率)	0.00Hz	○
P01.10	消磁时间	0.00~30.00s	0.00s	○
P01.11	电机直流制动电流	0.0~100.0%	0.00%	○
P01.12	电机直流制动时间	0.00~50.00s	0.00s	○
P01.18	上电端子运行保护选择	0: 上电时端子运行命令无效 1: 上电时端子运行命令有效 注意：仅在 P01.21~0 时有效。	0	○
P01.21	停电再启动选择	0: 禁止再启动 1: 允许再启动	0	○
P02.00	电机 1 类型	0: 异步电机 1: 同步电机 2: 同步磁阻电机	0	○
P02.01	异步电机 1 额定功率	0.1~3000.0kW	机型确定	○
P02.02	异步电机 1 额定频率	0.1~P00.03 (Hz)	机型确定	○
P02.03	异步电机 1 额定转速	1~6000.0rpm	机型确定	○
P02.04	异步电机 1 额定电压	0~1200V	机型确定	○
P02.05	异步电机 1 额定电流	0.8~6000.0A	机型确定	○
P03.00	电机 1 速度环比例增益	0.0~200.0	20.0	○
P03.01	电机 1 速度环积分时间	0.000~10.000s	0.200s	○
P03.02	电机 1 速度环积分低限值	0.0~P03.05 (Hz)	5.00Hz	○
P03.03	电机 1 速度环比例增益 2	0.0~200.0	20.0	○
P03.04	电机 1 速度环积分时间 2	0.000~10.000s	0.200s	○
P03.05	电机 1 速度环切换高点频率	P03.02~P00.03 (Hz)	10.00Hz	○
P03.11	转矩设定方式选择	0: 键盘设定转矩 (P03.12) 1: 键盘设定转矩 (P03.12) 2: 模拟量 AI1 设定转矩 3: 模拟量 AI2 设定转矩 4: 高速脉冲 HDIA 设定转矩 5: 简易 PLC 程序设定 6: 多段速运行设定 7: Modbus/Modbus TCP 通讯设定 8: Modbus/Modbus TCP 通讯设定 9: PROFIBUS/CANopen/DeviceNET 通讯设定 10: 以太网通讯设定 11: 高速脉冲 HDIB 设定转矩 12: 脉冲串 AB 设定转矩 13: EtherCAT/PROFINET/EtherNet IP 通讯设定 14: PLC 可编程卡设定 15: 模拟量 AI5 设定转矩 16: 模拟量 AI6 设定转矩 17: 模拟量 AI7 设定转矩 18: 预留	0	○
P04.01	电机 1 转矩提升	0.0%~(自动转矩提升)，0.1%~10.0%	0.0%	○
P04.09	电机 1 V/F 转差补偿增益	0.0~200.0%	100.0%	○
P04.10	电机 1 低频抑制振荡因子	0~100	10	○
P04.11	电机 1 高频抑制振荡因子	0~100	10	○
P05.01	S1 端子功能选择	0: 无功能 1: 正转运行 (FWD) 2: 反转运行 (REV) 3: 三线式运行控制 (SIN)	1	○
P05.02	S2 端子功能选择	0: 无功能 1: 正转运行 (FWD) 2: 反转运行 (REV) 3: 三线式运行控制 (SIN)	4	○
P05.03	S3 端子功能选择	0: 无功能 1: 正转运行 (FWD) 2: 反转运行 (REV) 3: 三线式运行控制 (SIN)	7	○
P05.04	S4 端子功能选择	0: 无功能 1: 正转运行 (FWD) 2: 反转运行 (REV) 3: 三线式运行控制 (SIN)	0	○
P05.05	HDIA 端子功能选择	0: 无功能 1: 正转运行 (FWD) 2: 反转运行 (REV) 3: 三线式运行控制 (SIN)	0	○
P05.06	HDIB 端子功能选择	0: 无操作 1: 完整参数旋转自学习 2: 完整参数静止自学习 3: 部分参数静止自学习 4: 变频器参数自学习 十位：初始磁极角自学习 0: 无操作 1: 旋转自学习 2: 静止自学习 3: 旋转自学习 2 百位：系统惯量自学习 0: 无操作 1: 模式 1 2: 模式 2	0	○
P05.29	AI2 下限值	-10.00V~P05.31	-10.00V	○
P05.35	AI2 上限值	P05.33~10.00V	10.00V	○
P06.01	Y1 输出选择	0: 无效	0	○
P06.02	HDO 输出选择	1: 运行中 2: 正转运行中 3: 反转运行中 4: 点动运行中 5: 变频器故障 6: 频率水平检测 FDT1 7: 频率水平检测 FDT2 8: 频率到达	0	○
P06.03	继电器 RO1 输出选择	1: 运行中 2: 正转运行中 3: 反转运行中 4: 点动运行中 5: 变频器故障 6: 频率水平检测 FDT1 7: 频率水平检测 FDT2 8: 频率到达	1	○
P06.04	继电器 RO2 输出选择	1: 运行中 2: 正转运行中 3: 反转运行中 4: 点动运行中 5: 变频器故障 6: 频率水平检测 FDT1 7: 频率水平检测 FDT2 8: 频率到达	5	○
P06.14	AO1 输出选择	0: 无效 1: 运行频率 2: 斜波给定频率	0	○
P06.15	AO0 输出选择	0: 无效 1: 运行频率 2: 斜波给定频率	0	○
P06.16	HDO 高速脉冲输出选择	0: 无效 1: 运行频率 2: 斜波给定频率	0	○

功能码	名称	详细说明	缺省值	更改
P06.17~P06.26	AO/PTC 输出上下限设置	4: 输出电流 (100%对应 2 倍变频器额定电流) 5: 输出电流 (100%对应 2 倍电机额定电流) 6: 输出电压 (100%对应 1.5 倍变频器额定电压) 7: 输出功率 (100%对应 2 倍电机额定功率)	-	○
P07.00	用户密码	0-65535	0	○
P14.00	本机通讯地址	1-247 注意：从机地址不可为 0。	1	○
P14.01	通讯波特率设置	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	4	○
P14.02	数据位校验设置	0: 无校验 (N, 8, 1) for RTU 1: 偶校验 (E, 8, 1) for RTU 2: 奇校验 (O, 8, 1) for RTU 3: 无校验 (N, 8, 2) for RTU 4: 偶校验 (E, 8, 2) for RTU 5: 奇校验 (O, 8, 2) for RTU	1	○

6 常见故障及对策

故障码显示	故障类型	可能的原因	故障解决方法
OUT1 [1]	逆变单元 U 相保护	● 加速太快 ● 该相 IGBT 内部损坏 ● 干扰引起误动作 ● 驱动线连接不良 ● 是否对地短路 ● 机器使用环境温度导致内部出现火花	● 增大加速时间 ● 更换逆变单元 ● 检查设备和系统是否可靠接地 ● 请检查驱动线是否有松动 ● 检查电机线型和电机对地是否有短路 ● 定期清理变频器内部粉尘或油污
OUT2 [2]	逆变单元 V 相保护	● 加速太快 ● 该相 IGBT 内部损坏 ● 干扰引起误动作 ● 驱动线连接不良 ● 是否对地短路 ● 机器使用环境温度导致内部出现火花	● 增大加速时间 ● 更换逆变单元 ● 检查设备和系统是否可靠接地 ● 请检查驱动线是否有松动 ● 检查电机线型和电机对地是否有短路 ● 定期清理变频器内部粉尘或油污
OUT3 [3]	逆变单元 W 相保护	● 加速太快 ● 该相 IGBT 内部损坏 ● 干扰引起误动作 ● 驱动线连接不良 ● 是否对地短路 ● 机器使用环境温度导致内部出现火花	● 增大加速时间 ● 更换逆变单元 ● 检查设备和系统是否可靠接地 ● 请检查驱动线是否有松动 ● 检查电机线型和电机对地是否有短路 ● 定期清理变频器内部粉尘或油污
OC1 [4]	加速过电流	● 加速太快 ● 电网电压偏低 ● 变频器功率太小 ● 负载突变或者异常 ● 三相输出电流是否平衡 ● 外部存在强干扰源 (系统有接触器切换、系统接地不良)	● 增大加速时间 ● 调高电网输入电压 ● 选用功率大一档的变频器 ● 检查电机是否接错或短路 ● 检查变频器三相输出电流是否平衡和电机三相电压是否平衡 ● 检查是否存在强干扰现象 (电机线远离接触器、系统可靠接地)
OC2 [5]	减速过电流	● 加速太快 ● 电网电压偏低 ● 变频器功率太小 ● 负载突变或者异常 ● 三相输出电流是否平衡 ● 外部存在强干扰源 (系统有接触器切换、系统接地不良)	● 增大加速时间 ● 调高电网输入电压 ● 选用功率大一档的变频器 ● 检查电机是否接错或短路 ● 检查变频器三相输出电流是否平衡和电机三相电压是否平衡 ● 检查是否存在强干扰现象 (电机线远离接触器、系统可靠接地)
OC3 [6]	恒速过电流	● 加速太快 ● 电网电压偏低 ● 变频器功率太小 ● 负载突变或者异常 ● 三相输出电流是否平衡 ● 外部存在强干扰源 (系统有接触器切换、系统接地不良)	● 增大加速时间 ● 调高电网输入电压 ● 选用功率大一档的变频器 ● 检查电机是否接错或短路 ● 检查变频器三相输出电流是否平衡和电机三相电压是否平衡 ● 检查是否存在强干扰现象 (电机线远离接触器、系统可靠接地)
OV1 [7]	加速过电压	● 加速时间过短 ● 输入电压异常 ● 存在电机反转中能量的现象 ● 负载存在较大能量回馈 ● 能耗制动功能未打开	● 增大加速时间 ● 检查输入电压 ● 采用转速跟踪启动 ● 需增加能耗制动组件或能耗制动单元 ● 设置能耗制动功能参数
OV2 [8]	减速过电压	● 加速时间过短 ● 输入电压异常 ● 存在电机反转中能量的现象 ● 负载存在较大能量回馈 ● 能耗制动功能未打开	● 增大加速时间 ● 检查输入电压 ● 采用转速跟踪启动 ● 需增加能耗制动组件或能耗制动单元 ● 设置能耗制动功能参数
OV3 [9]	恒速过电压	● 加速时间过短 ● 输入电压异常 ● 存在电机反转中能量的现象 ● 负载存在较大能量回馈 ● 能耗制动功能未打开	● 增大加速时间 ● 检查输入电压 ● 采用转速跟踪启动 ● 需增加能耗制动组件或能耗制动单元 ● 设置能耗制动功能参数
UV [10]	母线欠压故障	● 电网电压偏低 ● 母线电压显示异常 ● 缓冲接触器吸合异常	● 调高电网输入电压 ● 联系厂家 ● 联系厂家
OL1 [11]	电机过载	● 加速太快 ● 对旋转中的电机实施再启动 ● 电网电压过低 ● 电机额定电流设置不正确 ● 电机堵转或负载过大	● 增大加速时间 ● 避免停机再启动或进行转速跟踪启动 ● 调高电网输入电压 ● 选择功率更大的变频器
OL2 [12]	变频器过载	● 加速太快 ● 对旋转中的电机实施再启动 ● 电网电压过低 ● 电机额定电流设置不正确 ● 电机堵转或负载过大	● 增大加速时间 ● 避免停机再启动或进行转速跟踪启动 ● 调高电网输入电压 ● 选择功率更大的变频器
SPI [13]	输入侧缺相	● 输入 R、S、T 缺相或者波动大 ● 输入侧螺丝松动	● 检查输入线是否有松动或接触不良 ● 检查输入线是否平衡和电机三相阻抗是否平衡
SPO [14]	输出侧缺相	● 输出线有破损或对地短路或断路 ● 输出 U、V、W 缺相 (或负载三相严重不平衡)	● 检查输出线是否有松动或接触不良 ● 检查负载是否平衡和电机三相阻抗是否平衡
OH1 [15]	整流模块过热	● 风道堵塞或风扇损坏 ● 环境温度过高 ● 保持现场通风顺畅，降低环境温度	● 疏通风道或更换风扇 ● 保持现场通风顺畅，降低环境温度
OH2 [16]	逆变模块过热	● 风道堵塞或风扇损坏 ● 环境温度过高 ● 保持现场通风顺畅，降低环境温度	● 疏通风道或更换风扇 ● 保持现场通风顺畅，降低环境温度
EF [17]	外部故障	● S 端子外部故障输入信号动作	● 检查外部设备输入是否正确
CE [18]	485 通讯故障	● 波特率设置不当 ● 通讯线路故障 ● 通讯地址错误 ● 通讯受到强干扰	● 设置合适的波特率 ● 检查通讯接口配线连接是否正确 ● 设置正确通讯地址 ● 建议更换使用屏蔽线，提高抗干扰性
ItE [19]	电流检测故障	● 电机线或电机绝缘异常 ● 霍尔线接触不良 ● 霍尔器件或电流采样光耦损坏	● 拆除电机线进行验证 ● 检查霍尔线接头 ● 联系厂家
tE [20]	电机自学习故障	● 电机容量与变频器容量不匹配，相差 5 个功率等级以上容易出现此故障 ● 检查电机接线，电机类型和	● 更换变频器容量，或者采用 V/F 模式控制

故障码显示	故障类型	可能的原因	故障解决方法
ETH1 [32]	对地短路故障 1	● 变频器输出与地短接 ● 电流检测电路出现故障 ● 实际电机功率设置和变频器功率相差太大	● 参数设置 ● 使电机空载，重新辨识 ● 检查上限频率是否大于额定频率的 2/3 ● 适当减小脉冲电流设置值
ETH2 [33]	对地短路故障 2	● 变频器输出与地短接 ● 电流检测电路出现故障 ● 实际电机功率设置和变频器功率相差太大	● 参数设置 ● 使电机空载，重新辨识 ● 检查上限频率是否大于额定频率的 2/3 ● 适当减小脉冲电流设置值
dEu [34]	速度偏差故障	● 负载过重或者被堵转	● 检查电机对地是否短路，接线是否接反 ● 检查电机功率是否设置正确，重新做电机参数自学习 ● 检查速度反馈控制参数是否合适
STo [35]	失调故障	● 负载异常 ● 同步电机参数设置不当 ● 电机自学习参数设置不准 ● 变频器未接电机 ● 弱磁应用	● 检查负载是否异常、过重、堵转 ● 检查电机参数设置是否正确，重新做电机参数自学习 ● 增加失调检测时间 ● 适当调整弱磁系数，电流环参数
LL [36]	电子欠载故障	● 变频器按设定值进行欠载预警	● 检测负载和欠载预警点
ENC1o [37]	编码器断线故障	● 编码器接线错误，或信号线未接好 ● 编码器信号受到干扰 ● 编码器损坏	● 检查编码器接线是否正确，编码器线和动力线分开走线 ● 编码器线使用屏蔽线，屏蔽层和系统可靠接地 ● 更换新的编码器
ENC1d [38]	编码器反向故障	● 编码器速度信号与电机运行方向相反	● 重新设置编码器方向
ENC1Z [39]	编码器 Z 脉冲断线故障	● Z 信号线断开	● 检查 Z 信号线，重新接线
OT [59]	电机过温故障	● 电机过温输入端子有效 ● 温度检测电阻异常 ● 电机长时间过载运行或散热异常	● 检查电机过温输入端子 (端子功能 57) 接线 ● 检查温度传感器是否正常 ● 检查电机并进行维护

附录 A 常用扩展卡

扩展卡类型	功能规格
IO 扩展卡 4	● 3 路模拟量 AI 输入 ● 3 路模拟量 AO 输出 ● 3 路继电器输出 ● 实现三路温度采样；支持 PT100/PT1000/KTY84/PTC，检测精度 5℃ ● 适用于 5V 或 12V OC 型编码器 ● 适用于 5V 或 12V 推挽型编码器 ● 适用于 5V 差分型编码器 ● 支持 A、B、Z 正交输入 ● 支持 A、B、Z 分频输出 ● 支持脉冲串

Goodrive350A Series High-performance General-purpose VFD Quick Start Guide

This guide briefly describes the external wiring, terminals, keypads. Scan the QR code to view the quick running, common function parameter settings, and common full version of the product e-manuals and solutions of Goodrive350A series High-performance manual.



Visit www.invt.com for more information (including energy efficiency data) and source download. For details, see the full version of corresponding product e-manual.

Warning

This guide only provides the basic installation and commissioning information. Failure to comply with the safety instructions and installation and commissioning instructions in the relevant documentation may result in accidents such as equipment damage, personal injury, or even death.

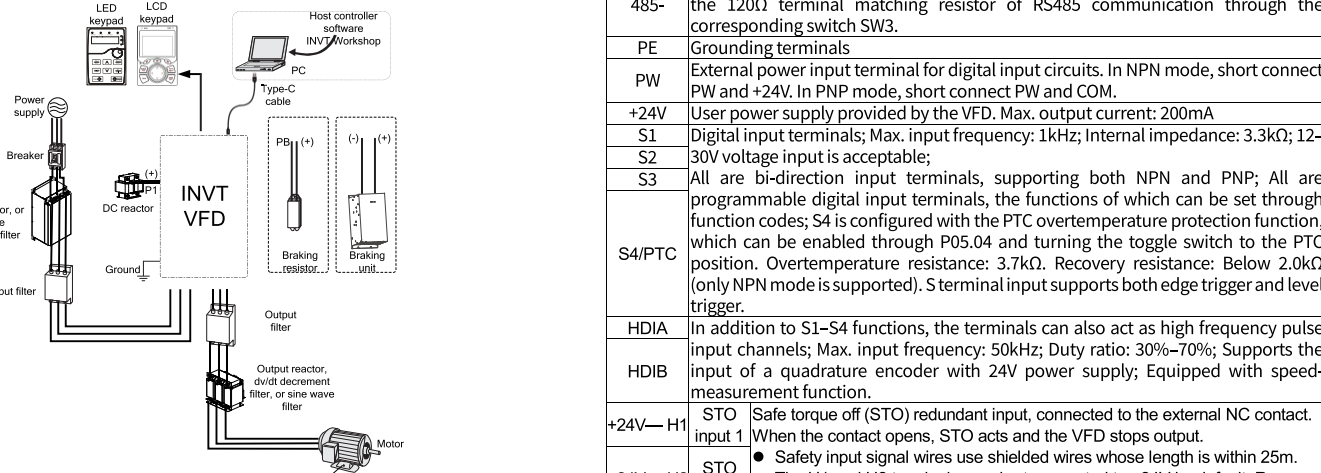
Only trained and qualified professionals are allowed to carry out related operations.

Danger

Do not perform any operations including wiring, inspection, or component replacement when power supply is applied. Before performing these operations, ensure all the input power supplies have been disconnected, and wait for at least the time designated on the VFD or until the DC bus voltage is less than 36V.

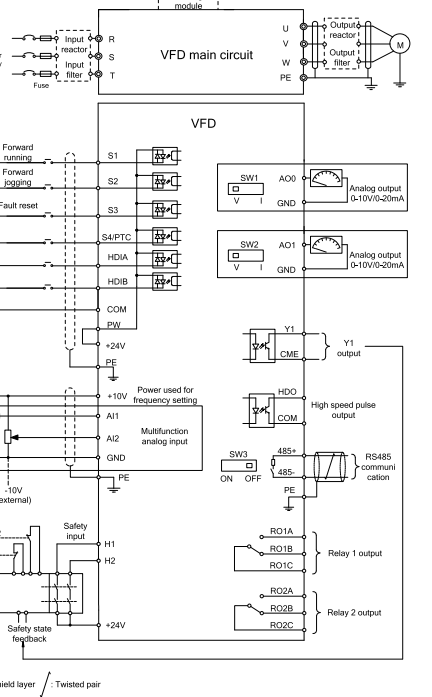
Frame	Minimum waiting time
E1-E11	5 minutes
E12-E13	15 minutes
E14	25 minutes

1 External wiring



2 Terminal

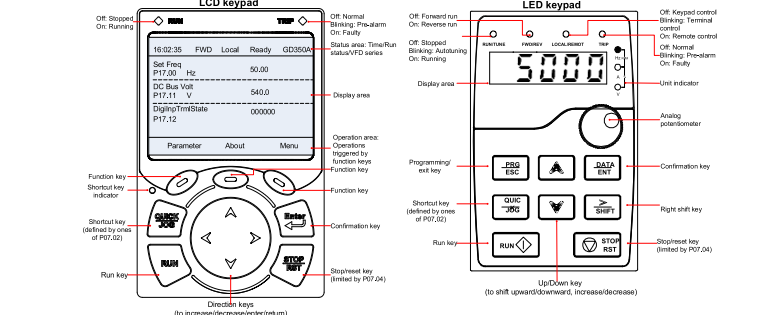
Figure 2-1 Typical VFD wiring



Terminal	Description
Main circuit terminals	
R, S, T (L1, L2)	3PH (or 1PH) AC input terminals, connected to the grid.
U, V, W	3PH AC output terminals, connected to the motor usually
P1	P1 and (+) connect to external DC reactor terminals.
(+)	(+) and (+) connect to external braking unit terminals.
(-)	PB and (+) connect to external braking resistor terminals.
PB	PE terminal. The PE terminals of each machine must be grounded reliably.
Control circuit terminals	
+10V	Locally provided 10V power supply
A11	Analog input, using voltage input by default, which can be changed to current input through the corresponding jumper
A12	Analog input. Input range: AI1 0~10V/0~20mA, AI2 10~10V Supports S terminal mode: less than 3V is judged as a logical low level; 7V~10V is judged as a logical low level.
GND	+10V reference ground
A00	Analog output; output range: 0~10V/0~20mA
A01	Whether voltage or current is used for output is set through the switch SW1
AO1	Analog output; output range: 0~10V/0~20mA
AO2	Whether voltage or current is used for output is set through the switch SW2
RO1A	RO1 output; RO1A: NO; RO1B: NC; RO1C: common
RO1B	Contact capacity: 3A/AC250V, 1A/DC30V
RO1C	
RO2A	RO2 output; RO2A: NO; RO2B: NC; RO2C: common
RO2B	Contact capacity: 3A/AC 250V, 1A/DC 30V
RO2C	
COM	+24V reference ground
CME	Common terminal of open collector output; short connected to COM by default
Y1	Switch capacity: 50mA/230V. Output frequency range: 0~1kHz
48S+	RS485 differential signal communication port. Use shielded twisted pairs for standard RS485 communication interfaces. You can determine whether to connect the 120Ω terminal matching resistor of RS485 communication through the corresponding switch SW3.
PE	Grounding terminals
PW	External power input terminal for digital input circuits. In NPN mode, short connect PW and +24V. In PNP mode, short connect PW and COM.
+24V	User power supply provided by the VFD. Max. output current: 200mA
S1	Digital input terminals; Max. input frequency: 1kHz; Internal impedance: 3.3kΩ; 12~30V voltage input is acceptable.
S2	All are bi-directional input terminals, supporting both NPN and PNP; All are programmable digital input terminals, the functions of which can be set through function codes; S4 is configured with the PTC overtemperature protection function, which can be enabled through P05.04 and turning the toggle switch to the PTC position. Overtemperature resistance: 3.7kΩ. Recovery resistance: Below 2.0kΩ (only NPN mode is supported). S terminal input supports both edge trigger and level trigger.
S3	
S4/PTC	
HDIA	In addition to S1~S4 functions, the terminals can also act as high frequency pulse input channels; Max. input frequency: 50kHz; Duty ratio: 30%~70%; Supports the input of a quadrature encoder with 24V power supply; Equipped with speed-measurement function.
HDIB	
+24V—H1	Safe torque off (STO) redundant input, connected to the external NC contact. When the contact opens, STO acts and the VFD stops output.
+24V—H2	- Safety input signal wires use shielded wires whose length is within 25m. - The H1 and H2 terminals are short connected to +24V by default. Remove the jumper from the terminals before using the STO function.
Type-C	The Type-C interface directly connects to the computer's Workshop software via a cable. Regardless of whether the main power supply is powered on, software upgrades, parameter commissioning, and bulk parameter upload/download can be performed. When the main power supply is powered on, the VFD operation can be controlled, and the operating parameters can be monitored.
Keypad interface	The keypad port can be used to connect an external keypad. The external keypad cannot be used when the local VFD keypad is used.

3 Keypad

The product is equipped with a standard LCD keypad and supports an optional LED keypad.



4 Quick running

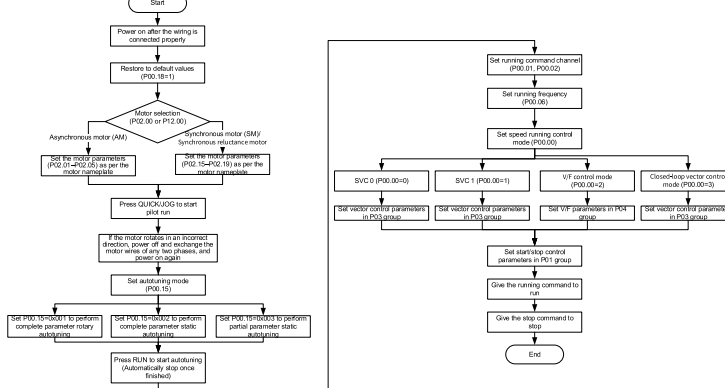
4.1 Check before power-on

- Ensure that all terminals have been securely connected.
- Ensure that the motor power matches the VFD power.

4.2 Operating upon first power-on

Ensure the wiring and power are correct, and close the air switch of the AC power at the VFD input side to power on the VFD. The LCD keypad interface enters the setup wizard, which guides you to complete the setup.

The quick startup flowchart is as follows:



5 Common function parameter setup

The following briefly describes only some common function parameters and typical values.

"○" indicates that the value of the parameter can be modified when the VFD is in stopped or running state.

"⊙" indicates that the value of the parameter cannot be modified when the VFD is in running state.

● indicates that the value of the parameter is detected and recorded, and cannot be modified.

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

Function code	Name	Description	Default	Modify
P00.00	Speed control mode	0: SVC 0 1: SVC 1 2: V/F control mode 3: Closed-loop vector control mode	Model depended	⊙
P00.01	Channel of running commands	0: Keypad 1: Terminal 2: Communication	0	○
P00.03	Max. output frequency	P00.04~599.00Hz	50.00Hz	⊙
P00.04	Upper limit of running frequency	P00.05~P00.03 (Max. output frequency)	50.00Hz	⊙
P00.05	Lower limit of running frequency	0.00Hz~P00.04 (Upper limit of running frequency)	0.00Hz	⊙
P00.06	Setting channel of A frequency command	0: Keypad 1: AI1 2: AI2 3: AI3 4: High-speed pulse HDIA 5: Simple PLC program 6: Multi-step speed running 7: PID control 8: Modbus/Modbus TCP communication 9: PROFIBUS/CANopen/DeviceNet communication 10: Ethernet communication 11: High-speed pulse HDIB 12: Pulse train AB setting 13: EtherCAT /PROFINET/ EtherNet IP communication 14: Programmable card 15: AIS 16: AIG 17: AIT 18: Reserved	0	○
P00.07	Setting channel of B frequency command	10: Ethernet communication 11: High-speed pulse HDIB 12: Pulse train AB setting 13: EtherCAT /PROFINET/ EtherNet IP communication 14: Programmable card 15: AIS 16: AIG 17: AIT 18: Reserved	18	○
P00.10	Setting frequency through keypad	0: Keypad (P03.12) 1: Keypad (P03.12) 2: AI1 3: AI2 4: AI3 5: Pulse frequency HDIA 6: Multi-step torque 7: Modbus/Modbus TCP communication 8: PROFIBUS/CANopen / DeviceNet communication 9: Ethernet communication 10: Pulse frequency HDIB 11: EtherCAT /PROFINET/ EtherNet IP communication 12: Programmable card 13: AIS 14: AIG 15: AIT	50.00Hz	○
P00.11	ACC time 1	0~0~3600.0s	20.0s	○
P00.12	DEC time 1	0~0~3600.0s	20.0s	○
P00.13	Running direction	0: Run at the default direction. 1: Run at the opposite direction. 2: Discrete reverse running. 3: Ones: Motor basic parameter autotuning 4: No operation 5: Complete parameter rotary autotuning 6: Complete parameter static autotuning 7: Partial parameter static autotuning 8: VFD parameter autotuning Tens: Initial pole angle autotuning 0: No operation 1: Rotary autotuning 2: Static autotuning 3: Rotary autotuning 2 Hundreds: System inertia autotuning 0: No operation 1: Mode 1 2: Mode 2	0	○
P00.15	Motor parameter autotuning	0: Run at the default direction 1: Run at the opposite direction. 2: Discrete reverse running. 3: Ones: Motor basic parameter autotuning 4: No operation 5: Complete parameter rotary autotuning 6: Complete parameter static autotuning 7: Partial parameter static autotuning 8: VFD parameter autotuning Tens: Initial pole angle autotuning 0: No operation 1: Rotary autotuning 2: Static autotuning 3: Rotary autotuning 2 Hundreds: System inertia autotuning 0: No operation 1: Mode 1 2: Mode 2	0x000	⊙
P00.16	AVR function selection	0: Invalid 1: Valid during the whole process	1	○
P00.17	VFD type	0: type 1: P type	0	⊙
P00.18	Function parameter restoration	0: No operation 1: Restore to default values (excluding motor parameters) 2: Clear fault records 3-4: Reserved 5: Restore to default values (factory test mode) 6: Restore to default values (including motor parameters) Note: For a customized version, when 1 is selected, only customized parameters are restored to default values; when 5 is selected, parameters are restored to default values for the corresponding standard version (including motor parameters). For a standard version,	0	⊙

Function code	Name	Description	Default	Modify
P01.00	Running mode of start	0: Direct start 1: Start after DC braking 2: Start after speed tracking (with exciting) 3: Start after speed tracking (without exciting) 4: Start after speed tracking (software) 5: Decelerate to stop 6: Coast to stop	0	⊙
P01.08	Stop mode	0: Direct start 1: Start after DC braking 2: Start after speed tracking (with exciting) 3: Start after speed tracking (without exciting) 4: Start after speed tracking (software) 5: Decelerate to stop 6: Coast to stop	0	○
P01.09	Starting frequency of DC braking for stop	0.00Hz~P00.03 (Max. output frequency)	0.00Hz	○
P01.10	Demagnetization time	0.00~30.00s	0.00s	○
P01.11	DC braking current for stop	0.0~100.0%	0.00%	○
P01.12	DC braking time for stop	0.00~50.00s	0.00s	○
P01.18	Terminal-based running command and protection at power-on	0: The terminal-based running command is invalid at power-on 1: The terminal-based running command is valid at power-on Note: Valid only when P01.21 is set to 0.	0	⊙
P01.21	Power-off restart selection	0: Disable restart 1: Enable restart 2: Asynchronous motor (AM) 1.5M	0	○
P02.00	Type of motor 1	2: Synchronous reluctance motor	0	⊙
P02.01	Rated power of AM 1	0.1~3000.0kW	Model depended	⊙
P02.02	Rated frequency of AM 1	0.01~P00.03 (Hz)	Model depended	⊙
P02.03	Rated speed of AM 1	1~6000rpm	Model depended	⊙
P02.04	Rated voltage of AM 1	0~1200V	Model depended	⊙
P02.05	Rated current of AM 1	0.8~6000.0A	Model depended	⊙
P03.00	Speed-loop proportional gain 1 of motor 1	0.0~200.0	20.0	○
P03.01	Speed-loop integral time 1 of motor 1	0.000~10.000s	0.200s	○
P03.02	Low-point frequency for speed-loop switching of motor 1	0.00~P03.05 (Hz)	5.00Hz	○
P03.03	Speed-loop proportional gain 2 of motor 1	0.0~200.0	20.0	○
P03.04	Speed-loop integral time 2 of motor 1	0.000~10.000s	0.200s	○
P03.05	High-point frequency for speed-loop switching of motor 1	P03.02~P00.03 (Hz)	10.00Hz	○
P03.11	Torque setting method	0: Keypad (P03.12) 1: Keypad (P03.12) 2: AI1 3: AI2 4: AI3 5: Pulse frequency HDIA 6: Multi-step torque 7: Modbus/Modbus TCP communication 8: PROFIBUS/CANopen / DeviceNet communication 9: Ethernet communication 10: Pulse frequency HDIB 11: EtherCAT /PROFINET/ EtherNet IP communication 12: Programmable card 13: AIS 14: AIG 15: AIT	0	○
P04.01	Torque boost of motor 1	0.0% (Automatic torque boost), 0.1%~10.0%	0.0%	○
P04.09	V/F slip compensation gain of motor 1	0.0~200.0%	100.0%	○
P04.10	Low-frequency oscillation control factor of motor 1	0~100	10	○
P04.11	High-frequency oscillation control factor of motor 1	0~100	10	○
P05.01	Function of S1	0: No function 1: Run forward (FWD)	1	⊙
P05.02	Function of S2	2: Run reversely (REV)	4	⊙
P05.03	Function of S3	3: Three-wire running control (SIN)	7	⊙
P05.04	Function of S4	4: Jog forward 5: Jog reversely 6: Coast to stop 7: Fault reset 9: External fault input	0	⊙
P05.05	Function of HDIA terminal	10: Increase frequency setting (UP) 11: Decrease frequency setting (DOWN)	0	⊙
P05.29	AI2 lower limit	10.00V~P05.31	-10.00V	○
P05.35	AI2 upper limit	P05.33~10.00V	10.00V	○
P06.01	Y1 output	0: Invalid 1: Running	0	○
P06.02	HDO output	2: Running forward 3: Running reversely	0	○
P06.03	RO1 output	4: Jogging 5: VFD in fault	1	○

Function code	Name	Description	Default	Modify
P06.04	RO2 output	6: Frequency level detection FDT1 7: Frequency level detection FDT2 8: Frequency reached	5	○
P06.14	AO1 output	0: Running frequency 1: Set frequency	0	○
P06.15	AO0 output selection	2: Ramp reference frequency 3: Rotational speed (100% corresponds to the speed corresponding to the max. output frequency) 4: Output current (100% corresponds to twice the VFD rated current) 5: Output current (100% corresponds to twice the motor rated current) 6: Output voltage (100% corresponds to 1.5 times the VFD rated voltage) 7: Output power (100% corresponds to twice the motor rated power)	0	○
P06.17~P06.26	AO/PTC output upper and lower limit setting	For details, see the full version of product e-manual.	-	○
P07.00	User password	0~65535	0	○
P14.00	Local communication address	1~247 Note: The communication address of a slave cannot be to 0.	1	○
P14.01	Communication baud rate setting	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	4	○
P14.02	Data bit check setting	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	1	○

6 Common faults and solutions

Fault code	Fault type	Possible cause	Solution
OU1	[1] Inverter unit U-phase protection	● ACC/DEC is too fast. ● IGBT module damaged. ● Misoperation caused by interference.	● Increase ACC/DEC time. ● Replace the inverter unit. ● Check whether the devices and system are grounded reliably. ● Check for loose drive wires.
OU2	[2] Inverter unit V-phase protection	● Drive wires are poorly connected. ● To-ground short circuit occurred.	● Check for abnormal motor wiring, and motor-to-ground short connection. ● Remove the dust or oil stain inside the VFD regularly.
OU3	[3] Inverter unit W-phase protection	● Sparks occurred inside due to poor use environment conditions.	● Increase ACC/DEC time. ● Increase grid input voltage. ● Select a VFD with larger power. ● Check for motor stalling, short connection, and load device exceptions.
OC1	[4] Overcurrent during ACC	● Check for abnormal VFD output voltage and motor 3PH resistance imbalance. ● Check for strong interference (whether motor cable far away from contactor and system grounded reliably).	● Increase grid input voltage. ● Check the input voltage. ● Use the speed-tracking start function. ● Add dynamic braking devices or regenerative units. ● Set dynamic braking function parameters.
OC2	[5] Overcurrent during DEC	● ACC/DEC is too fast. ● Grid voltage is too low. ● VFD power is too small. ● Load transient or exception occurred. ● 3PH output current imbalance. ● There are strong external interference sources (contactor switchover or improper grounding).	● Check for motor stalling, short connection, and load device exceptions. ● Check for abnormal VFD output voltage and motor 3PH resistance imbalance. ● Check for strong interference (whether motor cable far away from contactor and system grounded reliably).
OC3	[6] Overcurrent during constant speed running	● Load exception. ● Incorrect SM parameter settings. ● Autotuned motor parameters are inaccurate. ● The VFD is not connected to the motor. ● Flux weakening application.	● Check for overload or stalling. ● Check motor parameter and counter EMF settings. ● Re-perform motor parameter autotuning. ● Increase the maladjustment detection time. ● Adjust flux weakening coefficient and current loop parameters.
OV1	[7] Overvoltage during ACC	● ACC/DEC time is too short. ● Abnormal input voltage. ● Start during motor rotating. ● Load energy regeneration is too large. ● Dynamic braking is disabled.	● Increase ACC/DEC time. ● Check the input voltage. ● Use the speed-tracking start function. ● Add dynamic braking devices or regenerative units. ● Set dynamic braking function parameters.
OV2	[8] Overvoltage during DEC	● Grid voltage is too low. ● Motor rated current is set incorrectly. ● Motor stall or load jumps violently.	● Increase grid input voltage. ● Reset the motor rated current in the motor parameter group. ● Check the load and adjust the torque boost.
OV3	[9] Overvoltage during constant speed running	● ACC is too fast. ● The motor in rotating is restarted. ● Grid voltage is too low. ● Load is too heavy. ● VFD power is too small. ● Phase loss or violent fluctuation occurred on inputs RST.	● Increase acceleration time. ● Avoid restart upon stop to enable speed-tracking start. ● Increase grid input voltage. ● Select a VFD with larger power. ● Check for abnormal input power and loose input cables. ● Set P11.10 to screen out the fault.
UV	[10] Bus undervoltage	● Grid voltage is too low. ● Abnormal bus voltage display. ● Abnormal precharge contactor closing.	● Increase grid input voltage. ● Contact us. ● Contact us.
OL1	[11] Motor overload	● Grid voltage is too low. ● Motor rated current is set incorrectly. ● Motor stall or load jumps violently.	● Increase grid input voltage. ● Reset the motor rated current in the motor parameter group. ● Check the load and adjust the torque boost.
OL2	[12] VFD overload	● ACC is too fast. ● The motor in rotating is restarted. ● Grid voltage is too low. ● Load is too heavy. ● VFD power is too small. ● Phase loss or violent fluctuation occurred on inputs RST.	● Increase acceleration time. ● Avoid restart upon stop to enable speed-tracking start. ● Increase grid input voltage. ● Select a VFD with larger power. ● Check for abnormal input power and loose input cables. ● Set P11.10 to screen out the fault.
SPI	[13] Phase loss on input side	● Input-side screws are loose. ● Output cables are broken or short connected to the ground. ● U/V/W phase loss (or the three phases of load are seriously asymmetrical).	● Check for loose or broken output cables. ● Check for sharp load fluctuation and motor 3PH resistance imbalance.
SPO	[14] Phase loss on output side	● Air duct is blocked or fan is damaged. ● Ambient temperature is too	● Ventilate the air duct or replace the fan. ● Keep good ventilation to lower

Fault code	Fault type	Possible cause	Solution
OH2	[16] Inverter module overheating	● high. ● Long-time overload running.	● ambient temperature. ● Select a VFD with larger power.
EF	[17] External fault	● S terminal external fault input signal action.	● Check whether external device input is normal. ● Set a proper baud rate. ● Check the communication port wiring. ● Set the communication address correctly. ● You are recommended to use shielded cables to improve anti-interference.
CE	[18] RS485 communication fault	● Incorrect baud rate ● Communication line fault. ● Incorrect communication address. ● Communication suffers from strong interference.	● Remove motor cables to check. ● Check the Hall cable connector. ● Contact the manufacturer.
ITE	[19] Current detection fault	● Abnormal motor cable or motor insulation. ● Hall cable in poor contact. ● Hall component or current sampling optocoupler damaged.	● Change the VFD model, or adopt V/F mode for control ● Check motor wiring, motor type, and parameter settings. ● Empty the motor load and re-perform autotuning. ● Check whether the upper limit frequency is larger than 2/3 of the rated frequency. ● Decrease the pulse current setting properly.
IE	[20] Motor autotuning fault	● Motor capacity does not match with the VFD capacity. This fault may occur if the capacity difference exceeds five power classes. ● Incorrect motor parameter setting. ● The parameters gained from autotuning deviate sharply from the standard parameters. ● Autotuning timeout. ● Pulse current setting is too large.	● Remove motor cables to check. ● Check the Hall cable connector. ● Contact the manufacturer.
ETH1	[32] To-ground short-circuit fault 1	● The output of the VFD is short circuited to the ground. ● Current detection circuit fault.	● Check whether the motor is short circuited to the ground and wiring is normal. ● Check whether the motor wiring is normal. ● Replace the hall component. ● Replace the main control board.
ETH2	[33] To-ground short-circuit fault 2	● Actual motor power setup deviates sharply from the VFD power.	● Reset the motor parameters properly. ● Check for overload, increase speed deviation detection time, or prolong ACC/DEC time. ● Check motor parameter settings and re-perform motor parameter autotuning. ● Check speed loop control parameter settings.
dEU	[34] Speed deviation fault	● The load is too heavy or stalled.	● Check for overload or stalling. ● Check motor parameter and counter EMF settings. ● Re-perform motor parameter autotuning. ● Increase the maladjustment detection time. ● Adjust flux weakening coefficient and current loop parameters.
Sto	[35] Mal-adjustment fault	● Load exception. ● Incorrect SM parameter settings. ● Autotuned motor parameters are inaccurate. ● The VFD is not connected to the motor. ● Flux weakening application.	● Check for overload or stalling. ● Check motor parameter and counter EMF settings. ● Re-perform motor parameter autotuning. ● Increase the maladjustment detection time. ● Adjust flux weakening coefficient and current loop parameters.
LL	[36] Electronic underload alarm	● The VFD reports the underload alarm according to the setting.	● Check the load and underload alarm threshold. ● Check whether the encoder wiring is normal, and route the encoder cable separately from the power cable. ● Use a shielded cable for the encoder cable, and ensure the shield layer is grounded reliably. Ensure the system is grounded reliably. ● Replace the encoder with a new one.
ENC1o	[37] Encoder disconnection fault	● Incorrect encoder line sequence, or signal wires poorly connected. ● The encoder signal is interfered. ● Encoder is damaged.	● Check the load and underload alarm threshold. ● Check whether the encoder wiring is normal, and route the encoder cable separately from the power cable. ● Use a shielded cable for the encoder cable, and ensure the shield layer is grounded reliably. Ensure the system is grounded reliably. ● Replace the encoder with a new one.
ENC1d	[38] Encoder reversal fault	● The encoder speed signal is opposite to the motor running direction.	● Reset the encoder direction.
ENC1Z	[39] Encoder Z-pulse disconnection fault	● Z signal disconnection	● Check the wiring of Z signal and perform the wiring again.
OT	[59] Motor overtemperature fault	● Motor overtemperature input terminal is valid. ● The temperature detection resistance is abnormal. ● Long-time overload running or exception occurred.	● Check the wiring of the motor overtemperature input terminal (terminal function 57). ● Check whether the temperature sensor is proper. ● Check the motor and perform maintenance on the motor.

Appendix A Common expansion card

Expansion card type	Specification
IO expansion card 4	Three analog inputs Three analog outputs Three relay outputs

Expansion card type	Specification
Multi-function incremental PG card	Implements three-channel temperature sampling; supports PT100/PT1000/KTY84/PTC with a detection accuracy of ±5°C Applicable to OC encoders of 5V or 12V Applicable to push-pull encoders of 5V or 12V Applicable to differential encoders of 5V Supporting the orthogonal input of A, B, and Z Supporting the frequency-divided output of A, B, and Z Supporting input of pulse train reference

Note: The GD350A series products support various I/O expansion cards, communication expansion cards, and PG expansion cards. For details, refer to the *Goodrive350A Series High-Performance General-Purpose VFD User Manual*.

Appendix B Product ratings

B.1 Ratings of single VFD

Table B-1 Ratings for 1PH 220V VFD models

Frame	VFD model	Output power (kW)	Input current (A)	Output current (A)
E2	GD350A-1R5G-S2	0.75	9.3	5.0
E3	GD350A-1R5G-S2	1.5	18.5	9.5
E4	GD350A-2R2G-S2	2.2	22	14
E7	GD350A-004G-S2	4	38	18.5