

HDv-E6xx 系列 简易 SVC 控制

HDv-E600/610 Simple SVC Control

产品 product	变频器 frequency converter	适用型号 Applicable model	HDv-E6xx 全系列 Applicable model	保密等级 Confidentiality level	<input checked="" type="radio"/> 公开 <input type="radio"/> 内部分享 <input type="radio"/> 保密
				文档编号 document number	HDv-E600610_V005
author	全哲哲	部门 department	工业驱动产品线 Industrial Drive Product Line	发布日期 Release Date	2024/06/27

- 本文档使用设备和工具

- 变频器: HDv-E600-2S0.4B-000
- IM 马达: 51K60A-YF 【3Phase-AC220V-0.2KW】

- This document uses equipment and tools

- Inverter: HDv-E600-2S0.4B-000
- IM motor: 51K60A-YF [3Phase AC220V -0.2KW]

- 功能说明

- Function Description

- HDv-E6xx 系列变频器支持 VF/SVC/FVC 三种控制模式, 本篇文章将为你讲解 SVC 模式下使用面板控制永磁同步电机启停调试步骤以及需要设置的参数等。
- The HDv-E600/610 frequency converter supports two control modes: VF/SVC. This document will explain the steps for using panel control to start and stop the permanent magnet synchronous motor in SVC mode, as well as the parameters that need to be set.

- 免责声明

- Disclaimers

- 我们对文档内容都进行了测试与检查, 但可能仍有些差错, 请您谅解。如果您对本文档有个人的意见或建议, 欢迎发送邮件联系作者: dongjianning@hcfa.cn
- We have tested and checked the content of the document, but there may still be some errors. Please understand. If you have personal opinions or suggestions on this document, please feel

操作步骤及说明

Operation steps and instructions

1: 变频器连接电机

1: Connect the frequency converter to the motor

将同步电机的动力线 U/V/W，地线分别连接变频器底部的 U/V/W、地线端子

Connect the power line U/V/W and ground wire of the synchronous motor to the U/V/W and ground wire terminals at the bottom of the frequency converter, respectively

2: 变频器通电

2. Inverter powered on

a. 给变频器 CN7 端口【R/L1、S/L2】端子接通 AC220V 电压

Connect AC220V voltage to the terminals of the CN7 port [R/L1, S/L2] of the frequency converter

b. 等待变频器面板 CHG 电源灯点亮后，变频器面板显示 50.00Hz 频率闪烁，变频器上电完成

After waiting for the CHG power light on the inverter panel to turn on, the inverter panel will display a flashing frequency of 50.00Hz, indicating that the inverter has been powered on

3: SVC 控制模式下，面板控制相关参数设置

In SVC control mode, panel control related parameter settings

a. 变频器控制模式【P00.01=0】：SVC 控制

Inverter control mode [P00.01=0]: SVC control

b. 变频器命令源选择【P00.02=0】：操作面板命令

Inverter command source selection [P00.02=0]: Operation panel commands

c. 变频器频率源选择【P00.03=0】：数字设定（面板设置）

Frequency source selection for frequency converter [P00.03=0]: digital setting (panel setting)

4: 电机参数设置

Motor parameter settings

- a. 电机类型【P02.00=2】：永磁同步电机

Motor type [P02.00=2]: Permanent magnet synchronous motor

- b. 电机额定功率【P02.01】：根据电机铭牌设置

Rated power of motor [P02.01]: set according to the motor nameplate

- c. 电机额定电压【P02.02】：根据电机铭牌设置

Rated voltage of motor [P02.02]: set according to the motor nameplate

- d. 电机额定电流【P02.03】：根据电机铭牌设置\

Rated current of motor [P02.03]: set according to the motor nameplate

- e. 电机额定频率【P02.04】：根据电机铭牌设置

Rated frequency of motor [P02.04]: set according to the motor nameplate

- f. 电机额定转速【P02.05】：根据电机铭牌设置

Rated speed of motor [P02.05]: set according to the motor nameplate

5: 参数调谐

Parameter tuning

使用同步机动态调谐前，需要保证电机处于空载状态，正反转不会碰到机构

Before using a synchronous machine for dynamic tuning, it is necessary to ensure that the motor is in an unloaded state and that the forward and reverse directions do not touch the mechanism

- a. 进入参数【P00.33】，设置为 12（同步机动态调谐），按下确定键后，此时变频器面板显示 TUNE 字体，准备开始调谐

Enter parameter P00.33 and set it to 12 (synchronous machine dynamic tuning). After pressing the OK button, the frequency converter panel will display TUNE font, ready to start tuning

- b. 按下面板绿色运行键后，此时变频器面板显示 RUN，开始自动运行调谐参数，过程大概持续 10s 左右

After pressing the green run button on the panel, the frequency converter panel will display RUN and start automatically tuning parameters. The process will last for about 10 seconds

- c. 运行停止后，调谐后的参数会自动写入，面板此时显示的频率闪烁，代表变频器调谐完成

After the operation stops, the parameters after tuning will be automatically written, and the frequency

displayed on the panel will flash, indicating that the frequency converter tuning is completed

6: 试运行

Trial operation

变频器面板由 50.00Hz 频率闪烁变为固定显示（不闪烁）变频器开始按照加速时间 1 【P00.13】 参数设置的加速时间开始加速运行至预置频率 【P00.12】 设置的频率值后，按照预置频率 【P00.12】 设置的频率值开始恒速运行。按下面板 ▽▽▽ 【R/STOP】 按键变频器开始按照减速时间 1 【P00.14】 参数设置的减速时间开始减速运行至 0.00Hz 后停机停机后面板显示 50.00Hz 频率闪烁

The frequency converter panel changes from flashing at a frequency of 50.00Hz to a fixed display (no flashing). The frequency converter starts accelerating according to the acceleration time set by parameter P00.13 to the frequency value set by the preset frequency P00.12, and then starts running at a constant speed according to the frequency value set by the preset frequency P00.12. Press the ▽▽▽ [R/STOP] button on the panel, and the frequency converter will start decelerating according to the deceleration time set in parameter 1 [P00.14]. It will run at 0.00Hz and then stop the machine. The panel will display a frequency of 50.00Hz flashing

常见问题与解答

Frequently Asked Questions and Answers

1. 调谐失败，是什么原因？

What is the reason for the tuning failure?

- a. 是否有正确按照电机铭牌设置参数，重点检查额定频率。

Is the parameter set correctly according to the motor nameplate, with a focus on checking the rated frequency.

- b. 【P00.33】 是否设置为 12，同步机动态调谐，使用静态调谐会失败。

【 P00.33 】 Is it set to 12? The synchronous machine is dynamically tuned, and using static tuning will fail.

- c. 以上动态调谐参数设置无误，电机空载，调谐还是失败，可以尝试降低 【P03.01】 和 【P03.04】 速度环增益，再进行调谐。

The above dynamic tuning parameter settings are correct, but the motor is unloaded and the tuning still fails. You can try reducing the speed loop gain of [P03.01] and [P03.04] before tuning again.

2. 设置 【P02.04】 电机额定频率时，频率只能设到 50HZ，是什么原因？

When setting the rated frequency of motor P02.04, the frequency can only be set to 50HZ.

What is the reason?

a. 检查【P00.08】最大频率，出厂默认 50hz，如果同步电机额定频率为 100hz，要先把【P00.08】设置为 100hz，才能设置 P02.04 参数为 100hz。

Check the maximum frequency of P00.08, which defaults to 50Hz at the factory. If the rated frequency of the synchronous motor is 100Hz, first set P00.08 to 100Hz before setting P02.04 parameter to 100Hz.

b. 【P00.10】频率上限设定值不能小于正常运行的频率值，建议按照【P00.08】最大频率值设置。

The upper limit of [P00.10] frequency cannot be smaller than the normal frequency. You are advised to set the upper limit of [P00.08] frequency.

3. 电机运行噪音大，怎么解决？

. Motor running noise, how to solve?

a. 提高【P00.25】载波频率，默认为 6hz，可以以 1hz 为单位，增大参数，会改善电机运行声。

Increasing the carrier frequency of P00.25, default to 6Hz, can be done in units of 1Hz. Increasing the parameter will improve the sound of motor operation.

b. 可以调整【P00.27】DPWM 切换上限频率，出厂默认 15hz。变频器有 CPWM 和 DPWM 两种 PWM 调制发波方式。运行频率大于【P00.27】切换频率时，为 DPWM 调制；运行频率小于 P00.27 切换频率时，为 CPWM 调制。DPWM 调制可提高变频器效率，CPWM 调制可减小电机噪声。

The upper limit frequency for DPWM switching can be adjusted to P00.27, with a factory default of 15Hz. The frequency converter has two PWM modulation methods, CPWM and DPWM. When the operating frequency is greater than the switching frequency of P00.27, it is DPWM modulation; When the operating frequency is less than P00.27 and the switching frequency is switched, it is CPWM modulation. DPWM modulation can improve the efficiency of frequency converters, while CPWM modulation can reduce motor noise.

4、低速运行，噪音大，提高 P00.25 无效，怎么解决？

Low speed operation, loud noise, increasing P00.25 is ineffective, how to solve it?

a. 设置【P07.05】同步机 SVC 低速载波频率，出厂为 1.5kHz，可以以 1hz 为单位，增大参数，会改善电机低速运行时的噪音。

Set the low-speed carrier frequency of synchronous machine SVC to 1.5kHz at the factory, which can be measured in 1Hz units. Increasing the parameter will improve the noise of the motor during low-speed operation.

5、客户批量设备，每台同步电机都需要动态调谐比较麻烦，怎么解决？

How to solve the problem of dynamic tuning required for each synchronous motor in bulk equipment for customers?

学习后 OK 后，记录【P02.11--P02.14】 / 【P03.13--P03.16】参数值，后续同型号电机手动输入【P02.00--P02.05】 / 【P02.11--P02.14】 / 【P03.13--P03.16】参数即可。

After learning, record the parameter values of 【 P02.11-- P02.14 】 / 【 P03.13-- P03.16 】 , and then manually input the parameters of 【 P02.00-- P02.05 】 / 【 P02.11-- P02.14 】 / 【 P03.13-- P03.16 】 for the same model motor.