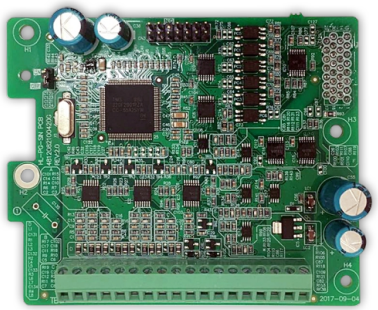
HL–PG–SIN1 正余弦卡
HL–PG–LD1 Sine/Cosine Card
（S3500系列用）操作手册
(For S3500 Series) User Manual

感谢您选购SAVCH HL–PG–SIN1选配卡，此卡主要功能：
1. 接收编码器速度反馈。
2. 反馈脉冲信号1:1输出。

Thanks for using SAVCH HL-PG-SIN1 PG card. Its functions is as below:
1. Receive the speed feedback from encoder.
2. The output rate of feedback pulse signal is 1:1.

一、HL–PG-SIN1外观图 External View



二、端子说明 Terminal Introduction

端子名称 Terminal	功能说明 Function	规格 Specification
PO	编码器电源 Encoder power	输出规格： Output: DC5V ± 5%，300mA
DCM	电源及信号公共端 Common port for power&signal	
PA+	脉冲输入端子A(+) Pulse input terminal A(+)	输入频率最高： The highest input frequency: 50kHz 差分输入电压信号： Differential input voltage signal: Sin/Cos 0.6~1.2VP–P
PA–	脉冲输入端子A(–) Pulse input terminal A(-)	
PB+	脉冲输入端子B(+) Pulse input terminal B(+)	
PB–	脉冲输入端子B(–) Pulse input terminal B(-)	
PC+	脉冲输入端子C(+) Pulse input terminal C(+)	输入频率最高： The highest input frequency: 24.4Hz 差分输入电压信号： Differential input voltage signal: Sin/Cos 0.6~1.2VP–P
PC–	脉冲输入端子C(–) Pulse input terminal C(-)	
PD+	脉冲输入端子D(+) Pulse input terminal D(+)	
PD–	脉冲输入端子D(–) Pulse input terminal D(-)	

注意：接线必须使用屏蔽线，最大接线长度20米。
Note: shielded wire is needed and the length shall not be longer than 20m.

分频输出端子 The specification of frequency dividing output terminal

端子名称 Terminal	功能说明 Function	规格 Specification
FPA	以比例1:1的对脉冲编码器输入端子PA、PB的信号进行集电极开路输出。 Ratio 1:1 for open collector output of pulse encoder input terminals PA and PB.	最大DC27V/50mA Max DC27V/50mA 动作时：VOL≤2V，VOH≤27V Running: VOL≤2V, VOH≤27V 动作电流最大50mA Max current is 50mA when running
FPB		
DCM	信号公共端 Signal common end	

注意：
1. 接线必须使用屏蔽线，最大接线长度5米。
2. 分频电路用于控制继电器，必须在继电器励磁线圈两端并联二极管吸收浪涌电压。

Note:
1. Shielded wire is needed and the length shall not be longer than 5m.
2. When frequency dividing circuit is used to control relay, the diode absorbing surge voltage shall be connected in parallel at ends of relay LF.

三、安装和配线 Installation and Wiring

⚠危险 DANGER

实施安装和配线前，需在电源断开22kW及以下经过5分钟以上，30kW以上经过10分钟以上后，确认操作面板以及充电指示灯已经熄灭，并利用万用表确认主回路端子P(+)–N(–)之间的直流母线已降至安全的电压（DC+25V以下）后才能进行。

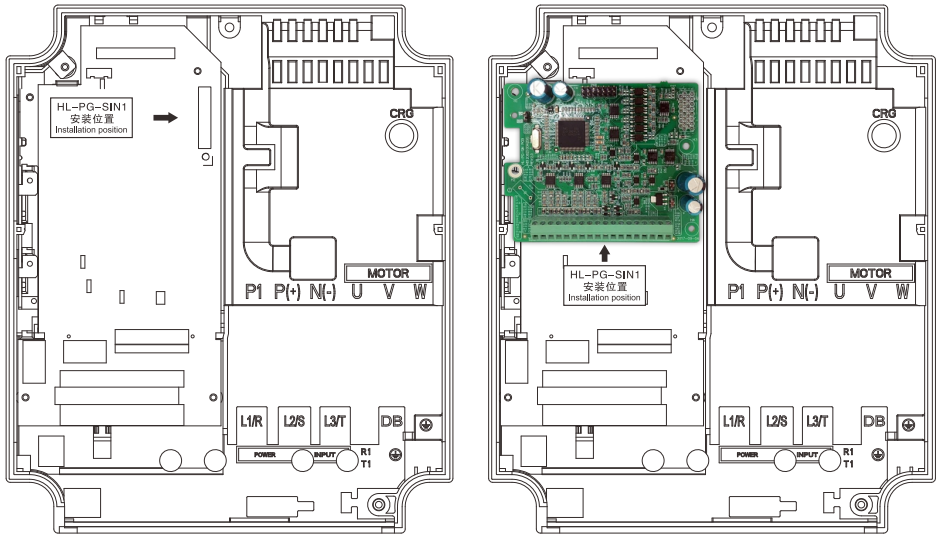
否则有触电危险！

Before install and wiring, the power has to be disconnected. If the power is under 22kW, it needs 5 minutes at least; if the power is above 30kW, it needs 10 minutes at least. Besides, please confirm the keypad and the charge indictor are extinguished and confirm the voltage between P(+) – N(-) decreases to below DC+25V by multi meter.

Otherwise, there is risk of electric shock!

1. 请将HL–PG-SIN1卡安装在下图控制板中所示位置。
2. 使用M3规格自升带垫片螺丝锁紧选配卡。
3. 端子使用螺丝规格：M2；配线规格：AWG16~24；螺丝扭矩：0.22~0.25N.m。

1. Please install the card as below.
2. Lock the card by M3 screw with self-climbing gasket.
3. Screw specification for terminal: M2; wiring specification: AWG 16~24; screw torque: 0.22~0.25N.m.



四、应用示例 Application Example

1. 驱动带编码器的永磁同步电机实现高性能矢量控制 Drive PM motor with encoder

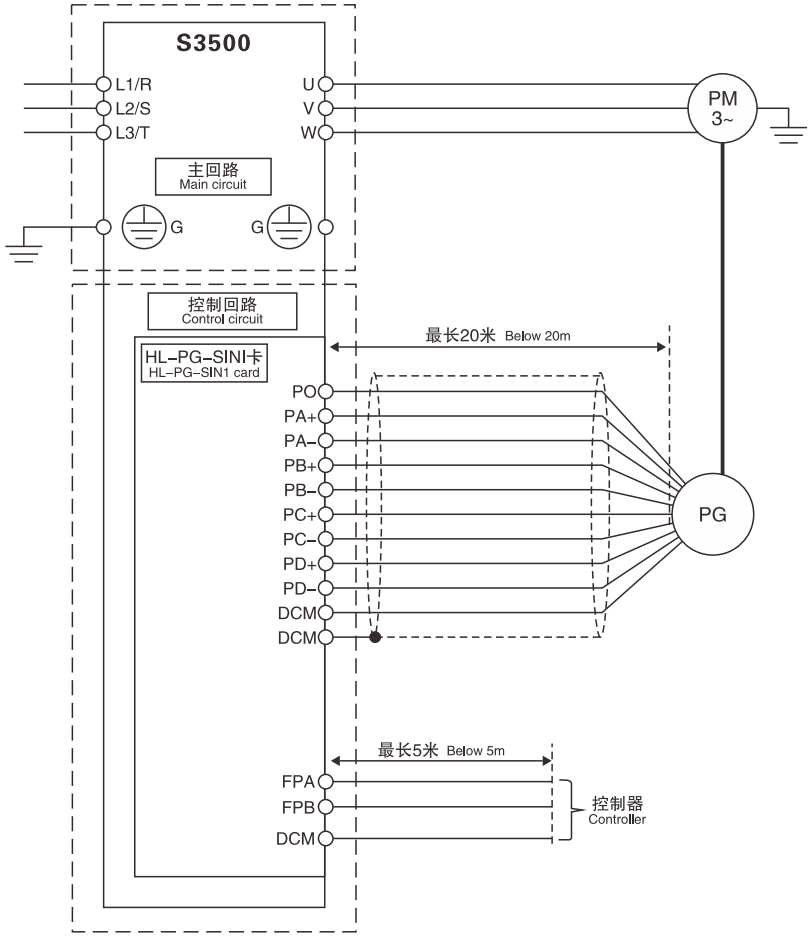
在电机上安装编码器后，可以实现闭环矢量控制。变频器可以实现高精度、高响应的速度控制。

It achieves close-loop vector control after installing a PG card to reach high accuracy and fast responding speed control.

2. 控制性能 Control performance

项目 Project		性能 Performance	备注 Remark
控制性能 Control performance	最大输出频率 Max output frequency	输出频率换算后为120Hz（4极：3600r/min） After convert, the output frequency is 120Hz (4 poles: 3600r/min)	脉冲编码器推荐使用海德汉 We recommend to select pulse encoder of Heidenhain ERN1387
	速度控制范围 range of speed control	输出频率换算后为120Hz（4极：3600r/min） After convert, the output frequency is 120Hz (4 poles: 3600r/min)	
	速度控制精度 Accuracy of speed control	模拟设定：最高速度的±0.2%以下（25±10℃） 多段速、通讯设定：最高速度的± 0.01%以下（–10～+50℃） Below ± 0.2% of the highest speed (25±10℃) Multi-speed, communication setting: below ±0.01% of the highest speed (-10～+50℃)	

3. 接线示例图 Wiring Example



备注：

1. 由于信号线容易受到外部噪声的影响，必须使用屏蔽线，且配线尽可能短（20m以下）。屏蔽导线推荐接到选配卡的DCM端子。
2. 选配卡的接线和其它电源线接线分开，防止干扰造成误动作。
3. 若编码器的屏蔽线和编码器框架连接，屏蔽线应接大地。

Remark:

1. Since the signal line is susceptible to external noise, shielded wires must be used and the wiring should be as short as possible (below 20m). The shielded conductor is recommended to connect to the DCM terminal of the optional card.
2. The wiring of the optional card is separated from other power cable wiring in case of disturbing.
3. If the shielded wire connects with encoder frame, the shielded wire shall ground.