SIEMENS

SIMOTICS M-1PH1 Main Motor

Installation Guide

08/2016

1 Safety instructions

1.1 General safety instructions

DANGER

Danger to life due to live parts and other energy sources

Death or serious injury can result when live parts are touched.

- Only work on electrical devices when you are qualified for this job.
- Always observe the country-specific safety rules.

Generally, six steps apply when establishing safety:

1. Prepare for shutdown and notify all those who will be affected by the procedure.
2. Disconnect the machine from the supply.
   - Switch off the machine.
   - Wait until the discharge time specified on the warning labels has elapsed.
   - Check that it really is in a no-voltage condition, from phase conductor to phase conductor and phase conductor to protective conductor.
   - Check whether the existing auxiliary supply circuits are de-energized.
   - Ensure that the motors cannot move.
3. Identify all other dangerous energy sources, e.g. compressed air, hydraulic systems, or water.
4. Isolate or neutralize all hazardous energy sources by closing switches, grounding or short-circuiting or closing valves, for example.
5. Secure the energy sources against switching on again.
6. Ensure that the correct machine is completely interlocked.

After you have completed the work, restore the operational readiness in the inverse sequence.

WARNING

Danger to life through a hazardous voltage when connecting an unsuitable power supply

Touching live components can result in death or severe injury.

- Only use power supplies that provide SELV (Safety Extra Low Voltage) or PELV-(Protective Extra Low Voltage) output voltages for all connections and terminals of the electronics modules.

WARNING

Danger to life when live parts are touched on damaged motors/devices

Improper handling of motors/devices can damage them.
For damaged motors/devices, hazardous voltages can be present at the enclosure or at exposed components.

- Ensure compliance with the limit values specified in the technical data during transport, storage and operation.
- Do not use any damaged motors/devices.

WARNING

Danger to life due to fire spreading if housing is inadequate

Fire and smoke development can cause severe personal injury or material damage.

- Install devices without a protective housing in a metal control cabinet (or protect the device by another equivalent measure) in such a way that contact with fire is prevented.
- Ensure that smoke can only escape via controlled and monitored paths.

WARNING

Danger to life through unexpected movement of machines when using mobile wireless devices or mobile phones

Using mobile wireless devices or mobile phones with a transmit power > 1 W closer than approx. 2 m to the components may cause the devices to malfunction, influence the functional safety of machines therefore putting people at risk or causing material damage.

- Switch the wireless devices or mobile phones off in the immediate vicinity of the components.

WARNING

Danger to life due to the motor catching fire in the event of insulation overload

There is higher stress on the motor insulation through a ground fault in an IT system. If the insulation fails, it is possible that death or severe injury can occur as a result of smoke and fire.

- Use a monitoring device that signals an insulation fault.
- Correct the fault as quickly as possible so the motor insulation is not overloaded.

WARNING

Danger to life due to fire if overheating occurs because of insufficient ventilation clearance

Inadequate ventilation clearances can cause overheating of components with subsequent fire and smoke. This can cause severe injury or even death. This can also result in increased downtime and reduced service lives for devices/systems.

- Ensure compliance with the specified minimum clearance as ventilation clearance for the respective component.

WARNING

Danger to life through electric shock due to unconnected cable shields

Hazardous touch voltages can occur through capacitive cross-coupling due to unconnected cable shields.

- As a minimum, connect cable shields and the cores of cables that are not used at one end at the grounded housing potential.

WARNING

Danger to life when safety functions are inactive

Safety functions that are inactive or that have not been adjusted accordingly can cause operational faults on machines that could lead to serious injury or death.

- Observe the information in the appropriate product documentation before commissioning.
- Carry out a safety inspection for functions relevant to safety on the entire system, including all safety-related components.
- Ensure that the safety functions used in your drives and automation tasks are adjusted and activated through appropriate parameterizing.
- Perform a function test.
- Only put your plant into live operation once you have guaranteed that the functions relevant to safety are running correctly.

NOTE

Important safety notices for Safety Integrated functions

If you want to use Safety Integrated functions, you must observe the safety notices in the Safety Integrated manuals.

WARNING

Danger to life from electromagnetic fields

Electromagnetic fields (EMF) are generated by the operation of electrical power equipment such as transformers, converters or motors.
People with pacemakers or implants are at a special risk in the immediate vicinity of these devices/systems.

- Ensure that the persons involved are the necessary distance away (minimum 2 m).

1.2 Handling electrostatic sensitive devices (ESD)

Electrostatic sensitive devices (ESD) are individual components, integrated circuits, modules or devices that may be damaged by either electric fields or electrostatic discharge.

NOTICE

Damage through electric fields or electrostatic discharge

Electric fields or electrostatic discharge can cause malfunctions through damaged individual components, integrated circuits, modules or devices.

- Only pack, store, transport and send electronic components, modules or devices in their original packaging or in other suitable materials, e.g conductive foam rubber of aluminum foil.
- Only touch components, modules and devices when you are grounded by one of the following methods:
  - Wearing an ESD wrist strap

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	– Wearing ESD shoes or ESD grounding straps in ESD areas with conductive flooring • Only place electronic components, modules or devices on conductive surfaces (table with ESD surface, conductive ESD foam, ESD packaging, ESD transport container).

1.3 Residual risks of power drive systems

When assessing the machine- or system-related risk in accordance with the respective local regulations (e.g., EC Machinery Directive), the machine manufacturer or system installer must take into account the following residual risks emanating from the control and drive components of a drive system:

1. Unintentional movements of driven machine or system components during commissioning, operation, maintenance, and repairs caused by, for example,
   - Hardware and/or software errors in the sensors, control system, actuators, and cables and connections
   - Response times of the control system and of the drive
   - Operation and/or environmental conditions outside the specification
   - Condensation/conductive contamination
   - Parameterization, programming, cabling, and installation errors
   - Use of wireless devices/mobile phones in the immediate vicinity of electronic components
   - External influences/damage
   - X-ray, ionizing radiation and cosmic radiation
2. Unusually high temperatures, including open flames, as well as emissions of light, noise, particles, gases, etc., can occur inside and outside the components under fault conditions caused by, for example:
   - Component failure
   - Software errors
   - Operation and/or environmental conditions outside the specification
   - External influences/damage
3. Hazardous shock voltages caused by, for example:
   - Component failure
   - Influence during electrostatic charging
   - Induction of voltages in moving motors
   - Operation and/or environmental conditions outside the specification
   - Condensation/conductive contamination
   - External influences/damage
4. Electrical, magnetic and electromagnetic fields generated in operation that can pose a risk to people with a pacemaker, implants or metal replacement joints, etc., if they are too close
5. Release of environmental pollutants or emissions as a result of improper operation of the system and/or failure to dispose of components safely and correctly

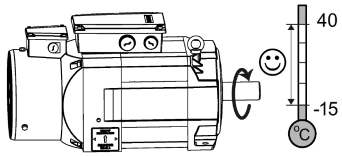
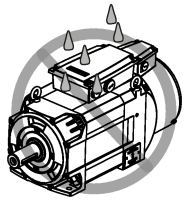
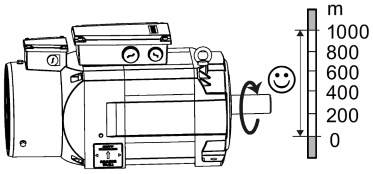
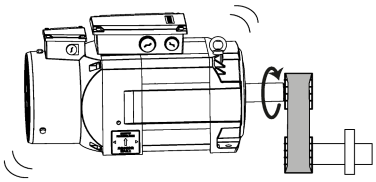
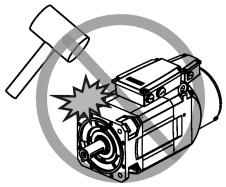
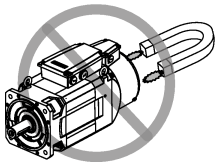
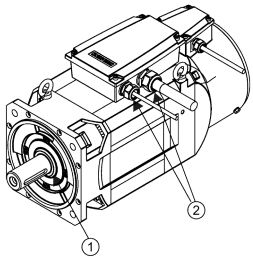
For more information about the residual risks of the drive system components, see the relevant sections in the technical user documentation.

	NOTE Protect the device, e.g. by installing it in a control cabinet with degree of protection IP54 according to IEC 60529 or NEMA 12. Further measures may be necessary for particularly critical operating conditions. If condensation or conductive pollution can be excluded at the installation site, a lower degree of control cabinet protection may be permitted.

1.4 Warning labels

Warning labels on servo motors
Do not exert any shock at the shaft end; otherwise, the encoder may be damaged.
The surface temperature of the motor may exceed 80 °C. Do not touch the **hot surfaces**.
Warning labels in this document
Indicates that death, severe personal injuries or material damages may result if proper precautions are not taken.
Indicates the actions that must not be performed.

2 Installation environment

Ambient temperature	
	• Operation: -15 °C to 40 °C (without power derating) • Storage: -20 °C to 65 °C
Ambient humidity	
	• Operation: ≤ 90% RH • Storage: ≤ 95% RH
Operation altitude	
	≤ 1000 m (without power derating)
Vibration severity grade	
	• 1PH11❑❑-1❑F: B (up to 1800 rpm) S (1800 rpm to 10000 rpm) • 1PH11❑❑-1❑D: B (up to 1800 rpm) R (1800 rpm to 6000 rpm)
Shock resistance	
	• Continuous axial shock: 2.25 m/s^2 • Continuous radial shock: 10 m/s^2
Magnetic field	
NOTICE To avoid magnetic interference to the absolute encoder, do not use electromagnetic devices near the absolute encoder, such as electromagnetic memory sticks, memory cards, and key cards.	
	Keep the servo motor with an absolute encoder at least 15 mm away from the devices that produce a magnetic field stronger than 10 mT.
Protection class	
	• A motor with fitted connectors has a protection class of IP54 (dust-tight and splash-proof during motor operation). The shaft opening (①) is protected with an oil seal. • The terminal box has a protection class of IP65. • To guarantee adequate protection, use specified cable gland (②) when wiring.

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3 Mechanical installation

Lifting a motor

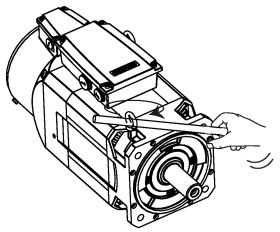
WARNING

Death or injuries by unresolved burdens
At the transport the motor can cause death or injuries by unchecked movements.

- Use lifting equipments and load suspension devices which are only interpreted for the burden of the motor and intact.
- Do not stay under and in the jib range of unresolved burdens.
- Safeguard the motor against rolling away at the side when removing.
- Do not lift a motor by pulling the cables.

NOTICE

Do not overtighten the eyebolts of motors.

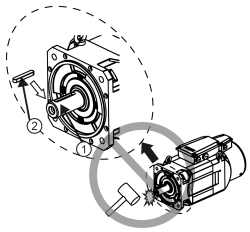


- Screw in the eyebolts manually and completely before lifting the motors.
- Lift the motors only at the eyebolts.
- When mounting the motors vertically, screw the eyebolts in the screw holes on the two side walls of the non-drive end shield.

Installing a key (optional)

WARNING

Injuries by an ejected key
When a motor using a key is running, the fitted key on the shaft may be ejected, which can cause personal injuries. The fitted key on the shaft must be firmly secured to prevent them from being flung out.



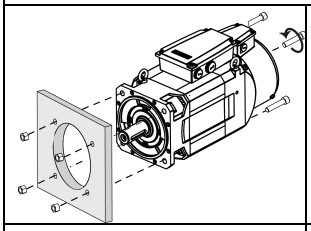
NOTICE

For the motor using a key (②), the key is preinstalled on the shaft extension. When reinstalling it, do not strike the key slot (①).

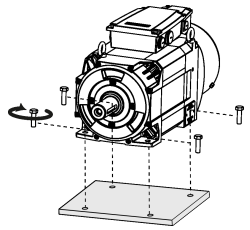
Mounting a motor

NOTE

To ensure better heat dissipation, do not insert any insulators between the motor flange and the mounting flange.



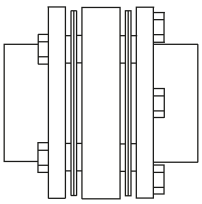
Mount the motor through a mounting steel flange. Use four M12 screws with a tightening torque of 84 Nm.



Remove the anchor plates with a wrench, tighten the screws to fix the motor to the mounting plate, and then reinstall the anchor plates. Use the screws properly as required below:

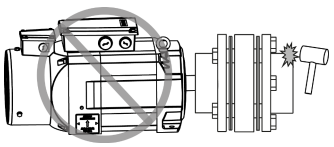
Motor variant	Screw	Tightening torque
1PH110❑	4 x M10	39 Nm
1PH113❑	4 x M12	84 Nm

Selecting a coupling



Use a flexible coupling with high torsional rigidity specifically designed for servo motors, which allow to transfer the motor torque to the mechanics and to compensate radial, axial and angular misalignments.

Installing a coupling



NOTICE

Do not strike the shaft when installing a coupling and ensure that the radial and axial forces are smaller than the allowable maximum values specified in the Operating Instructions.

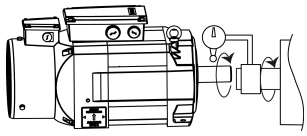
Aligning a coupling

NOTICE

When a motor is equipped with a flange coupling, ensure that the radial deviation is smaller than **0.03 mm**. Otherwise, the bearing will be damaged.

NOTE

The required alignment accuracy differs with the motor speed and the coupling type. Please determine the accuracy according to actual applications.



- Turn the motor shaft and the machine shaft to align the coupling.
- An alignment accuracy test is preferred. If unachievable, judge the accuracy by observing whether the coupling can slide smoothly on both shafts.

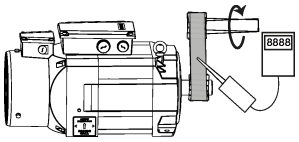
Coupling realignment

If the coupling gives out abnormal sounds, refer to the step "**Aligning a coupling**" to realign the coupling until the sounds disappear.

Tension measurement

NOTICE

The belt tension must be smaller than the allowable radial forces of the motor.



- Measure the belt tension at multiple points using a tension meter while turning the motor shaft by 45°.
- Try your best to reduce the axial misalignment of the belt-pulleys to keep the axial forces to the motor shaft to a minimum.

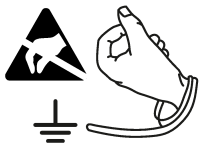
4 Electrical installation

WARNING

Personal injuries by hazardous voltage and unregulated move
If you connect the cables with the power supply switched on, it may cause personal injuries by a hazardous voltage and unregulated move from the motor.

- Switch off the power supply.
- Make sure that there are no voltage conditions.
- Prevent the energy sources from switching on again.

Before connecting



Before connecting the cables, you must take necessary ESD protection measures, e.g. wearing an ESD wrist strap, ESD gloves, and ESD clothes.

Cable connecting

NOTICE

Do not put much stress upon cables or connectors while wiring.

NOTE

- The recommended sequence for cable connections is as follows: encoder cable first, power cable next, and then the fan cable.
- There are threaded holes available on both sides of the terminal box housing for you to pass the cables through. You can select to connect the individual cables to the terminal boxes from the threaded holes on the desired side.

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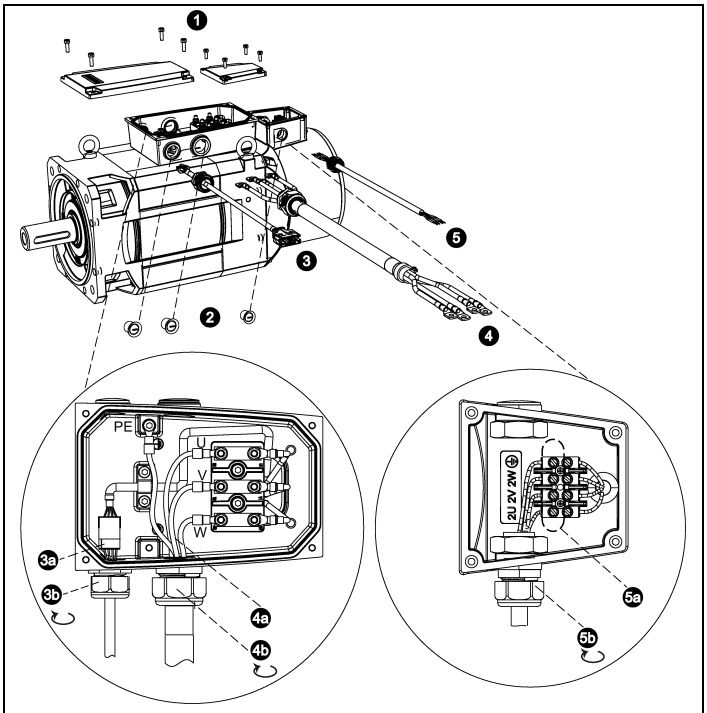


1. Loosen the screws on the top of both the motor terminal box and the fan terminal box to remove the terminal box covers.
2. Remove the three screw plugs on one side of the two terminal boxes.
3. Loosen the cable gland pre-assembled on the encoder cable. Pass the encoder cable through the first threaded hole in the motor terminal box housing. Follow the steps below to connect the encoder cable to the motor terminal box:

3a. Insert the male connector of the encoder cable into the female connector in the motor terminal box.

3b. Tighten the cable gland of the encoder cable onto the threaded hole.

4. Pass the power cable through the cable gland, and then through the second threaded hole in the motor terminal box housing. Follow the steps below to connect the power cable to the motor terminal box:

4a. Remove from the terminal box the three binding post nuts that correspond to the power cable terminals U, V, and W. Place the three terminal lugs at the end of the power cable conductors onto the corresponding binding posts. Fasten the cable conductors with the nuts. Remove the grounding screw for power terminal PE. Place the terminal lug of the PE conductor on the grounding screw, and then tighten the screw for the PE terminal.

4b. Tighten the cable gland of the power cable onto the threaded hole.

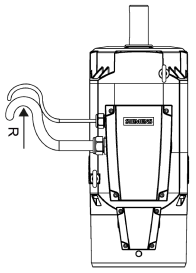
5. Pass your own fan cable (recommended cable outer diameter: 4 mm to 8 mm) through the cable gland, and then through the threaded hole in the fan terminal box housing. Follow the steps below to connect the fan cable to the fan terminal box:

5a. Loosen the four screws that correspond to the fan cable terminals U, V, W and PE. Insert the terminal lugs at the end of fan cable conductors into the corresponding sockets under the binding posts, and then fasten the cable conductors with the screws.

5b. Tighten the cable gland of the fan cable onto the threaded hole.

6. Replace the covers of the terminal boxes, and then tighten the screws respectively for the motor terminal box (4 x M5: max. 4.7 Nm) and the fan terminal box (4 x M4: max. 2.4 Nm).

Minimum cable bending radius (R)

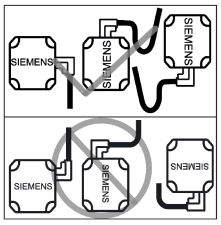


The minimum cable bending radii are listed as follows:

Cable type	Cable cross-section (mm²)	Minimum static bending radius (mm) [1]	Minimum dynamic bending radius (mm) [2]
Power cable	4x2.5	5×10	180
	4x4	5×11.4	210
	4x10	5×20	360
	4x16	5×24.2	440
Encoder cable	6x0.2 + 4x0.25	5×7.4	20×7.4

[1] = 5 x outer diameter
[2] = 20 x outer diameter (encoder cable)

Routing cables



Route the power cables, encoder cables, and fan cables as shown in the figure, especially in a humid environment.

5 Technical support

Country	Hotline
China	+86 400 810 4288
Germany	+49 911 895 7222
India	+91 22 2760 0150
For further service contact information, visit: https://support.industry.siemens.com/cs/ww/en/.	

For more information, refer to the *SINUMERIK 808D/SINUMERIK 808D ADVANCED Commissioning Manual*.

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SIMOTICS M-1PH1 主轴电机

安装指南

2016 年 8 月

1 安全说明

1.1 一般安全说明

危险

接触带电部件和其他能源供给会引发生命危险

接触带电部件会造成人员重伤，甚至死亡。

- 只有专业人员才允许在电气设备上作业。
- 在所有作业中必须遵守本国的安全规定。

通常有六项安全步骤：

1. 做好断电的准备工作，并通知会受断电影响的组员。
2. 断开设备电源。
   - 关闭设备。
   - 请等待至警告牌上说明的放电时间届满。
   - 确认导线与导线之间和导线与接地线之间无电压。
   - 确认辅助电压回路已断电。
   - 确认电机无法运动。
3. 检查其他所有危险的能源供给，例如：压缩空气、液压、水。
4. 断开所有危险的能源供给，措施比如有：闭合开关、接地或短接或闭合阀门。
5. 确定能源供给不会自动接通。
6. 确保正确的设备已经完全闭锁。

结束作业后以相反的顺序恢复设备的就绪状态。

警告

连接了不合适的电源所产生的危险电压可引发生命危险

接触带电部件可能会造成人员重伤或死亡。

- 所有的连接和端子只允许使用可以提供 SELV（Safety Extra Low Voltage：安全低压）或 PELV（Protective Extra Low Voltage：保护低压）输出电压的电源。

警告

接触损坏电机/设备上的带电部件可引发生命危险

未按规定操作电机/设备可能会对其造成损坏。
电机/设备损坏后，其外壳或裸露部件可能会带有危险电压。

- 在运输、存放和运行设备时应遵循技术数据中给定的限值。
- 不要使用已损坏的电机/设备。

警告

外壳大小空间不足可引起火灾从而导致生命危险

明火和烟雾可引起重大人员伤亡或财产损失。

- 没有保护外壳的设备应安装在金属机柜中（或采取相同效果的措施进行保护），以避免设备接触明火。
- 确保烟雾只能经所设安全通道排出。

警告

使用移动无线电装置或移动电话时机器的意外运动可引发生命危险

在距离本组件大约 2 m 的范围内使用发射功率大于 1 W 的移动无线电设备或移动电话时，会导致设备功能故障，该故障会对设备功能安全产生影响并能导致人员伤亡或财产损失。

- 关闭设备附近的无线电设备或移动电话。

警告

绝缘过载可引起火灾从而导致生命危险

在 IT 电网中接地会使电机绝缘增加负荷。绝缘失效可产生烟雾，引发火灾，从而造成严重人身伤害或死亡。

- 使用可以报告绝缘故障的监控设备。
- 尽快消除故障，以避免电机绝缘过载。

警告

通风不足会引起过热、引发火灾，从而导致生命危险

通风空间不足会导致过热，产生烟雾，引发火灾，从而造成人身伤害。 这可能会造成人员重伤或死亡。此外，设备/系统故障率可能会因此升高，使用寿命缩短。

- 组件之间应保持规定的最小间距，以便通风。

警告

电缆屏蔽层未接地可引起电击从而导致生命危险

电缆屏蔽层未接地时，电容超临界耦合可能会出现致命的接触电压。

- 电缆屏蔽层和未使用的电缆芯线至少有一侧通过接地的外壳接地。

警告

无效的安全功能可导致生命危险

无效的或不适合的安全功能可引起机器功能故障，可能导致重伤或死亡。

- 调试前请注意相关产品文档中的信息。
- 对整个系统和所有安全相关的组件进行安全监控，以确保安全功能。
- 进行适当设置，以确保所使用的安全功能是与驱动任务和自动化任务相匹配并激活的。
- 执行功能测试。
- 在确保了机器的的安全功能能正常工作后，才开始投入生产。

说明

Safety Integrated 功能的重要安全说明

使用 Safety Integrated 功能时务必要注意 Safety Integrated 手册中的安全说明。

警告

电磁场可引发生命危险

在电气能源技术设备例如变压器、变频器、电机运行时会产生电磁场（EMF）。

因此可能会对设备/系统附近的人员，特别是对那些带有心脏起搏器或医疗植入体等器械的人员造成危险。

- 确保相关人员和设备保持一定的距离（至少为 2 m）。

1.2 操作静电敏感元器件（ESD）

静电敏感元器件（ESD）是可被静电场或静电放电损坏的元器件、集成电路、电路板或设备。

注意

电场或静电放电可损坏设备

电场或静电放电可能会损坏单个元件、集成电路、模块或设备，从而导致功能故障。

- 仅允许使用原始产品包装或其他合适的包装材料（例如：导电的泡沫橡胶或铝箔）包装、存储、运输和发运电子元件、模块和设备。
- 只有采取了以下接地措施之一，才允许接触元件、模块和设备：
  - 佩戴防静电腕带
  - 在带有导电地板的防静电区域中穿着防静电鞋或配带防静电接地带
- 电子元件、模块或设备只能放置在导电性的垫板上（带防静电垫板的工作台、导电的防静电泡沫材料、防静电包装袋、防静电运输容器）。

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1.3 驱动系统（电气传动系统）的遗留风险

机器或设备制造商在依据相应的本地指令（比如欧盟机械指令）对机器或设备进行风险评估时，必须注意驱动系统的控制组件和驱动组件会产生以下遗留风险：

1. 调试、运行、维护和维修时机器或设备部件意外运行，原因（举例）：
   - 编码器、控制器、执行器和连接器中出现了硬件故障和/或软件故障
   - 控制器和传动设备的响应时间
   - 运行和/或环境条件不符合规定
   - 凝露/导电杂质
   - 参数设置、编程、布线和安装出错
   - 在电子器件附近使用无线电装置/移动电话
   - 外部影响/损坏
   - X 射线辐射、电离辐射和宇宙辐射
2. 在出现故障时，组件内/外部出现异常温度、明火以及异常亮光、噪音、杂质、气体等，原因可能有：
   - 零件失灵
   - 软件故障
   - 运行和/或环境条件不符合规定
   - 外部影响/损坏
3. 危险的接触电压，原因（举例）：
   - 零件失灵
   - 静电充电感应
   - 静充电感应
   - 运行和/或环境条件不符合规定
   - 凝露/导电杂质
   - 外部影响/损坏
4. 设备运行中产生的电场、磁场和电磁场可能会损坏近距离的心脏起搏器支架、医疗植入体或其它金属物。
5. 当不按照规定操作以及/或违规处理废弃组件时，会释放破坏环境的物质并且产生辐射。

其它有关驱动系统组件产生的遗留风险的信息见用户技术文档的相关章节。

说明

保护设备，例如：将组件装入符合 EN 60529 IP54 防护等级或符合 NEMA 12 的控制柜中。在特别关键的使用条件中必要时还需采取其他措施。
如果安装地点排除了凝露或导电异物，则使用较低防护等级的控制柜。

1.4 警告标识

伺服电机上的警告标识

严禁敲打轴端，否则会导致编码器损坏。

严禁触摸电机，其表面温度可能超过 80 °C。

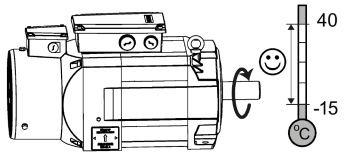
文档中的警告标识

表示如不采取相应的预防措施会导致死亡、严重的人身伤害或设备损坏。

表示禁止执行的操作。

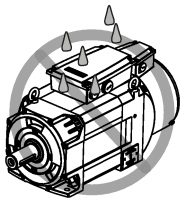
2 安装环境

环境温度



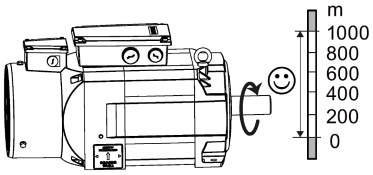
- 运行温度：-15 °C 到 40 °C（无功率降额）
- 储存温度：-20 °C 到 65 °C

环境湿度



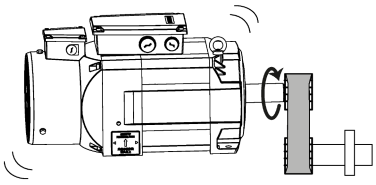
- 运行湿度：≤ 90% RH
- 储存湿度：≤ 95% RH

运行高度



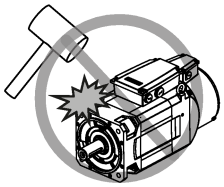
≤ 1000 m（无功率降额）

振动强度等级



- 1PH11❑❑-1❑F：
  B（1800 rpm 及以下）
  S（1800 rpm 至 10000 rpm）
- 1PH11❑❑-1❑D：
  B（1800 rpm 及以下）
  R（1800 rpm 至 6000 rpm）

抗冲击性

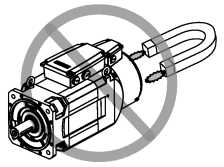


- 连续轴向冲击：2.25 m/s^2
- 连续径向冲击：10 m/s^2

磁场干扰

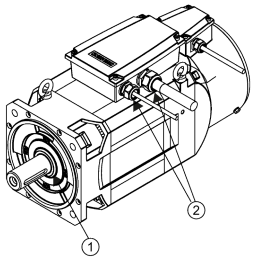
注意

为防止绝对编码器受到磁干扰，请勿在绝对编码器附近使用电磁设备，如记忆棒、存储卡和钥匙卡。



请勿在带绝对值编码器的伺服电机附近 15 mm 范围内放置会产生强磁场（高于 10 mT）的设备。

防护等级



- 电机的防护等级为 IP54（电机运行时，防尘防水溅落），轴贯通部（①）有轴封保护。
- 接线盒部分防护等级为 IP65。
- 为保证防护能力，连线时请使用专用电缆固定头（②）。

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3 机械安装

吊装电机

警告

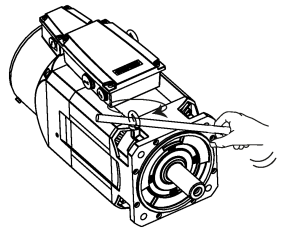
不稳定重物导致死亡或人身伤害

运输时电机非正常移动可能导致死亡或人身伤害。

- 请使用针对电机及其负载的专用吊装设备。
- 切勿站在负载吊臂下方或其移动范围内。
- 移动时必须固定电机，防止侧翻掉落。
- 切勿通过提拉电缆来吊装电机。

注意

旋拧电机吊环时不可过紧。



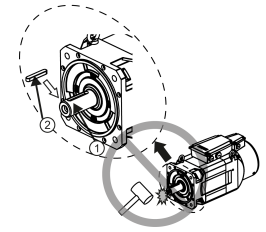
- 吊装前必须手动完全拧紧吊环。
- 必须通过吊环进行电机的吊装。
- 当需要竖直安装电机时，请将吊环拧入后端盖两侧的螺孔内。

安装轴键（可选）

警告

甩飞轴键导致人身伤害

当带键电机运行时，安装于轴端的轴键可能会甩出，从而导致人身害。轴端的轴键必须安装紧固，以防甩出。



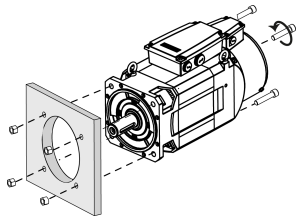
注意

对于带键电机，轴键（②）已预装在轴上。重新安装时，请勿敲打键槽（①）。

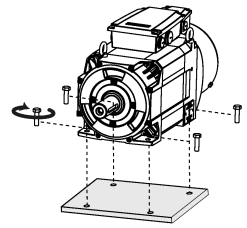
安装电机

说明

为保证良好的散热效果，请勿在电机法兰和安装法兰之间插入任何绝热体。



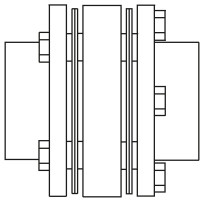
将电机安装到钢制安装法兰上。请使用 4 个 M12 的螺钉，拧紧扭矩为 84 Nm。



对于地脚安装型电机，应先用扳手取下地脚盖板，拧上地脚螺钉，将电机固定于安装板，再合上地脚盖板。请按如下要求正确使用螺钉：

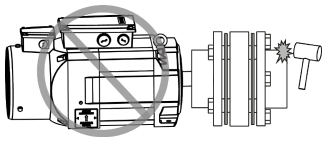
电机型号	螺钉	拧紧扭矩
1PH110❑	4 x M10	39 Nm
1PH113❑	4 x M12	84 Nm

选择联轴器



请选择伺服电机专用的具有高扭转刚度的挠性联轴器，且该联轴器可将电机扭矩传递给机构，并补偿轴向、径向和角度的偏移。

安装联轴器



注意

安装联轴器时请勿敲打轴，且需确保轴向和径向负载小于操作说明手册中规定的最大值。

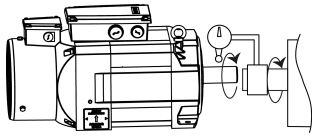
联轴器定芯

注意

当电机使用凸缘联轴器时，请确保径向偏差**小于 0.03 mm**。否则会损坏电机轴承。

说明

定芯的精度要求因电机转速和联轴器类型而异。请根据实际的应用来确定精度要求。



- 通过旋转两侧轴来定芯。
- 建议通过测试来校正定芯精度。如果条件不具备，通过观察联轴器可否在两侧轴上自由滑动来判断定芯精度。

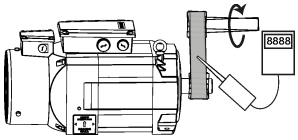
定芯调整

联轴器发出异常声响时，请参见上一步“联轴器定芯”来重新调整定芯直至异响消失。

拉力测量

注意

传动带的拉力必须小于电机允许的最大径向力。



- 以 45° 角旋转电机轴，然后通过拉力计测量传动带各点的拉力。
- 尽量降低皮带轮的轴向偏差，使电机轴所受的轴向力降到最低。

4 电气安装

警告

危险电压和电机意外运动导致人身伤害

电机上电时连接电缆，存在危险电压和电机意外运动风险，会导致人身伤害。

- 切断电源。
- 确保无电压存在。
- 防止电源再次打开。

接线前准备

连接电缆前请采取必要的静电防护措施，如套上防静电带、带上防静电手套和穿着防静电服。

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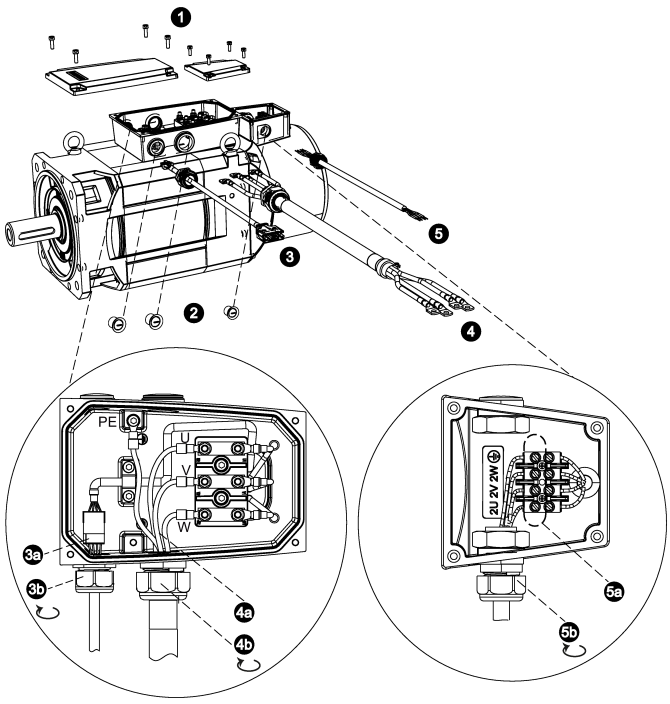
接线

注意

接线时请勿对电缆或连接器过度用力。

说明

- 推荐的电缆连接顺序依次为编码器电缆、动力电缆、以及风扇电缆。
- 接线盒两侧均有电缆过线孔。如有必要，可选择从任意一侧的过线孔连接各电缆。



1. 分别松开电机接线盒及风扇接线盒顶盖上的螺钉，取下接线盒顶盖。
2. 拧下位于两个接线盒同一侧的三个旋转塞头。
3. 拧松编码器电缆上预安装好的电缆固定头。将编码器电缆穿过电机接线盒上已取下塞头的第一个过线孔。按以下步骤连接编码器电缆：

3a. 将电缆端部的插头与接线盒内对应的编码器电缆插座对插。

3b. 将编码器电缆上的电缆固定头旋紧在过线孔上。

4. 将动力电缆穿过电缆固定头，而后穿过电机接线盒上已取下塞头的第二个过线孔。按以下步骤连接动力电缆：

4a. 拧下接线盒内与 U、V、W 端子对应的三个接线螺母。将动力电缆上的三个接线端子分别套在对应的接线螺柱上，然后锁紧螺母。拧下 PE 端子的接地螺钉。将 PE 接线端子套在接地螺钉上，然后拧紧螺钉。

4b. 将动力电缆上的电缆固定头旋紧在过线孔上。

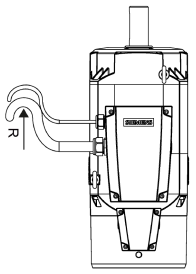
5. 将用户自备的风扇电缆（建议电缆外径为 4 mm 至 8 mm）穿过电缆固定头，而后穿过风扇接线盒上已取下塞头的过线孔。按以下步骤连接风扇电缆：

5a. 拧松接线盒内与 U、V、W、PE 端子对应的四个螺钉。将风扇电缆上的四个接线端子分别插入螺柱下方对应的接线槽内，然后用螺钉锁紧端子。

5b. 将风扇电缆上的电缆固定头旋紧在过线孔上。

6. 重新装上接线盒顶盖，然后分别拧紧电机接线盒（4 x M5：最大 4.7 Nm）和风扇接线盒（4 x M4：最大 2.4 Nm）的螺钉。

电缆最小折弯半径（R）



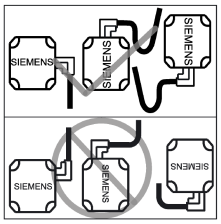
电缆的最小折弯半径如下表所示：

电缆类型	电缆截面积（mm²）	静态最小折弯半径（mm）[1]	动态最小折弯半径（mm）[2]
动力电缆	4x2.5	5×10	180
	4x4	5×11.4	210
	4x10	5×20	360
	4x16	5×24.2	440
编码器电缆	6x0.2 + 4x0.25	5×7.4	20×7.4

[1] = 5 倍的电缆外径

[2] = 20 倍的电缆外径（编码器电缆）

走线



请按左图所示的正确方向连接电源电缆、编码器电缆和风扇电缆，特别是在潮湿环境中。

5 技术支持

国家	热线
中国	+86 400 810 4288
德国	+49 911 895 7222
印度	+91 22 2760 0150
更多服务联络信息，请访问：https://support.industry.siemens.com/cs/cn/zh/。	

更多产品信息，请参见 *SINUMERIK 808D/SINUMERIK 808D ADVANCED 调试手册*。

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