

操作说明

具防爆功能的外壳与控制箱接线盒

Operating manual

Explosion protected junction boxes and control boxes



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内容

1. 安全说明
2. 初始操作
3. 保养维护
4. 法兰箱
5. 装配选项
6. 重要提示
7. 符合标准
8. 技术数据

本防爆装置上的所有工作只能由符合 IEC 60079-14 的合格专业人员执行。任何后续修改都必须在本操作手册的范围内。此说明的目标族群为合格电工及符合 IEC 60079-14 的适当培训人员。未遵守规定，操作许可证将失效！

1. 安全说明

保存操作说明

操作说明必须仔细阅读并保存于外壳安装现场。为正确操作，必须遵守交付时随附的所有文件以及需连接组件的操作说明。

仅将外壳使用于经认可的用途！

经由错误或未经授权的使用以及未遵循此操作说明而造成的损坏 ROSE

Systemtechnik GmbH 不承担任何责任。

外壳只允许在完整未损坏的情况下操作

禁止在外壳上进行未经授权的工作！

安装、维护、维修和故障排除仅能由获得授权并经过培训的人员执行。

请注意以下安装和操作说明：

- 损坏可能导致失去防爆功能
- 国家和地方安全法规
- 国家和地方事故预防法规
- 国家和地方的组装和安装法规
- 技术状态
- 本操作手册中的安全说明
- 将说明与设备种类标示牌放置于设备上/中
- 如果同时使用本质安全和非本质安全电路，则必须遵守电气间隙和爬电距离；建议本安全区域单独使用浅蓝色的电缆密封套、线路和端子。

功能

上述端子和控制箱接线盒是用于固定安装的防爆设备。

安全和等电位导体连接

防爆外壳必须按照 IEC 60079 ff.、IEC 61439 ff. 和 IEC 60364-5-54 的规范接地

中文
EN



关于电路接地，请确保接地线的所有横截面的尺寸与实际连接横截面相对应。金属法兰与盖子、金属面板和金属密封套必须包含在电位均衡中！若使用保护导体母线，每个夹具可以容纳 2 个最大 6 mm² 的导体。如果只连接 1 个导体，则需将其弯曲成弓形，以产生均匀的接触压力。

汇入电缆和导线，密封塞

依照 IEC 60079-0 附录 B，只能汇入经过测试和认证的电缆、导线以及密封塞。只允许铺设固定的电缆和导线。操作人员必须确保释放相应的张力。运用于存在可燃粉尘区域使用时，仅使用经防爆测试最低防护等级为 IP6X 的电缆、导线以及密封塞。当使用 IP 防护等级低于设备适用等级的电缆和导线时（参见设备种类标示牌），整体设备的 IP 防护等级将会降低。未使用的汇入口必须用经认证的密封塞封锁，以建立最低程度的保护。为了达到外壳所需的 IP 防护等级，运输填塞必须更换为经批准的防爆电缆密封套、防爆盲塞、防爆排气管或防爆排水管。必须考虑设备的自热因素以选择适合的工作温度范围。孔洞之间的距离应遵循“电缆接头孔距”表格进行。

(参阅 www.rose-systemtechnik.com/en/downloads/operating-manuals)。设备于交付时符合适用的防爆法规。根据 IEC 60079-17，安装人员或维修技术人员有义务在初始操作前对汇入的电缆和密封塞检查其固定性，也可依据电缆密封套制造商提供的规格信息确保固定性。

此外，请注意 IEC 60079-14 中的规范。

提示说明

使用 4 集耳电缆密封套时，安装方式必须确保机械损坏的最低风险。

保护电缆密封套免于机械式损坏，例如安装冲击保护装置。

安装

安装/操作受相关的 IEC 标准和国家安全法规以及公认最新技术的规范。



元件的电力连接只允许由合格专业人员执行 (IEC 60079-14)



电气间隙和爬电距离必须符合 IEC 60079-7 的标准。为维持防爆功能，务必特别小心地进行导线连接。绝缘体必须要达到端子。导体本身不得损坏。必须遵守最小和最大可连接导体横截面。所有连接端子的螺钉和/或螺母都应根据端子制造商的扭矩规格拧紧。内置标准端子设计为用于直接连接导体与铜芯。使用 DIN 电缆接线片与内置螺栓端子连接。



必须以专业的方式将电缆接线片压印到电缆上。遵守 (IEC 60079-7) 的规范确保所需的最小爬电距离与电气间隙。

安装时需确保与大地之间的导电或耗散连接。使用外壳内和外壳上标记的接地点。打开外壳之前，请确保在无电压状态下或采取适当的保护措施。铝制外壳 05/15/606020 和不锈钢系列 35.xxxxxx 和 36.xxxxxx，在卸下底座的塑料密封塞后，必须使用涂有塑料的齿盘进行组装（在附件包中）。仅有原厂 ROSE 的组装材料才适用于 IP 防护的安装。



外壳遭到损坏时经测试的技术特性将无法维持。

关闭设备/盖子

清除设备中所有异物。

为确保最低保护等级的需求，必须拧紧盖板螺钉。

过度的紧固可能会影响保护的等级。

不当的安装和操作外壳将导致保修失效。

2. 初始操作

初始操作前需注意：

- 仅使用经测试和认证的端子
- 最大公称横截面
- 最大限度电流
- 最大限度电压
- 必须考虑设备的自热因素以选择适合的工作温度范围。

如果随交叉连接器，有必要时需降低电压。必须遵守端子制造商的说明。在露天环境中，建议为防爆设施配备保护性的屋顶或墙壁。垂直安装时，外壳能以任何方向安装。水平安装时，盖子必须在顶部。盖子悬垂的情况下不允许进行悬挂安装！若为混合设备时必须清楚标示。

- 例如：
 - 使用标签
 - 或分离 Ex e 与 Ex i 区域

3. 保养维护

必须遵守适用于潜在爆炸性环境中电力设备维护的 IEC 标准和国家法规 (IEC 60079-17)。

所需的维修保养间隔因应用而异，因此由操作人员根据实际操作条件定义。在维护范围内，应特别检查与防爆功能相关的部件（例如外壳的完整性和密封性、密封件以及电缆和线路的完整性）。对于外壳的维修工作，例如更换密封件，必须向 ROSE 订购相同的组件，否则操作许可证将失效。

有关防爆功能的维修只能由 ROSE 或合格的电工根据产品安全法规和适用判例进行 (IEC 60079-19)。

打开外壳之前确保为无电压状态。对于本质安全电路，允许在电压状态下工作。

4. 法兰箱

如需拆卸法兰板（例如钻汇入口孔洞），在组装过程中为维持最低保护程度必须确保法兰板正确就位。法兰板需以能够确保 IP 防护等级的方式安装。与此同时必须注意密封件是否准确就位且完整无损。

5. 装配选项

由于端子的接触电阻和汇入外壳中的电缆，每个接线盒都会产生热能。为确保接线盒不超过允许的最高温度，接线盒中电路的电流负载不得超过，因而导体不得超过最大允许数量。每个相应接线盒根据电流负载和导体横截面，可在外壳的装配图中找到导体的最大允许数量。



设备种类标示牌上的额定电流数据 (Imax XA) 优先于装配图。不允许后续安装。

6. 重要提示

交叉连接器：经由使用交叉连接器，可显著降低最大输入电压！更多信息可在端子制造商的防爆认证中找到。未遵守这些说明将导致设备认证失效。

依据 UL 508A 或 NEC 505 设计的产品，在初始操作前必须密封未使用孔洞或螺纹。这些必须与 ROSE 设备种类标示牌上的防爆等级相对应，并根据 ROSE 文件按类别代码命名。

Für UL 508A: 档案号 E66473
Für NEC 505: 档案号 E203312

7. 符合标准

本设备已根据以下标准针对潜在爆炸区域进行了测试与认证：

- CNCA-C23-01 / CNEX-C2301
- GB/T3836.1; GB/T3836.2; GB/T3836.3; GB/T3836.4; GB/T3836.9; GB/T3836.31

最新的符合性声明和产品证书可在我们的网站上找到：

www.rose-systemtechnik.com

8. 技术数据

技术数据是一般通用的，应就相应的使用进行检查。



防爆等级、环境温度范围、温度分类、IP 防护等级以及额定电压、额定电流和导体横截面都可能有所不同。实际有关应用的标记和额定值请参见具体设备种类标示牌。

制造商：

ROSE Systemtechnik GmbH
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额定电压：

最大 1500V，取决于组件

额定电流：

最大 630A，取决于组件与环境温度

最大载体横截面：

最大 300 mm²，取决于组件

安全载体横截面：

最大 150 mm²，取决于组件

防护等级：

最大 IP66，取决于组件

环境温度：

-60°C 至 +90°C，取决于密封元件

表格 1: 防爆证书和标记 /

Table 1: Ex-certificates and marking

	证书编号 / 标记 Certificate number / marking	产品 Product
铝 / Aluminium	CCC 接线盒 / Junction box CCC 2023312303000721 (ROSE Systemtechnik GmbH) 2023312303000726 (PM India PVT. Ltd. Plant I & II) 2023312303000733 (PM India PVT. Ltd. Plant III) 2023312303000730 (PM SE Asia Pte. Ltd.) Ex db eb ia [ia] mb IIC T4/T5/T6 Gb Ex tb IIIC T85°C/T100°C/T135°C Db	05 15
	CCC 控制箱 / Control box CCC 2020312304000743 (ROSE Systemtechnik GmbH) 2020312304000878 (PM India PVT. Ltd. Plant I & II) 2020312304000907 (PM India PVT. Ltd. Plant III) 2020312304000873 (PM SE Asia Pte. Ltd.) Ex db eb ia [ia] mb IIC T4/T5/T6 Gb Ex tb IIIC T85°C/T100°C/T135°C Db	
聚酯 / Polyester	CCC 接线盒 / Junction box CCC 2023312303000723 (ROSE Systemtechnik GmbH) 2023312303000725 (PM India PVT. Ltd. Plant I & II) 2023312303000732 (PM India PVT. Ltd. Plant III) 2023312303000729 (PM SE Asia Pte. Ltd.) Ex db eb ia [ia] mb IIC T4/T5/T6 Gb Ex tb IIIC T85°C/T100°C/T135°C Db	06 16
	CCC 控制箱 / Control box CCC 2020312304000744 (ROSE Systemtechnik GmbH) 2020312304000877 (PM India PVT. Ltd. Plant I & II) 2020312304000906 (PM India PVT. Ltd. Plant III) 2020312304000874 (PM SE Asia Pte. Ltd.) Ex db eb ia [ia] mb IIC T4/T5/T6 Gb Ex tb IIIC T85°C/T100°C/T135°C Db	
不锈钢 / Stainless Steel	CCC 接线盒 / Junction box CCC 2023312303000722 (ROSE Systemtechnik GmbH) 2023312303000724 (PM India PVT. Ltd. Plant I & II) 2023312303000731 (PM India PVT. Ltd. Plant III) 2023312303000728 (PM SE Asia Pte. Ltd.) Ex db eb ia [ia] mb IIC T4/T5/T6 Gb Ex tb IIIC T85°C/T100°C/T135°C Db	35 36
	CCC 控制箱 / Control box CCC 2020312304000745 (ROSE Systemtechnik GmbH) 2020312304000876 (PM India PVT. Ltd. Plant I & II) 2020312304000905 (PM India PVT. Ltd. Plant III) 2020312304000875 (PM SE Asia Pte. Ltd.) Ex db eb ia [ia] mb IIC T4/T5/T6 Gb Ex tb IIIC T85°C/T100°C/T135°C Db	

Content

1. Safety instruction
2. Initial operation
3. Maintenance
4. Flange enclosures
5. Equipment options
6. Important notes
7. Standard conformity
8. Technical data



All work on this Ex-instrument must be carried out only by qualified specialist personnel following IEC 60079-14. Any subsequent modification must be within the framework of this operating manual. The target group of these instructions is electrical specialists and suitably trained staff following IEC 60079-14.
The operating permit expires in the event of non-compliance!

1. Safety instruction

Storage of the operating manual

Read the operating manual carefully and keep them at the place where the enclosure is fitted. In order to ensure correct operation, note the contents of all the documentation included with delivery and the operating manual for all the components which are connected.

Use the enclosure only for the intended and authorised purpose!

ROSE Systemtechnik GmbH does not accept any liability whatsoever for any damage which is caused by faulty or unauthorised use or by failure to follow the operating instructions. The enclosure must only be used in an undamaged condition.

No unauthorised work on the enclosure!

Installation, maintenance, servicing and troubleshooting procedures must only be carried out by personnel who are authorised to do so and have been trained accordingly.

Please note the following instructions for installation and operation:

- Damage may result in the loss of explosion protection
- National and local safety regulations
- National and local accident prevention regulations
- National and local mounting and installation regulations
- State of the art technology
- The safety information contained in these operating manual
- Information and type plates on or inside the enclosure
- If intrinsically safe electric circuits are used in combination with non-intrinsically-safe electric circuits, ensure that the clearance and creepage distances are complied with. We recommend using separate cable glands, cables and terminals, light-blue coloured, for the intrinsically safe section.

Function

The above-mentioned junction boxes and control stations are explosion-proof devices for fixed installation.

Protective and potential equalising conductor connection

Explosion-proof enclosures must be earthed in accordance with the requirements of IEC 60079 ff., IEC 61439 ff. and IEC 60364-5-54.



For electrical earthing, always ensure that all cross-sections of earth wires are of suitable size regarding the real connection cross section. Metal flanges, lids, metal panels and metal cable glands must be included in the potential equalisation!
If protective conductor busbars are used, each of the clamps can hold 2 conductors up to 6 mm². If only 1 conductor is connected, this must be bent into a bow shape so that the bow creates even contact pressure.

Cable and wire entries, blanking plugs

In accordance with IEC 60079-0 annex B, use only tested and certified cable and wire entries and blanking plugs. Feed in only fixed installed cables and wires. The operator must ensure that there is appropriate strain relief. For operation in an atmosphere with flammable dust, use only explosion-proof tested cable and wire entries and blanking plugs with a minimum IP6X protection class. If cable and wire entries with an IP protection class which is lower than that for the device are used (see the device type plate), this reduces the IP protection class for the whole device.

Unused entry openings must be closed with a certified blanking plug in order to create the minimum protection class.

In order to achieve the enclosure's required IP ingress protection, transport plugs must be replaced with suitable certified explosion-proof cable glands, explosion-proof blind plugs, explosion-proof ventilating nozzles or explosion-proof draining plugs.

The operating temperature range which is appropriate for the device must be selected by taking into account its self-heating factor.

The distance between the drill holes must be maintained in accordance with the "Drill hole spacing for cable glands" table

(see www.rose-systemtechnik.com/en/downloads/operating-manuals).

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Before delivery, the devices were tested for compliance with the valid Ex regulations for explosion protection. According to IEC 60079-17, you as installer and/or maintainer are obliged to check before start-up that cable entries and blanking plugs are a tight fit or guarantee a tight fit in accordance with the provisions of the cable gland manufacturers.

In addition, pay attention to the conditions specified in IEC 60079-14.

Note:

If 4 Joule cable glands are used, the device must be set up in such a way that there is only a low risk of mechanical danger or damage.

The cable glands must be protected against mechanical damage, e.g. by means of an impact protection device.

Installation

The relevant IEC standards and national regulations in respect of machine safety codes and also the generally accepted state of the art are obligatory for the setting up and operating processes.



All electrical connection work must only be carried out by suitably qualified electricians (IEC 60079-14).

The clearance and creepage distances acc. to IEC 60079-7, must be maintained. In order to maintain the ignition protection type, the conductor connection must be carried out with extreme care.

The insulation must reach as far as the terminal. The conductor itself must not be damaged. Pay attention to the minimum and maximum connectable conductor cross-sections.

All connection terminal screws and nuts must be tightened in accordance with the terminal manufacturer's torque specifications.

The fitted standard terminal is designed for the direct connection of conductors with copper wires.

Use DIN cable lugs when bolt terminals are fitted.



The pressing of the cable lugs onto the cable must be carried out by a trained electrician. Always ensure that the necessary minimum clearance and creepage distances are complied with in accordance with the normative specifications (IEC 60079-7).

During installation, ensure that there is a conductive or dissipative connection to the earth. Use the earthing points marked in and on the enclosure. Before opening the enclosure, check that no voltages are present, or alternatively take suitable protective measures.

For the 05/15/606020 aluminium enclosure and 35.xxxxxx and 36.xxxxxx and RMS R5/R6/R7/R8 xxxxxxxx stainless steel series, remove the plastic plugs in the base and carry out assembly by using sealing system suitable for IP protection (included in the accessories kit).

Use only original ROSE assembly materials in order to ensure installation which is suitable for IP protection.



Enclosures must not be damaged. If enclosures are damaged, the tested technical characteristics cannot be maintained.

Closing the device / lid

Remove all foreign bodies from the device.

Tighten the lid screws in order to ensure the necessary minimum type of protection. Over-tightening may affect the type of protection.

Incorrect installation and operation of the enclosures may result in the warranty becoming invalid.

2. Initial operation

Before initial operation, check the following:

- only tested and certified terminals
- max. nominal cross-section
- max. current
- max. voltage
- The operating temperature range which is appropriate for the device must be selected by taking into account its self-heating factor.

If cross-connectors are used, it may be necessary to reduce the voltage. Very important: Always follow the terminal manufacturer's instructions! If the explosion-proof device is exposed to the weather, we recommend

equipping it with a protective roof or wall.

With vertical installation, the enclosures can be fitted in any position. With horizontal installation, the lid must be on top. Suspended mounting in which the lid overhangs is not permitted!

Enclosures with mixed assemblies must be marked accordingly.

Example:

- with an inscription label
- or a spatial separation for explosion-proof e and explosion-proof i areas.

3. Maintenance

Always comply with the IEC standards and national regulations which relate to the maintenance of electrical equipment in potentially explosive atmospheres (IEC 60079-17).

The required servicing intervals depend on the actual amount of use and must be determined by the operator according to the actual operating conditions.

As part of the maintenance process, above all those parts on which the ignition protection type depends on must be tested (e.g. the intactness and tightness of the enclosure, intactness of the seals and the cable and wire entries).

If repairs are carried out on the enclosure, e.g. replacement of the seal, please order only the same components from ROSE in order to ensure that the warranty is not invalidated.

Repairs which affect explosion protection must only be carried out by ROSE or a qualified electrician in accordance with the product safety regulations and the valid legislation (IEC 60079-19).

Before opening the enclosure, ensure that no voltages are present. In the case of intrinsically safe electric circuits, live working is permissible.

4. Flange enclosure

If flange panels need to be dismantled, for example to allow the drilling of entry openings, pay attention during installation to the correct seat of the flange panel in order to maintain the minimum protection type.

The flange panels must be fitted in such a way that the IP protection class is maintained. To do this, ensure the exact seat and the intactness of the seal.

5. Equipment options

The contact resistances at terminal positions and the cables inside the enclosure generate heat in every terminal enclosure. In order to prevent the maximum permitted temperature from being exceeded, the current load on the circuits in the terminal enclosure must not be too high. Details of the maximum number of cables for each terminal enclosure, depending on the current load and the conductor cross-section can be found in the assembly table.



Measurement of current data (Imax XA) on the device plate overrides the layout diagram. No additional retrofitting is permitted!

6. Important notes

Cross connectors: By using the cross connectors the maximum input voltage may be substantial reduced! Please see further instructions in the Ex-certificate of terminal manufacturer. For non-observance to this advice, the equipment certification will expire.

For products, that comply UL 508A or NEC 505, open drill holes or threads must be closed before commissioning. These must correspond both to the type of protection of the Rose type plate and to the category Code according to the ROSE-file.

For UL 508A: File Nr. E66473

For NEC 505: File Nr. E203312

7. Standard conformity

This equipment is tested and approved for potentially explosive atmospheres to:

- CNCA-C23-01 / CNEX-C2301
- GB/T3836.1; GB/T3836.2; GB/T3836.3; GB/T3836.4; GB/T3836.9;
- GB/T3836.31

The most up-to-date conformity declarations and product certificates can be found on our website: www.rose-systemtechnik.com

8. Technical data

The technical data are expressed in general terms and must always be checked regarding the individual intended use.



Ignition protection, ambient temperatures, temperature classification, IP-ratings and rated voltage, rated current and conductor cross-sections may vary. For actually applied marking and rating data see specific device type plate.

Manufacturer:	ROSE Systemtechnik GmbH Erbeweg 13-15 D-32457 Porta Westfalica
Rated voltage:	max. 1500 V, depending on fitted equipment
Rated current:	max. 630 A, depending on fitted equipment and ambient conditions
max. conductor cross-section:	max. 300 mm², depending on fitted equipment
Protective earth conductor cross-section:	max. 150 mm², depending on fitted equipment
Ingress protection:	max. IP66, depending on fitted equipment
Ambient temperature:	max. -60°C to +90°C, depending on gasket



For ex-certificates and marking please see table 1 on page 4.