SOL-SC... string combiner boxes

Mounting conditions and installation instructions

Application note
111048_en_00

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1 About this document

This document contains specifications, notes and recommendations for mounting, installing and operating Phoenix Contact string combiner boxes (SCBs).

Make sure you always use the latest SCB documentation. It can be downloaded at phoenixcontact.com/products.

2 Overview of housing material properties

The material properties of the housings used in the SCBs from Phoenix Contact can be found in the table below.

		Material resistance/property														
Product component	**Material**	**Acid (weak)**	**Acid (strong)**	**Lye (weak)**	**Lye (strong)**	**Alcohol**	**Gasoline**	**Benzol**	**Mineral oil**	**Diesel**	**Ammonia (gaseous)** DLG focus test	**Fat (vegetable)**	**Fat (animal)**	**Halogen-free**	**Free from heavy metals, PVC, and silicone**	**Flammability in accordance with DIN EN 60695 (VDE 0471)/UL94**
Housing	Polycarbonate (fiberglass-reinforced)	✓	✗	✗	✗	✓	(✓)	✗	✓	(✓)	✓	✓	(✓)	Yes	Yes	960°C/V-2 (5VA*)
Cover	Polycarbonate (transparent)	✓	✗	✗	✗	(✓)	(✓)	✗	✓	(✓)	✓	✓	✓	Yes	Yes	850°C/V-2

Key: ✓ = Resistant (✓) = Conditionally resistant ✗ = Not resistant

* 5 inch (127 mm) flame test in accordance with UL 746 C (comparable to UL 94, 5VA requirements)

3 Environmental influences and protective measures during mounting, installation, and operation

Always observe the installation regulations for electrical equipment applicable at the installation location. Select a mounting substrate that is flat and suitable for the weight of the SCB. If the mounting substrate is not flat, the housing may warp and start to leak.

If necessary, take additional measures for fire protection and for protecting the SCB from environmental influences such as UV radiation, temperature changes, humidity, and chemical influences.

The following subsections provide additional information on the topics mentioned and the special features to be observed in this regard.

3.1 Fire protection

HD 60364-4-42 is a harmonized standard developed by CENELEC on behalf of the European Commission. It describes that measures must be taken to protect people, livestock, and property from the risk of fire when installing electrical equipment. The German equivalent of this standard is DIN VDE 0100-420. Always observe the fire protection requirements applicable at the installation location.

Fires can have various causes, e.g., electric arcs due to short circuits, overtemperature due to increased contact resistance or due to heat build-up, etc.

During intended operation, the SCBs are not expected to cause any increased risks for fire protection (e.g., electric arcs). The electrical equipment is installed in a housing that can withstand the highest temperatures expected during operation. The housing is flame-retardant and fire-resistant in accordance with V-2 rating for plastics (see Section 2). In the event of incorrect operation or due to installation errors, however, short circuits or electric arcs may still occur.

Protective measures:

- Create a risk analysis of the fire hazards, taking into account the individual fire risks at the installation location, and implement adequate measures, if necessary.
- Select the installation location so that heat cannot build up.
- Use cables and lines suitable for the application and install them in accordance with the type of installation.
- Make sure that all screw and crimp connections have been properly made.
- Make sure that the electrical installation will not be damaged.

3.2 UV radiation

The plastic housings used for the SCBs are UV-resistant. The plastic used for housing and cover has successfully passed weathering tests in accordance with DIN 53 387 (replaced by DIN EN ISO 4892-2) as well as UL 746 C.

However, long-term exposure to UV radiation with temporary peak intensity may affect SCB components.

Protective measures:

- To avoid high operating temperatures and the associated impact on service life of the installed components, we recommend avoiding installation locations exposed to permanently high UV radiation as far as possible.
- Phoenix Contact offers the SOL-WR weather protection roofs as accessories for protection against the effects of weather. You will find the approved accessories for the SCB with the product at phoenixcontact.com.

3.3 High ambient temperatures

The components used in the SCB heat up during operation. Solar radiation in unshaded installations and other external heat sources may cause the temperature inside the housing to increase to values outside the permissible operating range of the installed components. This may impair the function of the components or even damage them.

Protective measures:

- Make sure that the specified temperature limits for the installation location are complied with. For the permissible operating temperature range of the SCB, refer to the technical data for the product.
- Select an installation location that is in a permanently shaded area. Avoid locations that are exposed to high levels of heat, e.g., from direct sunlight.
- Ensure that air can circulate sufficiently around the SCB housing. For this, maintain sufficient distance from weather and sun shield panels, for example.

3.4 Condensation

Especially at installation locations with high temperature fluctuations, the temperature differences between the ambient air and the air inside the housing of the SCB may result in a change of pressure conditions causing the housing to draw in additional air. The moisture in the air drawn in may condense on cold surfaces inside the housing, e.g., on the housing cover. Over time, this allows more and more water to accumulate in the housing. The power dissipation of the components in the housing further increases these effects.

If the housing has an increased degree of protection and is accordingly particularly tight, the water inside the housing can no longer escape and damage may occur.

Protective measure:

- To prevent condensation, the housings of the SCBs are equipped with a pressure compensation element by default. The operating principle is explained in Figure 1.

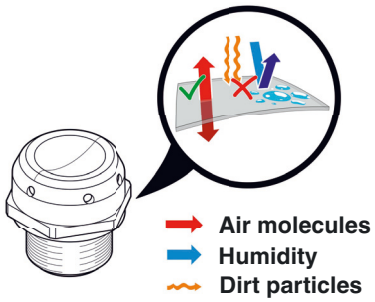

Figure 1 Operating principle of the pressure compensation element

3.5 Precipitation and backwater

The SCBs have the IP65 degree of protection. They are dust-tight, touch-proof, and protected against jet water from any angle.

However, the IP tests carried out in accordance with DIN EN 60529 for the SCB housing are only comparative tests and are used to classify properties. They only take a few minutes and cannot simulate any real installation situation.

Note that water or dust may penetrate the SCB caused by mechanical stress during installation, aging, particular weather conditions such as storms or heavy rain, etc., for example.

Backwater on housing surfaces and in housing recesses must be avoided in particular, as it may freeze at low temperatures and lead to an impermissibly high mechanical stress on the housing, which can damage the housing.

Protective measures:

- Install the SCB in a wind-protected and weatherproof location.
- Phoenix Contact offers the SOL-WR weather protection roofs as accessories for protection against the effects of weather. You will find the approved accessories for the SCB with the product at phoenixcontact.com.

3.6 Chemical influences

The housings used in SCBs are resistant to mineral oil and vegetable and animal fats. Detailed information can be found in Table “Overview of housing material properties” on page 2.

Protective measure:

- Make sure that the SCB at the installation location is protected from chemical influences damaging the housing in accordance with Section 2.