

Roxtec recommends that all installations are performed without facility operation. Follow national regulations and installation codes. Any action affecting the routed service should be performed according to manufacturer recommendations.

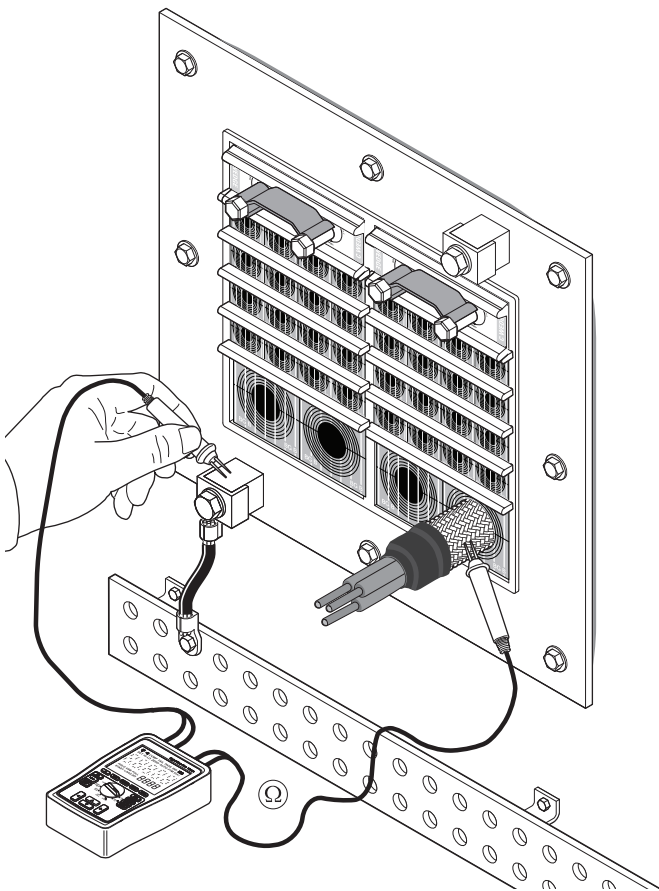
Verification of contact resistance for Roxtec BG™ solutions

General information Roxtec BG™

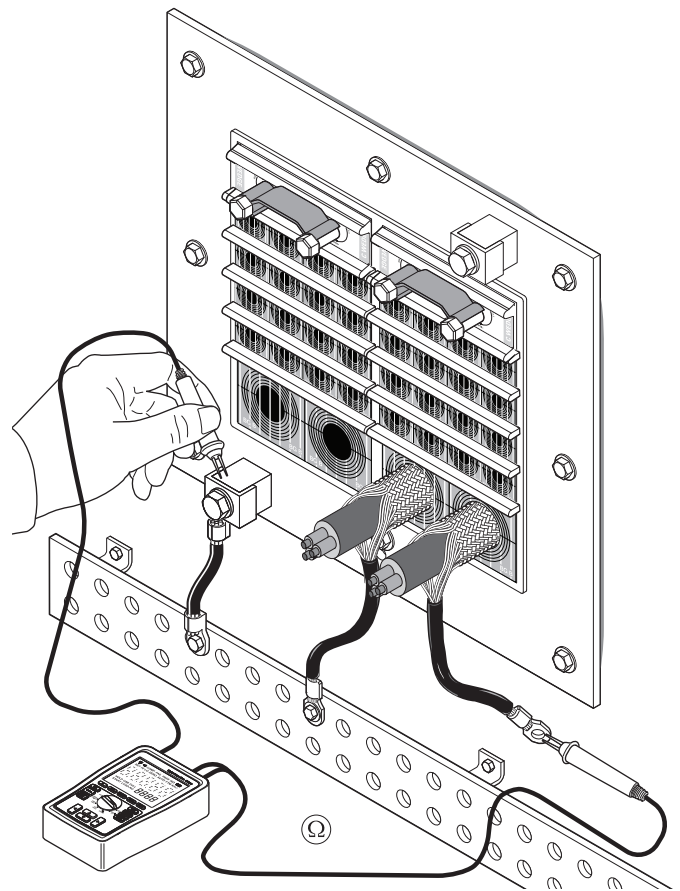
After installation of Roxtec solutions for bonding and grounding, earth continuity tests should be performed to verify a satisfying connection between the cable armor/shield and the Roxtec frame. To measure contact resistance, a 4-pole method shall be used, 10 ADC or higher following national legislation. Always check that the system is correctly installed. See the installation instructions for the corresponding product.

Measuring methods for Roxtec BG™ B

In most installations with Roxtec BG B modules it is possible to measure the connection between the BG B braid and the armor/shield directly at the system. Tests should be performed with an earth continuity tester (4-pole measurement) @ 10 ADC. The resistance from armor/shield to the frame is typically $<1\text{ m}\Omega$ except for where a stainless steel frame is used, which typically shows values $<2.5\text{ m}\Omega$. Each cable shall be tested. Note: The values above are typical for copper or aluminum armor/shields taken in close proximity to the system. Other less conductive armor material, e.g. steel wire armor, may show higher values. If it is not possible to measure from the armor/shield at the point of termination, see measuring methods for Roxtec BG.



Measure the resistance from the Roxtec frame ground lug to the cable armor/shield (cables may continue further than the picture shows). Repeat until all cables have been tested.



Remove the so called pig-tails from the earth bar. Measure the resistance from the Roxtec frame ground lug to the end of the pig-tail. Repeat until all cables have been tested.

Measuring methods for Roxtec BG™

The connection between armor/shield and BG braid is enclosed within the Roxtec BG module and can therefore not be measured directly at the connection. The method that Roxtec recommends is measuring the earth continuity between one end of the cable armor/shield and the frame through which the cable runs. To get a reliable test result, the armor/shield must be unconnected in both ends.

When a test is performed, the length, material and cross-section of the armor/shield must be considered. Tested with an earth continuity tester (4-pole measurement) @ 10 ADC, the resistance from armor inside the module to frame is typically <1 mΩ except for where a stainless steel frame is used, which typically shows values <2.5 mΩ.

However, the additional resistance coming from the extended cable length has to be added. See example below. Each cable shall be tested.

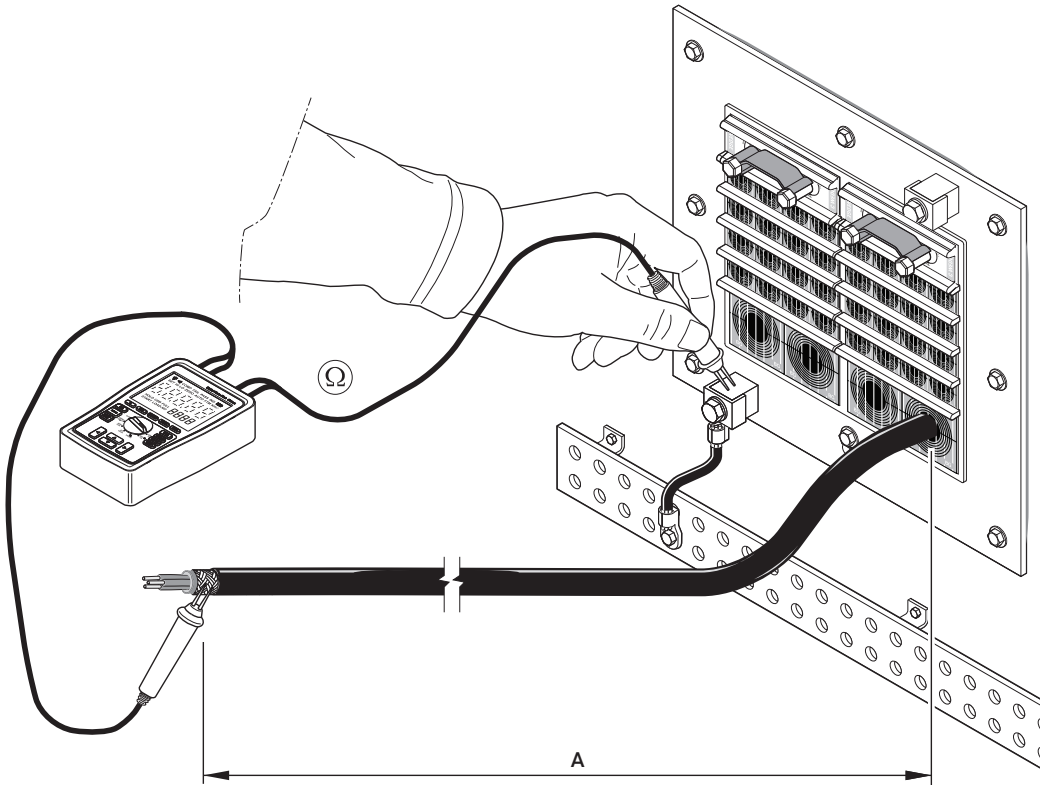
Example:

A=25 m 4x95/29 cable, shield resistance: 0.64 Ω/Km => 0.64 mΩ/m (values taken from cable supplier and @ 20°C).

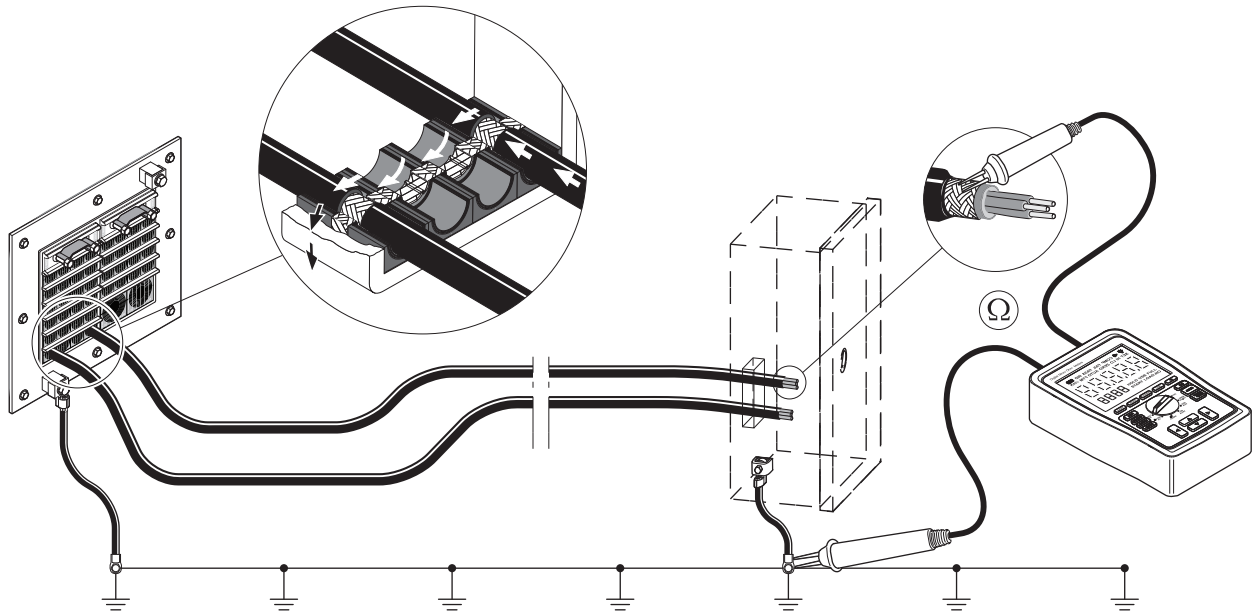
$0.64 \text{ m}\Omega/\text{m} \times 25 \text{ m} = 16 \text{ m}\Omega$.

Adding 1 mΩ or 2.5 mΩ depending on the frame, the measured value should be between 17 and 18.5 mΩ.

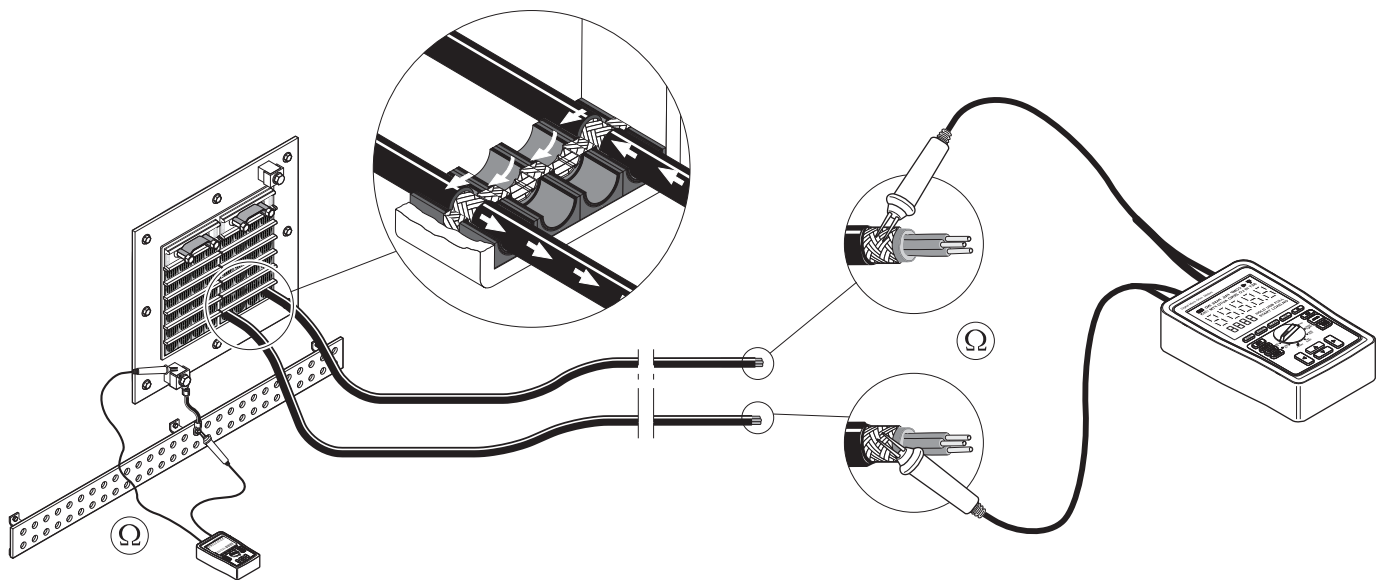
Alternative methods of measuring are the following.



Measure the resistance from the Roxtec frame grounding lug to the cable armor/shield. Repeat until all cables have been tested.



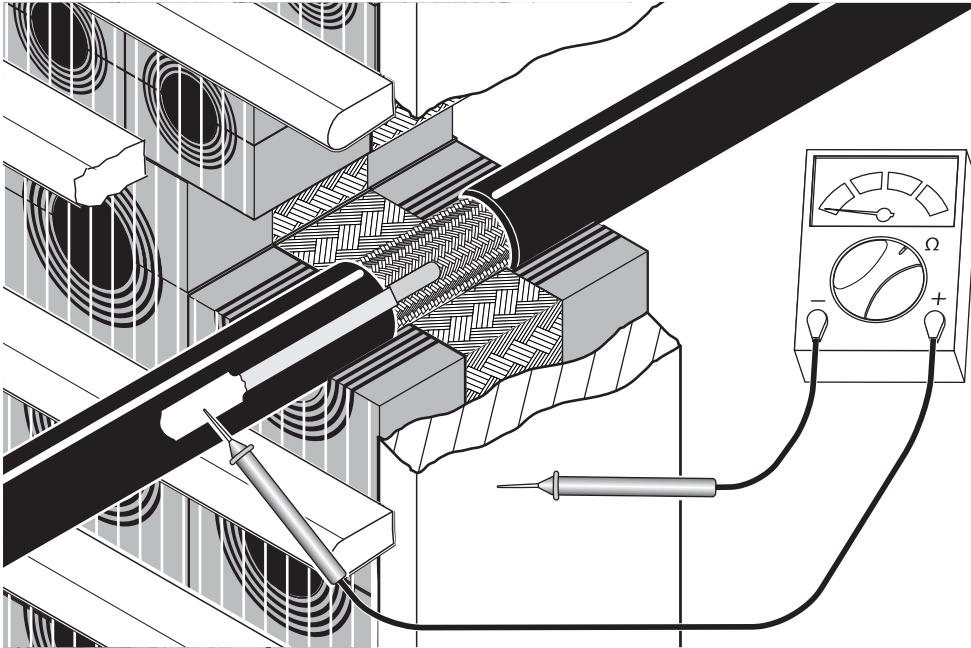
When cable ends are not accessible within reach of the system, check that the frame is connected to earth. Measure the resistance from end of armor/shield to local earthed object. The result will depend on armor type, size, length and the resistance in the local earth loop. Repeat until all cables are tested.



When cable ends are not accessible within reach of the system, check that the frame is connected to earth. Measure the resistance from cable to cable. The actual value will be the result of two cables and depend on armor type, size and length. Repeat until all cables are tested. This method requires more than one routed cable. Verify the connection between the grounding lug of the frame and earth bar separately.

Measuring with Roxtec EC test stick

The Roxtec EC test stick is used to get an indication of the electrical performance of cable transit installations using Roxtec BG™ or ES solutions.



Install the Roxtec EC test stick into your system. The test stick provides a measuring point outside the transit. Use a 2-pole or 4-pole method with maximum measurement current of 1A. The resistance between the test stick and the frame should be less than 100 mΩ. Test all cables in the transit.

Note

- The described methods can be applied to verify contact resistance for the various Roxtec ES and PE products as well. High frequency properties, such as shielding effectiveness cannot be verified this way.
- An ordinary multimeter with 2-pole ohm-meter function will not show actual contact resistance cable armor/shield to frame, but will just work as a continuity check.
- This document is also valid for round solutions.

Disclaimer

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 (b) Installation shall be carried out in accordance with Roxtec installation instructions in effect from time to time.

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