

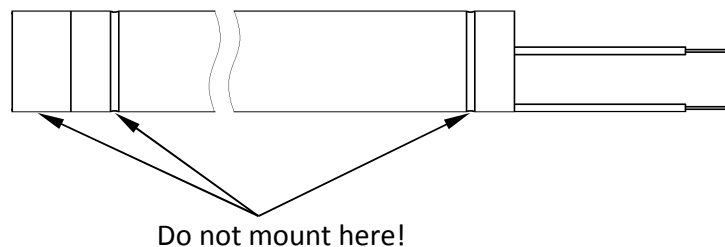
Instructions for the use of Geiger-Müller counter tubes

Geiger-Müller counter tubes are **highly sensitive sensors** for the detection of ionising radiation. These detectors require **appropriate handling** both during production of the measuring devices with which they are equipped and during the operation thereof. As part of these user instructions, fundamental aspects of the correct and intended use of these types of sensors are provided. However, compliance with these instructions is no substitute for further care on the part of the user. As a basis for the operation of the sensors, radiometric as well as electrical and geometric parameters for each type are provided in the corresponding data sheets.

Particular attention to the handling of the counter tubes results from the special design of these sensors. They consist of a gas-filled counter tube body made of glass or metal. During joining or connection of individual parts of the sensor, sensitive areas occur at various locations, in particular in the area of metal-glass compounds, which require great care. The following points comprise instructions for handling our products that have been compiled based on the experiences of customers using the counter tubes.

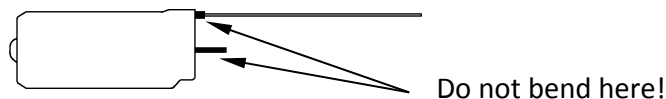
Mounting of counter tubes

A suitable type of mounting is to be selected based on the requirements of the use of the sensor in the desired application. The counter tubes are often held on PCBs either in special adapters or using plastic cable ties. It is important to ensure that the mechanical stress is only as low as necessary. If necessary, an additional fixation by means of a permanently elastic adhesive or the like is also suitable to achieve greater stability. The holder should not adversely affect the radiometric properties, but above all should not cause any deformation of the counter tube body or the corrective, which is made of soft metals for physical reasons. The edge regions of the uncorrected metal counter tubes, especially the corrugations, are not suitable for mounting purposes since sensitive metal-glass compounds are located there in the interior.



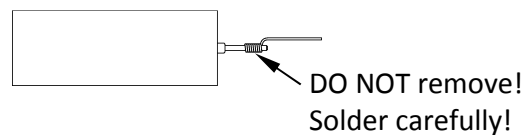
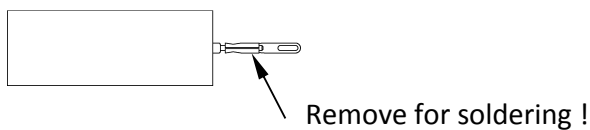
Changing the counter tube connections

Since parasitic capacities on the GM counter tube are to be kept low due to physical reasons associated with counter tubes, the terminal wires should be kept as short as possible and special care is required when designing the contact. Changes to the terminal wires may only be made in such a way that the operation of the counter tube is not affected. There should be no bending of the rigid terminals in the vicinity of the counter tube (especially the cathode terminals in the case of glass counter tubes and the anode feedthroughs). When shortening insulators, it is to be ensured that these are not pulled out of the counter tube, since otherwise the counter tube corrective may short circuit.



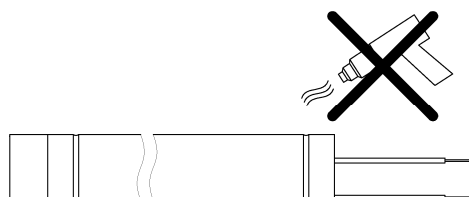
Soldering to the terminal elements

All soldering on the terminal must be performed so that no unnecessarily significant heat is introduced into the counter tube. In case of contacts with plug contacts on the anodes, these should be removed during soldering and then plugged in again carefully. Please ensure that plugged-in torsion springs should not, however, be removed, since these can only be plugged in again using a special tool.



Thermal cycling

Special care is to be taken in connection with the use of heat-shrinkable tubing for insulation or mounting of the counter tube. Sudden high thermal cycling resulting from use of hot air blowers for shrinking is to be avoided and can, in extreme cases, lead to destruction of the counter tube. Such work should be performed at defined temperature profiles (maximum temperature) and at low temperature gradients in the oven.



The complex issue can only be handled using methods forming part of this user information. We offer assistance for requests requiring substantial changes to the contact. For larger quantities, we can also develop customised solutions.

Please do not hesitate to contact us in order to collaborate in finding a good solution for your application.