INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC 60079-11
Edition 7.0 2023-01

Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”

INTERPRETATION SHEET 4

This interpretation sheet has been prepared by subcommittee 31G: Intrinsically-safe apparatus, of IEC technical committee 31: Explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31G/425/DISH	31G/430/RVDISH

Full information on the voting for the approval of this interpretation sheet can be found in the report on voting indicated in the above table.

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IEC 60079-11:2023 (Edition 7.0)

EXPLOSIVE ATMOSPHERES – Part 11: Equipment protection by intrinsic safety “i”

Background

The table of changes for IEC 60079-11:2023 (Edition 7) states:

Where two diodes are used in a safety shunt for Level of Protection “ia”, the failure of only a single diode has been extended to the failure of a single shunt path. This means that the tracking from the diode to reference voltages (for example, ground) no longer have to be infallible.

IEC 60079-11:2023-01/ISH4:2025-09(en)

ICS 29.260.20

IEC 60079-11:2011 (Edition 6) 8.7.1 states:

Where diodes or Zener diodes are used as the shunt components in an infallible shunt safety assembly, they shall form at least two parallel paths of diodes. In Level of Protection "ia" shunt safety assemblies, only the failure of one diode shall be taken into account in the application of Clause 5. Diodes shall be rated to carry the current which would flow at their place of installation if they failed in the short-circuit mode.

IEC 60079-11:2023 (Edition 7) 7.7.6 states:

The following shunt assembly constructions shall be considered infallible for Level of Protection "ia" against failure to limit the output voltage where they comply with 7.7.5:

a) two parallel paths of diodes or Zener diodes or diode chains; the failure of only a single diode or Zener diode to either open circuit or short circuit shall be considered a single countable fault;

b) an assembly of bridge connected diodes;

c) two independent controlled semiconductor voltage limitation circuits if both the input and output circuits are intrinsically safe circuits or where it can be shown that they cannot be subjected to any transient voltage; or

d) for associated apparatus, three independent controlled semiconductor voltage limitation circuits where these can be subjected to transient voltage.

Question

Do connections within "two parallel paths of diodes or Zener diodes or diode chains" (as in 7.7.6 a)) or within "two independent controlled semiconductor voltage limitation circuits" (as in 7.7.6 c)) need to be infallible?

Answer

No. For 7.7.6 a) and c) above, countable faults can be applied to one of the limitation circuits including the separations, components, tracks, vias, connections and any other elements in a shunt limiting circuit, but not to the other. Non-countable faults are applied as usual to the whole limitation circuit.