

## CTL DECISION SHEET (DSH)

| Standard(s) (incl. year)   | Subclause(s)  | Tracking No.        | Publication date |
|--|---|---------------------|------------------|
| IEC 62368-1:2014<br>IEC 62368-1:2018   | 5.5.2.2   | DSH 2200            | 2022             |
| <b>Category</b>  |   |                     |                  |
| ITAV   |   |                     |                  |
| <b>Subject</b>   | <b>Keywords</b>                                       | <b>Developed by</b> |                  |
| Capacitor discharge after disconnection of a connector   | - Opening of a fuse<br>- Limits of accessible voltage | ETF 2               |                  |
| <b>Question</b>  |   |                     |                  |
| <p>Many AC mains supplied products contain a fuse within the filter circuit. Sub-clause 5.5.2.2 addresses the capacitor voltage being accessible after disconnection of a connector. The voltage measured after 2s shall comply with:</p> <ul style="list-style-type: none"> <li>- ES1 limits under NORMAL OPERATING CONDITIONS for an ORDINARY PERSON, and</li> <li>- ES2 limits under SINGLE FAULT CONDITIONS for both an ORDINARY PERSON and an INSTRUCTED PERSON.</li> </ul> <p>Per 5.5.2.2 «If a switch (for example, the mains switch) has an influence on any test result, it is placed in the most unfavorable position.»</p> <p>However the standard does not specifically address the situation when a fuse has operated as a consequence of a single fault within the equipment, or have been removed by an ordinary person.</p> <p>Questions 1:</p> <p>Since a fuse can open as a consequence of a single fault or be removed by the operator, should the measurement according to 5.5.2.2 be carried out with a fuse open?</p> <p>Question 2:</p> <p>If the answer to question 1 is yes, which limit applies to the accessible voltage after opening of the fuse?</p> <p>Example:</p> |   |                     |                  |

|  | <b>Decision</b>   |
|--|---|
|  | 1): Yes, if the opening or removal of a fuse can influence the result of the measurement.<br><br>2): The ES2 voltage limit applies to the capacitor voltage that becomes accessible after disconnection of a connector because if the fuse can be removed by an ordinary person it is considered as an Abnormal operation condition and because opening of a fuse is a consequence of a single fault. |
|  | <b>Explanatory notes</b>  |
|  | It was common practice to consider the opening of a fuse in the legacy standards IEC 60950-1 and IEC 60065. Although not ideal design practice sometimes a fuse separates a bleeder resistor from a X-capacitor. Therefore the consequence of a fuse opening needs to be taken into account (see example).  |