

CTL DECISION SHEET (DSH)

Standard(s) (incl. year)	Subclause(s)	Tracking No.	Year
IEC 60335-1: 2020	22.27 and 22.42	2190	2022
Category			
HOUS			
Subject	Keywords	Developed by	
Evaluation of Y2 capacitors used as protective impedance	<ul style="list-style-type: none"> - Protective impedance - Y2 capacitor 	ETF 1	
Question			
<p>Is it acceptable to use two Y2 capacitors (voltage proof 1500 V) in line as protective impedance for IEC 60335 series, if they comply only with IEC 60384-14 including IEC 60384-14:2013/AMD1:2016?</p> <p>If acceptable, are there further tests required to comply with IEC 60335 series and what are they?</p> <p>If it is not acceptable, can one of the Y2 capacitors be used while the second Y2 will be checked according to IEC 60335-1:2020 Annex F a test voltage of 1750 V for supplementary insulation (where Y2 capacitors must comply with IEC 60384-14 in any case)? What further tests will be necessary?</p>			
Decision			
<p>Yes, it is acceptable to use two Y2 capacitors (voltage proof 1500 V) in line as protective impedance for IEC 60335 series.</p> <p>For protective impedance components comprising Y2 capacitors, the 1st and 2nd paragraphs of the test specification in Clause 24.1, taking into account the last paragraph of Clause 24.1.1, give two options:</p> <ol style="list-style-type: none"> 1) Full compliance with IEC 60384-14:2013 including IEC 60384-14:2013/AMD1:2016; or 2) Compliance with the specific clauses of IEC 60384-14:2013 including IEC 60384-14:2013/AMD1:2016 as detailed in Annex F. 			
Explanatory notes			
<p>The standard does not give clear instructions on how to proceed in the case of two Y2 capacitors connected in series.</p> <p>According to IEC 60335-1:2020 Annex F, a minimum proof voltage of 1750 V for additional insulation for protective impedance is not defined.</p> <p>The requirements for the electric strength test from IEC 60335-1 Ed. 6.0 and proof voltage from IEC 60384-14 Ed.4.1 are different:</p> <ul style="list-style-type: none"> • According to IEC 60335-1:2020: <ul style="list-style-type: none"> ○ Clauses 13.1 and 16.1: Protective impedance are disconnected before carrying out the tests. ○ Clause 22.27: Parts connected by protective impedance shall be separated by double insulation or reinforced insulation. ○ Clause 22.42: Protective impedance shall consist of at least two separate components. If any one of the components is short-circuited or open-circuited, the values specified in 8.1.4 shall not be exceeded. 			

- Component impedances shall be unlikely to change significantly during the lifetime of the appliance.
- Compliance should be checked by inspection and by measurement and if necessary, by the tests for class Y capacitors in IEC 60384-14:2013 including IEC 60384-14:2013/AMD1:2016 appropriate to the rated voltage of the appliance.
- Clause 24.1.1: The relevant standard for capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing is IEC 60384-14:2013 including IEC 60384-14:2013/AMD1:2016. If the capacitors have to be tested, they are tested in accordance with normative Annex F.
- As per tables 4 and 7, the required test voltage for supplementary insulation is 1750 V.
- According to IEC 60384-14 Ed.4.1 Table 10, proof voltage is at least 1500 V.

The decision was confirmed in the second IEC/TC61 meeting held in November 2021.