

INTERNATIONAL STANDARD

AMENDMENT 1

Power transformers –
Part 10-1: Determination of sound levels – Application guide

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[IEC 60076-10-1:2016/AMD1:2020](https://standards.iteh.ai/catalog/standards/sist/d32d7a16-19fd-444f-9ccd-0ec63eb0e0c9/iec-60076-10-1-2016-amd1-2020)

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FOREWORD

This amendment has been prepared by IEC technical committee 14: Power transformers.

The text of this amendment is based on the following documents:

CDV	Report on voting
14/1037/CDV	14/1047/RVC

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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7.10 Converter transformers with saturable reactors (transductors)

Delete the existing text of 7.10 and replace it with the following:

7.10 Converter transformers with saturable reactors (transductors)

It is normally not possible to perform factory sound level measurements on converter transformers with built-in saturable reactors with the reactors functioning as in service, i.e. with nominal d.c. current. During factory test, a.c. currents are applied, and the saturable reactors thereby experience strong saturation in both directions. This saturation generates a specific audible noise that normally significantly exceeds the generated sound level of the transformer itself.

The main operating component of a saturable reactor is the magnetic core, which is the source of the noise. When the reactor cores enter saturation during transformer testing with a.c. load current, the accompanied magnetic flux in the saturable reactor cores is heavily distorted and causes vibration components of higher harmonic frequencies that dominate the measured converter transformer sound level. Converter transformer sound levels measured under such conditions are consequently found to be significantly higher than those of regular transformers of same power rating.

The service sound level of converter transformers with built-in saturable reactors due to load current is normally dominated by the presence of current harmonics produced by the converters (see Annex A). However, higher frequency sound components are also produced by the saturable reactors in regular service condition. There are no reliable methods to calculate the sound level of saturable reactors.

NOTE Sound levels from converter transformers are also discussed in IEC TS 61973:2012, IEC 61378-3:2015, CIGRÉ Technical Brochure 202: "HVDC stations audible noise" and CIGRÉ Paper "Sound contribution of saturable reactors in rectifier transformers during FAT".

Bibliography

Add:

PYROG, S., BENZMÜLLER, F., GREVE, G., PLOETNER, C. *Sound contribution of saturable reactors in rectifier transformers during FAT*. CIGRE SC A2 Colloquium, Cracow, Poland 2017

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