



# ISO Electrical Documents 13297 (a.c.) and 10133 (d.c.)

What's coming up? *By John Adey*

The ISO electrical documents have been under a several year review. The challenges and opportunities to harmonize with U.S. standards have created some interesting changes and benefits in the new draft standards. Although these documents are not slated for release for several months, this article outlines some of the major changes you can expect to see in both the a.c. and d.c. electrical documents.

## ISO Working Group 10 – Electrical...A bit of history

Many of you may or may not be aware that since the mid 1990's, ABYC has held the convenership of ISO Working Group (WG) 10. I recently took over the convenership from long-time ISO and ABYC member Ralph Lambrecht. Ralph had the distinction of having more ISO WG convenerships than any other person in the process, quite a position for an American in a foreign standards writing group! He had the history, the knowledge and the skills that make his shoes very difficult to fill. Fortunately, I had been able to work with Ralph as sort

of a vice-chairman for the last several years. This gave me the opportunity to get to know the members, the issues and the nuances of running an ISO WG meeting. My personal thanks goes out to Ralph and I hope I continue his long standing tradition of excellence.

## The documents

10133 Small craft - Electrical systems - Extra-low-voltage d.c. installations (ISO 10133:2000)

You will see that the current version of the d.c. electrical standards is from 2000. The versions that are in the final stages of the ISO process are the ones that will be discussed briefly here. The purpose of this article is to give you a heads-up regarding the changes the WG has made to the documents. Please do not make engineering changes based on what I offer here; rather, evaluate what you may have to consider as this document moves through the long process at ISO headquarters.

Original text	Notable Change	Discussion
Crafts earth	Main grounding/earthing point	The group has apparently always been confused by craft's "earth." We now have a common point, similar to ABYC. This change is made throughout the document.
*Addition*	Self limiting	Like ABYC, the concept has been added to the document and additional overcurrent protection flexibility allowed.
*Addition*	Definition of a "system"	System – All components, conductors and power sources (e.g. batteries, charging sources) considered collectively, that provide, distribute and consume d.c. power.
10% voltage drop	Addition of a 3% voltage drop	Like ABYC, 10133 now includes certain items that are required to have a 3% voltage drop: Panelboard mains, navigation lights and bilge blowers.
Overcurrent protection	Now matches E-11	Exceptions for self-limiting were added as stated above as well as tweaking the wording to match ABYC rules and exceptions.
"Screw clamp" connections	"Screw-clamp terminals or screwless terminal blocks shall clamp conductors to ensure reliable mechanical linkage and electrical contact is properly maintained without bearing directly on conductor strands"	This is now the same as E-11. The screw can no longer bear directly on the conductor.
Drawings	Overcurrent protection	The 7", 40" and 72" drawings were added from E-11 to clarify the location of the overcurrent protection.

## ISO Small craft - Electrical systems - Alternating current installations (ISO 13297:2000)

13297 was actually slated to be published earlier than 10133. ISO has a similar problem that ABYC encountered with our old E-8 (AC) and E-9(DC) standards before our current E-11. Every time a change in one standard affects the other, the group wants to re-open the other standard. This is truly counterproductive and creates a nightmare

for a builder trying to comply. The French have actually submitted a comment to ISO that proposes to merge the two documents. Due to financial issues of processing this proposed combined document ISO is continuing with the separate standards but on the same review cycle. Please keep in mind my caveat above: this is for information only and not intended to detail the upcoming standard for the purposes of engineering changes.

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Crafts earth	Main grounding/earthing point	The group has apparently always been confused by craft's "earth." We now have a common point, similar to ABYC. This change is made throughout the document.
*Addition*	Definition of a "system"	System – All components, conductors and power sources (e.g. batteries, charging sources) considered collectively, that provide, distribute and consume d.c. power.
Residual Current Device (RCD) allows the a.c. ground to not be connected on shore	This is no longer allowed	The group decided that the crafts ground must be attached to shore (with the common exception of an isolation transformer like E-11)
*Addition*	Reverse polarity added	There was no previous requirement for reverse polarity in 13297. Craft fitted with Isolation or Polarization transformers or an unpolarized system are exceptions.
Residual Current Device (RCD)	GFCI's OR RCD's could be used (an either/or situation)	The way the standard reads now, a builder can use the US ELCI (equipment leakage circuit interrupter, really an RCD) for export. There is no allowance for GFCI's to substitute the use of an RCD. Now both E-11 and 13297 require whole boat protection in this area.
"Screw clamp" connections	"Screw-clamp terminals or screwless terminal blocks shall clamp conductors to ensure reliable mechanical linkage and electrical contact is properly maintained without bearing directly on conductor strands"	This is now the same as E-11. The screw can no longer bear directly on the conductor.
*Addition*	Inverters & inverter/chargers	This is a new addition to 13297. The corresponding requirements from ABYC A-31 Battery Chargers and Inverters has been added. There are no real surprises here if you are familiar with A-31 and E-11. NOTE: the "break before make" connection is still in force in 13297. The intent is to add an annex once ABYC is done with our document outlining "load sharing." Stay tuned for July's supplement (we hope!).
*Addition*	Diagrams	Some of these will look very familiar with an ISO flavor. E-11 and A-31 drawings were modified to suit the new 13297.

## Final thoughts

We at ABYC are under a constant mandate to harmonize standards where possible. The new 10133 and 13297 are a "perfect storm" scenario when attempting to carry out this mandate. We did a complete study on E-11 vs 10133 and 13297. Following this, we submitted comments on the differences between the U.S. and EU standards. Through several meetings we were able to agree,

on both sides, that bringing the standards as close as possible is the right thing to do. I am very happy with the work the group has completed and look forward to the final Draft International Standard being released in the next several months.

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