Requirements in Annex 33B v102

> **Info (not part of baseline)**
>
> Annex 33B contains a key requirement for PSEs to meet system unbalance. This requirement really belongs in the main text, not buried in an Annex. Conversely, there are a number of 'shalls' in 33B that should not be requirements, but guidelines on how to measure.
>
> It took us a while to get it right, but the $I_{Con-2P-unb}$ requirement in 33.3.8.10 for the PD is pretty good. It indicates that a PD (the DUT) may not exceed $I_{Con-2P-unb}$ when connected to a certain source, with certain unbalanced source impedance.
>
> What we need for the PSE section is the mirror image of this. The PSE shall not source more than $I_{Con-2P-unb}$, when connected to such and such PD, given a certain unbalanced channel in between. The right place for this is 33.2.8.4.1. This section contains an equation for R_{PSE_max} and R_{PSE_min}. These are internal parameters to the PSE and I doubt we really need these. For now I leave them untouched.

33.2.8.4.1 PSE PI pair-to-pair resistance and current unbalance

Add the following material to this section at the end:

A Type 3 or Type 4 PSE shall not exceed $I_{Con-2P-unb}$ on any pair, when connected to a load that draws P_{Class_PD} through load resistances R_{load_min} and R_{load_max}, defined in Table 33–19a. An overview of how to connect the system to measure $I_{Con-2P-unb}$ is defined in Figure 33–25a.
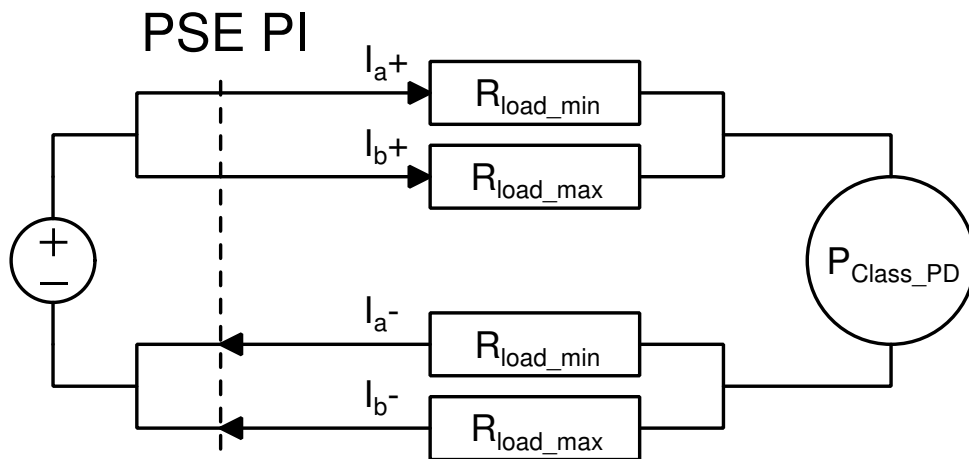

Figure 33–25a — PSE measurement setup for $I_{Con-2P-unb}$

Table 33–19a — R_{load_min} and R_{load_max} at low and high channel resistance

PSE Class	R_{load_min} (Ω)	R_{load_max} (Ω)
Low channel resistance condition		
5	0.723	1.628
6	0.623	1.289
7	0.590	1.090
8	0.544	0.975
High channel resistance condition		
5	5.920	7.190
6	5.780	7.000
7	5.710	6.870
8	5.650	6.790

Annex 33B

Replace 33B.1 as follows:

33B.1 Introduction

End to end pair-to-pair resistance/current unbalance refers to current differences in powered pairs of the same polarity. Current unbalance can occur in positive and negative powered pairs when a PSE uses all four pairs to deliver power to a PD..

$I_{Con-2P-unb}$ and Equation (33–15) are specified for total channel common mode pair resistance from 0.2 Ω to 12.5 Ω and worst case unbalance contribution by a PD. When the PSE is tested for channel common mode resistance less than 0.2 Ω, i.e. 0 Ω< $R_{Chan-2P}$ < 0.2 Ω, the PSE is tested with ($R_{load\_min} - R_{Chan-2P}$) and ($R_{load\_max} - R_{Chan-2P}$) to meet $I_{Con-2P-unb}$ requirements and R_{PSE_min} and R_{PSE_max} conformance to Equation (33–15). The values of R_{load_min} and R_{load_max} are defined in Table 33–19a.

Measurement methods to determine R_{PSE_max}, R_{PSE_min}, and $I_{Con-2P-unb}$ are defined in 33B.2, 33B.3 and 33B.4.

33B.3 Effective PSE resistance R_{PSE} measurement

Change the last sentence as follows:

The effective resistance test method applies to the general case. If pair-to-pair balance is actively controlled in a manner that changes effective resistance to achieve balance, then the current unbalance measurement method described in 33B.4 ~~shall~~ can be used.

33B.4 Current unbalance measurement

> **Info (not part of baseline)**
>
> The 'shall' here is a repeat of the ex-shall in the introduction, which now resides in 33.2.8.4.1.

The following method may be used if the internal PSE circuits are not accessible or if the PSE is using active or passive current balancing circuitry that results in a variable effective resistance to control current unbal- ance. ~~The current unbalance requirement shall be met for any pairs of the same polarity and with the load resistances per Table 33B–1.~~

Remove 33B.5 PICS subsection.