

A-Core Container

Energy storage system loss during charging and discharging



Overview

Are EV battery losses localized in EV charging and discharging?

The results presented in section 4 show that losses are highly localized whether in EV charging or in GIV charging and discharging. Loss in the battery and in PEU depends on both current and battery SOC. Quantitatively, the PEU is responsible for the largest amount of loss, which varies widely based on the two aforementioned factors.

What is the balanced charging/discharging power?

The balanced charging/discharging power is approximately 52 W. By comparison of Fig. 6 and Fig. 8 (b), it can be seen that the balanced power is still lower than that under the equal flow rate. It is noted that the initial charging power decreases to approximately 130 W, owing to the reduction of the charging flow rate.

What causes a change in charging power and discharging power?

The variations of the charging power and discharging power are presented in Fig. 6. The variation is mainly caused by the change in the heat transfer temperature difference between the ESU and the water. For an initial temperature of 20 °C, the temperature of the ESU increases, and gradually becomes stable.

What is the percentage charging loss for a 10amp battery?

According to , for low currents charging and discharging battery losses are equal, while for higher currents, the discharging losses are approximately 10% more compared to the charging losses. Therefore, the battery percentage charging losses for 10Amps are 0.64%, and for 70Amps are 2.9%.

What is the difference between charging and discharging?

Generally, with some exceptions, percentage losses are higher at lower current, more consistently for charging than discharging. Some very high

losses are found at low SOC (again, with exceptions). For charging, generally the higher efficiencies are achieved at higher SOC and higher current.

How can balanced charging/discharging be reduced?

The balanced charging/discharging can be reduced if either the charging flow rate or the discharging flow rate is decreased by comparing Fig. 6, Fig. 7 (b), and Fig. 8 (b). But the time duration to reach stable states is all around 7500 s for the system under the three flow rate combinations.

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