

**Technical advice regarding charging process of LiFePO<sub>4</sub> batteries for MPC4 Battery Chargers.  
Regarding the DBL (1050(/3AC), 1200(/3AC), 1600(/3AC).**

July 20, 2016

Dear Sir or Madam,

The Deutronic DBL-MPC4 series of battery chargers for 12VDC on-board electronic systems have been developed for both external electrical supply and charging of lead acid / Gel / AGM / VRLA starter batteries.

Due to the fact that the integrated measuring circuits in the device are regardless of the circuit of voltage generation, a regulation of power and voltage takes place constantly including a continuous functional check within the stated tolerances. The redundant OVP control (Over Voltage Protection) prevents the occurrence of output voltages that could be harmful for the on-board electronic system.

**A) Equipment testing in an external electrical supply application and charging of lead-acid batteries:**

The device tolerances specified in the DBL-MPC4 data sheet are sufficiently dimensioned based on a typical voltage curve for a lead-acid battery during a charging or discharging process. It is not necessary to regularly check the measurement accuracy and control accuracy.

**B) Application with charging of LiFePO<sub>4</sub> batteries:**

The accuracy requirements for charging technology regarding measurement and control technology have changed significantly with the introduction of Lithium Iron Phosphate batteries for 12 VDC on-board electronic systems. This change is due to the completely different chemical characteristics of the LiFePO<sub>4</sub> batteries which have a significantly flattened voltage characteristic - nearly on the whole SoC (State of Charge) range of the battery.

**Example:**

A LiFePO<sub>4</sub> battery SoC range moves from 30% up to 90% within the voltage range of 13,00V up to 13,28V. A technically perfect DBL1200-14 complies with the data sheet tolerances (of „2% over all“) can reach a possible deviation of up to 340...400mV with a dimensioned voltage measurement range of up to ~20VDC (17 VDC plus additional tolerances).

## Recommendation:

Due to the high accuracy required in the manufacturing process when using LiFePO<sub>4</sub> batteries in 12VDC on-board electronic systems, we recommend that the measurement and control of the Deutronic MPC4 battery charger be checked periodically (recommendation: annually).

This service can be carried out by Deutronic.

Functionality and electrical safety of the battery chargers – whether as external electrical supply and lead-acid charging applications - are independent of the periodical check advised here.

## Reference:

DBL-MPC4 battery chargers have the capability of charging LiFePO<sub>4</sub> batteries with a firmware update in conjunction with calibration of the charger. Moreover the devices are able to automatically distinguish between lead-acid and LiFePO<sub>4</sub> batteries.

This technology developed by Deutronic has been used on industrial application since 2013.

Not all MPC4 battery chargers are suitable for the detection and charging of LiFePO<sub>4</sub> batteries. Please do not hesitate to contact us for further information.

Furthermore, we recommend the use of Deutronic battery chargers with a high charging performance (such as DBL1600) because of the typical LiFePO<sub>4</sub> technology (significantly increased charging acceptance compared with lead-acid batteries with comparable capacity).

Yours faithfully,

Deutronic Elektronik GmbH