

<b>Examination Procedure</b>  Rubrik / Title <b>Acceptance test – Stationary Batteries valve regulated types</b>	Beteckning / Document <b>KBE EP-128:2</b>
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## 1 Scope

This examination procedure applies to valve regulated (AGM) lead-acid batteries designed for connection to a load and a rectifier.

## 2 Objective

Through tests verify the ability of a battery to handle in TS (Technical Specification) specified load to verify the battery capacity and to establish the spread in important cell parameters.

The test results are to be used as reference values during commissioning tests and warranty claims.

## 3 Method

### 3.1 General

Acceptance Test shall be carried out at the Manufacturer/Vendor site whom shall be responsible for the required equipment and personnel.

The following standard shall be adhered to where applicable unless otherwise prescribed below or in the TS:

IEC 60896-21      Stationary lead acid batteries - Part 21: Valve regulated types  
– Methods of test

IEC 60896-22      Stationary lead acid batteries - Part 21: Valve regulated types  
– Requirements

#### Scope of test:

- Test of suitability for floating battery operation in accordance with section 3.2 in this document.
- Capacity test in accordance with section 3.3 in this document.
- Load profile test in accordance with section 3.4 in this document.

Cells shall be marked in accordance with regulations specified in TBE 113:2 for cell numbering and connected in numerical order.

The Purchaser shall be called to witness all types of delivery tests. Official test report shall be compiled by the Manufacturer/Vendor and approved by the Purchaser.

Batteries to be tested shall be fully charged and have been subject to production inspection by the Manufacturer. The various parts of the battery shall be connected electrically using connections of the same type as those included in the delivery.

The temperature of the Cells should be as close to +20°C as possible when testing begins, and remain between +15°C and +25°C.

## **3.2 Test of suitability for floating battery operation**

### **3.2.1 Implementation**

The cell voltage of a fully charged battery with a constant voltage type charger connected shall be measured.

### **3.2.2 Recording**

Measurements shall be recorded.

## **3.3 Capacity test**

### **3.3.1 Implementation**

Capacity test shall be carried out on a fully-charged battery with a constant five hour current to the final voltage according to the TS. Temperature compensation shall be done according to standard.

### **3.3.2 Recording**

During discharge test, the terminal voltage and the voltages of all cells shall be recorded after 50, 80, 90, 95 and 100% of the discharge time and when the battery 's final voltage is reached. The total test time shall be recorded when the test is terminated.

## **3.4 Load profile test**

### **3.4.1 Implementation**

Load profile test shall be carried out on a fully charged battery with a current according to the load profile specified in the TS.

### **3.4.2 Recording**

Throughout profile test, the terminal voltage and current shall be recorded. The resolution shall be sufficiently high to permit the voltage and current to be read off easily.

Measurement equipment shall have distinct time markings. Maximum and minimum values shall be marked so that they can be easily discerned from the recordings.

The terminal voltage shall also be indicated by display instruments and checked and documented at critical points on the discharge curve.

## **4 Acceptance Criteria**

### **4.1 Test of suitability for floating battery operation**

Cell uniformity shall be approved if the cell voltage deviation is within the limits specified in TBE 113:2.

### **4.2 Capacity test**

After discharge with the five-hour current specified in the TS, the end voltage and acceptance interval shall comply with the stipulations of the TS and TBE 113:2.

### **4.3 Load profile test**

When discharging with the specified load profile, the terminal voltage of the battery must not be less than the minimum voltage specified in the TS.

## **5 Documentation**

Inspection carried out shall be documented by means of an inspection report. Several inspections within one and the same inspection plan may be included in the same document.

The document shall as a minimum include the following:

- Product inspected

Product, designation, quantity, production number and reference to the Purchaser's order number shall be specified.

- Identity

The identity of the product in terms of a type-tested design and/or a specification shall be specified if this identity is not certified in a separate document.

- Examination Procedure

The procedure used for the inspection shall be specified (this Examination Procedure or other procedure agreed upon).

- Measurement equipment

Type of equipment, unit number, calibration data, etc, shall be specified for testing devices, which performance is significant to the results.

- Results

Measured values which are to be documented as per the procedure and any deviations shall be reported.

It shall be evident that the product has met the set requirements.

- Inspector

Date and signature of the inspector responsible.

- Approval

The document shall be examined and approved by the quality assurance function and according to the manufacturer's internal instructions.

Inspections carried out as routine (100%) inspection or sampling inspection with the units supplied shall be reported to the Purchaser with original documents.