EMOB32_MAN_EXT_GB_V401

Picture shows an EMOB32 including MT310s2

ZERA

OPERATING MANUAL

EMOB32

Test case for on-site testing of AC charging stations

Please keep for future use.
Status: 7/03/2023

ZERA

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1. General

Declaration of conformity

Manufacturer

ZERA GmbH

Humboldtstr. 2a

D-53639 Königswinter

Validity of Declaration of conformity

The company ZERA GmbH hereby declares under sole responsibility that the product described below is in conformity with the fundamental requirements of the Directives listed below:

- Product description: Three-phase portable test case
- Type: EMOB32

Declaration of conformity with Directives

The manufacturer declares that the reference meter described above is in conformity with the following directives:

- 2014/30/EU (Electromagnetic Compatibility)
- 2014/35/EU (Low Voltage Directive)

Standards compliance

The reference meter described above comp□ies with the requirements in the following European standards:

- DIN EN 61010-1
- DIN EN 61000-4-2
- DIN EN 61000-4-3
- DIN EN 61000-4-4
- DIN EN 61000-4-5
- DIN EN 61000-4-6
- DIN EN 61000-4-8
- DIN EN 61000-4-11
- DIN EN 55011

About these operating manual

Manufacturer

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Validity and purpose

This operating manual applies to the test case EMOB32 with 300 V (AC) CAT II.

The instructions for use contain the information needed for safe and correct working practices when testing AC charging stations for electric vehicles.

Target readership

This operating manual is intended solely for trained electricians who are additionally qualified to work with live voltages.

Conventions used for hazard notices

Warning Instructions

WARNING

Red lines with text inside mean that if ignored, damage to property or person can occur.

User Information, Hints, References

HINT

Blue lines with text inside provide information, hints and references to further documentation to use.

Text Markings

1. Numbers mark activities, which are to be accomplished in the indicated order.

- Bullets mark general enumerations

2. Safety

General safety instructions

Only electrically skilled person with a minimum age of 18 years having relevant education and experience which enables him/her to perceive risks and to avoid hazard/damage which electricity can create is allowed to operate and maintain the device.

Also observe local safety regulations, generally approved accident prevention regulations and generally approved engineering regulations concerning safety. If the device appears to be damaged or operates abnormally, protection may be impaired. Do not attempt to operate it any further. Report the defects or damages to the supervisor in charge immediately. The operation has to be stopped until defects and damages have been repaired or removed.

It is not allowed to make any modification at the device without prior consultation of ZERA GmbH.

The operating manual must be in close proximity of and accessible to the person operating the device at all times.

Intended use

The EMOB32 is a three-phase portable test case. It is used for on-site testing load of AC charging stations for electric vehicles of different types in battery mode.

In combination with a reference meter of the s2-series (MT310s2 or MT320s2) the test case can be used for:

- Current measurement up to max. 32 A (AC)
- Voltage measurement up to 300 V (AC)

Restrictions on use

The test case must not be used for tests that lie outside the range specified in the technical data. The EMOB32 can only be used in combination with a reference meter of the s2-series from ZERA at AC charging stations for electric vehicles with a charging capacity of max. 22 kW*.

* Operation on a 43 kW charging station is also permissible if the load, which is carried out in accordance with the standards, is reduced to 22 kW operation by using a 32 A connection cable (according to IEC 62196 type 2).

3. Design and function of the test case

Content of the test case and accessories

The scope of delivery depends on the individual order. A delivery note is included with each case. The delivery note tells you what the case contained when shipped. Check against the delivery note that the case contains all the parts listed.

Picture of the test case with a MT310s2 reference meter

Elements of the basic kit

No.	Item
1	Delivery note
2	EMOB32 test case
3	Power supply unit 230 V : 24 V / DC, 1670 mA
4	DC cable extension 0,5 m
5	MT3x0s2 reference meter
6	BM4100 battery module for MT310s2
7	Mobile power supply for battery module BM4100

Accessories, optional

The following accessories are optionally available. According to the conditions and equipment on site, you may need additional connecting cables to the charging station or to the vehicle.

Nr.	Item	Note
1	Explorer Case incl. organizer	Case for separate accessories
2	Charging cable with sense line 2.5 m	For connection of charging station and test case
3	Charging cable with sense line 5 m	For connection of charging station and test case Standard for max. 32 A Optional available for max. 20 A
4	Charging cable with sense line 7.5 m	For connection of charging station and test case Standard for max. 32 A Optional available for max. 20 A
5	Connecting cable 2.5 m	For connection of electric vehicle and test case
6	Electric fan heater, 3 kW	Load to be applied
7	Connecting cable for connecting of max. 3x electric fan heaters with the test case, 2.5 m, plug type 2	For connection of electric fan heater with the test case
7	Microsoft Surface Pro4 tablet including WinSAM 7 and test sequence	For software guided test procedure
8	ProCase protective cover 12“ Grey	For Microsoft Surface Pro4 tablet
9	WinSAM 7 test sequence without installation	For customer PC
10	Half-day training or briefing on the handling and testing with the EMOB32	For a professional and safe handling with the test case and the WinSAM test procedure.

A complete and updated overview of our accessoiries can be found on our webpage:

https://www.zera.de/en/product/test-systems-e-mobility/emob32-test-case/

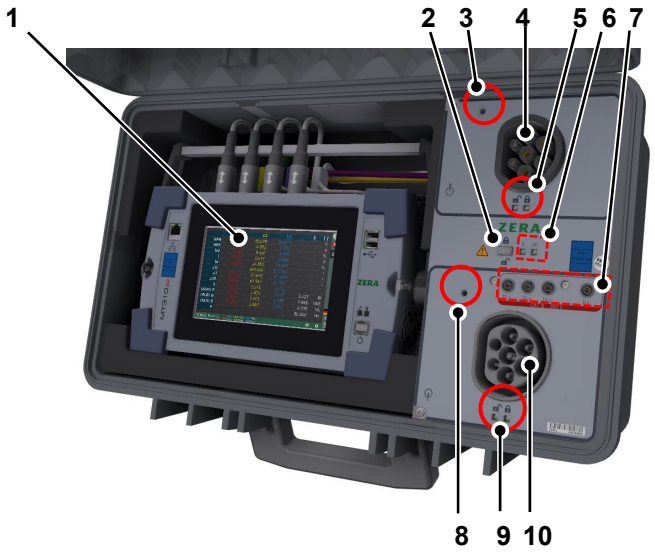
The test case EMOB32

The test case EMOB32 serves for on-site-testing of charging stations by means of a reference meter of the s2-series as well as specified cables for connection of charging station and test case resp. electric vehicle (or an optional load) with the test case.

Functions

- Max. current and voltage measurement (32 A (AC) and 300 V (AC)) of charging stations during the charging procedure in combination with a reference meter of the s2-series (MT3x0s2)
- Checking the cables for correct connection and type
- Accuracy measurement 0.1 %

Indicators and connections



No.	Meaning	
1	Free space for the reference meter (here: MT310s2, permanently connected with the test case)	
2	Button for locking/unlocking mechanism **Press** = Release of the locking resp. unlocking mechanism of points 4 and 10.	
3	Opening for emergency release for point 4	
4	Connection with the electric vehicle resp. the required load (for example a fan heater), plug type 2	
5/9	**LED indicator for interlock status (padlock symbol)**	
	Indication	***Meaning***
	LED off	Interlock open, no cable connected
	LED Green	Interlock open, cable according to IEC 62196 detected
	LED Red & Green	Interlocking oder unlocking process is running
	LED Red	Interlock is closed
	LED Red & Green are lighting up simultaneously	Malfunction of the interlock mechanism, cable not connected properly

6	**LED indicator for the EMOB32 status**	
	Indication	***Meaning***
	P (Power)	*Power supply of the EMOB32*
	LED Green	Power supply available
	LED Red	No power supply available
	LED Blue flashing	Firmware update
	R (Ready)	*Ready for operation*
	LED Green	Device is ready for use
	LED Red	No measurement possible, error message (for example due to inadmissible cable constellation, overcurrent)
	LED Red flashing	No measurement possible, internal hardware malfunction
7	Voltage connection U_{L1}, U_{L2}, U_{L3} and U_N for high accurate measuring of the voltage via sense line	
8	Opening for emergency release for point 10	
10	Connection with the charging station for electric vehicles acc. to the standard IEC 62196 type 2	

Emergency release

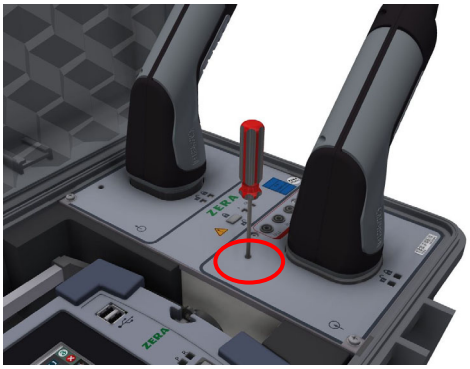
WARNING

In case of insufficient power supply to the EMOB32 or failure of the MT3x0s2 battery pack, the locking mechanism can be opened mechanically via an emergency release.

In case of a power failure, open the locking mechanism as follows:

Emergency release connection point electric vehicle

1. Choose a suitable cross-head screwdriver and and place it vertically inside the small opening next to the connection point for the electric vehicle (point 3, page 9)
2. Push the screwdriver carefully downwards until the plug releases.



Emergency release connection point charging station

Follow the steps described abouve for this connection point (point 8, page 9).

Technical Data

General	
Temperature range, operation	-10° … + 40° C
Relative humidity (not condensing)	10 ... 90 %
Safety	
Declaration of conformity	CE conform
Overvoltage category current measurement	CAT II 300 V
Voltage Measurement	
Voltage range(s) 23)	250 V, 8 V, 100 mV
Voltage measurement accuracy 23)	< 0.05 % @ 30 ... 300 V < 0.5 % @ 10 mV ... < 30 V < 1 % @ 2 mV … < 10 mV
Current measurement AC	
Fundamental frequency	45 ... 65 Hz
Current measurement	10 mA … 32 A
Current range(s) 23)	50 A, 10 A, 5 A, 1 A, 500 mA, 100 mA, 50 mA
Current measurement accuracy 23)	< 0.05 % @ 32 A .. 100mA < 0.1 % @ 100 mA ... 20 mA
Angle measurement accuracy 23)	< 0.015 ° @ 32 A .. 100mA < 0.03 ° @ 100mA .. 20 mA
Maximum current	32 A ~
Current channels surge current capability	63 A (1 min)
Power Measurement AC	
Power/energy measurement accuracy 23)	< 0.1 % @ 32 A .. 100 mA < 0.15 % @ 100 mA ... 20 mA

23: In connection with MT310s2

20.06.2022

Subjects to alteration.

4. Testing

Connection example: Testing during the charging process

Perform a test

Requirement

It is required to use a reference meter MT3x0s2 including battery pack BM4100 for testing according to regulations.

HINT

Make sure that the battery pack BM4100 is fully charged and connected with the MT3x0s2 appropriately. Further information can be found in the external operating manual of the MT3x0s2.

Connection options

HINWEIS

An example for connection the EMOB32 can be found her: https://vimeo.com/566058793

Due to the different conditions and equipment on-site, the following connection options may be required:

Example 1 - Connection with a load, charging station without permanently connected cable

1. First connect the charging cable (incl. sense line) with the test case (point 5, page 9).

   Plug the additional voltage connection of the sense line from the charging cable with the voltage terminal of the test case (point 4, page 9).
2. Connect the cable for the load connection with the test case (point 3, page 9).
3. Connect the cable with the load.
4. Finally connect the charging cable with the charging station.

Example 2 – Connection with a load, charging station with permanently connected cable

1. First connect the charging cable for the load connection with the test case (point 3, page 9).
2. Connect the cable with the load.
3. Finally connect the charging cable of the charging station with the test case (point 5,page 9).

Example 3 - Connection with an electric vehicle, charging station <u>without</u> permanently connected cable

1. First connect the charging cable (incl. sense line) with the test case (point 5, page 9).

   Plug the additional voltage connection of the sense line from the charging cable with the voltage terminal of the test case (point 4, page 9).
2. Connect the cable for the electric vehicle connection with the test case (point 3, page 9).
3. Connect the cable with the electric vehicle.
4. Finally connect the charging cable with the charging station.

Example 4 - Connection with an electric vehicle, charging station <u>with</u> permanently connected cable

1. Connect the cable for the electric vehicle connection with the test case (point 3, page 9).
2. Connect the cable with the electric vehicle.
3. Finally connect the charging cable of the charging station with the test case (point 5, page 9).

Types of testing

There are different types of testing:

- Manually controlled testing
- Guided testing via WinSAM test sequence

Procedure for a manually controlled testing

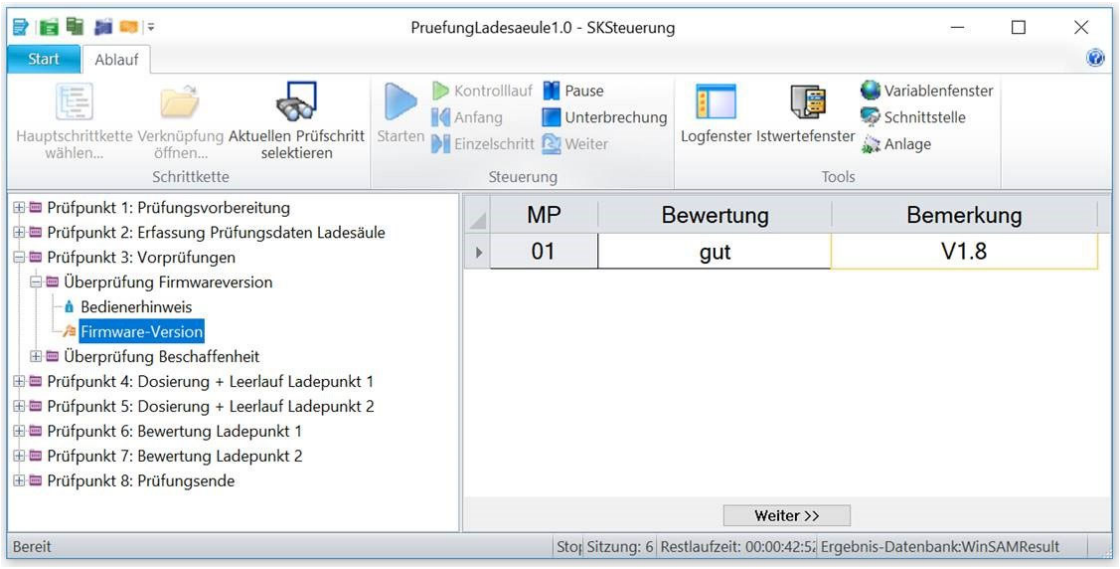
For performing a manually controlled testing proceed as follows:

1. Connect the test case, the electric vehicle resp. the load and the charging station as described on the previous pages.
2. Start the MT3x0s2 and wait until the LED indicators P and R at the device turns to green.
3. Now start the energy comparison as described in the operating manual of the MT3x0s2 chapter *The measuring functions → Energy comparison*.
4. To finalize a testing procedure, disconnect the cables in reversed order (see previous pages, points 4 resp. 3 up to 1) and switch off the MT3x0s2.

Procedure for a guided testing via WinSAM test sequence

1. Connect the test case, the electric vehicle resp. the load and the charging station as described on the previous pages.
2. Start the tablet or notebook.
3. Start the test sequence by double-click to the Icon *Test sequence charging station* on your desktop.

4. Start the predefined test sequence.



5. Follow the instructions/hints appearing on the screen until you have passed the complete testing procedure.
6. To finalize a testing procedure, disconnect the cables in reversed order (see previous pages, points 4 resp. 3 up to 1) and switch off the MT3x0s2.

5. Service

In case of technical questions, please contact our service department along with the following information:

Serial number of the equipment

Detailed description of the problem

Phone +49 (0)2244 / 9277 - 169

E-mail service@zera.de