Installation routine test summary

This is a sample installation routine test report that was produced as an annex to the Guidelines.

Version	Creation date	Description	Author
1.0	05-96-2023	Final first version	D. Widmer, G. Hribar

Traction unit	EVN of the unit where the sensors are installed	

Sensor AC current	Type	
	Serial number (S/N):	

Sensor AC voltage	Type	
	Serial number (S/N):	

Sensor DC current	Type	
	Serial number (S/N):	

Sensor DC voltage	Type	
	Serial number (S/N):	

DHS	Type	
	Serial number (S/N):	

If all tests are successful, the DHS is ready to be used.

Routine test completed successfully	YES	NO
Date and time of inspection		
Inspection site name		
Signature		
Additional comments		

Installation routine test procedure

This document describes the routine test protocol for the DHS system, based on EN 50463-5.

Step	Action	Expected result	OK/NOK
1.1.	Switch the train in mode SHUTDOWN	Train is in mode SHUTDOWN	

General safety requirements

Check that any measures regarding the general safety requirements identified during the installation design review are correctly implemented.

Step	Action	Expected result	OK/NOK
2.1.	Check if installation of energy meter and energy sensor is in accordance with installation design.	Installation in accordance with installation design.	

Visual inspection

Check that the EMS equipment type and traction unit are in accordance with the type reported in the Conformity Assessment File. Carry out a visual inspection in accordance with EN 50155:2017, 13.4.1. Check if EMS equipment type has been installed in accordance with the installation design and installation procedures.

Attention: follow workshop procedures/work-instructions for inspection on and near high-voltage installations.

Step	Action	Expected result	OK/NOK
3.1.	Check if the right type of energy meter is placed	Type in accordance with installation design.	
3.2.	Check if the energy meter is correctly placed	Installation in accordance with installation design.	
3.3.	Check if the right type of sensors is placed	Type in accordance with installation design.	
3.4.	Check that the sensors are correctly installed,	Installation in accordance with installation design.	
3.5.	Check the cabling of the meter	Installation in accordance with installation design.	
3.6.	Check the cabling of the sensors, especially the polarity of the sensors power supply (if applicable)	Installation in accordance with installation design.	

Power-up

Energize the power supply to the EMS and check that the EMS reaches operational status in accordance with EN 50463-1:2017, 4.2.3.2. (The EMS shall achieve operational status and be ready to measure energy within 60 s after application of power to the EMS.)

Step	Action	Expected result	OK/NOK
4.1.	Power up the vehicle		
4.2.	Start measuring time when the vehicle is powered up	Train is in mode READY or OPERATE	
4.3.	Check: DHS Status		
4.4.	Stop measuring time when DHS is operational	Measured time < 60 s	

Power-down

Energize the IUA with all external equipment. Initiate an intentional power down of the power supply used by the EMS and check the EMS has successfully powered down in accordance with EN 504631:2017, 4.2.3.3. (In the event of intentional loss of power to the EMS, no CEBD and other data shall be lost. Unintentional loss of power shall not affect data stored in the EMS. NOTE The EMS could include a procedure for transmitting all unsent CEBD to DCS)

Step	Action	Expected result	OK/NOK
5.1.	Power off the DHS	DHS is powered off	
5.2.	Wait at least 1 minute		
5.3.	Power on the DHS	DHS is operational again	
5.4.	Download the log file / Check DCS	Log file is downloaded	
5.4.	Check in the logfile / DCS that the DHS has powered down and powered up again with no failure messages	DHS logfile should indicate that no measured data has been lost	

Traction supply system change

Apply the input signals to the EMS, check that traction supply system change is detected in accordance with EN 50463-1:2017, 4.2.5.1.
NOTE If the same device is used for different traction supply systems, it is sufficient to perform one traction supply system change.

Step	Action	Measurements are taken without interruption	OK/NOK
6.1.	Perform one traction supply system change.	Measurements are taken without interruption	

Protection from non-authorized access

Check that the measures for protection from non-authorized access identified during the installation design review are implemented and functioning.

Step	Action	Expected result	OK/NOK
7.1.	Check if installation of energy meter and energy sensor is in accordance with installation design. And check if measures for protection from nonauthorized access (e.g., seal) are functional.	Installation in accordance with installation design. All measures for protection from non-authorized access are functional.	

Indicator

Check if the required indicators are functioning correctly.
The indicators shall be checked in the internal diagnostic system of the DHS energy-meter.

Step	Action	Expected result	OK/NOK
8.1.	Vehicle in mode READY or OPERATE	Vehicle in mode READY or OPERATE	
8.2.	Check: DHS Status / indicators	Indicators should be …	

EMS data flow test

Provide signals to each of the EMS inputs and check that all devices are functioning and CEBD is stored in the DHS. Check that CEBD in the DHS is available through the local service port. Initiate data export from the DHS to a DCS and check that transfer is successful. Check that the DHS is accessible from the DCS.
NOTE The DCS can be the actual or a simulated one.

Step	Action	Expected result	OK/NOK
9.1.	Trainset should be in mode READY or OPERATE	Train is in mode READY or OPERATE	
9.2.	Trainset should be in READY or OPERATE for at least one period when sending data (e.g., 30 min if sending data each 30 minutes)		
9.3.	Check in the DHS log file, that the last CEBD file has been sent successfully to the DCS OR check on the DCS for the measurements	Log file indicates a successful transfer OR data available on the server	
9.4.	Check data, that the reading corresponds to the expected values.	Results indicates correctly stored energy measurement values.	

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