

Test report - Dry heat test

Summary:

Test report for 55°C dry heat testing of GalaxyVM 200kVA. Test setup in accordance with DNV2.4 "Standard for Certification" section 3.7. Test is performed at Schneider Electric ITB in Kolding/Denmark and is witnessed by DNV.

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1	15/08/2014	CAA	Test report made

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1. CONCLUSION

Two tests were carried out and passed

	Test 1	Test 2
Test result	PASS	PASS
Ambient temperature:	45°C	55°C
Loading of system	The system was loaded to maximum input current (~345A). An internal current limiter prevent higher loadings	The system was loaded to maximum output power at power factor 1
Mode of operation:	Inverter output operation with charging of batteries	Inverter output operation
Voltage:	380V, 50Hz	380V, 50Hz
Power factor:	0.9	1.0
Output power:	200kVA	180kW
Battery charge power:	35kW	0
Relative humidity:	<55%RH	<55%RH
Test duration:	16 hours	16 hours
Observations made during the test	The system remained in inverter operation during the entire test. All parts of the product worked as intended before, during and after the test.	The system remained in inverter operation during the entire test. All parts of the product worked as intended before, during and after the test.

This test was witnessed by DNV represented by Principal Surveyor Leif Rasmussen from Fredericia Maritime

Test date:

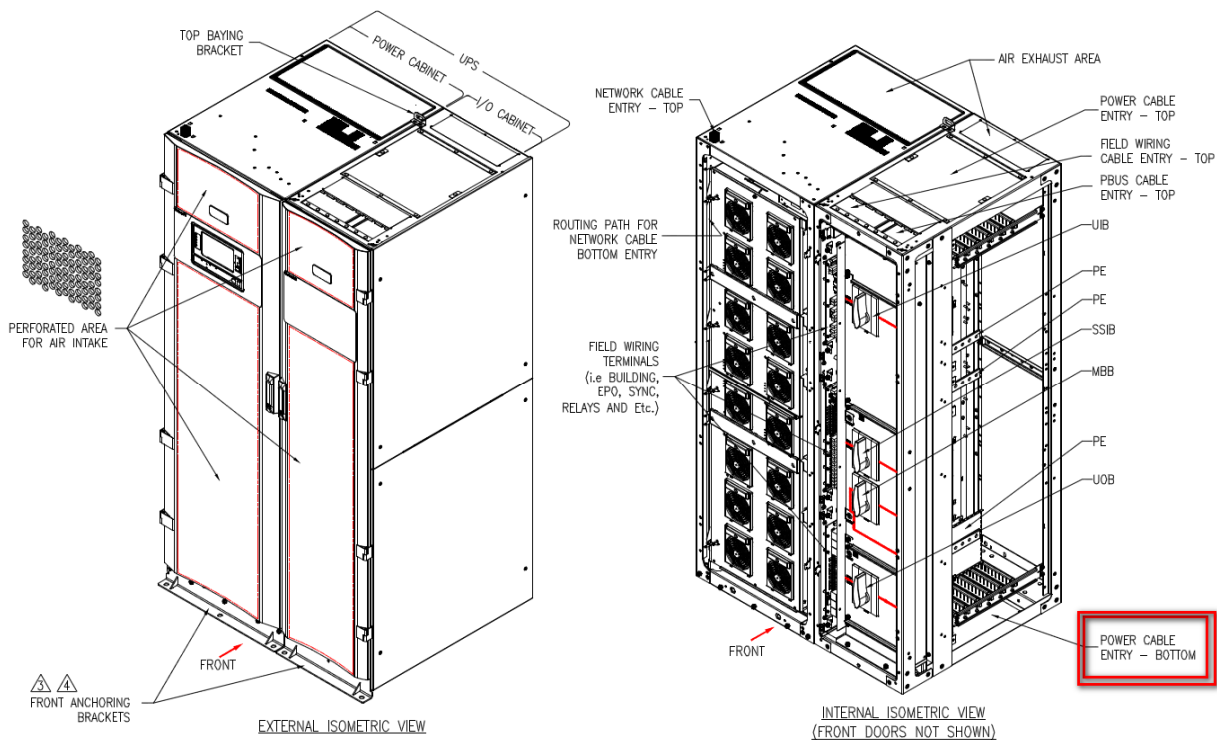
Signature and stamp.

2. TEST LOCATION

*	Company name	Schneider Electric
*	Address	Silcon Allé 1
*	City	Kolding
*	Zip code	6000
*	Country	Denmark
*	Tel.:	72170286
*	Contact person	Claus Andersen/ Preben Bonde
*	E-mail:	claus.andersen@schneider-electric.com , preben.bonde@schneider-electric.com

3. TEST OBJECT

Name of test item	Galaxy VM 200 kVA UPS Single 400-400V
Model / type	GVMSB200KHS consisting of two cabinets bayed together: IO cabinet Power cabinet
Part no.	IO cabinet: OG-GVM200KH Power cabinet: OG-VMPB200K225D
Serial no.	IO cabinet: ID1329000154 Power cabinet: ID1324000003
Manufacturer	Schneider Electric – India
Weight	724kg
Dimensions	1970, 1052, 854mm



4. TEST SETUP

The test is setup in a thermal chamber.

IP32 roof is fitted on top

Ambient temperature is logged with sensors that are located at top, center and bottom.



Figure 1. Test setup in thermal chamber.



Figure 2. Sensors location for ambient temperature.

5. TEST RESULTS

All test results and associated files are located here

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6. MEASUREMENT EQUIPMENT

Temperature was logged with an Agilent 34970A datalogger coupled with type K thermocouples

Current and voltage was measured with a YOKOGAWA WT1600 digital power meter.



Figure 3. Equipment used for the test

7. FUNCTIONAL VERIFICATION BEFORE THE TEST

Start up the unit and verify:

- Display function & Mimic function
- Inverter operation
- Requested bypass
- Service bypass

8. CRITERIA FOR COMPLIANCE

The unit shall remain in inverter operation throughout the test.

The test object shall not become dangerous or unsafe as a result of the application of the tests.

At the end of the test verify

- Display function & Mimic function
- Inverter operation
- Requested bypass
- Service bypass

A. DNV2.4 – TEST 3.7

3.7 Dry Heat Test

3.7.1 General

This test serves to demonstrate that under the influence of dry heat, no damage is caused to the EUT and no permanent or temporary malfunctions occur.

3.7.1.1 Chamber Temperature and Humidity Measurement

The chamber is to be so constructed that the specified conditions in the working space can be maintained within the tolerances given. The conditions at any point of the working space are to be uniform and as similar as possible to those prevailing in the immediate vicinity of temperature and humidity sensing devices installed. These devices are to be located at such a distance from the , that the effect of dissipation is negligible.

3.7.1.2 Air Flow

Forced convection in the chamber is to not be used when testing heat generating specimen.

3.7.2 Test Procedure

Basis: IEC publication 60068-2-2, Tests Bb and Bd.

3.7.2.1 Preconditioning

Prior to the dry heat test the EUT is to be visually inspected, electrically and mechanically checked and has been subject to performance tests at normal ambient conditions in accordance with the relevant test programme.

3.7.2.2 Temperature Cycle

After the preconditioning time, the temperature cycle is started at normal ambient temperature T_N and run as shown in Fig. 3.3.

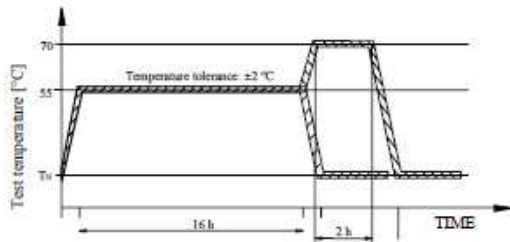


Figure 3-3
Dry heat, temperature cycle

The rate of change of temperature when the chamber temperature is shifted from one level to another, is normally limited by the thermal time constant of the EUT. The EUT is to be in thermal equilibrium with its surroundings during this period to enable reproducible performance tests to be carried out as specified in the relevant test programme. If no performance testing is required during this period, the maximum rate of

change of temperature is 1°C per min. average over a period of not more than 5 minutes.

Normal power supply for the particular specimen is to be applied in the temperature rise and temperature fall intervals. Unless otherwise stated in the relevant test programme, the most unfavourable power supply for the particular specimen is to be applied in the test temperature interval.

3.7.2.3 Performance Tests

During the last hour of the upper test temperature interval, performance testing according to the relevant test programme is to be carried out.

After completion of the complete test cycle the EUT is to be kept at normal ambient conditions and fed by normal power supply for performance testing under load according to the relevant test programme.

3.7.2.4 Test Levels

Relative humidity: RH = max. 55%.

Table 3-10 Upper test levels according to temperature class		
Class	Test temperature	Test duration
A	55°C	16 hours
B	70°C	16 hours at 55°C + 2 hours at 70°C
C	55°C	16 hours
D	70°C	16 hours at 55°C + 2 hours at 70°C

The lower test levels for the different temperature classes specified in this test, are given in 3.9, Cold Test.

For environmental testing according to temperature class A or B, cold test may be required. This is to be specified in the relevant test programme. For environmental testing according to temperature class C or D, cold test will always be required.

3.7.2.5 Tolerances

Temperature: $\pm 2^\circ \text{C}$.

Relative humidity: $\pm 10\%$.

3.7.3 Test Result

The test is deemed to have been passed if the specified functions are demonstrated, the results fall within the specified tolerance limits and no damage to the EUT is detected.