

Surveillance tests for mass products bearing a LOVAG Mark

Inspection and follow-up instructions

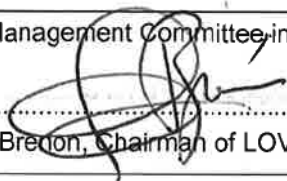
General

A – The inspection procedure for the annual visit at the holder's premises is common to all the products listed with the Mark.

B – The sampling criteria and test frequency are specific for every product IEC Standard

1. Inspection procedure

- At each visit to the holder's premises the CB representative shall see the entire lot of product listed with the Mark. All premises, where the product or parts of the products are manufactured shall be inspected. Basis of the inspection are the entire LOVAG test report and a detailed product description with reference to drawings, materials and critical components.
- The sampling has to be done at the whole process of manufacturing.
- Sample for visual inspection shall be preferably selected from the production line. A careful inspection shall be carried out on the most critical components.
- The CB representative shall ask the holder to list any change introduced in his current product compared with the product which has granted the Mark.
- The CB representative shall evaluate the influences of the changes on the performances. Provisions of the standard regarding construction changes have to be taken into consideration.
- The CB representative shall take into consideration the changes, if any, of the current IEC Standard compared with the Standard which has been applied to grant the Mark
- If the CB representative deems that the changes to the product or/and to the IEC Standard may affect the performances, a suitable test programme shall be scheduled and witnessed by the CB representative. Also changing the location of manufacturing of the product line or parts hereof has to cause an inspection. In this case some testing should be performed.

<p>LOVAG OD 03-02 Edition 1.1</p>	<p>Approved by LOVAG Management Committee in April 2013</p> <p>Signed: </p> <p>Michel Breton, Chairman of LOVAG</p>
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2. Sampling criteria and test requirements

- In the following sampling requirements are specified for the different products which the LOVAG Mark is applicable.
- If a LOVAG MSS is installed, his evaluations should be taken into account with the aim of demonstrating that current production is in compliance with applicable standards. For this purpose, test reports, quality reports and manufacturing documentation can be submitted to CB for approval.

2.1 Circuit breakers - IEC 60947-2 (2006-05)

2.1.1 Sampling criteria

- The number of samples for testing shall be in accordance with Table 10 of the a.m. Standard

2.1.2 Test frequency

- The test repetition rate shall be

Rated current	Minimum annual production units (1)	Test sequence (2) (3)	Frequency
$I_n \leq 100A$	25000	Full compliance	12 months
$100 < I_n \leq 250A$	12000		18 months
$250 < I_n \leq 1250A$	3000		24 months
$I_n > 1250A$	1000		36 months

- Notes:**
- 1) For lower annual production the frequency can be reduced
 - 2) For sequences II, III, IV, V and VI to be tested 1 sample of the maximum rated current at one rated voltage
 - 3) Different ratings (e.g. different rated voltage and different rated short circuit current) and different versions (e.g. three/four poles, drawable/fixed) shall be taken into consideration by scheduling the follow-up sessions when the LOVAG Mark is granted

2.2 Switches, disconnectors, switch-disconnectors, fuse-combination units - IEC 60947-3 (2008-08)

2.2.1 Sampling criteria

- The number of samples for testing shall be in accordance with the following relevant tables of the test sequences of the a.m. standard: Table 10, Table 13, Table 14, Table 15 and Table 16.
- The provisions of clause 8.3.2 of the a.m. standard regarding the simplified test procedure for equipment having the same fundamental design, can be applied.

2.2.2 Test repetition rate

- The test repetition rate takes into account the number of products sold to the market.

The minimum rate should not exceed 36 months.

- The test repetition rate shall be as follows:

Rated current	Test sequence	Frequency
$I_n \leq 630A$	Full compliance	24 months
$I_n > 630A$		36 months

Notes:

- (1) A maximum 6 months variation can be accepted in case a product modification is operated during the 18 months period.
- (2) Choice between sequence III and sequence IV depends on the manufacturer's statement regarding short-circuit making capacity and conditional short-circuit current.
- (3) EMC tests concern equipment incorporating electronic circuits.
- (4) Where the equipment is for direct switching of a single motor, provisions of Annex A are applicable.

2.3 Low voltage power switchgear and controlgear assembly – IEC 61439-2

General

The manufacturer for each LOVAG Marked assembly, or each LOVAG Marked batch of identical assemblies, shall issue an assessment report which confirms the compliance of the products with the IEC 61439-2 standard with reference to the test, calculations and design rules reports on which is based the license for LOVAG Mark use (forms are given in Appendix:1). This report is not requested for the assemblies listed in the license (e.g. the Assemblies identified by a product code).

2.3.1 Sampling criteria

At least one sample under assembling process and one fully assembled shall be available during the factory inspections; these samples shall be as much as possible representative of the products under license.

2.3.2 Test frequency

- During the factory inspection, the a.m. assessment reports issued by the manufacturer shall be verified by the CB; if a LOVAG MSS is installed, the results of his verifications can be taken into consideration.
- It shall be verified, on the sample under assembly, the quality of the assembling process and the use of the same materials and components assembled on the samples tested.
- A routine test program shall be carried out on the sample fully assembled.
- The repetition of the tests, of the calculation and of the verification based on design rules shall be carried out when design, components, process or the product standard are changed.

If a LOVAG MSS is installed, his evaluations, regarding the influence of the modifications On the performances, can be taken into consideration.

Low-voltage switchgear assembly assessment report⁽¹⁾

Assembly under assessment: Designation	IEC 61439-2 2nd Edition
TYPE DESIGNATION ⁽²⁾ :	IDENTIFICATION ⁽³⁾ :

Assembly under assessment: Characteristics⁽⁴⁾												
Un	Rated voltage (of the ASSEMBLY)	_____	V									
Ue	Rated operational voltages (of the circuits of the ASSEMBLY)	___/___/___	V									
Ui	Rated insulation voltages (of the circuits of the ASSEMBLY)	___/___/___	V									
Uimp	Rated impulse withstand voltage (of the ASSEMBLY)	_____	kV									
InA	Rated current of the ASSEMBLY	_____	A									
Inc	Rated currents of the circuits	Main	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
		A	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
l_{pk}	Rated peak withstand current	_____	kA									
l_{cw}	Rated short-time withstand currents (of the circuits of the ASSEMBLY)	___/___/___	kA/s									
l_{cc}	Rated conditional short-circuit current of the ASSEMBLY	_____	kA									
RDF	Rated diversity factor	_____	-									
f_n	Rated frequency	_____	Hz									
P_{max1}	P max single sections (L ₁ x H ₁ x W ₁) (See attached sheet) ^(4a)	_____	W₁									
P_{max2}	P max single sections (L ₂ x H ₂ x W ₂) (See attached sheet) ^(4a)	_____	W₂									
.....	_____										
P_{maxn}	P max single sections (L _n x H _n x W _n) (See attached sheet) ^(4a)	_____	W_n									
IP	Degree of protection	_____	-									
Form	Form of internal separation	_____	-									

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Low-voltage switchgear assembly assessment report⁽¹⁾

Assembly under assessment: Designation	IEC 61439-2 2nd Edition
TYPE DESIGNATION ⁽²⁾ :	IDENTIFICATION ⁽³⁾ :

Design assessment⁽⁵⁾					
N°.	Clauses or subclauses	Characteristic to be verified	Verified parts		Assessment results ⁽⁷⁾
			Description	Test Report ⁽⁶⁾	
1	10.2	<i>Strength of material and parts:</i>	-	-	-
	10.2.2	Resistance to corrosion	Materials		
	10.2.3	<i>Properties of insulating materials:</i>	-	-	-
	10.2.3.1	Thermal stability	Insulating materials		
	10.2.3.2	Resistance to abnormal heat and fire due to internal electric effects	Insulating materials		
	10.2.4	Resistance to ultra-violet (UV) radiation	Insulating outdoor enclosure		
	10.2.5	Lifting	Provision for lifting		
	10.2.6	Mechanical impact	Enclosure		
10.2.7	Marking	Labels			
2	10.3	Degree of protection of enclosures	Enclosure ^(6a)		
3	10.4	Clearances	Circuits		
4	10.4	Creepage distances	Circuits		
5	10.5	<i>Protection against electric shock and integrity of protective circuits:</i>	-	-	-
	10.5.2	Continuity between exposed conductive parts and protective circuit	Protective circuit		
	10.5.3	Short-circuit withstand strength of the protective circuit	Busbar ^(6b)		
6	10.6	Incorporation of switching devices and components	Devices and components		
7	10.7	Internal electrical circuits and connections	Circuits and connections		
8	10.8	Terminals for external conductors	Terminals		
9	10.9	<i>Dielectric properties:</i>	-	-	-
	10.9.2	Power-frequency withstand voltage	Circuits		
	10.9.3	Impulse withstand voltage	Live parts		
10	10.10	Temperature-rise limits	Main busbar ^(6c)		
			Distribution busbar ^(6d)		
			Sections ^(6e)		
11	10.11	Short-circuit withstand strength	Main busbar ^(6c)		
			Distribution busbar ^(6d)		
12	10.12	Electromagnetic compatibility (EMC)	Assembly		
13	10.13	Mechanical operation	Enclosure		

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Low-voltage switchgear assembly assessment report⁽¹⁾

Assembly under assessment: Designation	IEC 61439-2 2nd Edition
TYPE DESIGNATION ⁽²⁾ : IDENTIFICATION ⁽³⁾ :	

Routine verification ⁽⁸⁾				
No.	Clauses	Characteristic to be verified	Involved part	Routine verification report ^(6b)
1a	11.2	Degree of protection of enclosures	Enclosure IP__ ^(6a)	
2a	11.3	Clearances and creepage distances	Circuits	
3a	11.4	Protection against electric shock and integrity of protective circuits	Basic protection Fault protection Screws/Bolts	
4a	11.5	Incorporation of built-in components	Components	
5a	11.6	Internal electrical circuits and connections	Circuits; connections	
6a	11.7	Terminals for external conductors	Terminals	
7a	11.8	Mechanical operation	Interlocking and locking arrangements for removable and withdrawable parts	
1b	11.9	Dielectric properties	Circuits	
2b	11.10	Wiring, operational performance and function	Labels, Wiring, Functional test	

Notes

- (1) **Scope of the document:** *It shall be used to verify if the characteristics of every manufactured assembly comply with the ones listed in the referred LOVAG Mark Licence.*
- (2) **Type Designation:** *Trade name of the assembly LOVAG Mark licenced family*
- (3) **Identification:** *Assembly identification (e.g. drawing references)*
- (4) **Assembly under assessment:** *Rated characteristics of the assembly under assessment shall be reported*
 - (4a) *To calculate and report the maximum dissipated power, for each section of different dimension of the assembly,*
- (5) **Design assessment:** *The design assessment shall be carried out with reference to the licenced design*
- (6) **Test Report:** *In this column shall be listed, for every clause of the Standard, the Test Report/s (identification number and date) reported in the LOVAG Mark Licence.*
 - (6a), (6b), (6c), (6d), (6e) *It is possible to list all the possibly construction variants covered by the LOVAG Mark Licence (e.g different degree of protection, different busbar system, etc.etc)*
- (7) **Assessment results:** *In this column, clause by clause, shall be reported the assessment result (Yes/No). The verification has to be carried out by checking if each technical and constructional characteristic of the assembly under assessment (rated values, type and dimension of the insulating materials, busbar number, shape and dimensions, busbar support number, shape and dimension, creepage distances, selection of switching devices and components (subclause 10.6), etc.etc) is covered by the results reported in the Test Reports, listed in the column on the left side.*
 - The temperature rise verification has to be carried out, section by section, by comparison of the maximum dissipated power listed in the "Assembly under assessment: rated characteristics" table, with the maximum dissipated power stated in the Test Reports (measured or calculated) for section having the same dimensions.*
 - The LOVAG Mark can be used on the assessed assembly only if the all assessment results are positive (Yes).*
- (8) **Routine verification:** *In this table shall be listed all the Routine Verification Reports (identification number and date) supporting the positive results of all the required verifications.*

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