

REPORT No 11895

Date of issue: July 10, 2026

Status: FINAL REPORT

IEC 60669-1

SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED - ELECTRICAL INSTALLATIONS

Program: SQ-2593

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Prepared by:	Reviewed by:	Approved by:
Valentyn Kravchenko Assistant Technician	Eng. Esteban Di Marco Electromechanical expert	Eng. Emiliano Medina Quality Assurance Lead

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1. FOREWORD

This report summarizes the results of the **SQ-2593** proficiency testing program on the determination of compliance with the general requirements. This program is conducted in a bilateral format, following the “split-sample” design described in clause A.4.2 of ISO/IEC 17043: 2023 (Alternative interlaboratory comparisons).

South Quality conducted the testing program in May/June 2026 with the aim of assessing the laboratory's ability to competently perform the designated tests.

2. ORGANIZATION

Program Coordinator: Eng. Esteban Di Marco
Assistant Technician: Valentyn Kravchenko
Statistics: Lic. Manuel Tozaki
Supervision: Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine compliance with the general requirements of a switch for household and similar fixed-electrical installations, using the following standard:

Standard
IEC 60669-1: 2017

To verify this, batches of switch samples have been selected.

Participants in this program have not been previously informed about the expected behavior of the samples they receive.

4. PARTICIPANT

Company: **ACLAB**
Laboratory: **ACLAB**
Country: Morocco
Client ID: F293
Contact person: Jihane Sakar
Responsable Metrologie et Essai Interlaboratoire
essais.interlaboratoire@gmail.com

5. HOMOGENEITY

Several batches were prepared identically by the staff at South Quality.

Subsequently, a homogeneity study was conducted with an ISO/IEC 17025: 2017 accredited laboratory.

The control process followed ISO 33405: 2024, clauses 7.4.1.1 / 7.4.1.2. Stratified random sampling was applied, and samples were selected using random number generation software.

The results of this test are presented below:

Size of each batch: **500 units**

Tested samples from each batch: **100 units**

IEC 60669-1 CHAPTER NO	SAME RESULTS IN THE SAMPLES TESTED			
	BATCH: LEM3446	BATCH: LEM3447	BATCH: LEM3448	BATCH: LEM3449
8	YES	YES	YES	YES
10	YES	YES	YES	YES
11	NA	NA	NA	NA
12	YES	YES	YES	YES
14	YES	YES	YES	NO
15	YES	YES	YES	YES
16	YES	YES	YES	YES
17	YES	YES	YES	YES
21	NO	YES	YES	YES
22	YES	YES	YES	YES
23	NO	YES	YES	YES
24	YES	YES	YES	YES

Samples for this program are taken from the selected batch identified as **LEM3447**.

For the indicated batch, the values determined in the homogeneity study are utilized as the assigned values.

The analysis of the test data indicated that the selected samples exhibited sufficient homogeneity for the program. Therefore, the results of participants identified as outliers cannot be attributed to sample variability.

6. SAMPLE INFORMATION

The following samples were sent for testing:

Batch:	LEM3447
Sample ID:	07
Characteristics:	Switch - 250V - 16AX - 20 units Trademark: KALOP

7. IMAGES



8. ASSIGNED VALUES

BATCH: LEM3447		
CHAPTER	REQUIREMENT	VERDICT
8	Marking	PASS
10	Protection against electric shock	PASS
11	Provision for earthing	N/A
12	Terminals	PASS
14	Mechanisms	PASS
15	Resistance to ageing, protection provided by enclosures of switches and resistance to humidity	PASS
16	Insulation resistance and electric strength	PASS
17	Temperature rise	PASS
21	Resistance to heat	PASS
22	Screws, current carrying parts and connections	PASS
23	Creepage distances, clearances distances through sealing compound	PASS
24	Resistance of insulating material to abnormal heat, to fire and to tracking	PASS

9. PARTICIPANT RESULTS (SEE APPENDIX B)

CODE: LEM3447-07		
CHAPTER	REQUIREMENT	VERDICT
8	Marking	PASS
10	Protection against electric shock	PASS
11	Provision for earthing	N/A
12	Terminals	PASS
14	Mechanisms	PASS
15	Resistance to ageing, protection provided by enclosures of switches and resistance to humidity	PASS
16	Insulation resistance and electric strength	PASS
17	Temperature rise	PASS
21	Resistance to heat	PASS
22	Screws, current carrying parts and connections	PASS
23	Creepage distances, clearances distances through sealing compound	PASS
24	Resistance of insulating material to abnormal heat, to fire and to tracking	PASS

10. STATISTICS

The results must be treated as qualitative.

For qualitative results, the comparison will be made directly against the assigned values, so any difference will be evaluated as **Unsatisfactory**.

11. EVALUATION OF PERFORMANCE

CHAPTER	REQUIREMENT	BATCH: LEM3447		PERFORMANCE RESULT
		PARTICIPANT RESULT	ASSIGNED VALUE	
8	Marking	PASS	PASS	SATISFACTORY
10	Protection against electric shock	PASS	PASS	SATISFACTORY
11	Provision for earthing	N/A	N/A	SATISFACTORY
12	Terminals	PASS	PASS	SATISFACTORY
14	Mechanisms	PASS	PASS	SATISFACTORY
15	Resistance to ageing, protection provided by enclosures of switches and resistance to humidity	PASS	PASS	SATISFACTORY
16	Insulation resistance and electric strength	PASS	PASS	SATISFACTORY
17	Temperature rise	PASS	PASS	SATISFACTORY
21	Resistance to heat	PASS	PASS	SATISFACTORY
22	Screws, current carrying parts and connections	PASS	PASS	SATISFACTORY
23	Creepage distances, clearances distances through sealing compound	PASS	PASS	SATISFACTORY
24	Resistance of insulating material to abnormal heat, to fire and to tracking	PASS	PASS	SATISFACTORY

12. CONCLUSIONS

The overall performance of this **SQ-2593** program from the participant laboratory **ACLAB**, is **SUFFICIENT** based on expected results.

The criteria used for the evaluation of the overall performance are the following:

- **SUFFICIENT** performance: No unsatisfactory results were obtained.
- **INSUFFICIENT** performance: An unsatisfactory result was obtained.

APPENDIX A

INSTRUCTIONS



INSTRUCTIONS

PROGRAM:	Switches for household and similar fixed-electrical installations
CODE:	SQ-2593
VERSION:	-
STANDARD:	IEC 60669-1
COORDINATOR:	Eng. Esteban Di Marco (edimarco@ptsouthquality.com)

1 - General

This document serves as a guide for managing the results of the **SQ-2593** program.

2 - Standard

IEC 60669-1: 2017

3 - Tests involved

TEST
Determination of compliance with the general requirements (Complete standard)

4 - Samples

CODE	SAMPLE	QUANTITY
LEM3447-07	Switch 250V - 16AX Trademark: KALOP	20

5 - Notes

- a) Being a bilateral program, there is no deadline for submitting results.
- b) The participant must submit the results using the usual report employed by their laboratory.
- c) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to **IEC 60669-1**.
- d) Samples must be retained until the end of the program, which concludes with the submission of the final report.
- e) To review the results, test images would be appreciated. Images can be attached at the end of this document or sent by email.

PHOTOGRAPHS

DSQ-012

- REV 06 -

SQ-2593

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APPENDIX B

PARTICIPANT RESULTS (TEST REPORT)



Test Report No : Interlaboratory Test V/01

Report issue date: le 15/06/2026

Applicant	SAOUTH QUALITY
Declarant	
Client name and contact details	
Description of received samples	Switch
Purchase Order No °	SQ-2593
Sampling No	
Sampling Date	
Sampling Location	
Freight Forwarder	
Sample code	LEM3447
Invoice No.	
Sample reception date	Le 06/05/2026
Requested Test	▪ Switch conformity according to IEC 60669-1 standard
Number of pages	5
Remarks	NTR

ACLAB : Lot N° 182, Zone Industrielle - Mohammedia
 ICE : 001715050000092 - Patente : 31590749 - IF : 15237310 - RC : 24015 - CNSS : 4391504 Tél : 0523 320 495
 Fax : 0523 303 103 - GSM : 0666 127 332 - E-mail : acslaboratoire@gmail.com - web : www.acslaboratoire.ma

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Ref : FORMPRIM4_V05 - Date : 15/11/2024



Test Report No : Interlaboratory Test V/01

Analysis start date: 06/05/2026

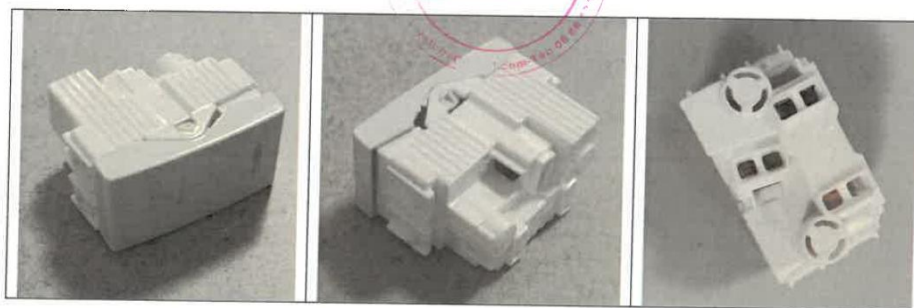
Analysis end date: 18/05/2026

Sample description: Switch

1. Sample Description:

Brand	model	Input voltage	Current
KOLAP	40100-01-02-15	250V	16A
Power	Frequency	Ambient Temp	Humidity
--	--	22°C	54%

See illustration :



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Test Report No : Interlaboratory Test V/01

TEST RESULTS

	Test Explanation	Acceptance Criterion	Result	Conclusion
8 : Markings and Indications	This test consists of examining the marking of the switches to ensure it meets the requirements of section 8 of the applicable standard.	Presence, legibility, and durability of the marking.	Marking present and durable on the sample.	Compliant
10 : Protection Against Electric Shock	Verification of the protection against direct contact with live parts is carried out according to article 10 of the standard NM EN 60669-1. It consists of using a test finger to detect the accessibility of live parts.	No part of the sample in direct contact with the user is liable to be live.	Live parts are inaccessible.	Compliant
11 : Earthing Arrangements	This test consists of verifying that the metallic parts are properly connected to the earth and measuring the resistance of the earth connections according to clause 11.4 of the standard.	Presence of an earth connection	N.A	Not Applicable
		$R(\text{earth}) < 0.05 \text{ ohm}$.		
12 : Terminals	This test consists of verifying the construction and mechanical strength of screw or screwless terminals according to clause 12 of the standard. This test is carried out after the 15.1 aging test, except for screwless terminals.	Behavior and construction of terminals within standard limits	Terminal behavior meets standard requirements.	Compliant
14 : Mechanism	This test consists of verifying that the operating member and/or the moving contacts automatically take the position corresponding to the switch state and that no electric arc is produced during operation.	No anomaly with respect to the standard requirements.	The operating mechanism does not present any anomaly.	Compliant
15.1 : Resistance to Aging	This test is performed according to clause 15.1 of the standard and consists of subjecting the sample to an aging test at a temperature of 70°C for 168 hours.	Absence of cracks on the sample, and the material must not become sticky.	No damage affecting user safety.	Compliant
17 : Temperature Rise Test	The temperature rise of the terminals under the conditions specified by the standard must not exceed excessive values.	Terminal temperature rise $\leq 45\text{K}$	32K	Compliant
15.3 : Resistance to Humidity	The sample underwent a hygroscopic test at 25°C and 93% RH for 48 hours.	No damage or deterioration to its operation.	No damage or deterioration found	Compliant

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Test Report No : Interlaboratory Test V/01

			Insulation Resistance		Dielectric Strength		
			Measured MΩ	Standard MΩ	Voltage kV	Breakdown (Yes/No)	
16 : Insulation Resistance and Dielectric Test	After undergoing the hygroscopic test, the switch was tested for insulation resistance by applying a continuous voltage of 500 V DC for one minute. Following this, it underwent an electric strength test according to article 16.2 of the standard NM EN 60669-1 by applying an AC voltage for 1 minute	All poles connected together and to the ground, Switch in closed position	>120GΩ	>5MΩ	2000	No breakdown	Compliant
		Each pole and all other poles connected to the ground, Switch in closed position	>120GΩ	>5MΩ	2000	No breakdown	
		Terminals electrically connected to each other, Switch moving from closed to open position	>120GΩ	>2MΩ	2000V	No breakdown	

			Creepage Distance (mm)		Clearance (mm)		
			Measured	Standard	Measured	Standard	
23 Creepage Distances and Clearances	The creepage distances and clearances provided on the devices or parts of devices must not be less than the normative values.	Live parts separated when contacts are open	3.6	≥ 3	3.6	≥ 3	Compliant
		Between live parts of different polarities	---	≥ 4	---	≥ 3	
		Between live parts and:	>10		>10		
		- Accessible surfaces of insulating material parts	---		---		
		- Grounded metal parts including the earth circuit	---		---		
		- Metal frames supporting the base of flush-mounted switches	---	≥ 3	---	≥ 3	
		- Screws or fixing devices for bases, covers, and cover plates	---		---		
		- Metal parts of the mechanism (if they must be insulated from live parts)	---		---		

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22 : Screws, Current-Carrying Parts and Connections	The screws are tightened and loosened several times according to the normative torque using a torque screwdriver. Afterward, the condition of the screws, terminals, connections, screw anti-rotation, and the mechanical strength of the connections and contacts are verified.	No deterioration that could impair the subsequent use of the screws and connections	No damage or deterioration that could compromise the use of the screws and connections.	Compliant
--	--	---	---	-----------

21 Resistance to Heat	Samples must undergo thermal testing with or without a ball pressure test according to the standard's requirements	1-hour test: No modification or damage compromising subsequent use within the framework of the standard.		No deformation of the sample.		Compliant
		Part Under Test		Temperature (°C)	Indentation (mm)	
		Ball Pressure Test : Ø Target: Indentation diameter Ø < 2 mm	Insulating material parts not necessary to retain live parts in position	70°C	0.5mm	
			Insulating material parts necessary to retain live parts in position	125°C	0.9mm	
24 : Resistance to Abnormal Heat and Fire	This test is performed using a glow-wire apparatus and consists of heating the wire to a specified temperature and placing it in contact with the sample for 30 seconds according to § 24.1 of the standard NM EN 60669-1.	No flame, or the flame extinguishes in less than 30 seconds		No flame occurred.		Compliant

Test Report No.: Interlaboratory Test/V01 cancels and replaces Test Report No.: Interlaboratory Test, following the removal of the indications "NTR" and "(-)", which have been replaced by the test assessment: "Compliant" or "Not Applicable".

Technical Responsible
M. Larbi ELBADRAOUI



Direction of the Laboratory
Technical Expert
Dr. Said GMOUH



End of Report

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