

REPORT No 11666

Date of issue: April 22, 2026

Status: FINAL REPORT

IEC 60669-1

SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED-ELECTRICAL INSTALLATIONS

Program: SQO-EM5 Round 14

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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 **SQO-EM5 (Round 14)** proficiency testing program on the determination of proper functionality of switches. This program is carried out under a simultaneous participation format, as described in clause A.2.2 of ISO/IEC 17043: 2023 (Types of PT schemes).

South Quality conducted the testing program in February/March 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
 Statistic: Lic. Manuel Tozaki
 Supervision: Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine the following parameters:

- Constructional requirements
- Normal operation
- Resistance to abnormal heat and to fire

These parameters are verified using the following standard:

Standard
IEC 60669-1: 2017

To verify this, batches of electric switches have been selected.

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

4. PARTICIPANTS

In the present round, 27 laboratories have participated with the following details:

CODE	Country	ISO 17025 accredited	Results delivered
01	Mexico	Yes	Yes
02	Mexico	Yes	No
03	Chile	No	Yes
04	Türkiye	Yes	Yes
05	Belgium	Yes	Yes
06	France	Yes	Yes
07	South Africa	Yes	Yes
08	Australia	Yes	Yes
09	Argentina	Yes	Yes
10	China	No	No
11	Peru	Yes	Yes
12	Malaysia	Yes	Yes
13	Netherlands	Yes	Yes
14	Hong Kong	No	Yes
15	Portugal	Yes	Yes
16	Canada	Yes	Yes
17	Belgium	Yes	Yes
18	Italy	Yes	Yes
19	Peru	No	Yes
20	South Africa	Yes	Yes
21	Colombia	Yes	Yes
22	Argentina	Yes	No
23	Spain	No	Yes
24	South Africa	Yes	Yes
25	Türkiye	No	Yes
26	Germany	Yes	Yes
27	Brasil	Yes	Yes

5. HOMOGENEITY

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

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

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

The results of this test are presented below:

Size of each batch: **400 units**

Tested samples from each batch: **40 units**

IEC 60669-1 CLAUSE NO	SAME RESULTS IN TESTED SAMPLES			
	BATCH: LEM3048	BATCH: LEM3049	BATCH: LEM3050	BATCH: LEM3051
13	YES	YES	YES	YES
19	YES	YES	NO	YES
24.1	YES	YES	YES	YES

Samples for this program are taken from the selected batch identified as **LEM3049**.

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 (Participant **Code 23**):

Batch:	LEM3049
Sample ID:	23
Characteristics:	Switch 1P - 16AX - 250V~ - 10 units Trademark: SCHNEIDER ELECTRIC Model: 16AX-250V

7. IMAGES



8. ASSIGNED VALUES

The assigned values are obtained from the results reported by all participants (**Consensus values**).

9. PARTICIPANTS' RESULTS

CHAPTER	REQUIREMENT	LABORATORY CODE												CONSENSUS VALUE
		01	03	04	05	06	07	08	09	11	12	13	14	
13	Constructional requirements	P	F	P	P	P	P	P	P	P	P	P	P	P
19.1	Test for switches intended for inductive loads	P	P	P	P	P	P	P	P	P	P	P	P	P
19.1 (16)	Electric strength	P	P	P	P	P	P	P	P	P	P	P	P	P
19.1 (17)	Temperature rise	P	F	P	P	P	P	P	P	P	P	P	P	P
19.1 (17)	Temperature rise - Maximum (K)	44	47	39	40	43	40	39	37	39	40	41	42	40.5 (SD 3.7)
19.1 (14.3)	Undue arcing	P	P	P	P	P	P	P	P	P	P	P	P	P
19.2	Test for switches intended for externally ballasted lamp loads	P	P	P	P	P	P	P	P	F	P	P	P	P
19.2 (16)	Electric strength	P	P	P	P	P	P	P	P	P	P	P	P	P
19.2 (17)	Temperature rise	P	F	P	P	P	P	P	P	P	P	P	F	P
19.2 (17)	Temperature rise - Maximum (K)	42	48	42	41	38	43	42	40	40	44	37	48	42.2 (SD 3.0)
19.2 (14.3)	Undue arcing	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3	Test for switches intended for self-ballasted lamp loads	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3 (16)	Electric strength	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3 (17)	Temperature rise	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3 (17)	Temperature rise - Maximum (K)	37	27	32	26	32	32	25	29	28	32	31	32	29.6 (SD 2.2)
19.3 (14.3)	Undue arcing	P	P	P	P	P	P	P	P	P	P	P	P	P
24.1	Resistance to abnormal heat and to fire	P	P	P	P	P	P	P	P	P	P	P	P	P

CHAPTER	REQUIREMENT	LABORATORY CODE												CONSENSUS VALUE
		15	16	17	18	19	20	21	23	24	25	26	27	
13	Constructional requirements	P	P	P	P	P	P	P	P	P	P	P	P	P
19.1	Test for switches intended for inductive loads	P	P	P	P	P	P	P	P	P	P	P	P	P
19.1 (16)	Electric strength	P	P	P	P	P	P	P	P	P	P	P	P	P
19.1 (17)	Temperature rise	P	P	P	P	P	P	P	P	P	P	P	P	P
19.1 (17)	Temperature rise - Maximum (K)	38	43	41	42	33	41	36	41	36	41	36	45	40.5 (SD 3.7)
19.1 (14.3)	Undue arcing	P	P	P	P	P	P	P	P	P	P	P	P	P
19.2	Test for switches intended for externally ballasted lamp loads	P	P	P	P	P	P	P	P	P	P	P	P	P
19.2 (16)	Electric strength	P	P	P	P	P	P	P	P	P	P	P	P	P
19.2 (17)	Temperature rise	P	P	P	P	P	P	P	P	P	F	P	F	P
19.2 (17)	Temperature rise - Maximum (K)	40	41	43	42	40	38	44	43	41	46	39	50	42.2 (SD 3.0)
19.2 (14.3)	Undue arcing	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3	Test for switches intended for self-ballasted lamp loads	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3 (16)	Electric strength	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3 (17)	Temperature rise	P	P	P	P	P	P	P	P	P	P	P	P	P
19.3 (17)	Temperature rise - Maximum (K)	30	30	31	32	31	27	26	27	31	26	26	31	29.6 (SD 2.2)
19.3 (14.3)	Undue arcing	P	P	P	P	P	P	P	P	P	P	P	P	P
24.1	Resistance to abnormal heat and to fire	P	P	P	P	P	P	P	P	P	P	P	P	P

References:

P: PASS
 F: FAIL
 NA: NOT APPLICABLE
 ND: NOT DONE
 VNI: VERDICT NOT INDICATED

NOTE: Any differences in the test method (voltage or test intensity, cycles, torque, etc.), even if the result matches the assigned value, will be reported in **Annex B** for review by the participating laboratory.

10. STATISTICS

The results must be treated as qualitative and quantitative.

According to B.4.1.3 of ISO/IEC 17043: 2023, the appropriate technique is to compare participant results with the assigned values.

- a) For qualitative results, the comparison will be made directly against the assigned value, so any difference will be evaluated as **Unsatisfactory**.
- b) For quantitative results (Temperature rise) the comparison will be made through **z score** (B.3 – ISO/IEC 17043: 2023).

$$z = \frac{x - X}{\hat{\sigma}}$$

x is the participant’s result
 X is the assigned value
 $\hat{\sigma}$ is the standard deviation

The performance evaluation of each sample is carried out with the following criteria:

- $|z| \leq 2.0$ indicates “satisfactory” performance and generates no signal;
- $2.0 < |z| < 3.0$ indicates “questionable” performance and generates a warning signal;
- $|z| \geq 3.0$ indicates “unsatisfactory” performance and generates an action signal;

11. EVALUATION OF PERFORMANCE

A. QUANTITATIVE RESULTS

z score												
CLAUSE	LABORATORY CODE											
	01	03	04	05	06	07	08	09	11	12	13	14
19.1 (17)	0.9	1.8	0.4	0.1	0.7	0.1	0.4	0.9	0.4	0.1	0.1	0.4
19.2 (17)	0.1	1.9	0.1	0.4	1.4	0.3	0.1	0.7	0.7	0.6	1.7	1.9
19.3 (17)	3.4	1.2	1.1	1.6	1.1	1.1	2.1	0.3	0.7	1.1	0.6	1.1

z score												
CLAUSE	LABORATORY CODE											
	15	16	17	18	19	20	21	23	24	25	26	27
19.1 (17)	0.7	0.7	0.1	0.4	2.0	0.1	1.2	0.1	1.2	0.1	1.2	1.2
19.2 (17)	0.7	0.4	0.3	0.1	0.7	1.4	0.6	0.3	0.4	1.3	1.1	2.6
19.3 (17)	0.2	0.2	0.6	1.1	0.6	1.2	1.6	1.2	0.6	1.6	1.6	0.6

B. QUALITATIVE RESULTS

Laboratory Code 01: The laboratory has obtained **UNSATISFACTORY** quantitative results in the verification of clause 19.3 (Normal operation - Temperature rise). However, **SATISFACTORY** results were obtained for the remaining chapters.

Laboratory Code 02: The laboratory did not send the results before the deadline.

Laboratory Code 03: The laboratory has obtained **UNSATISFACTORY** qualitative results in the verification of chapter 13 and clauses 19.1 and 19.2 (Normal operation - Temperature rise). However, **SATISFACTORY** results were obtained for the remaining chapters.

Laboratory Code 04: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 05: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 06: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 07: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 08: The laboratory has obtained **QUESTIONABLE** quantitative results in the verification of clause 19.3 (Normal operation - Temperature rise). However, **SATISFACTORY** results were obtained for the remaining chapters.

Laboratory Code 09: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 10: The laboratory did not send the results before the deadline.

Laboratory Code 11: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 12: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 13: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 14: The laboratory has obtained **UNSATISFACTORY** qualitative results in the verification of clause 19.2 (Normal operation - Temperature rise). However, **SATISFACTORY** results were obtained for the remaining chapters.

Laboratory Code 15: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 16: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 17: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 18: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 19: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 20: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 21: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 22: The laboratory did not send the results before the deadline.

Laboratory Code 23: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 24: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 25: The laboratory has obtained **UNSATISFACTORY** qualitative results in the verification of clause 19.2 (Normal operation - Temperature rise). However, **SATISFACTORY** results were obtained for the remaining chapters.

Laboratory Code 26: The laboratory has obtained **SATISFACTORY** results in the verification of all chapters.

Laboratory Code 27: The laboratory has obtained **UNSATISFACTORY** qualitative results in the verification of clause 19.2 (Normal operation - Temperature rise) and **QUESTIONABLE** quantitative results in the same clause. However, **SATISFACTORY** results were obtained for the remaining chapters.

12. CONCLUSIONS

The overall performance in the **SQO-EM5 (Round 14)** program, based on expected results from the participating laboratories, was as follows:

- Participants Codes **04, 05, 06, 07, 09, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 23, 24,** and **26** have obtained a **SUFFICIENT** performance according to the expected results, and no action is required.
- Participant Code **08** has obtained an **ALMOST SUFFICIENT** performance according to the expected results and must evaluate if it is necessary to take action on the tests where they have obtained a different result than expected.
- Participants Codes **01, 03, 14, 25** and **27** have obtained an **INSUFFICIENT** performance according to the expected results and must take action in the clauses where their results differ from the expected ones (see Annex B).

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

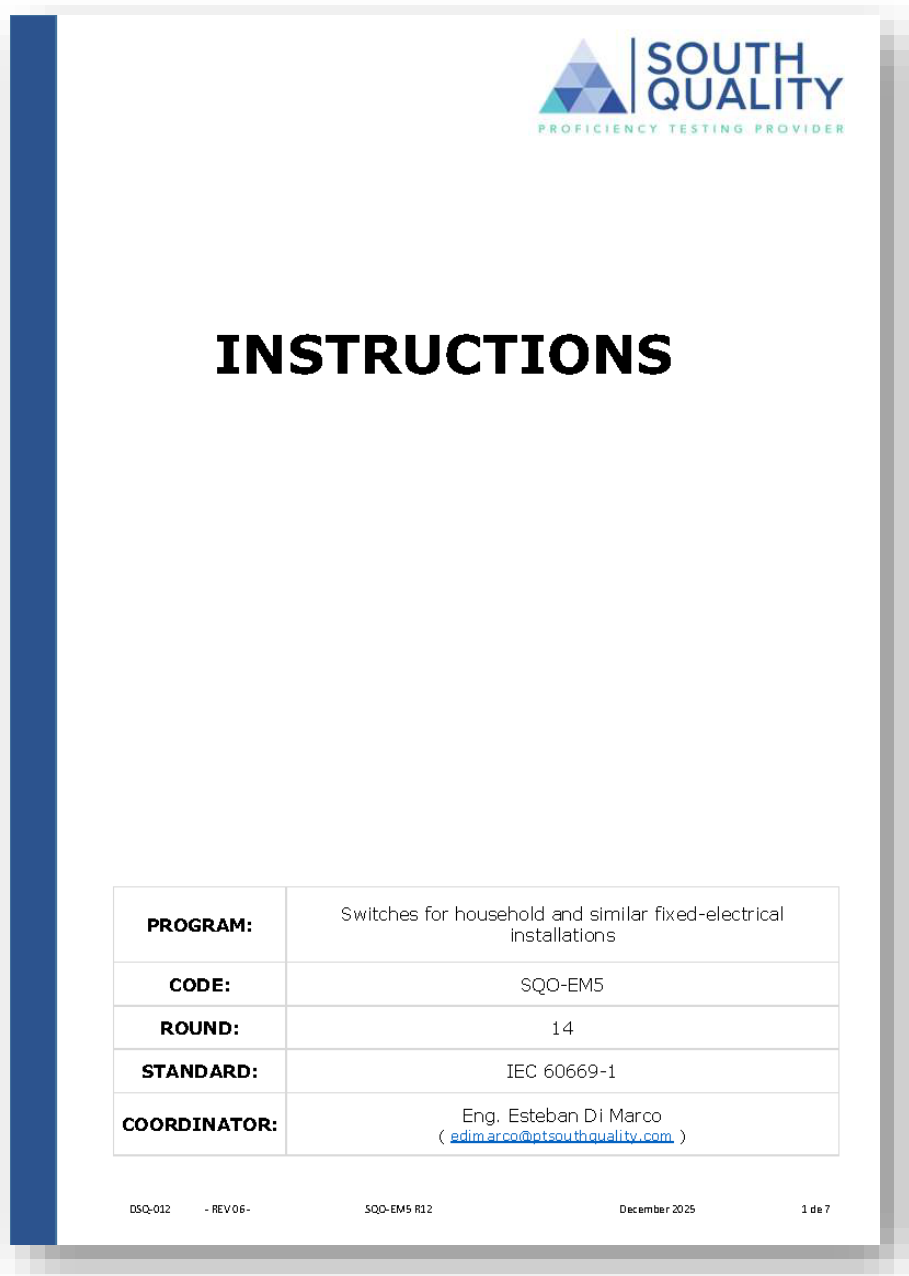
- **SUFFICIENT** performance: No unsatisfactory/questionable results were obtained.
- **ALMOST SUFFICIENT** performance: No unsatisfactory results were obtained, but one questionable result was found.
- **INSUFFICIENT** performance: An unsatisfactory result or two questionable results were obtained, or some verdicts were absent.

APPENDIX A

A1 - PARTICIPANT DATA

Company: **SIMON TECH S.L.**
Laboratory: SIMON TECH LABORATORY
Country: Spain
Client ID: E539
Contact person: Alex Jiménez Cámara (Laboratory Quality and Automatization Manager)
alex.jimenez@simonelectric.com

A2 - INSTRUCTIONS



The cover page features the South Quality logo at the top right, consisting of a stylized triangle made of smaller triangles. The word "SOUTH" is above "QUALITY", and "PROFICIENCY TESTING PROVIDER" is written in smaller text below. The word "INSTRUCTIONS" is centered in a large, bold, black font. At the bottom, there is a table with five rows and two columns. The first column contains labels: PROGRAM, CODE, ROUND, STANDARD, and COORDINATOR. The second column contains the corresponding values. At the very bottom of the page, there is a footer with technical details: DSQ-012 - REV 06-, SQQ-EM5 R12, December 2025, and 1 de 7.

PROGRAM:	Switches for household and similar fixed-electrical installations
CODE:	SQQ-EM5
ROUND:	14
STANDARD:	IEC 60669-1
COORDINATOR:	Eng. Esteban Di Marco (edimarco@ptsouthquality.com)

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1 - General

This document serves as a guide for managing the results of the **SQO-EM5 (Round 14)** program.

2 - Standard

IEC 60669-1: 2017

3 - Participant

Simon Tech S.L. Simon Tech Laboratory	CODE 23
--	----------------

4 - Tests involved

TEST	SUBTEST
Determination of proper functionality of switches	<ul style="list-style-type: none"> - Constructional requirements (Clause 13) - Normal operation (Clause 19) - Resistance to abnormal heat and to fire (Clause 24.1)

5 - Samples

CODE	SAMPLE	QUANTITY
LEM3049-23	Switch 1P - 16AX - 250V ~ Trademark: Schneider Electric Model: 16AX-250V	10

6 - Notes

- a) The deadline for the delivery of results is **March 3, 2026**.
- b) Participants must submit the results in the usual report used by their laboratory.
- c) The samples must be kept until the end of the program, which closes with the submission of the final report.
- d) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to IEC 60669-1.
- e) To review the results, sending images of the tests will be appreciated. Images can be attached to the end of this document or inserted into your regular report.

PHOTOGRAPHS

SET UP CHAPTER 13 – FOR CHAPTER 20 TESTS;



SET UP CHAPTER 19;



19.1 RL LOADS:



DSQ-012 - REV 06 -

SQO-EM5 R12

December 2025

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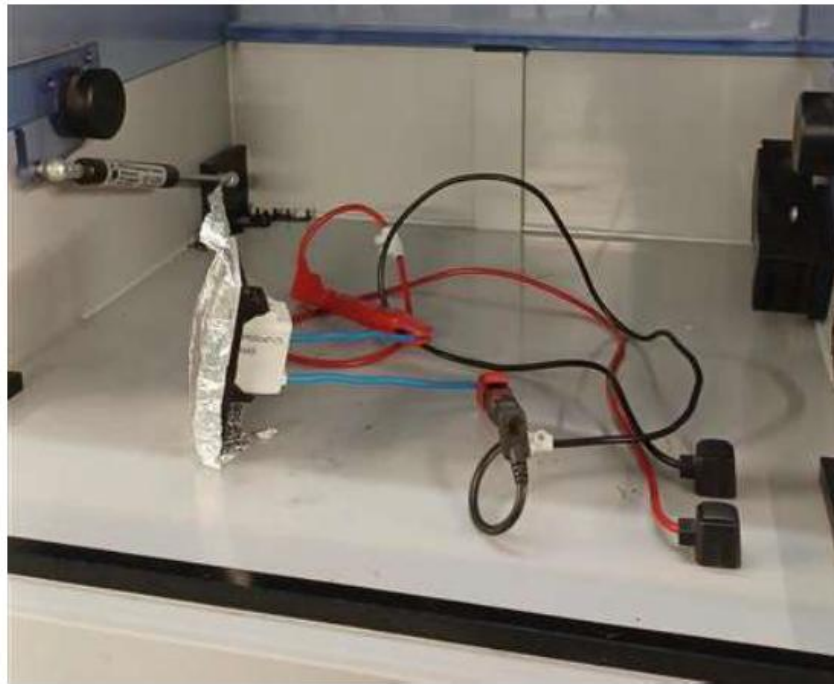
19.2 EXTERNALLY BALLASTED LAMPS (EBL)



19.3. SELF BALLASTED LAMPS (SBL)



TEMPERATURE RISE TEST / ELECTRIC STRENGTH



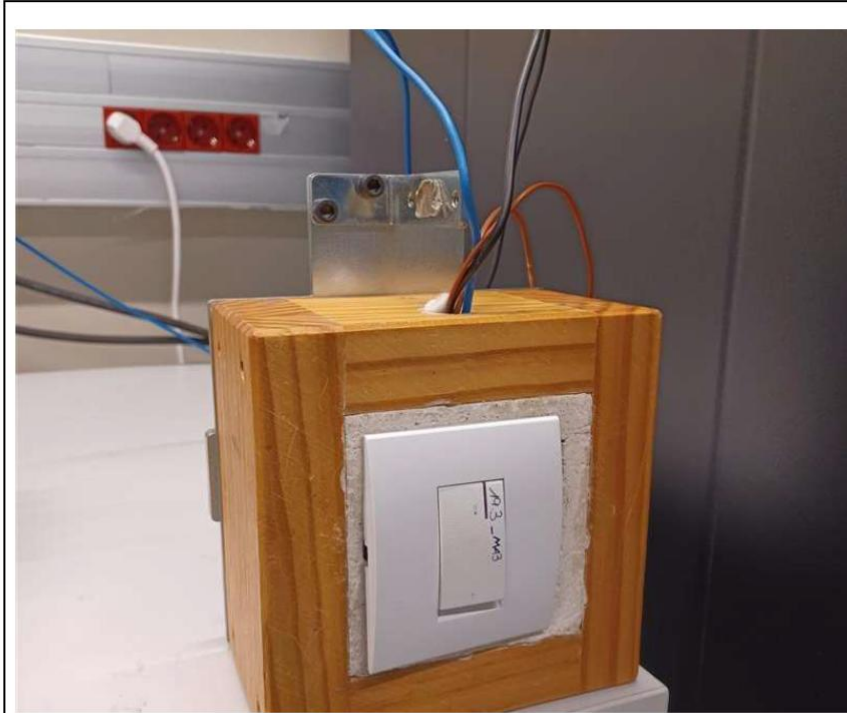
DSQ-012

- REV 06 -

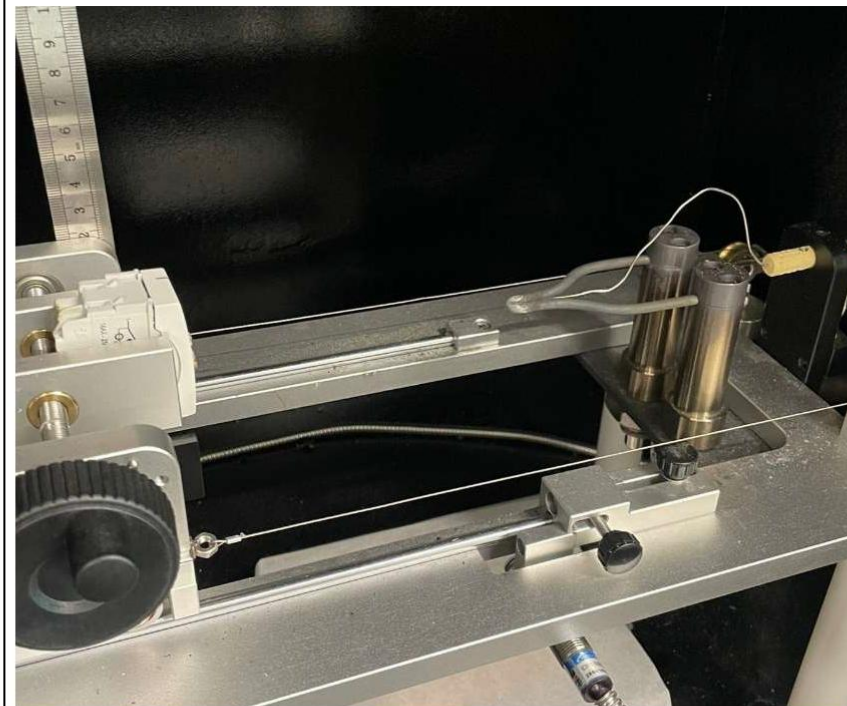
SQO-EM5 R12

December 2025

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SET-UP CHAPTER 24.1;



A3 - PARTICIPANT RESULTS (TEST REPORT # 0926012723)

	TEST REPORT	0926012723
		Page: 1/14

REQUESTED BY:	Department	Date	SE Number	Project
Alex Jimenez	LST Quality	29/01/2026 18:39:54	0926012723	PCOT25-026

CONFIDENTIAL

1. - TEST OBJECTIVES

Realizar la intercomparación de interruptores en base a la normativa IEC 60669-1

2. - VERSION

na /

3. - REQUEST TEST TITLE AND DESCRIPTION

Project Name: Intercomparación PT-SOUTHQUALITY SGO-EM5 SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED-ELECTRICAL INSTALLATIONS IEC 60669-1

4. - FEATURES OF TEST

Other:
Realizar los ensayos indicados a las muestras entregadas de la intercomparación

5. - QUANTITY, TYPE AND TEST ITEM DESCRIPTION

Test Item Description
muestras de interruptor

Quantity
10

Extra Material Description
Marco

Quantity
1

Customer acceptance criteria
na

TESTED BY	APPROVED	ENVIRONMENTAL CONDITIONS:
G.R.N/H.M.G	G.R.N	Environmental Temperature: 20 ±5 °C
		Relative Humidity: 50 ±20 %
		TEST CASE VEREDICTS
		Pass P
		Fail F
		NotApply N/A
		NotTested NT
		NotS No
DATE: 03/03/2026	DATE: 03/03/2026	

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PG010_01 Rev 3

6. - TEST RESULTS

13	CONSTRUCTIONAL REQUIREMENTS		
13.1	Mechanical requirements for insulating means		
	Insulating lining, barriers and like: adequate mechanical strength and secured in a reliable manner		P
13.2	Installation requirements		
	Switches constructed so as to permit:		
	- easy introduction into the terminal and reliable connection of the conductors in the terminals, except for lead wires of pilot lights		P
	- correct positioning of the conductors		P
	- easy fixing of the switch to a wall or in a box		P
	- adequate space between the underside of the main part and the surface on which the main part is mounted or between the sides of the main part and the enclosure (cover or box)		P
	Surface-type switches: fixing means do not damage insulation of the cable		N/A
	Switches comprising screwless terminals: connecting and/or disconnecting means of the screwless terminals cannot be activated by the conductors during and after installation of the switch in a box or on a wall		N/A
	Compliance is checked by inspection and in case of doubt by the following test		N/A
	The test is carried out with a solid copper conductor having the smallest cross-sectional area, as specified in 12.3.2 (mm ²)		N/A
	If it is not possible to exert a force onto the connecting / disconnecting means, the product is deemed to comply with the requirements of this sub clause without further tests		N/A

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PG010_01 Rev 3

	During the application of the pull, the conductor do not come out of the screwless terminal		N/A
	Switches classified as design A: permit easy positioning and removal of the cover or cover plate, without displacing the conductors or activating the connecting and/or disconnecting means of screwless terminals		P
13.3	Fixing of covers, cover plates and actuating members		
13.3.1	Covers, cover-plates and actuating members or parts of them intended to ensure protection against electric shock:		
	- held in place at two or more points by effective fixings		P
	- fixed by means of a single fixing, e.g. by a screw, provided that they are located by another means (e.g. by a shoulder)		N/A
	Where the fixing of covers, cover plates or actuating members of switches of design A serves to fix the main part there are means to maintain the main part in position, even after removal of the covers, cover plates or actuating members.		N/A
13.3.2	Covers, cover plates or actuating members whose fixing is of the screw-type:		
	Compliance checked by inspection only		N/A
13.3.3	Covers, cover plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by applying a force in a direction approximately perpendicular to the mounting / supporting surface (see table 12):		
	- when their removal may give access, with the test probe B of IEC 61032, to live parts:	by the tests of 20.5	P
	- when their removal may give access, with the test probe B of IEC 61032, to non-earthed metal parts separated from live parts in such a way that creepage distances and clearances have the values at least equal to those shown in table 23:	by the tests of 20.6	N/A

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PG010_01 Rev 3

	- when their removal may give access, with the test probe B of IEC 61032, only to	by the tests of 20.7	P
	- insulating parts, or		P
	- earthed metal parts, or		N/A
	- metal parts separated from live parts in such a way that creepage distances and clearances have at least twice the values shown in table 23, or		N/A
	- live parts of SELV circuits not greater than 25 V AC and 60 V DC:		N/A
13.3.4	Covers, cover-plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by using a tool, in accordance with the manufacturer's instructions given in an instruction sheet or catalogue:		
	By the same tests of 13.3.3 except that the covers, cover plates, actuating members or parts of them need not come out when applying a force not exceeding 120 N in directions perpendicular to the mounting / supporting surface		P
13.4	Openings in normal use		
	Switches: no free openings in their enclosures according to their IP classification		P
13.5	Attachment of knobs		
	Knobs of rotary switches securely attached to the shaft or part operating the mechanism		N/A
	- axial pull be applied for 1 min to try to pull off the actuating member		N/A
	- axial pull is likely to be applied in normal use, the force is 30 N		N/A
	- axial pull is unlikely to be applied in normal use, the force is 15 N		N/A
	- knob of switches having only one direction of operation: turned 100 times in the reverse direction		N/A

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PG010_01 Rev 3

	During the test: knob not become detached		N/A
13.6	Mounting means		
	Screws or other means for mounting the switch on a surface or in a box or enclosure: easily accessible from the front		P
	Fixing means not serve any other fixing purpose		P
13.7	Combination of switches		
	Combinations of switches, or of switches and socket-outlets, comprising separate bases: correct position of each main part is ensured		N/A
	Fixing of each main part be independent of the fixing of the combination to the mounting surface		N/A
13.8	Accessories combined with switches		
	Accessories combined with switches: comply with their standard		N/A
13.9	Surface-type switches having an IP code higher than IP20		
	Surface-type switches with IP > 20 are in according to their classification when fitted with conduits or with sheathed cables		N/A
	Surface-type switches with IPX4, IPX5 and IPX6 have provisions for opening a drain hole		N/A
	Switches provided with a drain hole: it is not less than 5 mm in diameter, or 20 mm ² in area with a width and a length not less than 3 mm...: Ø mm / mm ²		N/A
	Drain hole: effective		N/A
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N/A
13.10	Installation in a box		
	Switches to be installed in a box: conductor ends can be prepared after the box is mounted in position, but before the switch is fitted in the box		N/A

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	Main part has adequate stability when mounted in the box		N/A
13.11	Connection of a second current-carrying conductor		
	Surface-type switches with IP > IPX0, pattern numbers 1, 5 and 6, with more than one inlet opening, provided with:		
	- fixed additional terminal complying with the requirements of clause 12, or		N/A
	- adequate space for a floating terminal		N/A
13.12	Inlet openings		
	Inlet openings: allow the introduction of the conduit or the sheath of the cable		N/A
	Surface-type switches: intended conduit or the sheath of the cable can enter at least 1 mm into the enclosure		N/A
	Inlet openings for conduit entries of surface-type switches: capable of accepting conduit sizes of 16, 20, 25 or 32 or a combination of at least two of these sizes not excluding two of the same size		N/A
	Inlet openings for cable entries of surface-type switches: capable of accepting cables having the dimensions specified in table 13 or be as specified by the manufacturer: rated current (A), limits of external diameter of cables min/max (mm)		N/A
13.13	Provision for back entry from a conduit		
	Surface-type switches: provision for back entry (if are intended)		N/A
13.14	Switch provided with membranes or the like for inlet openings		
	Switch is provided with membranes or the like for inlet openings: replaceable		N/A
13.15	Requirements for membranes in inlet openings		
13.15.1	Membranes are reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use		N/A

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	Test on membranes subjected to the ageing treatment specified in 15.1 and fitted with the switches		
	Switches placed at 40 °C for 2 h. Force of 30 N applied for 5 s by means of the tip of test probe 11 of IEC 61032. During the test: no deformation, live parts not accessible		N/A
	Membranes likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During the test: membranes not come out		N/A
	Test repeated with membranes not subjected to any treatment		N/A
13.15.2	Membranes be so designed and made of such material that: Introduction of the cables into the switch is permitted when the ambient temperature is low.		N/A
	Test on membranes not subjected to the ageing treatment, those without opening being suitably pierced:		
	Switches kept at a temperature of (-15 ± 2) °C for 2 h: possibility to introduce cables of the heaviest type through the membranes		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
13.16	Pilot light units		
	Pilot light units comply with IEC 60669-2-1:2002, IEC 60669-2-1:2002/AMD1:2008 and IEC 60669-2-1:2002/AMD2:2015, 101.1.1.1 and Clause 102, as far as applicable		N/A (*1)

(*1) – NO INFORMATION ABOUT THE PILOT LIGHT.

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19	NORMAL OPERATION		
19.1	Test for switches intended for inductive loads		
	For the purpose of this test, pilot lights are disconnected		P
	Switches withstand, without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		P
	- model / type reference	Switch 1p – WDA5101-	
	- pattern number	1	
	- nominal cross-sectional area per clause 18 (mm ²)	2,5mm	
	- test voltage (Vn) (V)	250	
	- test current (In) (cos φ 0,6) (A)	0,6	
	- number of operations per table 18	40000	
	- rate (operations per minute)	150pm	
	- samples number	1	
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	Reduced electric strength per clause 16	See appended table 19.1	P
	Reduced temperature rise test per clause 17	See appended table 19.1	P
	After the tests the specimens not show:		
	- wear impairing their further use		P
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		P
	- deterioration of enclosures, insulating lining or barriers		P
	- seepage of sealing compound		N/A
	- loosening of electrical or mechanical connections		P
	- displacement of moving contacts of switches pattern number 2, 3, 03 or 6/2		N/A

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	During the test, specimens are not lubricated		N/A
	No sustained arcing in slowly operation (sub clause 14.3)		P
19.2	Test for switches intended for externally ballasted lamp loads		
	Switches intended for externally ballasted lamp loads withstand, without excessive wear or other harmful effect, the electrical and thermal stresses occurring when controlling externally ballasted lamp circuits		P
	- model / type reference	Switch 1P – WDA5101-	
	- pattern number	1	
	- nominal cross-sectional area per clause 18 (mm ²)	2,5	
	- rate (operations per minute)	15	
	- test voltage (Vn), test current (In) (cos φ 0,9); number of operations with load A	250V;16A;0,9cos;5000	
	- test voltage (Vn), 100 operations with load B	-	
	- samples number	1	
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	Reduced electric strength per clause 16	See appended table 19.2	P
	Reduced temperature rise test per clause 17	See appended table 19.2	P
	After the tests it is possible to make and break the switch by hand, and specimen not show:		
	- wear impairing their further use		P
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		P
	- deterioration of enclosures, insulating lining or barriers		P
	- loosening of electrical or mechanical connections		P

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	- seepage of sealing compound		N/A
	- displacement of moving contacts of switches pattern number 2, 3 or 6/2		N/A
19.3	Test for switches intended for self-ballasted lamp loads		
	Switches intended for self-ballasted lamp (SBL) loads withstand, without excessive wear or other harmful effect, the electrical and thermal stresses occurring when controlling self-ballasted lamp circuits		P
	- model / type reference	Switch 1P – WDA5101-	
	- pattern number	1	
	- nominal cross-sectional area per clause 18 (mm ²)	2,5	
	- test voltage (Vn) (V)	250V	
	- test current (In) (A)	16A	
	- number of operations per table 18	40000	
	- rate (operations per minute)	15opm	
	- samples number	1	
	During the test, copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	Reduced electric strength per clause 16	See appended table 19.3	P
	Reduced temperature rise test per clause 17	See appended table 19.3	P
	After these tests, it is possible to make and break the switch by hand in the test circuit and the specimen not show:		
	- wear impairing further use		P
	- discrepancy between the position of the actuating member and that of the moving contacts		P
	- deterioration of the enclosures, insulating lining or barriers		P
	- loosening of electrical or mechanical connections		P

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	- seepage of sealing compound		N/A
	- displacement of the moving contacts of switches of pattern numbers 2, 3 or 6/2		N/A
24	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING		
24.1	Resistance to abnormal heat and to fire		
	Parts of insulating material which might be exposed to thermal stresses due to electric effects and the deterioration of which might impair the safety are not unduly affected by abnormal heat and fire		P
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11	See appended table 24.1	P

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19.1	TABLE: Test for switches intended for inductive loads (clause 19.1)			P
	Reduced electric strength per clause 16			
item per table 23	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)	
1	(M) + (1 + 2)	1500	NO	
3	(M+1) + (1)	1500	NO	
3	(M+2) + (2)	1500	NO	
	Reduced temperature rise test per clause 17			
	Rated current passed for 1 h (A)	16A		
thermocouple locations	max. measured temperature rise (K)	allowed temperature rise (K)		
MA1 – TERMINAL 1	39	≤ 45		
MA1 – TERMINAL 2	41	≤ 45		
Supplementary information: PILOT LIGHT IS DISCONNECTED				

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19.2	TABLE: Test for switches intended for externally ballasted lamp loads (clause 19.2)			P
	Reduced electric strength per clause 16			
item per table 23	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)	
1	(M) + (1 + 2)	1500	NO	
3	(M+1) + (1)	1500	NO	
3	(M+2) + (2)	1500	NO	
	Reduced temperature rise test per clause 17			
	Rated current passed for 1 h (A)	16A		
thermocouple locations	max. measured temperature rise (K)	allowed temperature rise (K)		
MA2 – TERMINAL 1	43	≤ 45		
MA2 – TERMINAL 2	34	≤ 45		
Supplementary information: PILOT LIGHT IS DISCONNECTED				

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19.3	TABLE: Test for switches intended for self-ballasted lamp loads (clause 19.3)	P
Reduced electric strength per clause 16		
item per table Z3	test voltage applied between:	test voltage (V)
1	(M) + (1 + 2)	1500
3	(M+1) + (1)	1500
3	(M+2) + (2)	1500
flashover / breakdown (Yes/No)		
1		NO
3		NO
3		NO
Reduced temperature rise test per clause 17		
Rated current passed for 1 h (A) 16A		
thermocouple locations		max. measured temperature rise (K)
MA3 – TERMINAL 1		27
MA3 – TERMINAL 2		23
		allowed temperature rise (K)
		≤ 45
		≤ 45
<i>Supplementary information: PILOT LIGHT IS DISCONNECTED</i>		

24.1	TABLE: Glow-wire test	P
part under test	material designation	test temperature (°C)
BACK SAMPLE	-	850
FRONT - ROCKER	-	650
		remarks
		P
		P
<i>Supplementary information:</i>		

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APPENDIX B

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----- END OF REPORT -----