REPORT No 12051

Date of issue: *October 7, 2026*

Status: FINAL REPORT

****

IEC 60529

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP CODE)

Program: SQO-IP1 (Round 9)

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1. FOREWORD

This report summarizes the results of the **SQO-IP1 (Round 9)** proficiency testing program on the classification of degrees of protection of enclosures. 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 between July and September 2026. The aim of the program was to assess the ability of laboratories to competently perform the nominated 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 the minimum approved IP code protection level for the samples provided, in accordance with the following standard:

Standard
IEC 60529 Ed. 2.2

To perform this verification, batches of luminaires and industrial enclosures were selected.

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

4. PARTICIPANTS

In the present round, 24 laboratories have participated with the following details:

CODE	Country	ISO 17025 accredited	Results delivered
01	Hong Kong	Yes	Yes
02	Romania	Yes	Yes
03	Pakistan	No	No
04	China	Yes	Yes
05	Malaysia	Yes	Yes
06	France	Yes	Yes
07	Colombia	No	Yes
08	Spain	Yes	No
09	Spain	Yes	Yes
10	Brazil	Yes	Yes
11	Brazil	Yes	Yes
12	Portugal	Yes	Yes
13	Argentina	No	Yes
14	Peru	Yes	Yes
15	England	Yes	No
16	South Korea	Yes	Yes
17	Chile	Yes	Yes
18	Germany	Yes	Yes
19	Thailand	Yes	Yes
20	Mexico	Yes	Yes
21	Italy	Yes	Yes
22	Netherlands	Yes	Yes
23	Netherlands	Yes	Yes
24	Belgium	Yes	No

5. HOMOGENEITY

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

Subsequently, a homogeneity study was conducted with an ISO 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: **50 units** Tested samples from each batch: **10 units**

DETERMINATION	LUMINAIRE - HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LIP3527	BATCH: LIP3528	BATCH: LIP3529
IP code	YES	YES	YES

Size of each batch: **50 units** Tested samples from each batch: **10 units**

DETERMINATION	INDUSTRIAL ENCLOSURE - HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LIP4238	BATCH: LIP4239	BATCH: LIP4240
IP code	YES	NO	YES

Samples for this program are taken from the selected batches identified as **LIP3528**, and **LIP4240**.

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.

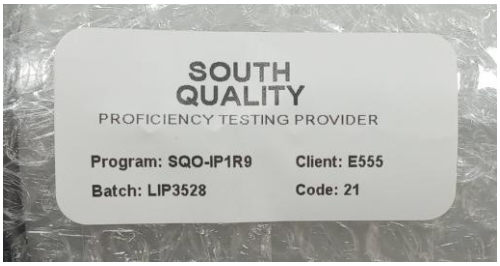
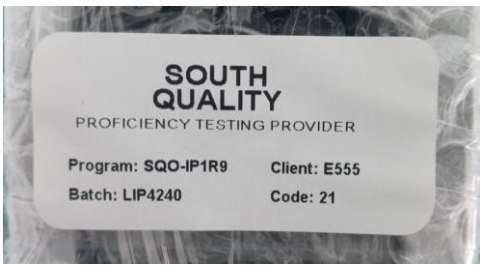
6. SAMPLE INFORMATION

The following samples were sent for testing (Participant **Code 21**):

Batch:	LIP3528
Sample ID:	21
Characteristics:	Garden lamp stand - No lamp

Batch:	LIP4240
Sample ID:	21
Characteristics:	Industrial enclosure - 8.0 x 7.5 x 6.5 cm

7. IMAGES

SAMPLES
  
GARDEN LAMP STAND
  
INDUSTRIAL ENCLOSURE

8. ASSIGNED RESULTS

The assigned results are derived from the consensus of the valid results reported by participating laboratories (**Consensus values**).

Results submitted after the deadline, missing results, and results excluded under the statistical procedure are not included in the consensus.

9. STATISTICS

The results must be treated as quantitative.

For quantitative results the comparison is made according to B.4.1.3 of ISO 17043 and the appropriate technique is to compare participant results with the assigned values. The results can be compared using difference ***D*.**

$$D = (x - X)$$

x is the participant's result

X is the assigned value

The performance evaluation is carried out with the following criteria:

$|D| = 0$ indicates "satisfactory" performance and generates no signal;

$|D| = 1$ indicates "questionable" performance and generates a warning signal;

$|D| > 1$ indicates "unsatisfactory" performance and generates an action signal;

10. PARTICIPANTS' RESULTS

LABORATORY CODE	IP CODE			
	Batch: LIP3528		Batch: LIP4240	
	First characteristic numeral	Second characteristic numeral	First characteristic numeral	Second characteristic numeral
01	5	3	5	4
02	5	3	5	5
04	5	3	5	4
05	NP	3	NP	4
07	5	3	5	4
09	5	2	5	4
10	5	3	5	4
11	5	3	5	4
12	3	3	5	6
13	5	3	5	4
14	5	3	6	4
16	5	3	5	4
17	5	ND	NP	NP
18	5	3	5	2
19	NP	6	NP	4
20	5	3	5	4
21	3	5	6	6
22	2	3	5	4
23	5	3	6	4

ASSIGNED VALUES				
PROPERTY	**Batch: LIP3528**		**Batch: LIP4240**	
IP CODE	**5**	**3**	**5**	**4**

Legends: **ND**: Not determined

NP: Not performed

11. EVALUATION OF PERFORMANCE

LABORATORY CODE	$\|D\|$			
	Batch: LIP3528		Batch: LIP4240	
	First characteristic numeral	Second characteristic numeral	First characteristic numeral	Second characteristic numeral
01	0	0	0	0
02	0	0	0	1
04	0	0	0	0
05	-	0	-	0
07	0	0	0	0
09	0	1	0	0
10	0	0	0	0
11	0	0	0	0
12	2	0	0	2
13	0	0	0	0
14	0	0	1	0
16	0	0	0	0
17	0	-	-	-
18	0	0	0	2
19	-	3	-	0
20	0	0	0	0
21	2	2	1	2
22	3	0	0	0
23	0	0	1	0

Laboratory **Code 01**: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory **Code 02**: The laboratory obtained a **QUESTIONABLE** result in the verification of the second characteristic numeral for batch **LIP4240**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

Laboratory **Code 03**: The laboratory did not send the results before the deadline.

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

Laboratory **Code 05**: The laboratory did not perform the determination of the first characteristic numeral for either batch, as it does not carry out dust testing. It obtained **SATISFACTORY** results in the verification of the second characteristic numeral for both batches.

Laboratory **Code 06**: The laboratory did not send the results before the deadline.

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

Laboratory **Code 08**: The laboratory did not send the results before the deadline.

Laboratory **Code 09**: The laboratory obtained a **QUESTIONABLE** result in the verification of the second characteristic numeral for batch **LIP3528**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

Laboratory **Code 10**: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

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

Laboratory **Code 12**: The laboratory obtained **UNSATISFACTORY** results in the verification of the first characteristic numeral for batch **LIP3528** and of the second characteristic numeral for batch **LIP4240**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

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

Laboratory **Code 14**: The laboratory obtained a **QUESTIONABLE** result in the verification of the first characteristic numeral for batch **LIP4240**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

Laboratory **Code 15**: The laboratory did not send the results before the deadline.

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

Laboratory **Code 17**: The laboratory obtained a **SATISFACTORY** result in the verification of the first characteristic numeral for batch **LIP3528**. For the second characteristic numeral of batch **LIP3528**, it did not determine compliance: it only indicated the degree that was not met, without stating the degree that was met. It did not submit the results for batch **LIP4240** before the deadline.

Laboratory **Code 18**: The laboratory obtained an **UNSATISFACTORY** result in the verification of the second characteristic numeral for batch **LIP4240**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

Laboratory **Code 19**: The laboratory did not perform the determination of the first characteristic numeral for either batch, because its dust testing equipment failed. It obtained an **UNSATISFACTORY** result in the verification of the second characteristic numeral for batch **LIP3528** and a **SATISFACTORY** result for batch **LIP4240**.

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

Laboratory **Code 21**: The laboratory obtained **UNSATISFACTORY** results in the verification of both characteristic numerals for batch **LIP3528** and of the second characteristic numeral for batch **LIP4240**. It obtained a **QUESTIONABLE** result in the verification of the first characteristic numeral for batch **LIP4240**.

Laboratory **Code 22**: The laboratory obtained an **UNSATISFACTORY** result in the verification of the first characteristic numeral for batch **LIP3528**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

Laboratory **Code 23**: The laboratory obtained a **QUESTIONABLE** result in the verification of the first characteristic numeral for batch **LIP4240**. However, it achieved **SATISFACTORY** results in the verification of the remaining parameters.

Laboratory **Code 24**: The laboratory did not send the results before the deadline.

12. CONCLUSIONS

The overall performance of the laboratories participating in the **SQO-IP1 (Round 9)** program, based on expected results from the participating laboratories, was as follows:

- Participants Codes **01, 04, 05, 07, 10, 11, 13, 16, 17,** and **20** have obtained a **SUFFICIENT** performance according to the expected results and should not take action.

- Participants Codes **02, 09, 14,** and **23** have obtained an **ALMOST SUFFICIENT** performance according to the expected results and must evaluate if it is necessary to take corrective action.

- Participants Codes **12, 18, 19, 21,** and **22** have obtained an **INSUFFICIENT** performance in accordance with the expected results and must take corrective action (See annex B).

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

- **SUFFICIENT** performance: No unsatisfactory/questionable results 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.

APPENDIX A

A1 - PARTICIPANT DATA

Company: **RISORSE ALTERNATIVE SRL**

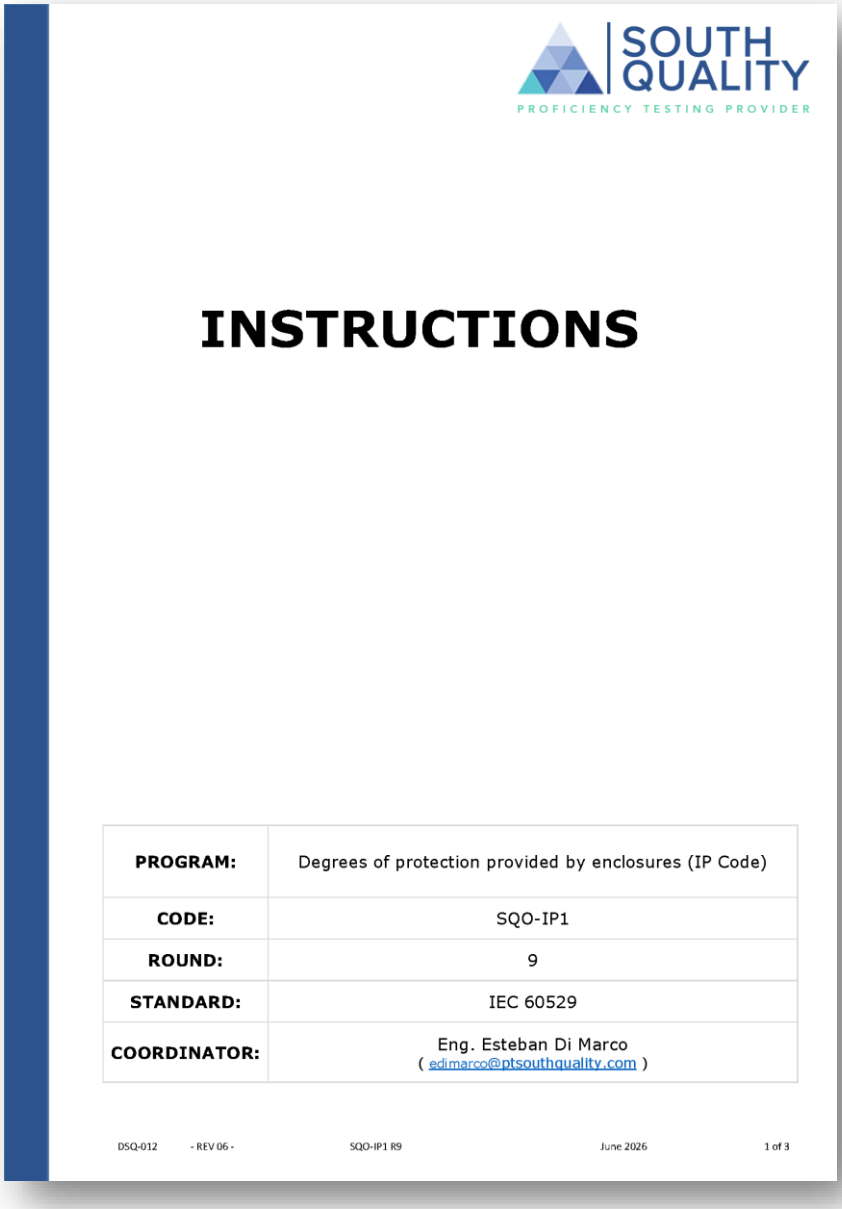
Country: Italy

Client ID: E555

Contact person: Mauro Brambilla - Responsabile Laboratorio e Certificazioni

mauro.brambilla@risorsealternative.com

A2 - INSTRUCTIONS



SOUTH QUALITY
PROFICIENCY TESTING PROVIDER

INSTRUCTIONS

PROGRAM:	Degrees of protection provided by enclosures (IP Code)
CODE:	SQO-IP1
ROUND:	9
STANDARD:	IEC 60529
COORDINATOR:	Eng. Esteban Di Marco (edimarco@ptsouthquality.com)

DSQ-012 - REV 06 - SQO-IP1 R9 June 2026 1 of 3

1 - **General**

This document serves as a guide for managing the results of the **SQO-IP1 (Round 9)** program.

2 - **Standard**

IEC 60529 Ed. 2.2

3 - **Participant**

RISORSE ALTERNATIVE SRL	CODE 21

4 - **Tests involved**

TEST
Classification - Minimum approved degree of protection (First and second characteristic number)

5 - **Samples**

CODE	SAMPLE	QUANTITY
LIP3528-21	Garden lamp stand - No lamp	1
LIP4240-21	Industrial enclosure - 8.0 x 7.5 x 6.5 cm	1

6 - **Notes**

a) The deadline for the delivery of results is **August 21, 2026**.
b) The participant must submit the results using the usual report employed by their laboratory.
c) The maximum IP ratings to be verified (inclusive) are as follows:

LIP3528	IP 56
LIP4240	IP 66

d) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to **IEC 60529**.
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

A3 - PARTICIPANT RESULTS (TEST REPORT #LIP3528-21)

Test Report issued under the responsibility of:

PJLA Testing Accreditation 117360

risorse alternative LIGHT ENGINEERING

TEST REPORT

Degrees of protection provided by enclosures (IP Code)

Report Number ..... :	LIP3528-21
Date of issue ..... :	2026-07-30
Total number of pages ..... :	28
Name of Testing Laboratory preparing the Report ..... :	Risorse Alternative S.r.l. Via Leonardo da Vinci 36, 24030 Valbrembo (BG) Italia
Applicant's name ..... :	-
Address ..... :	-
Test specification:	
Standard ..... :	IEC 60529:1989 + A1:1999 + A2:2013 EN 60529:1997 Ed.2 (incl. Corringendum: 2016-12 and 2019-02) + A1:2000 + A2:2013
Test procedure ..... :	Test report
Non-standard test method ..... :	N/A
TRF template used ..... :	N/A
Test Report Form No. ..... :	MOD-063
Test Report Form(s) Originator .... :	Risorse Alternative S.r.l.
Master TRF ..... :	Rev.03 11/03/2026

General disclaimer:

This report shall not be reproduced except in full without the written approval for authorization of RISORSE ALTERNATIVE Laboratory.The test results presented in this report relate only to the items tested. The authenticity of this Test Report and its contents can be verified by contacting RISORSE ALTERNATIVE Laboratory, responsible for this Test Report. Sample selected by the Customer.

RISORSE ALTERNATIVE declines responsability on information provided by the Customer.
The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

MOD-063 rev.03 11/03/26

Test item description	Garden lamp stand
Trademark(s)	-
Manufacturer	-
Model/Type reference	LIP3528-21
Ratings	-

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒ **Testing Laboratory:**	
Testing location/ address	Risorse Alternative S.r.l. Via Leonardo da Vinci 36, 24030 Valbrembo (BG) Italia
Tested by (name, function, signature)	Stefano Rossi (Lab. Technician)
Approved by (name, function, signature)	Mauro Brambilla (Lab. Manager)

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Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Measurement	U_{LAB}[1]
-	-

1) Uncertainty is reported with a coverage factor of k=2, which indicates approximately 95% confidence

Information on uncertainty of measurement:
Unless otherwise stated the uncertainties for the tests and measurements are evaluated in according to RISORSE ALTERNATIVE Operational Instruction IO-057, furthermore, component and process variability of devices similar to that tested may result in additional deviation.
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.
The estimate of the measurement uncertainty is that referred to the calibration certificate.
Internal Procedure PROC-118 ensures that the requirements for traceability of calibrations, of all test equipment requiring calibration, and calibration intervals are met.

Test item particulars	—
Classification of installation and use	Garden lamp stand
Supply Connection	Supply cord
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing	Engineering sample sent by South Quality for PT code SQO-IP1 round 9
Date of receipt of test item	2026/07/09
Date (s) of performance of tests	2026/07/20 to 2026/07/29

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

General remarks

Test conditions and acceptance conditions tests for protection against access to hazardous part indicated by the first characteristic numeral as required of clause 12 of IEC 60529:1989 + A1:1999 + A2:2013
Test conditions and acceptance conditions tests for protection against solid foreign objects indicated by the first characteristic numeral as required of clause 13 of IEC 60529:1989 + A1:1999 + A2:2013
Test conditions and acceptance conditions tests for protection against water indicated by the second characteristic numeral as required of clause 14 of IEC 60529:1989 + A1:1999 + A2:2013

1. DESCRIPTION OF THE EQUIPMENT UNDER TEST

Garden lamp stand – no lamp.

2. CONSIDERATION ON TEST

Garden lamp stand has been performed with not to use a lamp bulb for the test.
The test has been performed with the luminaire wired, in particular with a 2x0,5mm2 H05VV-F type with a diameter of 4,6mm.

Test condition for degrees of protection first characteristic numeral that we must carry out in sequence:
a. IP2X
b. IP3X
c. IPiX
d. IP5X
with minimum approved degree of protection.

Test condition for degrees of protection second characteristic numeral that we must carry out in sequence:
e. IPX3
f. IPX4
g. IPX5
h. IPX6
with minimum approved degree of protection.

Temperature range: 15 to 35 °C ; temperature measured: 24°C
Relative humidity: 25 to 70 % ; relative humidity measured: 48 %
Air pressure: 86 to 106 kPa; air pressure measured: -

3. **TEST**

Clause	Requirement + Test	Result - Remark	Verdict
12	**TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL**		—
12.1	**Access probes**		—
	Access probes to test the protection of persons against access to hazardous parts are given in Tab. VI.		P
12.2	**Test conditions**		—
	The access probe is pushed against or (in case of the test for first characteristic numeral 2) inserted through any openings of the enclosure with the force specified in Tab. VI.		P
	For tests on low-voltage equipment, a low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp should be connected between the probe and the hazardous parts inside the enclosure. Hazardous live parts covered only with varnish or paint, or protected by oxidation or by a similar process, are covered by a metal foil electrically connected to those parts which are normally live in operation.		N/A
	The signal-circuit method should also be applied to the hazardous moving parts of high-voltage equipment.		N/A
	Internal moving parts may be operated slowly, where this is possible.		N/A
12.3	**Acceptance conditions**		—
	The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.		P
	For the test of first characteristic numeral 1, the access probe 50 mm diameter shall not completely pass through the opening.		N/A
	For the test of first characteristic numeral 2, the jointed test finger may penetrate to its 80 mm length, but the stop face (Ø 50 ˚20 mm) shall not pass through the opening. Starting from the straight position, both joints of the test finger shall be successively bent through an angle of up to 90° with respect to the axis of the adjoining section of the finger and shall be placed in every possible position.		P
	See Annex A for further clarification. Adequate clearance means:		—

12.3.1	**For low-voltage equipment** (rated voltages not exceeding 1000 V a.c. and 1500 V d.c.)		—
	The access probe shall not touch hazardous live parts.		P
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		P
12.3.2	**For high-voltage equipment** (rated voltages exceeding 1000 V a.c. and 1500 V d.c.)		—
	When the access probe is placed in the most unfavourable position(s), the equipment shall be capable of withstanding the dielectric tests as specified in the relevant product standard applicable to the equipment.		N/A
	Verification may be made either by dielectric test or by inspection of the specified clearance dimension in air which would ensure that the tests would be satisfactory under the most unfavourable electric field configuration (see IEC 71-2).		N/A
	In the case where an enclosure includes sections at different voltage levels the appropriate acceptance conditions for adequate clearance shall be applied for each section.		N/A
12.3.3	**For equipment with hazardous mechanical parts**		—
	The access probe shall not touch hazardous mechanical parts.		N/A
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		N/A

13	**TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL**				—
13.1	**Test means**				—
	Test means and the main test conditions are given in Tab. VII.				
	Tab. VII-7 **Test means for the tests for protection against solid foreign objects**				—
	0	No test required	—	—	N/A
	1	Rigid sphere without handle or guard 50 mm diameter	50 N ± 10%	13.2	N/A
	2	Rigid sphere without handle or guard 12,5 mm diameter	30 N ± 10%	13.2	P
	3	Rigid steel rod 2,5 mm diameter with edges free from burrs	3 N ± 10%	13.2	P
	4	Rigid steel wire 1 mm diameter with edges free from burrs	1 N ± 10%	13.2	F
	5	Dust chamber Fig. 2, with or without under pressure	—	13.4 and 13.5	N/A
	6	Dust chamber Fig. 2, with under pressure	—	13.4 and 13.6	N/A

13.2	**Test conditions for first characteristic numerals 1, 2, 3, 4**		—
	The object probe is pushed against any openings of the enclosure with the force specified in Tab. VII.		P
13.3	**Acceptance conditions for first characteristic numerals 1, 2, 3, 4**		—
	The protection is satisfactory if the full diameter of the probe specified in Table VII does not pass through any opening.	IP2X not pass IP3X not pass IP4X pass	P
13.4	**Dust test for first characteristic numerals 5 and 6**		—
	The test is made using a dust chamber incorporating the basic principles shown in Fig. 2 whereby the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50 mm and the nominal width of a gap between wires 75 mm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests.		N/A
	Enclosures are of necessity in one of two categories:		—
	Category 1: Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below that of the surrounding air, e.g., due to thermal cycling effects.		N/A
	Category 2: Enclosures where no pressure difference relative to the surrounding air is present		N/A
	Category 1 enclosures:		—
	The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump.		N/A
	The suction connection shall be made to a hole specially provided for this test.		N/A
	If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts.		N/A
	If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole.		N/A
	If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site.		N/A
	The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour.		N/A
	In no event shall the depression exceed 2 kPa (20 mbar) on the manometer shown in Fig. 2.		N/A

	If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h.		N/A
	If, with a maximum depression of 2 kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed.		N/A
	or a period of 8 h has elapsed.		N/A
	Category 2 enclosures:		—
	The enclosure under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump.		N/A
	Any drain-hole normally open shall be left open for the duration of the test.		N/A
	The test shall be continued for a period of 8		N/A
	Category 1 and category 2 enclosures:		—
	If it is impracticable to test the complete enclosure in the test chamber, one of the following procedures shall be applied:		N/A
	testing of individually enclosed sections of the enclosure;		N/A
	testing of representative parts of the enclosure, comprising components such as doors, ventilation openings, joints, shaft seals, etc., in position during test;		N/A
	testing of a smaller enclosure having the same full-scale design details.		N/A
	In the last two cases, the volume of air to be drawn through the enclosure under test shall be the same as for the whole enclosure in full scale.		N/A
13.5	**Special conditions for first characteristic numeral 5**		—
13.5.1	**Test conditions for first characteristic numeral 5**		—
	The enclosure shall be deemed category 1 unless the relevant product standard for the equipment specifies that the enclosure is category 2.		N/A
13.5.2	**Acceptance conditions for first characteristic numeral 5**		—
	The protection is satisfactory if, on inspection, talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment or impair safety.		N/A
	Except for special cases to be clearly specified in the relevant product standard, no dust shall deposit where it could lead to tracking along the creepage distances.		N/A
13.6	**Special conditions for first characteristic numeral 6**		—
13.6.1	**Test conditions for first characteristic numeral 6**		—
	The enclosure shall be deemed category 1, whether reductions in pressure below the atmospheric pressure are present or not.		N/A

13.6.2	**Acceptance conditions for first characteristic numeral 6**					—
	The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.					N/A

14	**TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL**					—
14.1	**Test means**					—
	The test means and the main test conditions are given in Tab. VIII.					P
	Tab. VIII-8 **Test means and main test conditions for the tests for protection against water**					—
	Second characteristic numeral	**Test means**	**Water flow rate**	**Duration of test**	**Test conditions**	
	0	No test required	—	—	—	N/A
	1	Drip box Fig.3 Enclosure on turntable	1 mm/min	10 min	14.2.1	N/A
	2	Drip box Fig.3 Enclosure in 4 fixed positions of 15° tilt	3 mm/min	2,5 min for each position of tilt	14.2.2	N/A
	3	Oscillating tube Fig. 4 Spray ± 60° from vertical, distance max. 200 mm or Spray nozzle Fig. 5 Spray ± 60° from vertical	0,07 l/min ± 5% per hole, multiplied by number of holes 10 l/min ± 5%	10 min 1 min/m² at least 5 min	14.2.3 a) 14.2.3 b)	P
	4	As for numeral 3 Spray ± 180° from vertical	As for numeral 3		14.2.4	P
	5	Water jet hose nozzle Fig. 6 Nozzle 6,3 mm diameter, distance 2,5 m to 3 m	12,5 l /min ± 5%	1 min/m² at least 3 min	14.2.5	P
	6	Water jet hose nozzle Fig. 6 Nozzle 12,5 mm diameter, distance 2,5 m to 3 m	100 l /min ± 5%	1 min/m² at least 3 min	14.2.6	F
	7	Immersion tank Water-level on enclosure: 0,15 m above top 1 m above bottom	—	30 min	14.2.7	N/A
	8	Immersion tank Water-level: by agreement	—	by agreement	14.2.8	N/A
14.2	**Test conditions**					—
	Test means and main test conditions are given in Tab. VIII.					P
	Details concerning compliance of degrees of protection – in particular for second characteristic numerals 5/6 (water jets) and numerals 7/8 (immersion) – are given in Clause 6.					P
	The tests are conducted with fresh water.					P
	During the tests for IPX1 to IPX6 the water temperature should not differ by more than 5 K from the temperature of the specimen under test.			Water temperature 22 °C		P

	If the water temperature is more than 5 K below the temperature of the specimen a pressure balance shall be provided for the enclosure.		N/A
	For IPX7 details of the water temperature are given in 14.2.7.		N/A
	During the test, the moisture contained inside the enclosure may partly condense. The dew which may thus deposit shall not be mistaken for ingress of water.		P
	For the purpose of the tests, the surface area of the enclosure is calculated with a tolerance of 10%.		P
	Adequate safety precautions should be taken when testing the equipment in the energized condition.		P
14.2.1	**Test for second characteristic numeral 1 with the drip box**		—
	The test is made with a device which produces a uniform flow of water drops over the whole area of the enclosure.		N/A
	The turntable on which the enclosure is placed has a rotation speed of 1 r/min and the eccentricity(distance between turntable axis and specimen axis) is approximately 100 mm.		N/A
	The enclosure under test is placed in its normal operating position under the drip box, the base of which is larger than that of the enclosure.		N/A
	Except for enclosures designed for wall or ceiling mounting, the support for the enclosure under test should be smaller than the base of the enclosure.		N/A
	An enclosure normally fixed to a wall or ceiling is fixed in its normal position of use to a wooden board having dimensions which are equal to those of that surface of the enclosure which is in contact with the wall or ceiling when the enclosure is mounted as in normal use.		N/A
	The duration of test is 10 min.		N/A
14.2.2	**Test for second characteristic numeral 2 with the drip box**		—
	The dripping device is the same as specified in 14.2.1 adjusted to provide the water flow rate specified in Tab. VIII.		N/A
	The table on which the enclosure is placed does not turn as in the case of the test for the second characteristic numeral 1.		N/A
	The enclosure is tested for 2,5 min in each of four fixed positions of tilt. These positions are 15° on either side of the vertical in two mutually perpendicular planes (see Fig. 3b)).		N/A
	The total duration of the test is 10 min.		N/A
14.2.3	**Test for second characteristic numeral 3 with oscillating tube or spray nozzle**		—
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.	Fig. 4	P

	a) Conditions when using the test device as in Fig. 4 (oscillating tube):			Small arc with radius tube 200mm with 8 open holes with total water flow 0,56 l/min.		P
	b) Conditions when using the test device as in Fig. 5 (spray nozzle):					N/A
14.2.4	**Test for second characteristic numeral 4 with oscillating tube or spray nozzle**					—
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.			Fig. 4		P
	a) Conditions when using the test device as in Fig. 4 (oscillating tube):			Small arc with radius tube 200mm with 12 open holes with total water flow 0,84 l/min.		P
	b) Conditions when using the test device as in Fig. 5 (spray nozzle):					N/A
	Tab. IX-9 **Total water rate qv under IPX3 and IPX4 test conditions Mean flow rate per hole qv1 = 0,07 l/min**					—
	Tube radius R mm	**Number of open holes N(1)**	**Total water flow Qv l/min**	**Number of open holes 1)**	**Total water flow qv l/min**	P
	200	8	0,56	12	0,84	P
	400	16	1,1	25	1,8	N/A
	600	25	1,8	37	2,6	N/A
	800	33	2,3	50	3,5	N/A
	1000	41	2,9	62	4,3	N/A
	1200	50	3,5	75	5,3	N/A
	1400	58	4,1	87	6,1	N/A
	1600	67	4,7	100	7,0	N/A
	(1)Depending on the actual arrangement of the hole centers at the specified distance, the number of open holes N may be increased by 1.					
14.2.5	**Test for second characteristic numeral 5 with the 6,3 mm nozzle**					—
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.					P
	The conditions to be observed are as follows:					—
	- internal diameter of the nozzle: 6,3 mm;					P
	- delivery rate: 12,5 l/min ± 5%;					P
	- water pressure: to be adjusted to achieve the specified delivery rate;					P
	- core of the substantial stream: circle of approximately 40 mm diameter at 2,5 m distance from nozzle;					P
	- test duration per square metre of enclosure surface area likely to be sprayed: 1 min;					P

	- minimum test duration: 3 min;		P
	- distance from nozzle to enclosure surface: between 2,5 and 3 m	2,5 m	P
14.2.6	**Test for second characteristic numeral 6 with the 12,5 mm nozzle**		P
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.		P
	The conditions to be observed are as follows:		P
	- internal diameter of the nozzle: 12,5 mm;		P
	- delivery rate: 100 l/min ± 5%;		P
	- water pressure: to be adjusted to achieve the specified delivery rate;		P
	- core of the substantial stream: circle of approximately 120 mm diameter at 2,5 m distance from nozzle;		P
	- test duration per square metre of enclosure surface area likely to be sprayed: 1 min;		P
	- minimum test duration: 3 min;		P
	distance from nozzle to enclosure surface: between 2,5 and 3 m.	2,5 m	P
14.2.7	**Test for second characteristic numeral 7: temporary immersion between 0,15 and 1 m**		—
	The test is made by completely immersing the enclosure in water in its service position as specified by the manufacturer so that the following conditions are satisfied:		N/A
	a) the lowest point of enclosures with a height less than 850 mm is located 1000 mm below the surface of the water;		N/A
	b) the highest point of enclosures with a height equal to or greater than 850 mm is located 150 mm below the surface of the water;		N/A
	c) the duration of the test is 30 min;		N/A
	d) the water temperature does not differ from that of the equipment by more than 5 K.		N/A
	However, a modified requirement may be specified in the relevant product standard if the tests are to be made when the equipment is energized and/or its parts in motion.		N/A
14.2.8	**Test for second characteristic numeral 8: continuous immersion subject to agreement**		N/A
	Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user,		N/A
	but they shall be more severe than those prescribed in 14.2.7		N/A
	And they shall take account of the condition that the enclosure will be continuously immersed in actual use.		N/A

14.3	Acceptance conditions		—
	After testing in accordance with the appropriate requirements of 14.2.1 to 14.2.8 the enclosure shall be inspected for ingress of water.		P
	It is the responsibility of the relevant Technical Committee to specify the amount of water which may be allowed to enter the enclosure and the details of a dielectric strength test, if any.		P
	In general, if any water has entered, it shall not:		—
	- be sufficient to interfere with the correct operation of the equipment or impair safety;	IPX3 pass IPX4 pass IPX5 pass IPX6 fail	P
	- deposit on insulation parts where it could lead to tracking along the creepage distances;	IPX3 pass IPX4 pass IPX5 pass IPX6 fail	P
	- reach live parts or windings not designed to operate when wet;	IPX3 pass IPX4 pass IPX5 pass IPX6 fail	P
	- accumulate near the cable end or enter the cable if any.	IPX3 pass IPX4 pass IPX5 pass IPX6 fail	P
	If the enclosure is provided with drain-holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.		N/A
	For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.	IPX3 pass IPX4 pass IPX5 pass IPX6 fail	P

4. TEST RESULT

TYPE REFERENCE	TEST	VERDICT
LIP3528-21 Garden lamp stand	Classification - Minimum approved degree of protection (First and second characteristic number)	IP35

5. PHOTOGRAPHIC DOCUMENTATION

Photo No. 1

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ Sample mounting position



Photo No. 2

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ Sample mounting position



Photo No. 3

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ Wire 2x0,5mm² H05VV-F type with a diameter of 4,8mm



Photo No. 4

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ Wire 2x0,5mm² H05VV-F type with a diameter of 4,8mm into luminaire



Photo No. 5

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ IP2X test (Pass)

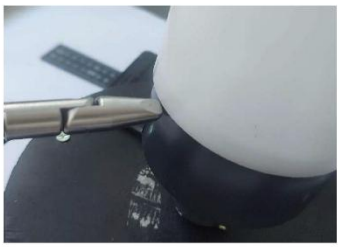

Photo No. 6

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ IP2X test (Pass)



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Photo No. 7	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP3X test (Pass)	

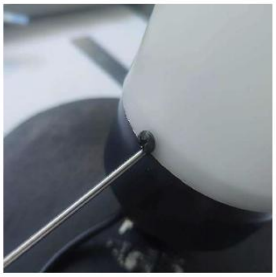

Photo No. 8	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP3X test (Pass)	



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Photo No. 9	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP4X test (Fail)	



Photo No. 10	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP4X test (Fail)	



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Photo No. 11	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX3 test (Pass)	



Photo No. 12	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX3 test (Pass)	



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Photo No. 13	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX4 test (Pass)	



Photo No. 14	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX4 test (Pass)	



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Photo No. 15	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX5 test (Pass)	



Photo No. 16	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX5 test (Pass)	



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Photo No. 17	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Fail)	



Photo No. 18	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Fail)	



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Photo No. 19	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Fail)	



Photo No. 20	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Fail)	

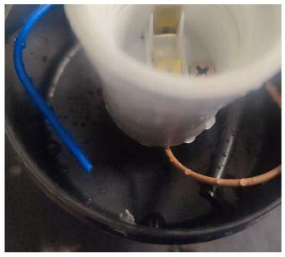

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Photo No. 21	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Fail)	



Photo No. 22	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Fail)	



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6. TEST EQUIPMENT

Clause	Measurement / testing	Internal code	Testing / measuring equipment / material needed (description, manufacturer, code)	Calibration due date (gg/mm/yy)
--	Laboratory atmospheric conditions measurement	LS-093	Thermo-Hygrometer Data Logger, XS INSTRUMENTS, mini TH	19/03/2027
13.2	IP2X test	LS-006	Jointed test finger 80 mm length, ATS GALBUSERA, 01.01	12/03/2028
13.2	IP3X test	LS-007	Test rod 2,5 mm diameter, ATS GALBUSERA, 01.11	11/03/2028
13.2	IP4X test	LS-008	Test wire 1,0 mm diameter, ATS GALBUSERA, 01.12	11/03/2028
13.4, 13.5	IP5X test (Category 2 of clause 13.4)	LS-008	Test wire 1,0 mm diameter, ATS GALBUSERA, 01.12	11/03/2028
		LS-024	Test device to verify protection against dust (dust chamber), ATS GALBUSERA, 03.01-A	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
13.4, 13.6	IP6X test (Category 2 of clause 13.4)	LS-008	Test wire 1,0 mm diameter, ATS GALBUSERA, 01.12	11/03/2028
		LS-024	Test device to verify protection against dust (dust chamber), ATS GALBUSERA, 03.01-A	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
14.2.3 a)	IPX3 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.01	Flow meter (IPX3 or IPX4 test), ASA, E5-2600/H	11/03/2028
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-025.11	Oscillating tube radius 200 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.12	Oscillating tube radius 400 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.13	Oscillating tube radius 600 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.14	Oscillating tube radius 800 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration

Clause	Measurement / testing	Internal code	Testing / measuring equipment / material needed (description, manufacturer, code)	Calibration due date (gg/mm/yy)
		LS-025.15	Oscillating tube radius 1000 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.16	Apparatus for arc oscillation speed, ATS GALBUSERA, no code	To use
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
14.2.4 a)	IPX4 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.01	Flow meter (IPX3 or IPX4 test), ASA, E5-2600/H	11/03/2028
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-025.11	Oscillating tube radius 200 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.12	Oscillating tube radius 400 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.13	Oscillating tube radius 600 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.14	Oscillating tube radius 800 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.15	Oscillating tube radius 1000 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.16	Apparatus for arc oscillation speed, ATS GALBUSERA, no code	To use
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
14.2.5	IPX5 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.02	Flow meter (IPX5 test), OFFICINE OROBICHE, FTV225-G-A-J-V	11/03/2028
		LS-025.07	6,3 mm hose nozzle (IPX5 test), ATS GALBUSERA, 03.30-D	18/03/2027
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027

Clause	Measurement / testing	Internal code	Testing / measuring equipment / material needed (description, manufacturer, code)	Calibration due date (gg/mm/yy)
14.2.6	IPX6 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.03	Flow meter (IPX6 test), OFFICINE OROBICHE, FTV250-G-A-J-V	11/03/2028
		LS-025.08	12,5 mm hose nozzle (IPX6 test), ATS GALBUSERA, 03.30-D	30/03/2027
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027

- END OF THE TEST REPORT -

A4 - PARTICIPANT RESULTS (TEST REPORT #LIP4240-21)

Test Report issued under the responsibility of:

ilac-MRA PJLA Testing Accreditation 117360

risorse alternative LIGHT ENGINEERING

TEST REPORT

Degrees of protection provided by enclosures (IP Code)

Report Number ..... :	LIP4240-21
Date of issue ..... :	2026-07-31
Total number of pages ..... :	29
Name of Testing Laboratory preparing the Report ..... :	Risorse Alternative S.r.l. Via Leonardo da Vinci 36, 24030 Valbrembo (BG) Italia
Applicant's name ..... :	-
Address ..... :	-
Test specification:	
Standard ..... :	IEC 60529:1989 + A1:1999 + A2:2013 EN 60529:1997 Ed.2 (incl. Corringendum: 2016-12 and 2019-02) + A1:2000 + A2:2013
Test procedure ..... :	Test report
Non-standard test method ..... :	N/A
TRF template used ..... :	N/A
Test Report Form No. ..... :	MOD-063
Test Report Form(s) Originator .... :	Risorse Alternative S.r.l.
Master TRF ..... :	Rev.03 11/03/2026

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RISORSE ALTERNATIVE declines responsability on information provided by the Customer.
The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

MOD-063 rev.03 11/03/26

Test item description	Industrial enclosure
Trademark(s)	-
Manufacturer	-
Model/Type reference	LIP4240-21
Ratings	-

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒ **Testing Laboratory:**		
Testing location/ address	Risorse Alternative S.r.l. Via Leonardo da Vinci 36, 24030 Valbrembo (BG) Italia	
Tested by (name, function, signature)	Stefano Rossi (Lab. Technician)	
Approved by (name, function, signature)	Mauro Brambilla (Lab. Manager)	

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2. CONSIDERATION ON TEST	Page 5
3. TEST	Pages 6 to 14
4. TEST RESULTS	Page 14
5. PHOTOGRAPHIC DOCUMENTATION	Pages 15 to 26
6. TEST EQUIPMENT	Pages 27 to 29

Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Measurement	U_{Lab}[1]
-	-

1) Uncertainty is reported with a coverage factor of k=2, which indicates approximately 95% confidence

Information on uncertainty of measurement:
Unless otherwise stated the uncertainties for the tests and measurements are evaluated in according to RISORSE ALTERNATIVE Operational Instruction IO-057, furthemore, component and process variability of devices similar to that tested may result in additional deviation.
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.
The estimate of the measurement uncertainty is that referred to the calibration certificate:
Internal Procedure PROC-118 ensures that the requirements for traceability of calibrations, of all test equipment requiring calibration, and calibration intervals are met.

Test item particulars	—
Classification of installation and use	Industrial enclosure
Supply Connection	—
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing	Engineering sample sent by South Quality for PT code SQO-IP1 round 9
Date of receipt of test item	2026/07/09
Date (s) of performance of tests	2026/07/20 to 2026/07/29

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

General remarks

Test conditions and acceptance conditions tests for protection against access to hazardous part indicated by the first characteristic numeral as required of clause 12 of IEC 60529:1989 + A1:1999 + A2:2013
Test conditions and acceptance conditions tests for protection against solid foreign objects indicated by the first characteristic numeral as required of clause 13 of IEC 60529:1989 + A1:1999 + A2:2013
Test conditions and acceptance conditions tests for protection against water indicated by the second characteristic numeral as required of clause 14 of IEC 60529:1989 + A1:1999 + A2:2013

1. DESCRIPTION OF THE EQUIPMENT UNDER TEST

Industrial enclosure – 8.0 x 7.5 x 6.5 cm

2. CONSIDERATION ON TEST

Industrial enclosure has been mounted on wall position and for to install it has been used alternative means (see photo documentation).

Test condition for degrees of protection first characteristic numeral that we must carry out in sequence:

a. IP2X
b. IP3X
c. IP4X
d. IP5X
e. IP6X

with minimum approved degree of protection.

Test condition for degrees of protection second characteristic numeral that we must carry out in sequence:

f. IPX3
g. IPX4
h. IPX5
i. IPX6

with minimum approved degree of protection.

Temperature range: 15 to 35 °C ; temperature measured: 25°C
Relative humidity: 25 to 70 % ; relative humidity measured: 47 %
Air pressure: 86 to 106 kPa; air pressure measured: -

3. TEST

Clause	Requirement + Test	Result - Remark	Verdict
12	**TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL**		—
12.1	**Access probes**		—
	Access probes to test the protection of persons against access to hazardous parts are given in Tab. VI.		P
12.2	**Test conditions**		—
	The access probe is pushed against or (in case of the test for first characteristic numeral 2) inserted through any openings of the enclosure with the force specified in Tab. VI.		P
	For tests on low-voltage equipment, a low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp should be connected between the probe and the hazardous parts inside the enclosure. Hazardous live parts covered only with varnish or paint, or protected by oxidation or by a similar process, are covered by a metal foil electrically connected to those parts which are normally live in operation.		N/A
	The signal-circuit method should also be applied to the hazardous moving parts of high-voltage equipment.		N/A
	Internal moving parts may be operated slowly, where this is possible.		N/A
12.3	**Acceptance conditions**		—
	The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.		P
	For the test of first characteristic numeral 1, the access probe 50 mm diameter shall not completely pass through the opening.		N/A
	For the test of first characteristic numeral 2, the jointed test finger may penetrate to its 80 mm length, but the stop face (Ø 50 ˙20 mm) shall not pass through the opening. Starting from the straight position, both joints of the test finger shall be successively bent through an angle of up to 90° with respect to the axis of the adjoining section of the finger and shall be placed in every possible position.		P
	See Annex A for further clarification. Adequate clearance means:		—

12.3.1	**For low-voltage equipment** (rated voltages not exceeding 1000 V a.c. and 1500 V d.c.)		—
	The access probe shall not touch hazardous live parts.		P
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		P
12.3.2	**For high-voltage equipment** (rated voltages exceeding 1000 V a.c. and 1500 V d.c.)		—
	When the access probe is placed in the most unfavourable position(s), the equipment shall be capable of withstanding the dielectric tests as specified in the relevant product standard applicable to the equipment.		N/A
	Verification may be made either by dielectric test or by inspection of the specified clearance dimension in air which would ensure that the tests would be satisfactory under the most unfavourable electric field configuration (see IEC 71-2).		N/A
	In the case where an enclosure includes sections at different voltage levels the appropriate acceptance conditions for adequate clearance shall be applied for each section.		N/A
12.3.3	**For equipment with hazardous mechanical parts**		—
	The access probe shall not touch hazardous mechanical parts.		N/A
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		N/A

13	**TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL**				—
13.1	**Test means**				—
	Test means and the main test conditions are given in Tab. VII.				
	Tab. VII-7 **Test means for the tests for protection against solid foreign objects**				—
	0	No test required	—	—	N/A
	1	Rigid sphere without handle or guard 50 mm diameter	50 N ± 10%	13.2	N/A
	2	Rigid sphere without handle or guard 12,5 mm diameter	30 N ± 10%	13.2	P
	3	Rigid steel rod 2,5 mm diameter with edges free from burrs	3 N ± 10%	13.2	P
	4	Rigid steel wire 1 mm diameter with edges free from burrs	1 N ± 10%	13.2	P
	5	Dust chamber Fig. 2, with or without under pressure	—	13.4 and 13.5	P
	6	Dust chamber Fig. 2, with under pressure	—	13.4 and 13.6	P

13.2	**Test conditions for first characteristic numerals 1, 2, 3, 4**		—
	The object probe is pushed against any openings of the enclosure with the force specified in Tab. VII.		P
13.3	**Acceptance conditions for first characteristic numerals 1, 2, 3, 4**		—
	The protection is satisfactory if the full diameter of the probe specified in Table VII does not pass through any opening.		P
13.4	**Dust test for first characteristic numerals 5 and 6**		—
	The test is made using a dust chamber incorporating the basic principles shown in Fig. 2 whereby the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50 mm and the nominal width of a gap between wires 75 mm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests.		P
	Enclosures are of necessity in one of two categories:		—
	Category 1: Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below that of the surrounding air, e.g., due to thermal cycling effects.		N/A
	Category 2: Enclosures where no pressure difference relative to the surrounding air is present		P
	Category 1 enclosures:		—
	The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump.		N/A
	The suction connection shall be made to a hole specially provided for this test.		N/A
	If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts.		N/A
	If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole.		N/A
	If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site.		N/A
	The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour.		N/A
	In no event shall the depression exceed 2 kPa (20 mbar) on the manometer shown in Fig. 2.		N/A

	If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h.		N/A
	If, with a maximum depression of 2 kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed.		N/A
	or a period of 8 h has elapsed.		N/A
	Category 2 enclosures:		—
	The enclosure under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump.		P
	Any drain-hole normally open shall be left open for the duration of the test.		P
	The test shall be continued for a period of 8		P
	Category 1 and category 2 enclosures:		—
	If it is impracticable to test the complete enclosure in the test chamber, one of the following procedures shall be applied:		N/A
	testing of individually enclosed sections of the enclosure;		N/A
	testing of representative parts of the enclosure, comprising components such as doors, ventilation openings, joints, shaft seals, etc., in position during test;		N/A
	testing of a smaller enclosure having the same full-scale design details.		N/A
	In the last two cases, the volume of air to be drawn through the enclosure under test shall be the same as for the whole enclosure in full scale.		N/A
13.5	**Special conditions for first characteristic numeral 5**		—
13.5.1	**Test conditions for first characteristic numeral 5**		—
	The enclosure shall be deemed category 1 unless the relevant product standard for the equipment specifies that the enclosure is category 2.		N/A
13.5.2	**Acceptance conditions for first characteristic numeral 5**		—
	The protection is satisfactory if, on inspection, talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment or impair safety.		P
	Except for special cases to be clearly specified in the relevant product standard, no dust shall deposit where it could lead to tracking along the creepage distances.		N/A
13.6	**Special conditions for first characteristic numeral 6**		—
13.6.1	**Test conditions for first characteristic numeral 6**		—
	The enclosure shall be deemed category 1, whether reductions in pressure below the atmospheric pressure are present or not.		N/A

13.6.2	**Acceptance conditions for first characteristic numeral 6**		—
	The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.		P

14	**TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL**				—
14.1	**Test means**				—
	The test means and the main test conditions are given in Tab. VIII.				P
	Tab. VIII-8 **Test means and main test conditions for the tests for protection against water**				—
	Second characteristic numeral	**Test means**	**Water flow rate**	**Duration of test**	**Test conditions**
	0	No test required	—	—	— N/A
	1	Drip box Fig.3 Enclosure on turntable	1 mm/min	10 min	14.2.1 N/A
	2	Drip box Fig.3 Enclosure in 4 fixed positions of 15° tilt	3 mm/min	2,5 min for each position of tilt	14.2.2 N/A
	3	Oscillating tube Fig. 4 Spray ± 60° from vertical, distance max. 200 mm or Spray nozzle Fig. 5 Spray ± 60° from vertical	0,07 l/min ± 5% per hole, multiplied by number of holes 10 l/min ± 5%	10 min 1 min/m² at least 5 min	14.2.3 a) 14.2.3 b) P
	4	As for numeral 3 Spray ± 180° from vertical	As for numeral 3		14.2.4 P
	5	Water jet hose nozzle Fig. 6 Nozzle 6,3 mm diameter, distance 2,5 m to 3 m	12,5 l /min ± 5%	1 min/m² at least 3 min	14.2.5 P
	6	Water jet hose nozzle Fig. 6 Nozzle 12,5 mm diameter, distance 2,5 m to 3 m	100 l /min ± 5%	1 min/m² at least 3 min	14.2.6 P
	7	Immersion tank Water-level on enclosure: 0,15 m above top 1 m above bottom	—	30 min	14.2.7 N/A
	8	Immersion tank Water-level: by agreement	—	by agreement	14.2.8 N/A
14.2	**Test conditions**				—
	Test means and main test conditions are given in Tab. VIII.				P
	Details concerning compliance of degrees of protection – in particular for second characteristic numerals 5/6 (water jets) and numerals 7/8 (immersion) – are given in Clause 6.				P
	The tests are conducted with fresh water.				P
	During the tests for IPX1 to IPX6 the water temperature should not differ by more than 5 K from the temperature of the specimen under test.		Water temperature 22 °C		P

	If the water temperature is more than 5 K below the temperature of the specimen a pressure balance shall be provided for the enclosure.		N/A
	For IPX7 details of the water temperature are given in 14.2.7.		N/A
	During the test, the moisture contained inside the enclosure may partly condense. The dew which may thus deposit shall not be mistaken for ingress of water.		P
	For the purpose of the tests, the surface area of the enclosure is calculated with a tolerance of 10%.		P
	Adequate safety precautions should be taken when testing the equipment in the energized condition.		P
14.2.1	**Test for second characteristic numeral 1 with the drip box**		—
	The test is made with a device which produces a uniform flow of water drops over the whole area of the enclosure.		N/A
	The turntable on which the enclosure is placed has a rotation speed of 1 r/min and the eccentricity(distance between turntable axis and specimen axis) is approximately 100 mm.		N/A
	The enclosure under test is placed in its normal operating position under the drip box, the base of which is larger than that of the enclosure.		N/A
	Except for enclosures designed for wall or ceiling mounting, the support for the enclosure under test should be smaller than the base of the enclosure.		N/A
	An enclosure normally fixed to a wall or ceiling is fixed in its normal position of use to a wooden board having dimensions which are equal to those of that surface of the enclosure which is in contact with the wall or ceiling when the enclosure is mounted as in normal use.		N/A
	The duration of test is 10 min.		N/A
14.2.2	**Test for second characteristic numeral 2 with the drip box**		—
	The dripping device is the same as specified in 14.2.1 adjusted to provide the water flow rate specified in Tab. VIII.		N/A
	The table on which the enclosure is placed does not turn as in the case of the test for the second characteristic numeral 1.		N/A
	The enclosure is tested for 2,5 min in each of four fixed positions of tilt. These positions are 15° on either side of the vertical in two mutually perpendicular planes (see Fig. 3b)).		N/A
	The total duration of the test is 10 min.		N/A
14.2.3	**Test for second characteristic numeral 3 with oscillating tube or spray nozzle**		—
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.	Fig. 4	P

	a) Conditions when using the test device as in Fig. 4 (oscillating tube):			Small arc with radius tube 200mm with 8 open holes with total water flow 0,56 l/min.	P
	b) Conditions when using the test device as in Fig. 5 (spray nozzle):				N/A
14.2.4	**Test for second characteristic numeral 4 with oscillating tube or spray nozzle**				—
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.			Fig. 4	P
	a) Conditions when using the test device as in Fig. 4 (oscillating tube):			Small arc with radius tube 200mm with 12 open holes with total water flow 0,84 l/min.	P
	b) Conditions when using the test device as in Fig. 5 (spray nozzle):				N/A
	Tab. IX-9 **Total water rate qv under IPX3 and IPX4 test conditions Mean flow rate per hole qv1 = 0,07 l/min**				—
	Tube radius R mm	**Number of open holes N(1)**	**Total water flow Qv l/min**	**Number of open holes 1)**	**Total water flow qv l/min** P
	200	8	0,56	12	0,84 P
	400	16	1,1	25	1,8 N/A
	600	25	1,8	37	2,6 N/A
	800	33	2,3	50	3,5 N/A
	1000	41	2,9	62	4,3 N/A
	1200	50	3,6	75	5,3 N/A
	1400	58	4,1	87	6,1 N/A
	1600	67	4,7	100	7,0 N/A
	(1)Depending on the actual arrangement of the hole centers at the specified distance, the number of open holes N may be increased by 1.				
14.2.5	**Test for second characteristic numeral 5 with the 6,3 mm nozzle**				—
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.				P
	The conditions to be observed are as follows:				—
	- internal diameter of the nozzle: 6,3 mm;				P
	- delivery rate: 12,5 l/min ± 5%;				P
	- water pressure: to be adjusted to achieve the specified delivery rate;				P
	- core of the substantial stream: circle of approximately 40 mm diameter at 2,5 m distance from nozzle;				P
	- test duration per square metre of enclosure surface area likely to be sprayed: 1 min;				P

	- minimum test duration: 3 min;		P
	- distance from nozzle to enclosure surface: between 2,5 and 3 m	2,5 m	P
14.2.6	**Test for second characteristic numeral 6 with the 12,5 mm nozzle**		P
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.		P
	The conditions to be observed are as follows:		P
	- internal diameter of the nozzle: 12,5 mm;		P
	- delivery rate: 100 l/min ± 5%;		P
	- water pressure: to be adjusted to achieve the specified delivery rate;		P
	- core of the substantial stream: circle of approximately 120 mm diameter at 2,5 m distance from nozzle;		P
	- test duration per square metre of enclosure surface area likely to be sprayed: 1 min;		P
	- minimum test duration: 3 min;		P
	distance from nozzle to enclosure surface: between 2,5 and 3 m.	2,5 m	P
14.2.7	**Test for second characteristic numeral 7: temporary immersion between 0,15 and 1 m**		—
	The test is made by completely immersing the enclosure in water in its service position as specified by the manufacturer so that the following conditions are satisfied:		N/A
	a) the lowest point of enclosures with a height less than 850 mm is located 1000 mm below the surface of the water;		N/A
	b) the highest point of enclosures with a height equal to or greater than 850 mm is located 150 mm below the surface of the water;		N/A
	c) the duration of the test is 30 min;		N/A
	d) the water temperature does not differ from that of the equipment by more than 5 K.		N/A
	However, a modified requirement may be specified in the relevant product standard if the tests are to be made when the equipment is energized and/or its parts in motion.		N/A
14.2.8	**Test for second characteristic numeral 8: continuous immersion subject to agreement**		N/A
	Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user,		N/A
	but they shall be more severe than those prescribed in 14.2.7		N/A
	And they shall take account of the condition that the enclosure will be continuously immersed in actual use.		N/A

14.3	Acceptance conditions		—
	After testing in accordance with the appropriate requirements of 14.2.1 to 14.2.8 the enclosure shall be inspected for ingress of water.		P
	It is the responsibility of the relevant Technical Committee to specify the amount of water which may be allowed to enter the enclosure and the details of a dielectric strength test, if any.		P
	In general, if any water has entered, it shall not:		—
	- be sufficient to interfere with the correct operation of the equipment or impair safety;		P
	- deposit on insulation parts where it could lead to tracking along the creepage distances;		P
	- reach live parts or windings not designed to operate when wet;		P
	- accumulate near the cable end or enter the cable if any.		P
	If the enclosure is provided with drain-holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.		N/A
	For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.		P

4. TEST RESULT

TYPE REFERENCE	TEST	VERDICT
LIP4240-21 Industrial enclosure	Classification - Minimum approved degree of protection (First and second characteristic number)	IP66

5. PHOTOGRAPHIC DOCUMENTATION

Photo No. 1

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ Sample mounting position



Photo No. 2

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ Sample mounting position



Photo No. 3

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ IP2X test (Pass)



Photo No. 4

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ IP2X test (Pass)



Photo No. 5

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ IP3X test (Pass)



Photo No. 6

View:
- ☐ Front
- ☐ Rear
- ☐ Right side
- ☐ Left side
- ☐ Top
- ☐ Bottom
- ☒ IP3X test (Pass)



Photo No. 7	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP4X test (Pass)	



Photo No. 8	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP4X test (Pass)	



Photo No. 9	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP5X test (Pass)	



Photo No. 10	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP5X test (Pass)	



Photo No. 11	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP6X test (Pass)	



Photo No. 12	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP6X test (Pass)	



Photo No. 13	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP6X test (Pass)	



Photo No. 14	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IP6X test (Pass)	



risorse alternative

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Photo No. 15	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX3 test (Pass)	



Photo No. 16	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX3 test (Pass)	



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risorse alternative

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Photo No. 17	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX4 test (Pass)	



Photo No. 18	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX4 test (Pass)	

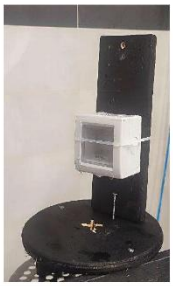

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Photo No. 19	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX4 test (Pass)	



Photo No. 20	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX5 test (Pass)	



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Photo No. 21	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX5 test (Pass)	



Photo No. 22	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Pass)	



MOD-063 rev.03 11/03/26

Photo No. 23	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Pass)	

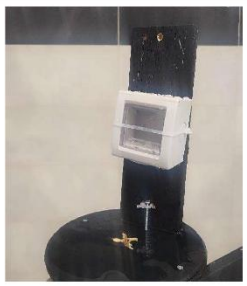

Photo No. 24	
View:	
☐ Front	
☐ Rear	
☐ Right side	
☐ Left side	
☐ Top	
☐ Bottom	
☒ IPX6 test (Pass)	



6. TEST EQUIPMENT

Clause	Measurement / testing	Internal code	Testing / measuring equipment / material needed (description, manufacturer, code)	Calibration due date (gg/mm/yy)
--	Laboratory atmospheric conditions measurement	LS-093	Thermo-Hygrometer Data Logger, XS INSTRUMENTS, mini TH	19/03/2027
13.2	IP2X test	LS-006	Jointed test finger 80 mm length, ATS GALBUSERA, 01.01	12/03/2028
13.2	IP3X test	LS-007	Test rod 2,5 mm diameter, ATS GALBUSERA, 01.11	11/03/2028
13.2	IP4X test	LS-008	Test wire 1,0 mm diameter, ATS GALBUSERA, 01.12	11/03/2028
13.4, 13.5	IP5X test (Category 2 of clause 13.4)	LS-008	Test wire 1,0 mm diameter, ATS GALBUSERA, 01.12	11/03/2028
		LS-024	Test device to verify protection against dust (dust chamber), ATS GALBUSERA, 03.01-A	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
13.4, 13.6	IP6X test (Category 2 of clause 13.4)	LS-008	Test wire 1,0 mm diameter, ATS GALBUSERA, 01.12	11/03/2028
		LS-024	Test device to verify protection against dust (dust chamber), ATS GALBUSERA, 03.01-A	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
14.2.3 a)	IPX3 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.01	Flow meter (IPX3 or IPX4 test), ASA, E5-2600/H	11/03/2028
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-025.11	Oscillating tube radius 200 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.12	Oscillating tube radius 400 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.13	Oscillating tube radius 600 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.14	Oscillating tube radius 800 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration

Clause	Measurement / testing	Internal code	Testing / measuring equipment / material needed (description, manufacturer, code)	Calibration due date (gg/mm/yy)
		LS-025.15	Oscillating tube radius 1000 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.16	Apparatus for arc oscillation speed, ATS GALBUSERA, no code	To use
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
14.2.4 a)	IPX4 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.01	Flow meter (IPX3 or IPX4 test), ASA, E5-2600/H	11/03/2028
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-025.11	Oscillating tube radius 200 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.12	Oscillating tube radius 400 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.13	Oscillating tube radius 600 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.14	Oscillating tube radius 800 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.15	Oscillating tube radius 1000 mm (IPX3 or IPX4 test), ATS GALBUSERA, no code	Not under calibration
		LS-025.16	Apparatus for arc oscillation speed, ATS GALBUSERA, no code	To use
		LS-108	Timer, no manufacturer, PC2810	18/03/2027
14.2.5	IPX5 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.02	Flow meter (IPX5 test), OFFICINE OROBICHE, FTV225-G-A-J-V	11/03/2028
		LS-025.07	6,3 mm hose nozzle (IPX5 test), ATS GALBUSERA, 03.30-D	18/03/2027
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027

Clause	Measurement / testing	Internal code	Testing / measuring equipment / material needed (description, manufacturer, code)	Calibration due date (gg/mm/yy)
14.2.6	IPX6 test	LS-025	Test device to verify protection against water tests, ATS GALBUSERA, 03.30-D	Not under calibration
		LS-025.03	Flow meter (IPX6 test), OFFICINE OROBICHE, FTV250-G-A-J-V	11/03/2028
		LS-025.08	12,5 mm hose nozzle (IPX6 test), ATS GALBUSERA, 03.30-D	30/03/2027
		LS-025.10	Tank and water pump, ATS GALBUSERA, no code	Not under calibration
		LS-108	Timer, no manufacturer, PC2810	18/03/2027

- END OF THE TEST REPORT -

APPENDIX B

FINDINGS

When an interlaboratory comparison is conducted, findings are derived from the evaluation of practices, procedures, and results reported by all participating laboratories.

Any identified differences in the application of the test method may be documented in this report.

Where unsatisfactory or discrepant results are identified, participating laboratories are expected to address the relevant areas for improvement to ensure compliance with the applicable standard (IEC 60529) and to maintain the reliability of future results.

Laboratories are therefore requested to implement appropriate corrective actions to enhance their performance in subsequent rounds.

The following differences were observed for participant **code 21**:

Aspect (IEC 60529)	Laboratory **CODE 21**	Most participants (*)
Sample mounting / intended position of use (access probes, first characteristic numeral - LIP3528)	IP4X probe test performed with the sample not in its intended mounting position; probe access that would not be possible with the sample mounted as in normal use	Sample tested in the intended mounting position
Sample fastening during dust / water tests (LIP4240; also noted for both assays)	Enclosure secured with a cable tie (zip tie), which could compress the cover beyond its as-received sealing condition	Enclosure tested without additional fastening that alters cover sealing

(*) Participants with insufficient performance are excluded from the evaluation.

The findings described above refer exclusively to observed differences among the results submitted by participants. They do not imply, in any way, that the participant's result is directly attributable to these differences.

The participant is expected to conduct an internal analysis of any deviations that may have occurred during testing and to take appropriate corrective measures.

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