



TEST REPORT

Number:

C/221129I1

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SORT OF TESTS

DEGREES OF PROTECTION PROVIDES BY ENCLOSURES (IP Code) according to UNE-EN 60529:2018 (IEC 60529:1989) and UNE-EN 60529:2018/A1:2018

IP66/IP67

APPLICANT

LIBELIUM COMUNICACIONES INALAMBRICAS DISTRIBUIDAS, S.L.

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SAMPLE IDENTIFICATION

Libelium One - One main node

DATE/S OF TEST

21/11/2022 to 22/11/2022

DATE OF RECEPTION

17/11/2022

OBSERVATIONS

Authorized signatory/ies

Date of issue

17/01/2022

Dr. Mateo Iglesias Amella
Date and time: 1/22/2023
10:37:02 AM

Technician

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The results of the present report refer to the moment, conditions and samples in which the measurements were taken.

SAMPLE DESCRIPTION

Sample description:	Data logger with 4G connectivity		
Trade Mark:	LIBELIUM		
Manufacturer:	LIBELIUM COMUNICACIONES DISTRIBUIDAS S.L.		
Model/Type reference:	Libelium One - One main node		
Ratings:	Power : 5 – 24 V DC , 800mA Rechargeable battery: 3.6 V 10.2 Ah		
Samples code:	C/221129/2	C/221129/3	C/221129/4
- Serial number.....:	1122-011152	1122-011139	1122-011159
- HW version.....:	1.0	1.0	1.0
- SW version.....:	1.0.6	1.0.6	1.0.6
- Manufacturer code.....:	#19	#18	#17
Summary of testing:			
The product FULFILLS the requirements tested.			
The product provides a IP66/IP67 degree of protection against access to hazardous parts, ingress of foreign objects and water according to IP – Code and standard UNE-EN 60529:2018.			
The tests have been carried out on the sample as provided by the manufacturer (Screws 0.8-0.9N/m, Nuts 0.3-0.4N/m)			
Tests performed:			
Tests are carried out according to UNE-EN 60529:2018 (IEC 60529:1989) and UNE-EN 60529:2018/A1:2018.			

Photos:



Sample type under test

Test item particulars: Information technology equipment
<p>General product information: (***) Installation and use: Installation on walls or poles. Outdoor used. Supply Connection: By means of detachable power supply cord with female connector. Mass of equipment (kg): 0.490 Material: PC</p>
<p>Environmental test conditions: The test was performed at an ambient temperature of 15 ° C to 35 ° C, relative humidity of 25% RH to 75% RH, and an air pressure of 860 mbar to 1060 mbar.</p> <p>During the test the water temperature should not differ by more than 5 K. Water temperature IPX6: 19.6 °C Sample temperature IPX6: 17.4 °C Water temperature IPX7: 18.3 °C Sample temperature IPX7: 21.6 °C</p>

<p>Possible test results:</p> <ul style="list-style-type: none"> - 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)
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<p>Abbreviations used in the report:</p>

<p>Uncertainty of the test measurement:</p> <p>The expanded uncertainty is obtained by multiplying the combined standard uncertainty by a coverage factor k=2. For a normal distribution this corresponds to a level of confidence of approximately 95%. The uncertainty has been estimated and derived from the uncertainty of the measurement equipments, of the measurement procedure, of the magnitude to be measured and of the environmental conditions. Detailed information regarding measurement uncertainty is available in the test laboratory and could be shown on customer request.</p>
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<p>Observations:</p> <p>Throughout this report a point is used as the decimal separator.</p> <p>(***) : Information provided by the manufacturer. The laboratory is not responsible for such information.</p>
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List of test equipment used:

Test equipment	Code
Digital Thermohigrometer (logger)	3PG20052.C40
Atmospheric pressure meter	3PG00052.400
Test probe 1 mm Ø	3PG20052.C10
Dynamometer	3PG20052.180
Dust chamber	3PG20052.490
Water controller equipment	3PG20052.630
Test nozzle 12.5 mm Ø	3PG20052.680
Water tank	3PG20052.B80
Meter	3PG20052.D03
Chronometer	3PG00052.437
Digital thermometer	3PG20052.370
Inmersion temperature probe	3PG20052.371
Surface temperature probe	3PG20052.372

Test equipment	Code
Dust	-----
Water	-----

UNE-EN 60529

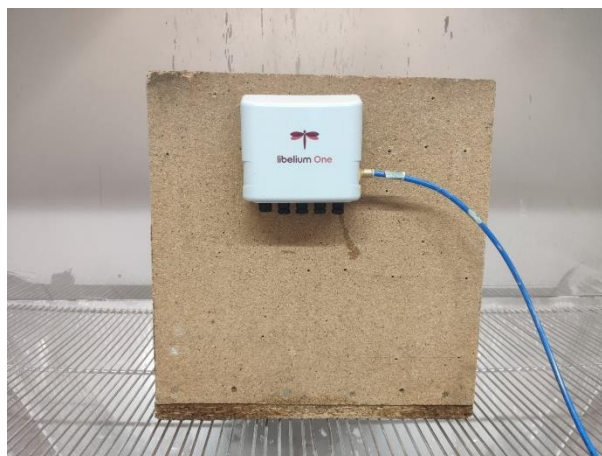
Clause	Requirement + Test	Result - Remark	Verdict
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TEST

12	DEGREES OF PROTECTION AGAINST ACCES TO HAZARDOUS PARTS INDICATED BY THE FIRST CODE ELEMENT		P
	Protected against access to hazardous parts with a wire, degree of protection IP6X		P
	The access probe shall not penetrate. Access probe: 1 mm Ø, 100 mm length. Test force: 1 N ± 10%	The access probe does not penetrate into enclosure.	P
13	DEGREES OF PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CODE ELEMENT		P
13.4 & 13.6	Dust-tight, degree of protection IP6X		P
	Dust ingress shall not be allowed Category 1 enclosure. The enclosure is subjected to a maximum underpressure of 20 mbar. Exposure time: 8 hours.	The dust not ingress.	P

Supplementary information: Sample tested C/221129/4 #17

Photos:



Sample before test



Sample after test

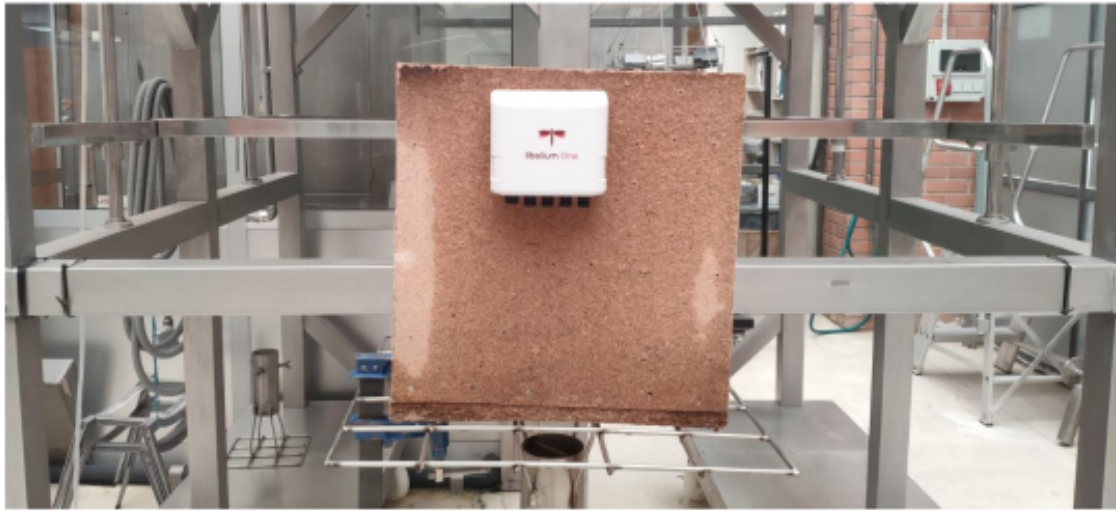
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Clause	Requirement + Test	Result - Remark	Verdict
14	DEGREES OF PROTECTION AGAINST WATER INDICATED BY THE SECOND CODE ELEMENT		P
14.2 & 14.2.6	Protected against powerful water jets, degree of protection IPX6		P
	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects. Internal diameter of the nozzle: 12.5 mm Delivery rate: 100 l/min \pm 5% Distance test nozzle-enclosure: 2.5 m to 3 m. Minimum test duration: 3 min	The water not ingress.	P
14.3	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
	In general, if any water has entered, it shall not:		P
	- be sufficient to interfere with the correct operation of the equipment or impair safety.		P
	- be deposited on insulation parts where it could lead to tracking along the creepage distances.		P
	- be reached live parts or windings not designed to operate when wet.		P
	- be accumulated near the cable end or enter the cable if any.		P
	Dielectric strength test, if applicable. Application parts: Test voltage. (V):		N/A
	Enclosure provided with drain holes		N/A
Supplementary information: Sample tested C/221129/3 #18			

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Clause	Requirement + Test	Result - Remark	Verdict
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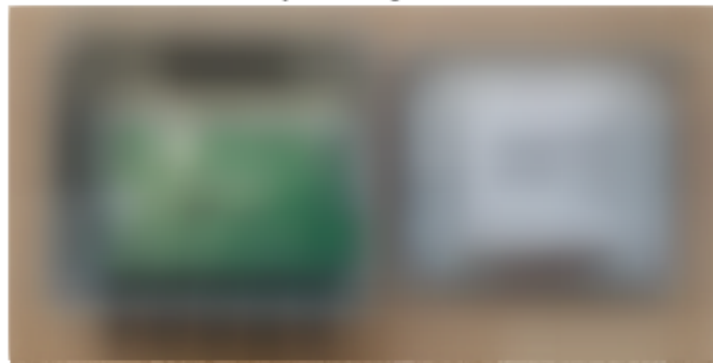
Photos:



Sample disposition



Sample during the test



No dust / water inside after test

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Clause	Requirement + Test	Result - Remark	Verdict
14	DEGREES OF PROTECTION AGAINST WATER INDICATED BY THE SECOND CODE ELEMENT		P
14.2 & 14.2.7	Protected against the effects of temporary immersion in water, degree of protection IPX7		P
	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time. Water-level on enclosure: 0.15 m above top 1 m above bottom. Exposure time: 30 min	The water not ingress.	P
14.3	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
	In general, if any water has entered, it shall not:		P
	- be sufficient to interfere with the correct operation of the equipment or impair safety.		P
	- be deposited on insulation parts where it could lead to tracking along the creepage distances.		P
	- be reached live parts or windings not designed to operate when wet.		P
	- be accumulated near the cable end or enter the cable if any.		P
	Dielectric strength test, if applicable. Application parts: Test voltage. (V):		N/A
	Enclosure provided with drain holes		N/A
Supplementary information: Sample tested C/221129/2 #19			

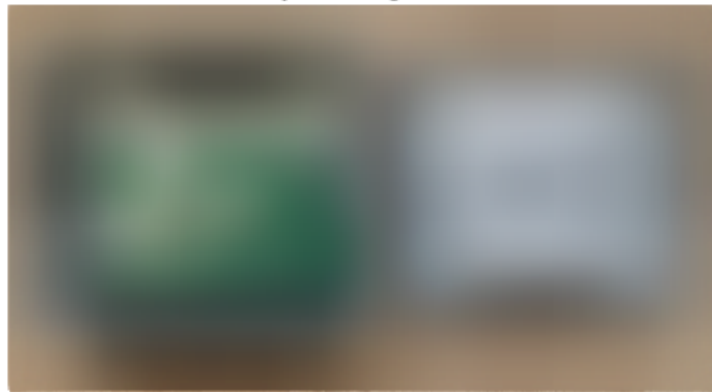
UNE-EN 60529

Clause	Requirement + Test	Result - Remark	Verdict
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Photos:



Sample during the test



No water inside after test

End of report