

Environmental Test Report

EUT :

**Renson 411 – 414 - 431 with Mesh
and Drain**

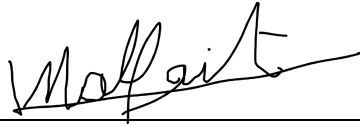
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Date: 23 May 2023

	Renson 411- 414 - 431 with Mesh and Drain	 082-TEST Joseph Cardijnstraat 21 9420 Erpe-Mere Tel : +32(0)53 43 23 04
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Approval Sheet

Function title		Name	Signature	Date
Technical Manager	Author	Ivan Malfait		23 May 2023
Managing Director	Reviewer	Mario Van de Velde		23 May 2023

Distribution List

Function title		Name	Signature	Date

Test Overview and Results

Test	Test Date	Test result
IPX3: Protection against spraying water	17 Apr. 2023	Pass
IPX2: Protection against water dripping	17 Apr. 2023	Pass
IPX1: Protection against vertically dripping	17 Apr. 2023	Pass
IP2X: Protection against access to hazardous parts with a finger	17 Apr. 2023	Pass
IP2X: Protection against solid foreign objects of 12.5 mm	17 Apr. 2023	Pass
IPXXD: Protection against access to hazardous parts with wire	17 Apr. 2023	Pass

Proprietary data notice

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Release overview

Document	Release	Release date	Author	Description
ENV-032-2023	01	23 May 2023	Ivan Malfait	Initial release

Referenced data items

The table below lists all data items that are used or referenced to in this report (Categories : Customer info, Standards, Other info)

Document name	Release date	Revision	Category
EN 60529	1991	NA	Standard
A1	2000	NA	Standard
A2	2013	NA	Standard

Abbreviations and acronyms

Abbreviation	
EUT	Equipment Under Test
RH	Relative Humidity

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1. Test Laboratory

Blue Guide EMC Lab
Joseph Cardijnstraat 21
9420 Erpe-Mere
Belgium
BE 0882 166 104



2. Customer Identification

Manufacturer : Renson Ventilation
Address : Industriezone 2 Vijverdam Maalbeekstraat 10
8790 Waregem
Belgium
E-mail: giel.bruyneel@renson.be
Tel: +32 56 30 33 32

Test witnessed by: Giel Bruyneel

Test Offer : BGEMC-23-063

3. EUT

3.1 Identification

Name	:	Renson 411 – 414 - 431 with Mesh and Drain
Lab identification	:	ENV-032-2023
Part Number	:	-
Serial Number	:	-
Manufacturing Date	:	-
Firmware release	:	-



3.2 Description

The EUT is applied in walls/doors.

4. Performed Tests

4.1 Degrees of protection against water indicated by the second characteristic numeral (IP-3)

4.1.1 Referenced Specification

Test performed according EN 60529:1991 + A1:2000 + A2:2013.

4.1.2 Purpose of the test

The object of the IP test (second numeral) is to verify the protection of equipment or other articles against access harmful effects due to the ingress of water.

4.1.3 Deviations from Test Procedure

None

4.1.4 Test parameters

- IP-3: Spraying water. Water is sprayed at an angle of 60° on either side
- Duration:
 - IP-3: 1 min./m² with at least 5 min. *Calculate the surface area*
- Water flow rate:
 - IP-3: 10 L/min

4.1.5 EUT Test Setup

- Mounting or positioning: normal position

IP-3

Step 1: EUT (not operational) is placed on the turntable
Step 2: The Spray nozzle is used with shield
Step 3: The water flow rate is adjusted for 10 L/min.
Step 4: Calculate the outer surface area: less than 1 m²
Step 5: Test duration is 5 min.



4.1.6 Test Description

According to BGEMC Work Instruction: WI-0219

- Step 1: Measurement of environmental parameters (temperature, humidity)
- Step 2: Measure the water temperature
- Step 3: The turntable is not rotating
- Step 4: EUT is exposed to the conditions for the specified duration

4.1.7 Pre-Test Control and initial measurements

- Check if the EUT is operating normally: -
- Initial measurements (if any): none
- Specific observations/conditions: none

4.1.8 Pre-conditioning

None

4.1.9 Testing

Atmospheric conditions in test lab:

Ambient Temperature	:	19.9	°C
Ambient Relative Humidity	:	40	%RH
Water temperature	:	17.9	°C





Uncertainty of measurement: IPX3 : ± 1.4 %

4.1.10 Pass-Fail criteria

The EUT will PASS the test when :

- If any water has entered, it shall not
 - Be sufficient to interfere with the correct operation of the equipment or impair safety
 - Deposit on insulation parts where it could lead to tracking along the creepage distances
 - Reach live parts or windings not designed to operate when wet
 - Accumulate near the end or enter the cable if any
- 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 harm to the equipment.

4.1.11 Post-Test Control

- After testing, the enclosure shall be inspected for ingress of water
- Specific observations/conditions:
- Water drops were found up to 32 cm behind the grid.
- Check if the EUT is operating normally: -





4.1.12 Test Result

- No visual degradation observed

Minor remarks

- Water drops were found up to 32 cm behind the grid.
- A “safe zone” will be mentioned in the installation instructions.

Test Result: PASS

4.2 Degrees of protection against water indicated by the second characteristic numeral (IP-2)

4.2.1 Referenced Specification

Test performed according EN 60529:1991 + A1:2000 + A2:2013.

4.2.2 Purpose of the test

The object of the IP test (second numeral) is to verify the protection of equipment or other articles against access harmful effects due to the ingress of water.

4.2.3 Deviations from Test Procedure

None

4.2.4 Test parameters

- IP-2: Dripping water.
 - Water is falling vertically
 - Turntable is not rotating
 - Duration: 2.5 min in 4 orthogonal positions.
 - Water flow rate: 3 L/min

4.2.5 EUT Test Setup

- Mounting or positioning: normal position
- IP-2
 - Step 1: EUT (not operational) is placed on the turntable (not turning)
 - Step 2: The Drip Box is used and the water flow rate is adjusted for 3 mm/min. The turntable is tilted for 15 °
 - Step 3: The Drip Box is placed at 200 mm from the top of the EUT.
 - Step 4: Duration of the test: 2.5 min for the 4 orthogonal positions of the EUT



4.2.6 Test Description

According to BGEMC Work Instruction: WI-0219

- Step 1: Measurement of environmental parameters (temperature, humidity)
- Step 2: Measure the water temperature
- Step 3: The turntable is not rotating
- Step 4: EUT is exposed to the conditions for the specified duration

4.2.7 Pre-Test Control and initial measurements

- Check if the EUT is operating normally: -
- Initial measurements (if any): none
- Specific observations/conditions: none

4.2.8 Pre-conditioning

None

4.2.9 Testing

Atmospheric conditions in test lab:

Ambient Temperature	:	19.9	°C
Ambient Relative Humidity	:	40	%RH
Water temperature	:	17.9	°C





Uncertainty of measurement: IPX2

: $\pm 0.41 \%$

4.2.10 Pass-Fail criteria

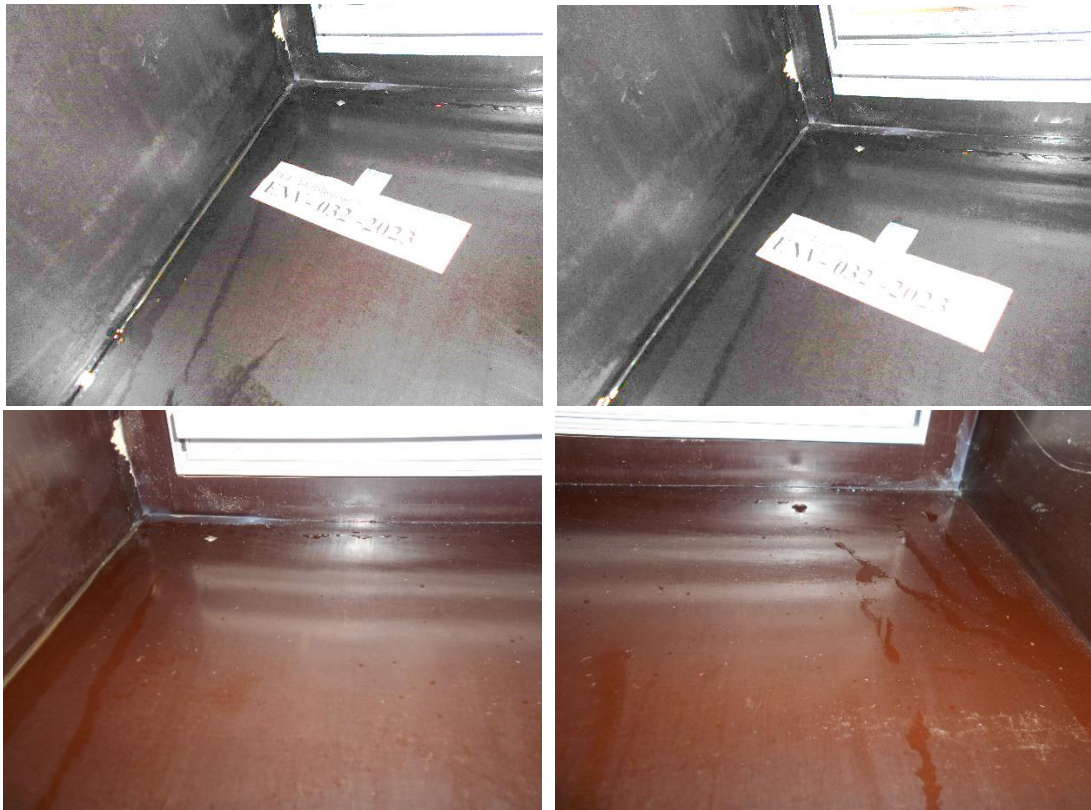
The EUT will PASS the test when :

- If any water has entered, it shall not
 - Be sufficient to interfere with the correct operation of the equipment or impair safety
 - Deposit on insulation parts where it could lead to tracking along the creepage distances

- Reach live parts or windings not designed to operate when wet
- Accumulate near the end or enter the cable if any
- 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 harm to the equipment.

4.2.11 Post-Test Control

- After testing, the enclosure shall be inspected for ingress of water
- Specific observations/conditions:
 - Water drops were found up to 32 cm behind the grid.
- Check if the EUT is operating normally: -





4.2.12 Test Result

- No visual degradation observed

Minor remarks

- Water was found behind the grid.
- Mainly due to the drain and rotating the EUT during the test.
- A “safe zone” will be mentioned in the installation instructions.

Test Result: PASS

4.3 Degrees of protection against water indicated by the second characteristic numeral (IP-1)

4.3.1 Referenced Specification

Test performed according EN 60529:1991 + A1:2000 + A2:2013.

4.3.2 Purpose of the test

The object of the IP test (second numeral) is to verify the protection of equipment or other articles against access harmful effects due to the ingress of water.

4.3.3 Deviations from Test Procedure

None

4.3.4 Test parameters

- IP-1: Dripping water.
 - Water is falling vertically
 - EUT under an angle of 0 °
 - Turntable is rotating at 1 turn/min.

- Duration: 10 min.
- Water flow rate: 1 L/min

4.3.5 EUT Test Setup

- Mounting or positioning: normal position
- IP-1
 - Step 1: EUT (not operational) is placed on the turntable (turning)
 - Step 2: The Drip Box is used and the water flow rate is adjusted for 1 mm/min.
 - Step 3: The Drip Box is placed at 200 mm from the top of the EUT.
 - Step 4: Duration of the test: 10 min



4.3.6 Test Description

According to BGEMC Work Instruction: WI-0219

- Step 1: Measurement of environmental parameters (temperature, humidity)
- Step 2: Measure the water temperature
- Step 3: The turntable is rotated with 1 rev/min
- Step 4: EUT is exposed to the conditions for the specified duration

4.3.7 Pre-Test Control and initial measurements

- Check if the EUT is operating normally: -
- Initial measurements (if any): none
- Specific observations/conditions: none

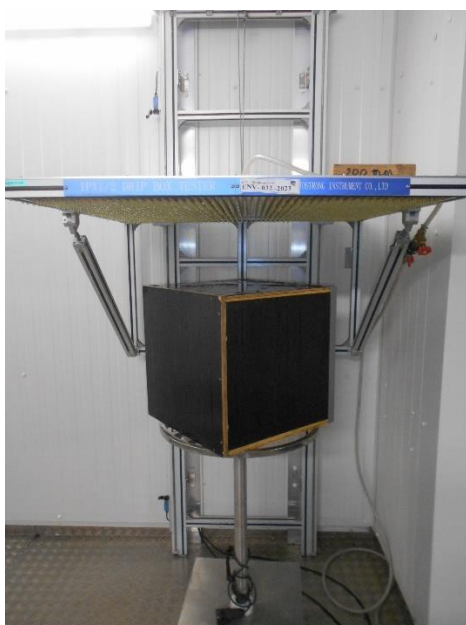
4.3.8 Pre-conditioning

None

4.3.9 Testing

Atmospheric conditions in test lab:

Ambient Temperature	:	19.9	°C
Ambient Relative Humidity	:	40	%RH
Water temperature	:	17.9	°C



Uncertainty of measurement: IPX1 : ± 0.64 %

4.3.10 Pass-Fail criteria

The EUT will PASS the test when :

- If any water has entered, it shall not
 - Be sufficient to interfere with the correct operation of the equipment or impair safety
 - Deposit on insulation parts where it could lead to tracking along the creepage distances
 - Reach live parts or windings not designed to operate when wet
 - Accumulate near the end or enter the cable if any
- 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 harm to the equipment.

4.3.11 Post-Test Control

- After testing, the enclosure shall be inspected for ingress of water
- Specific observations/conditions:
 - Water drops were found up to 32 cm behind the grid.
- Check if the EUT is operating normally: -

No water found on the inner side.

4.3.12 Test Result

- No visual degradation observed

Test Result: PASS

4.4 Degrees of protection access to hazardous parts (IP2-) Protection of Persons

4.4.1 Referenced Specification

Test performed according EN 60529:1991 + A1:2000 + A2:2013.

4.4.2 Purpose of the test

The object of the IP test (first numeral) is to verify the protection of equipment or other articles against access to hazardous parts with a finger.

4.4.3 Deviations from Test Procedure

None

4.4.4 Test parameters

None

4.4.5 EUT Test Setup

- Specific mounting or positioning: normal position

4.4.6 Test Description

IP2-

Step 1: Measurement of environmental parameters (temperature, humidity)

Step 2: The Jointed Test Finger with a diameter of 12.5 mm is used to push against or inserted through any openings of the enclosure with a force of max. 10 N.

Described in Laboratory Work Instruction: WI-0086

4.4.7 Pre-Test Control and initial measurements

- Initial measurements (if any): none
- Specific observations/conditions: none

4.4.8 Pre-conditioning

None

4.4.9 Testing

Atmospheric conditions in test lab:

Ambient Temperature	:	19.9	°C
Ambient Relative Humidity	:	40	%RH



4.4.10 Acceptance conditions

The EUT will PASS the test when :

- If adequate clearance is kept between the access probe and hazardous parts.
- For Low-voltage equipment: the access probe shall not touch hazardous live parts.
- For High-voltage equipment: the equipment shall be capable of withstanding the dielectric tests.
- For equipment with hazardous mechanical parts: the access probe shall not touch hazardous mechanical parts.

4.4.11 Post-Test Control

- Specific observations/conditions: none

4.4.12 Test Result

The finger could not enter the EUT.

Test Result: PASS

4.5 Degrees of protection against access to hazardous parts (IP2-) Protection against solid foreign objects

4.5.1 Referenced Specification

Test performed according EN 60529:1991 + A1:2000 + A2:2013.

4.5.2 Purpose of the test

The object of the IP test (first numeral) is to verify the protection of equipment or other articles against ingress of solid foreign objects.

4.5.3 Deviations from Test Procedure

None

4.5.4 Test parameters

- None

4.5.5 EUT Test Setup

- Specific mounting or positioning: normal position

4.5.6 Test Description

IP2-

Step 1: Measurement of environmental parameters (temperature, humidity)

Step 2: The Rigid Sphere with a diameter of 12.5 mm is used to push against any openings of the enclosure with a force of max. 30 N.

Described in Laboratory Work Instruction: WI-0219

4.5.7 Pre-Test Control and initial measurements

- Initial measurements (if any): none
- Specific observations/conditions: none

4.5.8 Pre-conditioning

None

4.5.9 Testing

Atmospheric conditions in test lab:

Ambient Temperature	:	19.9	°C
Ambient Relative Humidity	:	40	%RH



4.5.10 Acceptance conditions

The EUT will PASS the test when :

- IP2-: The full diameter of the probe does not pass through any opening.

4.5.11 Post-Test Control

- Specific observations/conditions: none

4.5.12 Test Result

The probe could not enter the EUT.

Test Result: PASS

4.6 Degrees of protection against access to hazardous parts with wire (IP--D)

4.6.1 Referenced Specification

Test performed according EN 60529:1991 + A1:2000 + A2:2013.

4.6.2 Purpose of the test

The object of the IP test (additional letter) is to verify the protection of equipment or other articles against access to hazardous parts with a wire.

4.6.3 Deviations from Test Procedure

None

4.6.4 Test parameters

- None

4.6.5 EUT Test Setup

- Specific mounting or positioning: normal position

4.6.6 Test Description

IP—D: The access probe is pushed against any openings of the enclosure with a force of 1 N.

Described in Laboratory Work Instruction: WI-0219

4.6.7 Pre-Test Control and initial measurements

- Initial measurements (if any): none
- Specific observations/conditions: none

4.6.8 Pre-conditioning

None

4.6.9 Testing

Atmospheric conditions in test lab:

Ambient Temperature : 19.9 °C
Ambient Relative Humidity : 40 %RH



4.6.10 Acceptance conditions

The EUT will PASS the test when :

- IP--D: the stop face shall not penetrate any opening.

4.6.11 Post-Test Control

- Specific observations/conditions: none

4.6.12 Test Result

The stop face could not enter the EUT.

Test Result: PASS

5. General Conclusion

EUT passed all testing as described in the test overview.
The EUT is compliant IP23D.

6. Test Equipment

Equipment	Brand	Model	Serial number	Calibration Due
Temperature/humidity meter BGEMC 01-118K	TFA Dostmann	AirSain	None	07 Apr. 2023
Temperature Meter BGEMC 01-119K	Fluke	51	6150051	01 Aug. 2023
Water spray Nozzle IPX3/4 BGEMC 01-042	Shen Autostrong Instrument	AUTO_IPX3/4	AUTO131023005	NA

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Flow Meter 0.25 ... 5 L/min BGEMC 01-157K	MAG&VIEW	MVM-005-QA	79399	03 Jan. 2024
Drip Box BGEMC 01-150	Shen Autostrong Instrument	None	None	NA
Turntable BGEMC 01-151	Shen Autostrong Instrument	None	None	NA
Timer BGEMC 01-117K	Fortex	FX-TMR-01	None	NA
Access Probe 1 mm PEMC 11-005K	PTL	P10.27	5011557	31 Aug. 2023
Jointed IEC Testfinger PEMC 11-003K	PTL	P10.14	5011555	27 Aug. 2023
Sphere 11-027K	Shen Autostrong Instrument	None	None	29 Aug. 2024