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Environmental Test Report

EUT :

Renson 450

Mesh 2,3x2,3mm, 300x271mm, with gutter

Filename : ENV-031-2017

Release : 01

Date: 23 Oct. 2017

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Approval Sheet

Function title		Name	Signature	Date
Technical Manager	Author	Arne Van Hulle		23 Oct. 2017
General Manager	Reviewer	Ivan Malfait		23 Oct. 2017

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Test Overview and Results

Test	Test Date	Test result
Degrees of protection provided by enclosures for electrical equipment against access to hazardous parts (IP4X code)	10 Oct. 2017	See overall conclusion
Degrees of protection provided by enclosures for electrical equipment against solid foreign objects (IP4X code)	10 Oct. 2017	See overall conclusion
Degrees of protection provided by enclosures for electrical equipment against ingress of water (IPX4 code)	10 Oct. 2017	See overall conclusion

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Proprietary data notice

Release overview

Document	Release	Release date	Author	Description
ENV-031-2017	01	23 Oct. 2017	Arne Van Hulle	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 +A1:2000+A2:2013	2013	NA	Standard

Abbreviations and acronyms

Abbreviation	
EUT	Equipment Under Test
RH	Relative Humidity

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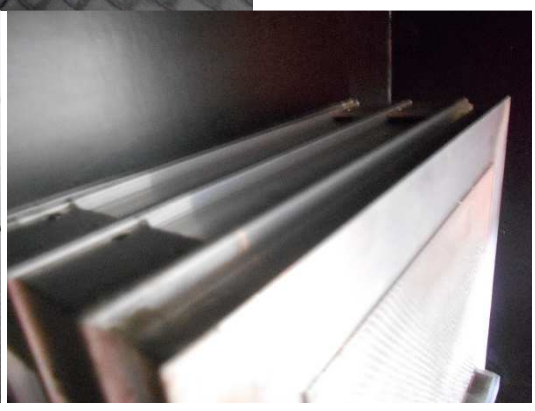
1. EUT Description

1.1 EUT Identification

EUT

Name	:	Renson 450
Lab identification	:	ENV-031-2017
Dimensions	:	300 x 271 mm
Mesh	:	Mesh 2,3mm
Gutter	:	Gutter inside



1.2 Customer Identification

Manufacturer: Renson
Address: Industriezone 2 Vijverdam, Maalbeekstraat 10, 8790 Waregem
Offer Number: BGEMC-17-299 & BGEMC-17-360

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2. Tests

2.1 Degrees of protection provided by enclosures for electrical equipment against access to hazardous parts indicated by the first characteristic numeral (protection of persons)

2.1.1 Referenced Specification

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

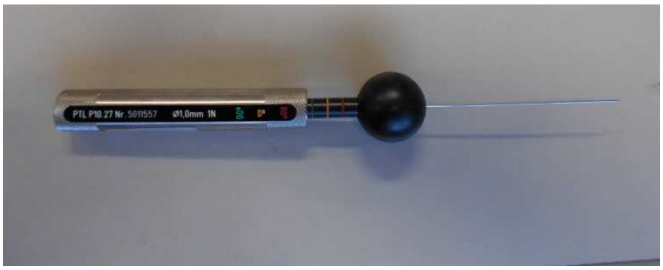
4	Protection against hazardous parts with a wire	1,0 mm probe

2.1.2 Deviations from Test Procedure

Test executed on non-electrical/electronic enclosure (vent grills).

2.1.3 EUT Test Setup

- The EUT is mounted and positioned vertical in a test fixture provided by the manufacturer.
- Test equipment: Test wire 1.0 mm



2.1.4 Test Description

- The access probe is pushed against or inserted through any openings of the enclosure with the force specified in the table below:

Degrees of protection against access to hazardous parts indicated by the first characteristic numeral (protection of persons)		
4	Test wire 1 mm (PEMC 11-005)	1N

- If applicable (not required if it's obvious the access probe is not penetrating at all) for low voltage equipment (<1000VAC/1500VDC) a low voltage supply (40V-50V) in series with a suitable lamp will be connected between the probe and the hazardous parts inside the enclosure: **not applicable since no electrical/electronic parts are present**

2.1.5 Pass-Fail criteria

To comply with the conditions of the first characteristic numeral, adequate clearance shall be kept between the access probe and the hazardous parts (as practical definition of hazardous live parts definition 1.2.8.6 of IEC60950 is applied):

- The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts. For low voltage equipment (< 1000VAC/1500VDC) this means the access probe shall not touch hazardous live parts. If (IEC 60529 section 12.3.1) adequate clearance is verified by a signal circuit the lamp shall not light.

2.1.6 Test Result

- No hazardous parts can be touched by the test probe for IP4X.

2.2 Degrees of protection provided by enclosures for electrical equipment against solid foreign objects by the first characteristic numeral 2/3/4 (protection of equipment)

2.2.1 Referenced Specification

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

Protection of persons (solid foreign objects)

2	Protection against foreign objects >12,5mm	sphere 12,5 mm
3	Protection against foreign objects >2,5 mm	2,5 mm probe
4	Protection against foreign objects >1 mm	1,0 mm probe

2.2.2 Deviations from Test Procedure

Test executed on non-electrical/electronic enclosure (vent grills).

2.2.3 EUT Test Setup

- The EUT is mounted and positioned vertical in a test fixture provided by the manufacturer.
- Test equipment: Test wire 1.0 mm / Test wire 2,5 mm / Test Sphere (12,5 mm)

2.2.4 Test Description

- The access probe is pushed against any openings of the enclosure with the force specified in the table below:

Degrees of protection against access to hazardous parts indicated by the first characteristic numeral (protection of persons)		
2	Sphere Ø12,5mm (PEMC 11-027K)	10N
3	Test wire 2,5 mm (PEMC 11-004)	3N

4	Test wire 1 mm (PEMC 11-005)	1N

2.2.5 Pass-Fail criteria

The EUT will PASS the test when (penetration is considered a means for entering the area behind the grill) :

- (IP2) The object probe shall not fully penetrate, the protection is satisfactory if the full diameter of the probe does not pass through any opening
- (IP3/4) The object probe shall not penetrate at all

2.2.6 Test Result

- No penetration possible using test sphere for IP2X* (12,5mm), nor with test probe for IP3X* (2,5mm) and IP4X* (1mm)

  *it should be noted the test sphere of 12,5mm and test probes can penetrate the grill itself but cannot further penetrate due to the mesh behind the grill (test sphere) and due to the fact the actual length of the probes is not enough to penetrate the area behind the grill.

2.3 Degrees of protection provided by enclosures for electrical equipment against ingress of water (IPX4 code)

2.3.1 Referenced Specification

Test performed according EN 60529:1991 +A1:2000 +A2:2013, protection against ingress of water

4	Protection against splashing water	Spray nozzle

2.3.2 Deviations from Test Procedure

Test executed on non-electrical/electronic enclosure (vent grills).

2.3.3 EUT Test Setup

- The EUT is mounted and positioned vertical in a test fixture provided by the manufacturer.
- Test equipment: spray nozzle with flow meter

2.3.4 Test Description

- The EUT was sprayed in a horizontal plane of 180°, and in vertical planes of 180°.
- Water flow rate: 10 liter /min.
- Duration of test: 1min/m², at least 5 min -> 5 minutes
- Distance from nozzle to EUT: between 30 and 50cm

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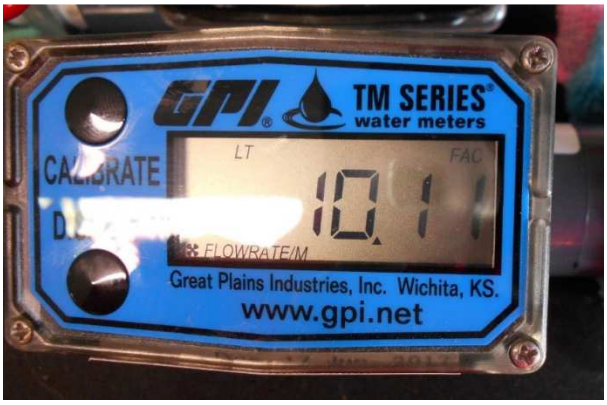
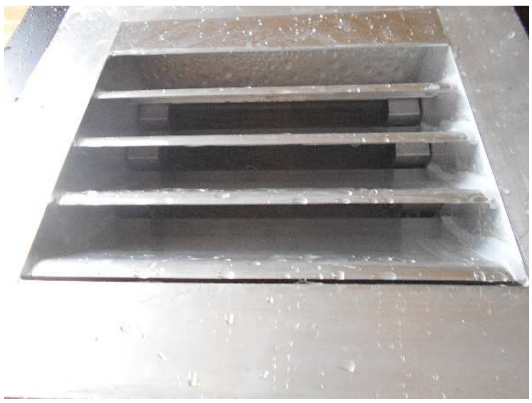
2.3.5 Testing

Atmospheric conditions in test lab just before start of test:

Ambient Temperature	:	19,0	°C
Ambient Relative Humidity	:	63,5	%RH





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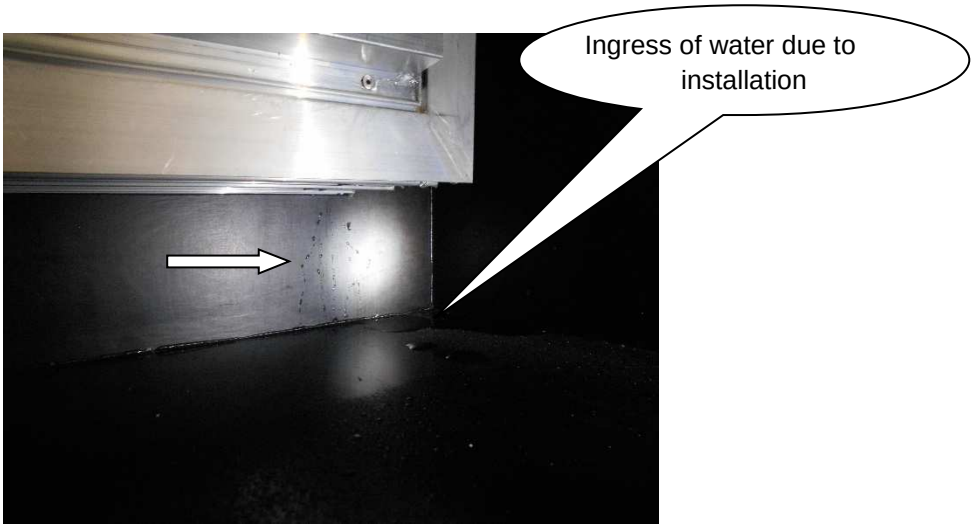
2.3.6 Pass-Fail criteria

The EUT will PASS the test when :

- No ingress of water observed, or should be limited in quantity and location depending on the application
- Limited water “dust” (mist) allowed in the clearance area as prescribed in the installation manual/procedures.

2.3.7 Observation

- Some ingress of water observed which however is not the result of water entering through the grill (from outside to inside, which is the scope of this IP test) but due to water entering via the openings the way the EUT is installed. The manufacturer will specify a correct way of installing the grill (with outside and inside kitting after installation).



2.3.8 Test Result

- Water “dust” (mist) observed in the area behind the grill (25-30cm)
- Limited ingress of water observed which however is not the result of water entering through the grill (from outside to inside, as intended by this IP test) but due to water entering via the inner construction of the grill itself.
- EUT can be considered IPX4 on condition enough clearance is kept.

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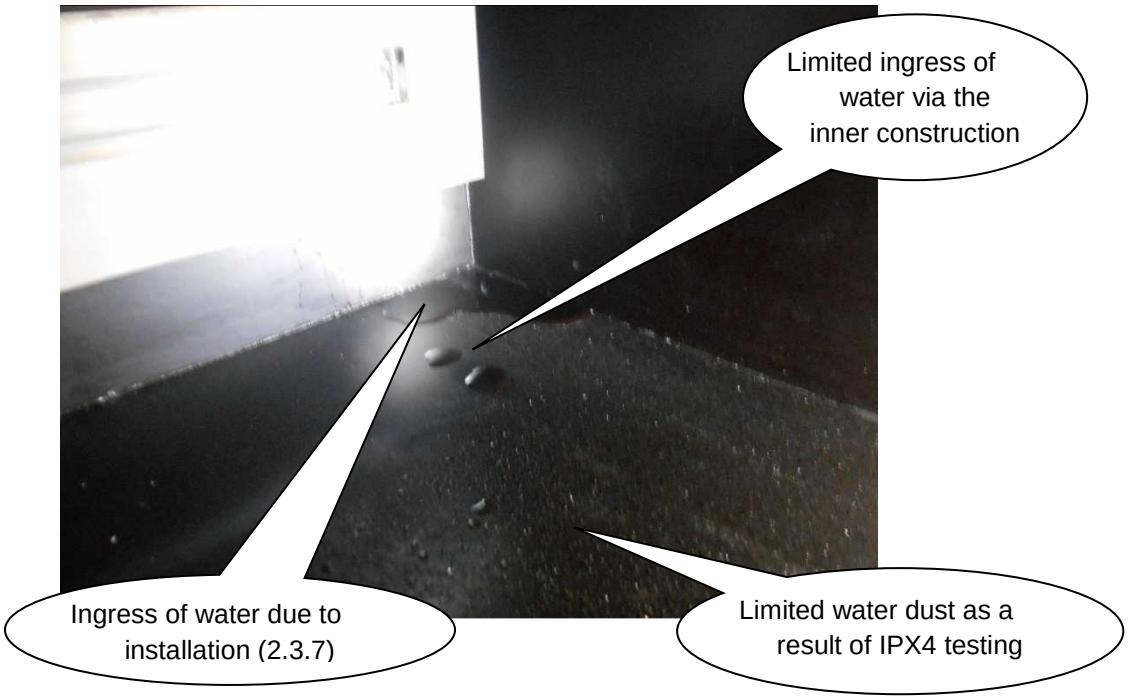

3. General Conclusion

EUT can be considered IP44 on condition enough clearance (see 3.2) is kept to hazardous parts (by mounting/installation instructions). It should be noted limited ingress of water is observed via the inner construction, yet not as such the EUT is no longer IPX4 compliant. The IPX4 rating of the “installed EUT” (EUT built in in the application) depends on the correct way of installation (as per manufacturers installation instructions).

3.1 Degrees of protection provided by enclosures for electrical equipment indicated by the first characteristic numeral

The EUT can be given the following IP code:

- The actual protection is IP4X
- Remark: depending on the shape/size of a small object it’s not excluded such objects (0-15mm) might enter the grill itself. But cannot penetrate any further due to the presence of the mesh.

3.2 Degrees of protection provided by enclosures for electrical equipment indicated by the second characteristic numeral

The EUT can be given the following IP code:

- The actual protection is IPX4 on condition enough clearance (250-300mm) is kept to hazardous parts (by mounting/installation instructions)
- Next to the actual protection grade of the EUT itself it should be noted the overall IP grade (for protection against ingress of water) after building in depends on the way the EUT is installed in its application.

4. Test Equipment

4.1 List of test equipment

Equipment	Brand	Model	Serial number
Test wire 1.0 mm (rigid IEC steel rod with dynamometer 1N) PEMC 11-005	PTL	PTL P10.27	5011557
Sphere 12,5mm PEMC 11-027K	Shenzen Autostrong Instrument Co, Ltd	AUTO-Q-12,5mm	AUTO150211002
Jointed IEC test finger PEMC 11-003	PTL	PTL P10.14	5011555
Spray nozzle IPX3/4 BGEMC 01-041	Shenzen Autostrong Instrument Co, Ltd	AUTO_IPX3/4	AUTO131023005
Flow meter (7,6-76l/min) BGEMC-01-063K	Great Plans Industries	TM75	01/063
Manometer 0-1,6 bar BGEMC 01-089K	Afriso	RF40 R1/8 AX 0+1,6	A0020991
Timer 99 min BGEMC 01-065K	TFA Dostmann	38.2013	BGEMC 01-065K
Temperature/humidity meter BGEMC 01-086K	Testo	608-H1	601 0130 0660 6081 45066326

4.2 Calibration dates and certificates

Equipment	Serial number	Calibration date	Due date	Calibration certificate
Test wire 1.0 mm	5011557	28 Jul. 2017	28 Jul. 2018	2017072802.01 (BGEMC)
Jointed IEC test finger PEMC 11-003	5011555	22 Jan. 2013	22 Jan. 2018	20130122 (BGEMC)
Flow meter (7,6-76l/min) BGEMC-01-063K	01/063	17 Aug. 2017	17 Aug. 2019	30595 (TPF control)
Timer 99 min	BGEMC 01-065K	17 Aug. 2016	17 Aug. 2018	2016081701.01 (BGEMC)
Temperature/humidity meter BGEMC 01-086K	601 0130 0660 6081 45066326	08 Nov. 2016	08 Nov. 2017	2016101801.01 (BGEMC)