

REDTRONIC IP69K

Certificate No: RED-202201

TEST CERTIFICATE

Company : Redtronic Ltd
Address : Unit 1-9, Wellington Business Park, Quebec Street, Elland, HX5 9BX,
United Kingdom
Sample Name : Tornado Microbar
Date Tested : 3rd February 2022

TESTING LABORATORY ACCREDITATION:

ISO 9001:2015 certificate is approved by Q.A. International Certification Limited
Certificate No: QAIC / UK / 501

Regulations: 72/245/EC, ECE10 as amended is approved by Vehicle Certification Agency
Registration No: VCAMC/14/0043/A

UN/ECE Regulation No 65 is approved by Unidad De Certificación Del Automovil
Certificate No: C1 29571503D

TEST METHOD:

BS EN 60068-2-38:2009: Environmental testing – Temperature/humidity cyclic test

BS EN 60529:1992+A2:2013 – Degrees of protection provided by enclosures

ISO 20653: 2013-02 IP6X: Dust Test

ISO 20653: 2013-02: IPx9K high-pressure cleaning

WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures.
We assume full responsibility for the accuracy and completeness of these tests and vouch
for the qualifications of all personnel performing them.

	Name	Date
Technical Engineer	Dan Jackson	03/02/2022

NOTE:

1. This certificate will be invalid if reproduced in part or altered in anyway.
2. This certificate refers only to the specimen(s) submitted to test and is invalid if used otherwise.

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1. GENERAL INFORMATION

1.1 DESCRIPTION OF UNIT

Manufacturer: Redtronic Ltd
Sample name and Sample quantity:

Sample Name	Sample Quantity
Microbar A	1 unit

1.2 UNIT OPERATING CONDITION

Unit is powered off and disconnected from power source. During testing there is a function test at beginning and end of test procedure.

2. HIGH PRESSURE CLEANING TEST

2.1 TEST EQUIPMENT

Model	Calibration Date
HAIDA	January 2022

2.2 LABORATORY AMBIENCE CONDITION

Temperature: 25°C ± 10°C

Relative Humidity: 50% ± 25% (RH)

2.3 REFERENCE DOCUMENT

This test method refers to BS EN 60529:1992+A2:2013 – Degrees of protection provided by enclosures, specifically ISO 20653: 2013-02: IPx9K high-pressure cleaning.



2.4 TEST PARAMETERS

Distance of the Nozzle to the specimen:	100 to 150mm
Water flow rate:	15l / min
Water pressure:	100 bar
Water temperature:	80°C
Speed test table:	5 U / min
Spray angle:	0°, 30°, 60°, 90°
Number of cycles:	1
Test Conditions:	The specimen is not in electrical operation.

2.5 SUMMARY OF TEST

After testing, visual inspection showed no water permeated into the unit.

3. ATTACHMENTS HIGH PRESSURE CLEANING

SETUP	
	
AFTER TESTING	
	
Comments: Device passed IPX9K test with no negative reaction. The microbar worked both at beginning of test cycle, during and after test cycle complete.	

4. DUST TEST

4.1 TEST EQUIPMENT

Model	Calibration Date
HAIDA	January 2022

4.2 LABORATORY AMBIENCE CONDITION

Temperature: $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$

Relative Humidity: $50\% \pm 25\%$ (RH)

4.3 REFERENCE DOCUMENT

This test method refers to, specifically ISO 20653: 2013-02: IP6x Dust Test.

4.4 TEST PARAMETERS

Dust Material: Talcum powder (100% dry fine)

Particle Size	Amount (%)
< 5 μm (Diameter)	$42.3\% \pm 5$
5~10 μm (Diameter)	$35.85\% \pm 5$
10~20 μm (Diameter)	$21.15\% \pm 5$
20~40 μm (Diameter)	$0.69\% \pm 5$
> 40 μm (Diameter)	0%

Amount of Talcum Powder: 2 kg/m³ (chamber volume)

Dust Density: 2.03 g/cm³

Depression level: 0 mbar


Air Direction: Vertically to achieve slowest possible downward settlement

Duration: 8 hours

4.5 SUMMARY OF TEST

After testing, visual inspection showed no dust particle permeated into the unit.

5. ATTACHMENTS DUST TEST

SETUP	
	
AFTER TESTING	
Comments: Device passed IP6X test with no negative reaction. The Microbar worked both at the beginning of the test cycle and after the test was complete. There was no ingress of dust within the Microbar enclosure.	
Conclusion: Device passed IP69K test with no negative ingress effects.	

6. ENVIRONMENTAL TESTING

6.1 TEST EQUIPMENT

Model	Calibration Date
HAIDA	January 2022

6.2 LABORATORY AMBIENCE CONDITION

Temperature: $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$

Relative Humidity: $50\% \pm 25\%$ (RH)

6.3 REFERENCE DOCUMENT

BS EN 60068-2-38:2009: Environmental testing – Temperature/humidity cyclic test

6.4 TEST PARAMETERS

Section of test:	Parameters:
Preconditioning	$55^{\circ}\text{C} \pm 2\text{ K}$ 20% RH for 24h
Initial measurements	Visual Inspection of specimen
Conditioning	$\pm 2\text{ K}$ tolerance
Test cycle	$25^{\circ}\text{C} \pm 2\text{ K}$ 93 $\pm 3\%$ RH at start of test then follow BS EN 60068-2

6.5 SUMMARY OF TEST

After testing, visual inspection showed no water permeated into the unit. And no effect had been caused by the heat cycle.

7. ATTACHMENTS ENVIRONMENTAL TEST

SETUP

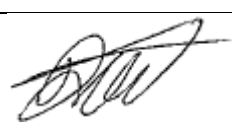


AFTER TESTING



Comments: Device passed test with no negative reaction. The Microbar worked both at beginning of test cycle and after the test was complete.

Conclusion: Device passed IP69K test with no negative ingress effects.

	Name	Signature	Date
Technical Engineer	Dan Jackson		03/02/2022