



Technical Report No. 68.210.18.0093.01

Rev. 00

Dated 2018-07-06

Client : Name: Perixx Computer GmbH
Address: Heerdter Landstraße 189e, 40549 Düsseldorf, Germany
Contact person: Allen Liang

Manufacturing place : Manufacturer's name/Address: Same as client
Factory's name/Address: Same as client

Test subject..... : Product: Water Proof IP58 Keyboard
Type: PERIBOARD-523

Test specification : IP58 test according to IEC 60529:1989+A1:1999+A2:2013

Purpose of examination..... : Test according to the test specification

Test result : The test results show that the presented product is in compliance with the specified requirement.

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1 Description of the test subject

Water Proof Keyboard

1.1 Function

- Manufacturer's specification for intended use: According to user instruction
- Manufacturer's specification for predictive misuse: According to user instruction

1.2 Consideration of the foreseeable misuse

- Not applicable
- Covered through the applied standard
- Covered by the following comment
- Covered by attached risk analysis

1.3 Technical Data

- Degree of protection : IP58

2 Order

2.1 Date of Purchase Order, Customer's Reference

2018-03-14

2.2 Receipt of Test Sample, Location

Samples were received on 2018-03-14, E&E Department, Shenzhen

2.3 Date of Testing

From 2018-03-14 to 2018-07-06

2.4 Location of Testing

E&E Department, Shenzhen

2.5 Points of Non-compliance or Exceptions of the Test Procedure

N/A

3 Test results

3.1 IP5X test procedure and requirement

5 Degrees of protection against access to hazardous parts and against solid foreign objects indicated by the first characteristic numeral

5.1 Protection against access to hazardous parts

Table 1 gives brief descriptions and definitions for the degrees of protection against access to hazardous parts.

Table 1 – Degrees of protection against access to hazardous parts indicated by the first characteristic numeral

First characteristic numeral	Degree of protection		Test conditions, see
	Brief description	Definition	
5	Protected against access to hazardous parts with a wire	The access probe of 1,0 mm \varnothing shall not penetrate	12.2

5.2 Protection against solid foreign objects

Table 2 gives brief descriptions and the definitions for the degrees of protection against the penetration of solid foreign objects including dust.

Table 2 – Degrees of protection against solid foreign objects indicated by the first characteristic numeral

First characteristic numeral	Degree of protection		Test conditions, see
	Brief description	Definition	
5	Dust-protected	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety	13.4 13.5

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 figure 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 μm and the nominal width of a gap between wires 75 μm . 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.

NOTE Health and safety regulations should be observed in selecting the type of talcum powder and its use.



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, for example, due to thermal cycling effects.

Category 2: Enclosures where no pressure difference relative to the surrounding air is present.

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. Any drain-hole normally open shall be left open for the duration of the test. The test shall be continued for a period of 8 h.

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.

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. 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.

3.2 Test result:

Category 2 enclosure was considered and tested 8h. Visual inspection after disassembly.

After the test of IP5X, the test wire of 1.0mm ϕ was not penetrate and the specimen exhibited no ingress of dust.

3.3 IPX8 test procedure and requirement

14.1 Test means

The test means and the main test conditions are given in table 8.

Table 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, see
8	Immersion tank Water-level: by agreement	–	by agreement	14.2.8

14.2 Test conditions

14.2.8 Test for second characteristic numeral 8: continuous immersion subject to agreement

Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user, but they shall be more severe than those prescribed in 14.2.7 and they shall take account of the condition that the enclosure will be continuously immersed in actual use.

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.

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.

In general, 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 cable 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 any harm to the equipment.

For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.

3.4 Test result:

Visual inspection after disassembly.

After the test of IPX8, the specimen exhibited no ingress of water.



4 Remark

4.1 The test condition of IPX8 was specified by manufacturer as below:

- The lowest point of enclosures is located 1200 mm below the surface of the water;
- The duration of the test is 45 min.

5 Documentation

APPENDIX 1 – Product photo.

6 Summary

The test specification is met.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
TÜV SÜD Group

Engineer: Derick Dong
Derick Dong
Project Handler

Technical Report checked: Hedy Li
Hedy Li
Designated Reviewer

End of Report ---



APPENDIX 1

Details of: Product overview 1 (before test)



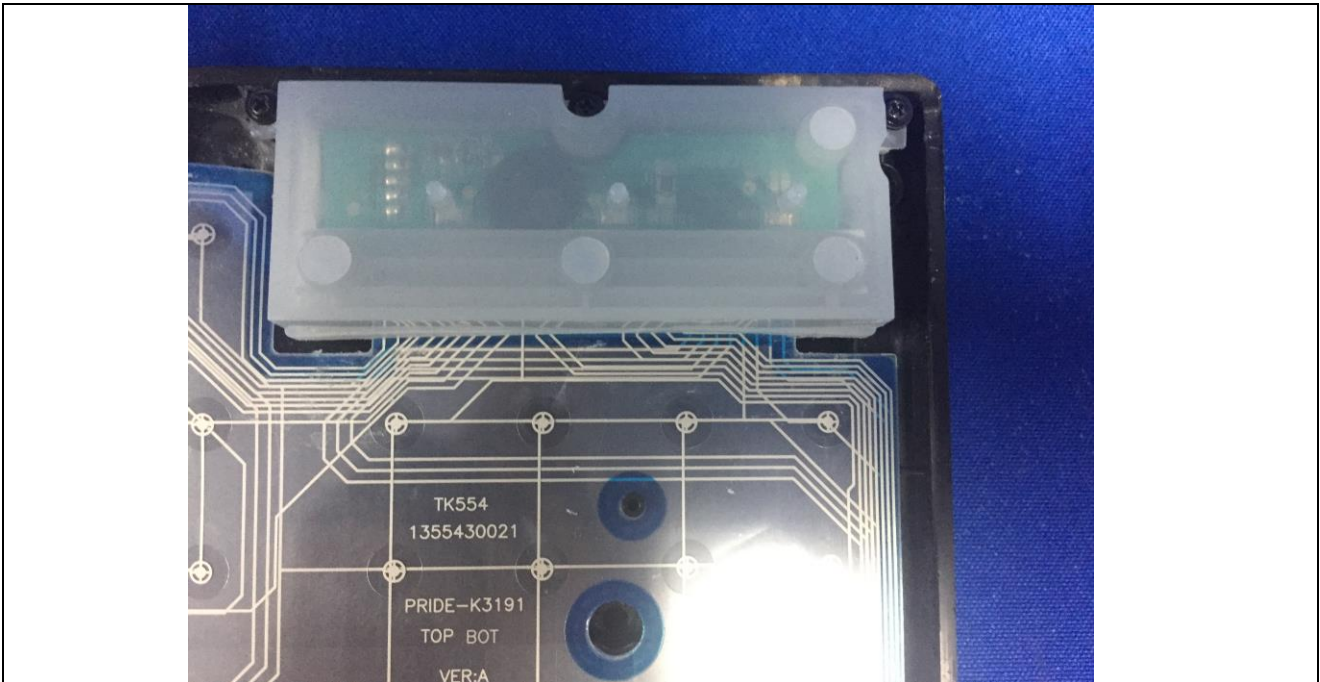
Details of: Product overview 2 (before test)



Details of: Product overview 3 (before test)

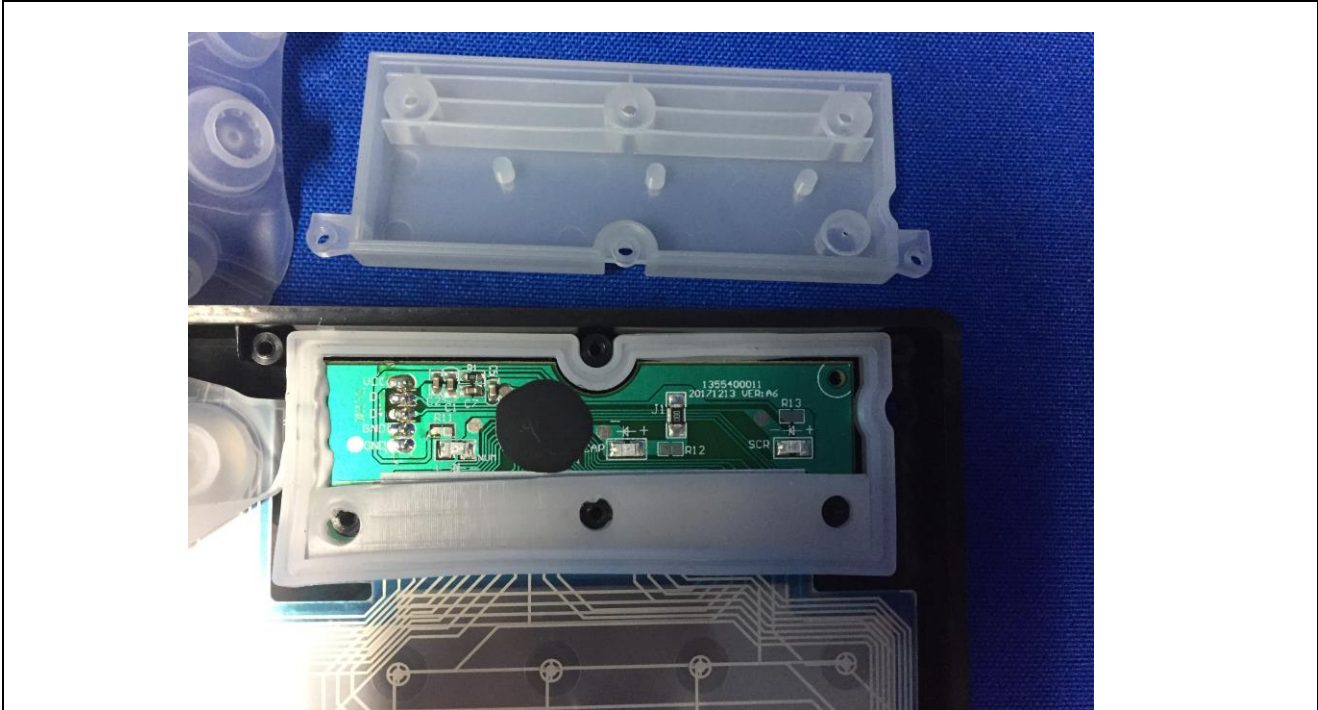


Details of: Internal view 1 of product after IP5X test

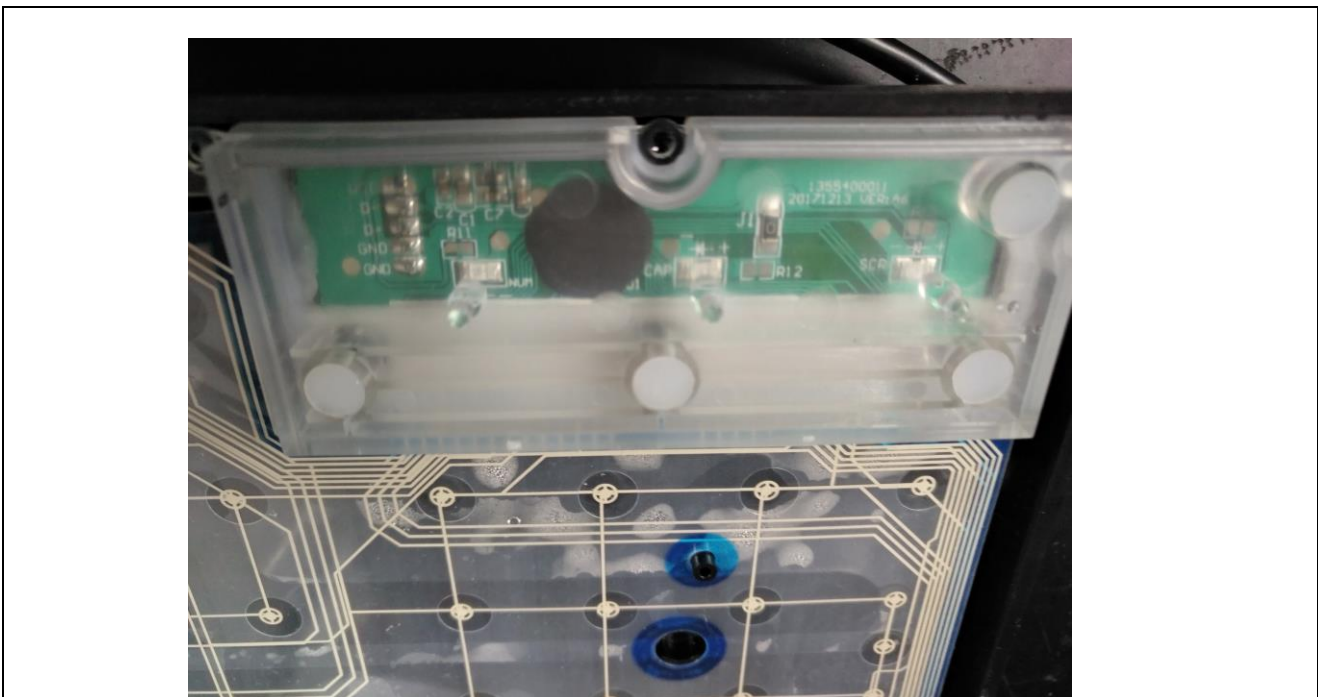


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Details of: Internal view 2 of product after IP5X test

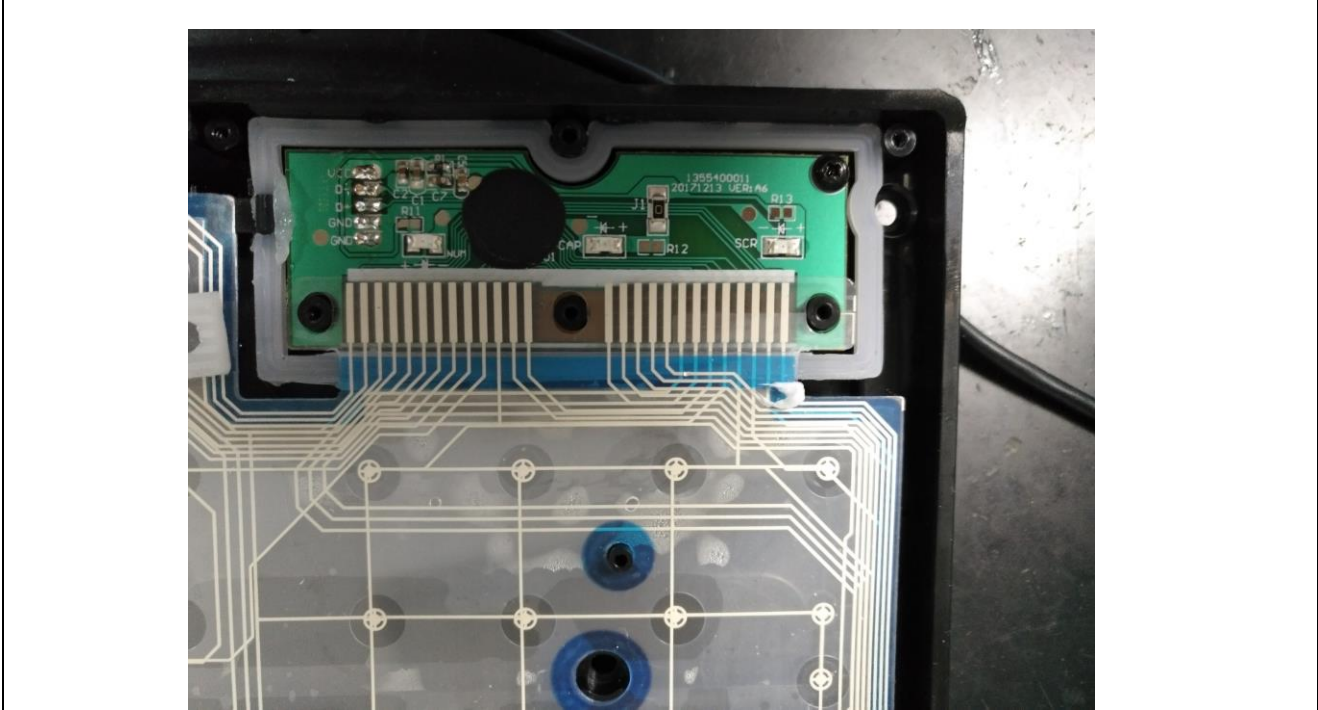


Details of: Internal view 1 of product after IPX8 test



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Details of: Internal view 2 of product after IPX8 test



Details of: Internal view 3 of product after IPX8 test

