HIOKI E. E. CORPORATION

February 24, 2022
No. QAR-22-008-2-EN
Quality Assurance Department

To whom it may concern,

Non-conformance of the firmware of INSULATION TESTER SM7420

Thank you very much for your continued patronage.
We have found that there is a possibility for the incorrect judgement in the contact check function of the SM7420.
We hereby report details in the following for the products delivered to you.
We are sorry for your inconvenience, but thank you in advance for your kind understandings.

1. Non-conformance
   The calculation result after the OPEN compensation of contact check function becomes the absolute value (no negative value) when the DUT capacitance of contact check (WORK.C) is set to LOW.
   As a result, the contact check result becomes always PASS regardless to the actual contact condition when all conditions in below are applicable.
   1) The DUT capacitance of the contact check (WORK.C) is set to LOW.
      (The iInitial settings is NORMAL.)
   2) ”OPEN compensation value for fixture capacitance” > “Contact check judgment threshold”
   3) “OPEN compensation value for fixture capacitance” > “Electrostatic capacitance of fixture and DUT”
      Example: When the disconnection in the fixture
   4) |”Electrostatic capacitance of fixture and DUT – OPEN compensation value of fixture capacitance”| > “Contact check threshold”

   Conditions may get the incorrect judgment
   When the unit is set to 1) and 2), there is a possibility to get the incorrect judgment if the contact check value is 3).
   “Electrostatic capacitance of fixture and DUT” is smaller than “OPEN compensation value for fixture capacitance”, so that the calculation result after OPEN compensation is negative.
   Normally, the OPEN compensation value never becomes smaller than the electrostatic capacitance of fixture and DUT. However, it occurs when there is disconnection in the fixture, and connecting a different fixture from the fixture connected when executing the OPEN compensation, etc.

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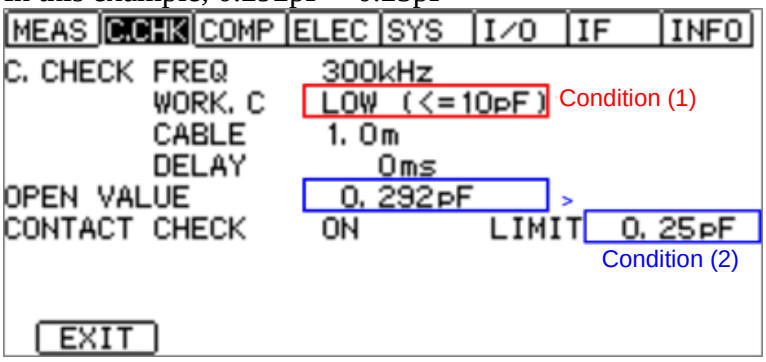
How to confirm the settings of 1) and 2)

Confirm the display of the contact check (C.CHECK) is set both (1) and (2) in below.

(1) WORK.C is set as "LOW (<=10pF)".

(2) OPEN VALUE is bigger than the LIMIT setting.
In this example, 0.292pF > 0.25pF



Details of the incorrect judgment of contact check 4)

The unit does not always judge as PASS even if the conditions of 1), 2), and 3) are satisfied. If the calculation result after OPEN compensation (processed by the absolute value that causes the non-conformance) becomes bigger than the contact check threshold, it is always judged as PASS. --- 4)

Example

OPEN compensation value of fixture capacitance: 0.292pF
Contact check threshold: 0.25pF
Electrostatic capacitance of fixture and DUT (with disconnection): 0.03pF
The calculation become;
| 0.03pF – 0.292pF | > 0.25pF
Therefore, the contact check is incorrectly judged as PASS.

However, if the conditions are the same, except;
Electrostatic capacitance of fixture and DUT (with disconnection): 0.1pF
The calculation result after OPEN compensation (absolute value) is smaller than the contact check threshold, so that the contact check judges as FAIL.
| 0.1pF – 0.292pF | < 0.25pF

2. Cause

The contact check calculation was changed when updating the firmware to MAIN Ver2.00 (SUB V3.00). There was incorrect processing for the OPEN compensation calculation. The calculation result after OPEN compensation is processed as the absolute value, so that the calculated value becomes incorrect when the result is negative.

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3. Subjected products
   -1. INSULATION TESTER SM7420
   Firmware version: MAIN: V2.00, SUB: V3.00 or V3.01
   -2. The products manufactured from July, 2019 to January, 2021
   The products repaired to exchange the current circuit board

4. Action for subjected products
   -1. Update the firmware to SUB V3.02 to solve the incorrect judgment possibility of the contact check. There is no change for MAIN firmware and it remains as V2.00.
   There is no impact to the measurement and adjustment values by this firmware update.
   -2. Please download the firmware update file (ZIP file) from “myHIOKI - download” on our web site, and execute the update procedures.

Please contact to our sales representative if you have any question.

Sincerely yours,

T. Yamaguchi

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