

DUT / Date of delivery:	SCHURTER Switches MSS19, MSS22, MSS22 IO-Link, MSS30 (7 switches with sealing ring pre-installed in boxes) Delivered: 2024-04-09
Pre-treatment:	See customer documentation.
Aim of tests:	Environmental tests.
Test specification:	ISO 20653
Test load:	Dust IP6K9K.
Used test equipment:	Dust Chamber (IP6KX): Self-construction. Dust exchange after 20 Tests. Last dust exchange: March 2024. IPX9K equipment: Selfconstruction, turntable TT-50, flowmeter IFM, Temperature transmitter IFM. Last calibration: February 2024.
Witness:	Dr. Oliver Maus / TEA AG
Sub-conducting:	---
Test period:	2024-04-09 to 2024-04-15.
Procedure:	Definition of the test loads: During the test series the DUTs are not in operating. IP6KX (ISO 20653): Application of dust (Arizona Dust A2) by using method ISO 20653 for 20 cycles each 20 Minutes. During test application the DUT is not in operation mode. IPX9K (ISO 20653): 100bar water pressure with 80°C, 30s spraying each angle (0°, 30°, 60° and 90°), distance 100...150mm.
Test configuration:	The test arrangement is demonstrated in Fig. 1 to Fig. 7 . For application of the test load see Fig. 8 to Fig. 13 .
Destination DUT:	Back to customer.
Function Test:	no.
Results:	IP6KX: No indication dust penetration or damages caused by the test load. IPX9K: No indication of water penetration or damages caused by the test load. The state of the DUTs before and after each test steps are shown in Fig. 14 to Fig. 76 .
Interpretation / Notes	The customer take care for correct function assessment after test application. Moreover he will disassemble the DUTs in order to verify DUTs state. For the results see customer documentation.

Revision history	Rev. 1: Designation of the DUTs changed Rev. 2: Date of test period changed
<i>The use of parts of that report is not permitted. Exceptions needed the written approval of TEA AG. The results in this report apply only to the sample(s) tested. In case of technical changes on the sample(s), later re-test(s) shall be necessary. The reports will be archived for 10 years at TEA AG. Details to measurement uncertainty beyond the information to be reported only take place to particular customer request.</i>	



Fig. 1 Arrangement IP6KX, test chamber with DUT.



Fig. 2 Position DUT IP6KX.

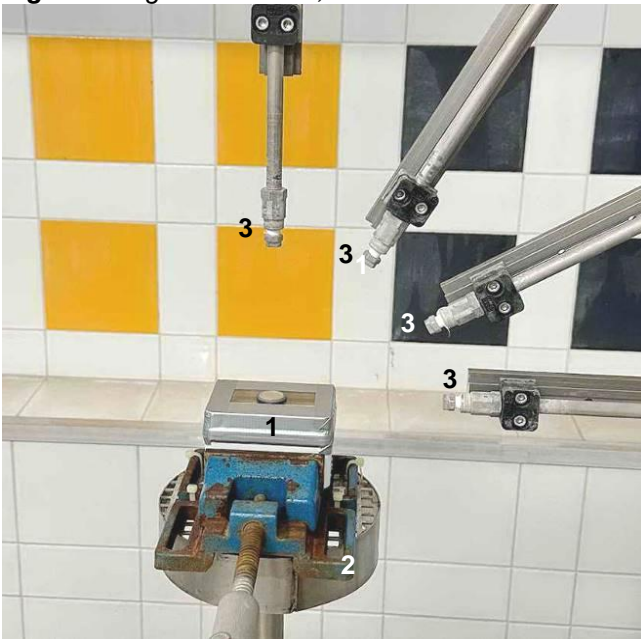


Fig. 3 Test arrangement IPX9K.

- 1: DUT.
- 2: Rotary table.
- 3: Nozzle

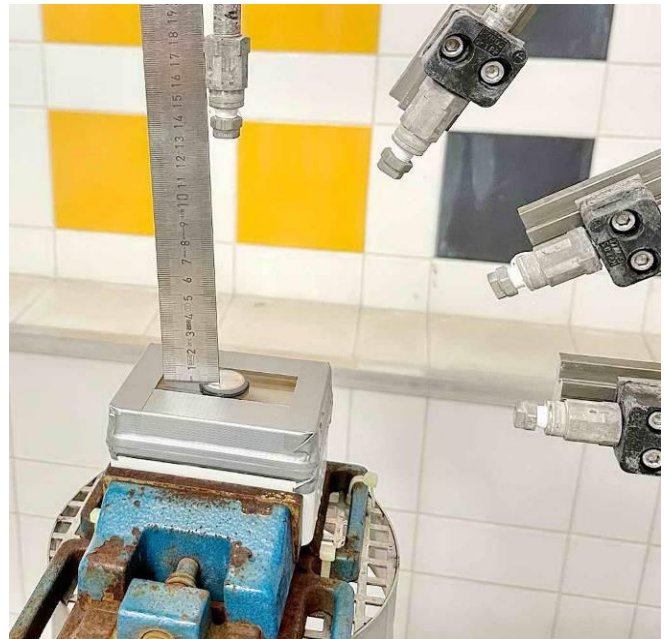


Fig. 4 Distance 90°.



Fig. 5 Distance 60°.



Fig. 6 Distance 30°.

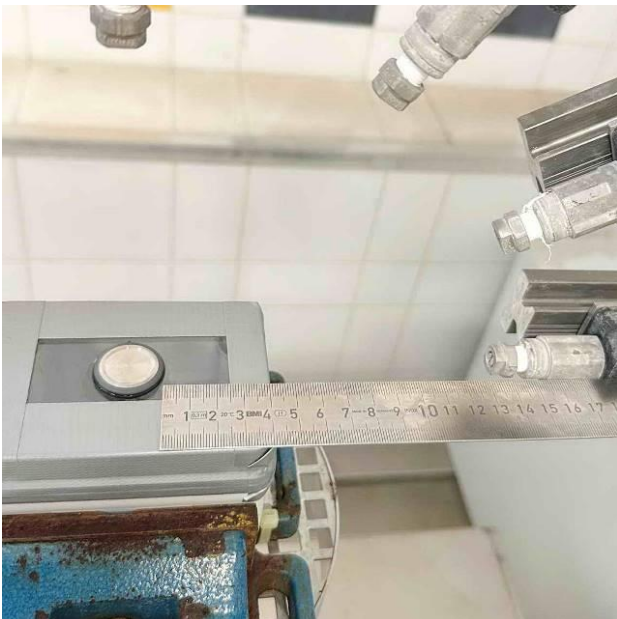


Fig. 7 Distance 0°.

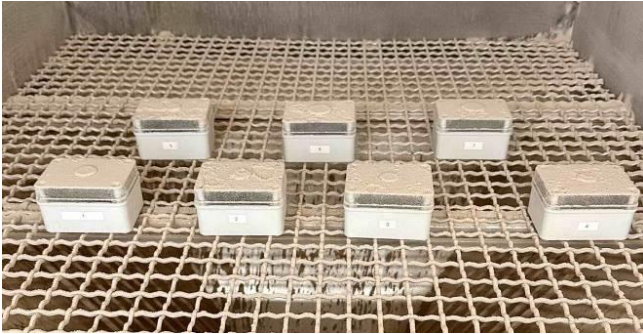


Fig. 8 DUT at the end of test application IP6KX.



Fig. 9 DUT at the end of test application IP6KX, excess dust removed.



Fig. 10 DUT during spraying 90°, IPX9K.



Fig. 11 DUT during spraying 60°, IPX9K.



Fig. 12 DUT during spraying 30°, IPX9K.



Fig. 13 DUT during spraying 0°, IPX9K.



Fig. 14 Sample 1 before.



Fig. 15 Sample 1 after IP6KX, view 1.



Fig. 16 Sample 1 after IP6KX, view 2.



Fig. 17 Sample 1 after IP6KX, view 2_1 detail.



Fig. 18 Sample 1 after IPX9K view 1.



Fig. 19 Sample 1 after IPX9K view 2.



Fig. 20 Sample 1 dry test after IPX9K pos. 1.



Fig. 21 Sample 1 dry test after IPX9K pos. 2.



Fig. 22 Sample 1 dry test after IPX9K pos. 3.



Fig. 23 Sample 2 before.



Fig. 24 Sample 2 after IP6KX, view 1.



Fig. 25 Sample 2 after IP6KX, view 2.



Fig. 26 Sample 2 after IP6KX, view 2_1 detail.



Fig. 27 Sample 2 after IPX9K view 1.



Fig. 28 Sample 2 after IPX9K view 2.



Fig. 29 Sample 2 dry test after IPX9K pos. 1.

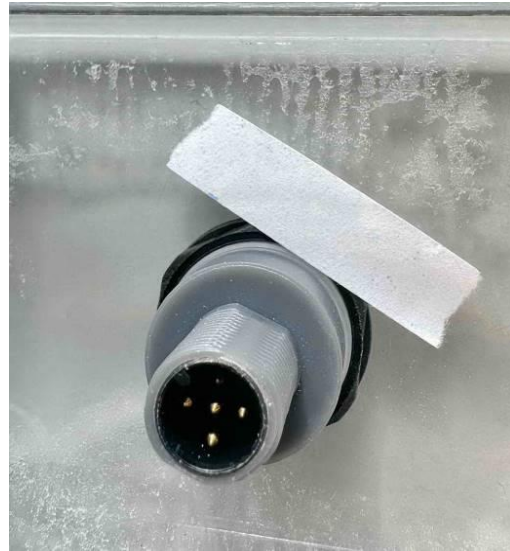


Fig. 30 Sample 2 dry test after IPX9K pos. 2.



Fig. 31 Sample 2 dry test after IPX9K pos. 3.



Fig. 32 Sample 3 before.



Fig. 33 Sample 3 after IP6KX, view 1.



Fig. 34 Sample 3 after IP6KX, view 2.

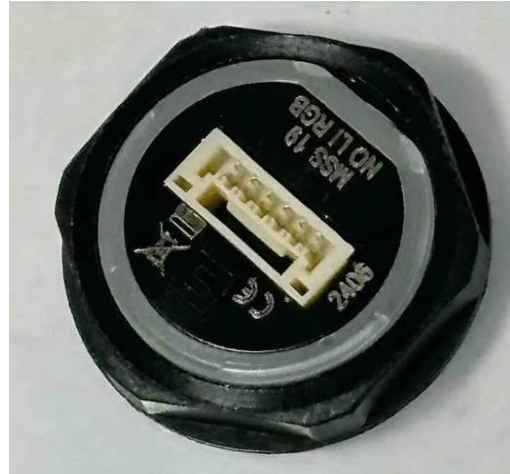


Fig. 35 Sample 3 after IP6KX, view 2_1 detail.



Fig. 36 Sample 3 after IPX9K view 1.



Fig. 37 Sample 3 after IPX9K view 2.



Fig. 38 Sample 3 dry test after IPX9K pos. 1.



Fig. 39 Sample 3 dry test after IPX9K pos. 2.



Fig. 40 Sample 3 dry test after IPX9K pos. 3.



Fig. 41 Sample 4 before.



Fig. 42 Sample 4 after IP6KX, view 1.



Fig. 43 Sample 4 after IP6KX, view 2.

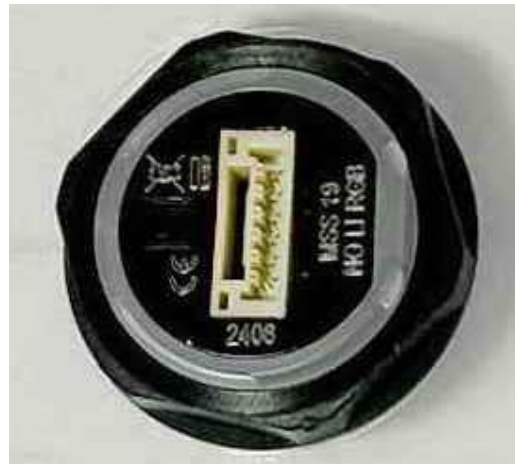


Fig. 44 Sample 4 after IP6KX, view 2_1 detail.



Fig. 45 Sample 4 after IPX9K view 1.



Fig. 46 Sample 4 after IPX9K view 2.



Fig. 47 Sample 4 dry test after IPX9K pos. 1.



Fig. 48 Sample 4 dry test after IPX9K pos. 2.



Fig. 49 Sample 4 dry test after IPX9K pos. 3.



Fig. 50 Sample 5 before.



Fig. 51 Sample 5 after IP6KX, view 1.



Fig. 52 Sample 5 after IP6KX, view 2.

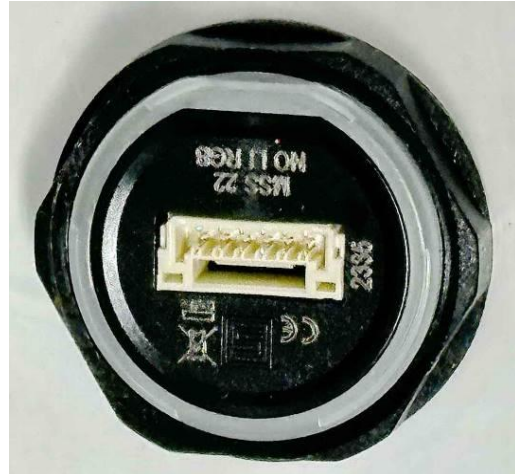


Fig. 53 Sample 5 after IP6KX, view 2_1 detail.

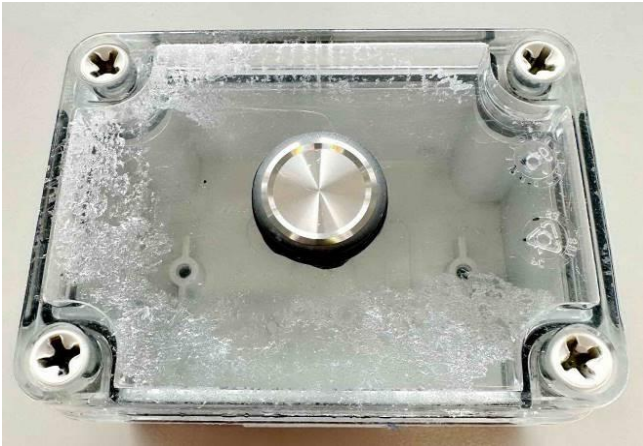


Fig. 54 Sample 5 after IPX9K view 1.



Fig. 55 Sample 5 after IPX9K view 2.

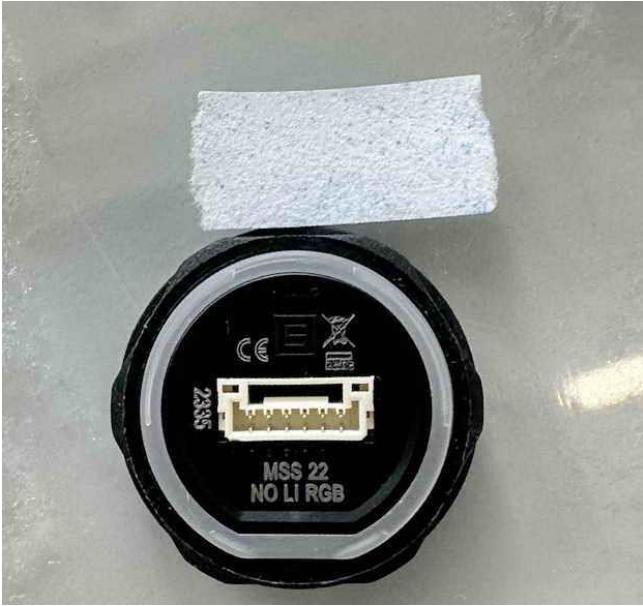


Fig. 56 Sample 5 dry test after IPX9K pos. 1.



Fig. 57 Sample 5 dry test after IPX9K pos. 2.



Fig. 58 Sample 5 dry test after IPX9K pos. 3.



Fig. 59 Sample 6 before.



Fig. 60 Sample 6 after IP6KX, view 1.



Fig. 61 Sample 6 after IP6KX, view 2.



Fig. 62 Sample 6 after IP6KX, view 2_1 detail.



Fig. 63 Sample 6 after IPX9K view 1.



Fig. 64 Sample 6 after IPX9K view 2.



Fig. 65 Sample 6 dry test after IPX9K pos. 1.



Fig. 66 Sample 6 dry test after IPX9K pos. 2.



Fig. 67 Sample 4 dry test after IPX9K pos. 3.



Fig. 68 Sample 7 before.



Fig. 69 Sample 7 after IP6KX, view 1.



Fig. 70 Sample 7 after IP6KX, view 2.

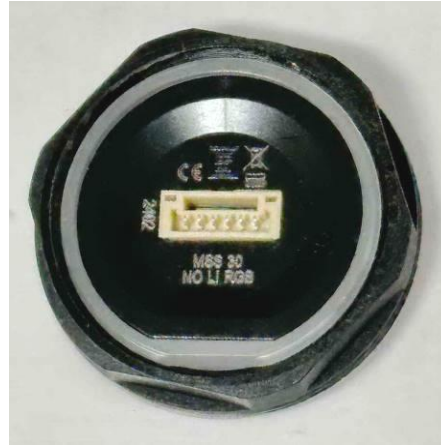


Fig. 71 Sample 7 after IP6KX, view 2_1 detail.



Fig. 72 Sample 7 after IPX9K view 1.



Fig. 73 Sample 7 after IPX9K view 2.



Fig. 74 Sample 7 dry test after IPX9K pos. 1.



Fig. 75 Sample 7 dry test after IPX9K pos. 2.



Fig. 76 Sample 7 dry test after IPX9K pos. 3.

Test	Location of performance
IP6KX	Motorenstrasse 109, CH-8620 Wetzikon
IPX9K	Daimlerstrasse 35, D-76185 Karlsruhe

Originator:



Dr. O. Maus
(CEO)

Approved:



D. Meinhardt
(Senior Engineer)

To: Mr. Titus Niedlisbach
Files

Schurter AG, CH-6002 Luzern
TEA AG, CH-8620 Wetzikon