AUCOTEAM GMBH BERLIN

Testing laboratory for climatic, mechanical,
and corrosive environmental test

QUALITY TEST CERTIFICATE

Test report No. 20-15685 Rev.01

Client	**Knick Elektronische Messgeräte GmbH & Co. KG** Beuckestraße 22 14163 Berlin	
Equipment under test	**Protos II** quantity labelled No.	**4400C** 1 sample 22675000
Purpose	**Test for the certification of the corrosive resistance according to specifications of the standards and to the demands of the client. The test was carried out in the test laboratory TZO Technologie-Zentrum für Oberflächentechnik und Umweltschutz Leipzig GmbH.**	
Test program	**Harmful gas test - Test Ke, method 4** *according to IEC 60068-2-60*	
Test period	3 July to 13 July 2020	
Execution /results	see page 2 to 3	
Total number of pages	9 (incl. 2 appendices)	
Test results	**The test was carried out according to the specifications of the standards and to the demands of the client. During and after the test no damage or malfunctions were determined at the specimen.** **Passed - according to the client, the measured values determined during the test were within the prescribed limits.**	

Dipl.-Ing. (FH) Ch. Kretschmer
Head of the testing laboratory

Berlin, 08 October 2020

AUCOTEAM GmbH Berlin QUALITÄTSPRÜFUNG

Dipl.-Ing. M. Geburtig
Test engineer

1 Purpose

Test for the certification of the corrosive resistance according to the specifications of the standards and to the demands of the client.

2 Equipment under test

Protos II	**4400C**
with following modules:	- digital module MS4400-160 (inside the device housing) - storage card F-ZU1080-P-N-D (inside the device housing) - conductivity sensor F-SE604-MS (outside the test chamber)
Power supply	24 V_{DC}
dimensions / weight	appr. 165 x 160 x 22 mm, appr. 4 kg
quantity	1 sample
labelled No.	22675000

3 Basics

3.1 Demands of the client

3.2 Used standards

IEC 60068-1:2013 **DIN EN 60068-1; VDE 0468-1**:2015-09
„Environmental testing - Part 1: General and guidance“

IEC 60068-2-60:1995 **DIN EN 60068-2-60**:1996-09
„Environmental testing - Part 2-60: Tests - Test Ke: Flowing mixed gas corrosion test“
Remark This standard is not part of the Aucoteam GmbH accreditation!

4 Test program

Harmful gas test - Test Ke, method 4
according to the IEC 60068-2-60 and to the demands of the client

specimen	operating, supplied with 24 V_{DC} with self monitoring (by the client)	
temperature	(23±5) °C	
humidity	(75±3) %	
gas concentration	SO_2	0,2 ppm
	H_2S	0,01 ppm
	NO_2	0,2 ppm
	Cl_2	0,01 ppm
test duration	10 d	(240 h)

Visual inspection / functional check
Before and after the test, the specimen shall be examined for external damage and any other alterations.
During the test the displayed values will be checked visually every day.

5 Realization

Test for the certification of the corrosive resistance of the ***Protos II*** was carried out according to the test program, in compliance with the specifications of the current standards and according to the demands of the client in the test laboratory „TZO Technologie-Zentrum für Oberflächentechnik und Umweltschutz Leipzig GmbH“, see appendix 2 – Test report 187/20 (13 July 2020).

Measuring and test equipment

corrosion test chamber	K 350 (CTS GmbH)
Flex Gas Detector	SPM (Honywell Analytics, Inc. USA)
Power supply (24.0 V_{DC})	TSX3510P (test laboratory TZO)

Visual inspection / functional check

After the test the specimen was examined for external damage and any other alterations.
During the test the displayed values was checked visually every day.

6 Results

After the test of the ***Protos II 4400C*** with

- Harmful gas test - Test Ke, method 4 *(10 d, operating)* ***- Test Ke***

no damage or defects are visible, see appendix 2 – Test report 187/20 (13 July 2020),
Before, during and after the test, the values displayed were within the plausible range; no significant deviations could be detected.
The further evaluation will be done by the client.

The test was carried out according to the specifications of the standards and to the demands of the client. During and after the test no damage or malfunctions were determined at the specimen.

Passed - according to the client, the measured values determined during the test were within the prescribed limits.

The results of the test refer exclusively to the above mentioned equipment under test.
This report, or individual pages of this test report, may only be copied following the written consent of the testing laboratory. This test report No. 20-15685 Rev.01 includes 3 pages and 2 appendices.

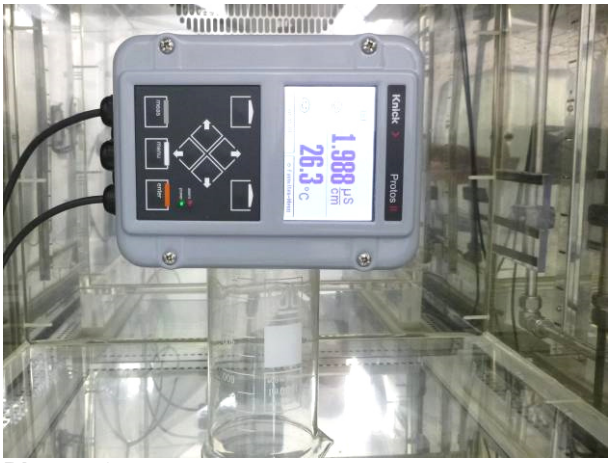
Appendix 1 – Pictures (1 page)
Appendix 2 – Test report 187/20 (5 pages)
(TZO Technologie-Zentrum für Oberflächentechnik und Umweltschutz Leipzig GmbH 13 July 2020)

Changes in the Revision 01 compared to the Test report Pb 20-15685 of 15 July 2020:
- The evaluation of the measurement results by the customer was included as a test result.

Pictures

Picture 1
Protos II
state of delivery
before the harmful gas test

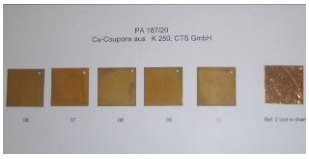
Picture 2
Protos II
state of delivery
before the harmful gas test



Picture 3
Protos II – operating with displayed values
in the corrosion test chamber K 350
at the beginning of the harmful gas test

Picture 4
Protos II – operating with displayed values
in the corrosion test chamber K 350
at the end of the harmful gas test

Picture 5
Protos II
without visible damage or defects
after the harmful gas test



Picture 6
Protos II without visible damage or defects and
copper samples to determine the increase in mass
after the harmful gas test

Labor für Umwelterprobung
und Werkstoffprüfung
Telefon +49 (0) 3 41 / 4 84 32 - 25
Telefax +49 (0) 3 41 / 4 84 32 - 14
E-Mail umwelterprobung@tzoleipzig.de

Technologie -Zentrum für Oberflächentechnik
und Umweltschutz Leipzig GmbH
Hornstraße 5 • D-04249 Leipzig
Telefon +49 (0) 3 41 / 4 84 32 - 0 • Fax +49 (0) 3 41 / 4 84 32 - 14
E-Mail info@tzoleipzig.de

TEST REPORT

No. 187/20

Client	AUCOTEAM GmbH Test laboratory / GB P Mr. Michael Geburtig Storkower Straße 115 a D–10407 Berlin	
Date of order	2020-04-26	test order no. P20A0208
Date of receiving the specimen	2020-05-25	
Period of testing	2020-07-03 to 2020-07-13	

1 TEST OBJECT

1.1 Designation / Number of pieces

Protos II / 1 piece

Labelled with No. 2267500

The test object was provided by the client.

1.2 Producer Knick Elektronische Messgeräte GmbH & Co. KG
Beuckestraße 22
D – 14163 Berlin

2 TASK

Testing to determine the resistance against flowing mixed gas in accordance with
DIN EN 60068–2–60 : 2016–06, Test Ke, Method 4 and in accordance with the client's specification

3 TEST PROGRAMME

Table 1 Environmental conditions

$T_{Min.}$	$T_{Max.}$	$RH_{Min.}$	$RH_{Max.}$
18 °C	28 °C	25 %	75 %

3.1 Initial examinations

3.1.1 Function *carried out by the client*

3.1.2 Visual inspection

3.2 Testing to determine the resistance against flowing mixed gas in accordance with DIN EN 60068–2–60, Test Ke, Method 4 and in accordance with the client's specification

Test device Corrosion Test Chamber K 250 CTS GmbH
Measurement of the gas concentration by SPM Flex Gas Detector, Honeywell Analytics, Inc. USA

Concentration of Hydrogen sulphide (H_2S)	0,01 cm^3 / m^3 (ppm)	(10 ± 5) ppb
Concentration of Nitrogen dioxide (NO_2)	0,2 cm^3 / m^3 (ppm)	(200 ± 20) ppb
Concentration of Chlorine (Cl_2)	0,01 cm^3 / m^3 (ppm)	(10 ± 5) ppb
Concentration of Sulphur dioxide (SO_2)	0,2 cm^3 / m^3 (ppm)	(200 ± 20) ppb
Temperature	(25 ± 1) °C	
Relative Humidity	(75 ± 3) %	
Rate of ventilations per hour	(6,5 ± 3,5)-times	
Mass increase of copper coupons	(1,8 ± 0,6) mg / (dm^2 · d)	
Exposition	*see annex page 1*	
Test duration	10 d	

Electrical operation in accordance with the client
U_B = (24,0 ± 0,5) V DC
power supply TSX3510P

3.3 Final examinations *carried out by the client*

4 PERFORMANCE AND RESULTS

The test activities were successfully carried out in accordance with sub-clause 3.1.2 and 3.2.
Measurement of the gas concentration *see annex page 2*

4.1 Initial examinations

4.1.1 Function *see the record written by the client*

4.1.2 Visual inspection

Damages or defects are not visible.

4.2 Testing to determine the resistance against flowing mixed gas

No changes are visible.

4.3 Final examinations

see the record written by the client

Leipzig, 2020-07-13

Laboratory for Environmental Testing and Material Testing

Annex page 1 and 2

Dr.-Ing. Frank Erler
Laboratory Manager

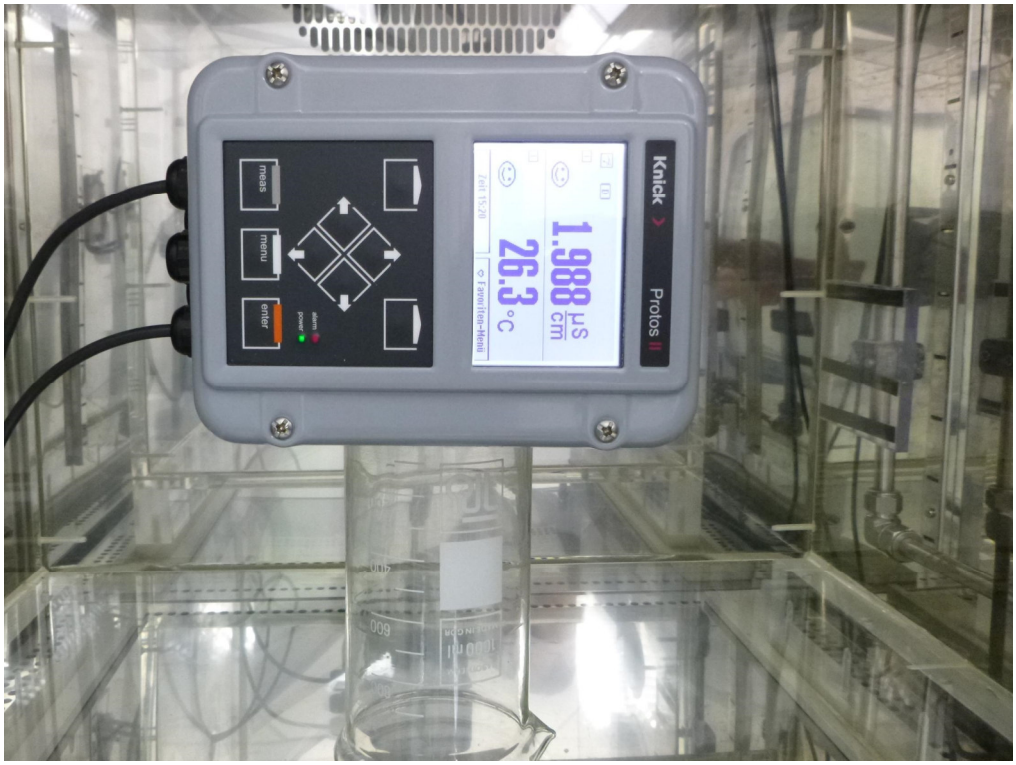
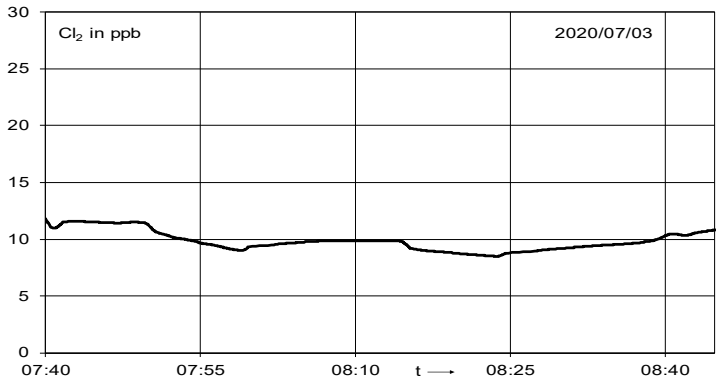


Figure 1 Exposition of test object at beginning of load

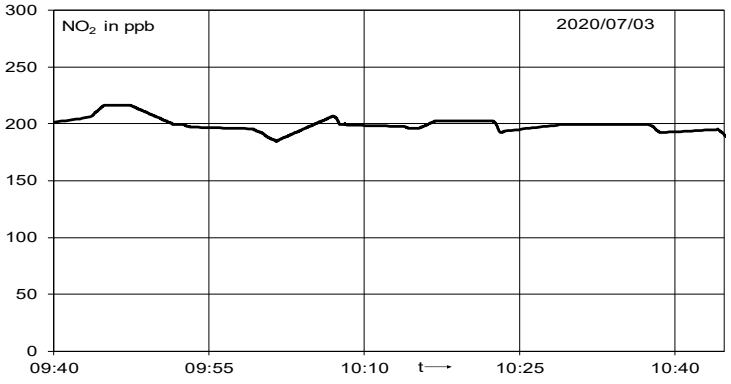
Figure 2 Test object at end of load after 10 d

Optics calibration performed on 2020/07/03 at 07:26:16, result: successful

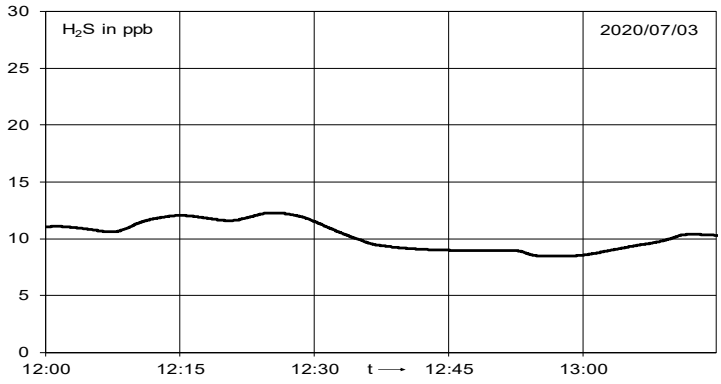
Chlorine:



Nitrogen dioxide:



Hydrogen sulphide:



Sulphur dioxide: