






Test Report issued under the responsibility of:



| TEST REPORT IEC 60 529 / EN 60 529 Degrees of protection provided by enclosures (IP code) | |
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| Report reference No. | 15-Ex-0075.01 |
| Tested by (name + signature) | Thomas Köhntopp Project engineer  |
| Approved by (name + signature) | Stefan Hartmann Project engineer  |
| Date of issue | 2015-12-02 |
| CB/CCA Testing Laboratory Name | Electrosuisse |
| Address | Luppenstrasse 1, 8320 Fehraltorf SWITZERLAND |
| Testing procedure | --- |
| Testing location / Address | Luppenstrasse 1, 8320 Fehraltorf SWITZERLAND |
|  | |
| Applicant's Name | AGRO AG |
| Address | Korbackerweg 7, 5502 Hunzenschwil, SWITZERLAND |
| Test specification | |
| Standard | IEC 60529:2013-08 (Edition 2.2) EN 60529 :1991-10 + A1: 2000-02 + A2: 2013-03 |
| Test procedure | Type testing for IP54 |
| Procedure deviation | none |
| Non-standard test method | none |
| Test Report Form IECEN60529A | |
| TRF originator. | IMQ (modified by Electrosuisse) |
| Master TRF (date) | Dated 2006-06 (2006-07) |
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Test item description

Trade Mark

AGRO AG

Manufacturer

AGRO AG

Korbackerweg 7, 5502 Hunzenschwil, SWITZERLAND

Model /Type reference

2450.12.32

2450.17.32

2450.20.32

Ratings

Copy of marking plate:

N / A – small equipment with no marking plate necessary.

Summary of testing:

Pressure balance elements

2450.12.32 M12x1.5 No. ①-③

2450.17.32 M16x1.5 No. ④-⑤

2450.20.32 M20x1.5 No. ⑥

Passed the testing for IP5x / IPx4

Test items particulars :

Degree of protection: IP5x / IPx4

Possible test case verdicts :

Test case does not apply to the test object : N/A

Test item does meet the requirement : P(ass)

Test item does not meet the requirement : F(ail)

Test case not checked : --

Testing

Date of receipt of test item : 2015-12-01

Date(s) of performance of test : 2015-12-01 and 2015-12-02

General remarks

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

General product information:

Pressure balance element with sinter filter

Material: Nickel-plated brass

O-ring: NBR

Filter disc: Sintered bronze (Degree of filter: 40 µm)

Temperature range: -50 °C to +110 °C

| Type | Thread | Wrench size | Hight | Length |
|------------|---------|-------------|--------|--------|
| 2450.12.32 | M12x1.5 | 18 mm | 9.5 mm | 8 mm |
| 2450.17.32 | M16x1.5 | 18 mm | 9.5 mm | 8 mm |
| 2450.20.32 | M20x1.5 | 22 mm | 10 mm | 8 mm |

| IEC 60529 / EN 60529 | | | |
|----------------------|--|---|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 5 | DEGREES OF PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS AND AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL | | |
| 6 | DEGREES OF PROTECTION AGAINST INGRESS OF WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL | | |
| 7 | DEGREES OF PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE ADDITIONAL LETTER | | |
| 8 | SUPPLEMENTARY LETTERS | | |
| 9 | EXAMPLES OF DESIGNATIONS WITH THE IP CODE | | |
| 10 | MARKING | Not part of this test procedure. | N / A |
| 11 | GENERAL REQUIREMENTS FOR TESTS | | |
| 11.1 | Atmospheric conditions for water or dust tests | Test temperature: 21.5 °C Relative humidity: 42.6 % rh Air pressure: 96 kPa | Pass |
| 11.2 | Test samples | Test of six samples attached in a test box. | Pass |
| 11.3 | Application of test requirements and interpretation of test results | According to this standard. | Pass |
| 11.4 | Combination of test conditions for the first characteristic numeral | The EUT was assessed for numeral 5 according to table 5. | Pass |
| 11.5 | Empty enclosures | Test of the pressure balance elements in an empty test box. | Pass |
| 12 | TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL | | |
| 12.1 | Access probes | Access probe for first numeral 5. | Pass |
| 12.2 | Test conditions | Test force of 1 N. | Pass |
| 12.3 | Acceptance conditions | Adequate clearance is kept between the access probe and hazardous parts. | Pass |
| 12.3.1 | For low-voltage equipment (rated voltages not exceeding 1000 V a.c. and 1500 V d.c.) | It is not possible to touch any parts with the access probe. | Pass |

| IEC 60529 / EN 60529 | | | |
|----------------------|---|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 12.3.2 | For high-voltage equipment (rated voltages exceeding 1000 V a.c. and 1500 V d.c.) | It is not possible to touch any parts with the access probe. | Pass |
| 12.3.3 | For equipment with hazardous mechanical parts | It is not possible to touch any parts with the access probe. | Pass |

| | | | |
|-----------|---|---|-------|
| 13 | TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL | | |
| 13.1 | Test means | Assessed with test for first numeral 5 (Dust chamber with under-pressure) | Pass |
| 13.2 | Test conditions for first characteristic numerals 1, 2, 3, 4 | The EUT was assessed for numeral 5. | N / A |
| 13.3 | Acceptance conditions for first characteristic numerals 1, 2, 3, 4 | The EUT was assessed for numeral 5. | N / A |
| 13.4 | Dust test for first characteristic numerals 5 and 6 | Assessed as category 1 enclosure. | Pass |
| 13.5 | Special conditions for first characteristic numeral 5 | | |
| 13.5.1 | Test conditions for first characteristic numeral 5 | Assessed as category 1 enclosure. | Pass |
| 13.5.2 | Acceptance conditions for first characteristic numeral 5 | Small traces of dust on pressure balance element no. 5 visible. Powder has not accumulated in an amount that could impair the safety of the device. | Pass |
| 13.6 | Special conditions for first characteristic numeral 6 | | |
| 13.6.1 | Test conditions for first characteristic numeral 6 | The EUT was assessed for numeral 5. | N / A |
| 13.6.2 | Acceptance conditions for first characteristic numeral 6 | The EUT was assessed for numeral 5. | N / A |

| | | | |
|-----------|--|--|-------|
| 14 | TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL | | |
| 14.1 | Test means | Assessed with test for second numeral 4 | Pass |
| 14.2 | Test conditions | Fresh water of 20.5 °C spraying 10 minutes with oscillating tube from all practical directions <200 mm away. | Pass |
| 14.2.1 | Test for second characteristic numeral 1 with the drip box | Not assessed. | N / A |
| 14.2.2 | Test for second characteristic numeral 2 with the drip box | Not assessed. | N / A |

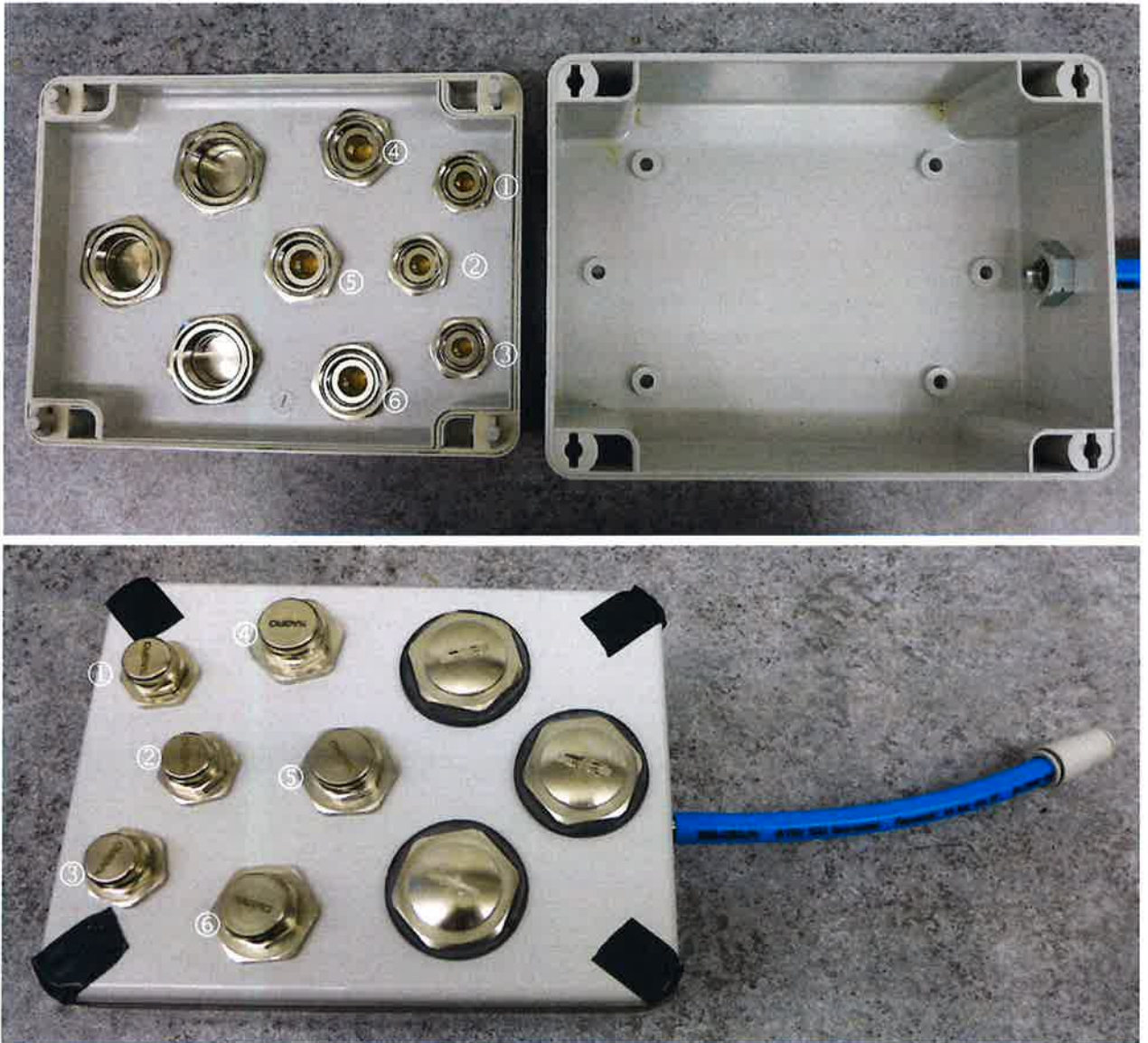
| IEC 60529 / EN 60529 | | | |
|-----------------------------|---|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 14.2.3 | Test for second characteristic numeral 3 with oscillating tube or spray nozzle | Not assessed. | N / A |
| 14.2.4 | Test for second characteristic numeral 4 with oscillating tube or spray nozzle | Oscillating tube 400 mm spraying with $\pm 180^\circ$ with 25 holes and 1.8 l/min. | Pass |
| 14.2.5 | Test for second characteristic numeral 5 with the 6,3 mm nozzle | Not assessed. | N / A |
| 14.2.6 | Test for second characteristic numeral 6 with the 12,5 mm nozzle | Not assessed. | N / A |
| 14.2.7 | Test for second characteristic numeral 7: temporary immersion between 0,15 and 1 m | Not assessed. | N / A |
| 14.2.8 | Test for second characteristic numeral 8: continuous immersion subject to agreement | Not assessed. | N / A |
| 14.2.9 | Test for second characteristic numeral 9 by high pressure and temperature water jetting | Not assessed. | N / A |
| 14.3 | Acceptance conditions | After the test no ingress of water was found inside the EUT. | Pass |

| | | | |
|-----------|--|---------------|-------|
| 15 | TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE ADDITIONAL LETTER | | |
| 15.1 | Access probes | Not assessed. | N / A |
| 15.2 | Test conditions | Not assessed. | N / A |
| 15.3 | Acceptance conditions | Not assessed. | N / A |

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|-----------|--|------------|------|
| ZA | ANNEX ZA (NORMATIVE) Other International Publications quoted in this standard with the references of the relevant European Publications | | |
| | When the International Publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies. | (EN 60529) | Pass |

Photos

Test Box with attached pressure balance elements:



Legend:

- ①-③ 2450.12.32 M12x1.5 Pressure balance element
- ④-⑤ 2450.17.32 M16x1.5 Pressure balance element
- ⑥ 2450.20.32 M20x1.5 Pressure balance element

No penetration with the test probe possible.



Test box after IP5x testing:



No traces of talcum powder at the elements 1 – 3:



No traces of talcum powder at the elements 4 and 6, small traces of powder at element 5:



Test box during IPx4 testing:



Test box after IPx4 testing. No traces of water inside the box.

