

REPORT

IB-07-8-069

about the test of an enclosures series
MBA ***** and MBP *****
against outer mechanical stress
according to DIN EN 50102 and degree of protection IP66

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B E R I C H T**IB-07-8-069**

**about the test of an enclosures series
MBA ***** and MBP ***** against outer mechanical stress
according to DIN EN 50102 and degree of protection IP66**

1 Applicant

MULTI-BOX GmbH
Wallücker Bahndamm 7
32278 Kirchlegern
GERMANY

2 Type of test

Testing according to DIN EN 50102
Degree of protection for electrical apparatus (equipment) against outer me-
chanical stress (IK code)
Section 4.2 IK08 (5 joules)

3 Test item

Enclosure series MBA ***** and MBP *****

Technical data

MBA ***** aluminium enclosure (pressure die-casting)
MBA ***** GK aluminium enclosure (chilled casting)

Measures (L x W x H): of 50 mm of x 45 mm x 30 mm
to 600 mm of x 310 mm x 180 mm

(MBP ***** polyester enclosure (glass fibre-reinforced polyester, inflammable and
self-extinguishing)

Measures (L x W x H): of 80 mm of x 75 mm x 55 mm
to 600 mm of x 250 mm x 120 mm

Temperature range: Neoprene sealing: - 40 °C to +110 °C
Silicone sealing: - 50 °C to +140 °C

2 pieces aluminium enclosure type MBA128055, silicone sealing
2 pieces aluminium enclosure type MBA221290
2 pieces aluminium enclosure type MBA402311, silicone sealing
1 piece aluminium enclosure type MBA402311 (chilled casting) neoprene sealing
2 pieces polyester enclosure type MBP807555, neoprene sealing
2 pieces polyester enclosure type MBP261690
2 pieces polyester enclosure type MBP402512, silicone sealing

The test samples were delivered to IBExU on 2nd July 2008.
(Test sample no. Ex-el 283/08 . 288/08)

4 Test documents

Order of 17th July 2007
Drawing enclosure type MBA128055, state 30.11.04
Drawing enclosure type MBA221290, state 03.12.04
Drawing enclosure type MBA402311, state 23.01.05
Drawing enclosure type MBA402311 GD, state 21.07.08
Drawing enclosure type MBP807550, state 28.04.05
Drawing enclosure type MBP261690, state 17.05.05
Drawing enclosure type MBP402512, state 23.01.05

5 Execution of the tests and results

The tests were carried out in order of the manufacturer MULTI-BOX GmbH in 32278 Kirchlegern, Germany, for the enclosure series MBA ***** and MBP ***** at the test samples in 6 sizes. The constructive design of the enclosures of all sizes of this series is identical inclusive of the sealing compound with the test samples.

Preparation

The enclosures in the delivered condition were screwed together tightly and located at indoor climate on a 20 mm strong iron plate under the drop facilities.

Climate conditions:

Indoor temperature:	23 °C ± 2 °C
Air humidity:	50 % rh. ± 5 % rh.
Air pressure:	97.1 kPa (971 mbar)
Height:	407 m

5.1 Impact test IK08 according to DIN EN 50102, section 6

It has to be executed with 5 joules against every side of the enclosures 5 stresses, if the product norm stipulates nothing else. The stresses must evenly be distributed on the areas of the test sample to be tested in which no more place may be loaded more than 3 times.

After consultation with the customer the test was executed on all sides apart from the back.

Means of testing

A device in accordance with DIN EN 50102 was used for the impact strength test. As impact element a weight of 1 kg with an inserted ball as impact body with a diameter of 50 mm Ø made of hardened steel was used. The impact energy is determined by the height of drop. It is 0.5 m at 5 joules.

Execution

One enclosure each per size was tested for the compliance with degree of protection IK08 in accordance with the specifications of EN 50102, section 6. The test was carried out on 9th July 2008.

5 impacts were executed on all accessible sides of the enclosures according to the mentioned test specifications. During none of the impacts it came to such damage, that obviously the tightness of the enclosures would have been impaired.

Test result: **The resistance against mechanical stress according to IK 08 was proved.**

5.2 Testing of dust tightness according to EN 60529:2000, sections 13.4 and 13.6

The enclosure **MBA 128055** was tested in the delivered condition in accordance with the specifications of EN 60529:2000, sections 13.4 and 13.6 for maintenance of degree of protection IP 6X (dust-proof). The test was carried out on 11th July 2008.

Test instrument:	dust chamber according to EN 60529
Prepared low pressure:	≤ 2 kPa
Enclosure volume:	approx. 0.4 dm ³
Sucked air volume:	0.4 l
Test duration:	8 h
Result of the visual inspection:	no dust penetration
Test result:	IP 6X is fulfilled

The enclosure **MBA 402311** was tested in the delivered condition in accordance with the specifications of EN 60529:2000, sections 13.4 and 13.6 for maintenance of degree of protection IP 6X (dust-proof). The test was carried out on 16th July 2008.

Test instrument:	dust chamber according to EN 60529
Prepared low pressure:	≤ 2 kPa
Enclosure volume:	approx. 9.2 dm ³
Sucked air volume:	0.8 l
Test duration:	8 h
Result of the visual inspection:	no dust penetration
Test result:	IP 6X is fulfilled

The enclosure **MBA 402311** (chilled casting) was tested in the delivered condition in accordance with the specifications of EN 60529:2000, sections 13.4 and 13.6 for maintenance of degree of protection IP 6X (dust-proof). The test was carried out on 17th July 2008.

Test instrument:	dust chamber according to EN 60529
Prepared low pressure:	≤ 2 kPa
Enclosure volume:	approx. 9.2 dm ³
Sucked air volume:	1.0 l
Test duration:	8 h
Result of the visual inspection:	no dust penetration
Test result:	IP 6X is fulfilled

The enclosure **MBP 807555** was tested in the delivered condition in accordance with the specifications of EN 60529:2000, sections 13.4 and 13.6 for maintenance of degree of protection IP 6X (dust-proof). The test was carried out on 10th July 2008.

Test instrument:	dust chamber to EN 60529
Prepared low pressure:	≤ 2 kPa
Enclosure volume:	approx. 0.2 dm ³
Sucked air volume:	4.3 l
Test duration:	8 h
Result of the visual inspection:	no dust penetration
Test result:	IP 6X is fulfilled

The enclosure **MBP 402512** was tested in the delivered condition in accordance with the specifications of EN 60529:2000, sections 13.4 and 13.6 for maintenance of degree of protection IP 6X (dust-proof). The test was carried out on 15th July 2008.

Test instrument:	dust chamber to EN 60529
Prepared low pressure:	≤ 2 kPa
Enclosure volume:	approx. 10.0 dm ³
Sucked air volume:	21.0 l
Test duration:	8 h

Result of the visual inspection: no dust penetration
Test result: **IP 6X is fulfilled**

Remark: The sealing sits a little too deeply in the groove, a little dust had accumulated there.

5.3 Testing of Protection against strong water jets according to EN 60529:2000, sections 14.2.6 and 14.3

Then the 5 test samples were tested in accordance with the specifications of EN 60529:2000, section 14.2.58 for maintenance of degree of protection IP X6 (protected against strong water jets). The samples were in standing working position. The test was carried out on 14th and 18th July 2008.

Test instrument: jet nozzle 12.5 mm
Water volumetric flow rate: 100 l/min \pm 5 %; with pressure balance
Distance: 2.5 to 3 m
Test duration: 3 min
Result of the visual inspection: no water penetration
Test result: **IP X6 is fulfilled**

6 **Summarising test result**

With the successful tests of the test samples mentioned under 3, substitutionary for the complete enclosure series of MBA ***** and MBP ***** , which were carried out according to DIN EN 50102 and DIN EN 60529 was proved that the enclosure series fulfils the requirements of degree of protection IK08 (5 joules) according to the international IK code as well as the degree of protection IP 66.