

KEMA Test Certificate

No. 2112767.100

Issued to: BMT Co., Ltd.
1617-7 Songjeong-dong
Gangseo-gu Busan
Korea

For the product: Busbar system of a Low-voltage switchgear and controlgear assembly
(distribution panel)

Trade name: BMT

Type/Model: MCPD-DB-125 A 12 Way

Ratings: Icw 10 kA-1 s, 25 kA-0,1 s

Manufactured by: BMT Co., Ltd.
1617-7 Songjeong-dong
Gangseo-gu Busan
Korea

Subject: Type test

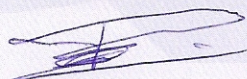
Requirements: IEC 60439-1:1999 and amendment 1:2004, clause 8.2.3, 8.2.4 and 8.2.7

Remarks: -

This Test Certificate is granted on account of an examination at Prof. Ir. Damstra Laboratorium, Hengelo, The Netherlands and supervised by KEMA, the results of which are laid down in test report no. 2112767.01-QUA/INC, dated February 25, 2008

The examination has been carried out on one single specimen of the product, submitted by the manufacturer. The Attestation does not include an assessment of the manufacturer's production. Conformity of his production with the specimen tested by KEMA is not the responsibility of KEMA.

KEMA Quality B.V.
Arnhem, February 25, 2008



F.S. Strikwerda
Certification Manager

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KEMA Quality B.V. Utrechtseweg 310, 6812 AR Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 26 3 56 20 15 F +31 26 3 52 58 00 customer@kema.com www.kema.com Registered Arnhem 09085396

Applicant : BMT Co., Ltd.
1617-7 Songjeong-dong
Gangseo-gu Busan
Korea

Application Date : January 3, 2008

Order Number : 211276700-QUA/INC

Subject assembly : Busbar system of a Low-voltage switchgear and controlgear
(distribution panel)

Trademark : BMT

Type(s) : MCPD-DB-125 A 12 Way

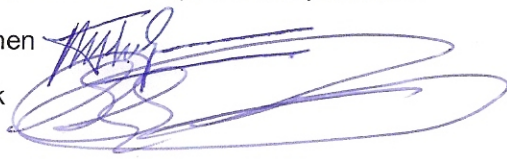
Arnhem, February 25, 2008

Manufacturer/ Production sites : BMT Co., Ltd., 1617-7 Songjeong-dong,
Gangseo-gu Busan, Korea

Overview of tests : See Page 2

Test Requirements : IEC 60439-1:1999 and amendment 1:2004, clause 8.2.3, 8.2.4
and 8.2.7

Conclusion : The product complies with the specified requirements

Tested by : M.T.H. van Gemen 

Checked by : H.L. Schendstok

Contents

- 7 pages general and description
- 2 sheets
- 2 test circuit diagrams
- 10 oscillograms
- 9 photographs
- 2 drawings

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KEMA Quality B.V., Utrechtseweg 310, 6812 AR Arnhem, The Netherlands, PO Box 5185, 6802 ED Arnhem,
The Netherlands. Website www.kema.com www.BuyerRisk.com Telephone: +31 26 3 56 20 00.
Telefax: +31 26 3 52 58 00.

1 Subject

Low voltage switchgear and controlgear assembly (distribution panel)

Product information

Trademark : BMT
Type : MCPD-DB-125 A 12 Way

2 Tested ratings

Short-circuit withstand strength of assembly (I_{cw}) : see table below
Degree of protection : IP54

Short-circuit ratings

Busbar systems

type of busbar system	Cross-section		Distance Between busbar supports [mm]	Centre distance between busbars [mm]	Short-circuit strength	
	Phase bar [mm]	Neutral bar [mm]			Short time withstand current [kA-s]	Peak withstand current [kA peak]
Vertical busbar	15 x 4	15 x 4	Moulded case over total length 367	35	10 – 1,0 25 – 0,1	17,2 53,1
					6 – 1,0 15 – 0,1	9,18 30

PE: 25 x 5 mm, 260 mm, 10 kA peak, I²t 2550 kA²s

3 Ratings assigned by manufacturer

Rated operational voltage (U_e) : 415 V
Rated insulation voltage (U_i) : 500 and 690 V
Rated impulse withstand voltage (U_{imp}) : 6 kV
Rated frequency : 50 Hz
Rated operational current (I_e) : 125 A

4 Object identification

5 Summary of type tests

- Verification of the short-circuit withstand strength, subclause 8.2.3 of IEC 60439-1;
- Verification of effectiveness of the protective circuit, subclause 8.2.4 of IEC 60439-1;
- Verification of the degree of protection, subclause 8.2.7 of IEC 60439-1.

6 General Items

Location of the tests

All tests were carried out in the KEMA laboratory, with exception of the short-circuit tests. The short-circuit tests were carried out at the Prof. Ir. Damstra Laboratory in Hengelo, The Netherlands.

Test were carried out by

All tests with exception of short-circuit tests:

M.T. H. van Gemen KEMA Quality B.V., Arnhem, The Netherlands

Short-circuit tests:

P. van Gessel Prof. Ir. Damstra Laboratory, Hengelo, The Netherlands.

Manufacturer's representatives during tests

Mr. Kim Dae-Young BMT Co., Ltd., Gangseo-gu Busan, Korea

The short-circuit tests were supervised by

Mr. M.T.H. van Gemen KEMA Quality B.V., Arnhem, The Netherlands

Notes on tests

The frequency during the tests was 50 Hz, the ambient air temperature did not exceed + 40 °C and the average ambient air temperature did not exceed + 35 °C over a period of 24 h.

Fluctuations of the ambient temperature in the test-hall did not exceed 1 °C in 1 h and the airflow (draught) in the test-hall was less than 0,5 m/s.

7 DESCRIPTION OF THE TESTS

7.1 The short-circuit strength (IEC / EN 60439-1 clause 8.2.3)

Details of the testing of the short-circuit strength of the busbar systems is given on Sheet 1 and 2

From data stated on this page can be concluded that the short-circuit strength of the busbar system complies with the specified values as given on Sheet 1

6.2 Effectiveness of the protective circuit (IEC / EN 60439-1 clause 8.2.4)

The examination of the electrical continuity of the construction of the assembly has given the result that the resistance between the various exposed parts of the assembly and the PE-circuit is sufficiently low ($\leq 0,1 \Omega$). The test current was 10 A. The measured resistance was between 2,5 m Ω and 24 m Ω .

The results comply with the requirements.

Details of the testing of the short-circuit strength of the PE are given on Sheet 1. From data stated on this page can be concluded that the short-circuit strength of the PE complies with the requirements.

short-circuit rating:

PE busbar system: 25 x 5 mm, L – PE: 10 kA peak and 2550 kA²s

6.7 Degree of protection (IEC / EN 60439-1 clause 8.2.7)

The tests were carried out according to IEC 60529. The degree of protection was determined on the panel with the door closed. The degree of protection for the assembly is IP54.

Test for the first numeral 5

Degree of protection test to IP 5X against access to hazardous parts as indicated by the first characteristic numeral using a 1,0 mm diameter rigid steel wire applied with the force of 1N, as per IEC 60529 sub-clause 12.2.

Test results

Protection to IP5X against access to hazardous parts:

Results of the degree of protection to IP5X against access to hazardous parts protection by using 1,0 mm diameter rigid steel wire applied with the force of 1N was satisfactory if the access probe did not penetrate through any opening but the clearance was adequate between the access probe and hazardous parts.

Protection to IP5X against dust:

The test was made using the equipment according to fig. 2 of EN 60529, consisting of a closed test chamber in which talcum powder is maintained in suspension by an air current. The talcum powder used is able to pass through a square-meshed sieve with a nominal wire diameter of 50 μm and the nominal width between wires is 75 μm .

The talcum powder used is be able to pass through a square-meshed sieve with a nominal wire diameter of 50 μm and the nominal width between wires is 75 μm .

The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber.

The distribution panel under test was placed in a vertical position on the floor. The duration of the test was 8 h.

After the test there was no dust found in the distribution panel under test.

Conclusion: The distribution panel is in compliance with the specified requirements.

TEST FOR IPX4 (the second numeral 4)

Protection against splashing water

Performance of the test:

The test was made using the test device as described in figure 1 (spray nozzle) in accordance with the relevant product standard.

Conditions during the test:

The counterbalanced shield was removed from the spray nozzle and the distribution panel was sprayed from all practicable directions.

The rate of water flow was 10 l/min $\pm$ 5%. The pressure to achieve this delivery rate was in the range of 50 kPa to 150 kPa and was kept constant during the test.

The test duration must be 1 min/m² of the calculated surface area of the distribution panel, with a minimum duration of 5 min.

The duration of the test was 5 min.

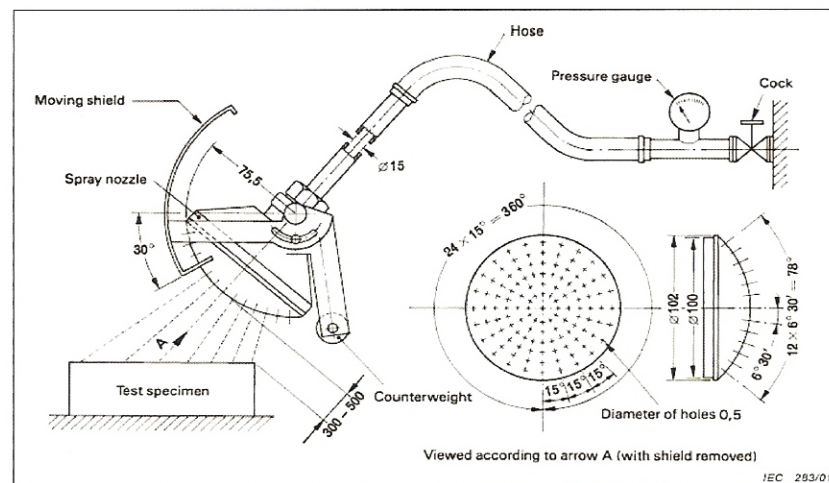


figure 1

Pass criteria:

After testing the distribution panel shall be inspected for ingress of water.

In general, if any water has entered, it shall not:

- be sufficient to interfere with the correct operation of the equipment or impair safety
- deposit on insulation parts where it could lead to tracking along the creepage distances
- reach live parts or windings not designed to operate when wet
- accumulate near the cable end or enter the cable if any

Test results:

After the test there was no ingress of water.

The tested sample withstood the test as described well.

The tested distribution panel is in compliance with the specified requirements

KEMA		TABLE WITH TEST RESULTS Short-circuit withstand tests				Date: 01-28-2008	Sheet: 1
Object		Manufacturer: BMT Co., Ltd Type: BMT DB MCPD 125A 12W					
Osc no	Current				Test voltage [V]	Remarks	
	peak [kA]	rms [kA]	duration [ms]	thermal equivalent for 1 s			
L1 – L2 –L3							
1	16.5 12.7 13.1	-	118	-	95.6	No visible disturbance Pass	
2	17.2 13.2 13.6	-	126	-	99.1	No visible disturbance Pass	
3	-	7.2 7.3 7.3	342	-	104	No visible disturbance Pass	
4	-	10.1 10.1 10.2	1032	-	146	No visible disturbance Pass	
L3 - N							
5	10.3	-	125	-	67.8	No visible disturbance Pass	
6	-	3.9	328	-	62.6	No visible disturbance Pass	
7	-	6.1	1042	-	98.2	No visible disturbance Pass	
L3 – PE Voltage drop before test: 87mV at 100Adc							
8	10.3	-	113	-	71.3	Energy during test: 2.55 *10 ⁶ A²s Voltage drop after test: 71mV at 100Adc	
Phase values are to be read: R → L1 S → L2 T → L3							

KEMA	TABLE WITH TEST RESULTS				Date:	Sheet:
	Short-circuit withstand tests				01-28-2008	2
Object Manufacturer: BMT Co., Ltd Type: BMT DB MCPD 125A 12W						
Osc no	Current				Test voltage [V]	Remarks
	peak [kA]	rms [kA]	duration [ms]	thermal equivalent for 100 ms		
L1 – L2 – L3						
9	53.1 40.4 45.3	25.7 24.7 24.3	115	27.6 26.5 26.1	445	No visible disturbance Pass
L3 – N						
10	30.1	15.7	103	-	259	No visible disturbance Pass
Phase values are to be read: R → L1 S → L2 T → L3						
After test 10, dielectric test at 2500V: Pass						