



POWER SYSTEMS, INC.

Hubbell Power Systems, Inc.
8711 Wadsworth Road
Wadsworth, OH 44281
Tel: (330) 335-2361
Fax: (330) 336-9252

Cable Accessories Test Report Bulletin CH 9910 SF-00

Switching and Fault-Closure Interchangeability

25 kV Class 200 Amp Loadbreak Bushing Insert

CERTIFICATION

The Hubbell Power Systems three phase rated, 25kV Class, 200 Amp, Loadbreak System is designed to meet or exceed the requirements of the IEEE Standard 386-2006, "Separable Insulated Connector Systems for Power Distribution Systems above 600 Volts." This product complies with the interface dimensions in Figure 7 of this standard.

This report certifies that the tests shown in the following table have been performed on Hubbell Power Systems, 25 kV Class 200 Amp Loadbreak Bushing Insert test samples in accordance with IEEE 386-2006. Separate reports shown in the table provide details of the tests.

<u>Test</u>	<u>Standard</u>	<u>Section</u>	<u>Report No.</u>	<u>Issue Date</u>
Switching Test	IEEE 386-2006	7.7	Bulletin Ch 9902 SF-01	2006-11-16
Fault-closure Test	IEEE 386-2006	7.8	Bulletin Ch 9902 SF-02	2006-11-16

Michael G. Comber

Michael G. Comber
Manager – Engineering

S. A. Senthil-Kumar

Senthil S. A. Kumar
Project Engineer



POWER SYSTEMS, INC.

Hubbell Power Systems, Inc.
8711 Wadsworth Road
Wadsworth, OH 44281
Tel: (330) 335-2361
Fax: (330) 336-9252

TEST REPORT Bulletin CH 9910 SF-01

Switching Test

TEST PROCEDURE:

Each test sample, consisting of a 25 kV 200A elbow and a bushing insert was subjected to 10 complete switching operations under the conditions listed in Figure 19 and Table 7 of IEEE Standard 386 –2006. The test circuit complies with Figure 19 (b) of the Standard. Switching was performed manually. The test samples were operated using the parallel method of switching. Each switching operation was recorded by an oscillogram.

TEST RESULTS:

Three combinations of bushing inserts and elbows were tested: Hubbell bushing insert/Hubbell elbow, Hubbell bushing insert/Cooper elbow, and Hubbell bushing insert/Elastimold (T&B) elbow. In each case, at least 10 consecutive successful tests were recorded, as indicated in Table 1. The requirements of Section 7.7 of IEEE Standard 386 – 2006 were met for all three combinations.

Table 1. Summary of Switching Test

Test Sample: Hubbell Bushing Insert with Hubbell Elbow

Sample Number	Pass/Fail	Sample Number	Pass/Fail
1	P (1)	16	P (16)
2	P (2)	17	P (17)
3	P (3)	18	P (18)
4	P (4)	19	P (19)
5	P (5)	20	P (20)
6	P (6)	21	P (21)
7	P (7)	22	P (22)
8	P (8)	23	P (23)
9	P (9)	24	P (24)
10	P (10)	25	P (25)
11	P (11)	26	P (26)
12	P (12)	27	P (27)
13	P (13)	28	P (28)
14	P (14)	29	P (29)
15	P (15)	30	F



POWER SYSTEMS, INC.

Hubbell Power Systems, Inc.
 8711 Wadsworth Road
 Wadsworth, OH 44281
 Tel: (330) 335-2361
 Fax: (330) 336-9252

Test Sample: Hubbell Bushing Insert with Cooper Elbow (LE225MC06)

Sample Number	Pass/Fail	Sample Number	Pass/Fail
1	P (1)	16	P
2	P (2)	17	P
3	P (3)	18	P
4	P (4)	19	F
5	P (5)	20	P
6	P (6)	21	P
7	P (7)	22	P
8	P (8)	23	P
9	P (9)	24	P
10	P (10)	25	P
11	P (11)	26	P
12	P (12)	27	F
13	F	28	P
14	P	29	P
15	P	30	P

Test Sample: Hubbell Bushing Insert with Elastimold (T&B) Elbow (2731LR-H5240)

Sample Number	Pass/Fail	Sample Number	Pass/Fail
1	P (1)	16	F
2	P (2)	17	P (1)
3	P (3)	18	P (2)
4	P (4)	19	P (3)
5	P (5)	20	P (4)
6	P (6)	21	P (5)
7	P (7)	22	P (6)
8	P (8)	23	P (7)
9	P (9)	24	P (8)
10	P (10)	25	P (9)
11	P (11)	26	P (10)
12	P (12)	27	F
13	P (13)	28	P
14	F	29	P
15	P	30	P

Note:

() – Consecutive successful test.



POWER SYSTEMS, INC.

Hubbell Power Systems, Inc.
8711 Wadsworth Road
Wadsworth, OH 44281
Tel: (330) 335-2361
Fax: (330) 336-9252

TEST REPORT Bulletin CH 9910 SF-02

Fault-closure Test

TEST PROCEDURE:

25 kV 200A elbow and bushing insert connectors that were subjected to the switching test (Bulletin CH 9902 SF-01) were then subjected to the fault-closure test with the fault current given in Table 2 and under the conditions listed in Figure 20 and Table 9 of IEEE Standard 386-2006. The test was conducted on the samples in the same sequence used for the switching test. The test circuit complies with Figure 20 (b) of the Standard. The closing operation was performed manually and each operation was recorded by an oscillogram.

TEST RESULTS:

For each combination of samples, as shown in Table 1, ten consecutive tests were recorded meeting the criteria that their oscillograms showed no external ground current and that all parts remained within the closed connector assembly. At least one connector in each combination was closed at an instant when the voltage is 80% or more of its peak value. The samples tested met the requirements of Section 7.8 of IEEE Standard 386-2006.

Table 1. Summary of Fault-closure Test

Test Sample: Hubbell Bushing Insert with Hubbell Elbow

Sample Number	Pass/Fail	Sample Number	Pass/Fail
1	P	16	**
2	F	17	**
3	P (1)	18	**
4	P (2)	19	**
5	P (3)	20	**
6	P (4)	21	**
7	*	22	**
8	P (5)	23	**
9	P (6)	24	**
10	*	25	**
11	P (7)	26	**
12	P (8)	27	**
13	P (9)	28	**
14	P (10)	29	**
15	**	30	***



POWER SYSTEMS, INC.

Hubbell Power Systems, Inc.
 8711 Wadsworth Road
 Wadsworth, OH 44281
 Tel: (330) 335-2361
 Fax: (330) 336-9252

Test Sample: Hubbell Bushing Insert with Cooper Elbow (LE225MC06)

Sample Number	Pass/Fail	Sample Number	Pass/Fail
1	F	16	P (6)
2	P	17	P (7)
3	P	18	P (8)
4	P	19	***
5	F	20	P (9)
6	P	21	P (10)
7	F	22	**
8	F	23	**
9	F	24	**
10	P (1)	25	**
11	P (2)	26	**
12	P (3)	27	***
13	***	28	**
14	P (4)	29	**
15	P (5)	30	**

Test Sample: Hubbell Bushing Insert with Elastimold (T&B) Elbow (2731LR-H5240)

Sample Number	Pass/Fail	Sample Number	Pass/Fail
1	P	16	***
2	P	17	P (9)
3	P	18	P (10)
4	P	19	**
5	F	20	**
6	F	21	**
7	P (1)	22	**
8	P (2)	23	**
9	P (3)	24	**
10	P (4)	25	**
11	P (5)	26	**
12	P (6)	27	***
13	P (7)	28	**
14	***	29	**
15	P (8)	30	**

Note:

- () - Consecutive successful test.
- * - Sample used for switching test evaluation.
- ** - Sample not tested since fault-closure test requirements have been met.
- *** - Sample failed in switching test.