

Equipments for industrial environment (BT) Sector

Product description: Low Voltage Isolators
Model: CPH and ISO (see table in annex 01 for details of models and codes)
HW revision: -- **SW/FW revision:** --
Test specification: EN 60664-1: 2003-04 - EN 60439-1: 1999-10 +A1: 2004-04
Performed tests: See § 5
Result: **Compliant** **Not Compliant** **See § 5**
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Applicant: Same as Manufacturer
Customer: Same as Manufacturer
Purchase Order: 02/08 **dated:** 2008.02.27
Order Confirmation: 08-0091 **dated:** 2008.02.27

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Samples receiving date: 2008.02.26
Tests date: from: 2008.03.13 to: 2008.04.10

Tested by:

Claudio Bariselli
Tecnico di Laboratorio



Approved by:

Ivo Meroni
Test and Measurement Division Manager

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Rev.	Date	Description

Results of tests and controls reported in this document refer only to samples as tested and described.
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1. PURPOSE

Purpose of this document is to contain results of the tests performed to verify correspondence of test samples, as identified and described in paragraph 3, to requirements of standards listed in paragraph 2.

2. APPLICABLE DOCUMENTS

In agreement with customer request, the tests have been performed in compliance with the standards listed below:

Standard	Year	ed.	Title
EN 60664-1	2003-04	--	Switches for household and similar fixed-electrical installations Part 1: General requirements
EN 60439-1 +A1	1999-10 2004-04	--	Low-voltage switchgear and controlgear assemblies Part 1: Type-tested and partially type-tested assemblies

Following "applicable documents" will be indicated without date and/or edition number.

The applicable documents listed above are used as reference for insulating tests. The traction, compression and flexion/cut tests were been instead performed using test methods of the laboratory described in short way in the paragraphs 7, 8 and 9 of this report.

3. TEST SAMPLE IDENTIFICATION**3.1 DESCRIPTION**

Identification data of test samples are reported in the first page of this document.

3.1.1 TECHNICAL DATA

Power supply nominal voltage:	1000 Vac - 1500 Vdc
Rated frequency:	50 - 60 Hz
Rated power / current:	--
Extreme environmental ranges:	--
Other:	--

3.1.2 CLASSIFICATION

Degree of enclosure protection:	--
Other:	--

3.1.3 ADDITIONAL INFORMATION

Isolatori serie CPH	Plastic Thermoset Polyester Resin with 20% Glass Fiber
Isolatori serie ISO	Polyamide 6.6 with 30% Glass Fiber

3.2 SAMPLES ORIGIN

The test samples were furnished by:			
Manufacturer <input checked="" type="checkbox"/>	Customer <input type="checkbox"/>	Applicant <input type="checkbox"/>	
The beginning sampling was carried out by:			
Manufacturer <input checked="" type="checkbox"/>	Customer <input type="checkbox"/>	Applicant <input type="checkbox"/>	
Received samples:	280 (total codes)	Tested samples:	3 for each code
Selection method:	Random taking <input checked="" type="checkbox"/>		None <input type="checkbox"/>

4. TEST INSTRUCTIONS

4.1 CONDITIONS DURING TESTING

4.1.1 TEST ATTENDANT

INTEK S.p.A. test engineer: ***Claudio Bariselli***

Customer agent: --

4.1.2 TESTS SEQUENCE

Tests are reported into the "Test report" in order "as performed".

4.1.3 MODIFICATION

Test samples were not modified during the tests.

4.1.4 ENVIRONMENTAL / OPERATIVE CONDITIONS

Laboratory environmental conditions are recorded during tests and they are shown on relevant paragraphs. The measurement uncertainties are given with expanded uncertainty with a level of confidence of 95 % (K = 2).

4.1.5 CONVENTIONS

If applicable, on the right of each chapter or paragraph is written the number of the chapter or paragraph of reference Standard in the form: § number.

4.1.6 ABBREVIATIONS

Not Applicable = NA

Non Compliant = NC

Not Required by the customer = NR

Compliant = C

Test Report = TR

Equipment Under Test = EUT

4.2 CONFIGURATION

The test samples are individually verified following the methods and the procedures specified in reference standard or described in the paragraph of this document.

5. TESTs RESULT

§ TR	Test / Verification	§ Standard	Result	Annex N°	Notes
6	Verification of insulation resistance and dielectric test voltage for solid insulation	EN 60664-1 § 4.1.2.3 EN 60947-1 § 8.3.4 - § 8.3.2.2	Compliant	1-2	--
7	Traction test	--	See § 7	1-2	--
8	Compression test	--	See § 8	1-2	--
9	Flexion / cut test	--	See § 9	1-2	--

Notes: --

6. VERIFICATION OF INSULATION RESISTANCE AND DIELECTRIC TEST VOLTAGE FOR SOLID INSULATION

6.1 DESCRIPTION OF INSULATION RESISTANCE MEASUREMENT

The test was been performed in conformity to § 8.3.4 of the EN 60947-1 standard reference.

The sample was subjected to a continuous voltage of 500 V for 1 minute, at the end of the voltage application, shall be measured the value of the insulating resistance.

Acceptance criteria:

The value of the insulating resistance shall be > of 0,5 MΩ.

6.2 DESCRIPTION OF DIELECTRIC VOLTAGE TEST

The test was been performed in conformity to § 8.3.2.2 of the EN 60947-1 standard reference and to the § 4.1.2.3 of the EN 60664-1 standard reference, choosing the worst case among the test parameters of the two standards.

The sample is subjected to a preconditioning of 168 h at the following environmental conditions:

- Ambient temperature 40 °C;

Relative Humidity 93%.

Suddenly at the end of the hygroscopic preconditioning, the sample is subjected for 1 minute to a sinusoidal voltage at power frequency (50 Hz) at the value of 3500 V.

Acceptance criteria:

During and at the end of the test no disruptive discharges or perforation of the insulating material shall occur.

6.3 ENVIRONMENTAL CONDITION

Of the laboratory out of the climatic chamber:

Temperature: 21 °C ± 2 °C

Relative Humidity: 40 % ± 5 %

Atm. pressure.: 1005 mbar ± 20 mbar

6.4 SUMMARY OF RESULTS

Annex Nr	Fig. Nr	Sample Nr	Description	Result	Notes
1 2	-- 1	See table below	Insulating resistance: at the end of the test, for all the samples under test, the value of the insulating resistance is more than 0,5 MΩ.	Compliant	--
1 2	-- 2	See table below	Dielectric test: during and at the end of the test, for all the samples under test, no disruptive discharges or perforation of the insulating material occur.	Compliant	--

Notes: --

Model	Insulating resistance in MΩ				Dielectric test result		
	Specimen 1	Specimen 2	Specimen 3	Average	Specimen 1	Specimen 2	Specimen 3
CPH 15M4	1270	1945	1986	1734	No discharges	No discharges	No discharges
CPH 75M12	> 2 GΩ	> 2 GΩ	> 2 GΩ	> 2 GΩ	No discharges	No discharges	No discharges
ISO 15M4	273	273	279	275	No discharges	No discharges	No discharges
ISO 100M12	460	520	611	530	No discharges	No discharges	No discharges

7. TRACTION TEST**7.1 DESCRIPTION OF THE TEST**

The test is performed by subjecting the sample to an axial traction applied at the threaded inserts and recording the maximum value at the time of the break of the sample. Where the mechanical characteristics of the sample should overcome the security features of the test, the test is stopped corresponding to the safety value and as a result is indicated "more than xxx N".

Direction of the traction force:

**7.2 ENVIRONMENTAL CONDITION**

Temperature: 21 °C ± 2 °C

Relative Humidity: 40 % ± 5 %

Atm. pressure.: 1005 mbar ± 20 mbar

7.3 SUMMARY OF RESULTS

Results of traction test [N]				
Model	Specimen 1	Specimen 2	Specimen 3	Average
CPH 15M4	1759	2243	1492	1831
CPH 20M6	3354	1943	3300	2866
CPH 30M8	5209	6117	5182	5503
CPH 35M10	9406	8325	7337	8356
CPH 75M12	15887	15062	14918	15289
ISO 15M4	2875	2871	2918	2888
ISO 20M6	4370	4490	4437	4432
ISO 25M5	3837	4128	4440	4135
ISO 30M8	9168	8981	9925	9358
ISO 35M10	15362	14443	15250	15018
ISO 75M12	More than 20000 N	More than 20000 N	More than 20000 N	More than 20000 N
ISO 75M16	8190	9539	9315	9015

Notes: --

8. COMPRESSION TEST**8.1 DESCRIPTION OF THE TEST**

The test is performed by subjecting the sample to an axial compression applied at the threaded inserts and recording the maximum value at the time of the break of the sample. Where the mechanical characteristics of the sample should overcome the security features of the test, the test is stopped corresponding to the safety value and as a result is indicated "more than xxx N".

Direction of the compression force:

**8.2 ENVIRONMENTAL CONDITION**

Temperature: 21 °C ± 2 °C

Relative Humidity: 40 % ± 5 %

Atm. pressure.: 1005 mbar ± 20 mbar

8.3 SUMMARY OF RESULTS

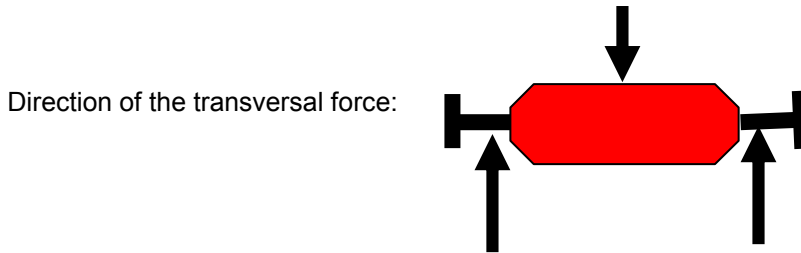
Results of traction test [N]				
Model	Specimen 1	Specimen 2	Specimen 3	Average
CPH 15M4	9243	8750	9142	9045
CPH 20M6	14050	13337	14187	13858
CPH 30M8	25262	26125	29400	26929
CPH 35M6	24037	23037	19881	22318
CPH 35M10	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
CPH 50M8	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
CPH 60M10	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
CPH 75M12	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 15M4	13400	13670	13250	13440
ISO 20M6	20020	21350	20956	20775
ISO 25M5	17406	15262	15062	15910
ISO 30M8	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 35M6	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 35M10	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 60M8	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 60M10	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 75M12	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 75M16	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N
ISO 100M12	More than 30000 N	More than 30000 N	More than 30000 N	More than 30000 N

Notes: --

9. FLEXION/CUT TEST

9.1 DESCRIPTION OF THE TEST

The test is performed by subjecting the sample to a transversal force applied at the threaded inserts and recording the maximum value at the time of the break of the sample. Where the mechanical characteristics of the sample should overcome the security features of the test, the test is stopped corresponding to the safety value and as a result is indicated "more than xxx N".



9.2 ENVIRONMENTAL CONDITION

Temperature: 21 °C ± 2 °C

Relative Humidity: 40 % ± 5 %

Atm. pressure.: 1005 mbar ± 20 mbar

9.3 SUMMARY OF RESULTS

Results of traction test [N]				
Model	Specimen 1	Specimen 2	Specimen 3	Average
CPH 15M4	1871	1954	1331	1719
CPH 20M6	3473	3512	2823	3269
CPH 30M8	6506	5857	7600	6654
CPH 35M10	6559	7225	6900	6895
CPH 75M12	10268	8587	7078	8644
ISO 15M4	3021	3200	2987	3069
ISO 20M6	2448	2578	2750	2592
ISO 25M5	4565	3725	3568	3953
ISO 30M8	10212	9275	10590	10026
ISO 35M10	12900	15731	13025	13885
ISO 75M12	24650	28187	25750	26196
ISO 75M16	7934	8953	10296	9061

Notes: --

10. TEST INSTRUMENTATION

§ TR	Description	Manufacturer	Model	Intek ID
6	Climatic chamber	Perani	UCS 600/70	0696-UL
6	Insulating resistance tester	ABAG	IT-02	0285-UL
6	Thermo/hygrometer - Barometer	RB Elektrotechn Laboratorium	UM 26/10	0067-U
7-8-9	Traction/compression test equipment	ZWICK	Z150	--
6÷9	Thermo/hygrometer - Barometer	Fischer	--	0054

10.1 INSTRUMENTATION ACCURACY

If reference standard doesn't specify otherwise, accuracy of used instrumentation for the tests is in accordance to the limits indicated in the document "Collection of CIG-OSM/IN decision n° OSM/IN 004" meeting n° 7 Item 6.27, with object "Limits of accuracy of the instruments that shall be considered during CCA tests" published from CIG Operational Staff Meeting Installation material and components.

11. ANNEXES LIST

Annex N°	Description
01	Product datasheet.
02	Test set-up photograph.

End of test report.



ISOLATORI BASSA TENSIONE

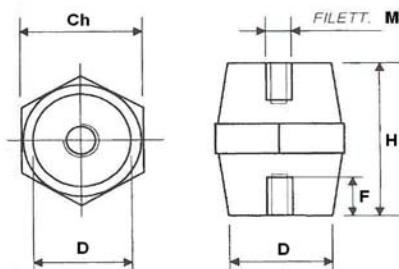


TABELLA 1

Caratteristiche Tecniche :

Composto : Termoindurente plastico Resina Poliestere caricata 20% Fibra di vetro

Colore : Rosso

Auto estinguente

Temperatura di funzionamento continuo fino a 90°C

R.T. Resistenza alla trazione
 R.C. Resistenza alla compressione
 R.F. Resistenza alla flessione / taglio

Codice	Rif	Ch	tipo	H	M	F	Ø D	Tensione d'esercizio	R.T.	R.C.	R.F.
								AC	daN	daN	daN
CPH1000	CPH 15M4	16	Esa	15	M4	6	14				
CPH1010	CPH 20M6	19	Esa	20	M6	8	15				
CPH1020	CPH 25M6	26	Esa	25	M6	10	15				
CPH1025	CPH 30M6	33	Esa	30	M6	10	25				
CPH1030	CPH 30M8	33	Esa	30	M8	12,5	25				
CPH1035	CPH 35M6	35	Esa	35	M6	12,5	26				
CPH1040	CPH 35M8	34	Esa	35	M8	12,5	26				
CPH1045	CPH 35M10	35	Esa	35	M10	13	26				
CPH1055	CPH 40M8	40	Esa	40	M8	12,5	30				
CPH1070	CPH 45M8	40	Esa	45	M8	15	30				
CPH1085	CPH 50M8	45	Esa	50	M8	15	35				
CPH1090	CPH 50M10	45	Esa	50	M10	15	35				
CPH1100	CPH 60M10	50	Esa	60	M10	18	38				
CPH1105	CPH 75M12	55	Esa	75	M12	23	38				

TABELLA 2

Caratteristiche Tecniche :

Composto : Poliammide 6.6 caricato 30% Fibra di vetro
 Colore : Nero
 Auto estinguente UL 94VO
 Glow wire test :960°C

R.T. Resistenza alla trazione
 R.C. Resistenza alla compressione
 R.F. Resistenza alla flessione / taglio

Codice	Rif	Ch	tipo	H	M	F	Ø D	Tensione	R.T.	R.C.	R.F.
								d'esercizio	daN	daN	daN
dimensioni								AC	daN	daN	daN
ISO1000	ISO 15M4	14	Ott.	15	M4	4,5	12				
ISO1005	ISO 20M4	17	Esa.	20	M4	5	15				
ISO1010	ISO 20M6	17	Esa.	20	M6	5	15				
ISO1015	ISO 25M5	19	Esa.	25	M5	7	15				
ISO1020	ISO 25M6	19	Esa.	25	M6	7	15				
ISO1025	ISO 30M6	30	Esa.	30	M6	9	26				
ISO1030	ISO 30M8	30	Esa.	30	M8	9	26				
ISO1035	ISO 35M6	31	Esa.	35	M6	10	28				
ISO1040	ISO 35M8	31	Esa.	35	M8	10	28				
ISO1045	ISO 35M10	31	Esa.	35	M10	10	28				
ISO1050	ISO 40M6	32	Esa.	40	M6	12	28				
ISO1055	ISO 40M8	32	Esa.	40	M8	12	28				
ISO1060	ISO 40M10	32	Esa.	40	M10	12	28				
ISO1065	ISO 45M6	40	Ott.	45	M6	17	34				
ISO1070	ISO 45M8	40	Ott.	45	M8	17	34				
ISO1075	ISO 45M10	40	Ott.	45	M10	17	41				
ISO1080	ISO 50M6	35	Esa.	50	M6	17	29				
ISO1085	ISO 50M8	35	Esa.	50	M8	17	29				
ISO1090	ISO 50M10	35	Esa.	50	M10	17	29				
ISO1095	ISO 60M8	55	Ott.	60	M8	17	44				
ISO1100	ISO 60M10	55	Ott.	60	M10	17	44				
ISO1105	ISO 75M12	50	Esa.	75	M12	28	36				
ISO1110	ISO 75M16	50	Esa.	75	M16	28	36				
ISO1115	ISO 100M12	65	Esa.	100	M12	28	52				

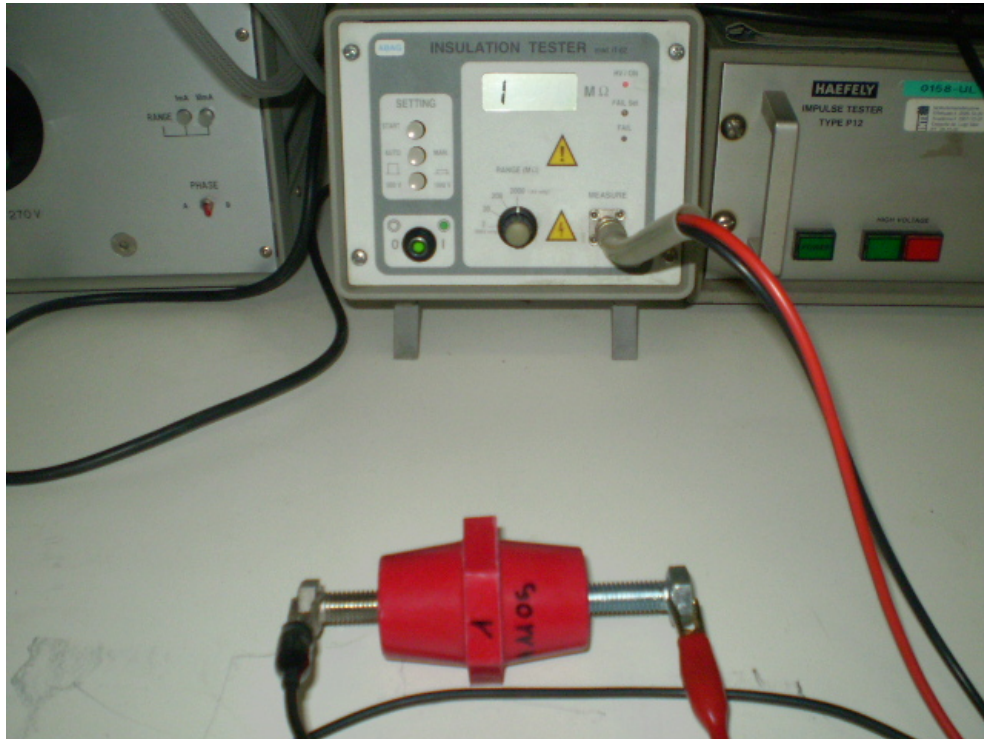


Fig. 1. - Set-up for insulating resistance test



Fig. 2. - Set-up for dielectric test

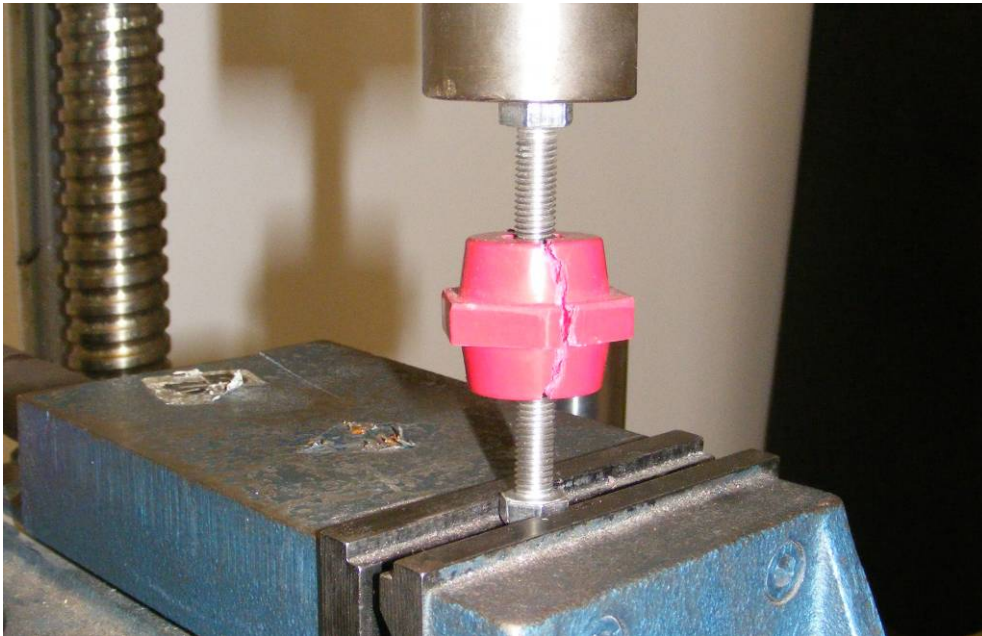


Fig. 3. - Set-up for traction and compression tests



Fig. 4. - Set-up for flexion / cut test