

**Switches for Electrical Fixed Installations  
for household and similar purposes**

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## 1 – OBJECTIVE

This document presents the complementary criteria for the “Rules of Certification of Product” – 700-RC-001 for the grant and maintenance of the license for the use of the Conformity Marking of CEBS (Conformity Evaluation Brazilian System), INMETRO and TÜV Rheinland do Brasil Ltda.

## 2 – APPLICATION FIELD

Applicable to all the companies in the segment that request the grant for the license of the use of the Conformity Marking of the CEBS - switches for alternated current, manually operated, for general purposes, for rated voltage up to and including 440 V and for nominal current up to and including 63 A, to be used for electrical fixed installations for household and similar purposes (being interior or exterior), in generally treated as “switches”.

**Note:** This complement applies equally to the following switches:

Switches that incorporates the pilot light, switches with remote control, electromagnetic (particular requirements are given in the standard IEC 60669-2), switched with time-delay (particular requirements are given in the standard IEC 60669-2), combinations of switches and other functions (with the exception of switches combined with fuses), electronic switches (particular requirements are given in the standard IEC 60669-2), switches having facilities for the outlet and retention of flexible cables (see annex B) and isolating switches (particular requirements are given in the standard IEC 60669-2).

## 3 – COMPLEMENTARY DOCUMENTS

INMETRO decree nº 231 from September 28<sup>th</sup>, 2006

INMETRO decree nº 234 from June 30<sup>th</sup>, 2008

**INMETRO decree nº 335 from August 29<sup>th</sup>, 2011**

**700.PI-2 - Constitution and Attribution of the Technical Commission**

NBR 5426:1985 Guide to the use of ABNT NBR 5426 - Sampling procedures and tables for inspection by attributes - Procedure

ABNT NBR NM 60669-1:2004 Switches for household and similar fixed-electrical installations Part 1: General requirements

NBR ISO 9001:2008 Quality management systems - Requirements

NBR ISO 9000:2005 Quality systems - Fundamentals and vocabulary

ABNT ISO/IEC Guide 2:2006 Standardization and related activities - General vocabulary

## 4 – SAMPLE AND TESTS FOR SWITCHES

4.1 – Initial tests

4.1.1 – Type tests

The type tests are carried out by accredited laboratories by Inmetro or that fulfills the item 9 in the 700-RC-001.

4.1.1.1 – For one set of switches be considered as the same family must, necessarily, it needs to be fulfilled the following requirements:

- ✓ Same basic design;
- ✓ Same outer dimensions of the poles;
- ✓ Same materials, finishing and the dimensions of the conductive parts of current;
- ✓ Same type of terminals;
- ✓ Same size, material, configuration and method of fixation of the contacts;
- ✓ Same mechanism of operation, same materials and physical characteristics;
- ✓ Same molding and insulation materials;

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✓ The multipolar devices must be composed by monopolar devices or constructed with the same components of the monopolar devices, having the same general dimensions by pole, excluding additional barriers between the poles.

For one same family of switches are accepted the following variations:

- ✓ Mode of use as specified in the standard ABNT NBR NM 60669-1:2004;
- ✓ Method of installations as specified in the standard ABNT NBR NM 60669-1:2004;
- ✓ Color;
- ✓ Types of terminals; and
- ✓ Cover plates

**Table 1 – Additional tests due to variation in the families**

Model (Function) I nom V nom	Tests of the standard ABNT NBR NM 60669-1:2004 to be applied			
	Flush type	Surface type	Difference of Color	Difference of cover plate material
Single pole (1)	All applicable	Sections 8, 13, 20, 22, 23 and 24	Section 24	Sections 8, 20 and 24
Push-button (1)	Sections 8 and 25 (spring does not greased)	---	---	---
Two ways (6)	---	---	---	---
Double poles (2)	Sections 8, 13, 16, 17, 18, 19 and 20	---	---	---
Two-way double-pole (6/2)	---	---	---	---
Two-way reversing (7)	Sections 8, 13, 16, 17, 18, 19 and 20	---	---	---

In case not specified, the complementary tests, necessary at each extension, will be established by one evaluation made among TÜV and the manufacturer.

**4.1.1.2 – Definition of the tests to be carried out**

The type tests are all described in the standard ABNT NBR NM 60.669-1:2004.

**4.1.1.2.1 – Definition of the laboratory**

The requirements for the selection of the laboratory are the Accreditation by Inmetro, according to the item 9 of the 700-RC-001.

**4.1.1.2.2 – Definition of sample**

The collect of samples must be taken obeying the quantity established in the standard ABNT NBR NM 60.669-1:2004 to be carried out the tests, taken from each model, object of the certification.

**Note:** In case of prototypes, the manufacturer can collect and send the necessary samples to the Laboratory or TÜV, as established among them, and under responsibility of TÜV. The approval of the prototype in the initial tests does not exempt TÜV of validating the products after the beginning of the operation of the production line.

**4.1.2 –** In case of occurrence of non-conformities in the initial tests, the manufacturer must make the necessary adjustments and then after, new samples can be collected by TÜV.

**4.2 – MAINTENANCE TESTS**

The maintenance tests are carried out according to:

**4.2.1 –** The maintenance tests must be carried out, at each 6 (six) months, after the grant of the Authorization for the Use of the Seal of Conformity Identification. TÜV can carry out the tests at smaller period since justified by changes in the productive process or denunciation about the product.

**4.2.2 –** For each sample of maintenance, must be always performed the tests and the checkings, as in the standard ABNT NBR NM 60.669-1:2004, indicated as follow:

- a) Markings (section 8);
- b) Ratings (section 6);

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- c) Checking of dimensions (section 9);
- d) Classification (section 7);
- e) Mechanism (section 14)

**4.2.3** – Beyond the tests and checkings established in the subitem 4.2.2, must be carried out additionally, when applicable, the tests and the checkings, as the standard ABNT NBR NM 60.669-1:2004, indicated as follow:

- a) 1<sup>o</sup> semester: temperature rise (section 17); Making and breaking capacity (section 18); normal operation (section 19); mechanical strength (section 20); provision for earthing (section 11).
- b) 2<sup>o</sup> semester: resistance to ageing, protection provided by enclosures of switches, and resistance to humidity (section 15); insulation resistance and electric strength (section 16); resistance of insulating material to abnormal heat, to fire and to tracking (section 24).
- c) 3<sup>o</sup> semester: resistance to heat (section 21); screws, current carrying parts and connections (section 22); creepage distances, clearances and distances through sealing compound (section 23); resistance to rusting (section 25); provision for earthing (section 11); temperature rise (section 17); making and breaking capacity (section 18); normal operation (section 19).
- d) 4<sup>o</sup> semester: protection against electric shock (section 10); terminals (section 12); constructional requirements (section 13); resistance of insulating material to abnormal heat, to fire and to tracking (section 24).

**4.2.4** – At the end of the cycle of 4 semesters, must be started another sequence of tests and checkings, as described in the sub items 4.2.2 and 4.2.3.

### **4.2.5** – Definition of laboratory

The requirements for the selection of the laboratory are the Accreditation by Inmetro, as the item 9 from 700-RC-001, of this Complement for the Rule of Certification.

### **4.2.6** – Definition of sample

Representative samples of the production must be submitted to the maintenance tests. From each certified basic design certified must be collected samples from the commerce or in the logistic department from at least one item from each family, considering the totality of the maintenance tests to be carried out.

**4.2.7** – If there is modification of materials or of project during the surveillance of the certification, will be carried out additional tests according to the standard ABNT NBR NM 60669-1:2004, as the item 4.1.3 of this CRC, according to TÜV.

**4.2.8** – TESTS FOR THE EXTENSION OF THE LICENSE, the necessary tests for the evaluation of the changes for the basic design will be carried out according to the standard ABNT NBR NM 60669-1:2004, as the item 4.1 of this CRC, according to TÜV.

**4.2.9** – The number of necessary pieces to be carried out each test is established in the standard ABNT NBR NM 60669-1:2004.

## **5 – COMMISSION OF CERTIFICATION**

TÜV Rheinland do Brasil Ltda constitutes and keeps working a Commission of Certification according to the procedure 700-PI-002, under consulting purpose, that must be gather together, at maximum every three months, in order to analyses critically the issued certificates, renewed, suspended, cancelled or cancelled in this period.

The Commission of Certification has the permanent and consulting purpose. Their function is to analyse the processes of certification.

Their composition includes people representant of class entities, consumers and of neutral organizations, among others, recognized by their representativity and/or capacity in their area of actuation.

The opinion of the Commission of Certification has consulting purpose and, it does not exempt TÜV Rheinland do Brasil Ltda responsibility on the issued certificates, kept or renewed.

## **6 – FACTORY EVALUATION**

### **6.1** – Initial audit

TÜV must carry out the initial audit having as reference the item 6.3 of this document, and:

- a) TÜV must check the documentation (original) previously sent, focusing the validation of the presented dates and to evaluate the conformity of the process to the normative requirements;

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- b) TÜV must check the treatment of non-conformity in the initial evaluation;
- c) After the initial audit, and in the initial test, having non-conformity, TÜV and the manufacturer will discuss about the possible lines of action to be adopted for the elimination of its root cause;
- d) Technical Commission carries out the last analysis of the collected information during the previous stage and recommend or not the certification.

**6.2 – Maintenance audit**

The maintenance audit must be carried out, at each 6 (six) months, after the grant of the Authorization for the Use of the Seal of the Identification of the Conformity having as reference the item 6.3 of this document. TÜV can perform the audits at smaller periods since justified by changes in the productive process or denunciation about the product.

**6.2.1** –TÜV must proceed, at least, as the follow steps:

- a) Documentation analysis (original) previously sent, particularly as its availability, organization and recovery;
- b) Treatment of non-conformities during the maintenance evaluation;
- c) After the maintenance audit and the maintenance tests, having non-conformities, TÜV and the manufacturer discuss about the possible lines of action to be adopted for the elimination of the root causes.
- d) Communication of the result of the maintenance audit.

**6.3** – The initial and maintenance audit, of the quality management system of the manufacture must check the fulfillment according to the requirements indicated below, when applicable in the scope of the Quality Management System of the Manufacturer:

1. Control of records – (\*) to fulfill to the sub item 4.2.4 of the standard
2. Control of production – (\*) to fulfill to the sub items 7.5.1 and 7.5.2 of the standard
3. Identification and traceability – (\*) to fulfill the sub items 7.5.3 of the standard
4. Preservation of product – (\*) to fulfill the sub item 7.5.5 of the standard
5. Control of monitoring and measuring devices – (\*) to fulfill the sub item 7.6 of the standard
6. Monitoring and measurement of product – (\*) to fulfill the sub item 8.2.4 of the standard
7. Control of nonconforming product – (\*) to fulfill the sub item 8.3 of the standard
8. Corrective action – (\*) to fulfill the sub item 8.5.2 of the standard
9. Preventive action – (\*) to fulfill the sub item 8.5.3 of the standard

(\*) Note: for this evaluation, must be used, as reference, the content presented in the NBR ISO 9001:2000 Quality Management System – Requirements and in the criteria of the factory inspection reports CIG 22 and 23.

**6.3.1** – Routine tests that must be carried out on 100% of production, being carried out according to the manufacturer's procedure and under its responsibility, for the production checking.

- a) Electrical continuity checking;

**6.3.2** – Routine tests (AQL and IL according to the manufacturer's procedure and under its responsibility):

- a) Resistance to heat (section 21);
- b) Temperature rise (section 17);
- c) Insulation resistance and electric strength (section 16);
- d) Resistance of insulating material to abnormal heat, to fire and to tracking (section 24).

**6.3.3** – The mentioned tests in the items 6.3.1 and 6.3.2 must be carried out according to the standard ABNT NBR NM 60669-1:2004, under responsibility of the manufacturer.

**6.4** – The manufacturer must keep the records of the tests carried out as in the item 6.3.1, indicating the product type, test date, manufacture local (if made in different places), tested quantity, number of failures and taken actions, i. e., destructed or separated.

**6.5** – The manufacturer must carry out the equipment functional checking of the test described in the item 6.3.1 of this Complement, before and after each period of usage and for the continuous usage at least once each 24h.

During the checking, the equipment must present that indicates the failures when the accessories supposed defected are checked or when are simulated failures.

The test equipment must be calibrated at least once a year.

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It must be kept the records of the checkings and of all the intervention that are necessary.

**7 – ADJUSTMENTS TO ABNT NBR NM 60669-1:2004**

The INMETRO decree nº 27 from February 18<sup>th</sup>, 2000 establishes as follow:

- a) It must not used ferrous material in the electrical current conduction.
- b) The scope products of this CRC must have the indications of the rated voltage that are intended to be used in Volt (V), Power in Watt (W) or the Current in Amperes (A), beyond the identification of the manufacturer.

**8 – MODEL WITH LOT CERTIFICATION:**

**8.1 –** This model is based in the method “pass, not pass”, for the certification of each lot, and must be applied to isolated lots of production unique or intermittent with large intervals of time, with few or not recognized control during the process of manufacture.

**8.1.1 – Request of the beginning of process**

The customer must formalize its option for the model of certification that covers the evaluation of the object product of the request, as well as the execution of the tests established in the relevant technical standards related to the item 2 of this complement on the samples collected in the factory.

Note: the condition of the Legal representative person of the manufacturer, foreigner or national, must be clear in the application form.

**8.1.1.1 –** In the application form must contain, attached, the description of the switch and its descriptive sheet.

**8.1.2 – Initial test**

**8.1.2.1 – Type tests for Lot**

**8.1.2.1.1 –** The type tests for lot are the established in the sub item 4.1.1.

**8.1.2.1.2 –** For the execution of the type tests for lot must be followed by the requirements established in the sub item 4.1.1.2.

**8.1.2.2 – Definition of the laboratory**

The requirements for the selection of the laboratory are the Accreditation by INMETRO, according to the item 9 of the 700-RC-001.

**8.1.2.3 – Definition of sample**

The collect of samples for the execution of the tests must be done by TÜV obeying the double of the established quantity for the execution of the tests according to the established in the standard ABNT NBR NM 60.669-1:2004, taken from each model, object of the certification.

**8.1.3 – Tests for the Inspection of Lot**

**8.1.3.1 –** Beyond the type tests, described in the item 8.1.2.1, TÜV must, under its responsibility, carry out the following tests indicated below:

- a) Resistance to ageing, protection provided by enclosures of switches, and resistance to humidity;
- b) Insulation resistance and electric strength;
- c) Temperature rise; and
- d) Resistance of insulating material to abnormal heat, to fire and to tracking.

**8.1.3.2 – Definition of the laboratory**

The requirements for the selection of the laboratory are the Accreditation by Inmetro, as the item 9 of the 700-RC-001.

**8.1.3.3 – Plan of Sample of Inspection of Lot**

The collected samples according to the standard NBR 5426:1985, must obey the plan of sample double normal, general inspection level I and NQA of 0,25.

**8.1.3.3.1 –** The tests for the inspection of lot must be carried out as to the standard ABNT NBR NM 60.669-1:2004,

using the totality of collected samples, divided in two parts, one for the checkings established in the sub items a) and b) and the other for the checkings established in the sub items c) and d).

**9 – AUTHORIZATION FOR THE USE OF THE SEAL OF IDENTIFICATION OF THE CONFORMITY**

**9.1** – For the purpose of development of the seal of identification of the conformity, were observed the advices of the INMETRO decree nº 73/2006.

**9.2 – Specification**

The Seal of the Identification of the Conformity, established in the item 9.2.2 and 9.2.3 of this document, has the purpose indicate that the switches are in accordance with the standard ABNT NBR NM 60.669-1:2004.

**9.2.1** – The switches must bear the Seal of Identification of the Conformity on the product and on the primary package, when exists, according to the established in the items 9.2.2 and 9.2.3 of this document.

**9.2.2 – Seal of Identification of the Conformity on the package**

a) On the package, the seal can be printed or can be used one label, with characteristics of indelibility, since obey the dimensions established as follow:

b) The use of colors on the seals has as purpose differentiate the focus of the Program. This way, the seal of one Program, whose focus is the safety, must be yellow. However, although must be preferably used the version in “color” of the seal, it is allowed to used the version in just one “color”.

c) On the individual packages of products, must be used the model of compact full seal. However, in case where there is no enough space for the application of the full seal or in case where the application is made by printing directly on the package, will be allowed the use of the compact seal, Model 2, without the word “Segurança”. In this case, will be allowed the printing of the word “Segurança” from the right or left side to the seal, according to the model as below, respecting the minimum dimension of the seal, of 11mm of width, and the character to be used in the word “Segurança”.

d) On the collective product packages, used to pack the individual packages already properly identified, however, must be used preferably the seal “one color” or the seal “compact, Model 2”, is allowed the application of the seal “compact, Model 2” without the word “Segurança”, or the application of the one speech mentioning “esta embalagem contém produtos certificados”.

Character  
Univers  
Univers Black



Pantone 1235

- 100%
- 80%

CMYK

- C0 M27 Y76 K2
- C0 M20 Y75 K2



Greyscale

- 100%
- 90%
- 70%



Or

Full Seal

Compact Seal, Model 2





11mm





11mm

**Segurança**

**Segurança**



**Segurança**   Or **Segurança**  

  **Segurança** Or   **Segurança**

Model of Compact Seal with the word “segurança” from the right or left side

**9.2.3 – Seal of Identification of the Conformity on the Product**

- a) On the product, when the identification of the conformity is stamped or inserted by mean of seal, case there is no enough space on the frontal part of the switch for electrical fixed installation for household and similar purposes can be put in other parts on them.
- b) On the product where there is no enough space for the application of the seal “compact” or in cases that the application is made by direct stamp on the product through the use of molding, will be allowed the use of the “compact” seal without the word “Segurança”.
- c) Will be allowed the use of the “compact” seal with the minimum dimension smaller than 11mm being respected the relevant proportions to identify the product with evaluated conformity mandatorily in the scope of Conformity Evaluation Brazilian System - CEBS.

**Segurança**

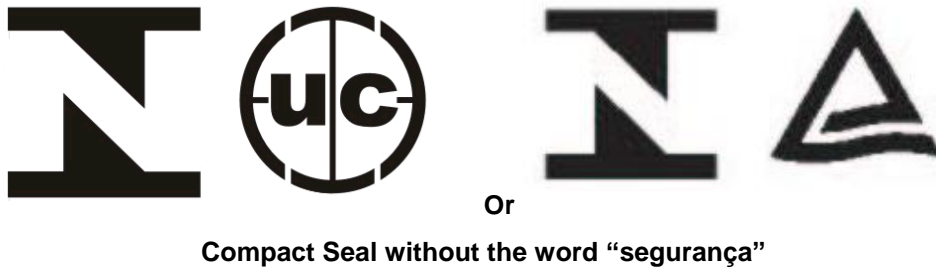
**Segurança**



Or

Compact Seal, Model 2





**LOGO UCIEE:** Can be used just for the customers that already used it, on their products and packages, before 2007.

**10 – REVISION MADE:**

Date	Revision	Responsible
23/08/2013	Change the number of documents	Gabriela Halphen
03/08/2015	Change of the item 5. - COMMISSION OF CERTIFICATION, with regard to the systematic of realization of the certification commission.	Ana Paula Tamasia
20/07/2016	Deleted the INMETRO decree nº 27 from 18/02/2000; included INMETRO decree nº 335 from 29/08/2011 and updated the procedure 700.PI-028 - Constitution and Attributions of the Technical Commissions	Vanessa Hernandes