PEP ecopassport®PROGRAMME

PSR

SPECIFIC RULES FOR
Electrical switchgear and control gear Solutions

PSR-0005-ed2-EN-2016 03 29
According to PSR-modele-ed1-EN-20150320

Association P.E.P. 11/17, rue de l'Amiral Hamelin - 75016 Paris
Téléphone : 01.45.05.71.61 - Fax : 01.47.04.68.57
Association Loi 1901

List of the editorial modifications of the present document

On 2016 09 09 :

Party changed	**Change made**
§3.13 **“Passive product - continuous operation" scenario:** products through which the main current passes during continuous operation ▪ percentage of utilization time: 30%	percentage of utilization time: 30% is replaced by 100%

Contents

1. Introduction

This reference document complements and explains the Product Environmental Profile (PEP) Drafting Rules defined by the PEP Ecopassport® Program (PEP-PCR ed.3-EN-2015 04 02), available at www.pep-ecopassport.org.

It defines the additional requirements applicable to Electrical Switchgear and Controlgear Solutions. These requirements must be satisfied in order to:

- Qualify the environmental performance of these solutions on an objective and consistent basis,
- Publish PEP (Product Environmental Profile) that comply with PEP Ecopassport® requirements and with international reference standards[1].

This reference document was drawn up in compliance with the open, transparent rules of PEP Ecopassport® Program with the support of stakeholders and manufacturers of Electrical Switchgear and Controlgear Solutions.

	www.pep-ecopassport.org
PSR reference	PSR-0005-ed2-EN-2016 03 29
Critical review	The third-party critical review was carried out by CODDE, a Bureau Veritas subsidiary. The certificate of compliance published on 2016/05/12 is shown in Appendix.
Availability	The critical review report is available on request from the PEP Association contact@pep-ecopassport.org
Scope of validity	The critical review report and the certificate of compliance remain valid within 5 years or until the PEP Drafting Rules, or the normative reference texts to which they refer, are modified.

[1] ISO 14025, ISO 14040 and ISO 14044 standards

2. Scope

The scope covers both systems and products of electrical installation for energy and communication networks.
The scope of product categories covered by the PSR is specified below from the IEC standards for electrical switchgear and controlgear that describe the functional characteristics of these products. If an electrical switchgear and controlgear device is not included in a product category covered by the standards listed in the Annex, the PEP writer may refer to the content of other standards if he justifies their use in the accompanying report.
If referencing an IEC is not possible, the PEP writer shall describe the functional characteristics of the product explicitly in the PEP.

A reference single scenario for all the families of targeted products, has been selected regardless of the variety of applications. This requirement enables to simplify the LCA, to facilitate comparability of the environmental impacts generated by identical solutions and to meet the LCA international standards (ISO 14040s series) that required to use a worth case scenario in case of uncertainty on the use of the product (residential, industrial, ...). To ensure comparability between the PEPs, the reference life and the use scenario proposed in the PSR shall be applied without deviation.

Electrical Switchgear and Controlgear Solutions functional families are numerous and varied to adapt to all needs. To facilitate access to information, the list below mentions the link between large main function and main application area, for which the devices are suitable in terms of technological response, involving components, equipment and systems of appropriate size, complexity and life duration.

At the crossroads of both, there is the standardization group that allows to view the standards for these couples' solution / application area "that describe in detail all of their characteristics, uses, etc.

Examples of standards groups: TC = 121 IEC technical committee for LV switchgear, SC 23B = Sub Committee for IEC sockets for household and similar purposes.

Instructions: 1 / for specific rules on the product, identify the product category and go to chapter 3 paragraph mentioned. 2 / to examine the detailed standards of a product category, identify the applicable chapter and the standardization group (TC and SC concerned) in the list and go to Annex 1 3 / the combinations of functions are covered in Chapter 3.12

Product category	Chap.	Main function summarized		Relevant TC et SC
PROTECT CIRCUIT AND PERSONS				
Circuit-breakers	3.1	Protect the installation from overload and short circuits.		SC121A, SC23E
Blocks and differential switches	3.2	Protect people and premises at risk of fire or explosion against insulation defects.		SC121A, SC23E
Differential circuit-breakers	3.3	Protect the installation against overloads and short circuits and protect people and premises at risk of fire or explosion against insulation defects.		SC121A, SC23E
disconnectors	3.4	Separate installation or part of the installation of any energy source		SC121A, SC23B
Surge arresters	3.10	Protect electrical equipment against the direct or indirect effects of lightning or against transient overvoltage.		SC37A
unequipped enclosures and cabinets	3.9	Protect people against electric shocks by direct contact and the equipment it houses against the penetration of solids and liquids and against mechanical shocks.		SC121B, SC23B
Fuses	3.13	Protect downstream equipment against effects of overload or short circuit, by interrupting the current.		TC32
Measurement relays and protection equipment	3.13	Control, monitor and protect power networks.		TC95
OPEN / CLOSE THE CIRCUIT				
switches	3.5	Establish and cut off the supply of an electrical circuit.		SC121A, SC23B/J
Contactors, remote control switches, combination starters	3.6	Establish and cut off the supply of a downstream installation from an electrical and/or mechanical control.		SC121A
Thermostats and programmable thermostats	3.7	Regulate the temperature of a room according to a defined temperature set by the user.		SC23B, TC72
All or nothing relays	3.13	Establish and interrupt an electric circuit.		TC94
CONNECT				
Sockets	3.8	Provide a point of connection to a network (energy, telecommunications, ...)		SC23H, SC23B/C/G
Terminal blocks	3.11	Establish connections between two or more conductors		SC121A, TC23

3. Specific rules for each product category

The information set out below for each product category (i.e. the functional unit, the characteristics of the product, the reference lifetime (RLT), the use scenario, the reference product) shall be mentioned in the PEP. Evidence supporting the assumptions made and the chosen characteristic values shall be documented and presented in the accompanying report.

These characteristics are defined assumptions for modeling needs of life cycles and do not represent actual performance or the specific use of a product.

3.1. Circuit-breakers

3.1.1. Functional Unit (FU) and characteristics of the referent product

The PEP editor shall specify the FU as follows:

Application	Functional Unit	Standardized Product characteristics to provide
Low voltage	Protect during 20 years the installation against overloads and short-circuits in circuit with assigned voltage U and rated current In. This protection is ensured in accordance with the following parameters: - Number of poles Np - Rated breaking capacity Icn - Tripping curve Cd	U = Rated voltage (V) In = Rated current in continuous operation (A) Np = Number of poles Icn = Rated breaking capacity (A) Cd = Tripping curve If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.1.2. Reference lifetime and Use scenario

Application	Reference lifetime	Use scenario
Low Voltage	20 years	Load rate: 50% of In Use time rate: 30% of RLT

3.2. Blocks and differential switches

3.2.1. Functional Unit (FU) and characteristics of the referent product

The PEP editor shall specify the FU as follows:

Application	Functional Unit	Standardized Product characteristics to provide
Low voltage	Protect during 20 years people and premises at risk of fire or explosion against insulation defects in circuit with assigned voltage U and rated current In. This protection is ensured in accordance with the following parameters: - Number of poles Np - Sensitivity S - Type of differential protection Tp	U = Rated voltage (V) In = Rated current in continuous operation (A) Np = Number of protected poles (one pole and the neutral one, three poles, three poles and the neutral one) S = Sensitivity (30mA, 300mA,…) Tp = Type of differential protection (A, A selective, B, F, AC, AC selective, …) If the degrees of protection are considered as specific functions for the product, specify in the FU: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.2.2. Reference lifetime and Use scenario

Application	Reference lifetime	Use scenario
Low voltage	20 years	Load rate: 50% of In Use time rate: 30% of RLT

3.3. Differential circuit breaker

3.3.1. Functional Unit (FU) and characteristics of the referent product

The PEP editor shall specify the FU as follows:

Application	Functional Unit	Standardized Product characteristics to provide
Low voltage	Protect during 20 years the installation against overloads and short-circuits and people and premises at risk of fire or explosion against insulation defects in circuit with assigned voltage U and rated current In. This protection is ensured in accordance with the following parameters: - Number of poles Np - Rated breaking capacity Icn - Tripping curve Cd - Number of poles Np - Sensitivity S - Type of differential protection Tp	U = Rated voltage (V) In = Rated current in continuous operation (A) Np = Number of protected poles (one pole and the neutral one, three poles, three poles and the neutral one) Icn = Rated breaking capacity (A) Cd = Tripping curve S = Sensitivity (30mA, 300mA,…) Tp = Type of differential protection (A, A selective, B, F, AC, AC selective, …) If the degrees of protection are considered as specific functions for the product, specify in the FU: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.3.2. Reference lifetime and Use scenario

Application	Reference lifetime	Use scenario
Low voltage	20 years	Load rate: 50% of In Use time rate: 30% of RLT

3.4. Disconnectors

3.4.1. Functional Unit (FU) and characteristics of the referent product

The PEP editor shall specify the FU as follows:

Application	Functional Unit	Standardized Product characteristics to provide
Earthing disconnectors Low voltage disconnectors	Turn off all or part of an installation by separating the installation or part of the installation of all electrical energy or earth, for safety reasons with a rated voltage U and rated current In ensuring isolation characterized by rated voltage Ui. This function is provided for R years.	U = Rated voltage (V) In = Rated current in continuous operation (A) Ui = Rated insulation level (V) R = Reference lifetime according to below section If the degrees of protection are considered as specific functions for the product, specify in the FU: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.4.2. Reference lifetime and Use scenario

Application	Reference lifetime	Use scenario
Earthing	30 years	Load rate: 0% Use time rate (closed unit): 90% of RLT
Low voltage	20 years	Load rate: 50% Use time rate (closed unit): 30% of RLT

3.5. Switches

3.5.1. Functional Unit (FU) and characteristics of the referent product

The PEP editor shall specify the FU as follows:

Application	Functional Unit	Standardized Product characteristics to provide
Low voltage	Establish, support and interrupt for 20 years rated currents in normal conditions of circuit characterized by the current Ith, including any conditions specified for overload in operation characterized by the current Ie, for the operating voltage Ue and a current for short-circuit Icw for a specified time.	Ue = Rated voltage (V) Ith = Rated current in continuous operation (A) Icw = Rated short time withstand current (A) Ie = Overcurrent (A) If the degrees of protection are considered as specific functions for the product, specify in the FU: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

For a modular switch, all elements allowing to fulfill the function “switch” shall be integrated: the mechanism (which is clipped on the frame) + the actuating finger (which is clipped on the mechanism) + the frame (which is fixed on the wall) + the plate to cover the frame.

3.5.2. Reference lifetime and Use scenario

Application	Reference lifetime	Use scenario
Low voltage	20 years	Load rate: 50% of In Use time rate: 30% of RLT

3.6. Contactors, remote control switch, combinations, starters

3.6.1. Functional unit (FU) and reference product specifications

The PEP writer shall specify the FU as follows:

Application	Functional unit	Standardized product specifications to fulfil
Low voltage	Switch on and off during 20 years electrical power supply of a downstream installation with an electrical and/or mechanical control. The functional unit is characterized by a type X, a control circuit voltage Uc, a power circuit voltage Up and a maximum allowed intensity by the power circuit Ip.	X = Product type (1F, 1F + 1O, 3F,…) Uc = control circuit voltage (V) (12V, 24V, 230V,…) Up = power circuit voltage (V) Ip = Maximum allowed intensity by the power circuit (A) If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.6.2. Reference Life Time and use scenario

Application	Reference lifetime	Reference product use scenario
Low voltage	20 years	Load factor : 50% of Ip Use rate: 50% of the RLT

3.7. Thermostats and programmable thermostats

3.7.1. Functional Unit (FU) and reference product characteristics

The PEP writer shall specify the FU as follows:

Standardized products' family	Functional Unit	Standardized product characteristics to indicate
Thermostats	Control during 10 years the ambient temperature in a zone according to a temperature set by the user in a range of X, with a temperature step of Y and characterized by a rated current of In and a current of IL when the contact is closed (heating/air conditioning is on).	X = « ambient temperature between 0° à 35°C » Any other temperature value shall be specified. Y = « 0,5°C » Any other temperature value shall be specified. IL = Maximum allowed current when the relay is closed (A) In = Maximum rated current of the product (A)
Programmable thermostats	Control during 10 years the ambient temperature set by the user in N zones, in a range of X, with a temperature step of Y, according to Z temperature set points and characterized by a rated current of In and a current of IL when the contact is closed (heating/air conditioning is on).	X = ambient temperature between 0° à 35°C » Any other temperature value shall be specified. Y = « 0,5°C » Any other temperature value shall be specified. N = Number of zones Z = a temperature set point could be COMFORT, ECO, FROST PROTECTION, or any other recorded program or recordable by the user IL : Maximum allowed current when the contact is closed (A) In : Maximum rated current of the product (A)

3.7.2. Reference life time and Use scenario

Application	REFERENCE LIFETIME	Use scenario
Thermostats and Programmable thermostats	10 years	Load rate of the product: 100% of In during 100% of the RLT Load rate of the closed contact : 30% of IL during 14% of the RLT

3.8. Sockets

3.8.1. Functional Unit (FU) and reference product characteristics

The function of the socket is to allow users to connect and disconnect the plug of an electrical load or the source of a signal from a network:

- Electric power: power socket,
- Communication: RJ45 socket, TV socket, Phone socket,
- Electronic: Loudspeaker socket, USB socket.

This function is specified by the kind of transferred signal.

For a modular socket, all elements allowing to fulfill the function "socket" shall be integrated: the mechanism (which is clipped on the frame) + the cover plate (which is clipped on the mechanism) + the frame (which is fixed on the wall) + the plate to cover the frame + the packaging.

The PEP writer shall specify the FU as follows:

3.8.1.1. Power socket and electronic connection socket

Standardized products' family	Functional Unit	Standardized product characteristics to indicate
Power socket	Connect/Disconnect during 20 years the plug of a load consuming In under a voltage of U while protecting the user from direct contact with live parts and with a protection class IP and IK.	In= Rated current of the socket (A). U = Voltage (V) If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262 *(1)* If necessary, indicate the type and/or socket standard: e.g. 2P+T French/Belgian standard, 2P+T Schuko,…
Loud speaker socket	Make available during 20 years a connection point to distribute an electric audio signal with cables having a maximum section of X mm², with Y connectors.	X = Maximum section in mm² Y = Name of the connector type and if relevant the finishing (golden,…)
USB socket	Make available during 20 years a USB X connection.	X = All the characteristics of USB standard (USB2, maximum allowed power, …)

3.8.1.2. Copper Telecom accessories

Standardized products' family	Functional Unit	Standardized product characteristics to indicate
copper telecom accessory	« To protect, link, splice or connect a connection point during X years (reference lifetime) with a Y% use rate for a Z application, as defined in the table given in §3.8.2.2 »	Y : use rate X : reference lifetime Z : application

According to the functional unit definition, production, distribution, installation and end of life stages shall be considered for the maximum capacity of the reference flow fulfilling the functional unit.
The study is done:

- On a copper telecom accessory having a number N of connection points,
- During the reference lifetime.

To ensure consistency of environmental impacts results between functional unit and reference product, the PEP shall mention environmental impacts of production, distribution, installation and end of life stages as follows:

$$\text{Environmental impacts from PEP} = \frac{\text{Reference product environmental impacts}}{\text{Number of connection points of reference product}}$$

Doing so, in the environmental impacts table, the "Total" column mentions the environmental impact of the functional unit.
Moreover, the following precision shall be completed and mentioned in the PEP, to ensure clarity and transparency for the PEP user:
"The PEP has been developed taking into account the number of connection points. The effective impact of the product shall be calculated by the PEP user multiplying impacts by the number of product connection points."
Precisions:

- A connection point is available in various ways: fusion splices, mechanical splicing, connectors. The nature of these connection points shall be specified within the reference flow in the PEP.
- Storing, Mixing and Deriving are secondary functions of equipment and accessories for copper Telecom connections which are not included in the calculation of environmental impacts. Nevertheless, if necessary, these functions will be specified in the PEP.

Example of formulation of the functional unit:
« To protect and link a connection point during 10 years with a 17% use rate for copper telecommunication application in residential building ».

3.8.2. Reference life time and Use scenario

3.8.2.1. Power socket and electronic connection socket

Application	Reference lifetime	Use scenario
Power socket	20 years	Load rate: 50 % of In Use rate: 50% of the RLT
Loudspeaker socket	20 years	Load rate: 30 % of the rated current Use rate: 30% de the RLT
USB socket	20 years	Load rate: 100 % of the rated current according to the USB standards Load rate: 30% de the RLT

3.8.2.2. Copper Telecom accessories

For copper telecom accessories, the calculation of the energy losses during the use phase is described in the section 4.1. The use scenarios to be considered are the ones listed in the table below.

APPLICATION AREAS	Applications	Reference Life time (years)	Use rate (%)
INFRASTRUCTURES	Energy distribution networks	40	100%
	Railway networks	30	100%
	Telecom networks (fixed and mobile phones)	20	100%
INDUSTRIAL APPLICATIONS	Oil, gas and petrochemicals	30	100%
	Handling	10	50%
	Automation	5	100%
	Nuclear	40	100%
	Wind turbines	20	30%
	Photovoltaic power plants	10	50%
	Airports	20	100%
ONBOARD SYSTEMS	Civil aeronautics	15	80%
	Shipbuilding and marine	30	80%
	Rolling stock	30	50%
	Automotives (Cars and trucks)	10	10%
BUILDING	Residential/tertiary/industrial	30	70%
	Data centers	10	100%
	LAN : residential	10	17%
	LAN: tertiary	10	25%
	LAN: industrial (factories, warehouses)	10	100%

3.9. Unequipped enclosures and cabinets

3.9.1. Functional Unit (FU) and reference product characteristics

The PEP writer shall specify the FU as follows:

Standardized products' family	Functional Unit	Standardized product characteristics to indicate
Enclosures and cabinets	Protect persons during 20 years against direct contact with live parts and allow grouping monitoring, control and protection devices in a single enclosure or a cabinet having the following dimensions H x L x P or an assembly of X enclosures or cabinets having the following dimensions H x L x P, while protecting against mechanical impacts (IK) and the penetration of solid objects and liquids (IP).	H = Height (mm) L = Width (mm) P = Depth (mm) X = Total number of enclosures or cabinets Pw = Maximum permissible power of the enclosure or cabinet (W) If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.9.2. Reference life time and Use scenario

Application	Reference lifetime	Use scenario
Low voltage	20 years	Non applicable for unequipped enclosures and cabinets

3.10. Surge arresters

3.10.1. Functional unit (FU) and reference product specifications

Standardized product range	Functional unit	Standardized product specifications to fulfil
Surge arresters and Surge protective devices type 1, 2 or 3 connected to low voltage power systems	Protect during 20 years against direct or indirect effects of lightning or against transient overvoltages electrical equipements connected to electrical networks with a rated operational voltage up to 1000 V AC or 1500 V DC	Uc = Maximum continuous operating voltage (V) Iimp = Impulse discharge current for class 1 test (current waveshape 10/350s) (kA) In = nominal discharge current for class 2 test (current waveshape 8/20µs) (kA) Uoc = open circuit voltage of the combination wave generator for surge protective devices type 3 (kV) Up = Voltage protection level (kV) Ic = current drawn by the surge protective device and his related functions (A) Note : « the current drawn includes all potential currents drawn during the lifetime of the surge protective device: leakage current between phase and neutral, earth-leakage current, current drawn by electronic components like indicators, …) F = Frequency range of the low voltage system (d.c; or a.c. from xx Hz to xx Hz) N = Number of protected conductors T = Surge protective devices type according standard IEC 61643-11. T= T1 or T2 or T3 If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262.
Surge protective devices connected to telecommunications and signalling networks	Protect during 20 years against direct or indirect effects of lightning or against transient overvoltages electronical equipements connected to connected to telecommunications and signalling networks with a rated operational voltage up to 1000 V AC (rms) or 1500 V DC	Uc = Maximum continuous operating voltage (V) In = Rated current for test (A) according to the product category Iimp = Impulse discharge current for surge protective devices category D1 (waveshape 10/350s) ou D2 (waveshape 10/250s) (kA) C = Product category (A1, A2, B1, B2, B3, C1, C2, C3, D1, D2) according to the standard IEC 61643-21 Up = Voltage protection level (V) Ic = current drawn by the surge protective device and his related functions (A) N = Number of protected conductors If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

3.10.2. Reference Life Time and use scenario

Standardized product range	Reference Life Time (RLT)	Reference product use scenario
Surge arresters and Surge protective devices type 1, 2 or 3 connected to low voltage power systems	20 years	Load factor : 100% of Ic Use rate: 100 % of the RLT
Surge protective devices connected to telecommunications and signaling networks	20 years	Load factor : 100% of Ic Use rate: 100 % of the RLT

Note: « the reference lifetime is defined in standard operating conditions without overvoltage and lightning »

3.11. Terminal Blocks

These rules apply to the terminal blocks which refer to the standard IEC 60947-7. For all other connection devices you shall refer to the PCR in effect or to the PSR001 – Wires, cables and accessories.

3.11.1. Functional unit (FU) and reference product specifications

Application	Functional unit	Standardized product specifications to fulfil
Low Voltage	Connect during 20 years N clamping units between 2 or more wires with a rated connecting capacity Sn, a rated voltage U, a short time withstand current Icw and a voltage drop DU.	U = Rated voltage (V) DU = Voltage drop (mV) Sn = Rated connecting capacity (A) Icw = short-time withstand current (A) N = number of clamping units If the degrees of protection are considered as specific functions for the product, specify in the functional unit: IP = Degree of protection against ingress of solid foreign objects and water with harmful effects in accordance with the standard IEC 60529 IK = Degree of protection against external mechanical impacts in accordance with the standard IEC 62262

For terminal blocks with additional functions (for example indicator), see chapter 3.12

3.11.2. Reference Life Time and use scenario

Application	Reference Life Time (RLT)	Reference product use scenario
Terminal blocks for copper conductors and disconnect terminal blocks (standard 60947-7-1)	20 years	Load factor: 30% of In Use rate: 90% of the RLT
Fuse terminal blocks (standard 60947-7-3)	20 years	Load factor : 30% of In Use rate: 90% of the RLT
Protective conductor terminal blocks (standard 60947-7-2) (see nota 1)	20 years	Load factor : 100 % of Icw Use rate: 3 seconds(1)

Nota 1: a protective conductor terminal block is designed to release a short circuit current: it is used to form the electrical and mechanical connection between copper conductors and the fixing support. The standard IEC 60947-7-2 specifies that the protective conductor terminal block shall be capable of withstanding 3 applications of 1 second duration each of the short-time withstand current Icw which corresponds to 120 A/mm2 of its rated cross-section.
In the PEP boundaries we consider that the protective conductor terminal block is passed through 100% of the short-time withstand current when it discharges this current. At the rest of the time no electric current passes through this terminal block: no energy losses by Joule effect.
The standard specifies that this terminal block shall be capable of withstanding 3 applications of 1 second duration each of the short-time withstand current => for the PEP we consider that the terminal block dissipates energy 3 times during 1 second each time for its total lifetime => so the use time is 3 seconds.

3.12. Combination of functions

3.12.1. Functional unit (FU)

When a product covered by this PSR includes additional functions, the functional unit defined in the PSR shall be used and shall be completed in order to take into account these additional functions

Examples of products relevant for combination of functions:

- circuit breaker with controller (electronic controller, motor drive, …)
- Switch or disconnector with controller (electronic controller, motor drive, …)
- Assembled enclosures

3.12.2. Reference Life Time and use scenario

When functions are combined, the reference life time of the functional unit is equal to the longest reference lifetime between those of all the combined functional units.

If one or more elements in the combination of functions has(have) a reference lifetime shorter than the reference lifetime specified in the functional unit, maintenance and/or replacement of this element shall be included in the product life cycle assessment .

When electronic functions are introduced, the reference lifetime to be considered for these functions is 10 years. When the product reference lifetime is over 10 years, the replacement of electronic functions shall be taken into account.

The use scenario shall be selected between the use scenarii of the assembled products in the combination. This choice shall be justified in the LCA report and described in the PEP.

Use, maintenance and replacement scenarii shall be notified in the PEP.

3.13. Other equipments

Other switchgear and controlgear solutions mentioned in the scope (e.g. fuses TC32, all-or-nothing relays TC94, Measuring relays and protection equipment TC95), apply the general rules of PCR and mention in the accompanying report the functional unit, the reference product characteristics, the reference lifetime and the use scenario which are applied consistently with the relevant IEC technical standards.

In the absence of specific rules, it is recommended to rely on active or passive character of the equipment to characterize the products in terms of reference lifetime and use scenario

	Passive products	Active products
definition	Passive products are traversed by the main current and do not require energy for their main function. They perform the contact, opening or conduction functions in the installation	Active products need to consume energy for their main function.
Reference Life Time	20 years	10 years
Use scenario	Energy dissipation by Joule effect See category 1 scenario below	Energy consumption See category 2 scenario below

The use scenario are mentioned below:

Category 1: passive product

- **"Passive product - non-continuous operation" scenario:** products through which the main current passes during non-continuous operation
    - load rate / rated current (In): 30 % of In
    - percentage of utilization time: 30%
- **“Passive product - continuous operation" scenario:** products through which the main current passes during continuous operation
    - load rate / rated current (In): 30 % of In
    - percentage of utilization time: 100%

Category 2: active product

The following information must be given, according to the mode(s) of operation of the reference product:

- The consumed power for each operating mode identified (OFF, standby, ON, etc.)
- The duration of the operating modes expressed as a percentage of the full cycle time.

Where they exist, the energy consumption calculation scenarios established in the context of the regulatory devices applicable to the product categories concerned (European regulation based on directive ErP, Thermal regulations, Energy-saving Certificates, Ecolabel, etc.) must be taken into account. They must be described in the PEP and justified in the accompanying report.
For complex operating modes corresponding to variable power levels, average power levels can be established by justifying and specifying the calculation assumptions.

4. Measurement method of the energy consumption in use phase

The energy consumption of the different parts constituting the functional unit shall be determined according to the rules of the in force PCR.
When methods of measurement are described in applicable standards (indicate the considered standards in the PEP), these shall be applied to determine the total energy consumption of the functional unit.
If these methods are not described, the energy consumption shall be determined by order of priority:

- By a measurement report from a laboratory,
- By calculation, using or not measured figures (use the calculation methods described in the applicable standards and indicate them in the PEP)
- By considering figures communicated by the manufacturer to its customers (catalogues, datasheets,…).

In any case, considered assumptions and used methods for the calculation shall be indicated in the accompanying report.

4.1. Case of copper telecom accessories

The energy losses during the use phase are determined applying the following methods.

4.1.1. Balanced connectors

Examples of balanced connectors covered by this paragraph are RJ 45 and RJ 11.

The losses (Pconnector loss) specified by IEC 60603-7-X shall be used. The calculation of the maximum value of the connector losses is made as follow:

$$P_{\text{connector loss}} = (P_e - P_s) \times \text{Nbpair}$$

$$P_s = P_e \times 10^{\left(\frac{-0.02\sqrt{f}}{10}\right)}$$

Where,

Pe : injected power in mW given by the standards : 14 mW

Ps : output power in mW

f : working frequency in MHz

Nbpair : is the used pair number for the considered protocol

To meet the requirements of these protocols, the connectors are divided into categories. For each category is assigned an attenuation value according to the central frequency of the relevant Protocol. This maximum attenuation by category is defined in the standard IEC 61156 corresponding to the cable category.

The table below includes all the data to use and taken from reference (the standard IEC 60603-7 and the Ethernet IEEE standard 802.3).

Table 1 – Power losses of balanced connectors

Protocol	Frequency	Category	Power loss
Ethernet 100M BP(*)=100MHz	31.25 MHz	Cat.5 According to IEC 60603-7-2	0.02* $\sqrt{f}$ at 31.25 MHz Injected power = 14 mW leading to **0,712 mW** on 2 used pairs
1 G Ethernet BP (*) = 250 MHz	83 MHz	Cat 6 According to IEC 60603-7-4	0.02* $\sqrt{f}$ at 83 MHz Injected power = 14 mW leading to **1,15 mW** on 2 used pairs
10G Ethernet BP (*) = 500 MHz	400 MHz	Cat. 6a According to IEC 60603-7-4	0.02* $\sqrt{f}$ at 400 MHz Injected power = 14 mW leading to **4,927** mW on 4 used pairs
10G Ethernet BP(*)=600 MHz	400 MHz	Cat 7 According to IEC 60603-7-7	0.02* $\sqrt{f}$ at 400 MHz Injected power = 14 mW leading to **4,927** mW on 4 used pairs
10G Ethernet BP(*)=1000MHz	400 MHz	Cat 7a According to 60603-7-71	0.02* $\sqrt{f}$ at 400 MHz Injected power = 14 mW leading to **4,927** mW on 4 used pairs
10G Ethernet BP(*)=1200MHz	400 MHz	Cat 7+ According to IEC 60603-7-81	0.02* $\sqrt{f}$ at 400 MHz Injected power = 14 mW leading to **4,927** mW on 4 used pairs

(*) BP: cable bandwidth

The energy lost by the balanced connector, expressed in joule, is then obtained by multiplying the power loss, expressed in watt, by the reference lifetime, expressed in seconds, and the use rate.

for example, for an ethernet 100m balanced-connector, with a reference lifetime of 10 years and a 100% use rate, the total energy lost in use is:

0.712 mW x 10 [years] x 365 [days] x 24 [hours] x 3600 [seconds] = **224.5 kJ**

For illustration, 224.5 kJ is the energy consumption of a bulb of 60 watts during 1 hour.

4.1.2. Coaxial connectors

Examples of coaxial connectors covered by this paragraph are TV-radio-SAT connectors and RF connectors.

The power losses (P_{cx}) specified in IEC 61169 series for the coaxial connectors shall be used.

It is considered that the power injected into the connector is 30 dBm or 1 W.

The calculation of the maximum losses of the connector is made as follow:

$$P_{connector} = 1 - 10^{-\frac{P_{cx}}{10}}$$

Table 2 – Power losses of coaxial connectors

Standard	Power loss Pcx expressed in dB/m	Power loss
IEC 61169-54	$0.05\sqrt{f}$ dB with f in GHz	11.5 mW
	0.05 dB at 1 GHz	

The energy lost by the coaxial connector, expressed in Joule, is then obtained by multiplying the power loss, expressed in Watt, by the REFERENCE LIFETIME, expressed in seconds, and the use rate.

For example, for a coaxial connector in an industrial building application, the REFERENCE LIFETIME is 10 years and the use rate is 100%, the total energy lost is use is:

11.5 mW x 10 [years] x 365 [days] x 24 [hours] x 3600 [seconds] = **3.62 MJ**

For illustration, 3.62 MJ is the energy consumption of a bulb of 60 watts during 16 hours.

4.2. Case of battery powered products

For reference products powered by non-rechargeable batteries: the energy (or part of the energy) consumed in use and provided by this kind of batteries shall not be considered. Indeed, the energy provided by the battery during the use stage is taken into account during its own manufacturing.

The batteries delivered with the product shall be considered in manufacturing stage.
The replacement batteries used during the reference life time of the product shall be considered in the use stage.
For rechargeable batteries, the necessary energy to charge them shall be considered in the use stage during the whole reference life time of the reference product.

5. Glossary

A : Ampere
A^2s : square Ampere Second
LV : Low Voltage
°C : Celsius Degrees
RLT : reference lifetime
GIMELEC : « Groupement des Industries de l'Equipement Electrique, du Contrôle-Commande et des Services Associés »
HBES : Home and Building Electronic Systems
HV : High Voltage
Hz : Hertz
IEC : International Electrotechnical Commission
IGNES : Industrie du Génie Numérique, Energétique et Sécuritaire
PCR : Product Category Rules
PEP : Product Environmental Profile
PSR : Product Specific Rules
RJ45 : **R**egistered **J**ack **45**
SC : IEC technical SubCommitee
TC : IEC Technical Commitee
TV : Television
FU : Functional Unit
USB : Universal Serial Bus
V : Volt
W : Watt

6. Annex

6.1. Annex 1: Product categories and applicable standards

6.1.1. Switchgear and controlgear and their assemblies for low voltage (TC121)

Low-voltage switchgear for industrial, commercial and similar use rated below or equal to 1 kV a.c. and 1.5 kV d.c. The scope includes open and enclosed separate items of equipment as well as combinations of items of equipment into complete functional units.

Products' examples: circuit breakers, switches, contactors, starters, disconnectors, busbars and any switchgear assemblies, …

6.1.2. Electrical accessories (TC23)

Electrical appliances for household and similar purposes, the word similar including locations such as offices, commercial and industrial premises, hospitals, public buildings, etc.

These accessories are intended for fixed installation or for use in or with appliances and other electrical or electronic equipment.

This PSR does not apply to the following products covered by subcommittee SC23A: Cable Management Systems, already addressed in the PSR0003 "Specific Rules for Cable Management solutions".

Products' examples: switches, HBES switches, plug and socket-outlets, circuit breakers, contactors, connecting devices, enclosures for accessories, connectors, thermostats,….

6.1.3. Surge arresters (TC 37 and SC37A/B)

Surge arresters for protection against indirect or direct effects of lightning and/or against other transient overvoltages. These devices are to be used in power, telecommunications and/or signalling networks with voltages up to 1000 V a.c. and 1500 V d.c.

Products' examples: low voltage surge arresters, surge arresters for signalling and telecommunication networks,…

6.1.4. Applicable standards list

These standards are for reference, the list is not exhaustive.

TC23		Electrical accessories
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60998-1		Connecting devices for low-voltage circuits for household and similar purposes - Part 1: General requirements
IEC 60998-2-1		Connecting devices for low-voltage circuits for household and similar purposes - Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units
IEC 60998-2-2		Connecting devices for low-voltage circuits for household and similar purposes - Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units
IEC 60998-2-3		Connecting devices for low-voltage circuits for household and similar purposes - Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units
IEC 60998-2-4		Connecting devices for low-voltage circuits for household and similar purposes - Part 2-4: Particular requirements for twist-on connecting devices
IEC 61210		Connecting devices - Flat quick-connect terminations for electrical copper conductors - Safety requirements
IEC 61545		Connecting devices - Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units

SC23B		Plugs, socket-outlets and switches
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC/TR 60083	3.8	Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC
IEC 60669-1	3.6	Switches for household and similar fixed-electrical installations - Part 1: General requirements
IEC 60669-2-1	3.5	Switches for household and similar fixed electrical installations - Part 2-1: Particular requirements - Electronic switches
IEC 60669-2-2	3.5	Switches for household and similar fixed electrical installations - Part 2-2: Particular requirements - Electromagnetic remote-control switches (RCS)
IEC 60669-2-3	3.5	Switches for household and similar fixed electrical installations - Part 2-3: Particular requirements - Time-delay switches (TDS)
IEC 60669-2-4	3.5	Switches for household and similar fixed electrical installations - Part 2-4: Particular requirements - Isolating switches
IEC 60669-2-6	3.5	Switches for household and similar fixed electrical installations - Part 2-6: Particular requirements - Fireman's switches for exterior and interior signs and luminaires
IEC 60670-1	3.9	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations - Part 1: General requirements
IEC 60670-21	3.9	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations - Part 21: Particular requirements for boxes and enclosures with provision for suspension means
IEC 60670-22	3.9	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations - Part 22: Particular requirements for connecting boxes and enclosures
IEC 60670-23	3.9	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations - Part 23: Particul requirements for floor boxes and enclosures
IEC 60670-24	3.9	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations - Part 24: Particular requirements for enclosures for housing protective devices and other power dissipating electrical equipment
IEC 60884-1	3.8	Plugs and socket-outlets for household and similar purposes - Part 1: General requirements
IEC 60884-2-1	3.8	Plugs and socket-outlets for household and similar purposes - Part 2-1: Particular requirements for fused plugs
IEC 60884-2-2	3.8	Plugs and socket-outlets for household and similar purposes - Part 2-2: Particular requirements for socket-outlets for appliances
IEC 60884-2-3	3.8	Plugs and socket-outlets for household and similar purposes - Part 2-3: Particular requirements for switched socket-outlets without interlock for fixed installations
IEC 60884-2-4	3.8	Plugs and socket-outlets for household and similar purposes - Part 2-4: Particular requirements for plugs and socket-outlets for SELV
IEC 60884-2-5	3.8	Plugs and socket-outlets for household and similar purposes - Part 2: Particular requirements for adaptors
IEC 60884-2-6	3.8	Plugs and socket-outlets for household and similar purposes - Part 2-6: Particular requirements for switched socket-outlets with interlock for fixed electrical installations
IEC 60884-2-7	3.8	Plugs and socket-outlets for household and similar purposes - Part 2-7: Particular requirements for cord extension sets
IEC 60906-1	3.8	IEC system of plugs and socket-outlets for household and similar purposes - Part 1: Plugs and socket-outlets 16 A 250 V a.c.
IEC 60906-2	3.8	IEC system of plugs and socket-outlets for household and similar purposes - Part 2: Plugs and socket-outlets 15 A 125 V a.c. and 20 A 125 V a.c.
IEC 60906-3	3.8	IEC System of plugs and socket-outlets for household and similar purposes - Part 3: SELV plugs and socket-outlets, 16 A 6V, 12 V, 24 V, 48 V, a.c. and d.c.

SC23E		Circuit-breakers and similar equipment for household use
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60898-1	3.1	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Part 1: Circuit-breakers for a.c. operation
IEC 60898-2	3.1	Circuit-breakers for overcurrent protection for household and similar installations - Part 2: Circuit-breakers for a.c. and d.c. operation
IEC 60934	3.1	Circuit-breakers for equipment (CBE)
IEC 61008-1	3.2	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) - Part 1: General rules
IEC 61008-2-1	3.2	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's). Part 2-1: Applicability of the general rules to RCCB's functionally independent of line voltage
IEC 61008-2-2	3.2	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's). Part 2-2: Applicability of the general rules to RCCB's functionally dependent on line voltage
IEC 61009-1	3.2	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules
IEC 61009-2-1	3.2	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) - Part 2-1: Applicability of the general rules to RCBO's functionally independent of line voltage
IEC 61009-2-2	3.2	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) - Part 2-2: Applicability of the general rules to RCBO's functionally dependent on line voltage
IEC 61540	3.2	Electrical accessories - Portable residual current devices without integral overcurrent protection for household and similar use (PRCDs)
IEC 61543	3.2	Residual current-operated protective devices (RCDs) for household and similar use - Electromagnetic compatibility
IEC 62019	3.1	Electrical accessories - Circuit-breakers and similar equipment for household use - Auxiliary contact units
IEC 62020	3.2	Electrical accessories - Residual current monitors for household and similar uses (RCMs)
IEC 62335	3.3	Circuit breakers - Switched protective earth portable residual current devices for class I and battery powered vehicle applications
IEC 62423	3.2	Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses
IEC 62640	3.3	Residual current devices with or without overcurrent protection for socket-outlets for household and similar uses

SC23G		Appliance couplers
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60320-1	3.6	Appliance couplers for household and similar general purposes - Part 1: General requirements
IEC 60320-2-1	3.6	Appliance couplers for household and similar general purposes - Part 2-1: Sewing machine couplers
IEC 60320-2-3	3.6	Appliance coupler for household and similar general purposes - Part 2-3: Appliance coupler with a degree of protection higher than IPX0
IEC 60320-2-4	3.6	Appliance couplers for household and similar general purposes - Part 2-4: Couplers dependent on appliance weight for engagement
IEC 60799	3.6	Electrical accessories - Cord sets and interconnection cord sets

SC23H		Plugs, Socket-outlets and Couplers for industrial and similar applications, and for Electric Vehicles
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60309-1	3.8	Plugs, socket-outlets and couplers for industrial purposes - Part 1: General requirements
IEC 60309-2	3.8	Plugs, socket-outlets and couplers for industrial purposes - Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories
IEC 60309-4	3.8	Plugs, socket-outlets and couplers for industrial purposes - Part 4: Switched socket-outlets and connectors with or without interlock
IEC 61316	3.8	Industrial cable reels
IEC 62196-1	3.8	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 1: General requirements
IEC 62196-2	3.8	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories
IEC 62613-1	3.8	Plugs, socket-outlets and ship couplers for high-voltage shore connection systems (HVSC-Systems) - Part 1: General requirements
IEC 62613-2	3.8	Plugs, socket-outlets and ship couplers for high-voltage shore connection systems (HVSC-SYSTEMS) - Part 2: Dimensional compatibility and interchangeability requirements for accessories to be used by various types of ships

S23J		Switches for appliances
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 61020-1	3.5	Electromechanical switches for use in electrical and electronic equipment - Part 1: Generic specification
IEC 61058-1	3.5	Switches for appliances - Part 1: General requirements
IEC 61058-2-1	3.5	Switches for appliances - Part 2-1: Particular requirements for cord switches
IEC 61058-2-4	3.5	Switches for appliances - Part 2-4: Particular requirements for independently mounted switches
IEC 61058-2-5	3.5	Switches for appliances - Part 2-5: Particular requirements for change-over selectors

SC32B		Low-voltage fuses
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60269-1	3.13	Low-voltage fuses - Part 1: General requirements
IEC 60269-2	3.13	Low-voltage fuses - Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to K
IEC 60269-3	3.13	Low-voltage fuses - Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) - Examples of standardized systems of fuses A to F
IEC 60269	3.13	Low-voltage fuses - Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices
IEC 60269	3.13	Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems

SC32C		Miniature fuses
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60127-1	3.13	Miniature fuses - Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links
IEC 60127-2	3.13	Miniature fuses - Part 2: Cartridge fuse-links
IEC 60127-3	3.13	Miniature fuses - Part 3: Sub-miniature fuse-links
IEC 60127-4	3.13	Miniature fuses - Part 4: Universal modular fuse-links (UMF) - Through-hole and surface mount types
IEC 60127-5	3.13	Miniature fuses - Part 5: Guidelines for quality assessment of miniature fuse-links
IEC 60127-6	3.13	Miniature fuses - Part 6: Fuse-holders for miniature fuse-links
IEC 60127-7	3.13	Miniature fuses - Part 7: Miniature fuse-links for special applications

TC37		Surge arresters
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60099-7	3.10	Surge arresters - Part 7: Glossary of terms and definitions from IEC publications 60099-1, 60099-4, 60099-6, 61643-1, 61643-12, 61643-21, 61643-311, 61643-321, 61643-331 and 61643-341
IEC 61643-11	3.10	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods
IEC 61643-21	3.10	Low voltage surge protective devices - Part 21: Surge protective devices connected to telecommunications and signalling networks - Performance requirements and testing methods

TC 121		Low voltage switchgear and controlgear
Applicable standard number	**Chapter of PSR**	**Applicable standard title**
IEC 60947-1	3.1	Low-voltage switchgear and controlgear - Part 1: General rules
IEC 60947-2	3.1	Low-voltage switchgear and controlgear - Part 2: Circuit-breakers
IEC 60947-3	3.4 3.5 3.12	Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
IEC 60947-4-1	3.6	Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters
IEC 60947-4-2	3.6	Low-voltage switchgear and controlgear - Part 4-2: Contactors and motor-starters - AC semiconductor motor controllers and starters
IEC 60947-4-3	3.6	Low-voltage switchgear and controlgear - Part 4-3: Contactors and motor-starters - AC semiconductor controllers and contactors for non-motor loads
IEC 60947-5-1		Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices
IEC 60947-5-2		Low-voltage switchgear and controlgear - Part 5-2: Control circuit devices and switching elements - Proximity switches
IEC 60947-5-3		Low-voltage switchgear and controlgear - Part 5-3: Control circuit devices and switching elements - Requirements for proximity devices with defined behaviour under fault conditions (PDDB)
IEC 60947-5-5		Low-voltage switchgear and controlgear - Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function
IEC 60947-6-1		Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment - Transfer switching equipment
IEC 60947-6-2		Low-voltage switchgear and controlgear - Part 6-2: Multiple function equipment - Control and protective switching devices (or equipment) (CPS)
IEC 60947-7-1	3.11	Appareillage à basse tension - Partie 7-1: Matériels accessoires - Blocks de jonction pour conducteurs en cuivre Low-voltage switchgear and controlgear - Part 7-1: Ancillary equipment - Terminal blocks for copper conductors
IEC 60947-7-2	3.11	Low-voltage switchgear and controlgear - Part 7-2: Ancillary equipment - Protective conductor terminal blocks for copper conductors
IEC 60947-7-3	3.11	Low-voltage switchgear and controlgear - Part 7-3: Ancillary equipment - Safety requirements for fuse terminal blocks
IEC 60947-7-4		Low-voltage switchgear and controlgear - Part 7-4: Ancillary equipment - PCB terminal blocks for copper conductors
IEC 60947-8		Low-voltage switchgear and controlgear - Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines
IEC 61095		Electromechanical contactors for household and similar purposes
IEC 61439-0	3.9	Low-voltage switchgear and controlgear assemblies - Part 0: Guidance to specifying assemblies
IEC 61439-1	3.9	Low-voltage switchgear and controlgear assemblies - Part 1: General rules
IEC 61439-2	3.9	Low-voltage switchgear and controlgear assemblies - Part 2: Power switchgear and controlgear assemblies
IEC 61439-3	3.9	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO)
IEC 61439-4	3.9	Low-voltage switchgear and controlgear assemblies - Part 4: Particular requirements for assemblies for construction sites (ACS)
IEC 61439-5	3.9	Low-voltage switchgear and controlgear assemblies - Part 5: Assemblies for power distribution in public networks
IEC 61439-6	3.9	Low-voltage switchgear and controlgear assemblies - Part 6: Busbar trunking systems (busways)
IEC 61439-7	3.9	Low-voltage switchgear and controlgear assemblies - Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicles charging stations
IEC 61912-1		Low-voltage switchgear and controlgear - Overcurrent protective devices - Part 1: Application of short-circuit ratings
IEC 61915-1		Low-voltage switchgear and controlgear - Device profiles for networked industrial devices - Part 1: General rules for the development of device profiles
IEC 62026-1		Low-voltage switchgear and controlgear - Controller-device interfaces (CDIs) - Part 1: General rules
IEC 62 208	3.9	Empty enclosures for low-voltage switchgear and controlgear assemblies - General requirements
IEC 62626-1		Low-voltage switchgear and controlgear enclosed equipment - Part 1: Enclosed switch-disconnectors outside the scope of IEC 60947-3 to provide isolation during repair and maintenance work

6.2. Annex 2: Declaration of conformity issued from critical review

CODDE

PEP ecopassport® Programme

Conformity declaration of « Product Specific Rules for electrical switchgear and control gear »

Person in charge of the critical review : Julie ORGELET – Operation manager Bureau Veritas CODDE

Reviewed document: PSR-0005-ed2-FR-2016 03 29

Version & date: v2 – May 2016

Critical review period: July 2014 to May 2016

Established by : GIMELEC - Groupement des industries de l'équipement électrique, du contrôle-commande et des services associés

Standards and reference documents :

The critical review aims at verifying the compliance of the document considering the following standards and rules:

- PEP ecopassport® product category rules PEP–PCR-ed3-EN-2015 04 02
- International standard ISO 14025 :2010
- International standard ISO 14 040 :2006 and ISO 14 044 :2006

The critical review was leaded in compliance with ISO 14 071 : 2014 standards.

Conclusion :

The reviewed document does not include non-conformity considering the above cited referential. So the Product Specific Rules for electrical switchgear and control gear - PSR-0005-ed2-FR-2016 03 29 is compliant with the considered standards.

CODDE
Conception Développement Durable Environnement
SAS au capital de 37 000 € - SIREN 443 827 399
170, rue de Chatagnon - ZI Centr'alp
38430 MOIRANS - FRANCE
Tél : + 33 4 76 07 36 46 - www.codde.fr

Julie ORGELET – Operationnal manager - CODDE

CODDE
COnception Développement
Durable Environnement
Part of Bureau Veritas

170, rue de Chatagnon
ZI Centr'alp
38430 Moirans
France

Tél : + 33 4 76 07 36 46
Fax : + 33 4 76 37 44 30
www.codde.fr

SAS au capital de 37 000 euros
RCS GRENOBLE 443 827 399
N° TVA intracommunautaire
FR 69 443 827 399