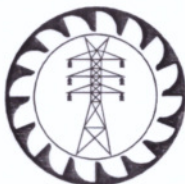


011-2: 2024

CEB
SPECIFICATION

LOW VOLTAGE SURGE ARRESTERS



CEYLON ELECTRICITY BOARD
SRI LANKA



Telephone: +94 11 232 8051

Fax: +94 11 232 5387

Contents

1.0 SCOPE 3

2.0 SYSTEM PARAMETERS..... 3

3.0 SERVICE CONDITIONS 3

4.0 APPLICABLE STANDARDS 3

5.0 BASIC FEATURES..... 4

6.0 REQUIREMENTS FOR SELECTION 5

7.0 INFORMATION TO BE FURNISHED WITH THE OFFER 6

8.0 SAMPLES 7

9.0 PACKING AND LABELING/ MARKING 7

10.0 INSPECTION AND TESTING 7

11.0 ANNEXES 8

Annex A - SCHEDULE OF TECHNICAL REQUIREMENTS AND GUARANTEED TECHNICAL
PARTICULARS..... 9

Annex B - Non-Compliance Schedule 10



SPECIFICATION FOR LOW VOLTAGE SURGE ARRESTERS

1.0 SCOPE

This specification covers the general requirements of the design, manufacture, testing, supply and delivery of Low Voltage Surge Arresters of Gapless Metal-Oxide type for Distribution Transformers in CEB which are used in LV bare overhead network.

2.0 SYSTEM PARAMETERS

(a)	Nominal voltage	400V
(b)	System highest voltage	440V
(c)	System frequency	50Hz
(d)	Number of phases	03
(e)	Method of earthing	Solid earthed
(f)	System fault current	25kA

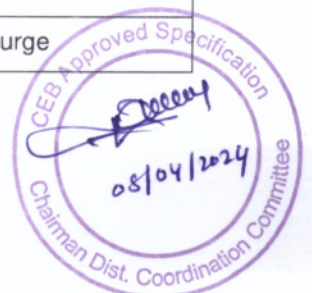
3.0 SERVICE CONDITIONS

i.	Annual average ambient temperature	30 °C
ii.	Maximum ambient temperature	40 °C
iii.	Maximum relative humidity	90%
iv.	Solar Radiation	4.5 kWh/m ² /day
v.	Environmental conditions	Humid tropical climate with heavily polluted atmosphere
vi.	Operational altitude	From M.S.L. to 1900 m above M.S.L.
vii.	Isokeraunic (Thunder days) level	100 days

4.0 APPLICABLE STANDARDS

The equipment and components supplied shall be in accordance with the latest editions of the standards specified below and amendments thereof.

(a)	IEC 60099-4:2014	Surge Arresters – Metal-oxide surge arresters without gaps for a.c. systems
(b)	IEC61643-1 - (1998)	Surge protective devices connected to low – voltage power distribution systems.
(c)	IEC 61643-11:2002	Low-voltage surge protective devices – Part 11: Surge



		protective devices connected to low-voltage power systems – Requirements and test methods
(d)	IEC 61643-12 – (2002-02)	Surge protective devices connected to low-voltage power distribution systems – selection and application principles

However, in the event of discrepancy, details given in this CEB specification supersede above standards.

5.0 BASIC FEATURES

5.1 Minimum Technical Requirements

- | | |
|---|---|
| a) SPD type | : Limiting voltage, Polymer housed |
| b) Standards | : IEC61643-1 - class II |
| c) Continuous operating voltage (U_c) | : 440 V |
| d) Voltage protection level (U_p) | : 1.5 kV at I_n / 2.5 kV at I_m |
| e) Nominal discharge current (I_n) 8/20 μ s | : 10 kA |
| f) Maximum discharge current (I_m) 8/20 μ s | : 40 kA |
| g) Short-circuit withstand | : 3 kA |
| h) Frequency | : 50 Hz |
| i) SPD disconnecting device | : Should be available
and easily identifiable
when disconnected |
| j) Location | : Outdoor |
| k) Maximum Temperature | : 60 °C |



5.2 Design

The Surge Arrester shall be designed for outdoor service conditions stipulated in Clause 3.0. It shall be complete with the following;

- I. Insulated stainless steel bracket to mount and connect surge arrester on LV bushing of the transformer.
- II. Nut and washers to attach surge arrester to stainless steel bracket.
- III. Insulated earth cable to connect earth connection terminal of surge arrester with transformer body.
- IV. Screw, nut and washers to connect earth cable with earth connection terminal of surge arrester.

5.3 Manufacture

The Surge Arrester shall be of the metal-oxide varistor type without spark gaps. The metal-oxide Varistor shall be housed in a hermetically sealed insulator casing to prevent ingress of moisture.

5.4 Insulator Details

The housing insulator of the surge arrester shall be of polymeric type and level of hydrophobicity should be higher to avoid accumulation of water.

5.5 Arrester Disconnecter

The Surge Arrester shall have a device for disconnecting it from the system in the event of arrester failure. It shall give a visible indication when the arrester has failed.

6.0 REQUIREMENTS FOR SELECTION

6.1 Quality Assurance

The manufacturer shall possess ISO 9001:2015 or latest Quality Assurance Certification for the design, manufacture and testing of Surge Arresters. The certificate shall be valid throughout the delivery period of this bid. In the event the meters are manufactured in a plant under the license of the manufacturer, the manufacturing plant shall possess ISO 9001:2015 or latest Quality Assurance Certificate for manufacturing and testing of Surge Arresters. The Bidder shall furnish a copy of the ISO certificate certified as true copy of the original by the manufacturer, along with the offer.

6.2 Manufacturing Experience

Manufacturer shall have a minimum of 10 years experience of the manufacture of LV Surge Arresters and shall have supplied to minimum of ten Electricity Utilities internationally during last 10



years. The manufacturer shall submit proof documents such as supply records, the name and particular of the purchasers, quantity sold, and the year of sale.

6.3 Type Tests

Type Test Certificates conforming to the above referred standards or any other international standard which is not less stringent, issued by an accredited independent testing laboratory acceptable to the CEB shall be furnished with the offer. Type Test Certificates shall clearly indicate the relevant standard, items concerned, showing the manufacturers identity, type No. /catalogue No. and basic technical parameters. In case if the submitted type tests are according to any other international standard which is not less stringent than the specified, then the copy of the used standard in English shall be submitted with offer.

Proof of accreditation and accredited scope by a national/ international authority shall be forwarded with the offer. Test certificates shall be complete including all the pages as issued by the testing authority. Type test certificates shall be in English language. Parts of test certificates shall not be acceptable.

Type Test certificates conforming to IEC 61643-11 shall be submitted with the offer, as applicable.

7.0 INFORMATION TO BE FURNISHED WITH THE OFFER

The following shall be furnished with the offer.

- a) Technical details in English clearly identifying the offered items, but not limited to:
 - i. The Comprehensive catalogues
 - ii. The dimensional drawings
 - iii. Schematic diagrams
 - iv. Calculations, graphs and tables
 - v. Literature describing the operational features
 - vi. Constructional & mounting details with electrical clearances
 - vii. Materials used for components & relevant literature and electrical properties and mechanical properties
- b) ISO 9001:2015 or latest Quality Assurance Certificate in accordance with clause 6.1.
- c) Manufacturer shall furnish a list of supplies with supplied item, purchaser (specifying address contact persons and contact details, country), year & quantity to prove his manufacturing experience and outside the country sales in accordance with Clause 6.2.
- d) Type Test Certificates in accordance with the clause 6.3.



- e) Duly filled and signed 'Annex - B: Schedule of Technical Requirements and Guaranteed Technical Particulars'.
- f) Other relevant Technical Details, protection operating curves and Calculations.

Not furnishing above documents and details may result in offer being rejected.

8.0 SAMPLES

One complete set of the offered model of the surge arrester shall accompany with the Bid to facilitate analysis and evaluation.

9.0 PACKING AND LABELING/ MARKING

9.1 Packing

Each set of Surge Arrester shall be packed in a suitable box. Number of these boxes shall be held together in a firm position and measures shall be taken to avoid damage against jerks and collision between adjacent units during transportation.

Each packing shall contain a copy of installation instruction in English Language. The voltage rating, manufacturer's name / identification, Country of Origin, and the quantity shall be clearly marked on each packing.

9.2 Identification and Labelling/ Marking

The following ratings and data of the arresters shall be provided and it shall be weather proof and corrosion proof.

- a. Rated voltage / frequency.
- b. Arrester type and discharge class
- c. Nominal discharge current
- d. Manufacturer's identification (name or trade mark etc.)

10.0 INSPECTION AND TESTING

10.1 Routine Tests

The Routine Test Certificates conforming to the relevant standards (depending on the choice of the applicable standards) shall be furnished for the observation of the Engineer appointed by CEB at



the time of inspection. In addition, the routine test certificates shall be sent with the shipment.

The following Routine Tests shall be carried out on all the arresters as per IEC 61643-11 and the test report shall be made available for the observation of the CEB Inspector at the time of inspection.

- (a) Power frequency reference voltage test.
- (b) Residual voltage tests.
- (c) Partial discharge test.
- (d) Leakage test

10.2 Inspection

The Successful bidder shall make necessary arrangements for inspection by an Engineer appointed by the CEB and also to carry out in his presence necessary Acceptance tests on procured item and material without any additional cost. Acceptance test reports shall be a part of the shipping document. CEB may waive off the inspection either with the condition of witnessing the acceptance tests by an independent body acceptable to CEB or completely. In such a situation a notice of waive off will be issued in advance to the supplier.

10.3 Acceptance Tests

Unless specified below, visual inspection, dimensional checks, sample tests specified in the relevant standards, selected type tests and the routine tests conducted for the selected sample in addition to the complete routine test reports shall form the acceptance test report.

The following acceptance tests as per IEC 61643-11 shall be witnessed by the CEB Inspector.

- a) Operating duty test
- b) Short circuit withstand capability test
- c) Rated load current test
- d) Standby power consumption and residual current test
- e) TOV failure test

11.0 ANNEXES

- Annex – A: Schedule of Technical Particulars – To be filled by the Manufacturer
- Annex – B: Non - Compliance Schedule



Annex A - SCHEDULE OF TECHNICAL REQUIREMENTS AND GUARANTEED TECHNICAL PARTICULARS

(CEB Requirements shall be filled by the procurement entity and information of the offer shall be filled by the manufacturer)

1)	Name of manufacturer and country of origin		
2)	Rated voltage	(kV)	
3)	Maximum continuous operating voltage (MCOV)	(kV)	
4)	Whether Type Test Reports as per cl. 6.3 is furnished	(Yes/No)	
5)	Classification of arrester as per IEC61643-1		
6)	Arrester housing;		
	a) Material		
	b) Insulation withstand level		
	i) Lighting impulse (1.2/50 μ s) withstand voltage	(kV peak)	
	ii) Power frequency wet withstand voltage	(kV)	
	c) Total creepage distance	mm	
7)	Nominal discharge current (In) 8/20 μ s	kA	
8)	Maximum discharge current (Im) 8/20 μ s	kA	
9)	Whether the arrester earth lead disconnecter is provided?	(Yes/No)	
10)	Whether a Mounting bracket is provided?	(Yes/No)	
11)	Whether an Earth cable is provided	(Yes/No)	
15)	Dimensions and weight	(mm x mm),kg	
19)	Whether the ISO 9001 Certificate as per Clause 7.0 is furnished	Yes/No	
20)	Whether the acceptance tests as per Clause 12.2 will be carried out at the time of inspection Place of testing	(Yes/No)	
21)	Whether the rating plate marking as per Clause 9.1 provided.	Yes/No	

.....
Signature of the Manufacturer and seal

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date

9/10



Annex B - Non-Compliance Schedule

On this schedule the bidder shall provide a list of non-compliances with this specification, documenting the effects that such non-compliance is likely to have on the equipment life and operating characteristics. Each non-compliance shall be referred to the relevant specification clause.

Clause No.	Non-Compliance

.....
Signature of the Manufacturer

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date

