

ICS 29.080.99

CCS K 49



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 28182-2024

**Surge arresters containing series gapped structures with rated
voltage 52 kV and less
(English Translation)**

Issued on: May 28, 2024

Implemented on: December 1, 2024

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Marking and classification	
4.1 Lightning arrester marking	
4.2 Arrester classification	
5 Standard Ratings and Operating Conditions	
5.1 Standard rated voltage	
5.2 Standard rated frequency	
5.3 Standard nominal discharge current	
5.4 Operating conditions	
6 Technical Requirements	11
6.1 Insulation withstand	
6.2 Residual pressure	
6.3 Impact protection level	
6.4 Partial discharge	
6.5 Sealing performance	
6.6 Thermal stability	
6.7 Heat dissipation characteristics	
6.8 Repeated Charge Transfer Tolerance	
6.9 Action load	
6.10 Power frequency voltage withstand time characteristics	
6.11 Short circuit performance	
6.12 Disconnecter	
6.13 Leakage current	
6.14 Power frequency discharge	
6.15 Mechanical load	
6.16 End of Life	
6.17 Anti-fouling performance	
6.18 High current impact tolerance	
6.19 Packaging, transportation and storage	

- 6.20 Typical information provided in inquiries and bids
- 7 Test requirements
 - 7.1 Measuring equipment and accuracy
 - 7.2 Sample
- 8 Type test (design test)
 - 8.1 General
 - 8.2 Insulation withstand test
 - 8.3 Impact protection level test
 - 8.4 Repeated charge transfer test
 - 8.5 Action load test
 - 8.6 Power frequency voltage withstand time characteristic test
 - 8.7 Disconnecter test
 - 8.8 Power frequency discharge voltage test
 - 8.9 Short circuit test
 - 8.10 Bending load test
 - 8.11 Environmental testing
 - 8.12 Sealing test
 - 8.13 Internal component insulation withstand test
 - 8.14 Leakage current test
 - 8.15 Partial discharge test
 - 8.16 Unified creepage distance inspection
 - 8.17 High current impulse withstand test
- 9 Routine tests, acceptance tests, periodic tests and sampling tests
 - 9.1 Routine test
 - 9.2 Acceptance test
 - 9.3 Periodic testing
 - 9.4 Sampling test
- 10 Composite jacket arrester
 - 10.1 Scope
 - 10.2 Normative references
 - 10.3 Terms and Definitions
 - 10.4 Marking and classification
 - 10.5 Standard ratings and operating conditions
 - 10.6 Technical requirements
 - 10.7 Test requirements

10.8 Type test (design test)

10.9 Routine tests, acceptance tests, periodic tests and sampling tests

Appendix A (Informative) Comparison of this document with IEC 60099-6:2019 structure number

Appendix B (Informative) Technical differences between this document and IEC 60099-6:2019 and their causes

Appendix C (Normative) Abnormal operating conditions

Appendix D (Normative) Typical electrical parameters of lightning arresters

Appendix E (Normative) Mechanical Test

E.1 Bending load test

E.2 Definition of mechanical load

E.3 Calculation of wind pressure

E.4 Bending load test procedure

Appendix F (Normative) Packaging, transportation and storage

F.1 Packaging

F.2 Technical documents provided with the product

F.3 Transportation and storage

Appendix G (Informative) Typical information provided in inquiries and bids

G.1 Information provided in the inquiry

G.2 Information provided in the bid

Appendix H (Normative) Thermal Equivalence Test

H.1 General

H.2 Test of the entire arrester

H.3 Thermal Proportional Unit Test

H.4 Relative temperature rise

H.5 Starting temperature determination

References

Figure 1 Resistor repeated charge transfer test procedure

Figure 2 Series gap repeated charge transfer test procedure

Figure 3 Rated heat transfer charge Q_{th} test procedure

Figure 4 Power frequency voltage withstand time characteristic test procedure (TOV test)

Figure 5 Arrester structure example

Figure 6 Example of fuse installation position of "Design A" arrester

Figure 7 Example of fuse installation position of "Design B" arrester

Figure 8 Porcelain jacket arrester short circuit test arrangement

Figure 9 Short-circuit test arrangement of composite jacket arrester

Figure 10 Test circuit for repeated application of short-circuit current immediately after pre-fault application

Figure 11 Hot engine test

Figure 12 Arrangement of thermal mechanical test and bending load direction

Figure 13 Water immersion test

Figure E.1 Definition of mechanical load

Figure E.2 Arrester dimensions

Figure E.3 Flowchart of bending load test procedure

Table 1 Classification of distribution type lightning arresters

Table 2 Rated voltage difference

Table 3 Type test items

Table 4 High current impact requirements

Table 5 Rated heat transfer charge Q_{th}

Table 6 Test requirements for porcelain-coated arresters

Table 7 Current values for short circuit test

Table 8 Routine test items

Table 9 Acceptance test items

Table 10 Periodic test items

Table 11 Sampling test items

Table 12 Type test items

Table 13 Test requirements for composite jacket arresters

Table 14 Routine test items

Table 15 Periodic test items

Table A.1 Comparison of structure numbers between this document and IEC 60099-6:2019

Table B.1 Technical differences between this document and IEC 60099-6:2019 and their causes

Table D.1 Typical electrical parameters of lightning arresters for power stations and distribution

Table D.2 Typical electrical parameters of lightning arresters for motors

Table D.3 Rated repetitive transfer charge Q_{rs} of typical lightning arresters

Table E.1 Maximum allowable horizontal tension