
Tiristorski ventili za zaporedne kondenzatorje s tiristorskim upravljanjem (TCSC) - Električno preskušanje

Thyristor valves for thyristor controlled series capacitors (TCSC) - Electrical testing

Thyristorventile für thyristorgesteuerte Reihenkapazitoren (TCSC) - Elektrische Prüfung

Valves à thyristors pour condensateurs série commandés par thyristors (CSCT) - Essai électrique

Ta slovenski standard je istoveten z: EN 62823:2015/prA1:2019

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
31.080.20	Tiristorji	Thyristors

SIST EN 62823:2016/oprA1:2019

en,fr,de

ITeH STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/67f6128e-de5f-4522-b88d-5346cd-c3c4f4/sist-en-62823-2016-oprA1-2019>



22F/518/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 62823/AMD1 ED1	
DATE OF CIRCULATION: 2019-03-01	CLOSING DATE FOR VOTING: 2019-05-24
SUPERSEDES DOCUMENTS: 22F/487/CD,22F/499A/CC	

IEC SC 22F : POWER ELECTRONICS FOR ELECTRICAL TRANSMISSION AND DISTRIBUTION SYSTEMS	
SECRETARIAT: Russian Federation	SECRETARY: Mr Lev Travin
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 33, TC 115	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

Thyristor valves for thyristor controlled series capacitors (TCSC) - Electrical testing

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

This document is circulated as a CDV in accordance with the decision taken at SC 22F meeting held in St. Denis, France, on September 04-05, 2018 (see 22F/510A/RM, Item 11, Decision 2018-10, Action 2018-09). The Working Draft of the Amendment was developed by SC 22F Maintenance Team 34 (convenor Mr. Baoliang SHENG, Sweden).

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FOREWORD

This amendment has been prepared by subcommittee 22F: Power electronics for electrical transmission and distribution systems, of IEC technical committee 22: Power electronic systems and equipment.

The text of this amendment is based on the following documents:

FDIS	Report on voting
22F/xxx/FDIS	22F/xxx/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

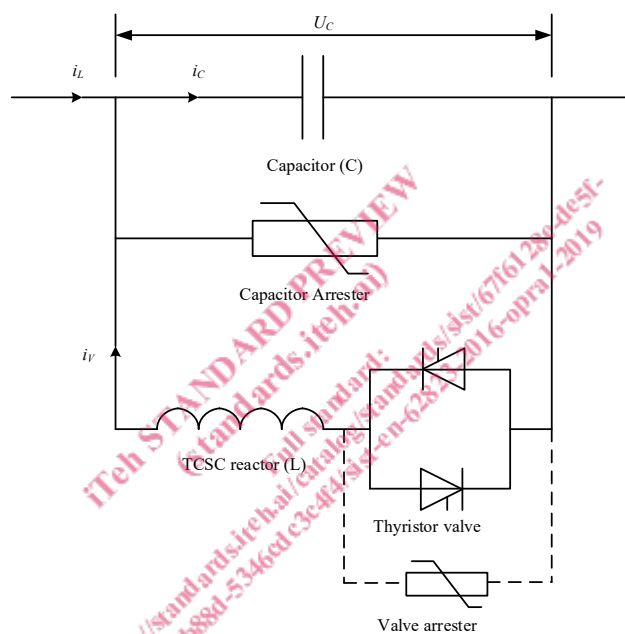
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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Full standard:
<https://standards.iteh.ai/catalog/standards/sist/67f6128e-de5f-4522-b88d-5346cd-c3c4f4/sist-en-62823-2016-oprA1-2019>

19

20 **2 Normative references**21 *Add the following reference:*

22 ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories

23 **3 Terms and definitions**24 **3.23**25 **boost factor**26 *Replace words "...divided by ..." by the word "...and ...".*27 **4 TCSC valve and valve operation in general**28 **Figure 2**29 *Replace existing Figure 2 by the following Figure:*

30

31

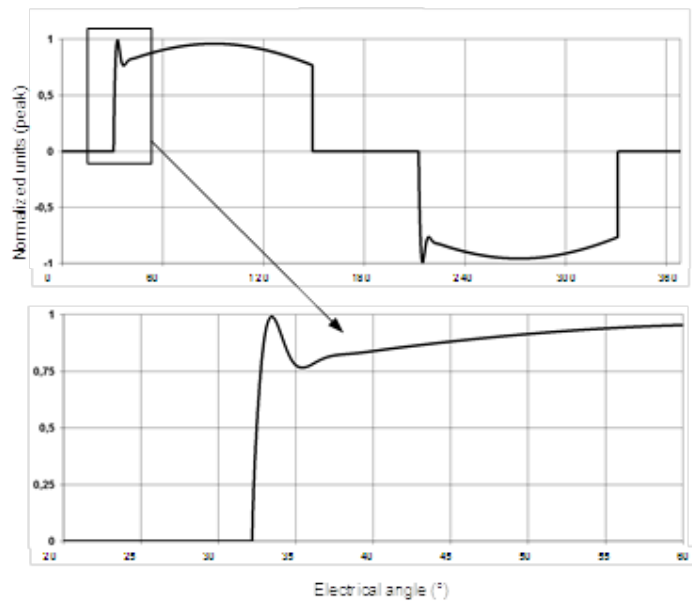
32 *Add the following Note under Figure 2:*

33 NOTE Valve arrester is optional.

34

35 **4.2.2 Waveshapes of valve current and voltage in capacitive boost operation**36 **Figure 4**37 *Replace existing Figure 4 by the following Figure:*

38



39

40

41 4.2.3.1 Capacitive boost operation mode

42 Replace letter symbol " i_L " by " I_{L_peak} " in all equations of subclause 4.2.3.1.

43 Replace the definition under the equations in subclause 4.2.3.1:

44 " i_L is the AC system line current;"

45 by:

46 " I_{L_peak} is the peak value of the AC system line current;"

47 Place in brackets letter symbols " $\omega_N \cdot t$ ", " $\lambda \cdot \beta$ " and " $\lambda \cdot \omega_N \cdot t$ " in the first equation.

48 Replace " di/dt " by " di_v/dt " in the line above the second equation.

49 Delete the comma immediately following the formula for X_0 .

50 Correct the typing mistake by replacing the existing last equation in subclause 4.2.3.1 by the following
51 equation:

$$52 \quad k_B = 1 + \frac{2}{\pi} \cdot \frac{\lambda^2}{\lambda^2 - 1} \cdot \left\{ \frac{2 \cdot \cos^2 \beta}{\lambda^2 - 1} \cdot [\lambda \cdot \tan(\lambda \cdot \beta) - \tan \beta] - \beta - \frac{\sin(2 \cdot \beta)}{2} \right\}$$

53 5 General requirements

54 5.1.1.2 Test object

55 Replace words "valve interface electronics" by "valve base electronics" in the first paragraph.

56 5.2.3 Atmospheric correction factor

57 Replace word "hall" by "enclosure" in two places.

58 6 Summary of tests

59 Table 2 – List of tests

60 Row 2:

61 Delete word "earth".

62 Row 3 Colom 2:

63 Replace "7.2" with "7.3.1".

64 Row 4 Colom 2:

65 Replace "7.3" with "7.3.2".

66 Row 6 Colom 2:

67 *Replace “8.2” with “8.3.1”.*

68 Row 6 Colom 2:

69 *Replace “8.3” with “8.3.2”.*

70 Row 16:

71 *Replace the existing title “Test for valve insensitivity to electromagnetic disturbance” by the title “Test*
72 *for valve insensitivity to electromagnetic disturbance (type test)”.*

73 Row 17 Colom 2:

74 *Replace “11.3” with “11”.*

75 **7 Dielectric tests between valve terminals and valve enclosure**

76 **7.3.1.1 Test values and waveshapes**

77 a) Test voltage U_{ts1} , 1 min

79 *Replace the existing text in the bracket of U_{s1} definition part:*

80 “typically derived from operation with maximum temporary overload in capacitive boost mode operating
81 point B2 in Figure 5)”

82 *by the following text:*

83 “(typically derived from the lower value of valve surge arrester, if any, protective level or series
84 capacitor protective level);”

85 b) Test voltage U_{ts2} , 10 min

86 *Replace the existing text in the bracket of U_{s2} definition part:*

87 “(typically derived from operation with maximum continuous capacitive boost mode operating point A2
88 in Figure 5);”

89 *by the following text:*

90 “(typically derived from operation with maximum continuous capacitive boost mode operating point A2
91 in Figure 5 for TCSC allocated for application of power flow control or from the peak voltage of
92 maximum continuous voltage across the series capacitor for TCSC allocated for application of power
93 oscillations damping or elimination of the risk of sub-synchronous resonance);”

94 **7.3.2 Lightning impulse test**

96 *Replace the whole text of 7.3.2 with the following text:*

97 “The test shall comprise three applications of positive polarity and three applications of negative
98 polarity lightning impulse voltages between the main terminals, which are in common, and valve
99 enclosure.

100 A standard lightning impulse voltage waveshape in accordance with IEC 60060 shall be used.

101 The test voltage shall be selected in accordance with the insulation co-ordination of the TCSC
102 installation.

103 NOTE To use standard lightning impulse withstand voltage according to IEC 60071-1, based on the rated TCSC voltage, U_N ,
104 for testing is an alternative. However, this alternative doesn't take the TCSC capacitor surge arrester or TSC valve surge
105 arrester, if any, protection into consideration and applies an unrealistic higher voltage on the supporting structure and the
106 choice of this alternative is subjected to agreement of valve supplier”.

107

108

109 **8 Dielectric tests between valve terminals**

110 **8.3.1.1 Test values and waveshapes**

112 *Replace words “1 minute” by “15 sec” in the first paragraph.*

113

114 *Replace the existing text in the bracket of U_{v1} definition part:*

115 “(typically derived from operation with maximum temporary overload in capacitive boost mode
116 operating point B2 in Figure 5);”

117 *by the following text:*

118 “(typically derived from the lower value of valve surge arrester, if any, protective level or series
119 capacitor protective level);”

120 *Delete the following words in paragraph 2:*

121 “Where this is the case, subject to agreement between purchaser and supplier, the 1 min AC voltage
122 withstand test may be replaced by several shorter tests whose minimum duration is determined from
123 the maximum possible duration of the specified overvoltage condition multiplied by 2, but with a total
124 duration of not less than 1 min.”

125 *Replace the existing letter symbol “ k_{TV2} ” by “ k_3 ” in the second equation.*

126 *Replace the existing text in the bracket of U_{V2} definition part:*

127 “(typically derived from operation with maximum continuous capacitive boost mode operating point A2
128 in Figure 5);”

129 *by the following text:*

130 “(typically derived from operation with maximum continuous capacitive boost mode operating point A2
131 in Figure 5 for TCSC allocated for application of power flow control or from the peak voltage of
132 maximum continuous voltage across the series capacitor for TCSC allocated for application of power
133 oscillations damping or elimination of the risk of sub-synchronous resonance);”

134 **8.3.2 Switching impulse test**

135 *Add a Note at the end of this subclause:*

136 NOTE If the valve impulse withstand levels are equal to or less than the valve a.c. test level, it is deemed that the valve a.c.
137 test can cover the impulse tests and consequently the impulse tests can be omitted.

138 **9 Periodic firing and extinction tests**

139 **9.3.5.1.2 Test values and waveshapes**

140 *Replace the 3rd paragraph by the following text:*

141 “The test duration shall be 1,2 times the specified time at maximum temporary current bypass mode.”

142 **11 Test for valve insensitivity to electromagnetic disturbance**

143 **11.1 Purpose of tests**

144 *Replace word “converter” in the 2nd paragraph, the 2nd bullet by the word “valve”.*

145 *Replace the last paragraph by the following text:*

146 “The valve insensitivity to electromagnetic disturbance can be checked by monitoring the valve during
147 other type tests. Of these, the switching impulse test of valve (8.3.2) is the most important.”

148 **11.3 Test requirements**

149 *Replace words “valve interface electronics” by “valve base electronics” in the third line.*

150 **A.2 TCSC characteristics**

151 *Delete the comma immediately following the formula for λ .*

152

153 **A.4 Reactive power rating**

154 *Replace text “with nominal boost and nominal line current” by the following text “with the nominal boost
155 factor and the rated line current” in the last line.*

156 **A.9.2 Transient overvoltages**

157 *Delete words “overvoltage protection” from the last sentence.*