

SUMMARY OF TOPICS

The following is being recirculated:

1. The Proposed Third Edition of the Standard for Low-Voltage Switchgear and Controlgear – Part 5-1: Control Circuit Devices and Switching Elements – Electromechanical Control Circuit Devices

COMMENTS DUE: MARCH 25, 2013

For your convenience in review, proposed additions to the previously proposed requirements dated 2007-08-24 are shown underlined and proposed deletions are shown ~~lined-out~~.

1. The Proposed Third Edition of the Standard for Low-Voltage Switchgear and Controlgear – Part 5-1: Control Circuit Devices and Switching Elements – Electromechanical Control Circuit Devices

RATIONALE

Responses to comments have been posted within the Subject 6951 Proposal Review Work Area dated 2007-08-24. The following revisions are also the result of ANCE pulling out of the harmonization effort at this time as well as comments received from CSA.

PROPOSAL

1DV DR Modification of 1 by adding the following:

1DV.1 Manufacturers designing products for use in Canada can find a helpful summary of the equipment-related references of the Canadian Electrical Code, Part I, in the CSA publication, Guide for the Design of Electrical Equipment for Installation and Use in Canada. In Mexico and the United States, this does not apply.

1DV.2 In Canada, the requirements of reference item 2 of Table ~~DVD-3~~ 104.DVD.3.1 in Annex ~~DVD~~ 104.DVD are applicable. In Mexico and the United States, this does not apply.

1.1DV DR Modification of 1.1 by adding the following:

~~1.1DV.1~~ In Mexico and the United States, with respect to the National Installation codes, equipment operating at more than 600 V is considered high-voltage equipment. In Canada, with respect to the National Installation codes, equipment operating at more than 750 V is considered high-voltage equipment.

1.2DV.1 D1 Modification to delete reference to IEC 60073:2002 in 1.2 as follows:

~~1.2DV.1.1~~ IEC 60073:2002 does not apply.

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1.2DV.2 D2 Addition of the following references to 1.2:

~~1.2DV.2.1~~ Standard for Low-Voltage Switchgear and Controlgear – Part 1: General Rules, UL 60947-1

Low-Voltage Switchgear and Controlgear – Part 1: General Rules, CAN/CSA C22.2 No. 60947-1

~~Low-Voltage Switchgear and Controlgear – Part 1: General Rules, NMJ-J-515-ANCE~~

2.1.3DV D1 Addition Deletion:

~~2.1.3DV.1~~ Subclause 2.1.3 does not apply.

3.3DV D2 Modification of 3.3 by adding the following:

~~3.3DV.1~~ In Canada and the United States, the following applies: Devices with horsepower ratings can may be assigned a contact rating code in accordance with the table in Annex ~~DVB 102.DVB~~. In Mexico, this does not apply.

4.3.6DV D2 Addition Deletion:

~~4.3.6DV.1~~ Subclause 4.3.6 does not apply.

Table 1DV D2 Modification of Table 1 to replace it with the following:

Table 1DV.1 – Ratings of a device controlling an external load

Contact rating type	Contact rating units
ac Resistive	Amperes, resistive
ac General Use	Amperes
dc Resistive	Amperes, resistive
dc General Use	Amperes
Incandescent lamp	Amperes or watts, tungsten
ac Pilot Duty	Code designation, volt-amperes, standard or heavy-duty pilot duty
dc Pilot Duty	Code designation, volt-amperes, standard or heavy-duty pilot duty
Ballast (Electric Discharge Lamp)	Amperes, ballast

4.4DV D2 Addition of 4.4DV.1, Table 4.4DV.1.1.1, and Table 4.4DV.1.1.2 to 4.4:**4.4DV.1 Control circuit device ratings**

4.4DV.1.1 The rating of a control-circuit device shall be one of the following:

a) In the form of a code designation in accordance with Table 4.4DV.1 4.4DV.1.1.1 or 4.4DV.2 4.4DV.1.1.2, as applicable; or

b) The rating may indicate the voltage and whether it is intended for standard duty (codes B and P) or heavy duty (codes A and N); or

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c) The rating of an auxiliary device may be in volts, amperes, and inrush amperes; volts and volt-amperes; or volts, amperes, and the words "pilot duty".

4.4DV.1.2 Equipment markings shall be as follows:

da) General purpose: Devices are marked with voltage and ampere rating and may be marked "General Purpose" or equivalent.

eb) Tungsten lamp: Devices are marked with voltage, ampere rating, and "tungsten". Relays intended for television application shall be marked "TV-X", where "TV" signifies the television and "X" is the steady-state current rating of the relay to be replaced by the actual ampere value (such as TV-5, TV-3, and the like).

fc) Resistive: devices are marked with voltage and ampere rating and "Resistive" or equivalent.

gd) Electrical discharge lamp: Devices are marked with voltage and ampere rating and "Ballast" or equivalent.

Table 4.4DV.1.1.1 –Rating codes for ac control circuit contacts at 50 and 60 hertz

Contact rating code designation ^{a)}	Thermal continuous test current, amperes	Maximum Current, Amperes ^{b)}								Maximum volt-amperes	
		120 volts		240 volts		480 volts		600 volts			
		Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A150	10	60	6.00	–	–	–	–	–	–	7200	720
A300	10	60	6.00	30	3.00	–	–	–	–	7200	720
A600	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B150	5	30	3.00	–	–	–	–	–	–	3600	360
B300	5	30	3.00	15	1.50	–	–	–	–	3600	360
B600	5	30	3.00	15	1.50	7.5	0.75	6	0.60	3600	360
C150	2.5	15	1.5	–	–	–	–	–	–	1800	180
C300	2.5	15	1.5	7.5	0.75	–	–	–	–	1800	180
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3.00	0.30	1800	180
D150	1.0	3.60	0.60	–	–	–	–	–	–	432	72
D300	1.0	3.60	0.60	1.80	0.30	–	–	–	–	432	72
E150	0.5	1.80	0.30	–	–	–	–	–	–	216	36
a) The numerical suffix designates the maximum voltage design values of 600, 300 and 150 volts for suffixes 600, 300, and 150, respectively. The test voltage is to <u>shall</u> be 600, 240, or 120 volts.											
b) For maximum ratings at voltages between the maximum design value and 120 volts, the maximum make and break ratings are to <u>shall</u> be obtained by dividing the volt-amperes rating by the application voltage. For voltages below 120 volts, the maximum make current is to <u>shall</u> be the same as for 120 volts, and the maximum break current is to <u>shall</u> be obtained by dividing the break volt-amperes by the application voltage, but these currents are <u>shall</u> not to exceed the thermal continuous test current.											

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Table 4.4DV.1.1.2 –Rating codes for dc control circuit contacts

Contact rating code designation ^{a)}	Thermal continuous test current, amperes	Maximum make or break current ^{b)} , amperes			Maximum make or break volt-ampere at 300 volts or less
		125 volts	250 volts	301 to 600 volts	
N150	10	2.2	–	–	275
N300	10	2.2	1.1	–	275
N600	10	2.2	1.1	0.40	275
P150	5.0	1.1	–	–	138
P300	5.0	1.1	0.55	–	138
P600	5.0	1.1	0.55	0.20	138
Q150	2.5	0.55	–	–	69
Q300	2.5	0.55	0.27	–	69
Q600	2.5	0.55	0.27	0.10	69
R150	1.0	0.22	–	–	28
R300	1.0	0.22	0.11	–	28

a) The numerical suffix designates the maximum voltage design values of 600, 300, and 150 volts for suffixes 600, 300, and 150, respectively. The test voltage shall be 600, 250, or 125 volts.

b) For maximum ratings at 300 volts or less, the maximum make and break ratings are to shall be obtained by dividing the volt-ampere volt-ampere rating by the application voltage, but the current values are shall not to exceed the thermal continuous test current.

4.9DV D2 Deletion Addition:

4.9DV.1 Subclause 4.9 does not apply.

4.10DV D2 Modification to 4.10 by adding the following:

4.10DV.1 Contact elements shall be assumed to be opposite polarity for multipole devices unless they are marked as having same polarity (see Figure 10DV).

4.11DV D2 Deletion Addition:

4.11DV.1 Subclause 4.11 does not apply.

4.13DV D2 Addition:

4.13DV.1 Additional requirements for devices for integrally connected and interconnected cords and cables

4.13DV.1.1 Annex DVD 104.DVD applies.

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5.1DV—D2 Addition of item o):

5.1DV.1 Individual contact blocks of a push-button or selector switch unit shall be marked to indicate the operators with which they are intended to be used unless the switch unit has been found acceptable for use with all operators to which they may be assembled that are made available by the manufacturer.

For equipment that can be assembled in different combinations, all components shall be identified and reference shall be made on the basic equipment to all components that can be assembled together.

5.1DV.2 D2 Modification of 5.1 item (e):

e) Utilization category and rated operational currents at the rated operational voltages of the control circuit device (4.4 DV.1 D2)

5.1DV.3 D2 Addition:

Items f), h), i), k) through m) do not apply.

5.1DV.4 D2 Addition:

i) Enclosure Type Rating per reference item 7 of Annex DVD.

5.1DV.5 D2 Addition:

p) When the marked ratings noted in Item e) are the code designations specified in Tables 4.4DV.1 and 4.4DV.2, the information concerning the voltage and overload current ratings for each contact rating code designation shall be made available to the user.

5.2.1DV D2 Modification of 5.2.1 by adding the following paragraphs:

5.2.1DV.1 The data specified in items (c), and (f) through (m) of Clause 5.1 does not apply.

5.2.1DV.2 5.2.1DV.1 The data specified in Items d) and n) of Clause 5.1 shall be marked on the nameplate of the control circuit device, in order to permit the complete information to be obtained from the manufacturer.

5.2.1DV.3 The data specified in item (e) of Clause 5.1 shall be marked on the nameplate of the control circuit device. Where space does not permit complete electrical ratings, one or more ratings shall be marked on the device, with additional rating(s) provided in the manufacturer's published literature.

5.2.1DV.4 The data specified in item (i) of Clause 5.1 shall be marked on the component, its carton, or accompanying instruction sheet per reference item 7 of Annex 104.DVD. A component intended for use with a designated environmental-type enclosure shall include the following statement or equivalent: "For Use on a flat surface of a type __ enclosure." The type or types of enclosures for which the component has been evaluated and found to be acceptable shall be marked in the blank space.

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5.2.1DV.5 When the marked ratings noted in Item e) are the code designations specified in Tables 4.4DV.1.1.1 and 4.4DV.1.1.2, the information concerning the voltage and overload current ratings for each contact rating code designation ~~The data specified in Item p) of Clause 5.1~~ shall be published in a catalog, contained on a marking sheet packed with the product, or otherwise made available to the user.

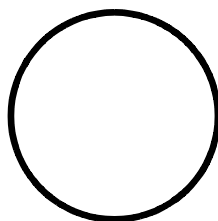
5.2.1DV.6 Individual contact blocks of a push-button or selector switch unit shall be marked to indicate the operators with which they are intended to be used unless the switch unit has been found acceptable for use with all operators to which they may be assembled that are made available by the manufacturer.

5.2.1DV.7 For equipment that can be assembled in different combinations, all components shall be identified and reference shall be made on the basic equipment to all components that can be assembled together. ~~The data specified in Item o) of Clause 5.1 shall be marked~~ marking can appear on the component or provided in the accompanying instruction sheet.

5.2.3DV DR *Modification of 5.2.3 by adding the following sentence and figures:*

~~5.2.3DV.1~~ Symbols for "on" and "off" shall conform to Figure 5.2.3DV.1.

Figure 5.2.3DV.1 = "On" and "off" symbols: Symbols 5007 and 5008 of IEC 60417



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5.2.6DV D2 Deletion~~Addition~~:

~~5.2.6DV.1~~ Subclause 5.2.6 does not apply.

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7.1.4.3DV D2 Deletion~~Addition~~:

~~7.1.4.3DV.1~~ Subclause 7.1.4.3 does not apply.

7.1.4.4DV D2 DeletionAddition:

~~7.1.4.4DV.1~~ Subclause 7.1.4.4 does not apply.

7.1.6DV D1 DeletionAddition:

~~7.1.6DV.1~~ Subclause 7.1.6 does not apply.

7.1.7DV D2 DeletionAddition:

~~7.1.7DV.1~~ Subclause 7.1.7 does not apply.

7.2.1.2DV D2 Modification of 7.2.1.2 by replacing it with the following:

The limits of operation for contactor relays shall be in accordance with reference item 3 of Table ~~DVD.3~~ 104.DVD.3.1 in Annex ~~DVD~~ 104.DVD.

7.2.3DV D2 Modification of 7.2.3 by replacing it with the following:

7.2.3DV.1 Clause 7.2.3 reference item 3 of Table ~~DVD.3~~ 104.DVD.3.1 in Annex ~~DVD~~ 104.DVD applies with the following addition.

7.2.3DV.2 For Class II control circuit devices insulated by encapsulation, see Annex F.

7.2.4.1DV D2 Modification of 7.2.4.1 by replacing it with 7.2.4.1DV.1 and ~~7.2.4.1DV.2 = 7.2.4.1DV.3~~:

7.2.4.1DV.1 Overload test

7.2.4.1DV.1.1 As a result of an overload test consisting of 50 operations of making and breaking a circuit of 110 percent of the maximum rated voltage, there shall be no

- a) electrical or mechanical breakdown of the device;
- b) undue burning or pitting of the contacts; or
- c) welding of the contacts.

The contacts shall be tested in accordance with Clause 8.3.3.5.1DV.

7.2.4.1DV.2 Endurance test

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7.2.4.1DV.2.1 As a result of an endurance test consisting of 6000 cycles of operation of making and breaking a test circuit of maximum rated voltage, there shall be no

- a) electrical or mechanical breakdown of the device;
- b) undue burning or pitting of the contacts; or
- c) welding of the contacts.

The contacts shall be tested in accordance with Clause 8.3.3.5.2DV.

~~7.2.4.1DV.3~~ D2 Addition:

7.2.4.1DV.3 ~~7.2.4.1DV.3.1~~ Tables 4 and 5 do not apply.

7.2.4.3DV D2 ~~Deletion~~ Addition:

~~7.2.4.3DV.1~~ Subclause 7.2.4.3 does not apply.

7.2.5DV D2 ~~Deletion~~ Addition:

~~7.2.5DV.1~~ Subclause 7.2.5 does not apply.

7.2.6DV D2 ~~Deletion~~ Addition:

~~7.2.6DV.1~~ Subclause 7.2.6 does not apply.

7.2.7DV D2 ~~Deletion~~ Addition:

~~7.2.7DV.1~~ Subclause 7.2.7 does not apply.

7.3DV D2 ~~Deletion~~ Addition:

~~7.3DV.1~~ Subclause 7.3 does not apply.

4DV D2 ~~Deletion~~ Addition:

~~4DV.1~~ Table 4 does not apply.

5DV D2 ~~Deletion~~ Addition:

~~5DV.1~~ Table 5 does not apply.

8.1.2DV D2 ~~Modification~~ Addition:

~~8.1.2DV.1~~ Verification of d) and e) is not applicable.

8.2DV D2 Modification of 8.2 by replacing it with the following:

Clause 8.2 of reference item 1 of Table 104.DVD.3.1 in Annex 104.DVD applies, except for Clause 8.2.5 (see also the note to Clause 7.1).

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~~8.2DV D2 Modification of 8.2 by replacing it with the following:~~

~~8.2DV.1 Clause 8.2 of reference item 1 of Table DVD.3 in Annex DVD applies, except for Clause 8.2.5 (see also the note to Clause 7.1).~~

8.3 Performance

8.3.1 Test sequences

The type and sequence of tests to be performed on representative samples are as follows.

– **Test sequence I** (sample No. 1)

Test No. 1 – Operating limits of contactor relays (8.3.3.2), if applicable

Test No. 2 – Temperature rise (8.3.3.3)

Test No. 3 – Dielectric properties (8.3.3.4)

Test No. 4 – Mechanical properties of terminals (8.2.4 of IEC 60947-1)

– **Test sequence II** (sample No. 2)

Test No. 1 – Making and breaking capacities of switching elements under normal conditions (8.3.3.5.2)

Test No. 2 – Dielectric verification (8.3.3.5.5 b))

– **Test sequence III** (sample No. 3)

Test No. 1 – Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.3)

Test No. 2 – Dielectric verification (8.3.3.5.5 b))

– **Test sequence IV** (sample No. 4)

Test No. 1 – Performance under conditional short-circuit current (8.3.4)

Test No. 2 – Dielectric verification (8.3.3.5.5 b))

– **Test sequence V** (sample No. 5)

Test No. 1 – Degree of protection of enclosed control circuit devices (Annex C of IEC 60947-1)

Test No. 2 – Verification of actuation force or moment (8.2.5)

– **Test sequence VI** (sample No. 6)

Test No. 1 – Measurement of clearances and creepage distances, if applicable (7.1.3)

Test No. 2 – Verification of limitation of rotation of a rotary switch (8.2.6).

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