INCH-POUND

MIL-C-39019C
AMENDMENT 2
25 January 1996
SUPERSEDING
AMENDMENT 1
20 May 1993

MILITARY SPECIFICATION

CIRCUIT BREAKERS, MAGNETIC, LOW-POWER,
SEALED, TRIP-FREE,
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-C-39019C, dated 13 October 1987, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

* 2.1 1, SPECIFICATIONS, FEDERAL, delete in its entirety

* 2 1.1, SPECIFICATIONS, MILITARY, delete in its entirety.

* Beneficial comments, address, delete and substitute· "US Army Communications Electronics Command, ATTN AMSEL-LC-LEO-EP, Fort Monmouth, NJ 07703-5023"

PAGE 2

* 2 1 1, STANDARDS, MILITARY, delete in its entirety and substitute.

"MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts
"MIL-STD-1285 - Marking of Electrical and Electronic Parts."

* Add the following new handbook.

"HANDBOOK

"MIL-HDBK-454 - General Guidelines for Electronic Equipment "

* 2.2, AMERICAN NATIONAL STANDARDS INSTITUTE, add the following

"ANSI/J-STD-004 - Requirements for Soldering Fluxes

"ANSI/J-STD-006 - Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications

"ANSI/NCSL Z540-1 - Calibration Laboratories and Measuring and Test Equipment - General Requirements.

"INTERNATIONAL ORGANIZATION FOR STANDARDS (ISO)

"ISO 10012-1 - Quality assurance requirements for measuring equipment - Part 1 Metrological confirmation system for measuring equipment "

* 2.2, AMERICAN NATIONAL STANDARDS INSTITUTE, address, delete and substitute

"(Application for copies should be addressed to the American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036-8002, Telephone (212) 642-4900, Fax (212) 302-1286.)

"(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents These documents also may be available in or through libraries or other informational services)"

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PAGE 3

3 3 3, delete and substitute

"3 3 3 Solder and soldering flux Solder, when used, shall be in accordance with ANSI/J-STD-006 and soldering flux shall be in accordance with ANSI/J-STD-004 The solder and solder flux shall be such a quality as to enable the circuit breaker to meet the performance requirements of this specification "

3 4 4, after last sentence, add the following "The actuator shall not work to an intermediate position, give a false trip indication, or be removable from the circuit breaker "

3 4.8 1, last two sentences, delete and substitute "The terminal design shall be hook style for configuration 1, and screw terminals for configuration 2."

3 4.8 3, delete and substitute

"3 4.8 3 Solderability of hook terminals. Hook terminals shall be treated to facilitate soldering Coating such as hot solder dip is acceptable "

PAGE 6

3.14, first sentence, delete and substitute: "When circuit breakers are tested as specified in 4 7 11, no contact shall fail to open or close its individual circuit in proper sequence, and there shall be no evidence of mechanical damage or loosening of parts."

PAGE 7

3 25.1, first sentence, delete and substitute: "The following information shall be marked on the circuit breaker in accordance with MIL-STD-1285, as a minimum "

PAGE 8

4 1.2, delete and substitute:

"4.1.2 Test equipment and inspection facilities The manufacturer shall establish and maintain a calibration system in accordance with ANSI/NCSL Z540-1, ISO 10012-1, or equivalent system as approved by the qualifying activity."

TABLE III, Applicable specification column, delete in its entirety

PAGE 10

4 5.4 1b, last sentence, delete "(see 4.5.4.3)"

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PAGE 11

TABLE V, delete and substitute

"TABLE V Retention of qualification inspection

Inspection 1/	Military part number	Requirement paragraph	Test method paragraph	Number of samples
(1st Quarter)	M39019/02-200	3.1, 3 4,	4 7 1, 4 7 7.1,	1
Lever strength, lever	M39019/02-257	3.10 1, 3 10.2,	4.7 7.2, and 4.7.16	1
operating force, shock	M39019/04-301	and 3.19	"	1
and dimensions	M39019/04-339	"	"	1
"	M39019/06-202	"	"	1
"	M39019/06-259	"	"	1
(2nd Quarter)	M39019/02-301	3.1, 3.4, 3.5,	4.7.1, 4.7.2, and	1
Solderability,	M39019/02-339	and 3.16	4.7.13	1
vibration, and	M39019/04-200	"	"	1
dimensions	M39019/04-257	"	"	1
"	M39019/06-202	"	"	1
"	M39019/06-259	"	"	1
"				
	M39019/02-202	3.1, 3 4, 3.20,	4 7.1, 4.7.17, and	1
(3rd Quarter)	M39019/02-259	and 3.21	4 7.18	1
Trip-free calibration,	M39019/04-202	"	"	1
salt spray and	M39019/04-259	"	"	1
dimensions	M39019/06-300	"	"	1
"	M39019/06-338	"	"	1
"				
"				
	M39019/02-200	3.1, 3.4, 3.13,	4 7.1, 4.7.10,	1
	M39019/02-257	3.14, 3 17,	4.7.11, 4.7.14,	1
(4th Quarter) 2/	M39019/04-301	3.23, and 3.24	4.7.20, and 4.7.21	1
"	M39019/04-339	"	"	1
"	M39019/06-202	"	"	1
"	M39019/06-259	"	"	1
"				
"				

1/ Dimensions taken shall be variables data
2/ High-low temperature operation, endurance, and dimensions shall be performed the 4th quarter of the first year, moisture resistance and dimensions shall be performed the 4th quarter of the second year, and temperature rise, interrupting capacity, and dimensions shall be performed the 4th quarter of the 3rd year. After the 3rd year, the sequence repeats."

PAGE 12

4.6.1.1 1.1, delete and substitute·

"4.6 1 1 1 1 Sampling plan. Group A inspection shall be on an inspection lot basis. Samples shall be selected in accordance with table VI-1, based on the inspection lot If there are one or more failures, the inspection lot shall be considered to have failed "

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TABLE VI, delete and substitute

"TABLE VI. Group A inspection

Inspection	Requirement paragraph	Test method paragraph
Marking	3.25 through 3.25.2	--
Workmanship	3.26	--
Dielectric withstanding voltage	3.6	4.7.3
	3.7	4.7.4
Insulation resistance	3.9	4.7.6.2
Calibration	3.11	4.7.8
Seal		

4.6.1.1.2, delete and substitute:

"4.6.1.1.2 Rejected lots. If an inspection lot is rejected, the supplier may rework it to correct the defects or 100 percent inspect the lot and remove all defective parts. Reworked lots shall be resubmitted for inspection. Such lots shall be separated from new lots and shall be clearly identified as reinspected lots. If one or more defects are found in this second sample, the lot shall be rejected and shall not be supplied to this specification."

Following table VI, add new table VI-1:

"TABLE VI-1. Group A, zero defect sampling plan.

Lot size			Sample size
1	-	13	100 percent
14	-	150	13
151	-	280	20
281	-	500	29
501	-	1,200	34
1,201	-	3,200	42
3,201	-	10,000	50
10,001	-	35,000	60
35,001	-	150,000	74
150,001	-	500,000	90
500,001	and up		102

PAGE 13

4.6.3, delete in its entirety.

PAGE 14

4.7.5a, delete and substitute:

"a. Main contacts: Samples shall be divided as evenly as possible (with respect to current rating) into three groups for testing at dc, 60 Hz, and 400 Hz. With the circuit breakers mounted in their normal vertical mounting position, the resistance or impedance shall be measured between main terminals of each pole at 100 percent rated current, and applicable frequency (see 3 1), using the voltmeter-ammeter method. These measurements shall be made and recorded after the circuit breaker has been subjected to these conditions for 1 hour."

4.7.6 through 4.7.6.2.2 inclusive, delete in its entirety and substitute·

"4.7 6 Calibration (see 3.9).

"4.7 6.1 Method I. (Used for qualification inspection and trip-free calibration)

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"4 7 6 1 1 Time delays A and B Circuit breakers shall be mounted by their normal mounting means and tested in each of three mutually perpendicular positions Circuit breakers shall be connected as shown on figure 2 and conditioned for 1 hour at 100 percent of rated current, rated voltage, and rated frequency Tripping times shall then be measured when circuit breakers are subjected to the following percentages of applied rated current 100, 135, 200, 400, 600, and 800 The sample units shall be divided as evenly as possible (with respect to current rating and time delay) into three groups for testing at the following voltages and frequencies 50 V dc, 240 V ac at 60 Hz, and 240 V ac at 400 Hz. There shall be sufficient time (not less than 10 minutes) between each application of current to permit proper cooling of the circuit breaker Circuit breakers rated for high inrush shall also be mounted in three mutually perpendicular directions and while mounted in each position shall be subjected to a half wave of a 60 Hz waveform the peak value of which is 800 percent of the rms and dc rated load current and a half wave of a 60 Hz or 400 Hz waveform the peak value of which is 1400 percent of the rms and dc rated load current Normally tests shall be conducted within the rated operating voltage. However, if the inherent resistance or impedance of the circuit breaker precludes attainment of the required percentages of overload current at the rated operating voltage, for the purpose of determining tripping times and high inrush capabilities, the voltage shall be increased as necessary, up to a maximum of 40 percent If the specified overload current cannot be obtained with a maximum increase in voltage of 40 percent, tests of these particular overload levels shall be omitted with qualification activity approval Each section of multipole breakers shall be subjected to the calibration current specified, with remaining pole or poles passing no current

"4 7 6 1.2 Time delay C. Circuit breakers shall be tested as specified in 4.7.6 1.1, except the circuit breakers shall only be subjected to 100, 135, and 200 percent of rated current

"4 7.6 2 Method II. (Used for group A inspection, high- and low-temperature operation, endurance, moisture resistance, and interrupting capacity)

"4 7 6 2.1 Time delays A and B. Circuit breakers shall be tested as specified in 4.7 6 1.1, except the circuit breakers shall be tested when mounted in the vertical plane only and only 135 and 200 percent of rated current shall be applied. The sample units shall be divided as evenly as possible (with respect to current rating and time delay) into three groups for testing at the following current types and frequencies· DC, ac at 60 Hz, and ac at 400 Hz The applied voltage should be at a level sufficient to maintain the specified percent of rated current during testing. Circuit breakers rated for high inrush shall be subjected to a half wave of the 60 Hz waveform or a half wave of the 400 Hz waveform, (see 3.1).

"4 7 6.2.2 Time delay C. Circuit breakers shall be tested as specified in 4.7.6 1.2, except the circuit breakers shall be tested when mounted in the vertical plane only and shall only be subjected to 135 and 200 percent of rated current "

PAGE 17

4 7 11, after first sentence, add the following. "Circuit breakers shall be continuously monitored and recorded to determine whether any contact has failed to open or close its individual circuit in the proper sequence."

PAGE 18

Fifth line: Delete "(see 6 5.4)" and substitute "(see 6 6.4)".

PAGE 20

* 4 7 21a, third sentence, delete and substitute: "The power factor shall be 75 to 80 percent for the 60 Hz test and 30 to 80 percent for the 400 Hz test "

PAGE 21

* 5 through 5 4 3 2 inclusive, delete in its entirety and substitute

"5 PACKAGING

"5 1 Packaging The requirements for packaging shall be in accordance with the contract or purchase order (see 6.2) "

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PAGE 24

6 2 1, delete c and d and substitute

"c Requirements for packaging (see 5 1) "

6 3, last sentence, delete and substitute "The activity responsible for the qualified products list is the US Army Communications Electronics Command, , ATTN AMSEL-LC-LEO-EP, Fort Monmouth, NJ, 07703-5023, however, information pertaining to qualification of products may be obtained from the Defense Electronics Supply Center, ATTN DESC-ELSE, 1507 Wilmington Pike, Dayton, OH, 45444-5764, phone (513) 296-6277 "

6 4, lines four, eight, and nine Delete "table VI" and substitute "table VII" four places

6 4 4, line two Delete "table VI" and substitute "table VII"

PAGE 27

TABLE VII, Group No. 15, delete "cadmium, plated and chromated"

PAGE 29

After 40.1, add the following new paragraph

"40 2 Qualification of circuit breakers of the configuration 1 type will also grant qualification to circuit breakers that are of the configuration 2 type provided that the type 2 are subjected to and pass the group III qualification inspection tests in table IV Six sample units shall be selected from MIL-C-39019/6, configuration 2, and qualification will be extended to MIL-C-39019/1 through MIL-C-39019/6 Additionally, six samples may be selected from MIL-C-39019/4, configuration 2, and qualification will be extended to MIL-C-39019/1 through MIL-C-39019/4."

The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made This was done as a convenience only and Government assumes no liability whatsoever for any inaccuracies in these notations Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment

CONCLUDING MATERIAL

Custodians:
Army - ER
Navy - EC
Air Force - 85

Review activities
Army - AT, AV, MI
Navy - AS, MC
Air Force - 19, 99
DLA - ES
NASA - NA

Preparing activity
Army - ER

Agent
DLA - ES

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