

METRIC

DOD-S-17773B(SH)

AMENDMENT 2

30 October 1989

SUPERSEDING

AMENDMENT 1

20 January 1988

MILITARY SPECIFICATION

SWITCHES, BUS TRANSFER, ELECTRIC POWER
AUTOMATIC AND MANUAL (METRIC)

This amendment forms a part of DOD-S-17773B(SH), dated 14 September 1983, and is approved for use by the Naval Sea Systems Command, Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

PAGE 1

1.2.1: Delete and substitute:

"1.2.1 Bus transfer switch part numbers. The standard type designations for the bus transfer switches shall be designated as follows:

<u>ABT</u>	—	<u>4</u>		<u>A</u>		<u>1</u>		<u>S</u>	—	<u>XXX</u>		<u>D</u>
Style		Voltage		Frequency		Application		Special		Current		Cabinet
(see		(see		(see		(see		features		rating		integrity
1.2.1.1)		1.2.1.2)		1.2.1.3)		1.2.1.4)		(see		(see		(see
								1.2.1.5)		1.2.1.6)		1.2.1.7)

At bottom of page: Delete and substitute:

" Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 6110

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PAGE 2

1.2.1.1, line 1: Delete "Type." and substitute "Style."

1.2.1.2: Delete and substitute:

"1.2.1.2 Voltage.

- 1 - 120 V
- 2 - 208 V (400 Hz only), 240 V (dc only)
- 3 - 450 V (ac only)"

1.2.1.4, item 5, line 2: Delete "drop-out" and substitute "transfer".

Line 3: Delete "instantaneous drop-out below 60 to 70 percent" and substitute "random transfer below 25 percent."

* 1.2.1.4: Add items 7 and 8 as follows:

- "7 - Denotes transfer switch senses voltage and frequency, is instantaneous, non selective, has transfer stabilization time delay and has an operating transfer time of 70 milliseconds maximum upon voltage failure.
- 8 - Similar to application 7 with additional current sensing on load terminals to inhibit transfer during overload conditions."

1.2.1.4: Under "Note" change to "Notes: 1." and add "2. Inphase monitors are not used in 400 Hz ABTs on Naval vessels."

1.2.1.5: Delete and substitute:

"1.2.1.5 Special features. An abstract letter shall be added after or in place of designation of application to show special features, such as: "a nonstandard pick-up and drop-out voltage setting, load fuses, frequency sensing in other than application 5 or special timing."

1.2.1.7: Add new:

"1.2.1.7 Cabinet integrity.

- D - Dripproof
- W - Watertight
- No designation - open (switchboard) mounted."

2.1.1: Delete and substitute:

"2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation."

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2.2: Delete and substitute:

"2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation."

2.2, lines 13 to 15: Delete and substitute:

"(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)"

2.3: Delete and substitute:

"2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained."

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3.2, line 1: Delete "(see 6.2.1)" and substitute "in the contract or purchase order."

3.3.1, line 2: Delete "circuits." and substitute "systems."

3.4.3.1, line 2: Delete "450 line V" and substitute "450 rms line V. 400 Hz switches, in addition to above, shall be rated for 208 rms line volts."

PAGE 6

Table I, column 3: Delete "50 to 1600" and "AQB". Row 4: Delete "1600" and substitute "600".

PAGE 7

3.4.13, Add: "A 60 Hz comparison test may be used for dc and 400 Hz testing in cases where these required laboratory power supplies are not practicable."

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Table III: Delete and substitute:

Continuous rating (A)	Short circuit current (A) at pf 0.15-0.20		Duration (seconds)	
	60 Hz and dc	400 Hz	60 Hz and dc	400 Hz
To 50	10000	10000	0.017	0.021
100	15000	10000	.017	.021
250	20000	10000	.025	.028
400	30000	10000	.028	.033
600	50000	10000	.028	.033
<u>1/</u> over 600				

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3.5.2.10.1.1, line 10: Delete "manual" and substitute "mechanical".

*

3.5.2.10.4: Delete and substitute:

"3.5.2.10.4 Operating voltages.

"3.5.2.10.4.1 Drop-out voltages. Drop-out voltage for type applications A1, 2, 3, 6 and 9 and F1 and 2 as specified in 1.2.1 shall be between 60 and 70 percent. For A4 and F4, the drop-out voltage shall be between 75 and 85 percent. A tighter tolerance may be specified (see 6.2.1). For type applications A3, A5, A6 and A9 supplied with an inphase monitor, the inphase transfer shall operate between 80 and 85 percent to between 20 and 30 percent. Below 20 to 30 percent, instantaneous random transfer shall occur. For A7 and A8 drop-out voltage shall be 76 to 80 percent of rated line voltage.

3.5.2.10.4.2 Pick-up voltage. Pick-up voltage shall be between 85 and 95 percent. A tighter tolerance may be specified for type applications A4 and F4 and A5. For A7 and A8 pick-up voltage shall be 86 to 90 percent of rated line voltage."

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3.5.2.10.5.3, lines 8 to 13: Delete from "When" to end of paragraph and substitute:

"When the voltage falls below 20 to 30 percent of nominal, on switches furnished with an inphase monitor, the transfer shall be initiated instantaneously."

* Add as new paragraph 3.5.2.10.5.4:

"3.5.2.10.5.4 Transfer stabilization time. When specified by type designation (see 1.2.1), retransfer shall be inhibited for 100 to 150 milliseconds after transfer to allow for source stabilization."

* 3.5.2.10.6: Delete and substitute:

"3.5.2.10.6 Operating frequency. When specified by the type designation (see 1.2.1), frequency sensing shall be provided. For A5, transfer shall be initiated when the frequency drops 2 to 3 Hz below rated. Unless otherwise specified (see 6.2.1), if transfer is not initiated before the voltage drops below 20 to 30 percent of rated, instantaneous random transfer shall occur. For A7 and A8, transfer shall be initiated when the frequency falls to 89 to 93 percent of rated line frequency unless otherwise specified (see 6.2.1), provided the frequency of the alternate source is 95 to 98 percent of rated line frequency or greater."

PAGE 14

3.5.2.10.9: Delete and substitute:

"3.5.2.10.9 Inphase monitor control circuit. When specified (see 6.2.1), automatic bus transfer switches shall be provided with an inphase monitor that will limit the motor inrush current to its starting current upon completion of transfer. This is equivalent to completing transfer when the two sources are within 60 electrical degrees of each other."

* Add as new paragraph 3.5.2.10.10:

"3.5.2.10.10 Transfer inhibit on overload. When specified by type designation (see 1.2.1), transfer shall be inhibited if the load current supplied by the switch exceeds 125 ± 5 percent of the switch ampere rating."

3.5.2.11, last line: Delete "ABT-AL" and substitute "ABT-A6".

PAGE 17

4.1.1: Delete and substitute:

"4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The

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absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material."

4.1.2: Add new paragraph:

"4.1.2 Inspection system. When specified in the contract or order an inspection system shall be maintained (see 6.2.2)."

PAGE 21

4.8: Add: "When exact test settings are specified, the tolerance shall be either plus or minus so as to verify the specified set point."

PAGE 27

* 4.8.12.1.4, first line: Delete "Timing and time delay" and substitute "Timing, time delay, and operating transfer time".

PAGE 28

4.8.12.1.4 (cont.) line 2: Delete "0.50" and substitute "0.05".

4.8.12.1.7: Delete and substitute:

"4.8.12.1.7 Inphase monitor. Automatic bus transfer switches furnished with inphase monitors shall be operated five times in each direction including the low voltage dropout point (minimum of 80 percent voltage or as specified) and 30 percent voltage or less. The frequency of the two sources shall be a nominal 60 Hz. After these operations are completed the voltage shall be rapidly reduced to 25 ± 5 percent for instantaneous random transfer verification. When frequency sensing is specified, the switch shall be operated five additional times in each direction. The voltage shall be set at 5 points including 114 percent or greater and 85 percent or less. These tests shall be conducted by one of the two following methods:

- (a) The tests shall be performed with a load consisting of a motor of sufficient size to maintain a voltage greater than 30 percent for minimum of 0.50 second after the power is suddenly disconnected.
- (b) The tests shall be performed with any convenient load. A calibrated phase angle sensing instrument shall be used to record the phase angle displacement between the normal and alternate sources at the completion of transfer. In each operation, except the instantaneous random transfer when voltage is reduced to 25 percent, the phase angle difference at the completion of transfer shall not exceed 60 degrees."

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* Add as new paragraph 4.8.12.1.9:

"4.8.12.1.9 Overload inhibit. When transfer inhibit on overload has been specified (see 3.5.10.10), a transfer operation shall be initiated by failing voltage on the connected source to determine transfer will not occur if the load current is above overload inhibit value specified."

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6.2.1(t): Delete and substitute:

"(t) Special frequency variation or time delay requirements for frequency sensing automatic bus transfer switches (see 3.5.2.10.6)."

* 6.2.1: Add as new item (ab):

"(ab) Setting for inhibiting transfer on overload (see 1.2.1.4, application 8)."

6.2.2: Delete and substitute:

"6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DOD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraphs."

PAGE 31

6.2.2, line 16: Delete "final" and substitute "standard".

6.2.2, line 17: Delete "4.1.1" and substitute "4.1.2".

6.2.2, line 22: Delete "5000.19L., Vol. II" and substitute "5010.12-L.,".

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6.4 Delete and substitute:

"6.4 First article inspection. When a first article inspection is required, the item should be a sample from normal production line as specified in 4.5.2. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples of bus transfer switches with

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special type designation for first article inspection as to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract."

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* Add as new paragraph 6.5.14.1:

"6.5.14.1 Operating transfer time. Operating transfer time is the time measured from the instant of monitored voltage source deviation to the closing of main contacts on an available alternate source, exclusive of any purposely introduced time delay."

NOTE: The margins of this amendment are marked with an asterisk or vertical lines to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the 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.

Preparing activity:
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