

INCH-POUND

MIL-M-24347A(SH)  
10 February 1989  
 SUPERSEDING  
 MIL-M-24347(SHIPS)  
 30 August 1968  
 (See 6.9)

## MILITARY SPECIFICATION

MONITOR, AVAILABLE LOAD, 60 AND 400 HERTZ, A.C.,  
 1 PHASE, ELECTRICAL POWER  
 (NAVAL SHIPBOARD USE)

This specification 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.

### 1. SCOPE

1.1. Scope. This specification covers an available load monitor (ALM-1) to be used for sensing a load on either a 115 or 440 volt single phase circuit of either 60 or 400 hertz (Hz).

### 2. APPLICABLE DOCUMENTS

#### 2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

### FEDERAL

PPP-F-320 - Fiberboard: Corrugated and Solid, Sheet Stock  
 (Container Grade) and Cut Shapes.

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 5925

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## MILITARY

- MIL-S-901 - Shock Tests, H.I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
- MIL-E-917 - Electric Power Equipment, Basic Requirements (Naval Shipboard Use).
- MIL-E-2036 - Enclosures for Electric and Electronic Equipment.
- MIL-P-15024 - Plates, Tags and Bands for Identification of Equipment.
- MIL-P-15024/5 - Plates, Identification.
- MIL-O-16485 - Ohmmeters, Insulation Resistance-Indicating, Portable.
- MIL-E-17555 - Electronic and Electrical Equipment, Accessories, and Provisioned Items (Repair Parts): Packaging of.
- MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.
- MIL-I-46058 - Insulating Compound, Electrical (for Coating Printed Circuit Assemblies).

## STANDARDS



## MILITARY

- MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited).
- MIL-STD-462 - Electromagnetic Interference Characteristics, Measurement of.
- MIL-STD-471 - Maintainability Verification/Demonstration/Evaluation.
- MIL-STD-701 - Lists of Standard Semiconductor Devices.
- MIL-STD-740-1 - Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment.
- MIL-STD-781 - Reliability Testing for Engineering Development, Qualification, and Production.
- MIL-STD-810 - Environmental Test Methods and Engineering Guidelines.
- MIL-STD-1399 - Interface Standard for Shipboard Systems, Section 300 Electric Power, Alternating Current. (Metric)
- MIL-STD-1561 - Provisioning Procedures, Uniform Department of Defense.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

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2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.5) in accordance with 4.3.

3.2 General requirements. The monitor, fabricated of static components, shall be in accordance with MIL-E-917, and the requirements of this specification except as otherwise specified in the contract or order. If any requirement specified herein conflicts with the requirements of MIL-E-917, the requirements of this specification shall govern.

3.2.1 Painting. Parts not fabricated of a corrosion-resisting material or having a corrosion-resistant treatment as specified in MIL-E-917, except for semi-conductors, shall be painted as specified in MIL-E-917. One coat of gray enamel shall be applied to the outside of the enclosure. Touching-up will be permitted for marks or scratches due to factory handling.

3.3 Definitions. Definitions shall be as specified in MIL-STD-1399, section 300.

3.4 Performance. The single phase monitor shall perform the functions specified herein when connected in either a single or three phase main power circuit of either 115 or 440 normal voltage and either a 60 or 400 Hz normal frequency. The monitor shall operate within the specified limits when the voltage is reduced to 85 percent of normal or raised to 10 percent above normal. The operating frequency range shall be plus or minus 5 percent of normal. A typical monitor external wiring diagram is shown on figure 1. The monitor shall receive its voltage from the load side connections of the disconnect device. Under the above conditions, the monitor shall permit the load disconnect to close and stay latched if a load of 1-1/2 amperes (plus or minus 15 percent) exists. When the load current is reduced below 1-1/2 amperes (plus or minus 15 percent), the monitor shall actuate its normally open single contact static device to close and cause the disconnect device to open. Upon receipt of a signal, the contact shall have a delay of 5 seconds before it operates. If current goes above 1-1/2 amperes before 5 seconds, the monitor shall reset.

3.4.1 Contact device. The static single contact device in the monitor is considered normally open when normal voltage and a load current of 1-1/2 amperes (plus or minus 15 percent) or more is available at the monitor. The normally open contact shall have a continuous rating of 1 ampere.

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3.4.2 Input power. The monitor shall meet the performance requirements of 3.4 when powered in accordance with MIL-STD-1399, section 300, types II and III.

3.5 Static components. Static components shall be in accordance with MIL-E-917. Controlled rectifiers, transistors and diodes shall be of the silicon type in accordance with MIL-STD-701. Field adjustment of the sensing circuits shall be provided to compensate for aging of components. Each monitor shall be provided with a toroid-type current sensing transformer as shown on figure 2 for external mounting on one wire connected on the load side of the disconnect device. Even though two wires in parallel are used in lieu of one wire, the sensing transformer placed around only one wire shall perform satisfactorily provided the current in the wire is 1-1/2 amperes (plus or minus 15 percent).

3.6 Duty. The monitor shall sense the load circuit continuously and shall permit the closing and tripping of the disconnect device for 40 consecutive operations at 10-second intervals (see 4.6.6.1).

3.7 Enclosure. The enclosure shall be of dripproof or watertight construction in accordance with MIL-E-2036 (see 6.2), and as shown on figure 3. Holes of 1-1/16 inch diameter shall be placed in the two sides of the enclosure. The manufacturer shall recommend cable connectors that will ensure dripproof or watertight construction.

3.8 Internal components. Internal components shall be in accordance with MIL-E-917 and shall be mounted in an assembly which can be readily removed from the enclosure. The terminal board for connection of external wiring shall be marked as shown on figure 1. Printed circuit boards shall be coated in accordance with MIL-I-46058, types AR, SR, UR or XY.

3.9 Ventilation. Ventilation shall be by natural draft.

3.10 Environmental.

3.10.1 Ambient temperature. The normal ambient temperature shall be 50 degrees Celsius ( $^{\circ}\text{C}$ ). The monitor shall meet the specification requirements when operating in an ambient temperature from 0 to  $65^{\circ}\text{C}$ .

3.10.2 Humidity. The monitor shall meet the requirements specified herein when exposed to an ambient humidity within the humidity range specified in MIL-STD-810 (see 4.6.15).

3.11 Mounting. The monitor shall comply with the mounting dimensions shown on figure 3. Dimensions for the monitor current sensing transformer shall be as shown on figure 2 and shall meet the mounting requirements specified in 3.5.

3.12 Weight. The weight of the monitor and its separate sensing transformer shall be held to a maximum of 2.5 pounds.

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3.13 Insulation resistance. The insulation resistance of all circuits shall be not less than 10 megohms (see 4.6.3).

3.14 Dielectric strength. The monitor shall withstand, for 1 minute, a dielectric test voltage between separate circuits and to ground as follows (see 4.6.12):

<u>Ac ((rms) input or output voltage)</u>	<u>Test voltage (rms)</u>
60 and under	600
61 to 90	900
91 to 600	1000 plus twice rated
Over 600	2000 plus 2-1/4 times rated

3.15 Vibration. The monitor shall withstand vibration in accordance with type I of MIL-STD-167-1 without mechanical damage or malfunctioning (see 4.6.13).

3.16 Shock. The monitor shall withstand shock specified in MIL-S-901 for light weight equipment without the use of shock mounts. With rated voltage applied, all devices shall function properly during and after the shock test (see 4.6.16). Mounting fixture 4A in accordance with MIL-S-901 shall apply.

3.17 Noise. The monitor shall not exceed noise limits in accordance with MIL-STD-740-1 for type 3 and grade C equipment (see 4.6.8).

3.18 Interference. The monitor shall withstand interference limits as specified in MIL-STD-462 (see 4.6.9).

3.19 Inclined operation. The monitor shall show no change in operation when inclined at an angle of 45 degrees from the vertical in any direction (see 4.6.7).

3.20 Warm-up. The monitor shall meet the performance requirement specified herein after being energized for a maximum of 1 minute (see 4.6.5).

3.21 Reliability. The upper test mean time between failure (MTBF) for continuous and intermittent operation in accordance with MIL-STD-781 shall be 15000 hours under the environmental conditions specified for the monitor when tested in accordance with 4.6.10. A failure (as used herein) shall be as specified in 4.6.17.

3.22 Maintainability. The monitor shall facilitate trouble-shooting, fault isolation, and repair down to the lowest nonrepairable part or nonrepairable assembly (see 4.6.11).

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3.23 Interchangeability. In no case shall parts be physically interchangeable or reversible unless such parts are also interchangeable or reversible with regard to function, performance and strength.

3.24 Connection diagram and identification plates. Plates shall be in accordance with MIL-P-15024 and MIL-P-15024/5. The plates shall be brass or corrosion-resistant steel of not less than 0.030 inch in thickness and marked by etching, engraving, stamping or photoprocess. The marking shall be not less than 0.003 inch deep.

3.24.1 Connection diagram plate. Each monitor shall be provided with a connection diagram plate mounted on the inside surface of the front cover. The plate shall contain the data shown on figure 1.

3.24.2 Identification plate. Each monitor shall be provided with an identification plate mounted on the outside of the front cover. The identification plate for the complete equipment assembly shall indicate the following data:

MONITOR: AVAILABLE LOAD VOLTAGE: 115-400 PH.1 AC  
 TYPE: ALM-1 FREQ: 60-400 DUTY: CONT. AMB.: 50°C  
 CONTACT: NORMALLY OPEN UNDER LOAD CONTACT RATING: 1 AMP. CONT.  
 CLOSING LOAD: 1-1/2 AMPS. OPENING LOAD: LESS 1-1/2 AMPS.  
 CAT. NO. \_\_\_\_\_ SER NO. \_\_\_\_\_ YEAR \_\_\_\_\_  
 STK.NO. \_\_\_\_\_ CONTRACT \_\_\_\_\_ NAVSHIPS 0963- \_\_\_\_\_  
 MANUFACTURER'S NAME AND ADDRESS \_\_\_\_\_

3.24.3 Component identification. Components shall be identified by stamping or stenciling the data immediately adjacent to the component.

3.25 Drawings. See 6.3 and appendix A.

3.26 Provisioning. Provisioning shall be in accordance with MIL-STD-1561 (see 6.3).

3.27 Workmanship. Metal surfaces shall have a smooth finish and all details of manufacture, including the preparation of parts and accessories, shall be in accordance with the best practice for high quality electrical equipment. Particular attention shall be given to neatness and thoroughness of soldering, wiring, impregnation of coils, marking of parts, plating, lacquering, riveting, clearance between connections, ruggedness, and suitability of enclosure.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of

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the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall 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 absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

- (a) First article inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).

4.3 First article inspection. First article inspection shall consist of the examination and tests specified in table I (see 6.3).

4.3.1 First article sample. The first article sample shall be one monitor of each type.

4.4 Quality conformance inspection. Each production monitor shall be subjected to the quality conformance inspection specified in table I (see 6.3).

4.5 Examination. Each monitor shall be examined to determine compliance with the workmanship requirements of 3.27.

4.6 Test procedures. Unless otherwise specified herein, all tests requiring electrical loading of equipment shall normally be performed using a resistive load for uniformity and convenience.

4.6.1 Effectiveness of enclosure. The equipment enclosure shall be tested in accordance with MIL-E-2036 for dripproof and watertight requirements. Dripproof and watertight enclosures shall be accepted or rejected based on inspection to ascertain that the enclosure effectively performs its specified function (see figure 3). External wiring connections shall be made to the unit.

4.6.2 Creepage and clearance. Creepage and clearance distances shall be demonstrated by actual measurement in accordance with MIL-E-917.



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TABLE I. First article, comparison, and quality conformance inspection.

Inspection	First article inspection	Comparison inspection	Quality conformance inspection	Requirement	Inspection
General examination	X	X	X	3.27	4.5
Effectiveness of enclosure	X	---	---	3.7	4.6.1
Creepage and clearance	X	X	---	3.2	4.6.2
Insulation resistance	X	X	---	3.13	4.6.3
Wiring	X	X	---	3.4	4.6.4
Warm-up	X	X	---	3.20	4.6.5
Performance	X	X	X	3.4	4.6.6
Trip duty	X	X	---	3.6	4.6.6.1
Inclined operation	X	X	---	3.19	4.6.7
Noise	X	X	---	3.17	4.6.8
Interference	X	---	---	3.18	4.6.9
Reliability	X	---	---	3.21	4.6.10
Maintainability	X	---	---	3.22	4.6.11
Dielectric strength	X	X	X	3.14	4.6.12
Vibration	X	---	---	3.15	4.6.13
Voltage surge	X	X	---	3.4.2	4.6.14
Humidity	X	---	---	3.10.2	4.6.15
Shock	X	X	---	3.16	4.6.16

4.6.3 Insulation resistance. Insulation resistance shall be as specified in 3.13. The measurement of insulation resistance shall be made with all circuits of different voltage above ground connected together. Circuits or groups of circuits of equal voltage shall be tested separately. Insulation resistance shall be measured with an insulation-resistance-indicating meter (500 volts direct current (dc)) conforming to type GC of MIL-0-16485. The time of test voltage application shall be not less than 60 seconds. Measurements shall be made at any convenient ambient temperature with all circuits cold. The relative humidity and ambient temperature shall be recorded. The monitor shall not be damaged when the main shipboard power circuit cables are being tested between phases or between phase and ground with the 500-volt dc tester.

4.6.4 Wiring. The connecting voltage leads and current sensing leads to the monitor shall be individually subjected to open circuit and grounded to determine that no damage occurs to the monitor.

4.6.5 Warm-up. When the monitor is subjected to nominal voltage and frequency at both 0 and 65°C ambient the equipment shall meet the requirements of 3.20.



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4.6.6 Performance. The monitor connection wiring diagram shown on figure 1 shall be used for this testing (see 3.4). The monitor tests shall be performed with each circuit breaker having a shunt trip and also a remote control switch. The opening coils of the above disconnect devices shall have a resistance from 15 to 400 ohms. The single phase monitor shall perform the functions specified herein when connected in either a single or three phase main power circuit of either 115 or 440 normal voltage and either a 60 or 400 Hz normal frequency. The monitor shall operate satisfactorily within the specified limits when the voltage is reduced to 85 percent of normal or raised to 10 percent above normal. The operating frequency range shall be plus or minus 5 percent of normal. The monitor shall perform satisfactorily when two cables are connected in parallel to form one leg of the load circuit and the current sensing transformer is placed around one cable only which has an available current of 1-1/2 amperes (plus or minus 15 percent) or more. Under the above conditions the monitor shall permit the load disconnect device to close and stay latched if a load of 1-1/2 amperes (plus or minus 15 percent) or more exists. When the above load is removed, the monitor shall actuate its normally open static contact to a closed position and cause the load disconnect device to open. The static normally open contact in the monitor shall have a 1-ampere continuous current carrying rating. The tests shall be performed over an ambient temperature range as specified in 3.10.1.

4.6.6.1 Performance latch and trip. During the testing of 4.6.6, it shall be demonstrated that the monitor has latched and tripped the associated disconnect device for at least 40 cycles of operation (see 3.6). For the duration of this test, a relay with a resistor load may be substituted to simulate a shunt trip function.

4.6.6.2 Reset. During the performance test, the available current shall be increased to 1-1/2 amperes. The current shall then be reduced to less than 1-1/2 amperes before the delay time is reached and the monitor sends a trip signal. The monitor shall reset.

4.6.7 Inclined operation. The monitor shall be tested for inclined operation at rated voltage and frequency. Inclination of the monitor in the following positions shall not affect the performance requirements of 3.4 and 3.19:

- (a) Inclined 45 degrees forward.
- (b) Inclined 45 degrees backward.
- (c) Inclined 45 degrees to the right side.
- (d) Inclined 45 degrees to the left side.

4.6.8 Noise. Noise tests shall be conducted in accordance with MIL-STD-740-1 for type 3 and grade C equipment (see 3.17). The monitor shall be energized simulating actual operation.

4.6.9 Interference. The monitor shall be tested in accordance with MIL-STD-462 as specified in 3.18.

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4.6.10 Reliability. Reliability tests shall be as follows:

4.6.10.1 Demonstration phase. Unless otherwise specified (see 6.2), the demonstration phase of reliability testing shall be conducted on at least 5 (but not more than 10) monitors in accordance with test plan IIIC of MIL-STD-781. The upper test MTBF shall be as specified in 3.21.

4.6.10.2 Test schedule. The test shall consist of an uninterrupted series of three 8-hour periods per day. One of the three periods shall be manned. The remaining two periods need not be manned.

4.6.10.3 Stress conditions. Unless otherwise specified below or in the contract or order (see 6.2), environmental and electrical stress conditions shall be as specified under the combined environments for shipboard equipment (sheltered) in appendix B of MIL-STD-781.

- (a) Electrical stress: When operation from two or more nominal voltages is required, the nominal voltage for reliability testing shall be the highest required nominal voltage.
- (b) Thermal stress: The test time for each thermal cycle shall be 8 hours.

4.6.10.4 Sampling phase. When specified (see 6.2), the sampling phase of reliability testing shall be conducted on at least 5 (but not more than 10) monitors in accordance with test plan IVC of MIL-STD-781. The upper test MTBF shall be as specified in 3.21. The test schedule and stress conditions of 4.6.10.2 and 4.6.10.3 shall apply.

4.6.11 Maintainability demonstration. When specified (see 6.2), conformance to 3.22 shall be verified through a maintenance demonstration procedure, maintenance task selection, and maintenance task performance in accordance with MIL-STD-471.

4.6.12 Dielectric strength.

4.6.12.1 General. The dielectric strength test shall be conducted following completion of the tests specified in 4.6.1 through 4.6.10. The dielectric test shall be made upon the completely assembled equipment and not upon individual parts (see 6.6).

4.6.12.2 Test voltage. The frequency of the testing voltage shall be not less than 60 Hz and shall approximate a true sine wave. The value of test voltage shall be as specified in 3.14 and shall be applied continuously for 1 minute. Rectifiers, bridges and zener references shall be shorted out before applying the voltage.

4.6.12.3 Measurement of test voltage. The measurement of the voltage used in dielectric tests shall be made by the voltmeter method whereby the

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meter derives its voltage from the high-voltage circuit either directly or by means of a voltmeter coil placed in the testing transformer, or through an auxiliary ratio transformer.

4.6.12.4 Points of application. The test voltage shall be successively applied between each electric circuit, and all other electrical circuits and grounded metal parts not electrically connected to it.

4.6.13 Vibration. Equipment shall be subjected to type I vibration tests in accordance with MIL-STD-167-1, when energized at approximately nominal voltage and frequency (see 3.15).

4.6.14 Voltage surge. The indicator shall be subjected to an impulse test of 450 volts with spikes to 2500 volts in accordance with MIL-STD-1399, section 300.

4.6.15 Humidity. Humidity tests shall be in accordance with method 507.2, procedure III of MIL-STD-810.

4.6.16 Shock. Shock tests shall be conducted in accordance with MIL-S-901 for grade A, class I equipment (see 3.16). After the shock tests, the equipment shall be spot checked for the specified operation (see 3.4).

4.6.16.1 Disposition. If a monitor passes the shock test, it may be furnished as an item under the contract or order after correction of possible minor damage and touch up of paint.

4.6.17 Nonconformance. For acceptance, the monitor shall be as follows:

- (a) Breakage or appreciable distortions shall not occur for any parts.
- (b) Electrical malfunction. The sensing features shall not malfunction, become inoperative or deviate from specifications.
- (c) Insulation resistance shall not vary from its original value.

4.7 Inspection of packaging. Sample stowage packs, and the inspection of the preservation-packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

## 5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.7.)

5.1 Packaging requirements. Monitors shall be preserved level A, C, or Commercial, packed level A, B, C or Commercial as specified (see 6.2) and

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marked in accordance with MIL-E-17555 and shall include bar codes and applicable packaging acquisition options therein as specified (see 6.2). In addition, for Navy acquisitions, the following applies:

(a) Navy shipboard stowage fire-retardant requirements.

- (1) Treated lumber and plywood. When specified (see 6.2), all lumber and plywood including laminated veneer material used in shipping containers and pallet construction, members, blocking, bracing, and reinforcing shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Levels A and B            -    Type II - weather resistant.  
Category I - general use.

Level C                    -    Type I - non-weather resistant.  
Category I - general use.

- (2) Fiberboard. When specified (see 6.2), fiberboard used in the construction of class-domestic, non-weather resistant fiberboard and cleated fiberboard boxes including interior packaging forms shall meet the flamespread and the specific optic density requirements of PPP-F-320 and amendments thereto.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not necessary.)

6.1 Intended use. The monitor is intended for use to sense a power circuit and permit the closing and latching of the associated disconnect device if a load in the specified range exists. When the load is removed for a period of time exceeding the preset delay interval, the monitor should signal the disconnect device to open.

6.2. Acquisition requirements. Acquisition documents must specify the following:

- (a) Title, number and date of this specification.
- (b) Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1).
- (c) When first article is required (see 3.1).
- (d) Whether dripproof or watertight enclosures are required (see 3.7).
- (e) Conditions for reliability tests, if other than specified herein (see 4.6.10).
- (f) Whether maintainability demonstration is required (see 4.6.11).
- (g) When fire-retardant treated materials are not required (see 5.1).
- (h) Level of preservation, packing and marking required (see 5.1).

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6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DoD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Reference Paragraph</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
3.25 and appendix A	DI-E-7031	Drawings, engineering and associated lists	Level 2
3.26	DI-V-7002	Provisioning parts list	
4.3	DI-T-4901	First article inspection procedure	
4.3	DI-T-4902	First article inspection report	
4.4	DI-T-5329	Inspection and test reports	

The above DID's were those cleared as of the date of this specification. The current issue of DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, military specifications and standards that have been cleared and listed in DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract.

6.5 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the items should be a first article sample and the number of items to be tested as specified in 4.3. The contracting officer should also 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 for first article inspection 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. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

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6.6 Provisioning. Spare parts, and repair parts should be furnished as specified in the contract. When ordering spare parts or repair parts, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

6.7 Sub-contractor material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.8 Subject term (key word) listing.

Dripproof  
Watertight

6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:  
Navy - SH  
(Project 5925-N115)

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## APPENDIX

## DRAWING TECHNICAL CONTENT REQUIREMENTS

## 10. SCOPE

10.1 Scope. This appendix covers the technical content requirements that should be included on drawings when required by the contract or order. This appendix is mandatory only when the appropriate data item description is cited on the DD Form 1423.

## 20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

## 30. DRAWINGS

30.1 Drawings. When required by the contract or order, drawings shall contain the following information:

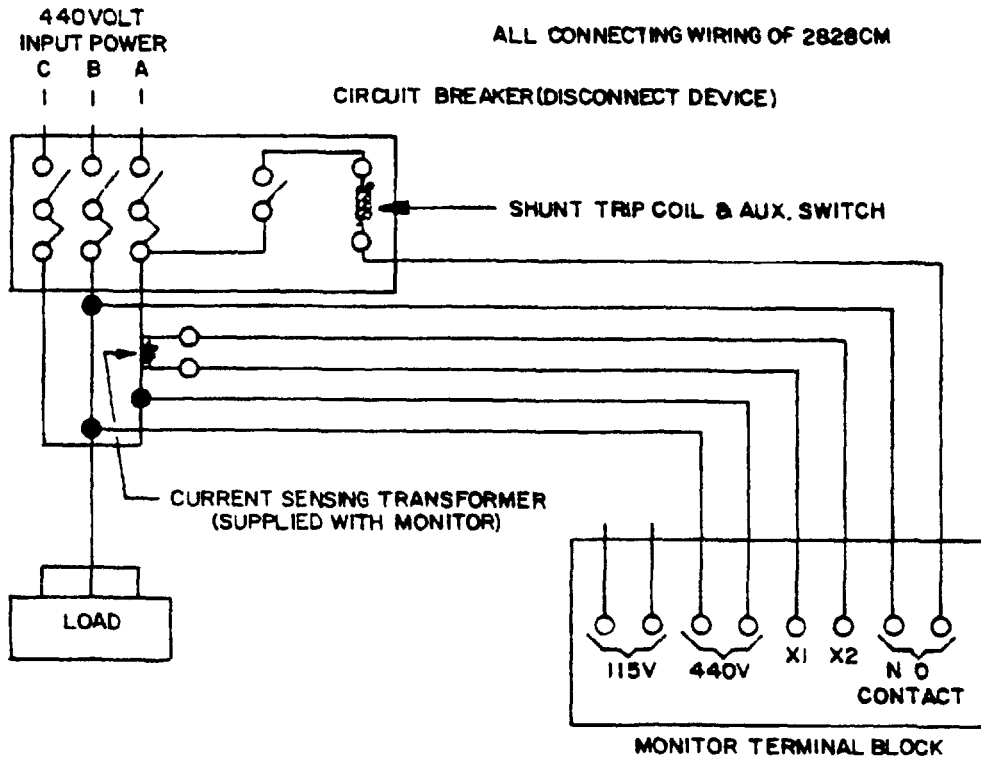
- (a) Manufacturer's name and catalog number or equivalent identification of the equipment.
- (b) List of descriptive data of the equipment including:
  - (1) Applicable specification and exceptions.
  - (2) Complete rating showing input voltage frequency, number of phases, etc.
  - (3) Duty.
  - (4) Shock classification.
  - (5) Enclosure classification.
  - (6) Ventilation.
  - (7) Vibration classification, noise classification.
  - (8) Ambient temperature.
  - (9) Temperature limits (when specified).
  - (10) Weight of equipment (net).
  - (11) Notification of the corrosion-resistant treatment of all hardware.
  - (12) Special features.
- (c) A complete external wiring connection diagram, a complete wiring diagram and a complete schematic circuit.
- (d) Finish, including method of treatment of enclosure for paintings, color and applicable specification of paint.
- (e) List of material excluding items of hardware.



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- (f) Outline of equipment showing overall and principal dimensions of front, side, top and sectional views, as necessary, to show approximate mounting arrangement and location of components of list of material. Components shall be flagged by items or piece number. Views shall show identification and information plates with data to appear thereon.
- (g) A table of insulation indicating the location, class of insulation, insulation material and applicable specifications and remarks.
- (h) A table or list of component units such as transformers, diodes, resistors, capacitors, and similar items giving piece number, type, and rating of capacitors, and similar items giving piece number, type, and rating of each. This data is a supplement to the list of material where space normally does not permit complete listing of component rating. Rating shall include both manufacturer's rating and the specific application rating.
- (i) Outline dimensional drawings of component units such as transformers, reactors, transformer and reactor cores, capacitors and similar items except for those components which have received separate qualification approval under applicable component specifications in which case the components shall be identified by making reference to the contracting activity approval letter and the test report number.
- (j) Transformer and reactor data:
  - (1) Core material and core or lamination form and size (including stack height). If core boxes are used, the material and size of the box shall be given.
  - (2) Winding data including number of turns, tape, wire size and specification type designation, insulation, method of impregnation and treatment and dc resistance at a specified temperature.
  - (3) If potted, the method of potting and potting compound should be identified.
  - (4) Identification as to where used.

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Typical wiring shown for monitor when connected to a circuit breaker with shunt trip coil on a 440 volt circuit. Monitor normally open static contact is rated at 1 ampere continuous.

In each application the 115 volt-115 volt or 440 volt-440 volt terminals, as applicable, shall be connected to the load side of the main circuit disconnect device

FIGURE 1. Typical external wiring connections to monitor.

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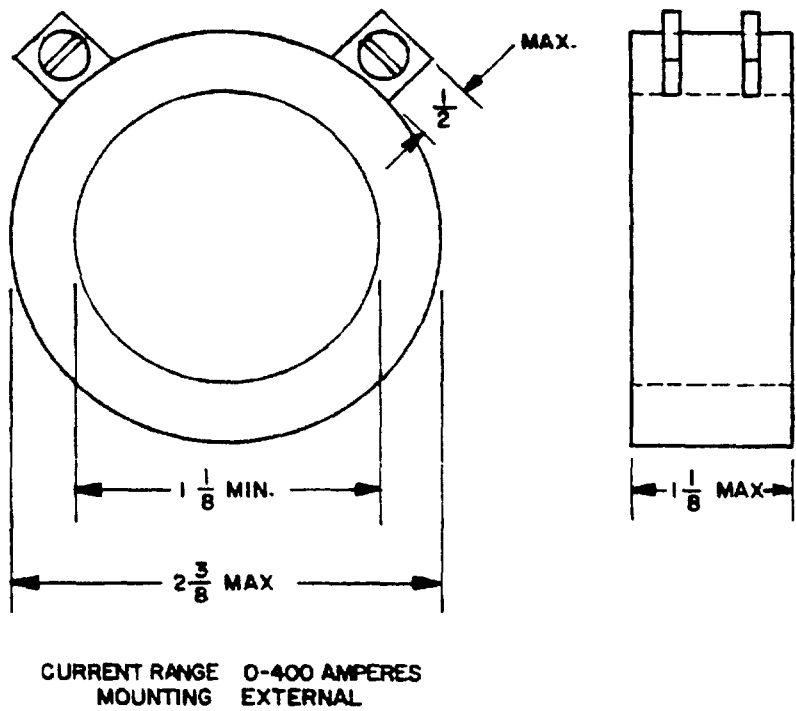
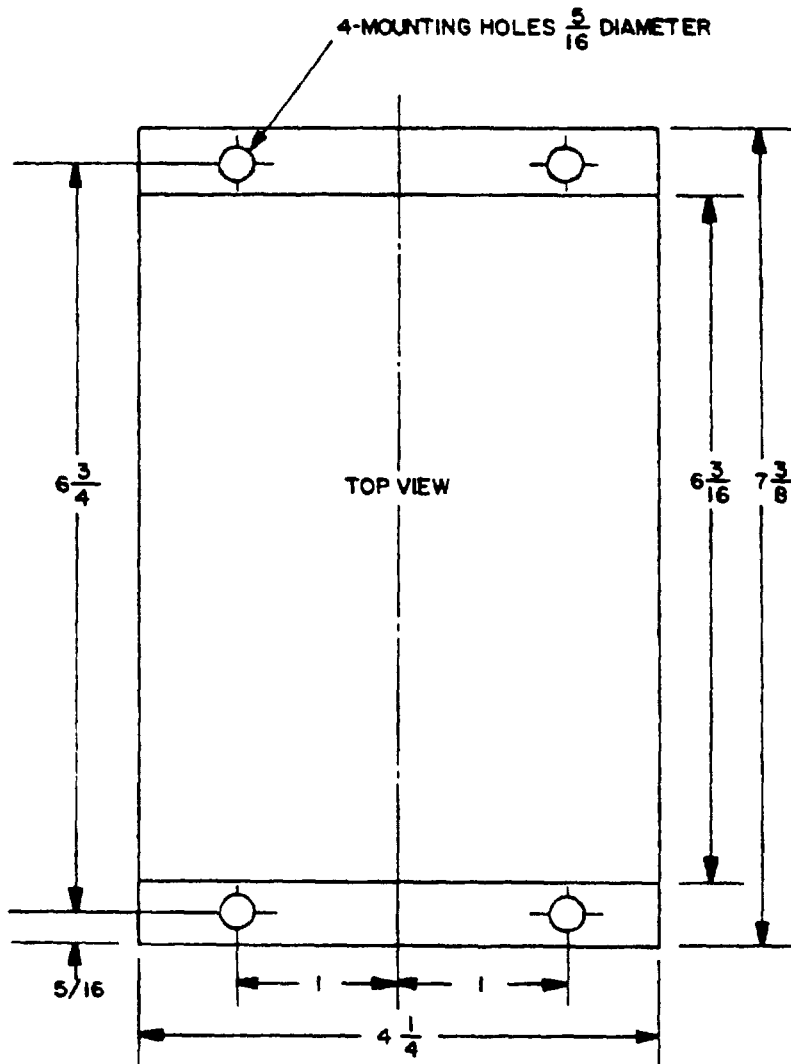


FIGURE 2. Outline dimensions for monitor current sensing transformer.

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4 INCHES OVERALL DEPTH OF ENCLOSURE-(MAX.)

FIGURE 3. Monitor outline and mounting dimensions.



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