



PART NO. MS90412-1  
WEIGHT: 0.8 POUNDS MAX

#### NOTES:

1. DIMENSIONS ARE IN INCHES: TOLERANCE : 1/32 INCH UNLESS OTHERWISE SPECIFIED.
2. ALL OUTLINE DIMENSIONS ARE LIMITING DIMENSIONS ONLY.
3. FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN.
4. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BIDS OR REQUEST FOR PROPOSAL, EXCEPT THAT REFERENCED ADOPTED INDUSTRY DOCUMENTS SHALL GIVE THE DATE OF THE ISSUE ADOPTED.

#### REQUIREMENTS:

1. ANY PROTRUSIONS SUCH AS SCREW AND RIVETS HEADS AND BOSSES SHALL BE CONTAINED WITHIN THE OUTLINE SHOWN.
2. THE UNDERFREQUENCY PROTECTOR SHALL BE COMPATIBLE WITH THE AC GENERATING SYSTEM DESCRIBED IN MS21970. RELAYS INCORPORATED IN THE UNDERFREQUENCY PROTECTOR SHALL COMPLY WITH MILITARY SPECIFICATION MIL-R-5757.
3. THE UNDERFREQUENCY PROTECTOR SHALL BE CAPABLE OF BREAKING THE CIRCUITS A-A AND B-B (SEE WIRING DIAGRAM ABOVE) ANY TIME THE INPUT FREQUENCY IS LESS THAN 725Hz AND SHALL CLOSE CIRCUITS A-A AND B-B WHENEVER THE INPUT FREQUENCY IS ABOVE 775 Hz AT SEA LEVEL AMBIENT CONDITIONS. THERE SHALL BE A MINIMUM DIFFERENCE BETWEEN CLOSING AND OPENING OF 20Hz.
4. THE COMPLETE REQUIREMENT FOR PROCURING THE UNDERFREQUENCY PROTECTOR DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND MIL-G-21480 (AS) AS AMENDED OR DELETED BELOW. IN ALL INSTANCES SUBSTITUTE UNDERFREQUENCY PROTECTOR FOR "GENERATOR", "EXCITER", "REGULATOR" AND/OR "SUPERVISORY PANEL".

REVISED AND REDRAWN

P.A. NAVY - AS Other Code	TITLE  PROTECTOR, UNDERFREQUENCY A-4E, A-4F AIRCRAFT	MILITARY STANDARD
PROCUREMENT SPECIFICATION MIL-G-21480	SUPERSEDES:	MS90412 (AS)
SHEET 1 OF 2		

This military standard is approved by NAVAL AIR SYSTEMS COMMAND, Department of the Navy and shall be used by the military. All other military activities are required to employ this standard where suitable.

DD FORM 672-1 (Limited coordination)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

PROJ. NO. 6115-N381

PLATE NO. 23071

APPROVED 7 FEB 1966 REVISED 26 MARCH 1978

FED. SUP CLASS  
6115

- 1.1 SCOPE: DELETE AND ADD: THIS SPECIFICATION COVERS THE REQUIREMENTS FOR AN UNDERFREQUENCY PROTECTION UNIT TO BE USED WITH AN AIRCRAFT CONSTANT FREQUENCY 400 Hz ELECTRIC POWER SYSTEM.
- 3.4.10.1 VOLTAGE SETTING: DELETE AND ADD: THE VOLTAGE APPLIED BETWEEN PINS A AND B WILL BE  $39 \pm 1$  VOLT.
- 3.4.13 IDENTIFICATION OF PRODUCT: DELETE AND ADD: NAMEPLATE SHALL BE IN ACCORDANCE WITH MIL-N-16307
- 3.5.7.1 FALSE TRIPS: CHANGE TO READ: "NO TRIPPING OF THE GENERATOR SYSTEM SHALL BE CAUSED BY BUILD UP, LOAD SWITCHING, INPUT SPEED ACCELERATION OR DECELERATION, DURING EXTERNAL POWER APPLICATION OR FAULT CLEARING OUTSIDE THE OPERATING BAND OF THE UNDERFREQUENCY PROTECTOR.
- 3.5.7.4 UNDERFREQUENCY: CHANGE TO READ: "THE UNDERFREQUENCY PROTECTOR SHALL PROVIDE MEANS OF PREVENTING A FREQUENCY OF LESS THAN 362.5 Hz BEING IMPRESSED ON THE LOAD BUS FOR A PERIOD IN EXCESS OF 0.1 SECONDS. THE DEVICE SHALL HAVE A MAXIMUM PICK-UP OF 387.5 Hz.
- 4.2.1.1 QUALIFICATION: ADD: QUALIFICATION TESTS SHALL BE SUPPLEMENTED WITH A MINIMUM 100 HOUR FAILURE FREE FLIGHT TEST BEFORE CONSIDERATION IS GIVEN TO INCORPORATING THE ITEM ON THE QUALIFIED PRODUCTS LIST.
- 4.5.14 DELETE (a), (b), (c), (d) and (e) and add:
- (a) WITH THE UNDERFREQUENCY PROTECTOR CONNECTED INTO THE AC GENERATING SYSTEM MS21970, IT SHALL BE CAPABLE OF MEETING WITHIN 0.5% OF THE CONDITIONS OF REQUIREMENT 3 WHEN SUBJECTED TO THE FOLLOWING AMBIENT TEMPERATURES AND ALTITUDES: SEA LEVEL +125°C AND 50,000 FEET AT -55°C.
- (b) THE UNDERFREQUENCY PROTECTOR SHALL BE SUBJECTED TO THE VIBRATION TESTS OF MIL-E-81910, AFTER WHICH IT SHALL MEET THE CONDITIONS OF REQUIREMENT 3.
- 6.1 DELETE AND ADD: INTENDED USE: "THE UNDERFREQUENCY PROTECTOR MAY BE INSTALLED IN THE SYSTEM REGULATOR CIRCUIT (MS21790) SO AS TO AUTOMATICALLY DEENERGIZE THE GENERATOR DURING SHUT-DOWN AND/OR CONSTANT SPEED DRIVE MALFUNCTION SO THAT LOW/FREQUENCY POWER WILL NOT BE APPLIED TO THE AIRCRAFT BUS.

DELETE ALL REFERENCE TO AND REQUIREMENTS OF: 3.4.6 THROUGH 3.4.10, 3.4.12.1, 3.4.13.1 THROUGH 3.4.14, 3.5 THROUGH 3.5.6, 3.5.7.2, 3.5.7.3, 3.5.7.5 THROUGH 3.5.7.7, 4.3 THROUGH 4.4.4, 4.5.2 THROUGH 4.5.4.2, 4.5.6 THROUGH 4.5.11, 4.5.13, 4.5.15 THROUGH 4.5.19, 4.5.20.2, 4.5.23, 4.5.26 THROUGH 4.5.29, 4.5.31, 4.5.33.1.

APPROVED 7 FEB 1966 REVISED (E) FOR CHARGES SEE SHEETS 1 AND 2

P.A. NAVY - AS Other Cust	TITLE PROTECTOR, UNDERFREQUENCY A-4E, A-4F AIRCRAFT	MILITARY STANDARD
PROCUREMENT SPECIFICATION MIL-G-21480	SUPERSEDES:	MS90412 (AS)
		SHEET 2 OF 2