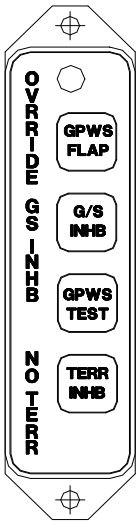
INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

MD41-1300 Series Terrain Awareness Annunciation Control Unit for Honeywell Mark VII EGPWS Systems

MFG. P/N: MD41-1310	28VDC	Vertical Mount , (shown on page 11)
MFG. P/N: MD41-1310(5V)	28VDC	Vertical Mount, 5 volt lighting
MFG. P/N: MD41-1311	28VDC	Horizontal Mount, (shown on page 11)
MFG. P/N: MD41-1311(5V)	28VDC	Horizontal Mount, 5 volt lighting



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Manual Number 9012204
REV. 2 November 25, 2003

MANUAL REVISION AND HISTORY

MANUAL: MD41-1310, -1311, -1310(5V), -1311(5V)
REVISION: Rev. 1 August 06, 2002
MANUAL NUMBER: 9012204

Environmental test were DO160C, now DO160D.

Updated schematics to Mod 1 status. This mod must be incorporated to comply with DO160D Section 16.

Added TSO C151a

REVISION: Rev. 2 November 25, 2003

Corrected typo, section 1.2.4.1. Was TWAS, now TAWS

TABLE OF CONTENTS

SECTION 1 GENERAL DESCRIPTION

1.1 INTRODUCTION

The MD41-1300 series are compact, self -contained Annunciation and Control Units (ACU). The fully integrated, control units provides annunciation and mode selection for both TAWS (Terrain Awareness Warning System) and EGPWS (Enhanced Ground Proximity Warning systems).

Other features include dual 20,000 hour lamps used for all annunciations, internally lighted selection switches and choice of manual or automatic photocell dimming. An external annunciation dimming adjustment is provided for balancing low level light conditions.

1.2 SPECIFICATIONS, TECHNICAL

1.2.1 PHYSICAL CHARACTERISTICS

Mounting:	Panel
Width:	3.25 Inches
Height:	.80 Inches
Depth:	3.20 Inches
Weight:	0.50 lbs.

1.2.2 ENVIRONMENTAL CHARACTERISTICS

TSO Compliance:	C151a
PMA Compliance:	PQ3738CE
Applicable Documents:	RTCA DO-160D
Operating Temperature Range:	-55°C to +70°C
Humidity:	95% Non-Condensing
Altitude Range:	0 to 55,000 ft.
Operational Shock:	Rigid Mounting, 6 G Operational 20 G Crash Safety

1.2.3 SPECIFICATIONS, ELECTRICAL

Design	All Solid State
MD41-1310, -1311	0.30 Amps
MD41-1310(5V), -1311(5V)	0.40 Amps

1.2.4 FRONT PANEL CONTROLS AND ANNUNCIATIONS

1.2.4.1 CONTROLS

GS/INHB	Momentary Switch, when pressed, will disable or enable glideslope.
GPWS TEST	Momentary switch, when pressed, will activate the TWAS computer self-test.
TERR/INHB	Alternate action switch, when pressed, will place TAWS/EGPWS computer in standby mode.
GPWS FLAP	Alternate action switch.

1.2.4.2 ANNUNCIATIONS

NO/TERR (amber)	Terrain information is not available.
GS/INHB (amber)	Glide-slope information to EGPWS has been disabled.
OVERRIDE (amber)	Flap override.

1.2.5 EQUIPMENT LIMITATIONS

The MD41-1300 series control units contain specific dash numbers to be used with various Terrain Awareness Warning Systems. The installer must match the correct controller part number with the system that is being installed.

The MD41-1310, -1311, -1310(5V), -1311(5V) is TSO'D and certified for use with the Honeywell Mark VII EGPWS systems. Any attempts to install the listed units in an installation other than above system is prohibited. **This will void the TSO.**

NOTE: If the MD41-( ) is disconnected or removed from the aircraft, there will be no effect in the operation of the EGPWS system.

1.2.6 MAJOR COMPONENTS

This system is comprised of one major component, the MD41-1300 series TAWS Annunciation Control Unit.

SECTION 2 INSTALLATION CONSIDERATIONS

2.1 COOLING

No direct cooling is required. As with any electronic equipment, overall reliability may be increased if the MD41-1300 series ACU is not located near any high heat source or crowded next to other equipment. Means of providing a gentle air flow will be a plus.

2.2 EQUIPMENT LOCATION

The MD41-1300 series ACU must be mounted as close to the pilot's field of view as possible. Please reference the EGPWS installation manual for approved locations. The unit depth, with connector attached, must also be taken into consideration.

2.3 ROUTING OF CABLES

Care must be taken not to bundle the MD41-1300 series ACU logic and low level signal lines with any high energy sources. Examples of these sources include 400 HZ AC, Comm, DME, HF and transponder transmitter coax. Always use shielded wire when shown on the installation print.

Avoid sharp bends in cabling and routing near aircraft control cables.

SECTION 3 INSTALLATION PROCEDURES

3.1 GENERAL INFORMATION

This section contains interconnect diagrams, mounting dimensions and other information pertaining to the installation of the MD41-1300 series ACU. After installation of cabling and before installation of the equipment, ensure that power is applied only to the pins specified in the interconnect diagram.

3.2 UNPACKING AND INSPECTING EQUIPMENT

When unpacking equipment, make a visual inspection for evidence of damage incurred during shipment. The following parts should be included:

1. MD41-1310 (28volt) 28 volt button lighting Vertical Mount or
   MD41-1310(5v) (28volt) 5 volt button lighting Vertical Mount or
   MD41-1311 (28volt) 28 volt button lighting Horizontal Mount or
   MD41-1311(5v) (28volt) 5 volt button lighting Horizontal Mount
2. J1 Connector Kit (25 pin). MCI P/N 7014517
3. Installation Manual. MCI P/N 9012204

3.3 MOUNTING THE MD41-( )

Avoid mounting close to heater vents or other high heat sources. Allow a clearance of at least 3 inches from back of unit for plug removal.

The indicator is secured in place behind the panel since it is designed for rear mount only. Make a panel cutout as shown in Figure 3-2. Secure the indicator in place with two 4-40 x 3/8 flat head phillips screws.

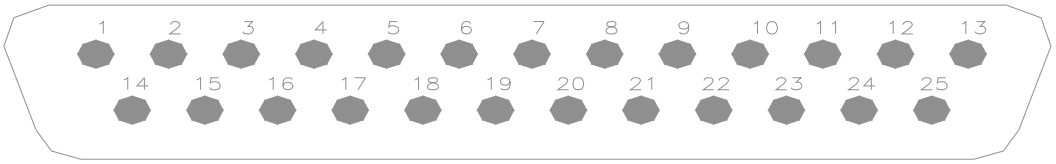
3.4 INSTALLATION LIMITATIONS

Wire the aircraft harness according to figure 3-3 or 3-4. Use at least 24 AWG wire for all connections. Avoid sharp bends and routing cable near high-energy sources. Care must be taken to tie the harness away from aircraft controls and cables. Also see equipment limitations, section 1.2.5.

"The TSO identifies the minimum performance standards, tests and other conditions applicable for issuance of design and production approval of the article. The TSO does not specifically identify acceptable conditions for installations of the article. The TSO applicant is responsible for documenting all limitations and conditions suitable for installation of the article. An applicant requesting approval for installation of the article within a specific type or class of product is responsible for determining environmental and functional compatibility."

This Annunciation Control Unit is part of an incomplete system. The intended function is to provide required or optional annunciation and mode selection for Class A or B TAWS systems.

J1 CONNECTOR

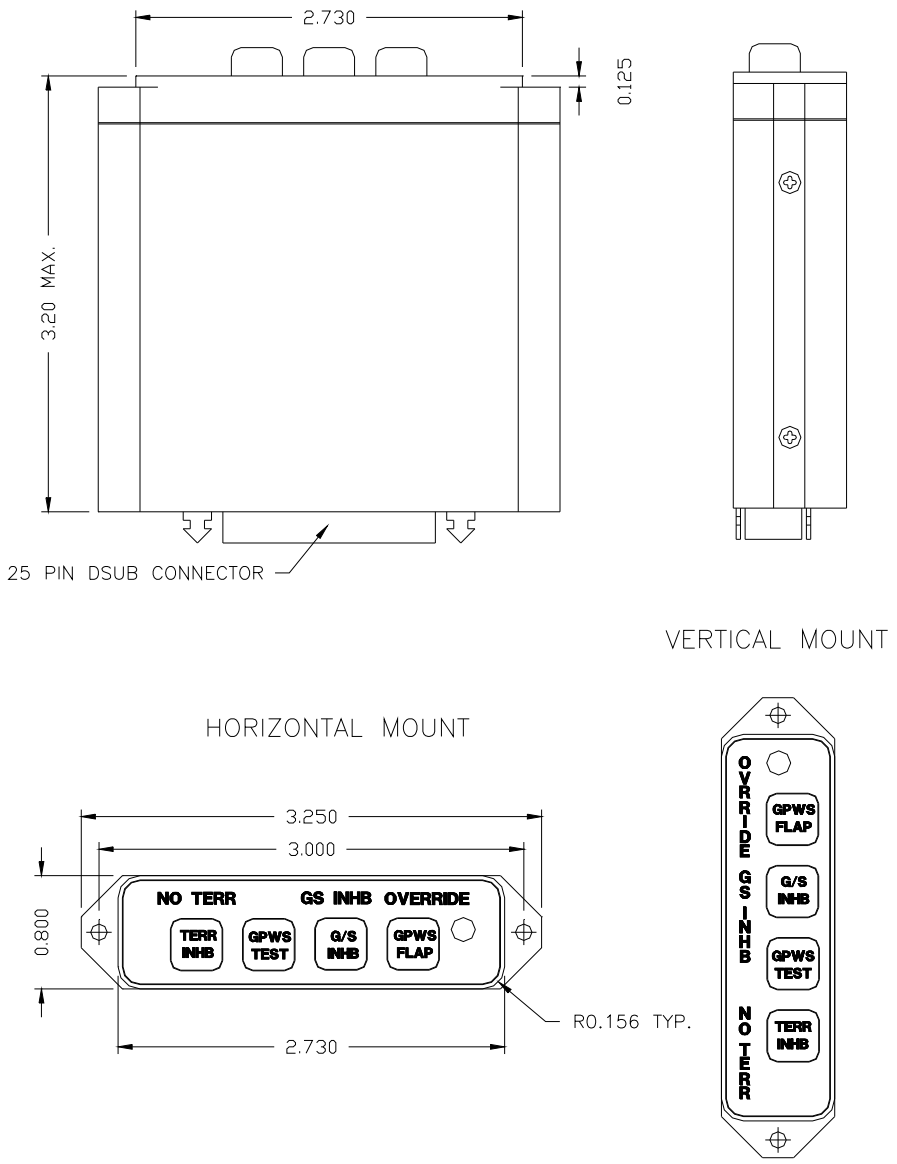


REAR VIEW OF J1 (bottom) CONNECTOR

J1
PIN NO.

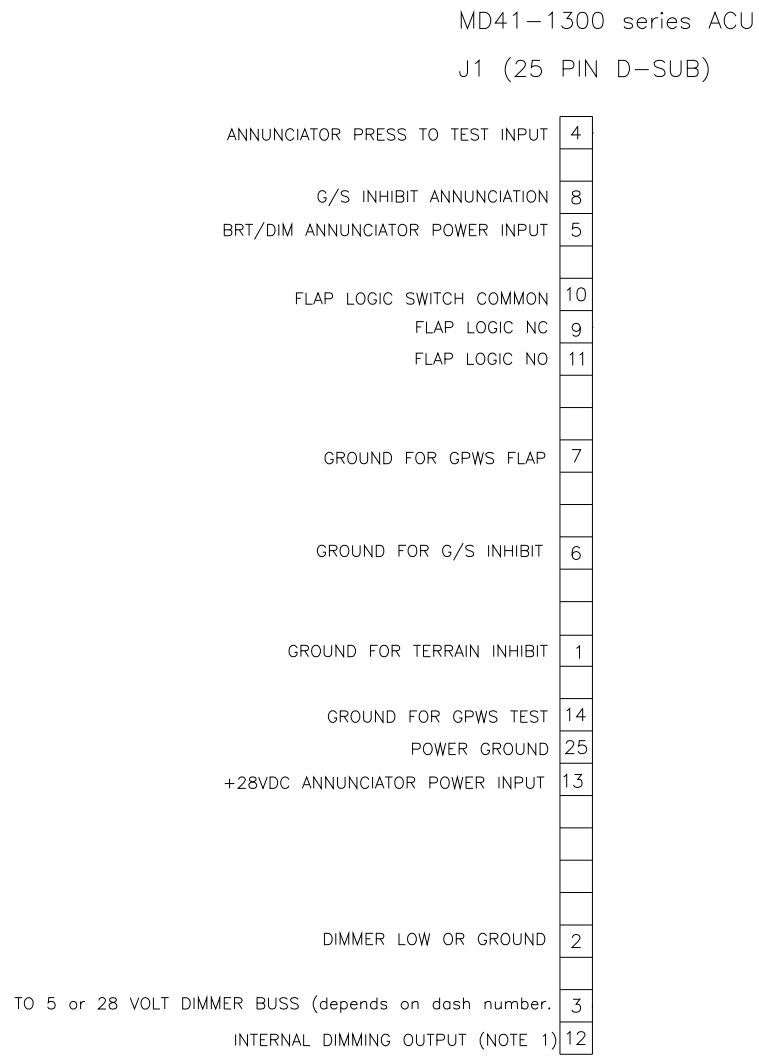
1 ----------	Terrain Inhibit select switch. Alternate action switch, provides ground output to select.
2 ----------	Ground for push-button lighting.
3 ----------	Push Button Lighting. To 28V or 5Vdc lighting buss. Depends on dash number.
4 ----------	LAMP TEST (receives ground from remote test switch)(optional conn).
5 ----------	Bright/Dim annunciation lamp power. 28Vdc for bright, 18Vdc for dim.
6 ----------	GD inhibit select output. Momentary switch, provides ground output to select.
7 ----------	GPWS FLAP annunciate input. Receives logic low to annunciate.
8 ----------	GS Inhibit annunciate input. Receives logic low to annunciate.
9 ----------	Flap logic normally closed contact.
10 ----------	Flap logic switch common
11 ----------	Flap logic normally open contact.
12 ----------	Internal photocell dimming output. To use, jumper pin 12 to pin 5.
13 ----------	28 Vdc unit power. 300 mA max.
14 ----------	Terrain Self-Test switch. Momentary switch, provides ground output to select.
15 ----------	Spare
16 ----------	Spare
17 ----------	Spare
18 ----------	Spare
19 ----------	Spare
20 ----------	Spare
21 ----------	Spare
22 ----------	Spare
23 ----------	Spare
24 ----------	Spare
25 ----------	Power Ground

FIGURE 3-1 SCHEMATIC PINOUT, 25 PIN DSUB



Note 1: Use two 4-40 X 3/8" Flat Head Phillips Screws for Mounting

FIGURE 3-2 OUTLINE DRAWING



NOTES:

1) Use Honeywell Installation Design Guide Dwg. No. 060−4199−225 for interfacing MD41−1300 series ACU to Mark VII.
2) Unit shall incorporate both photocell and external dimmimg input. This is configured by installer.
3) Jump the internal dimming output (PIN 12) to BRT/DIM input (PIN 5) to use internal dimming circuit, otherwise leave it open.

FIGURE 3-3 WIRING DIAGRAM, MD41-1310, -1311

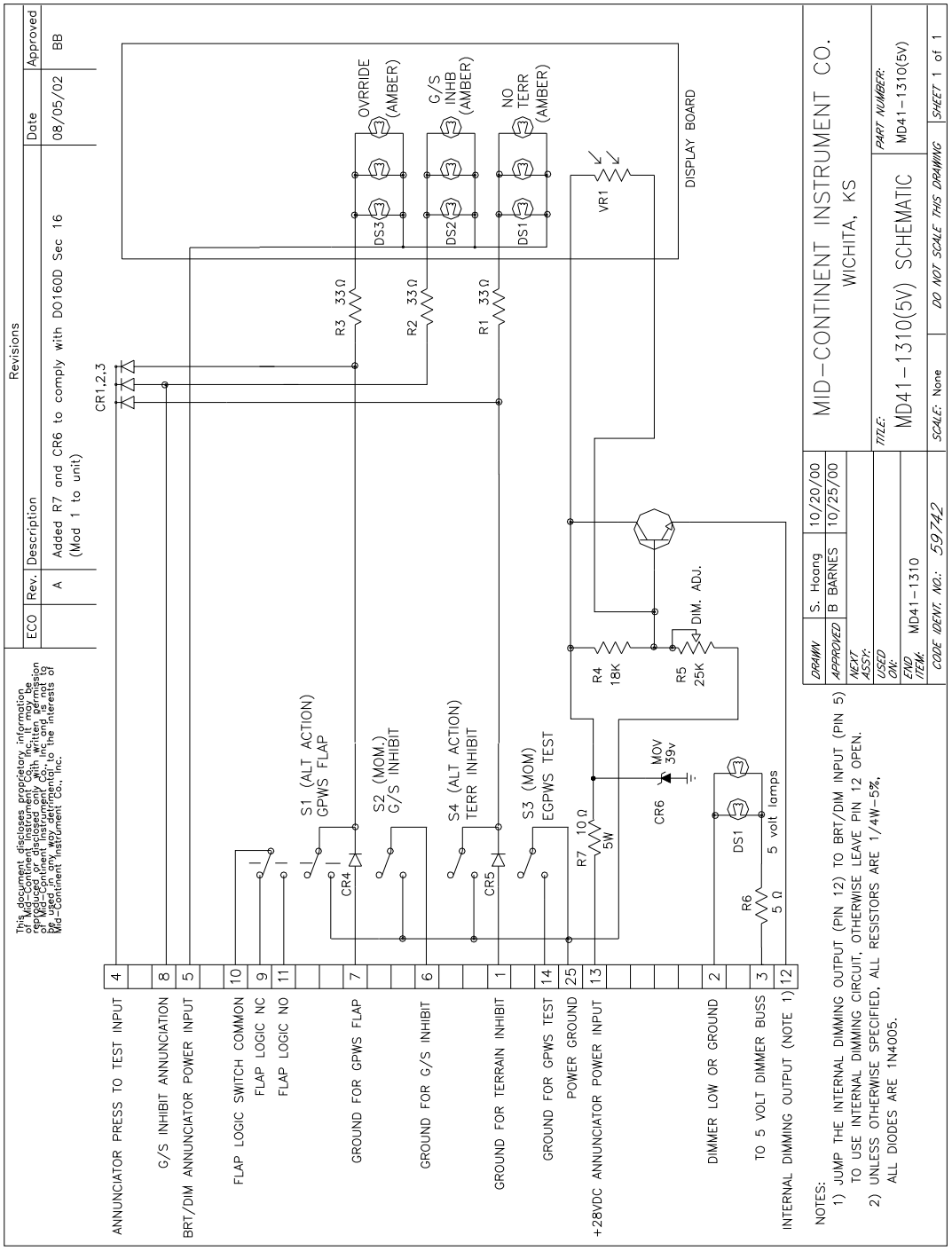


FIGURE 3-4 SCHEMATIC, MD41-1310(5V)

SECTION 4 POST INSTALLATION CHECKOUT

4.1 PRE INSTALLATION TESTS

With the MD41-1310, -1311 disconnected, turn on the avionics master switch and verify that aircraft power is on pin 13 for. Using an ohm-meter, verify pin 25 is aircraft ground.

4.2 OPERATING INSTRUCTIONS

Refer to the EGPWS pilots guide or installation manual for final testing of the MD41-1310, -1311. Unit should be tested in accordance with the Mark VII preflight test procedure.

SECTION 5 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

5.1 INTRODUCTION

This document identifies the instructions for Continued Airworthiness for the MD1300 series TAWS Annunciation Control Unit.

5.2 CONTROL, OPERATION INFORMATION

Refer to the Honeywell Mark VII Pilots Guide and section 1.2.4 of this manual.

5.3 MAINTENANCE INSTRUCTIONS

Repair of the MD41-1300 ACU is “on condition only”, periodic maintenance is not required.

Calibration and inspection intervals are not required. Service life will be a minimum of 20,000 hours.

5.4 TROUBLESHOOTING INFORMATION

Refer to the MD41-1300 series Maintenance Manual.

5.5 REMOVAL AND REPLACEMENT INFORMATION

If the unit is removed and reinstalled, a functional check of the equipment should be conducted in accordance with the Mark VII preflight test procedure.

5.6 DIAGRAMS

Refer to figure 3-2, 3-3 and 3-4 of this manual.

5.7 SPECIAL INSPECTION REQUIRMENTS

N/A

5.8 SPECIAL TOOLS

None

5.9 OVERHAUL PERIOD

No overhaul time limitations.

ENVIRONMENTAL QUALIFICATION FORM

RTCA / DO160D

NOMENCLATURE: MD41-( ) TERRAIN AWARENESS ANNUNCIATION CONTROL UNIT

MODEL NO: MD41-( ) TSO C151a

MANUFACTURER: Mid-Continent Instruments and Avionics
9400 E. 34th Street N.
Wichita, KS 67226
Phone (316) 630-0101

Conditions	Section	Description of Conducted Tests
Temperature and Altitude Low Temperature High Temperature In-Flight Loss of Cooling Altitude Decompression Overpressure	4.0 4.5.1 4.5.2 & 4.5.3 4.5.4 4.6.1 4.6.2 4.6.3	Equipment tested to Category A1 and F2 Cooling air not required Not Tested **Note:** DO160D section 4.0 is equivalent to already tested DO160C section 4.0
Temperature Variation	5.0	Equipment tested to Category C **Note:** DO160D section 5.0, category C is equivalent to already tested DO160C section 5.0, category C
Humidity	6.0	Equipment tested to Category A **Note:** DO160D section 6, category A is equivalent to already tested DO160C section 6, category A
Shock Operational Crash Safety	7.0 7.2 7.3	Equipment tested to Category B
Vibration	8.0	Aircraft type 1 (helicopter) tested to category U Aircraft type 2 through 6 tested to category S
Explosion	9.0	Equipment identified as Category X, no test required
Waterproofness	10.0	Equipment identified as Category X , no test required

Environmental Qualification (cont.)

Conditions	Section	Description of Conducted Tests
Fluids Susceptibility	11.0	Equipment identified as Category X, no test required
Sand and Dust	12.0	Equipment identified as Category X, no test required
Fungus	13.0	Equipment identified as Category X, no test required
Salt Spray	14.0	Equipment identified as Category X, no test required
Magnetic Effect	15.0	Equipment tested to Class Z **Note:** DO160D section 15.0 is equivalent to already tested DO160C section 15.0
Power Input	16.0	Equipment tested to Category B
Voltage Spike	17.0	Equipment tested to Category A **Note:** DO160D section 17.0, category A is equivalent to already tested DO160C section 17.0, category A
Audio Frequency Susceptibility	18.0	Equipment tested to Category B **Note:** DO160D section 18.0, category B is equivalent to already tested DO160C section 18.0, category B
Induced Signal Susceptibility	19.0	Equipment tested to Category A **Note:** DO160D section 19.0, category A is equivalent to already tested DO160C section 19.0, category A
Radio Frequency Susceptibility	20.0	Equipment tested to Category T
Radio Frequency Emissions	21.0	Equipment tested to Category B and M
Lightning Induced Transient Susceptibility	22.0	Equipment tested to Category A3C3
Lightning Direct Effects	23.0	Equipment identified as Category X, no tests required
Icing	24.0	Equipment identified as Category X, no test required