



# COMPLIANT ARC FLASH & ELECTRIC SHOCK EQUIPMENT LABELS

RELEASE DATE: March 31, 2024



**TW BECKER**  
ELECTRICAL SAFETY CONSULTING

## ELECTRICAL SAFETY BULLETIN

As outlined in NFPA 70E Article 130.5(H) or CSA Z462 Clause 4.3.5.7 arc flash and electric shock equipment labels can be applied to electrical equipment where incident energy analysis, the arc flash PPE category table method (NFPA 70E) or arc flash PPE selection table method have been used.

Additionally the employer can provide incident energy values and the arc flash boundary distance using a “Result Table” from an engineering study.

The equipment labels shall be ANSI Z535 Product Safety Signs and Labels.

CSA Z462 also includes Annex Q (authored and submitted by Terry Becker, P.Eng.) that provides additional information with respect to the simple Warning equipment label required by the CE Code Part I, Rule 2-306 and an example of compliant detailed arc flash and shock equipment label as Figure Q.3.

Over the years commercially available power system study software vendors have included a variety of templated options for arc flash and shock equipment labels and many of them would not provide information on them that we be correct. For example including an HRC #, Level “letter,” Level #,” or CAT “#” on an arc flash and shock equipment label provided based on incident energy analysis was not compliant.

Arc-rated PPE is specified as outlined in NFPA 70E Table 130.5(G) or CSA Z462 Table 2 (2024 Edition) with a recommended two arc-rated PPE levels, an ATPV of 1.2 – 12.0 cal/cm<sup>2</sup> everyday task wear or an arc flash suit with an ATPV >12.0 cal/cm<sup>2</sup>.

One of the most important pieces of information on the equipment label is in the footer where the equipment label needs to indicate the:

**Electrical Equipment ID: BATT0-1**

**Electrical Protective Device ID: LOAD SIDE, LINE SIDE or BUS** (and location of the incident energy in relation to the electrical protective device).

The following detailed arc flash and shock equipment labels are compliant.



# WARNING

## Arc Flash and Shock Hazard

**REFER TO [COMPANY]  
ELECTRICAL MAINTENANCE DEPARTMENT  
ARC FLASH INCIDENT ENERGY STUDY RESULTS  
TABLE OR CMMS ASSET RECORD FOR  
ARC FLASH & SHOCK DATA**

CONTACT PHONE: (XXX) XXX-XXXX

Building ID, Office ID

Table 6.1 – Arc-Flash Analysis Summary Table

Bus Name	Device Name	Bus KV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Blk. Opening (s.)	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm <sup>2</sup> )
01ES-2501-A	50/51-2501-09A	25.00	6.29	1.88	1.88	1.95	0.05	28' 2"	3'	105
01ES-2501-A (Line Side)	50/51-25-26.122	25.00	6.29	4.42	4.42	1.086	0.05	27' 9"	3'	102
01ES-2501-B	50/51-2501-9B	25.00	6.29	1.88	1.88	1.95	0.05	28' 2"	3'	105
01ES-2501-B (Line Side)	50/51-25-26.122	25.00	6.29	4.42	4.42	1.086	0.05	27' 9"	3'	102
01ES-2502-A	50/51-2502-02A	25.00	5.81	1.40	1.40	1.95	0.05	23' 9"	3'	75
01ES-2502-A (LineSide)	50/51-2501-10A	25.00	5.81	4.42	4.42	0.551	0.05	20'	3'	53
01ES-2502-B	50/51-2502-02B	25.00	5.81	1.40	1.40	1.95	0.05	23' 9"	3'	75
01ES-2502-B (Line Side)	50/51-2501-10B	25.00	5.81	4.42	4.42	0.551	0.05	20'	3'	53
01ES-2503-A	50/51-2501-09A	25.00	6.29	4.42	4.42	0.231	0.05	13' 5"	3'	24
01ES-2503-A (LineSide)	50/51-01ES-2503-01A	25.00	6.29	1.88	1.88	0.77	0.05	17' 11"	3'	43
01ES-2503-B	50/51-2501-09A	25.00	6.29	4.42	4.42	0.231	0.05	13' 5"	3'	24
01ES-2503-B (LineSide)	50/51-01ES-2503-01B	25.00	6.29	1.88	1.88	0.77	0.05	17' 11"	3'	43
01ES-2504-A	50/51-2502-02A	25.00	5.81	4.41	4.41	1.086	0.05	25' 11"	3'	89
01ES-2504-A (LineSide)	50/51-2504-01A	25.00	5.81	1.41	1.41	1.95	0.05	28' 10"	3'	111
01ES-2504-B	50/51-2502-02B	25.00	5.81	4.41	4.41	1.086	0.05	25' 11"	3'	89
01ES-2504-B (LineSide)	50/51-2504-01B	25.00	5.81	1.41	1.41	1.95	0.05	28' 10"	3'	111
01ES-2505-A	50/51-2505-01A	25.00	1.40	1.40	1.40	1.95	0.05	16'	3'	34
01ES-2505-A (Line Side)	50/51-2502-06A-	25.00	1.40	1.40	1.40	1.95	0.05	16'	3'	34
01ES-2505-B	50/51-2505-01B	25.00	1.40	1.40	1.40	1.95	0.05	16'	3'	34
01ES-2505-B (Line Side)	50/51-2502-06B-	25.00	1.40	1.40	1.40	1.95	0.05	16'	3'	34

<b>⚠ WARNING</b>	
<b>Arc Flash and Shock Hazard</b>	
<b>ARC FLASH PPE</b> <b>20.5</b> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <b>125 VDC</b>
<b>Arc Flash Boundary</b> 76 inches <b>Working Distance</b> 18 inches  Reference [Company] Electrical Safety Program For Arc Flash PPE Requirements.	<b>RIG Class #</b> 0 <b>Limited Aprch. Boundary</b> 42 inches <b>Restricted Aprch. Boundary</b> 12 inches  <small>(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</small>
<b>Equipment:</b> BATT0-1 <b>Protective Device:</b> 2 Sec Max Arcing Duration <b>Report #:</b> Company_TWBESC_PP_CE_2022_026_AFHIEA_02_JMC	
<b>Analysis By:</b> TWBESC <b>Date:</b> 2023-06-13	

<b>⚠ WARNING</b>	
<b>Arc Flash and Shock Hazard</b>	
<b>ARC FLASH PPE</b> <b>4.3</b> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <b>208 VAC</b>
<b>Arc Flash Boundary</b> 2 ft 10 inches <b>Working Distance</b> 18 inches  Reference TWBESC Electrical Safety Program For Arc Flash PPE Requirements.	<b>RIG Class #</b> 0 <b>Limited Aprch. Boundary</b> 42 inches <b>Restricted Aprch. Boundary</b> 12 inches  <small>(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</small>
<b>Equipment:</b> LP-1 <b>Protective Device:</b> LOAD SIDE of P-TXS BRKR, 2 Sec Max Arcing Duration <b>Report #:</b> TWBESC_TWBESC_PP_CE_2022_026_AFHIEA_02_XXX	
<b>Analysis By:</b> TWBESC <b>Date:</b> 2023-06-13 <b>Standard #:</b> IEEE 1584-2018	

	
<b>Arc Flash and Shock Hazard</b>	
<b>ARC FLASH PPE</b> <b>140.1</b> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <b>480 VAC</b>
<b>Arc Flash Boundary</b> 480 inches <b>Working Distance</b> 24 inches  Reference TWBESC Electrical Safety Program For Arc Flash PPE Requirements.	<b>RIG Class #</b> 0 <b>Limited Aprch. Boundary</b> 42 inches <b>Restricted Aprch. Boundary</b> 12 inches  <small>(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</small>
<b>Equipment:</b> MCC #1 Building, SWGR #1 <b>Protective Device:</b> LINE SIDE of MB-1 <b>Report #:</b> TWBESC-XXX-YYY-AHA-ZZZ Rev 1.0	<b>Analysis By:</b> TWBESC <b>Date:</b> 2020-01-30 <b>Standard #:</b> IEEE 1584-2018

	
<b>Arc Flash and Shock Hazard</b>	
<b>ARC FLASH PPE</b> <b>23.2</b> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <b>480 VAC</b>
<b>Arc Flash Boundary</b> 7 ft 9 inches <b>Working Distance</b> 18 inches  Reference TWBESC Electrical Safety Program For Arc Flash PPE Requirements.	<b>RIG Class #</b> 0 <b>Limited Aprch. Boundary</b> 42 inches <b>Restricted Aprch. Boundary</b> 12 inches  <small>(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</small>
<b>Equipment:</b> MCC-01 <b>Protective Device:</b> LOAD SIDE of MCC-01 MAIN BREAKER <b>Report #:</b> TWBESC_TWBESC_PP_CE_2022_026_AFHIEA_02_XXX	<b>Analysis By:</b> TWBESC <b>Date:</b> 2023-06-13 <b>Standard #:</b> IEEE 1584-2018

<b>! WARNING</b>	
<b>Arc Flash and Shock Hazard</b>	
<b>ARC FLASH PPE</b> <div style="font-size: 2em; font-weight: bold;">26.8</div> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <div style="font-size: 2em; font-weight: bold;">480 VAC</div>
Arc Flash Boundary            72 inches Working Distance            24 inches  <small>Reference [Company] Electrical Safety Program For Arc Flash PPE Requirements.</small>	RIG Class #                            0 Limited Aprch. Boundary        42 inches Restricted Aprch. Boundary    12 inches  <small>(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</small>
<b>Equipment:</b> MCC #1 Building, SWGR #1 <b>Protective Device:</b> LOAD SIDE of FB-1, <u>Maint. Mode ON</u> <b>Report #:</b> TWBESC-XXX-YYY-AHA-ZZZ Rev 1.0	
<b>Analysis By:</b> TWBESC <b>Date:</b> 2021-01-30 <b>Standard #:</b> IEEE 1584-2018	

<b>! WARNING</b>	
<b>Arc Flash and Shock Hazard</b>	
<b>ARC FLASH PPE</b> <div style="font-size: 2em; font-weight: bold;">17.8</div> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <div style="font-size: 2em; font-weight: bold;">600 VAC</div>
Arc Flash Boundary            72 inches Working Distance            24 inches  <small>Reference [Company] Electrical Safety Program For Arc Flash PPE Requirements.</small>	RIG Class #                            0 Limited Aprch. Boundary        42 inches Restricted Aprch. Boundary    12 inches  <small>(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</small>
<b>Equipment:</b> MCC #1 Building, SWGR #1 <b>Protective Device:</b> LOAD SIDE of FB-1, <u>Arc Flash Relay ON</u> <b>Report #:</b> TWBESC-XXX-YYY-AHA-ZZZ Rev 1.0	
<b>Analysis By:</b> TWBESC <b>Date:</b> 2021-01-30 <b>Standard #:</b> IEEE 1584-2018	

 <h1 style="margin: 0;">WARNING</h1>															
<b>Arc Flash and Shock Hazard   Capacitors</b>															
<b>ARC FLASH PPE</b> <span style="font-size: 2em;"><b>XX</b></span> cal/cm <sup>2</sup> incident energy	<b>SHOCK PROTECTION</b> <span style="font-size: 2em;"><b>480 VAC</b></span>														
<table border="0"> <tr> <td><b>Arc Flash Boundary</b></td> <td><b>144 inches</b></td> </tr> <tr> <td><b>Hearing Protection Boundary</b></td> <td><b>XX inches</b></td> </tr> <tr> <td><b>Lung Protection Boundary</b></td> <td><b>XX inches</b></td> </tr> <tr> <td><b>Working Distance</b></td> <td><b>18 inches</b></td> </tr> </table> <p style="font-size: small;">Reference [Company] Electrical Safety Program For Arc Flash PPE Requirements.</p>	<b>Arc Flash Boundary</b>	<b>144 inches</b>	<b>Hearing Protection Boundary</b>	<b>XX inches</b>	<b>Lung Protection Boundary</b>	<b>XX inches</b>	<b>Working Distance</b>	<b>18 inches</b>	<table border="0"> <tr> <td><b>RIG Class #</b></td> <td><b>0</b></td> </tr> <tr> <td><b>Limited Aprch. Boundary</b></td> <td><b>42 inches</b></td> </tr> <tr> <td><b>Restricted Aprch. Boundary</b></td> <td><b>12 inches</b></td> </tr> </table> <p style="font-size: x-small;">(FOR EXPOSED ENERGIZED CONDUCTORS or CIRCUIT PARTS)</p>	<b>RIG Class #</b>	<b>0</b>	<b>Limited Aprch. Boundary</b>	<b>42 inches</b>	<b>Restricted Aprch. Boundary</b>	<b>12 inches</b>
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<b>Equipment:</b> MCC #1 Building, SWGR #1, AUTO PF <b>Protective Device:</b> LOAD SIDE of FB-1 <b>Report #:</b> TWBESC-XXX-YYY-AHA-ZZZ Rev 1.0	<b>Analysis By:</b> TWBESC <b>Date:</b> 2023-10-30 <b>Standard #:</b> 70E-Ann. R / Z462 Ann. W														

RELEVANT RESOURCES	CONTACT
<p><b>FREE DOWNLOADS</b></p> <p><a href="https://twbesc.ca/esp-free-tools">https://twbesc.ca/esp-free-tools</a></p>	 <p><b>Terry W. Becker, P.Eng., CESCP, IEEE Senior Member</b>          terry.becker@twbesc.ca          1-587-433-3777  <b>CONNECT ON LINKEDIN</b>  <a href="https://www.linkedin.com/in/twbecker">linkedin.com/in/twbecker</a>   <a href="https://www.twbesc.ca">www.twbesc.ca</a></p>