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SUBJECT 1953

**OUTLINE OF INVESTIGATION
FOR
POWER DISTRIBUTION BLOCKS**

Issue Number: 3

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Summary of Topics

This new issue of SU 1953 is being issued to editorially correct a column heading in Table 7.1, to remove the "No." for the AWG wire designation, and to replace the references to UL 486A and UL 486B with the current Standard for Wire Connectors, UL 486A-486B.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ulforeword.html>

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INTRODUCTION

1 Scope

1.1 These requirements cover power distribution blocks that are rated 600 volts or less and intended to be used on the load side of service equipment in accordance with the National Electrical Code, NFPA 70. These blocks are used for splicing and tapping conductors in metallic wireways, auxiliary gutters, junction boxes, termination boxes, and the like, in order to distribute power to separate circuits or loads.

1.2 A power-distribution block consists of one or more pressure terminal connectors mounted on an insulating base. Each connector has provision for one or more incoming conductors and multiple tap-off conductors. A tap-off conductor is of the same or smaller size as the incoming conductor. The connectors may be of the lay-in construction which do not require the incoming conductor to be terminated.

1.3 A power distribution block is intended to permanently support and insulate the wire terminations and joints from each other, and from the surface on which the power distribution block is mounted.

1.4 These requirements do not cover terminal blocks which are covered by the Standard for Terminal Blocks, UL 1059.

1.5 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this Outline of Investigation, and that involves a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable level of safety as originally anticipated by the intent of this Outline of Investigation. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this Outline of Investigation cannot be judged to comply with this Outline of Investigation.

2 Glossary

2.1 The following definitions apply in this Outline of Investigation.

2.2 **POWER DISTRIBUTION BLOCK** – A rigidly mounted device consisting of an insulating base with barriers having one or more electrically isolated terminal assemblies. Each terminal assembly serves as a junction to electrically connect two or more conductors.

2.3 **PRESSURE-TERMINAL CONNECTOR** – A device that establishes the connection between one or more conductors in the field as specified in the National Electrical Code, NFPA 70.

2.4 **TERMINAL ASSEMBLY** – A single pole of the power distribution block consisting of one or more pressure-terminal connectors.

3 General

3.1 Units of measurement

3.1.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

3.2 References

3.2.1 Any undated reference to a code or standard appearing in the requirements of this Outline of Investigation shall be interpreted as referring to the latest edition of that code or standard.

4 Components

4.1 Except as indicated in 4.2, a component of a product covered by this Outline of Investigation shall comply with the requirements for that component. See Appendix A for a list of standards covering components generally used in the products covered by this Outline of Investigation.

4.2 A component need not comply with a specific requirement that:

- a) Involves a feature or characteristic not needed in the application of the component in the product covered by this outline, or
- b) Is superseded by a requirement in this outline.

4.3 A component shall be used in accordance with its recognized rating established for the intended conditions of use.

4.4 Specific components are recognized as being incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions for which they have been recognized.

CONSTRUCTION

5 Materials

5.1 Current-carrying parts

5.1.1 A current-carrying part intended for use with copper wire shall be of copper or a copper alloy.

5.1.2 A current-carrying part intended for use with aluminum wire shall be of aluminum, an aluminum alloy, copper, or a copper alloy and shall be coated with an electrically conductive coating such as tin that inhibits oxidation and corrosion.

5.2 Insulation

5.2.1 A polymeric material used as part of a power distribution block shall comply with requirements in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

5.2.2 A live screw head, rivet, or nut on the underside of a base intended for surface mounting shall be countersunk not less than 1/8 inch (3.2 mm) in the clear, and covered to a depth of not less than 1/8 inch with a waterproof, insulating, sealing compound that will not soften at a temperature of 90°C (194°F) as determined by the test for softening point by the ball pressure test in the Standard for Polymeric Materials – Short Term Property Evaluations, UL 746A.

Exception No. 1: The test is not required for a thermosetting material.

Exception No. 2: A sealing compound is not required if the screw or nut is prevented from loosening by being staked or upset by a lock washer or by other means and is insulated from the mounting surface by material other than sealing compound or is provided with spacings complying with Table 7.1.

6 Terminal Assemblies

6.1 General

6.1.1 A power distribution block shall be provided with one or more pressure-terminal connectors. Each connector shall be rated for a field installed conductor that is sized in accordance with Table 6.1.

Table 6.1
Ampacity of insulated conductors

Wire size		60°C (140°F) ampacities ^{a,c}		75°C (167°F) ampacities ^a	
AWG or MCM	mm ²	Copper	Aluminum	Copper	Aluminum
14	2.1	20	—	20	—
12	3.3	25	20	25	20
10	5.3	30	25	35	30
8	8.4	40	30	50	40
6	13.3	55	40	65	50
4	21.2	70	55	85	65
3	26.7	85	65	100	75
2	3.6	95	75	115	90
1	42.4	110	85	130	100
1/0 ^b	53.5 ^b			150	120
2/0 ^b	67.4 ^b			175	135
3/0 ^b	85.0 ^b			200	155
4/0 ^b	107.2 ^b			230	180
250 ^b	127 ^b			255	205
300 ^b	152 ^b			285	230
350 ^b	177 ^b			310	250
400 ^b	203 ^b			335	270
500 ^b	253 ^b			380	310
600 ^b	304 ^b			420	340
700 ^b	355 ^b			460	375
750 ^b	380 ^b			475	385
800 ^b	405 ^b			490	395

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Table 6.1 Continued on Next Page



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