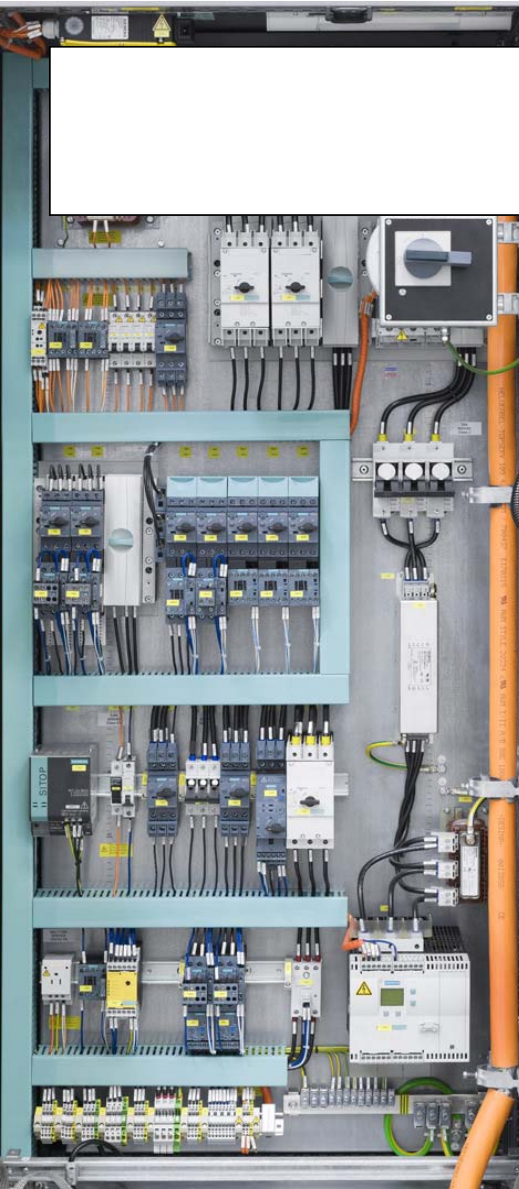


Branch Circuit – Feeder Circuit

- Overview and Definition
- Perspective in an Electrical System
- Example



Overview and Definition

Definitions acc. UL508A:

Feeder circuit:

Definition: The conductors and circuitry on the supply side of the branch circuit overcurrent protective device.

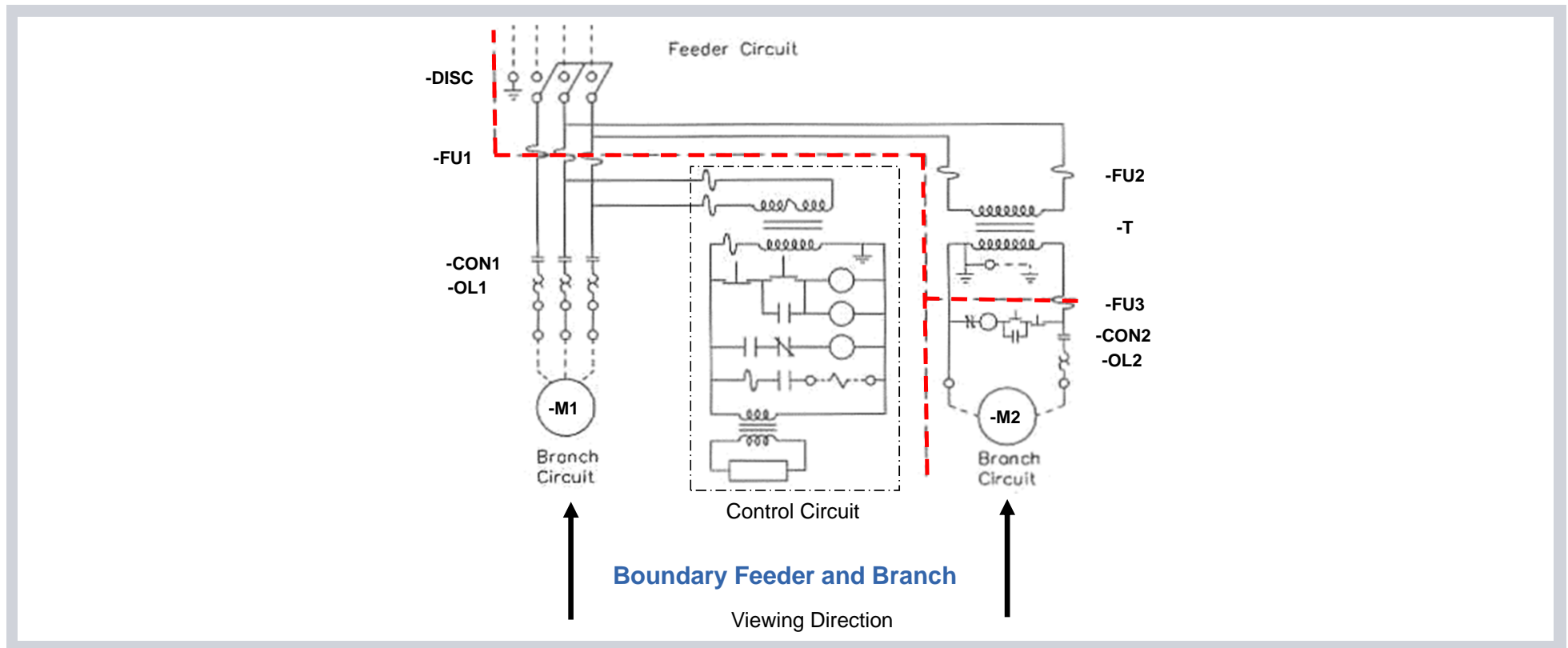
FCPD's: UL489 (3WL; 3VL; 3RV17/18; 5SJ4...-.HG)
UL248-4...-12 (3NW; Class CC)
UL98

Branch circuit:

Definition: BRANCH CIRCUIT – The conductors and components following the last overcurrent protective device protecting a load.

BCPD's: Depending on application case

Overview and Definition



Overview and Definition

Practical realization



Distance through air and over surface

- Depending on voltage up to
 - 1 inch – distance through air
 - 2 inches – distance over surface



Feeder circuits: see UL 508A table 10.2

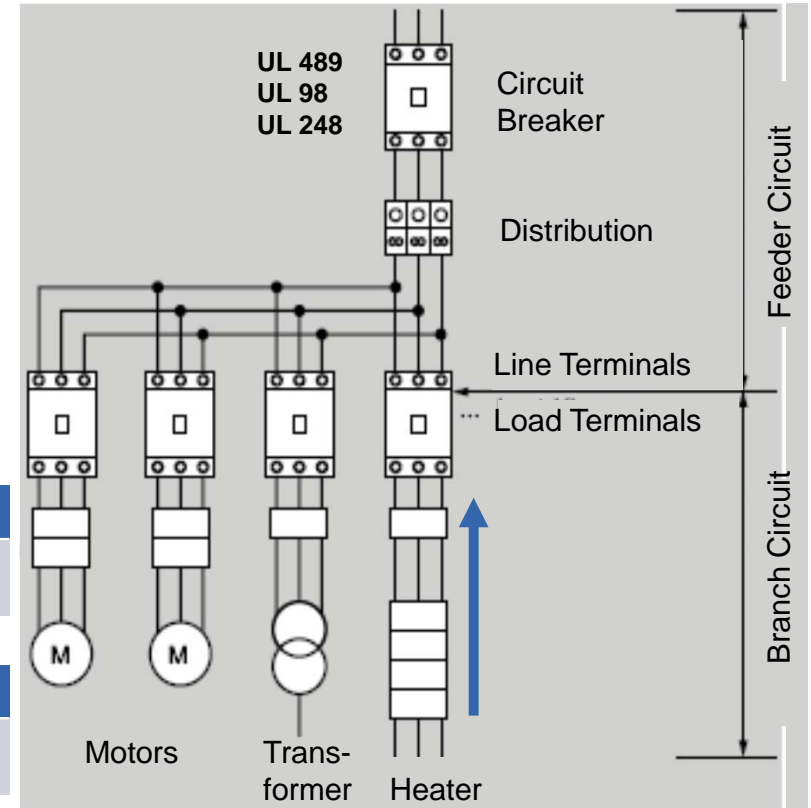
0 – 125 V	126 – 250 V	251 – 600 V
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Indication of the distances between the current-carrying wires and enclosure and the distances through air and over surface

Branch circuits: see UL 508A table 10.1

0 – 50 V	51 – 150 V	151 – 300 V	301 – 600 V
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Indication of the distances between current-carrying wires and enclosures and the distances through air and over surface



409.106 Spacings

Spacings in feeder circuits between uninsulated live parts of adjacent components, between uninsulated live parts of components and grounded or accessible non-current-carrying metal parts, between uninsulated live parts of components and the enclosure, and at field wiring terminals shall be as shown in Table 430.97(D).

Exception: *Spacings shall be permitted to be less than those specified in Table 430.97(D) at circuit breakers and switches and in listed components installed in industrial control panels.*

Table 10.1
Minimum required spacings in branch and control circuits

Table 10.1 effective April 25, 2003

Potential involved in volts rms ac or dc		Minimum spacing, inch (mm)					
		A			B		C
		General industrial control equipment			Devices having limited ratings ^a		All circuits ^d
		51 – 150	151 – 300	301 – 600	51 – 300	301 – 600	0 – 50
Between any uninsulated live part and an uninsulated live part of opposite polarity, uninsulated grounded part other than the enclosure, or exposed metal part ^{f,g} Between any uninsulated live part and the walls of a metal enclosure including fittings for conduit or armored cable ^{c,e}	Through air or oil	1/8 ^b (3.2)	1/4 (6.4)	3/8 (9.5)	1/16 ^b (1.6)	3/16 ^b (4.8)	1/16 ^b (1.6)
	Over surface	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	1/8 ^b (3.2)	3/8 (9.5)	1/16 ^b (1.6)
	Shortest distance	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/4 (6.4)	1/2 (12.7)	1/4 (6.4)

Table 10.2
Spacings in feeder circuit

Table 10.2 revised September 1, 2005

Voltage involved	Minimum spacing, inch (mm)		
	Between live parts of opposite polarity		Between live parts and grounded metal parts, through air and over surface
	Through air	Over surface	
125 or less	1/2 (12.7)	3/4 (19.1)	1/2 (12.7)
126 – 250	3/4 (19.1)	1-1/4 (31.8)	1/2 (12.7)
251 – 600	1 (25.4)	2 (50.8)	1 ^a (25.4) ^a

NOTE – An isolated dead metal part, such as a screw head or a washer, interposed between uninsulated parts of opposite polarity or between an uninsulated live part and grounded dead metal is evaluated as reducing the spacing by an amount equal to the dimension of the interposed part along the path of measurement.

^a The through-air spacing shall not be less than 1/2 inch between live parts of a circuit breaker or fusible disconnecting means and grounded metal, and between grounded metal and the neutral of an industrial control panel rated 277/480 volt, 3-phase, 4-wire.

Questions?

Note / Disclaimer

The circuit examples and interpretations of the standard are non-binding and do not claim completeness concerning configuration, equipping and contingencies. They do not represent customized solutions but merely provide support for typical tasks.

Every user of this presentation assumes full responsibility for the proper operation of the described products. This presentation does not relieve you of your obligation to ensure safe application, installation, operation and maintenance.

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Many tables and texts in this description were directly taken from NEC 2011 and the UL standards. Every user has to regularly check whether the quoted references are still up-to-date.

The final decision as to whether an application complies with the corresponding American standards and regulations lies with the end customer or any organization respectively authorized by him (e.g. authority having jurisdiction, AHJ).