



UL 508A

STANDARD FOR SAFETY

Industrial Control Panels

This is a preview. Click [here](#) to purchase the full publication.

This is a preview. Click [here](#) to purchase the full publication.

UL Standard for Safety for Industrial Control Panels, UL 508A

Third Edition, Dated April 24, 2018

Summary of Topics

This revision of ANSI/UL 508A dated August 5, 2021 is being issued to correct an error that occurred during publication of revisions to [Table 52.1, Locations of Required Markings](#).

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated July 16, 2021.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

No Text on This Page

APRIL 24, 2018
(Title Page Reprinted: August 5, 2021)



ANSI/UL 508A-2021

1

UL 508A

Standard for Industrial Control Panels

First Edition – April, 2001
Second Edition – December, 2013

Third Edition

April 24, 2018

This ANSI/UL Standard for Safety consists of the Third Edition including revisions through August 5, 2021.

The most recent designation of ANSI/UL 508A as an American National Standard (ANSI) occurred on July 13, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page. Any other portions of this ANSI/UL standard that were not processed in accordance with ANSI/UL requirements are noted at the beginning of the impacted sections.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

COPYRIGHT © 2021 UNDERWRITERS LABORATORIES INC.

This is a preview. Click here to purchase the full publication.

No Text on This Page

CONTENTS

PART 1 – GENERAL USE INDUSTRIAL CONTROL PANELS

INTRODUCTION

1	Scope	11
2	Glossary.....	13
3	Undated References	17
4	Components.....	17
5	Units of Measurement	17
6	Terminology.....	18

CONSTRUCTION

ALL PANELS

7	General	20
8	Protection Against Corrosion.....	20
9	Support and Securement of Live Parts.....	21
10	Spacings	21
11	Conduit Bushings	24
12	Insulating Barriers	24
13	Insulating Materials	25
14	Grounding – General	26
15	Grounding – Size of Terminal or Bonding Conductor	26
16	Transformer and Power Supply Secondary Grounding	28
17	Identification of Grounding and Grounded Circuit Conductors and Terminals.....	29

ENCLOSED PANELS

18	Enclosures.....	30
19	Enclosure Openings	31
20	Accessibility of Live Parts.....	33
21	Ventilation Openings.....	34
21.1	General.....	34
21.2	Location of ventilation opening.....	34
21.3	Construction.....	34
22	Barriers Used with Ventilation Openings	35
23	Observation Windows.....	36
24	Bonding	37
25	Wire Bending Space	37
26	Enclosure Environmental Control Devices.....	38
26.1	General	38
26.2	Enclosure fans	38
26.3	Enclosure air conditioner	39
26.4	Enclosure heater	39
26.5	Air filters.....	39
26.6	Enclosure thermal insulation	39
27	Enclosure Maintenance Lighting	40
27.1	General.....	40
27.2	Component requirements	40
27.3	Circuit requirements.....	40

This is a preview. Click here to purchase the full publication.

POWER CIRCUITS

28	Field Wiring.....	40
28.1	General.....	40
28.2	Component requirements	41
28.3	Sizing	42
28.4	Separation of circuits	44
28.5	Cord-connected equipment	45
28.6	Receptacles	46
28.7	Cable assemblies and fittings	47
29	Internal Wiring.....	47
29.1	General.....	47
29.2	Conductor requirements.....	48
29.3	Wiring methods	49
29.4	Routing of internal wiring	50
29.5	Separation of circuits	51
29.6	Sizing	51
30	Disconnect Switches	52
30.1	Component requirements	52
30.2	Sizing of disconnect switch.....	52
30.3	Location	53
30.4	Mechanical operating mechanism	54
31	Branch Circuit Protection	54
31.1	Component requirements	54
31.2	Location	55
31.3	Sizing of branch circuit protection for single motor circuit.....	56
31.4	Sizing of branch circuit protection for motor groups.....	58
31.5	Receptacles	59
31.6	Sizing of branch circuit protection for heater loads	60
31.7	Sizing of branch circuit protection for appliance loads	60
31.8	Sizing of branch circuit protection for lighting loads.....	61
32	Overcurrent Protection of Feeder.....	61
32.1	Component requirements	61
32.2	Location	61
32.3	Sizing of overcurrent protection.....	61
32.4	Feeder taps for non-motor loads	62
32.5	Feeder taps for motor loads	63
33	Load Controllers.....	63
33.1	Component requirements	63
33.2	Sizing/rating of load controllers	63
33.3	Location	64
33.4	Reversing motor controllers	65
33.5	Wye-delta motor controllers	65
33.6	Controllers for multi-speed and part winding motors	68
33.7	Autotransformer- and resistor-type reduced voltage motor controllers	68
34	Overload Protection of Motor Loads	68
34.1	Component requirements	68
34.2	Sizing of overload relay	68
34.3	Location	68
35	Power Transformers	70
35.1	Component requirements	70
35.2	Sizing of overcurrent protection for power transformer	70
35.3	Location	71
35.4	Low-voltage limited energy circuits.....	71
36	Other Circuit Components.....	72
36.1	Capacitors	72

This is a preview. Click here to purchase the full publication.

36.2 Resistors.....	72
36.3 Reactors	73
36.4 Surge protective devices (SPDs).....	73
36.5 Line filters	73

CONTROL CIRCUITS

37 Field Wiring Terminals	74
37.1 Component requirements	74
37.2 Sizing	74
37.3 Field wiring terminals of a low-voltage limited energy circuit	75
37.4 Field wiring terminals of Class 2 circuits.....	75
37.5 Separation of circuits	75
37.6 Receptacles	75
37.7 Flexible cords	75
37.8 Cable assemblies and fittings	75
38 Internal Wiring.....	75
38.1 Component requirements	75
38.2 Sizing of internal control circuit conductors	76
38.3 Wiring methods, wire routing, and separation of circuits for internal wiring of a control circuit.....	76
39 Disconnecting Means	76
40 Overcurrent Protection.....	77
40.1 Component requirements	77
40.2 Location of overcurrent protective devices	77
40.3 Sizing of overcurrent protection.....	77
41 Sizing of Overcurrent Protection – Control Circuits (Common)	78
42 Overcurrent Protection – Control Circuits (Isolated Secondary).....	79
42.1 Control transformers	79
42.2 Power supplies	80
42.3 Other isolated secondary sources	81
43 Low-Voltage Limited Energy Circuits.....	82
43.1 Component requirements	82
43.2 Secondary side requirements	83
44 Class 2 Circuits	83
44.1 Component requirements	83
44.2 Secondary side requirements	83
45 Switching Devices	83
45.1 Component requirements	83
45.2 Sizing/ratings of control circuit switching devices.....	84
45.3 Location	86
45.4 Undervoltage protection	86
46 Loads	87
46.1 Component requirements	87
46.2 Location	87
46.3 Rating of control circuit load.....	87
47 Miscellaneous Devices	88
47.1 Surge protective devices SPDs.....	88
47.2 Resistors.....	88
47.3 UPS (Uninterruptible Power-Supply) Equipment	88
47.4 Line filters	89
48 Pneumatic Switching Devices.....	89

RATING

49	Supply Ratings.....	89
50	Individual Load Ratings.....	90
51	Ratings for Control Circuit Outputs.....	93

MARKINGS

52	General Markings.....	93
53	Enclosure Markings.....	95
54	Field Wiring Terminal Markings.....	96
55	Hazard Markings	100
56	Fuseholder Markings.....	101
57	Switch Markings.....	101
58	Overload Relay Heater Table Markings	101
59	Receptacle Markings	101
60	Field Provided Components	101
61	Schematic Wiring Diagrams	102

PART 2 – SPECIFIC USE INDUSTRIAL CONTROL PANEL TYPES**ENCLOSURES**

62	General	102
63	Construction	103
	63.1 Metal thickness.....	103
	63.2 Covers and doors	108
	63.3 Corrosion protection.....	110
	63.4 Enclosure openings	111
	63.5 Ventilation openings.....	111
	63.6 Observation windows	111
64	Markings.....	111

INDUSTRIAL MACHINERY

65	General	111
66	Construction	112
	66.1 Enclosures	112
	66.2 Electrical assembly	113
	66.3 Grounding	113
	66.4 Field wiring – power circuits	114
	66.5 Internal wiring – power circuits	115
	66.6 Disconnecting means.....	116
	66.7 Branch circuit protection.....	117
	66.8 Motor controllers.....	119
	66.9 Internal wiring of control circuit.....	119
	66.10 Overcurrent protection of common control circuit.....	120
	66.11 Operator controls	120
67	Markings.....	121
	67.1 Nameplate markings	121
	67.2 Operator controls.....	121
	67.3 Components	121
	67.4 Cautionary marking.....	121

CRANE CONTROL

68	General	122
69	Glossary	122
70	Construction	122
	70.1 Field wiring terminals of power circuits.....	122
	70.2 Internal wiring.....	123
	70.3 Disconnecting means.....	124
	70.4 Branch circuit protection.....	124
	70.5 Motor overload protection.....	125
	70.6 Field wiring of control circuits	125
	70.7 Overcurrent protection of control circuit	125
71	Ratings.....	125
72	Markings.....	125

SERVICE EQUIPMENT USE

73	General	125
74	Glossary	125
75	Construction	126
	75.1 Grounding and bonding.....	126
	75.2 Spacings.....	133
	75.3 Field wiring terminals	133
	75.4 Disconnecting means.....	133
	75.5 Neutral disconnecting means.....	134
	75.6 Ground-fault protection	135
	75.7 Overcurrent protection	139
	75.8 Components on the supply side of the disconnecting means	139
76	Ratings.....	139
77	Markings	140
	77.1 Bonded neutral.....	140
	77.2 Insulated neutral.....	140
	77.3 Marking location	140
	77.4 Disconnects	140
	77.5 Ground-fault protection	141
78	Installation Instructions	141
79	Tests By The Manufacturer – Ground-Fault Protection Test	142

ELEVATOR CONTROL

80	General	142
----	---------------	-----

FLAME CONTROL

81	General	142
82	Construction	143
	82.1 Component requirements	143
	82.2 Spacings.....	143
	82.3 Internal wiring.....	143
	82.4 Location.....	143
	82.5 Separation of circuits	144
	82.6 Overcurrent protection	144
83	Marking	144