

UL 508A Control Panel Compliance Checklist

A section-by-section checklist for panel shops and machine builders. Use it at design review, again at build, and once more before the label goes on.

WHAT'S INSIDE

- UL 508A at a glance: what it covers and how it connects to NEC 409 and NFPA 79
- Fourteen checklist sections keyed to the standard's clause numbers
- A short-circuit current rating (SCCR) walk-through using Supplement SB
- Nameplate and marking requirements in one place
- The inspection findings we see most often, and how to avoid them

HOW TO USE IT

- Tick each box only when you can point to the drawing, BOM line, or component marking that proves it
- Clause references let you find the requirement quickly in your copy of the standard
- Print it and keep it in the job traveler; the last page has space for sign-off

Before you start: what UL 508A actually asks of you

UL 508A is the Standard for Safety for Industrial Control Panels. It does not certify your design. It tells a UL-authorized panel shop how to select, size, space, wire, protect, and mark the components inside an enclosure so the finished assembly can carry a UL Listed industrial control panel label.

Two parts, one label

- Part 1, General use panels** (clauses 1–61) covers every panel: construction, enclosures, spacings, grounding, power circuits, control circuits, ratings, and markings.
- Part 2, Specific use panels** (clauses 62 onward) adds requirements for particular applications. The one most machine builders meet is **Industrial Machinery** (clauses 65–67), which aligns the panel with NFPA 79.
- Supplement SB** is the method for determining the panel's short-circuit current rating. It is not optional: the SCCR must appear on the nameplate.

How it fits with the other rules

DOCUMENT	ROLE FOR A CONTROL PANEL
UL 508A	How the panel is built and marked so it can be Listed
NEC Article 409	Installation of industrial control panels; requires the SCCR marking and drives what the AHJ looks for
NFPA 79	Electrical standard for industrial machinery; disconnects, E-stop, conductor colors, operator controls
NEC 110.10 / 110.24	Equipment must be rated for the available fault current at the point of installation

Who does what

- 1

The machine builder or OEM
defines loads, supply, environment, and the SCCR target. Most inspection failures are locked in here.
- 2

The panel shop
holds the UL 508A procedure, selects components under that procedure, builds, and applies the label.
- 3

UL field staff
audit the shop's procedure and sample panels; they do not approve each design.
- 4

The AHJ
accepts the installation. They look for the label, the SCCR, and the disconnect. They rarely open the door.

The mindset that saves rework: every component in a power circuit needs three things you can point to on the drawing: a UL Listing or Recognition that fits its use, a rating that covers the circuit, and an SCCR (marked or default). If any one is missing, the panel's rating collapses to that component.

About clause numbers. References in this checklist follow the UL 508A clause structure (Second Edition numbering). Numbering shifts slightly between editions, so confirm against the edition your shop's procedure file is written to.

1. Project definition BEFORE DESIGN · UL 508A CL. 1, 49–50 · NEC 409

- ☐ Panel type identified: general use (Part 1 only) or industrial machinery (Part 1 plus cl. 65–67 and NFPA 79). cl. 1, 65
Determines disconnect, color code, and nameplate rules for the whole job.
- ☐ Supply defined: voltage, phases, frequency, and whether the panel is fed from a single source. cl. 49
- ☐ Available fault current at the installation point requested from the customer or facility engineer, in writing. NEC 110.24
Your SCCR target comes from this number, not from habit.
- ☐ Full load current of every load listed; largest motor identified. cl. 50
- ☐ Environment defined: indoor/outdoor, washdown, dust, ambient temperature range, altitude, corrosive atmosphere. cl. 18
- ☐ Control voltage strategy chosen (24 VDC, 120 VAC, or mixed) and documented with the reason. cl. 37–44
- ☐ AHJ and end-customer specifications collected (some sites require specific enclosure types, seismic bracing, or arc-flash labeling). Site

2. Enclosure UL 508A CL. 11, 18–27 · PART 2 CL. 62–64

- ☐ Enclosure is UL Listed (UL 50 / UL 50E) with a Type rating that matches the environment, or is evaluated under Part 2 cl. 63 for metal thickness, doors, and corrosion protection. cl. 18, 63
- ☐ Every opening you add (conduit, glands, pushbuttons, HMIs, vents, windows) is fitted with a device rated for the same or higher Type as the enclosure. cl. 19, 23
One Type 1 gland turns a Type 4X box into a Type 1 box.
- ☐ Conduit bushings or fittings protect conductors at every metal opening. cl. 11
- ☐ Live parts are not accessible with the door open without a tool, or are guarded; operator-accessible parts on the door are finger-safe. cl. 20
- ☐ Ventilation openings, fans, air conditioners, heaters, and filters are Listed for the purpose and located so they do not compromise the Type rating. cl. 21–22, 26
- ☐ Wire bending space at field wiring terminals meets the table minimums for the largest conductor landing there. cl. 25
- ☐ Heat load estimated; internal temperature at full load stays inside the ratings of the most sensitive component (drives and power supplies usually set the limit). cl. 26
- ☐ Enclosure marked with its Type rating; if a device on the door lowers the rating, the nameplate reflects the lower rating. cl. 53, 64

3. Spacings, barriers, and insulating materials UL 508A CL. 9–10, 12–13

- ☐ Every live part is secured so it cannot loosen or rotate into a reduced spacing. cl. 9
- ☐ Through-air and over-surface spacings between uninsulated live parts of opposite polarity, and to grounded metal, meet the table values for the circuit voltage. Check field-wiring terminals separately; the requirement is larger there. cl. 10
- ☐ Where spacings cannot be met, an insulating barrier of an acceptable material and thickness is installed and secured. cl. 12
- ☐ Insulating materials supporting live parts are rated for the temperature and voltage (no wood, no untested plastics). cl. 13
- ☐ Components mounted on DIN rail keep the manufacturer's stated clearance to adjacent devices and to the duct. Mfr. CoA

4. Grounding and bonding UL 508A CL. 14-17

- ☐ An equipment grounding terminal is provided for the field grounding conductor, sized to the table for the supply overcurrent device, and marked. cl. 14-15
- ☐ Enclosure, back panel, and door are bonded: paint removed at bonding points or serrated hardware used; door bonded with a flexible jumper if it carries electrical devices. cl. 14, 24
- ☐ Grounding conductors are green or green-with-yellow stripe; grounded (neutral) conductors are white or gray, and terminals are identified. cl. 17
- ☐ Transformer and power-supply secondaries are grounded where the standard requires it; a floating secondary is a deliberate, documented choice. cl. 16
- ☐ Ground bar is not used as a convenient neutral, and no neutral-to-ground bond exists inside the panel unless it is a separately derived system. cl. 16-17

5. Field wiring, power circuits UL 508A CL. 28

- ☐ Field wiring terminals are Listed and rated for the conductor size, material (usually copper only), and temperature the installer will land. cl. 28.2
- ☐ Supply terminals sized for at least 125% of the continuous load plus non-continuous load; terminal size matches the nameplate FLA. cl. 28.3
- ☐ Field wiring for power circuits is separated from control, Class 2, and low-voltage wiring by barriers, routing, or spacing. cl. 28.4
- ☐ Cord-connected panels use a Listed cord and strain relief; receptacles are Listed and protected. cl. 28.5-28.6
- ☐ Terminal torque values, wire range, and "Cu only" appear on or adjacent to the terminals or in the wiring diagram. cl. 54

6. Internal wiring, power circuits UL 508A CL. 29

- ☐ Conductors are a Listed type acceptable for panel use (MTW, THHN/THWN, or AWM used within its Recognized conditions); insulation rated for the circuit voltage and the panel temperature. cl. 29.2
- ☐ Ampacity meets the load; conductor size is not smaller than the overcurrent device allows for that circuit. cl. 29.6
- ☐ Wiring is routed away from sharp edges and moving parts, secured in duct or bundled, and protected where it passes through metal. cl. 29.3-29.4
- ☐ Conductors of different circuits sharing a duct are all insulated for the highest voltage present in that duct. cl. 29.5
- ☐ Terminations use the method the component is Listed for: ferrules where required, ring or fork lugs on studs, no more conductors per terminal than the device allows. cl. 29.3

7. Disconnecting means UL 508A CL. 30 · CL. 66.6 FOR MACHINERY · NFPA 79 CH. 5

- ☐ A Listed disconnect (switch or circuit breaker) opens all ungrounded supply conductors at once and is rated for the supply voltage and at least 115% of the panel full-load current, or horsepower-rated where motor loads require it. cl. 30.1-30.2
- ☐ Disconnect is operable from outside the enclosure without opening the door, and the handle is within reach height limits (NEC 404.8: center of grip not above 6 ft 7 in). cl. 30.3-30.4
- ☐ Door interlock provided, or the disconnect is lockable in the off position and the door requires a tool. cl. 30.4
- ☐ Anything left energized when the disconnect is open (supply terminals, an externally powered circuit) is guarded and marked; on machinery those circuits are wired in orange. cl. 55, NFPA 79
- ☐ If more than one supply feeds the panel, a cautionary marking says so and each source has its own disconnect. cl. 55

8. Branch circuit and feeder protection UL 508A CL. 31-32

- ☐ Every power circuit has branch circuit protection from a Listed fuse or circuit breaker (UL 248 fuses, UL 489 breakers). Supplementary protectors (UL 1077) are not used where branch circuit protection is required. cl. 31.1
- ☐ Single motor circuits sized from the motor table FLA using the standard's maximum percentages for the device type (the same limits as NEC 430.52). cl. 31.3
- ☐ Motor group circuits sized per cl. 31.4 with the conductor and controller ratings checked against the shared device. cl. 31.4
- ☐ Heater, appliance, lighting, and receptacle loads each protected to their own rule. cl. 31.5-31.8
- ☐ Protective devices are on the load side of the disconnect and located where they are accessible with the door open. cl. 31.2, 32.2
- ☐ Feeder protection, when the panel contains one, is sized to the feeder conductor and the sum of loads. cl. 32.3

9. Motor controllers and overload protection UL 508A CL. 33-34

- ☐ Each motor controller (contactor, starter, soft starter, drive) is Listed and rated for the motor horsepower and voltage, or for the FLA when hp ratings do not apply. cl. 33.1-33.2
- ☐ Overload relay sized to the motor nameplate FLA and service factor (typically 125% for service factor 1.15 or higher; 115% otherwise). cl. 34.2
- ☐ Reversing and wye-delta controllers meet the interlock and sizing rules; drives rely on their own Listed overload function only when the drive is rated for it. cl. 33.4-33.5

10. Power transformers, control transformers, power supplies UL 508A CL. 35, 42

- ☐ Power transformer primary overcurrent protection sized per the table for the primary current; secondary protection provided where the table requires it. cl. 35.2
- ☐ Control transformer secondary is protected (fuse or breaker sized to the secondary rating), or primary protection alone is used only within the allowance the standard gives. cl. 42.1
- ☐ 24 VDC power supplies are Listed (UL 508 or UL 62368/60950 as accepted) and their output circuits are classified: Class 2, low-voltage limited energy, or a general control circuit that needs its own overcurrent protection. cl. 42.2, 43-44
- ☐ Transformers and supplies are located so their heat does not raise adjacent components past rating. cl. 35.3

Reference: maximum branch circuit device size, single motor circuit

Percent of motor full-load current from the standard's motor tables (the same ceilings as NEC 430.52). Where the calculated value does not match a standard rating, the next larger standard size is permitted within the rules of cl. 31.3.

DEVICE TYPE	TYPICAL MAXIMUM	NOTES
Non-time-delay fuse	300%	Class CC, J, T, K5, RK5 without time delay
Dual-element time-delay fuse	175%	Most common choice for motor branch circuits in panels
Inverse-time circuit breaker	250%	UL 489 Listed; not a supplementary protector
Instantaneous-trip breaker (MCP)	800% (1100% for Design B energy-efficient)	Only as part of a Listed combination motor controller

11. Control circuits

UL 508A CL. 37–48

- ☐ Control circuit conductors are sized to their overcurrent protection and are a Listed type for the application; 18 AWG is the usual minimum for general control wiring, smaller only in Class 2 circuits.
- cl. 38.2
- ☐ Every control circuit has overcurrent protection matched to its conductor, whether it is tapped from the power circuit (common control) or fed from an isolated secondary.
- cl. 40–42
- ☐ Class 2 and low-voltage limited energy circuits are separated from higher-voltage circuits by barrier, routing, or by using conductors rated for the highest voltage in the duct.
- cl. 37.5, 38.3
- ☐ Pilot devices, relays, and PLC outputs carry ratings (pilot duty, resistive, inductive) that cover the load they switch.
- cl. 45–46
- ☐ Undervoltage protection provided where a restart on power return would be hazardous.
- cl. 45.4
- ☐ Field wiring terminals for control circuits are marked with the circuit class and wire range.
- cl. 37, 54

12. Short-circuit current rating

UL 508A SUPPLEMENT SB · NEC 409.110

1 · Collect

For every power-circuit component, record the marked SCCR. If it has none, use the default from Table SB4.1. Control-circuit components are excluded.

➤

2 · Combine

Apply series ratings or current-limiting only where SB4.3 allows and the combination is Listed. A current-limiting fuse does not automatically raise everything downstream.

➤

3 · Mark

Panel SCCR is the lowest value in the power circuit. Put it on the nameplate and compare it to the available fault current at the installation.

☐ SCCR worksheet completed and kept with the job file, listing each component, its marked or default rating, and the basis.

SB4

☐ Default values were only used knowingly. Unmarked terminal blocks, overload relays, and contactors carry low defaults and are the usual reason a panel ends up at 5 kA.

SB4.2

☐ Components on the line side of the main protective device are rated for the full available fault current on their own.

SB4.3

☐ Panel SCCR is at least the available fault current the customer provided in section 1. If it is not, the design changes now, not at inspection.

NEC 110.10

Design tip: choose components with high marked SCCRs at the BOM stage. A high-SCCR contactor or terminal block costs a little more; a re-spin because the panel came out at 5 kA on a 25 kA service costs the whole margin.

SCCR worksheet

One row per power-circuit component; extend the table in the job file. The lowest value in the "Rating used" column is the panel SCCR.

COMPONENT / TAG	MARKED SCCR	SB4.1 DEFAULT	COMBINATION OR SERIES BASIS	RATING USED
Panel SCCR (lowest value) · available fault current at installation				

13. Ratings and markings UL 508A CL. 49-61

- | | |
|--|--|
| ☐ Nameplate is permanent, legible, and visible with the door closed. cl. 52 | ☐ Field wiring terminal markings: wire size range, copper only, tightening torque, and 60/75 °C conductor rating. cl. 54 |
| ☐ Nameplate shows: manufacturer name, model or catalog number, and a date or serial reference. cl. 52 | ☐ Cautionary markings applied: more than one disconnect, externally powered circuits, arc-flash caution, "disconnect before servicing". cl. 55 |
| ☐ Electrical ratings: supply voltage, phases, frequency, full-load current, largest motor hp or FLA. cl. 49-50 | ☐ Fuseholders marked with fuse class and rating; switch positions marked. cl. 56-57 |
| ☐ Short-circuit current rating stated in kA (or A) at the supply voltage. SB, cl. 52 | ☐ Field-provided components (a customer-supplied drive, for example) are called out on the nameplate or drawing with the requirements they must meet. cl. 60 |
| ☐ Enclosure Type rating marked; ambient temperature limits marked if not the standard 40 °C. cl. 53 | ☐ A schematic wiring diagram ships with the panel and matches the build. cl. 61 |
| ☐ Control circuit output ratings marked where the panel feeds external control devices. cl. 51 | |

14. Industrial machinery panels UL 508A CL. 65-67 · NFPA 79

- | | |
|--|--|
| ☐ Supply disconnect meets the machinery rules: externally operable, lockable, interlocked with the door or tool-access only, and marked as the machine disconnect. cl. 66.6 | ☐ Operator controls on the door are finger-safe, legend plates fitted, and the layout separates operator controls from maintenance controls. cl. 66.11, 67.2 |
| ☐ Conductor color code applied: black for ungrounded power, red for AC control, blue for DC control, white/gray for grounded, green or green/yellow for ground, orange for circuits that stay live when the disconnect is open. NFPA 79 13.2 | ☐ Machinery nameplate carries the additional items required by cl. 67.1, including the electrical diagram number. cl. 67.1 |
| ☐ Emergency stop circuit uses safety-rated devices, red mushroom operator on yellow background, and a controlled reset; stop function does not depend on the PLC program. NFPA 79 9.2, 10.7 | ☐ Component markings and cautionary markings for machinery are complete. cl. 67.3-67.4 |

15. Documentation and shop procedure YOUR UL PROCEDURE FILE

- | | |
|--|---|
| ☐ Bill of materials lists the UL category (CCN) and file number for each component in a power circuit, and the Conditions of Acceptability for Recognized parts. cl. 4 | ☐ Label kit prepared: nameplate, cautionary labels, terminal markings, wire numbers, and the UL Listed panel label from the shop's stock. cl. 52-57 |
| ☐ Schematics, layout drawing, and SCCR worksheet are revision-controlled and match the panel as built. cl. 61 | ☐ Shop procedure file covers the enclosure and component types used on this job; anything outside it is flagged before build. Procedure |

The findings we see most often

None of these are exotic. They show up on panels from experienced shops because the decision that caused them was made weeks earlier, at the BOM or schematic stage.

SCCR defaulted to 5 kA

An unmarked terminal block or overload relay dragged the rating down. Specify marked SCCRs at BOM time and keep the SB worksheet with the job.

Supplementary protector used as branch protection

UL 1077 devices protect a circuit that already has branch protection upstream. They cannot be the only protection on a power circuit.

IEC-only components

A CE mark is not a UL Listing. Components without a North American certification cannot be used in a Listed panel, no matter how good they are.

Type rating broken by a door device

An unrated HMI, pushbutton, or vent turns a Type 4 enclosure into a Type 1 enclosure. Every door cut-out needs a device rated at least as high as the box.

Mixed-voltage duct with under-rated wire

Class 2 sensor wiring sharing a duct with 480 V power needs 600 V insulation or a barrier. Separate routes are cheaper than re-pulling.

Missing or incomplete nameplate

No SCCR, no largest motor, no enclosure Type. The AHJ reads the nameplate first, and an incomplete one invites a closer look at everything else.

Live parts on the line side unguarded

Supply terminals ahead of the disconnect stay live with the handle off. Guard them, mark them, and on machinery wire them orange.

Control transformer secondary unprotected

Primary fusing alone is only acceptable within a narrow allowance. A secondary fuse or breaker sized to the transformer rating settles it.

Sign-off

STAGE	REVIEWED BY	DATE	OPEN ITEMS
Design review			
BOM / SCCR worksheet			
Build complete			
Final inspection & label			

Working through a live design question?

Dynamic represents power, control, and connectivity lines for machine builders and panel shops in Northern California and Northern Nevada. We help at the schematic and BOM stage, where UL problems are cheapest to fix.

sales@dynamicrep.com · 408-780-9190 · dynamicrep.com

[Ask an application question](#)

A planning aid from Dynamic Measurement & Control Solutions, LLC. It summarizes requirements in plain language and is not a substitute for UL 508A, NFPA 79, the NEC, or your shop's UL procedure file. UL and the UL Mark are trademarks of UL LLC.