SIEMENS

L-858 Taxiway & Runway Signs

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Record of Changes

Page	Rev	Description	EC No.	Checked	Approved	Date
	F	Revised Tables 5-5 and 5-6.		EP	ED	
4-1, 4-2	G	Added blank panel part numbers and revised P/N for black paint.		EP	ED	
5-7	H	Added metric units and cautionary note to use correct frangible coupling size with sign.		EP	WT	
All	I	Reformatted manual. Deleted unnecessary figures: 6-4, 6-5 thru 6-13. Deleted Section 5.10, Sign Legends and Symbols, and the Legend Sheet.	3198	BR	WT	10/8/99
2-3	J	Added rated lamp life.	00355	ED	WT	12/21/99
5-2, 5-12, 8-2, 8-24	K	Added brightness adjustment procedure, wiring diagram, and troubleshooting procedure for Style 5 (5.5A only).	00364	BR	WT	1/12/00
2-1, 2-11	L	Added note on 2-1 that solid state devices are not involved in this product and note on 2-11 to differentiate the devices used to control current on lamp for 3-Step and 5-Step signs.	00474	BR	WT	4/28/00
2-3, 3-16, 7-2	M	Added notes to conform to ETL recertification. Deleted the term “SJO” for outside cordsets.	00619	JY	WT	5/4/01
Title page	N	Changed to Siemens sans font.	00696	JY	WT	5/16/01
7-3, 7-4	O	Added terminal block 72A0127 to parts list and Figure 7-2.	00831	JY	WT	2/14/02

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Warranties

Products of Siemens Airfield Solutions manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) for a period of one year from the date of installation or a maximum of two years from the date of shipment and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

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Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and Siemens Airfield Solutions disclaims any liability for damages or detriments suffered as a result of reliance on the information given herein or the use of products, processes or equipment to which this manual refers. No warranty is made that the use of the information or of the products, processes or equipment to which this manual refers will not infringe any third party's patents or rights. The information given does not release the buyer from making their own experiments and tests.

Section 1
Safety

1. Introduction

This section contains general safety instructions for using your Siemens Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- refer to the FAA Advisory Circular AC 150/5340-26, *Maintenance of Airport Visual Aids Facilities*, for instructions on safety precautions.
- observe all safety regulations. To avoid injuries, always remove power prior to making any wire connections and touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

2. Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.

WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

2. Safety Symbols *(contd.)*

WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Wear safety goggles. Failure to observe may result in serious injury.

CAUTION: Failure to observe may result in equipment damage.

3. Qualified Personnel

The term *qualified personnel* is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating this equipment to see that its personnel meet these requirements.

4. Intended Use

WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

Siemens Airfield Solutions cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine Siemens Airfield Solutions replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your Siemens Airfield Solutions equipment
- allowing unqualified personnel to perform any task

5. Installation

Read the installation section of all system component manuals before installing your equipment. A thorough understanding of system components and their requirements will help you install the system safely and efficiently.

WARNING: Failure to follow these safety procedures can result in personal injury or death.

- Allow only qualified personnel to install Siemens Airfield Solutions and auxiliary equipment. Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

6. Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.

Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

6. Operation *(contd.)*

- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

7. Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

8. Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with Siemens Airfield Solutions equipment are permitted to service this equipment.

- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved Siemens Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

8. Maintenance and Repair *(contd.)*

- Check interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.

Section 2
Description

1. Introduction

See Figure 2-1. This section describes L-858 taxiway and runway signs referred to in Table 2-1.

NOTE: This product contains no solid state devices to accomplish regulation of current to lamps.

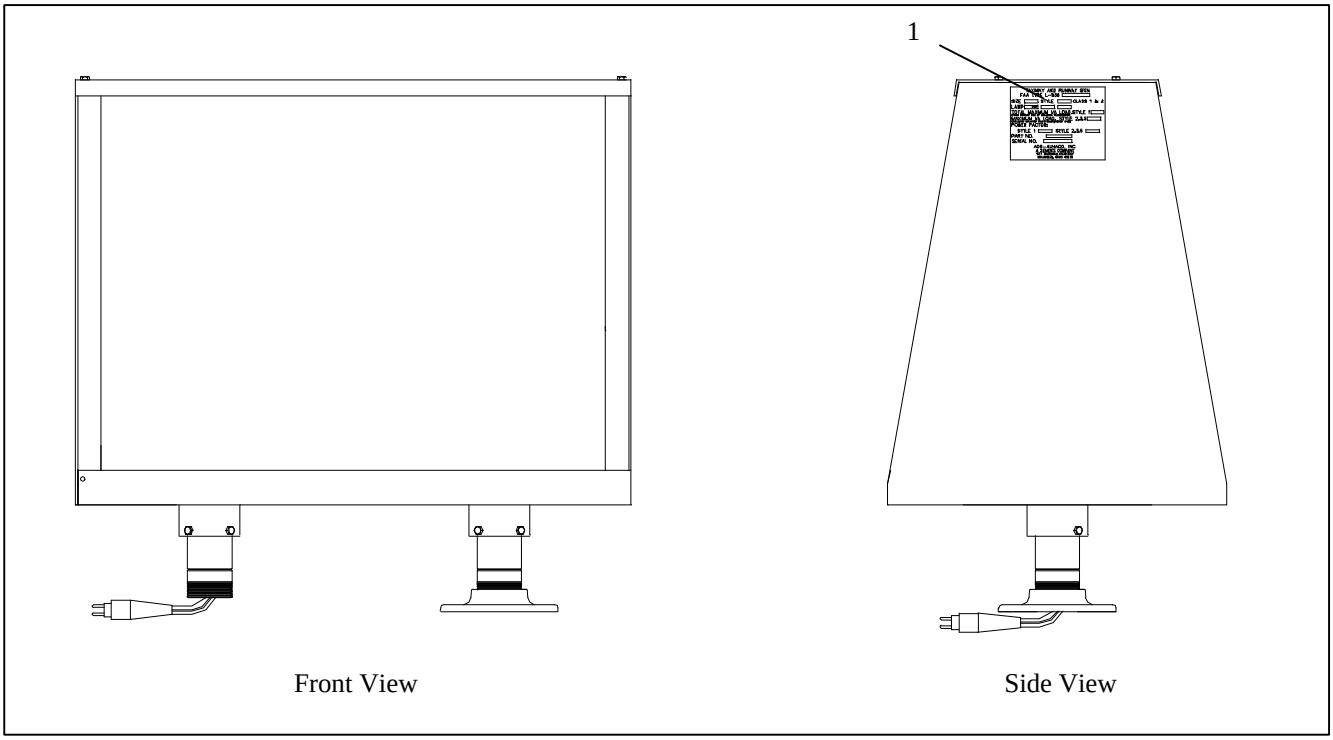


Figure 2-1. L-858 Taxiway and Runway Sign (1-Module) with Nameplate (1)

Table 2-1. L-858 Taxiway and Runway Signs

Sign Type	Purpose	Legend Color	Background Color
L-858Y	Taxiway, Direction, Destination, & Boundary	Black	Yellow
L-858R	Mandatory Sign	White	Red
L-858B	Runway Distance Remaining	White	Black
L-858L	Runway or Taxiway Location	Yellow	Black

1. Introduction *(contd.)*

The Siemens Airfield Solutions L-858 taxiway and runway signs are used on airports

- to guide pilots of aircraft to destinations in accordance with FAA AC 150/5340-18C
- to identify holding positions, intersecting runways and taxiways
- to prohibit entry into a particular area
- to provide runway distance remaining information to pilots during takeoff and landing operations

The basic sign module accommodates two characters and can be single- or double-faced. The signs are available in all FAA classifications of various lengths depending on the number of modules combined. Each sign is furnished complete with lamp(s), connecting leads, legend panels, brightness control transformer(s), and mounting assemblies designed for installation on concrete pads or metal stakes.

NOTE: Incandescent lamps are standard for L-858 taxiway and runway signs. Quartz lamps are optional.

2. L-858 Signs: Required Equipment

Refer to Table 2-2 for required equipment that is supplied. Refer to Table 2-3 for required equipment that is not supplied.

Table 2-2. Required Equipment Supplied

Description	Quantity
L-858 sign	1
Instruction manual	2 per order
Frangible couplings per module	2-3
Mounting hardware (base plate(s), floor flange(s))	As required

2. L-858 Signs: Required Equipment *(contd.)*

Table 2-3. Required Equipment Not Supplied

Description	Quantity
L-867 base	1
L-828 constant current regulator	1
L-830 isolation transformer (Refer to Tables 3-9 through 3-16 in the *Installation* section.)	1
L-824 cable	As required
Connectors	As required
Anchor bolts (two 1/2–13 bolts per foot)	As required
Anti-seize compound/petroleum jelly	As required

3. Specifications

This subsection provides specifications for L-858 taxiway and runway signs.

Rated Lamp Life

Rated lamp life at 6.6 A is 1000 hours. Since the 30 W lamp is run at 6.2 A, actual lamp life may be up to 4400 hours. Since the 45 W lamp is run at 6.0 A, actual lamp life may be up to 10,000 hours.

Construction

Structure is fabricated from aluminum sheet and aluminum extrusions. Mounting hardware is stainless steel.

Visibility

Sign type is discernible at nighttime up to a distance of 800 feet (243.84 m). Average luminance of 10 to 30 ft-lamberts (34.26–102.78 candelas per square meter) on all types and styles.

Style

Refer to Table 2-4 for sign style.

Table 2-4. Sign Style

Style	Power Source	Lamp Wattage (W)	Note
1	120 Vac	54	A
2	4.8–6.6 A (3-Step CCR)	30, 45	A
3	2.8–6.6 A (5-Step CCR)	30, 45	A
3	8.5–20 A (5-Step CCR) with 20 A/6.6 A L-830	30, 45	A
5	Powered from a series lighting circuit (5.5 A only)	30, 45	A
NOTE A: 54 W and 30 W lamps are not submitted for ETL certification test but are built to conform to all aspects of the FAA specification.			

Class

Refer to Table 2-5 for sign class.

NOTE: All Siemens Airfield Solutions signs meet Class 2 requirements.

Table 2-5. Sign Class

Class	Operating Temperature Range (Celsius)	Operating Temperature Range (Fahrenheit)
1	-20 to +55 °C	-4 to +131 °F
2	-55 to +55 °C	-67 to +131 °F

Conditions for Continuous Outdoor Use

The L-858 taxiway and runway sign is designed for continuous outdoor use under the conditions presented below for operating temperature range, wind, and rain.

Operating Temperature Range

-55 to +55 °C (-67 to +131 °F)

Wind

Withstands [225 mph (362.1 kph)] [0.9 psi (6205.28 N/m^2)]. Frangible couplings fail before reaching 270 mph (434.5 kph) (1.3 psi) (8963.19 N/m^2).

Rain

The L-858 taxiway and runway sign is designed for exposure to driving rains.

Sign Classification

Refer to Table 2-6 for sign classification.

Table 2-6. Sign Classification

Sign Type	Sign Size	Sign Face Height in. (mm)	Legend Height in. (mm)	Style Numbers	Class Numbers	Overall Mounting Height in. (mm)
L-858Y/R/L	1	18 (457.2)	12 (304.8)	2, 3	1, 2	24–30 (609.6–762)
L-858Y/R/L	2	24 (609.6)	15 (381)	2, 3	1, 2	30–36 (762–914.4)
L-858Y/R/L	3	30 (762)	18 (457.2)	2, 3	1, 2	36–42 (914.4–1066.8)
L-858B	4	48 (1219.2)	40 (1016)	2, 3	1, 2	54–60 (1371.6–1524)
L-858B	5	30 (762)	25 (635)	2, 3	1, 2	36–42 (914.4–1066.8)

NOTE: Signs can be supplied with either 6.6 A incandescent or 6.6 A quartz lamps.

Number of Lamps Per Module

This subsection provides for the number of lamps per module for Styles 2, 3, and 5.

Styles 2 and 3

Refer to Table 2-7.

Table 2-7. Number of Lamps Per Module (Style 2 and 3)

Sign Size	Incandescent 45 W Lamps Required	Quartz 45 W Lamps Required	120 Vac/40 W Lamps Required
1	1 per module	1 per module	1 per module
2	2 per module	2 per module	2 per module
3	3 per module	3 per module	3 per module
4	6 only	6 only	4 only
5	3 only	3 only	3 only

Style 5

Refer to Table 2-8.

Table 2-8. Number of Lamps Per Module (Style 5)

Sign Size	Incandescent 45 W Lamps Required	Quartz 45 W Lamps Required	Incandescent 30 W Lamps Required	Quartz 30 W Lamps Required
1	1 per module	1 per module	1 per module	1 per module
2	2 per module	2 per module	2 per module	2 per module
3	2 per module	2 per module	2 per module	2 per module
4	4 only	4 only	4 only	4 only
5	2 only	2 only	2 only	2 only

Modular Combination Lengths

Refer to Table 2-9 for modular combination lengths.

Table 2-9. Modular Combination Lengths

Sign Size	1 Module in. (mm)	2 Modules in. (mm)	3 Modules in. (mm)	4 Modules in. (mm)	Note
1	29.5 (749.3)	59 (1498.6)	88.5 (2247.9)	118 (2997.2)	A
2	36.06 (915.9)	72.12 (1831.9)	108.18 (2747.8)	144.25 (3664)	A
3	42.5 (1079.5)	85 (2159)	127.5 (3238.5)	170 (4318)	A
4	48 (1219.2)	Not applicable	Not applicable	Not applicable	
5	42.5 (1079.5)	Not applicable	Not applicable	Not applicable	
NOTE A: The length shown for 4 modules is the maximum length allowed per AC 150/5345-44F.					

Frangibility

All signs sustain a static load of 0.9 psi (6205.28 N/m^2) uniformly [225 mph (362.1 kph) wind] over the entire surface of the sign and break over before reaching 1.3 psi (8963.19 N/m^2) [270 mph (434.5 kph) wind].

Weight

Refer to Table 2-10 for sign weight.

Table 2-10. Sign Weight

Sign Size	lb per Module (Approximate)	kg per Module (Approximate)
1	48	21.77
2	65	29.48
3	80	36.29
4	132	59.87
5	80	36.29

Dimensions

See Figure 2-2. This subsection describes the dimensions for the L-858 signs.

NOTE: L-858 signs have five sizes. Figure 2-2 shows a Size 1 two-module L-858 sign. Size 1 signs have one lamp per module. Size 2 signs have two lamps per module. Refer to Tables 2-11 and 2-12 for the Size 1 and Size 2 dimensions for Size 1 and Size 2, all modules.

NOTE: Figure 2-2 is for dimension purposes only. Internal parts may differ according to Size and number of modules.

NOTE: In the dimension tables below, dimension D is the distance between each leg of the same module. This dimension is the same for all modules of the Size shown in Figure 1. Dimension E is the distance between from the leg of one module to the leg of a second module. Dimension E is not applicable to one-module signs.

Dimensions *(contd.)*

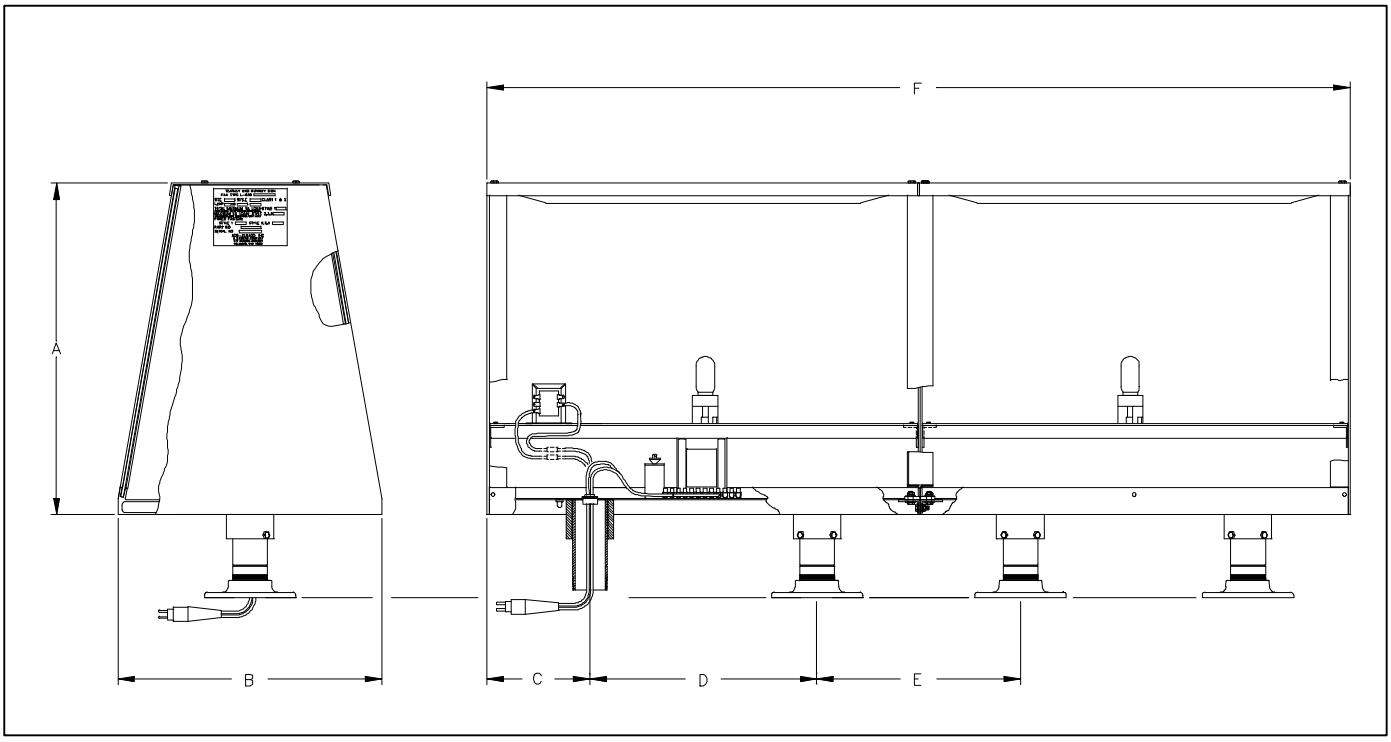


Figure 2-2. L-858 Sign Dimensions (Size 1, Two Module)

Table 2-11. L-858 Size 1 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)
Size 1, 1-Module	22.63 (574.8)	18 (457.2)	7 (177.8)	15.51 (393.95)	Not applicable	29.50 (749.3)
Size 1, 2 Module	22.63 (574.8)	18 (457.2)	7 (177.8)	15.51 (393.95)	13.9 (353)	59 (1498.6)
Size 1, 3-Module	22.63 (574.8)	18 (457.2)	7 (177.8)	15.51 (393.95)	13.9 (353)	88.5 (2250)
Size 1, 4-Module	22.63 (574.8)	18 (457.2)	7 (177.8)	15.51 (393.95)	13.9 (353)	118 (3000)

Table 2-12. L-858 Size 2 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)
Size 2, 1-Module	28.13 (714.5)	20 (508)	8.62 (218.95)	18.812 (477.82)	Not applicable	36.06 (915.92)
Size 2, 2 Module	28.13 (714.5)	20 (508)	8.62 (218.95)	18.812 (477.82)	17.16 (435.86)	72.12 (1830)
Size 2, 3-Module	28.13 (714.5)	20 (508)	8.62 (218.95)	18.812 (477.82)	17.16 (435.86)	108.18 (2750)
Size 2, 4-Module	28.13 (714.5)	20 (508)	8.62 (218.95)	18.812 (477.82)	17.16 (435.86)	144.25 (3660)

Dimensions *(contd.)*

Figure 2-3 shows the Size 3 two-module L-858 sign. Refer to Table 2-13 for Size 3 dimensions for all modules.

NOTE: Figure 2-3 is for dimension purposes only. Internal parts may differ according to Size and number of modules.

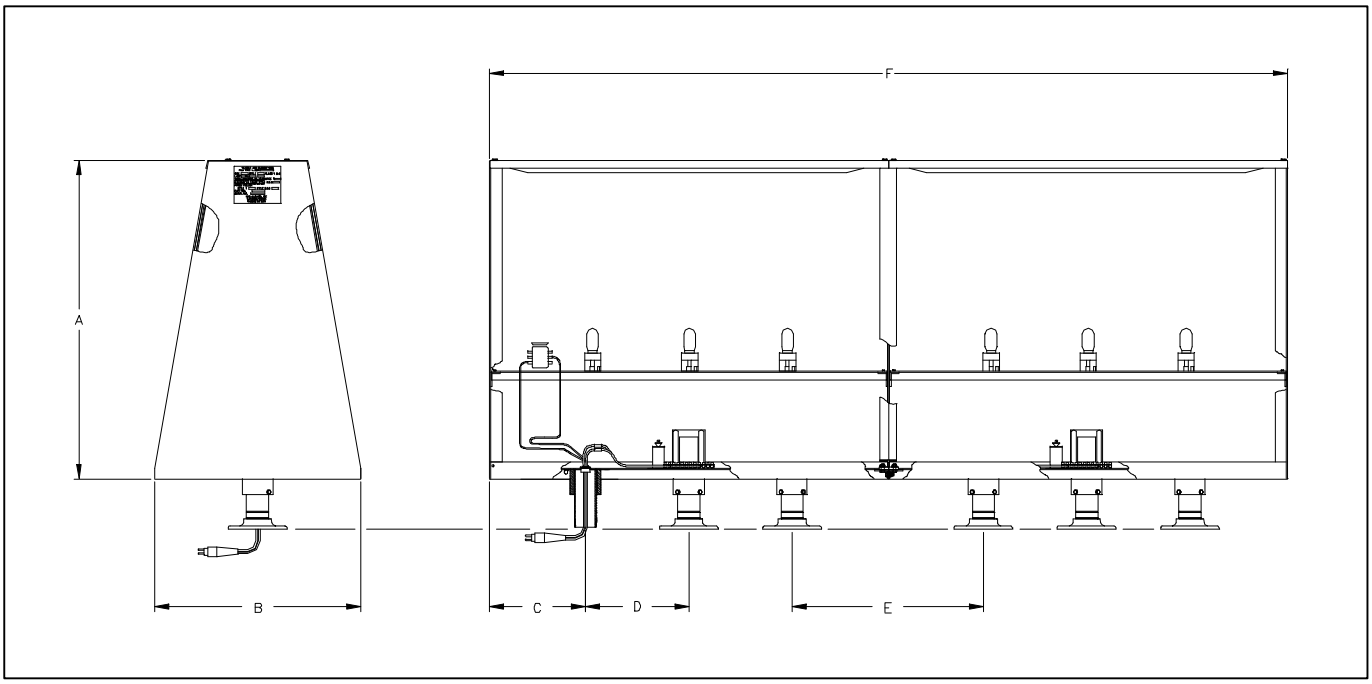


Figure 2-3. L-858 Sign Dimensions (Size 3, Two-Module)

Table 2-13. L-858 Size 3 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)
Size 3, 1-Module	33.88 (860.55)	22 (558.8)	10.23 (259.84)	11 (279.4)	Not applicable	42.50 (1080)
Size 3, 2 Module	33.88 (860.55)	22 (558.8)	10.23 (259.84)	11 (279.4)	20.39 (517.91)	85.12 (2160)
Size 3, 3-Module	33.88 (860.55)	22 (558.8)	10.23 (259.84)	11 (279.4)	20.39 (517.91)	127.68 (3240)
Size 3, 4-Module	33.88 (860.55)	22 (558.8)	10.23 (259.84)	11 (279.4)	20.39 (517.91)	170.25 (4320)

Dimensions *(contd.)*

Figure 2-4 shows the Size 4 L-858 Hz sign. Refer to Table 2-14 for Size 4 dimensions.

NOTE: Figure 2-4 is for dimension purposes only. Internal parts may differ according to Size and number of modules.

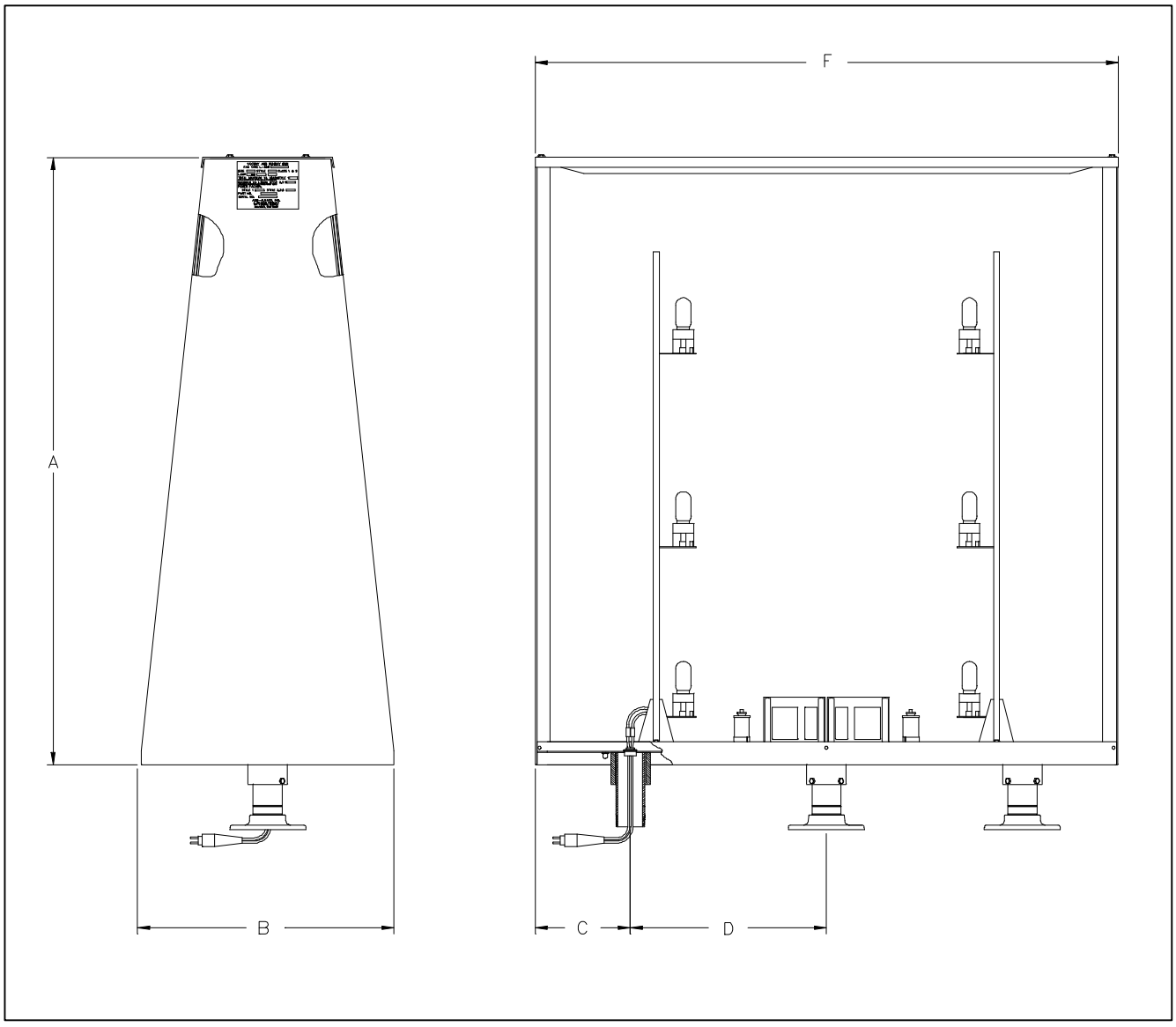


Figure 2-4. L-858 Sign Dimensions (Size 4)

Table 2-14. L-858 Size 4 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)
Size 4, 1-Module	50 (127)	20 (508)	7.87 (199.9)	16.125 (409.58)	Not applicable	48 (1220)

Dimensions *(contd.)*

Figure 2-5 shows the Size 5 L-858 sign. Refer to Table 2-15 for Size 5 dimensions.

NOTE: Figure 2-5 is for dimension purposes only. Internal parts may differ according to Size and number of modules.

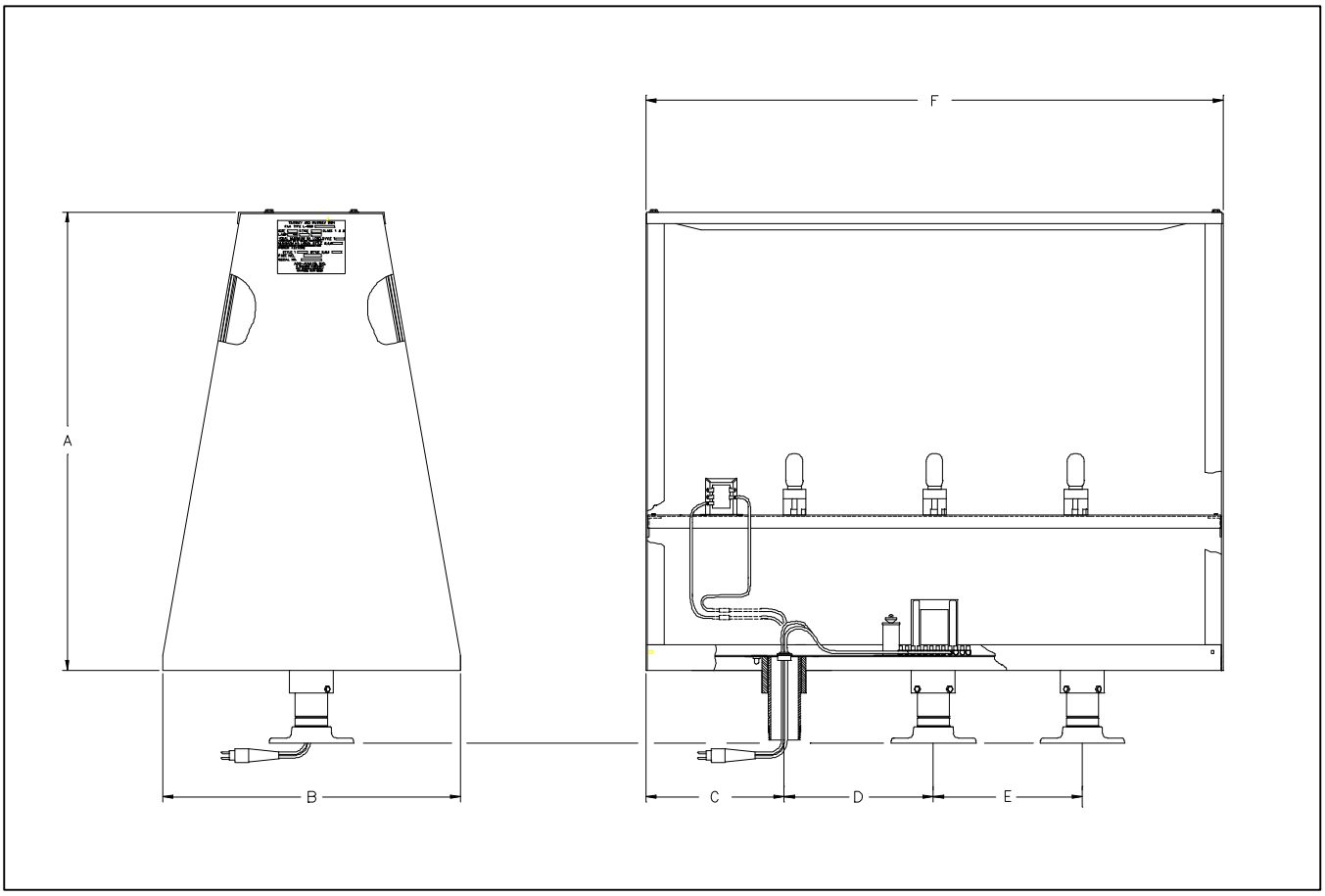


Figure 2-5. L-858 Sign Dimensions (Size 5)

Table 2-15. L-858 Size 5 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)
Size 5, 1-Module	33.88 (860.55)	22 (558.8)	10.23 (259.84)	11 (279.4)	Not applicable	42.5 (1080)

Sign Power Factor and Total VA Load

Refer to Tables 2-16 through 2-19. See Figure 2-1 for the nameplate containing electrical load specifications.

NOTE: The number for the total VA load imposed on CCR represents the actual load imposed on the regulator and accounts for power factor and load imposed by the L-830 transformer. Use this number when calculating regulator wattage to be used. You cannot determine this number by totaling nominal lamp wattage.

NOTE: Table 2-16 is for Siemens Airfield Solutions's L-858 sign that uses only a saturating transformer to control current through the lamp. See Figures 8-1 through 8-14 in the *Wiring Schematics* section. Table 2-17 is for Siemens Airfield Solutions's L-858 sign that uses a saturating transformer and capacitor to control current through the lamp. See Figures 8-15 through 8-28 in the *Wiring Schematics* section.

Table 2-16. 3-Step (Style 2) Sign Transformer

Number of Modules	PF/VA Load	Size 1	Size 2	Size 3	Size 4	Size 5
1	PF VA Load	0.49 131	0.59 223	0.61 240	0.56 455	0.61 240
2	PF VA Load	0.59 223	0.48 327	0.56 455	Not applicable	Not applicable
3	PF VA Load	0.61 240	0.56 455	0.56 825	Not applicable	Not applicable
4	PF VA Load	0.48 327	0.55 607	0.51 871	Not applicable	Not applicable

Table 2-17. 5-Step (Style 3) Sign Transformer

Number of Modules	PF/VA Load	Size 1	Size 2	Size 3	Size 4	Size 5
1	PF VA Load	0.21 231	0.32 316	0.24 645	0.23 910	0.24 645
2	PF VA Load	0.32 316	0.31 652	0.23 910	Not applicable	Not applicable
3	PF VA Load	0.24 645	0.23 910	0.23 1555	Not applicable	Not applicable
4	PF VA Load	0.31 652	0.31 1304	0.31 1820	Not applicable	Not applicable

Sign Power Factor and Total VA Load *(contd.)*

Table 2-18. Stepless (Style 5) Sign Transformer (Using 30 W Lamps)

Number of Modules	PF/VA Load	Size 1	Size 2	Size 3	Size 4	Size 5
1	PF VA Load	0.98 40	0.99 65	0.99 65	0.99 120	0.99 65
2	PF VA Load	0.99 65	0.99 120	0.99 120	Not applicable	Not applicable
3	PF VA Load	0.99 89	0.98 171	0.98 171	Not applicable	Not applicable
4	PF VA Load	0.99 120	1.00 228	1.00 228	Not applicable	Not applicable

Table 2-19. Stepless (Style 5) Sign Transformer (Using 45 W Lamps)

Number of Modules	PF/VA Load	Size 1	Size 2	Size 3	Size 4	Size 5
1	PF VA Load	0.99 48	0.99 86	0.99 86	0.99 160	0.99 86
2	PF VA Load	0.99 86	0.99 160	0.99 160	Not applicable	Not applicable
3	PF VA Load	0.99 127	1.00 238	1.00 238	Not applicable	Not applicable
4	PF VA Load	0.99 160	0.98 300	0.98 300	Not applicable	Not applicable

Section 3
Installation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Introduction

This section provides instructions for installing L-858 taxiway and runway signs. Refer to the airport project plans and specifications for the specific installation instructions and FAA AC 150/5340-18C.

2. Unpacking

The equipment is shipped ready for installation. Handle equipment very carefully to prevent component damage. Unpack the carton upon receipt and check the contents and their condition. Note any exterior damage to the carton that might lead to detection of equipment damage.

If you note any damage to any equipment, file a claim with the carrier immediately. The carrier may need to inspect the equipment.

3. Cordset Installation

This subsection provides information for installing cordsets. It includes sign installation kit reference numbers for three power leg cordset installation locations and mounting configurations.

Cordset Installation Reference Numbers

See Figure 3-1 for the sign installation kit reference numbers for all power leg cordset locations. See Figures 3-2 through 3-7 for sign installation kit reference numbers for special cordset locations.

Cordset Installation
Reference Numbers *(contd.)*

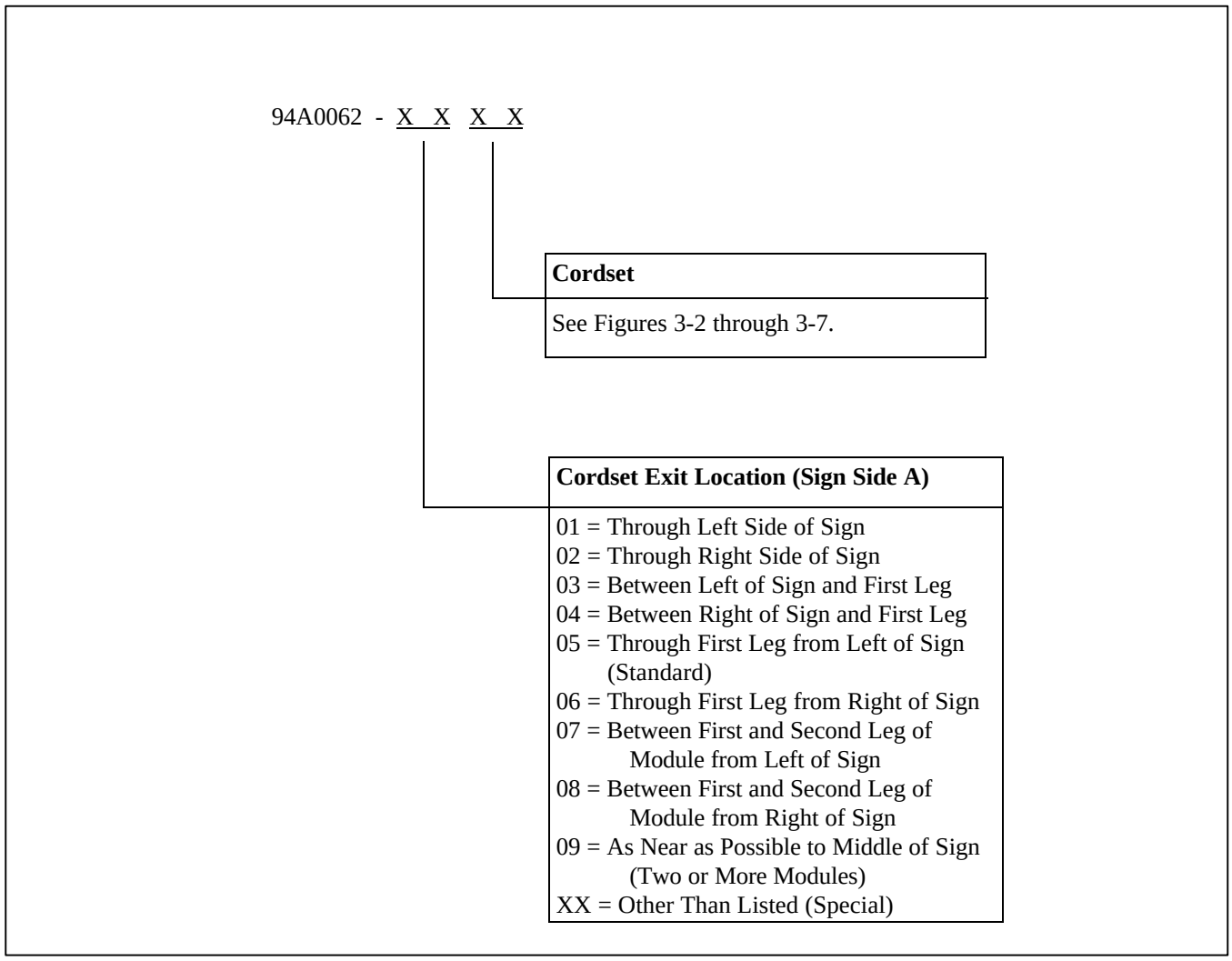


Figure 3-1. L-858 Installation Reference Numbers

Cordset Exit Location #1

Figure 3-2 shows the cordset part numbers for cordset location #1. Figure 3-3 shows the exit location for the cordset. The outdoor cordset exits the sign for 94A0062-03XX only. Other exit locations are possible and may be selected by entering the two-digit location number in the sign kit installation reference number. Refer to Table 3-1 for installation part numbers.

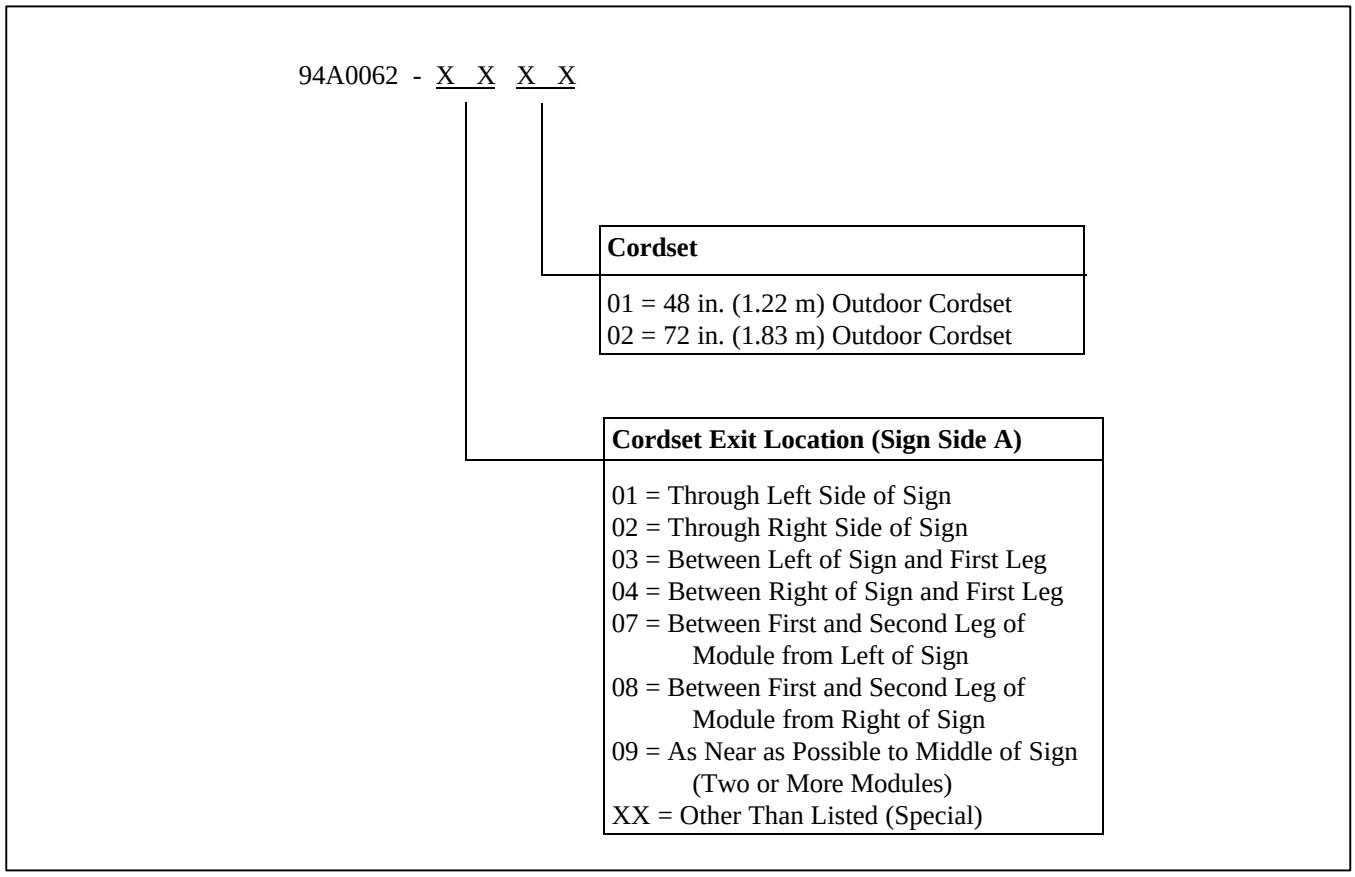


Figure 3-2. Cordset Location #1 Part Numbers

Cordset Exit Location #1 *(contd.)*

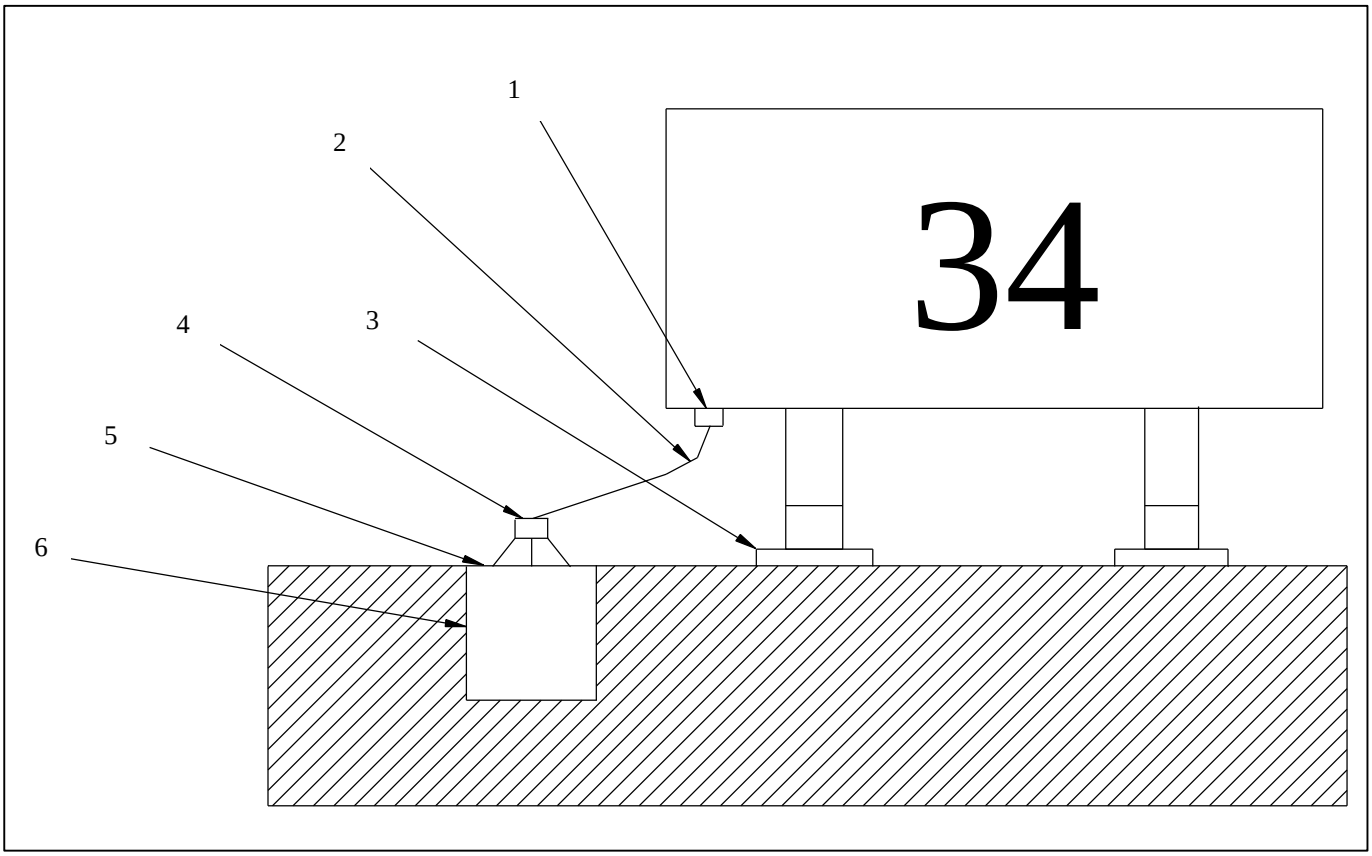


Figure 3-3. Cordset Location #1 (Nontypical)

Table 3-1. Cordset Location #1 Parts

Item	Description	Supplier	Part Number	Note
1	Strain relief	Siemens Airfield Solutions	70A0091	
2	15-in. (381-mm) outdoor cordset	Siemens Airfield Solutions	Not applicable	A
3	Floor flange	Siemens Airfield Solutions	62B0107-2	B
4	Connector plug	Siemens Airfield Solutions	63B0550	
5	2-in. (50.8-mm) L-867 base plate	Siemens Airfield Solutions	1932	B
6	12 x 24 in. (304.8 x 609.6 mm) L-867 base	Siemens Airfield Solutions	2124	B
NOTE A: Fifteen inches (381 mm) of cordset length is used for interior connections in sign. Refer to *Cordsets and Extension Cords* in this section for cordsets available if different cordset length is required. NOTE B: Requires a separate line item on purchase order.				

Cordset Exit Location #2

Figure 3-4 shows the cordset part numbers for cordset location #1. Figure 3-5 shows the exit location for the cordset. The outdoor cordset exits the sign for 94A0062-03XX only. Other exit locations are possible and may be selected by entering the two-digit location number in the sign kit installation reference number. Refer to Table 3-2 for installation part numbers. Refer to Table 3-3 for flexible conduit connectors.

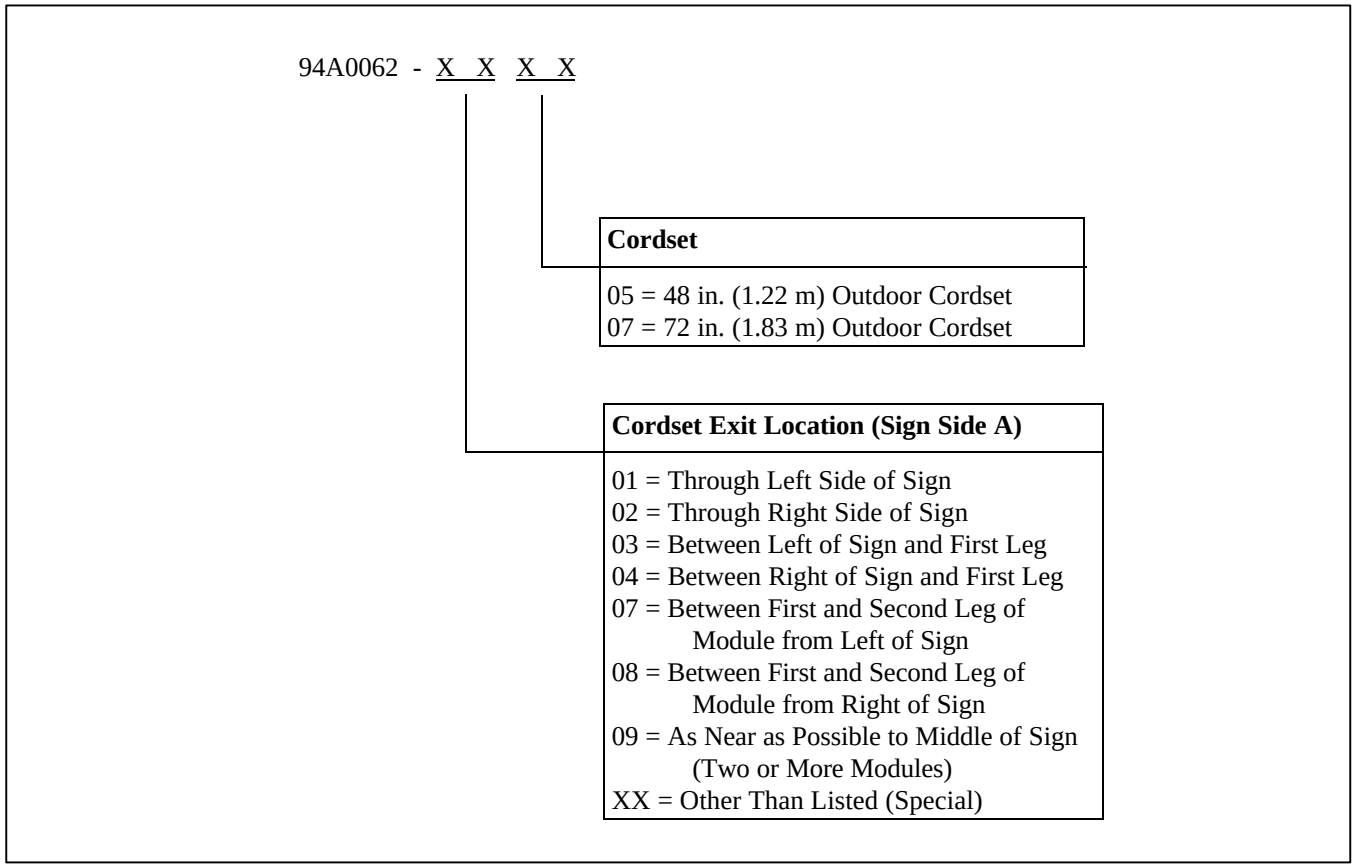


Figure 3-4. Cordset Location #2 Part Numbers

Cordset Exit Location #2 *(contd.)*

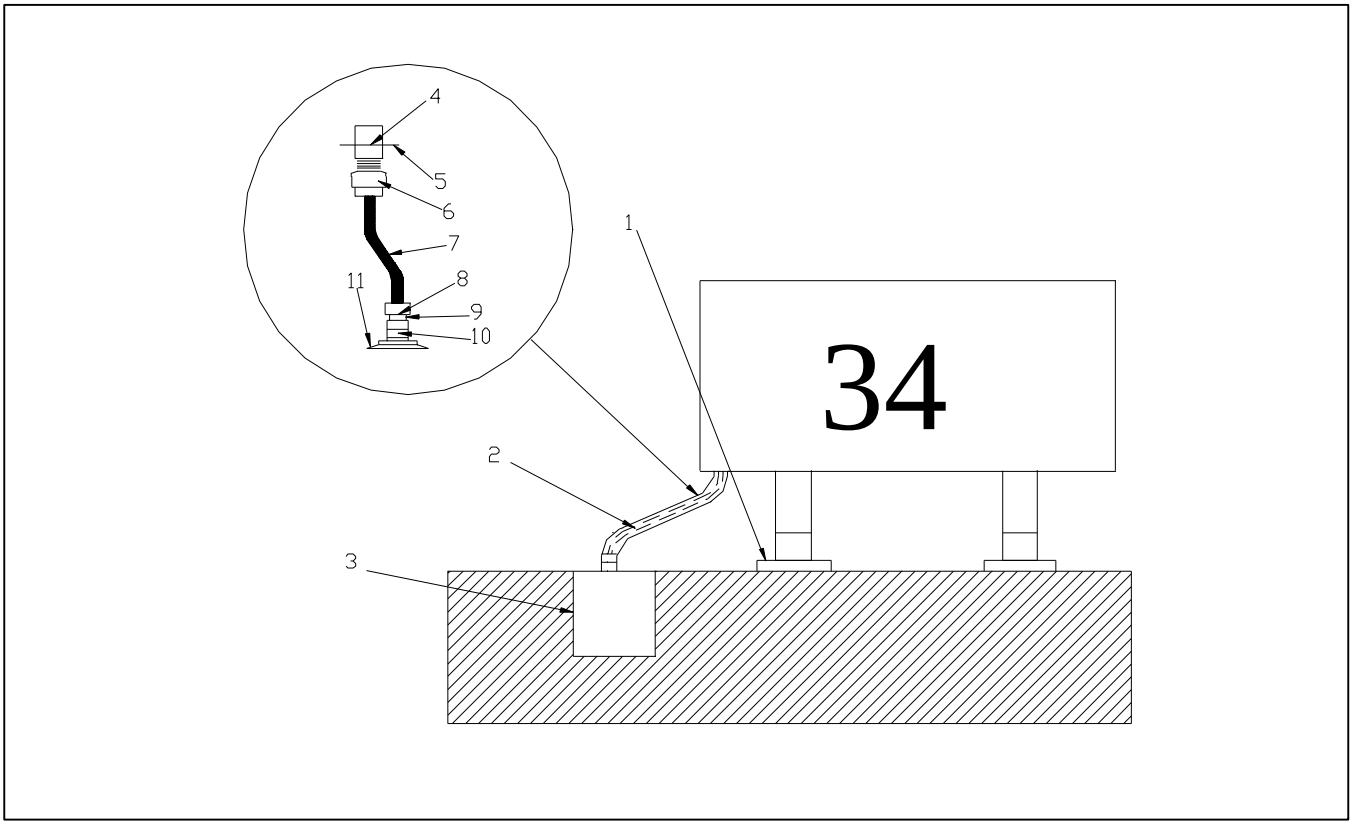


Figure 3-5. Cordset Location #2 (Nontypical)

Table 3-2. Cordset Location #2 Parts

Item	Description	Supplier	Part Number	Note
1	Floor flange	Siemens Airfield Solutions	62B0107-2	C
2	15-in. (381-mm) Outdoor Cordset	Siemens Airfield Solutions	Not applicable	B
3	12 x 24 in. (304.8 x 609.6 mm) L-867 base	Siemens Airfield Solutions	2124	C
7	Flexible conduit	Contractor	Not applicable	A
10	Frangible coupling	Siemens Airfield Solutions	62B0499	
11	2 in. (50.8 mm) L-867 base plate	Siemens Airfield Solutions	1932	C

NOTE A: Refer to Table 3-3 for flexible conduit connectors.
NOTE B: Refer to *Cordsets and Extension Cords* in this section for cordsets available if different cordset length is required.
NOTE C: Requires a separate line item on purchase order.

Table 3-3. Flexible Conduit Connectors

Item	Description	Supplier
4	3/4-inch (44.45 mm) diameter hole	Siemens Airfield Solutions
6	1/4 inch (31.75 mm) flexible conduit male connector	Others
7	1/4 inch (31.75 mm) flexible conduit	Others
8	1/4 inch (31.75 mm) flexible conduit male connector	Others
9	1-1/2 x 1-1/4-in. (38.1 x 31.75-mm) hex reducer bushing	Contractor

Cordset Exit Location #3

Figure 3-6 shows the cordset part numbers for cordset location #3. Figure 3-7 shows the exit location for the cordset. The L-823 cordset exits the sign for 94A0062-05XX only. Other exit locations are possible and may be selected by entering the two-digit location number in the sign kit installation reference number. Refer to Table 3-4 for installation part numbers.

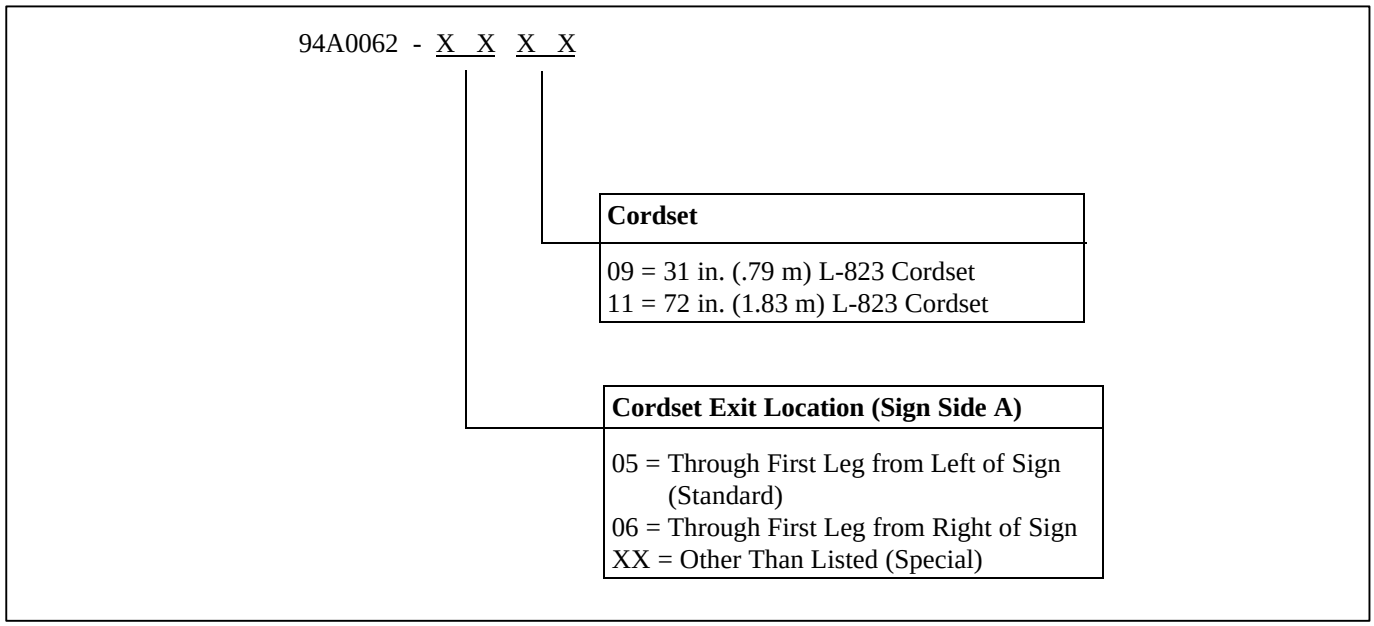


Figure 3-6. Cordset Location #3 Part Numbers

Cordset Exit Location #3 *(contd.)*

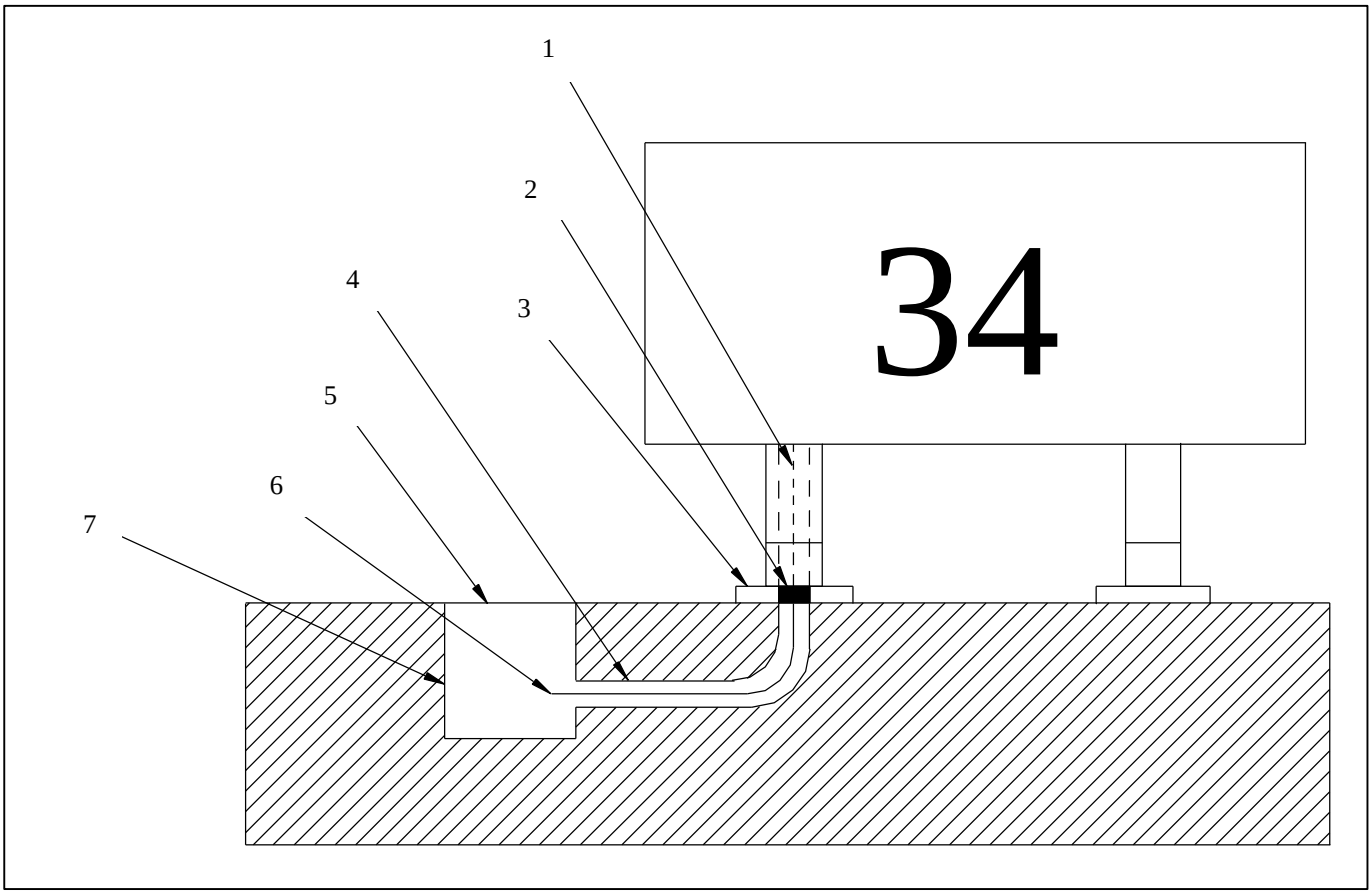


Figure 3-7. Cordset Location #3 (Standard)

Table 3-4. Cordset Location #3 Parts

Item	Description	Supplier	Part Number	Note
1	L-823 outdoor cordset	Siemens Airfield Solutions	Not applicable	A
2	Cable clamp	Siemens Airfield Solutions	63A0563	B
3	Floor flange	Siemens Airfield Solutions	62B0107-2	B
4	2-in. (50.8 mm) rigid conduit	Siemens Airfield Solutions	Not applicable	
5	3/8 inch (9.53 mm) thick base plate	Siemens Airfield Solutions	1000-6	
6	8-foot (2.44 m) extension cord	Siemens Airfield Solutions	73A0109-8	C
7	12 x 24 in. (304.8 x 609.6 mm) L-867 base	Siemens Airfield Solutions	2124	B
NS	Gasket	Siemens Airfield Solutions	2052	B, D

NOTE A: Fifteen inches (381 mm) of cordset length is used for interior connections in sign.
NOTE B: Requires a separate line item on purchase order.
NOTE C: Refer to *Cordsets and Extension Cords* in this section for extension cords available if different extension cord length is required.
NOTE D: Gasket is sold separately.

Cordset and Extension Cords

See Figure 3-8. Refer to Table 3-5 for cordset and extension cord types. Refer to Table 3-6 for cordset and cord parts.

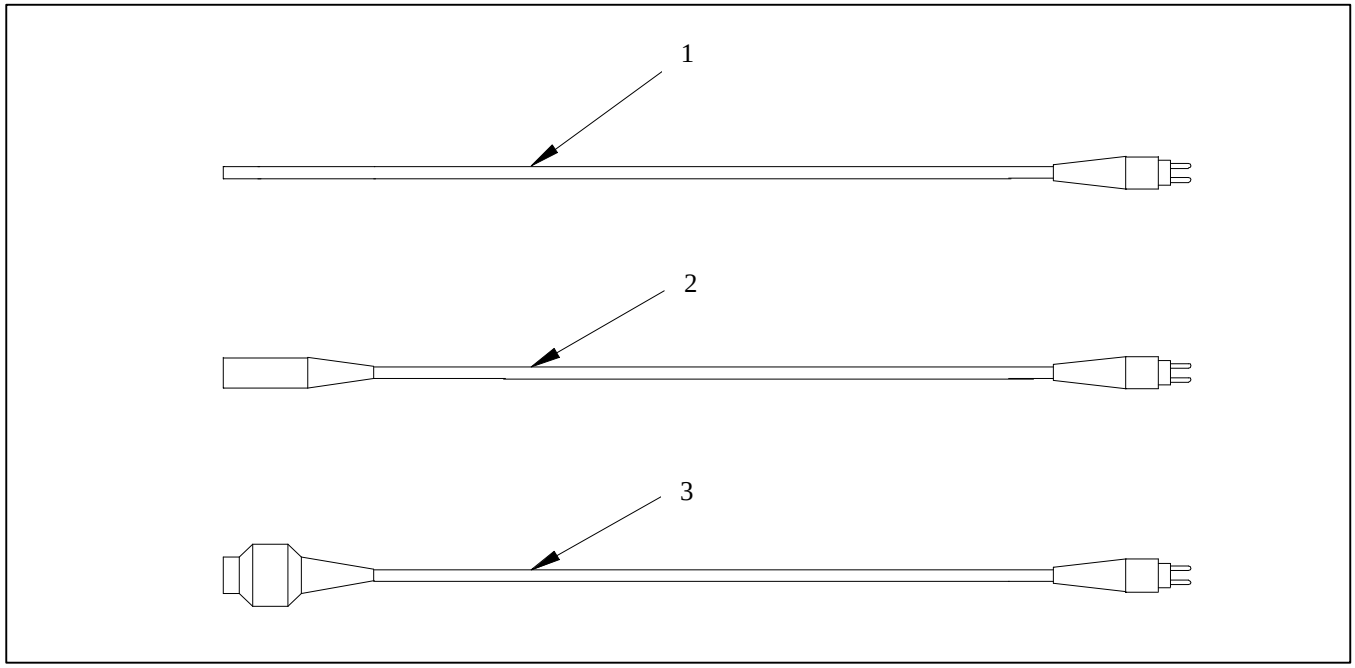


Figure 3-8. L-823 Cordset and Extension Cords

Table 3-5. Cordset and Extension Cord Length

Type	Part Number	Receptacle Style	Plug Style	Standard Length	Wire
1	73A0107-X	Not applicable	Type II, Class A, Style 1	4 ft (1.22 mm) 6 ft (1.83 mm)	16/2
2	73A0108-X	II, Class A, Style 7	Type II, Class A, Style 1	8 ft (2.44 mm)	16/2
3	73A0109-X	II, Class A, Style 7	Type II, Class A, Style 1	8 ft (2.44 mm)	16/2

Table 3-6. Cordset and Extension Cord Parts

Item	Description	Part Number	Note
1	L-823 cordset, 16/2 wire Cordset, standard size 4 ft (1.22 mm) Cordset, standard size 6 ft (1.83 mm)	 73A0107-48 73A0107-72	A, B
2	L-823 cordset extension cord, 16/2 wire, standard size 8 ft (2.44 mm)	73A0108-8	A, C
3	L-823 cordset extension cord, 16/2 wire, standard size 8 ft (2.44 mm)	73A0109-8	A, D

NOTE A: Other sizes require special order.
NOTE B: Fifteen inches (381 mm) of cordset length is required for internal sign connections. Usable exterior cordset length is equal to the cordset length minus 15 inches.
NOTE C: Receptacle may be connected to plug on 73A0107-X, 73A0109-8 cordset, or standard 31-inch (787.4 mm) L-823 cordset.
NOTE D: Receptacle must be connected to plug on, Plug Type II, Class A, Style 1, supplied with the sign.

4. Installation

WARNING: Signs must be grounded to a true earth ground. Failure to observe this warning may result in personal injury, death, or equipment damage.

General Guidelines

When installing signs, follow the guidelines below.

- Mount the signs on a concrete slab, concrete pedestals, or angle iron stakes.
- Do not allow concrete edges or stakes to protrude above grade.
- Provide power to the signs through breakaway cable connectors installed within the frangible coupling portion of the sign's mounting legs.
- Install auxiliary equipment, such as isolation transformers, in a light base embedded in the ground.

Overall Mounting Height

Install signs so that the overall height above the surrounding ground of the sign assembly, including mounting supports, does not exceed heights given in Table 3-7 and the clearances of aircraft wings as specified in AC 150/5340-18C. The sign must provide 12 inches (304.8 mm) of clearance between the top of the sign and any part of the most critical aircraft using, or expected to use, the airport when the aircraft's wheels are at the pavement edge.

Table 3-7. Overall Mounting Height

Sign Size	Overall Mounting Height in.	Overall Mounting Height mm
1	24–30	609.6–762
2	30–36	762–914.4
3	36–42	914.4–1066.88
4	54–60	1371.6–1524
5	36–42	914.4–1066.88

Sign Orientation

When orienting signs, follow the guidelines below.

- Orient the sign so that the face is perpendicular to the centerline of the taxiway or runway.
- For special situations where visibility would be improved, cant single-sided signs. Refer to FAA AC 150/5340-18C for the correct orientation.
- For signs identifying an instrument landing system (ILS) critical area, coordinate the location and orientation with the local FAA airway facilities personnel, and schedule installation with periodic ILS flight checks to ensure that signs do not cause interference with the ILS electronic signal.

Sign Distance from Pavement Edge

Refer to Table 3-8 for the distance of signs from the pavement edge. Refer to AC 150/5340-18C for more information on the location of different types of taxiway signs.

Table 3-8. Recommended Sign Distance from Pavement Edge

Sign Size	Distance from Pavement ft	Distance from Pavement m
1	10–20	3.048–6.096
2	25–35	7.62–10.668
3	35–60	10.668–18.228
4	50–75	15.24–22.86
5	20–35	6.096–10.668

Sign Installation on Concrete Pad

This subsection provides procedures for pouring a concrete pad and installing the sign onto the pad.

Concrete Pouring

To pour a concrete pad, perform the following procedure:

1. Determine the sign size and module.
2. Pour your concrete pad according to the following requirements:
   - a minimum of 30 inches (762 mm) wide, extending 14 inches (355.6 mm) beyond the end of the supports
   - a minimum of 4 inches (101.6 mm) depth, extending below the frost line to prevent frost heave
   - reinforced to meet load requirements and/or crack control
3. Install a minimum of one 12-inch (304.8 mm) L-867 power base (1) according to the following guidelines:
   - Install the base close to the sign in or near the concrete pad to provide easy access to the L-830 isolation transformer.
   - When installing the base in the concrete pad, hold the L-867 base firmly in place during construction of the pad so that the upper surface of the base flange is level within ± 2 degrees and not more than 3/8 inch (9.525 mm) above the concrete surface.
   - All other bearing surfaces on the pad for additional flange supports should be kept in the same horizontal plane as the L-867 base flange.

   NOTE: For 120 Vac parallel-powered signs, install a 2-inch (50.8 mm) conduit elbow, instead of an L-867 base, in the concrete pad. Center the conduit elbow on the L-867 base. Smooth the concrete so that you create a 1/2-inch per foot slope on the surface.

Sign Mounting

NOTE: Signs up to four modules are totally assembled at the factory and are ready for direct installation.

To mount the sign onto the concrete pad, perform the following procedure:

1. Before the concrete sets, install two 1/2–13 anchor bolts into the concrete pad. The bolts should be equally spaced on a 4.75-inch- (120.65-mm-) diameter bolt circle, 180 degrees apart for each foot. Bolts should be located perpendicular to the sign face.

   NOTE: A customer-supplied setting fixture is recommended to hold the bolts in position while the concrete sets.

   NOTE: Anchor bolts must be a minimum of 1.25 inches (31.75 mm) above the top surface of the concrete pad to attach the flange.

   NOTE: Hilti quick bolts are recommended for installing the flanges after the concrete sets.

2. Install the floor flange and mounting base plate (if used) on the anchor bolts.

3. Lubricate the threads of the frangible coupling with petroleum jelly or anti-seize compound.

4. Screw the frangible couplings into the floor flanges.

   NOTE: If male L-823 connector is routed through a leg, slide frangible coupling over male connector and insert into female connector in base plate, and then screw frangible coupling into base plate.

CAUTION: Sign frangible couplings are uniquely designed for use on the sign size stamped on the coupling and can only be used for that particular size sign. Before installing frangible couplings, make sure the sign size on couplings matches the size sign on which they are to be installed.

Sign Mounting *(contd.)*

5. Mount the sign on the frangible coupling and adjust the hub screws against the frangible coupling so that the sign is level.

   NOTE: The larger the sign, the more important for parts such as flanges to concrete and coupling to flanges to be at a 90 degree angle.

CAUTION: Be careful not to crush the couplings by overly tightening the hub screws against the couplings.

6. Connect an AWG 12 (minimum) ground wire to the earth ground lug on the bottom of the sign. Refer to *Wiring* in this section. Refer to the *Wiring Schematics* section for electrical connections for series circuit and parallel circuit installation.

WARNING: Lock out power before making any electrical connections. Failure to observe this warning may result in personal injury, death, or equipment damage.

7. Install optional tether (if used) to sign and anchor bolt. Refer to *Optional Tethers* in this section.

8. Plug the cordset into the sign and the transformer.

9. Reinstall panels (if removed) and top lid (if removed). Refer to the *Repair* section for more information on installing the lid.

Stake Mounting

NOTE: Stake mounting is recommended for Size 1 sign only.

To install a stake, perform the following procedure:

1. Install angle-iron stakes in 6-inch- (152.4-mm-) diameter holes at a depth of 30 inches (762 mm).

CAUTION: Do not drive stakes. Driving stakes may damage the stake and cause sign misalignment. Refer to FAA specification AC 150/5340-24.

Stake Mounting *(contd.)*

2. Pour concrete in the holes (6 x 6 x 12 in., minimum) (152.4 x 152.4 x 304.8 mm) to create a concrete anchor for the stakes.

3. Make electrical connections as required and backfill around the stake with compacted earth passing a 1-inch (25.4 mm) sieve.

4. Make sure the top of the metal hub that is attached to the stake is even or not more than 1/2 inch (12.7 mm) above the finished grade and the stake is a maximum of 1/2 degree of vertical.

5. Screw the frangible coupling into the hub. Mount the sign onto the coupling.

Wiring

Refer to the *Wiring Schematics* section for wiring diagrams.

When installing cable, follow the guidelines below.

- Install all cable for direct earth burial or for placement in duct according to Item 108 or Item 110 of AC 150/5370-10 as appropriate.

- Operate the signs as a part of a series 6.6 amp (or 20 amp) lighting system, or from a 120 Vac power supply. The signs are connected into the series circuit by means of L-830 isolation transformers. If installation is to be independent of other lighting circuits, use current edition of AC 150/5340-24, *Runway and Taxiway Edge Lighting System*, for system reference and material needs.

Earth Ground Lug

WARNING: Signs must be properly grounded to true earth ground. Failure to observe this warning may result in personal injury, death, or equipment damage.

Attach the earth ground lug. The earth ground lug is located on the outside frame of the sign to permit easy connection of an AWG 12 (minimum) earth ground wire to the sign. If necessary, you may remove the ground lug from the outside and place it on the inside.

Series Circuit Connection

Connect the male L-823 cable connector(s) from the sign to the secondary lead(s) of the appropriate L-830 isolation transformer(s). Refer to the *Wiring Schematics* section for wiring diagrams. Refer to Tables 3-9 through 3-16.

NOTE: For Tables 3-13 and 3-15, 30 W lamps on Style 5 signs are not submitted for ETL certification test but are built to conform to all aspects of the FAA specification.

Table 3-9. Required 3-Step Transformers for 6.6 A Series Circuit Installation

Sign Size	1 Module	2 Modules	3 Modules	4 Modules	Note
1	L-830-1, 30/45 W	L-830-4, 100 W	L-830-4, 100 W	L-830-6, 200 W	
2	L-830-4, 100 W	L-830-6, 200 W	L-830-10, 300 W	L-830-10, 300 W	
3	L-830-4, 100 W	L-830-10, 300 W	35A0224, 500 W	35A0224, 500 W	A
4	L-830-10, 300 W	Not applicable	Not applicable	Not applicable	
5	L-830-4, 100 W	Not applicable	Not applicable	Not applicable	
NOTE A: For 3-module and 4-module signs, 35A0224 transformers are 500 W (L-830-type) current isolation transformers. You must order these transformers from Elastimold. The 35A0224 transformers are not listed in the FAA Advisory Circular.					

Table 3-10. Required 5-Step Transformers for 6.6 A Series Circuit Installation

Sign Size	1 Module	2 Modules	3 Modules	4 Modules	Note
1	L-830-4, 100 W	L-830-6, 200 W	L-830-10, 300 W	L-830-10, 300 W	
2	L-830-6, 200 W	L-830-10, 300 W	35A0224, 500 W	L-830-10, 300 W (quantity = 2)	A
3	L-830-10, 300 W	35A0224, 500 W	L-830-10, 300 W, 35A0224, 500 W	35A0224, 500 W (quantity = 2)	A
4	35A0224, 500 W	Not applicable	Not applicable	Not applicable	A
5	L-830-10, 300 W	Not applicable	Not applicable	Not applicable	
NOTE A: The 35A0224 transformers are 500 W (L-830-type) current isolation transformers. You must order these transformers from Elastimold. The 35A0224 transformers are not listed in the FAA Advisory Circular.					

Table 3-11. Required 3-Step Transformers for 20 A Series Circuit Installation

Sign Size	1 Module	2 Modules	3 Modules	4 Modules	Note
1	L-830-2, 30/45 W	L-830-5, 100 W	L-830-5, 100 W	L-830-7, 200 W	
2	L-830-5, 100 W	L-830-7, 200 W	L-830-11, 300 W	L-830-11, 300 W	
3	L-830-5, 100 W	L-830-11, 300 W	35A0228, 500 W	35A0228, 500 W	A
4	L-830-11, 300 W	Not applicable	Not applicable	Not applicable	
5	L-830-5, 100 W	Not applicable	Not applicable	Not applicable	
NOTE A: For 3-module and 4-module signs, 35A0228 transformers are 500 W (L-830 type) current isolation transformers. You must order these transformers from Elastimold. The 35A0228 transformers are not listed in the FAA Advisory Circular.					

Series Circuit Connection *(contd.)*

Table 3-12. Required 5-Step Transformers for 20 A Series Circuit Installation

Sign Size	1 Module	2 Modules	3 Modules	4 Modules	Note
1	L-830-5, 100 W	L-830-7, 200 W	L-830-11, 300 W	L-830-11, 300 W	
2	L-830-7, 200 W	L-830-11, 300 W	35A0228, 500 W	L-830-11, 300 W (quantity = 2)	A
3	L-830-11, 300 W	35A0228, 500 W	L-830-11, 300 W, 35A0228, 500 W	35A0228, 500 W (quantity = 2)	A
4	35A0228, 500 W	Not applicable	Not applicable	Not applicable	A
5	L-830-11, 300 W	Not applicable	Not applicable	Not applicable	
NOTE A: The 35A0228 transformers are 500 W (L-830 type) current isolation transformers. You must order these transformers from Elastimold. The 35A0228 transformers are not listed in the FAA Advisory Circular.					

Table 3-13. Required Transformers for Stepless (Style 5) on 6.6 A Series Circuit Installation (Using 30 W Lamps)

Sign Size	1 Module	2 Modules	3 Modules	4 Modules
1	L-830-1, 30/45 W	L-830-3, 65 W	L-830-4, 100 W	L-830-6, 200 W
2	L-830-3, 65 W	L-830-4, 100 W	L-830-6, 200 W	L-830-6, 200 W
3	L-830-3, 65 W	L-830-4, 100 W	L-830-6, 200 W	L-830-6, 200 W
4	L-830-4, 100 W	Not applicable	Not applicable	Not applicable
5	L-830-3, 65 W	Not applicable	Not applicable	Not applicable

Table 3-14. Required Transformers for Stepless (Style 5) on 6.6 A Series Circuit Installation (Using 45 W Lamps)

Sign Size	1 Module	2 Modules	3 Modules	4 Modules
1	L-830-1, 30/45 W	L-830-4, 100 W	L-830-4, 100 W	L-830-6, 200 W
2	L-830-4, 100 W	L-830-6, 200 W	L-830-6, 200 W	L-830-10, 300 W
3	L-830-4, 100 W	L-830-6, 200 W	L-830-6, 200 W	L-830-10, 300 W
4	L-830-6, 200 W	Not applicable	Not applicable	Not applicable
5	L-830-4, 100 W	Not applicable	Not applicable	Not applicable

Table 3-15. Required Transformers for Stepless (Style 5) on 20 A Series Circuit Installation (Using 30 W Lamps)

Sign Size	1 Module	2 Modules	3 Modules	4 Modules
1	L-830-2, 30/45 W	L-830-5, 100 W	L-830-5, 100 W	L-830-5, 100 W
2	L-830-5, 100 W	L-830-5, 100 W	L-830-7, 200 W	L-830-10, 200 W
3	L-830-5, 100 W	L-830-5, 100 W	L-830-7, 200 W	L-830-10, 200 W
4	L-830-5, 100 W	Not applicable	Not applicable	Not applicable
5	L-830-5, 100 W	Not applicable	Not applicable	Not applicable

Table 3-16. Required Transformers for Stepless (Style 5) on 20 A Series Circuit Installation (Using 45 W Lamps)

Sign Size	1 Module	2 Modules	3 Modules	4 Modules
1	L-830-2, 30/45 W	L-830-5, 100 W	L-830-5, 100 W	L-830-7, 200 W
2	L-830-5, 100 W	L-830-7, 200 W	L-830-7, 200 W	L-830-11, 300 W
3	L-830-5, 100 W	L-830-7, 200 W	L-830-7, 200 W	L-830-11, 300 W
4	L-830-7, 200 W	Not applicable	Not applicable	Not applicable

5	L-830-5, 100 W	Not applicable	Not applicable	Not applicable

120 Vac Circuit Connection

Connect the male L-823 cable connector(s) from the sign to the user-supplied female connector attached to the 120 Vac power-supply lead. Refer to Figure 8-29 in the *Wiring Schematics* section.

Optional Tethers

See Figure 3-9. Install one tether (2) per sign or as specified in the airport plans and specifications. Location of the tether is determined when the sales order is placed.

NOTE: In the tether installation procedure below, the customer supplies the mounting hardware to attach one end of the tether to the concrete pad. The customer also supplies the expansion anchor for the bolt. The supplier provides the mounting hardware to be installed on the sign base.

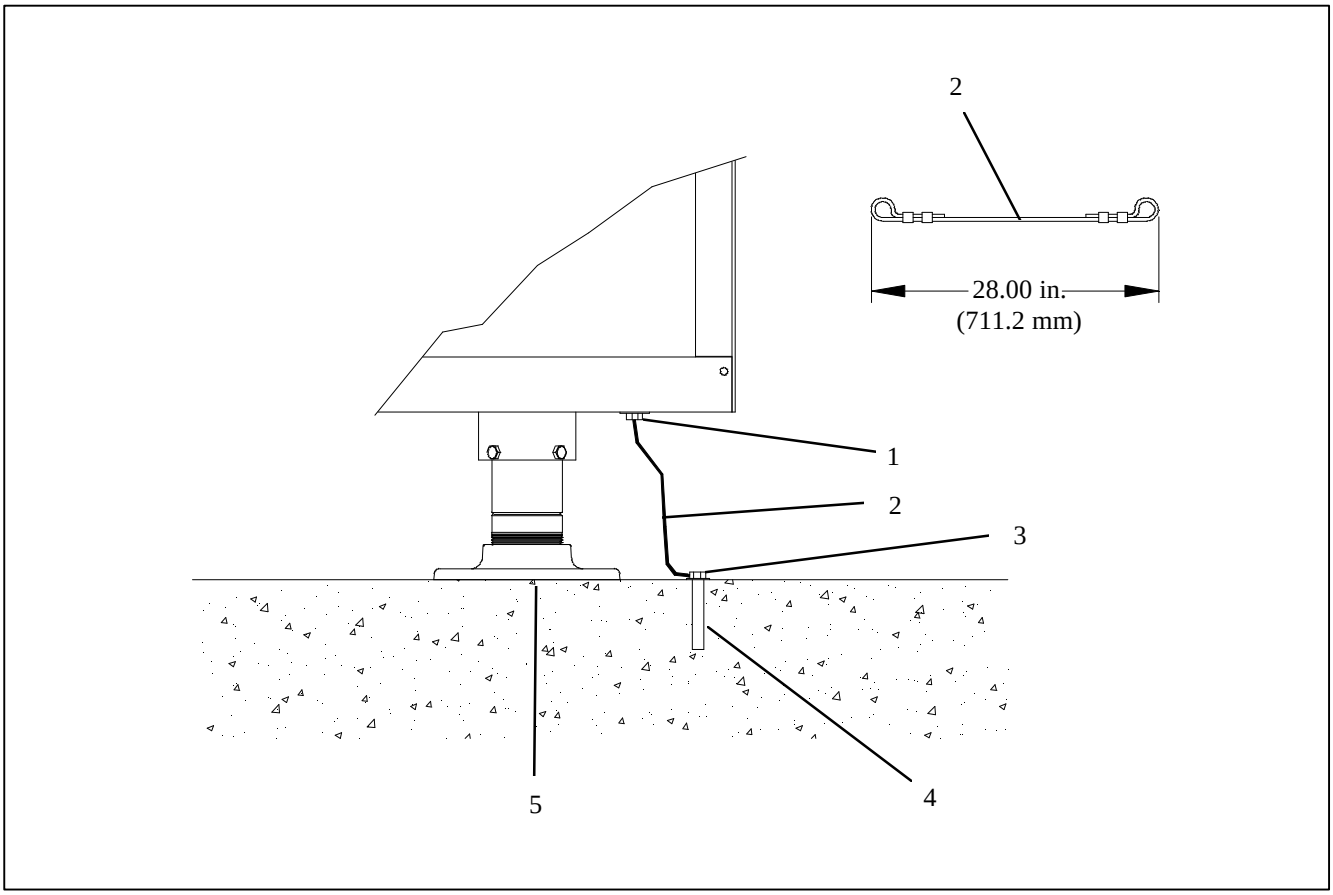


Figure 3-9. Installing Optional Tether

1. Mounting Hardware Inserted into Drain Hole on Sign Base
2. Tether
3. Mounting Hardware Attached to Expansion Anchor
4. Expansion Anchor for Bolt
5. Concrete Pad

Optional Tethers *(contd.)*

To attach a tether, perform the following procedure:

1. Unscrew the 3/8-inch nut from the 3/8–16 x 2-inch bolt on the tether. Remove the nut, 3/8-inch lockwasher, and 3/8-inch flatwasher from the bolt. Leave the second 3/8-inch flatwasher on the bolt.

2. Insert the bolt with flatwasher through the bottom side of the drain hole located on the sign base (1).

3. Install the flatwasher, lockwasher, and nut on the bolt and tighten securely to the sign base.

4. Install the customer-supplied mounting hardware to attach the tether to the expansion anchor (4) on the concrete pad (5).

To attach a tether to a stake-mounted sign, attach one end of the tether to the bolt in the sign base and the other end to the stake or a rod securely anchored in the ground.

Optional L-830 Series Wiring

See Figure 3-10. Refer to Tables 3-9 through 3-16. The following discussion applies only to a 4-module sign, Size 2 and Size 3.

When a multiple-module sign installation requires a 500 W isolation transformer, you may use two lower-wattage L-830s instead if they are series-wired and provided the total wattage of the transformers equals the wattage of the transformer they are replacing. For example, you can replace the 500 W transformer with two series-wired 300 W and 200 W L-830 transformers.

If your sign installation results in two cordsets exiting a sign cordset, you can eliminate one cordset by series wiring the L-830s and connecting the primary 3- or 5-Step sign transformer leads in series as required for single cordset installations.

Optional L-830 Series Wiring
(contd.)

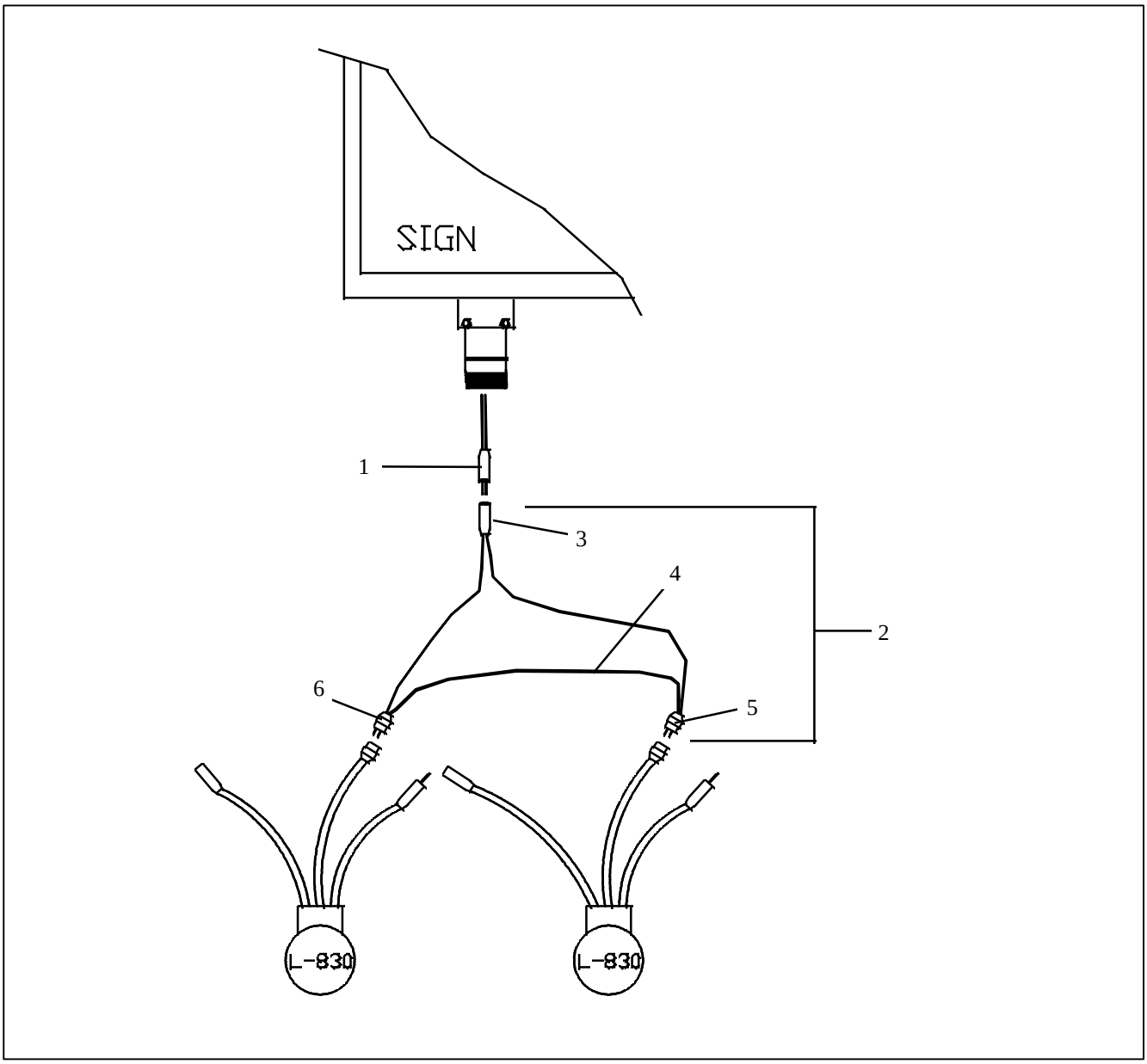


Figure 3-10. Installing Optional L-830 Series Wiring

1. Cordset
2. L-830 Series Wire Kit
3. Style 11 Receptacle Kit
4. Jumper Wire
5. Connector #1 of Style 4 Plug Kit
6. Connector #2 of Style 4 Plug Kit

Section 4
Maintenance

1. Introduction

This section provides preventive maintenance for L-858 signs.

2. Maintenance Schedule

To keep the L-858 taxiway and runway signs operating efficiently, follow a preventive maintenance schedule. Refer to Table 4-1.

Table 4-1. L-858 Taxiway and Runway Sign Maintenance

Interval	Maintenance Task	Action
Daily	Check for burned-out lamps.	Replace burned-out lamps. Check circuit operation.
Monthly	Check for dirty panels . Check for vegetation covering panel.	Clean with mild soap and water. Remove vegetation.
Semi-Annually	Check for loose wire connections. Check for cracked or deteriorated wire.	Tighten wires. Replace wire.
Annually	Check for paint flaking off. Check for panels yellowing. Check for deteriorated gaskets.	Repaint. Clean with Formula 409 or similar cleaning agent. Replace gaskets.

Section 5
Troubleshooting

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

WARNING: Always remove input power to a sign before making any wiring connections. Failure to observe this warning may result in personal injury, death, or equipment damage.

1. Introduction

This section contains troubleshooting information. The troubleshooting table below covers only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Siemens Airfield Solutions representative for help.

Problem	Possible Cause	Corrective Action
1. All lamps are out.	Loose wires or connections	Tighten or replace wires.
	Three- or five-step transformer adjustment	Measure the secondary current. If necessary, adjust the 3- or 5-step transformer. Refer to *Three- or Five-Step Transformer Adjustment* in this section.
	Current to lamps too high	Measure the secondary current. If necessary, adjust the 3- or 5-step transformer. Refer to *Three- or Five-Step Transformer Adjustment* in this section.
	Lamp(s) burned out	Replace lamp(s). **NOTE:** If burned-out lamp is near maximum lamp-hour, it is recommended that you replace all lamps.
	CCR circuit-shorted	Check circuit. Refer to AC 150/5340-26.

1. Introduction *(contd.)*

Problem	Possible Cause	Corrective Action
2. Signs are too bright or too dim.	Incorrect 3- or 5-step transformer adjustment or defective transformer	Measure the secondary current. If necessary, adjust the 3- or 5-step transformer. Refer to *Three- or Five-Step Transformer Adjustment* in this section.
3. Lamp life is short.	Current to lamps too high	Measure the secondary current. If necessary, adjust the 3- or 5-step transformer. Refer to *Three- or Five-Step Transformer Adjustment* in this section. If the current is too high, refer to *Brightness-Control Procedures* in this section.
4. All lamps out (Style 5, 5.5 A Only)	Transformer failed Lamps connected to wrong tap on transformer	Replace transformer and check for burned out lamps. Replace lamps, as required. Verify correct tap connections. Refer to Figure 8-30 in the *Wiring Schematics* section.

2. Troubleshooting Procedures

This subsection provides troubleshooting procedures for

- three- or five-step transformer adjustment
- three- or five-step series signs brightness level adjustment

Three- or Five-Step Transformer Adjustment

To adjust 3- or 5-step transformers, perform the following procedure:

1. Disconnect the L-830 secondary from the sign.
2. De-energize the lighting circuit and then install a jumper across the L-830 secondary.
3. Re-energize the circuit and measure the current across the secondary. If output current is correct, replace the defective sign transformer.

Three- or Five-Step Series Sign Brightness Level Adjustment

This subsection provides brightness level adjustment procedures for 3- or 5-step series signs.

Brightness-Control Transformers

NOTE: Siemens Airfield Solutions has set the tap on the 3- and 5-step transformers at the nominal position at the factory. You should normally not have to adjust these transformers.

Brightness-Control Transformers *(contd.)*

Three- and five-step brightness control transformers are installed in the L-858 sign

- to meet illumination requirements.
- to operate in series circuit lighting systems to maintain the current at the standards referred to in Table 5-1. This provides the most ideal brightness for the signs and extends lamp life.

NOTE: Refer to the *Wiring Schematics* section for 3-Step module and 5-Step module wiring schematics.

Table 5-1. Transformer Brightness Control Standards

Transformer	Lamp Current Range (Volt Amperes)	Primary Range (Volt Amperes)
3-Step	5.7–6.4	4.8–6.6
5-Step	2.8–6.6	8.5–20

Brightness-Control Procedures

This subsection provides brightness level and lamp brightness adjustment procedures.

Brightness Level Adjustment

To adjust the brightness level of the 3- or 5-step series sign, perform the following procedure:

1. Use a true-rms ammeter to check the lamp current.
2. Raise or lower the lamp current taps on the 3-step or 5-step transformer to increase (if the light is too dim) or decrease (if the light is too bright) the current to the lamps. Refer to *Lamp Brightness Adjustment (3-Step Transformer)*, *One- and Two-Lamp Brightness Adjustment (5-Step Transformer)*, and *Three- and Four-Lamp Brightness Adjustment (5-Step Transformer)* in this section.

Lamp Brightness Adjustment (3-Step Transformer)

To adjust the lamp brightness level for a 3-step transformer, perform the following procedure:

1. Set the regulator current to 4.8 A.

Lamp Brightness Adjustment (3-Step Transformer) *(contd.)*

2. See Figure 5-1. Use a true-rms ammeter to verify that the sign's lamp current is above 5.7 A. If the lamp current is not above 5.7 A, increase the current by moving the lamp output to taps that give a higher output current.

   NOTE: For example, if the factory ships a two-module Size 2 sign, the lamp taps are factory set at YEL-BLU. If the lamp current measured is not above 5.7 A for a CCR output current of 4.8 A, move the lamp wires down from YEL-BLU. See Figure 5-1.

Lamp Brightness Adjustment (3-Step Transformer) *(contd.)*

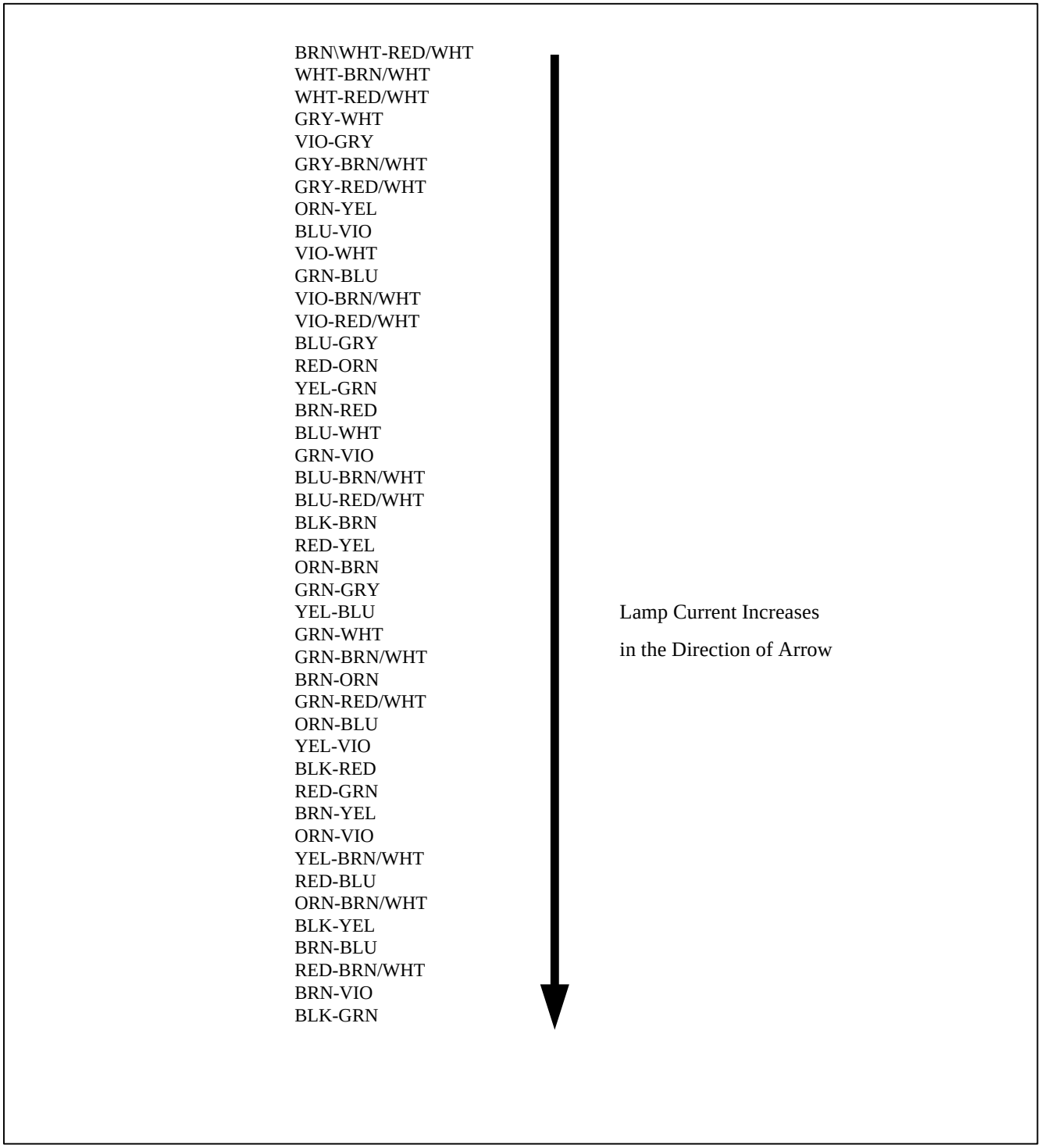


Figure 5-1. Increasing Lamp Current

Lamp Brightness Adjustment (3-Step Transformer) (contd.)

3. Set the regulator current to 6.6 A to ensure that the sign's lamp current is not above 6.4 A. If the lamp current is above 6.4 A, reduce the lamp current by moving the lamp output to taps in the opposite direction shown in Figure 5-1.

   NOTE: For example, if the lamp current is over 6.4 A for a CCR current reading of 6.6 A, move the lamp output to taps up, as shown in Figure 5-1.

One- and Two-Lamp Brightness Adjustment (5-Step Transformer)

To adjust a one- and two-lamp brightness level for a 5-step transformer, perform the following procedure:

1. Set the regulator current to 2.8 A.

2. Use a true-rms ammeter to verify that the sign's lamp current is above 5.5 A.

3. If the lamp current is not above 5.5 A, or if the sign circuit is a Siemens Airfield Solutions ferro-resonant regulator, perform the following:

   - See Figure 5-2. For one lamp, move the input wire from black/yellow to black/white.

   - See Figure 5-3. For two lamps, move the input wire from black to white/black or to the black/yellow wire tap.

One- and Two-Lamp Brightness Adjustment (5-Step Transformer)
(contd.)

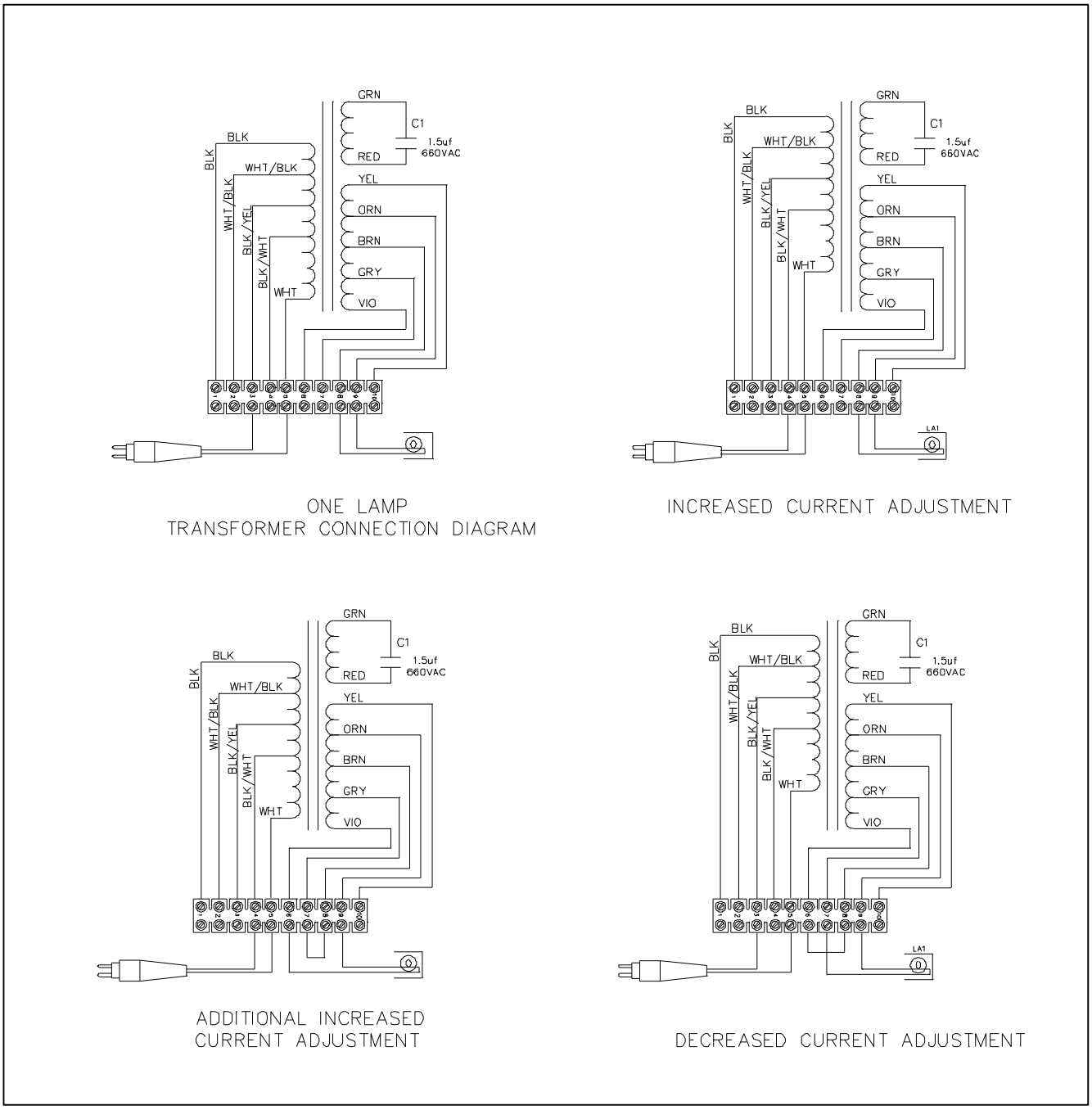


Figure 5-2. One-Lamp (5-Step Transformer) Brightness Adjustment

One- and Two-Lamp Brightness Adjustment (5-Step Transformer)
(contd.)

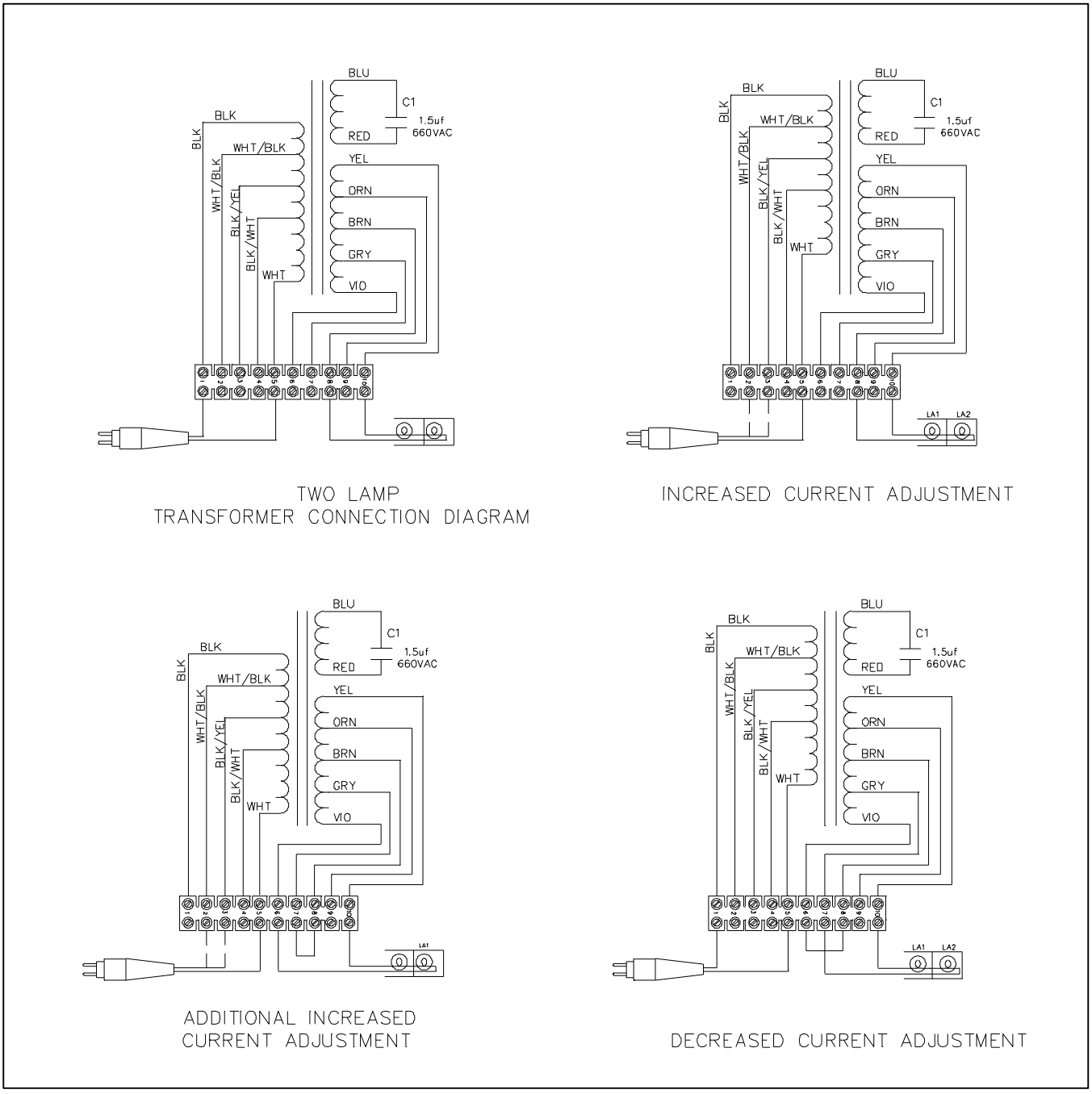


Figure 5-3. Two-Lamp (5-Step Transformer) Brightness Adjustment

One- and Two-Lamp Brightness Adjustment (5-Step Transformer) (contd.)

4. If the lamp current is not above 5.7 A at this time, then adjust the current up by moving the lamp wire from brown to violet, and place a jumper between the gray and brown wire tap.

5. Set the regulator current to 6.6 A to ensure that the sign's lamp current is below 6.4 A. If the lamp current is above 6.4 A, reduce the lamp current by moving the lamp wire from brown to gray and placing a jumper between the violet and brown wire taps.

Three- and Four-Lamp Brightness Adjustment (5-Step Transformer)

To adjust a three- and four-lamp brightness level for a 5-step transformer, perform the following procedure:

1. See Figures 5-4 and 5-5. Set the regulator current to 2.8 A.

   NOTE: Figure 5-4 shows three lamps, and Figure 5-5 shows four lamps.

Three- and Four-Lamp Brightness Adjustment (5-Step Transformer) *(contd.)*

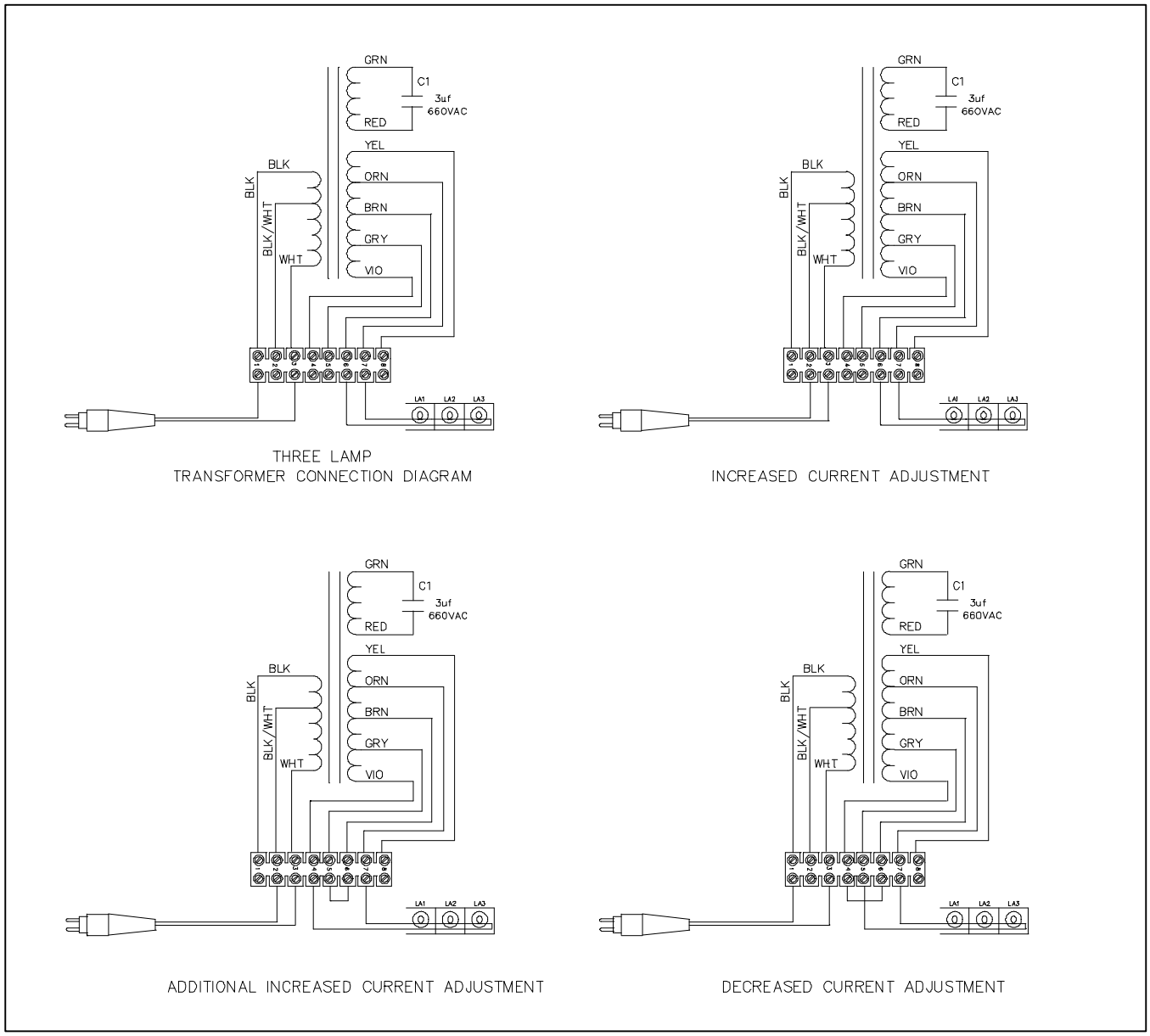


Figure 5-4. Three-Lamp (5-Step Transformer) Brightness Adjustment

Three- and Four-Lamp Brightness Adjustment (5-Step Transformer) *(contd.)*

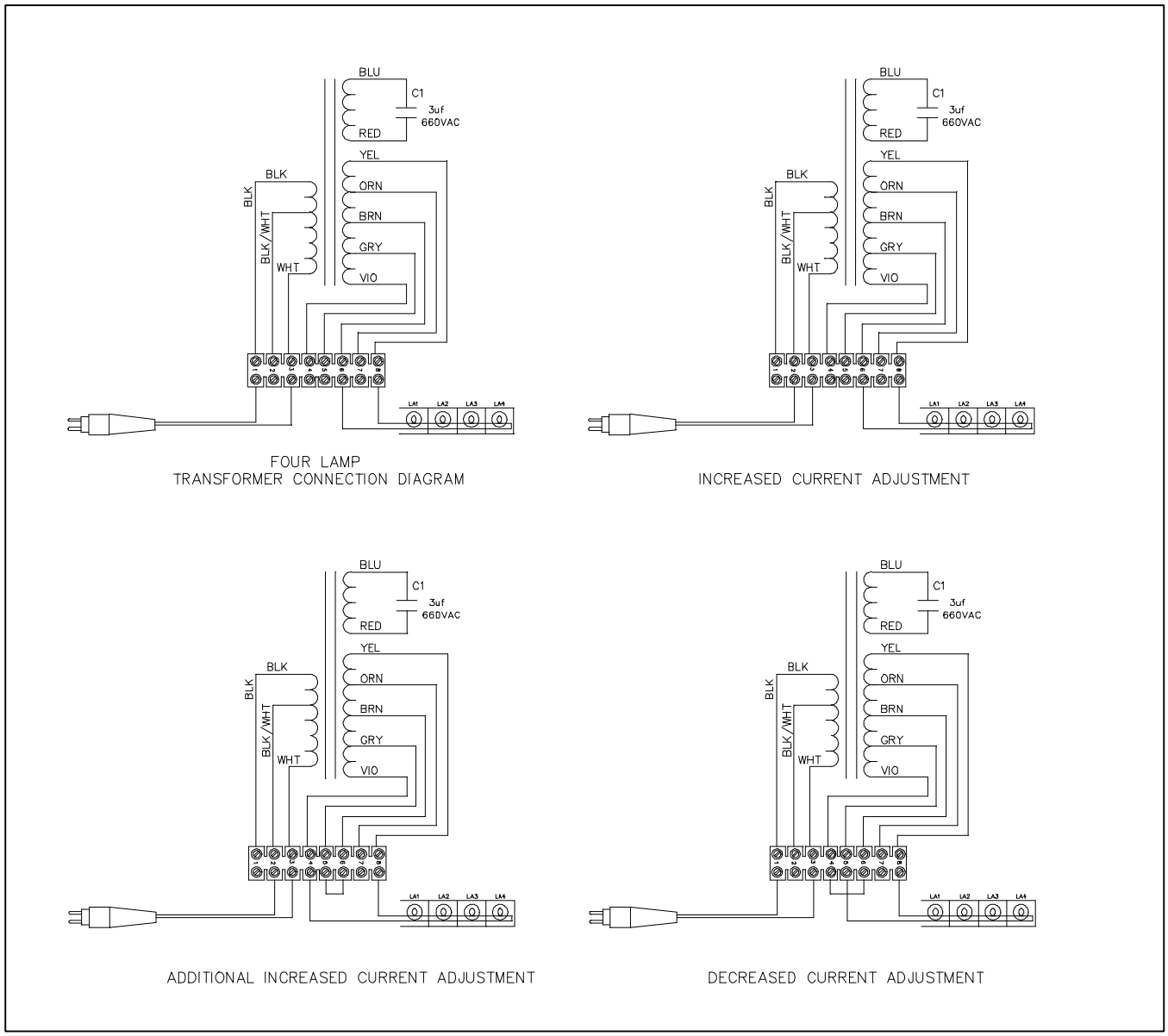


Figure 5-5. Four-Lamp (5-Step Transformer) Brightness Adjustment

2. Use a true-rms ammeter to verify that the sign's lamp current is above 5.5 A. If the lamp current is not above 5.7 A, or if the sign circuit is an Siemens Airfield Solutions ferro-resonant regulator, move the input wire from black to black/white.

3. If the lamp current is not above 5.7 A, adjust the current by moving the lamp wire from brown to violet and placing a jumper between the gray and brown taps.

Three- and Four-Lamp Brightness Adjustment (5-Step Transformer) *(contd.)*

4. Set the regulator current to 6.6 A to ensure that the sign's lamp current is below 6.4 A. If the lamp current is above 6.4 A, reduce the lamp current by moving the lamp wire from brown to gray and placing a jumper between the violet and brown wire taps.

No-Step Series (Style 5) Brightness Level Adjustment

Brightness level cannot be adjusted.

Section 6
Repair

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Introduction

This section provides procedures for replacing lamps.

2. Lamp Replacement

WARNING: Turn off the power to the sign before replacing lamps. Failure to observe this warning may result in personal injury, death, or equipment damage.

To replace lamp(s), perform the following procedure:

1. Turn off the power to the sign.

2. See Figure 6-1. Remove the hex screws (1) on the top lid (2) and remove the top lid from the sign. For a Size 4 sign, remove a panel (3) by sliding it upwards to gain access to the lamps.

2. Lamp Replacement *(contd.)*

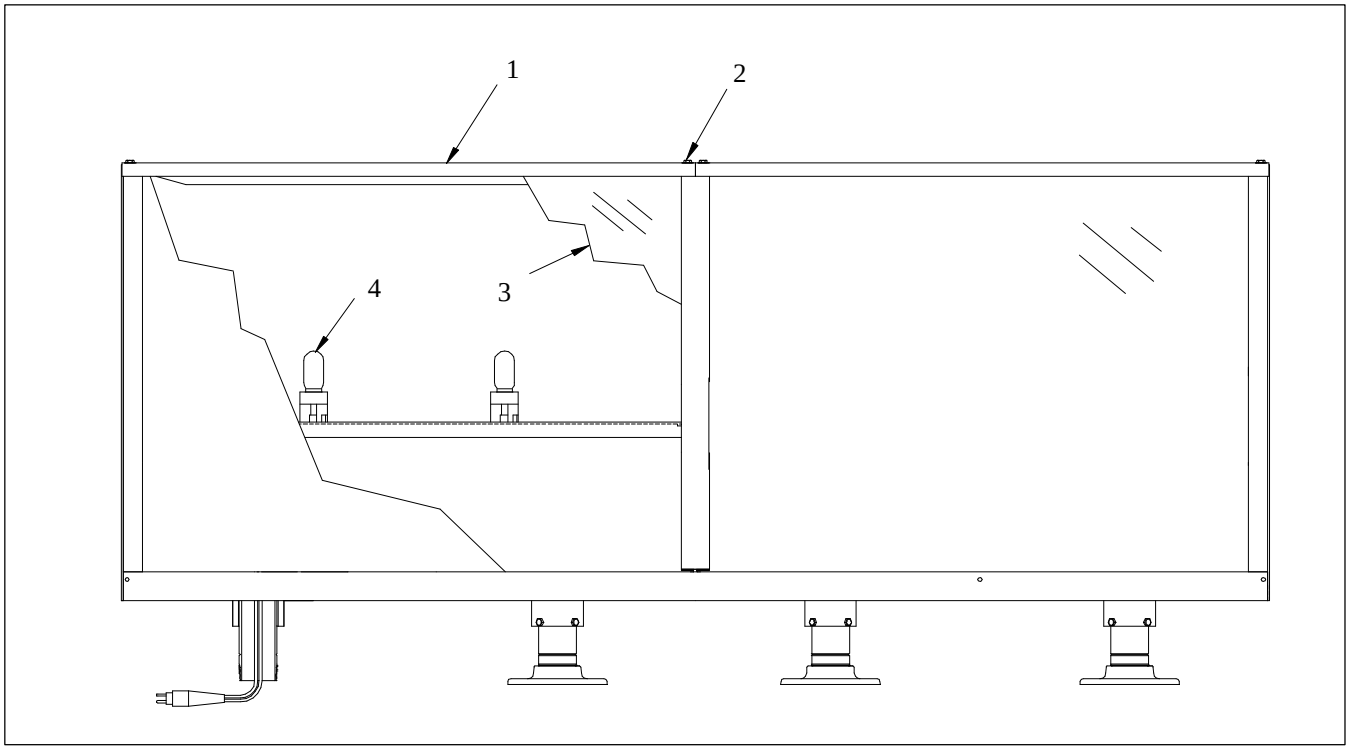


Figure 6-1. Lamp Replacement

1. Hex Screws
2. Top Lid
3. Panel
4. Lamp

3. Remove the lamp (4) from the socket. For a 6.6 A incandescent lamp, press down on the lamp and turn the lamp 90 degrees counterclockwise. For a 6.6 A quartz lamp, pull up on the lamp. For a 120 Vac lamp, unscrew the lamp.

4. Install the replacement lamp by reversing the removal procedure.

5. See Figure 6-2. Reinstall lid(s). Begin top lid (1) installation for multiple modules by tightening the hex screws for the top lid located near or at the center of the sign (2). Finger tighten the four hex screws located in the lid.

   NOTE: Two-module Size 3 signs have three legs per module. Two-module Size 1 and Size 2 signs have two legs per module.

6. Install successive lids by working outwards from the center module. After you have installed all lids and screws, tighten all hex screws with wrench.

2. Lamp Replacement *(contd.)*

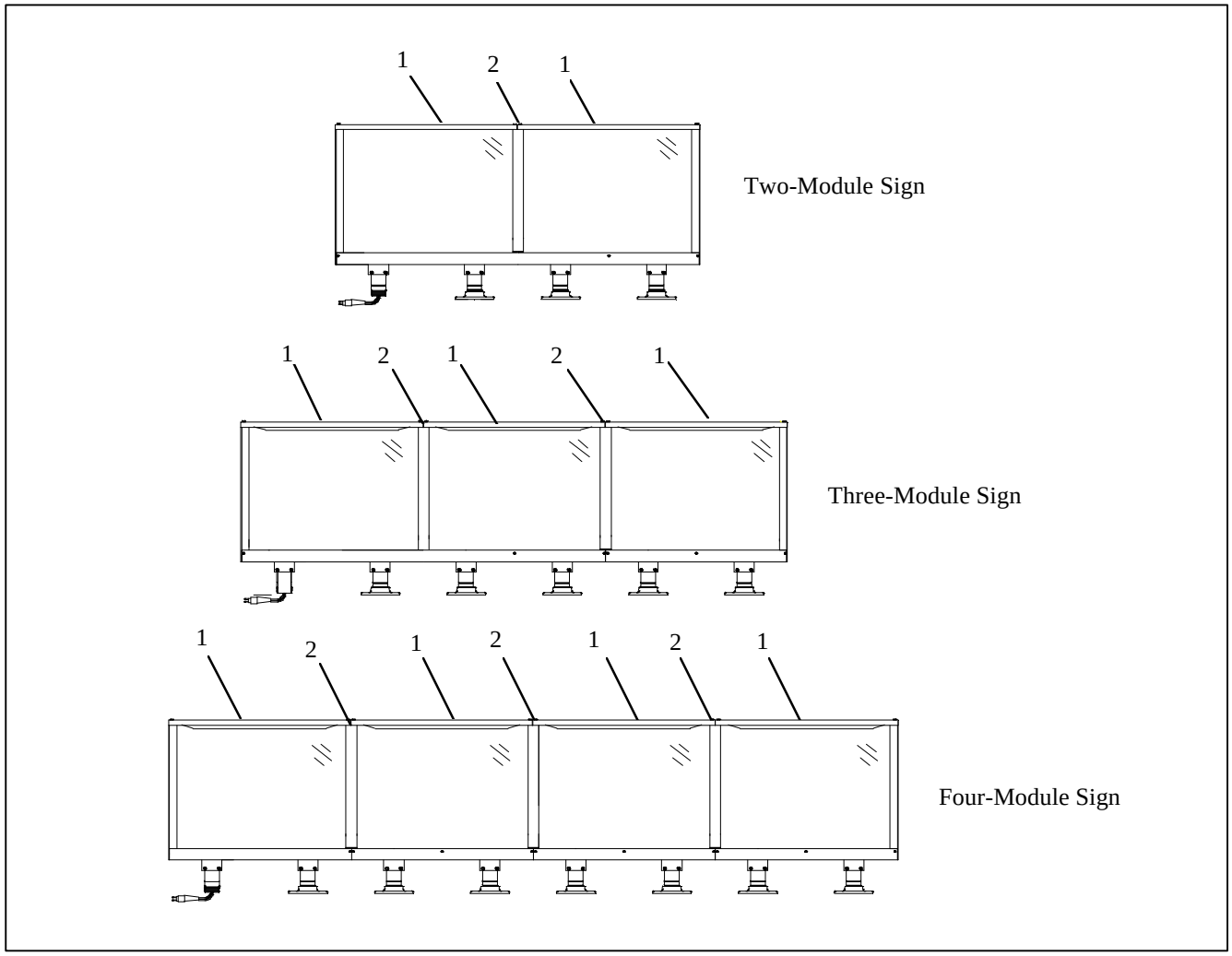


Figure 6-2. Reinstalling Lids for Multiple Module Signs

1. Lid 2. Center Module Hex Screws

Section 7
Parts

1. Introduction

To order parts, call Siemens Airfield Solutions Customer Service or your local Siemens Airfield Solutions representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

2. Using the Illustrated Parts List

This subsection describes how to use the illustrated parts list covered later in this section. It does not provide the actual parts list.

The Item column numbers correspond to the numbers that identify parts in illustrations following each parts list. NS (not shown) indicates that a listed part is not illustrated.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

The Part Number column gives the Siemens Airfield Solutions part number.

Item	Description	Part Number	Quantity	Note
S1	Assembly	xxxxxxxx	1	A
NS	Part	xxxxxxxx	1	
H1	Part or Assembly			
	Part/Assembly for option 1	xxxxxxxx	2	
	Part/Assembly for option 2	xxxxxxxx	2	
T1	Assembly	xxxxxxxx	1	
	• Part	xxxxxxxx	1	
	• Part	xxxxxxxx	2	
NOTE A				

The Quantity column contains the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

The Note column contains letters that refer to notes at the end of each parts list. Notes contain special ordering or product/part version information.

3. L-858 Part Numbering System

Figure 7-1 shows how to determine the part number for a particular L-858 module.

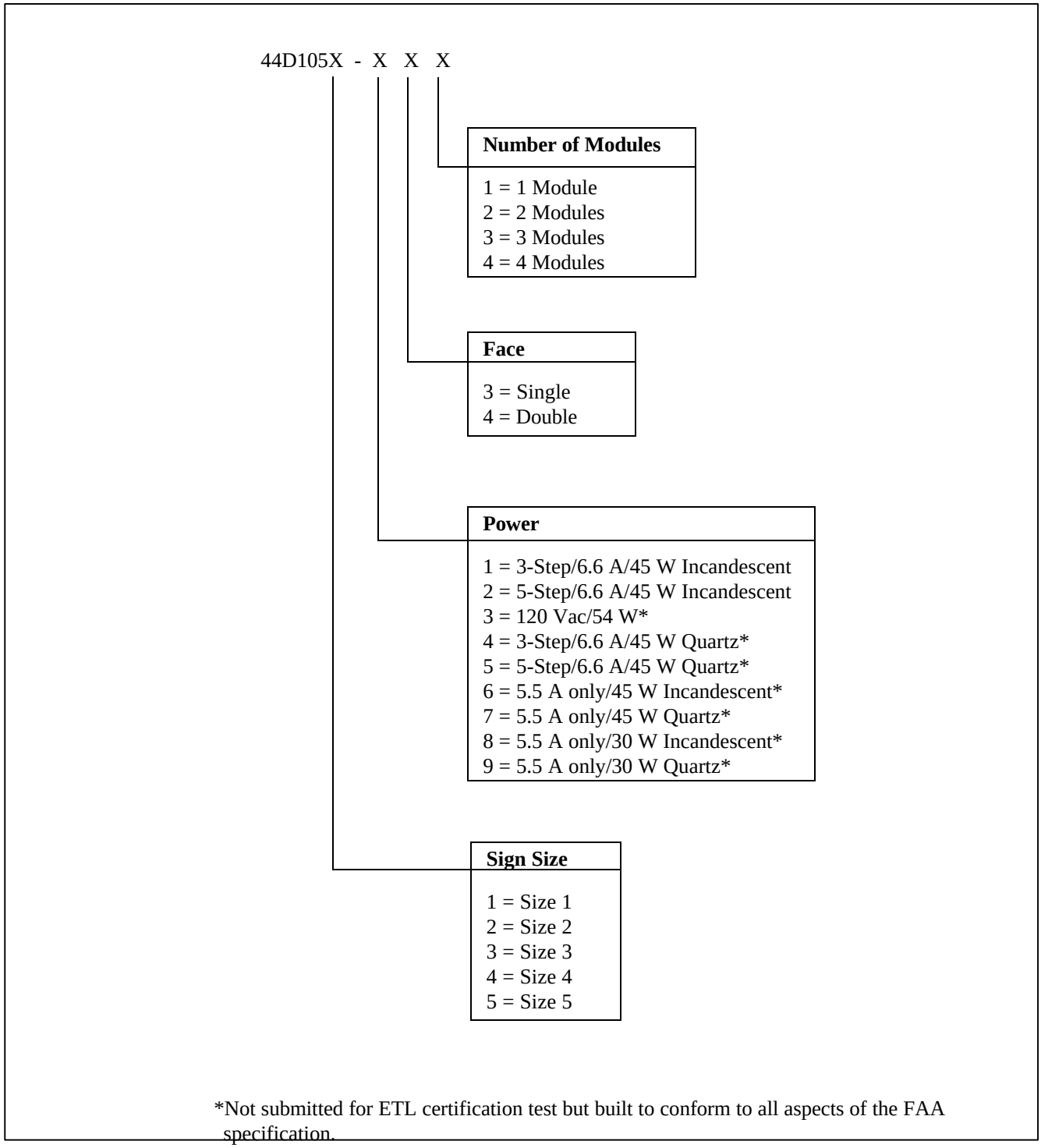


Figure 7-1. L-858 Sign Part Numbers

4. L-858 Sign Parts List

See Figures 7-2 and 7-3.

NOTE: Figure 7-2 shows Size 1, Size 2, and Size 3, multiple-module signs. Figure 7-2 also applies to one-module signs. The Size 5 sign is always one module. Figure 7-3 shows a Size 4 sign. The Size 4 sign is always one module.

NOTE: Refer to *Corset Installation* in the *Installation* section for cordset installation parts.

Item	Description	Part Number	Quantity	Note
LA1	Lamp socket		See note.	A
	6.6 A incandescent (Bryant #3743)	49A0002		
	120 Vac (Sylvania #143)	49A0014		
	6.6 A quartz (Sylvania TP29A)	49A0032		
LA1	Lamp		See note.	A
	6.6 A, 30 W incandescent	48A0006		
	6.6 A, 30 W quartz	48A0085		
	120 Vac, 54 W (Sylvania #12058-0)	48A0347		
	6.6 A, 45 W incandescent (Sylvania #17981-0)	48A0007		
	6.6 A, 45 W quartz (Sylvania HG-11 #55048)	48A0083		
T1	Transformer			B
	3-step, 6.6 A (four lamps maximum)	35A0415	1 to 3	
	5-step, 6.6 A (one or two lamps)	35A0418	1	
	5-step, 6.6 A (three or four lamps)	35A0417	1 to 3	
	1-step, 5.5 A (eight lamps maximum)	35A0455	1	C
T2	Terminal block	72A0127	1	
C1	Capacitor			
	Used with 5-step transformer #35A018, 1.5 µF	20A0036	1	
	Used with 5-step transformer #35A017, 3 µF	20A0035	1 to 3	
M3	Frangible coupling			D
	Size 1	62B0580-1	2	
	Size 2	62B0580-2	2	
	Size 3	62B0580-3	3	
	Size 4	62B0580-4	3	
	Size 5	62B0580-3	3	
NS	Base plate	1932	1	
M2	Floor flange	62B0107-2	1 or 2	
GND1	Ground lug	72A0010	1	

NOTE A: Quantity is 1 to 3 per module.
NOTE B: For signs purchased prior to July 15, 1992, contact Siemens Airfield Solutions Sales for transformer part numbers.
NOTE C: The transformer is located next to the lamps for 5.5 A application only.
NOTE D: Sign size is stamped on frangible couplings. Do not mix different size couplings.
NS: Not Shown.

Item	Description	Part Number	Quantity	Note
H1	Wire grommet	63A0042-4	1	
H3	Snap bushing	63B0385-67	1	
A2	Blank legend panel assembly		See note.	A
	Sign Size 1	44C1050-1		
	Sign Size 2	44C1050-2		
	Sign Size 3	44C1050-3		
	Sign Size 4	44C1050-4		
	Sign Size 5	44C1050-3		
A4	Legend panel assembly (retroreflective)		See note.	A
	Sign Size 1	44C2005-1		
	Sign Size 2	44C2005-2		
	Sign Size 3	44C2005-3		
	Sign Size 4	44C2005-4		
	Sign Size 5	44C2005-3		
H2	Gasket (end)	63A0374-1	1 or 2	
A5	Gasket	63A0374-3	1 to 3	
A6	Module connector		1 to 3	
	Module connector, Size 1	63A0386-1		
	Module connector, Size 2	63A0386-2		
	Module connector, Size 3	63A0386-3		
NOTE A: Quantity per customer request.				

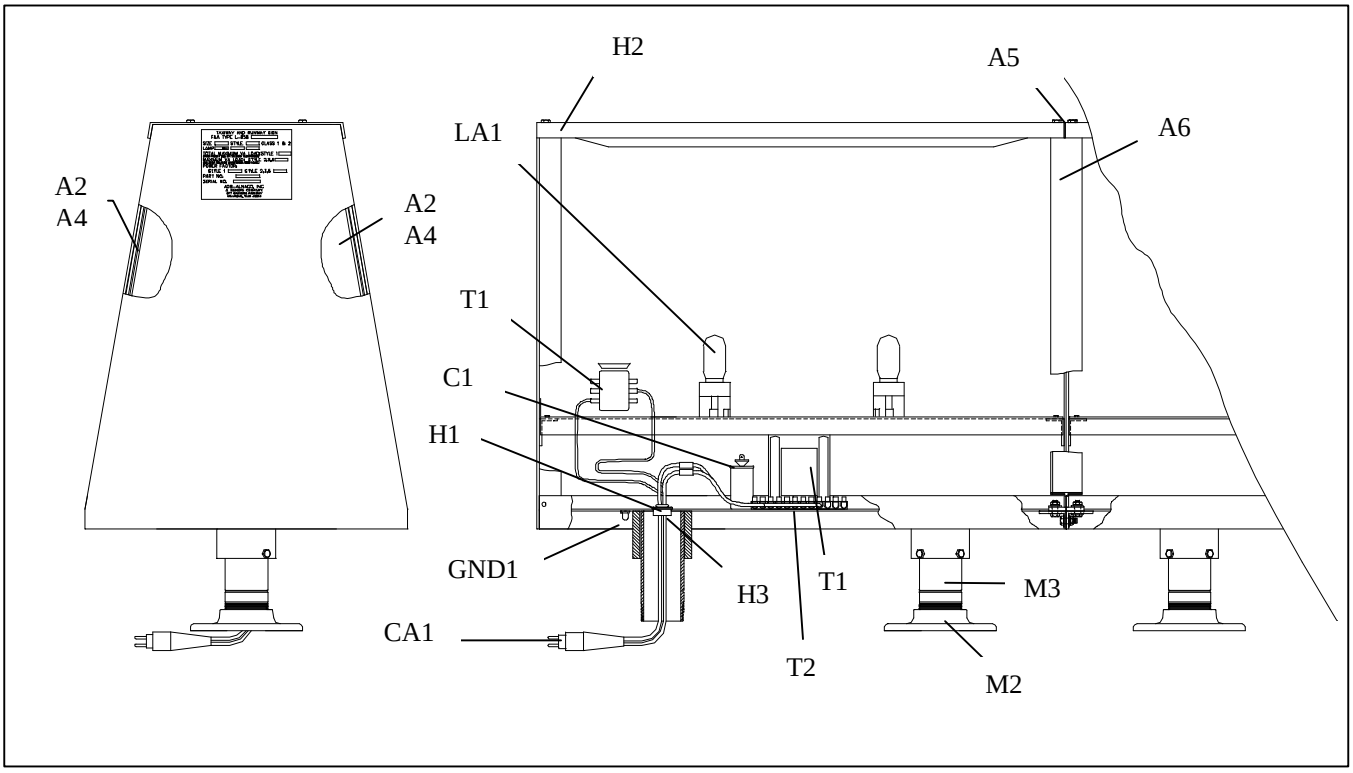


Figure 7-2. Cross-Sectional View of L-858 Sign Module Assembly (Sizes 1, 2, 3, Multiple Modules)

4. L-858 Sign Parts List
(contd.)

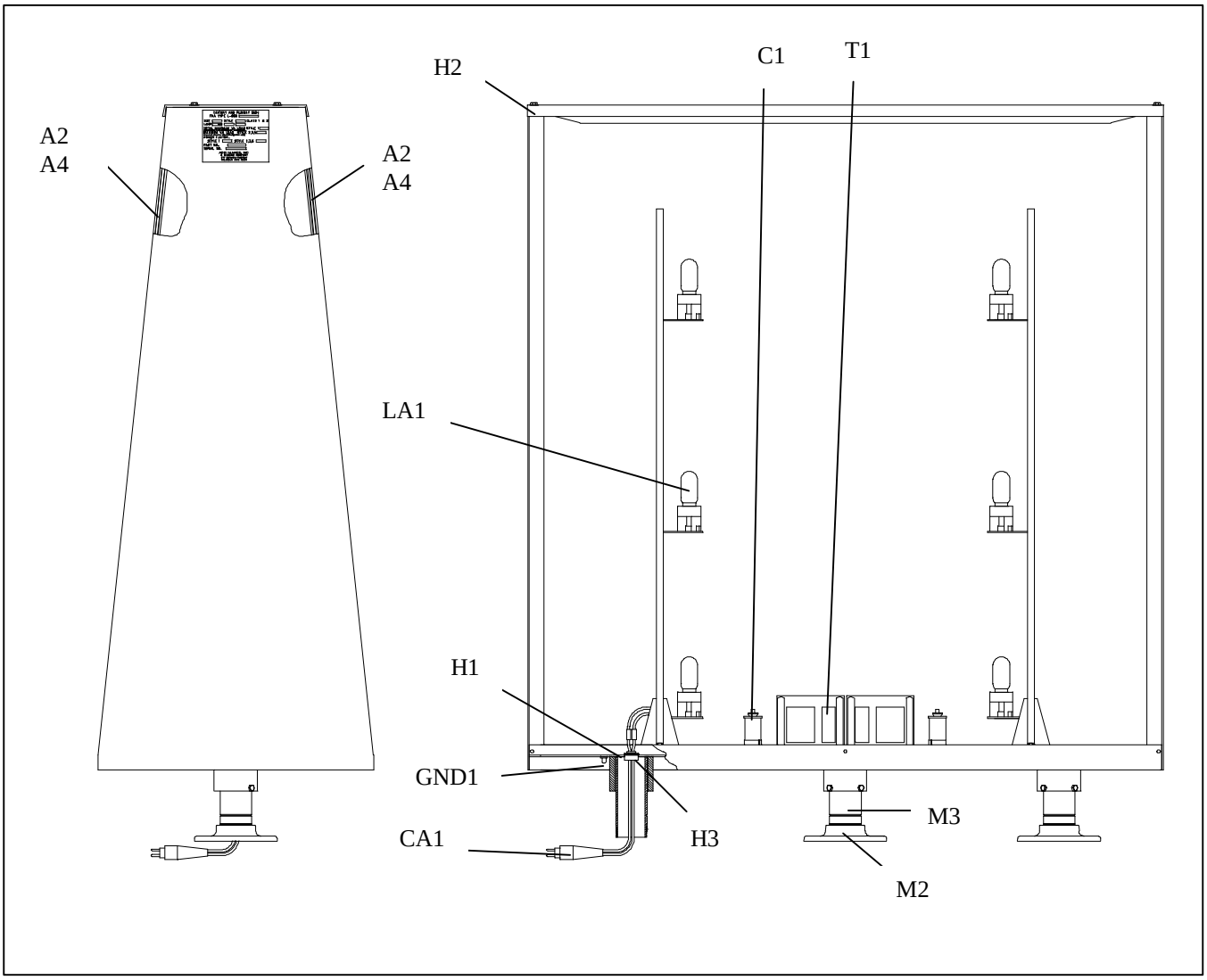


Figure 7-3. L-858 Sign Module Assembly (Size 4, One-Module)

5. Optional Parts

See Figures 7-2 and 7-3.

Item	Description	Part Number	Quantity	Note
CA1	L-823 cordset	73A0009-31	1	
NS	Connector plug (used with outdoor cable)	63B0550	1	
NS	Tether assembly (1 per sign) Tether, 28 in. Tether, 36 in.	 94A0054 94A0054-1	 AR 1	
NS	L-867 base, 12 in. diameter x 24 in. height (304.8 x 609.6 mm)	2124	1	
NS	L-867 extension, Size B, Class 1, 3 in. (76.2 mm) deep	2007	1	
NS	L-867 base plate, without hub, 3/8 in. (9.525 mm) thick steel	1000-6	1	A
NS	L-867 base plate, without hub, 1/4 in. (6.35 mm) thick steel	1000-4	1	A
NS	Angle-iron stake	44B1092	1	
NS	Black touch-up paint, 12 oz (0.355 liters) spray can	95A0012	AR	

NOTE A: For remote-mounted L-867 base.

NS: Not Shown

AR: As Required

6. Recommended Spare Parts

See Figures 7-2 and 7-3.

NOTE: Recommended quantity is dependent upon the number of signs.

Item	Description	Part Number	Quantity	Note
LA1	Lamp socket		See note.	A
	6.6 A incandescent (Bryant #3743)	49A0002		
	120 Vac (Sylvania #143)	49A0014		
	6.6 A quartz (Sylvania TP29A)	49A0032		
LA1	Lamp		See note.	A
	6.6 A, 30 W incandescent	48A0006		
	6.6 A, 30 W quartz	48A0085		
	120 Vac, 54 W (Sylvania #12058-0)	48A0347		
	6.6 A, 45 W incandescent (Sylvania #17981-0)	48A0007		
	6.6 A, 45 W quartz (Sylvania HG-11 #55048)	48A0083		
T1	Transformer		1	
	3-step, 6.6 A (four lamps maximum)	35A0415		
	5-step, 6.6 A (one or two lamps)	35A0418		
	5-step, 6.6 A (three or four lamps)	35A0417		
	1-step, 5.5 A (eight lamps maximum)	35A0455		
C1	Capacitor		1	
	Used with 5-step transformer #35A0418, 1.5 µF	20A0036	1 to 3	
	Used with 5-step transformer #35A0417, 3 µF	20A0035		
M3	Frangible coupling			
	Size 1	62B0580-1	2 per module	
	Size 2	62B0580-2	2 per module	
	Size 3	62B0580-3	3 per module	
	Size 4	62B0580-4	3 per module	
	Size 5	62B0580-3	3 per module	
NOTE A: Quantity is 1 to 3 per module.				

7. L-830 Series Wire Kit Parts List

See Figure 3-10 in *Optional L-830 Series Wiring* in the *Installation* section.

Item	Description	Part Number	Quantity	Note
2	L-830 series wire kit	94A0173	1	
3	Style 11 receptacle kit	70A0046	1	
4	Jumper wire	89A0154	6 feet	
5	Style 4 plug kit	70A0045	2	

Section 8
Wiring Schematics

1. Introduction

This section provides wiring schematics for the L-858 taxiway and runway signs.

2. Wiring Schematics

This subsection provides schematics for 3-step and 5-step transformer, 120 Vac, and Style 5 (5.5 A only) wiring schematics.

Refer to Table 8-1 to find the figure corresponding to a particular 3-step sign module. Refer to Table 8-2 to find the figure corresponding to a particular 5-step sign module. Figure 8-29 shows typical 120 Vac wiring. Refer to Table 8-3 to find the figure for Style 5 (5.5 A only) wiring.

Table 8-1. 3-Step Module Figures

If you have this module...	**Refer to this figure...**
Size 1, one-module	Figure 8-1
Size 1, two-module	Figure 8-2
Size 1, three-module	Figure 8-3
Size 1, four-module	Figure 8-4
Size 2, one-module	Figure 8-5
Size 2, two-module	Figure 8-6
Size 2, three-module	Figure 8-7
Size 2, four-module	Figure 8-8
Size 3, one-module	Figure 8-9
Size 3, two-module	Figure 8-10
Size 3, three-module	Figure 8-11
Size 3, four-module	Figure 8-12
Size 4, one-module	Figure 8-13
Size 5, one-module	Figure 8-14

Table 8-2. Five-Step Module Figures

If you have this module...	**Refer to this figure...**
Size 1, one-module	Figure 8-15
Size 1, two-module	Figure 8-16
Size 1, three-module	Figure 8-17
Size 1, four-module	Figure 8-18
Size 2, one-module	Figure 8-19
Size 2, two-module	Figure 8-20
Size 2, three-module	Figure 8-21
Size 2, four-module	Figure 8-22
Size 3, one-module	Figure 8-23
Size 3, two-module	Figure 8-24
Size 3, three-module	Figure 8-25
Size 3, four-module	Figure 8-26
Size 4, one-module	Figure 8-27
Size 5, one-module	Figure 8-28
120 Vac (Typical for all Sizes and Modules)	Figure 8-29

Table 8-3. Stepless – Style 5 (5.5 A Only) Figure

If you have this module…	**Refer to this figure…**
Sizes 1, 2, 3, 5, one, two, three, and four-module, Style 5 (5.5 A Only)	Figure 8-30

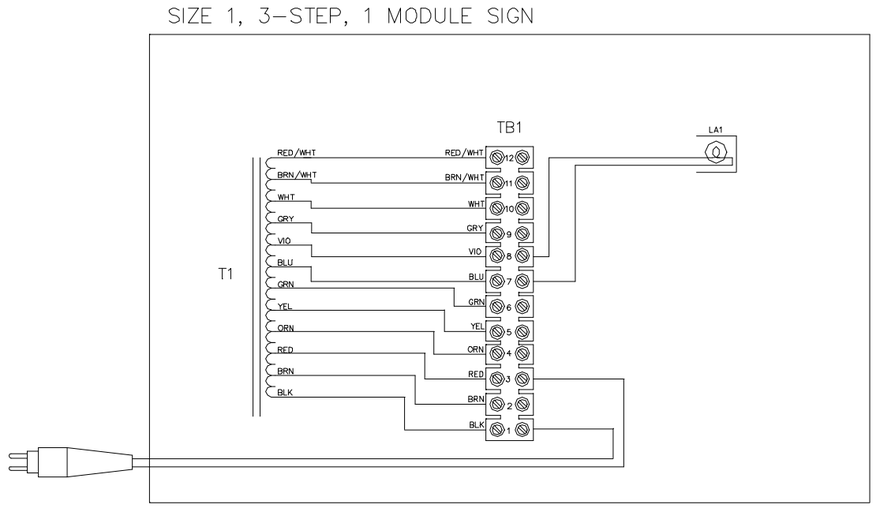


Figure 8-1. Size 1, One-Module, 3-Step

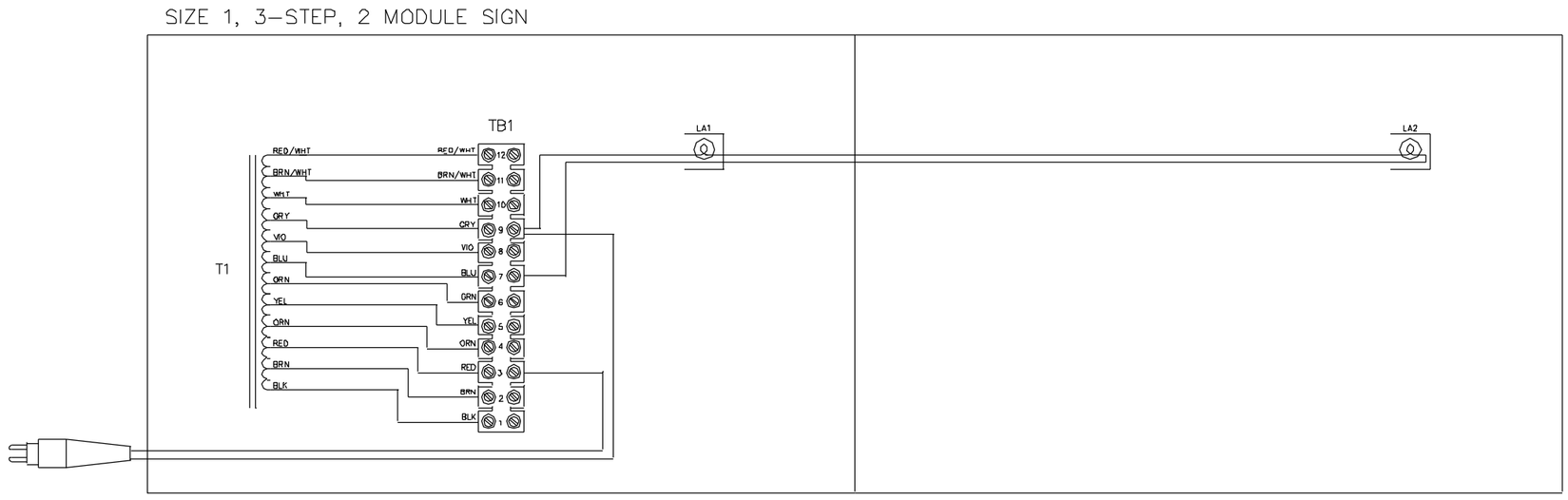


Figure 8-2. Size 1, Two-Module, 3-Step

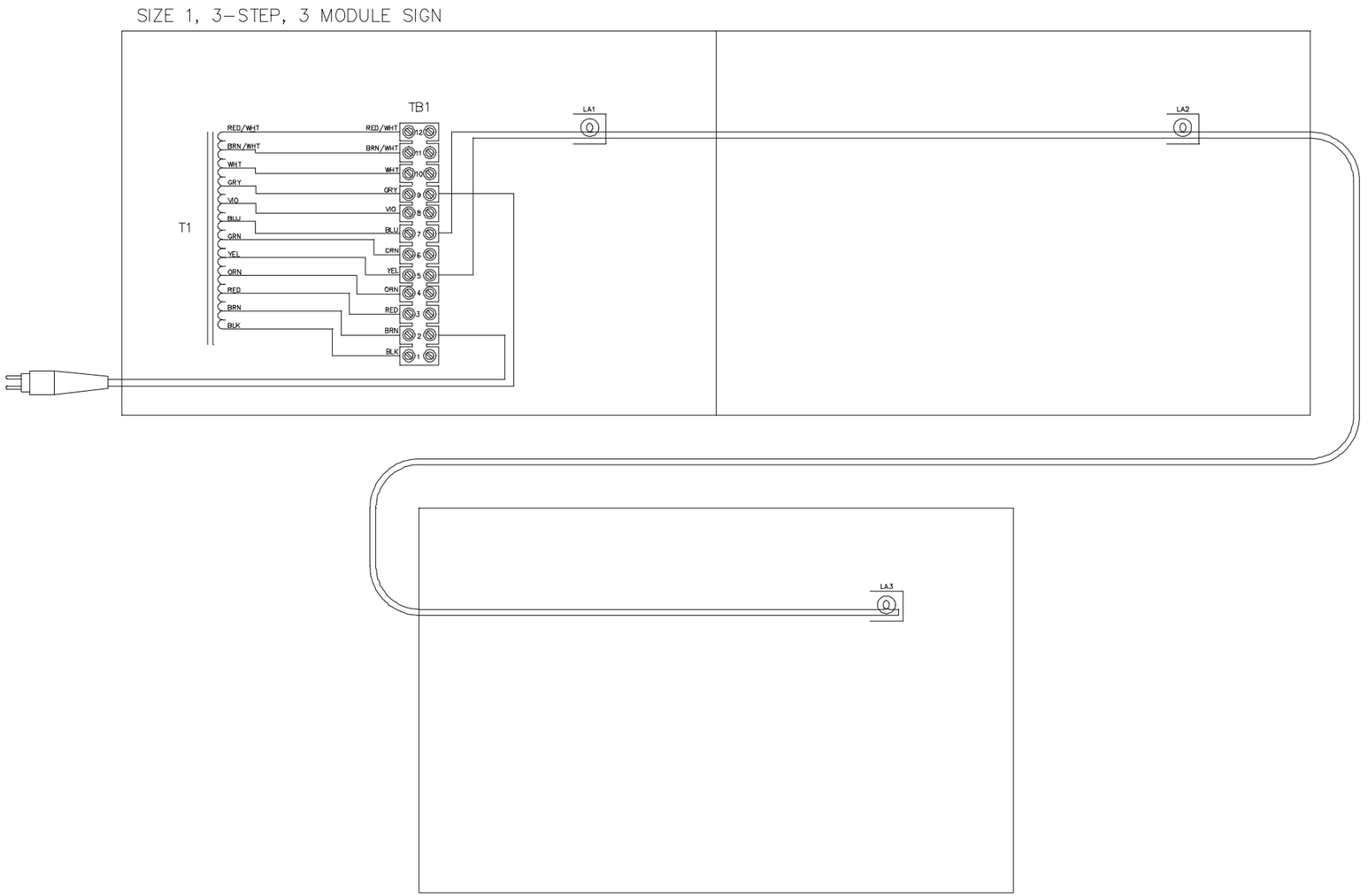


Figure 8-3. Size 1, Three-Module, 3-Step

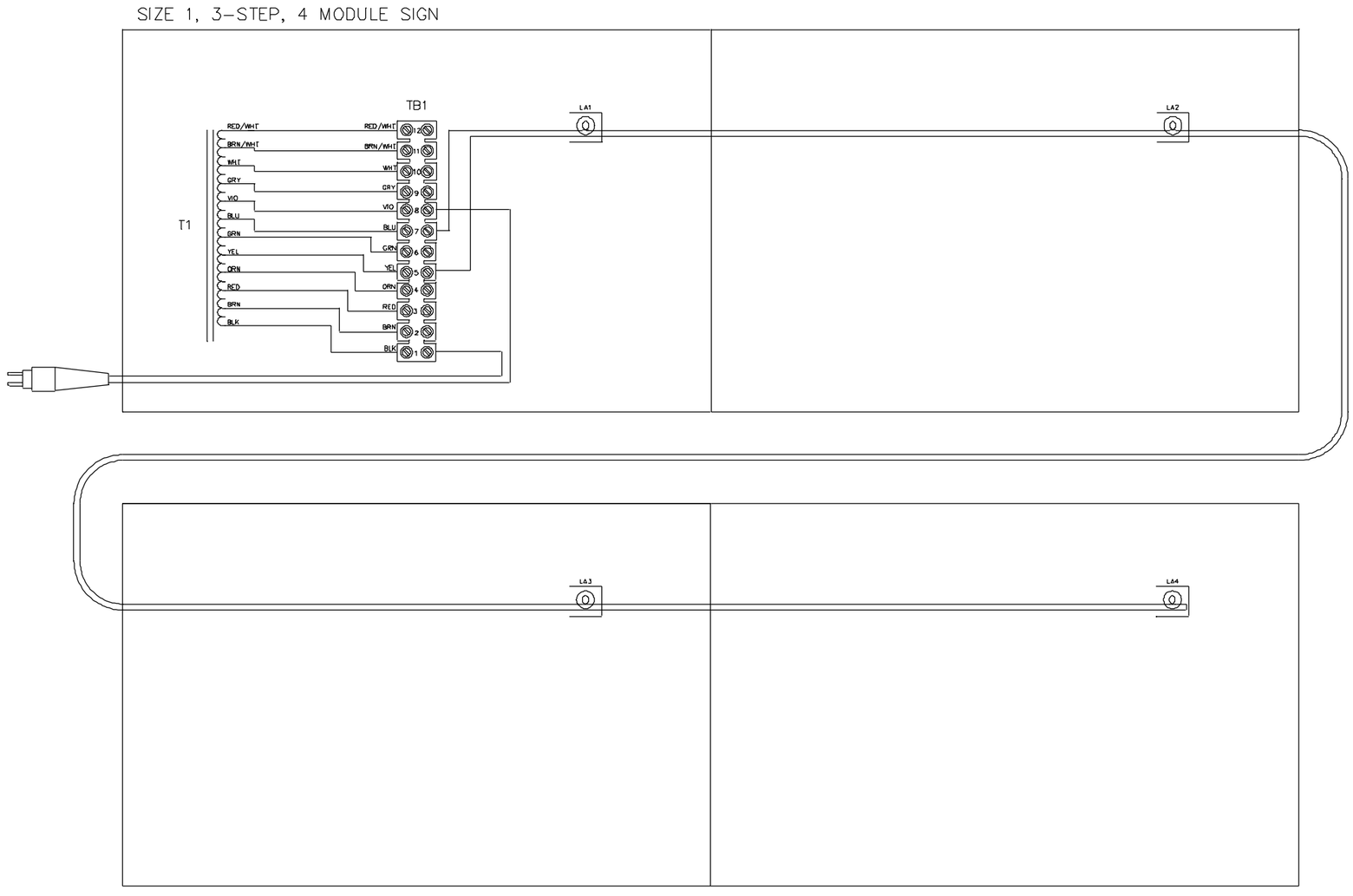


Figure 8-4. Size 1, Four-Module, 3-Step

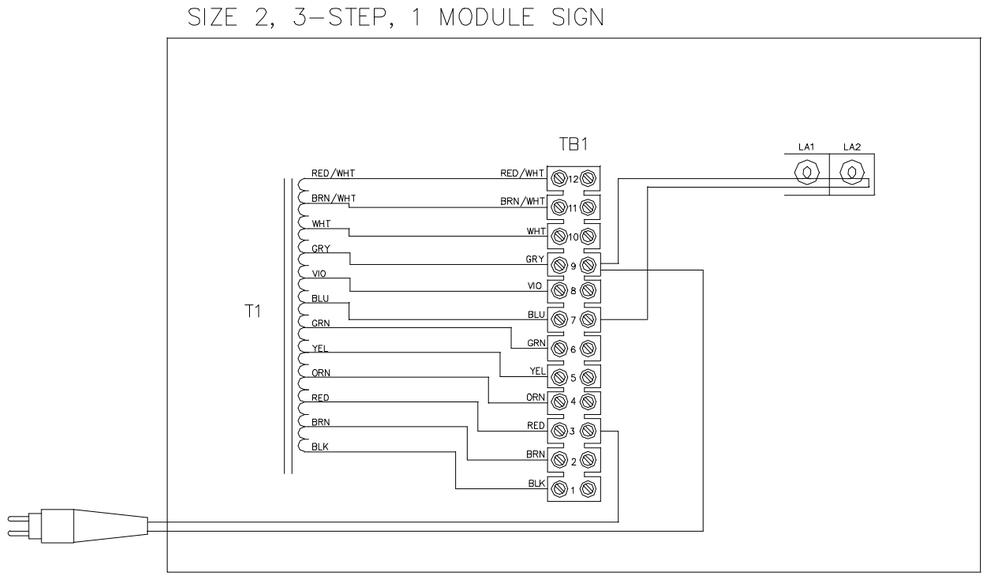


Figure 8-5. Size 2, One-Module, 3-Step

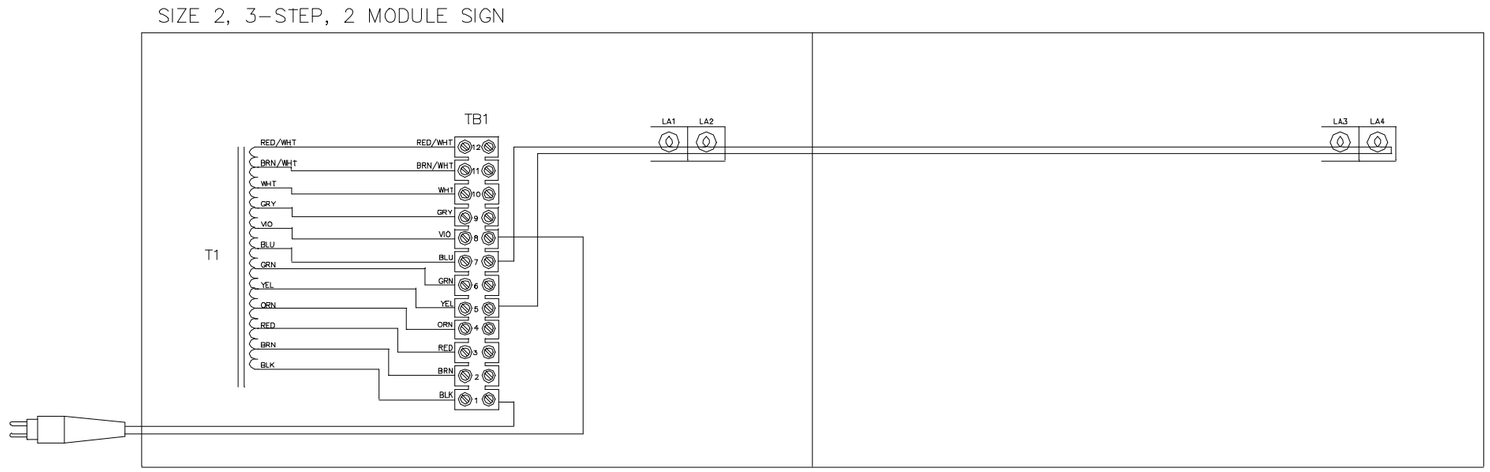


Figure 8-6. Size 2, Two-Module, 3-Step

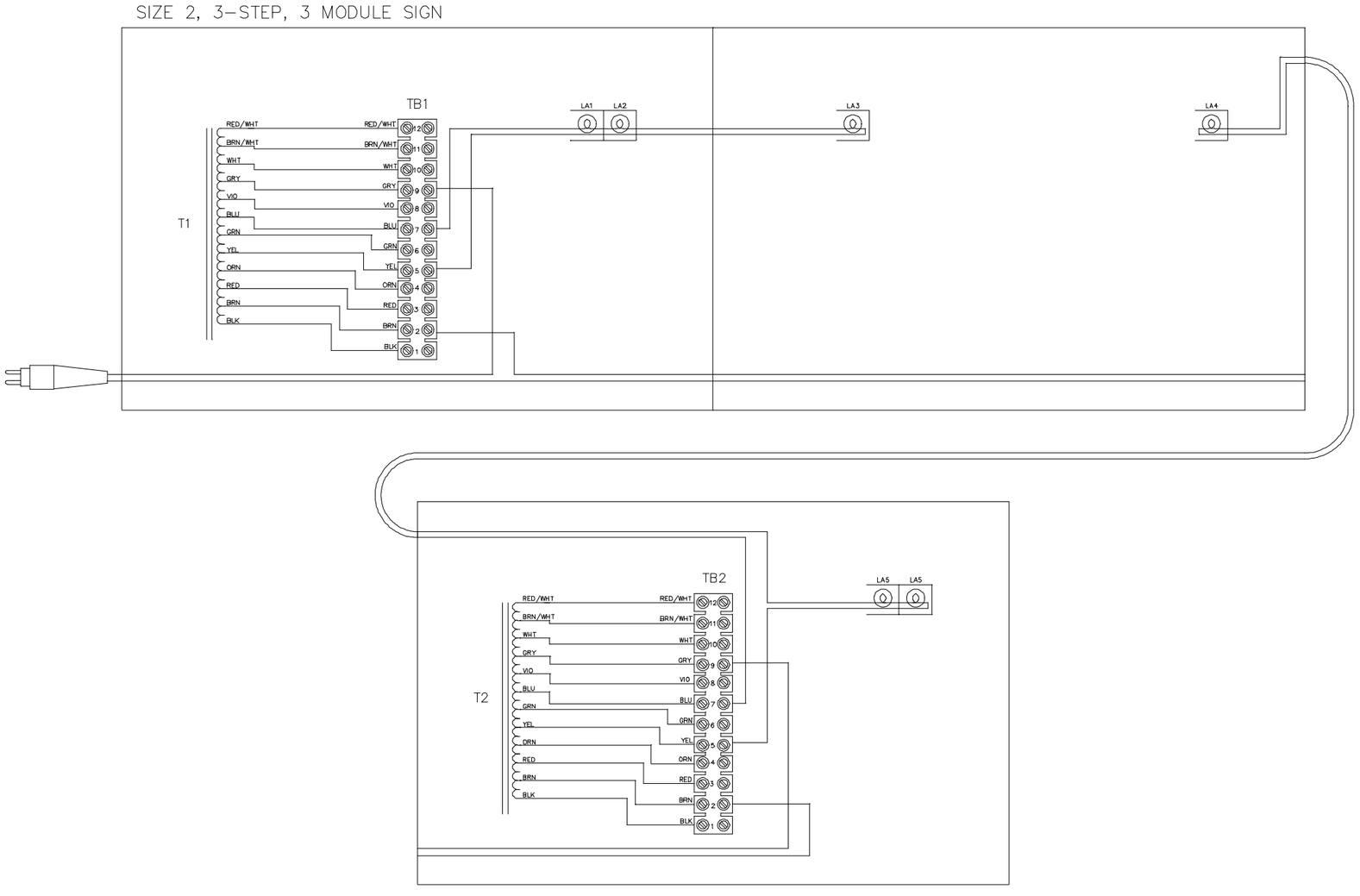


Figure 8-7. Size 2, Three-Module, 3-Step

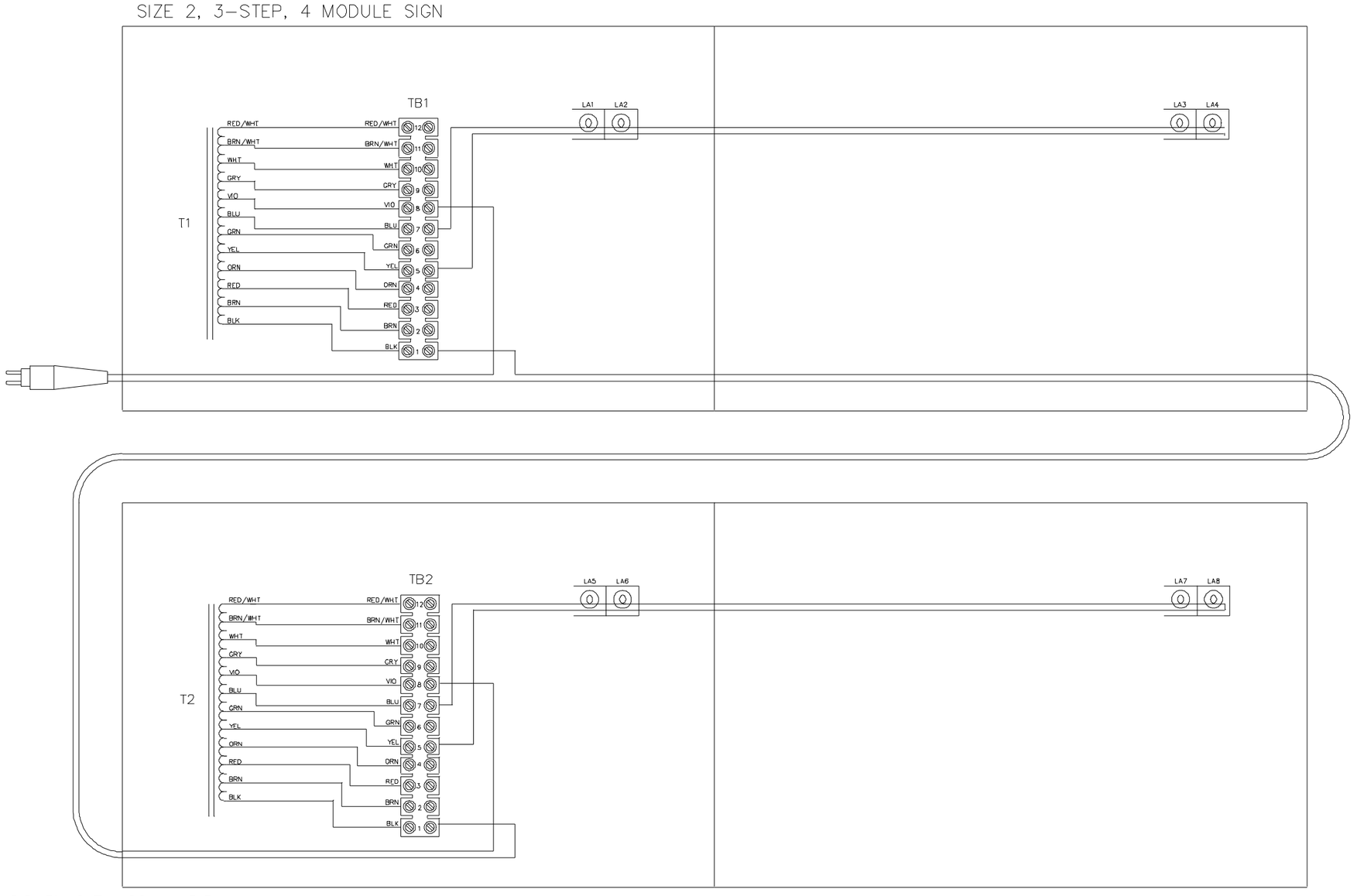


Figure 8-8. Size 2, Four-Module, 3-Step

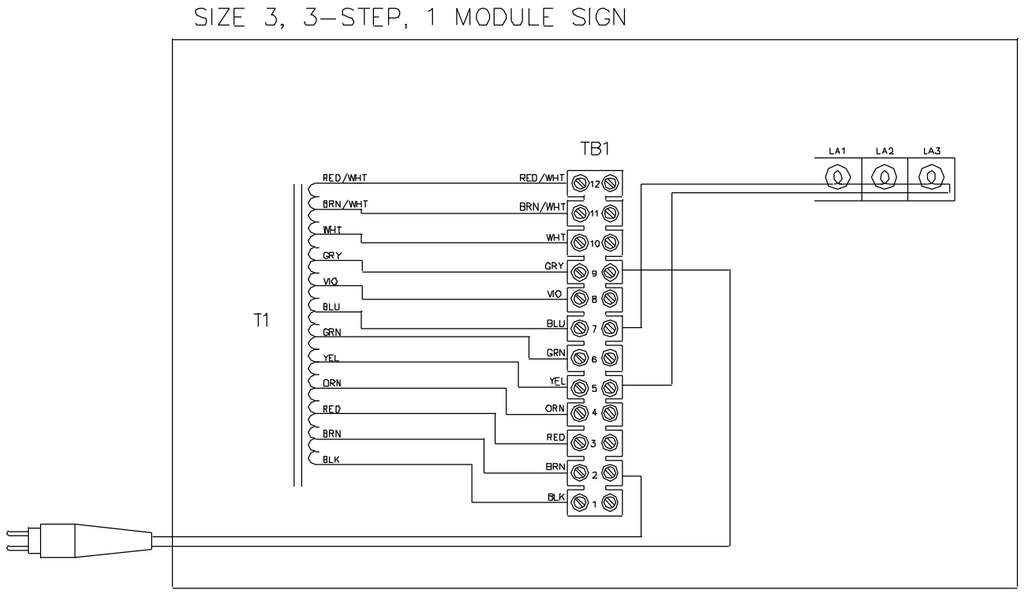


Figure 8-9. Size 3, One-Module, 3-Step

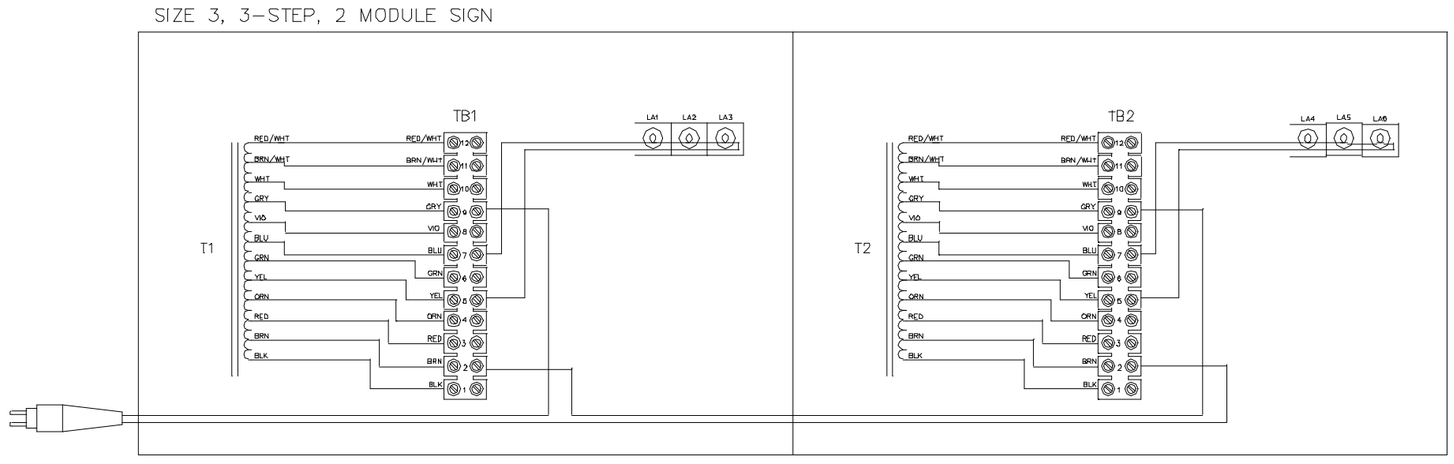


Figure 8-10. Size 3, Two-Module, 3-Step

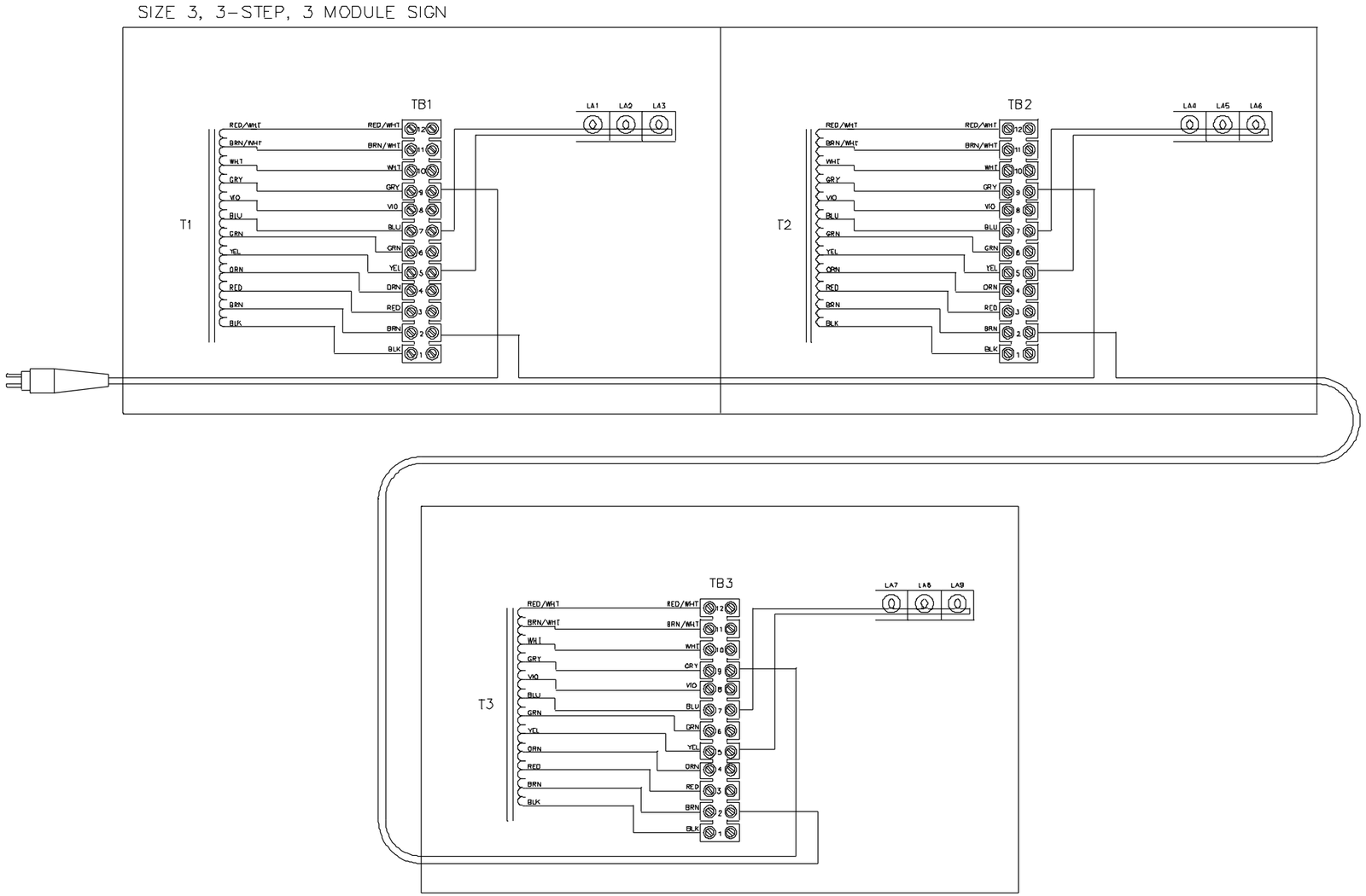


Figure 8-11. Size 3, Three-Module, 3-Step

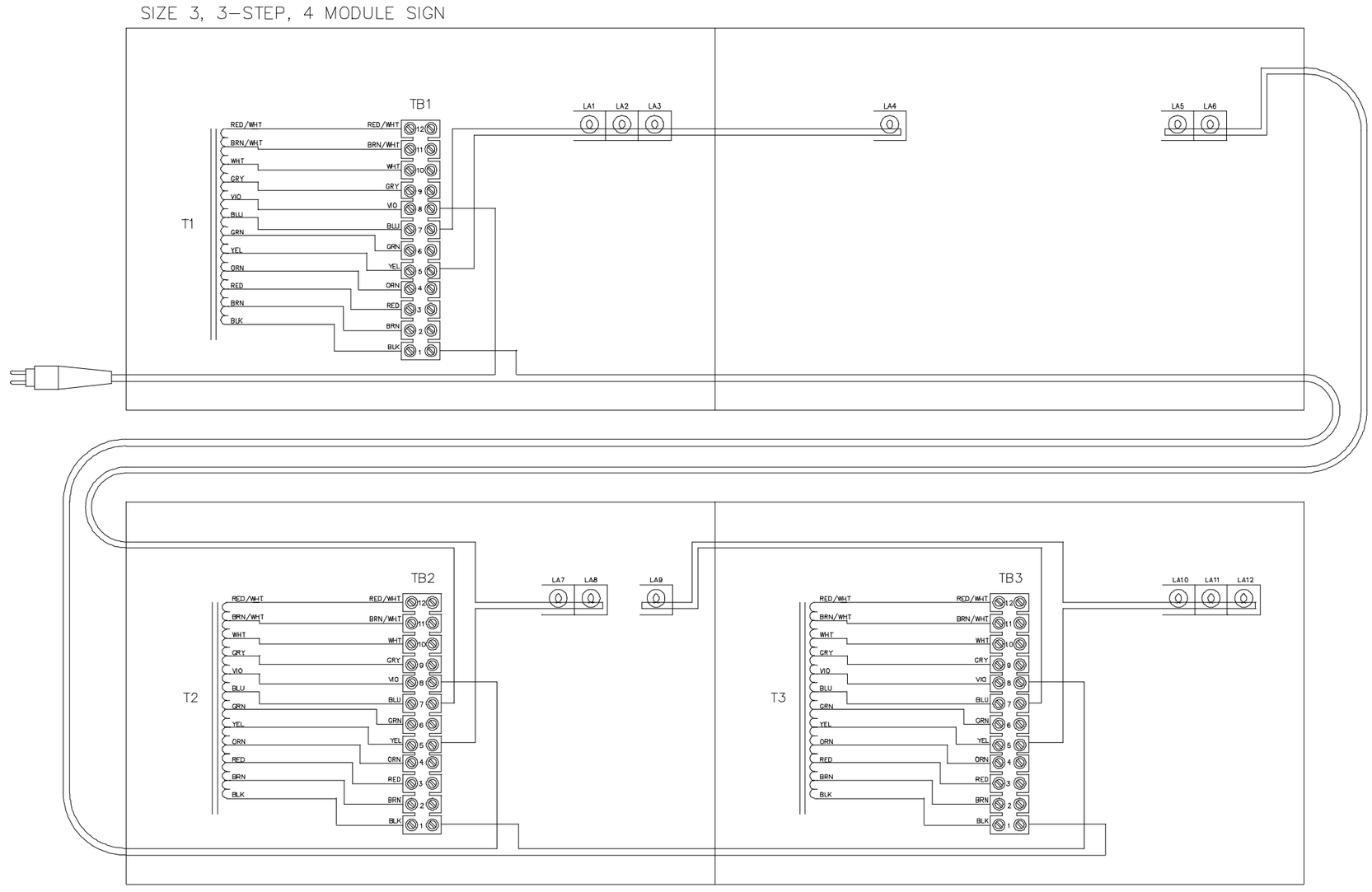


Figure 8-12. Size 3, Four-Module, 3-Step

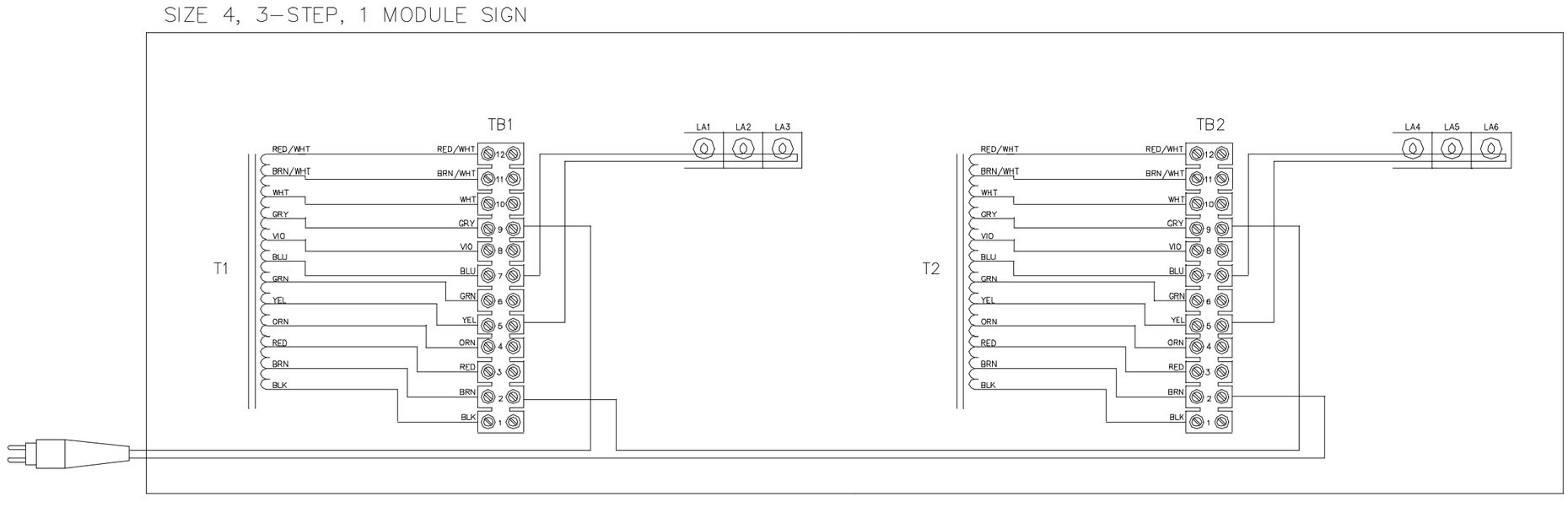


Figure 8-13. Size 4, One-Module, 3-Step

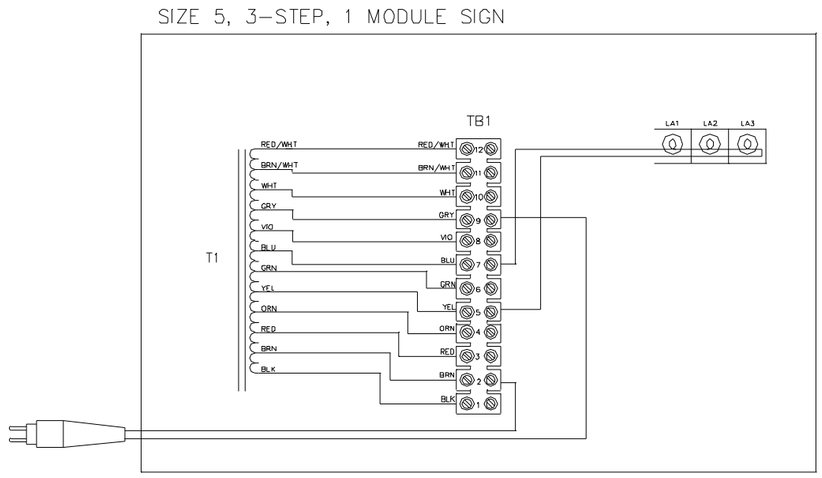


Figure 8-14. Size 5, One-Module, 3-Step

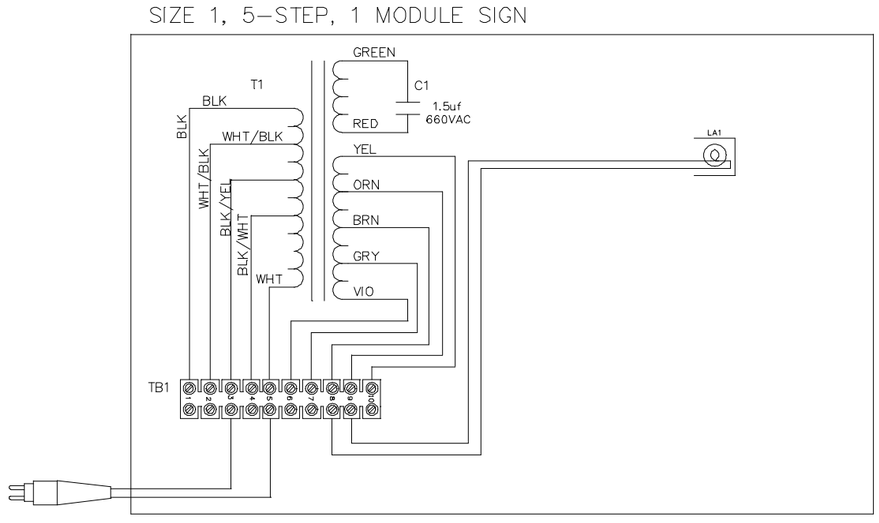


Figure 8-15. Size 1, One-Module, 5-Step

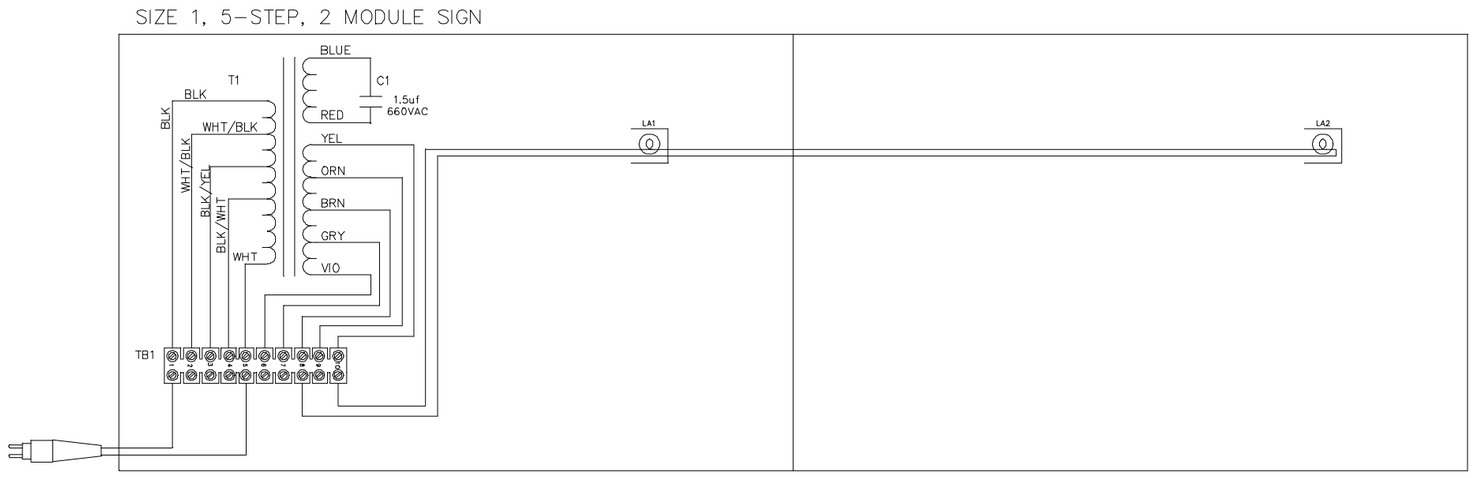


Figure 8-16. Size 1, Two-Module, 5-Step

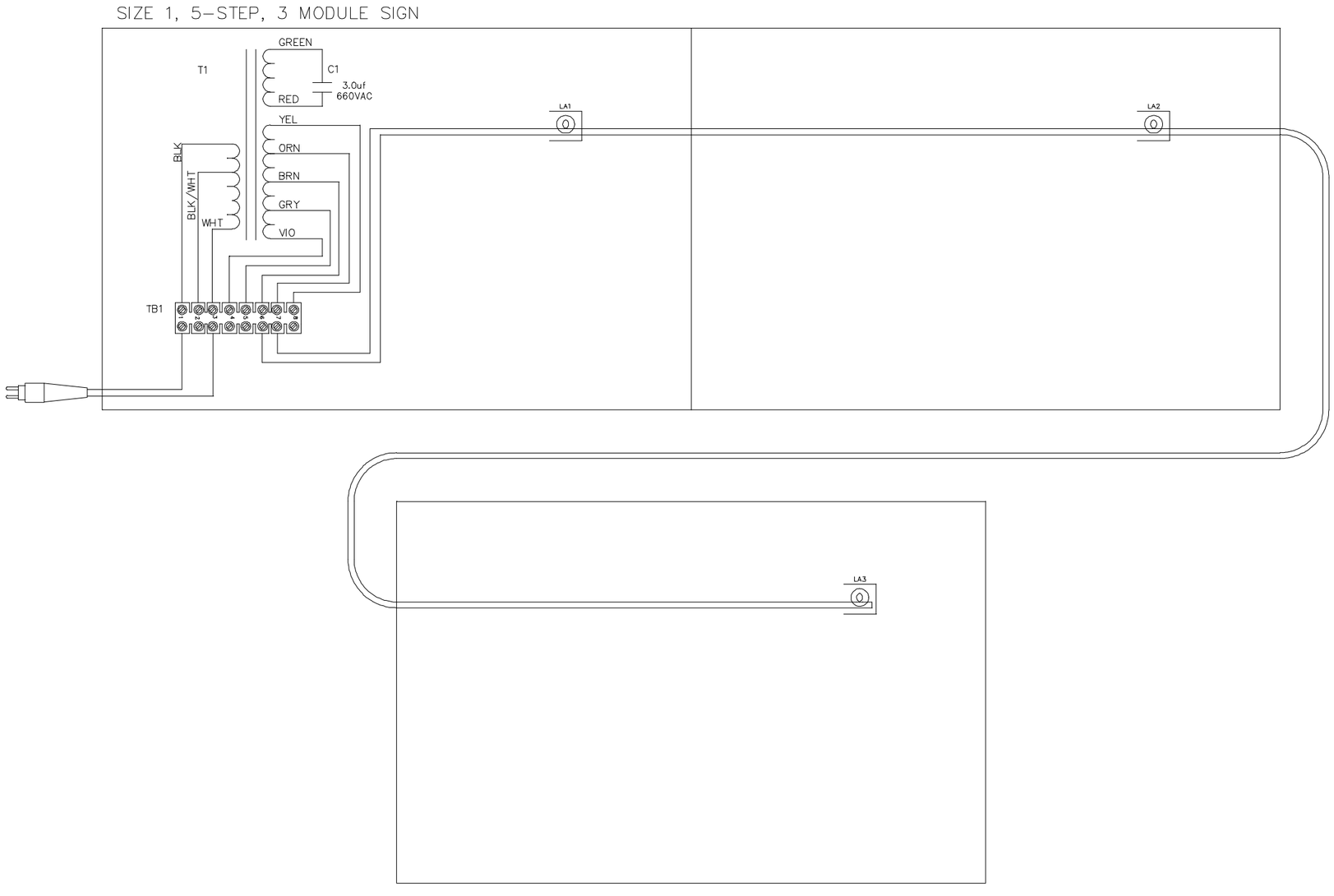


Figure 8-17. Size 1, Three-Module, 5-Step

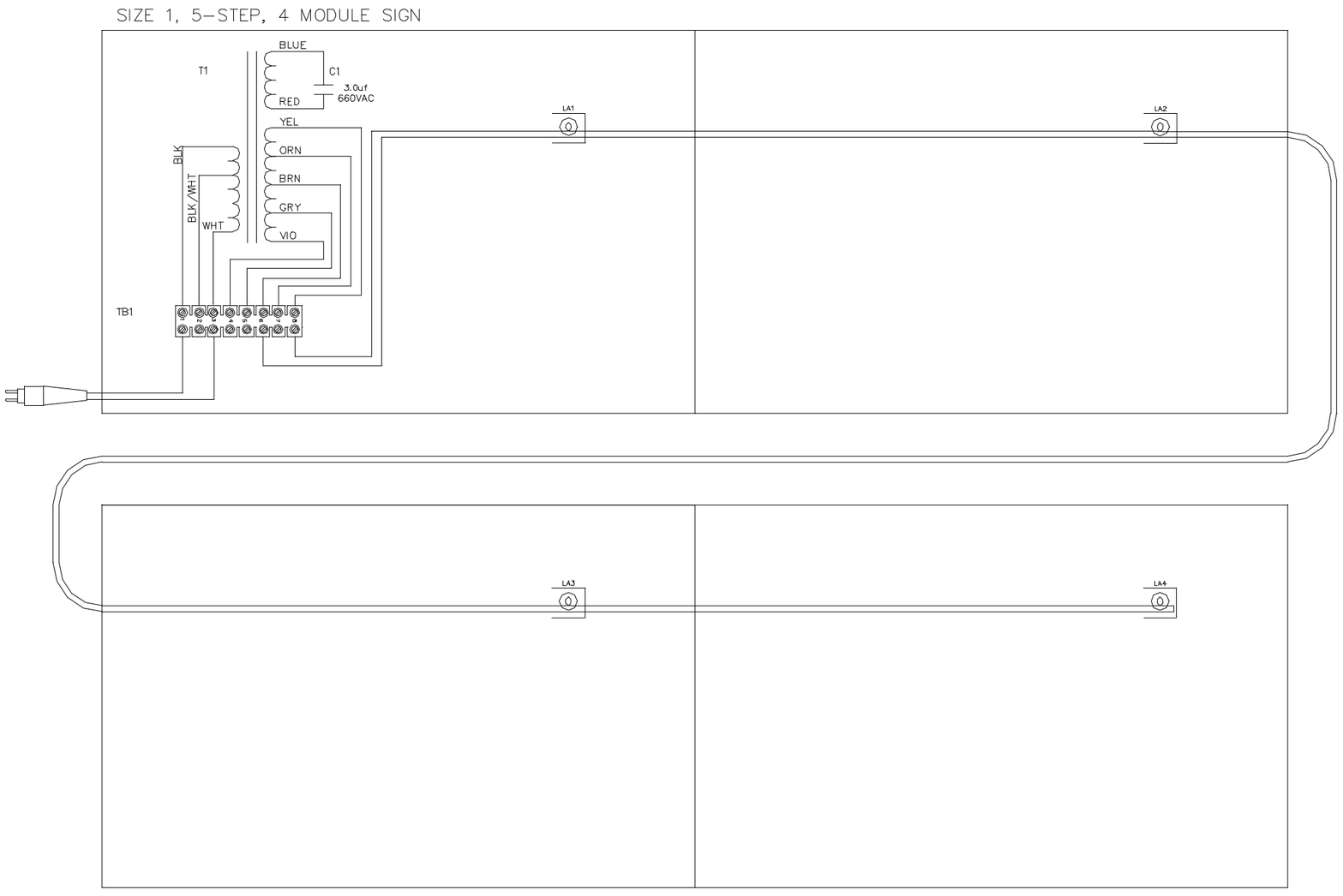


Figure 8-18. Size 1, Four-Module, 5-Step

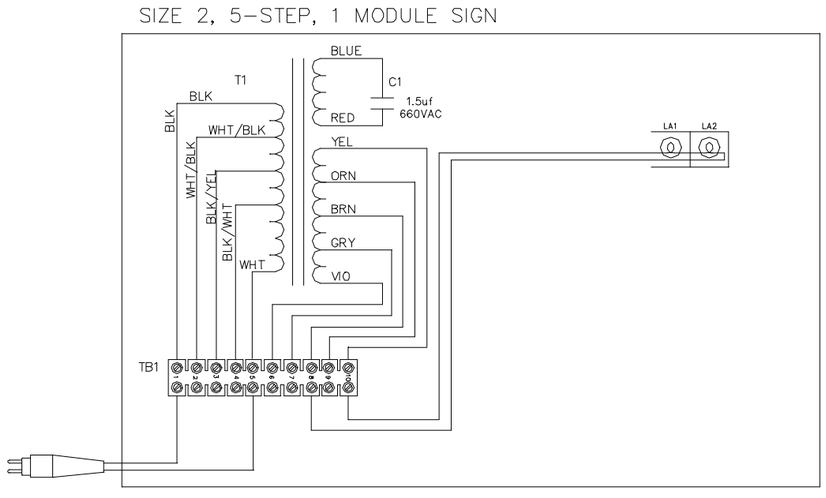


Figure 8-19. Size 2, One-Module, 5-Step

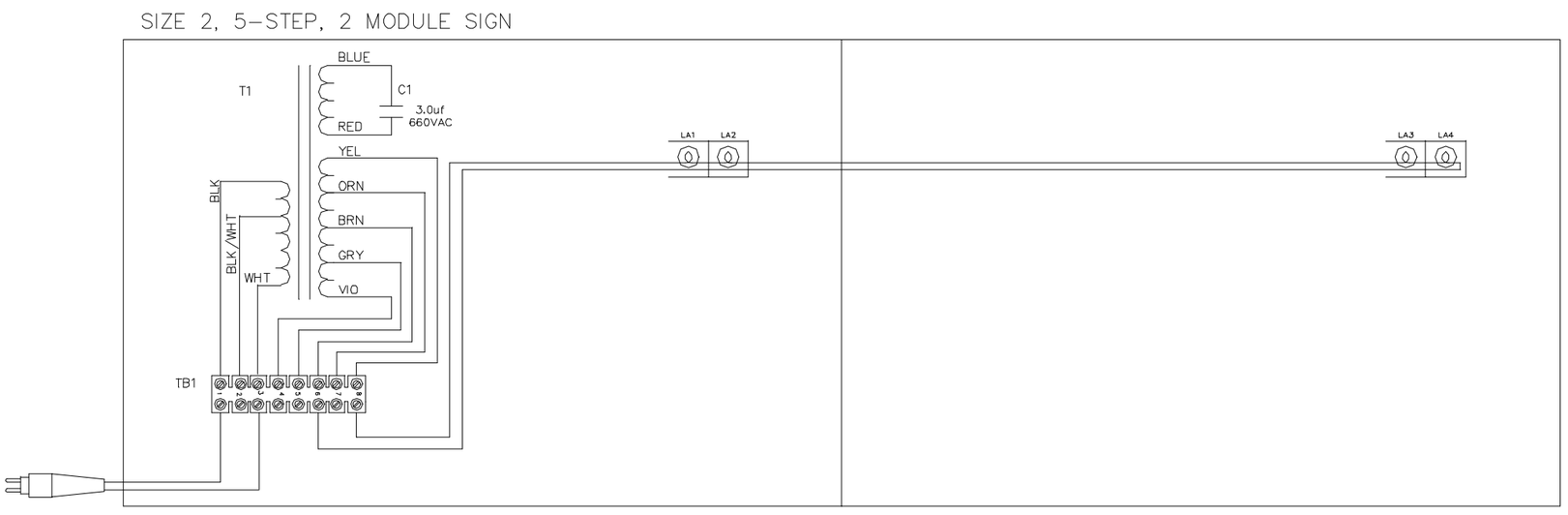


Figure 8-20. Size 2, Two-Module, 5-Step

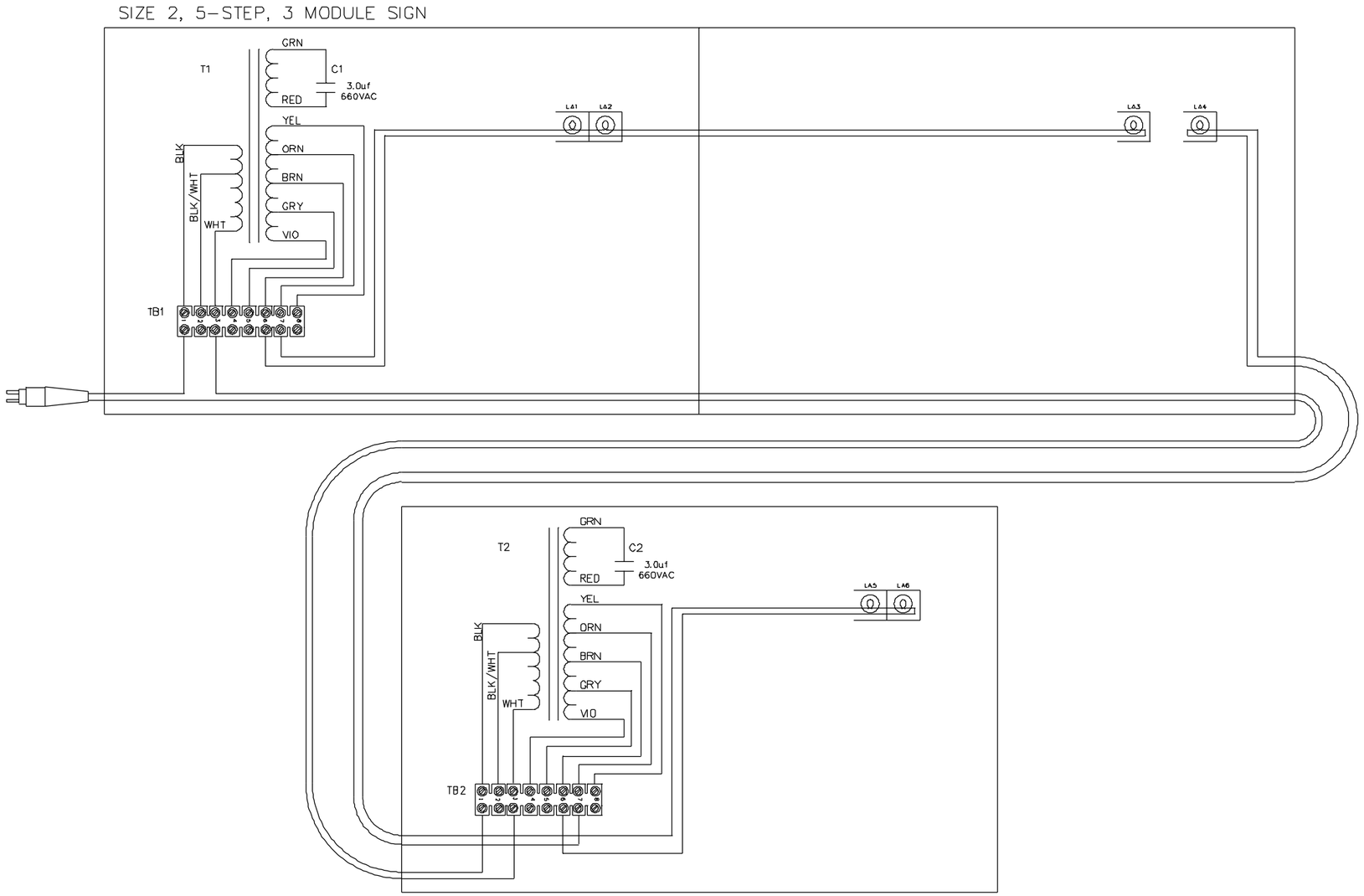


Figure 8-21. Size 2, Three-Module, 5-Step

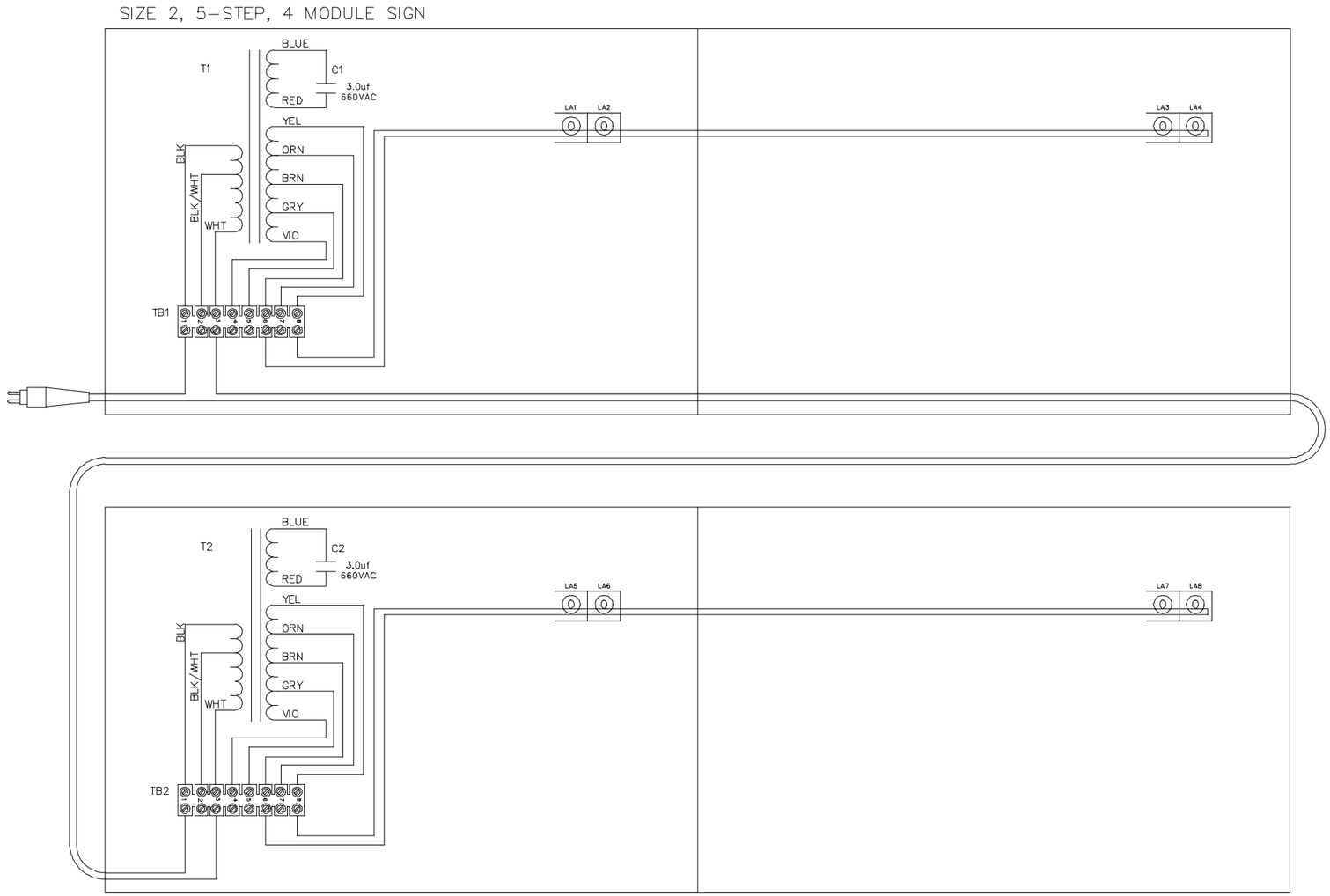


Figure 8-22. Size 2, Four-Module, 5-Step

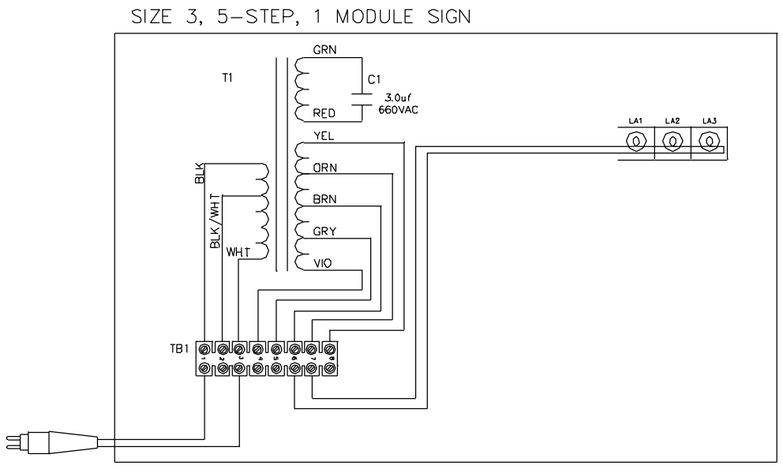


Figure 8-23. Size 3, One-Module, 5-Step

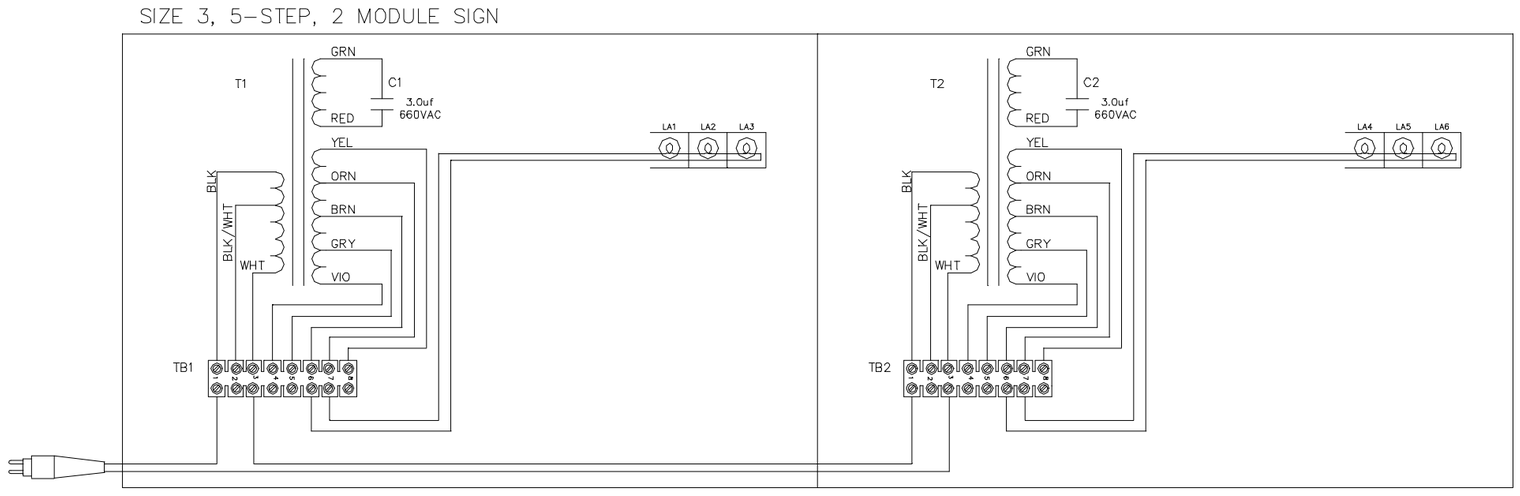


Figure 8-24. Size 3, Two-Module, 5-Step

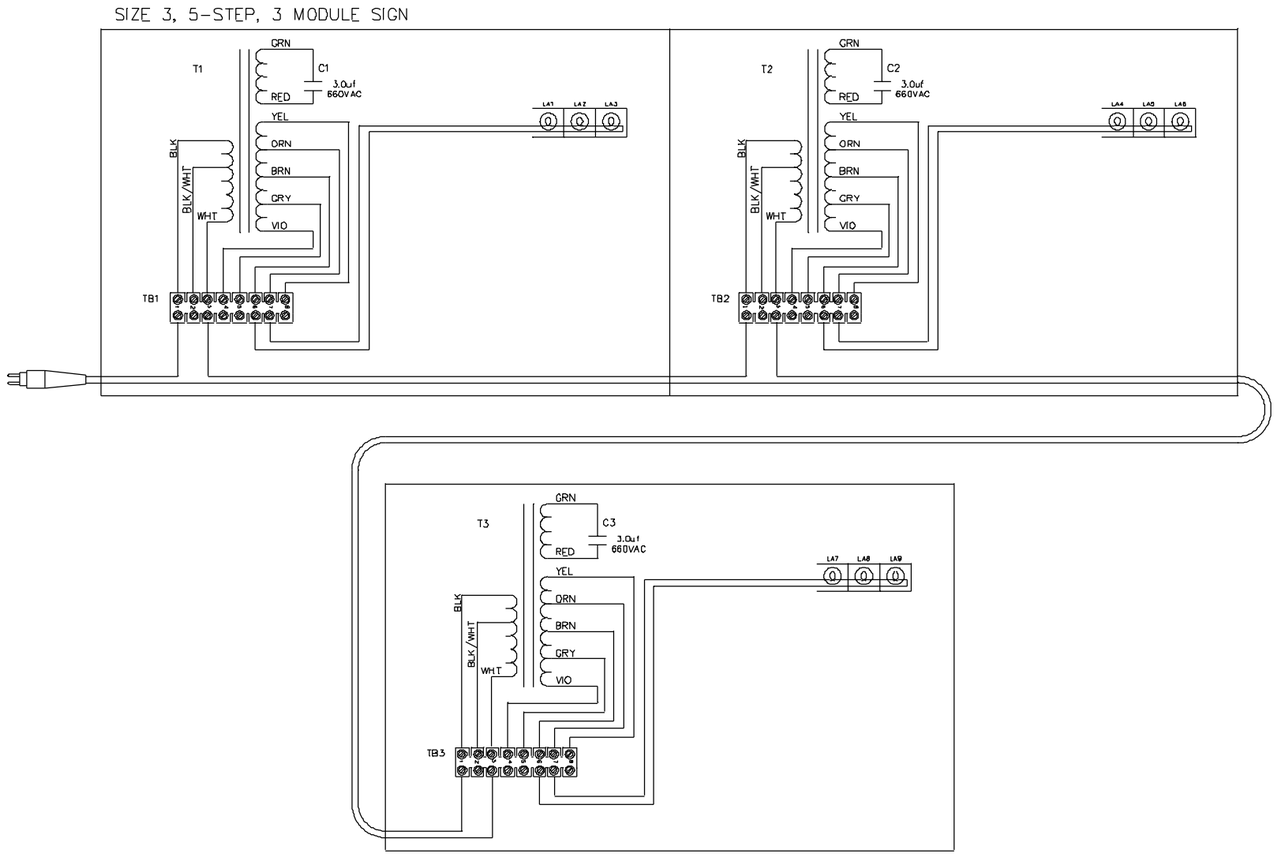


Figure 8-25. Size 3, Three-Module, 5-Step

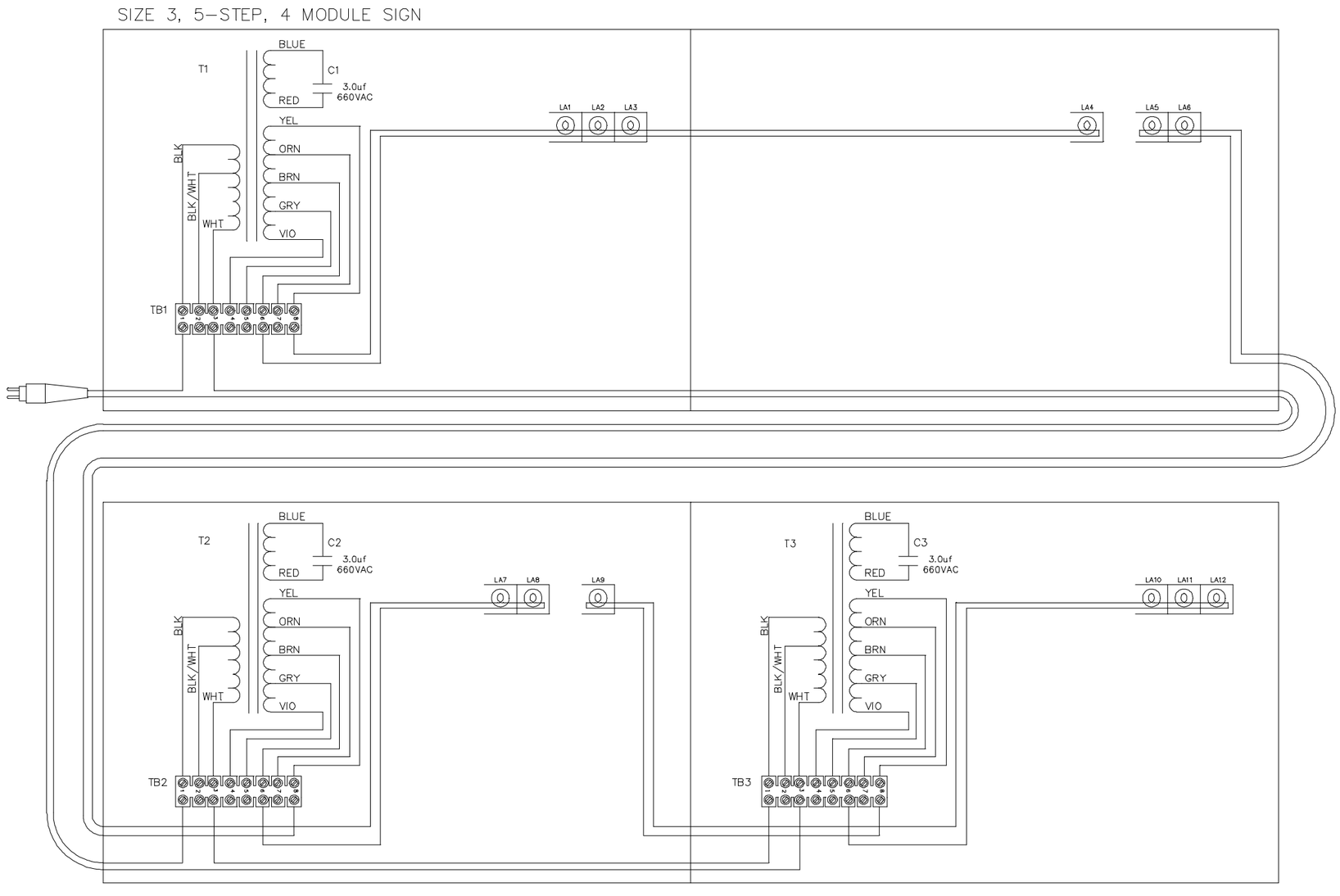


Figure 8-26. Size 3, Four-Module, 5-Step

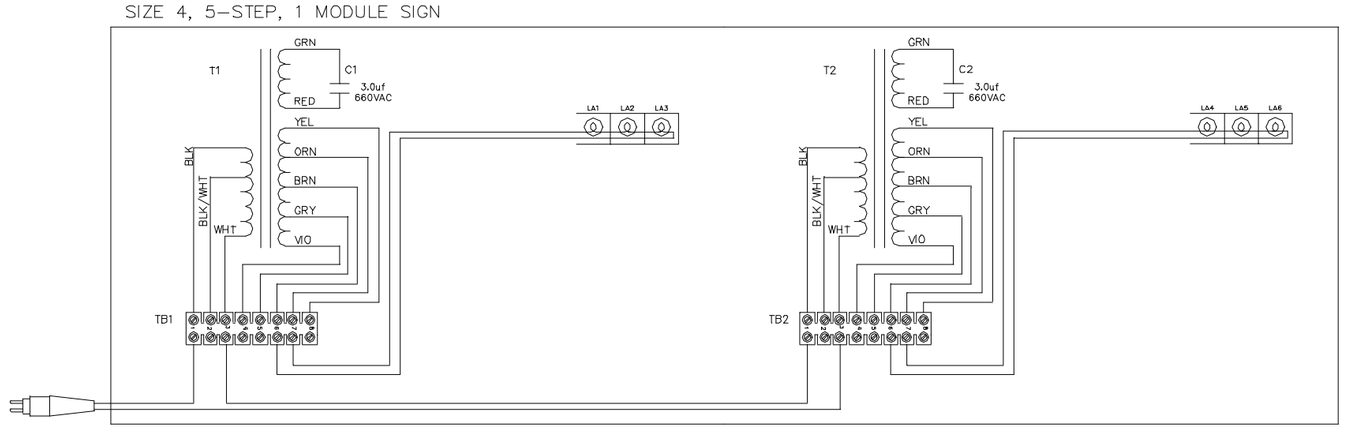


Figure 8-27. Size 4, One-Module, 5-Step

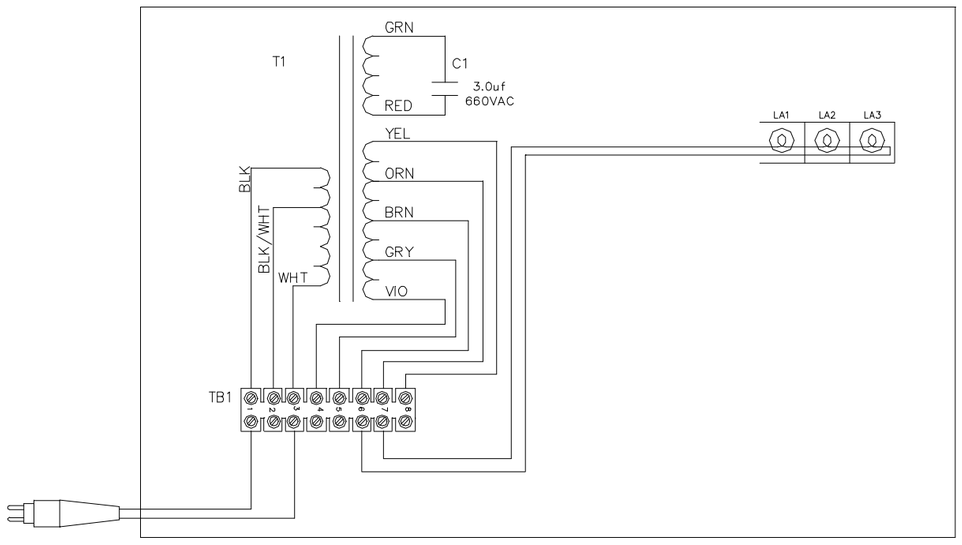


Figure 8-28. Size 5, One-Module, 5-Step

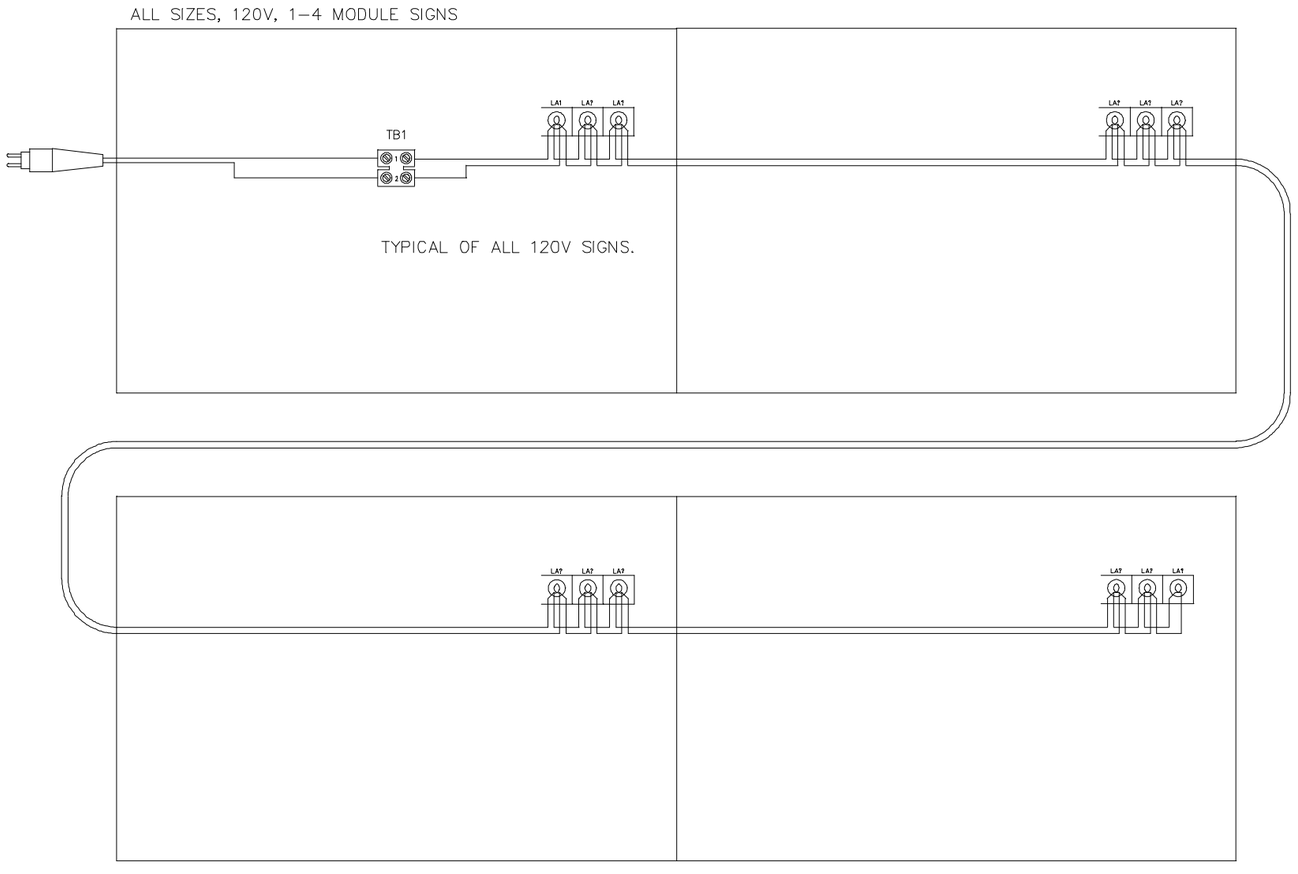
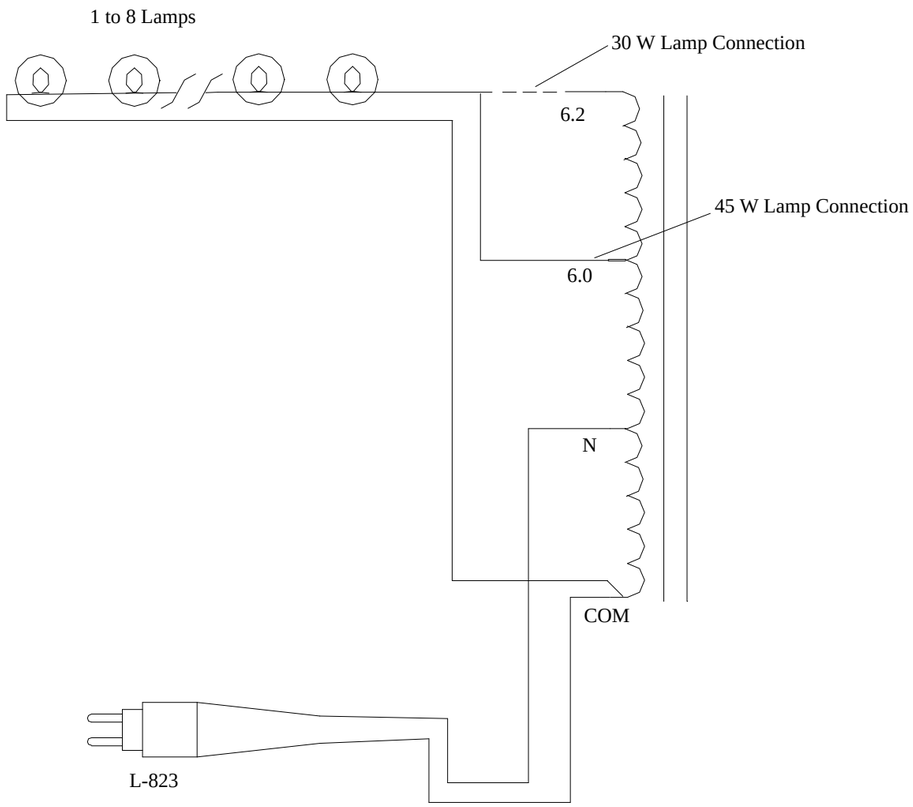


Figure 8-29. 120 Vac (Typical for all Sizes and Modules)



Refer to Tables 3-13 through 3-16 in the Installation section for required current isolation transformers for Style 5 series circuit installation.

Figure 8-30. Style 5 (5.5 A Only) Wiring Diagram