



ALSF/MALSR 400 V System

Approach Lighting System with Sequenced Flashers (ALSF)
and Medium Intensity Approach Lighting System (MALSR)
(Elevated and In-pavement Flashers)

Spare Parts List

SP-2091, Rev. 3.6.1, 2025-12-15


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Note

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1.0 Introduction

Provides the purpose, scope, and applicability of the technical manual.

The manual shows the information necessary to install and maintain the ALSF/MALSR system and associated equipment.

1.1 Low-Voltage ALSF/MALSR Approach Lighting System

Compliance with Standards

FAA:	Designed according to ALSF-1, ALSF-2, ALSF-2/SSALR: FAA-E-2628; MALSR: FAA-E-2325
ICAO:	Annex 14 Vol. 1, para. 5.3.4, 5.3.4.17, 5.3.7, and 5.3.8
Military:	UFC 3-535-01 – Chapter 3 for Approach Applications using sequenced flashing lights

Theory of Operation

ADB SAFEGATE's sequenced-flasher lighting systems include a master control unit, junction boxes, individual control cabinets (ICC), and either elevated or in-pavement flasher units. For MALSR systems, a 15 kVA transformer is also provided to power the steady-burning lights.

In the ALSF configuration, an array of light bars are installed symmetrically around the centerline of the approach lighting system, starting at the approach threshold and extending a total distance of 2,400 feet (731.5 m) outward into the approach zone up to 3,000 feet (914 m) at facilities where high-speed military aircraft share runway usage. Up to 21 flashing lamp assemblies (30 for ICAO applications) are installed in the outer portion of the approach lighting system at regular intervals.

In the MALSR configuration, an array of light bars are installed symmetrically around the centerline of the approach lighting system, starting at the approach threshold and extending a total distance of 2,400 feet (731.5 m) into the approach zone and up to 3,000 feet (914.4 m) at facilities where high-speed military aircraft share runway usage. Typically, up to 8 flashing lamp assemblies are installed in the outer portion of the approach lighting system at regular intervals.

The MALSR system uses white 120 VAC PAR-38 fixtures for the light bar arrays. Also, the MALSR system uses green 120 VAC PAR-56 fixtures for the threshold bar. The ALSF system uses white or red PAR-56 6.6 A or 20 A fixtures for light bar arrays and green PAR-56 6.6 A or 20 A fixtures for the threshold bar.

Flashing lights are arranged and connected in such a way as to produce a sequenced flashing light signal that has the appearance of a ball of light traveling down the system from the outer end (flasher farthest from the runway threshold) to the flasher assembly closest to the runway threshold.



Note

See ADB SAFEGATE's DS-1042 for more details on ALSF or MALSR PAR-56 fixtures.

Features

- MALSR sequenced flashers can be easily expanded to ALSF at a later date
- Flasher operating voltage is +400 VDC instead of +2000 VDC used in traditional systems, improving safety.
- 600 V cable can be used between the flasher and Individual Control Cabinet (ICC), eliminating the need for high voltage interconnecting cable.
- Lamp sub-assembly in elevated flash head can be quickly and easily replaced without the use of tools
- In-pavement flasher has an aluminum top cover, reducing maintenance requirements and resulting in a very low weight
- In-pavement flasher height above ground (without snow plow ring) is only 0.75" high. In-pavement flasher height above ground (with snow plow ring) is only 0.5" high.
- Flashers can be up to 393 ft (120 m) from the ICC, allowing placement outside the obstacle free zone
- ICC can be optionally supplied with one cabinet that can connect to 3 flashers, minimizing acquisition and installation cost
- ICC uses a highly efficient power supply. This yields lower power consumption, elimination of peak inrush currents, and allows use of smaller gauge supply power wires compared to traditional capacitive discharge systems.
- Numerous remote control/monitoring options maximize system flexibility. Remote control/monitoring can be accomplished via: - Individual 24 VDC, 48 VDC or 120 VAC hard-wired copper connections

ALSF Uses

ALSF-1, ALSF-2, and ALSF-2/SSALR approach lighting systems with sequenced flashing lights are used at airports and military air bases to provide landing approach guidance, such as runway alignment, height perception, horizontal reference, and roll guidance extending from the landing threshold outward (2,400-3,000 feet) into the approach zone. Note that FAA-E-2628 specifies only the sequenced flasher portion of the ALSF approach lighting system. The steady-burning portion of an ALSF system is implemented using either a 6.6 A or 20 A series circuit.

ALSF-1

- The ALSF-1 approach lighting system is used on Category I Instrument Landing Systems (ILS) and includes up to 24 light stations (100-foot spacing) with up to 22 centerline bars of steady-burning lights (five lights to a bar) and up to 15 flashers.

ALSF-2

- The ALSF-2 approach lighting system is used on Category II runways and includes up to 30 light stations (100-foot spacing) with 30 centerline bars of steady-burning lights (five lights to a bar) and up to 21 flashers.

ALSF-2/SSALR

- The SSALR approach lighting system has up to eight sequenced flashing lights and is used as part of a dual-mode approach lighting system (ALSF-2/SSALR) when Category I conditions exist on Category II designated runways.



Note

For ICAO applications, the system can also be used with up to 30 flashers.

MALSR Uses

The MALSR approach lighting system with sequenced flashing lights are used at airports and military air bases to provide landing approach guidance, such as runway alignment, height perception, horizontal reference, and roll guidance extending from the landing threshold outward (2,400-3,000 feet) into the approach zone. Note that FAA-E-2325 specifies both the sequenced flasher and steady-burning portions of a MALSR approach lighting system.

Operating Conditions

Temperature Range	-67 °F to +137 °F (-55 °C to +55 °C)
Humidity	0 to 100%
Altitude	0 to 10,000 ft (3,048 m) maximum

Master Control Cabinet (MCC)

The master control cabinet contains control and monitoring PCBs, which provide the power, timing signals, misfire monitoring circuitry, and three-step intensity control signals to the sequenced flasher assemblies in remote and local mode.



Equipment Data

Input and Output Voltage	120/240 VAC, +10%/-15%, 50/60 Hz, three-wire, single-phase (neutral center-tapped)
Time from Trigger Pulse to Trigger Pulse	In ALSF mode, corresponds to one cycle of 60 Hz line, 16.67 ms. In SSALR mode, corresponds to every other cycle of the 60 Hz line or 33.3 ms. For MALSR, corresponds to every other cycle of the 60 Hz line or 33.3 ms.
Enclosure	NEMA 4, outdoor and ventilated (to prevent condensation)
Maintenance Features on Control Cabinet	<ul style="list-style-type: none"> ▪ Rotary control switch for manual control of brightness level of system ▪ Flasher ON/OFF switch to de-energize flashers (if desired) when the approach lights are energized ▪ LED indicators for system monitoring ▪ Service entrance switch disconnects incoming power ▪ 100 W maintenance light ▪ Can lock door in a 120° open position
Lightning Protection	Rugged surge protection on all input and output electrical connections

Voltage	Dimensions	Weight
120/240 VAC (standard)	37.25 × 30 × 11.38 in	137 lb
	94.6 × 76.2 × 28.9 cm	62 kg

Master Input Power Requirements

Voltage	Max. No. of Flashers	Max. Power Req. ALSF	Max. Power Req. MALSR
120/240 VAC	3	4 kVA	18 kVA
	5		19 kVA
	6	5 kVA	
	8		20 kVA
	9	6 kVA	

Voltage	Max. No. of Flashers	Max. Power Req. ALSF	Max. Power Req. MALSR
	12	7 kVA	
	15	8 kVA	
	18	9 kVA	
	21	10 kVA	

Individual Control Cabinet (ICC)

Each flasher fixture is controlled by an individual control cabinet, which houses triggering circuits, terminal blocks, and lightning arresters. A safety interlock switch is incorporated into the enclosure to discharge the flash lamp power circuitry when the cabinet door is opened. The ICC can connect to one flasher or optionally, 3 flashers. ICC includes anti-condensation heaters, which are active when power is applied.



Equipment Data

Enclosure	Outdoor, door handle can be padlocked	
Input Voltage	240 VAC, 50/60 Hz	
Input Current	2 A in high intensity (average)	
Flash Lamp Output Voltage	400 VDC	
Intensity Step Change Component Life	150,000 operations minimum	
Protection	Rugged surge protection on all external wiring connections	
Mounting	Two 2-inch (5.08 cm) threaded fittings are provided on bottom of cabinet for mounting. Mounting lugs are also provided on back of the cabinet.	
Installation Distance	ICC can be installed a maximum of 393 ft (120 m) from flasher	
Dimensions	H × W × D	
1-in-1 ICC	20 × 16.5 × 9.25 in (50.8 × 41.9 × 23.5 cm)	
3-in-1 ICC	25.6 × 31.1 × 15 in (65 × 79 × 38 cm)	
Weight	1-in-1 ICC	3-in-1 ICC
	40.8 lb (18.5 kg)	103.6 lb (47 kg)

Elevated Flasher

Each elevated flash head assembly consists of a flashing light head, which houses a low-voltage (400 VDC) flash tube and a trigger transformer. A safety interlock switch disconnects the individual control cabinet (ICC) power when the flash head is opened. The elevated flash head is rated IP45.



Elevated Flasher Ordering Codes

Elevated Flasher ¹	1UE9C2Y00001
LIR Mounting Adapter ²	4762

Elevated Flasher Ordering Code Notes

¹ Flash head includes lamp.

² Must use LIR mounting adapter if mounting to an LIR mast.

In-Pavement Flasher

Each in-pavement fixture houses a low-voltage (400 VDC) flash tube and trigger transformer. A safety interlock switch disconnects the individual control cabinet (ICC) power when the bottom cover is removed.

Figure 1: In-pavement Fixture with Mating Female Connector



In-pavement flasher height is 0.75 inch without the snow plow ring and fits on a standard FAA 12-inch base can. Fixture height is 0.5 inch with the snow plow ring. The ring adapts from 12 inches to 16 inches and is mounted on an FAA L-868C base can.

Figure 2: In-Pavement Fixture with Snow Plow Ring



In-Pavement Flasher Ordering Codes

In-Pavement Flasher ^{1 2}	44A7445
Mating Female Connector (59-inch long)	73A0174
Snow-Plow Ring LB4 - 3/8-16 UNC	4072.37.320
Lifting Device ³	1420.55.600

In-Pavement Flasher Ordering Code Notes

¹ Includes 5 conductor cable with 12" long male plug.

² For FAA owned and operated flashing systems use FFL9C0000001.

³ Lifting Device allows in-pavement flashing fixture to be quickly and easily removed from its mounting system during maintenance activities.

Equipment Data

Input Voltage	400 VDC
Lamp	Xenon flash tube
Lamp Life	Average 500 hours on high-intensity step
Intensity Decrease	30% or less over minimum rated lamp life
Flash Skipping	Less than 1% with no consecutive skipping
Elevated Light Beam Axis	Adjustable vertically from the horizontal to 25° above the horizontal
Vibration	Withstands vibration in frequency range of 10 to 2,000 Hz in accordance with NEMA Standard FA1-3.01
Elevated Mounting	On a 2-inch (5.08 cm) frangible coupling or 2-inch EMT conduit, or 1.5-inch (3.81 cm) OD tube or 1.5-inch schedule 40 pipe. Mounting can be on a 1-inch (2.54 cm) pipe (used on an aluminum tower) using Mounting Adapter.
Installation Distance	A maximum of 393 ft (120 m) from ICC
Elevated Dimensions	10.6 × 5.75 × 6.7 in - H × W × D (27 × 14.6 × 17 cm)
In-pavement Dimensions	Fits on standard 12-inch base can. Overall Di-height is 6 inches.
Elevated Wt.	4 lb (1.8 kg)
In-Pavement Weight	16.5 lb (7.5 kg)

Photometric Data

Intensity Setting	Maximum Effective Intensity	Minimum Effective Intensity	Beam Spread	
			Horiz.	Vertical
Elevated Fixture				
High	20,000 cd	8,000 cd	±15°	+10°
Medium	2,000 cd	800 cd		
Low	450 cd	150 cd		
In-pavement Fixture				
High	20,000 cd	5,000 cd	±15°	+2 to +12°
Medium	2,000 cd	500 cd		
Low	600 cd	150 cd		

Junction Box

Junction boxes are used to distribute power and control signals to the ICCs. One junction box is required for each sequenced flasher in the system. Each junction box has two terminal strips to accommodate the incoming and outgoing power, control circuit, and monitoring wire for the flasher unit.



Steel Junction Box (Standard)	44A6765
Stainless Steel Junction Box	44A6765/1
Quantity	One for each flasher unit
Conduit Hub	Two 2-inch hubs in the bottom of the box
Dimensions	14 x 14 x 6 in (35.56 x 35.56 x 15.24 cm)
Weight	15 lb (6.8 kg)

15 kVA Power Transformer

The 15 kVA, 60 Hz power transformer powers the steady-burning PAR-56 and PAR-38 lights. Taps on the transformer are switched by contactors in the master control cabinet to provide power at any one of three voltage levels to the steady-burning lights. Taps provided on the primary of the transformer permit secondary voltage adjustment to within 2.5% of the required secondary output assuming the primary voltage is between 210 V and 252 VAC. The transformer is housed in an outdoor, rain-tight enclosure with lugs provided on the back of the enclosure for mounting the cabinet in a vertical position. Two external lightning arresters are provided for input and output lightning protection.



15 kVA Transformer	44D1685/1
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Equipment Data

Quantity	One	
Rating	15 kVA	
Input	210-252 VAC, 60 Hz	
Taps	Provided on primary to permit adjustment of secondary voltages	
Output Voltage (240 VAC Primary Input)	<u>Intensity Step</u>	<u>Secondary Output</u>
	Low	50/100 VAC $\pm 0.5\%$
	Medium	75/150 VAC $\pm 0.5\%$
	High	120/240 VAC $\pm 0.5\%$
Dimensions	13.25 × 12 × 18 in (33.7 × 30.48 × 45.7 cm)	
Weight	262 lb (119 kg)	

PAR-38 Lamp Holder

There are 45 PAR-38 lamp holders mounted five to a light bar in the runway approach. Each lamp holder is designed to accommodate 150 W, 120 VAC PAR-38 lamps. An adjustable base on the lamp holder permits vertical adjustment from the horizontal to 25° above the horizontal. Also, the mounting hardware permits horizontal alignment of the light beam axis to any horizontal angle within +1°. The lamp holder has a mounting base that mounts on the open top of a frangible coupling, on a light bar with an adapter sleeve, or to a 2-inch (EMT) conduit.



PAR-38 Lamp Holder

AS00061-001-02



Note

60 W, 120 VAC PAR-38 lamps are sold separately. Use part number EA00001-000-01.

Equipment Data

Quantity	45 total
Installation	Five PAR-38 lamp holders are installed on a light bar (Nine light bars in system)
Dimensions	9 × 3 × 3 in (22.9 × 7.6 × 7.6 cm)

LIR Adapter

An optional adapter sleeve is used to adapt the fiberglass LIR mast mountings to 2.36 in (60 mm) for the slip fitter attachment.



LIR Adapter

4762

PAR-56 Lamp Holder

Eighteen PAR-56 lamp holders are installed on the runway threshold. The lamp holder has mounting clips to hold the green filter and is designed to accommodate a 300 W, 120 VAC PAR-56 lamp. Each lamp holder has an adjustable base for vertical adjustment and mounts to a 2-inch EMT conduit or on top of a frangible coupling. PAR-56 lamp holders are ordered separately. See ADB SAFEGATE data sheet 1042 for more information.



Aiming Devices

Elevated FAA Steady-Burning Fixtures

Aiming devices can be used on either ground mounted lights or when the lights are mounted on low impact resistant structures conforming to FAA-E-2604 or FAA-E-2702. The aiming device is used to adjust the vertical elevation angle of PAR-38 and PAR-56 steady-burning lamp holders. The aiming device permits aiming of the lamp axis perpendicular to the plane of the cover glass at any angle from 0° to +25° above the horizontal. The aiming angle can be calibrated in 1° intervals, and the actual aiming angle of the lamp holder with the aiming device attached is accurate to within ±0.5°.





Note

For ICAO elevated steady-burning fixture applications, refer to ADB SAFEGATE data sheet 3031.

Steady Burn PAR-56 only	44D1654/1
Steady Burn PAR-56 and PAR-38	44D1654/2
Flasher Electronic Aiming Device	1570.05.400
Flasher Bubble-Level Aiming Device	1570.05.410



Note

The Electronic Aiming Device applies to inaccessible fixture mounting heights up to 33 ft (10 m). The Bubble-Level Aiming Device is for fixture mounting heights accessible from the ground, a ladder or a bucket truck.

Elevated Flashing Fixtures

This aiming device is used to adjust the vertical elevation of the elevated flash head. For elevated flashing fixture, the aiming device is available either as an electronic or as a simple mechanical (bubble level) based unit. Both aiming devices are accurate to within $\pm 0.5^\circ$.

Flasher Tester

Flasher Tester functionality is accomplished using the flasher tester software (CD included with the dongle) installed on a laptop. A separate portable flasher tester tool is not used with the Low-Voltage ALSF/MALSR Approach Lighting System.

The flasher testing software provides advanced monitoring and on-site configuration capabilities. The software may be loaded onto a customer supplied laptop or a laptop provided with the system (optional). The laptop is connected to the MCC or any ICC using the Flasher Tester Dongle. The software provides user-adjustable parameter setting and configuration functions and detailed individual status monitoring screens.

Flasher Tester Ordering Codes

Dongle	1444.00.010
Laptop Computer	44A6002/012

Spare Parts Trunk

Spare Parts Trunk includes spare PCBs for the MCC, ICCs, and flashers.



Spare Parts Trunk

Remote Connection - Hardwired
Flashers

44A6767/ 0 0

Remote Connection - Hardwired

- 0 = None
- 1 = +24 VDC
- 2 = +48 VDC
- 3 = 120 VAC

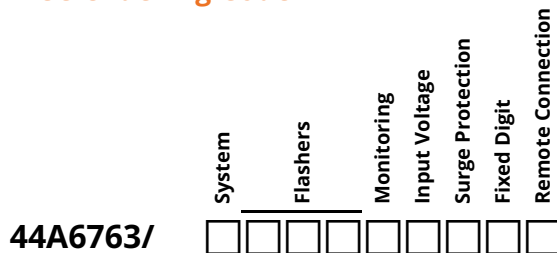
Flashers

- 0 = Elevated and In-pavement Flashers
- 1 = Elevated Flashers Only
- 2 = In-pavement Flashers Only

2.0 Parts

2.1 400V ALSF/MALSR Ordering Codes

MCC Ordering Code



System

- 1 = ALSF per FAA-E-2628 or ICAO
- 2 = MALSR per FAA-E-2325
- 3 = MALSR per FAA-E-2980
- 4 = UDAL¹
- 5 = ALSF per 2628 Stainless Steel

Flashers

XX = Maximum number of flashers

Monitoring

- 1 = Without monitoring
- 2 = With monitoring²

Input Voltage

- 1 = 120/240 VAC (standard)

Surge Protection

- 2 = Monitored surge protection³

Fixed Digit

- 0 = 0

Remote Connection

- 0 = None
- 1 = +24 VDC
- 2 = +48 VDC
- 3 = 120 VAC

MCC Ordering Code Notes

¹ A special Unidirectional Approach Lighting (UDAL) system can also be configured. Contact the ADB SAFEGATE Sales Department for details. A UDAL consists of 5 unidirectional sequenced flashers and 2 unidirectional REILs.

² Monitoring required for ALSF systems per FAA-E-2628.

³ Includes 40 kA surge protection devices in each ICC. Surge protection status monitored electronically.

Individual Control Cabinet (ICC)



System

- 1 = ALSF per FAA-E-2628/ICAO Annex 14
- 2 = MALSR per FAA-E-2325
- 3 = MALSR per FAA-E-2690
- 4 = UDAL

Flasher Quantity

- 1 = One-flasher unit
- 3 = Three-flasher unit

Surge Protection

- 2 = 80 kA surge protection

ICC Ordering Code Notes

- For ICC to Flash Head line lengths up to 131 ft (40 m) maximum, use ADB SAFEGATE Part No. 89A0290-5.
 - Wire is 5/C, 14 AWG, 600 V, shielded.
 - Cable is Alpha Part No. 65405CY-SL.
 - Cable comes in standard rolls of 1,000 feet.
- For line lengths up to 213 ft (65 m), use 12 AWG. For line lengths up to 328 ft (100 m), use 10 AWG. For Line lengths up to 383 ft (120 m), use 8 AWG.
- Serial communication wiring between Master and each ICC must be be ADC Wire Part No. 6801T0S, 18 AWG, Triad, shielded, 600 V cable or ADB SAFEGATE - approved equivalent.

PAR-56 Ordering Code

Shorting Device
Filters
Cord Set
Slip Fitter

44D1661/

Shorting Device

- 0 = Includes Shorting Device for 6.6 A Lamps*
- 1 = Includes Shorting Device for 20 A Lamps
- 2 = Without Shorting Device

Filters

- 1 = Clear (no filter)
- 2 = Green filter
- 3 = Yellow filter
- 4 = Red filter
- 5 = Blue filter (special order only)

Cord Set

- 1 = With L-823 Cord Set (used with shorting device)
- 2 = Without L-823 Cord Set
- 3 = With L-823 Cord Set (used without shorting device)

Slip Fitter

- 1 = Slip fitter for 2-in EMT, 1.5-in Tube & Tower
- 2 =
Slip fitter for 1.5-in Schedule 40 Pipe and Frangible Coupling (62B0064)

Spare Parts Trunk

Remote Connection - Hardwired
Flashers

44A6767/ 0 0

Remote Connection - Hardwired

- 0 = None
- 1 = +24 VDC
- 2 = +48 VDC
- 3 = 120 VAC

Flashers

- 0 = Elevated and In-pavement Flashers
- 1 = Elevated Flashers Only
- 2 = In-pavement Flashers Only

2.2 ALSF/MALSR Master Control Cabinet Parts List

The ALSF/MALSR MCC part number is 44A6850/XXXXXXXX.

Figure 3: Master Control Cabinet Parts and Diagram

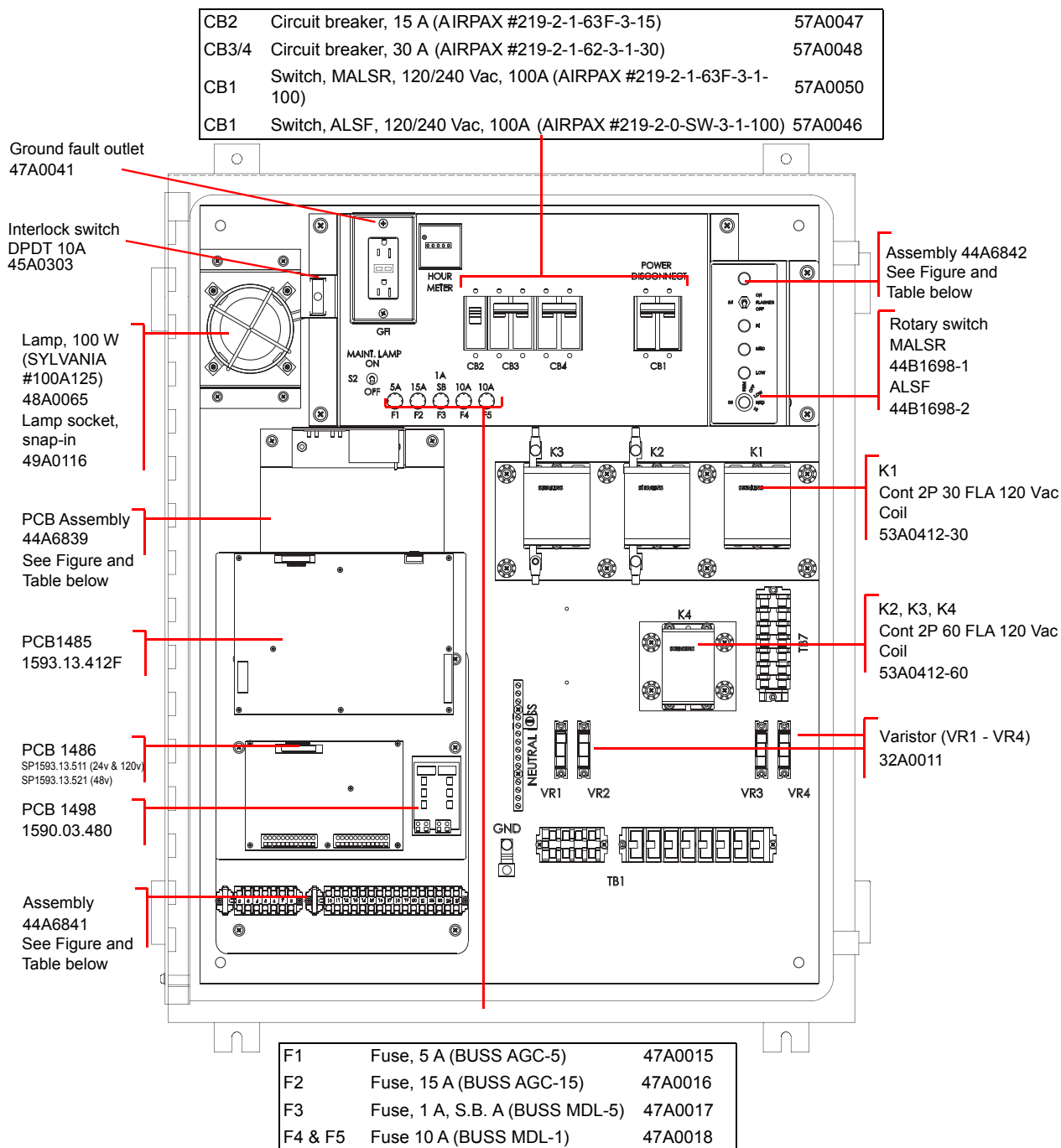


Figure 4: MCC Assembly 44A6839 Diagram

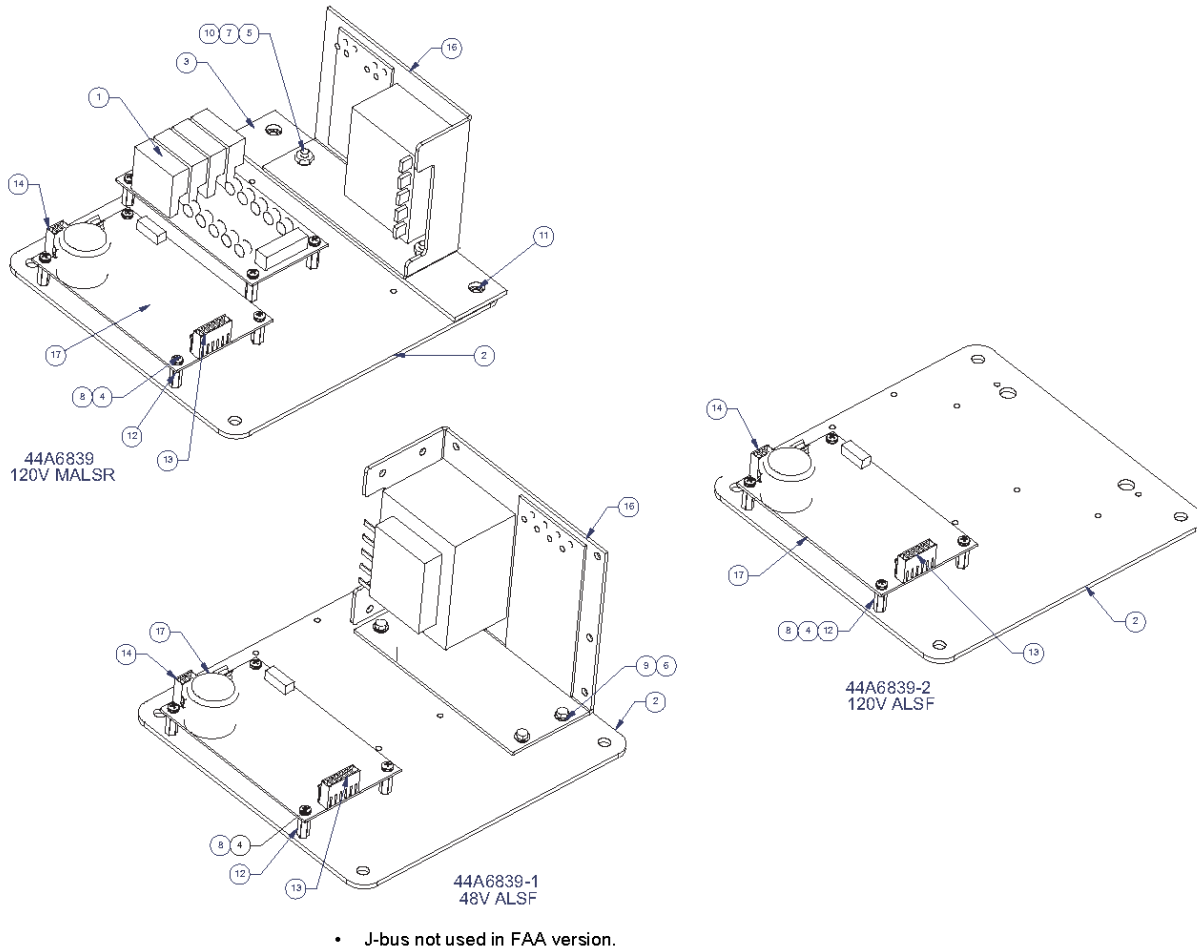


Table 1: MCC Assembly 44A6839 Parts

Item	Part Number	Description	Qty
1	SP1590.03.490	PCB1502: J-Bus interface (1590.03.490)	1
2	60A4008	Mounting Plate Power Supply MALSR	1
3	60A4009	XFMR Mounting Plate MALSR	1
4	64A0199-4	6-32 X 1/4 Pan Head Phillips	8
5	64A0177-8	10-32 X 1/2 Pan Head Phillips	2
6	64A0245/8	8-32 X 1/2 Hex Head Self Tap	2
7	65A0015-19	10-32 Hex Nut	4
8	66A0026/11	#6 Split Lockwasher	2
9	66A0026/15	#8 Split Lockwasher	4
10	66A0026/17	#10 Split Lockwasher	2
11	66A0039-6	#10 External Lockwasher	2
12	66A0129	Standoff Hex M-F 3/4 X 6-32	8
13	78A0775	Wire to PCB Multipole Connector, 6 Contacts, 3.96mm	1
14	78A0776	Wire to PCB Crimp Housing Connector, 3 Contacts, 3.96mm	1
15	72A0399	Crimp Pin	8
16	97A0001	Power Supply 48VDC 1.0 A	1
16	97A0010	Power Supply 24VDC 1.2 A	1
17	97A0028	LPT45 Switch Mode Power Supply	1

Figure 5: MCC Assembly 44A6842 and 44A6842/1 Diagram

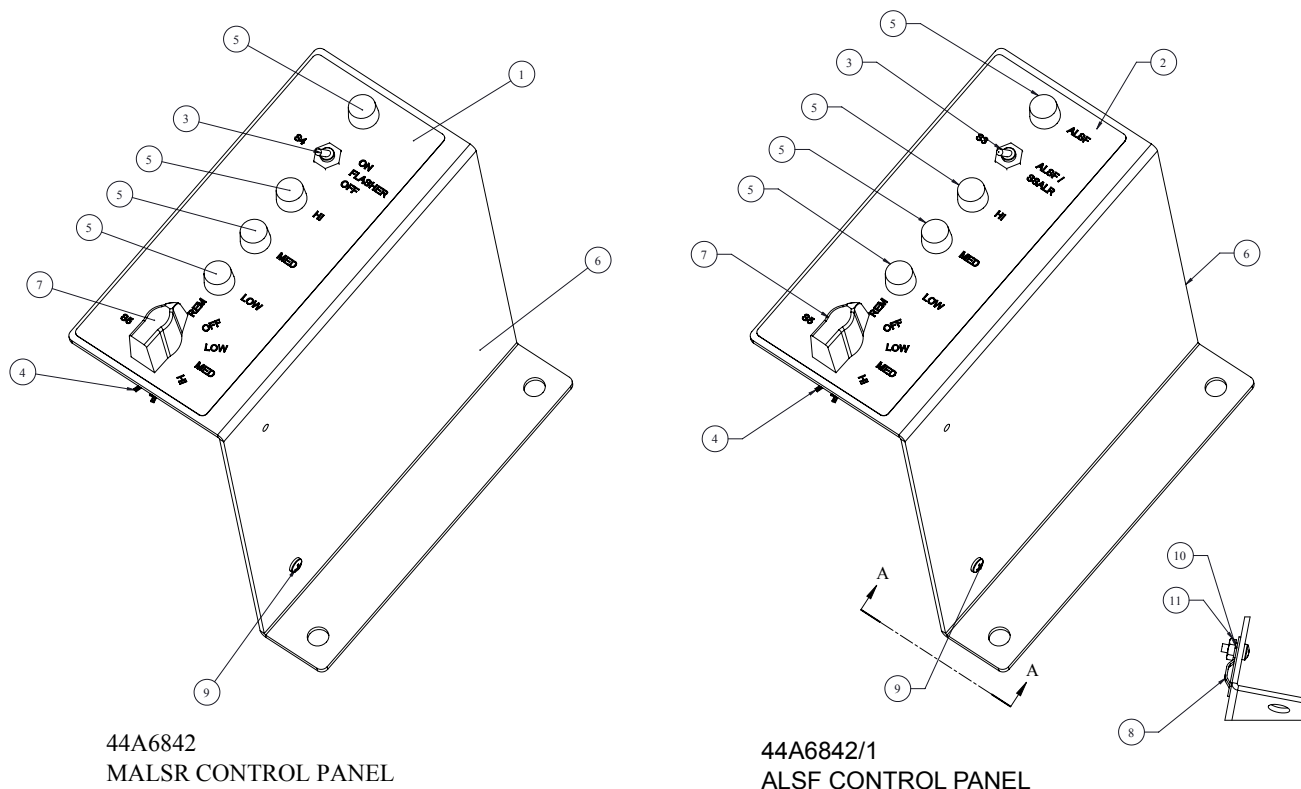
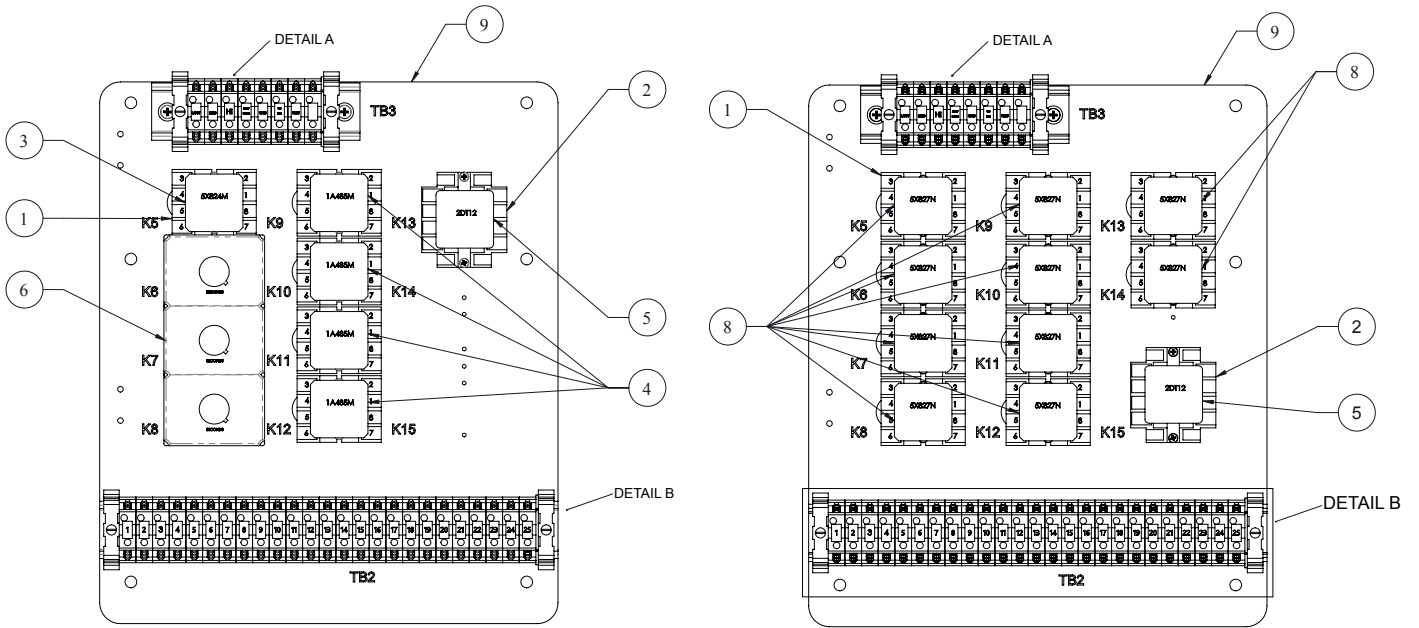


Table 2: MCC Assembly 44A6842 (MALSR) and 44A6842/1 (ALSF) Parts

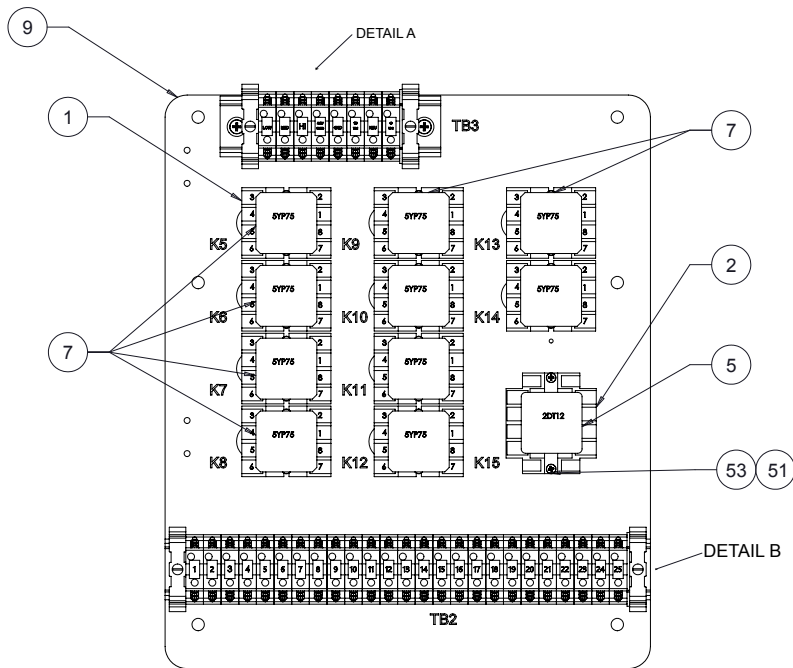
Item	Part Number	Description	44A6842 Qty	44A6842/1 Qty
1	42A0587	MALSR Switch/Light Panel Label	1	-
2	42A0609	ALSF Switch/Light Panel Label	-	1
3	45A0468	Switch Toggle SPDT, Solder Lug, 5 pcs	1	1
4	46A0092/6	Rotary Switch, SP, 6 Positions, 30°		1
5	61A0454	Knob, Phenolic, 1/4" Shaft, Pointer	1	1
6	48A0406	Neon Lamp, Neon Indicator, 110V, Amber	4	4
7	60A4010	Switch/Light Panel Bracket, MALSR	1	1
8	63A0255	Cable Tie Mount Metal	1	1
9	64A0198-6	6-32 X 3/8 Pan Head Phillips	1	1
10	66A0026-11	#6 Split Lockwasher	1	1
11	65A0015-11	#6-32 Hex Nut	1	1
12	72A0392	5-Conductor Terminal Block with Levers, Grey	1	1

Figure 6: MCC Relay Assembly 44A6841/x for ALSF/MALSR



**44A6841
120V ASSEMBLY
MALSR**

**44A6841/2
120V ASSEMBLY
ALSF**



**44A6841/1
48V ASSEMBLY
ALSF**

Figure 7: MCC Assembly 44A6841 TB2 and TB3 (Details A and B)

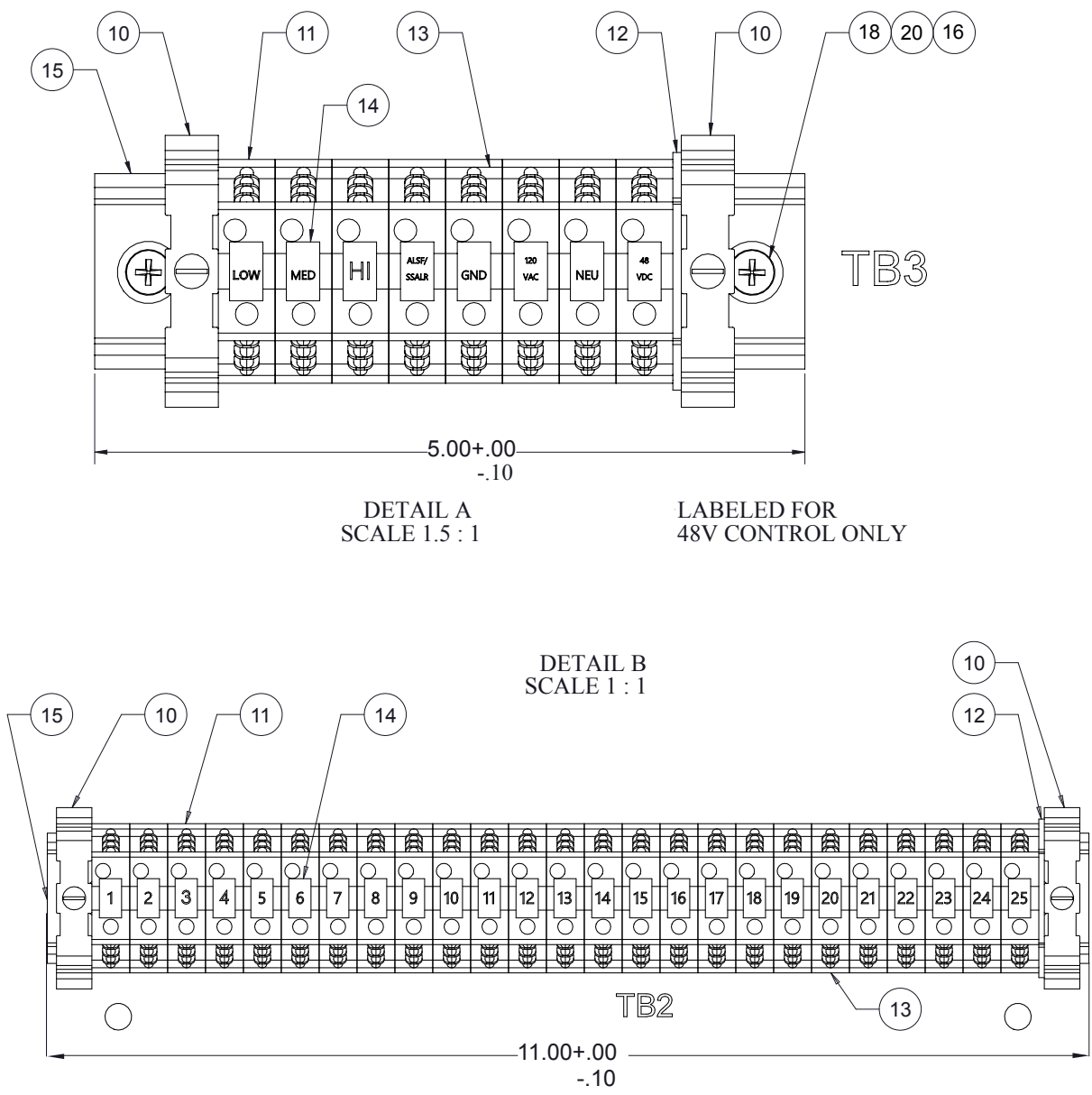


Table 3: MCC Assembly 44A6841 Parts

Item	Part Number	Description	44A6841 Qty	44A6841/1 Qty	44A6841/2 Qty
1	49A0361	Socket Relay 8 Pins	8	10	10
2	49A0363	Socket Relay 11 Pins	1	1	1
3	53A0436	120 Vac 50/60HZ 12 AMP SPDT	1	-	-
4	53A0437	24 Vdc 10 AMP DPDT	4	-	-
5	53A0442	Relay, 11 Pin, 3DPDT, 12A	1	1	1
6	53A0443	Relay Time Delay	3	-	-
7	53A0447	Relay DPDT, 48Vdc Coil, 8 Pins	-	10	-
8	53A0450	Relay DPDT 120Vac 50/60HZ 12AMP	-	-	10
9	60A4007	Relay Mounting Plate MALSR	1	1	1
10	72A0217/1	Terminal Block End Clamp	4	4	4
11	72A0225-3	Terminal Block Gray 10mm	31	31	31

Table 3: MCC Assembly 44A6841 Parts

Item	Part Number	Description	44A6841 Qty	44A6841/1 Qty	44A6841/2 Qty
12	72A0336	End Cover, for Phoenix Contact UK5 & UK10 Terminal Blocks	2	2	2
13	72A0390	Terminal Block, Universal Ground, Green/Yellow 10.2mm, 20-6 AWG	2	2	2
14	72A0429	Marker, Terminal Block, White (Card of 60)	33	33	33
15	RM0251	Mounting Rail 7.5mm U-Shape	2	2	2
16	66A0026/15	#8 Split Lockwasher	5	5	5
17	66A0026/7	#4 Split Lockwasher	18	22	22
18	64A0191/6	8-32 X 3/8 Pan Head Philips Screw	5	5	5
19	64A0169/16	4-40 X 1 Pan Head Philips Screw	18	22	22
20	66A0015/15	#8 Flatwasher	5	5	5

2.2.1 MALSR Master Control Cabinet Specific Parts List

See [Table 4](#). This subsection provides master control cabinet parts applicable only to the MALSR system. The MALSR master control cabinet part number is 44A6850/XXXXXXXX.

Table 4: MALSR MCC Specific Parts List

Item	Description	Part Number	Quantity
20	Circuit breaker, 70 A (AIRPAX #219-2-1-62F-3-1-70), MALSR	57A0049	1
21	Contact, 70 A, 120 Vac (TELEMECANIQUE #LC1-050BK), MALSR	53A0252	3

2.2.2 Steady Burning Elevated Light Assembly Parts List

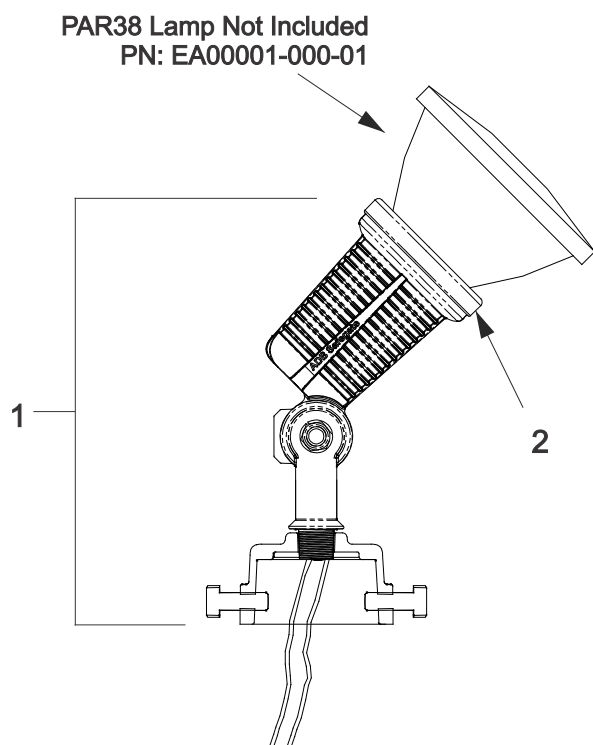
MALSR PAR-56 Lampholder Assembly Parts List

Refer to instruction manual 96A0119, Type FAP PAR-56 Approach Light for parts list and diagrams for the steady burning light assembly.

See [Figure 8](#). PAR-38 parts apply only to the MALSR system.

Item	Description	Part Number	Quantity
1	PAR38 Lamp Holder Assembly	AS00061-001-02	1
2	PAR38 Lamp Holder Silicone Seal (Spare Part)	SP00029-000-01	1 (qty 1 = 10pcs)

Figure 8: MALSR PAR-38 Lamp Holder Assembly Spare Parts



2.2.3 ALSF/MALSR In-Pavement Flasher Parts List

It is recommended to create a sufficiently large stock of spare parts to maintain the fittings. It will mainly consist of consumables like lamps, O-ring gaskets, etc. Other components that may need replacement, such as prisms, prism gaskets, terminal blocks and hardware even as sub-assemblies should be stocked in smaller quantities. It is recommended to store at least one complete fitting, 44A7445.

The table below gives for each screw used in the 44A7445 12", the reference to the type of screw, the tool to use, and the type of "Loctite" when needed:

Table 5: ALSF/MALSR In-Pavement Flasher Parts Requirements

Screw	Tool	Loctite	Torque
A1/A2	Socket hex, 3/8", J.9/16LA	Loctite 270 7870.05.110	190 in-lb (21 Nm)
B5 - screw TFC M5X10 DIN 965-Z INOX A2	Pozidriv2, RD.2	Loctite 270 7870.05.110	31 in-lb (3.5 Nm)
C2 - Screw TFC M5X10 DIN 965-Z INOX A2	Pozidriv2, RD.2	No	31 in-lb (3.5 Nm)
C4 - Screw TFC M4X10 DIN 965-Z INOX A2	Pozidriv2, RD.2	No	30 in-lb (3.3 Nm)
D7 - screw TFC M5X10 DIN 965-Z INOX A2	Pozidriv2, RD.2	No	31 in-lb (3.5 Nm)
Screws delivered for installation of adapter ring on deep base	Socket hex, 3/8", J.9/16LA	No	190 in-lb (21 Nm)

In the table below you will find the commercially available spare parts and main assemblies of the 44A7445 light fitting (the part numbers refer to [Figure 9](#))

Table 6: ALSF/MALSR In-Pavement Flasher Parts List

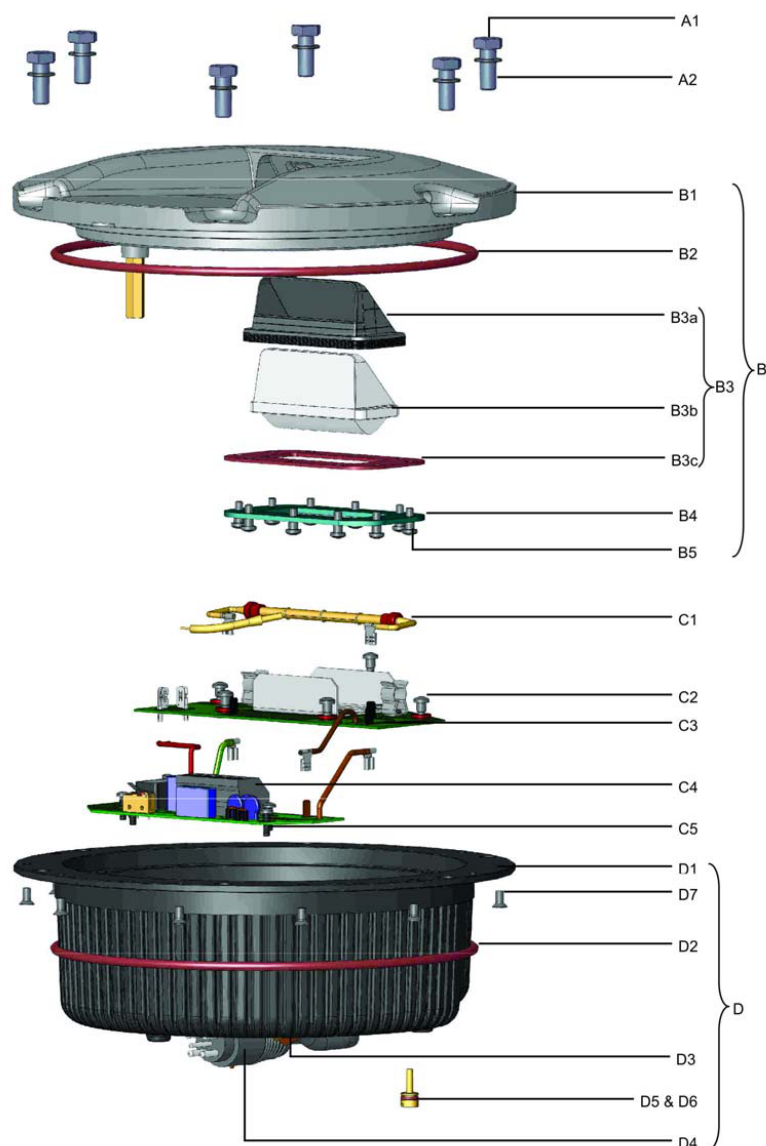
Ref.	ADB part number	Description	Qty used in fitting	Order quantity (Per xx)
B	1440.02.300	Cover assy, including:	1	1
B1	4072.02.010	Machined cover	1	1
B2	MS00001-376-01	F-range 12 O-ring gasket	1	1
B3	4072.06.720	Prism kit consisting of	1	1
B3a	4072.02.030	Sleeve gasket for prism	1	1
B3b	4072.01.520	Prism	1	1
B3c	4072.02.060	Flat seal for Prism	1	1
B4	4072.02.070	Prism keeper plate	1	1
B5	64A0936-13	Pan head screw M5 x 13 - Stainless Steel -DIN 7985-Z	10	100
C1	2990.82.674	Flashing lamp 60J - 400V (see note 1.)	1	1
C2	64A0936-13	Pan head screw M5 x 13 - Stainless Steel - DIN 7985-Z	5	100
C3	4072.20.810	Trigger PCB (see Note 2.)	1	1
C4	4072.02.181	Lamp PCB (see Note 2.) - does not include the lamp	1	1
C5	64A0964-10	Screw THRD M4X10 Stainless Steel	5	100
D	1440.02.310	FFL inner inner cover assembly including :	1	1
D1	4072.02.010	Machined FFL inner cover	1	1
D2	7080.90.650	O-ring seal between top cover and shallow base, for F- Range 12"	1	10
D3	77A0258	PG16 cable entry IP54 cable diameter 10 to 14 mm	1	1
D4	4072.03.980	5-pole plug assembly	1	1
D5	4072.20.981	Pressure release screw	1	10
D6	63B0267-011	O-ring for the pressure release screw	1	100
D7	64A0925-10	Screw TFC M5 X 10 Stainless Steel - DIN 965-Z	10	100



Note

Former version of the lamp, with fast-on connector on the trigger wire: 2990.82.671.
Order one Trigger PCB and one Lamp PCB to replace former FFL PCB ref. 4072.16.690.

Figure 9: Exploded Inset Light



2.3 Spare Parts

Refer below for optional parts.

Table 7: Parts: In-Pavement Flasher

Item	Description	Part Number	Quantity
NS	6-core cable ¹	6104.90.206	AR
NS	Connector kit, in-pavement flasher, male plug	70A0618	1
NS	Connector kit, in-pavement flasher, female receptacle	70A0619	1

NS: Not shown

AR: As required

¹One 6-core cable is needed with each in-pavement flasher. Please specify total length of cable required (in feet) when ordering.

Table 8: Parts: PAR-56 or PAR-38 elevated lights

Item	Description	Part Number	Quantity
NS	Adapter sleeve ¹	4762	1
NS	Flasher tester	44D1686-1	1
NS	EMT Frangible coupling	44B0180	AR
NS	Frangible coupling (Type F2)	62B0064	AR
NS	Lightning arrester	47A0019	2
NS	Power transformer, 15 kVA for MALSR only	44D1685-1	1
NS	Flasher Assembly with PCB, for Elevated Flasher 1UE9C2Y0X001	SP.011868	AR

NS: Not Shown

AR: As required

Table 9: Optional Parts

Reference	Description	Code number	Order qty
	Mounting system (Mounting flange, tube 60mm OD x 800mm length, flexible conduit and nipple connector for flexible conduit)	1440.20.200	1
	Three-phase TN and TT earthing systems over-voltage protection. Complete block assembly with supply phase and neutral cartridges (VAL-MS 230/3+1FM). Included with FCU3 with over-voltage option.	6134.03.040	1
	Single-phase TN, TT, and IT earthing systems over-voltage protection cartridge for supply phase and neutral (VAL-MS 230 IT ST). Included with FCU1 with over-voltage protection option.	6134.03.080 ²	1
	Temperature Sensor	1440.21.000	1

¹Used only on aluminum-tower cross arms to mount PAR-56 or PAR-38 lights, or on fiberglass tower for PAR-38 lampholders.

²For three-phase IT earthing systems over-voltage protection, replace all supply and neutral cartridges with 6134.03.080 (VAL-MS 230 IT ST).

Appendix A: SUPPORT

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ADB SAFEGATE Americas Technical Service & Support (International): **+1-614-861-1304**. For technical service press 3 and for sales support press 4.

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Gate: **gateservice.us@adbsafegate.com**

We look forward to working with you!

Before You Call

When you have an airfield lighting or control system problem, prior to calling, please ensure the following:

- Review the product's manual and troubleshooting guide.
- Be located with the product ready to troubleshoot.
- Have all necessary information available: airport code/company name, customer id number, contact phone number/email address, product/part number.
- Have all necessary tools that may be needed at hand.

When calling about an issue with Safedock A-VDGS, we can serve you better if you collect the following information before you call:

- Relevant information regarding the issue you are calling about, such as gate number, flight number, aircraft type and time of the event.
- What, if any, actions have been taken to resolve the issue prior to the call.
- If available, provide a CCTV recording of the incident to aid in aligning the information from the Safedock log file.

For more information, see www.adbsafegate.com, contact ADB SAFEGATE Support via email at **support@adbsafegate.com**.



A.1 ADB SAFEGATE Website

The ADB SAFEGATE website, www.adbsafegate.com, offers information regarding our airport solutions, products, company, news, links, downloads, references, contacts and more.

A.2 Recycling

A.2.1 Local Authority Recycling

The disposal of ADB SAFEGATE products is to be made at an applicable collection point for the recycling of electrical and electronic equipment. The correct disposal of equipment prevents any potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling. The recycling of materials helps to conserve natural resources. For more detailed information about recycling of products, contact your local authority city office.

A.2.2 ADB SAFEGATE Recycling

ADB SAFEGATE is fully committed to environmentally-conscious manufacturing with strict monitoring of our own processes as well as supplier components and sub-contractor operations. ADB SAFEGATE offers a recycling program for our products to all customers worldwide, whether or not the products were sold within the European Union (EU).

ADB SAFEGATE products and/or specific electrical and electronic component parts which are fully removed/separated from any customer equipment and returned will be accepted for our recycling program.

All items returned must be clearly labeled as follows:

- For Restriction of Hazardous Substances (RoHS)/Waste Electrical and Electronic Equipment (WEEE) Recycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

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