400 V: MALSR and ALSF

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

Spare Parts

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No. of Concession, Name

SP_2091, Rev. C, 2024/04/15





A.0 Disclaimer / Standard Warranty

CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The European directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and C22.2 No.180:13 (R2018) regulations. The CSA directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

All Products Guarantee

ADB SAFEGATE will correct by repair or replacement per the applicable guarantee below, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB SAFEGATE written notice of such defects after delivery of the goods to Buyer. Refer to the Safety section for more information on Material Handling Precautions and Storage precautions that must be followed.

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Products manufactured by ADB SAFEGATE are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of two years from the date of ex-works delivery, and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

Note

See your applicable sales agreement for a complete warranty description. Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

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ADB SAFEGATE L858 Airfield Guidance Signs are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation, per FAA AC 150/5345-44 (applicable edition).

ADB SAFEGATE LED products (with the exception of obstruction lighting) are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition). These FAA certified constant current (series) powered LED products must be installed, interfaced and powered with and through products certified under the FAA Airfield Lighting Equipment Program (ALECP) to be included in this 4 (four) year warranty. This includes, but is not limited to, interface with products such as Base Cans, Isolation Transformers, Connectors, Wiring, and Constant Current Regulators.

Note

See your sales order contract for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

Liability



WARNING

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

ADB SAFEGATE cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses, includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB SAFEGATE replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB SAFEGATE equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

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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 LV ALSF/MALSR

Low-Voltage ALSF High-Intensity and MALSR Medium-Intensity Approach Lighting Equipment with Elevated and In-pavement Sequenced Flashers 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. Flasher operating voltage is +400V DC instead of +2000V DC used in traditional systems, improving safety. This also allows standard 600V cable to be used between the flasher and Individual Control Cabinet (ICC).

This eliminates the need for high voltage interconnecting cable. MALSR sequenced flashers can be easily expanded to ALSF at a later date.

1.2 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	

ALSF Uses

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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 (3048 m) maximum



2.0 Parts

400V ALSF / MALSR

MCC Ordering Code 44A6763 - X X X X X X X 0 X
System1 = ALSF per FAA-E-2628 or ICAO2 = MALSR per FAA-E-23253 = MALSR per FAA-E-29804 = UDAL15 = ALSF per 2628 Stainless Steel
Flashers I I XX = Maximum number of flashers I I Examples: 08 = 8 flashers I I 08 = 8 flashers I I I 21 = 21 flashers I I I 30 = 30 flashers (ICAO applications) I I I
Monitoring ² 1 = Without monitoring 2 = With monitoring
Input Voltage 1 = 120/240 VAC (standard)
Surge Protection 2 = Monitored surge protection ³
0
Remote Connection – Hardwired 0 = None 1 = +24 VDC 2 = +48 VDC

2 = +48 VDC 3 = 120 VAC

Notes

- 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.

2.1 ALSF/MALSR Master Control Cabinet Parts List

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

Figure 1: Master Control Cabinet Parts and Diagram

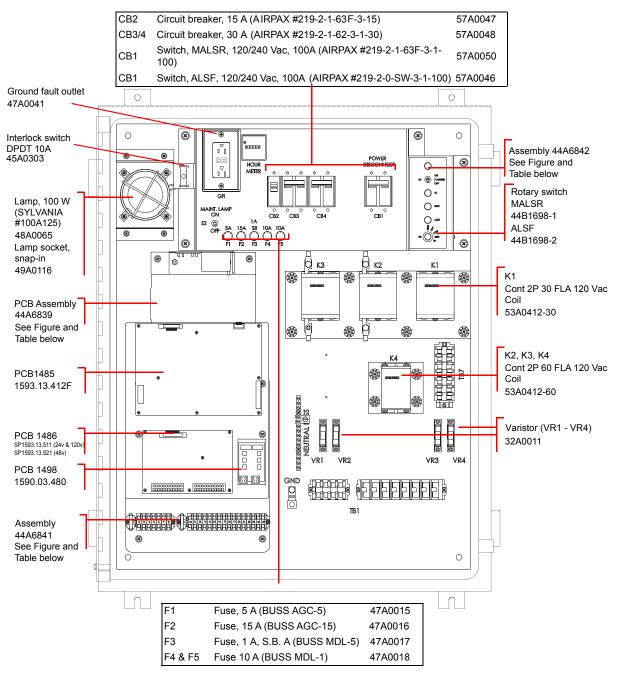


Table 1: MCC Assembly 44A6839 Parts

Item	Part Number	Description	Qty
1	1590.03.490	Master J-Bus Board, PCB 1502	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

4



Item	Part Number	Description	Qty
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

able 1: MCC Assembly 44A6839 Parts (Continued)

Figure 2: MCC Assembly 44A6839 Diagram

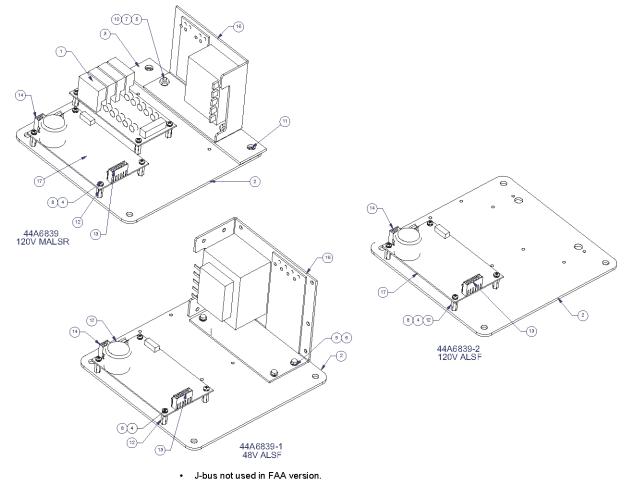


Table 2: MCC Assembly 44A6842 (MALSR) and 44A6842/1 (ALSF) Parts

ITEM	PART NUMBER	DESCRIPTION	QTY
1	42A0587	MALSR Switch / Light Panel Label	1
1	42A0609	ALSF Switch / Light Panel Label	1
2	45A0468	Switch Toggle SPDT SLDR LUG 5PCS	1
3	46A0092-6	Rotary SW 30DEG SP 6POS.	1
3	61A0454	Knob, Phenolic, 1/4" Shaft, Pointer	1
4	48A0406	Neon Lamp, Neon IND 110V AMB	4
5	60A4010	Switch / Light Panel BRKT MALSR	1
6	63A0255	Cable Tie Mount Metal	1
6	64A0198-6	6-32 X 3/8 Pan Head Phillips	1
6	66A0026-11	#6 Split Lockwasher	1
6	65A0015-11	#6-32 HX NUT	1

Figure 3: MCC Assembly 44A6842 Diagram (MALSR Light Panel Label Shown)

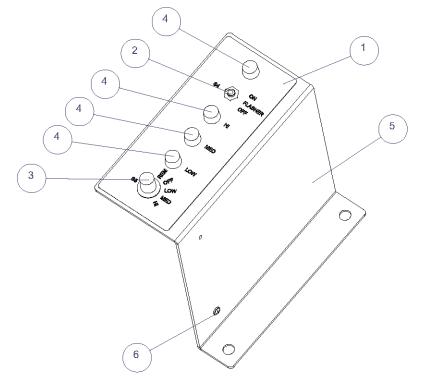


Table 3: MCC Assembly 44A6841 Parts

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	49A0361	Socket Relay 8 Pins	10
2	49A0363	Socket Relay 11 Pins	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
6	53A0443	Relay Time Delay	3



ITEM	PART NUMBER	DESCRIPTION	QTY.
7	53A0447	Relay DPDT, 48VDC Coil, 8 Pins	
8	53A0450	Relay DPDT 120VAC 50/60HZ 12AMP	10
9	60A4007	Relay Mounting Plate MALSR	1
10	64A0169-16	4-40 X 1" Pan Head Phillips	22
11	64A0169-6	#4-40 X 3/8 Pan Head Phillips	6
12	66A0015-7	#4 Flatwasher SS	6
13	66A0026-7	#4 Split Lockwasher	24
14	72A0066	Term BLK 22-10AWG 600V 50A,Use W/72A0067	33
15	72A0067	Term BLK End, Flat Base, Mates W/72A0066	3

Table 3: MCC Assembly 44A6841 Parts (Continued)

Figure 4: MCC Assembly 44A6841 ALSF/MALSR 120V Diagrams

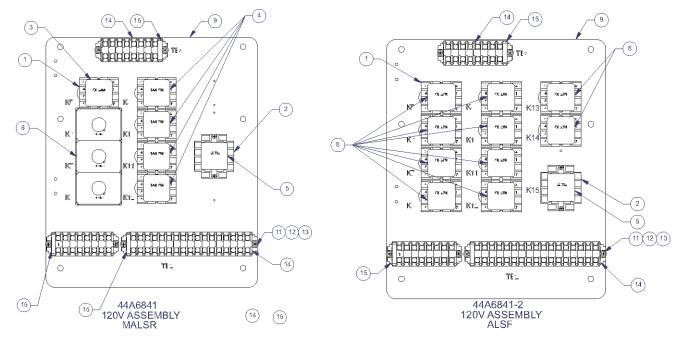
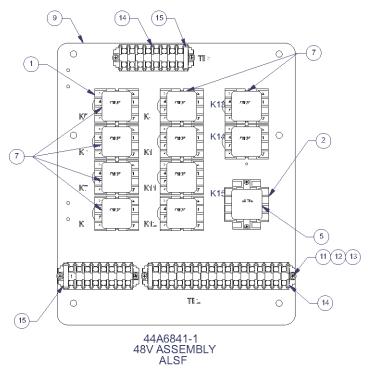


Figure 5: MCC Assembly 44A6841 ALSF 48V Diagram



2.1.1 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	Note
20	Circuit breaker, 70 A (AIRPAX #219-2-1-62F-3-1-70), MALSR	57A0049	1	
21	Contactor, 70 A, 120 Vac (TELEMECANIQUE #LC1-050BK), MALSR	53A0252	3	

2.1.2 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.

MALSR PAR-38 Lamp-holder Assembly Parts List

PAR-38 parts apply only to the MALSR system.

Table 5: MALSR PAR-38 Lamp-holder Assembly Parts List

Item	Description	Part Number	Quantity	Note
1	Lamp (150W PAR-38)	48A0447	1	
2	PAR-38 lamp-holder, PAR/SP	44A0094	1	
3	Slip-fitter	62B0528-2	1	



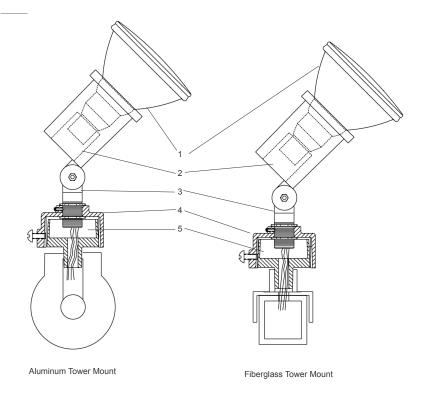
Table 5: MALSR PAR-38 Lamp-holder Assembly Parts List (Continued)

Item	Description	Part Number	Quantity	Note
4	PAR-38 tower mounting adapter (FAC)	62B0537	1	В
5	Lamp-holder assembly	44C1683	1	А

1. NOTE A: The lamp-holder assembly includes the PAR-38 lamp-holder (Item 2) and the slip fitter (Item 3). The lamp (item 1) is a separate line item and is not supplied with the lamp-holder assembly (item 5).

2. NOTE B: The mounting adapter (FAC) (item 4) is used in conjunction with the slip-fitter (item 3), when mounting the PAR-38 holder to a fiber glass or aluminum tower cross arms hub.

Figure 6: PAR-38 Lampholder



2.1.3 MALSR/ALSF 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 6: MALSR/ALSF 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)

Table 6: MALSR/ALSF In-pavement Flasher Parts Requirements (Continued)

Screw	Tool	Loctite	Torque
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 7)

Table 7: MALSR/ALSF In-pavement Flasher Parts List

Ref.	ADB part number	Description	Qty used in fitting	Order quantity (Per xx)
В	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	6126.01.330	PG16 cable entry IP54 cable diameter 10.5 to 16 mm	1	10
D4	4072.03.980	5-pole plug assembly	1	1
D5	4072.20.981	Pressure release screw	1	10



Table 7: MALSR/ALSF In-pavement Flasher Parts List (Continued)

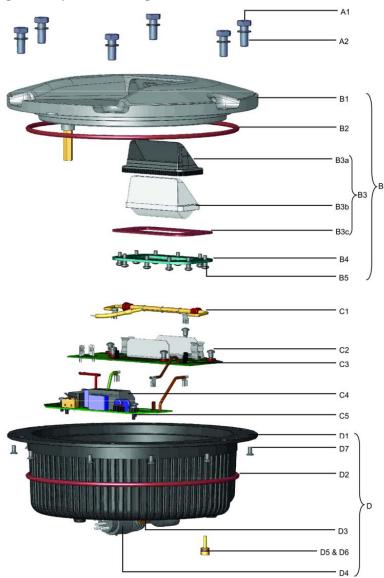
Ref.	ADB part number	Description	Qty used in fitting	Order quantity (Per xx)
D6	63B0267-011	O-ring for the pressure release screw	1	100
D7	64A0925-10	Screw TFC M5 X 10 Stainless Steel - DIN 965-Z	10	100

Note

o I

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.





2.2 Spare Parts

Refer below for optional parts.

Table 8: Parts: In-pavement Flasher

Item	Description	Part Number	Quantity	Note
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	

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

NS: Not shown

AR: As required

Table 9: Parts: PAR-56 or PAR-38 elevated lights

Item	Description	Part Number	Quantity	Note
NS	Adapter sleeve ¹	62B0537	1	
NS	Flasher tester	44D1686-1	1	
NS	EMT Frangible coupling	44B0180	AR	
NS	Frangible coupling (Type F2)	62B0064	AR	
NS	Lightning arrestor	47A0019	2	
NS	Power transformer, 15 kVA for MALSR only	44D1685-1	1	
NS	Flasher Assembly with PCB, for Elevated Flasher 1UE9C2Y0X001	4071.99.540	AR	

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

NS: Not Shown

AR: As required

Table 10: Parts: Optional

Reference	Description	Code number	Order qty
	Over-voltage protection cartridge for supply phase VAL-MS230ST	6134.03.050	1
	Over-voltage protection cartridge for supply neutral F-MS 12T	6134.03.060	1
	Temperature Sensor	1440.21.000	1



Appendix A: SUPPORT

Our experienced engineers are available for support and service at all times, 24 hour/7 days a week. They are part of a dynamic organization making sure the entire ADB SAFEGATE is committed to minimal disturbance for airport operations.

ADB SAFEGATE Support

Live Technical Support – Americas

If at any time you have a question or concern about your product, just contact ADB SAFEGATE's technical service department. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists are available 24 hours a day, seven days a week to provide assistance over the phone.

ADB SAFEGATE Americas Technical Service & Support (US & Canada): +1-800-545-4157 ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304 During regular business hours, you can also Chat with a Service Technician. We look forward to working with you!

Before You Call

When you have an airfield lighting or system control system problem, it is our goal to support airfield maintenance staff as quickly as possible. To support this effort, 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 a True RMS meter available and any other necessary tools.



Note

For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or Europe: +32 2 722 17 11 Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support. China: +86 (10) 8476 0106 Middle East and Africa: +971 4 452 7575

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 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 ROHS/WEEE Recycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

ADB SAFEGATE will continue to monitor and update according for any future requirements for *EU directives* as and when *EU member states* implement new *regulations* and or *amendments*. It is our aim to maintain our *compliance plan* and assist our customers.



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