L-884 Land and Hold Short Operations (LAHSO) Power Control Unit

Spare Parts

SP_2007, Rev. A, 2020/09/01

ADB SAFEGATE

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 FAA Airfield regulations. The FAA 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 above, 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.

ADB SAFEGATE reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. ADB SAFEGATE furthers reserves the right to require the return of such goods to establish any claim.

ADB SAFEGATE's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished.

ADB SAFEGATE's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by ADB SAFEGATE, warranty is limited to that extended by the original manufacturer. This is ADB SAFEGATE's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties being expressly disclaimed.

Standard Products Guarantee

Products of ADB SAFEGATE manufacture 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 sales order contract for a complete warranty description.

FAA Certified product installed in the United States and purchased or funded with monies through the Airport Improvement Program (AIP) installations guarantee

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 L858(L) Airfield Guidance Signs 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).

ADB SAFEGATE LED light fixtures (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). .

Note

See your sales order contract for a complete warranty description.

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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This manual could contain technical inaccuracies or typographical errors. ADB SAFEGATE BV reserves the right to revise this manual from time to time in the contents thereof without obligation of ADB SAFEGATE BV to notify any person of such revision or change. Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and ADB SAFEGATE BV 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.

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1.0 L-884 / LAHSO PCU

Land and Hold Short Operations (LAHSO) include landing and holding short of an intersecting runway, taxiway, predetermined runway point and/or an approach/departure flight path. A LAHSO system is controlled by the LAHSO PCU, this consists of a row of six or seven in-pavement unidirectional pulsing white lights installed across the runway at the hold-short point.

2.0 Product Introduction

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2.1 Land and Hold Short Operations Power and Control Unit

Uses

A Land and Hold Short Operations (LAHSO) system is used to increase airport capacity. A LAHSO system, controlled by an L-884 Power and Control Unit (PCU), consists of a row of six or seven in-pavement unidirectional pulsing white lights installed across the runway at the hold-short point.

For new installations, six lights are used. Seven lights are used if five lights were installed according to AC 150/5345-54. Lights pulse simultaneously at a rate of 1.72 seconds ON, 0.46 seconds OFF. The fixture may be either clear L-850A or L-850F (incandescent fixtures only). The L-850F has two lamps, one primary and one backup. If two or more lights in the primary LAHSO bar have failed, the PCU switches from the primary to the backup lamp bar. See data sheet 2001 (L-850A) or data sheet 2037 (L-850F) for more information.

PCU Specifications

Input Voltage	Outdoor unit: 240 VAC, 60 Hz Indoor unit: 120 VAC, 208 VAC, 240 VAC; 60 Hz
PCU maximum load	1,600 VA
Distance	LAHSO lights may be up to 10,000 ft (3 km) away (20,000 ft/6 km round trip) using AWG 8, L-824 wire
Indoor enclosure	- NEMA 1 - Style I, -40 °F to +131 °F (40 °C to +55 °C) - 63 lb (2 8.58 kg) - 24 × 8.6 3 × 24 in (61 × 22 × 61 cm)
Outdoor enclosure	- NEMA 4 - Style II, -67 °F to +158 °F (-55 °C to +70 °C) - 72 lb (3 2.66 kg) - 24 × 8 × 24 in (61 × 20.3 × 61 cm)

Note

Outdoor PCU must be mounted outside airfield safety area. Mounting an outdoor PCU in the vicinity of the LAHSO fixtures is the preferred method of installation.

Theory of Operation

LAHSO lights are flashing in-pavement white lights designed to pulse simultaneously so that they are distinguishable from the various runway lights. The lights pulse from one of the three steps (6.6 A, 5.2 A, or 4.1 A) for 1.72 seconds and then to 1 A for 0.46 seconds. The pulsing lights provide an effective visual cue for the pilot from short final through the landing rollout, indicating the point beyond which the landing aircraft is not authorized to proceed. Either six or seven unidirectional clear L-850A or L-850F lights (without film disc cutouts) are used.

The L-884 PCU consists of a microprocessor-controlled circuit that regulates the output current in a manner similar to an L-828 constant current regulator.

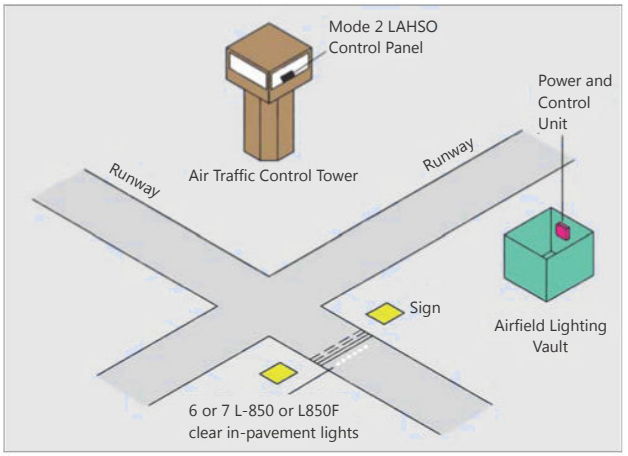
ON/OFF control is activated from the Air Traffic Control Tower or by a local control switch on the PCU (See Figure 1). If the PCU local control switch is in the Local position (OFF or B3/B4/B5), then the Field/Tower PCU contact will open, activating a “Field Control” light on the LAHSO panel. When the PCU local control switch is in the Remote position, the Field/Tower PCU contact will close, activating a “Tower Control” light on the LAHSO panel.

The PCU photocell defines whether day or night conditions exist. During daytime, the intensity is always set to B5 (6.6 A) even if the runway edge lights are off. At nighttime, the PCU uses two current sensing relays (mounted separately) to monitor the intensity of the corresponding HIRL (5-step) or MIRL (3-step) runway edge lighting circuit and to automatically set the intensity step. Alternately, an L-830 transformer can be used to monitor the runway edge circuit.

A fault alarm is generated if one of the following conditions occurs:

- Failure of the PCU electronics due to failure of the DC power supply (Time Delay = 0 sec)
- Loss of input power to PCU (Time Delay = 0 sec)
- Failure to pulse the lights (Time Delay = 5 sec)
- Two or more lights in a bar have failed (Time Delay = 5 sec)

Figure 1: Figure 1



The PCU has the following fail-safe modes:

- If the photocell fails, intensity reverts to the highest step
- If PCU DC power supply fails (using either L-850A or L-850F lamps), a Fault alarm is generated and LAHSO lamps go OFF
- If L-850A fixtures are used or if the LAHSO PCU has switched to the backup L-850F lamps and if the number of lamps out for Fault alarm occurs, then a Fault alarm is generated and the remaining LAHSO lamps continue to pulse

Note
The PCU is not designed for use with an L-847 Circuit Selector Switch.

3.0 LAHSO Parts

The parts section is a separate file in the book so that it can be used in the Parts manual.

Ordering Code[1,2]

44A601X - X X

Location
1 = Indoor LAHSO[3]
2 = Outdoor LAHSO

Input Voltage
1 = 240 V
2 = 208 V (indoor only)
3 = 120 V (indoor only)

Contact Relay
0 = Without dry contact relay (standard)
1 = With dry contact relay (optional)[4]

Notes

1. Current sensing relays are mounted separately. Current sensing relays are connected to the runway edge circuit associated with the LAHSO fixture.
2. To ensure proper lamp-out monitoring, L-850A and L-850F fixtures must not have film disc cutouts
3. Photocells are automatically mounted on the enclosure but can be removed and mounted separately
4. Custom monitoring output points when used with non-ADB SAFEGATE control systems. Contact the ADB SAFEGATE Sales Department for details.

Figure 2: Outdoor LAHSO PCU

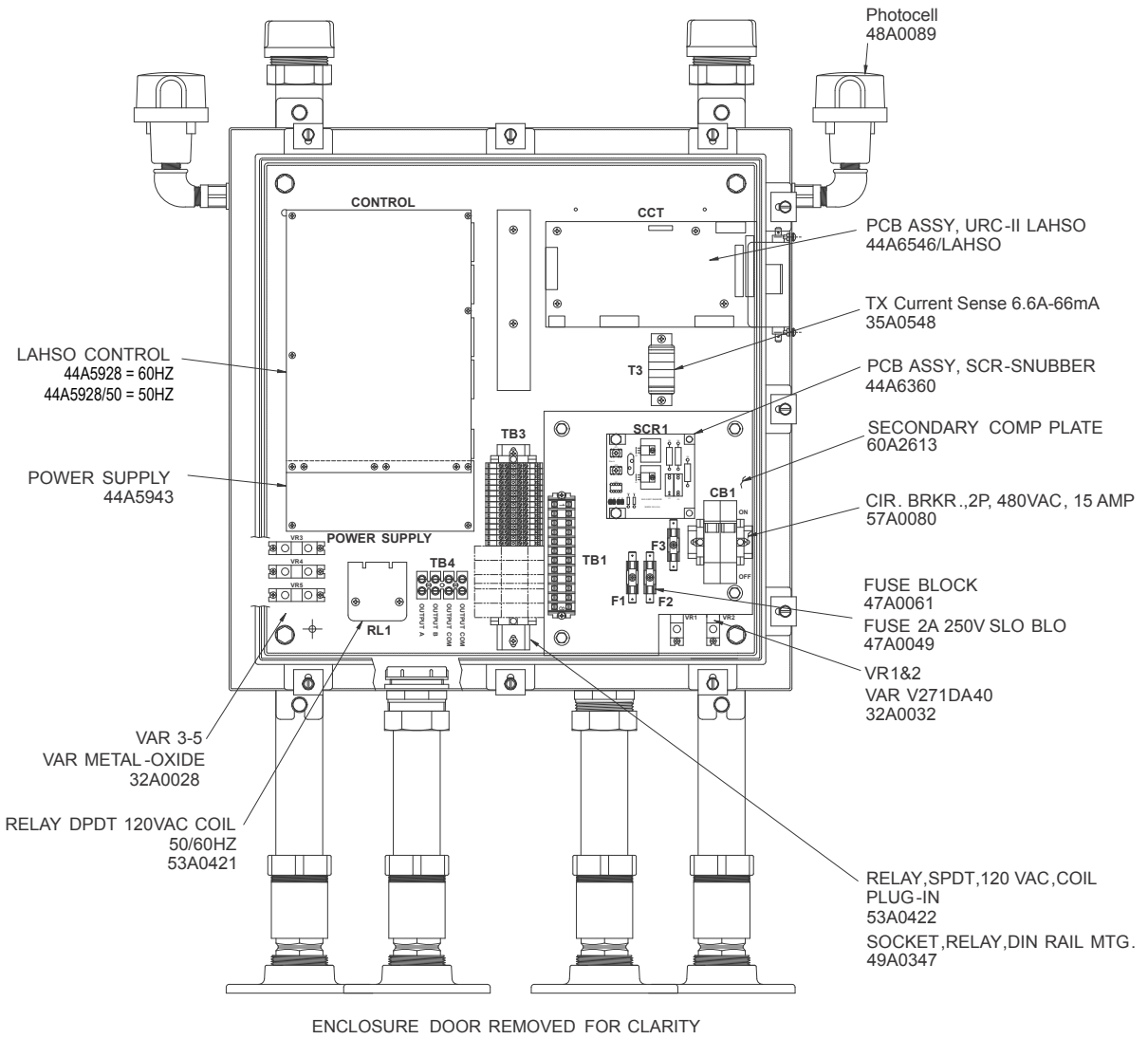


Figure 3: Components under Secondary Component Plate

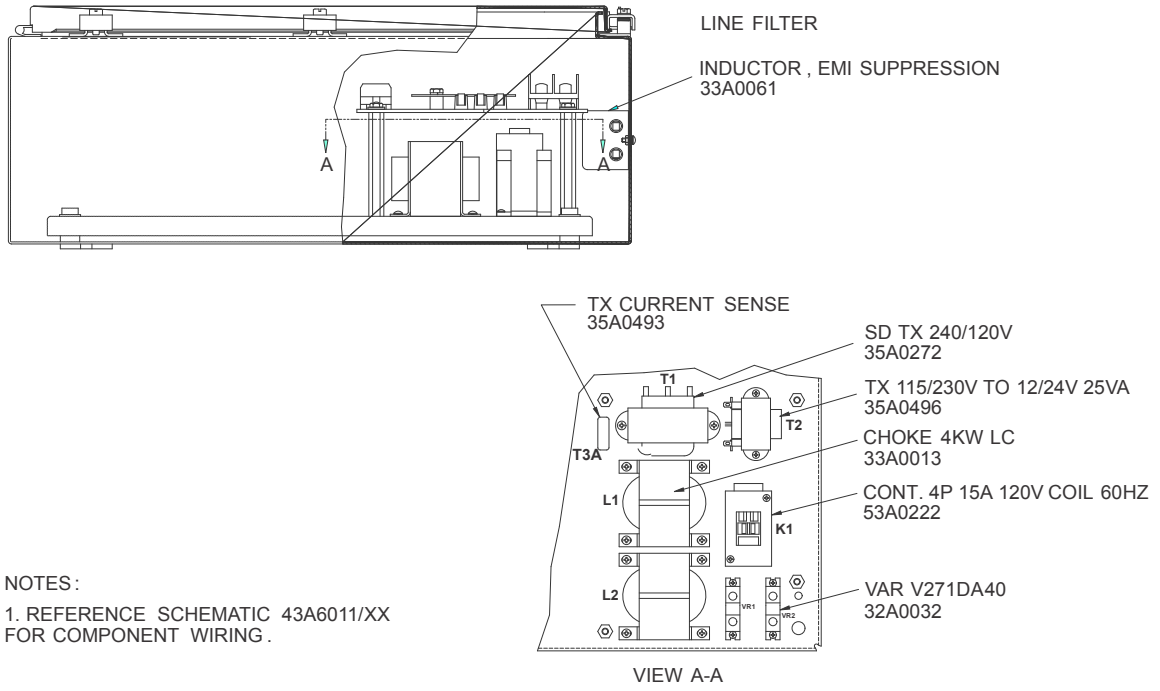
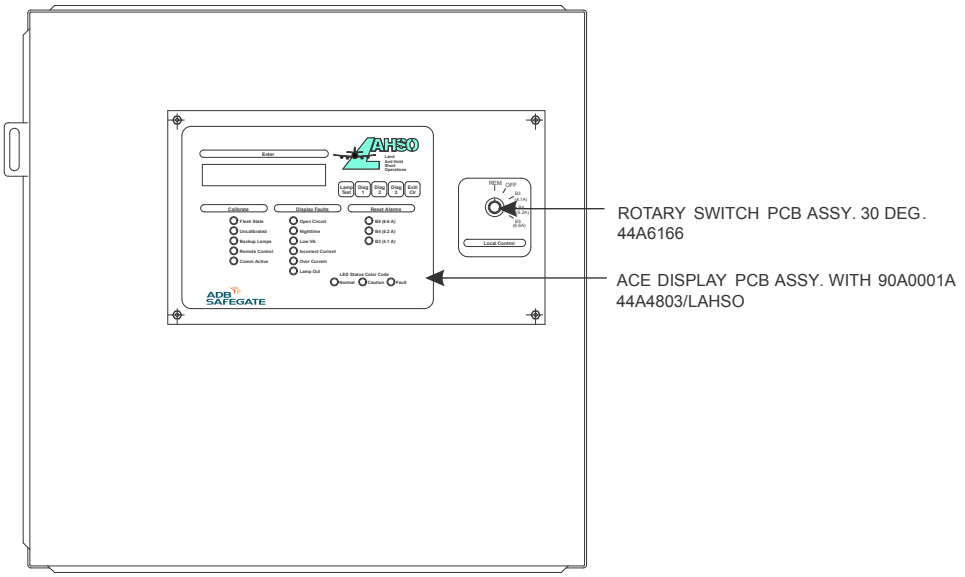


Figure 4: ACE Panel



3.1 Spare Parts

Create a sufficiently large stock of spare parts to maintain the APS unit and the fixtures in the field. Consider acquiring approximately 10% spare final assemblies (with a minimum quantity of 1) for the total amount of equipment in the field. This allows for repairs to be made in the shop. Components that are more likely to need replacement, such as prisms, prism gaskets and PCB sub-assemblies should be stocked in smaller quantities. For the APS unit, it is recommended to have a least one entire LAHSO unit as a spare, or for larger installations, at least 10% of the total LAHSO units installed.

See individual product manuals for recommended fixture spares.

For the LAHSO unit, see the table below for spares.

- Consider acquiring 10% spares for critical components noted as (A) in the table below. If only a small number of LAHSO units are installed, consider acquiring at least 1 of each of the components noted as (A) below.
- Also consider acquiring 1% spares for parts noted as (B) in the table below. If it is important to have a robust level of spare parts on hand, and only a small number of LAHSO units are installed, consider acquiring 1 of each of the components noted as (B) below.

Table 1: LAHSO Unit Spare Parts

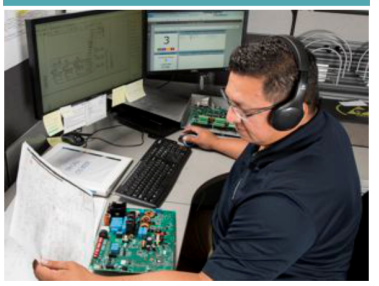
Part Number	Description	Location	Notes	Spares
44A6360	SCR/SNUBBER PCB assembly	SCR1		B
47A0049	Fuse, 2A, 250 V, SLO-BLO	F1, 2	3	A
47A0061	Fuse block		2	B
53A0421	Relay PDT, 25 A, 240 Vac, coil	RL1	1	B
32A0032	Varistor, V271DA40	VAR 1, 2	2	B
44A5943	PCB assembly, DC Power Supply		1	B
44A5928	PCB assembly, LAHSO control		60 Hz	B
44A5928/50	PCB assembly, LAHSO control 50Hz		50 Hz	B
44A6546/LASHO	UCR PCB assembly		1	B
32A0028	Varistor, 575 V	VAR 3-5	3	B
48A0089	Photocell (outdoor)	Outdoor only		B
53A0222	Contactor, 4 pole, 15 A, 120 V coil, 60 Hz	K1	1	B
35A0548	Current sensing transformer 6.6 A to 66 mA	T3	1	B
53A0422	Relay SPDT, 120 VAC plug in (dry contact option)		1	B
57A0080	C.B., 2p, 480 Vac, 15 Amp., DIN Rail Mtg.	CB1	1	B
35A0272	SD TX 240/120 Vac	T1	1	B
35A0496	TX 115/230 V to 12/24 V, 25 Amp.	T2	1	B
44A6166	Rotary Sw. PCB Assy., 30 Deg.		1	B
53A0283	Switch AC Output	Contractor Supplied	2	B
45A0269	Interlock Switch, SPST, 10A		1	B
44A4803/LASHO	ACE Display PCB with 90A0001A		1	B
35A0493	Current sensor		1	B
33A0013	Choke 4kW LC	L1/L2	2	B

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 we ask that you have the following information ready before calling.



- The *airport code*
- If not with an airport, then company name (prefer customer id number)
- Contact phone number and email address
- Product with part number preferable or product number
- Have you reviewed the product's manual and troubleshooting guide
- Do you have a *True RMS* meter available (and any other necessary tools)
- Be located with the product ready to troubleshoot

Note
For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or
Brussels: +32 2 722 17 11
Rest of Europe: +46 (0) 40 699 17 40
Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support.
China: +86 (10) 8476 0106

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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