

Taxiway Edge
Low intensity
Elevated Light



Type
VEE - 3 - 030

RECORD OF CHANGES					
Rev.	Page	Description	Checked	Approved	Date
1	7	Changes to fig. 11	WM	WM	
1	10	Polyurethane changed to aluminium alloy	WM	WM	
1	11	idem	WM	WM	
1	25	New parts numbers	WM	WM	
1	37	page 37 cancelled and replaced by new 37	WM	WM	
2	25	New CN for blue dome	WM	TRF	
3	25	New parts numbers	DSE	DSE	05/2000
4		Rebranding	EV		01/2010
5	23	New parts numbers	AES		05/2011

SAFETY INSTRUCTIONS

SAFETY PRECAUTIONS

The operating and maintenance personnel should refer to the maintenance procedures described in the ICAO Airport Service Manual, Part 9, Airport Maintenance Practices and in FAA Advisory Circular AC 150/5340-26 "Maintenance of Airport Visual Aid Facilities" for instructions on safety precautions.

Personnel must observe the safety regulations at all times. While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed.

KEEP AWAY FROM LIVE CIRCUITS

Operating and maintenance personnel must at all-time observe all safety regulations. Do not change lamps nor components or make adjustments inside equipment with the light circuit ON. See FAA Advisory Circular AC 150/5340-26 concerning safety.

RESUSCITATION

Operating and maintenance personnel should familiarise themselves with the technique for resuscitation found in the First Aid Instruction Manual.

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Any defect in design, material or workmanship, which may occur during proper and normal use over a period of one (1) year from date of shipment, will be repaired or replaced by ADB free of charge, ex works. Operational failure resulting from lamp burnt out, improper maintenance or installation, damage due to runway maintenance equipment, snow ploughs or aircraft arresting gear hooks is not considered a result of proper use and is beyond the scope of the warranty. Warranty does not cover natural wear and tear nor damage arising after delivery owing to faulty or negligent handling, excessive strain, unsuitable materials for Operation, deficient civil engineering Work, unsuitable soil conditions, and such chemical, electrochemical or electrical influences as were not assumed at the time of the Contract.

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ADB shall in no event be liable to Purchaser for any further claims, particularly claims for damages not affecting the goods themselves.

The above constitutes the limits of ADB's liabilities in connection with the inset lights covered by this manual.

TABLE OF CONTENTS

		<u>Page</u>
	Record of changes	1
	Safety instructions	2
	Use restriction notice	3
	Guarantee	4
	Table of contents	5
	List of illustrations	7
	List of tables	7
SECTION 1	GENERAL INFORMATION & REQUIREMENTS	
1.1	INTRODUCTION	9
1.1.1	Purpose	
1.1.2	Scope	
1.2	DESCRIPTION	10
1.3	USE	
1.4	EQUIPMENT SPECIFICATION DATA	
1.4.1	Data	
1.4.2	Performances	
SECTION 2	MAINTENANCE	
2.1	INTRODUCTION	16
2.2	LAMP REPLACEMENT	
2.3	MAINTENANCE HINTS AND TIPS	17
2.4	PREVENTIVE MAINTENANCE	18
2.5	CORRECTIVE MAINTENANCE	19
2.6	SNOW REMOVAL	

		<u>Page</u>
SECTION 3	TROUBLESHOOTING	
3.1	TROUBLESHOOTNG GUIDE	22
SECTION 4	PARTS LIST	
4.1	PARTS LIST	23
SECTION 5	INSTALLATION	
5.1	INTRODUCTION	24
5.2	UNPACKING	
5.2.1	Damage	
5.3	INSTALLATION CRITERIA	26
5.4	BASE MOUNTING	
5.5	STAKE MOUNTING	30
5.6	CONDUIT ELBOW MOUNTING	32
5.7	SETTING	33

LIST OF ILLUSTRATIONS

<u>Figure N°</u>	<u>Designation</u>	<u>Page</u>
1	VEE-3-030	8
2	Typical layout	11
3	Outline dimensions	13
4	Photometric curve	15
5	VEE-3-030 mounted on a L-867 base duct system	25
6	VEE-3-030 mounted on a L-867 base trench system	27
7	VEE-3-030 mounted on a L-867 base and the transformer in a pit, with cable duct	27
8	Typical wiring diagram	29
9	VEE-3-030 : stake mounting	29
10	VEE-3-030 : conduit elbow mounting	31
11	Exploded view	34

LIST OF TABLES

<u>Table N°</u>	<u>Designation</u>	<u>Page</u>
1	Ordering code	<u>12</u>
2	Equipment data	<u>12</u>
3	Equipment required but not supplied	<u>14</u>
4	Performances	<u>15</u>
5	Preventive and corrective maintenance tasks	<u>20</u>
6	Troubleshooting guide	<u>22</u>
7	Parts list	<u>23</u>



Fig. 1
VEE-3-030

SECTION 1

GENERAL INFORMATION AND REQUIREMENTS

1.1 INTRODUCTION

The VEE-3-030 fig. 1 Taxiway Edge Medium Intensity Omnidirectional Elevated Light, is used to delineate the edges of airport taxiways, holding bays and aprons. The VEE-3-030 is designed for either stake mounting conduit elbow mounting or mounting on an L-867 base. The base mounting is advantageous from a maintenance standpoint and provides added protection for equipment. Stake mounted VEE-3-030 taxiway lights use transformers, cables and connectors designed for direct ground burial.

1.1.1 Purpose

This manual describes procedures for the installation, maintenance, and troubleshooting of the VEE-3-030 Taxiway Edge Medium Intensity Omnidirectional Elevated Light.

1.1.2 Scope

This instruction manual covers equipment manufactured in compliance with FAA specification AC 150/5345-46A, and ICAO Annex 14 for use as taxiway and apron edge light; § 5.3.17.4 and with STANAG 3316 Ed. 7.

1.2 DESCRIPTION

The frame of the VEE-3-030 (Fig. 11) consists of a cast aluminium alloy frangible stem (8) fitted with a 2" - 11 TPI thread on its base, on which a ball joint device (6 & 7) enable the setting and levelling of the optical system. The optical system is composed of an upper and lower body (1, 5), the upper body (1) is a blue dome cast in an aluminium alloy ring which covers completely the lamp holder up to the lower body (5) providing like this water tightness without use of a gasket. Two lateral thumbscrews and washers (10) secure the upper body on the lower body.

The lower body, on its top part sustain the lamp holder secured by two screws, a

lead assembly for connection of the lamp holder to the two-pole plug is secured on the lower body by a strain relief bushing to avoid pulling on the connection to the socket, and to help disconnecting the plug in case of impact.

The lower part of the lower body (5) is half spherical shaped adapted to the polyester ball joint (6) stuck on the frangible stem. This knuckle-joint is locked on the lower body, thanks to three screws (11) and a clamp (7) below the split ball. This genuine knuckle-joint avoids the counter clockwise wires twisting problem during installation and maintenance. The lower body and the ring of the blue dome are made of an aluminium alloy.

A weakening groove is provided at the lower part of the frangible stem to eliminate the need of a separate breakable coupling. Between the groove and the thread, an hexagonal shaped part is provided to tighten or loosen the light unit from the ground mounting device (base, conduit elbow, anchor stake).

All the aluminium castings are phosphatized and protected with an aviation yellow electrostatic polyester powder coating. The lower body is fitted with a flag-holder to locate the light with a flag in countries with heavy snowfalls.

1.3 USE

The ADB VEE-3-030 elevated light is designed for the lighting of Taxiway Edges and Apron Edges serving Runways of all categories.

Fig. 2 shows typical layouts of the Taxiway Edge lights.

1.4 EQUIPMENT SPECIFICATION DATA

1.4.1 The ADB ordering code is given in Table 1 for the VEE-3-030. Reference data pertinent to the equipment is listed in Table 2.

Information on items not supplied which might be required for installation is given in Table 3.

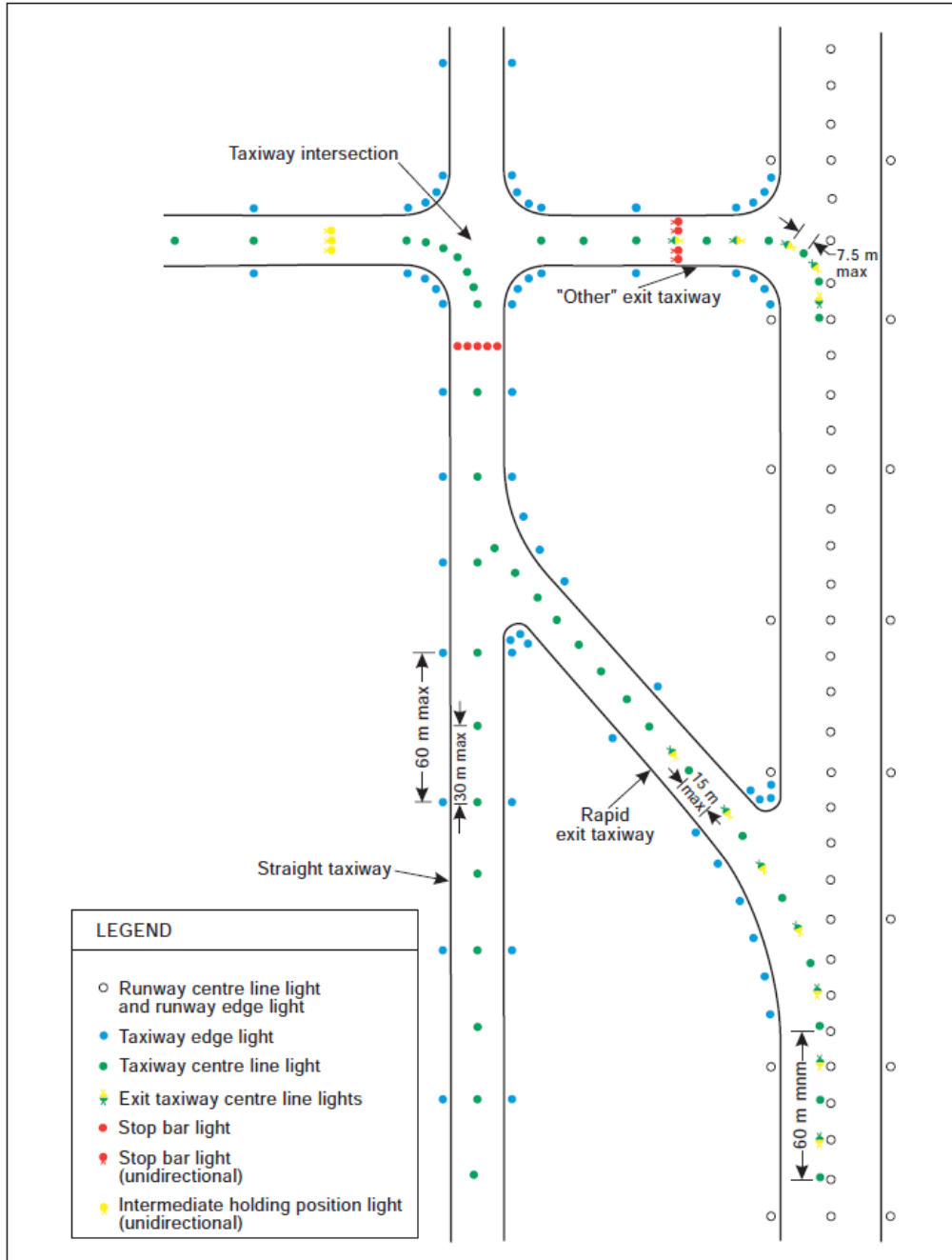


Fig. 2

VEE-3-030 : Typical layout for taxiway edge lighting

Table 1 : VEE-3-030 - ordering code

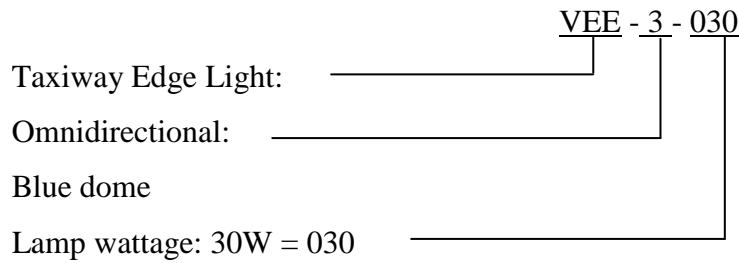


Table 2 : Equipment data

Type	: VEE-3-030
Input	: 6.6A
Lamp	: 30W/6.6A - EXL, quartz
Rated lamp life	: 1.000 hours
Temperature range of installation	: -55°C (-67°F) to +55°C (+131°F)
Humidity	: Up to 100%
Altitude	: Sea level to 3000 m
Wind	: Velocities up to 560 Km/h
Dimensions	: See figure 3
Net weight	: Approx. 1.2 kg

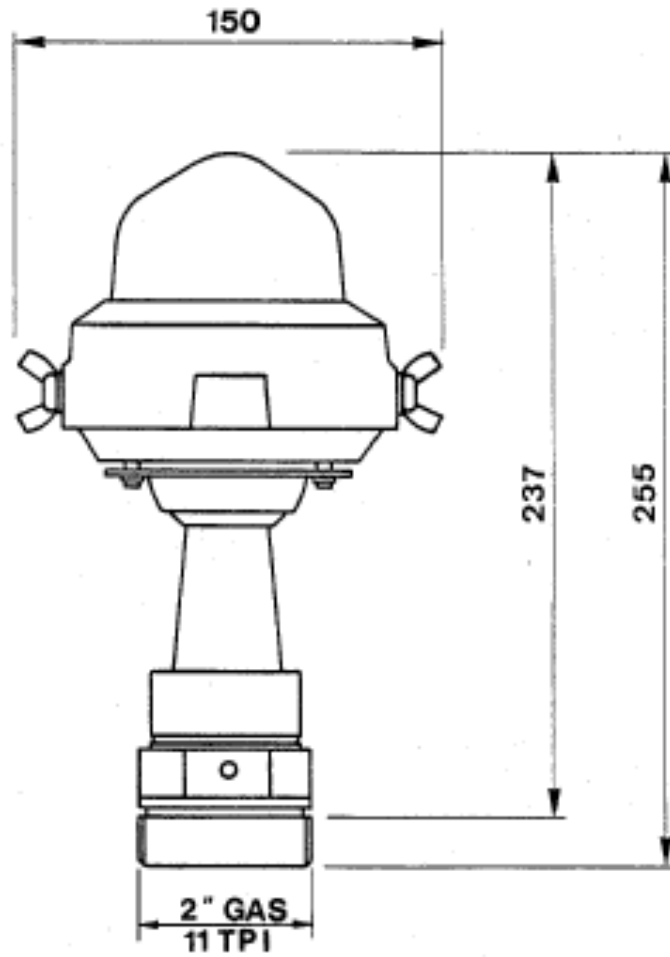


Fig. 3

VEE-3-030: outline dimensions

Table 3 : Equipment required but not supplied

Quantity	Description
1	Spanner 2" open ended
1	Ratchet, lever reversible (3/8") n° 435
1	Torque wrench (5-50Nm) n° 730/5 with
1	Square drive insert tool (3/8") n° 734/5
1	Socket n° 45a - 9/16 (3/8")
1	Water level
A/R	Loctite Grade AV or equivalent
1	T300/2 base plate assembly gasket and Mounting screws (if base mounted)
1	L-867 base (if base mounted)
1	Anchor stake PA2 (if stake mounted)
1	Conduit elbow (if conduit mounted)

1.4.2 Performances

The photometric performances are given in figure 4 and in table 4

Table 4 : VEE-3-030 Performances

Taxiway Edge	Colour	Peak Intensity	Average Intensity	Beam spread Horiz.	Beam spread Vert.
FAA L-861T	Blue	5 cd	3 cd	360°	0° to 6°
Taxiway edge ICAO	Blue	5 cd	2 cd	360°	0° to 30°

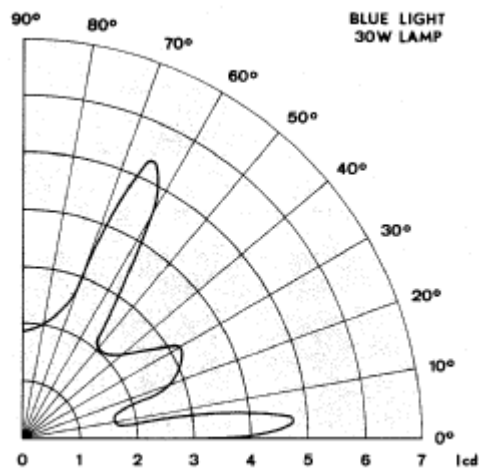


Fig. 4

VEE-3-030 - Photometric curve

SECTION 2

MAINTENANCE

2.1 INTRODUCTION

Maintenance personnel should refer to the maintenance procedure described in the ICAO Airport Services Manual, Part 9, Airport maintenance practices and in FAA Advisory Circular N° AC150/5340-26, chapter 4, section 4.

The method of maintaining the VEE-3-030 Taxiway Edge Elevated Light consists only of a light assembly servicing in the field, limited to cleaning of outer glassware and to lamp and broken glassware replacement. If any lamp is out, the location of the fixture should be recorded and the lamp replaced at a time when the circuit is de-energized.

2.2 LAMP REPLACEMENT

De-energize circuit and lockout circuit.

Remove dome from fixture by loosening the two thumbscrews on the side of the fixture. Pull out lamp. Wearing clean, white, lint free gloves insert a new lamp into lamp socket and remove protective sleeving. Reinstall dome and tighten the two thumbscrews.

2.3 MAINTENANCE HINTS AND TIPS

2.3.1 Relamping

2.3.1.1 Make sure you are using the proper lamp.

Check P/N, watts and current as printed on lamp base.

Several aviation lamps of different ratings have the same outside appearance.

2.3.1.2 Never touch the quartz bulb with bare fingers.

Oil or grease may contaminate the surface of the bulb and in operation cause reduced performance and premature failure. If the quartz is accidentally handled, clean before operation with a cloth moistened with alcohol or methylated spirit.

2.3.1.3 It is a good precaution to check systematically the condition of the lamp holder and the wiring at each lamp replacement. Signs of overheating are the result of poor electrical contacts. The degradation process is fast if no remedial action is taken in time.

2.3.1.4 Premature oxidation of lamp holder contacts in highly corrosive or salt-laden atmospheres. In some cases the problem has been cured successfully by coating the lamp pins and lamp holder contacts with a silicone jelly such as DOW CORNING # 4 COMPOUND or similar.

CAUTION

Touching the lamp with bare fingers may seriously shorten the lamp life. If the lamp has been touched, clean with tissue moistened with isopropyl alcohol or methylated spirit.

2.3.2 Water

Build-up of condensation water in an elevated light is a normal process resulting from the temperature and pressure differentials during the ON and OFF cycles of operation. However the lights are so designed that condensation water will drain away through the mounting stem and will be evacuated through one or two purpose-made holes located near the shearing groove.

IT IS ESSENTIAL TO MAKE SURE THAT THESE DRAINAGE HOLES REMAIN UNOBSTRUCTED

2.4 PREVENTIVE MAINTENANCE

Service life depends essentially on the respect of the preventive maintenance procedures. Table 5-1 List the maintenance task to perform to maintain the VEE-3-030 light operational at a maximum efficiency.

2.5 CORRECTIVE MAINTENANCE

Table 5-1 list the maintenance tasks.

2.5.1 Removal of a broken frangible stem

Use a 2" spanner applied on the hexagonal part of the stem above the thread to unscrew from the ground mounting device.

Dispose of the broken parts of the frangible base.

2.5.2 Replacement of a VEE-3-030

Use a 2" spanner applied on the hexagonal part of the base above the thread to unscrew from the ground mounting device.

Disconnect the plug from the receptacle.

Proceed as indicated in section 5. for installing a new VEE-3-030.

2.5.3 Dome maintenance

Remove the upper body losing the two thumb-screws.

Clean the blue dome with a liquid glass cleaner or a detergent solution.

Rinse thoroughly.

Replace by a new one if it shows signs of degradation.

2.6 SNOW REMOVAL

Snow-plough operators should exercise extra care not to strike the light fixture with snow-plough blades.

In regions where heavy snow falls can be expected it is recommended to mark the position of the VEE-3-030 lights by means of a small flag mounted on the fixture, in the dedicated hole.

Table 5 : Preventive and corrective maintenance tasks

<u>Interval</u>	<u>Maintenance Task</u>	<u>Action</u>
Daily	Lamp burned-out	Replace when system deactivated See Section 2.2
	Dimly burning lamp	Same as above
	Broken dome	Replace dome assembly
Weekly	Obscuration by Vegetation	Remove. Use weed killer
	Dirty lens cleaner	Clean with glass
Monthly	Misaligned fixture	Straighten, level and align
	Dirty lamp sockets	Clean when system is deactivated
	Dirty frangible coupling weep holes (stake-mounted fixtures only)	Clean
	Check drain holes for dirt	Clean
Semi-Annually	Improper ground elevation	Grade so frangible point is approximately one inch above ground elevation
	Improper light elevation	Maintain elevation of all lights at same height

Table 5 : Preventive and corrective maintenance tasks (continued)

<u>Interval</u>	<u>Maintenance Task</u>	<u>Action</u>
Semi-Annually	Moisture present in light housing or L-867 base	Check drain holes & annually clamps. Check lens for cracks. Replace if damaged. Use water pump to remove water from base
	Paint rusting or flaking off	Paint
Annually	Cracks, corrosion, shorts	Repair or replace
	Dirty contacts	Clean when system deactivated
	Loose connections	Tighten
Unscheduled	Prediction of heavy snowfall	Mark location of fixtures (use red flags or sticks) to facilitate snow removal and lessen the chance of damage to fixtures by snow removal equipment

SECTION 3

TROUBLESHOOTING

3.1 TROUBLESHOOTING GUIDE

The troubleshooting guide for the VEE-3-030 Taxiway Light is given in Table 6.

CAUTION

De-energize circuit and lockout circuit or regulator so that the circuit cannot be energized by remote means before attempting to service fixture.

Table 6 : Troubleshooting Guide

Problem: Lamp will not energize

<u>Possible cause</u>	<u>Solution</u>
Defective lamp	Replace lamp
Loose connections	Tighten
Deteriorated wire insulation	Replace wires
Moisture present in fixture	Open up & dry Inspect lens for cracks Replace lamp and any damaged parts

SECTION 4

PARTS LIST

4.1 PARTS LIST

Table 7 lists parts ordinarily required for repair or replacement.

Item on fig.11	ADB Code	Qty/ Unit	Designation
	1408.15.011	1	Taxiway Edge Omnidirectional Medium Intensity Elevated Light type VEE-3-030 (without lamp) comprising :
1	1408.03.395	1	Blue dome cast in aluminium alloy upper body
2	2990.40.830	1	GY9.5 Halogen lamp 30W - 6,6A - 1.000 Hours
5	4070.88.883	1	Lower body made of aluminium alloy with flag holder
6	4070.84.980	1	Yellow ball joint
7	4070.85.491	1	Stainless steel clamp for ball joint
8	4070.84.992	1	Stem, frangible
9	1458.10.820	1	2-pole plug assembly consisting of: * Lamp holder GY9.5 with leads * Clamp for cable * Retainer for clamp * 2-pole plug moulded on two AWG16, 250mm long wires fitted with crimp-on & shrink sleeves
10	7216.45.569	2	Thumbscrew
	7283.05.053	2	Washer for thumbscrew
	7080.38.680	2	Square nut for thumbscrew
11	7211.11.016	3	Levelling screw for clamp ball joint
	7285.08.017	3	Flat washer for clamp ball joint

SECTION 5

INSTALLATION

5.1 INTRODUCTION

This section provides instructions for the installation of the VEE-3-030 Taxiway Light. Refer to the airport project plans and specifications for the specific installation instructions.

5.2 UNPACKING

The equipment must be handled carefully to prevent component damage. Unpack carton upon receipt and check the contents and their condition. Note any exterior damage to carton which might lead to detection of equipment damage.

5.2.1 Damage.

If damage to any equipment is noted, a claim form should be filed with the carrier immediately.

Inspection of equipment by the carrier may be necessary.

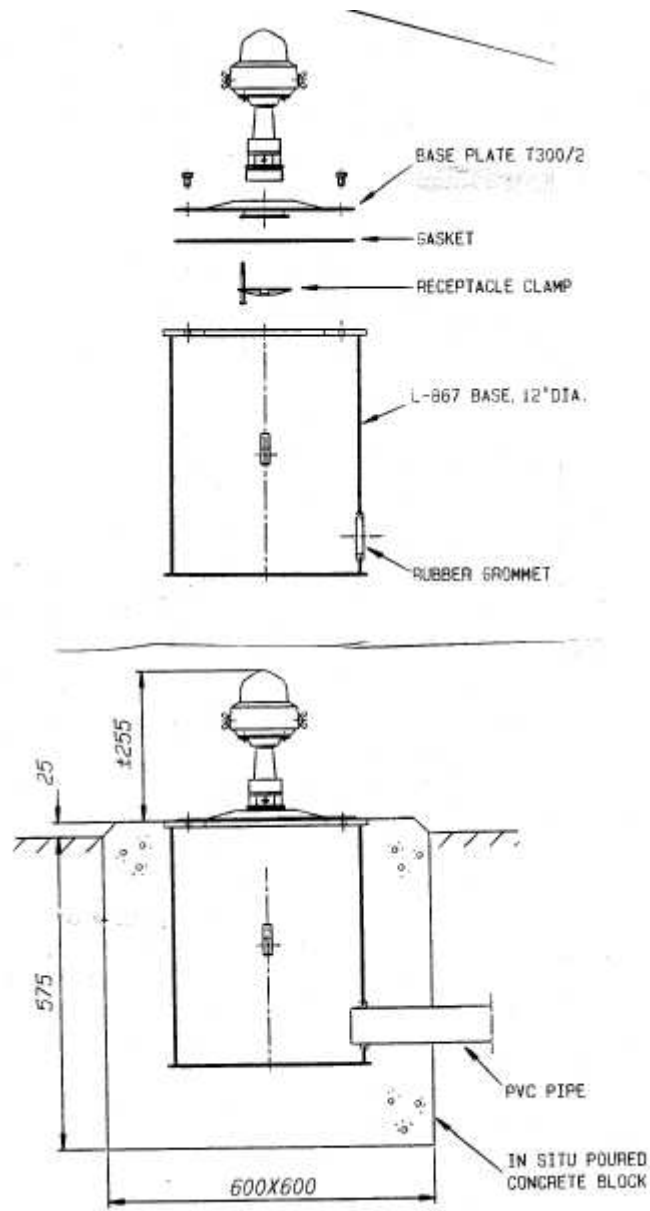


Fig. 5

VEE-3-030 mounted on a L-867 base: duct system

5.3 INSTALLATION CRITERIA

The light fixtures are normally positioned at a distance of not more than 3m of the edge of the hard surface of the taxiway, and in a straight line on each side of the taxiway.

The fixtures are spaced longitudinally not more than 60m apart to define the lateral limits of the taxiing paths. The longitudinal spacing of the lights is influenced by the physical layout of the taxiways.

Closer spacing of the lights should be provided on short taxiway sections, curves, and entrances to taxiways from runways or aprons.

See figure 3 for typical taxiway lighting configurations. Refer also to specific installation drawings.

5.4 BASE MOUNTING

5.4.1 L-867 Base Installation.

The VEE-3-030 light fixture can be mounted on an L-867 base and mated with a base plate T300/2 whose diameter and bolt-hole circle correspond to the 12" L-867 base. The base plate is designed to receive the 2" - 11 TPI frangible stem. A gasket is used with the base plate to form a watertight seal between the base plate and the L-867 base. The procedures to install the L-867 base are given in manual AM.05.120e. Fig. 5-1 shows typical installation method on L-867 base.

Figures 6 and 7 give other installation alternatives.

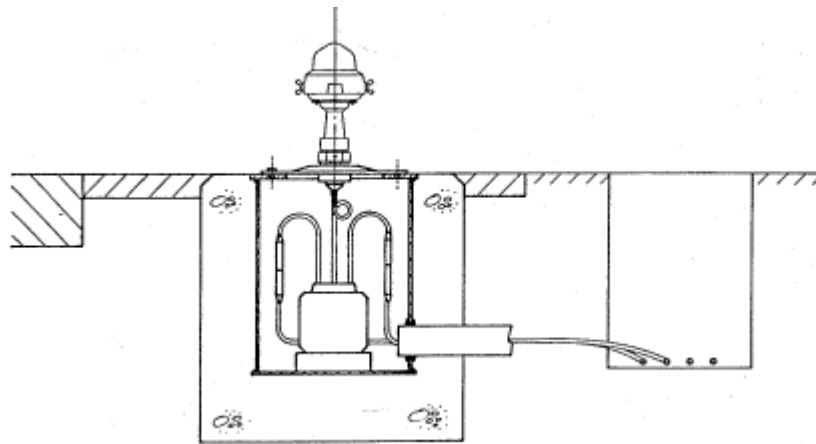


Fig. 6

VEE-3-030 mounted on a L-867 base: trench system

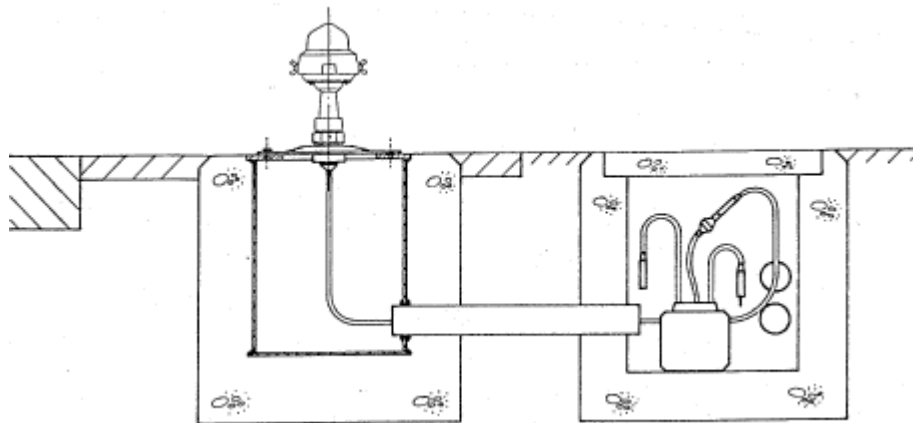


Fig. 7

VEE-3-030 mounted on a L-867 base and the transformer in a pit
(the pit can also be replaced by a L-867 base) with cables in duct.

5.4.2 Installation of VEE-3-030 on light base

See fig. 8 for typical wiring diagram.

5.4.2.1 Connect the primary series loop to the appropriate isolation transformer.

NOTE

Install transformer so that it is about 3 inches above the bottom surface of the L-867 base (use brick) to avoid the possibility of the transformer being partially immersed in case water accumulates under the level of the ducts or pipes.

5.4.2.2 Check the continuity of the series loop after the transformer has been connected.

5.4.2.3 Wrap the connector joints in the primary circuit with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape one-half lapped, extending at least 4 cm on each side of the joint.

5.4.2.4 Clamp the female secondary plug from the isolating transformer to the L-867 base plate fitting.

5.4.2.5 Bolt base plate T300/2 and base plate gasket to the L-867 base using six 3/8-16 UNC screws. Apply a drop of Loctite Grade AV to each bolt thread and use a torque wrench to torque bolts down to 11 Nm.

5.4.2.6 Connect the male L-823 plug from the VEE-3-030 light fixture to the female transformer plug in the base plate.

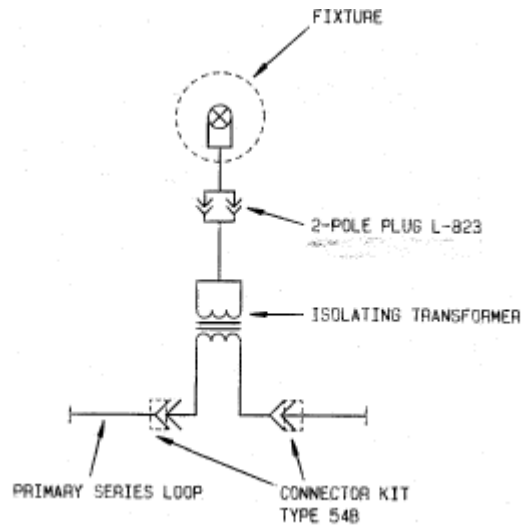


Fig. 8
Typical wiring diagram

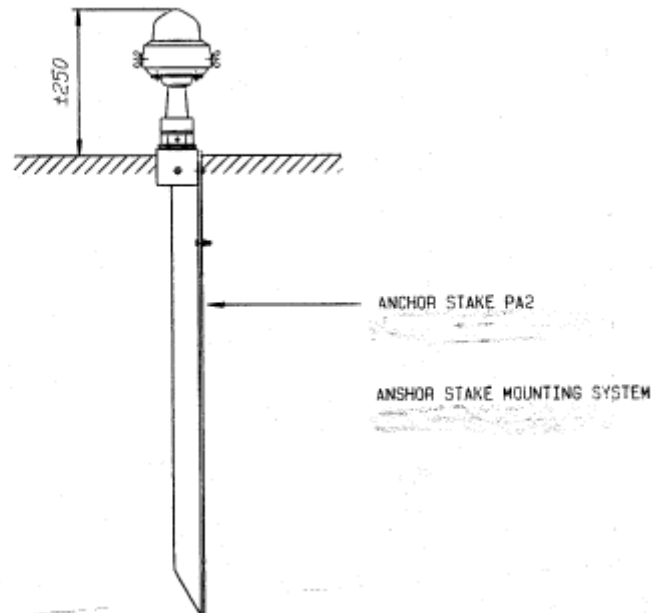


Fig. 9
VEE-3-030: Stake mounting

5.4.2.7. Loosen the three ball-joint screws holding the frangible stem to the lower body.
Screw breakable stem on the female base plate thread.

5.4.2.8 Screw three ball-joint screws.

5.4.2.9 Level light fixture. See paragraph 5.7.

5.5 PA-2 STAKE MOUNTING

The VEE-3-030 light fixture is mated with a 760 mm long stake with a fitting attached at the top to receive the male thread of the frangible stem. Stake mounted VEE-3-030 taxiway lights use transformers, cables and connectors that are designed for direct earth burial or in a pit.

5.5.1 Install stake in a 15 cm diameter hole at a depth of 76 cm.

NOTE

Do not install stake by driving

5.5.2 Make electrical connections (Refer to 5.4.2.) and backfill around the stake with thoroughly compacted earth which has passed a 25 mm sieve.

NOTE

Backfill with concrete in case of
unstable soil conditions

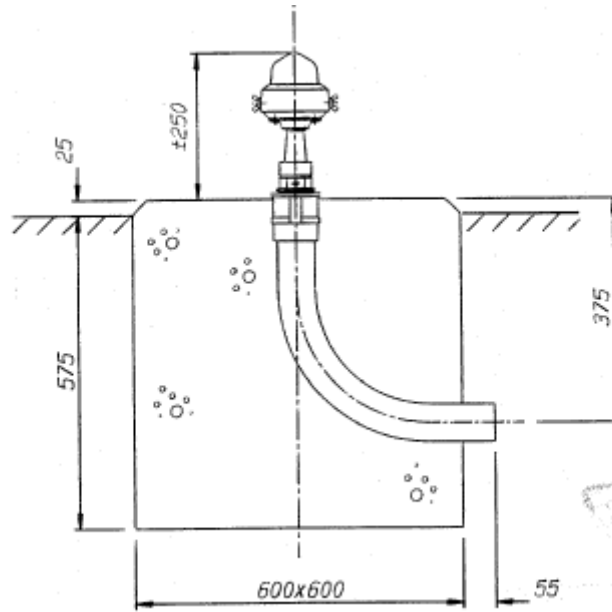


Fig. 10

VEE-3-030: conduit elbow mounting

- 5.5.3 Install the top of the stake even with, or not more than 15 mm above the finished grade and maintain within 1 degree of the vertical.

NOTE

In areas where frost may cause heaving, anchor the stake with concrete and use a permeable backfill material such as sand around the buried electrical components and then cover the top surface with an impervious material to reduce moisture penetration.

- 5.5.4 Insert the male VEE-3-030 plug into the transformer receptacle and install (avoid twisting the wires) the light fixture on the stake.

- 5.5.5 Level the light fixture. See paragraph 5-7.

5.6 TC-2 CONDUIT ELBOW MOUNTING

- 5.6.1 With this installation method the VEE-3-030 is mounted on 2" - 11 TPI tapped sleeve on the top of the conduit elbow which is encased in a concrete block as shown on fig. 10.

- 5.6.2 The transformers, cables and connectors are designed for direct burial or in a pit (or base).

- 5.6.3 Make electrical connection (Refer to 5.4.2).
Pass the secondary cable through the conduit elbow. Let the receptacle rest on the receptacle seat in adequate position.

5.7 SETTING

To level the light fixture, perform the following steps

5.7.1 Loosen the two thumbscrews and remove blue dome and lamp from the fixture.

5.7.2 Loosen the 3 ball-joint locking screws.

5.7.3 Place water level on top of the fixture, level the fixture placing water level parallel and perpendicular to the taxiway.

5.7.4 Tighten the 3 locking screws.

5.7.5 Double check the levelling.

5.7.6 Replace dome and lamp.

CAUTION

Touching the quartz bulb with bare fingers may seriously shorten the lamp life. If the bulb has been touched, wipe it carefully with a piece of lens cleaning tissue or similar material moistened with alcohol or methylated spirit.

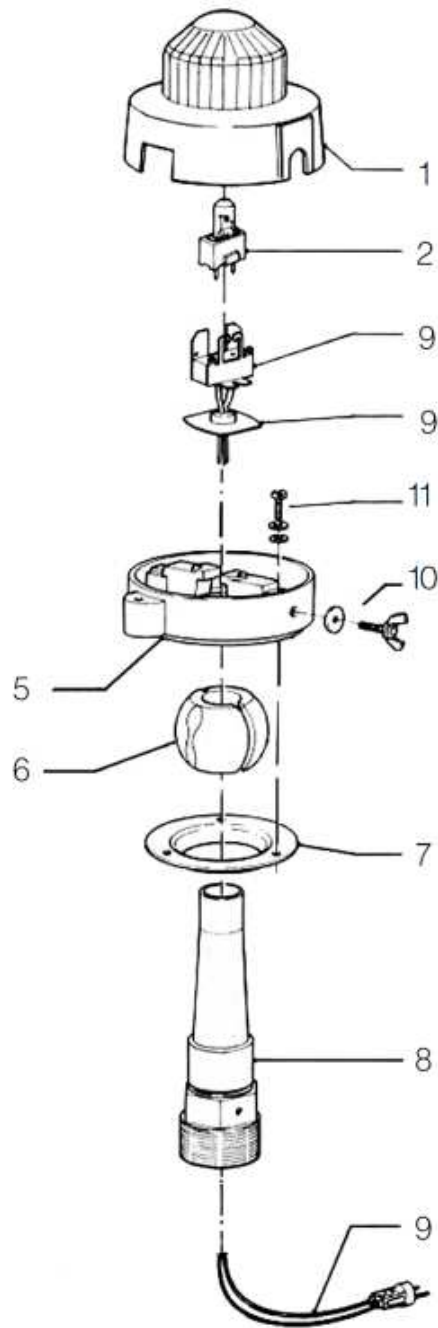


Fig. 11

VEE-3-030: Exploded view