ALSTOM

AIRPORT EQUIPMENT

INSTALLATION AND MAINTENANCE INSTRUCTIONS

and

SPARE PARTS LIST

for the

8" TAXIWAY EDGE, HELIPAD LIGHT & OMNI-DIRECTIONAL

FITTING

TYPE ZA290 SERIES

ALSTOM

CONTENTS

ALSTOM

ISSUE RECORD

	Issue Status		
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SAFETY ADVICE NOTICE

Please ensure that personnel are made aware of all safety aspects. **Appendix 'A'** contains safety advice and this appendix can be copied and used to record authorised personnel.

TOOLS AND CONSUMABLES

- Flat blade screwdriver - medium.
- 5mm A/F hex. Allen Key.
- P80 emulsifying rubber lubricant by International Products Group.

ZA290 SERIES

1. INTRODUCTION

The ZA290 series of inset taxiway edge, helipad and general omni-directional fittings that meet ICAO and FAA requirements for Categories I, II and III, all weather operation lighting systems.

Fittings are normally supplied complete with one long life, low energy reflector lamp and single 'B' type (L823) plug lead.

An internal lamp by-pass device is available as an option, when required.

The fitting is lightweight and robust due to its predominantly aluminium alloy construction which also gives good protection against corrosion. The glass prism dome is accurately located in the main body casting, secured by a retaining clamp without the need for sealing compounds. A full range of coloured light options is achieved by means of either coloured prisms or clear prisms and coloured filters.

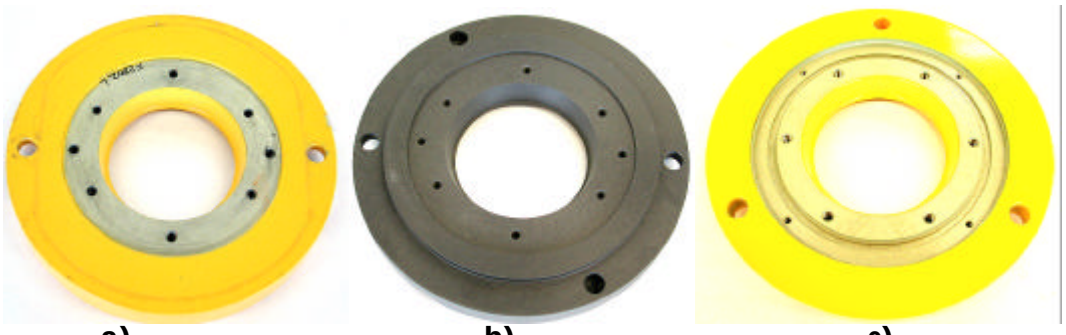
The optical system is completely adjustment free, on installation and in service, thereby considerably simplifying installation and maintenance procedures.

The fitting has three body styles that will allow the following installations:-

a) Standard body with 2 hole fixing may be installed directly into the ALSTOM ZM109 or ZM181 seating pot.

b) IEC body with 2 hole fixing for installation into the IEC 61826-2 style of seating arrangement.

c) NATO body with 3 hole fixing for installation into an SR8/13 or MOD 3A adaptor ring.



a) **b)** **c)**

Fig. 1. Showing an underside view of three body styles.

Additionally a range of PSA and FAA adapters are available for 12" and 15.5" seatings.

ZA290 series fittings can also be installed directly into a concrete block in accordance with the instructions contained in section 2.2.

The numbers appearing in the text in parentheses, refer to item numbers in the parts list in section 6 of the manual.

1.1 NOTES FOR 240V/120V (HIGH VOLTAGE) VERSION OF ZA292

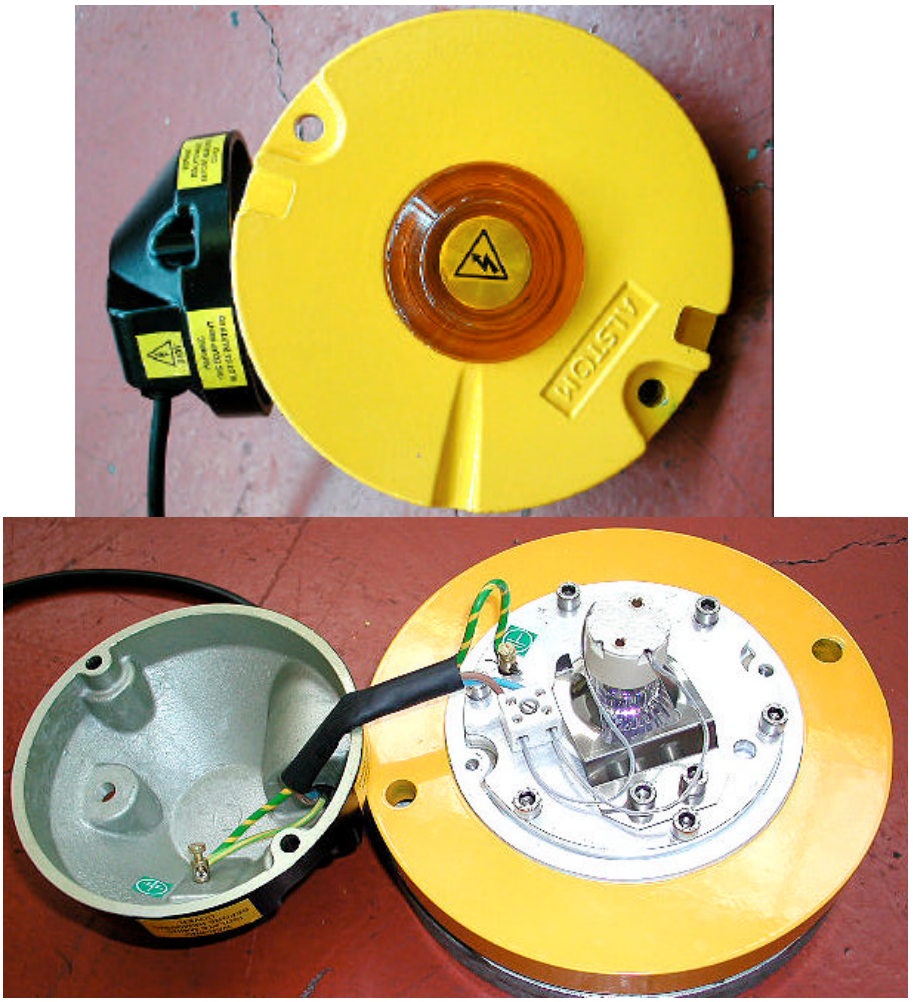


Fig. 1A. ZA292 240/120 volt version, external & internal views. Note, it is ONLY available in a 2 hole fixing body style.

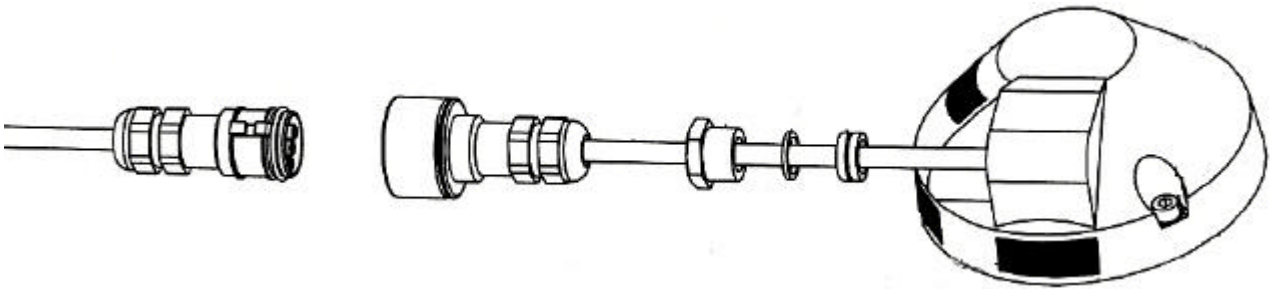


Fig. 1B. Aquasafe Plug and socket. Used on ZA292, 240/120 volt version only.

Before attempting any installation or maintenance on 240V/120V versions ensure that the fitting is isolated from the power supply.

240/120 volt fittings are earthed through an IP68 rated Elkay Aquasafe Plug.

- **Disconnect the Aquasafe plug before undertaking any work on a 240/120 volt fitting. See Fig. 1B.**

2. MOUNTING THE FITTING

2.1 INTO NEW SEATING POT (ZM109 OR ZM181)

2.1.1 SITE PREPARATION FOR INSTALLATION OF ZM109/ZM181 SEATING POT

Prior to installation of the seating pot, the runway pavement surface must be correctly prepared.

Detailed instructions for installing a ZM109 seating pot are contained in AVD89.

ZM181seating pot installation is contained within IMM-ZA-SEATING-POTS.

Copies of these documents can be requested from ALSTOM T & D, Ltd., Power Conversion.

2.1.2 INSTALLATION INTO ZM109 SEATING POT OR ADAPTOR

It is assumed that the seating pot and transformer secondary socket lead have been installed in accordance with section 2.1.1.

- Check that the light unit is of the correct type/option for the relevant position on the taxiway/apron; (See site plan).
- Remove the two holding down nuts and washers in the seating pot. Check that the studs themselves are fully home in the seating pot.
- Clean out any debris from the pot seating area. Check that there are no internal protrusions or casting faults, especially on the seating surface.
- Check the underside-seating surface of the light unit for debris, that would prevent correct beam alignment.
- Wipe clean the light unit and mating surfaces of the moulded plug and socket connector. Ensure that the female connector contacts are free from debris. Flush out with a suitable contact cleaner aerosol when required.
- When required, assemble the seating gasket to the seating pot/adaptor ring using the studs for alignment and ensure it lays flat.
- Insert the secondary lead plug into the appropriate transformer secondary lead socket. Take care to observe correct pin polarisation. These connections are defined by the site layout information.

- Assemble the light unit into the seating pot, using the extractor tool ALSTOM type SLC21226. Take care not to trap any leads between mating surfaces.

WARNING DO NOT USE THE EXTRACTOR TOOL FOR CARRYING THE FITTING TO OR FROM THE SEATING POT.

- Re-assemble both crinkle washers and M10 nuts, (either standard or Nyloc nuts can be used), to secure the light unit in the seating pot. Tighten each nut progressively in turn, until a torque of 40Nm (29lbf.ft) is achieved on each.

WHEN STANDARD NUTS ARE USED, ALSTOM RECOMMEND THAT THE HOLDING DOWN NUTS ARE RE-TORQUED TO 35Nm, 2 WEEKS AFTER INITIAL INSTALLATION, THEN PERIODICALLY AT PLANNED MAINTENANCE INTERVALS.

2.2 INSTALLATION INTO NEW CONCRETE BLOCK

- Provide a pre-formed concrete block generally as shown in **Fig. 2** on page 7, (Extract from drawing No. F25307).

The concrete block to be approximately 500mm square x 300mm deep, and have a recess on the top surface of 210mm (8 1/4") diameter and 25mm (1") deep with 2 equally spaced M10 holding down bolts cast in on a 178mm (7") P.C.D. A hole, 140mm (5.5") diameter through, is cast centrally in the block. See **Fig. 2.**

Concentricity and precise location of all of these features is important, to avoid interference, therefore Alstom recommend that the holes for the studs are positioned using a jig. Studs are to be manufactured from stainless steel grade 304 or better.

- Excavate a hole approximately 600mm square x 400mm deep (24" x 16").

- Cast a concrete base approximately 100mm (4") thick in the bottom of the hole and float dead level. DO NOT back fill the hole when un-evenly excavated.

- Pre-assemble the secondary socket lead from the isolating transformer through a groove in the block and up through the centre hole, ready for connection to the fitting.

- Install the concrete blocks onto the cast base ensuring the correct orientation of the fixing studs, the centres and alignment of fitting positions.

- Pour concrete around the concrete block and allow to cure.

- Install the fitting into the concrete block in accordance with section 2.1.2.

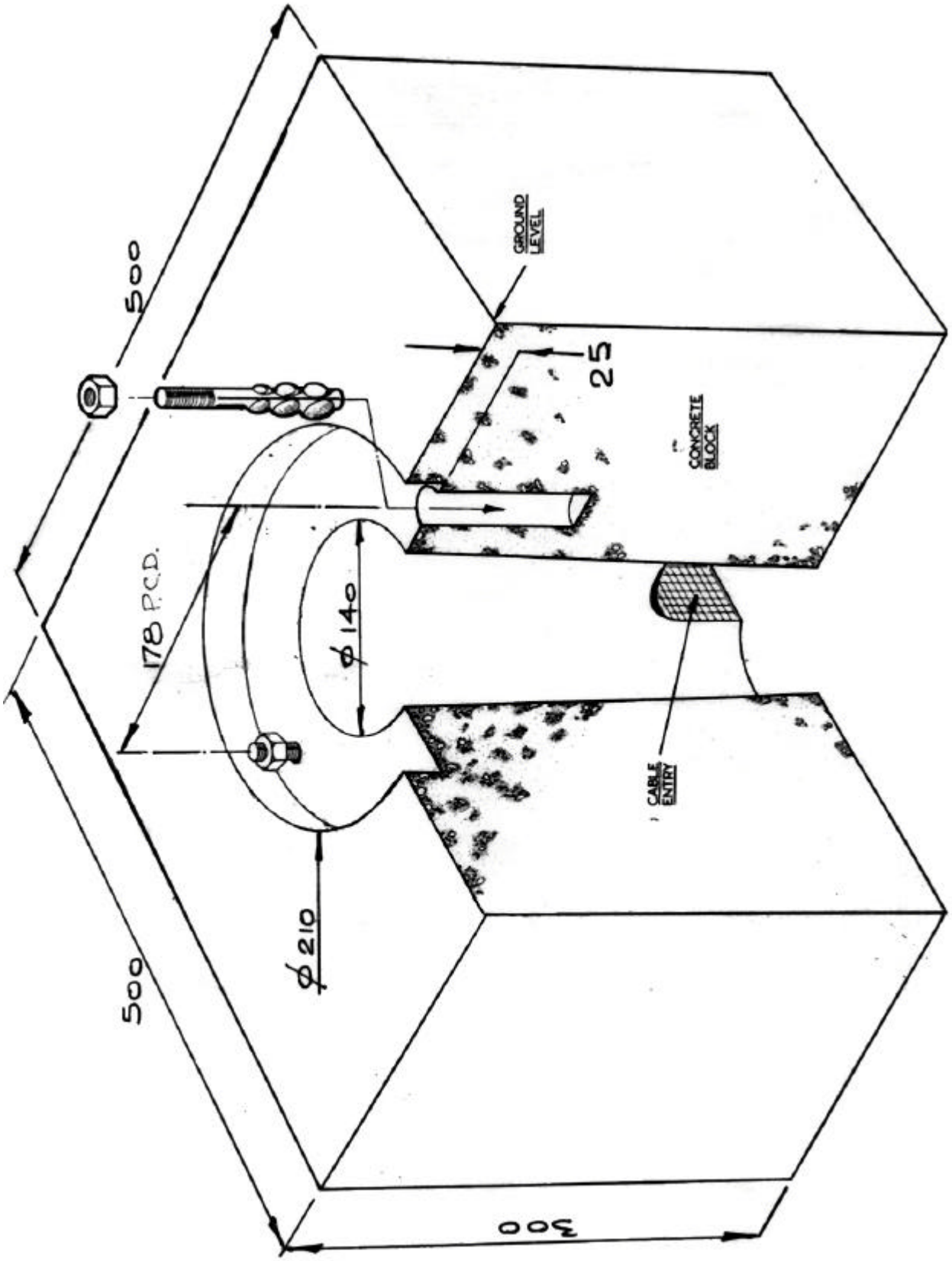


Fig. 2. Concrete Base for ZA290 fitting (derived from Drg No. F25307)

3. FITTING REMOVAL

- Release & remove the securing nuts and washers, Discard any damaged items and put un-damaged items safely aside for re-use.

Note: When Nyloc nuts are used these **must** be dis-carded and replaced with new items

- Lift the fitting out of the seating pot, or concrete block. Alstom recommend using the extractor tool ALSTOM type SLC 21226.

WARNING DO NOT USE THE EXTRACTOR TOOL FOR CARRYING FITTING TO OR FROM THE SEATING POT.

- Re-install the replacement fitting in accordance with section 2.

4. ON-SITE MAINTENANCE

On-site maintenance will normally be restricted to cleaning and inspection for any signs of damage to the prism.

Fig. 3. ZA290 fitting. Close up of Prism, examine for dirt or damage.

- Clean dirt and oil from the exposed surfaces using a suitable detergent applied with a stiff bristle brush. DO NOT USE abrasives on the prism surfaces, or detergents with high alkalinity.

- Replace a faulty fitting with a direct replacement or one of a similar type.

- Repair the faulty fitting in a workshop environment, or return for overhaul to ALSTOM T&D Ltd, Power Conversion, Airports division.

5. WORKSHOP MAINTENANCE

Alstom recommend that a comprehensive inspection is carried out each time the light fitting is dis-assembled. Future failures in service may be prevented and efficient spares holding can be defined.

- Generate local site documentation, record the status of fittings and major components.

- USE ONLY approved replacement parts.

Note: Only in exceptional circumstances can repairs to components be attempted and then only by qualified staff using recommended tooling.

- Re-assemble the fitting, using Loctite 222 Screwlock on all M6 screw threads and apply the recommended torque when tightening screws.

5.1 PREPARATION AND CLEANING

When repairing the fitting, use a workshop with a clean environment, free from dust, vapours and other atmospheric pollutants.

Prior to opening the fitting for inspection or maintenance, clean dirt and oil from its external surfaces (in order to avoid internal contamination).

- Clean externally using a suitable household detergent applied with a stiff bristle brush. DO NOT USE abrasive substances or detergents with high alkalinity.

- Wash in clean water and dry with a cotton cloth or tissue. DO NOT USE compressed air on the prism surfaces.

5.2 DIS-ASSEMBLY OF BODY CASTING FROM BOTTOM COVER ASSEMBLY

Numbers in parentheses refer to the item Nos. for the Standard 2 Hole Body in **Fig. 19.**

- Place the light fitting on a clean, flat, work surface with its bottom cover uppermost.

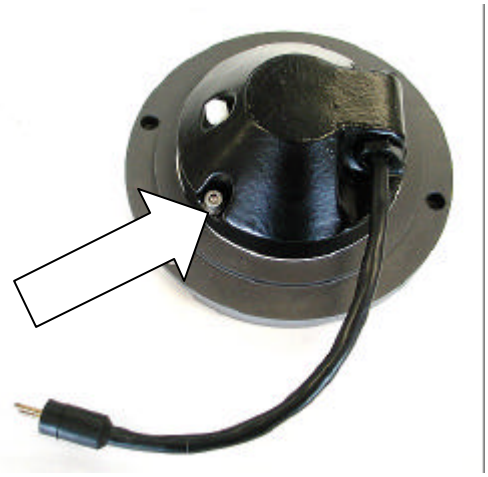


Fig. 4. ZA290 series fitting inverted on a work bench.

- Release two M6 cap head screws (5) attaching the bottom cover casting (2) to the body casting (1), using a 5mm A/F Allen Key. See **Fig. 4**.

- Discard any damaged items and place the un-damaged screws and crinkle washers aside for re-assembly.

Note: the 3 hole body, SRA version, has a spun aluminium bottom cover (7) that is secured by four M4 countersunk screws (9).

- Carefully lift off the bottom cover casting (2) and disconnect lamp (20) from plug lead terminations.

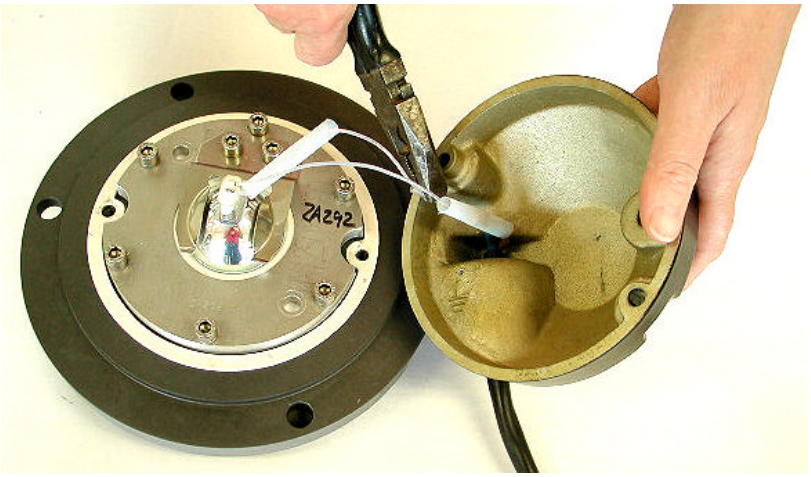


Fig. 5. Disconnecting the lamp.

- Place bottom cover casting (2) down on the work surface, 'open end' uppermost.

Fig. 6. Bottom cover assembly.

5.3 MAINTENANCE OF BODY CASTING ASSEMBLY

5.3.1 REMOVAL & REPLACEMENT OF PRISM

- Remove the six M6 socket head screws (17) using a 5mm A/F Allen Key. See **Fig. 7.**

- Release the prism clamp (6), gasket (15), lamp (20), lamp retaining spring (23) and lamp gasket (22).

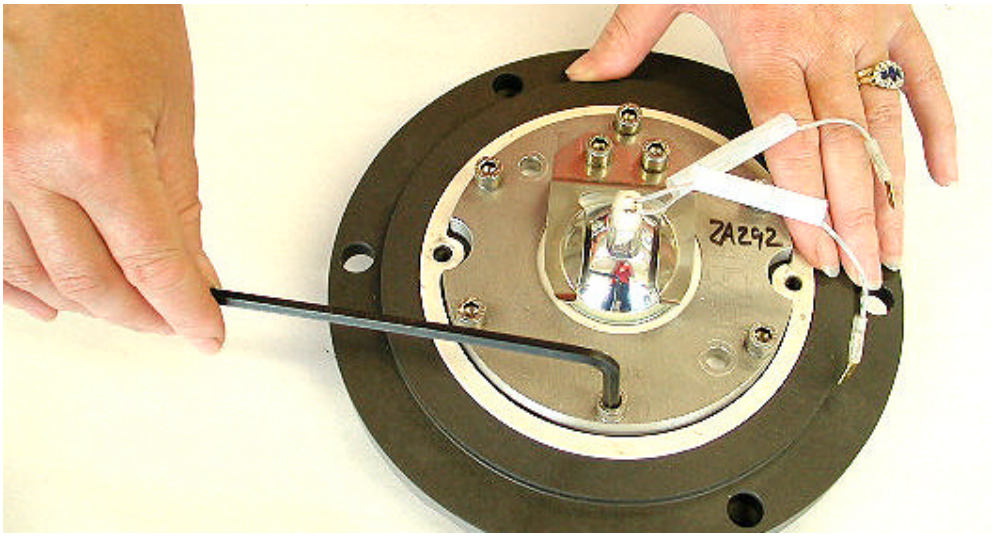


Fig. 7. ZA290 clamp securing screws.

- Check that reflector (19) in the roof of the glass prism (18), is un-damaged. See **Fig. 8.**

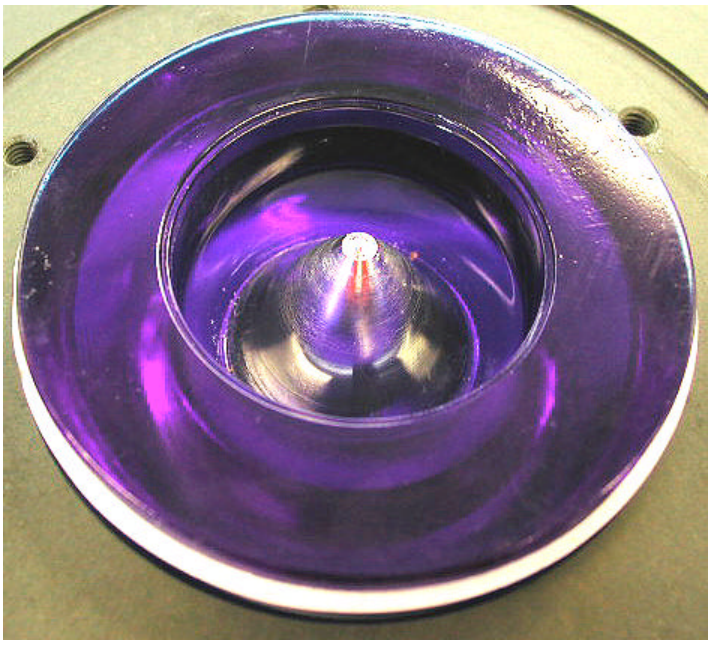


Fig. 8. Close up of reflector in prism.

Remove an intact prism.

USE SUITABLE PROTECTIVE GLOVES WHEN REMOVING OR REPLACING PRISMS

- Place the body casting on some cushioning material such as bubble wrap.

- Place both thumbs on the top of the prism dome and press vertically downwards onto the prism/gasket assembly until it is free of the body casting. See **Fig. 10**.

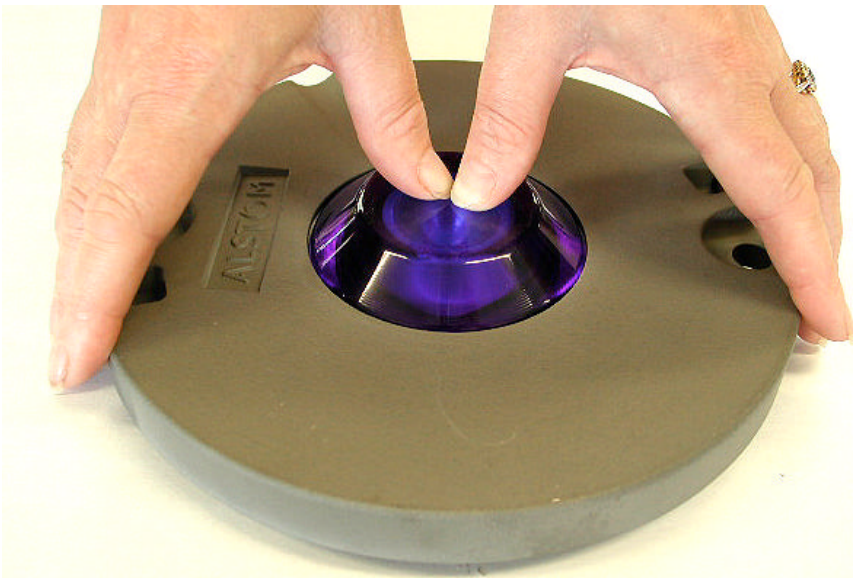


Fig. 10. Removal of prism from body.

- Remove prism gasket (16) and check for damage and/or signs of deterioration. Replace when necessary.

- Check prism (18), both inside and outside surfaces, for contamination, physical damage, chips and cracks. Check sealing around prism dome for obvious signs of physical damage or for evidence of water ingress.

Re-assembly of the prism/gasket assembly is a direct reversal of the dis-assembly with the addition of.

- Apply a rubber lubricant emulsion to the outer surface of the gasket to aid insertion. (e.g. International Products Group P80).

- Ensure that the prism clamp gasket (15) and prism clamp (6) mate with the underside of the body casting (1).

- Tighten prism retaining clamp screws (17) progressively, to a torque of 9.04 Nm (80 lbsf ins). See **Fig. 7.**

NOTE 1. DO NOT OVER TIGHTEN THE PRISM CLAMP RETAINING SCREWS AS THIS MAY CAUSE DAMAGE TO THE PRISM.

5.3.2 BOTTOM COVER GASKET

The bottom cover gasket (4) locates into a recess in the prism body casting (1). See **Fig. 11.**

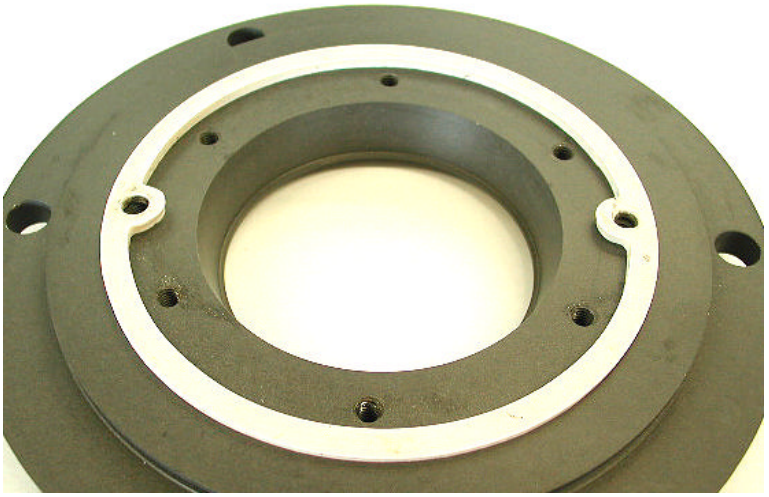


Fig. 11. Gasket in place on the inverted body.

When there is evidence of deterioration or damage, replace the bottom cover gasket.

- Check for seal failure as indicated by contamination of internal components and casting surfaces.
- Remove the bottom cover gasket (4) from its recess in the body casting (1).
- Clean the bottom cover gasket when it is to be re-used or discard as necessary.
- Clean the bottom cover gasket sealing face in the body casting to ensure an effective pressure seal on re-assembly.

5.3.3 REMOVAL & REPLACEMENT OF LAMP, LAMP GASKET AND COLOUR FILTER (WHEN FITTED)

- Pull the lamp retaining spring fingers (23) away from the lamp reflector using two fingers of one hand. With the other hand pull the lamp back until the reflector rim is clear of the prism clamp (6) enabling the lamp (20) to be lifted clear of the clamp. Care should be taken not to touch or otherwise contaminate the bulb of the lamp or reflector surface. See **Fig. 12**.

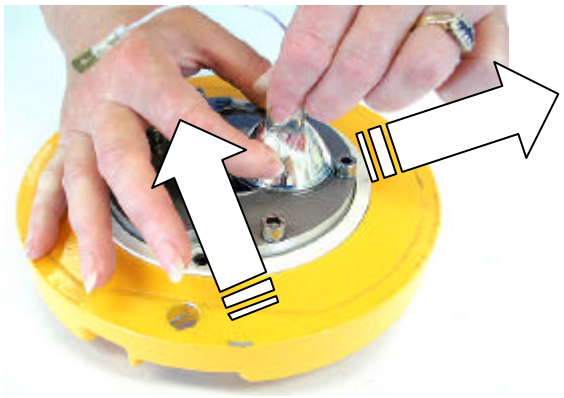


Fig. 12. Remove the lamp.

When colour filters (21) are fitted.

- Release 5 x M6 screws and remove the prism clamp (6)
- Remove filters, (21) by:
  - Push the filters out from the prism side,

  or,

  - Carefully pinch the rim of the lamp gasket with long nose pliars and remove the filter (21) and lamp gasket (22) together. See **Fig. 13**.

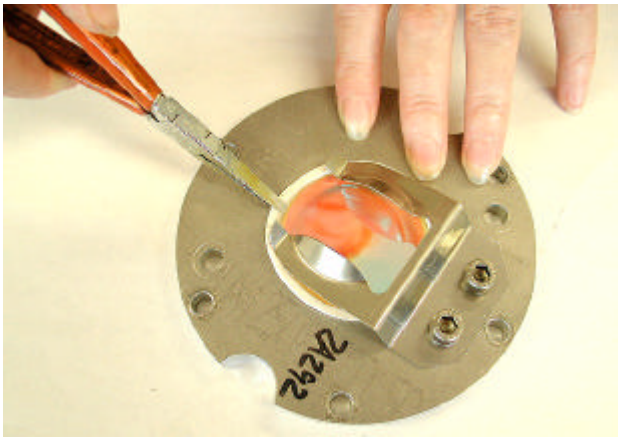


Fig. 13. Removal of lamp gasket (and filter, when fitted).

Re-assembly is the reverse of the dis-assembly procedure, with the addition of:

- Ensure that the lamp gasket (22) is seated correctly in the prism clamp (6) before locating the lamp (20).

5.3.4 LAMP RETAINING SPRING

- Check the lamp retaining spring (23) for damage.
- When it is damaged, remove and replace by releasing the two M6 cap head screws (27).

5.4 BOTTOM COVER ASSEMBLY MAINTENANCE

5.4.1 PLUG LEAD/CABLE GLAND

- Check the cable outer sheath for abrasions, nicks, cuts and cracks, especially where the cable moulds into the connector housing and enters the bottom cover cable gland (3).
- Check for physical or arcing damage to the cable plug pins.
- Check for looseness and evidence of arcing of the cable tail receptacles and overheating of the cable cores.

When there is evidence of water ingress, this may indicate a permeable cable or faulty gland seal. To replace a plug lead proceed as follows:-

- Unscrew the cable gland from bottom cover casting (2) and withdraw plug lead (24) complete with gland assembly. See **Fig. 14.**

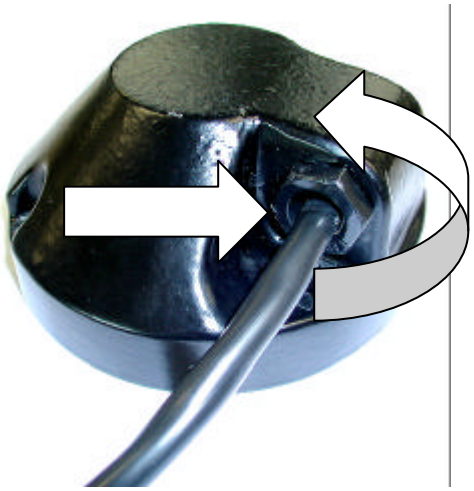


Fig. 14. Removal of lead and cable gland.

- Ensure that the cable entrance hole in the bottom cover casting (2) is free from debris.

DO NOT REPAIR POWER LEADS, a completely new gland assembly and lead must be used.

Assemble a new power lead by:

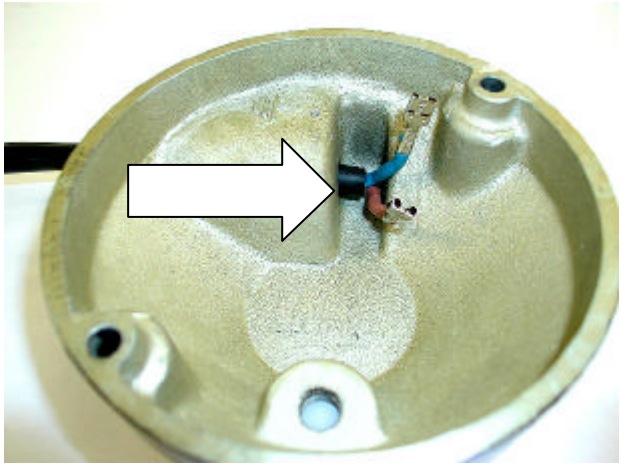


Fig. 15. New power lead and cable gland assembly.

- Assemble the gland components onto the plug lead cable, with 80 mm of cable protruding. The order in which components are assembled is gland nut, nylon washer and compression bush.

- Assemble the cable through the cable entry hole in the bottom cover casting (2) until the outer sheath projects approximately 5mm into the inner chamber of the bottom cover. See **Fig. 15**.

- Tighten gland nut fully into cable entry hole to create a watertight seal. (A pressure test will be conducted in section 5.6).

5.5 RE-ASSEMBLY OF BOTTOM COVER ASSEMBLY AND BODY ASSEMBLY

Re-assembly of the light unit described here is the reverse of the dismantling process.

It is assumed that any faulty components have been replaced and re-wired correctly as described in previous sections.

- Place the body casting assembly on the work surface, top surface downwards.

- Assemble the bottom cover gasket (4) correctly into recess in the body casting.

- Reconnect lamp spade terminals to plug lead receptacles ensuring that electrical connections are tight.

- Re-assemble the PTFE insulation sleeve, (to ensure that no electrical shorting occurs when body and base are re-assembled).

- Re-assemble the base assembly (2) or (7) to the body.

- When base (2) is used, re-assemble two M6 cap head screws (5) with crinkle washers progressively, to a torque of 6.8Nm (60 lbf ins).

or

- When base part (7) is used, re-assemble 4 M4 countersunk screws (9) and tighten.

5.6 AIR PRESSURE TEST

5.6.1 Standard 2 hole body with the bottom cover casting (2)

Undertake an air pressure test on the complete fitting. See **Fig. 16**.

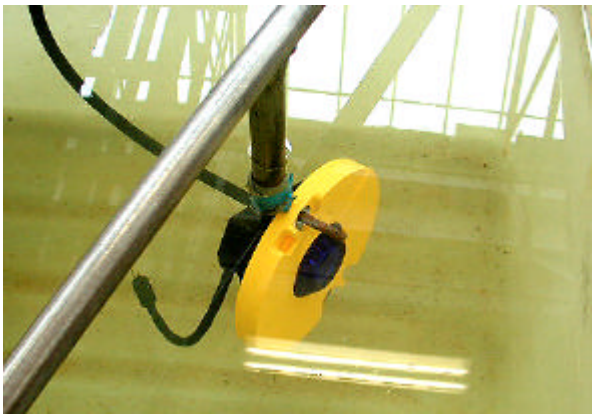


Fig. 16. Air Pressure Test in a water tank.

- Attach a compressed air line to the test plug hole of the fitting, using a 1/8" BSP adaptor.
- Apply an air pressure of 350 mbar (approx 5 p.s.i.) to the fitting and immerse in a tank of clean water.
- Check for the emission air bubbles from the area around the rim of the bottom cover casting (2), prism sealing gasket (16), and the gland assembly (3).
- When a satisfactory air pressure test is completed, re-assemble the nylon pressure test plug (25). **DO NOT OVER TIGHTEN TEST PLUG.**

5.6.2 SRA 3 hole body with The Bottom Cover Spinning (7)

Proceed as section 5.6.1 with the addition of:

- Ensure that the bottom cover is free from any damage. See **Fig. 17**.

Fig. 17. SRA type bottom cover in good condition.

- Check that the seals around the glands are in good condition, When necessary use silicone sealant on the mating surfaces.
- Ensure that the sealing gasket (14) is fitted correctly and that the stainless steel clamp ring (8) is fitted.
- Ensure that the 4 x M4 countersunk screws (9) have been progressively tightened.

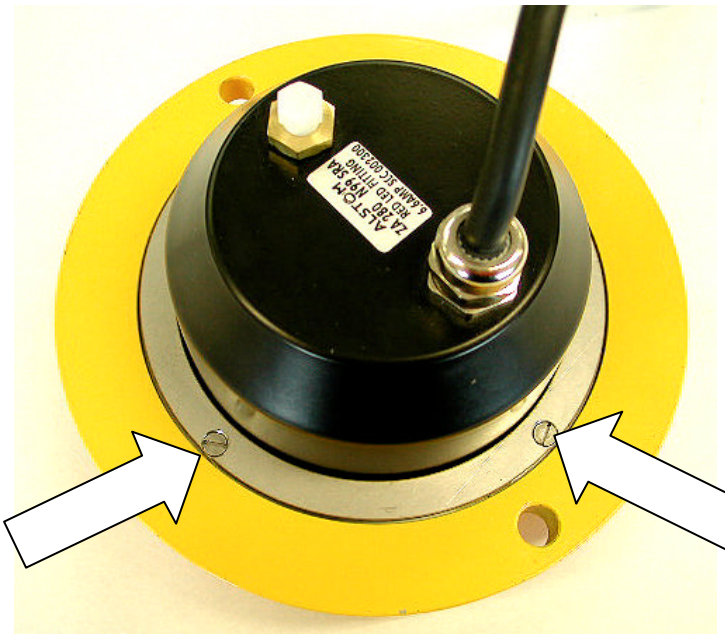


Fig. 18. SRA type bottom cover fitted.

6. SPARES

6.1 SPARE PARTS ORDERING

When ordering **spare parts** refer to the parts schedule and identify items required by stating:

Fitting type (see ordering code below)
Item description
Part no. or stock list code
Quantity required.

To place order or obtain price information please telephone or fax your requirements to:-

ALSTOM T&D Ltd. Power Conversion.
Airports Division
Boughton Road
Rugby
Warwickshire
CV21 1BU

Contact: Customer Support Section
Tel No: (01788) 563339 (Int. + + 44 1788 563339)
Alternative: (01788) 563501 (Int. + + 44 1788 563501)
Fax No: (01788) 563761 (Int. + + 44 1788 563761)

6.2 FITTING OPTION ORDERING CODES

When ordering **spare fittings** identify those required by using the following ordering code:

6.3 CREATING A FITTING CODE INSTRUCTION.

1. From Main Schedule 'A', select the required light colour, or application of the fitting, and then the associated table No. (i.e. Taxiway edge = table 2)
2. From chosen table, select body style, coloured or clear prism dome, filter, lead type, by-pass/connector option and lamp wattage.
3. Compare with standard option or default option (which has no code)
4. Define the Fitting Code.

Using the parts list:

1. Part 1 — Select prism dome colour/filter arrangement.
2. Parts 4-17, — Select body/bottom cover style, note that these are separated by two columns of parts.
3. Part 22 — Select lamp rating.
4. Parts 30-32 — Select by-pass options.

MAIN SCHEDULE 'A'

Fitting Code	Light Colour	Application	Table Number
ZA291	Red	L. I. Runway End	1
ZA292	Blue	Taxiway Edge	2
ZA293	Clear	Circular Guidance	3
ZA295	Green	L. I. Threshold	4
ZA297	Green/Red	L. I. Threshold/End	5
ZA298	Yellow	Taxiway Intersection	6
ZA299	Yellow	Helipad	7
ZA29X	Any	General Light	8

TABLE 1

Product Title: ZA291		**Application: L.I. End**				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard SRA (S) IEC (1)	Red (r) Clear (c)	Red Filter	B-type Earth (E)	Bypass (BP)	105W 49W 36W 30W
Standard Unit						
ZA291	Standard	Red (r)		B-type		30W

Standard Unit with Options						
ZA291	(N/I)	C	B	E	BP	49W
ZA291	= standard body + blue dome + 30 watt lamp					
ZA291S.C.R.E.BP.105	= SRA body + clear dome + red filter + earth lead + bypass + 105W lamp					

TABLE 2

Product Title: ZA292		Application: Taxiway Edge				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard SRA (S) IEC (1)	Blue (b) Clear (c)	N/A Blue (b)	B-type Earth (E)	Bypass (BP)	105W 49W 36W 30W
Standard Unit						
ZA292	Standard	Blue (b)		B-type		30W

Standard Unit with Options						
ZA292	(N/I)	C	B	E	BP	49W
ZA292	= standard body + blue dome + 30 watt lamp					
ZA292.S.C.B.E.BP.49	= SRA body + clear dome + blue filter + earth lead + bypass + 49W lamp					

TABLE 3

Product Title: ZA293		Application: Inset Runway Edge Circular Guidance				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard SRA (S) IEC (1)	Clear (c)	No Filter	B-type Earth (E)	Bypass (BP)	105W 49W 36W 30W
Standard Unit						
ZA292	Standard	Clear (c)		B-type		30W

Standard Unit with Options	
ZA293	= standard body + clear dome + 30 watt lamp
ZA292.S.C.N.E.BP.49	= SRA body + clear dome + earth lead + bypass + 49W lamp

TABLE 4

Product Title: ZA295		Application: L1 Threshold				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard SRA (S) IEC (I)	Clear (c) Green (g)	Green	B-type Earth (E)	Bypass (BP)	105W 49W 36W 30W
Standard Unit						
ZA295	Standard	Green (g)		B-type		30W

Standard Unit with Options	
ZA295	= standard body + clear dome + 30 watt lamp
ZA295.S.C.G.E.BP.105	= SRA body + clear dome + green filter + earth lead + bypass + 105W lamp

TABLE 5

Product Title: ZA297		Application: L1 Threshold/End				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard SRA (S) IEC (1)	Clear (c)	Green (g) Red (r)	B-type Earth (E)	Bypass (BP)	105W 49W 36W 30W
Standard Unit						
ZA297	Standard	Clear (c)	Grn (g) + red (r)	B-type		30W

Standard Unit with Options	
ZA297	= standard body + clear dome + green half + red half filter + 30 watt lamp
ZA297.S.E.G.R.BP.105	= SRA body + clear dome + green half + red filter + earth lead + bypass + 105W lamp

TABLE 6

Product Title: ZA298		Application: Taxiway Intersection				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
L-852F = 49W L-852F = 105W	Standard	Clear (c)	Yellow (y)	B-type	Bypass	49W 105W
Standard Unit						
ZA298 (L-852E) =	Standard					49W

Standard Unit with Options	
ZA298 (L-852F)	= standard body + clear dome + yellow filter + 105W lamp
ZA298.BP.105	= standard + clear dome + yellow filter + bypass + 105W lamp

TABLE 7

Product Title: ZA299		Application: Heli-Deck				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard SRA (S) IEC (1)	Clear (c) Yellow (y)	Yellow (y)	B-type Earth (E)	Bypass (BP)	105W 49W 36W 30W
Standard Unit						
ZA299	Standard	Clear (c)	Grn (g) + Red (r)	B-type		49W

Standard Unit with Options	
ZA299	= standard body + yellow dome + 49 watt lamp
ZA295.S.C.Y.E.BP.105	= SRA body + clear dome + yellow filter + earth lead + bypass + 105W lamp

TABLE 8

Product Title: ZA29X		Application: General Light				
Features	Body Style	Prism Colour	Filter Colour	Lead Type	Con. Block	Lamp
	Standard	Clear (c) Red (r) Yellow (r) Green (g) Blue (b)	Red (r) Yellow (y) Green (g) Blue (b)	B-type Earth (E) Mains	No Bypass (BP) HV Connector	12V 240V 120V
Standard Unit						
ZA29X	Standard	Clear (c)				

Standard Unit with Options	
ZA29X	= standard body + Clear dome + 240V lamp
ZA29X.S.C.Y.12 volt	= SRA body + clear dome + yellow filter + 12V lamp

SPARE PARTS SCHEDULE FOR ZA290 SERIES

Key To Abbreviations:

ALT = Alternative ST.STL = Stainless Steel
C'sunk = Countersunk

Item No.	Qty. per fitting		Part No.	Stock List Code	Description
	Standard & IEC Body (2 hole)	SRA Body (3 hole)			
1	1	-			Body Casting (Std) – Golden Yellow
ALT	1	-			Body Casting (IEC) - Golden Yellow
ALT	-	1			Body Casting – Golden Yellow
ALT	-	1			Body Casting – NATO Green
2	1	-	29014 A		Bottom Cover Casting
ALT	1	-	29014 B		Bottom Cover Casting (Earth Point)
3	1	-	Cat no. 305	21114/5/6	Elkay Gland Set
ALT	-	1	Cat no. 251	21330	Elkay Gland Set
4	1	-	29023 B	33080	Bottom Cover Gasket
5	2	-			M6 x 25 Socket Head Screw ST.STL
6	1	-	29038 E	21307	Prism Clamp
ALT	-	1	29038 G	21308	Prism Clamp
7	-	1			Bottom Cover Spinning
8	-	1	29045	21311	Bottom Cover Spinning Clamp
9	-	4			M4 x 10 C'Sunk Screw ST.STL
10	-	1		21333	Reducer MXF ¼" x 1/8" BSP
11	-	1		21334	Bulk Head Locknut ¼"
12	-	1			Reducer Seal Washer
13	-	1	Cat no. 93	21331	Lock Nut
14	-	1	29066	33093	Body/Base Gasket
15	1	1	29039 E	33058	Prism Clamp Gasket
16	1	1	29027	33090	Prism Gasket
17	6	6			M6 x 20 Socket Head Screw ST.STL
18	1	1	29025 B	19180	Blue Prism Dome
ALT	1	1	29025 C	16077	Clear Prism Dome
ALT	1	1	29025 G	19183	Green Prism Dome
ALT	1	1	29025 Y	19181	Yellow Prism Dome
ALT	1	1	29025 R	19182	Red Prism Dome
19	1	1	29033	28051	Reflector
20	1	1		08033	30W 6.6A Reflector Lamp
ALT	1	1		08081	36W 6.0A Reflector Lamp
ALT	1	1		08065	49W 6.6A Reflector Lamp
ALT	1	1		08072	105W 6.6A Reflector Lamp
ALT	1	1		08084	50W 110/120V Reflector Lamp
ALT	1	1		08086	50W 240V Reflector Lamp

Item No.	Qty. per fitting		Part No.	Stock List Code	Description
	Standard & IEC Body (2 hole)	SRA Body (3 hole)			
21	1	1	29030 AR	19155	Red Filter
ALT	1	1	29030 AB		Blue Filter
ALT	1	1	29030 AG	19156	Green Filter
ALT	1	1	29030 AY	19157	Yellow Filter
ALT	1	1	29030 BR	19158	Red Half Filter
ALT	1	1	29030 BG	19159	Green Half Filter
22	1	1	28877	33077	Lamp Gasket
23	1	1	28825	32039	Lamp Retaining Spring
24	1	1	10453 A	13001	'B' Type Plug Lead
ALT	1	1			3 Core Earth Lead
ALT	1	1	29075		PTFE Lead 'B' Type
25	1	1	28934	21256	Pressure Test Plug
ALT	1	1	14039		Schreider Tank Valve
26	10	10			M6 Crinkle Washer ST.STL
27	2	2			M6 x 8 Socket Head Screw ST.STL
28	1	1	28848		By-Pass Block Assy
29	2	2	28849		Insulated Mounting By-Pass
30	1	1	27752		PTFE Sleeving 450 Lg x 6.81 ID
31	1	1	850/2854		Lampholder (12V Lamps)
ALT	1	1	844		Lampholder (240V Lamps)
32	1	-	BK3		3 Pole Connector Block
33	1	-			M3 X 20 Cap Head Screw ST.STL
34	1	-			M3 Washer ST.STL
35	1	-	28983		M20 Gland Nut ST.STL
36	1	-	28984B		High Temperature Comp Bush
37	1	-	28985A		PTFE Skid Washer

N.B. item **21** used with clear prisms only, items **28 – 37** not illustrated.

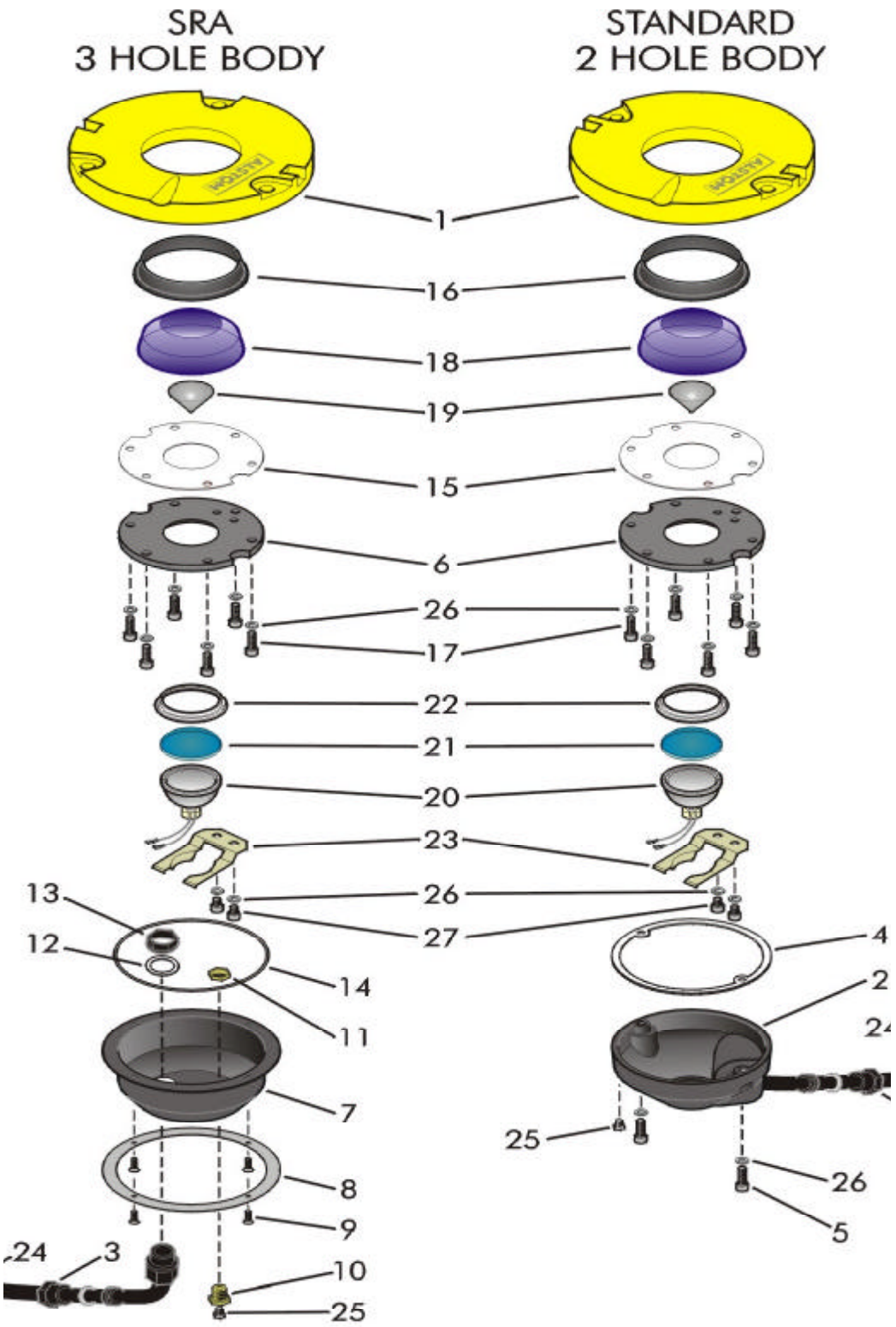


Fig. 19. Exploded view of 2 & 3 hole styles of ZA290 series fittings.

APPENDIX 'A' - SAFETY ADVICE

1. COMPLIANCE WITH INSTRUCTIONS IN THIS MANUAL

The purchaser/user is advised to comply with the instructions and information in this manual and ensure that all personnel to be associated with the apparatus under this contract are made familiar with the information contained herein.

2. GUIDANCE NOTES FOR USERS ON THE SAFETY OF PERSONNEL

Every employer shall ensure that his employees are informed, trained and supervised and use a safe system of work to ensure their safety. He is advised to comply with the information provided, to maintain the plant in a safe condition.

Electrically skilled personnel may have to gain access to apparatus, which is not completely isolated. The burden of responsibility, for the safety of such personnel carrying out the work, rests on those under whose authority they act.

3. INSTALLATION, OPERATION AND MAINTENANCE

The purchaser/user is advised to ensure that each piece of apparatus supplied to the purchaser's order is correctly installed, in a suitable location, by technically qualified and competent persons experienced in the class of work involved. The rules for ensuring the safety of personnel can be summarised as follows:-

During normal use, ensure that plant operators:-

- are fully conversant with all controls, particularly those for emergency shut down,
- comply with safety warning notices and keep all enclosures shut,
- are trained to recognise signs of maloperation and know what action to take in the event of trouble or difficulty.

During Maintenance, Testing etc., ensure that only suitably skilled persons are permitted to carry out work and that they:-

- comply with user's safe system of work and safe working procedures,
- isolate the apparatus completely, where possible, before opening enclosures and starting work,
- are conversant with the information provided particularly on measures relating to their safety,
- recognise the hazards which can arise when working on live apparatus and take all the necessary precautions,
- comply with all local safety regulations.

4. VOLTAGES GREATER THAN 50V A.C./120V D.C.

The purchaser/user is advised to ensure that apparatus operating on a voltage greater than 50V a.c./120V d.c. is isolated and made safe before any work is carried out upon it.

5. APPARATUS SUPPLIED AS LOOSE ITEMS, CHASSIS ETC.

The purchaser/user responsible for installing such apparatus is advised that, when live, it could constitute a safety hazard and relevant safety procedures are necessary.

6. ACCESS TO THE APPARATUS DESCRIBED IN THIS MANUAL

It is the purchaser's/user's responsibility to ensure that all personnel obtaining access to the apparatus are competent and work in accordance with the user's safe system of work

Record of Personnel made aware of Safety Advice.

Position/Job Title: ……

Signature: ……

Date: ……