Product Safety Notice – Evolution Floodlight

Recently there have been a small number of DNA branded capacitor failures involving the Chalmit Evolution, three of which have been serious. Two of the incidents have been when the product has been used significantly out-with its design operating parameters and in the third incident the cause is inconclusive as yet.

Chalmit Lighting has therefore, after rigorous investigation and testing, concluded that this fault could potentially affect HID Evolutions sold prior to March 2003.

Under certain conditions the power factor correction capacitor can fail within its Ex'd' screwed flame path chamber inside the Ex 'e' enclosure. In the unlikely event of capacitor failure, it can fail either passively which has been the case in all but the three above reported failures, or it can fail destructively. In the latter, the capacitor breaks down resulting in a build up of pressure forcing the screwed cap out of the chamber and in extreme situations shattering the outer Ex'e' cover.

We wish to advise all users of Evolution luminaires purchased prior to March 2003 to inspect and replace the existing capacitors with the current type (fitted since March 2003) which are of a different design, incorporating a fail-safe mechanism.
Replacement capacitor assemblies will be supplied by Chalmit free of charge.

Where there are immediate concerns it is advisable to disconnect the capacitor.

The Evolution luminaire like other products in the Chalmit range is certified to be used with or without capacitors, for instances where users are aware of high or uncontrollable harmonics.

This safety alert and free of charge replacement components applies only to
Chalmit Evolution 150W, 250W and 400W HPS and MBI versions (not 600W).
No other Chalmit product is affected.

For further information or to order replacement capacitors please contact:
+44 (0)141 810 9644 or contact techsupport@chalmit.com
Please provide the luminaire quantities, serial number, wattage and original purchase order number if known.

Full description of problem

Chalmit Lighting has identified a potential problem relating to DNA branded power factor correction capacitors fitted within the Evolution Ex'de' Zone 1 range of luminaires.

The incidence of luminaires which have been found to contain faulty capacitors is extremely low. Chalmit Lighting has produced in excess of twenty thousand Evolutions since 1997. The number of capacitors which have failed destructively has so far numbered only three.
Chalmit Lighting is totally committed to safety and as such offers free replacement capacitors for all Chalmit Evolution luminaires manufactured before March 2003. Due to a design change, all Evolutions after this date are fitted with a different design of capacitor, containing a disconnect feature, which prevents this type of fault occurring.

Luminaires affected
Power factor correction capacitors are fitted only to HID (High Intensity Discharge) models of 150W, 250W and 400W. The 600W version is a slave unit and does not contain any capacitors. Both HID lamp types, HPS (High Pressure Sodium) and MBI (Metal Halide) are potentially at risk as they use the same control gear design. 600W (HPS) versions and Tungsten Halogen (TH) versions do not contain power factor correction capacitors and are not subject to this safety alert.

Luminaires supplied direct from Chalmit Lighting after 1st March 2003 are not subject to this safety alert, however luminaires supplied by a stockist or distributor after this date may be of an older type and the date of manufacture should be confirmed. Any luminaire manufactured after 1st March 2003 will have a serial number higher than **W0066134**. If you are unsure of the date of manufacture please contact Chalmit Lighting for guidance, quoting the serial number of all luminaires.

The luminaire wattage, lamp type and serial number can be found on the nameplate which is located on the Ex'e' chamber lid as shown below in figure 1.

figure 1

The required information is contained in the nameplate as shown below in figure 2.
Note:- on earlier models the nameplate is circular.

figure 2

Fault Description

The Chalmit Evolution has an Ex'e' chamber at one end of the luminaire. This chamber contains the mains incoming terminals, the ballast and electrical connections. It also affords access to the lampholder assembly and the power factor correction capacitor which is enclosed within an Ex'd' chamber. See figure 3 below.

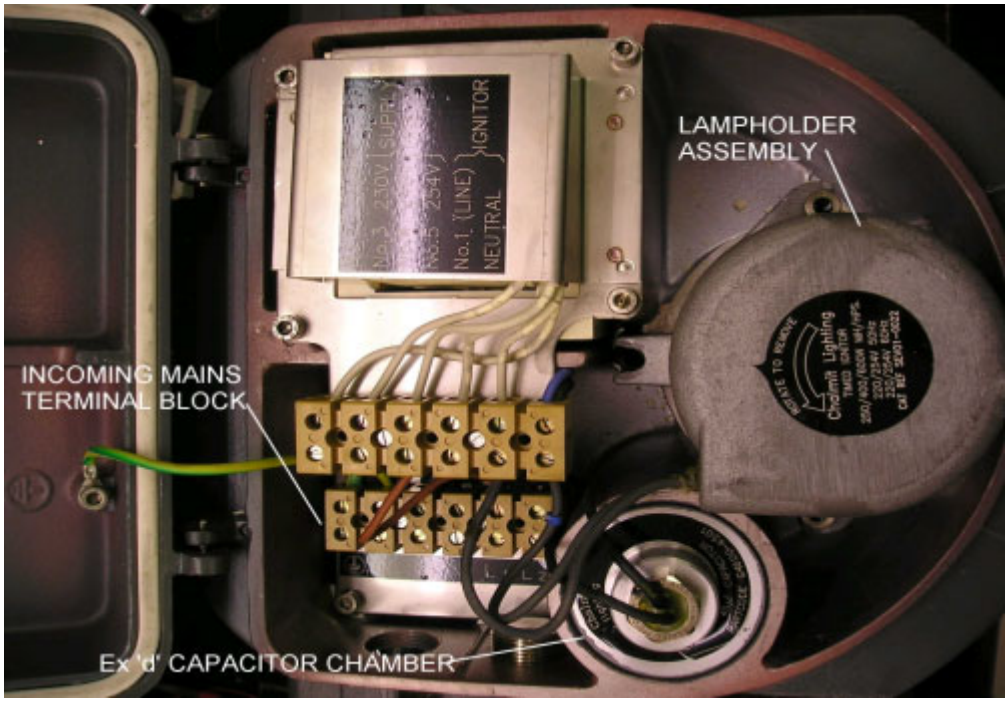


figure 3

Under certain conditions the power factor correction capacitor can fail within its Ex'd' screwed flame path enclosure inside the Ex 'e' chamber. The most likely cause of failure is thought to be abnormal voltage conditions out-with the specified operating parameters. Extensive testing has been carried out on both new and aged capacitors under laboratory conditions and the results are consistent with this theory.

As actual site conditions can vary enormously by location and also during different time periods other causes cannot be ruled out.

The DNA capacitor in question is of the self healing type and is encapsulated within a plastic case which in turn is assembled onto the capacitor cap. This cap has a threaded flamepath which is screwed into the capacitor housing. See figure 4 below.

figure 4

Where the capacitor has failed passively, this causes the metalised film within the capacitor to short circuit. Heat generated by this allows the encapsulation material to expand and flow from the plastic case as shown in figure 5.

Generally the short circuit will either self heal or will fail safe due to the electrical connection breaking at the film connection. This has been the experience in the majority of cases with the exception of the three destructive failures.


figure 5

In the case of the three destructive failures, the electrical connection was not severed and the heat build up caused pyrolisation of the polymeric carrier. The pyrolised film ruptured through the plastic case of the capacitor. If this occurs near the top of the capacitor then this material can block the threads of the flameproof cap preventing venting of any pressure being built up within the chamber.

Under laboratory conditions it is possible to recreate a situation where the electrical connection can be maintained to the metalised film. The resultant short circuit then vapourises polymeric material causing a rapid increase in pressure within the chamber. In extreme cases this could cause the threaded cap to be expelled from the chamber with sufficient force to shatter the Ex'e' chamber cover.

Required Action

1. The power circuit of the floodlight should be isolated and the area containing the floodlight should be confirmed to be free of flammable gases. Isolation is achieved by disconnecting and separating the electrical circuit from every source of electrical energy. Any stored energy in the electrical circuits should be discharged taking particular care with batteries and capacitors. For further guidance see the HSE publication, "Memorandum of guidance on the Electricity at Work Regulations 1989.

2. Using the guidance notes above, determine the type of capacitor fitted.

3. If concerns exist as to the condition of the electrical supply, it is recommended that the power factor correction capacitor is disconnected immediately.
This should be carried out as follows:
a) Disconnect the two capacitor cables from the relevant terminals ensuring that the terminals are properly tightened after removal.
b) Using an appropriate tool cut the capacitor cables as close as possible to the capacitor cap and remove the cables.

4. Contact Chalmit lighting by telephone or email using the contact details given at the end of this document and provide the required information to allow Chalmit to despatch replacement capacitor assemblies.

5. On receipt of the replacement capacitor assemblies, identify the correct assembly to be fitted relevant to the luminaire wattages as detailed below:

Luminaire Wattage	Capacitor Value	Replacement Partcode
150W	20uf	PEVOC-0001
250W	30uf	PEVOC-0002
400W	40uf	PEVOC-0003

6. Remove the existing capacitor assembly from the Ex'd' chamber using an adjustable spanner/wrench and inspect chamber.

7. Screw the replacement capacitor assembly into the Ex'd' chamber until hand tight. Using a suitable spanner/wrench tighten the assembly a further quarter turn clockwise.

8. Connect the capacitor cables to the live and neutral terminals as shown in figure 6.
(Note: different wiring arrangements are employed depending on the ballast type. This can be easily identified with reference to the wiring diagrams in figure 6.)

9. Check that all other connections within the Ex'e' chamber are secure and close the cover.

10. Tighten centre cover screw using an appropriate hexagon key.

11. No specialised training needs to be carried out before this capacitor change is carried out although it should be done by a competent electrician with the luminaire isolated and, if carried out with the luminaire in place, under a permit to work.

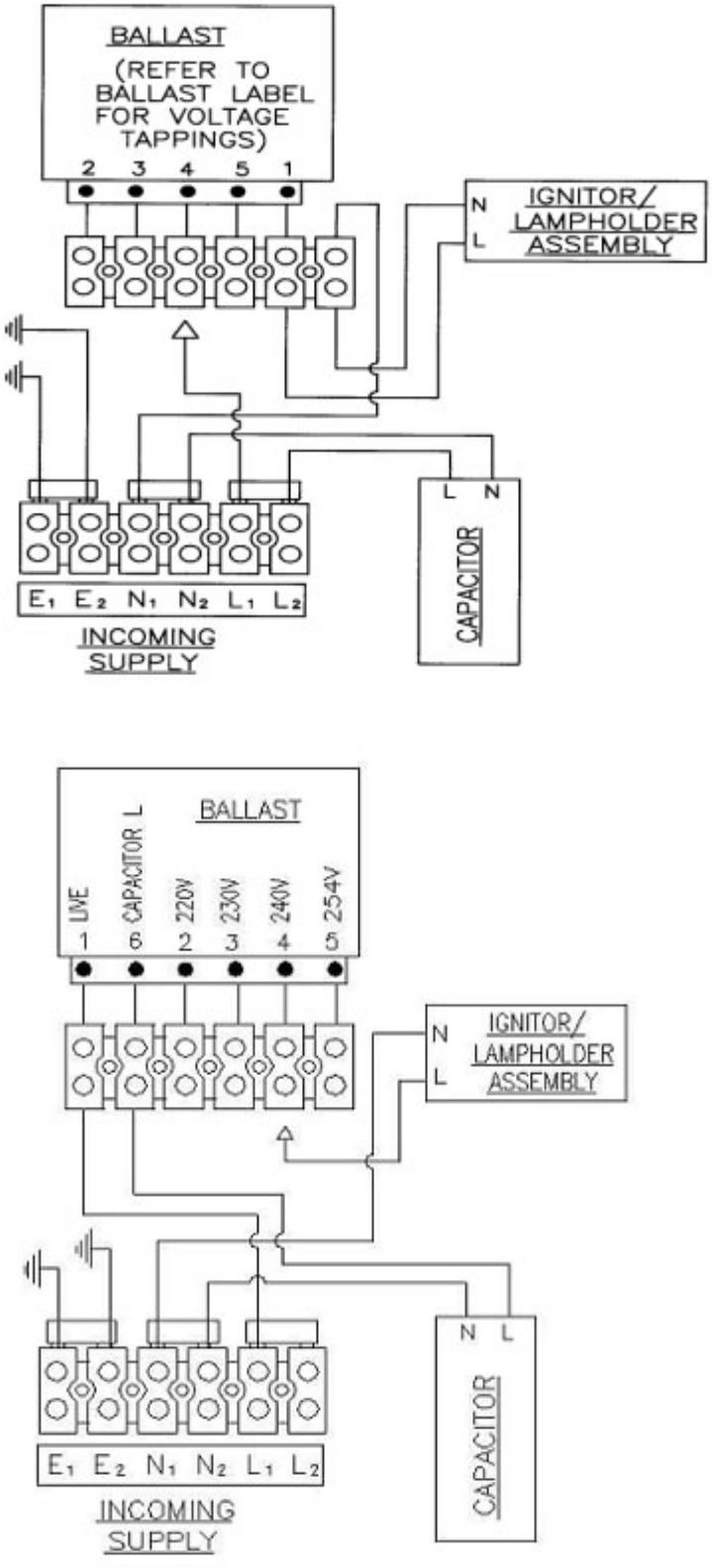
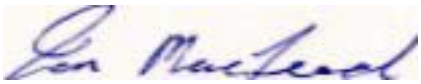

BALLAST
(REFER TO BALLAST LABEL FOR VOLTAGE TAPPINGS)
2 3 4 5 1
N
L
IGNITOR/ LAMPHOLDER ASSEMBLY
L N
CAPACITOR
E1 E2 N1 N2 L1 L2
INCOMING SUPPLY
BALLAST
LIVE
CAPACITOR L
220V
230V
240V
254V
1 6 2 3 4 5
N
L
IGNITOR/ LAMPHOLDER ASSEMBLY
N L
CAPACITOR
E1 E2 N1 N2 L1 L2
INCOMING SUPPLY

figure 6

This safety alert and the associated offer of free replacement capacitor assemblies is a voluntary action by Chalmit Lighting, made in the interest of good safety practices, and there is no statutory duty on Chalmit Lighting in relation to this alert.

As stated earlier, if any further information is needed, please contact us via the following dedicated email address: techsupport@chalmit.com or by telephone on: +44 (0)141 810 9644.



Ian MacLeod

Technical Manager