



Ellison Air Circuit Breakers

Justification for ACB Retrofits

ACBs are the central and most important component of most low-voltage electrical switchgear installations. Failures can have catastrophic consequences including:

- Operator injury/Death
- Complete switchboard destruction
- Damage to surrounding equipment
- Business closure

Things to ask yourself.....

- Is your installation really safe to operate?
- Will your ACB operate correctly in the event of a fault?
- Can your business afford to shut down for weeks whilst new equipment is manufactured?
- Is your business relying on obsolete and unmaintained circuit breakers?
- How would you explain a failure when your business is interrupted?
- Would you be personally criticised in the event of a failure?
- Can you obtain reliable spares for your installations?
- Would you lose your job in the event of a failure?
- Are you still insured?

Low-Voltage Power Circuit Breaker failures can have Catastrophic Consequences

The Ellison range of GEA and ABDO Air Circuit Breakers have proven to give good service for many years but their replacement should be considered as a matter of importance **now** for the following reasons:

1. Every Ellison GEA or ABDO type ACB in service today has passed its designed service life. All of the internal mechanisms, springs, contacts, insulation and conductors are operating beyond the limits to which they were originally designed.
2. In the event of any overload or short-circuit condition, the correct operation of the trip relay or oil dashpots cannot be relied upon – see separate notes regarding CPR relay.
3. In the event of the ACB being called upon to clear a fault, the speed and effectiveness of the ACB clearing the fault cannot be guaranteed. There have been a number of instances that we are aware of whereby the ACB has operated too slowly which has resulted in danger to the operator and considerable damage to the ACB and surrounding equipment.
4. There is a lack of spare parts and more importantly a lack of the knowledge and skills required to fit spare parts if they are found.
5. Even if these ACBs are serviced we would not guarantee their ongoing operation.
6. Many GEA and ABDO ACBs contain asbestos arc chutes.
7. In the event of any failure resulting in injury or damage, any insurance claim would be extremely difficult to justify if the business is reliant upon obsolete equipment.



8. There is no direct equivalent ACB available quickly in the event one is required. Any replacement will require manufacturing – a process that will take some time.
9. After replacement by one of our retrofit systems, the ACB will be of a modern, currently manufactured type which is widely available even if it is not us that supplies it. An ACB of the correct type would then be simple to replace if required.

As well as addressing the above points, an ACB retrofit can also bring additional benefits over and above any like-for-like replacement.

1. The new ACB will be fully serviceable using modern techniques such as injection testing units.
2. Spares will be fully available.
3. Additional metering functions can be added easily such as communications options and multi-meter functionality.
4. Additional control functions can be integrated such as remote operation for arc-mitigation or automatic change-over controls.
5. Interchangeability of ACBs and components can provide simplified spares requirements.
6. The improved reliability of modern ACBs allows for a reduced maintenance regime (subject to site conditions)
7. The **exellison** Complete Retrofit solution is a fully modular system that can be tested prior to its installation – including metering and controls.

The **exellison** ACB replacement is a unique solution to the replacement of air circuit breakers. The design utilises modern ACBs which are more compact than the older ACBs. This allows a framework to be built which incorporates everything necessary to guarantee a first-time fit replacement. The **exellison** solution replaces the entire ACB **including the fixed cassette racking mechanism and isolating contacts**.

As we know the volume taken by the existing ACB and the position of the ACB connections relative to the existing panel and support steelwork we are able to construct an assembly utilising a modern ACB and all of the necessary copperwork and CTs within this known space. The copperwork is manufactured to exactly align with the connection points of the old ACB. This guarantees that the assembly will fit every time. The application of the ACB is irrelevant as the switchboard copperwork position will remain the same.

The assembly is arranged such that a skid is provided to allow simple insertion of the new assembly and to ensure correct alignment with the existing busbar system. The unit delivered to site is fully assembled and tested at our works including all CTs, meters, fuses and controls. We also include a terminal rail positioned to pick up the existing wiring loom so that any existing control scheme such as a change-over system is retained and will operate exactly as it did with the old breaker.

The whole assembly is jig aligned and fully wired and tested at our works prior to delivery. Witness testing is always encouraged.

Only **exellison** have the necessary knowledge and experience to provide this unique and proven solution.

Please see the following illustrations for more information.....

exellison

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Main switchboard at Aberdeen Hospital requiring ACB retrofits.....

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The same switchboard following the completion of 6 ACB retrofits. The panel operated correctly first time including metering and the complex change-over scheme.

'As a consulting engineer tasked by Grampian NHS Trust with renewal of circuit breakers spread over three hospitals in Aberdeen, I have to say I did anticipate a nerve-wracking time given the critical nature of the installations with regard to acute patient care.'

'Looking back I can honestly say that the works were carried out better than I dared hope. To have some 16 air circuit breakers replaced in-situ without a glitch was a real achievement, especially considering the complex control circuitry involved with mains/generator change-over controls etc.'



This photograph shows 21 of 43 ACB retrofits completed at a UK data center. In this case Schneider ACBs were utilized.

WARNING

The danger of retaining old cluster contacts and springs.

It has come to our attention that there are ACB replacements on the market that utilise an old ACB chassis whilst mounting a new FIXED ACB on to it. The old chassis then plugs into the existing cluster contacts.

THE OLD CLUSTER CONTACTS AND CONTACT SPRINGS ARE PART OF THE FIXED CASSETTE AND ARE NOT REPLACED .

We are of the opinion that an ACB replacement should replace all of the old parts including old cluster contacts and springs. The exellison COMPLETE replacement introduces a new truly fully withdrawable ACB including the fixed cassette. Simply plugging in a new front does not replace critical components.



Old cluster contacts and springs shown with chassis removed for clarity.

exellison's COMPLETE ACB replacement provides a new withdrawable cassette as we go right back to the busbars.

Plugging in a new ACB into an old chassis only does half the job!



You don't want your ACB cassette to end up like this after a plug-in retro-fit ACB.....