

Use and Benefits of Standards

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- **Crouzet Aerospace and Defense**
 - Facts and Figures
 - Product lines Aerospace and Defense
- **DIN Committees – Crouzet Fields of Activity**
 - NA131-04 FBR “Electrics, Avionics“
 - NA131-04-01AA "Electrical Power Supply"
 - NA131-04-05AA "Switches, Relays, and Electrical Protection Equipment”
 - NA140-00-08AA "Circuit Breakers"
- **Crouzet Advantages working within DIN**
 - Working directly with OEM's
 - Testing ground for Crouzet innovation
 - Securing Company Growth
- **New PrEN Standard – Innovation at Work!**
 - Standardizing PCB mountable circuit breakers

Over 50 Years of Experience

Historical partner and proven expertise in aeronautics

Crouzet Automatismes has been producing **High Performance Aerospace components** for over forty years and has secured a leading role in three Product lines dedicated to aerospace applications:

- **Detection and Sensing:** Limit switches, Proximity switches and sensors
- **Electrical Protection and Distribution:** Circuit Breakers & Circuit Breaker panels, Solid State Power Controllers
- **Cockpit Equipment:** Control Wheels, Helicopter grips, buttons

Aerospace and Defense Product Lines



Detection and Sensing

- Limit switches, proximity switches & proximity sensors: 3 technologies available whatever the application



Electrical Protection

- A complete range of circuit breakers and modular panels to optimise your total performances



Cockpit Equipment

- Feeling, ergonomics, tactile effects, electrical functions: each program requires numerous parameters

Crouzet Fields of Activity within DIN

Electrical Protection



Detection and Sensing



Active participation in standardization allows us to...

- place our own technology on the market
- understand the requirements and trends of the market
- evaluate the strengths and weaknesses of our competitors
- network directly with OEMs
- create innovative solutions for our customers

A Standard is the Baseline for New Business



Standardizing Crouzet PCB mountable Circuit Breakers



➤ Crouzet → Innovation at work!



USE AND BENEFITS OF STANDARDS :

« Plugging Circuit breakers for panels using Printed Circuit boards (PCB) technology »

EN3773-006

ILA BERLIN 2012

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Crouzet Aerospace

Crouzet Aerospace

OUTLINE :

- 1- Draw backs of traditional circuit breaker panels
- 2 - Benefits of the « plug in » circuit breaker EN3773-006
- 3 - Actual designs
- 4 – What the standard brings to the community



EN 2996
EN 2995



New

« EN 3773-006 »
« FASTON PLUGIN »

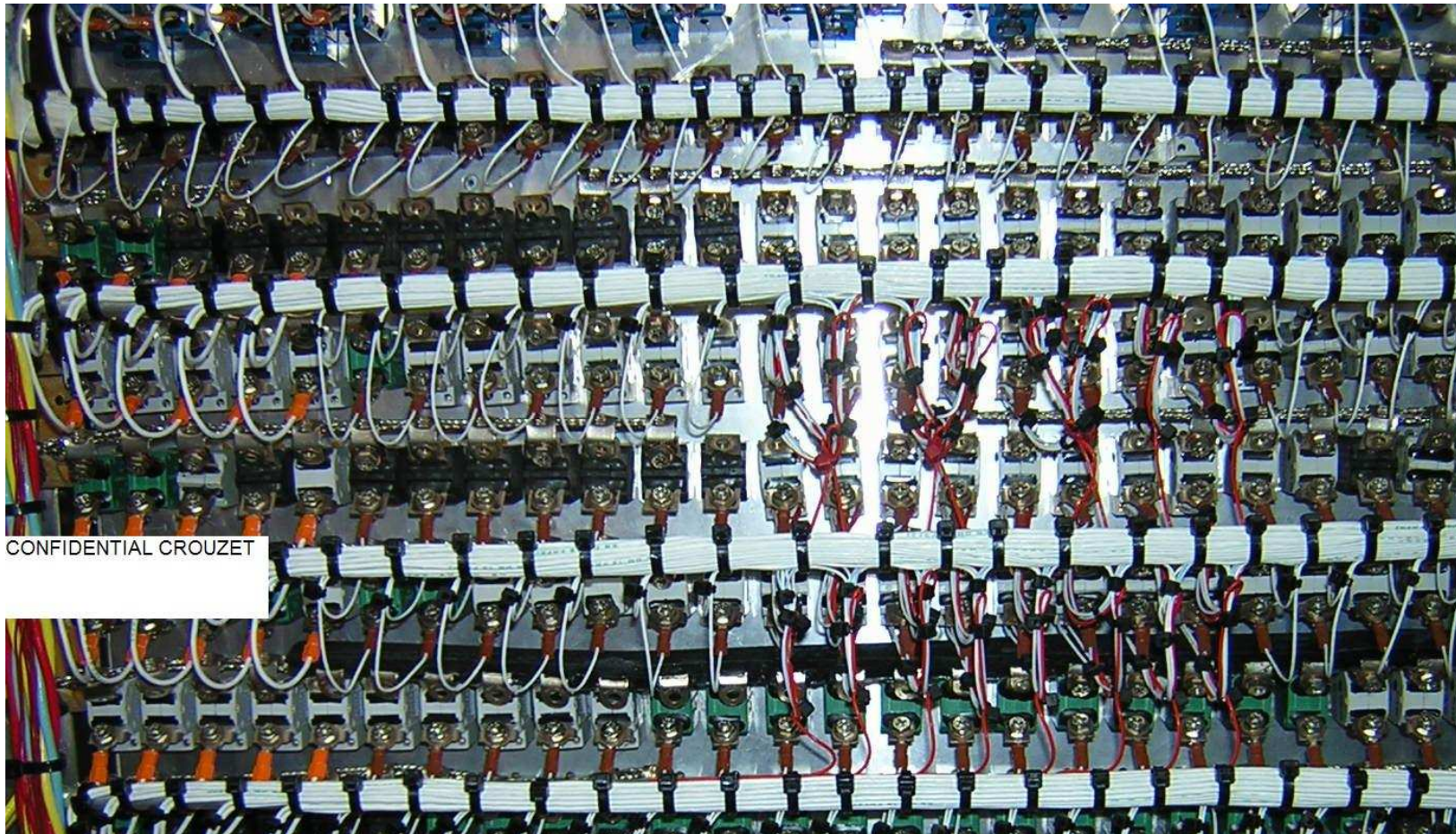


General aviation



Helicopter

- CB change inside a panel => Cumbersome

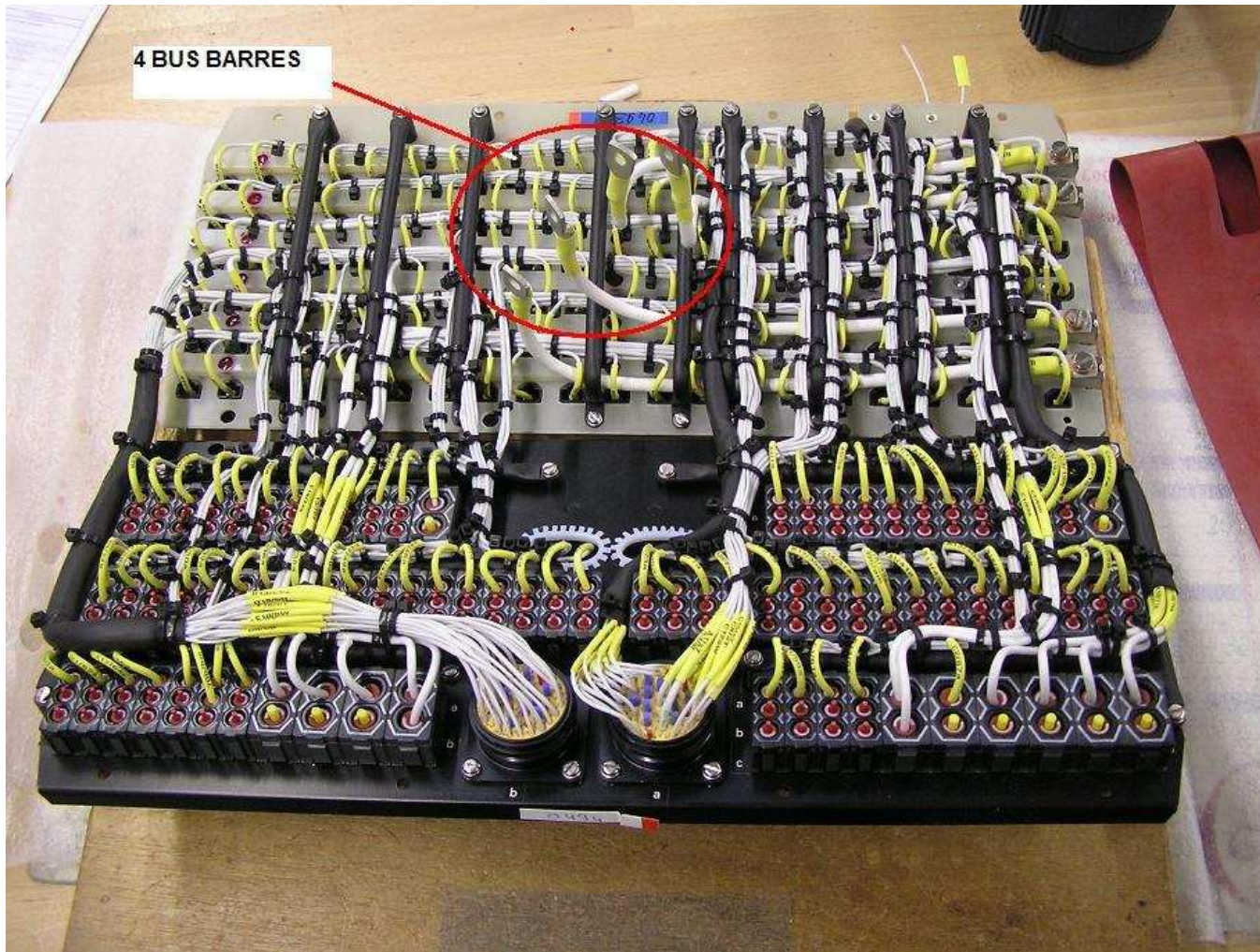


- Traditional circuit breaker panels are
 - expensive in wiring
 - need dedicated test benches
 - not easily re-configurable
 - not very compact



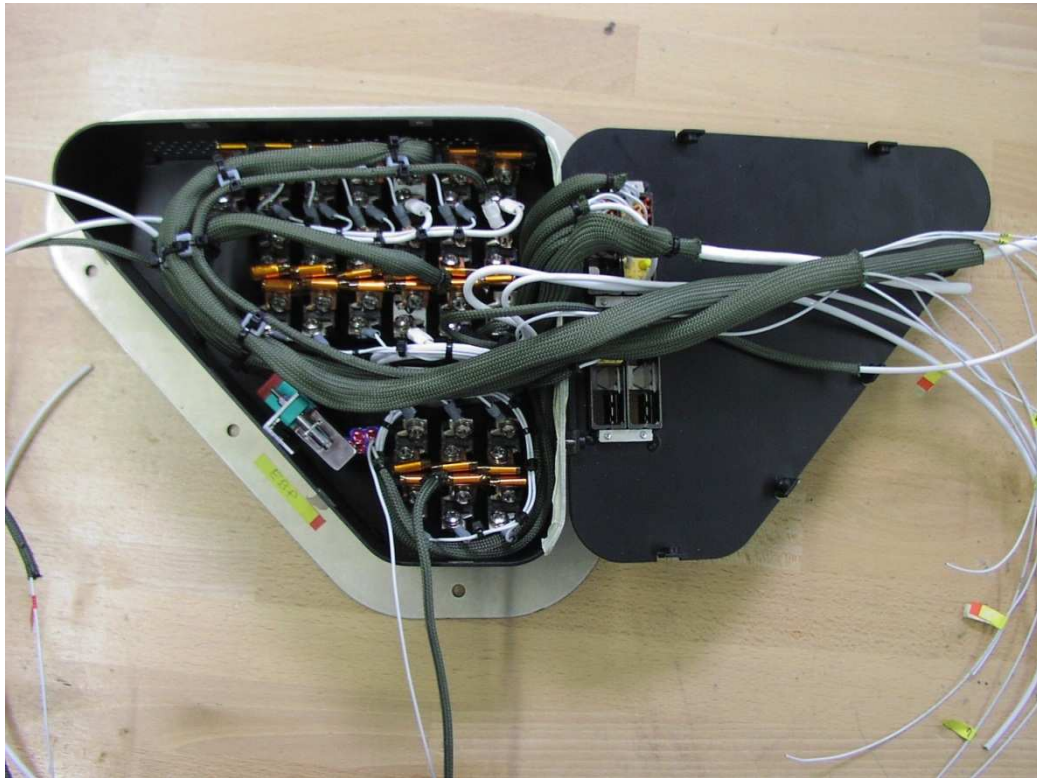
100 CB regional jet panel

- expensive in wiring (the bundles must be prepared)

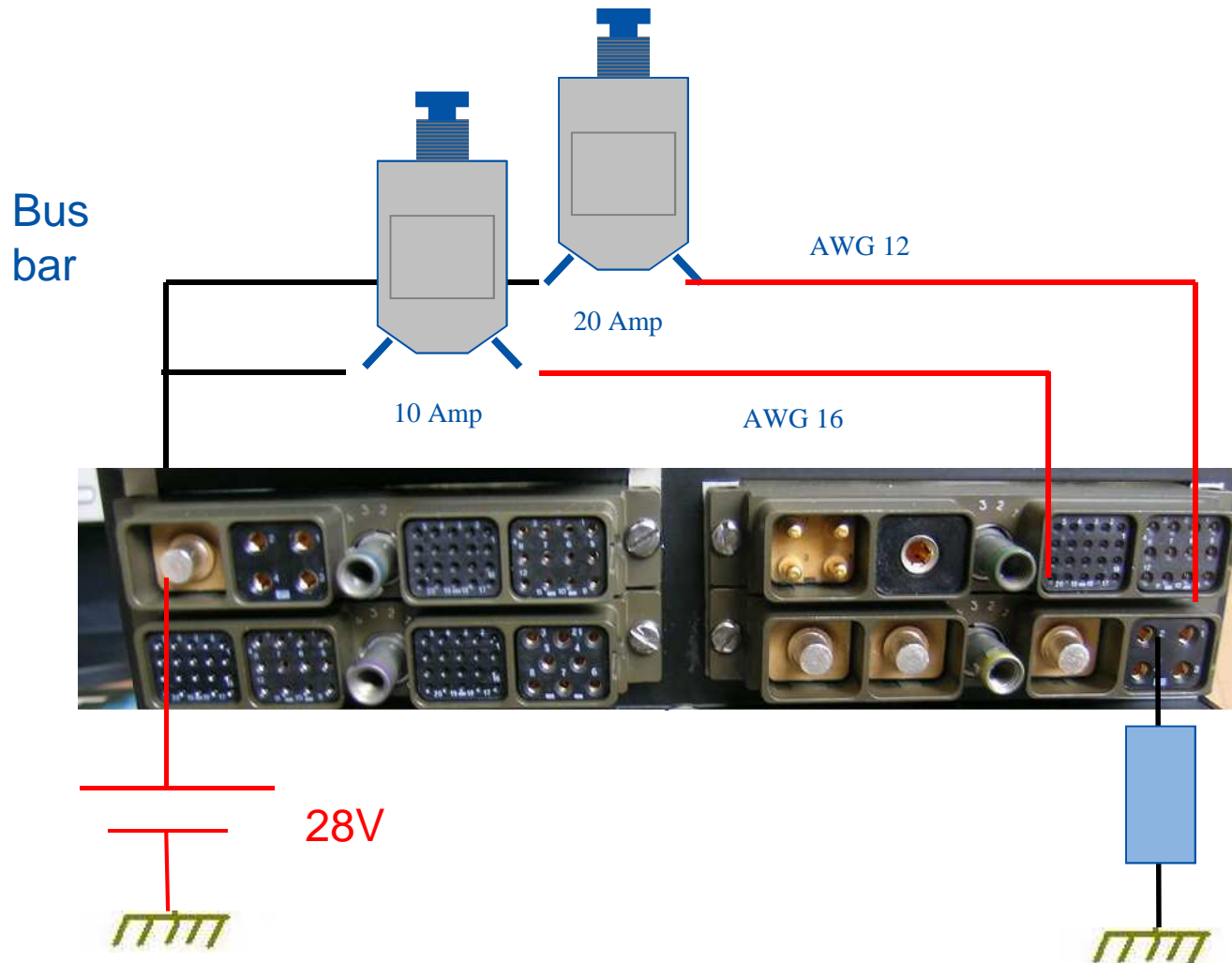


- Bundle &Harness preparation on a board with nails

The first bundles are manually assemble on the first prototypes



- Test bench measurements

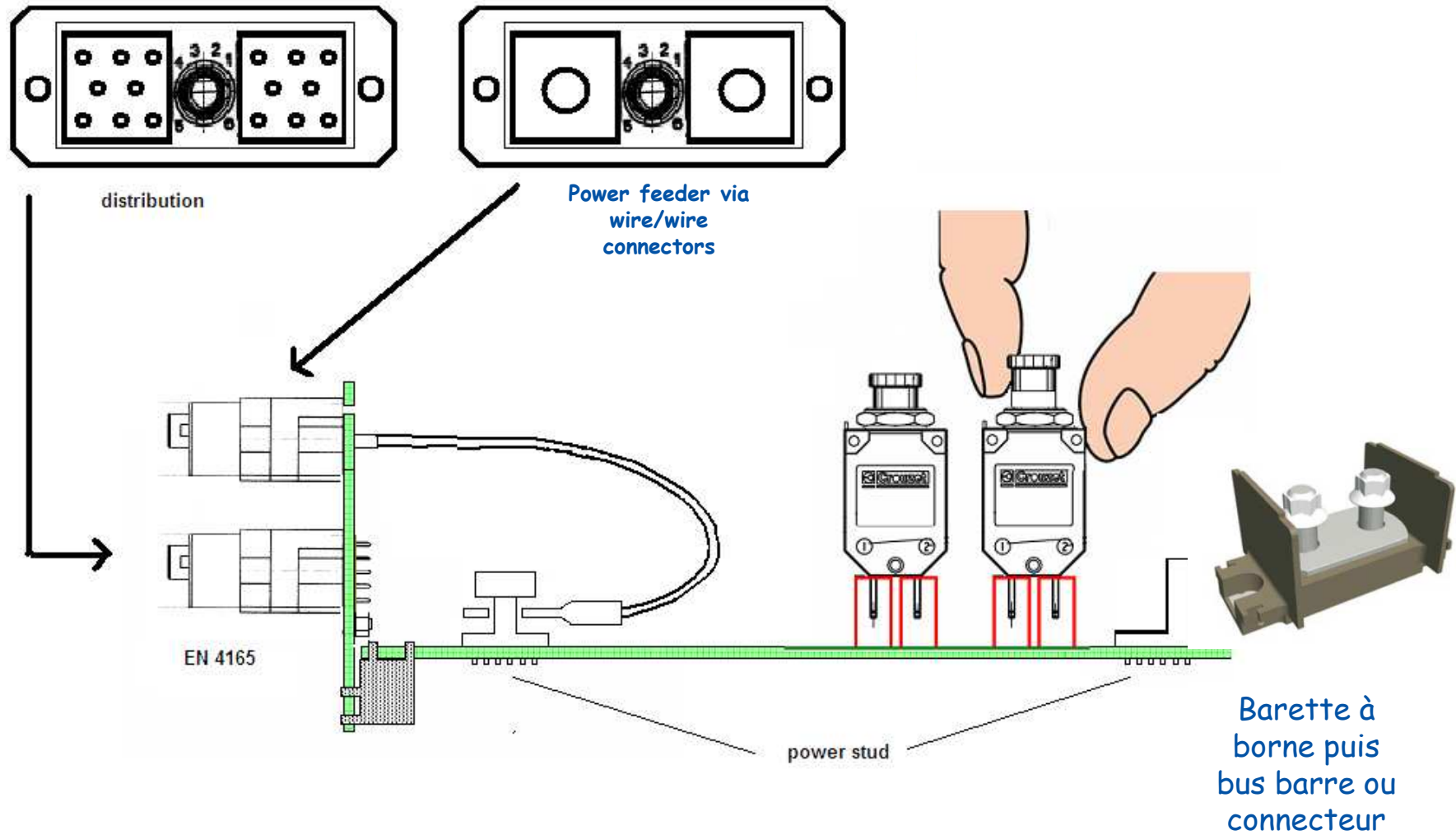


The EN 3773-006 « FAST INSERTION CB »:

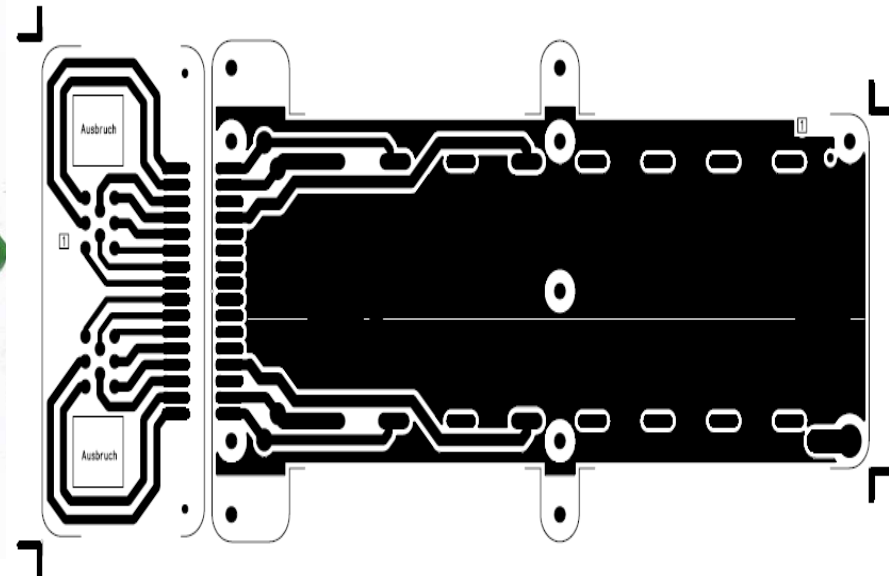
body < 15g

One faston < 1,5g

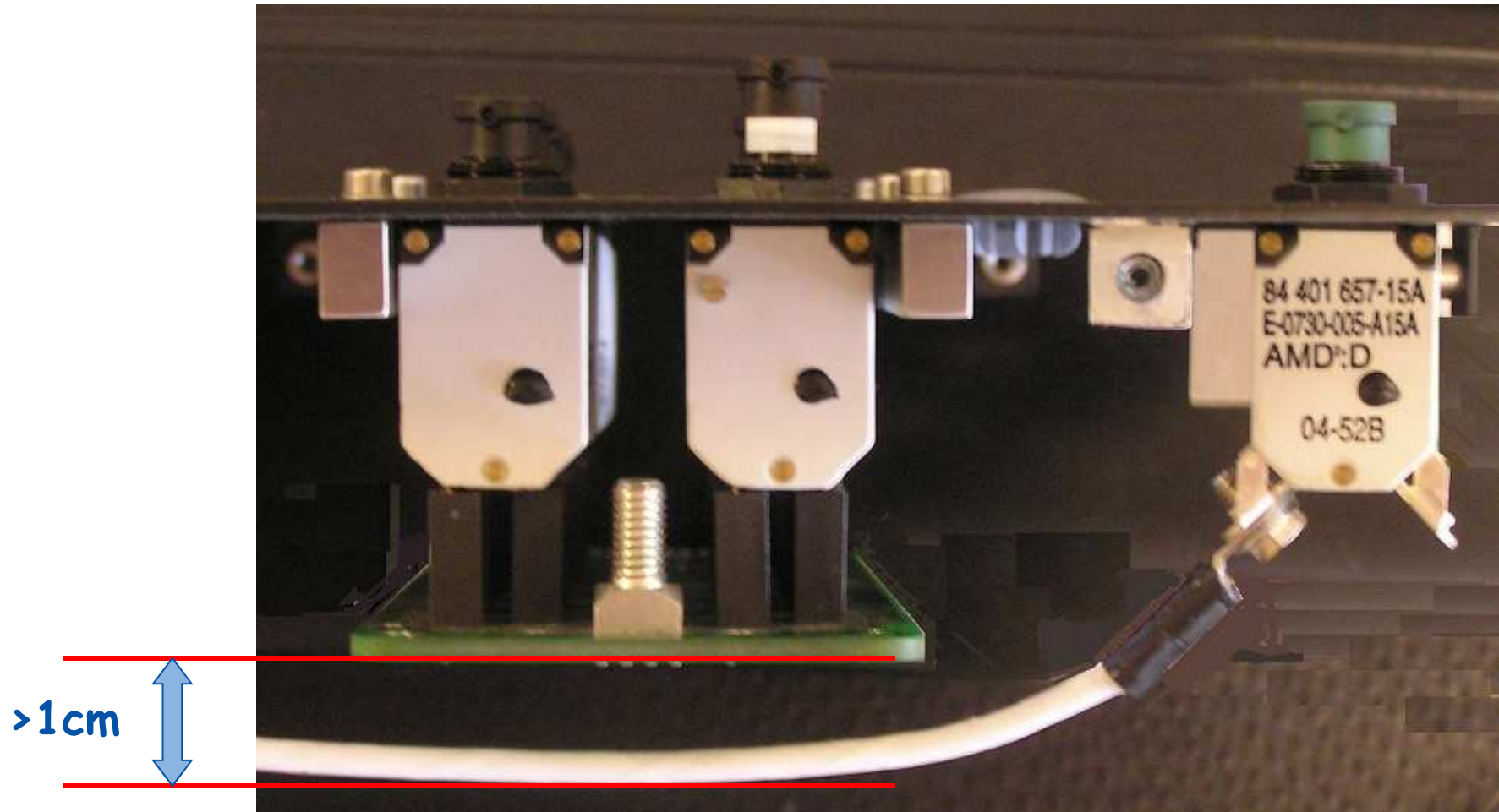
CB+2 receptacles < 18g



- Wiring is replaced by PCB tracks



Weight can be gained by compactness





CB panel with printed circuit board (PCB)

- Test bench is replaced

at PCB manufacturing level by an equipotential test
after panel assembly by a camera

- Circuit breaker change is straightforward

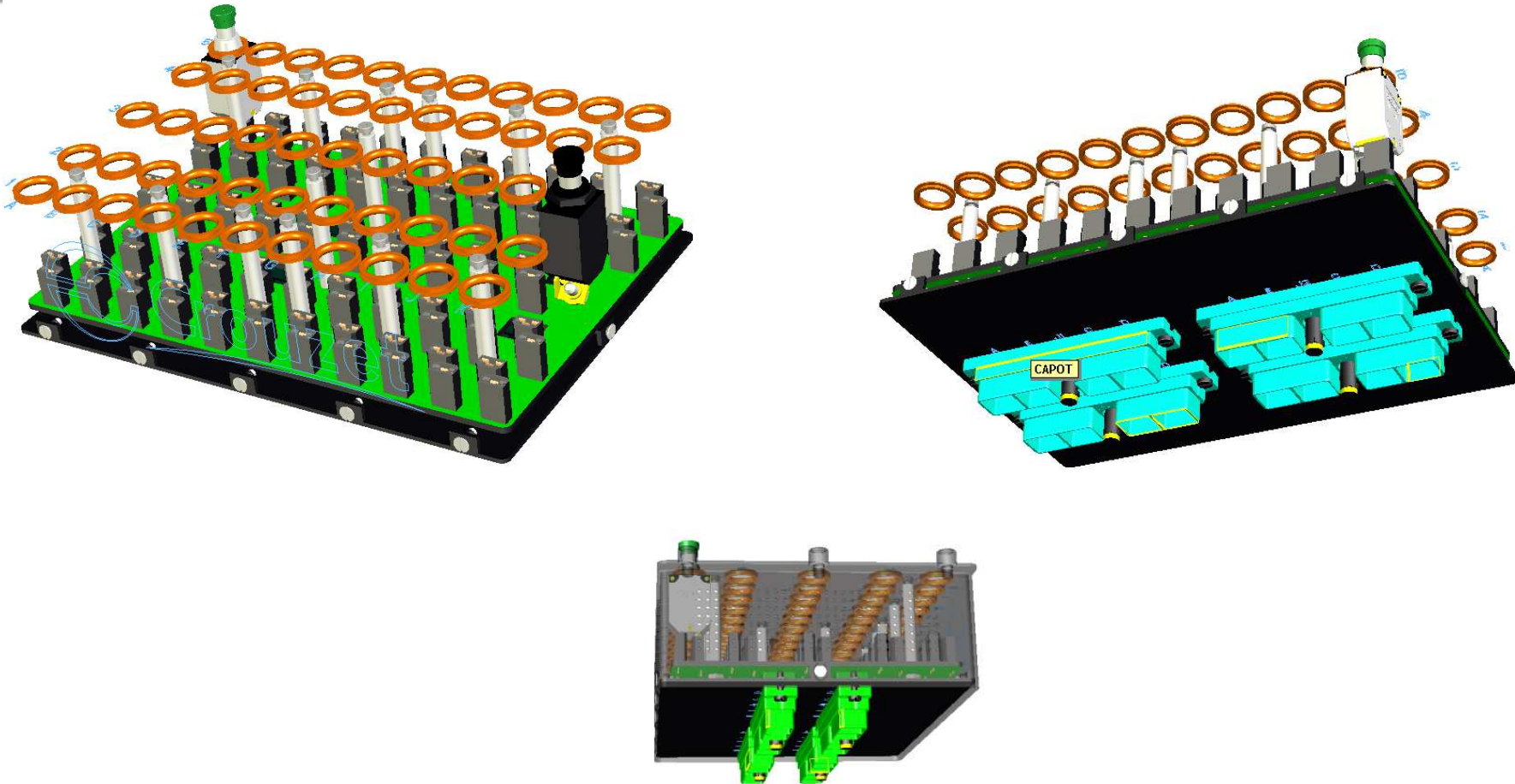
CONCLUSION

- less volume and weight than equivalent traditional panels
 - extreme quality (no human error repetitivity of the PCB and testing)
 - faster and cheaper development (little re-qualification required)
 - retarded circuit breaker rating definition
- Costs
- NRC are lower because there is no longer bundles definition
 - RC is the same because the PCB is costly
 - => trend is correct (labor cost vs machine cost)



CB panel with printed circuit board (PCB)

**REALISATIONS WITH THE NEW
STANDARD EN3773-006**



**Taylor made solution based on the standard :
the new Helicopter panel**

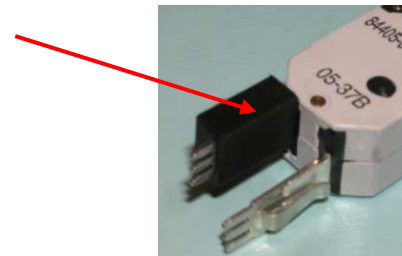
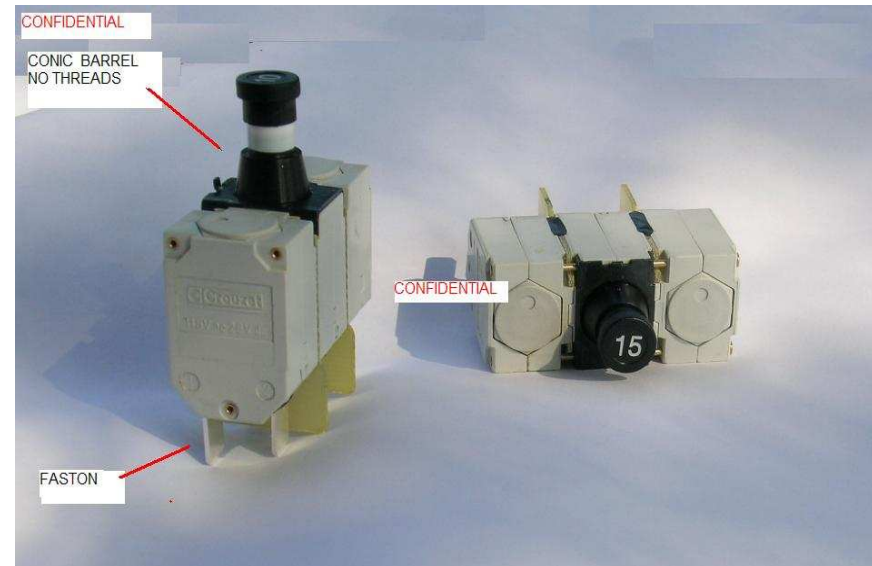
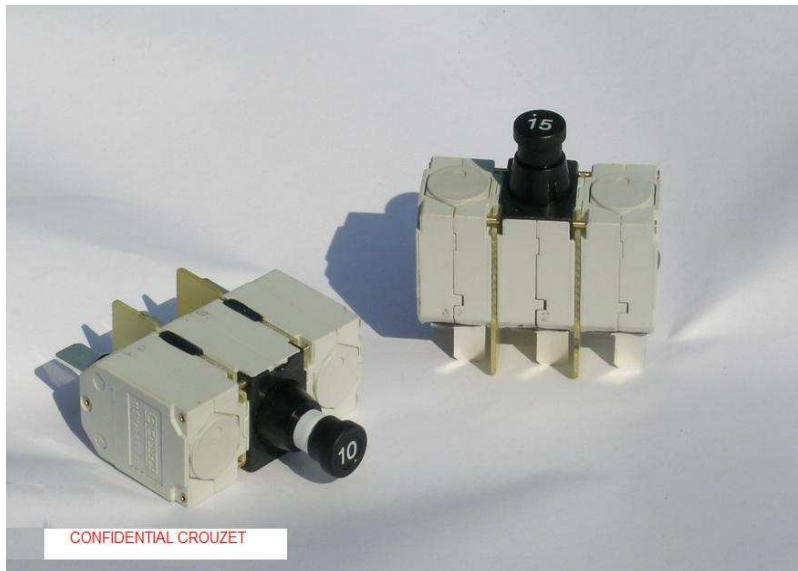


Generic solution for small aircrafts : The PCB kit

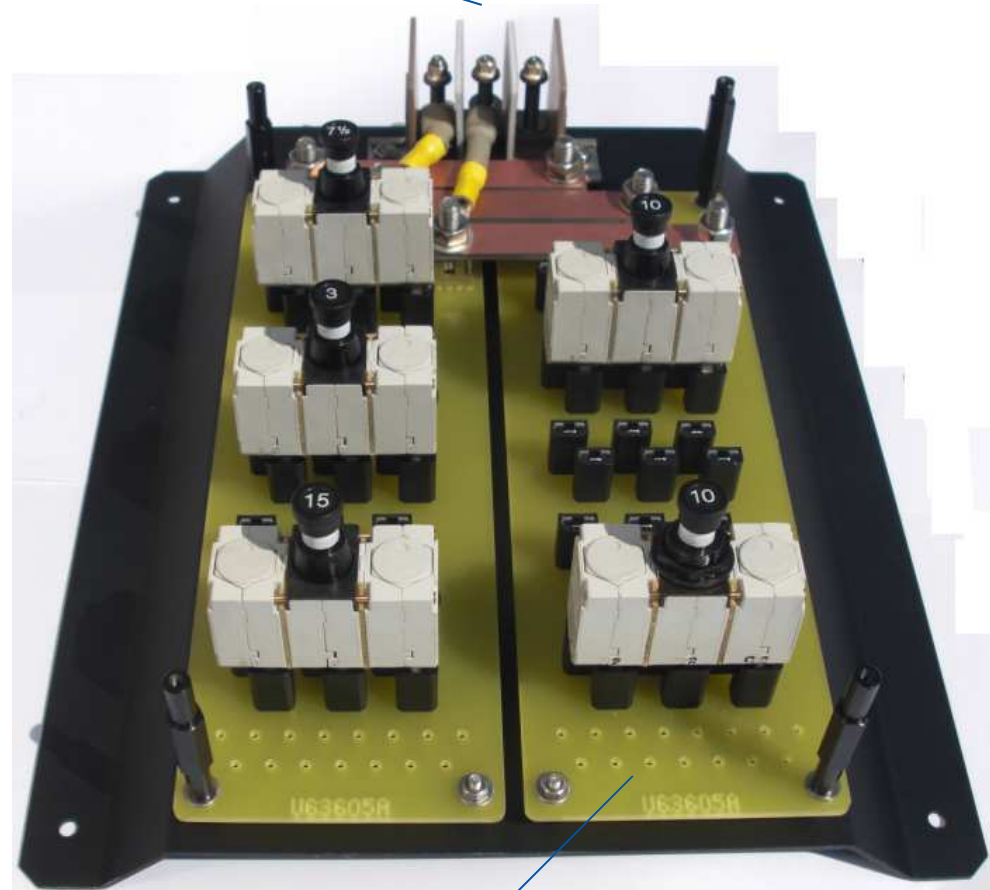
Benefits for the industry :

- Several suppliers for the CBs
 - Several suppliers for panels (less knowhow)
- ⇒ Competition brings more cost effective panels with higher quality

A Solution for
115VAC 400Hz exists



115 VAC Feeder



Distribution (to connectors & loads)



CB panel with printed circuit board (PCB)

Thank you for your attention

Questions?