

ELECTRICAL DISTRIBUTION

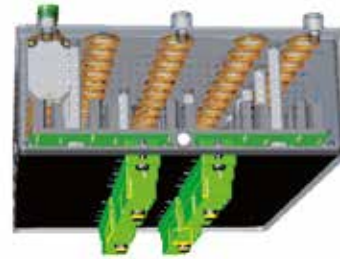
CIRCUIT BREAKER PANELS

SUPPLIER OF CIRCUIT BREAKER PANELS ON SEVERAL JET AND HELICOPTER PROGRAMS

Crouzet has extensive experience in the design, development and production of illuminated and non-illuminated Circuit Breaker panels in Push/Pull or Push/Push versions, wire or PCB-FASTON version.



100 CB regional jet panel
(wire + casing)

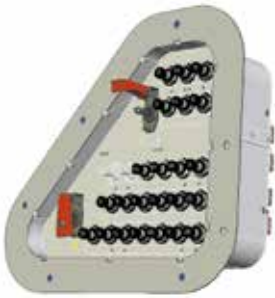


55 CB search and rescue helicopter panel
(PCB + casing)

OUR KNOW HOW

As a manufacturer of CB panels we will optimise your needs:

- › Geometry, connection and mounting as specified by your requirements and constraints
- › Customised marking of the front panel
- › Labelling of Circuit Breaker functions by engraving or easily-modified labels
- › Reduced weight due in part to our specially developed light weight Circuit Breaker and busbars
- › Expertise in mechanical and thermal limits (wire gauges, suitable sizes for Circuit Breakers, optimum distribution of Circuit Breaker, ...)
- › Expertise in busbars and connections with all the safety requirements (segregation, protection, ...)
- › ATP performed by automatic test benches

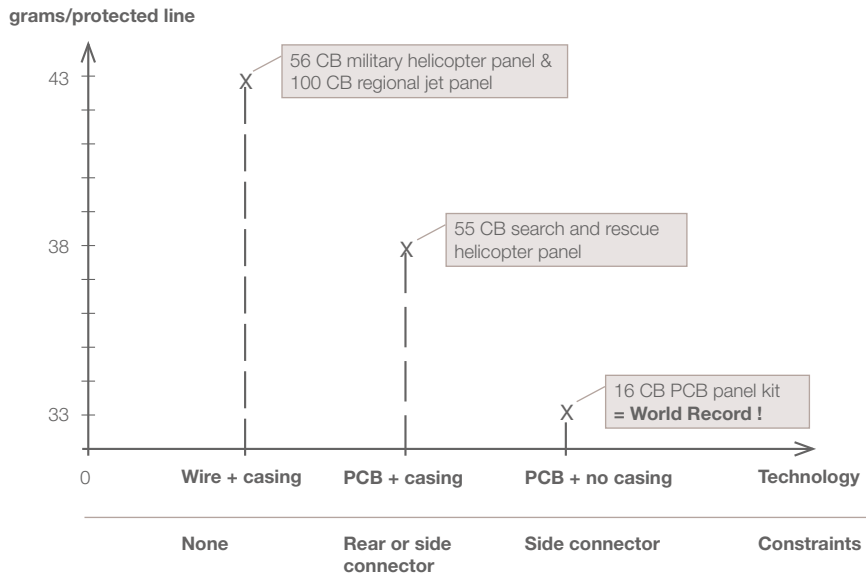


25 CB offshore helicopter panel
(wire + casing)

PREDICTABLE PANEL MASS FOR PANELS CONTAINING ONLY CBs



56 CB military helicopter panel
(PCB + casing)



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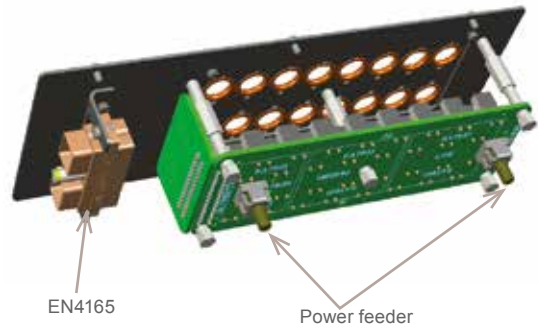
THE «DO IT YOUR SELF» KIT & BUS BARS

THE KIT:

Crouzet is the first company to invent the concept of «do it yourself» Circuit Breaker panels and with this technique, it has created the **lightest extractible Circuit Breaker panel in the world!** The concept is based on a generic PWB carrying 16 Push Fit CBs that you can duplicate (if several bus bars are needed or if more Circuit Breakers are needed).



The «Do it your self» kit



KIT CONSTITUTION

The kit is composed of spacers, a PCB board, FASTON Circuit Breakers, and positioning rings. The front plate is compatible with accessories (Circuit Breaker gags and obturators).

WORLD RECORD

The above kit assembly conveys 150 A at 71°C, it weighs 528 g with 16 Circuit Breakers and thus gives a panel efficiency ratio of 528 g=33g/CB → a world record!

PREQUALIFICATION

To reduce development time the kit is qualified to harsh environment.

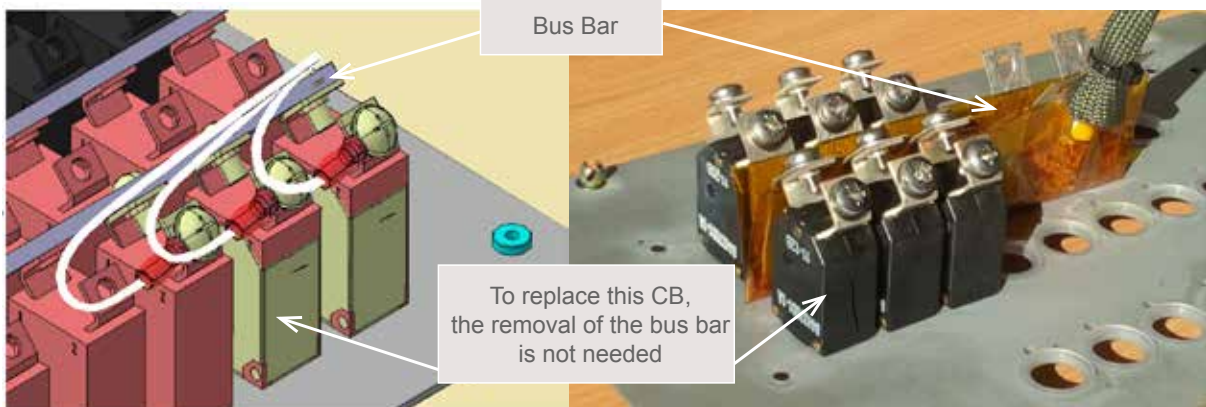
The use of the panel or its sub-sets enables the quick fielding of a qualified solution. If the assembly recommendation and Circuit Breaker locations are respected, Crouzet guarantees the electrical and vibrational behavior of the kit:

- › Temperature and electrically from -55°C to 71°C with a 100% utility factor (150 A output)
- › Vibrations: Random and Sinusoidal rays (Harsh Helicopter Level)
- › Crash, fungus, sand and dust.

BUS BARS:

Traditional bus bar (rectangular)

Crouzet bus bar (flexible)

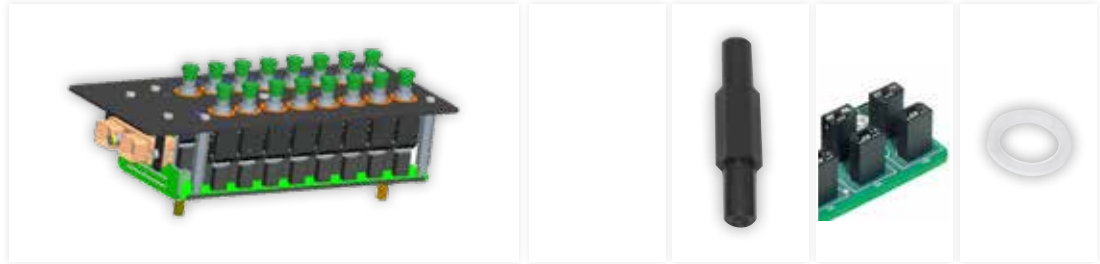


Use of frog legs CB (45° or 60°) is necessary

The flexible bus bar is compatible of many CB families

CIRCUIT BREAKER PANEL KIT

PANEL KIT FOR PUSH-FIT 6.3 MM BLADE CB



Read also page 15

REFERENCES

	complete panel	PCB	Right angle 90°	Spacers	Straight 180°
complete panel large	84 341 641				
complete panel small	84 341 640				
spacer				79 219 431	
receptacle					25 579 113
centring grommet			Air LB		
EN 4165 connector support			79 219 440		79 219 333
PWB with 32 receptacles		79 219 439			
front plate			79 219 441/42		

Spacer kit

5 spacers	
16 grommets	79 219 443
32 receptacles	

Connection possibilities

- EN4165 (2 modules of 8 size 16 pins) with pins soldered on the vertical PCB
- EN4165 (2 modules of 8 size 16 pins) held by 79219440 with crimped contact pins
- Flying leads soldered on the vertical PCB

Circuit Breaker type

Faston without auxiliary contact	84 408 0xx
Faston with auxiliary contact non polarised	84 408 8xx
Faston with auxiliary contact polarised	84 408 6xx

Weight (g)

Without standard CB (only mechanical panel)	< 351
Panel with 16 Circuit Breakers	< 528
MTBF FH (Typical)	> 60 000

GENERAL CHARACTERISTICS

Electrical

Vehiculated current	15*4+6*10+6*5=150 A	from -60°C to 71°C
Vehiculated power	150*28=4200 W	
Prospective current (blocked mechanism)	1800 A	28 VDC (no copper tracks destruction)
Dielectric	500 VDC between 2 copper tracs and between each track and power feeder	

Mechanical

	torque (max) N.m
Power stud (M6)	3.9
Every screw/spacer (M3)	2
Locktite	on every screw/spacer (not on power stud nut)

Environmental

DO160 section	Test	category	method
4	Altitude		similarity
5	Temperature	from -60°C..71°C (with power)	test
6	Humidity		test
7	Crash	MIL STD 810E 80 ms 1/2 sine (20 g on all axes)	test
8	Vibration	MIL STD 810E helicopter random wide band+ sine strips	test
9	Explosion proofness		demonstration
10	Waterproof		N/A
11	Fluids		N/A
12	Sand and dust		similarity
13	Fungus resistance		no tested
14	Salt spray	48h no power + 48h dry	test
15	Magnetic effect		demonstration
16 → 23	EMI		N/A
25	Inflammability	FAR 25853	demonstration

HOW DOES IT WORK?

The assembly is qualified and distributes securely up to 150 A under 71°C with a configuration carrying four 15 A, six 10 A and six 5 A Circuit Breakers (thus a total of 16 CBs).

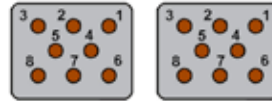
The distribution connector can be mounted on the vertical PCB or distribution leads can be soldered on the vertical PCB.

› If leads are soldered directly on the vertical PCB, the maximum currents are:

Red zone: 15 A max
 Yellow zone: 10 A max
 Green zone: 5 A max

Max output:
 $4 \times 15 + 6 \times 10 + 6 \times 5 = 150 \text{ A}$

› If EN 4165 is soldered and used with leads the size 16 pins limit the current to 13 A:

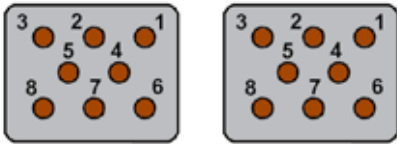


Max output:
 $4 \times 13 + 6 \times 10 + 6 \times 5 = 142 \text{ A}$

PIN TO CB AFFECTATIONS

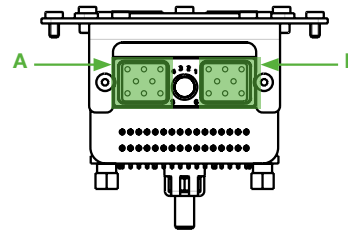
EN4165

Layout 0816: 8 contacts size 16 x 2



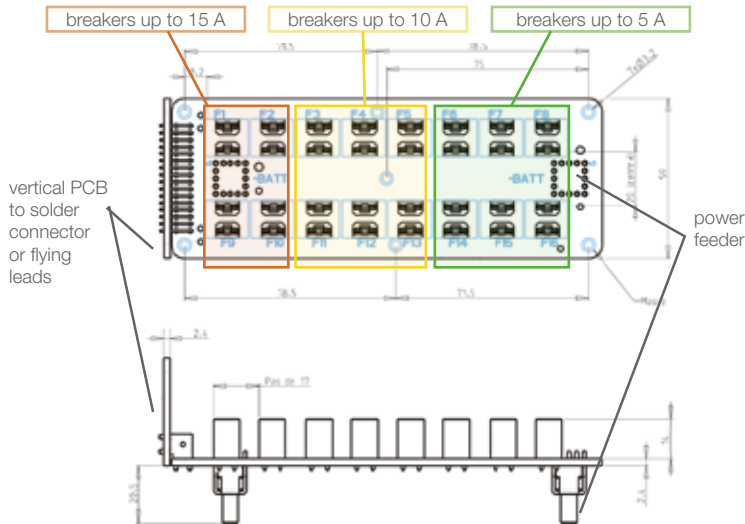
Module A	CB#
1	F6
2	F2
3	F1
4	F7
5	F3
6	F8
7	F5
8	F4

connector EN 4165 8T16

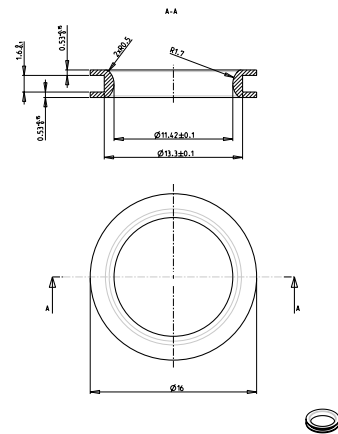


Module B	CB#
1	F9
2	F10
3	F14
4	F11
5	F15
6	F12
7	F13
8	F16

DIMENSIONS AND SPECIFIC ZONES FOR CB RATINGS

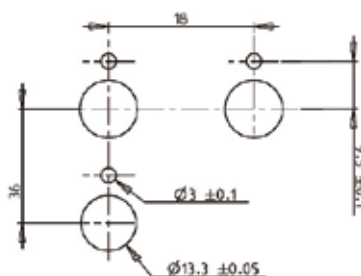


CENTRING GROMMET



PANEL CUTOUT RECOMMENDATION FOR CB 84 408 XXX FAMILY

› Required panel thickness for centring grommet 79219333: 1.6 mm



84 408 0

