CASE STUDY

Circuit Breakers - In Theatres

Hydraulic-magnetic circuit breakers eliminate the effect of ambient temperatures in confined spaces

The obvious solution

The Q Range of hydraulic-magnetic circuit breakers in mini-rail and DIN versions from 1 - 63 Amps

SUPERIOR PRODUCTS THROUGH EXPERIENCE

INTRODUCTION

Ever since miniature circuit breakers replaced fuses in stage/theatre lighting control panels, designers have been grappling with the problem of the heat build up in these enclosures creating a need for the derating of the circuit breakers.

THE PROBLEM

The problem the stage and theatre lighting designers had was that they had to over rate the thermal magnetic breakers by as much as 50% to allow for the effects of the mutual influence the breakers had on each other. This problem was further aggravated by the fact that different circuit breaker manufacturers use different calibration reference temperatures.

It is seldom that one finds the same characteristics in two different makes of miniature circuit breaker which have the same tripping curve.

This meant that parameters selected for one circuit breaker manufacturer were not necessarily correct for another manufacturer. As long as all the circuits were simultaneously loaded and there was sufficient heat generated to derate the breakers, they would offer reasonable protection to the individual cable circuits feeding different banks of lighting.

THE SOLUTION

CBI helped to solve the problem with their range of hydraulic-magnetic circuit breakers which always carry 100% of rated current and always trip within the predetermined percentage of their rated current, irrespective of the ambient temperature conditions.

Not only could the stage and theatre lighting engineers solve their protection problems, but they were able to design their control panels 30% smaller, because the CBI hydraulic-magnetic range of miniature circuit breakers are only 13mm wide compared to the 18mm standard DIN range. Furthermore no increase in the cable/wire cross section was necessary.

The unnecessary risk involved with derating of the breakers could be eliminated. The hydraulic-magnetic breakers would perform in accordance with the laid down tripping curves irrespective of the ambient temperature in the enclosures.

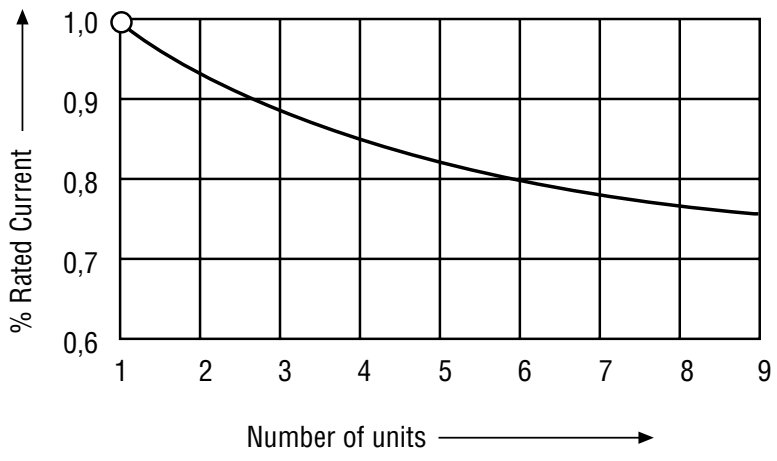

Fig. 1: A typical example of mutual thermal influence in the case of simultaneous loading of thermal magnetic MCB's mounted side by side

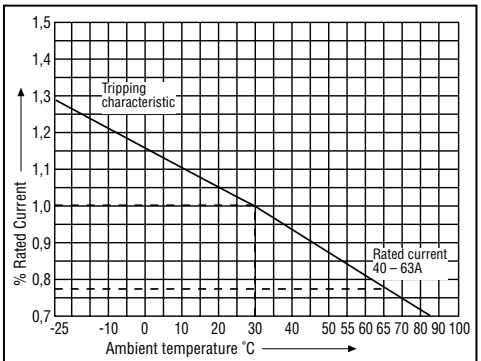

Fig. 2: Typical current carrying capacity of thermal magnetic MCB's as a function of ambient temperature

BENEFITS TO THE CUSTOMER

The key benefits of this product are:

- No over-rated cables
- No nuisance tripping caused by high ambient temperatures
- Trips to mid-point
- Immediate reset after fault has been cleared
- No ageing or deterioration of sensing mechanism which is hermetically sealed
- UL approvals
- 10 year warranty
- Compact in size (only 13mm wide)

CUSTOMERS COMMENTS

The customer who is based in Germany said that they were pleased to be able to solve this problem after so many years of complicated calculation to ensure the system was adequately protected.

It's so simple and accurate now with no more margin for error. And the added bonus is the extremely small size of the circuit breakers.

For more information on the wide range of Q Range & other hydraulic-magnetic products, please contact Circuit Breaker Industries Inc. on 610-524-9949 or visit our website at www.cbibreakers.com

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