

## PAUWELS SLIM® TRANSFORMER GIVES PEAK PERFORMANCE

“A zero-fault electrical system is an absolute must on this mountain-top site”, says Mr. Emerick Desvaux, operations manager of the installations on the Aiguille-du-Midi high-altitude platform at Chamonix, France. “Up to 5000 people a day visit the platform, which is at 3842 metres, so public safety is vital. Also, the site is of national importance as a communications centre, because Télédiffusion de France’s television and radio transmitters serving the whole of south-eastern France are located here, as well as several military and police

transmitters. These were the prime factors we took into account when choosing transformers for the refurbishment of the electrical installations at this 50 year-old site. The limited space on the platform was also important.”

The Aiguille-du-Midi (= Needle of the South) is the next-door neighbour of Mont-Blanc, Europe’s highest mountain. Compagnie du Mont-Blanc, which operates the site, selected consulting engineers KW Industrie, of Grenoble, France, to plan its recent refurbishment, write



### Technical description:

Power rating	250 kVA
Voltage	HV = 15 kV LV = 400 V three-phase
No-load losses	650 W
Load losses at 75° C	3250 W
at 110° C	3700 W

### Dimensions, including LV cable box and roller base + wheels:

Length	0,985 m
Width	0,765 m
Height	1,5 m
Mass	1060 kg

### Application:

- 250 kVA transformer installed on a mountain-peak platform at 3842 metres, serving radio and television transmitters of national importance.

### Requirements:

- Safety in use.
- Reliability, extended lifetime.
- Ability to withstand violent atmospheric discharges.
- Overload potential.

### Configuration:

- Step-down SLIM® transformer with NOMEX® brand paper insulation, and silicone liquid, representing a homogeneous high temperature insulation system according to new IEC 60076-14.



250 kVA Pauwels SLIM® with DuPont™ NOMEX® thermal technology.

specifications for the new equipment, and supervise the installation work bringing the medium-voltage (15 kV) electrical installations on the platform up to modern standards.

A 250 kVA Pauwels SLIM® with NOMEX® thermal technology and silicone liquid coolant, and two 400 kVA Pauwels dry-type units with conventional technology, were installed on the platform, replacing PCB -filled transformers. "We originally planned to install three dry transformers

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of conventional design", says Mr. Jean-Pierre Bresson-Lavigne, head of KW Industrie. "The smallest Pauwels transformers with NOMEX® insulation available until then were about 1 MVA. These were developed mainly for installation in wind-turbines. Then the 250 kVA SLIM® unit became commercially available when work was already under way, and with Compagnie du Mont-Blanc we decided to install this new type."

"Lightning strikes are, technically speaking, our main concern", says Mr. Desvaux. "At high altitudes, lightning is both more frequent and more intense than near sea level. Violent atmospheric discharges can severely damage both dry-type and conventional liquid-filled transformers, or at least shorten their working life", he explains.

Pauwels SLIM® transformers are also ideal for high-altitude locations, being less vulnerable to electrical discharges, because NOMEX® insulation is more resistant to overloads, including lightning, and because silicone liquid dielectric is chemically more stable than conventional mineral oil. "In due course, we shall probably exchange the two dry-type transformers already installed for two more SLIM® units", says Mr. Desvaux. The two dry-type transformers supply heating, lighting, kitchens and other ancillary services on the platform.

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The Pauwels SLIM® transformer with NOMEX® technology was installed in May 2004. "Since then, it has given faultless service", Mr. Desvaux adds. Pauwels SLIM® transformers offer economic, technical and environmental advantages.

- The NOMEX® insulation's high-temperature resistance improves reliability and gives greater overload potential, ensuring long service life.
- With NOMEX® thermal technology and silicone liquid dielectric, transformers can be made smaller and lighter.
- No-load losses are lower than with alternative technologies.
- Use of silicone liquid as dielectric ensures good fire resistance and environmental friendliness.
- Their compact size and optimised design means less material usage overall (copper, steel, insulating material, silicone liquid). At the end of a transformer's service life, disposal of these materials poses no difficulties or hazards.

In the SLIM® range, Pauwels' skills in transformer design and manufacturing come together with DuPont's know-how and experience in high-grade insulation with NOMEX® thermal technology solutions. With this technology, plus use of silicone liquid as dielectric, transformers can be made compact, yet safe in operation and highly reliable.

**Product safety information is available upon request.**

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