



Free cooling in the extreme cold

BTS sites in Norway are blessed with ideal temperature conditions for utilising energy-efficient free cooling to remove excess heat. However, the cold is not entirely a blessing, since the winter season creates serious challenges with severe snow, frost and limited access.

Norwegian Telecom operators were looking for an energy-efficient, reliable way to remove heat from their BTS sites. Traditional free cooling, was ideal in principle, since the ambient temperatures of this region are almost always lower than the internal temperature set point. However, the solution also led to a series of challenges to be considered.

Dantherm developed a customised free cooling solution capable of withstanding these harsh conditions – a solution now installed at more than 2000 sites in Norway.

Main challenges: Location and climate	Units: Overall reliability – maximum efficiency
High heat load Site specific installation requirements Cold “bridge” from cooling unit into the site	The Dantherm TKS 60 is a flexible, high-capacity free cooling solution enclosed in an extra rugged, insulated cabinet designed for indoor and outdoor installation. This creates a unit capable of handling high heat loads and withstanding the extreme cold conditions on location while offering flexible mounting methods. The outdoor unit air intake is protected by a snow hood designed for this solution.
Obstructed air path due to heavy snow	The Dantherm TKS 60 (indoor version) is designed with air inlet through the bottom of the unit. The entire shelter is elevated to create space underneath the floor, ensuring obstruction-free air intake from beneath. Also, the risk of total air path blockage is minimized, since even heavy snowfall usually only covers the shelter in part and thus always leaves an open air path somewhere under the construction.
Transmission equipment shutdown below 5°C	The original solution to this problem was an installed heater. Dantherm added a motorized damper and connected both items to the intelligent Dantherm controller designed for complete climate control. If the ambient temperature is too low to be added to the shelter, the Dantherm controller protects the transmission equipment and maintains set temperature by closing the damper and activating the existing heater.
Limited access during the winter season, reliability and 100% uptime	Being a DC-based passive cooling solution, the TKS 60 maintains stable operation on battery backup. Furthermore, the solution is ready for Dantherm remote climate control and is built to last for a minimum of 10 years. All of this adds up to a solution which needs a minimum of maintenance and requires few service visits.

