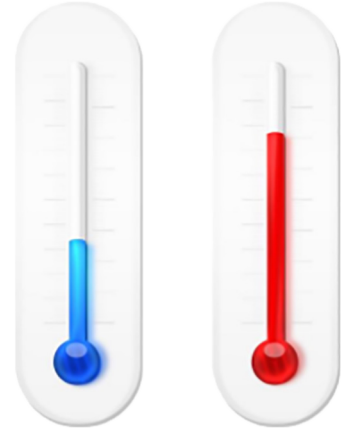




# OPERATING TEMPERATURE RATINGS

The specified temperature rating for Emphatec's VANGUARD®, SIGNEXT®, DEPRO® and DC PLUS® products is the range over which the product operates within specified parameters, e.g. accuracy, response time, minimum and maximum voltage, etc., and/or meets regulatory requirements.

Maximum operating temperatures refer to the maximum ambient temperature and are often determined by the product certification process. The combination of ambient temperature and the temperature rise above ambient caused by power dissipation within the components must not exceed the rating of the component as well as maximum temperatures specified by CSA, UL or other approval agencies.



The minimum operating temperature is not a concern to the approval agencies so it is based on component ratings as well as the parameters mentioned above. Many modules rated for -20°C or -25°C will operate at -40°C but may not meet the published accuracy specifications. This is the case with SIGNEXT® analog signal conditioners. They still provide isolation at -40°C but the accuracy suffers.

Many modules will operate at -40°C but cannot be installed or removed from the DIN rail at those temperatures as the plastic used in the DIN rail mounting foot is brittle and would likely break.

With regards to the DEPRO® Class 1 Division 2 rated modules, a -40°C ambient temperature does not impact the C1D2/Zone 2 rating but operating the disconnect mechanism on the QTD modules, disconnecting/connecting the plug and socket connectors on the fuse monitoring or optocoupler modules or handling the fuse covers on the "FM" modules is not recommended due to brittleness of the plastic. .

DC PLUS® power supplies will operate at -40°C but may not turn on under full load, or even partial load, at that temperature. This is due to the characteristics of electrolytic capacitors at low temperatures. If the power supply is turned on at a higher temperature and then the ambient drops to -40°C they will continue to operate properly but if switched off at -40°C they may not restart until the ambient temperature increases.

Beware of claims of a -40°C rating for electronic products, particularly switchmode power supplies – an operating rating is not the same as a turn-on or cold start rating.