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Issue No.: 06/02
Date: 26th September 2002
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Subject: REVERSE CYCLE HEATING IN LOW AMBIENTS
Units: OSA/ISD, OPA & PA UNITS

Heat pump units are designed specifically to operate in heating mode in low outside ambient conditions but do still have some limitations with regards to the indoor conditions.

For a heat pump to operate satisfactorily the air temperature on to the indoor coil must be sufficient to produce a reasonable condensing temperature and system pressure.

Our pamphlet performance data presents a range of indoor temperatures between 15°C and 25°C, and while this is not absolute, we strongly recommend that units are not operated outside of this range without consultation with temperzone Engineering.

Above 25°C there is a risk of high condensing pressures tripping the High Pressure switch especially if the air flow is at the lower end of the unit's range.

Below 15°C there is the risk of not developing sufficient pressure to ensure the refrigeration system works properly and efficiently, especially if the air flow is at the upper end of the unit's range. This can easily lead to TX valves not metering properly and distributors not feeding evenly to the coils resulting in extreme icing of the outdoor coils. Prolonged operation in this condition can cause liquid slugging and the resulting compressor damage from oil being washed out of the crankcase.

The most likely scenario is the coincidence of low outdoor ambient temperature and low indoor temperature as would occur during early morning start ups and for this situation we recommend:

- (a) The fitting of electric boost heating and low ambient thermostat. The heating would operate for ambients below 2°C to boost the unit's performance and help to speed up the warm up period in start up situations. While there is no definite limit, we generally suggest the fitting of boost heat to any system operating in ambients 2°C and below.
- (b) A warm up cycle where all the fresh and exhaust air dampers remain closed until the space temperature and/or on coil temperature is well above 15°, preferably 20°C.
- (c) Night set back where the equipment continues to operate during the night but at a lower temperature than normal in winter, conversely higher in summer. We suggest no lower than 15 - 16°C for the winter night set back.
- (d) Stopping the indoor fan during the de-ice cycle, essential in this situation if no boost heat is fitted. Most of temperzone units will allow the option of stopping the indoor fan. Not so important if boost heat is fitted and there is more than one compressor/system with separated de-ice cycles.