Transformer installation and temperature:

During transformer voltage and current conversions, losses (core, conductor and eddy current losses) generate heat. Therefore, it is possible to feel heat near transformers. For security reasons, standards have established maximum allowable temperature rises.

Temperature rise of a transformer enclosure can reach 65°C maximum. Combined with a maximum ambient temperature of 40°C, enclosure surface temperature may attain 105°C. Hotspot temperature inside the transformer can reach 180°C at full load. Given ambient temperature, operating temperature can reach 220°C. Transformer insulation system is based on average temperature rise of conductors, ambient temperature and hotspot. At maximum temperatures, the system must be capable of withstanding 220°C.

It is important to note that the core and the top of the enclosure can reach maximum allowable temperatures even at no load. This situation is completely normal and is caused by losses in the core due to the presence of magnetic field once the transformer is energized.

Adequate ventilation is mandatory in order to control transformer temperature. When the transformer is installed in a confined area, proper ventilation will provide adequate ambient temperature. At all times, ambient temperature shall be less than 30°C nor exceed 40°C over a 24-hour period. Enclosure ventilation area is based on transformer KVA, heat losses in KW, height differential between inlet and outlet louvers and air temperature differential at inlet and outlet. Total area is designed to allow adequate ventilation of transformer and it must be kept free from any obstacles. No nearby object shall impede ventilation.

Recommendations on transformer location:
- Never locate transformer near a source of heat.
- Area shall be well ventilated.
- Clearances required by Electrical Code and applicable standards shall be met.
- Power and load cables shall not obstruct enclosure louvers.
- Ambient temperature shall never exceed 40°C during transformer operation nor 30°C over a 24-hour period.
- Ensure regular maintenance to prevent louvers and transformer from being covered with dust.

Should you require additional assistance do not hesitate to contact us:

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TEMPERATURE LEVEL ANALYSIS

Top (centre)
Left
Centre
Right
Top of the core
Coil (2" from the top)

1
2
3